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CONCEPT – An Introduction to the SDS 9

The SDS 9 is a 5-drum kit, comprising bass, snare and 3 tom-toms, triggering up to 40 complete "drum kits" (20 factory and 20 programmable presets).

Hitting a specific pad triggers the corresponding channel on the "electronics". A microprocessor controls the dynamic (or volume) of each individual "hit" giving a sensitivity to playing previously unheard of in electronic drums: a "real" drum feel, in fact!

The SIMMONS SDS 9 gives you the sounds, feel and control of acoustic drums plus all the sounds and advantages of electronic drums.

To add to all this "reality", the small pads (snare and toms) have a floating head, the snare also has a rim shot/cross-stick facility and the bass pad is piston loaded – giving you the feel and playability of acoustic drums.

The SDS 9 electronically synthesises the sounds of each drum. The bass, snare and toms use different methods of synthesis – each the most appropriate for the sound and control you require. The bass is software generated directly by the computer. The snare/rim are digital samples of acoustic drums. The tom-toms are synthesised using analogue circuitry. The toms also have a unique 'second skin' switch to match the sound and response of a double headed acoustic tom.

The program/store memory facility allows you to build up your own drum sounds. These programmed sounds can be saved to tape, giving you almost limitless capacity to store new sounds, or recall previously stored sounds.

There is also a sophisticated automatic trigger that allows sounds to be reviewed without hitting the pads, and a mode where the drums can be triggered by button tapping.

The SDS 9 is the first drum kit that has a built in MIDI interface. This is completely assignable in terms of voice changes and note values. By using the MIDI interface you can directly interface with many available keyboard synthesisers and play their voices from the pads. You can also use MIDI real time recorders/sequencers to record your playing and then playback the SDS 9 exactly as you played it.

Another interesting feature of the SDS 9 is its' built in programmable echo. This programmable effect can be used for single 'slap back' echo or for long repeating echoes to produce stunningly unique rhythmic-ic-ic patterns and eff-eff-eff-ects-ects.

We have done a lot of work using the latest high technology and computer aided design tools to develop the SDS 9 – a new instrument, using new voicing techniques and new materials to give you everything any acoustic kit has to offer and much more besides – the kit that's destined to add a whole new dimension to your art.

All of us at SIMMONS hope that you enjoy the use of your SDS 9 and that it gives you the edge.

Simon Davidmann
April 1985

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BEFORE YOU START

CONNECTING TO A MAINS SUPPLY
European mains voltage

Connect an appropriate mains plug to the mains cable according to the following colour code.

Brown — Live
Blue — Neutral
Green/Yellow — Earth (Ground)
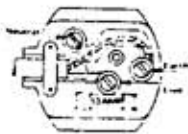
Check that the voltage label on the back of the panel matches your domestic mains supply.

240v — G.B. and Australia
220v — Europe
115v — U.S.A. and Canada
100v — Japan

The SDS 9 is a computer-controlled synthesiser and should be treated with care. A few simple rules, if followed, will avoid problems in the future.

They are:

Try and use a clean power source, away from equipment that may produce transient spikes through the mains power, i.e. electric motors, heavy switch gear etc.

The SDS 9 is supplied with a three core power cord — use this with a grounded AC power source.

Switch on the SDS 9 last, and off first.

Do not place the SDS 9 on top of speaker cabinets or amplifiers which might subject it to excessive heat and vibration.

SETTING UP

THE PADS

The 5 pads should be assembled on their stands to suit your own preference. Care must be taken to ensure the snare pad is not confused with the tom pads. This is because the snare is a dual pick-up pad, enabling cross-stick and rim-shots to be played. The snare pad is distinguished from the tom pads by having a GREY playing surface (as opposed to black).

You should be able to arrive at a playing position you feel happy with. You could also experiment with novel and unusual ways of setting up which would normally be impossible with acoustic drums. This is one of the many advantages you will come across when using the SDS 9.

Mounting small drum on stand — The small drum pads are mounted on conventional 22mm diameter tom tom stands. One side of the small pad has a hole for the tom tom arm. Carefully push the drum on to the arm, a gentle rocking action will ease the drum on to the arm. If the arm will not enter the drum, turn the locking bolt anti-clockwise 1 turn with a conventional drum key.

The tom tom arm can enter the drum to a maximum depth of 6 inches.

Loosen the 'memory lock' ring on the tom tom arm (if fitted) and locate the tongue of the ring into the drum pad. Tighten the locking bolt and memory lock with a drum key by turning the key clockwise.
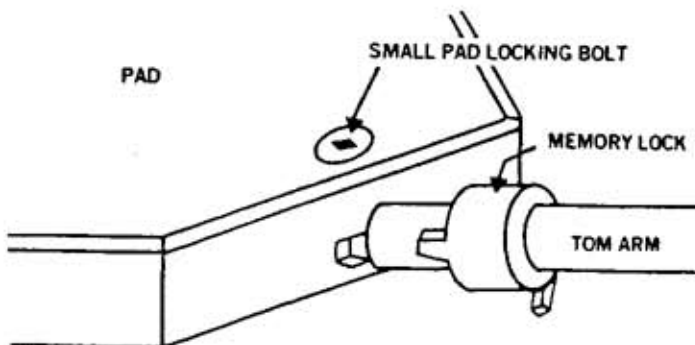
Bass drum pad — Insert the spurs into the side of the bass drum by loosening the turn keys (turn anti-clockwise to loosen) and push the end of the spur into the nylon clamp, so that the spurs slope forward to form a tripod with the bass drum pedal plate.

Tighten the spurs in this position by rotating the turn keys clockwise.

Note: Memory locks can be fitted on the spurs if required.

Fit a bass drum pedal on the plate in the conventional manner. Ensure that the pedal is adjusted so that the beater strikes the drum in the central 'piston area'.
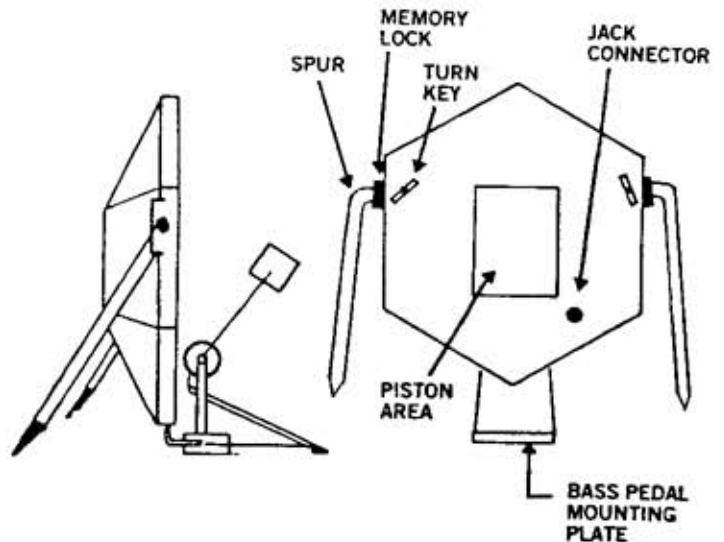
CONNECTING UP

All the sockets for connecting up are situated along the top edge of the electronics.

Pad Inputs — Each pad connects to the appropriate "Trigger Input" socket (Bass drum – ch.1, Snare – ch2 etc.). Again, care must be taken with the snare. A special stereo jack lead is supplied for this drum, to enable the rim/ cross-stick operation. Using one of the mono jack leads will result in only the snare sound being triggered.

Footswitch — There is a footswitch to change the kits (more of this later) which is plugged into the "Foot Select" socket. You will probably want to experiment with the most convenient positioning of the footswitch itself, but try placing it just to the left of the hi-hat pedal. A quick sideways movement of the foot will change the presets.

Audio Outputs — Each drum has its own individual output socket (for mixing desks etc.), but if you have a limited number of available channels (e.g. one or two channels of an amplifier etc.) you can use the "Mix Output" or the "Stereo Output" channels to the right of the individual outputs. The stereo output is a stereo jack socket.

The mix output is a mono mix of all five drums, the relative levels of each drum is set on the individual output level controls, whilst the mix level control varies the overall volume. These controls do not affect the stereo or individual outputs, so that if you were using the mono mix on stage for your own monitoring you can adjust your own mix levels without affecting the main feeds to the P.A. (individual outs/stereo outs).

Headphones — There is also a headphone socket which will accept any standard jack headphone plug and enable you to hear the SDS 9 without any amplification equipment. The jack is standard ¼" stereo and headphones of 600Ω impedance are recommended.

Snare/Rim Audio Output — Note that the snare individual output is a stereo socket. If you use a mono jack lead you get the combined snare drum sound (both snare and rim – the balance given by the current kit). If a stereo jack plug is used, the tip of the plug gives the combined sound while the edge gives the raw rim sound. The amount of rim coming out of the combined output can be programmed with the snare/rim balance control, so if you need complete separation of snare and rim, program the kits to be full snare and use a stereo plug with a split lead to the mixing desk etc.

Sequencer Input — An 8 pin din to jack lead is available from SIMMONS which enables 5-15v gate signals to trigger the SDS 9 (such as the SIMMONS SDS 6).

CH1 (BASS) ——— GROUND
CH4 (HI TOM) ——— CH6 (LO TOM)
CH2 (SNARE) ——— CH3 (RIM)
——— CH5 (MED TOM)
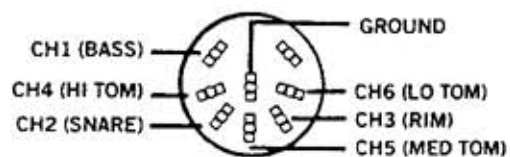
MIDI/TAPE. IN/OUT — This is discussed in the section on MIDI and for tape applications in the section on tape dumping/loading.

Amplification — The SDS 9 sounds have been chosen to sound good through small combos as well as larger P.A. systems but the question of a recommended system has no easy answer. Obviously such variables as the size of the venue and the type of music being played should affect your choice. By their definition, drum sounds are highly percussive and it is certainly desirable to amplify the SDS 9 at a level at least comparable to a conventional drum kit. Therefore, your chosen system should be capable of reproducing very dynamic sounds, spanning a broad frequency range.

If you have previously been playing an amplified acoustic kit, the outputs from the SDS 9 can simply replace the drum mics.

If the SDS 9 is being played live and you wish to utilise the facilities of an external mixing desk, the sockets marked "Audio Outputs", 1-6 should be utilised to connect each channel with a separate channel of the desk. The output of each of these connections contains only the sound from the relevant channel. This allows each drum sound to be equalised independently and is certainly the most desirable method of amplifying or recording the drums. If you have only a small stereo mixing desk and vacant channels are in short supply, the output marked stereo should be utilised to connect the SDS 9 to two channels of the desk. The drum sounds are panned automatically in these outputs and hence the pan controls on the mixing desk should be turned to left in the channel receiving the left output and right in the channel receiving the right.

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Whether using individual audio outputs or the stereo outputs for recording or playing live, the output marked "Mix" can be used to simultaneously connect the SDS 9 to a separate amplifier for the purpose of monitoring. This is essential when playing on stage as the drum pads themselves produce no sound. The monitor system should be placed near the drummer and used at a suitable volume to allow all the musicians on the stage to hear the drums clearly. The relative level of each drum in the monitor mix will be set on the individual channel level controls.

CONNECTIONS TO SDS 9
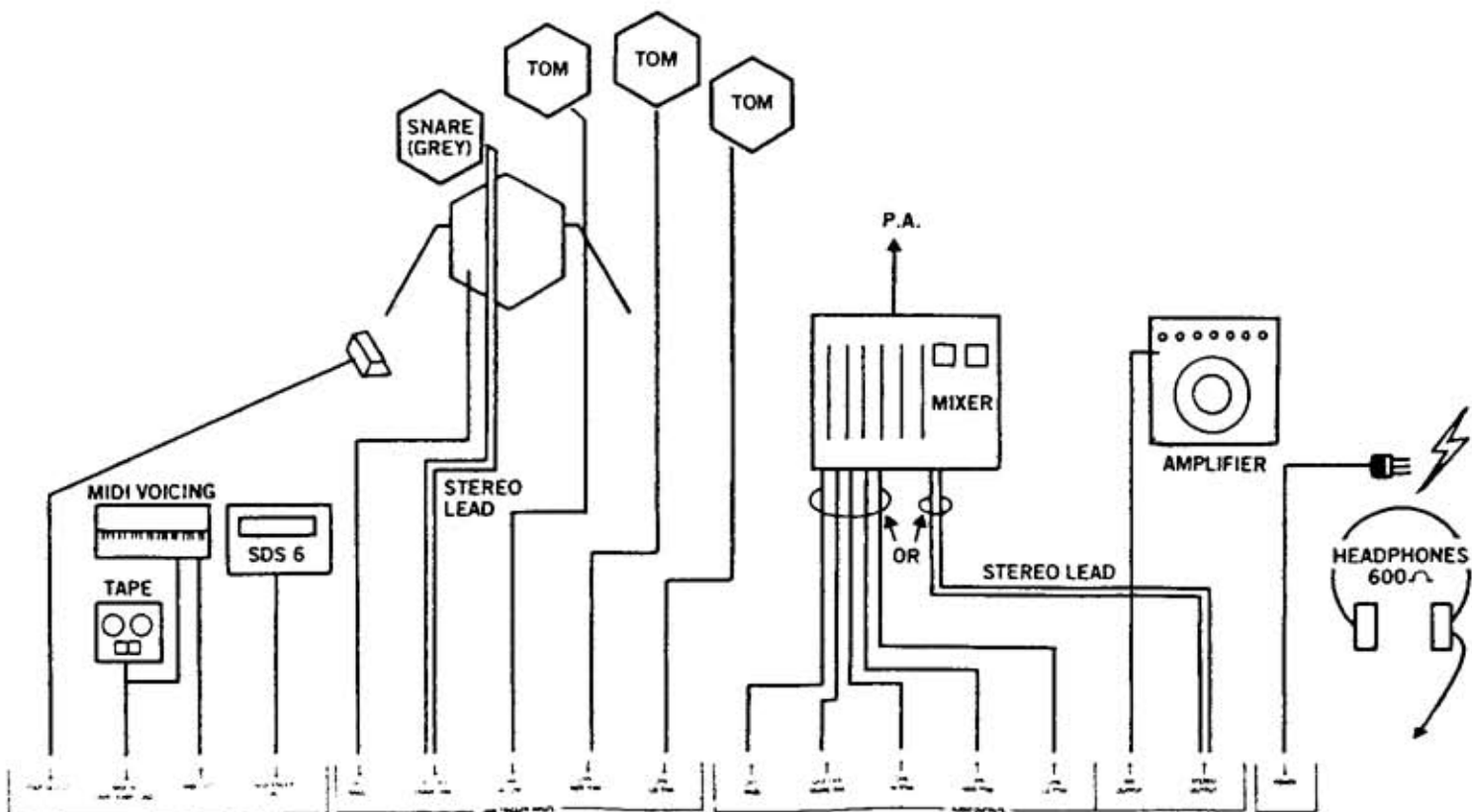
Conventional 5 drum set-up

LO TOM   MED TOM   HI TOM   SNARE   BASS DRUM
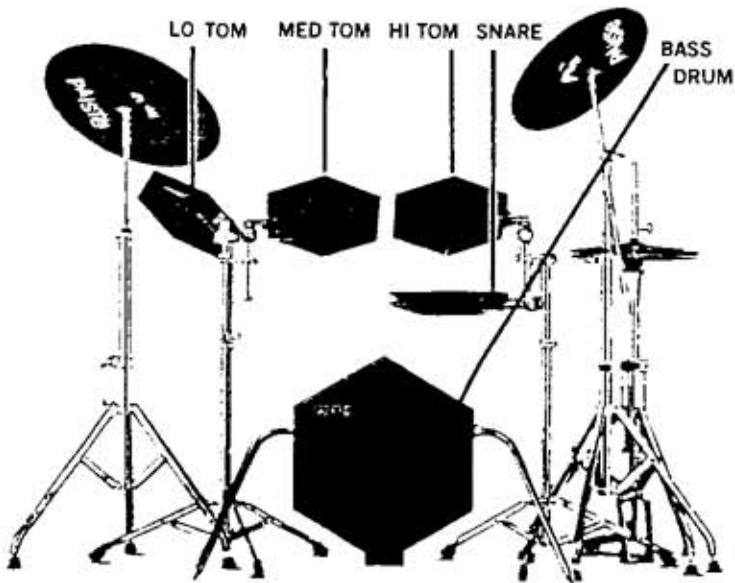
It is advisable to place the electronics within easy reach of the pads, once you have found a set up that is comfortable. (You should be able to sit at the kit and operate the unit at the same time).

A stand is not supplied for the electronics, they will fit on a standard snare stand, music stand, or in a standard 19" rack when fitted with optional rack mounting ears.

PLAYING THE "FACTORY" SOUNDS

POWER ON!

Once you have connected up all the leads the next thing to do is switch on! The power switch is on the top right of the electronics.

SELECTING A KIT

When the power is turned on the "Bank" light will show above "A" and the "Kit Display" will show "1". This means you are on "Factory Kit" A1 (or Bank A, Kit 1). There are 4 banks, each containing 5 kits giving you a total of 20 "Factory" kits. These kits can be "accessed" by pushing the "Bank Select" or "Kit Select" buttons (situated below the displays). You can also change the kits in any one bank using the footswitch. Each tap on the switch advances the number by 1 through to 5 and then cycles back to 1, and so on. With a bit of practise you should be able to change the kits whilst playing, by using the footswitch.

PAD SENSITIVITY

The sensitivity of the drum pads is controllable, using the sensitivity pots at the top of each individual channel. This allows you to alter the sensitivity of each drum according to your own taste and preference. (Note that the snare has two sensitivity pots — one for the drum middle and one for the rim).

When set low (anti-clockwise) the drums must be struck very hard to produce a "hard" sound and when set high (clockwise), the drums will produce a "hard" sound with a very light tap of the stick. These controls should be set to facilitate your technique. Of course the perceived sensitivity of the pad will also be affected by the weight and type of stick, and in the case of the bass drum, the type and throw of the beater.

The playing surfaces of the SDS 9 have been designed to emulate the response of a conventional drum head, but we do recommend that you experiment with various weights of stick and select the type that suits you best. Similarly with bass drum beaters the choice is yours, however we do suggest that you avoid the use of wooden beaters. The playing surfaces will not wear out but will mark at the point of impact. These marks can be removed with a damp cloth.

PLAY AWAY

At this point we recommend that you experiment with the 20 'Factory pre-set kits'. Explore the feel of the pads and interaction of the sounds programmed for the rim and snare. As well as amplification, reverb etc. Note that whilst playing the snare, the rim can be struck anywhere and will produce the rim sound at a volume dependent upon how hard it has been struck. If the rim and snare are struck simultaneously, both sounds are accented.

A list of factory sounds are listed at the back of the manual.

BUTTON TAP

TRIGGERING THE DRUMS FROM THE BUTTONS

Pressing the button labelled "Button tap on/off" enables this function. "Button Tap" allows you to hear all the drums in all the kits in one bank without playing the pads, instead the buttons shown will each play a drum. Notice that the play led flashes while you are in tap-in mode.

