MESA/BOOGIE®

SUBWAY® D-800+™

Owner's Manual

Greetings from the Home of Tone®

…You, smart player and intuitive human, have put your trust in us to be your amplifier company. This is something that we do not take lightly. By choosing this instrument to be part of your musical voice, you have become part of the MESA® family… WELCOME!

Our goal is to never let you down. Your reward is that you are the new owner of an amp, bred of fine heritage, benefitting from the many pioneering and patented MESA circuits as well as fresh cutting edge research and development efforts, leading to this new and exciting model. We feel confident that this amp will inspire many hours of musical satisfaction and lasting enjoyment. It was built with you in mind, by players who know the value of a fine musical instrument and the commitment it takes to make great music. The same commitment to quality, value and support we make to you… our new friend.

SUBWAY® D-800+™

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IMPORTANT SAFETY INSTRUCTIONS

Read these instructions.

Keep these instructions.

Heed all warnings.

Follow all instructions.

Do not use this apparatus near water.

Clean only with dry cloth.

Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.

Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.

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.

Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.

Only use attachments/accessories specified by the manufacturer.

Unplug this apparatus during lightning storms or when unused for long periods of time.

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.

To insure proper ventilation always make sure there is at minimum four inches (101.6mm) of space behind the rear of the apparatus. The ventilation should not be impeded by covering the ventilation openings with items, such as newspapers, tablecloths, curtains, etc. Do not impede ventilation by placing objects on top of the apparatus which extend past the rear edge of its cabinet.

When Rack Mounting this unit proper ventilation space must be maintained. Do Not cover or block Front and Rear and allow at least 2" of open "breathing" space on both sides of the unit.

No naked flame sources, such as lighted candles, should be placed on the apparatus.

The apparatus shall not be exposed to dripping or splashing and no objects filled with liquids, such as vases, shall be placed on the apparatus.

WARNING: To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture.

The AC plug is the mains disconnect. The plug should remain accessible after installation.

WARNING: EU: permission from the Supply Authority is needed before connection.

WARNING: Always make sure proper load is connected before operating the amplifier. Failure to do so could pose a shock hazard and may result in damage to the amplifier.

Do not expose amplifier to direct sunlight or extremely high temperatures.

Always insure the amplifier is properly grounded. Always unplug AC power cord before performing ANY service to the amplifier, including but not limited to changing the fuse. Use only same type and rating when replacing fuse.

Keep amplifier away from children.

To avoid damaging your speakers and other playback equipment, turn off the power of all related equipment before making the connections.

Do not use excessive force when handling buttons, switches and controls. Do not use solvents such as benzene or paint thinner to clean the unit.

Always connect to an AC power supply that meets the power supply specifications listed on the rear of the unit. Export models: always insure unit is wired for proper voltage. Make certain grounding conforms with local standards.

YOUR AMPLIFIER IS LOUD! EXPOSURE TO HIGH SOUND VOLUMES MAY CAUSE PERMANENT HEARING DAMAGE!

Your MESA/Boogie® Amplifier is a professional instrument. Please treat it with respect and operate it properly.

READ AND FOLLOW INSTRUCTIONS OF PROPER USAGE.

SUBWAY® D-800+™

Operating Instructions

Overview:

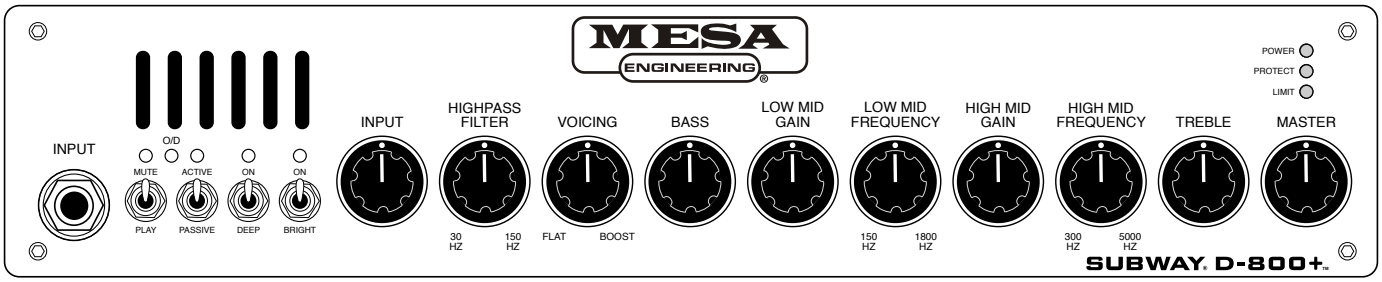
Congratulations on your choice of the SUBWAY® D-800+™ and welcome to the MESA/Boogie® family! First, we would like to thank you for choosing us as your amplifier company and trusting us to help create your musical voice. This is something we never take for granted and you'll find that we are here and ready to assist you should you ever need help. Our goal is to help you sound your best at all times! We feel confident that your new amplifier will bring you many years of reliable service, rewarding inspiration and create for you a newfound freedom to express your music.

You have chosen an amplifier bred of a fine heritage, and this model is our testament to our legacy of tone. Its forefathers can be traced back to the very first MESA® amplifier ever built, the MESA 450 Bass Head. In fact, the first 5 MESA amplifiers built in the Lagunitas mountain shack were Bass amps…a piece of trivia little known and overshadowed by our overwhelming notoriety for guitar amplification. But we've always loved the Bass, and have—since day one—been committed to elevating its stature through our art form. The bloodline for MESA bass continued with the first rack-mount chassis bass amplifier in 1980, the D-180. The mid-eighties saw the introduction of the BASS 400 and later in 1988, the BASS 400+ with its stunning Pitch, Punch and Power delivered by an additional 6 x 6L6s to bring the total to twelve 6L6s in the mighty power section.

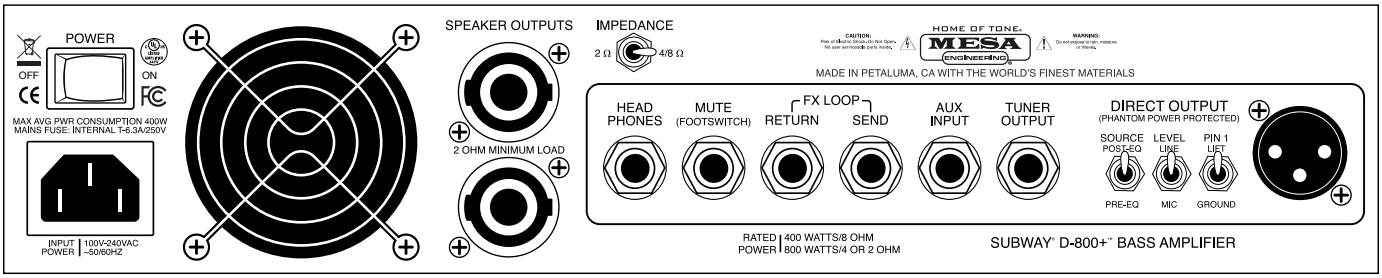
The 400+ went on to become a classic used by the world's most talented bassists for two decades. Paul McCartney, Mark King, Stanley Clark, Jack Blades, Michael Anthony, Blasko and Bootsy Collins, are but a few of the international stars that put the 400+ center stage to anchor the band during its 20 year build cycle. Those iconic amps still bring top dollar when you can find one changing hands on the pre-owned market. While MESA has since pioneered an entire line of tube-driven mosfet amplifiers that shored up our place in the Bass market, changing times have encouraged us to take what we have learned over this time and create a whole new approach to the bass amp, while remaining true to our heritage and tradition of tone.

Tone Freaks Rejoice! The SUBWAY D-800+ is the next step in the MESA Bass Amp Bloodline. A tone dripping powerhouse that's both compact and lightweight, packaged to go the distance with features, packaging and control over the entire bass spectrum makes it an iconic step forward in bass amplification. The SUBWAY D-800+ is built in Petaluma, CA with the World's Finest Materials.

