



WARNING:
TO PREVENT ELECTRICAL SHOCK OR FIRE
HAZARD, DO NOT EXPOSE THIS APPLIANCE
TO RAIN OR MOISTURE.

STUDIO PRO™

Operating Guide

GENERAL DESCRIPTION

Our new Studio Pro™ satisfies the need for a small professional amplifier for those applications where sound quality, electronic sophistication, and unmatched interface capability are more important than large size and brute force.

This new amp was designed to fill the needs of the studio professional and features Peavey's remarkable new "SATURATION™" preamp circuitry as well as a full brace of equalization controls. The Studio Pro's™ internal reverb unit is driven by an active current source wherein the drive coil becomes a part of the feedback circuitry to greatly linearize its response. The back panel features a remote switch jack to enable remote control of the SATURATION™ feature as well as reverb. To facilitate the use of external effects such as pedal boards and other auxiliary equipment, we have included an effects loop consisting of a transient overvoltage protected preamp out and power amp input. In the past, many efforts have been made to patch a signal from an instrument preamp directly into consoles, tape recorders, etc., with generally poor results. Most amp manufacturers find it necessary to build into their amps considerable high end pre-emphasis in order to compensate for the relatively poor high end frequency response of the heavy-duty speakers necessary to handle instrument applications. This pre-emphasis generally causes "direct out" signals to be harsh, noisy and unsuitable for high quality applications. The speaker's limited frequency response acts as a bandpass filter, thus eliminating much of the objectional stridency and noise. Peavey's unique line amplifier circuitry features roll-off characteristics closely matched with those of a loudspeaker with the result that the signal fed to auxiliary equipment closely matches that heard from the instrument amp's own speaker system. To provide unmatched interface capability, this compensated line out circuit features a transformer balanced output from a three-pin XLR connector as well as a low impedance unbalanced signal from a standard phone jack.

Overall, the new Studio Pro™ certainly lives up to its name and, while it is not an unduly large and powerful amplifier, its tonal and equalization capabilities, SATURATION™ dynamics, sophisticated circuitry and compact and portable size make it a must for the busy studio musician. As a practice amplifier, the Studio Pro™ is exceptional.....with enough sophistication and features to satisfy the working professional while being affordable even to the amateur.

FRONT PANEL

INPUTS (A) (B)

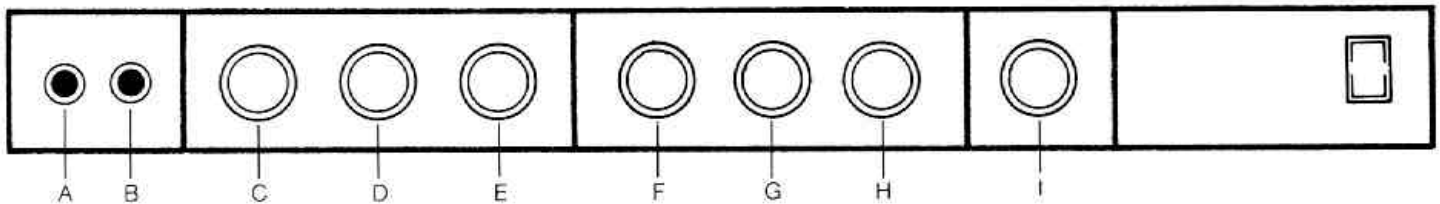
The new Studio Pro™ has been provided with two input jacks, each having different sensitivities and a unique arrangement allowing the gain of **both** jacks to be **equalized** when instruments are plugged into **both** jacks. The high gain jack (A) is the input normally used and has considerably more sensitivity and input impedance than the low gain jack (B). This low gain jack has been included to allow extension of the input dynamic range. If the output signal from your instrument is overloading (distorting) the high gain input, then the low gain (-6 dB) should be used.

GAIN BLOCK™

The Studio Pro™ has been designed utilizing our new "GAIN BLOCK™" signal processing front end. The provision of three interacting controls allows complete and total control of the amp's gain structure (dynamics), harmonic content, overload texture, and output level. Each of the three control functions must be understood and adequate experimentation time spent in order to utilize the full potential of this unique and innovative new amp.

PRE GAIN (C)

Our pre gain (C) is similar to a conventional volume control in that it is the first level setting device in the system. Our input preamp circuitry utilizes variable negative feedback with the pre gain control as part of the active circuit. Utilization of this type circuitry enables an optimum combination of input dynamic range, input impedance, and low noise operation for any particular gain setting. Operation should present no problem since its action is conventional even though the associated circuitry is quite different from older, totally passive circuits. Please be aware that this control exhibits the professionally accepted logarithmic (audio) taper having approximately one-fourth of the gain achieved at the 12:00 o'clock position with the balance being obtained as the control is rotated clockwise. Many manufacturers utilize "linear" action controls that concentrate almost all of the gain in the first one-third of the control rotation. While this "linear operation" is "initially impressive," it should be noted that having **all** the gain "up front" in the first one-third turn is **misleading** and significantly reduces the amount of control latitude available.