TAPPING	→	HITS	→	DYNAMIC CONTROL
VERIFY MEMORY		– RIM		(PROGRAM VARIABLE 2)
DUMP MEMORY		– HI TOM		(PROGRAM VARIABLE 3)
LOAD MEMORY		– MED TOM		(PROGRAM VARIABLE 4)
AUTO TRIGGER		– LO TOM		(PROGRAM VARIABLE 5)
MODE		– SNARE		(PROGRAM VARIABLE 6)
BANK SELECT		– BASS DRUM		(PROGRAM VARIABLE 7)
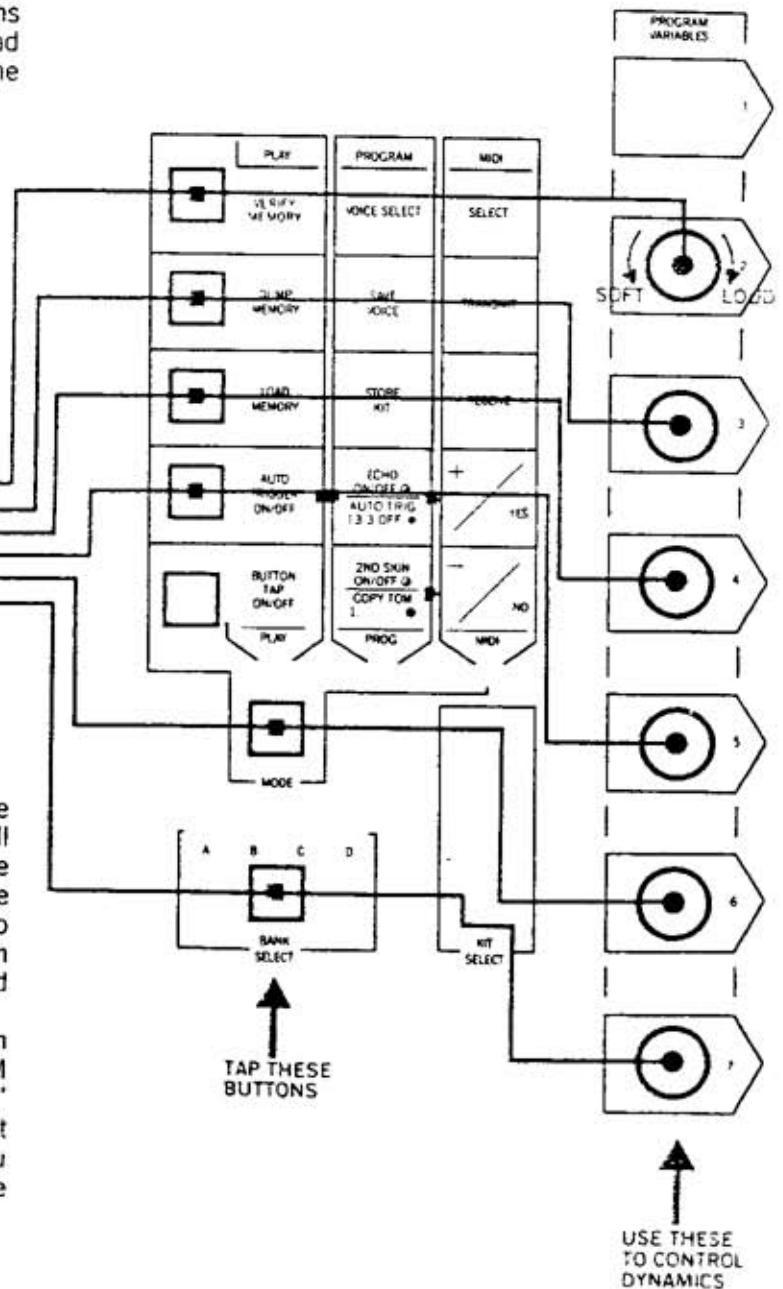
It is possible to adjust the dynamic of the buttons using the pots 2 to 7 (program variables). A little experimentation will find the optimum playing level for each sound. This feature is useful for hearing the different sounds produced when the sounds are triggered at different dynamic levels. Tap 'dump memory' (hi tom) whilst turning up and down program variable 3 – this is the same as striking the pad harder and softer.

Note – it is not possible to change "Banks" when in button tap mode, as the Bank Select button is the BASS DRUM sorry!. To exit "Button Tap" mode just press "Button Tap" again. Sometimes you have to press the button twice to get out of tap-in mode. This is because we don't want you jumping out of this mode accidentally when you are frantically tapping other buttons.

TAP THESE BUTTONS

USE THESE TO CONTROL DYNAMICS

AUTO-TRIGGER

FOOTSWITCH

Another useful function. There are several different types of Auto-Trigger, but for the time being we'll cover only one. Pressing the Auto-trigger button will start a cycle triggering each drum "voice" in sequence, (bass drum, snare, rim, hi tom, med tom, lo tom).

The speed of the trigger cycle can be adjusted whilst in this mode using "Program Variable" pot 6 (Auto Speed). The "dynamic" or volume at which the voices are triggered is controlled by pot 5 (Auto Trig Dynam). This changes the "hardness of hit" (in drummer jargon!). You'll find that with some of the presets, changing the trigger dynamic can have a dramatic effect!

Whilst in Auto-Trigger mode it is possible to run through all 20 Factory kits (and User kits – keep reading to find out about them!).

The footswitch allows you to change "kits" in any one bank whilst playing. The kits will advance by 1 through to 5 and back to 1 etc. It is still only possible to change banks using the bank select button.

The footswitch is actually connected to the kit select button, so that any time you want to press the kit select button you can use the footswitch.

SELECTING 'USERS' KITS OR FACTORY KITS

As well as the 20 Factory kits, whose sound cannot be altered, the SDS 9 has an additional 20 kits of 'User' sounds which you can alter and re-program, stored as before in 4 banks of 5 kits each. These kits can be 'accessed' by pressing 'kit' and 'bank' SIMULTANEOUSLY (a sharp jab at both works well).

'User' kits are shown on the bank panel by the bank light flashing. To get back to the factory kits, push kit and bank simultaneously – and note that the bank light no longer flashes thus indicating the factory kits.

FLASHING = USER SOUNDS YOU CAN PROGRAM THESE.

NOT FLASHING = FACTORY SOUNDS. YOU CANNOT CHANGE THESE.

PRESS TOGETHER ALTERNATES BETWEEN USER AND FACTORY SOUNDS
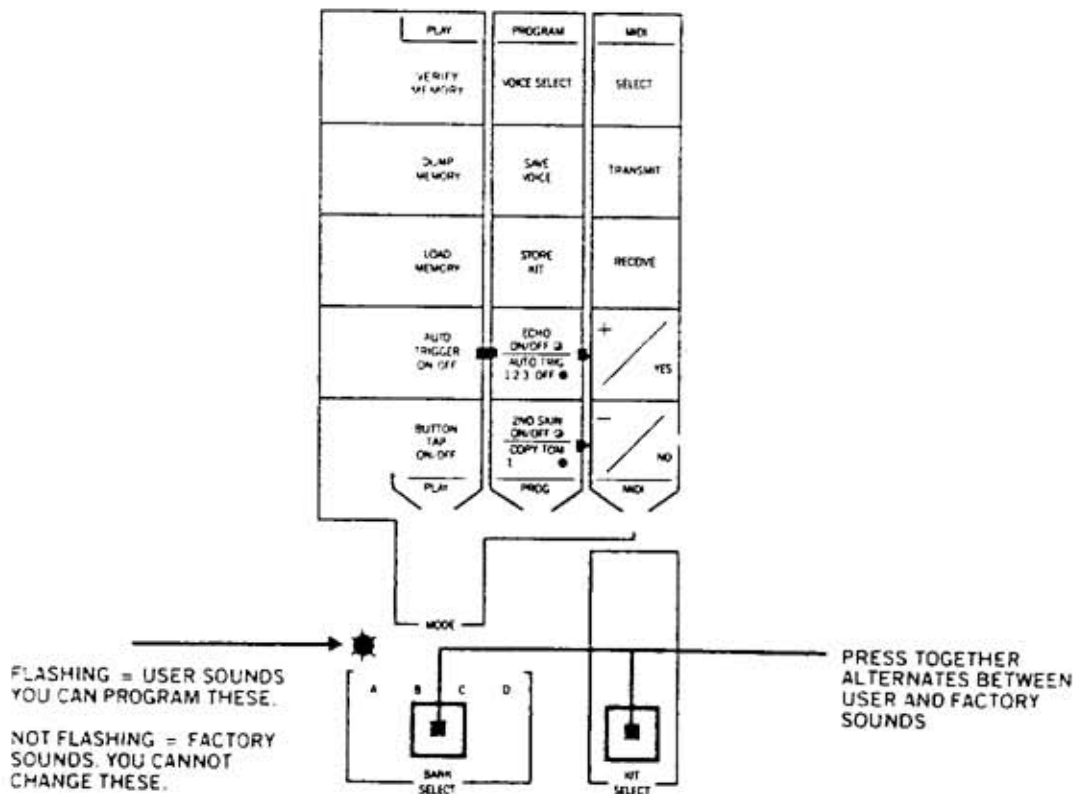
Examples

Bank led B on – ●

means Factory Bank B

Bank led B flashing ◐

means User Bank B

Note that you can swap between user and factory kits whenever the bank select button is active (i.e. any time apart from when you are in button tap-in mode).

SWITCHING BETWEEN
THE SDS 9 MAIN MODES
(OR – THE MODE BUTTON)

You will by now have noticed that there is a led above the mode button that has been lit – the play led – indicating that you are in play mode! In play mode the five buttons take on the meaning described in the column above the play led (e.g. button tap, auto trig etc.).

When you switch on the SDS 9 it will always power-up in play mode, with factory kit A1 selected. This is the normal 'playing' mode where all the sounds are available to you for performance. The other two modes are used to program the various functions of the SDS 9, i.e. the sounds and midi.

If you press the "Mode" button you will see the play led go off and the 'prog' led come on. This indicates that you are now in programming mode. The five buttons now take on the meaning described in the column above the prog led (e.g. voice select, save voice etc.). If you keep pressing the mode button you will move to the midi mode, and again moves you back to the play mode.

Thus you can tell what mode you are in and very easily what function each button currently is used for.

PROGRAMMING KITS

Programming a particular drum kit is achieved by following a logical series of actions as follows:-

1) **Enter prog mode** by pressing mode – the led under prog will be lit.

2) **Select a kit to program** by pressing bank select and kit select. You can use any of the 20 Factory or 20 User kits as a starting point – but remember you can only STORE kits in the User area.

3) **Select a voice to program** by pressing 'voice select' each press moves on to the next voice to program i.e. bass – snare – rim – hi tom – med tom – lo tom. The 'Prog' led on the appropriate channel will flash.

4) **Program a voice** by turning the program variable controls, these have different effects on different channels. The effects are printed on the front panel.

5) **Save a voice** by pressing the 'Save voice' button – the prog led for the selected voice will stop flashing and stay on permanently. Note – the voices are only temporarily stored at this stage.

6) **Store a kit** by selecting a kit with bank and kit select (you can of course store your new kit back where you originally had it in 2 above) and press 'store kit'. The display will flash s.t.o.r.i.n.g. and will store those channels that have the 'prog' led lit, i.e. those that were saved in 5 above. Note – you cannot store kits in the factory area, the display will blink n.o. if you attempt to, so make sure the bank led is flashing (i.e. user) before storing.
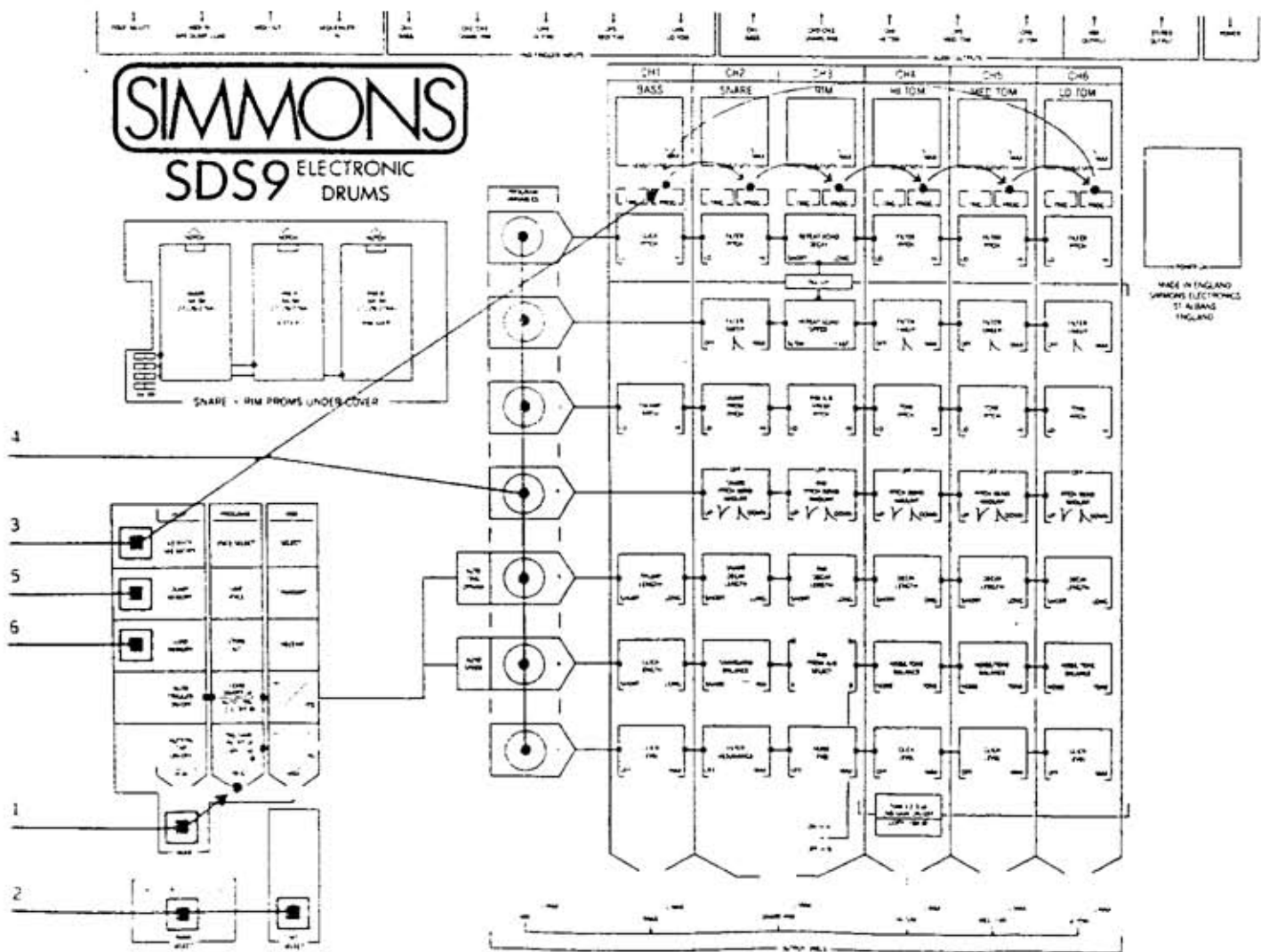
PROGRAMMING SOUNDS – IN MORE DETAIL

To enter program mode, first press the Mode button. The light currently on "play" should move along to "prog". The buttons along the left edge of the panel now correspond to each of the functions above "prog".

SELECTING A VOICE TO PROGRAM

Press the top button (Voice select), the "prog" light on the Bass voice will start to flash. This voice is now "soft" (or programmable). Using the program variable pots, you can now change the sounds (or parameters) of the bass drums voice. In other words the program variable pots (pots 1-7) take on the meaning written in the column under the voice whose program led is flashing. For example, the bass drum can have the thump pitch changed when pot 3 is adjusted – but only when the bass drum program led is flashing. To select a different voice to program you keep pressing 'voice select', this steps you on to the next voice.

ACTIVATING THE 'PROGRAM VARIABLE' POTS

A variable will only change when the pot has been turned past the value of the sound already stored. So once you have decided which variable you wish to change, a good tip is to twist the pot fully in both directions (to give you complete control) before you start. Remember, if you lose the sound originally stored and wish to return to it, just reload this kit by using either the bank or kit select buttons to cycle back to this kit and bank number.

SAVING A VOICE

Once you have arrived at a sound you are happy with, you may "harden" the sound by pressing "Save Voice" (Button 2). The voices "prog" light will now stay on constantly. You can then move on to another voice and do the same again. To "resoften" a voice just press "Save Voice" a second time and the voices "prog" light will once again flash.

STORING VOICES

You can only store voices which have been "saved" (hardened) first. Any voices still remaining "soft" will be lost if you change bank or kit to a new kit (as the sounds for the new kit are loaded into all soft voices). So first "save" all the voices you wish to store. Then press "Store Kit". As you press the button you will notice that the display will flash S.T.O.R.I.N.G. This indicates that the voices have been stored (Note that only 'hard' voices are stored).

USING THE FACTORY PRESETS AS A STARTING POINT

Factory voices may be changed (exactly the same way as "User" voices), the difference comes when you try to store them. Factory sounds are stored in ROM (Read Only Memory) which cannot be updated. If you hit "Store Kit" in Factory kits, the display will flash N.O. (No!). It is possible, however, to store a great sound that was derived from a Factory voice by changing to the "User" kits while the sound is hard, and then "storing" it.

It is possible to shuffle voices around from kit to kit by entering "prog" mode, "saving" the particular voices, changing Bank/Kit, and storing the voices at their new destination!

AVOIDING LOSING SOUNDS (OR BE CAREFUL)

If you change Kit/Bank while any voices are still "soft" you will lose all the changes that have been made, and the soft voices will revert to the original sound stored. You don't, however, have to "store" the voice, just "saving" it will do. It is possible to work on all the 6 channels, saving each one in turn before you need to decide which voices to "store". However, it is safer to save and store as you go, as one wrong move can lose all you have worked on.

Voice prog 'hard' ● (non flashing)
= voice saved; pots not active.

Voice prog led 'soft' ♪ (flashing)
= pots active.

PROGRAMMING THE SOUNDS

PROGRAMMING THE BASS DRUM

The following pages discuss in detail the various parameters of the sounds that can be altered.

The sounds are alterable whilst in the program mode and the program led is flashing over the particular channel to be programmed.

The 7 program variable controls vary the parameters boxed under the channel heading — for example program variable pot 1 (the top control) will vary click pitch when programming the bass drum, and filter pitch when programming the snare. There are 5 variables for the bass drum, 12 for the snare and rim (the two channels are classed as one drum) and 7 for each of the tom toms. The balance and amount of these variables can change drastically according to how hard the particularly drum has been struck. For example bend and brightness can be programmed to increase with harder hits, so during programming it is advisable to strike the drum with differing strength to hear the effect. During programming of the snare, the rim should be struck as well, so as to hear the balance between the variable snare and rim parameters.

There is an auto trigger facility which hits the drum for you at different dynamic levels whilst you are programming (see – more complex auto-trigger variations), but for the moment we'll assume you will be hitting the drum whilst programming the sounds.

THE PARAMETERS YOU CAN CHANGE
The bass drum is a digitally synthesised voice incorporating two main component parts.

THUMP & CLICK
Thump is the main body of the sound – in an acoustic drum this is the bass drum head vibrating after it has been struck.

Click is the sound of the bass drum beater hitting the skin. In an acoustic drum the size and tension of the drum skin will vary the pitch of the drum. The amount of damping affects the length of the thump, whilst the type of beater along with equalisation during recording drastically changes the quality of the beater sound or click.

These are the most commonly manipulated parts of an acoustic bass drum sound, you can change these easily on the SDS 9.

There are program variable pots to change the pitch of both click and thump.

It is also possible to change the length of click and thump.

Finally there is a pot for click level.

With these 5 variables, an amazing number of different bass drum sounds can be attained. From the tightest Jazz bass drum to the heaviest metal sound (and all in between!).