FRONT VIEW: SUBWAY® D-800+™



REAR VIEW: SUBWAY® D-800+™



Overview: Front Panel

The SUBWAY D-800+ begins with the front panel input section, which is comprised of the INPUT jack, MUTE switch, ACTIVE/PASSIVE switch, DEEP switch and BRIGHT switch. The INPUT jack feeds a high impedance monolithic J-FET input amplifier which provides appropriate loading to the pickup, and isolates the switching circuitry from the high impedance signal path. The MUTE switch silences the signal from the INPUT jack to the SPEAKER output, HEADPHONE output and DI output for silent tuning with a tuner connected in line with the instrument or to the TUNER OUTPUT jack. The ACTIVE/PASSIVE switch sets the gain of the input preamplifier, reducing gain in the active position to prevent unwanted distortion. A DEEP switch and BRIGHT switch are provided to allow for classic preset voicing options. Tally (indicator) LEDs are provided for all switched functions.

The preamp section includes a precision variable 4 pole HIGH PASS FILTER to block unwanted sub-sonic signal as well as for specific tone shaping functions, feeding a monolithic J-FET variable GAIN stage using carefully tuned anti-saturation technology to prevent momentary sticking to the supply rails, instantaneous recovery and a more tube-like feel when driven hard into non-linear territory. An O/L (overload) LED is provided to give visual indication of when the preamp is being overdriven.

Tone shaping on the SUBWAY D-800+ includes a VOICING control that modifies the amplifier's response from a more flat like curve to a more vintage curve by modifying and shifting the frequency response in all regions with a simple turn of the knob. The signal then feeds the 4 BAND EQUALIZATION section which consists of a LOW FREQUENCY shelving band, 2 sweepable MIDRANGE FREQUENCY peak/dip bands, and a HIGH FREQUENCY shelving band. It is suggested that you first experiment with the VOICING control to "rough in" the overall response that you are looking for, and then adjust the 4 band EQUALIZATION to "polish up" the tone.

Finally, there is a MASTER volume control which sets the volume after the equalization. The combination of positions between the INPUT and MASTER volume, along with the signal strength from your bass (which is also affected by your playing style and touch) allows for a wide range of tones, from shimmering clean to moderately overdriven and everything in between.

Overview: Rear Panel

On the rear panel, you will find the power switch, and the AC mains inlet on a standard IEC "C14" connector. The SUBWAY D-800+ contains an auto-ranging universal power supply that can take anywhere between 100-120 volts & 220-240 volts AC, 50/60Hz without the need for a fuse change. This feature makes these amps ideal for the international touring musician who plays in a variety of global regions. The only thing necessary to make the amp work is a correct power (mains) cable that matches the power source. It is important for the mains power to be grounded/earthed for safety as well as EMC/EMI reasons.

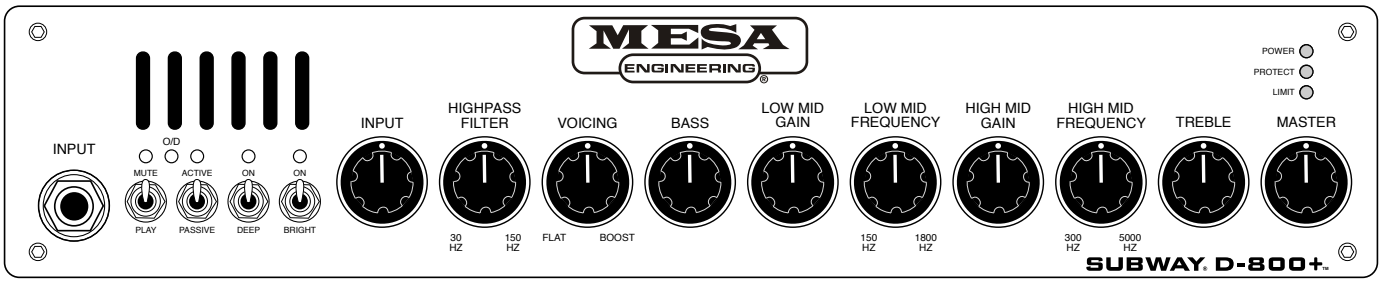
Next are parallel connected NL-4 SpeakOn™ connectors, which are wired with the amplifier positive to terminal "1+" and the amplifier negative to terminal "1-". All cables with NL-2 connectors (2 pole) will be wired this way. There is an IMPEDANCE SELECTOR switch provided to properly match the power amplifier to the load. When driving a load less than 4 ohms (like 2.66 ohms or 2 ohms), set the impedance switch to the 2 ohm position.

The SUBWAY D-800+ is equipped with a HEADPHONE output, which will drive all common headphones and IEM ear pieces between 8 and 32 ohms. It's advisable to use caution whenever sticking a sound source in your ear as damaging volume is possible, especially when volume is factored over a long period of time. There is a MUTE footswitch jack that mutes the signal when the tip is shorted to the sleeve. Note that the front panel mute switch must be in the down position for this function to operate. A serial master EFFECTS LOOP (SEND & RETURN), an AUX input, and a TUNER output rounds out the rear panel features.

A feature that sets your new SUBWAY D-800+ apart from the rest of the market is the inclusion of a studio grade XLR balanced DIRECT OUTPUT, complete with PRE-EQ/POST-EQ signal routing switch, MIC/LINE level switch, and pin 1 GROUND LIFT switch. Circuit attributes include full phantom power protection, high RFI immunity and extreme tolerance to reasonable ground potential differences.

INSTANT GRATIFICATION The SUBWAY D-800+ is about the easiest amp on the planet to get great sound from… it really is "plug and play". Start with the MUTE switch down (mute off), the ACTIVE/PASSIVE switch down (passive pickup), VOICING control in the "flat" position, the BASS, LOW MID GAIN, HIGH MID GAIN & TREBLE controls in the "flat" (12:00 straight up) position and the MASTER volume control in the 1:00 position. Plug your bass in, and turn the GAIN control up until you reach your desired volume. Now, gradually rotate the VOICING control clockwise towards the vintage position and stop when you achieve the basic amp voicing that you are looking for. The more clockwise, the greater the low end boost, mid cut (frequency also shifts as the control is rotated) and a mild treble boost. Then, EQ to taste.

FRONT PANEL (CONTROLS & FEATURES)



INPUT JACK This jack is the instrument INPUT that feeds the first stage monolithic J-FET buffer amp of the SUBWAY D-800+. The input sensitivity of this input buffer amp is adjustable with the ACTIVE/PASSIVE switch, the ACTIVE position being about 10dB less sensitive (lower gain) than the PASSIVE position.

MUTE SWITCH This switch (and its associated red indicator LED) mutes the audio signal being sent to the DIRECT OUTPUT and SPEAKER OUTPUT for silent tuning with a tuner connected to the instrument cable and then through to the amp or to the TUNER OUTPUT jack. When the switch is in the up position, the red LED will illuminate and NO audio will be present at the DIRECT OUTPUT jack, HEADPHONE jack or the SPEAKER OUTPUT jack. This switch can also be used to place the amp into standby mode before and between sets without adjusting any of the controls.

ACTIVE/PASSIVE SWITCH This switch (and its associated blue indicator LED) sets the sensitivity of the J-FET input buffer. Often (though not always), an active bass may have a signal level up to 10dB greater than a typical passive bass. If you find that you are operating the gain control near the low end of the control's rotation in order to prevent the O/L LED from flashing, switching this switch up (into the ACTIVE position) will reduce the input sensitivity (gain) by ~10dB, allowing greater control range and freedom from overload with high output active basses. The ACTIVE/PASSIVE switch will not change the tone of your bass.

DEEP SWITCH This switch (and its associated blue indicator LED) engages the DEEP filter, our take on classic low frequency response enhancement and extension. When engaged, there is a mild boost in the very low frequency response while also lowering the effective high pass filter frequency. This combination brings a more round, thicker, fatter response to the bottom end. When using with small (compact style) cabinets, be aware of the possibility of damage due to overpowering at higher volumes.

BRIGHT SWITCH This switch (and its associated blue "indicator" LED) engages the BRIGHT filter, which causes a rising response at higher frequencies much like the switches found on the most popular classic tube amps. Engaging this filter can bring some "bark & bite" into the tone.

