Hughes & Kettner STUDIO 84/TUBE 20 Manual

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Congratulations and thank you for purchasing the HUGHES & KETTNER STUDIO 84/TUBE 20 guitar amplifier!

Your Hughes & Kettner Tube Series amp is a direct descendant of the most comprehensive all-tube head ever made, the revolutionary new Hughes & Kettner TriAmp. The STUDIO 84/TUBE 20 incorporates key elements of the TriAmp design that make it a very versatile amp as well. A unique combination of all-tube circuitry, a custom-designed Celestion RockDriver Pro speaker, high-quality components and a power amp that clips harmonically (if desired, even at low volumes) is responsible for this amp's impressive range of overtones and characteristic sounds.

As you investigate the tonal possibilities of your new amp and discover how quickly you can find precisely the tone you want, this amp will soon become one of your most important sound-shaping tools.

Take your time - keep this manual nearby - and discover for yourself the vast potential of this amp.

We wish you a great deal fun and success with your new STUDIO 84/TUBE 20!

IMPORTANT: BEFORE POWERING UP!

- Check that your local wall socket voltage and the amp's AC power rating are identical before you plug the amp in.

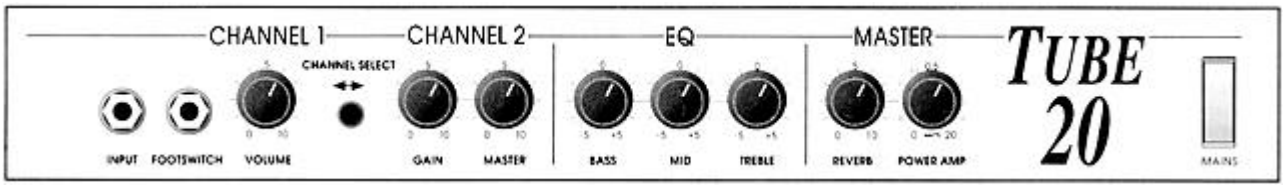
- Ensure air can circulate around your amp's ventilation ducts.

- Make sure the amp sits securely on a stable platform where it is not exposed to mechanical shocks or temperature extremes which may damage the amp or endanger the safety of bystanders.

- Hughes & Kettner is not liable for damages due to improper use.

1.0 JACKS AND CONTROLS

Front Panel



INPUT: Input jack for guitars.

VOLUME: Determines the volume and gain for CHANNEL 1. Higher VOLUME settings (depending on your instrument's output level) add a crunchy edge to the signal.

FOOTSWITCH: Jack for a standard footswitch (e.g. Hughes & Kettner FS-1); allows you to switch channels.

YELLOW CHANNEL LED: The yellow LED illuminates to indicate CHANNEL 1 is active.

CHANNEL SELECT: This channel selector switch activates either CHANNEL 1 or CHANNEL 2. This switching function can also be executed via footswitch.

RED CHANNEL LED: The red LED illuminates to indicate CHANNEL 2 is active.

CHANNEL 2 GAIN: Controls the amount of distortion in CHANNEL 2.

CHANNEL 2 MASTER: Determines the volume level of CHANNEL 2.

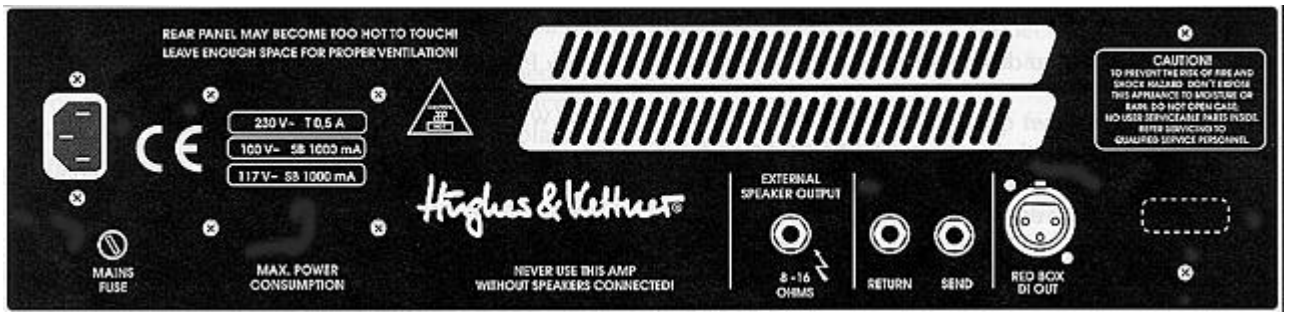
EQ SECTION: Common BASS, MID and TREBLE controls for the both channels. MID and TREBLE controls influence each other: if you boost the treble, the mids are cut and vice versa. This EQ shaping feature allows you dial in a wide variety of subtle tonal variations.

