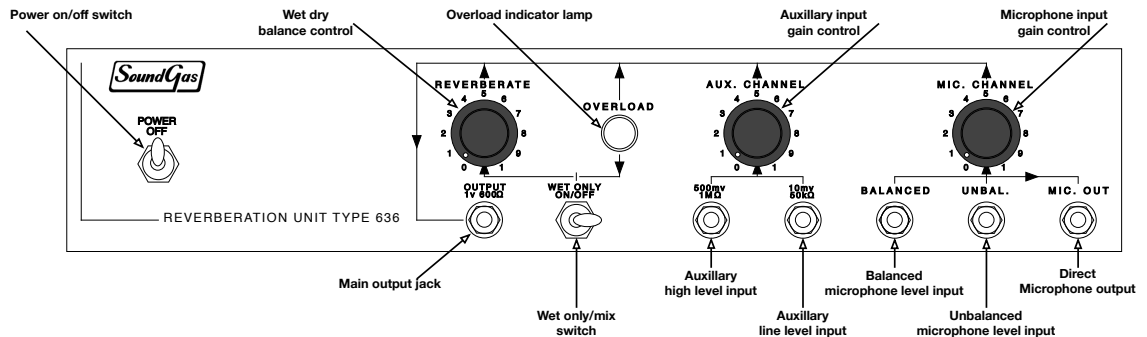


SOUNDGAS TYPE 636 REVERBERATION UNIT

OPERATION MANUAL



This instrument, intended for either amateur or professional use, employs a pair of mechanical (spring) delay lines with electromagnetic transducers to simulate the reverberant effect of a “live” hall.

The delay lines have nominal transmission times of 29 and 37 milliseconds respectively. This alters depending upon the tanks’ characteristics. The lines are deliberately mismatched at their terminations to promote multiple reflections of the original signal, thus simulating the effect of two pairs of parallel walls (spaced approximately 32ft. and 41ft. apart respectively) reflecting sound waves.

The total reverberation time (defined as the time taken for a sound to die away to 1×10^{-6} of its original intensity) at 300 Hz is greater than 2 seconds. There are two signal paths through the instrument; a direct path through which the unmodified input signal reaches the output, and the reverberation path described above, which embodies a separate gain or “reverberation” control. This enables the ratio of reverberant to direct sound to be varied from zero to approximately 1:1.

The direct signal path through the instrument has a reasonably flat frequency response (35Hz - 20KHz) but the response of the reverberation path is deliberately limited to 100Hz – 5KHz. Two independent input channels are provided; a low level channel specifically intended for medium or low impedance microphones, and a low or high level, high impedance channel which can accept line level signals.

The single microphone channel is arranged to accept either a balanced or unbalanced input connection and embodies a novel variable negative feedback circuit which will accept the very large input signals associated with close microphone technique without danger of overloading the associated pre-amplifier. The maximum output of the unit is 1V across 600Ω impedance, which is more than adequate to feed the “radio” input of an average tape recorder, and may be fed through long lines with very little high frequency loss. To achieve a good overall signal to noise ratio it is necessary to drive the mechanical delay lines to near their maximum capacity, this is done by means of a 500mW push-pull, constant current, driver amplifier. The danger of overloading this amplifier is averted by the small pilot lamp which is situated in the output circuit which serves as a combined overload indicator signal compressor and protective device.

The electronic circuits embodied in the instrument are fully transistorised; particular care has been taken to ensure minimum noise, and stability of gain over a wide range of operating temperatures. It should be stressed that this instrument is intended to be used for improving the quality of recorded music and vocals – especially when recording takes place under abnormally “dead” acoustic conditions; and for dramatic effects – it is NOT intended to provide the “flutter-echo” effect associated with electric guitars on “pop” music recordings.

TECHNICAL SPECIFICATION.

INPUTS:

Two independently controlled input channels are provided, one for microphone level signals, and the other for high impedance signals.

MICROPHONE CHANNEL CONNECTION:

Balanced or unbalanced lines via two standard A Type 6.35mm (¼") jack sockets.

Sensitivity: 20 μ V across 600 Ω .

Maximum level: 25mV.

MICROPHONE OUTPUT:

Unbalanced, via standard A Type 6.35mm (¼") jack socket.

Program level: at rated input -8dBm (=300mV)

Source Impedance: 600 Ω .

Maximum level: +2dBm (=1V).

AUX CHANNEL:

Connection: unbalanced via two standard A Type 6.35mm (¼") jack sockets.

Matching Impedance: (a) 50K Ω (b) 1M Ω

Sensitivity: (a) 10mV (b) 500mV

Maximum Level: (a) 300mV (b) 15V

MAIN OUTPUT:

Connection: Unbalanced, via standard A Type 6.35mm (¼") jack sockets.

