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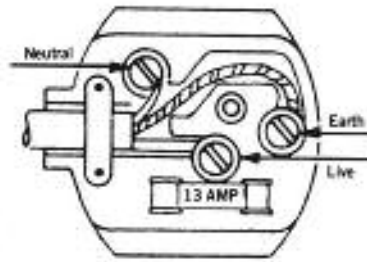
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## **CONCEPT-An Introduction to the SIMMONS Drum Expander**

With the continuing popularity of electronic drums the scope of sound production available to the drummer and percussionist has widened considerably. No longer is the drummer constrained to the narrow confines of 'keeping the beat' - indeed the special skills and disciplines learned by the drummer can now be applied to the wider areas of melody. Lead lines, backing phrases and chords can now be played on the drum kit. Exclusive to the keyboard player for years, midi and the electronic drum kit opens the entire arsenal of sampled, synthesised and digitally generated sound to the humble drummer. The SDE is just one weapon in this armoury.

SDE stands for SIMMONS Drum Expander. The unit is an add-on electronic voice unit which can be controlled via midi from electronic drum kits such as the SIMMONS SDS 9, or trigger to midi converters such as SIMMONS MTM or SIMMONS TMI. The unit is capable of making a vast range of sounds including wood blocks, bells, percussion sounds, string sounds and special effects etc and is the ideal instrument to expand the range of sounds available to the electronic percussionist.

- **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 SDE is a computer-controlled synthesiser and should be treated with care.

A few simple rules, if followed, will avoid problems in the future.

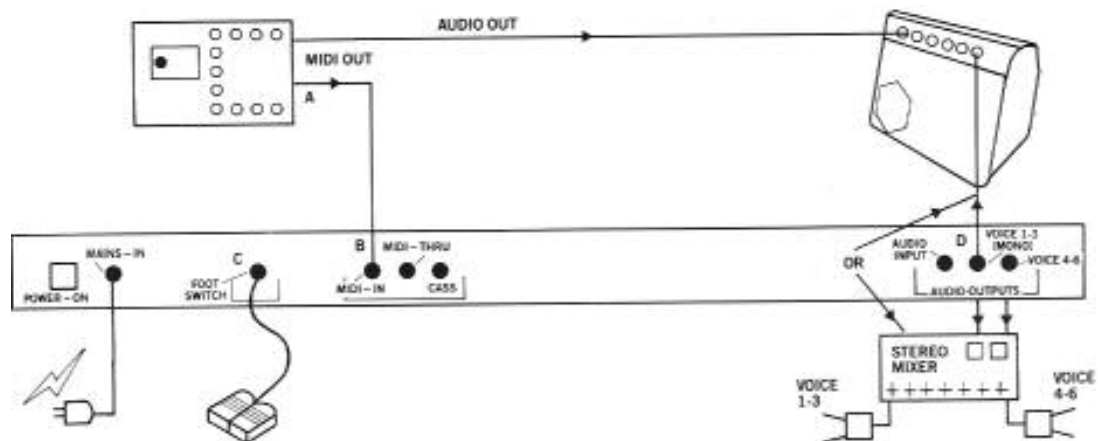
They are:

**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 SDE is supplied with a three core power cord - use this with a grounded AC power source.**

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

## • CONNECTING UP



Connect the SDE up as follows: Plug the unit 1 to a domestic power supply. Make sure that you have the correct voltage unit.

The connections to the SDE are as follows: Footswitch socket, midi in socket, midi through socket, cassette, audio input, audio outputs 1 to 3 and 4 to 6.