To get rid of the click component completely, both 'click length' and 'click level' must be turned fully to the left (anti-clockwise).

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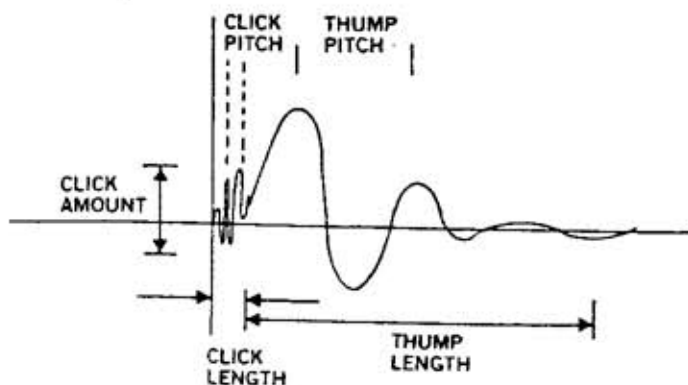
RECAP ON CHANGING BASS DRUM SOUND

Get into the program 'mode' (use mode button (1)). Select bass drum voice (use voice select – top button (2)). Give a little twist left then right of the parameter pot you wish to change; pot 1 = click pitch, pot 3 = thump pitch, pot 5 = thump length, pot 6 = click length, pot 7 = click level (note pots 2 and 4 are not used for the bass drum (3)). Make the bass drum 'hard' (use the save button – second from top (4)). Change to a new user kit and bank if you want to (using bank and kit buttons) where you want to store this bass drum sound. Store it (use 'store kit' button – 3rd button down (6)). Note the display will flash s.t.o.r.i.n.g.

SNARE DRUM CONCEPT

PROGRAMMING THE SNARE DRUM
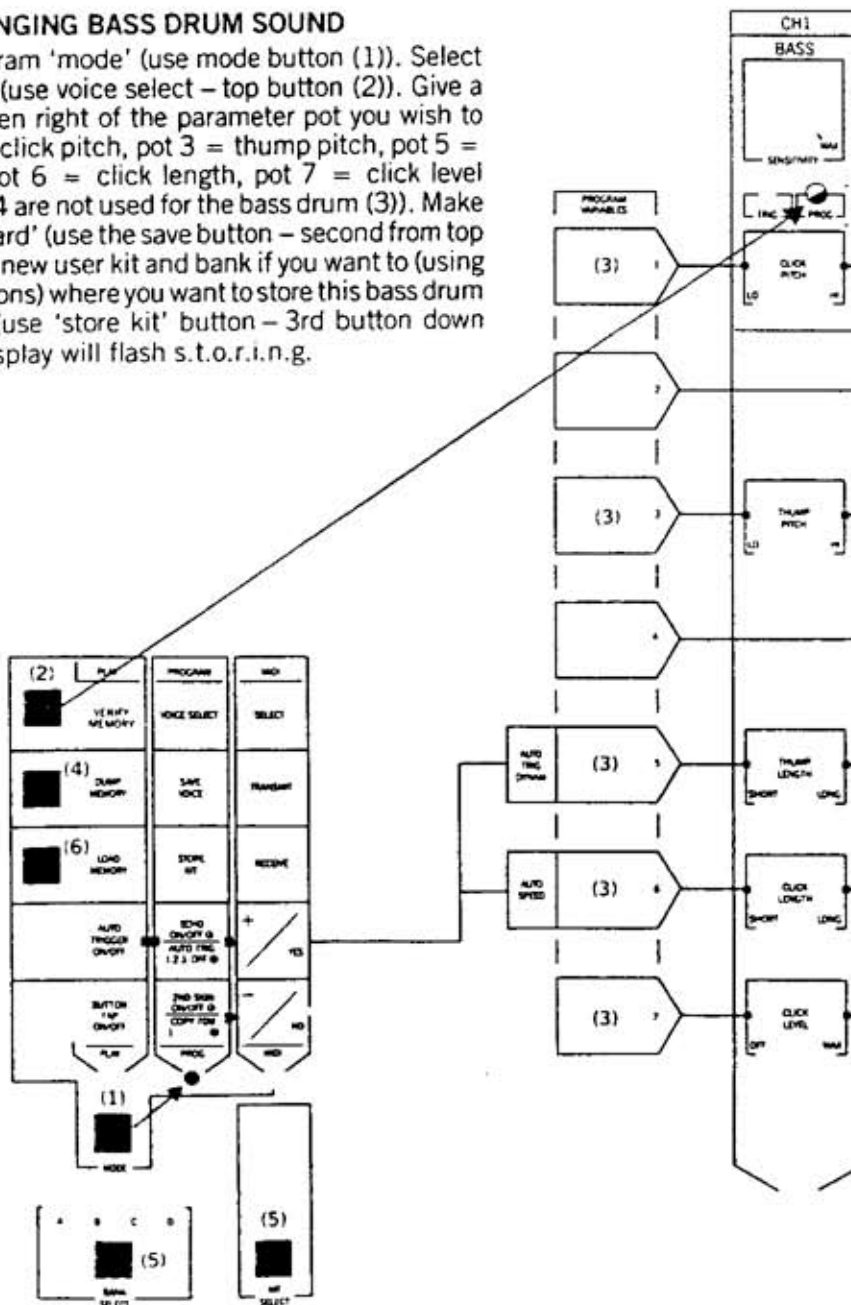
The SDS 9 snare has been designed to be the most flexible snare you have ever possessed.

Imagine its acoustic counterpart —

TUNING

You can tune it at a turn of a knob and store that tuning away. You can tune the rim, for higher or lower pitched rim shots and cross-sticks.

It's like having variable depth of shell, material of shell, make of drum head.

DAMPING

You can have a long snare sound, or a damped sound, with a short rim or long x – stick with ambience as counterpoint and again store these variations for re-call later.

Add extra snare 'rattle' with the noise control.

E.Q.

Change the filtering of the snare sound with the on board variable filter with resonance.

CHANGE OF PITCH WITH DYNAMICS

You can raise or lower the pitch of the snare or rim independently by how hard you strike the drum.

If that is not enough, insert your own sounds in the prom sockets and have a breaking glass sound when you hit the rim, or a gun shot, or timpani, timbale, guitar chord.

Choose the sound you require from SIMMONS extensive prom library, or sample your own with the SIMMONS E.P.B. (See sampling).

THE PARAMETERS YOU CAN CHANGE

The snare drum is itself divided into two voices: the snare itself and the rim. Both of these voices are digital samples of acoustic drums held in PROM. Even though it has 2 voices, when programming it is treated as one drum – note that both voices are loaded and stored together (and they are always either hard or soft together). The SDS 9 comes supplied with three snare proms which go to make the complete snare drum sound.

These proms are:-

Semi live snare hit
Live cross-stick with ambience
Live snare rimshot (snares detached)

Changing the proms, sampling and E-proms are discussed later in this manual.

With both voices you can alter the pitch, pitchbend (both up and down), and the length of decay. On the snare voice there is also control over the filter cutoff, the filter sweep and filter resonance.

The rim voice also has a pot for white noise level (the tone and sweep of this is largely controlled by the filter 'parameters'). The noise is only triggered by the snare however. As there is a COMMON individual output for both snare voices, there is also a pot which controls the snare/rim balance. On the rim you have a choice of 2 sounds (held in the proms under the hatch in the electronics)

RIM A — CROSS-STICK (CLICK)

RIM B — RIM-SHOT (CLANG)

Turning the Rim Select pot anti-clockwise will select RIM A, clockwise will select RIM B.

ALTERNATING BETWEEN THE SNARE AND RIM VOICES

Because the snare and rim voices are used for one drum – and one filter is used for both it is often necessary to swap between adjusting a parameter on one voice and then adjusting one on the other. To make this easy, pressing the bottom button (the one labelled '2nd skin/on/off') while the snare and rim voices are soft will toggle you between the voices.

A PROGRAMMING SESSION WITH THE SNARE DRUM

1. Enter prog mode by pressing the mode button so that the prog led is lit.

2. Press the voice select button twice so that the snare prog led is flashing.

3. Select factory sound A1 (bank led A non-flashing) – this re-calls the factory sound stored in A1 as a starting point for programming.

4. **Filter Pitch** Whilst hitting the snare drum, rotate the filter pitch control (variable 1) fully clockwise and anti-clockwise and note how the sound gets brighter (clockwise) and duller (anti-clockwise). Leave the control half-way.

5. **Filter Resonance** Again, whilst hitting the snare, turn the filter resonance half-way, (don't forget to 'activate' the pot by rotating clock and anti-clockwise first), then go back and rotate the filter pitch. Note the definite pitch or whistle that the sound now has. Try different amounts of resonance at different filter pitch settings. Leave control half-way.

6. **Filter Sweep** Activate the control, turn the filter pitch anti-clockwise, then, whilst striking the drum, turn the filter sweep anti-clockwise and then gradually clockwise — Note how you can hear the filter 'sweeping' downwards as the sound decays. This 'sweeping' effect is exaggerated because of the resonance control being half-way. Note that the amount of 'sweep' is dependent upon how hard you hit the drum.

Turn the resonance anti-clockwise (off). Now as you hit the drum harder the sound will get brighter (unless the filter pitch is as high as it will go anyway).

Turn the resonance and sweep fully anti-clockwise (off) and the filter pitch fully clockwise.

7. **Snare Prom Pitch** Activate the control, hit the snare and vary the snare pitch control, note how the low sounds get long and distorted whilst the high sounds are short and crisp, (see Sampling for more details). Hit the snare and rim together to see how different snare pitches work against the rim sound. Leave the control half-way.

8. **Snare Pitch Bend** Whilst hitting the snare with varying dynamics, turn the control clockwise – note how the pitch of the snare goes up when you hit the drum hard.

Turn the control anti-clockwise, note how the pitch of the drum goes down when the drum is struck hard.

At roughly the halfway point, no bend will be apparent. A small amount of bend down sounds most realistic. Experiment with different amounts of bend at different snare pitches.

9. **Snare Decay** Try different lengths of snare sound. Note that you can never get a longer sound than the sample itself. The length of the sample is dependent upon the speed (i.e. pitch) that it is played at.

10. **Snare Rim Balance** Hit the snare and rim together. Rotate the control anti-clockwise and note that the sound is almost entirely snare, turn clockwise to hear just rim. Leave the control halfway.

Rim To program the rim, press voice select. Note the rim prog led is now flashing – press '2nd skin on/off' (bottom switch) note that the snare prog led now flashes, press again and you are back to the rim. This saves you 'cycling' around the toms and bass drum, this would happen if you used the voice select button.

Leave the rim prog led flashing and repeat the above steps for the 'rim A/B pitch', rim bend, rim decay.

Rotate the prom select knob fully clockwise. Note the prom select led goes out. This means that the second rim prom (B) is now in use.

Rotating the rim select control left and right selects prom (A) or prom (B).

Repeat the programming exercise for the rim shot sound (prom B).

Noise Turn the noise control up. Hit the snare, note that white noise has now been added to the snare sound.

Press '2nd skin on/off' to switch back to prog snare and experiment with different settings of filter pitch and resonance on the noise.

Saving At any time you can hit save voice. Both prog led's (snare and rim) will go hard (non flashing). If you change to a user kit and hit store kit, the new snare and rim settings will be stored in that kit, overwriting the old snare sound.

SNARE

RIM

SENSITIVITY SNARE

SENSITIVITY RIM

PITCH
LOW PITCH — HIGH PITCH

NO BEND
BEND
LOWER PITCH WHEN HIT HARD — HIGHER PITCH WHEN HIT HARD

DECAY
SHORT SOUND — LONG SOUND

NOISE
NONE — LOTS

LOUDNESS

SNARE SOUND PROM

LOUDNESS

X-STICK

RIM SHOT

PITCH
LOW PITCH — HIGH PITCH

NO BEND
BEND
LOWER PITCH WHEN HIT HARD — HIGHER PITCH WHEN HIT HARD

DECAY
SHORT SOUND — LONG SOUND

RIM A/B
X-STICK SOUND — RIM-SHOT SOUND

½ SNARE ½ RIM

SNARE/RIM BALANCE
ALL SNARE — ALL RIM

RIM OUTPUT TO RING OF STEREO JACK CH 2/3

FILTER PITCH
LOW (DULL) — HIGH (BRIGHT)

FILTER SWEEP
NO SWEEP — BRIGHTER WHEN HIT HARD

RESONANCE
OFF — ADDS NOTE OR 'WHISTLE' – NOTE PITCH IS ADJUSTED WITH FILTER PITCH

FILTER

ACCENT WHEN BOTH RIM + SNARE HIT

AMPLIFIER

SNARE DRUM OUTPUT

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CHANGING THE SNARE DRUM PROMS

At the top left of the electronics is a hatch held in by a thumb screw. Under this hatch are the eproms that contain the samples used for the snare drum. You can change these for alternative sets available from your SIMMONS dealer or you can have these programmed using the SIMMONS SDS EPB – Sampler and Eprom Blower. With the hatch off you will see 4 small switches that select whether the eprom are 8K or 16K bytes. The top one is for the snare, the second from the top for rim A, the third for rim B. The switches should be switched to the left for 16K eproms and to the right for 8K Eproms. (The bottom switch is not used).

Note that the factory sounds have been programmed for the sampled sounds that are in the eproms shipped with the SDS 9 by SIMMONS. If you change these eproms, the factory presets will not be set up correctly.

If you intend to be changing proms constantly, you are advised to purchase a set of ZIF (zero insertion force) sockets, which plug into the existing prom sockets. This makes changing eproms very simple – a small lever locks the proms into place and no force is required to remove the proms. Be careful not to bend the prom legs if you are not using zif's.

Contact your SIMMONS dealer for more info on zif's.

See 'sampling your own snare sounds'.

RECAP ON CHANGING THE SNARE DRUMS SOUNDS

Get into 'prog' mode (using the mode button) (1). Select the snare drum voice (use voice select twice) (2). Adjust the parameters that you require in the snare voice (3) (remembering to activate the pots). Change to programming the rim voice (using the 2nd skin/copy tom button) (4). Adjust parameters. Make the snare drum 'hard' (use the save button) (5). Change to a new kit/bank where you want to put this new snare drum sound (using kit and bank buttons). Store it (use store kit button (6) noticing that the display will flash s.t.o.r.i.n.g. – if it doesn't – you are trying to store this in the factory kits – i.e. bank led not flashing?).

To change the snare sound dramatically, e.g. a breaking glass sample on the rim – open the hatch, remove existing eprom, insert new eprom, select eprom size with the small switches, close hatch, reprogram kits for new sample.

SIMMONS SDS9 ELECTRONIC DRUMS
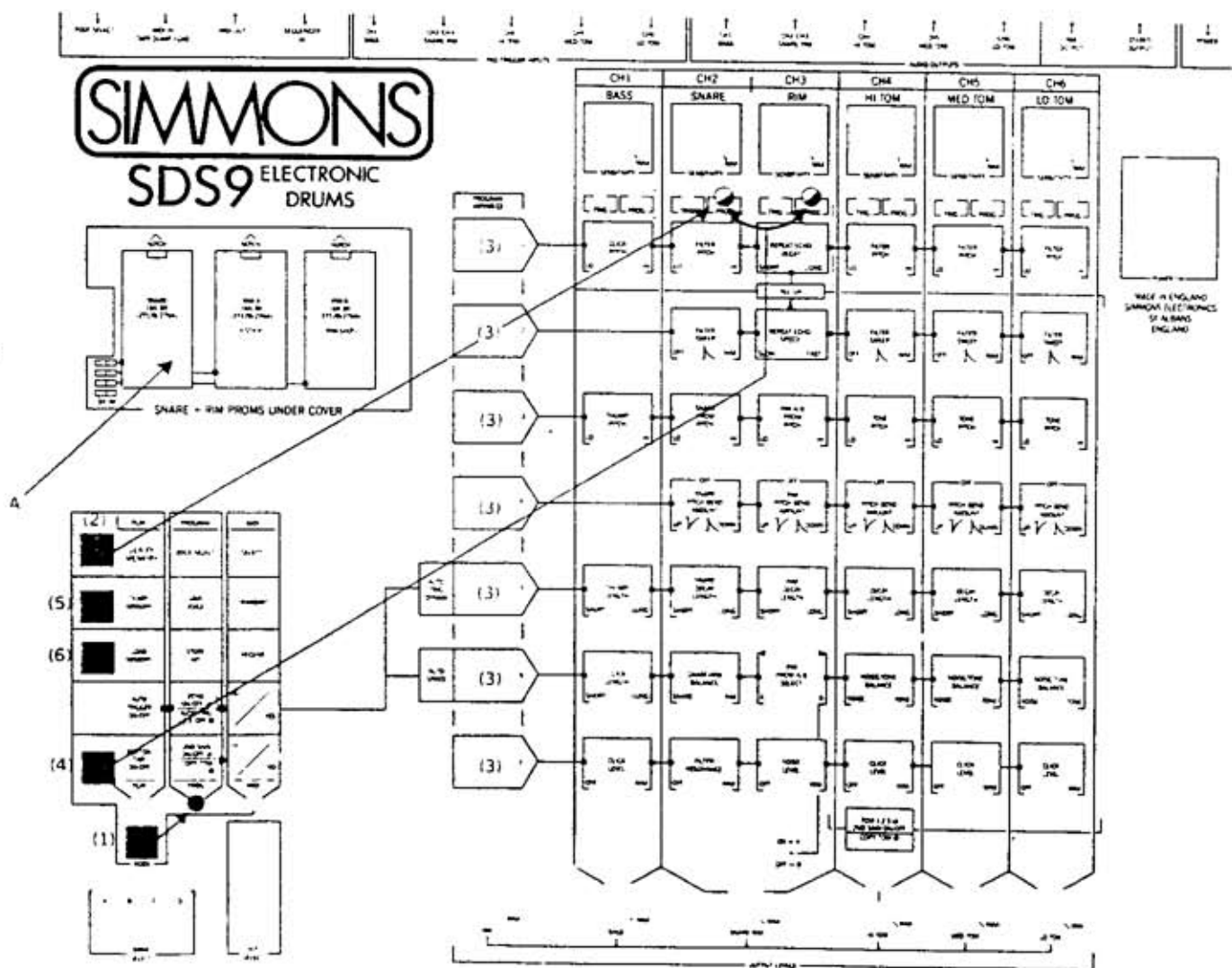
TOM TOM CONCEPT

The three tom toms are identical on the SDS 9 apart from pitch, the hi tom is higher in pitch than the medium tom, and this is higher in pitch than the lo tom.

The tom sound itself is made up from four 'sound' components – tone, noise, click, and 2nd skin (frequency modulation) and four 'control' parameters – filtering, bending, amplifying (dependent upon dynamic) and decay length.

TONE

The 'tone' of the drum is its natural pitch, i.e. the pitch to which you would tune an acoustic drum. This pitch can change dependent upon how hard the drum is struck. This pitch change is called bend. The pitch can be bent down (i.e. the pitch goes up as the drum is struck harder and then bends down as the sound dies away – normal tom sounds) or bent up (i.e. the pitch goes down as the drum is struck harder and then bends up as the sound dies away – tabla like sounds).

NOISE AND FILTER

The noise contents of the sound mimics the high random tones or brightness in the drum. This brightness dies away as the drum sound dies away. The drum sound also gets brighter the harder the drum is struck. These functions are carried out by the filter controls (filter pitch – the initial brightness of the drum, and filter sweep – how the brightness changes as the drum sound dies away).

