



Kustom

# Owner's Manual



# THE DEFENDER™

**Defending Your Right To Great Tone!**

Thank You for purchasing THE DEFENDER™, the 50-watt amplifier that reclaims the sound that sparked a revolution. Tapping into the essence of classic tube amplifiers, THE DEFENDER gives players the essential ingredients for smokin' tones, all the way down to its 1960s-era Pine cabinet. In this Owner's Manual, you'll learn about the many cool features of THE DEFENDER. Be sure to experiment and find the sounds that speak to you and your playing style. Ideally, use it with a band that will appreciate your now awesome TONE. Just be sure to give some thanks to THE DEFENDER...

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All specifications are subject to change without prior notice.

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# ENGLISH

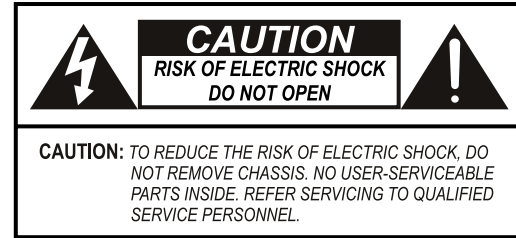
## Danger

Exposure to extremely high noise levels may cause a permanent hearing loss. Individuals vary considerably to noise induced hearing loss but nearly everyone will lose some hearing if exposed to sufficiently intense noise for a sufficient time.

The U.S. Government's Occupational Safety and Health Administration (OSHA) has specified the following permissible noise level exposures:

DURATION PER DAY (HOURS)	8	6	4	3	2	1
SOUND LEVEL (dB)	90	93	95	97	100	103

According to OSHA, any exposure in the above permissible limits could result in some hearing loss. Ear plugs or protectors in the ear canal or over the ears must be worn when operating this amplification system in order to prevent a permanent hearing loss. If exposure in excess of the limits as put forth above, to insure against potentially harmful exposure to high sound pressure levels, it is recommended that all persons exposed to equipment capable of inducing high sound pressure levels, such as this amplification system, be protected by hearing protectors while this unit is in operation.



**AVIS: RISQUE DE CHOC ELECTRIQUE-NE PAS OUVRIR.**



THIS SYMBOL IS INTENDED TO ALERT THE USER TO THE PRESENCE OF NON-INSULATED "DANGEROUS VOLTAGE" WITHIN THE PRODUCT'S ENCLOSURE THAT MAY BE OF SUFFICIENT MAGNITUDE TO CONSTITUTE A RISK OF ELECTRIC SHOCK TO PERSONS.



THIS SYMBOL IS INTENDED TO ALERT THE USER TO THE PRESENCE OF IMPORTANT OPERATING AND MAINTENANCE (SERVICING) INSTRUCTIONS IN THE LITERATURE ACCOMPANYING THE UNIT.



APPARATUS SHALL NOT BE EXPOSED TO DRIPPING OR SPLASHING AND THAT NO OBJECTS FILLED WITH LIQUIDS, SUCH AS VASES, SHALL BE PLACED ON THE APPARATUS.

# ENGLISH

## IMPORTANT SAFETY INSTRUCTIONS

1. Read all safety and operating instructions before using this product.
2. All safety and operating instructions should be kept for future reference.
3. Read and understand all warnings listed on the operating instructions.
4. Follow all operating instructions to operate this product.
5. This product should not be used near water, i.e. Bathtub, sink, swimming pool, wet basement, etc.
6. Only use dry cloth to clean this product.
7. Do not block any ventilation openings, It should not be placed flat against a wall or placed in a built-in enclosure that will impede the flow of cooling air.
8. Do not install this product near any heat sources ;such as, radiators, heat registers, stove or other apparatus (including heat producing amplifiers) that produce heat.
9. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding-type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord being walked on or pinched, particularly at Plugs, convenience receptacles and the point where they exit from the apparatus. Do not break the ground pin of the power supply cord.
11. Only use attachments specified by the manufacturer.
12. Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer or sold with the apparatus. When a cart is used, use caution when moving cart/ apparatus combination to avoid injury from tip-over.
13. Unplug this apparatus during lightning storms or when unused for long periods of time.
14. Care should be taken so that objects do not fall and liquids are not spilled into the unit through the ventilation ports or any other openings.
15. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way; such as, power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally or has been dropped.
16. **WARNING:** To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture.
17. The MAINS plug or an appliance coupler is used as the disconnect device, the disconnect device shall remain readily operable.