This manual assumes that you are using an electronic drum kit such as the SDS 9 or a pads to midi converter such as Simmons' MTM or TMI. Set these units up as per their instruction manuals and connect them to the SDE with the midi din cable supplied. Connect the drum kit's midi out (A) to SDE's midi in (B). If you have a footswitch, plug this into the footswitch socket on the rear of the SDE (C). Note: this is a dual footswitch which mimics the function of the front panel UP/DOWN button, in other words the left hand switch will step SDE backwards through its patches and the right hand switch will step SDE forwards through its patches

The SDE has two outputs, one output for voices 1, 2 and 3 and a second output for voices 4, 5 and 6. The two outputs are used to separate voices in a stereo system. If you have a stereo system connect voices 1-3 to one channel of your mixing desk and pan them fully left. Take the output from voices 4-6 and feed this to the second channel on your desk and pan this right. If you do not plug a jack lead into the voice 4-6' output then all the voices will come out of voice 1-3 output in mono (D).

## • **AMPLIFICATION**

Sounds produced by the SDE are by their very nature very percussive. Many of them have hard attack with high harmonic content and when used in conjunction with the electronic drum kit the combined signals can cause problems in many amplification systems. It is certainly desirable to amplify the electronic drum and SDE combination to 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 a mixing desk the best possible way of amplifying the combination is to take the individual outputs from your drum kit plus the outputs from the voices one to three and four to six and then panning, adding equalisation reverb, flanging, phasing, etc, to your taste. For a small venue Simmons have designed their own combination amplifier which will perfectly match the signals coming from the SDE and the electronic drum kit.

It is a 200w amplifier and speaker enclosure with separate inputs for bass, snare and tom toms with the appropriate 2 and 3 band equalisation to suit the different drums. The SDC 200 (Simmons Drum Combo) has a specially designed 300w RMS 12" speaker to project the high level of bass and handle the fast transients contained in the Simmons drum sounds. The cabinet amplifier speaker combination has been optimised to give you maximum sound level from this compact combo. See your dealer for further information.

## • GLOSSARY OF TERMS

In the following pages you will find many new terms that apply to the programming of the SDE. Here is a list of them and their meanings so that you will not be surprised when you come across them.

### **PATCH**

A Patch is a group of six sounds.

### **CHANNEL**

A channel is one of the six channels on the SDE. Each channel normally corresponds to a drum on the electronic drum kit that is playing the SDE. This is not to be confused with a mid channel.

### **VOICE**

An SDE Voice is the type of sound used by the channels in a patch, i.e. a brass voice, a bell voice, a woodblock voice.

### **SINGLE**

This means that all channels in a patch are using the same voice, i.e. six pads on your electronic drum kit would sound the same (all brassy, or all bells - although they might be at different pitches).

### **MNSP**

This stands for Midi Note Selects Pitch. This means that the midi note coming into the SDE chooses the note that should be played rather than choosing what channel is played. This is how expanders for keyboards are normally set up. In other words the keyboard sends the midi notes and the expander plays the relevant pitches. But of course with a drum expander you may want each patch to have a different tuning- in this case MNSP is off, the pitch of the mid note is ignored, the pitch is programmed separately for each channel in the patch.

### **PROGRAM VARIABLE**

This is one of the six variable control knobs on the front panel which can be used during program to vary a parameter to do with a patch or a voice.

### **CARTRIDGE**

This is a memory cartridge which can be used to extend the memory of the SDE. There are two different types of cartridge - Factory ROM which contains pre-programmed sounds, and User RAM into which you can program your own patches and voices.

### **FACTORY**

These are voices or patches that have been set up at the Simmons factory and cannot be changed.

**USER**

These are sounds that you can use and change although they have been initially set up at the factory.

**L.E.D.**

This stands for Light Emiffing Diode and is one of the small red lights on the front panel. These are used to indicate various functions on the SDE.

**RAM**

This stands for Random Access Memory. This is the type of memory that is used in the USER areas and cartridges. This is where you store your own patches and voices.

**ROM**

This stands for Read Only Memory. This is where the factory sounds are stored. You can only 'read' from this area. You cannot change the patches and voices stored in this area, although you can use them as a starting point for your own programs.

**MODE**

The SDE can work in four different modes, one to four. The modes are combination of Single, Voicing and Midi Notes Selects Pitch (MNSP), on and off.

**LIBRARY**

This is the area where the voices are stored. You modify a voice and put it in the library. Any patch can then use that voice as its sound. It references the voice in the library by the voice number.