Direct Path Program Level: (Reverb. off) at rated input -8dBm (=300mV)

Source Impedance: 600 Ω .

Maximum level: +2dBm (=1V).

Wet Only On/Off Switch

When the wet only switch is in the right hand position, a mix of reverberated signal & dry signal is fed to the wet dry mix control knob. In the left hand position only reverberated signal is sent to this control, and onward to the main output.

The wet dry mix control now acts as a wet level only control. This allows the operator to attain their own mix of wet/dry signal by sending an output from the Microphone output and the main output to a mixing console.

DIRECT PATH GAIN

Mic. Channel: Approximately 72dB (86dB voltage gain).

AUX. CHANNEL

(a) 52dB (32dB voltage gain)

(b) 30dB (-2dB voltage gain).

FREQUENCY RESPONSE

±2dB 35Hz – 20KHz on all inputs.

Gain Control Interaction: <1dB.

Noise: Both channels closed: -68 dBm at output.

Reverberation fully on: Aux. channel open terminated in 50KΩ.

Reverberation fully on: -63 dBm at output. Both channels open correctly terminated.

Reverberation fully on: -45 dBm at output.

Noise Factor of Mic. Channel: <5dB at 400Hz - 10KHz.

Distortion: <1% harmonic content at maximum input and output levels. Reverberation off.

REVERBERATION PATH

Delay Times: 29ms and 37ms nominal.

Reverberation Time: 2 seconds at 300Hz.

Frequency Response: 100Hz - 5KHz ±3db (averaged at 100Hz bandwidth).

The response will change depending on the reverberation tank fitted. These are vintage tanks and will have a unique and individual sound.

Direct to Reverberation Ratio: 1:1

Overload Indicator: 6.5V, 150mA E5 panel lamp.

POWER SUPPLY

Consumption: Approximately 50mA idling. 200mA on full drive. 50mA-100mA average on speech and music.

CONTROLS

Three rotary controls (numerically calibrated) for Mic. gain, Aux. gain and Reverberation, together with an overload indicator lamp and on/off switch, mounted on vertical front panel.

CONNECTIONS

6 standard A Type 6.35mm (¼”) jack sockets along the bottom edge of the front panel of the instrument.

OPERATING TEMPERATURE: 0°C – 50°C.

TRANSISTORS

12 x vintage new old stock germanium type transistors individually selected for low noise and musicality.

Microphone Amp Board: 1x each AC107 & OC45 or equivalents

Microphone Output Board: 1x each AC128 & AC128K or equivalents

Recovery/Output Board: 1x each AC107 & AC128 or equivalents

Aux Buffer/Buffer Splitter Board: 2x OC45 & 1x OC71 or equivalents

Tank Drive Amp Board: 2x AC128K & 1x AC128

As far as possible all transistors are grouped in DC feedback pairs to stabilise working points, and extensive use is made of AC negative feedback to ensure constant gain despite temperature variations and transistor spreads. This feedback also serves to reduce distortion and achieve the desired circuit impedances.

The arrangement of the microphone channel input jacks is such that inserting the appropriate plug automatically connects the primary of the mumetal screened microphone transformer for balanced or unbalanced input. The microphone preamplifier consists of a DC feedback pair with the input transistor biased for low noise operation.

Shunt and series AC feedback is applied overall to stabilise the amplifier input impedance and this feedback is varied inversely with the setting of the gain control at the output. This accommodates a wide range of input levels, without resorting to noisy high-current operation of the input transistor. This is followed by a buffer amplifier allowing the signal from the microphone amplifier to be split with one branch being used for the microphone output socket.

The auxiliary channel pre-amplifier is an emitter – follower stage providing a high input impedance, followed by a gain control. The input impedance at the high level input is still further increased by a resistor.

Outputs from the two pre-amplifiers are mixed and fed to the buffer splitter amplifier. This amplifier divides the signal between the direct and reverberation paths. It consists of a DC feedback pair with shunt AC negative feedback to reduce the input impedance and prevent interaction of the pre-amplifier gain controls. This feedback, together with the direct-path output is derived from the emitter of the second transistor.

The reverberation path output is directly coupled from the collector of this transistor to the base of the spring driver amplifier input transistor.

The spring driver amplifier is a conventional 500mW single-ended push-pull class B power amplifier, transformer driven from a class A common-emitter stage. Collector-base H.F. feedback is used on the class A stage to curtail the reverberation path frequency response, while series fed overall feedback ensures the desired constant current spring drive.

Overload protection is by a small indicator lamp connected in series with the spring unit drive coil. The output signal from the spring unit is fed via the reverberation control to the output amplifier, where it is mixed in series with the direct path signal.