# FRENCH

## Danger

L'exposition a des niveaux eleves de bruit peut provoquer une perte permanente de l'audition, Chaque organisme humain reagit differemment quant a la perte de l'audition, mais quasiment tout le monde subit une diminution de l'acuite auditive lors d'une exposition suffisamment longue au bruit intense. Les autorites competentes en reglementation de bruit ont defini les expositions tolerees aux niveaux de bruits:

DURE EN HEURES PAR JOUR	8	6	4	3	2	1
INIVEAU SONORE CONTINU EN dB	90	93	95	97	100	103

Selon les autorites, toute exposition dans les limites citees ci-dessus, peuvent provoquer certaines pertes d'audition. Des bouchons ou protections dans l'appareil auditif ou sur l'oreille doivent etre portes lors de l'utilisation de ce systeme d'amplification afin de prevenir le risque de perte permanente de l'audition, Dans le cas d'expositions superieures aux limites precitees il est recommande, afin de se premunir contre les expositions aux pressions acoustiques elevees potentiellement dangeereuses, aux personnes exposees aux

equipements capables de delivrer de telles puissances, tels ce systeme d'amplification en fonctionnement, de proteger l'appareil auditif.



CE SYMBOLE A POUR BUT D'AVERTIR L'UTILISATEUR DE LA PRESENCE DE VOLTAGE DANGEREUX NON-ISOLE A L'INTERIEUR DE CE PRODUIT QUI PEUT ETRE DE PUISSANCE SUFFISAMMENT IMPORTANTE POUR PROVOQUER UN CHOC ELECTRIQUE AUX PERSONNES.



CE SYMBOLE A POUR BUT D'AVERTIR L'UTILISATEUR DE LA PRESENCE D'INSTRUCTIONS D'UTILISATION ET DE MAINTENANCE DANS LES DOCUMENTS FOURNIS AVEC CE PRODUIT.



AFIN DE REDUIRE LES RISQUÉ D'INCENDIE ET DE DECHARGE ELECTRIQUE, NE PAS EXPOSER CET APPAREIL A LA PLUIE OU A L'HUMIDITE.

