

MARK III SERIES CENTURION OPERATING GUIDE

WARNING
TO PREVENT ELECTRICAL SHOCK OR FIRE
HAZARD, DO NOT EXPOSE THIS APPLIANCE
TO RAIN OR MOISTURE. BEFORE USING
THIS APPLIANCE, READ BACK COVER FOR
FURTHER WARNINGS.

GENERAL DESCRIPTION

The Peavey Centurion embodies many of the refinements innovated in our massive R & D programs over the past several years. Recent advances in semiconductor technology have enabled Peavey engineers to design into the Centurion features and circuitry that would have been totally "out of reach" just a few years ago.

The Centurion is built around our newly developed 260C module (130 Watts RMS @ 0.1% THD at 4 Ohms). This power module features entirely new circuitry and embodies an extremely sophisticated new compression circuit using Peavey's exclusive DDT (Distortion Detector Technique) which allows absolute maximum dynamic range available from the power amplifier and virtual elimination of power amplifier clipping. This new "DDT" circuit automatically senses when power amp clipping is imminent and instantaneously adjusts the signal to avoid or minimize clipping. Conventional compressors have used either a fixed or variable threshold level to adjust the compression effect and are dependent on absolutely correct adjustment for optimum operation. Peavey's DDT circuitry electronically senses the onset of distortion and performs the necessary compression functions completely automatically, thus avoiding wasting even a Watt of precious amplifier power. The 260C power module allows full peak music power at the output and electronically compresses the signal to optimize signal demand versus amplifier voltage swing capability. This unique compression circuitry results in tremendously better reproduction, as well as greatly minimizing speaker problems by eliminating the large percentage of clipping (square wave) during high output conditions. When any amplifier is driven into clipping, a large portion of its output is d.c. (direct current) and this subsequently increases the average power absorbed by the speaker tremendously. This phenomenon contributes to speaker failure even though the speaker's rated power may be more than the amplifier's rated power (clean). Compression capability is especially useful on instruments requiring large instantaneous bursts of power such as found when amplifying bass instruments. The DDT/compression effect is controlled with a simple in/out switch, thus removing the chance for error in setting an adjustment. Action of the circuit is indicated by an LED indicator.

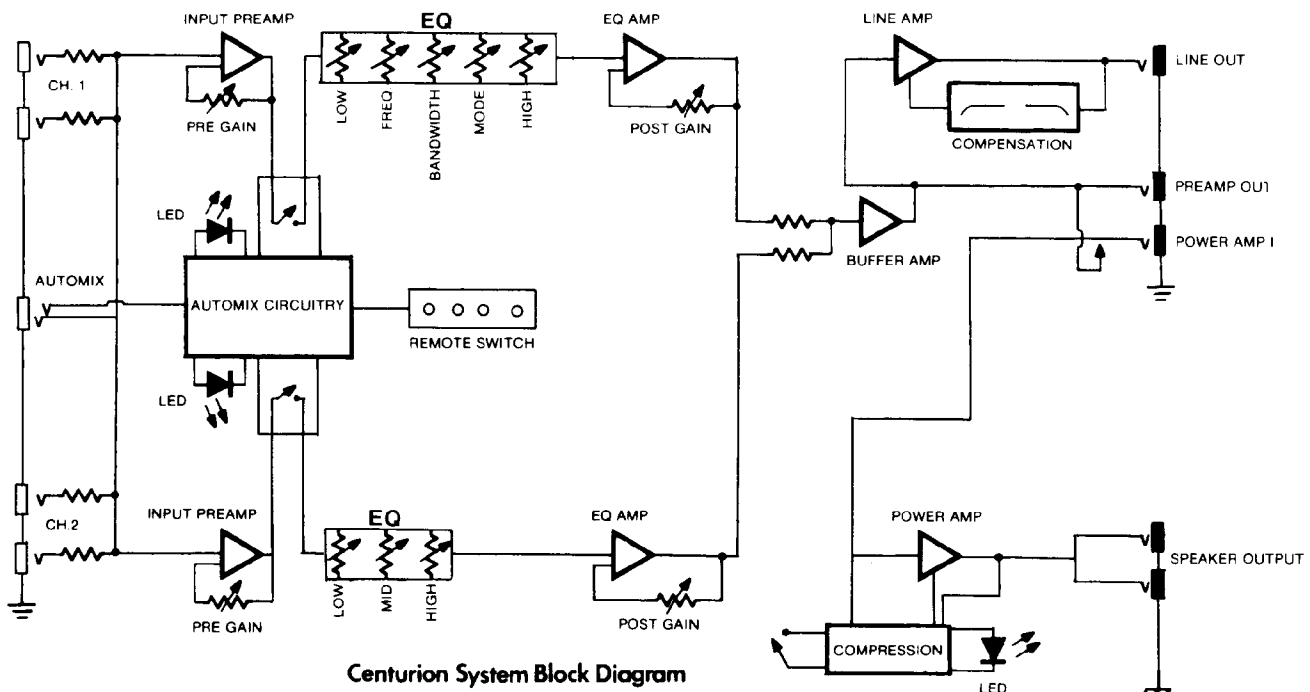
The Centurion features two input preamp channels, each voiced differently. Channel 1 has Peavey's exclusive pre and post gain controls and is complemented by a new equalization system featuring full parametric mid equalization. The low and high end EQ is controlled by active "shelving type" equalizers since these type circuits extend to the extremes of low and high frequencies as opposed to the "peak/dip" characteristics of the parametric's circuitry. The vital mid range frequencies actually set the character of the instrument's sound and our versatile parametric middle circuitry enables full control of these vital frequencies.