INPUT CONTROL (GAIN) & O/D LED The INPUT control determines the input gain of the first gain stage and thus the level at which the following electronics stages operate. Overdriving the input gain stage may be a desirable tonal characteristic of your playing style and the amber O/D LED provides a visual indication of the status of the drive signal level and how much preamp overdrive is being achieved. When using significant overdriven tones, you may find it helpful to back down on the TREBLE EQ a little bit to reduce harshness and also to reduce the BASS EQ or increase the HIGHPASS FILTER frequency to increase the clarity and impact.

HIGH PASS FILTER This control sets the low frequency roll-off point of the amplifier, and is an important feature in maintaining control over the extreme low end, especially under high drive conditions. This precision four pole filter is comprised of two cascaded two pole filters, one fixed with a turnover frequency that is set at approximately 22Hz and a second variable filter that is variable such that the overall low frequency roll-off can be adjusted from 30Hz to 150Hz. While HPF's have been standard fare within the pro audio industry for decades, this feature has only appeared in bass guitar amplifiers within the past few years (with a few notable exceptions). This filter also provides additional mechanical protection to the speakers being used with the amp by limiting the power to the speaker below the frequency range that the speaker cabinet cannot provide adequate acoustic loading to the drivers. This is one of the primary (and preventable) causes of premature speaker failure, especially with compact speaker cabinet products that are driven very hard. Another valuable use for this filter is to roll off the very low end when overdriving the amp. This prevents the signal from becoming muddy, and preserves the naturally musical growl and grit of the overdriven signal. Experimentation will be helpful in such applications..

VOICING CONTROL This active EQ control modifies the amplifier's response from a more flat like curve (in the counter-clockwise position) to a more vintage curve (in the clockwise position) by modifying and shifting the frequency response in all regions with a simple turn of the knob. As the control is rotated clockwise, the low end increases and the high end increases while the midrange decreases and shifts upward. Common uses for the more vintage positions are the old school funk and slap tones, and rock tones where a rounder bottom and a little bite are needed. Experimentation is an important part of discovering the potential of this powerful tool.

BASS CONTROL This active EQ control is responsible for the amount of low frequencies present in the signal, relative to the rest of the spectrum. Low frequencies (<80Hz) are responsible for the "bottom", "roundness", or "feel" of the tone. This is an active control with boost and cut, the amount of boost proportional to the clockwise rotation to the right of "flat" (12:00 straight up) position and the amount of cut proportional to the counter-clockwise rotation to the left of "flat" (12:00 straight up) position. As with everything related to EQ, generally, a little bit goes a long way. Use enough to get the job done and no more. Note that if you have very compact cabinets and need high volumes, you will want to be aware that it is possible to overdrive speakers with excessive bass boost. If your speaker is not getting you enough high level low end, it's also possible that you do not have enough "rig for the gig", and "more speaker" is needed. This is a shelving style filter.

LOW MID GAIN CONTROL This control is responsible for the *amount* (or volume) of low midrange frequencies present in the signal, relative to the rest of the spectrum. Low mid frequencies (the actual center frequency is selected with the low mid frequency control) are responsible for the "earthy", "woody" character of the tone. This is an active control with boost and cut, the amount of boost proportional to the clockwise rotation to the right of "flat" (12:00 straight up) position and the amount of cut proportional to the counter-clockwise rotation to the left of "flat" (12:00 straight up) position. This is a peak-dip (or bell) style filter.

LOW MID FREQUENCY CONTROL This control is responsible for selecting the center *frequency* (or pitch) that the low mid gain control acts on. Rotating this control sweeps the center frequency from lower (counterclockwise) to higher (clockwise). If the low mid gain control is set at 12:00 noon, there will be no effect by the low mid frequency control because there is no boost or cut being performed. Sweep range is from 150Hz - 1800Hz.

HIGH MID GAIN CONTROL This control is responsible for the *amount* (or volume) of high midrange frequencies present in the signal, relative to the rest of the spectrum. High mid frequencies (the actual center frequency is selected with the high mid frequency control) are responsible for the "boxy", "barky" character of the tone. This is an active control with boost and cut, the amount of boost proportional to the clockwise rotation to the right of "flat" (12:00 straight up) position and the amount of cut proportional to the counter-clockwise rotation to the left of "flat" (12:00 straight up) position. This is a peak-dip (or bell) style filter.

HIGH MID FREQUENCY CONTROL This control is responsible for selecting the center *frequency* (or pitch) that the high mid gain control acts on. Rotating this control sweeps the center frequency from lower (counterclockwise) to higher (clockwise). If the high mid gain control is set at 12:00 noon, there will be no effect by the high mid frequency control because there is no boost or cut being performed. Sweep range is from 300Hz - 5000Hz.

TREBLE CONTROL The TREBLE control determines the amount of high frequencies present in the signal, relative to the rest of the spectrum. High frequencies (>2.5kHz) are responsible for the “bright”, “airy”, “shimmery” character of the tone. This is also an active control with boost and cut, the amount of boost proportional to the clockwise rotation to the right of “flat” (12:00 straight up) position and the amount of cut proportional to the counter-clockwise rotation to the left of “flat” (12:00 straight up) position. This is a shelving style filter.

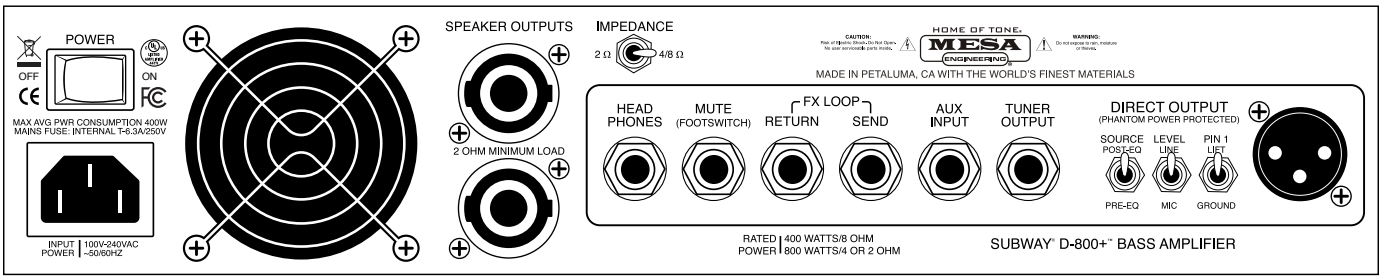
MASTER VOLUME CONTROL The MASTER sets the level of signal being sent to the power amp, and determines the overall playing volume of the SUBWAY D-800+. Using the MASTER VOLUME along with the INPUT GAIN, allows the optimal control over gain and front end drive as well as playing volume. For example, if you are using high input gain to achieve an overdriven tone, it will likely be necessary to adjust the master volume down to obtain a reasonable playing volume and to avoid excessive overdriving of the power amp. Likewise, if you are looking for a very clean tone, you may wish to start with a lower INPUT GAIN control setting and use a higher MASTER VOLUME control setting to obtain the desired playing volume.

POWER LED This blue LED indicates that the amplifier is connected to a power source and is switched on, operating correctly. If this LED is not on, double-check the power source, and be sure the power cable is firmly inserted into the IEC power inlet socket.

PROTECT LED This red LED indicates that the amplifier has entered protect mode and is either protecting itself from an external fault (such as a shorted speaker cable or defective speaker), or that there is an internal fault within the amp itself. Verify that it’s not a fault external to the amplifier by disconnecting all cables (except the power cable) from the amplifier. If the protect LED is no longer lit, the problem is most likely a bad speaker cable or defective speaker. Testing with a set of headphones can help to narrow down the problem, as the headphone signal is derived post-power amp using a frequency compensation, cabinet emulation network.

LIMIT LED This amber LED indicates that the power amp is nearing maximum power and is entering the soft clip/limit output tube emulation mode. Soft clip/limit output tube emulation mode mimics many of the desirable characteristics of tube amp output stage overdrive while eliminating the common solid state clipping artifacts. There is approximately 6dB of range on this circuit, driving beyond this, of course, will cause gradual output stage clipping. It’s acceptable for this amplifier to operate in output stage overdrive mode (if that’s the tone you are after) with the LED flashing roughly 25% of the time on.