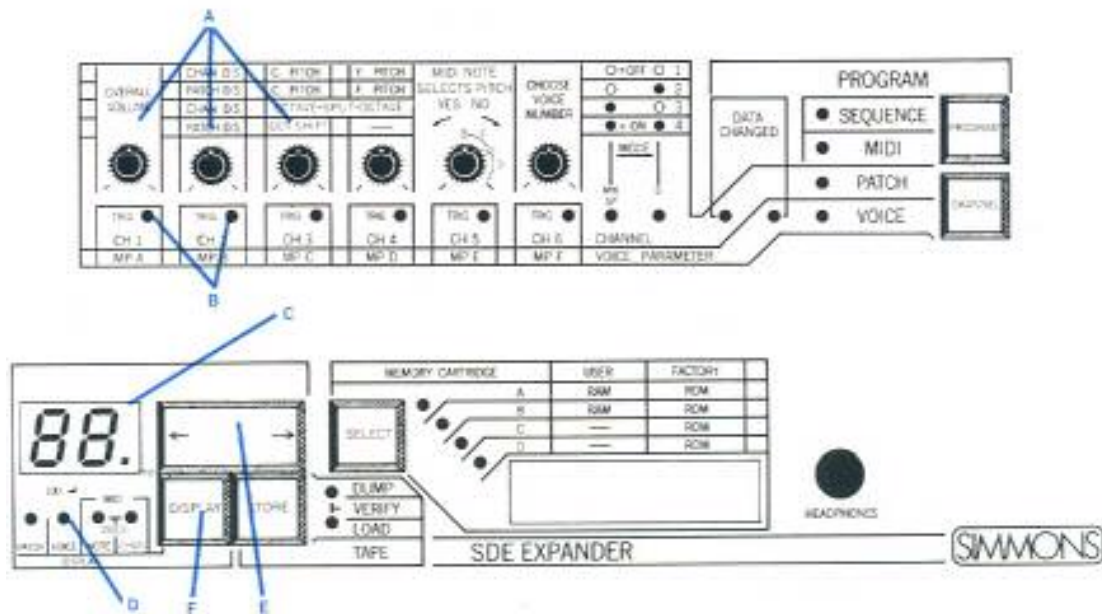
**SPLIT**

The incoming midi notes are split by SDE. Those below the split point use one voice, those above the split point uses another.

**DYNAMIC SENSITIVITY**

This controls how much the sound changes due to playing dynamics. At minimum, the sound will not change at all due to dynamics (apart from volume) at maximum you can change the sound a lot dependant on how hard you strike the drum.

- SDE FRONT PANEL



The SDE front panel consists of two major sections. One section on the left hand side are the six voice parameter controls which are used to set up the voices (A), as well as various parameters to do with patch.

Underneath each of the six controls is an LED (B) which can indicate a triggering of the sound or, in program mode, the selection of the channel to be programmed.

On the right hand side of the unit is the display section consisting of two displays (C), some display LEDs (D) and data entry buttons (E). The display LEDs light to indicate what the main display is telling you, i.e. if voice' is lit up then the display will be showing you the voice number that you are dealing with. If the 'patch' is lit up then it is displaying the particular patch you are dealing with.

You use the display button (F) to cycle around these LEDs, so at any time you can see the information pertinent to your particular activity.

## • **MIDI**

### **CHANNELS AND NOTES**

Before you can start using the SDE it is necessary to talk a little bit about midi channels and notes. Because the SDE can only communicate via midi, it is important that you understand how it is doing this otherwise your electronic kit will never be able to play the SDE.

### **MIDI CHANNELS**

Midi is explained in greater detail later on in this manual but here is enough information to get you started with the SDE. Your electronic drum kit will be transmitting midi on one of sixteen midi channels.

The SDE must be listening on the same channel that your electronic drum kit is transmitting on, i.e. if your electronic drum kit is transmitting on channel one then SDE must be switched to channel one. If it was listening on channel two obviously it would not be receiving midi data at all.