Channel 2 features our usual pre and post gain controls, along with more conventional passive equalization circuitry. Three-band equalization allows an extremely wide range and is included to allow a distinctly different tonal characteristic than Channel 1's active low and high/parametric mid range circuitry.

The Centurion's AUTOMIX function has been recently redesigned around the latest in analog switching circuitry and includes LED activity indicators to indicate the channels in use. **(PLEASE NOTE: LED'S ARE INACTIVE UNTIL AN INSTRUMENT IS PLUGGED INTO THE AUTOMIX JACK.)**

A full patch panel has been included to enable patching effects devices "in line" and also to provide a frequency compensated low impedance output to drive recording or P.A. consoles directly without need of a "direct box" or other amp/mixer interface device.

Overall, the Centurion is Peavey's latest offering in musical instrument amplifiers and will provide almost any tonal coloring with proper control settings.



Centurion System Block Diagram

FRONT PANEL
INPUT JACKS A AND B (1)

The Centurion features both a high gain (A) and a low gain (B) (-6 dB) input to enable it to accept signals of varying levels and also to facilitate using two instruments into either channel. The high gain (A) input is the one normally used. If the output signal from your instrument or its associated electronics is overloading the high gain (A) input, then the low gain (B) input should be used. Because of the unique switching circuitry, A and B inputs automatically are gain balanced when two instruments are inserted into both A and B.

NOTE!

THE AUTOMIX JACK IS A SPECIAL SWITCHING JACK THAT HAS A DOUBLE DETENT, I.E., OR TWO POSITIONS. TO ACHIEVE PROPER OPERATION, THE INPUT PLUG MUST BE INSERTED ALL THE WAY OR TO THE SECOND CLICK. PROPER INSERTION OF THE INSTRUMENT'S INPUT PLUG WILL BE INDICATED BY ILLUMINATION OF EITHER OR BOTH AUTOMIX LED ACTIVE CHANNEL INDICATORS.

AUTOMIX JACK (2)

The AUTOMIX circuitry was pioneered by Peavey several years ago in order to enable the use of both channels of the amplifier. It used to be common to play through one channel only while the other channel was not used. Our AUTOMIX circuitry enables the player to utilize the **full** capability of this amplifier by allowing either or both channels to be used during a performance. The switching function is controlled by the remote footswitch which is supplied as standard equipment with the amplifier. The AUTOMIX effect is activated when your input plug is **fully inserted** into the AUTOMIX jack and is accompanied by illumination of one or both LED's. Our improved circuitry has provided post gain controls for both channels which are actually master volume controls for the respective channels enabling sensitivity and dynamics to be **independently** adjusted in each channel with the selection of either or both channels accomplished by the AUTOMIX circuitry and its remote footswitch.

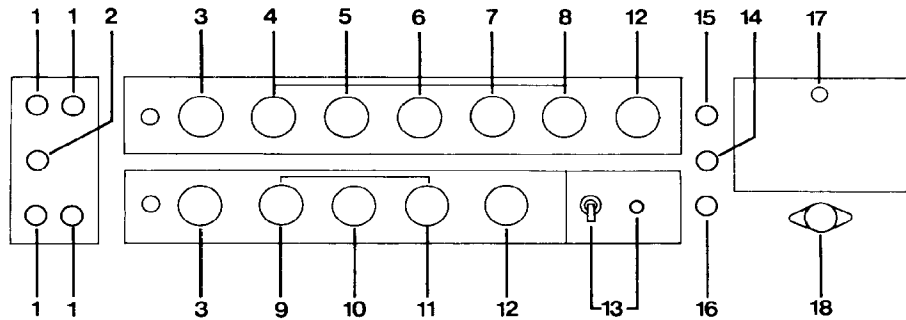
The remote footswitch features a "Selector" button, which enables alternate selection of **either** Channel 1 **or** Channel 2. The "Combiner" button operates to lock the two channels together and **defeats** the "Selector" button. Obviously, when the "Combiner" button is activated, both channels are in the circuit as indicated by their LED indicators. When in the combined mode, the "Selector" button is inoperative since the combined mode must functionally override the select mode to operate both channels simultaneously. To reactivate the select mode, depress the "Combiner" button once.