REAR PANEL (CONTROLS & FEATURES)



POWER SWITCH This switch is used to turn your amp on and off by disconnecting the amplifier from the power source. This amplifier complies with the new EU Eco-design directive by providing a switched “0.00 watt power consumption off-mode”. The D-800+ is additionally protected against high inrush current conditions at power up that can damage the inrush current limiting circuitry. If power ON is re-applied to the amplifier within 15-20 seconds of a previous power-up event, the AC Mains Short Power Cycle Protection is provided. Allowing the unit to cool for 20-30 seconds will allow the protective inrush current limiting components to cool enough to allow the unit to power up again.

IEC POWER INLET This power inlet conforms to the IEC C-14 type standard, and is used with a cordset containing a matching connector, and appropriate plug for the intended country's AC requirements. The power supply is internally monitored by supervisory protection circuits and thus contains a non-user replaceable fuse that opens in the event of a major failure. The amplifier is designed to be used with grounded or earthed power, meaning that the chassis is always maintained at ground/earth potential even in the event of a gross failure within (or external to) the amplifier. Never remove the grounding/earthing pin from the power plug, or alter the power cable in any way.

COOLING FAN The SUBWAY D-800+ incorporates a low speed cooling fan to allow it to drive difficult loads (including 2 ohms) at very high duty cycles. Be sure this fan inlet is not blocked or the amplifier's protection circuits shutting the amplifier down due to a thermal fault condition.

SPEAKER OUTPUTS The SUBWAY D-800+ is rated to drive a minimum 2 ohm load (with the impedance selector switch set in the 2 ohm position), meaning either 4 x 8 ohm cabinets or 2 x 4 ohm cabinets. The amplifier incorporates a pair of SpeakOn™ NL4FC connectors wired in parallel that mate with either NL-2MP or NL4-MP plugs. Cables using NL-2 plugs contain only 1+/1- terminals and will always be correctly wired for use with the amplifier, but cables using NL4 connectors come with different wiring configurations. If using cables with NL-4 connectors, they may be constructed with standard 2 wire cable and they must be wired 1+ to 1+ and 1- to 1-. 4 wire cables are fine as well, terminals 2+ and 2- are not used. The cables to avoid are what are called NL4 bridge mode cables, which are typically 2 wire, and wired 1+ to 1+ and 1- to 2+. These SHOULD be clearly marked but sometimes they are not, so be aware of the possibility. Why SpeakOn™ cables and not the "old favorite" ¼" (or 6.35mm) connector? Well, there are a couple important reasons, the first being that with the changes in safety laws globally, this amplifier requires "touch-proof connections" in many markets because it exceeds the threshold for maximum voltage swing. The second reason is because the power amplifier's internal topology is BTL (bridge tied load), which means that neither terminals are at ground potential, so touch-proof connectors provided an added layer of safety to the system.

SPEAKER IMPEDANCE All speakers will have a "rated nominal impedance". Impedance is resistance to AC electrical signal flow which the power amplifier must deliver. The lower the impedance, the greater the current that the power amplifier must provide. The lowest impedance that the amplifier is capable of driving safely is 2 ohms (with the impedance selector switch in the 2 ohm position), which is a parallel connection (the standard connection of virtually all speaker cabinets) of either two x 4 ohm cabinets or four x 8 ohm cabinets. When operating the SUBWAY D-800+ into a nominal impedance load of 2.7 ohms (that's one x 8 ohm cabinet + one x 4 ohm cabinet or three x 8 ohm cabinets) the impedance selector switch should be set to the 2 ohm position. Note that measuring speaker cabinets using an ohm meter will not give accurate results because ohm meters read DC resistance not AC impedance. AC impedance will always be greater than the DC resistance, a typical 8 ohm speaker will usually measure between 5 and 7 ohms, a typical 4 ohm speaker will usually measure between 2.5 and 3.5 ohms.

SPEAKER POLARITY (OR PHASE) All speakers have "polarity", that is a speaker wired to the industry standard will move forward with a positive DC voltage applied to the positive terminal of the speaker and a negative voltage applied to the negative terminal of the speaker. While there are standards, there are also deviations from standards, either by legacy (ie. early JBL drivers), by faulty repair (incorrectly wired cabinet or defective recone parts) or a manufacturer choosing to ignore the standard. If a multi-driver speaker cabinet or a pair of speaker cabinets does not appear to have the expected output or low end, it's always a good idea to double-check that all drivers move forward with positive DC voltage from a 9V battery applied to the + terminal (this will be the 1+ terminal on a SpeakOn™ connector, or the tip on a 1/4" connector). If you find on a multi-speaker cabinet that one speaker moves out while the other does not move, it's likely that the non-moving driver has failed or has become disconnected. If one driver moves out while the other driver moves in, it's likely that the driver moving in is wired incorrectly or in a sealed cabinet is failed or disconnected and is merely being moved in the opposite direction by the air mass inside the cabinet itself. Being aware of these possibilities can often help troubleshoot when something is not quite right.

IMPEDANCE SELECTOR SWITCH The SUBWAY D-800+ is equipped with an impedance selector switch to match the amplifier's current drive capabilities to loads below 4 ohms. Whenever using loads of either 2.66 ohms (a 4 ohm load paralleled with an 8 ohm load or three paralleled 8 ohm loads) or a 2 ohm load (a 4 ohm load paralleled with a 4 ohm load or four paralleled 8 ohm loads) this switch must be set in the 2 ohm position. Failure to do so will result in the amplifier's protection circuits shutting the amplifier down due to an over-current fault condition.

HEADPHONE OUTPUT The SUBWAY D-800+ includes a 1/4" TRS (tip-ring-sleeve) headphone output jack, which will drive all common headphones and IEM ear pieces between 8 and 32 ohms. It's advisable to use caution whenever sticking a sound source in your ear, as damaging volume is possible, especially with "bass player accidents" and when volume is factored over a long period of time. This output contains additional cabinet emulation circuitry.

MUTE FOOTSWITCH This MUTE footswitch jack is used in conjunction with a standard latching single button footswitch terminated with a 1/4" (tip-sleeve) plug. The amplifier mutes the signal when the tip is shorted to the sleeve. (Note that the front panel mute switch must be in the down position for this function to operate, otherwise, the front panel switch over-rides the footswitch placing the amp in mute mode regardless of the position of the footswitch) When in the mute mode, signal is available only at the tuner out jack. The signal is muted at the speaker output, headphone output, effects send output and DI output.

EFFECTS LOOP A serial (series) effects loop is provided (Effects SEND and Effects RETURN jacks) for connecting "serial" outboard effects devices such as compressors, and may also be used with parallel outboard devices such as delays, reverbs, harmonizers and octavers, etc. by using the wet-dry mix control on the outboard device. This loop is located right before the MASTER VOLUME control, and is also intended as a preamp out/power amp in connection for the linking of two amplifiers in a master-slave configuration. The MASTER VOLUME control on each amplifier is then used to set the volume between the two amplifiers. The effects loop's RETURN jack contains a "normal switch" that interrupts the signal whenever a plug is inserted into the RETURN jack, and automatically bypasses the effects loop when the plug is removed. Because of this, the effects SEND jack may be used as another post EQ, pre MASTER VOLUME output.

AUX INPUT The amplifier is provided with a 1/4" TRS AUX input. This TRS stereo jack properly sums left and right channels from an MP3 player, i-device, or laptop as many of these new devices do not contain adequate build out resistors for proper summing. The signal injection point is right before the MASTER VOLUME control, so you can use the instrument's volume control to balance the level between your bass and the playback device. Note that for best performance, a 1/8" TRS to 1/4" TRS cable (also called a stereo cable) is used, this will always match between devices and allow the amplifiers automatic summing circuitry to work properly.

TUNER OUTPUT The TUNER OUTPUT jack's signal routing is derived immediately after the input buffer/scaling amplifier (before all other circuitry), and is designed to drive a tuner without any additional loading of the pickups. This output may also be used to drive a separate direct box or high-impedance recording device (pre gain, pre filters, pre eq). The TUNER OUTPUT remains active when the amplifier is muted with the front panel MUTE switch, allowing silent tuning on stage.