DECAY

Decay length is simply the time it takes for the sound to die away after the drum has been struck. On an acoustic drum this would be achieved with tensioning the head, along with various pieces of gaffer tape and sponge!

CLICK

Click is the sound of the stick hitting the drum head. This is synthesized with a burst of noise and is shaped by the filter. The amount of click is independently variable.

2ND SKIN

By modulating the tone of the drum with a second, unrelated frequency, a deeper, harmonically rich sound can be produced. This is the 'second skin' feature on the SDS 9.
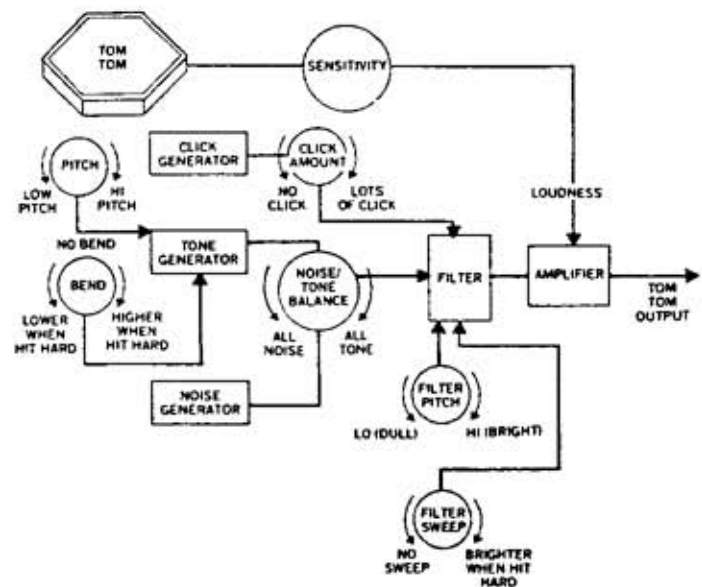
PROGRAMMING THE TOM-TOMS

THE PARAMETERS YOU CAN CHANGE

The tom voices are generated by analog synthesis, in a similar way to the SIMMONS SDS 5, 7 and SDS 8 but the SDS 9 toms have been specifically designed to sound more 'real' than ever before.

You have control over the tone pitch and pitch bend, the filter pitch and sweep, the length of the sound (decay), the amount of click and the balance between tone and noise.

THE SECOND-SKIN SWITCH – SINGLE/DOUBLE HEADED TOMS

This is a subharmonic tone, which when added to the existing tone gives the sound of a second skin to the toms. This is set for all the toms, so you choose whether you want a kit of single or double headed toms.

You switch on or off the double head tone while programming the hi tom (tom 1). When this voice is soft i.e. the voice prog led is flashing – indicated on the SDS 9 electronics by ∍ , you push the bottom of the five buttons (2nd skin on/off). This will turn it on if it is off, or off if it is on. You have to listen carefully because its' effect is subtle – make the pitch high and you should hear it easily). The current setting is stored when you store tom 1.

'COPY TOM' – A SIMPLE WAY TO PROGRAM THE TOMS

Often you will be programming tom 1 and get a great sound. You will then want to get the same sound (to get a matched set), on the other toms. You could of course switch to tom 2 and adjust it to get the same sound but at a lower pitch. To make setting of the toms simpler you can copy the hi tom (tom 1) to the other toms with an appropriate pitch change.

To do this, program your great sound on tom 1. To copy this to the other toms, first harden tom 1 (use the save voice button – the voice program led with stop flashing). Now press the bottom button – labelled "2nd skin/copy tom"). This will copy the parameters in tom 1 – its current sound, to the second and third toms, with an appropriate pitch change.

Of course, once successfully copied, you can change any of the variables to adjust the sound.

RECAP ON TOM-TOM PROGRAMMING

Enter prog by pressing mode (1) select hi tom to program, by pressing voice select 4 times (2). The prog led on the hi tom channel will flash. Alter any of the seven parameters as you require (3). Whilst this prog led is flashing(∍) use the 2nd skin on/off button to switch on or off the second skin as required (4). Press voice select to program CH5, and press once more if you wish to program CH6 (5) (to return to CH4-hi tom – simply keep pressing the voice select button to cycle back) or if you want to save CH4 press save voice (6) – the prog led will go hard (stop flashing). Pressing store kit will store the new settings (7), pressing copy tom 1 will copy the sound into CH5 and CH6 (4) (med + lo toms) and then hitting store kit will store all three tom toms (7).
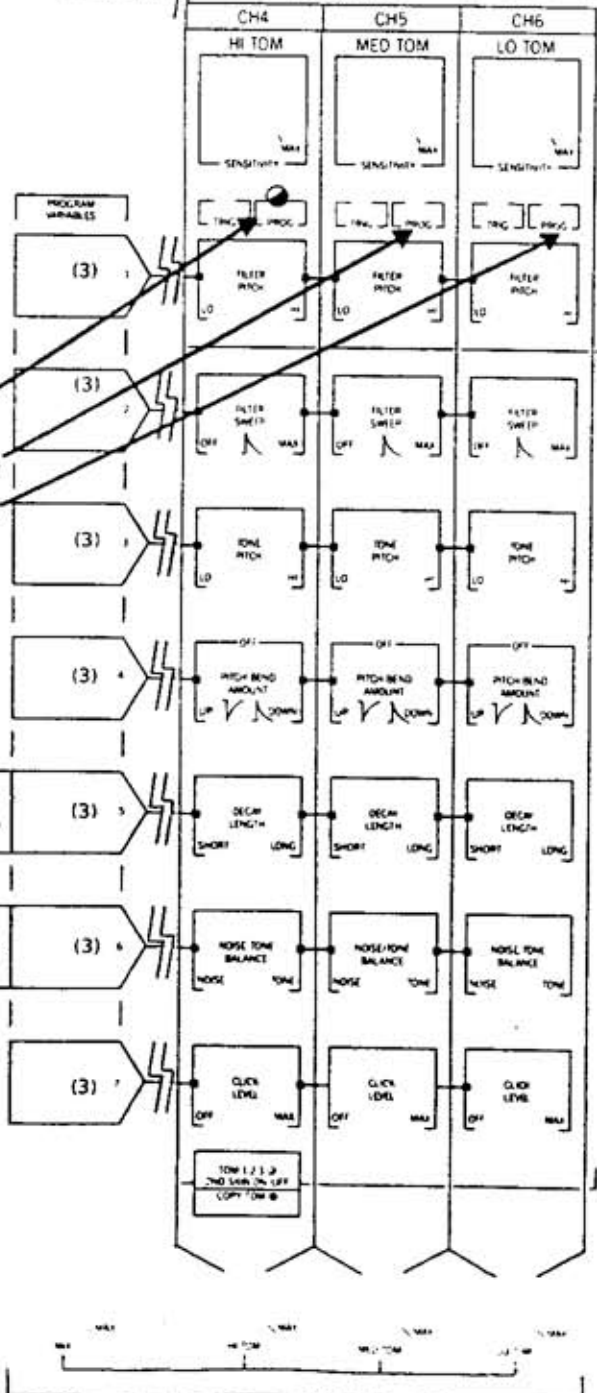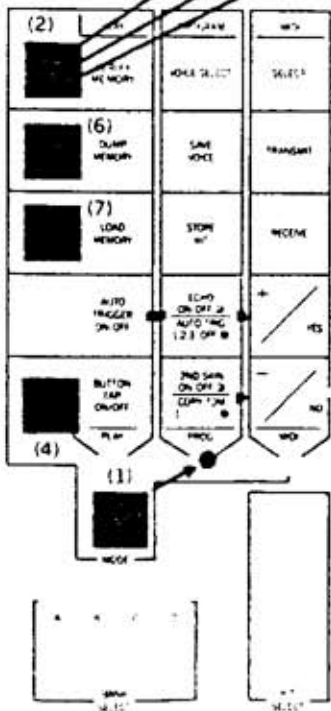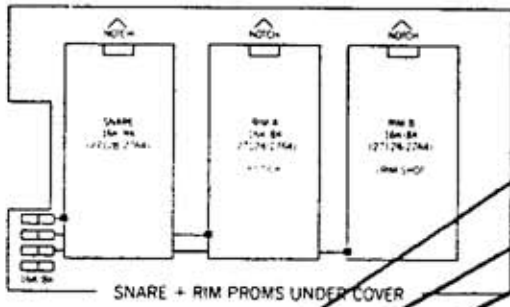
MORE COMPLEX AUTO-TRIGGER VARIATIONS

We have already covered the basic auto-trigger facility which enables you to hear kit sounds without playing them, thus leaving your hands free to change kits etc.

In program mode, there are several variations on this theme. First enter program mode and select a voice (any voice for the time being). Then "harden" the voice by pressing save voice. If you press the Auto-Trigger button, you will hear each voice triggered once in turn as before (mode 1).

If you press the auto-trigger button again, you will only hear the voice you are currently programming, and the trigger is at a constant dynamic (mode 2). Press a third time, and you will hear the same voice triggered this time with an increasing dynamic, rising to a peak (mode 3).

Mode 4 applies only to the snare/rim voices and the toms, and are different in both cases. With the snare/rim voices Mode 4 triggers first the snare, then the rim, then both together. This is very useful for setting up the balance between snare and rim. In mode 4 the tom voices are triggered one after the other in a 'triple' sequence, allowing easy comparison between tom sounds.

The dynamics and trigger speed of all these modes are controlled by program variable pots 5 and 6 (note – these will only operate when the voice is saved, or 'hard'. If you turn these pots while the voice is 'soft' you will change the sound of the voice in question).

AUTO TRIG MODES – DURING PROGRAMMING ONLY

To switch between modes the prog led on the relevant channel must be hard (non-flashing). Use the auto trigger button to cycle around the modes.

Pot 5 varies the trigger dynamics
Pot 6 varies the trigger speed } prog led must be hard

MODE	BASS	SNARE/RIM		HI TOM	MED TOM	LO TOM
1	Hits bass + then other channels	Hits snare then other channels	Hits rim then other channels	Hits hi tom then other channels	Hits med tom then other channels	Hits lo tom then other channels
2	Hits bass single dynamic	Hits snare single dynamic	Hits rim single dynamic	Hits hi tom single dynamic	Hits med tom single dynamic	Hits lo tom single dynamic
3	Hits bass with rising dynamic	Hits snare with rising dynamic	Hits rim with rising dynamic	Hits hi tom with rising dynamic	Hits med tom with rising dynamic	Hits lo tom with rising dynamic
4	As mode 3	Hits snare then rim, then both		Cycles around hi tom – med tom – lo tom	Cycles around hi tom – med tom – lo tom	Cycles around hi tom – med tom – lo tom
5	Off	Off	Off	Off	Off	Off

Note: Echo is disabled during auto trigger as all the repeating echoes would be very confusing.

REPEAT ECHO

This extra feature is unique to the SDS 9. It allows you to add a ''slap-back'' or repeat delay to any or all of the voices in a kit.

The SDS 9 achieves this echo effect by re-triggering the particular drum that has been struck after a time (the echo speed), and then continuing to trigger the drum with lower and lower dynamics – like the fading away of a repeat echo.

Because the SDS 9 uses a new triggered sound for each echo there is no degradation of the echo signal as you would expect from a tape echo.

Note: It is always the last stroke of a particular drum that is echoed, so that you can play very 'busy' passages and the echo will not 'muddle' the passage.

You can set a different speed and repeat time for each kit number, and then choose which particular drums in that kit have echo. So you can have just echo on the rim or just the toms, or just the low tom or echo on all of the drums.

Various factory kits have echo (see the list at the end of the manual).

To demonstrate the various echo functions select factory kit D1. Strike the tom-toms. Note they have a long repeat echo. By striking them at different times 'Micro Sequences' can be set up, i.e. repeating tom patterns. Note that there is no echo on the bass or snare drums. To switch the echo on or off you must be in prog mode. Press mode and then voice select twice to select the snare drum. Now press echo on/off and notice that the snare drum now has echo (hit it). Press again to switch the echo off. You can toggle the echo on and off like this in any of the channels.

Note: These changes will only be stored when you press store kit with the relevant prog light hard, in the normal way. Switch the echo on, on the snare. Now move to programming the rim. This is where you set up the different types of echo.

Program variable 1 changes the length of the echo, and whether it is a slap-back or repeat echo (i.e. how many distinct echoes are heard before the echo dies away). PV2 changes the speed of the echo (the delay time in between each echo.).

Whilst hitting the snare try different echo speeds and delays.

Once again any updates to the echo parameters are stored when you store the snare/rim channel.

REPEAT ECHO — SINGLE SLAP BACK

LOTS

NUMBER OF REPEAT ECHOES

REPEAT ECHO DECAY

SLAP BACK ECHO

ONE

HIT

HIT

WHILE RIM PROG FLASHES YOU CAN CHANGE ECHO PARAMETERS

REPEAT ECHO SPEED

SLOW   FAST

HIT

HIT

SIMMONS
SDS9 ELECTRONIC DRUMS

WHILE PROG LED FLASHES SWITCHES ECHO ON/OFF ON BASS DRUM
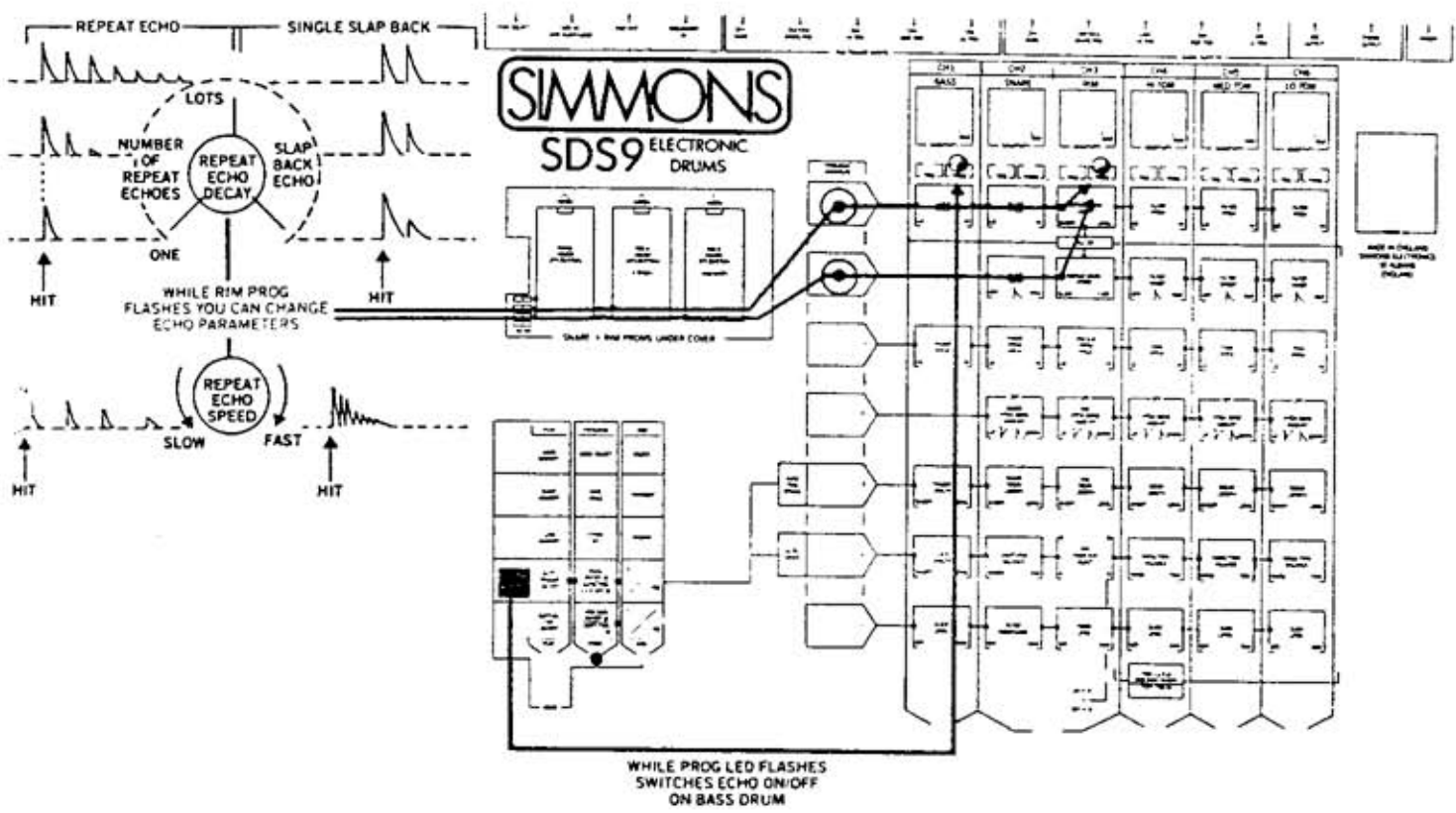
A SEQUENCE OF KITS
(HOW TO PROGRAM THE FOOTSWITCH)

WHAT IS THIS KIT SEQUENCE?

So far we have seen that the SDS 9's kit memory is 2 sets (factory and user) of 4 banks (A,B,C,D) of 5 kits (1,2,3,4,5) i.e. 40 possible different drum kit presets. For performance the footswitch has so far allowed us to only cycle between the 5 kits in any one bank.

It would be very nice indeed if we could tell the SDS 9 that we don't want to just cycle between the 5 kits in a bank when we depress the footswitch (or kit select button), but rather that we want it to choose kits from different banks in a predetermined order – when we depress the footswitch – this is exactly what the 'kit sequence' is!

There are 2 things involved in the use of the kit sequence: programming it, and 'playing' it back.

PROGRAMMING THE KIT SEQUENCE

There is only one kit sequence programmed into the SDS 9 at any time – though they are dumped and loaded from tape (when we dump the kits, the kit sequence is identified by '7'). Whenever we program the kit sequence we overwrite (lose) any previous kit sequence.

To program the kit sequence, get the SDS 9 into 'play' mode. Press mode, i.e. move into 'prog' mode. You are now in 'kit sequence program mode'.

(Note that to program the voices you press 'voice select' and the bass drum prog led would flash – don't do that now as we don't want to program the voices). Whenever you move into program mode and before you press voice select, you are in 'kit sequence program mode'.

You can now change between any factory or user bank and kit. You could also turn the auto trigger on/off allowing you to review the kits.

Select factory kit A1. Watching the prog led press 'store kit'. You should have seen the prog led blink once quite fast – this has just started a kit sequence with factory kit A1. Select factory kit B1, and press store kit – again watch for the prog led blink. Select factory kit C1 and press store kit again. You now have the kit sequence containing the factory kits A1, B1, C1. Press mode twice to get back to play mode.

If the prog led did not blink, you are probably in programming voices (did you press voice select?) if so use mode to go round midi, play and back to prog mode and try storing A1, B1, C1 again.

Note that if you try and create a sequence that has more than 96 kits it it, when you press 'store kit' the prog led will not blink, and the kit display will briefly display 'E' – you have tried to store too many – 96 is the limit!

'PLAYING BACK' THE KIT SEQUENCE

If you have just programmed the kit sequence as above, you should have the kit sequence containing factory A1, B1, C1 and be in the play mode with the current kit being factory C1.

To play back or select that the SDS 9 uses the kit sequence you need to put the SDS 9 into 'sequenced button tap mode'. This is a similar mode to the normal button tap mode discussed earlier – i.e. you can tap buttons to trigger the voices as before.