PRE GAIN (3)

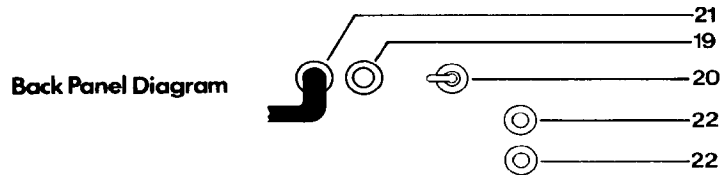
The pre gain controls determine the amount of gain produced in the input preamp. Please understand that this control determines the **sensitivity** and **not the power** output of the amplifier. The control settings in no way can be related to the power the amp is delivering to the speakers because of a number of other factors such as the input signal amplitude, setting of the post gain controls, etc.

EQUALIZATION

The equalization circuitry of the Centurion is extremely versatile, as well as reasonably simple to operate. Channel 1 features the latest active circuitry, while Channel 2 is designed around somewhat conventional passive circuitry. Because we have included parametric middle equalization, some knowledge and operating experience is necessary to obtain maximum benefit from this versatile feature.



Front Panel Diagram



Back Panel Diagram

CHANNEL ONE EQUALIZATION
LOW ACTIVE EQUALIZATION CONTROL (4)

The low equalization control is of the active shelving type capable of producing either a boost or a cut of the low frequencies. Vertical (straight up or 12:00 o'clock) settings produce a flat response, while counter-clockwise settings produce a cut, and clockwise settings produce a boost. It should be noted that because this circuit is active, significant amounts of boost are available. One should avoid overboosting the lows since this will tend to require excessive amounts of power from the amplifier and might tend to cause excessive compression or overdrive the power amp if compression is switched out at high boost (clockwise) settings.

PARAMETRIC MIDDLE EQUALIZATION

A parametric equalizer is capable of three distinct equalization functions: (1) It features the ability to vary the center frequency of its action over a considerable range; (2) It is capable of determining the bandwidth ("Q") of the peak or notch; i.e., it has a circuit wherein the boost or cut action can be varied from a sharp "notch or peak" to a "broad hill or valley" centering around the selected frequency; (3) A third control determines whether the selected frequency is either boosted or cut and by how much.

- (1) **FREQUENCY CONTROL:** (5) This control determines the center frequency of the peak or notch.
- (2) **BANDWIDTH CONTROL:** (6) This control determines whether the boost or cut effect is either sharp or broad ("Q").

(3) MODE CONTROL: (7) The mode control operates very similar to the low and high equalization controls since in the vertical (straight up or 12:00 o'clock) position, no effect is produced, while counter-clockwise settings produce a cutting effect and clockwise settings produce a boosting effect. Care should be taken not to overboost since this effectively increases the gain at the selected frequency and could overdrive the power amp and/or speaker, as well as increase the residual noise.

HIGH ACTIVE EQUALIZATION CONTROL (8)

The high equalization control is of the active shelving type, capable of producing either a boost or cut of the high frequencies. Its operation is similar to the low and parametric mode controls in that a vertical (straight up or 12:00 o'clock) position produces a flat response, while counter-clockwise positions yield cut and clockwise settings yield boost. It's a good idea to avoid extreme boosting of high frequencies since this tends to encourage emphasis of residual preamp noise and also tends to make the amp sound strident and unduly emphasize string noises, etc.

CHANNEL TWO EQUALIZATION

LOW EQUALIZATION CONTROL (9)

The low equalization control determines the low frequency emphasis and is capable of substantially more effect than many of the more conventional passive tonal networks. For this reason, the control will tend to make the amp sound "bassy" at high settings. We have designed the circuitry to provide more tonal variation to allow you a greater range of variable tonalities.

MIDDLE EQUALIZATION CONTROL (10)

The middle equalization control is located in Channel 2, and can be used to tailor the relative levels of the vital mid range frequencies. Experimentation with this middle control will show that it is very effective and enables the "voicing" of Channel 2 to be changed significantly because of its advanced circuit design.