DIRECT OUTPUT (DI OUT) A feature that sets your new SUBWAY D-800+ apart from the rest of the market is the inclusion of a studio grade XLR balanced DIRECT OUTPUT. This output is capable of driving balanced analog lines as long as 500 feet, is fully phantom power protected, is noise resistant and stability compensated for a reliable, high quality signal. This output follows the pro audio standards of pin 2=non-inverting, pin 3=inverting and pin 1=ground. Every known console in the world follows this wiring standard, so your SUBWAY will interface seamlessly to the console of your choice.

PRE/POST DI OUT SWITCH This switch selects the signal source routing that is used to derive the DIRECT OUTPUT signal. In the PRE position, the signal is sourced directly from the input buffer and the active/passive switch sets the operating gain to provide a more uniform signal level to the PA. Putting the amp in a sort of Standby Mode via the Front Panel MUTE switch defeats this output for silent tuning. In the POST position, the signal is sourced from the output of the 4-Band Equalizer and before the master volume control. Generally, for PA use the FOH (front of house) engineer will probably prefer a PRE EQ send because the capability of his PA system may be significantly different than the stage rig and the EQ that you use on stage to sound good to you may not work on a bigger system and in a larger acoustic space than just the stage. For recording, depending on the tracking goals of the engineer, either PRE or POST might be used. When using the amp as a preamp (into a pro audio power amp or powered PA cabinet for example), generally the POST position would be used and line level would be selected (unless the powered speaker can accept mic level signal).

DI LEVEL SWITCH This switch selects between sending mic level (about -30dBu) or line level signal (about +4dBu) from the DI OUTPUT jack. Mic level is probably more commonly used when sending a signal to a PA console (though pro consoles can almost always handle line level), and the line level signal is most often used for driving a recording interface (many are set up for line level only) or when using the Subway D-800+ as a preamp and driving an external power amp (with the signal source set to post-eq). When driving an external power amp, the power amp's input sensitivity control will function in place of the Subway D-800+ MASTER VOLUME control.

DI GROUND LIFT SWITCH This switch disconnects (lifts) the circuit ground/earth/common connection from pin 1 on the XLR DI OUT connector. Balanced outputs do not rely on the pin 1 or shield connection to transmit signal to the Console. While pin 1 is always connected to the console's master ground bus, often (due to differences in potential of a building's ground/earth system) currents will flow between grounds if there is a common connection, resulting in hum. By lifting the ground at the sending (bass amp) end, this allows the shielding to remain in place while breaking the ground current flow that is the cause for inducing hum into the signal carrying pair of conductors. Now, the one thing that complicates this is that at very high (radio) frequencies, ground is not "really" ground, so additional techniques are incorporated within this network that allows 2 functional grounding spectrums within the same network, providing added RFI (radio frequency interference) rejection. The general rule is to start with pin 1 lifted, and if there is noise, try connecting it. It should also be noted that there are a lot of other possible causes for noise, this switch is often a solution for ground loop noise between the PA and the bass amp.

PLAYERS NOTES AND REMINDERS

DISCUSSION ABOUT AMPS & CLASS D FROM THE DESIGN TEAM

QUESTION What makes this new amplifier so small and light weight?

ANSWER This amplifier uses new technology, both an SMPS (SwitchMode Power Supply) and a CLASS D power amplifier to decrease the size and weight. These designs are carefully implemented and fully tested to insure robust, reliable performance in real world conditions night after night

QUESTION How can a light weight amplifier deliver solid bass? I was always told that an amplifier has to be heavy to produce acceptable bass.

ANSWER By operating in a non-linear fashion (with the power devices that are either fully on or fully off) the output stages no longer have to accommodate reactive load inefficiencies, overly sensitive protection of “safe operating areas”, and dissipate waste heat like output devices operating within the linear region. This means more power and better low frequency control. In fact, the pro audio industry has been using SMPS and Class D almost exclusively in the large scale touring market for about 10 years now, driving massive arena and stadium subwoofers night after grueling night on the road. In fact, much of the technology in our power amplifiers comes from the high reliability touring pro audio world.

QUESTION How do I know that these amplifiers will be reliable?

ANSWER The design engineer of the Subway amplifier project has over 10 years of successful SMPS and Class D amplifier experience, both in bass amplifiers as well as in the touring pro audio world. We have worked closely with the European engineering team on the development of these new power modules, including extensive testing, not just in the lab, but real world testing on real stages with real musicians and real audiences, night after night.

QUESTION Why is the power supply so small and light weight?

ANSWER An SMPS is just like any other power supply, except for the fact that it operates at a much higher frequency (typically around 80-100kHz) than a line frequency power supply (either 50Hz or 60Hz). The higher the operating frequency, the smaller the power supply’s transformer core needs to be. Since most of the weight of a power transformer is in the core (and the copper wire around the core), making the core smaller reduces size, weight and the amount of copper needed to wrap around the core.

QUESTION How does the SMPS work?

ANSWER Without getting too technical, a switch-mode power supply takes the incoming AC mains (50-60Hz) power, rectifies it to a high voltage direct current (HVDC). This HVDC is then filtered and stored in the input filter capacitors as reserve energy for discharge as needed into dynamic loads. This HVDC is then chopped/switched at about 100kHz into a high voltage, high frequency alternating current (HVHFAC), which is then fed through a high frequency transformer which converts the HVHFAC into low voltage, high frequency alternating current (LVHFAC) which is then rectified and filtered into low voltage direct current (LVDC) that the power amplifier’s circuitry uses.

QUESTION Why is the Class D power amplifier so small and light weight?

ANSWER A Class D amplifier operates its output stage non-linearly, meaning that the output devices are switched either fully on or fully off at a switching frequency of about 500kHz. This “cutoff-saturation” switching minimizes waste heat by avoiding operation in the wasteful “linear range”, and without the heat, there’s no need for the large, heavy aluminum heatsinks.

QUESTION How does the Class D amplifier work?

ANSWER In Class D amplifiers, the analog audio signal is converted into a PWM (pulse width modulated) pulse train representation of the analog audio signal (similar to the A/D converter in a PWM digital audio recorder but at a much higher frequency) at +5 volts conventional computer logic level. This PWM pulse train is level shifted by large solid state switching power transistors (that operate non-linearly to avoid waste heat) to a high voltage (and current), the resulting high level PWM signal passes through a high powered “low pass reconstruction filter” that reintegrates the original but level shifted (amplified) audio signal from the PWM signal which feeds your speakers. Class D is neither digital or analog, but share properties of both platforms. (Disclaimer: While this is a very simplified description, and there are many critical details omitted, the basic operational function is correct. There are a lot of highly technical tricks used in this highly specialized area of audio that are important to a high performance, robust, safe and reliable design.)

TROUBLESHOOTING

In the event that your amplifier appears not to work correctly, often enough the problem is not with the amp, but a related piece of equipment that it's necessary to take a deliberate, systematic approach to troubleshooting in order to effectively identify and correct the problem. Yes, believe it or not, we have seen all of these things many times. Flip the MUTE SWITCH to the PLAY (down) position and enjoy the ride!

SYMPTOM

NO AUDIO OUTPUT

Is the power LED lit and do the indicator LEDs over the function switches work?

NO: Possible causes to check in this order are:

1. Verify the power source, verify that the IEC power cable is not damaged and is fully inserted into its socket,.
2. Verify that nobody unplugged your amp or turned off your power strip when you weren't looking (if so, blame the guitar player, turn on and play.)
3. If these do not solve your problem, it's possible that your amplifier has failed so call our customer service department and we will help you get this resolved.

YES: Possible causes to check in this order are:

1. MUTE switch engaged (turn mute function off)
2. INPUT or MASTER controls turned down (turn the controls up)
3. Defective speaker cable or cabinet (test known good speaker cable and cabinet)
4. Defective bass or cable (test with known good bass and cable)
5. There is indeed a problem with your amp, call our customer service department and we will help you get this resolved.