SATURATION™ (D)

The SATURATION™ control (D) is the element for setting the operating point of our new and unique "SATURATION™" circuitry. Because the guitar amp is a very vital part of the sound of the electric guitar, we have devoted many years toward achieving the proper "sound" and gain/overload dynamics sought by guitarists. Until now, amps utilizing vacuum tubes (valves) have been considered by most players to be superior to most solid-state units. Today, Peavey is the only **major** manufacturer of **both** tube type **and** solid-state amps, giving us a unique opportunity to study and analyze the various characteristics of each type.

Our extensive research revealed that tubes have the unique ability to "gain compress" at high levels producing a pleasing and "harmonically rich" smooth overload capability. Once having identified the various characteristics of tube amps, we set out to develop solid-state circuitry that would match the dynamics and harmonic textures of tube type equipment.

Our "SATURATION™" effect closely duplicates the gain/compression effect of vacuum tubes. The total tube sound is a result of the "interplay" between the voltage application (preamp) and the power amp/speaker interface. The "SATURATION™" circuit operates in the preamp circuitry and exhibits successively more gain/compression effect as the control is rotated clockwise. It should be noted that the SATURATION™ effect must be balanced with proper settings of all three controls in the GAIN BLOCK™ for maximum effect. The pre gain must be set high enough for adequate drive voltage to the SATURATION™ circuit while the SATURATION™ control should be varied to achieve the desired sustain/overload characteristics. The post gain (master volume) sets the sensitivity of the power amp (master volume) and must be used in conjunction with the above controls for proper results.

It should be remembered that the SATURATION™ effect takes place in the **preamp** and that when the pre and post gain are set to drive the power amp to maximum output, the SATURATION™ circuit will have correspondingly little effect on the total sound of the unit as the natural overload characteristics of the **power amp** come into play.

NOTE

TO ACHIEVE PROPER SATURATION™ CHARACTERISTICS FROM YOUR AMPLIFIER, YOU MUST UNDERSTAND THAT THE MAJOR PORTION OF THE SIGNAL PROCESSING CIRCUIT IS LOCATED IN THE PREAMP AND THAT WHEN THE POST GAIN IS SET HIGH ENOUGH (GENERALLY "5" OR HIGHER), THE POWER AMP THEN BEGINS ADDING ITS OWN HARMONICS TO THOSE ALREADY BEING GENERATED BY THE SATURATION™ CIRCUITRY. EXPERIENCE HAS PROVEN THAT THE BEST OVERALL RESULTS ARE OBTAINED WHEN ALL THE OVERLOAD IS TAKING PLACE WITHIN THE SATURATION™ CIRCUITRY, WHILE THE INTERNAL POWER AMP/SPEAKER REMAINS BELOW THE CLIPPING POINT.

The procedure for arriving at optimum control settings with any particular guitar and equalization characteristics are as follows:

1. Plug into the high or low gain input jack.
2. Set the **post gain** control somewhere in the **middle** of its range.
3. Set the **pre gain** control somewhere in the **middle** of its range.
4. Adjust the SATURATION™ control for the desired amount of gain/compressed clipping.
5. Readjust the **pre gain** control to assure adequate drive.
6. Readjust the **post gain** control just below the point at which the power amp/speaker reaches the clipping point and adds its own harmonics to the predistorted signal. This setting is readily noticeable since the additional harmonics are audible when the **power amp** reaches its maximum output level.

NOTE

PROPERLY SET UP, THE SATURATION™ CONTROL OPERATES THE POWER AMP JUST BELOW ITS CLIPPING POINT GIVING TOTALLY SMOOTH OVERLOAD CHARACTERISTICS. BY DRIVING THE POWER AMP TO ITS OUTPUT CLIPPING LEVEL, THE OUTPUT DOES NOT BECOME LOUDER.....JUST MORE DISTORTED AND SOMEWHAT LESS PLEASING.

Experimentation and operating experience will be necessary to fully realize the unique benefits of this SATURATION™ effect. The SATURATION™ effects may be remotely switched out of the circuit through use of the optional remote switch plugged into the footswitch jack (5) on the rear panel.

CAUTION

THE POST GAIN CONTROL MUST BE ADJUSTED TO PREVENT THE POWER AMP FROM CLIPPING IN ORDER TO HAVE A "CLEAN" SOUND WHEN SATURATION™ IS SWITCHED OUT.

