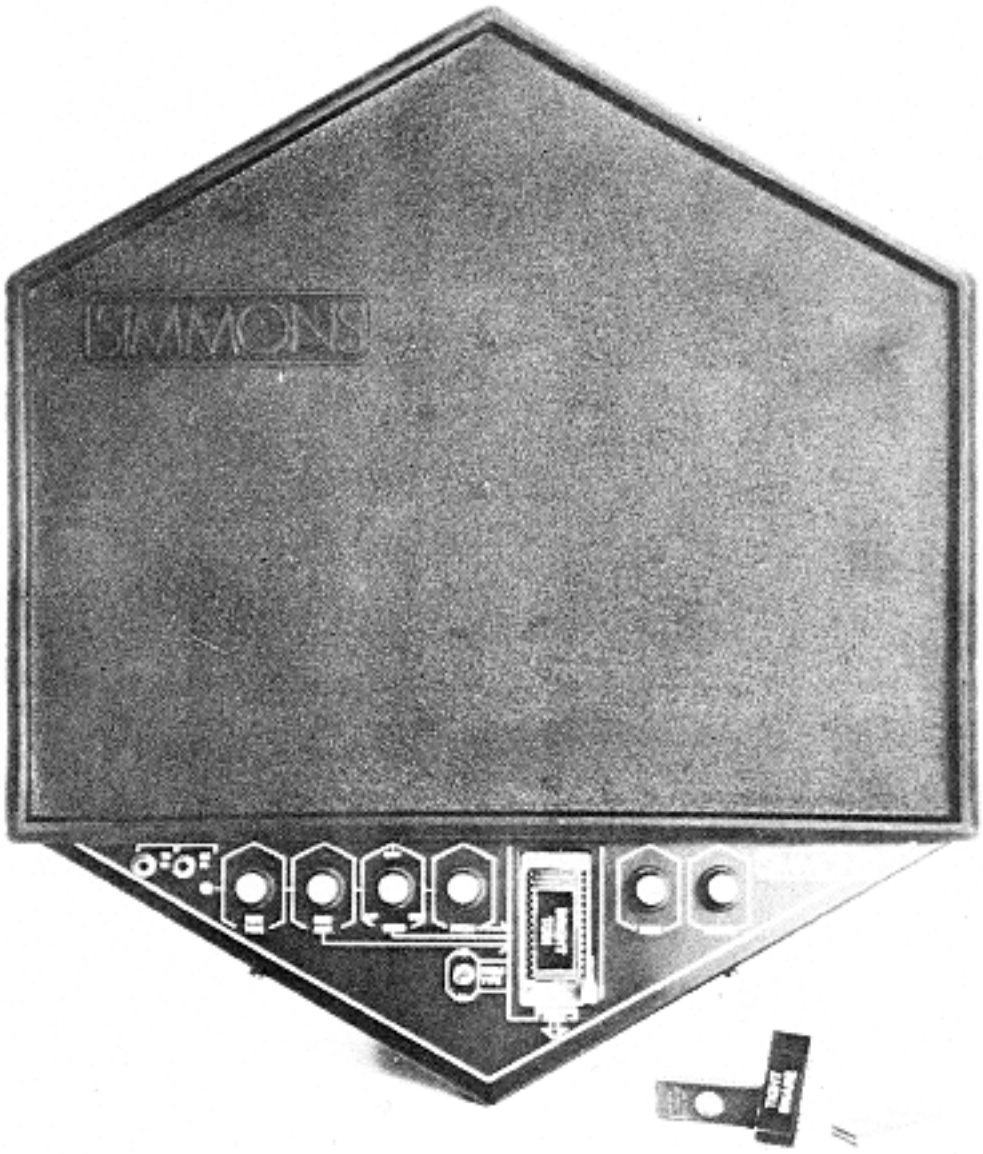
SIMMONS



SDS 1

OPERATING INSTRUCTIONS

SDS1 OPERATING INSTRUCTIONS

The SDS1 is a single battery operated digital drum incorporating many of the features found on the SDS3, 7, and 8 professional electronic drum kits. It can be used singularly, to augment existing electronic and acoustic drum kits, or as the basis for a 'multiple SDS1' digital drum kit.