# FRENCH

## IMPORTANTES INSTRUCTIONS DE SECURITE

1. Lire avec attention toutes les recommandations et précautions d'emploi avant d'utiliser ce produit.
2. Toutes les recommandations et précautions d'emploi doivent être conservées afin de pouvoir s'y reporter si nécessaire.
3. Lire et comprendre tous les avertissements énumérés dans les précautions d'emploi.
4. Suivre toutes les précautions d'emploi pour utiliser ce produit.
5. Ce produit ne doit pas être utilisé près d'eau, comme par exemple baignoires, évier, piscine, sous-sol humides ... Etc.
6. Utiliser exclusivement un chiffon sec pour nettoyer ce produit.
7. Ne bloquer aucune ouverture de ventilation. Ne pas placer le produit tout contre un mur ou dans une enceinte fermée, cela gênerait le flux d'air nécessaire au refroidissement.
8. Ne pas placer le produit près de toute source de chaleur telle que radiateurs, arrivées d'air chaud, fourneaux ou autres appareils générant de la chaleur (incluant les amplificateurs producteurs de chaleur) .
9. Ne pas négliger la sécurité que procure un branchement polarisé ou avec raccordement à la terre, Un branchement polarisé comprend deux fiches dont l'une est plus large que l'autre. Un branchement à la terre comprend deux fiches plus une troisième reliée à la terre. Si la fiche secteur fournie ne s'insère pas dans votre prise de courant, consulter un 'électricien afin de remplacer votre prise obsolète.
10. Protéger le cordon d'alimentation de tout écrasement ou pincement, particulièrement au niveau des fiches, des réceptacles utilisés et à l'endroit de sortie de l'appareil. Ne pas casser la fiche de terre du cordon d'alimentation.
11. Utiliser uniquement les accessoires spécifiés par le constructeur.
12. Utiliser uniquement avec le chariot de transport, le support, le trépied, la console ou la table spécifiés par le constructeur ou vendus avec l'appareil. Lors de l'utilisation d'un chariot, bouger avec précaution l'ensemble chariot/l'appareil afin d'éviter les dommages d'un renversement.
13. Débrancher cet appareil lors d'orages ou s'il n'est pas utilisé pendant une longue période.
14. Des précautions doivent être prises afin qu'aucun objet ne tombe et qu'aucun liquide ne se répande à l'intérieur de l'appareil par les orifices de ventilation ou n'importe quelle autre ouverture.
15. Pour toutes interventions techniques s'adresser à un technicien qualifié. L'intervention technique est nécessaire lorsque l'appareil a été endommagé de n'importe quelle façon, comme par exemple si le cordon secteur ou sa fiche sont détériorés, si du liquide a coulé ou si des objets sont tombés à l'intérieur de l'appareil, si l'appareil a été exposé à la pluie ou à l'humidité, s'il ne fonctionne pas normalement ou s'il est tombé.
16. ATTENTION: Pour réduire le risque d'incendie ou de choc électrique ne pas exposer l'appareil à la pluie ou à l'humidité.
17. La prise Mains, au coupler, est utilisée pour la source d'alimentation électrique. Il est conseillé de garder cette prise facilement accessible.