ENTERING 'SEQUENCED BUTTON TAP MODE'

To select 'sequenced button tap mode' press the 'button tap' and 'kit select' buttons together. You should notice 2 things: the play led flashes – you are in a button tap mode, and the bank and kit currently being used have become factory A1 (the first kit in the sequence programmed above) – you are now in 'sequenced button tap mode'. If you didn't manage to press 'button tap' and 'kit select' together, you will either have moved to kit A2 or be in normal button tap mode, try again to enter 'sequenced button tap mode'.

GOING FORWARDS THROUGH THE SEQUENCE

If you now press 'kit select' or the footswitch 3 times you should notice the kit changing from A1 to B1, B1 to C1 and then C1 to A1. You have now cycled through all the kits (3 of them) in the sequence and are now back at the beginning. Remember you can program a sequence of up to 96 kits in the sequence.

GOING BACKWARDS THROUGH THE KIT SEQUENCE

What would happen if you had a kit sequence of say 25 kits that you were using for a performance and when performing you accidently pressed the footswitch twice – you would have to frantically press it another 24 times to cycle back to the previous one – the one you really wanted. For just this reason the 'button tap' button will take you to the previous kit in the sequence.

Note that if you are at the beginning of the sequence, pressing 'button tap' will cause you to cycle back to the last kit in the sequence.

GETTING OUT OF 'SEQUENCED BUTTON TAP MODE'

While you are in this mode you must press the 'button tap' and 'kit select' buttons together to return to the play mode. A short jab at both works well.

A RECAP ON THE KIT SEQUENCE

The kit sequence allows you to program a sequence of any of the kits (both factory and user) in any order – up to 96 in total. You program the sequence by entering prog mode, selecting a kit, pressing 'store kit', selecting another kit, 'storing' it etc.

The sequence is played back in 'sequenced button tap mode' – a mode similar to the simple 'button tap' mode – where buttons trigger the drum voices – but where the kit select (or footswitch) and 'button tap' buttons cycle forward or backwards respectively through the kit sequence. You enter and exit this mode by pressing both 'button tap' and 'kit select' together.

The kit sequence is identified during dumps and loads by '7'.

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SAVING AND LOADING DATA TO/FROM CASSETTE

CONNECTING UP

The SDS 9 has a built in tape interface that allows you to store all of the 20 user kits, the programmable kit sequence, and all of your programmed midi data (see later) to audio tape (e.g. cassette).

The cassette lead supplied with the SDS 9 should be plugged into the 'MIDI IN/TAPE DUMP/LOAD' socket at the back of the electronics. The 2 small jacks coloured red and black should be plugged into your tape machine:
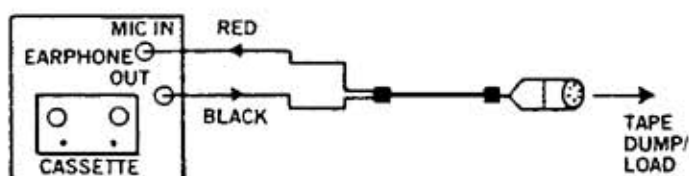
To enable the use of the 'tape' interface you must first disable midi. If you have not just programmed midi or even enabled midi you may skip the next section.

ENABLING THE CASSETTE INTERFACE

To enable the cassette interface, (and disable midi), use the mode button to put you in midi. The midi led above the mode button should be on. Use the bottom button, labelled – no, to turn off midi. The kit number display should be completely blank – indicating midi is disabled and the cassette interface is enabled (the dot would be on if midi was enabled and the cassette interface was disabled). Press the mode button again to get back to play mode.

The SDS 9 powers up with midi disabled and the cassette interface enabled.

BASIC OPERATIONS

There are 3 operations that can be used: dumping data to tape, verifying that the dumped data is correctly transferred, and loading back previously dumped data. It is also possible to send 'leader tones' so that optimum recording/playback levels may be set.

DUMPING YOUR KITS

Having connected up the SDS 9 to the tape machine, start it recording. Wait a few seconds and then press 'dump

memory' (2nd button from the top). The kit display should show 'd.' After a couple of seconds you will see kit A1 being displayed – for about ½ a second. You have just dumped kit A1. The display will then revert to 'd.' again and then on to A2. This will continue up to kit D5. This indicates that all of your kits have been dumped. The display will then show '6', 'd.', '7', 'd.' and then '8', 'd.'.

The displays of 6, 7 and 8 are the dumping of the basic midi data, the kit sequence and the midi kit note data – see elsewhere in this manual for descriptions of these. When all data has been dumped the SDS 9 will revert to being in play mode with user kit A1 selected.

If you now rewind your tape and play it back – and listen to what has been recorded, you will hear awful screeching sounds – this is good as it means data has been recorded.

At any time while dumping you can press the mode button to abort this dump and return you to play mode.

VERIFYING YOUR DUMP WORKED

Rewind your tape and press the 'verify memory' button – you will see a display of 'U.' for half a second and then 'U' – we are now awaiting data from the tape. Start the tape machine in playback mode. The display should change to 'U.' i.e. the dot comes on when the SDS 9 recognises data from the tape. If the dot does not come on, try adjusting the tape output volume, if you don't get it to work then read the section on setting correct recording play/back levels and then try dumping/verifying again. Assuming the dot came on, the display will show what is currently being verified. There will be displays of kits A1 to D5 and then '6', '7' and '8' for the midi data and kit sequence. If all goes well the SDS 9 will return to the play mode with user kit A1 being used.

If you get a display of 'E.' then there is something wrong with the tape – wrong level, bad tape etc. You can press the mode button at any time to abort this verify, or any other button to continue (noting that this kit or midi data or kit sequence will not be verified).

If you get a display of 'F.' then the data stored on the tape for this kit (or midi data or kit sequence) is different from that currently programmed in the SDS 9. Press mode to abort this verify, or any other button to continue with the rest of the data.

LOADING YOUR KITS

Rewind your tape to the starting point of the data and press the 'load memory' button – you will get a display of 'L.' for half a second and then 'L' – we are now awaiting data from the tape. Start the tape machine in playback mode, the display should change to 'L.' i.e. the dot comes on when the SDS 9 recognises data from the tape. If the dot does not come on, try adjusting the tape output volume level from the tape machine – if you still can't get the dot on, refer to the section on setting recording/playback levels – and then try loading again.

Assuming the dot came on, the display will show what is currently being loaded. There will be displays of kits A1 to A5 and then '6', '7' and '8' for the midi data and kit sequence. If all goes well the SDS 9 will return to the play mode with the user kit A1 being used.

If you get a display of 'E.' then there is something wrong with the tape – e.g. wrong level, bad tape etc. You can press the mode button at any time to abort this load, or any other button to continue (noting that this kit or midi data or kit sequence will not have been loaded).

If you get a display of 'F.' then the data has not been loaded. The mode button will abort this load and return you to the play mode with user kit A1 being used.

SELECTIVE LOADING

This allows you to load only specific parts of the data stored on tape. Basically you start a 'verify memory' operation and swap to loading for the specific bits of data you want to load. While you are doing a verify, you keep your finger pressed down on the verify memory button until the kit BEFORE the one you want to load (if you recall that verify displays an 'F.' when it finds a difference between tape and internal data and requires you to press a button to make it continue). Then quickly switch to pressing the 'load memory' button – the display will then display 'L.' for load. The data from then on will be loaded into the SDS 9 – while you keep the 'load memory' button pressed. When you release the load button you will be back to verifying data.

If you get a display of 'E.' there is something wrong with the tape. You can abort using the mode button.

ABORTING CASSETTE OPERATIONS

Any any time when you are dumping ('d.') or when loading ('L.') or verifying ('U.'), where there is data coming from the tape you can press the mode button to return you to the SDS 9 play mode.

SETTING CORRECT RECORDING/PLAYBACK LEVELS
(or having problems with the cassette interface).

If your tape recorder has a manual recording level, set to about half way. Also set the playback level to half way.

Read the rest of this section through once without touching your tape recorder, or your SDS 9, and then read through again doing what it says.

Press the dump button (2nd button from the top) and keep your finger on the button.

You should get a display of 'd.' on the kit display. (Check that there is indeed a '.' as this dot says we are using the cassette interface – if you don't get a dot go back and enable the cassette interface). While you have the dump button pressed, the SDS 9 is sending a leader tone. Start recording on your tape recorder – and keep your finger on the dump button – i.e. record a long leader tone. After about 30 seconds or so take your finger off the dump button. The SDS 9 will start dumping your kits and the rest of the data to be saved. When it starts doing this – i.e. the bank and kit displays identifying kits, use the mode button to abort.

Rewind the tape, and press play. Press the verify memory button (the top button). The display should show 'U.' Adjust the tape playback level until the '.' remains on the display. If you turn the volume up too much the dot will go off (overloading), if you turn the volume down too much the dot also goes off (not enough volume). Set the level to be halfway between these two points. If you cannot get this working successfully, try recording at a slightly lower/higher level and repeat this operation.

MIDI – INTERFACE TO OTHER INSTRUMENTS

WHAT IS MIDI?
– the Musical Instrument Digital Interface

MIDI is a standard interface that allows many different types of instruments from several different manufacturers to be connected together. These instruments include keyboard synthesizers, drum machines, recorders/sequencers, effects units and now a playable drum kit – the SDS 9.

Information is transmitted between these instruments via leads using 5 pin (180 degree) din connectors.

Each midi equipped instrument usually contains a receiver and a transmitter.

WHAT CAN I DO WITH MIDI?

By connecting the SDS 9 to a keyboard synthesizer via midi, you will be able to play the synths voices from the pads. You could also play the SDS 9 voices from the synths keyboard.

By connecting the SDS 9 to a midi sequencer or midi drum machine you will be able to trigger the SDS 9 voices from the drum machine – and make use of the SDS 9's amazing sounds – without playing the pads.

By connecting the SDS 9 to a midi recorder you can record your playing of the drums into the recorder, and then playback your recording exactly as you have played it.

By connecting the SDS 9 to a computer with appropriate midi interface and software you should be able to store and load all of the SDS 9 kit and midi data – to the computer's memory.

THE SDS 9 MIDI INTERFACE
— what is possible with the SDS 9 MIDI?

The basic things that the SDS 9 midi interface allows you to do are:-

- play voices of other instruments (e.g. synths) from the pads – and choose which notes are used for each pad. (tx mode 0, note assignment).

- play the SDS 9 voices from the keyboard of a synth, or a drum machine – and choose to ignore which midi channel they are sent down.

- if you have several synths connected up, you can direct each pad to a different synth.

- select a preset on the external synth when you change to a new SDS 9 kit – and choose to which preset the synth goes to.

- allow external synths to change the current SDS 9 kit.

- select whether the notes assigned to each pad change when you change SDS 9 kits – and choose which notes are used for each pad in each kit.

SDS 9 MIDI MODE

transmit (tx) mode 0, note assignment.

receive (rx) mode 0, ignore channel info.

tx mode 0, channel assignment.

tx mode 2, external kit number translation.

rx mode 2.

tx mode 6, assignment of different notes for each pad for each kit.

CONNECTING THE SDS 9 TO OTHER MIDI MUSICAL INSTRUMENTS

On the back of the SDS 9 are 2, 5-pin din sockets: MIDI IN, and MIDI OUT. MIDI IN is used when you want a synth or drum machine to trigger the SDS 9's drum voices. MIDI OUT is used when you want to play the voices of synths or drum machines from the SDS 9 pads.

DUMPING/LOADING THE SDS 9 KIT DATA ETC TO MIDI RECORDERS/COMPUTERS

By connecting the SDS 9 to a midi recorder or computer (with appropriate interface and software) you can load and dump all of the SDS 9 kit data and the midi interface state (i.e. mode switches and assignments) via midi. (By using the play mode dump/load/verify buttons while midi is enabled). You can also choose to dump/load just single kits of data between the SDS 9 and an external midi recorder/computer. (tx mode 4, rx mode 4).

ENABLING THE SDS 9 MIDI INTERFACE

When you turn the SDS 9 on (power on), the midi interface is disabled. You will have noticed that the MIDI IN socket is also used for TAPE IN/OUT. When the midi interface is enabled the cassette interface is disabled, and vice versa. So, to use midi we must enable it (and disable the cassette interface).

Press the mode button until you are in program midi (1) – the midi mode led should be on (3rd column). When in this program-midi mode, the 5 buttons are referred-to as: 'select', 'transmit', 'receive', ' +/yes', ' – /no'.

The kit display is used to show the midi mode and state. The '.' (dot) is used to signify that a mode is off (dot not on), or on (dot is on).

When you enter program midi mode the display is used to show whether midi is enabled or disabled. If the display is blank then all midi transmitting and receiving is disabled. If the dot is on, then midi is enabled (and its current programmed state is determined by the many different midi modes). You turn a midi mode on or off with the ' +/yes' and ' – /no' buttons. Press 'yes' (2). You will notice that the dot comes on – midi is now enabled. Press 'no' (3) and the dot will go off – midi is disabled. Press 'yes' again to enable midi. When midi is enabled you can move on to examining the current settings of all the other midi 'mode switches', initialise the midi state, and use the interface with external equipment.

To get out of program midi mode use the mode button.

The first time you use the SDS 9 midi interface, read below and make sure you initialise it.

Remember that every time the SDS 9 is turned on, midi is disabled. You therefore have to enter program midi mode (using the mode button), and then enable midi (using the 'yes' button) – every time you want to start using midi. All of the data that is used by midi that you can program (e.g. note, channel numbers etc) is battery backed up inside the SDS 9 and will remain, even after you turn the power off, until you reprogram it.

PLAY	PROGRAM	MIDI
VERIFY MEMORY	VOICE SELECT	SELECT
DUMP MEMORY	SAVE VOICE	TRANSMIT
LOAD MEMORY	STORE KIT	RECEIVE
AUTO TRIGGER ON/OFF (2)	ECHO ON/OFF / AUTO TRIG 1.2.3. OFF ●	+ / YES
BUTTON TAP ON/OFF (3)	2ND SKIN ON/OFF / COPY TOM 1. ●	– / NO
PLAY	PROG	MIDI

(1) — MODE

A	B	C	D

BANK SELECT

KIT SELECT
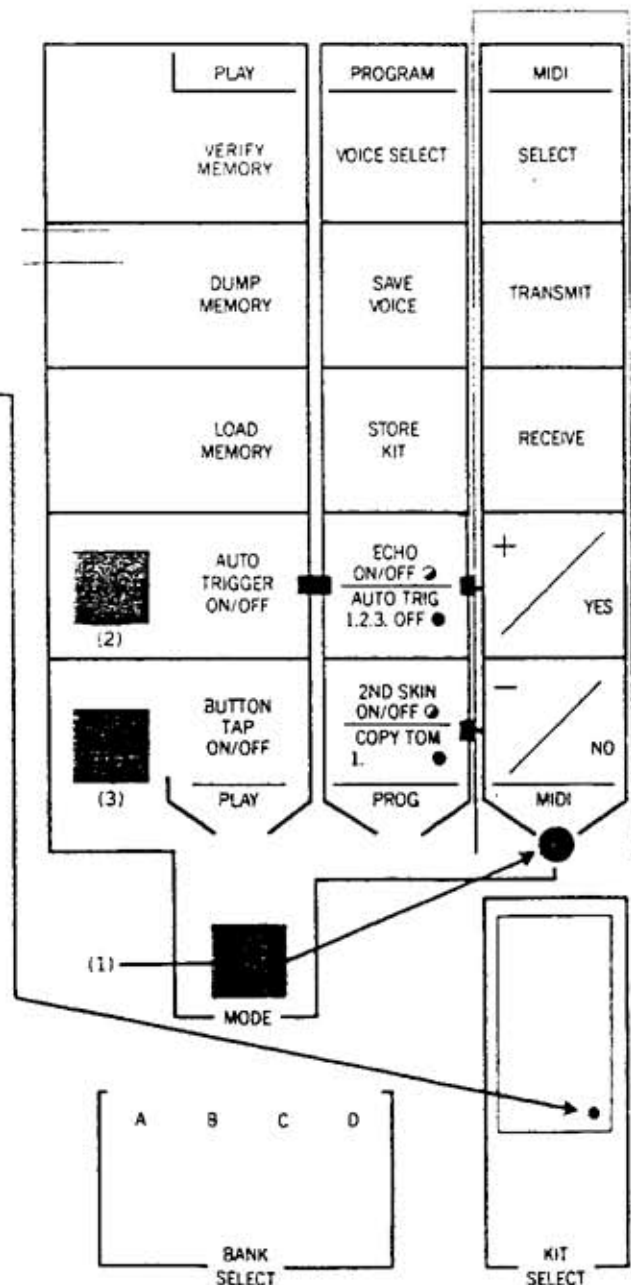
INITIALISING THE SDS 9 MIDI INTERFACE
– HOW TO DO IT

This is only necessary when you want to set the midi interface to a known state. It is recommended that you do this the first time you try and use midi. Initialising midi sets all midi data that can be programmed to specific values. (See below – 'what happens when you initialise the SDS 9 midi data – the initial state' for more information).

Put the SDS 9 into program midi mode and enable midi (1) (5) (the dot should be on in the display). Press the 'select' button (the top one) (2). There should now be an 'S' on the display. Press 'transmit' (3), the dot should appear. Press 'receive' (4), the dot should start flashing. Now press 'yes' (5) – this will initialise all the midi interface data. You must press the buttons in precisely this order or you will not initialise midi. After initialising the midi data you will have the display back to just the dot on – midi is enabled. You should now connect the SDS 9 to another midi instrument.

To get out of midi program mode, use the mode button (1).

If you have connected up and your keyboard can receive midi, the SDS 9 will now play the keyboard.

The notes that the SDS 9 are playing have been programmed by us. As you switch through kit numbers these notes will change. Chords and note progressions have been included – these are listed below, although to use midi musically we know you will want to change all these notes to suit your music. All 40 kits worth of notes can be programmed, so 240 different notes are at your drum tips (40 x 6).