POST GAIN (E)

The post gain control (E) determines the input sensitivity of the power amp. The action of this control is similar to that of a "master volume" control and can be used to control the overload dynamics of the preamp by **decreasing** the sensitivity of the power amp. The post gain control allows maximum gain and SATURATION™ effects to be achieved in the preamp circuitry, while maintaining the relatively low power output levels necessary in studio or practice applications. The operation of this control is conventional and no difficulty should be encountered. To achieve a "warm" SATURATION™ type sound, it is recommended that the post gain control be set at "5" or less. Please refer to the detailed instructions for the SATURATION™ control in order to achieve optimum results when using the post gain control in conjunction with the pre gain and SATURATION™ controls.

EQUALIZATION

To provide a degree of tonal range, most amps today are equipped with some kind of equalization controls. Many guitar amps have been designed by engineering teams having little or no understanding of the needs of guitarists and the usual result is some kind of "hi-fi" amp in a guitar amp configuration. As you know, a guitar amp is a vital link in the electric guitar **system** and proper attention must be paid to achieving the kind of response so necessary for proper tonal texture.

The Studio Pro™ includes controls for low, mid and high frequency ranges. While many amps have similar equalization control functions, many of these offer poor operation especially in the mid and low EQ ranges. Our unique EQ circuitry has been designed so that the low and mid control actions "overlap" slightly as do the mid and high control actions. This intentional "interaction" of the vital middle control enables the equalization circuitry to produce a virtual "rainbow" of tonal coloration and timbre combinations. These EQ controls are not "hi-fi" type controls where the vertical (12:00 o'clock) setting is flat. This EQ circuitry is capable of simulating most types of guitar response, especially when used in conjunction with the amp's gain/overload dynamics. Again, experimentation and understanding are necessary for achieving maximum performance from this versatile new unit.

LOW EQ CONTROL (F)

The low EQ control (F) is the control element for determining the low frequency response of the amplifier. Our unique low frequency EQ circuitry permits smooth and precise action of this control. Experimentation will illustrate that this type of EQ is ideal for musical instrument applications and its effect on the overall tonal color is profound. Increasing low frequency response is obtained as the control is rotated clockwise. Care should be taken not to overboost the low end to avoid prematurely overdriving the power amp. Most amps that are well-respected for "hard rock" have somewhat limited low end capabilities; therefore, it is not a good idea to use lots of low end boost. Because bass frequencies generally require more output power than middle or high frequencies, it is important to keep this fact in mind when using this medium powered (20 watts RMS) amp.

MID EQ CONTROL (G)

The mid EQ control (G) determines the level of the vital midrange frequencies. Our research has found that the midrange is most often the most important (and overlooked) range of frequencies. This midband is what actually makes many guitars and amps sound the way they do. The extremes of highs and lows sometimes have minimal effect on the overall tonal color, while those frequencies we generally call the "midrange" really make the vital difference between merely a "good sound" and a "great sound." The middle EQ control will enable tremendous tonal variation and is designed to interact slightly with both the low EQ and the high EQ controls. This interaction or overlapping action enables endless subtle tonal "shadings" to be achieved.

The action of this middle control is conventional with increasing midrange response as the control is rotated clockwise. This control is **very** effective in determining the overall "color" of the sound when using the SATURATION™/overload features of this amp. Generally, a much "thicker" and "fatter" sound is obtainable when more mid boost is used for hard rock. For clean country/jazz playing, more mid cut is generally better.....In any case, this mid EQ works and should be used to "fine tune" the overall low and high EQ to provide the tonal color needed.

HIGH EQ CONTROL (H)

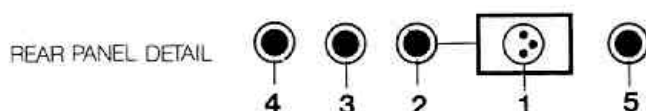
This is the control element determining the amount of high frequency boost in the output signal. The action of this control is conventional. An increasing amount of high boost is obtained as this control is rotated clockwise. This high EQ circuit (H) is extremely effective and should provide more than enough tonal variation for achieving almost any amount of "top end" required.

When playing hard rock, it is generally not a good idea to use maximum high end boost since excessive highs tend to make the smooth overload characteristics of this amp somewhat more "strident" and "hard" than is generally desirable.

Additional high end boost is available from the pull switch attached to the high control. Pull for boost.

REVERB CONTROL (I)

This control (I) determines how much delayed (reverb) signal is blended back into the main output signal. This control is conventional in operation and should present no operational problems. Please remember that the reverb function may be remotely controlled by use of a footswitch plugged into the footswitch jack on the rear of the chassis.