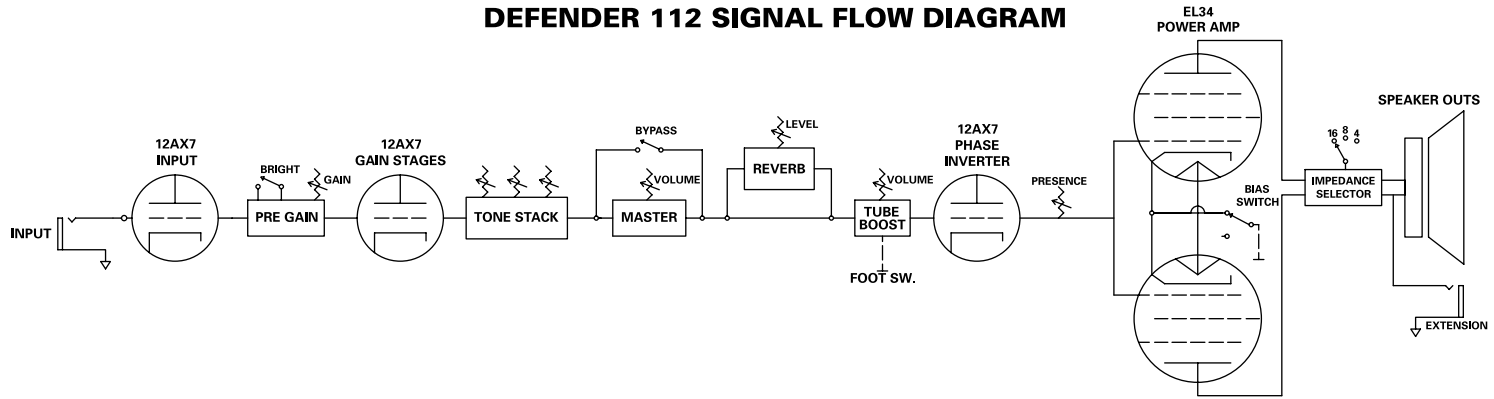


## The Defender Specifications

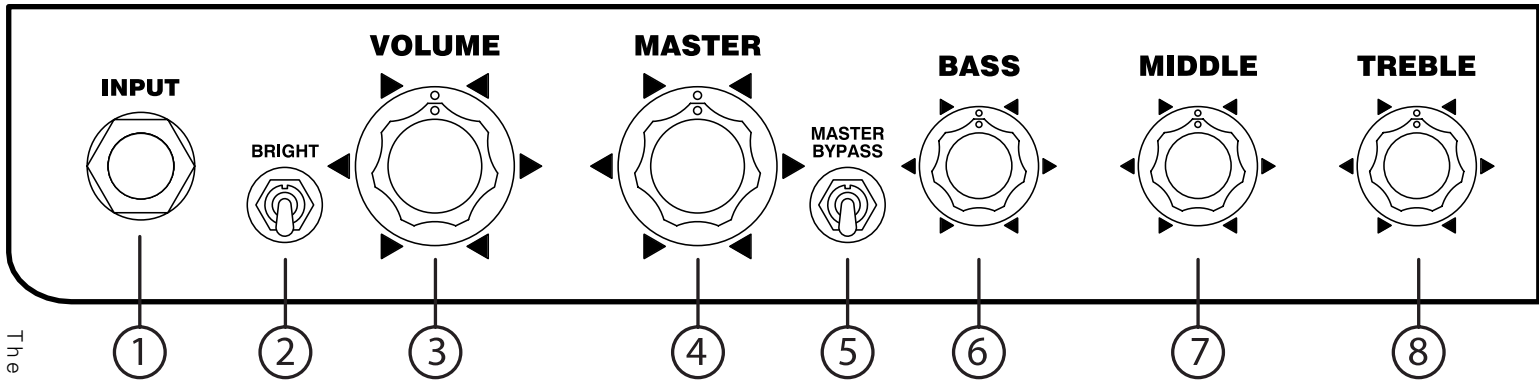
Model	Defender 112	All-Tube Guitar Combo Amp with 12-inch speaker
Tubes	Power Amp Tubes	2-EL34 power tubes using AUTOKRUISE™ biasing scheme
	Preamp Tubes	3-12AX7 preamp tubes(2 preamp, 1 phase inverter)
Output Power	50 W RMS	16, 8, or 4 Ohms @ 5% THD
Speaker	1 X 12 inch	KEI(Kustom-Eminence Integrated) EPIC-12, 16 Ohm
Input Impedance	1M Ohms	
Hum & Noise	-63dBV	Residual Noise, all level controls 0% (minimum), Bright Off, Presence @ 0
System Gain	60 dB	Nominal Gain, Volume @ 5
	86 dB	Maximum Gain, Volume @ 10
	Gain = +10 dB	Maximum gain of footswitchable volume boost
	Gain = +3 dB	Gain increase at 1 kHz when Bright is switched
Nominal Signal to Noise	60 dB	Volume half and Master maximum, Boost on 10
Footswitchable Boost	Master Volume Boost	Adjustable from 0 to +10 dBV, nominal -6dBV
Footswitch	Is compatible with single button Kustom Footswitch, part # KAC-FS100	
	Uses a standard mono shielded cable	
Power Requirements	USA/Canada	120VAC/60Hz, 180W
	Europe	230VAC/50Hz, 180W
	UK	230VAC/50Hz, 180W
	Australia	240VAC/50Hz, 180W
	Japan	100VAC/50-60Hz, 180W
Dimensions/Weight	mm/kg	486 mm (Height) X 569 mm (Width) X 261 mm (Depth), 17.3 kg
	inches/pounds	19.125" (Height) X 22.375" (Width) X 10.25" (Depth), 38 Lbs



# DEFENDER 112 SIGNAL FLOW DIAGRAM



A m p S i g n a l P a t h



### The Defender 112 Combo Control Panel

**1) Input:** This is a 1/4" 2-conductor input jack for plugging in your instrument. It is intended for guitar but will accept other instruments as well.