PLAY	PROGRAM	MIDI
(2) VERIFY MEMORY	VOICE SELECT	SELECT
(3) DUMP MEMORY	SAVE VOICE	TRANSMIT
(4) LOAD MEMORY	STORE XIT	RECEIVE
(5) AUTO TRIGGER ON/OFF	ECHO ON/OFF / AUTO TRIG 1.2.3. OFF ●	+ / YES
BUTTON TAP ON/OFF	2ND SKIN ON/OFF / COPY TOM 1. ●	− / NO
PLAY	PROG	MIDI

(1) MODE

A	B	C	D

BANK SELECT

KIT SELECT
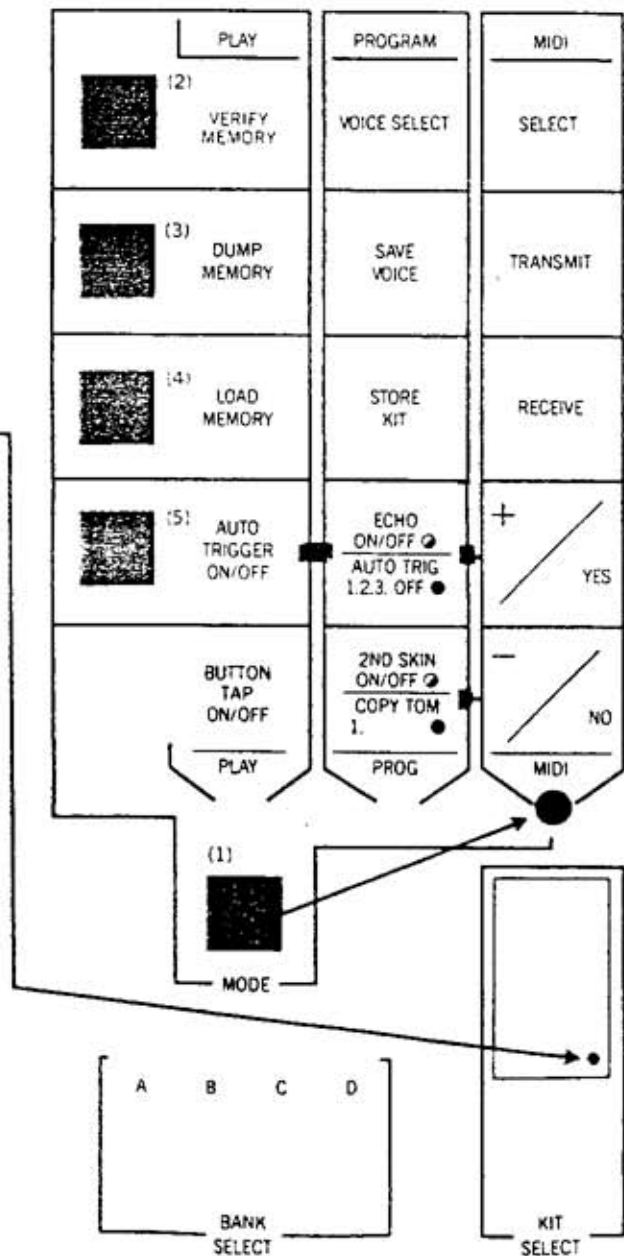
SDS 9 FACTORY PROGRAMMED MIDI NOTES (THESE CAN BE RE-PROGRAMMED) – USED WHEN TX MODE 6 IS ON

Factory Kit	Bass	Snare	Rim	Hi Tom	Med Tom	Lo Tom	Chord
A1	40 (E)	45 (A)	50 (D)	65 (F)	60 (C)	55 (G)	
A2	43 (G)	48 (C)	53 (F)	68 (G♯)	63 (D♯)	58 (A♯)	
A3	46 (A♯)	51 (D♯)	56 (G♯)	71 (B)	66 (F♯)	61 (C♯)	
A4	49 (C♯)	54 (F♯)	59 (B)	74 (D)	69 (A)	64 (E)	
A5	52 (E)	57 (A)	62 (D)	77 (F)	72 (C)	67 (G)	
B1	43 (G)	50 (D)	55 (G)	59 (B)	62 (D)	65 ((F))	G ((7))
B2	48 (C)	55 (G)	60 (C)	64 (E)	67 (G)	70 ((A♯))	C ((7))
B3	50 (D)	57 (A)	62 (D)	66 (F♯)	69 (A)	72 ((C))	D ((7))
B4	57 (A)	64 (E)	69 (A)	73 (C♯)	76 (E)	79 ((G))	A ((7))
B5	53 (F)	60 (C)	65 (F)	69 (A)	72 (C)	75 ((D♯))	F ((7))
C1	40 (E)	47 (B)	52 (E)	56 (G♯)	59 (B)	62 ((D))	E ((7))
C2	47 (B)	54 (F♯)	59 (B)	63 (D♯)	66 (F♯)	69 ((A))	B ((7))
C3	45 (A)	52 (E)	57 (A)	61 (C♯)	64 (E)	67 ((G))	A ((7))
C4	44 (G♯)	51 (D♯)	56 (G♯)	60 (C)	63 (D♯)	66 ((F♯))	G♯ ((7))
C5	49 (C♯)	56 (G♯)	61 (C♯)	65 (F)	68 (G♯)	71 ((B))	C♯ ((7))
D1	51 (D♯)	58 (A♯)	63 (D♯)	67 (G)	70 (A♯)	73 ((C♯))	D♯ ((7))
D2	54 (F♯)	61 (C♯)	66 (F♯)	69 (A)	72 (C)	76 ((D♯))	F♯ ((7))
D3	46 (A♯)	53 (F)	58 (A♯)	62 (D)	65 (F)	68 ((G♯))	A♯ ((7))
D4	37 (C♯)	39 (D♯)	42 (F♯)	44 (G♯)	46 (A♯)	49 (C♯)	Pentatonic
D5	42 (F♯)	44 (G♯)	46 (A♯)	49 (C♯)	51 (D♯)	54 (F♯)	Pentatonic + 5

User notes are pre-set + 2 midi notes higher (1 tone) – of course these notes can be re-programmed.

ALL KIT MODE MIDI NOTES USED WHEN TX MODE 6 IS OFF:-

Bass	Snare	Rim	Hi Tom	Med Tom	Lo Tom
43 (G)	50 (D)	55 (G)	59 (B)	62 (D)	65 (F)

MIDI NOTES

19 1B	1E 20 22	25 27	2A 2C 2E	31 33	36 38 3A	3D 3F	42 44 46	49 4B	4E 50 52	55 57	5A 5C	
C♯ D♯	F♯ G♯ A♯	C♯ D♯	F♯ G♯ A♯	C♯ D♯	F♯ G♯ A♯	C♯ D♯	F♯ G♯ A♯	C♯ D♯	F♯ G♯ A♯	C♯ D♯	F♯ G♯ A♯	
25 27	30 32 34	37 39	42 44 46	49 51	54 56 58	61 63	66 68 70	73 75	78 80 82	85 87	90 92	

Middle C

18	1A	1C	1D	1F	21	23	24	26	28	29	2B	2D	2F	30	32	34	35	37	39	3B	3C	3E	40	41	43	45	47	48	4A	4C	4D	4F	51	53	54	56	58	59	5B	5D
C	D	E	F	G	A	B	C	D	E	F	G	A	B	C	D	E	F	G	A	B	C	D	E	F	G	A	B	C	D	E	F	G	A	B	C	D	E	F	G	A
24	26	28	29	31	33	35	36	38	40	41	43	45	47	48	50	52	53	55	57	59	60	62	64	65	67	69	71	72	74	76	77	79	81	83	84	86	88	89	91	93

GOOD VOICES TO USE ON THE DX7

We used a Yamaha DX7 to test our MIDI, and choose MIDI Notes. The best Yamaha pre-set sounds are listed below.

Key

48	hexadecimal MIDI value for note
C	chromatic note label
72	decimal MIDI value for note

Master Group (A)

Clav 1	(20)
Vibe 1	(21)
Marimba	(22)
Koto	(23)
Orch Chime	(25)
Tub Bells	(26)
Steel Drums	(27)
Timpani	(28)

Keyboard + Plucked Group (B)

Piano	(1-4)
Celeste	(7)
Toy Piano	(8)
Harpsichord 2	(9)
Harpsichord 3	(10)
Clav 2	(11)
Clav 3	(12)
Caliope	(20)
Sitar	(22)
Guitar 5	(25)
Guitar 6	(26)
Harp 1	(29)
Harp 2	(30)

Cartridge 2 – Orchestra + Percussive Group (A)

Brass 4	Good for brass stabs (12)
Brass 5	(13)
Glokenspl	(22)
Vibe 2	(23)
Xylophone	(24)
Chimes	(25)
Gong 1	(26)
Gong 2	(27)
Bells	(28)
Cowbell	(29)
Block	(30)
Log drum	(32)

B

Harp flute	(17)
Shimmer	(23)
Octave war	(29)

All other voices will need re-programming to extend release times.

SIMPLE USE OF THE SDS 9 MIDI INTERFACE

The following sections assume that you have just initialised the SDS 9 midi interface.

THE SDS 9 PADS PLAYING A KEYBOARD

Connect the MIDI OUT of the SDS 9 to the MIDI IN of the synth. Set the synth up so that it receives midi note information on midi channel 1, and put it in poly mode and make sure that it will recognise midi data coming in. (Refer to the synth's operating manual).

Select a preset on the synth that has a fast attack and a long release, so that if you tap the keyboard fast (and release the key quickly) you get a good sound. It is necessary for a short tap on the keyboard to work and trigger a good sound, as this is what the midi information coming from the SDS 9 will do.

Make sure that the SDS 9 has midi enabled. Turn the volume of the SDS 9 down so that you will be able to hear the sounds coming out of the synth. You can now play the pads and the synthesisers voices should be heard. You can turn the SDS 9 volume back up and get a mix of both the SDS 9 drum sounds and the synths sound. If your keyboard is 'velocity sensitive' then when you hit the pads harder the synth sounds should get louder and maybe change.

If you can't get any sounds from the synth when you play the pads see the section 'having problems' below.

You can put the SDS 9 auto trigger on – to trigger the synth's voices (and the drums) – allowing you to program or change the current synth patch to find interesting sounds. You can also put the SDS 9 into 'button tap' mode and trigger the synth from the SDS 9 buttons.

The notes that are played on the synth when you strike the pads can be programmed by you to any notes on the keyboard. (See tx mode 0, note assignment and tx mode 6, note assignment).

Note that if the SDS 9 kit that you are currently playing has slapback or repeat echo, then the synth will also be played with this effect – you can get some amazing rhythms and effects by doing this – try it.

Also, when you change to a new SDS 9 kit the notes that the pads play will change – try it.

A KEYBOARD PLAYING THE SDS 9 DRUM VOICES

Connect the MIDI IN of the SDS 9 to the MIDI OUT of the synth. Set up the synth so that it will transmit midi note information when you play its' keys. (Refer to the synth's operating manual).

Make sure that the SDS 9 has midi enabled. Turn the volume of the synth down so that you will be able to hear the sounds coming out of the SDS 9. You can now play the keys of the synth and the drums will trigger. Note that there will be six notes on the keyboard that will trigger the six drum voices – you will easily find them, THESE NOTES WILL CHANGE WHEN YOU CHANGE SDS 9 KIT NUMBERS. If you have a 'velocity sensitive' keyboard, playing the keyboard harder will play the drums 'harder'. If you do not have a velocity sensitive keyboard the SDS 9 drum sounds will come out at a low dynamic – you can program the SDS 9 to ignore velocity information (rx mode 5), and to always trigger the drums at full dynamics from midi.

You can turn the synth's volume back up and get a mix of both the SDS 9 drum sounds and the synth's sound.

If you can't get any sounds from the SDS 9 when you play the synth's keys see the section 'having problems' below.

If you want to keep the same six notes on the keyboard when you change SDS 9 kits, you need to turn tx mode 6 off.

THE PADS PLAYING EXTERNAL DRUM VOICES ON A DRUM MACHINE

Read the section above and connect up etc as for a keyboard synth being triggered from the pads. For drum machines, each voice is assigned to one midi note. You have to program either the SDS 9 (tx mode 6, note assignment for the current kit), or the drum machine such that the notes for each voice correspond. Note that when you change kits, the notes change (tx mode 6), if you don't want this turn tx mode 6 off.

A DRUM MACHINE TRIGGERING THE SDS 9 VOICES

Read the section above and connect up etc as for a keyboard playing the drum voices. As drum boxes assign one midi note to each voice you will have to either program the SDS 9 (tx mode 6 voice note assignment for the current kit, or turn it off and use tx mode 0 – i.e. the received notes are the same as those programmed for transmit) or the drum machine such that the notes for each voice correspond.

CONNECTING TO A MIDI RECORDER

Connect the MIDI OUT of the SDS 9 to the MIDI IN of the midi recorder. Connect the MIDI IN of the SDS 9 to the MIDI OUT of the midi recorder.

Select the best quantization (smallest – closest to 'real time') on the midi recorder and put it into record mode. Start playing the SDS 9 pads – the midi recorder will now be recording your playing of the SDS 9. Stop the midi recorder and put it into playback mode – the SDS 9 should now play back what you recorded.

Note that if you change kits you must turn both tx mode 2 and rx mode 2 on (or turn tx mode 6 off).

Note that when you hit one of the pads, the SDS 9 sends down midi the fact that you have hit a pad (midi note on). To be compatible with keyboard instruments, the SDS 9 also sends midi note off information – this is not required for the SDS 9. To save memory space – i.e. note space in the midi recorder, you can stop the SDS 9 sending note off information (tx mode 1). Remember to turn this back on again before you use a keyboard synth, or you will find its' voices staying on and locking up.

AN INTRODUCTION TO PROGRAMMING THE SDS 9 FOR MIDI

NAMES USED – TERMINOLOGY FOR MIDI

When using midi equipped equipment you will find there are lots of buzz words and jargon used to describe things. This section is to explain some of this midi terminology, and also to explain how it relates to the SDS 9.

Note information: when a voice is triggered, information is sent down midi saying that a voice has come on (Note on) and when a voice has been released (Note off). This note information is sent down a Channel, it specifies which note it is and how hard it has been triggered.

Channel: there are 16 midi channels that can be used for transmitting midi information. The data all goes down the one midi cable, but can be directed to, and responded to, by assigning (selecting) channel numbers.

Basic channel: one channel is always assigned by each instrument to be its' basic channel. This channel is used for the information that affects all of its' voices. For the SDS 9 this is always the bass drum's channel.

Omni, Poly, Mono: these are used to describe how an instrument's voices respond to midi information. They basically describe whether the instrument ignores channel information, whether it responds to just one channel, or whether each voice is assigned a different channel. These are not used to describe any SDS 9 modes.

Note on: describes an event that represents a voice starting to sound. Part of note on information is how 'hard' the voice is to be sounded, and part is which note (the note number) it should play.

Note off: describes an event that represents that a voice should now stop being sounded. Part of the note off info is how 'hard' the voice should stop being sounded, and part is which note (the note number) should now be released. (For example when a key is released from a keyboard, and how quickly it is released). Note off info is of limited use to percussion synthesizers, and is normally ignored.

Note numbers: each key of a keyboard has been allocated a note number by the International Midi Association. Middle C has been defined as 60 (decimal), the C an octave below being 48 (decimal), etc. For percussion synthesizers (e.g. the SDS 9) it is usual to assign one midi note number for each drum (or voice).

Program change: when equipment changes patch (or a kit for the SDS 9), program change information can be transitted via midi, thus allowing several synths connected together to change patch simultaneously. This is transmitted and received down the basic channel (for the SDS 9 the bass drum channel).

Controller change: when two synthesizers are connected together it is often required for the performance controls on one to control similar controls on the other. This control information is sent via midi as controller changes. These controller changes are transmitted and received down the instrument's basic channel. The SDS 9 will transmit and receive several controller changes (see the 'controller allocation table' below).

System exclusive: this is used to transmit and receive special information between instruments from the same manufacturer. Examples of system exclusive data is data dumps etc.

Each midi equipment manufacturer can have a special number allocated – their MIDI ID, which allows their equipment to recognise its own data, and to ignore other data. SIMMONS MIDI ID is 18 (decimal).

System real time: there are several real time messages that allow synchronising of drum machines, sequencers etc. The SDS 9 does not use any real time messages.

THE VARIOUS SDS 9 MIDI MODES – A SUMMARY OF WHAT THEY DO

There are 2 sets of midi modes: those used for selecting different types of transmitted data (tx modes), and those used for selecting different types of received and recognised data (rx modes). Each mode can be switched either on or off. Some of the modes allow you to program the data that will be sent or received and recognised.

tx mode 0 — triggering external voices (transmitting 'note on' information)
— programming the channel assigned to each drum
— programming the note assigned to each drum

rx mode 0 — SDS 9 voices triggered from external instruments (receiving "note" information)
— ignoring channel information

tx mode 1 — turning off external voices (transmitting 'note off' information)

rx mode 1 — external instruments triggering the SDS 9 voices with echo, SDS 9 sending midi echo

tx mode 2 — the SDS 9 telling other instruments it has changed kit
— assigning a 'preset number' translation from the SDS 9 kit numbers to external synth patches

rx mode 2 — external instruments changing the current SDS 9 kit

tx mode 3 — telling other instruments that parameter variable controls have changed

rx mode 3 — other instruments changing SDS 9 program parameters

tx mode 4 — selective dumping to midi of kit data (the SDS 9 dumping kit program data when you change kits)

rx mode 4 — allowing selective midi loading of kit data

tx mode 5 — driving a keyboard that is not 'velocity sensitive'

rx mode 5 — triggering the SDS 9 voices from a keyboard that is not 'velocity sensitive'

'x mode 6 — playing several different notes on each pad
— assigning a different note for each pad for each kit

rx mode 6 — not used at present

CHANGING BETWEEN PROGRAMMING THE DIFFERENT MIDI MODES

When you enter program midi mode you will have seen that the dot is used to say that midi is enabled. Also, you will know that to enable midi you use the 'yes' button, and to disable midi you use the 'no' button. This enabling/disabling of midi can be thought of as turning a midi master enable on/off.

All the midi modes can be turned on/off with the 'yes' and 'no' buttons. A mode is on if the dot is on, and off if the dot is off.

Examining the different midi modes

Now let's have a look at the state of the midi modes. Get into program midi mode and turn the master midi enable on.

First, the transmit (tx) modes. Press 'transmit', the display will now show '0'. This means we are looking at the state of tx mode 0 (transmitting midi note on info). If the dot is on, then tx mode 0 is on. Turn it off (use 'no' button), now if you hit one of the pads with an external synth/drum voice connected you will not hear it sound. Turn this mode back on again ('yes' button – dot comes back on), and now the external voice should sound when you hit the pad.

If you now press 'transmit', the display will show '1' or '1.' showing you the state of tx mode 1. If you keep pressing the 'transmit' button you will see the states of all the tx modes (0-6). After seeing the state of tx mode 6, pressing 'transmit' will cycle you back to seeing tx mode 0.

Examining the state of the receive (rx) modes is done in a similar way as for the tx modes, but use the 'receive' button.

At any time while you are examining a tx mode you can press 'receive' and swap to examining the corresponding rx mode, and vice versa by pressing 'transmit'.

THE VARIOUS DISPLAYS

While programming midi, the many leds on the SDS 9 electronics take on different meanings than those that should by now be familiar to you. The midi mode led should always be on. The following sections describe what information the leds are displaying during program midi mode, and when these displays are used.

Display of voice channel numbers (channel assignment)

A channel number can be assigned to each voice. This assignment is done while programming tx mode 0.

A voice prog led indicates which voice's channel number is being displayed. The kit display indicates the current channel number:

1-9 on kit display represents channels 1-9
0.-6. on kit display represents channels 10-16
(the dot means add 10 to the number displayed).

Note that while displaying voice channel numbers, the bank leds are all off.

Display of voice note numbers (note assignment)

A note number can be assigned to each drum voice, this note number is used for transmitting to external instruments. This note number is also used when receiving midi to decide which drum voice to trigger when note information is recognised.

The assignment of notes to the drum voices is done in tx mode 0 (and also in tx mode 6 – but a separate note can be assigned to each voice, for each kit!).

A voice prog led indicates which voice's note number is being displayed. The kit display and bank leds show the current note number:

bank	kit	note number
●000	0-9	20-29
●000	0.-9.	30-39
0●00	0-9	40-49
0●00	0.-9.	50-59
00●0	0-9	60-69
00●0	0.-9.	70-79
000●	0-9	80-89
000●	0.-9.	90-99

where ●000 means bank A led on,
and   00●0 means bank C led on.

You also need to add 10 if the dot is on.
An easy way to remember this display is to think of bank A worth 20, B = 40, C = 60, D = 80, the dot means add 10.

For example middle C is note number 60, and is displayed as: 00●0 0, i.e. bank C led on, kit display of '0'.

Display of external kit translation numbers (external kit/patch numbers)

A number, the external kit/patch number can be assigned to each drum kit. This number is used for transmitting to external instruments to say that we require a patch change, and also to change the SDS9's kit number when instructed to do so by another midi instrument. The ability to assign external numbers to the SDS 9's kits allows you to select external synth patches in any order, with complete flexibility. When the SDS 9 changes to kit A1, the synth does not have to change to its' first kit, but by using the external kit/patch number, you can choose any of its' patches.

