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Thank you for purchasing the operative field technologies:

**SHADOW HILLS DUAL VANDERGRAPH**

The following is an overview of its functions and a guide for use.

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## Shadow Hills Dual Vandergraph

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### UNDERSTANDING YOUR SHADOW HILLS DUAL VANDERGRAPH

You have been issued our unique technology developed by the engineers at the Shadow Hills Austin Research Facility. This is the most advanced system for decelerating audio transmissions. By balancing temporal and transient proportions, the most ardent program material can be brought into compliance, for the proper use by our field operatives.

#### TRANSIENT LIMITING

##### *DISCRETE FULLY CLASS-A COMPRESSION*

The Dual Vandergraph utilizes our discrete, fully Class-A Voltage Controlled Amplifiers.

The controls are labeled:

Ratio, Filter, Compression, and Output Level.

#### STEREO OPERATION

The Shadow Hills Dual Vandergraph operates in stereo, but is controlled by a single set of Variable attenuators and selector switches. Changing parameters on the controls effect both left and right operation. The Dual Vandergraph can also function normally with a single channel connected.



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## Shadow Hills Dual Vandergraph

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### COMPRESSION ROTARY ATTENUATOR

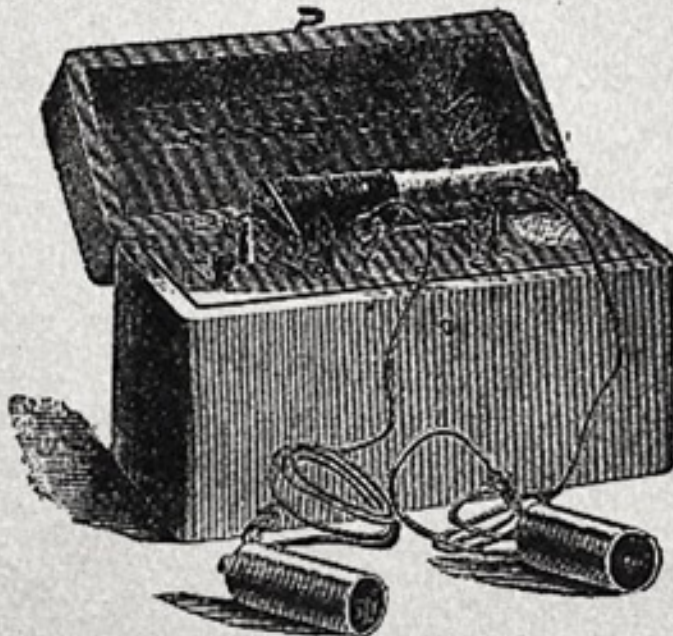
The Compression rotary attenuator controls the threshold at which the onset of compression occurs, thus determining the level of gain reduction, in conjunction with the selected ratio. Turning the Compression control clockwise delivers more compression. Turning the Compression control counter-clockwise reduces the amount of compression. When fully counter-clockwise no compression occurs.

### OUTPUT LEVEL ROTARY ATTENUATOR

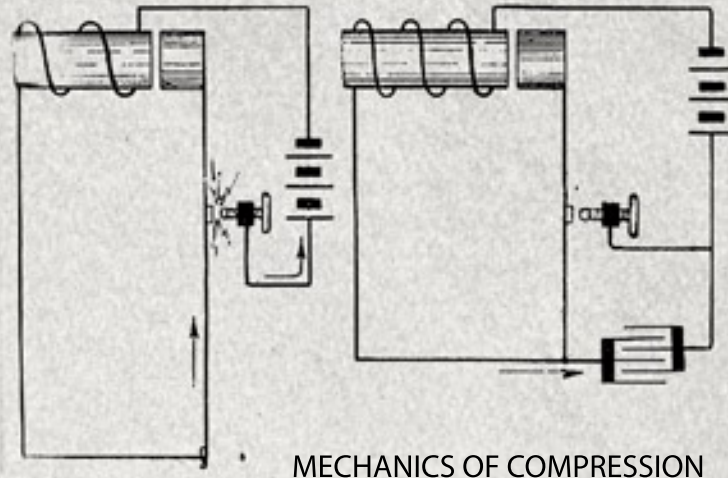
The Output Level rotary attenuator controls the gain required to make up the level attenuated by the compression circuit. Turning this control clockwise increases the amount of makeup gain. Turning this control counter-clockwise reduces the signal level.

### HARDWIRE BYPASS

The Hardwire Bypass determines whether the SHDV is actively affecting the program material. When out, the unprocessed material is heard. When in, the Shadow Hills Dual Vandergraph is engaged, processing is underway.



HARDWARE KIT



### COMPRESSION RATIO

The Ratio Selector Switch has five positions.

- First Position is Hard Wire Bypass.

The other four positions of the Ratio control select between the Dual Vandergraph's four able compression ratios.

- Second Position - 1.2:1

This is the slightest ratio, so at one point two decibels above the compression threshold, one additional decibel is produced.