The output amplifier consists of a DC feedback pair of which the first transistor is biased for low-noise operation. AC negative feedback is arranged to be fed in series with the reverberation path input and in shunt with the direct path input. This raises the reverberation path input impedance and prevents overloading the pick-up coil, while lowering the direct path input impedance to prevent signals being transmitted back along the direct path.

The output impedance of this amplifier is determined largely by the collector load and the resistor across the output jack prevents the leakage current of the coupling electrolytic disturbing the bias of any subsequent amplifier.

OPERATION

Setting the Controls

Give the unit a few seconds to settle after switching on. The appropriate gain control should be turned clockwise until the overload indicator lights. It should then be turned back until the indicator just glows intermittently on the very loudest sounds. The amount of reverberation added to the signal may then be adjusted by the Reverberation control.

Turning the control clockwise increases the amount of reverberation, and with the control set at '0' no reverberation is added. The control may be left in any desired position and the reverberation switched on and off by remote switch connected as described above. If, with the controls set as described above, the output of the system is too loud or too soft, or if in the case of a tape recorder, the recording level is incorrect, then the gain control of the amplifier or recorder following the reverberation unit should be adjusted, NOT the gain control of the unit. This means that, in the case of the recorder, the maximum recording level is adjusted to correspond with the overload point of the reverberation unit.

The system is now "lined up". With the system adjusted in this way any further adjustment to accommodate changes of input level from a microphone etc., should be made to the gain control on the reverberation unit; so that neither reverberation unit nor recorder is overloaded.

The correct setting up procedure is important. If the unit is overloaded, distortion will be heard when the reverberation is turned on. If the input is too weak the unit will produce "hiss" and be sensitive to mechanical vibration.

Position in System

Though it is theoretically possible to connect the reverberation unit almost anywhere before the power amplifier in a reproducing system, or either before or after a recorder in a recording-reproducing system, certain practical considerations make the choice of position important.

It is rarely desirable to add reverberation equally to the sound from a number of musical instruments, vocalists etc, – an example of this is the use of reverberation to give "body" to a vocalist while retaining the original musical backing. To do this it is necessary to connect the reverberation unit into a microphone channel used for

the vocalist only and mix the output of the unit with that of the microphone channels used for the backing.

POINTS OF GENERAL IMPORTANCE

Echo: This is a single reflection of sound.

Flutter echo: This is a multiple reflection of a sound which can be heard as a series of distinct separate echoes. The Soundgas Type 636 will not produce these effects.

Reverberation:

This is a series of multiple reflections of a sound which is heard, not as separate echoes but as a re-enforcement of the original sound, as in large halls, churches etc. The Soundgas Type 636 will produce this effect.

Reverberation can strengthen a weak solo voice when used in moderation, without causing a “hollow” sound.

Reverberation on large groups of musical instruments producing complex sound is usually unpleasantly confusing.

If in doubt, use too little rather than too much reverberation (rarely more than ‘4.’ on the control), especially when recording – it cannot be removed, but more can be added later.

POWER SUPPLY:

The 636 can be configured for various power line voltages. please specify when ordering.

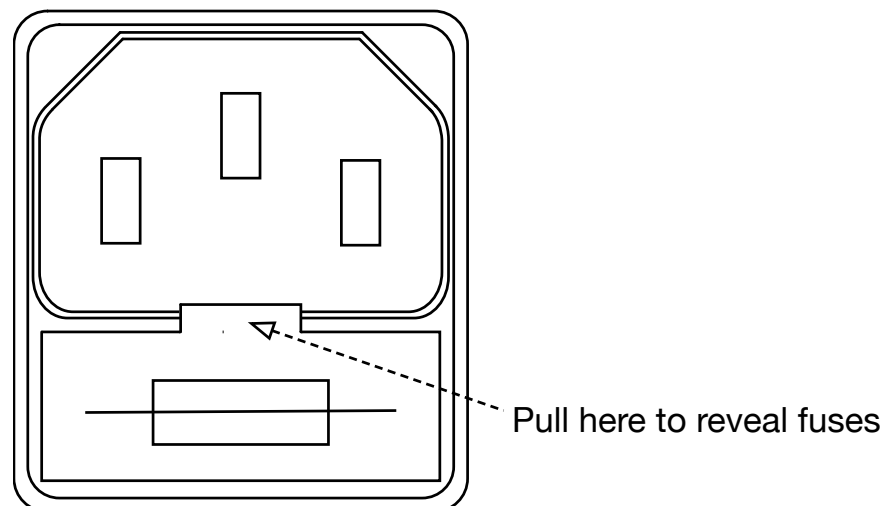
USA 115v:

2x 200mA 20mm T fuse

UK/Europe 220v:

2x 100mA 20mm T fuse

Disconnect from power before opening fuse holder



No user serviceable parts inside.
Please observe electrical safety procedure at all times.

Please contact Soundgas LTD for service and repair.

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