The assignment of external kit/patch numbers is done in tx mode 2. This assignment is also used when a synth tells the SDS 9 to change kit.

The bank leds and kit display show the external kit/patch number, in the same way as for displaying the voice note numbers, except that a voice led will not be on, and the patch numbers start from 1:

bank	kit	external kit/patch number
0000	1-9	1-9
0000	0.-9.	10-19
●000	0-9	20-29

(The rest of the numbers are displayed as for the voice note numbers).

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PROGRAMMING THE SDS 9 MIDI MODES
– DETAIL OF WHAT TO DO

To program the SDS 9 midi interface, you should really have it connected up to an external synth, or drum machine etc, so that you can see what effect each mode and assignment change makes.

To program any of the SDS 9 midi modes, you must get into that mode and then enable it. To recap, to get into tx mode 0, you press 'mode' to get into program midi, you press 'yes' to turn the midi master enable on, you press 'transmit' to see whether tx mode 0 is on or off, you then press 'yes' to turn tx mode 0 on. At this point you should have the mode led 'midi' on, the kit display should be '0.' – you are looking at tx mode 0, and it is on. You change modes by using the 'transmit' and 'receive' buttons.

.emember that to get out of program midi mode you use the mode button.

Note that when you change any assignments or turn/off any of the midi modes (tx and rx, 0-6) they take effect immediately, and are stored. This allows you to change any assignments, and to leave prog midi mode using the mode button, at any time.

TX MODE 0 – triggering external voices (transmitting note on info)
If this mode is off, no note data is sent via midi. If this mode is on, triggering an SDS 9 voice from the pads, the sequencer inputs, the auto trigger, or button taps will send note on information via midi.

– programming the channel and note assigned to each drum voice
This mode (tx mode 0) must be on to change the note and channel assignments. When it is on, press 'select'. The voice program led for the bass drum will come on.

The kit display now displays the current channel assignment for the bass drum. You can alter this number by pressing the '+/yes' and '–/no' buttons to increase or decrease respectively the current value by one. Re-read the section above 'display of voice channel numbers' to make sure you understand the display. Note that you can only have channels in the range 1-16. For most common usage a channel number of 1 will be used.

Note that tx mode 6, (if on) overrides the note numbers assigned in tx mode 0.

Press the 'select' button again. The voice program led for the bass drum stays on – indicating that we are still programming the assignments for the bass drum, but this time we are displaying the current note number assigned to the bass drum. This note assignment selects where the bass drum plays on an external synth. You can alter the note number by using the '+' and '–' buttons. Re-read the section above 'display of voice note numbers' to make sure you understand the display. Note that you can have a note number of 20-99.

If you now press the 'select' button again, you will see the voice program led move on to the snare drum, and the kit display change to the channel assigned to it. Pressing select again will show the snare's note number.

You continue examining current channel and note assignments for the different voices in this way, i.e. channel, note number, next voice channel, note number etc. From the lo-tom you move to the bass drum again.

Note that a voice program led will always be on. You can easily tell the difference between the SDS 9 displaying a channel assignment – no bank led on, and a note number assignment – one bank led will be on.

Note that for note assignments in tx mode 0 to be used, tx mode 6 must be turned off.

You can exit programming this mode in one of 3 ways:
Press the mode button to return to the SDS 9 play mode.
Press the transmit button to move on to programming tx mode 1.
Press the receive button to move on to programming rx mode 0.

RX MODE 0 – SDS 9 voices triggered from external instruments (receiving note on messages)
If this mode is off, the SDS 9 will not respond to any note information that it receives down midi. If this mode is on then the SDS 9 will respond to note information received.

When 'note on' information is received by the SDS 9 it checks if any of the SDS 9's voices are assigned to the 'channel and note' that the received 'note on' information relates to. If a match is found then that voice will be triggered.

The SDS 9 completely ignores any 'note off' data.

The 'channel' assignments used are those programmed for tx mode 0.

If tx mode 6 is on, then its' note assignments for the current kit are used. If tx mode 6 is off, then tx mode 0's note assignments are used.

– ignoring channel info

To change this setting, rx mode 0 must be on. While you are examining the state of rx mode 0, press 'select', you will now see either 'A' or 't' on the kit display.

A display of 'A' means that the SDS 9 is currently set to ignore all channel information for received messages, and will respond to any notes that match the current assigned voice note numbers i.e. responds to All channels.

A display of 't' means that the channel numbers assigned for tx mode 0 are used; any note on information being received is first checked to see if it matches a voice channel assignment, and only when it matches does a check take place to see if the note numbers match, and thus whether to trigger an SDS 9 voice.

You swap between ignoring ('A') and checking (using tx mode 0's channel assignments) by using the 'yes' and 'no' buttons respectively.

To move on press either: mode to get out of program midi, transmit to go to tx mode 0, or receive to go to rx mode 1.

TX MODE 1 – turning off external voices (transmitting note off info)

If this mode is on then midi note off messages are transmitted after every note on message. If this mode is off, then no note off messages are sent.

When using keyboard synths this mode must be on. A note off message is like releasing your finger from the keyboard – you must do this before you can play more notes (depending on the keyboards polyphony).

When using midi drum boxes it is usually not necessary to send note off messages, so you could turn this mode off.

The use of this mode really becomes apparent when you want to record your playing of the SDS 9 on a midi recorder. As mentioned previously, the SDS 9 completely ignores midi note off messages. If you are just going to use the recorded midi data to re-play the SDS 9, then switch off this mode, i.e. don't send note off messages – this will save storing them in the recorder, and give you much more room in the recorders memory to store your playing – you will be able to record far longer passages (in terms of stored events).

To move on press either: mode to get out of program midi, transmit to go to tx mode 2, or receive to go to rx mode 1.

RX MODE 1 – external instruments triggering the SDS 9 voices with echo, and the SDS 9 sending midi echo

This mode switch allows you to choose whether received midi note information causes the SDS 9 voices to be triggered with echo or not, and whether the SDS 9 sends midi echo.

If this mode is on, and a received midi note triggers a voice that is programmed with echo on, the voice will be triggered with echo, and no echo notes are sent when a drum voice echoes.

If this mode is off, received midi data will never trigger the echo that is programmed with a voice, and midi echo is sent.

To move on press either: mode to get out of program midi, transmit to go to tx mode 1, or receive to go to rx mode 2.

TX MODE 2 – the SDS 9 telling other instruments it has changed kit (transmitting program changes)

It is often useful to be able to not only play the voices of other instruments, but to also instruct them to change their sound or patch. This is a midi program change message.

If this mode (tx mode 2) is on, then when you change the current kit on the SDS 9, a midi program change message is sent.

If this mode is off, then nothing is transmitted when you change SDS 9 kits.

Program change messages are sent down the midi channel currently assigned to the bass drum (see tx mode 0) – the SDS 9's basic channel. The SDS 9's tx mode 0, i.e. note on transmitting does not need to be enabled for program change messages to be sent.

For each SDS 9 kit (both the 20 user and 20 factory ones) a different external patch number can be programmed. This allows, for example, for the SDS 9 to change to factory kit A 2, and to instruct the external instrument to change any one of its' patches. This allows you to then select which sounds on both instruments you want 'tied together' without having to move the sounds to different patches.

– assigning a 'preset number' translation from the SDS 9 kit numbers to external synth patches

This mode (tx mode 2) must be on for you to change any of the SDS 9's kit to external synth patch numbers. When it is on, press 'select', a bank and kit number will be displayed.

Select which kit you want to assign an external patch number to using the bank and kit buttons. You can of course swap between factory and user kits.

Having selected a kit, press the select button again. The SDS 9 is now displaying the external patch number assigned to this kit. You can alter this number by using the ' + ', and ' − ' buttons. Re-read the section above – 'display of external kit translation numbers' to make sure you understand the display.

Press the select button again to be able to assign external patch numbers to other kits. So, pressing the select button swaps you between changing kits, and changing the external patch number associated with the current kit.

After you have programmed an external patch number, and returned to kit selection, if you change the SDS 9 kit back to this one, the external synth should change to the patch that you programmed it to. You can of course be playing the pads, and the synth while trying to find kits and patches that sound good together.

It is easy to distinguish whether you are displaying the bank/kit number or the external patch number by pressing the 'yes' button. If anything changes on the display, then the SDS 9 is currently displaying the external number, and you have just incremented it. If nothing happens then it is a bank/kit display of the current SDS 9 kit (and the bank and kit buttons will affect it).

To move on press either: mode to get out of program midi, transmit to go to tx mode 3, or receive to go to rx mode 2.

RX MODE 2 – external instruments changing the current SDS 9 kit (receiving program changes).
If this mode is off, the SDS 9 will not respond to any program change data that it receives from midi. If this mode is on, then the SDS 9 will respond to program change data that it receives from midi.

When program changes are received by the SDS 9 and this mode (rx mode 2) is on, then a check is made to see if the SDS 9's basic channel (the midi channel assigned to the bass drum – see tx mode 0) matches the channel that this program change message has been sent down. Only messages whose channels match will be responded to.

If the SDS 9 is ignoring channel information (see rx mode 0) it will respond to any program changes that are received (regardless of channels).

To respond to a program change message the SDS 9 will search through all of the user kits and then the factory kits looking for an external patch number that matches the one received. If it finds a match, the SDS 9 will then select this one as the current kit, i.e. change to this kit. The external patch numbers are those programmed in tx mode 2.

To move on press either: mode to get out of program midi, transmit to go to tx mode 2, or receive to go to rx mode 3.

TX MODE 3 – telling other instruments that parameter variable controls have changed (transmitting controller changes)
Several of the midi program parameters have been assigned midi controller numbers (see 'the controller allocation table'). When enabled this mode allows you to change some parameters on external synths from within the SDS 9 programming voice mode.

If this mode is on, when you change any of the assigned controllers, then controller change messages are sent. If this mode is off, then none of these messages get sent.

Note that controller messages are sent down the SDS 9's bass drum channel (its' basic channel).

To move on press either: mode to get out of program midi, transmit to go to tx mode 4, or receive to go to rx mode 3.

RX MODE 3 – other instruments changing SDS 9 program parameters (receiving controller changes)
This allows external instruments to take control of several SDS 9 program parameters (see 'the controller allocation table'). For example, the synth's modulation wheel will change the snare's pitch, and the synth's pitch wheel will change the pitch of all the toms.

If this mode is on, controller changes that have been allocated, that are received down the SDS 9's bass drum channel, will affect SDS 9 parameters.

If this mode is off, the received controller change messages will be ignored.

To move on press either: mode to get out of program midi, transmit to go to tx mode 3, or receive to go to rx mode 4.

TX MODE 4 – selective dumping to midi of kit data
(the SDS 9 dumping kit program data when you change kits)
If this mode is on, whenever the SDS 9 changes to a new kit, all the data for this new kit will be transmitted down midi. If it is off, then no data is dumped when the SDS 9 changes kit.

This mode is not normally used but has been implemented for future use by SIMMONS.

To move on press either: mode to get out of program midi, transmit to go to tx mode 5, or receive to go to rx mode 4.

RX MODE 4 – allowing selective midi loading of kit data
If this mode is on, whenever an SDS 9 kit data dump is received, the new data will be loaded into the SDS 9 kit memory – as if you have programmed the kit. The SDS 9 will then select this kit.
If it is off, then these dumps will not be loaded, and will be ignored.

This mode is not normally used but has been implemented for future use by SIMMONS.

To move on press either: mode to get out of program midi, transmit to go to tx mode 4, or receive to go to rx mode 5.

TX MODE 5 – driving a keyboard that is not 'velocity sensitive'
If this mode is on, then no dynamic (velocity) information is transmitted down midi.
If it is off, then the full range of the SDS 9's dynamics are transmitted.

To move on press either: mode to get out of program midi, transmit to go to tx mode 6, or receive to go to rx mode 5.

RX MODE 5 – triggering the SDS 9 voices from a keyboard that is not 'velocity sensitive'
If this mode is on then when you play the keys of a synth that does not have a velocity sensitive keyboard, playing the keys will trigger the SDS 9 voices at their maximum level.
If it is off, then you can play the SDS 9 voices from a keyboard dynamically. (If you try this from a non velocity sensitive keyboard, the SDS 9 voices will always be triggered at a very low dynamic).

To move on press either: mode to get out of program midi, transmit to go to tx mode 5, or receive to go to rx mode 6.

TX MODE 6 – playing several different notes on each pad
This mode allows you to assign a different midi note number, to each voice, in each of the 40 kits. This allows you to have 6 notes being played on a keyboard when you play the 6 pads, and when you change to a new kit, to have 6 completely different notes.
For note information to be transmitted down midi, tx mode 0 must be on (tx mode 0 allows you to assign only one note to each voice that is used for all 40 kits). **If this mode (tx mode 6) is on then it overrides the six notes programmed in tx mode 0, and will choose new notes for each kit.**
If this mode is off then the notes that are transmitted are those programmed in tx mode 0.

– assigning a different note for each pad for each kit
This mode (tx mode 6) must be on for you to assign/change note assignments. Press select – the current kit and bank are displayed, you can change between any of the 40 kits.

When you have selected the kit that you want to change the note assignments in, press select again. The bass drum prog voice led will come on, and the bank and kit displays will show you the current note assigned to the bass drum for this kit. The note display is the same as that of tx mode 0, and you should re-read the section 'display of voice note numbers'. You can change the current note assignment by using the ' + ' and ' – ' buttons. You can of course play the pads to hear the current note assignments.

To change the assignments for other voices, use the select button to move to them. Note that after the lo-tom, no voice program led is on, the bank and kit displays show you the current kit. You can now change this as before to examine/change other kits note assignments.

Note that when this mode (tx mode 6) is on, the SDS 9 will expect to receive different notes from a keyboard, for each SDS 9 kit.

To move on press either: mode to get out of program midi, transmit to go to tx mode 0, or receive to go to rx mode 6.

RX MODE 6 – not used at present
Whether this mode is on or off is completely ignored by the current SDS 9 software (version 1.0).

WHAT HAPPENS WHEN YOU INITIALISE THE SDS 9 MIDI DATA —THE INITIAL STATE

When initialised (see 'initialising the SDS 9 midi interface'), all the user programmable assignments and switches are set to the following values.

MODE SETTINGS – TRANSMIT

mode	affects	options	initial state
tx mode 0	note info	on/off	on
tx mode 1	note off info	on/off	on
tx mode 2	patch changes	on/off	off
tx mode 3	control changes	on/off	off
tx mode 4	kit data dumps	on/off	off
tx mode 5	no dynamics	on/off	off
tx mode 6	notes per kit	on/off	on

MODE SETTINGS – RECEIVE

mode	affects	options	initial state
rx mode 0	note info	on/off	on
rx mode 1	note cause echo	on/off	off
rx mode 2	patch changes	on/off	off
rx mode 3	control changes	on/off	off
rx mode 4	kit data dumps	on/off	off
rx mode 5	no dynamics	on/off	off
rx mode 6	not used	on/off	off

VOICE NOTE AND CHANNEL ASSIGNMENT

These are programmed in tx mode 0

voice	channel (can be 1-16)	note (can be 20-99)
bass	1	4 3
snare	1	5 0
rim	1	5 5
hi tom	1	5 9
med tom	1	6 2
lo tom	1	6 5

Channel information is ignored on receive (rx mode 0).

Note assignment in tx mode 0 is overridden by tx mode 6 being on. See 'SDS 9 factory programmed midi notes' on page 35 for the initialised state of tx mode 6's note per kit assignment.

EXTERNAL SYNTH PRESET NUMBER TRANSLATION

These are programmed in tx mode 2

SDS 9 kit	ext num (can be 1-99)
User A 1	1
A 2	2
A 3	3
A 4	4
A 5	5
B 1	6
. . .	
D 4	19
User D 5	20
Fact A 1	21
A 2	22
. . .	
Fact D 5	40

THE CONTROLLER ALLOCATION TABLE

The controller allocation is fixed at the factory and cannot be changed.

continuous controllers	midi controller number
bass thump pitch	0
snare prom pitch	1 (mod wheel)
bass click pitch	2
rim prom a/b pitch	3
hi tom tone pitch	4
med tom tone pitch	5
lo tom tone pitch	6
repeat echo decay	7
repeat echo speed	8

switch controllers	midi controller number
bass echo	64
snare echo	65
rim echo	66
hi tom echo	67
med tom echo	68
lo tom echo	69

HAVING PROBLEMS? – EXPLANATION OF OFTEN OCCURRING PROBLEMS WHEN USING MIDI

PROGRAMMING

The most common problem when programming the SDS 9 midi, is not understanding what the bank, kit and voice prog leds are trying to show you – there are two things to look out for: if you are assigning individual values to voices, then a voice program led will be on. If you are assigning values to complete kits, then either the ' + ', ' – ' buttons or the 'bank' and 'kit' buttons are active, depending on whether you are assigning a value or changing the kit.

Another common problem is not knowing what current mode you are in. Just press the mode button to get out of programming midi, and then re-enter the programming midi, and get to the mode you actually want to be in. (Remember that data is updated the moment you change it, so you can never lose anything that you have just changed).

EXTERNAL INSTRUMENT NOT SOUNDING

Check the following:
- are the midi in/outs leads connected correctly? (The SDS 9 MIDI OUT should be connected to the external instruments MIDI IN).
- are both instruments trying to send/receive down the same midi channel? – They should be!
- is tx mode 0 on? – It should be!
- is the synth enabled to receive midi? – It should be!
- if the instrument is a synth, does its current patch have a fast attack and a long release? – this is tested by striking the keys very sharply – release the key very quickly. If you get no sound doing this, try different patches.
- If the instrument is a drum box, are both instruments using corresponding note numbers? – They should match.
- If it initially sounded and then after several triggers no longer sounded, then make sure that tx mode 1 is on. If it was not on, it is as if you have held down the keys of a synth and have not released them – you can only play a certain number of voices on most synths at one time (polyphony).

EXTERNAL INSTRUMENT VOICES STAY ON

Make sure that tx mode 1 is on, i.e. so that you send note off information to turn the external instruments voices off after they have been triggered.

THE SDS 9 VOICES NOT BEING PLAYED HARD ENOUGH FROM YOUR KEYBOARD

Either hit the keys harder, if the keys are velocity sensitive or, turn rx mode 5 on, so that any received voice triggers will play the SDS 9 voices with maximum dynamic.

THE SDS 9 VOICES NOT BEING TRIGGERED WITH ECHO WHEN YOU PLAY A KEYBOARD

Turn rx mode 1 on.

EXTERNAL INSTRUMENTS NOT SOUNDING WITH ECHO

Turn rx mode 1 off.

USING MIDI RECORDERS

Check that tx mode 0 is on – to send notes.
Check that rx mode 0 is on – to receive notes.
Check the state of tx mode 6 (it should be off if you are not sending kit changes – but are changing SDS 9 kits).
Check that tx mode 2 and rx mode 2 are on if you want to record kit changes.

You should turn rx mode 1 on so that no echo is stored in the recorder, but when the notes are played back into the SDS 9 they cause echo.

DUMPING/LOADING KIT DATA, THE KIT SEQUENCE AND THE MIDI DATA VIA MIDI

To dump/load via midi, you must have midi enabled, if it is not enabled you will be using the cassette interface.

With midi enabled and in the SDS 9 play mode you can press:

dump   to dump all of the data
load   to await data from midi
verify   to await data and verify it is the same as is
             currently in the SDS 9.

The displays you will see are the same as those for cassette dumping/loading/verifying.