**2) Bright:** Flipping the Bright switch will increase the high frequencies of the signal, while also reducing low frequencies for a chunkier, tighter attack. This function is very useful for fine-tuning the amp's tone and feel for different guitars.

**3) Volume:** This control adjusts the gain in the input stages of the pre-amp. Utilizing an exclusive new circuit called Duo-Mod™, it changes gain in multiple stages to allow a more variable range from clean to dirty than is typical of most tube guitar amps. This control is used in conjunction with the Master to adjust the amount of distortion and volume. For cleaner sounds, adjust Volume to lower settings and the Master to higher settings. For slight breakup, the controls should be set in their middle ranges. For heavier distortion, set the Gain higher and the Master lower.

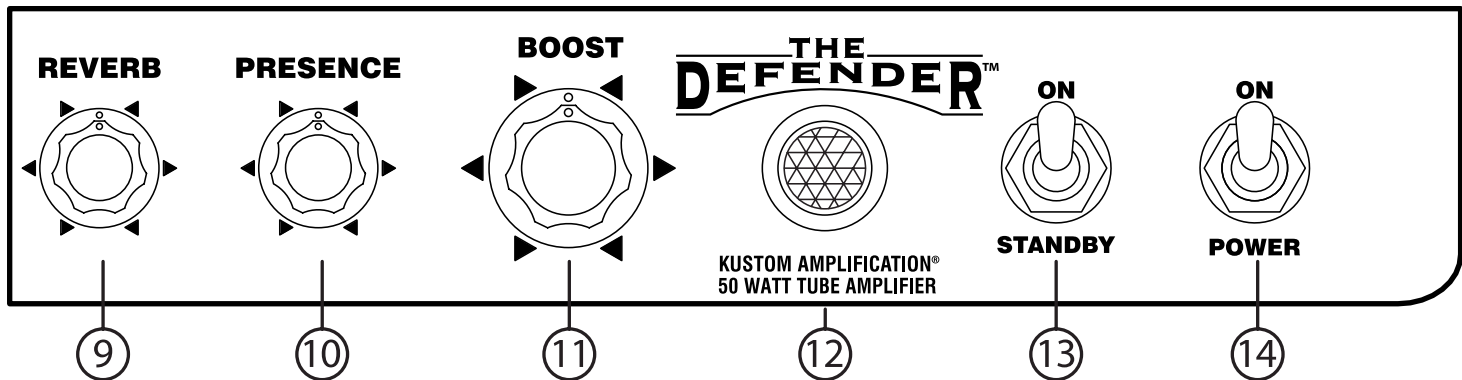
**4) Master:** The Master sets the overall volume and simultaneously tailors the tone controls to work better for that range. If the Master is set

higher, as it would be for cleaner sounds, then the tone is adjusted for cleaner, "chimey" tone. If the Master is set lower, as it would be for more distorted sounds, then the lows are increased for a fatter distortion tone that's still tight sounding. The resulting system makes it easy to get a good tone without having to change the EQ settings.

**5) Master Bypass:** Non-master volume amps are something that vintage amp experts have always touted as being an essential element to great, "crank it up" tones. This switch will entirely disable the Master Volume control from the circuit to give you the penetrating tone and headroom of vintage, non-Master types of amplifiers.

**6) Bass:** This passive EQ adjusts the low frequency equalization of the amplifier. It interacts with the Middle and Treble as described in the Treble EQ section (8). For a tighter low end, use the Bass EQ set to lower settings. This is particularly helpful when using the amp at very loud settings.

**7) Middle:** This passive EQ adjusts the midrange equalization of the amplifier. It interacts with the Bass and Treble EQ as described in the



Treble EQ section (8). For a heavier, more distorted sound, set the Middle lower. For more of a vintage-style, cleaner sound, set the Middle higher.