REVERB: Controls the amount of integrated reverb.

POWER AMP: Determines the STUDIO 84/TUBE 20's output level. In contrast to conventional master controls, the enhanced overtones and compressive effect of the STUDIO 84/TUBE 20 power amp is audible even at low POWER AMP settings. At the maximum setting, the STUDIO 84/TUBE 20 operates like any amp without a master control - i.e. the amount of power amp distortion is determined by the preamp's output signal level.

MAINS: Power On/Off switch.

Rear Panel



MAINS IN: Connect the included Euro-norm mains cord to this socket. Ensure the amp's voltage rating matches your local AC voltage rating before you plug the cord into the wall socket.

8 /16-OHM SPEAKER JACK:

Connect speaker cabinets with an overall impedance between 8 and 16 ohms (e.g. an 8-ohm cabinet) to this jack. The internal speaker will continue to operate.

FX RETURN:

Connect this jack to the output jack of your effects processor.

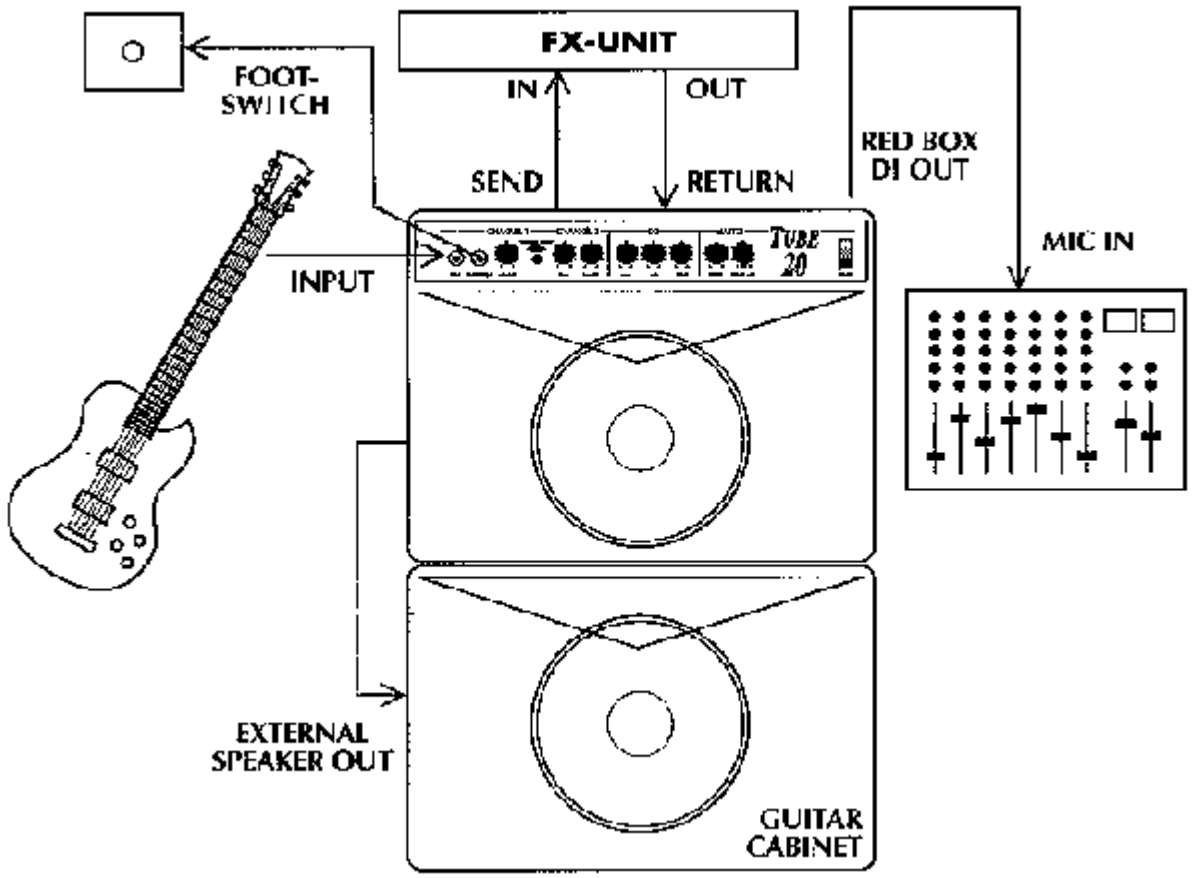
FX SEND:

Connect this jack to the input jack of your effects processor.

RED BOX D.I. OUT:

This is a frequency-corrected balanced output that enables you to feed the STUDIO 84/TUBE 20's signal directly to a mixing console for stage and recording purposes. If necessary, you can feed this signal to an unbalanced jack (1/4" mono) at the mixing console. The level of this output signal is influenced by the POWER AMP setting and the impedance of the connected speakers.

2.0 STANDARD SETUP/CABLE CONNECTIONS



3.0 OPERATING THE STUDIO 84/TUBE 20

3.1 SELECTING SOUNDS

To get the most out of your amp, we recommend you start with the following steps:

- Make all adjustments with your guitar's volume and tone controls turned all the way up.

- Start with the CHANNEL 1 VOLUME control. Dial in the desired volume level and amount of distortion.

- Switch over to CHANNEL 2. Use the GAIN control to set the amount of overdrive you want.

- Use CHANNEL 2 MASTER to adjust the volume so you have the desired level in comparison with the volume of CHANNEL 1.

- Use the POWER AMP control to determine the overall volume level.

NOTE: At low POWER AMP control settings, the STUDIO 84/TUBE 20's power output level is reduced, which means the power amp will generate harmonic overdrive even at low volumes, provided you turn the preamp levels up. If you do not want the power amp to clip, turn the POWER AMP control all the way up and use the preamp VOLUME and MASTER controls to adjust the overall volume level.

3.2 USING SIGNAL PROCESSORS

The STUDIO 84/TUBE 20 is equipped with a serial effects loop. The entire preamp signal is routed to the FX device and processed there. For this reason, you should invest in high-quality signal processors that color the amp's signal as little as possible.

Listen to the sound of your amp without a signal processor patched in to the FX loop. Add your processor to the signal chain and press the device's BYPASS button. There should be very little difference between the two sounds.

Distortion units and compressors are not designed for use in an FX loop. Connect these to the STUDIO 84/TUBE 20's instrument INPUT. Depending on the amount of distortion/compression you want to achieve, you will probably be more satisfied with the results if you use CHANNEL 1 for these types of devices.

Volume pedals, wah-wah pedals and similar stomp boxes generate different sounds depending on where you connect them, i.e. to the INPUT or to the FX loop. Give each option a try - ultimately this is a matter of personal preference.

4.0 REPLACING TUBES, SERVICE AND PREVENTIVE MAINTENANCE

Your STUDIO 84/TUBE 20 features factory-equipped EL84 and 12AX7A Hughes & Kettner tubes. Hughes & Kettner tubes are first burned in and then checked for their electrical and mechanical properties

(microphonics), selected and matched, and then given a final audio and response test once they have been installed in a STUDIO 84/TUBE 20.