The SDS 9 will not recognise or respond to midi loads unless you have pressed the buttons, and told it to expect data.

Tx mode 4 and rx mode 4 allow selective dumping/loading of kit data.

AUTO DEMONSTRATE.
INITIALISING USER KITS.
POWER UP ERROR CODE 'F.'

AUTO DEMONSTRATE

This mode enables you to hear the SDS 9 in action. It is primarily a sales aid – you cannot alter the rhythm or the sounds.

Monitor the SDS 9 through headphones or via amplifier – you do not have to plug in the pads, although you can play along with the demonstration if you wish.

TO TURN ON THE AUTO DEMONSTRATE

You hold down the mode button when you turn the power on. You will see a 'd' on the 7 seg (for demonstrate), when you release the button the SDS 9 will play back an internally recorded sequence playing back from the factory patches. It demonstrates the range of dynamics and sounds of the SDS 9. It was recorded by a drummer playing the SDS 9 into a midi recorder, the data was then transferred into the SDS 9 internal program memory for playback. The data being played is also transmitted down midi out. (Note that the current setting of the programmable midi interface is used). The SDS 9 will stay looping in this autodemonstrate mode until it is switched off.

INITIALISE ALL VOICES – FOR YOUR INFORMATION

If for any reason you lose the internal user memory of the SDS 9, you can initialise it to a starting point, and re-program them from there on. This is achieved by the computer in the SDS 9 copying the factory kits into the user area with the kit variations listed on page 59.

WARNING – this will destroy your user sounds.

To initialise hold down 'load' while you turn the power on, you will see a 'L' on the 7 seg (for load). If you then press 'bank' you will see it blink. If you then press 'kit', all of the kits in user ram are initialised. The footswitch sequence is initialised to a sequence of the 20 user kits. A1..A2..A3.. ...through to . . . D3..D4..D5.

ERROR CODE 'F' ON DISPLAY

Power on display on seven segment of 'F' — when the power is applied to the SDS 9 it does several built in tests to make sure it is functioning correctly. If when you power the SDS 9 up you get a display of 'F' on the seven segment, then the internal tests have failed. This means that something is not working correctly —

YOU MUST GET THE UNIT REPAIRED

you can override these power up tests by holding the auto trigger/echo button down while you turn the power on, but something is definitely wrong and must be fixed (you may be lucky though and be able to make some use of the unit, but probably not a lot!!).

SAMPLING YOUR OWN SNARE SOUNDS EPROMS AND THE SIMMONS EPB

As previously mentioned in this manual, the SDS 9 utilises digital recordings of conventional acoustic drums to form part of its sound generation. These digital sounds are recorded in a chip of computer memory called an EPROM. The SDS 9 snare has three digital sound sources.

SNARE + RIM PROMS UNDER COVER
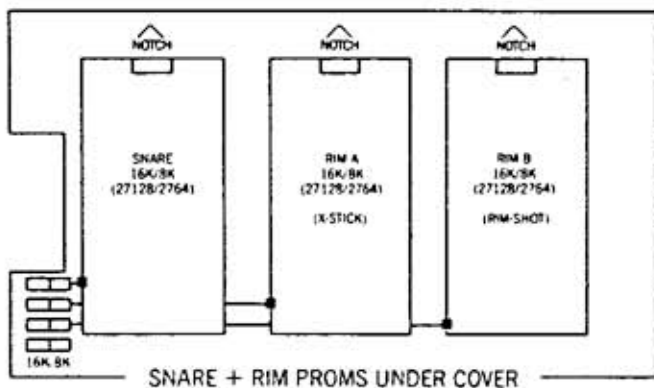
The action of digitally recording a sound and storing it in an EPROM is called sampling and blowing. There is an accessory available to your SDS 9 which enables sounds to be sampled, and if desired, blown into EPROMS to replace the factory fitted digitally sound sources. This unit is called the SDS EPB and is available from your Simmons dealer.

The SDS EPB is a digital sampler/EPROM blower capable of recording sounds digitally and storing them in an EPROM for use in the SDS 9.

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 SDS 9 owner, further increasing the scope of what is already an extremely versatile drum system.

With the EPB, you will be able to sample drums along with more unusual and creative percussive sounds such as breaking glass, slamming doors etc. Once installed in your SDS 9, these sounds can be programmed and stored as described earlier in the manual.

There follows a description of sampling and EPROM blowing with the SDS EPB and also information regarding the replacement of the EPROMS in your SDS 9.

WHAT IS AN EPROM?

EPROM 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 32,000 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) EPROM is marked (27)  16 ( 16 =   2 x 8)
 4K                           (27)  32 ( 32 =   4 x 8)
 8K                           (27)  64 ( 64 =   8 x 8)
16K                           (27) 128 (128 =  16 x 8)
32K                           (27) 256 (256 =  32 x 8)
```

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 be 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.

EPROMS 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.

SUMMARY

1. An EPROM can be programmed or 'blown' with numbers.
2. These numbers can represent an audio waveform.
3. The larger the EPROM, the more numbers it can store, and therefore it can contain a longer sound.
4. The larger the EPROM 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 EPROM can be reprogrammed.

SAMPLING — A brief discussion

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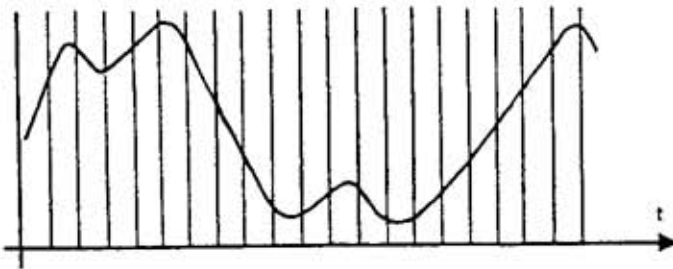
The amplitude of the signal can be represented by a number and if the wave form is measured at regular intervals these numbers would represent the change in amplitude of the signal over time.

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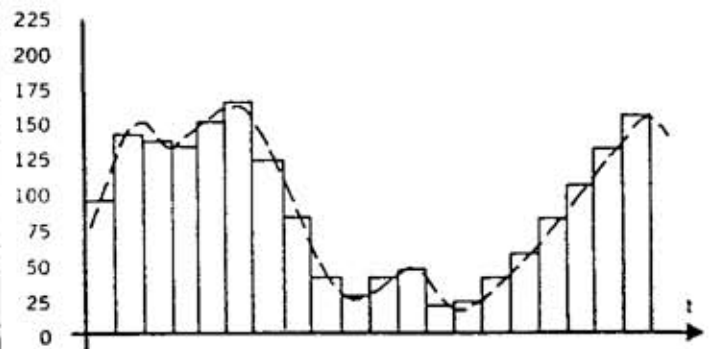
With the addition of filtering, a fairly accurate representation of the original wave form is produced. (Dotted line).

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, e.g. 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.

i.e. The sound is sampled 16,000 times a second.

If a 16K EPROM 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).

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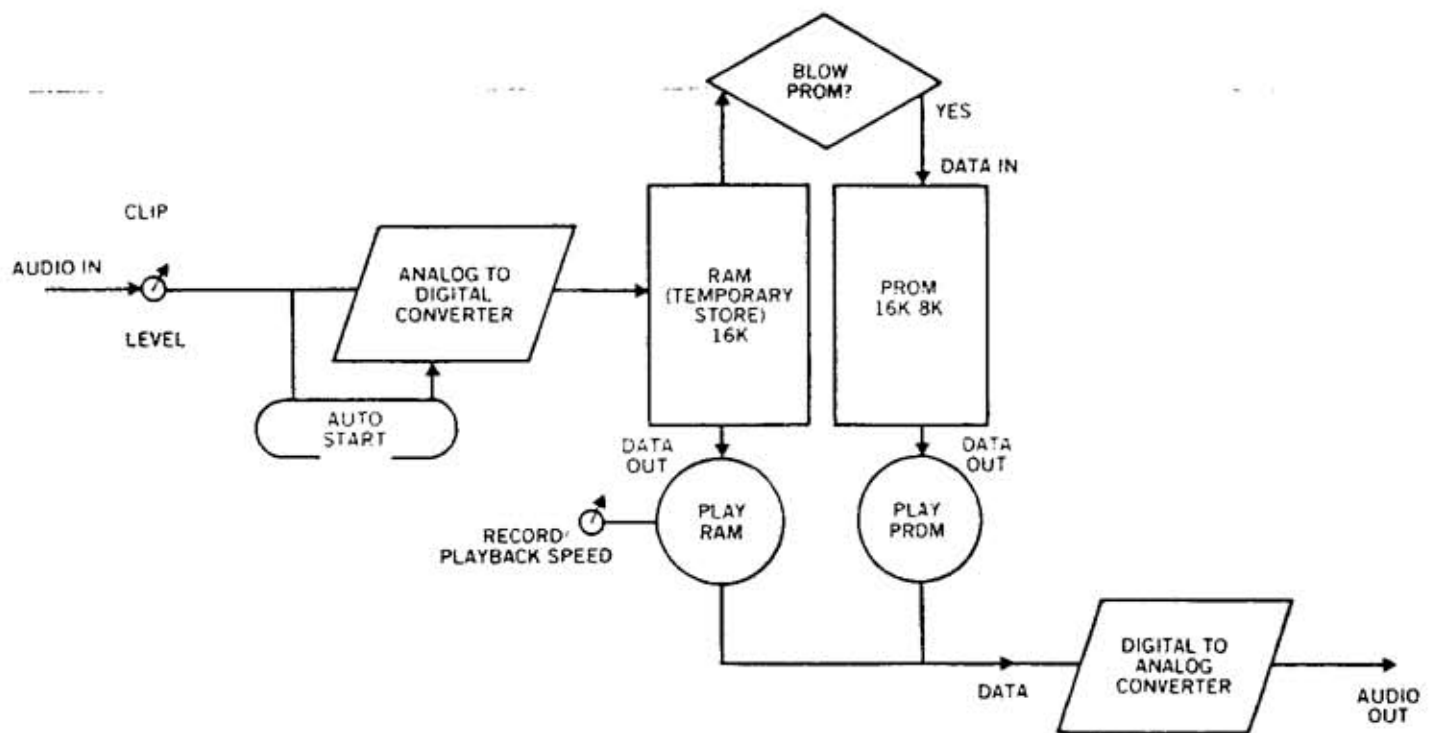
The EPB has 16K bytes of sample ram which is used when a sound is sampled. This ram is arranged in 2 x 8K blocks. So that if you wish to sample a short sound you can switch to 8K and save on the cost of proms. (8K proms being approx. half the price of 16K proms).

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 EPROM.

The trick in recording is in matching the length of the sample with the actual length of the sound to be sampled and recording with maximum level into ram before distortion.

The end of the sample should coincide with the end of the sound to be sampled, if on playback there is a gap between the end of the sound and the end of the available ram, then the sample rate could be increased which will improve the quality of the recording.

Record the sound at a level so that the overload light just flickers, this means that maximum level is going into ram, which will minimise sampling noise imposed during playback.
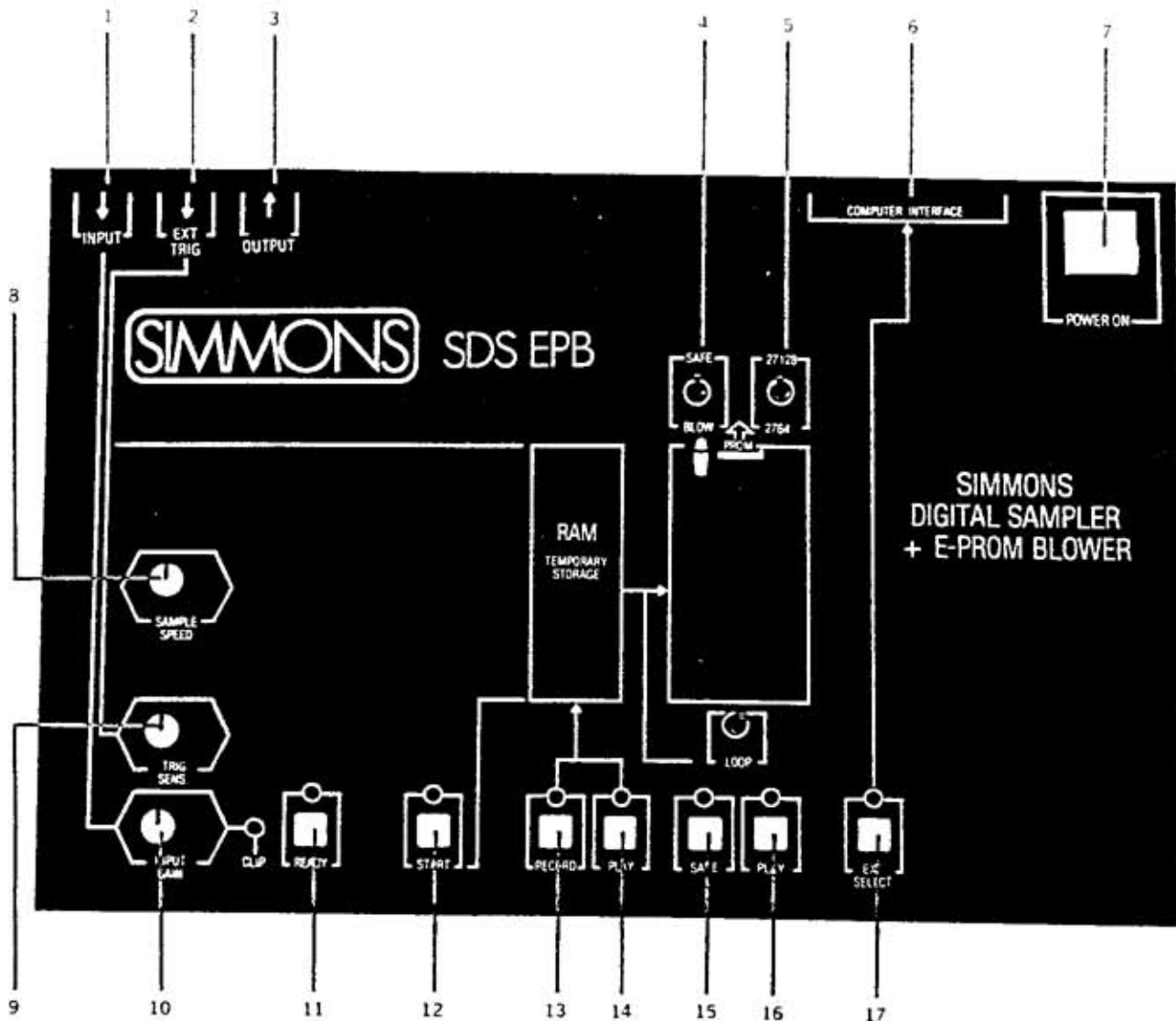
HIT DRUM

|←——————— LENGTH OF SOUND ———————→|
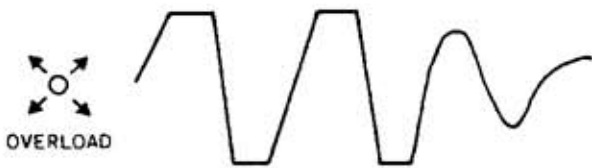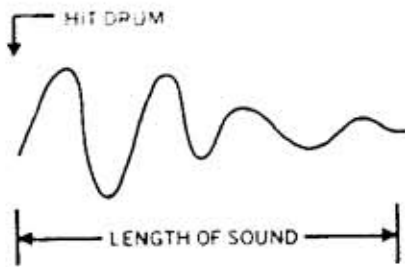
)|←——————————— LONG SAMPLE TIME ———————→| = Poor recording quality and wasted prom space.

|←————— SHORT SAMPLE TIME —————→| = Good quality but end of sound missing.

|←——————— LENGTH OF SAMPLE ———————→| = Reasonable quality and whole sound sampled.
             & SOUND MATCH

MAX
AMPLITUDE
OF SOUND

OVERLOAD
= Playback of sample – Recording sounds distorted (clipped) because level control set too high.

= Playback of sample – recording is quiet and sounds hissy and distorted due to errors – level control or signal low, adjust level so that overload LED just flickers at loudest part of sound.

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SIMMONS SDS EPB

SIMMONS DIGITAL SAMPLER + E-PROM BLOWER

1) Audio input
2) External trigger input
3) Audio output
4) Safe/blow switch
5) Eprom select switch
6) Computer interface port
7) Power on/off switch
8) Sample speed/duration
9) External trigger sensitivity

10) Input gain
11) Auto record pause
12) Record start
13) Record into RAM
14) Play RAM
15) Save to ROM
16) Play ROM
17) Computer interface enable

RECORDING A SOUND

Plug a microphone or signal from any source i.e. guitar, tape deck etc., into the audio input of the EPB, switch the EPROM switch to safe and EPROM size to 27128 (16K).

Connect the output of the EPB to a suitable amplifier to enable monitoring of the sample. This output is always 'live' – in other words a digital version of the signal appearing at the input of the EPB will always appear on the output whilst the 'play' LED is lit (unless you are playing back recordings stored in ram or prom).

Power up the EPB by connecting to your domestic mains supply and switching the power switch to on.

Turn the input gain and sample speed controls halfway.

Press the record ram button.

Make a noise into the microphone and adjust the gain control so that the clip LED just glows. At any time you can press the start button, which will start the digital recording. Monitor the output to listen to the digital version of the sound.

Experiment with the sample speed control to demonstrate the signal degradation as the sample speed is slowed down.

When the start LED is glowing, any signals appearing on the input jack will be sampled and stored in ram.

This process proceeds at the speed set on the sample speed control.

At the end of the sample period (8K or 16K depending upon the prom select switch) the start light will go out.

Press the ram play button to hear the sample played back – experiment with different playback speeds. (Sample speed).

AUTOMATIC START

Pressing the ready button switches in the automatic recording facility. The EPB waits until a signal appears on the input and then starts recording.

Press Record Ram.

Press Ready.

When a noise is made near the microphone, the ready LED will go out, the start LED will glow and the recording will commence.

The input gain control adjusts the sensitivity of the automatic start.

SAVING SAMPLE. (BLOWING THE PROM)

Proms come in many shapes and sizes. Many have different programming characteristics as well as varying access speeds and power consumption. The SDS EPB is only guaranteed to program proms supplied by SIMMONS. Proms are freely available, it's up to you to experiment if you wish with proms supplied from alternative sources.

The EPROM to be programmed is placed in the zero insertion force socket (Zifs). Make sure the lever on the left hand side of the zifs is in the up position. Place the prom in the zifs with the notch (in the prom) at the top of the zifs.
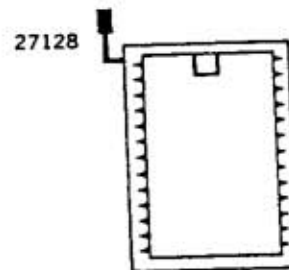
27128

If the prom is 27128 (16K) switch the selector to 27128. If it is 2764 (8K) switch to 2764.

If a 16K sample has been recorded but a 2764 is to be programmed only the first half of the recording will be blown into the prom.

During the prom programming process the original ram data is retained so that you can make multiple copies if you required.

Press the prom contact level down (this makes contact with all the prom pins).

Switch the prom protect switch to blow.

Press save.

Press start.

The start LED will glow whilst the transfer of data takes place. You will also hear the transfer if you are monitoring the EPB output (a series of low frequency clicks).

When the start LED goes out, the prom is blown. Switch the prom protect switch to safe – this protects the prom from being blown twice – which usually results in garbage being stored in the prom. To play the prom press play prom and then start.