SYMPTOM

DISTORTED AUDIO OUTPUT

1. Defective battery in active bass causing instrument's onboard preamp to distort (replace battery)
2. With very hot 18V basses, it's possible to overdrive the amp's preamp when in passive mode (switch to active mode)
3. Slightly intermittent cable in system (this can be an instrument cable, patch cable or loose screw in SpeakOn plug)
4. Defective or blown speaker(s) in cabinet (test with known good cabinet, repair cabinet as needed)
5. There is indeed a problem with your amp, call our customer service department and we will help you get this resolved.

SYMPTOM

NOISE (POPPING) IN AUDIO

1. Popping while playing, especially one string. (check bass set-up to be sure there is adequate clearances between the string and pickup pole pieces.)
2. Popping while just sitting there, or when touched. (under dry environmental conditions, it's possible that electrostatic discharge is the cause. (try antistatic mat on floor, humidifier in room)

SYMPTOM

NOISE (LOW FREQUENCY HUM) IN AUDIO

1. Defective instrument cable or problem with bass wiring (unplug instrument cable from amplifier, if hum goes away, this means that the noise is entering from outside the amplifier. Try known good instrument cable and/or bass)
2. Power source wiring is not grounded/earthed (check all wiring for missing grounding/earthing pins, have qualified electrician check building power wiring for missing ground/earth connections and correct as necessary.)
3. External stray magnetic field present coupling into the pickups, especially single coils (one clue that this may be the cause is when the volume level of the hum changes with position of the bass. Possible causes are large power transformers located near the performance area, if this occurs when you get close to another instrument amp it may be due to stray field from its power supply)

SYMPTOM

NOISE (HIGH FREQUENCY HISS AND HASH) IN AUDIO

1. If the noise goes away when the instrument cable into the amp is unplugged, the cause of the noise is external to the amp (possibly an active preamp with the treble turned all the way up, a failing battery, defective on board preamp)
2. If there is neon or fluorescent lighting close by, it's possible that EMI is radiating into the pick-up wiring (try turning off such lighting to see if noise goes away. If so, it could be an arcing secondary wire on neon lighting, failing ballast or tube on fluorescent lighting, radiated EMI getting into instrument pick-up)
3. Power source wiring is not grounded/earthed (check all wiring for missing grounding/earthing pins, have qualified electrician check building power wiring for missing ground/earth connections and correct as necessary.)
4. Tweeter turned all the way up in a quiet room (may need to turn tweeter down under such conditions, especially if the sensitivity of the tweeter greatly exceeds that of the low frequency drivers with tweeter turned up)

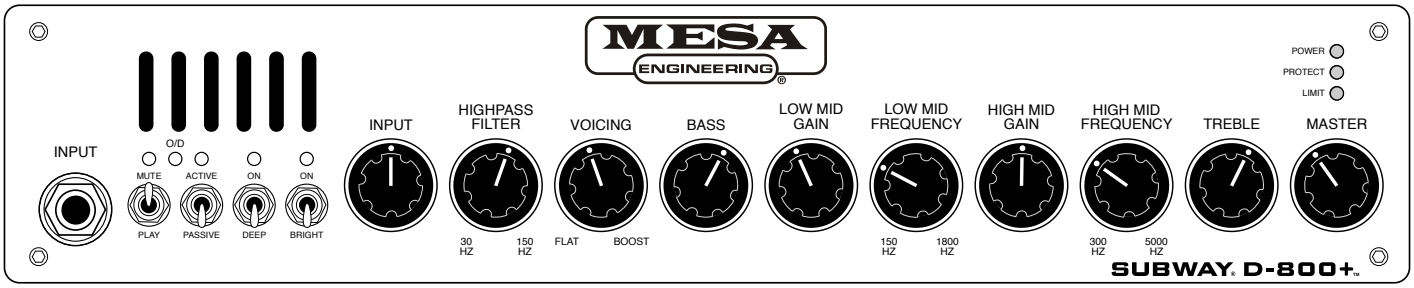
SYMPTOM

PROTECT LED TURNS ON

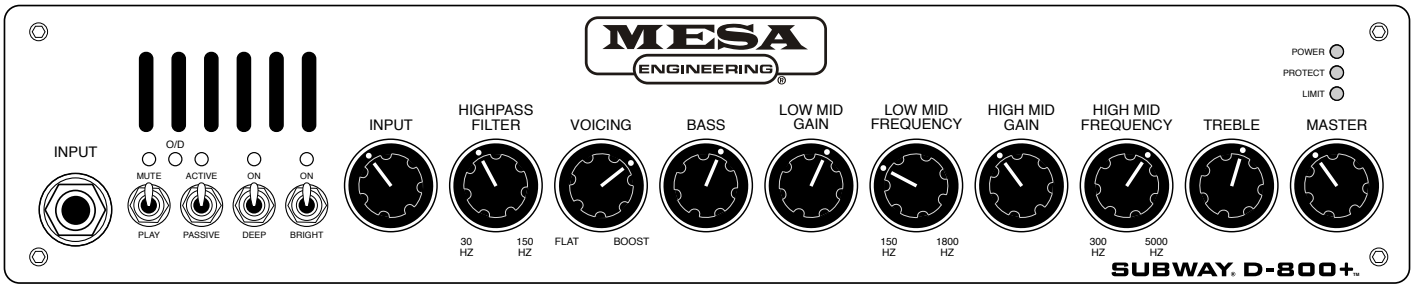
1. Disconnect all cables except power cable, if the amp is no longer in protect, try plugging in just the speaker cable. If the amp goes immediately into protect, one possible cause is a defective or damaged crossover that is presenting an illegal load to the amplifier and the protection circuit is working correctly. (Try a known good speaker cabinet from another manufacturer to rule this possibility out. If the amp works correctly with another speaker cabinet, call customer service for assistance. This is more common with "do it yourself" speaker projects with incorrectly designed crossovers. ALL amps with PWM carriers are sensitive to stored reactive energy in defective crossover tank circuits.)
2. Protect circuit shuts down amp while playing at low to moderate volumes (possible shorted speaker cable, try known good speaker cable)
3. Protect circuit shuts down amp at moderate to high volumes (Verify that total load to the amplifier has not fallen below 4 ohms (or 2 ohms on models that support 2 ohms with the impedance selector switch set to 2 ohms). Possible causes are incorrect pairing of multiple speaker cabinets, incorrectly labeled speaker cabinets that were repaired or modified without relabeling, defective driver that has shorted voice coil turns as voice coil warms up.)
4. Power source voltage falling dangerously low due to improper wiring or extension cable that is too long for it's wire size. (correct problems as needed with the help of a qualified electrician)