HIGH EQUALIZATION CONTROL (11)

The high equalization control sets the amount of high end boost available and its effect is dramatic. Overboosting of the highs is generally not desirable since it tends to cause a strident sound, as well as tending to emphasize residual preamp noise. Our equalization circuit is very effective and experimentation will allow the user to achieve almost any tonal coloring desired and will prove the versatility of this circuitry.

POST GAIN CONTROLS (12)

The post gain controls are the "master gain" controls for the respective channels. The action of these controls is conventional and experimentation will illustrate their function. Please be aware that extremely low settings of the post gain controls will require extremely high settings of the pre gain controls with subsequent loss of dynamic range in the input preamp. This may be desirable in some situations to create distortion effects in the input circuitry. However, with bass instruments, it's generally desirable to maximize dynamic range in the input preamp because of the strong output signals generated by most bass instruments. This is very important for maximum compression capability without distortion. Therefore, we recommend higher settings for normal use.

"DDT" COMPRESSION (13)

The Centurion is a small, reasonably powerful amplifier that features a 130-Watt RMS power amplifier with a full complement of equalization controls and a new type of dynamic compression. The compression effect enables us to maximize the performance of the amp/speaker combination. We have determined through much research that the compression circuitry should prevent the power amp/speaker combination from running out of headroom (clipping) and should be as simple to operate as possible to avoid undue complication for the user. Our compression circuit is very effective and is controlled by a simple on/off switch. Because of the dynamics and the percussive nature of plucked strings, it is quite common to activate the compressor, as indicated by the limit LED (light emitting diode) at reasonably low output levels. One should not be concerned that the limit LED indicates compression virtually constantly during a performance since this is what it was designed to do; i.e., to maximize the dynamics available from the amp within its power output capabilities. The compression effect may be switched off by the toggle switch on the front panel. We have not included other compression controls since we have designed an exclusive "Distortion Detector" circuit that senses conditions that might cause overload, and compression is activated only when clipping is imminent.

LINE OUT (14)

Many attempts have been made over the years to patch the preamp circuitry of musical instrument amplifiers directly into recording or sound reinforcement mixing consoles. Most of these attempts have been unsuccessful and have resulted in players and soundmen having to utilize various forms of what is popularly referred to as a "direct box" which, of course, means further complication, expense, etc. Most previous attempts at patching signals out of musical instrument amplifiers have ignored a very basic fact...generally poor frequency response from the musical instrument amplifier's speaker system. Most amp manufacturers have compensated for the speaker's poor top end frequency response by building in some degree of high frequency boost in order to satisfy the player. While this built-in high frequency boost is indeed good for increasing the response from the system, it tends to cause excessive residual noise, as well as "strident" or "screechy" tonality in the direct preamp output signal. Our line output has a built-in compensation circuit that very closely matches the rolloff characteristic of a speaker system in order to produce an output signal that corresponds very closely to what's being heard from the speaker system. There is also a rolloff of the extreme low frequencies to avoid overload of the associated console by the "sub" bass signals. This very important feature should prove very helpful in eliminating the need for direct boxes and mic'ing of musical instrument amplifiers. The signals from the line output jacks are low impedance (600 Ohms) unbalanced at a signal level of 1.5 Volts RMS.

PREAMP OUT (15)/POWER AMP IN (16)

To allow "in line" patching of the various accessories, we have included a system of preamp out/power amp in jacks of the front panel. The preamp out is the straight preamp signal which is the sum of the outputs of the two channels. The output level is approximately 1.5 Volts RMS and is a relatively low (600 Ohms) output impedance. The preamp out signal is connected through a switching contact to the power amp input jack and normally the preamp out is internally connected to the power amp's input. This circuit allows basically two modes of operation. When signal is taken from the preamp output, signal is also delivered to the internal power amplifier. If access to the internal power amplifier is needed or if some accessory device such as a noise gate, delay line, graphic equalizer, etc., is to be patched "in line", then the **preamp output** signal must be connected to the **auxiliary unit's input**, while the **auxiliary unit's output** must be connected to the **power amp input** with shielded cables, thereby placing the auxiliary unit in series or "in line" with the normal signal path. Additional booster amp/speaker combinations should be patched using the preamp output. With this unique patching facility, many interesting effects can be accomplished.

PILOT LED (17)

The pilot LED indicates when the electrical supply is switched on and is actually delivering power to the amplifier.

AUTOMIX REMOTE SWITCH SOCKET (18)

The remote switch socket is the standard "DIN" type and serves as the amp connection for the **supplied** remote footswitch. Please note that the "DIN" plug has an indentation that must be mated with the matching indentation in the footswitch receptacle on the front panel. This keying action allows the footswitch to be connected only in the proper manner. If the plug is forced or undue pressure is exerted on the shell or pins, damage could result to the footswitch plug or the chassis mounted socket. As with any precision device, reasonable care should be exercised.

