



# Apex Teton

## BEFORE YOU TURN ON THE AMP:

1. Make *SURE* you have the line voltage (the red switch on the back) set correctly for your area. 115V for 110/115/120V, and 230V for 220/230/240V.



2. Install the tubes as shown below. The sockets are the same so you need to make sure you put each tube in the right location. Otherwise, you will blow the amp's fuse, and probably one or more of the incorrectly installed tubes! The rectifier (5U4) goes closest to the transformers. The output tube (6080, 7236, 59978, 6AS7, etc.) goes in the middle. And the input tube (6SN7) goes on the far end, furthest from the transformers.



## **OPERATION:**

*Power* – You will see that there is a power switch on the back of the power supply, near the AC line input. And there is also a switch on the front of the amp, which is labeled “STBY” and “ON”.

The switch on the rear of the power supply removes all power to the amp. This does the same thing as unplugging the amp. You should turn off this switch before unplugging the amp, or if you plan to not use it for an extended period of time. Otherwise, you can leave this switch on.

When the rear power switch is on, a small “housekeeping” power supply is active inside the amp. You will see the “STBY” LED (green) on the amp is lit. In this mode, all power to the amplifier itself is turned off. The tubes are not heated.

When you move the amp power switch from “STBY” to “ON”, a power-up sequence begins. You will see the “ON” LED becomes illuminated, and the LEDs indicating the input and output selections light. At this point power is applied to the tube heaters and filaments to allow them to warm up. After about 30 seconds, the high voltage power supplies are activated. At about 60 seconds after turn-on, the output is enabled, and the LED at the ¼” output jack will light.

Moving the power switch back to “STBY” immediately disconnects the outputs and removes all power from the amplifier.

*Inputs* – The Teton has three sets of inputs. RCA connectors are provided for each input on the rear of the amp.

Which of the three inputs is fed to the amplifier is set by the “INPUT” control on the amp front – 1, 2, or 3.

*Output* – The Teton has three different outputs, provided on two sets of different connectors. On the amp front is a ¼” stereo unbalanced headphone jack. On the amp rear, there are RCA preamp outputs. All inputs and outputs are unbalanced (one side is grounded).

Which output is active is selected by the “OUTPUT” switch on the amp front panel. It has 3 positions:

- IEM – this provides an unbalanced output to the ¼” jack which is attenuated. A green LED at the jack will be lit. This output is appropriate for sensitive, low impedance IEMs.
- UNBAL– this provides a low source impedance unbalanced output to the ¼” jack.
- PREAMP – this routes the output to the preamp output jacks on the back of the amp.

## TUBES

It is possible to try tube types other than those supplied with the Teton. You can change the sound of the amplifier quite dramatically using different tubes. Following are some suggestions and warnings.

Note that whenever you change tubes in the Teton, you should allow time for the tubes to cool, both before removing them (or you may burn yourself!) and before turning the amp back on. In particular, tuning the Teton on with hot power tubes and a cold input tube stresses the circuits. It is safest to wait about 5 minutes after turning the amp off before turning it back on!

It is safe to change tubes when the power switch is in "STBY" – you do not need to turn off the rear power switch.

*Input Tube* – The Teton uses a 6SN7 dual triode as the input tube. This tube provides all the voltage gain in the amp. The Teton is normally supplied with a current manufacture, Tung-Sol branded 6SN7 made in Russia.

Any 6SN7 type can be used. The suffix – the letters after "6SN7" – denote various constructions and grades, but make no difference in terms of the electrical characteristics. So, 6SN7, 6SN7GT, 6SN7GTA, 6SN7WGT, 6SN7WGTA, etc. are all interchangeable. Similarly, the type 5692 is simply a military ruggedized 6SN7, so it is also interchangeable.

The European ECC32 and ECC33, although having a bit different characteristics, can be used.

Other tubes, even with the same base connections, should not be used. 6SL7, 6BX7, 6BL7 are examples of tubes that cannot be used here.

*Output Tube* – The output tube selection can have a large difference on the sound of the Teton. In some regards, it should be chosen depending on the headphones used.

The output impedance of the Teton is inversely proportional to the transconductance – gm – of the output tube. There are a number of dual triode power tubes that can be used. Following is a list, with the corresponding output impedance that it provides:

- 6AS7G – 142 ohms
- 6080 (or ECC230) – 142 ohms
- 6336 – 90 ohms
- 7236 – 80 ohms
- 5998 (or 5998A, WE421A) – 71 ohms
- 6528A – 27 ohms

In general, if you use low impedance headphones (lower than about 100 ohms) you may want a lower output impedance tube. Similarly, higher impedance headphones may sound better with a higher output impedance. But there are no rules – you should use whatever sounds best to you.

The 6336 and 6528A are large tubes that draw 60 watts of heater power. The Teton is designed to support them, but beware, they get very hot!

*Rectifier Tube* – The rectifier tube has the least influence on the sound of the Teton. Changing rectifier tubes can alter the B+ voltage inside the amp, so that can change the sound a bit.

Normally, a 5U4 type tube is used. Again, the suffix doesn't matter – 5U4, 5U4G, 5U4GT, 5U4GTA, etc. are all interchangeable. The 5Z3, 5X4, 5AS4 and 5931 tubes are also identical.

It is possible to use other rectifiers, both directly and indirectly heated. The rectifier needs to have a 5V filament or heater, and draw no more than 3A. It must be able to support a DC output current (total) of 200mA, and be happy with a 10uF input capacitor.

The Mullard GZ37 tube works well, and other tubes of the series (GZ32, GZ33, GZ34) can also be used. The 5AR4 will work, though some 5AR4 tubes seem to have a short lifetime.

5R4 rectifiers will work, but could be a bit stressed by the peak current with the 10uF input capacitor.

5Y3 and 5Z4 tubes should not be used as they cannot support 200mA output current.

### **MISCELLANEOUS INFORMATION:**

*Fuses* – The Teton uses two 5mm x 20mm slow-blow fuses. If you have a power surge, lightning strike, blown tube, etc. it is possible that a fuse may blow. Use a 3.15A fuse if you have 120V power, or a 1.6A fuse if you have 240V. Turn off the power switch and remove the AC line cord, then you can remove the fuse drawer by squeezing the tabs at its top and bottom.