**8) Treble:** This passive EQ adjusts the high frequency equalization of the amplifier, but also interacts with the Bass and Middle controls as follows: As the Treble is increased, the Bass automatically decreases and the Middle slides down in frequency. Conversely, if the Treble is decreased, the Bass automatically increases and the Middle slides up in frequency. This interaction is typical of vintage-style passive EQ, and is responsible for the increased effectiveness of such a simple system.

**9) Reverb:** Reverb controls the amount of the reverberation effect in the amplifier. This effect is created by an authentic spring reverb pan and sounds essentially like playing the amp in a large room. The Reverb can be defeated by turning the control fully counter-clockwise.

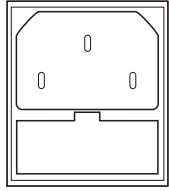
**10) Presence:** The Presence control operates in the power amp section of the amp and adds high frequencies to the tone. Higher settings will provide more bite and help you cut through the mix.

**11) Boost:** The Boost knob controls the amount of footswitchable boost in the power amp, and is particularly useful for solos. It will provide up to 10dB of "Master Volume" boost. The tone is optimized to increase the volume without sacrificing too much headroom in the power amp, so the resulting solo cuts through. (Note: Boost is active if the footswitch is unplugged.)

**12) Jeweled Pilot Light:** When lit, it indicates that the amplifier's power switch is in the ON position.

**13) Standby:** This allows the amplifier to be powered up, but with the tubes in a non-operational mode. The Standby can be used instead of the power switch between performance sets, since it allows the amp to "shut down" while keeping the tubes warm and ready to go. It's also best to power the amp up with this switch set to the downward "Off" position until the tubes have had a few minutes to warm up, although modern tubes are more tolerant of this.

**14) ON Power:** Provides AC power to the amplifier when in the upward "On" position.



FUSE: T3A L 250V  
120V~60Hz 180W

1



**ATTENTION**  
RISQUE DE CHOC ELECTRIQUE-NE PAS OUVRIR

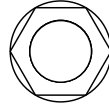
**CAUTION**  
CHASSIS SURFACE HOT

**ATTENTION**  
SUPERFICE DE CHASSIS CHAUDE



CONFORMS TO  
UL STD. 60065  
CERTIFIED TO  
CAN/CSA STD.  
C22.2 NO.60065:03

**FOOT  
SWITCH**



**BOOST**

2

**Kustom**<sup>®</sup>

KUSTOM MUSICAL AMPLIFICATION INC

MODEL: DEFENDER112

DESIGNED IN USA

MADE IN CHINA

## The Defender 112 Combo Back Panel

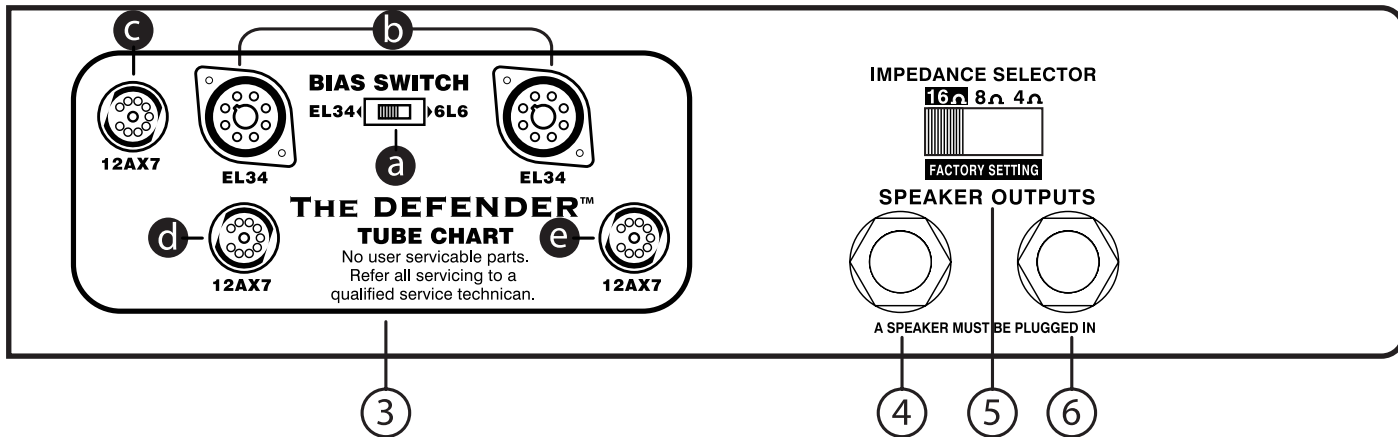
**1) Power Cord Receptacle/Fuse Holder:** Insert the AC cord (provided) firmly into the AC connector. NOTE: Replace the AC power cord if protective jacket is damaged or ground pin is damaged or removed. The fuse is located in a housing just below the receptacle. Replace only with same type and size. To remove the fuse, remove AC power cord and pull out on the tab above the fuse symbol located on the fuse carriage. Place the new fuse in the carriage clip and re-insert. NOTE: To prevent an electrical hazard, DO NOT replace fuse without using the fuse carriage. Replace the fuse carriage if lost or damaged before re-inserting the AC power cord.