One of the most important steps in the testing process is power tube matching, i.e. selecting and pairing tubes with identical characteristics.

When should you replace tubes?

The tubes in your STUDIO 84/TUBE 20 are of exceptionally high quality and will last extremely long. If you do encounter a problem, first check whether one of the following situations apply:

- Is the defect a problem caused by a faulty or worn-out tube, or is there actually a peripheral problem, for instance a defective speaker cable that caused damage to the tube?

If this is the case, unless you correct the defect first, the problem will recur once you have installed a new tube.

- Did the AC power supply fluctuate during operation? Whereas digital equipment often malfunctions when the power supply dips below a minimum value, all-tube amps tend to malfunction when the power level rises above a certain value. Generators and faulty high-power circuits often cause these power fluctuations.

- Did a fuse trip although there was no plausible cause?

Aging fuses, particle ionization in the tube or spark-over due to power spikes may cause this type of problem. In this case, replacing a tube will not solve the problem.

- Old tubes begin to show signs of wear after they have been in operation for a very long time: increased microphonics and noise, treble loss, weak power output, muddy sound, etc. are all indicators of pending tube failure. Power amp tubes wear out faster than preamp tubes. If you encounter these problems, replace the tubes. Not only do old tubes sound bad, they also have a tendency to fail altogether.

NOTE: We recommend you refrain from exchanging tubes solely for sound experimentation purposes. Be Improper use runs the risk of damaging your amp and will not be covered under warranty. sides, we tested every conceivable tube option and installed the tube types that deliver the best possible performance.

Keep the following in mind when you are ready to replace tubes:

- We recommend only qualified service personnel replace tubes.

- Before removing the chassis, ensure the mains cord is unplugged from the wall socket! Wait at least 2 minutes for the amp to power down.

- If you are replacing a power amp tube, ensure the replacement tube bears identical specs.

- Use only matched pairs of power amp tubes.

- If you install a matched pair of tubes bearing precisely the same specs as the original tubes, the amp does not have to be re-biased. Conversely, if the specs are not identical, the amp must be biased. Biasing is a complex procedure requiring special tools and should only be executed by a qualified amp technician.

How can you extend the life of your tubes?

- Never operate the STUDIO 84/TUBE 20 without a proper load (speaker) connected to the output. Switch the amp off and let the tubes cool down before transport. A quality flight case is a good investment and is only slightly more expensive than a complete set of tubes.

- Proper bias and trim are essential. If you find the tubes need to be replaced too often, consult a qualified technician.

All other STUDIO 84/TUBE 20 components do not require maintenance. Use a slightly dampened cloth for all metal parts and the exterior surfaces. Avoid exposure to mechanical shocks, extreme heat, dust and moisture. Ensure the cooling vents are not obstructed during operation.

5.0 TROUBLESHOOTING

1) The STUDIO 84/TUBE 20 is not getting any power:

- Check the mains cable to see if it is connected properly.

- The mains fuse may be defective. Replace the fuse with another identical fuse. If this fuse also trips, consult your Hughes & Kettner dealer.

2) The STUDIO 84/TUBE 20 is connected properly, but no sound is audible.

- One or several GAIN and MASTER controls may be turned all the way down. Dial in a higher setting.

- A short circuit in the speaker signal chain may have tripped an internal fuse, or one of the power tubes is defective. Replace the speaker cable and have a qualified service technician replace the fuse/tube (identical specifications are a must). Please read Section 4.0 on how to replace tubes correctly.

3) When using the RED BOX D.I. OUTPUT jack, you experience annoying hum.

- An electrical or magnetic field is causing interference. Use higher-quality cables or re-arrange the cables you are using to reduce interference to a minimum.

- Devices are connected to the RED BOX D.I. OUT in such a way as to cause a ground loop. DO NOT SEVER THE GROUND OF THE CONNECTED DEVICES UNDER ANY CIRCUMSTANCES! Try plugging all devices into the same socket via an AC power distributor/power strip. If this doesn't eliminate the noise, you must ensure the connection is galvanically separated by routing the signal through a transformer-balanced D.I. box.