The sound produced by the SDS1 is a digital recording of a real drum stored in a PROM. (Programmable Read Only Memory). The PROM is plugged into the front of the drum and can be changed easily, enabling the sound of the drum to be changed totally.

A library of sounds are available from your Simmons dealer including all popular drum and electronic drum sounds, or you can program your own sounds for use with the SDS1 with the Simmons Sampler and E-PROM blower (SDS EPB).

The SDS1 is dynamic, the harder you hit the drum the louder and brighter the sound is.

OPERATION

Mount the drum on the arm provided and clamp the Ax2 adapter to a convenient stand (full stands are available from your Simmons dealer). If you require to mount the SDS1 as a right hand drum (i.e. The control panel is at the top of the drum) fit the 'reverse legend' over the front panel by removing the six control knobs (they just pull off).

Fit 4 x PP16 1.5v cells in the battery holder at the side of the drum. Make sure you insert the batteries the correct way. - reversing the batteries may damage the SDS1.

Insert the batteries into the holder negative (-) ends first, so that the + end of the last battery is sticking out.

Alternatively, power the SDS1 from an external battery eliminator (6 volts DC) such as the type used to power calculators etc, via the DC IN 3.5mm Jack socket on the front panel.

Plug the PROM SUPPLIED (containing the digital stored sound) into the socket on the front panel, ensuring that the notch in the PROM faces the bottom of the drum.

AMPLIFICATION

Connect the SDS1 to a suitable amplifier via a standard amplifier 1/4 inch Jack - Jack lead, the output from the drum is on the clamp side of the drum along with the battery holder.

The SDS1 produces a punchy sound with a fast initial attack, you will need a good amplification system to achieve the best results from the SDS1. A full bandwidth P.A. type amplifier with a bin/horn speaker combination would be fine. Alternatively, in many cases, the group's P.A. system can be utilised.

PROMS

The SDS1 comes supplied with a PROM which contains the desired drum sounds (i.e. Snare - Tom Tom). This should be inserted with the notch away from the playing surface, i.e. to match the front panel legend CAUTION - PROMS are delicate silicon chips and will not stand abuse. The easy access to the PROM used in the SDS1 gives you maximum flexibility but also the opportunity to destroy the PROMS as well as the SDS1 internal circuitry. The following precautions should be taken:-

1. Do not expose the PROM to ultra violet light, direct sunlight, or any source of high intensity light or heat - this will erase the data (the sound of the drum) stored in the PROM.

2. Do not remove the voice identifier sticker on the PROM - this gives some protection against accidental erasure.

3. Do not plug the PROM into the socket upside down - this can cause untold harm to PROM and SDS1 - if in doubt consult your dealer.

4. If you are building a library of sounds, use PROMS supplied by Simmons and store them in the black conductive foam supplied and store them out of direct light in a safe place.

5. Avoid handling the PROMS in areas where high static charges are likely to build up - i.e. nylon carpets and Van der Graff generators.

6. Please do not hit the PROM with a drum stick.

The SDS1 can play two types of PROM; 8k (8000 bytes) labelled 2764 and 16k (16000 bytes) labelled 27128. The 27128 can store a sound twice as long as the 2764 (and is also twice the cost). Generally the 64 is used for short sounds i.e. cow bells, snares, bass drums, the 128 for Tom Toms, cymbals etc. - See more on PROMS for further discussion on sampling and E-PROMS.

Enough of the don'ts. Here's where you get to hit the drum .....

FUNCTIONS

1. SENSITIVITY AND VOLUME

Turn the run time, Bend, pitch, sens, and volume haf way.
Turn the run amount fully anticlockwise. Hit the SDS1 and adjust the output volume/amplifier volume for the desired level.