REAR PANEL (1) (2)

This amp has a built-in frequency compensated line amplifier providing both transformer balanced XLR (1) and unbalanced phone jack (2) line outputs. The frequency response of these line outputs has been carefully designed to match the response of the loudspeaker so that the line out signal will electronically correspond to what is being heard from the speaker. Because of this unique and exclusive feature, it is possible to use this unit without "direct boxes" and other matching devices when interfacing with mixers and other equipment. The level is 2 volts RMS, while the source impedance is approximately 600 ohms.

PREAMP OUT JACK (3)

The preamp out jack (3) is the output of the preamp and is provided for patching **out** the preamp signal to external devices and/or effects units.

POWER AMP IN JACK (4)

The power amp in jack (4) is of the switching type and, in the normal (nothing plugged in) configuration, the preamp output is internally connected to the power amp. When a plug is inserted into this power amp in jack, the internal patching connection is broken and the power amp's input is now the plug/patch into the power amp input jack. The purpose of the preamp out/power amp in jacks is to allow auxiliary effects units to be patched "in line" between the preamp and the power amp.

FOOTSWITCH JACK (5)

The footswitch jack (5) allows remote switching of both SATURATION™ and reverb effects. This jack is of the stereo (ring-tip-sleeve) type and will not function properly with standard (tip-sleeve) jacks.

STUDIO PRO™ SPECS:

POWER AMPLIFIER SECTION:

FREQUENCY RESPONSE:

+0, -3 dB, 60 Hz to 30 KHz, @ 1W into 8 ohms

RATED POWER & LOAD:

20W RMS into 8 ohms

POWER @ CLIPPING:

(8 ohms, 1 KHz, 120 VAC line)

Typically:

18W RMS @ 1% THD

21W RMS @ 5% THD

23W RMS @ 10% THD

TOTAL HARMONIC DISTORTION:

Less than 0.5%, 100 mW to 15W RMS, 50 Hz to 10 KHz, 8 ohms,

Typically below 0.25%

PREAMP SECTION:

THE FOLLOWING SPECIFICATIONS ARE MEASURED @ 1 KHz WITH THE CONTROLS PRESET AS FOLLOWS:

SATURATION, FULL COUNTERCLOCKWISE; POST GAIN, FULL CLOCKWISE; LOW & HIGH EQ, FULL CLOCKWISE; MID EQ, FULL COUNTERCLOCKWISE; REVERB, FULL COUNTERCLOCKWISE; HIGH BOOST, OFF, IN; NOMINAL LEVELS ARE WITH PRE GAIN @ 12; MINIMUM LEVELS ARE WITH PRE GAIN @ FULL CLOCKWISE

PREAMP INPUT CHARACTERISTICS:

JACK A INPUT:

Impedance: High Impedance, 220K ohms

Nominal Input Level: -28 dBV, 40 mV RMS

Minimum Input Level: -46 dBV, 5 mV RMS

Maximum Input Level: +8 dBV, 2.5V RMS

JACK B INPUT

Impedance: High Impedance, 44K ohms

Nominal Input Level: -22 dBV, 80 mV RMS

Minimum Input Level: -40 dBV, 10 mV RMS

Maximum Input Level: +14 dBV, 5V RMS

POWER AMP INPUT:

Impedance: Medium Impedance, 22K ohms

Designed Input Level: 0 dBV, 1V RMS

SIGNAL-TO-NOISE RATIO @ NOMINAL INPUT LEVEL:

74 dB, 20 Hz to 20 KHz unweighted

EQUALIZATION:

Special low, mid and high passive type EQ circuitry

SIGNAL OUTPUT CHARACTERISTICS:

PREAMP OUTPUT:

Load Impedance: 600 ohms or greater

Nominal Output: 0 dBV, 1V RMS

Maximum Output: +18 dBV, 8V RMS into 50K ohms

Maximum Output: +16 dBV, 5V RMS into 600 ohms

LINE OUTPUT & BALANCED LINE OUTPUT:

Load Impedance: 600 ohms or greater

Nominal Output: -10 dBV, 300 mV RMS

Maximum Output: +10 dBV, 3V RMS into 50K ohms

Maximum Output: +8 dBV, 2V RMS into 600 ohms

POWER REQUIREMENTS: (Domestic)

80W, 120 VAC, 50/60 Hz

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

AMP CAUTIONS 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

8
6
4
3
2
1½
1
¾
½ or less

SOUND LEVEL dBA, SLOW RESPONSE

90
92
95
97
100
102
105
110
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.