**2) Footswitch:** The Footswitch jack on The Defender is a mono jack that connects a footswitch to the amplifier. The footswitch switches the Boost feature on and off.

## 3) Tube Chart

**a. Bias Switch:** The Defender ships from the factory with classic EL34 output tubes. However, if you happen to prefer 6L6s or just want to try something different, this amp has the ability. Underneath the tube cage is a switch that may be used to change the bias to accommodate either EL34 or 6L6 power tubes. (Note: This switch is not a user serviceable item. Be sure to take it to a qualified service tech to make these changes.)

**b. EL34 Output Tubes:** These power tubes were selected to provide the best combination of performance and tube life, and shouldn't require adjustment to their bias. The amp uses a mixed-bias system, which is a combination of fixed and self-bias techniques to give the user the best of both worlds. The result is that the amp will control its own bias to a certain point, but without the typical reduc-



tion in power associated with normal self-biased amp designs. The Defender uses two EL34s in a “push-pull” amplifier configuration.

**c. Phase Inverter Tube:** The phase inverter tube uses a single 12AX7 in what’s called a long-tail pair configuration. This results in the most signal swing possible for driving a power amp and the most symmetrical drive capability, as well.

**d. Preamp Tube 2:** This 12AX7 is used in boosting the gain and driving the EQ. It has the biggest impact on higher gain sounds.

**e. Preamp Tube 1:** Half of this 12AX7 is the input tube, and as such, is the most likely to cause microphonic problems. If tube feedback occurs, it can usually be corrected by swapping this first tube with one of the other tube locations, since they have less gain following them and are less prone to feedback. The first tube also has the greatest effect on the “cleaned up” tone of the amp, i.e. the tone when the

guitar is turned down. The other half of this tube is responsible for providing the extra gain needed for the Boost control.

**4 & 6) Speaker Outputs:** These 1/4” jacks are provided to connect the internal and/or external speakers to The Defender. The amplifier should never be operated without a speaker plugged into a speaker jack.

**5) Impedance Selector:** This switch is used to select the appropriate impedance, and is important in achieving the desired results from The Defender. The correct impedance should be selected using the Impedance Selector Switch as follows:

- a. Internal speaker only: 16 ohm setting
- b. Internal speaker + external 16 ohm speaker: 8 ohm setting
- c. Internal speaker + external 8 ohm speaker: 4 ohm setting, although it’s not matched.



**KACCC36D** - Amp cover to defend The Defender from dust and the elements. Features an embroidered classic Kustom logo, top quality vinyl and piping.



**FACFS100** - Footswitch for activating the adjustable volume boost function on The Defender™. The Defender automatically will have the boost enabled at all times if no footswitch is plugged into the amp.

**You can find these accessories through your local Kustom dealer!**