Adjust the sens (sensitivity) to suit your style of playing. At minimum sensitivity, the drum will not trigger the sound at all, as you turn the sensitivity clockwise the drum becomes progressively more sensitive until all dynamic control is lost at its fully clockwise position. (Only the softest taps on the drum will sound quieter).

2. PROM TYPE

If the prom is a 27128, switch the PROM type switch to 128. (If the switch is in the '64' position only the first half of the sound will be played).

If the PROM is a 2764, switch the PROM type switch to 64. (If the switch is in the '128' position the sound will be played twice - ie. repeated).

You can use the switch in any position if you require the 'shortening' or 'echo' effect.

3. PITCH

The PITCH control adjust the pitch of the drum. Clockwise - the pitch of the drum is high, anticlockwise - low.

As the pitch of the drum is increased, the sound gets shorter.
As the pitch is lowered, the sound lengthens. At its lowest pitches the digital sound becomes distorted and 'grainy' - this is normal and unavoidable - See further discussion on SAMPLING + E-PROMS.

BEND

The pitch of the drum can be altered by the BEND control. At its half-way position, it has no effect. Turning the control clockwise from the central point adds an increasing amount of bend down: i.e. as the drum is struck, it starts at a higher pitch and the pitch falls as the sound dies away.

Turning the control anticlockwise from the central point has the reverse effect: i.e. as the drum is struck, the pitch is lower but rises as the sound dies away.

The amount of bend is also affected by how hard the drum is struck - the harder the hit, the more the pitch of the drum is bent.

RUN

The RUN generator in the SDS 1 is used to mimic a tom tom fill around a multi tom tom drum kit.

Turn the bend off (half way) so as to hear the effect of the run generator, set the run time and run amount half way.

Hit the drum six or seven times in rapid succession - each hit produces a note lower than the previous hit. When the run is in progress, the run LED will glow, the run period is indicated by how long the LED is lit.

The speed at which the pitch of the drum descends is controlled by the run time (at minimum a fraction of a second - at maximum four seconds) and the interval between the highest and lowest note in the run is controlled by the run amount control.

If a short run time is selected and a fast pattern played on the drum, a 'sample and hold' effect can be achieved - the run generator producing a randomly pitched sound at each successive hit.

SEQUENCER INPUT

A sequencer or any gate signal can be used to trigger the SDS1 by feeding the trigger signal into the trig jack on the front panel of the SDS1 (3.5mm Jack).

The SDS1 will trigger on the positive edge of the gate signal and will react dynamically to the amplitude of the incoming signal.

Other signals such as click tracks and sharp acoustic noises can be used to trigger the SDS1. (Via microphone etc).

A particularly interesting percussive effect can be obtained by using an existing drum pattern on tape, using this signal to trigger the SDS1 and utilising the run facility to produce a new drum track (or noise track depending upon the digital sample stored in the PROM) of random pitches.

EXTERNAL POWER SUPPLY

By plugging an external power source into the DC input socket on the front of the SDS1, the SDS1 can run without batteries.

A DC supply of 6 volts at 50 ma is required with the +ve wired to the tip of the 3.5mm Jack.

USE WITH THE SDS EPB

The SDS1 can be used to produce any acoustic sounds, from bells, breaking glass, to jingles, guitar chords and dogs barking - if that sound has been stored in a PROM and plugged into the SDS1. The Simmons Digital Sampler and E-PROM Blower (SDS EPB) will allow you to sample the sound of your choice, program an E-PROM with that sound and then use the E-PROM as the sound source for the SDS1 - using the controls on the SDS1 to manipulate the sound.

EG. Record a single guitar chord, plug the PROM into the SDS1 and use the run generator to produce randomly pitched percussive guitar chords as the drum is struck.

So, for your information, here is a printed extract from the EPB Manual to tell you about sampling, E-PROMS and the like:-

FURTHER DISCUSSION ON SAMPLING AND E-PROMS

The SDS EPB is a digital sampler/Eprom blower capable of recording sounds digitally and storing them in an Eprom for use in the SDS7 and SDS1.