FACTORY SAMPLE SETTINGS

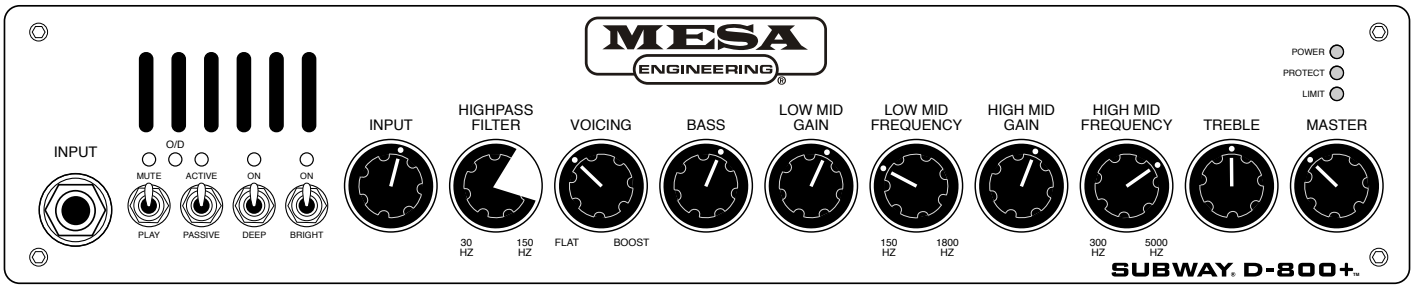
FUNK / FINGERSTYLE



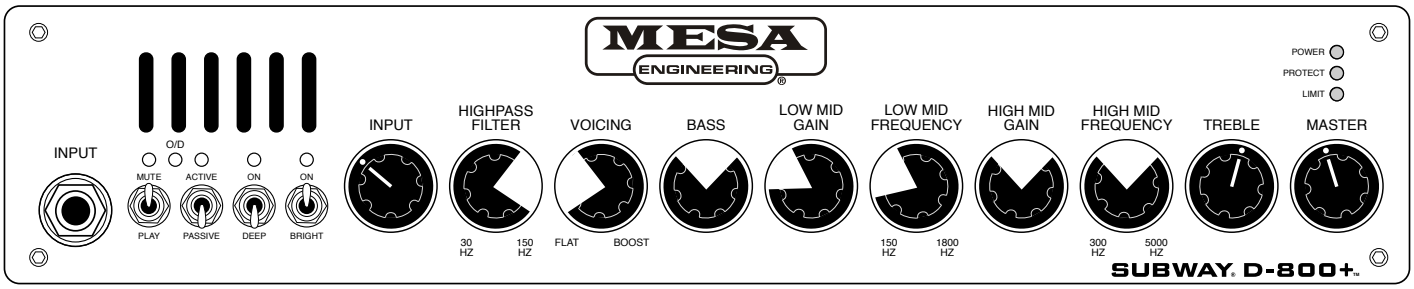
CLASSIC SLAP



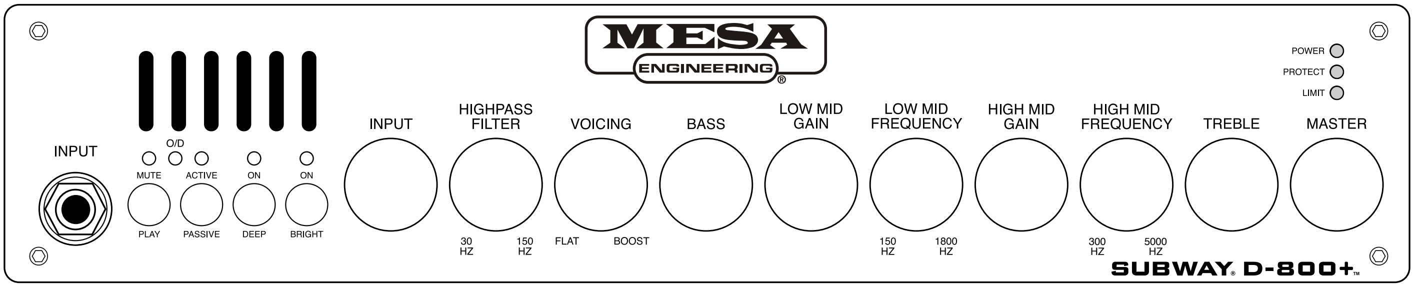
ROCK CONTROL

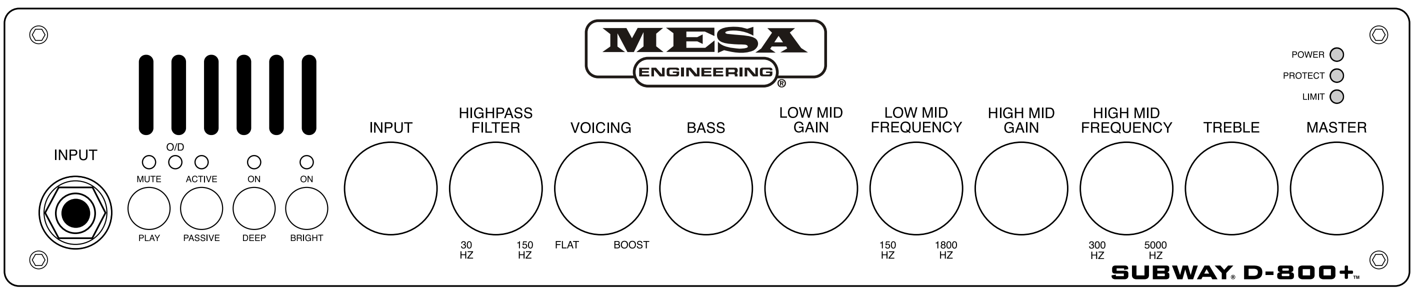


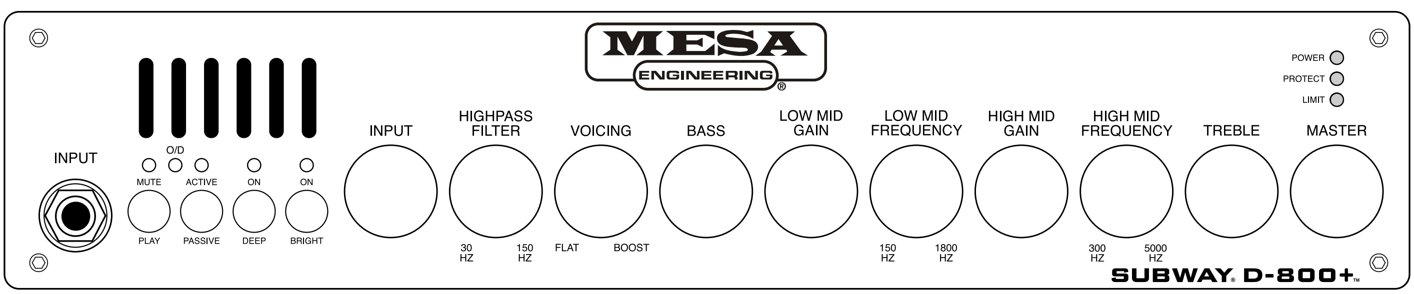
FRETLESS / UPRIGHT

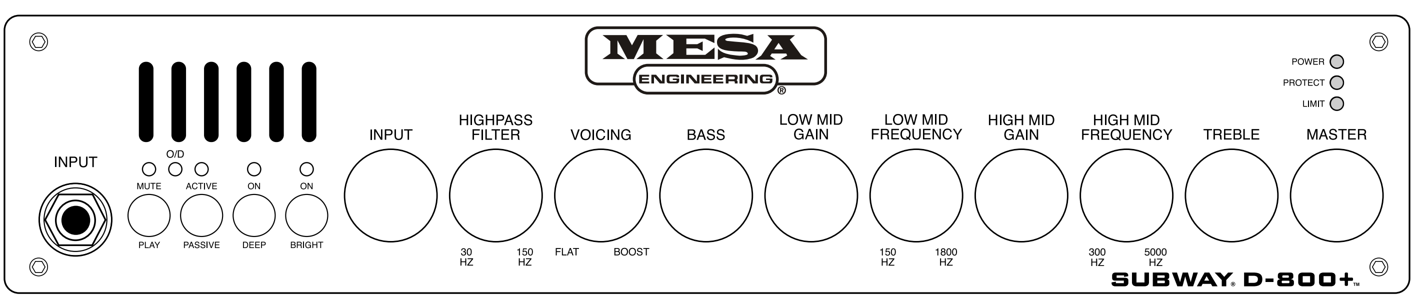


USER SETTINGS









SUBWAY® D-800+™

Specifications

Output Power Rating:	400 watts rms @ 8 ohms, 10% THD (includes preamp O/D THD) [note 1] 800 watts rms @ 4 ohms, 10% THD (includes preamp O/D THD) [note 1] 800 watts rms @ 2 ohms, 10% THD (includes preamp O/D THD) [note 1, 4]	
Signal to Noise Ratio:	-73dB (20-20kHz, unweighted)	
Maximum Available Gain:	78dB, (EQ controls flat, passive mode)	
High Pass Filter:	2 pole fixed, 2 pole variable, 30Hz – 150Hz	
Equalization:	Bass:	+14dB/-14dB @ 40Hz [note 2]
	Low Mid:	+14dB/-14dB @ 150-1800Hz
	High Mid:	+14dB/-14dB @ 300-5000Hz
	Treble:	+11dB/-14dB @ 4kHz [note 2]
Power Requirements:	100-120/220-240 VAC, 50/60Hz, 250W, auto-ranging power supply	
Size:	13.25” (336mm) wide x 10.15” (258mm) deep x 2.625” (67mm) high [note 3]	
Weight:	Approx. 6.3 lbs (2.86 kg)	