So the first thing to do is to check which channel your electronic drum kit is transmitting midi on and then switch the SDE to be receiving on this same channel.

You then have to program the SDE to match up the incoming midi notes. For example the electronic drum kit may be sending its bass drum signal as midi note 50, its snare drum signal as midi note 55, its tom-toms as midi note 60, 65 and 70. You will have to set the SDE so that its channels are triggered by those particular midi notes.

### **WHAT IS MIDI! - INTERFACE TO OTHER INSTRUMENTS**

MIDI stands for Musical Instrument Digital Interface and 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, electronic drum kits, and now percussion expanders. Information is transmitted and received between these instruments via 5 pin DIN connectors. This information is in the form of a 'serial stream', in other words all the information is sent one after the other in a serial form. This means that only two wires are needed to send and receive MIDI, although a 5 way connector (the din standard plug) is used for MIDI.

In the same way that a radio can be tuned into many stations (although the signals are being received down the same aerial), different instruments can 'talk' (transmit) or 'listen' (receive) on different MIDI 'channels'. There are 16 MIDI channels.

This enables many instruments to be physically linked together, and then 'switched' in and out, by changing MIDI channels.

An example - the SDS 9 electronic drum kit is connected to two MIDI voices, an analog synthesizer, and an SDE. As the drum kit is played signals are sent down MIDI which tell the synths to play.

The SDS 9 has six 'drums' bass, snare, rim, and three tom-toms. You want to add the sound of the analog synth to the bass and snare drums, but the SDE to the rim and toms. To separate the two sounds, you could program the SDS 9 to 'transmit' the bass and snare drums on MIDI channel 2, and the rim and toms on MIDI channel 1. Then if you programmed the analog synth to 'receive' on MIDI channel 2 and the SDE to 'receive' on channel 1, the sounds would be separated as desired.

MIDI does this by sending the following messages down MIDI -Channel 1 data hit bass, hit snare, hit bass . . . Channel 2 data hit low tom. hit rim . hit hi tom . . . etc. And of course the analog synth is only listening to channel 2 and the SDE is only listening to channel 1.

In reality the receiving synths have no idea that a 'bass drum' or a 'tom4om' is playing them. All they receive is a stream of numbers that tell them what note to play, when, and how loud to play it.

## • **SDE MIDI MODES**

The SDE has eight midi modes. These are modes in which the SDE expects to receive midi information. They are the eight possible combinations of the following information:

- Whether omni mode is on or off.
- Whether midi program changes are used or not.
- Whether SDE uses a global set of notes or not.

### **OMNI**

If Omni is on then the SDE will ignore all midi channel information, therefore any midi notes sent on any midi channel to the SDE will be recognised.

If Omni is off then SDE will only be receiving notes down a single selected midi channel. (One of sixteen midi channels).

### **MIDI PROGRAM CHANGE**

If midi Program Change is on then the SDE will respond to midi program change information. For example, if the driving instrument is an SDS 9 and you changed to kit 5 then SDE will change to user patch 5.

If midi Program Change is off then when you change to kit 5 on the SDS 9 the SDE will ignore the change and carry on using whatever patch has already been selected.

### **GLOBAL NOTES**

These are a set of over-riding midi notes that correspond to each channel on the SDE. For example, you can set up the global notes as follows:

Midi note 60 for channel 1  
62 for channel 2  
64 for channel 3  
66 for channel 4 etc, through to channel 6.