Depending on the capacity of the Eprom selected, the EPB can record sounds of between 0.4 and 3 seconds duration making it ideal for percussion synthesis.

The EPB is an invaluable tool to the SDS7 or SDS1 owner, further increasing the scope of what is already the world's most versatile drum system.

WHAT IS AN E-PROM

E-Prom stands for erasable programmable read only memory.

The memory itself consists of 'cells' of information. Each 'cell' can be either 1 or a logic zero (i.e. on or off).

These 'cells' are referred to as a 'Bit'. These bits of information are stored together in groups of eight. Each 8 bits being a 'byte' or 'word'

This byte can represent any number in the range zero (all bits = 0) to 255 (all bits = 1) and these numbers can in turn represent a musical tone or wave form (see sampling).

The number of bytes of information that a prom can contain depends upon the size of the silicon chip inside, coupled with how small each cell can be manufactured.

Up until a year or so ago the largest prom available (affordable) could store only 2000 bytes but with ever advancing technology proms are now readily available which can store 4000, 8000, 16,000 and 32000 bytes of information.

These chips are marked with a number that corresponds to the number of 'bits' that it contains. (Remember 1 byte = 8 bits), so:-

2K	(K=1000) E-Prom is marked	(27)	16	(16 = 2 x 8)
4K	" "	(27)	32	(32 = 2 x 8)
8K	" "	(27)	64	(64 = 8 x 8)
16K	" "	(27)	128	(128 = 16 x 8)
32K	" "	(27)	256	(256 = 32 x 8)

(Cont.....)

WHAT IS AN E-PROM? (.....Cont)

The number 27 is a type code, and this along with date codes, manufacturers trade marks, numbers and access speeds can be marked on the chip.

Read only memory means that the prom can only output data (Bytes). Once the prom is installed in a system, data can only read from it. Data can never be stored in it, other than the original programmed data.

The SDS EPB will enable you to enter data into the prom initially (this data will represent an acoustic sound) - this is called blowing the prom.

E-Proms however, have a window in the top of the chip which exposes the silicon wafer underneath. If the chip is exposed to ultra violet light for a length of time (approx 30 mins) any information stored in the chip is destroyed - clearing the chip, which can then be re-programmed as required.

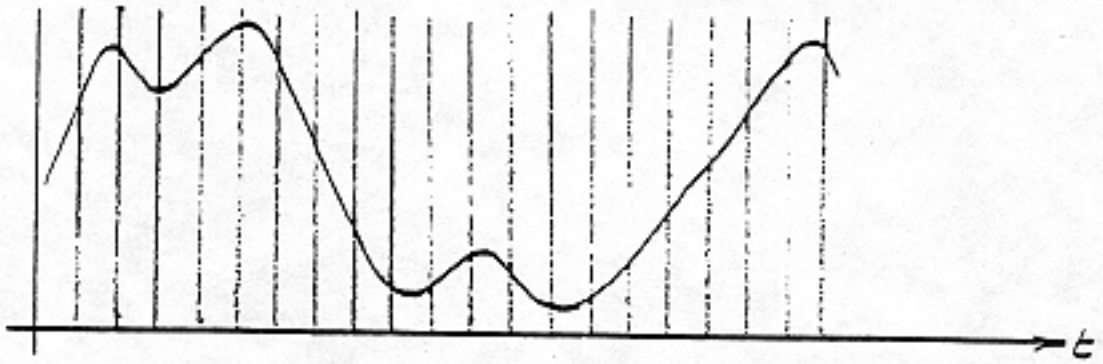
The EPB has 16K Bytes of sample ram which is used when a sound is sampled. This ram is arranged in 2 x 8K blocks. So that if you wish to sample a short sound you can switch to 8K and save on the cost of proms. (8K proms being approx half the price of 16K proms).

The process of recording a sound is as follows:-

Select record ram.
Sample Sound.
Playback the sample sound in ram.
If sound is ok insert prom in socket.
'Save' ram data in prom.
Playback E-Prom.