- Third Position - 2.5:1

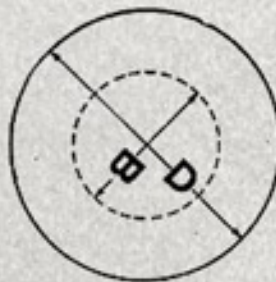
A two and a half decibel input produces one decibel of compressed output.

- Fourth Position - 4:1

Four decibels past the onset of compression produces an output of one decibel.

- Fifth Position 8:1

At eight decibels above the compression threshold, one additional decibel is produced.



### ATTACK AND RECOVER TIMES

The four ratios have preset attack and recover times that vary depending upon which ratio is selected. The different attack times vary how fast or slow the compression engages once the compression threshold had been reached. A slow attack time is useful for retaining signal transients relative to the compressed signal. Thus the initial attack is realized before the onset of compression. Fast attack times have the effect of equalizing initial transients relative to the level of compression. The preset Recover times determine how long it takes the signal to return to the uncompressed level, once the signal falls below the threshold of compression.

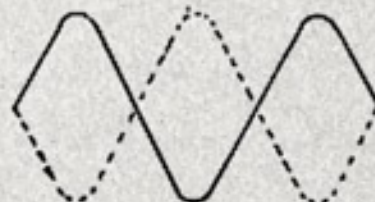
The attack and recover constants are as follows:

- Ratio 1.2:1  
Attack = 30 milliseconds  
Recover = 0.1 seconds
- Ratio 2.5:1  
Attack = 30 milliseconds  
Recover = 0.5 seconds
- Ratio 4:1  
Attack = 10 milliseconds  
Recover = 0.5 seconds
- Ratio 8:1  
Attack = 0.5 milliseconds  
Recover = 0.25 seconds

RATIO 1.2:1



RATIO 1.5:1

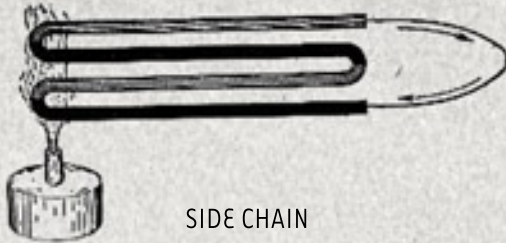


RATIO 4:1



RATIO 8:1





SIDE CHAIN



CLASS-A

### SIDECCHAIN FILTER

Built into the side chain, are very powerful selections of filters: 90 hertz, 150 hertz, 250 hertz, and bandpass. By engaging the filters, you choose at which point the onset of compression occurs. First position, nothing below ninety triggers compression. Second position, nothing below one-fifty. Third, nothing below two-fifty. The fourth position is a musical bandpass filter. In this position, compression is triggered by the program's mid-range frequency content, ignoring the highest and lowest frequencies. These filters are amazingly useful for shifting the focus of what should be more compressed and creating compression curves on purpose.

### CLASS-A AMPLIFICATION

In addition to our discrete fully Class-A voltage controlled amplifiers the output gain staging that drives our custom iron transformers are completely Class-A. The Dual Vandergraph is a no-compromise design!

### OPERATIVE DEPLOYMENT

The Engineers at our Austin Research facility have made every effort when designing the Shadow Hills Dual Vandergraph, that all of the contained technologies enhance its usefulness to operatives while in-theater. The SHDV is battle-hardened to withstand the rigors of the most adverse environments and the most grueling deployments. Our hope is that the Shadow Hills Dual Vandergraph will prove our technological superiority in practice and will lead to our inevitable victory!

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## Shadow Hills Dual Vandergraph

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### EVADING ENEMY CAPTURE

Should the probability of its capture be greater than not, it is the duty of the operative so issued to destroy the SHDV to keep the technologies contained therein, from falling into the wrong hands and thus our advantage forfeited to the enemy. The following instructions are offered for the proper destruction and disposal of the Shadow Hills Dual Vandergraph, should it become your duty.

First use a hex key to remove the 4/40 screws from the cover. Inside along the bottom of the main audio board are the Shadow Hills Operational amplifiers. There are two total. These "Op-amps" attach to the audio boards each by six pins. Pull each "Op-amp" out vertically. They are friction locked only. No desoldering is required. Once removed, break off each of the six pins and crush the "Op-amp" circuit board with the heel of your boot. If time permits, incinerate all pieces after crushing, then bury or scatter the remains. Remove the audio board, daughter board and attenuator board from the frame. Cut all wires several times, in a random fashion, so that the former lengths cannot be determined. The transformers connected to the frame must be shot through their cores, and the windings unraveled, their lamination separated, bent and scattered some distance away. The audio boards should be crushed under heel. Then folded or ripped, then incinerated according to the previously described method. The number for nuts that attach the front panel to the attenuators through the frame should be removed. The meter glass should be smashed and meter pointers broken off. The panel should be bent or folded then placed inside the chassis and either buried at least six feet deep or exploded by a grenade or other means.



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Your cooperation is greatly appreciated.

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