REAR PANEL

FUSE (19)

The fuse is located within the cap of the fuseholder and must be replaced with one of the proper type and value if it should fail. It is necessary that the proper type and value fuse be used in order to avoid damage to the equipment and to prevent voiding the warranty. If your unit repeatedly blows fuses, it should be taken to a qualified service center for repair.

POWER SWITCH (20)

On domestic units, the power switch is of the three-position type with the center position being "OFF". This switch has two "ON" positions, one of which is used to ground the amplifier properly. One of the "ON" positions will yield the lowest amount of residual hum or "popping" when the instrument is touched and this is the position that should be used.

On export models, we utilize a simple on/off switch that does not have multiple "ON" positions since the grounding (earthing) conditions vary with the different electrical systems of the United States versus other nations.

LINE CORD (21)

For your safety, we have incorporated a three-wire line (mains) cable with proper grounding facilities. It is not advisable to remove the ground pin under any circumstances. If it is necessary to use the amp without proper grounding facilities, suitable grounding adaptors should be used. Much less noise and greatly reduced shock hazard exists when the unit is operated with the proper grounded receptacles.

SPEAKER OUTPUTS (22)

The speaker output jacks are wired in parallel and are of the standard 1/4" type. Both the output jacks are wired in parallel and either or both may be used when connecting your speaker system. The 260C module has been optimized for a 4-Ohm load but has adequate performance to drive loads both above and below the recommended 4-Ohm impedance. Extreme care should be used when operating a unit at below 4 Ohms since lower load impedances tend to overload the power amplifier and may cause premature activation of the power amp's short circuit protection system and/or thermal fault protection circuitry. Because of the unique design of the compressor, the circuitry will still minimize clipping regardless of load values.

SPECS

Output Power: 130 Watts RMS @ 1% THD into 4 Ohms	Sensitivity: 15 mV @ 1 kHz (Tone Controls Flat; Volume 12:00)	Input Impedance: 100 K Ohms	Signal-To-Noise Ratio: 70 dB (50 K Ohms Source Impedance)
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DANGER

EXPOSURE TO EXTREMELY HIGH NOISE LEVELS MAY CAUSE A PERMANENT HEARING LOSS. INDIVIDUALS VARY CONSIDERABLY IN SUSCEPTIBILITY 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 IN HOURS SOUND LEVEL (dBA) SLOW RESPONSE

890
692
495
397
2100
1,102
1105
110
1/2 or less 115

ACCORDING TO OSHA, ANY EXPOSURE IN EXCESS OF THE ABOVE PERMISSIBLE LIMITS COULD RESULT IN SOME HEARING LOSS.

EAR PLUGS OR PROTECTORS IN THE EAR CANALS OR OVER THE EARS MUST BE WORN WHEN OPERATING THIS AMPLIFICATION SYSTEM IN ORDER TO PREVENT A PERMANENT HEARING LOSS IF EXPOSURE IS IN EXCESS OF THE LIMITS AS SET FORTH ABOVE TO INSURE AGAINST POTENTIALLY DANGEROUS EXPOSURE TO HIGH SOUND PRESSURE LEVELS. IT IS RECOMMENDED THAT ALL PERSONS EXPOSED TO EQUIPMENT CAPABLE OF PRODUCING HIGH SOUND PRESSURE LEVELS SUCH AS THIS AMPLIFICATION SYSTEM BE PROTECTED BY HEARING PROTECTORS WHILE THIS UNIT IS IN OPERATION.

CAUTION

THIS AMPLIFIER HAS BEEN DESIGNED AND CONSTRUCTED TO PROVIDE ADEQUATE POWER RESERVE FOR PLAYING MODERN MUSIC WHICH MAY REQUIRE OCCASIONAL PEAK POWER. TO HANDLE OCCASIONAL PEAK POWER, ADEQUATE POWER "HEADROOM" HAS BEEN DESIGNED INTO THIS SYSTEM. EXTENDED OPERATION AT ABSOLUTE MAXIMUM POWER LEVELS IS NOT RECOMMENDED SINCE THIS COULD DAMAGE THE ASSOCIATED LOUDSPEAKER SYSTEM. PLEASE BE AWARE THAT **MAXIMUM POWER** CAN BE OBTAINED WITH VERY LOW SETTINGS OF THE **GAIN** CONTROLS IF THE INPUT SIGNAL IS VERY STRONG.

Due to our efforts for constant improvement, specifications are subject to change without notice.

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