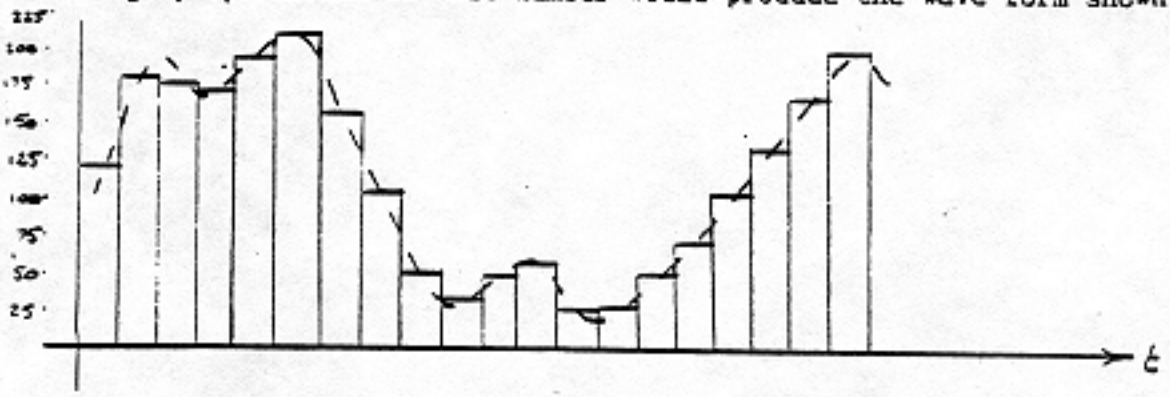
Sampling - A brief discussion

Fig. 1 is a graph of amplitude against time of somebody singing 'Ahhh'.



The amplitude of the signal can be represented by a number and if the wave form is measured at regular intervals these numbers would represent the change in amplitude of the signal over time.

These numbers can be stored in a prom and when cycled out and converted into a voltage proportional to that number would produce the wave form shown in Fig.2.



With the addition of filtering, a fairly accurate representation of the original wave form is produced. (Dotted line).

It can be seen that the faster the sampling the more accurate the reconstruction will be.

A rule of thumb being that you need a minimum of two samples for the highest frequency that you wish to sample. Eg. If the highest frequency in a tom tom sound was 8KHZ the minimum sample rate for a reasonably good sound would be 8K X 2 = 16KHZ.

ie. The sound is sampled 16,000 times a second.

If a 16K E-Prom is used then it can be seen that the sample will only last for one second.

If the sound is longer than a second there are two things that you can do: increase the size of the prom or slow the sample rate, with a subsequent loss in bandwidth and quality.

The slower the sample rate the poorer the quality of the sound during playback. (It will sound dull, distorted or crunchy).

SUMMARY

1. An E-PROM can be programmed or 'blown' with numbers.

2. These numbers can represent an audio waveform.

3. The larger the E-PROM, the more numbers it can store, and therefore it can contain a longer sound.

4. The larger the E-PROM the more expensive it is.

5. Once programmed, the data can only be changed by exposing the chip to ultra-violet light, which erases all the information stored.

6. Once erased then the E-PROM can be re-programmed.

For further information on PROMS and the EPB contact the Simmons Sales office or your local Simmons stockists.

SDS1 TECHNICAL

Batteries - 4 x 1.5 AA Cells.
Battery life (constant hitting) 8 Hours.
Standby battery life (Jack connected Normal use) 30 Hours.
Ext Power requirements - 6v DC at 50MA via 3.5mm Jack.
Ext Trig Amplitude - .5 - 5 volts via 3.5mm Jack.
Output level (max) - 2v p-p.
Dimensions (drum) - 360 x 320 x 60 (excluding turnkey).
Dimensions (box) - 416 x 416 x 136.
Weight (drum) - 1.5KG.
Weight (packed) - 3.3KG (including ARM + Ax2).