4) You have connected the RED BOX D.I. OUTPUT jack to a mixing console and the signal is totally distorted, even when you have dialed in a clean sound.

- The RED BOX D.I. OUTPUT signal is overloading the mixing console's input. Reduce the mixing console's input sensitivity (GAIN). If this doesn't rectify the problem, patch the signal to the mixing console's LINE input.

5) You have connected the RED BOX D.I. OUTPUT jack to a mixing console and the signal's volume level is way too low.

- The amp's output level is limited by an incorrectly adjusted POWER AMP or other level control knob. Turn up the control or controls.

- The mixing console's line input is not sensitive enough. Turn up the gain. If this is still insufficient, use the microphone input (if necessary, use an adapter cable or D.I. box).

6) When in use with a loud PA, the RED BOX D.I. OUT circuit is causing feedback even though the amp is set to a low volume.

- Speakers connected to a tube amp may have microphonic properties. Turn the STUDIO 84/TUBE 20’s POWER AMP control up and the circuit will stop feeding back. You can also turn the PA/monitor down or reposition the amp.

7) The sound is slightly distorted and you cannot get a truly clean tone.

- The POWER AMP control is turned down so low that the power amp is operating at minimum power, i.e. it is clipping even at low volume levels. Turn the POWER AMP knob up and the preamp VOLUME knob down.

Please see Section 3.1.

- The input section is being overdriven. Depending on the type of pickups in your guitar, this effect is very pronounced or may not be audible at all. If you don't want this slight distortion (although many players prefer a little dirt in their sound), reduce the volume of your guitar or volume pedal, turn the screws on the frame of your pickups so the distance between the strings and pickups is greater, or try a different combination of pickups.

- If the distortion has an annoying gritty edge to it, there may be some type of fault due to improper use of a signal circuit, for instance a speaker output connected to the STUDIO 84/TUBE 20's input. In this case, consult your Hughes & Kettner dealer.

8) Compared with another amp featuring a similar power rating, the volume of the other amp is substantially louder than the STUDIO 84/TUBE 20 even though the respective VOLUME/POWER AMP knobs are set to the same position.

- Please note that this type of comparison is only relevant when both VOLUME/POWER AMP knobs are turned all the way up! Unfortunately, many amps are equipped with linear master volume controls, consequently they achieve maximum power output when the knob is set to somewhere around the 12 o'clock position. We equipped the TUBE with a logarithmic POWER AMP pot, which gives you an evenly graduated power output curve. The STUDIO 84/TUBE 20’s headroom is not fully exhausted until you turn the POWER AMP pot all the way up.

6.0 Technical Specifications

TUBES: 2x 12AX7A (ECC 83); 2x 6BQ5 (EL84)

Preamp section: CHANNEL 1, CHANNEL 2 tube channels

INPUT: -10 dBV/ 1 MOhm

FX-RETURN: 0 dBV/ 47 kOhms

FX-SEND: 0 dBV/ 220 Ohms

RED BOX D.I. OUT: - 3 dBV/ 220 Ohms

Power amp section: variable power EL84 tube amp

Output Power: 20 W RMS (into 8 Ohms)

Frequency response (1W): 20 Hz - 25 kHz (into 4 Ohms or 8 Ohms)

Speakers: CELESTION Rock Driver Pro, 12", 8 Ohms

General TECHNICAL DATA:

Voltage: 230 V~ (European model)

117 V~ (North American model)

100 V~ (Japanese model)

Max. power consumption: 100 VA (into 4 Ohms)

Mains Fuse: Slo-Blo 500 mA (230 V model)

Slo-Blo 1000 mA (117 V model)

Slo-Blo 1000 mA (100 V model)

Anode Fuse: Slo-Blo 200 mA

Secondary Fuses: 1x Slo-Blo 100 mA (low voltage)

Dimensions: 480 x 490 x 275 mm (19" x 19.25" x 11") (W x H x D)

Weight: 16 kg (35 lb.) (approx.)

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