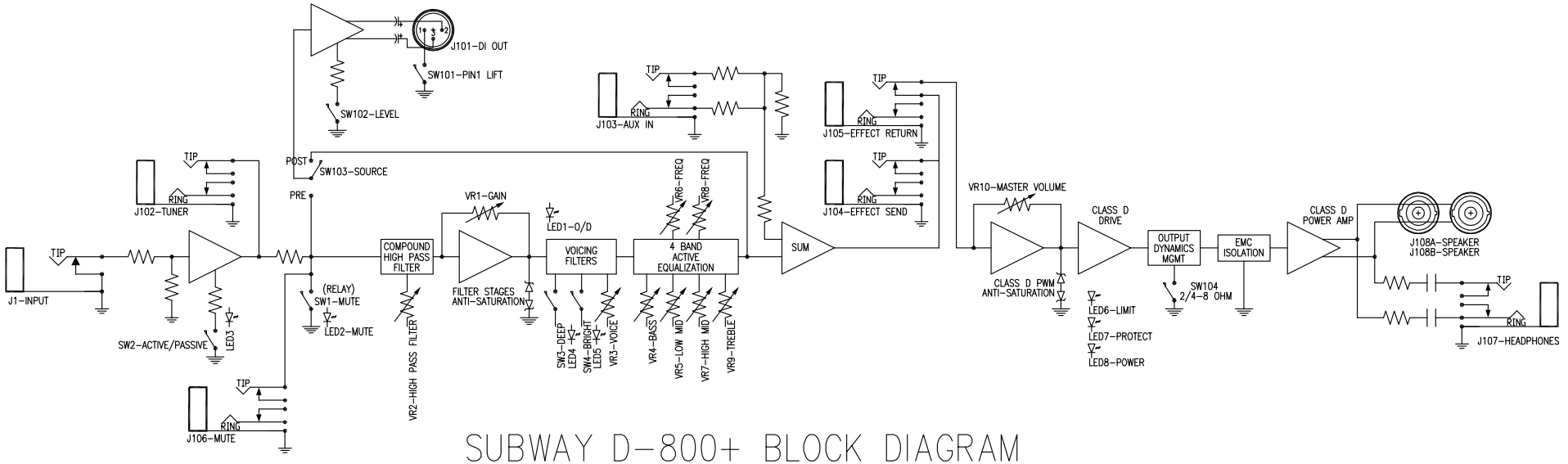
[note 1]: area under the curve, factoring preamp harmonics management.
[note 2]: measured approx. 1 octave from knee
[note 3]: chassis dimensions include controls, handle and feet
[note 4]: impedance selector switch set to 2 ohm position

MESA/Boogie® continually develops new products and improves existing ones. For this reason, specifications and information in this manual are subject to change without notice.

SERVICE INFORMATION

- **USA /CANADA Customer Support:**
  For technical support, troubleshooting, tone questions, settings help and more...
  707-778-6565 Monday-Thursday, 9AM-5PM Pacific Time
  NOTE: If a Product Specialist is not available when you call (helping other customers), PLEASE leave a voice message with a phone number and a good time to call and WE’LL CALL YOU BACK!

- **INTERNATIONAL Customer Support:**
  For warranty and technical support, please contact your LOCAL MESA DISTRIBUTOR.
  You may use this link to search the web for your local distributor’s contact information:
  www.mesaboogie.com/support/locations.html



SUBWAY D-800+ BLOCK DIAGRAM

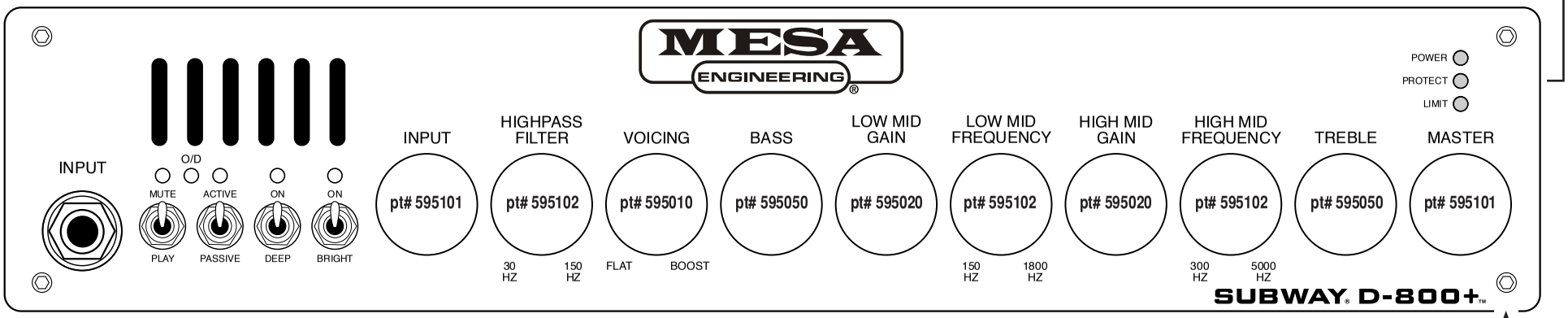
FRONT PANEL: SUBWAY D-800+

MUTE LED pt# 394201
O/D LED pt# 394251
ACTIVE LED pt# 394261
DEEP LED pt# 394261
BRIGHT LED pt# 394261

LOGO
pt# 800034

ALL FRONT PANEL KNOBS
PT# 408608

POWER LED pt# 394261
PROTECT LED pt# 394251
LIMIT LED pt# 394201



JACK
pt# 619354

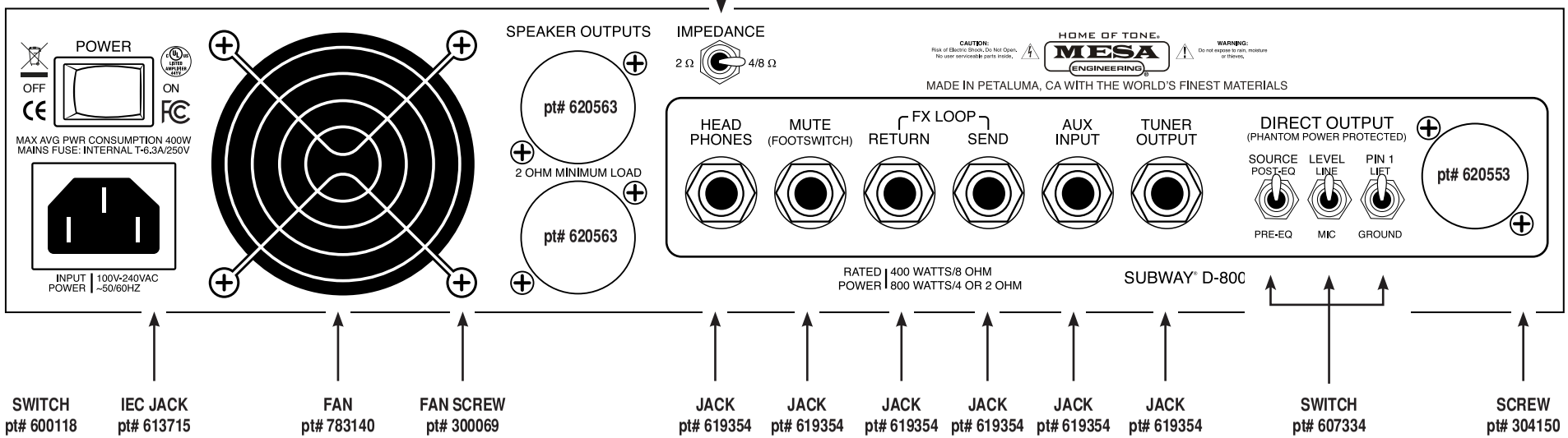
SWITCH
pt# 607200

SWITCH
pt# 607201

SCREW
pt# 302177

REAR PANEL: SUBWAY D-800+

SWITCH
pt# 607111



SWITCH
pt# 600118

IEC JACK
pt# 613715

FAN
pt# 783140

FAN SCREW
pt# 300069

JACK
pt# 619354

JACK
pt# 619354

JACK
pt# 619354

JACK
pt# 619354

JACK
pt# 619354

JACK
pt# 619354

SWITCH
pt# 607334

SCREW
pt# 304150

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