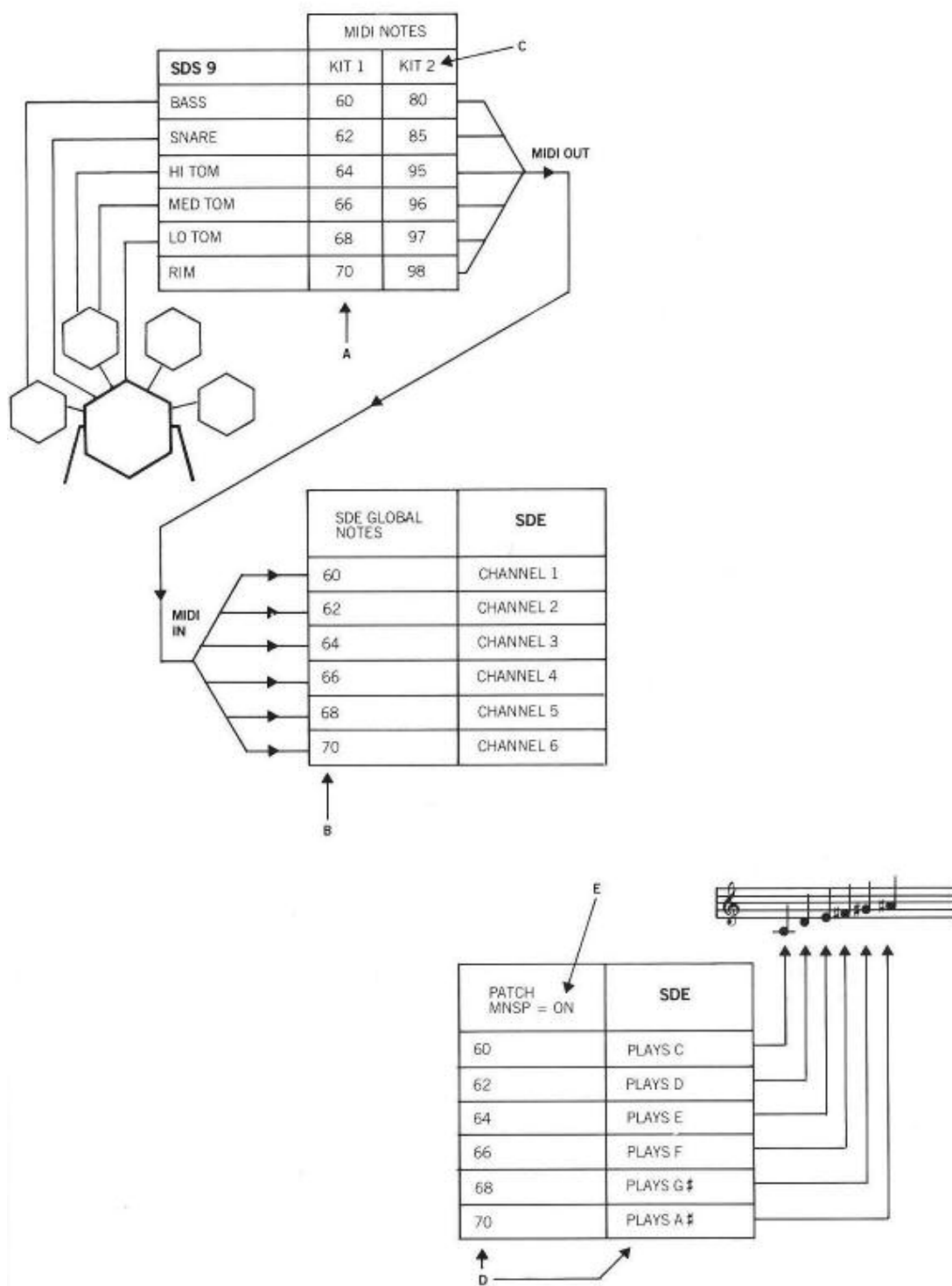
Then whenever SDE receives a midi note number 60 it will play the sound assigned to channel 1. If it receives midi note 64 it will play the sound assigned to channel 3.

These global notes have to match up with the set that have been programmed in the sending instrument. For example, an SDS 9 can be programmed to send its bass drum as midi note 60, its snare as midi note 62 and its tom-toms as midi note 64, 66 and 68 (A). If you match up SDE's global notes to this set of notes, then the bass drum will play channel 1, the snare drum will play channel 2, and the toms will play 3, 4 and 5 (B).

These global notes will be ignored in any SDE patch where MNSP is on. In this case the midi note number chooses the pitch of the channel rather than choosing the channel itself (D).

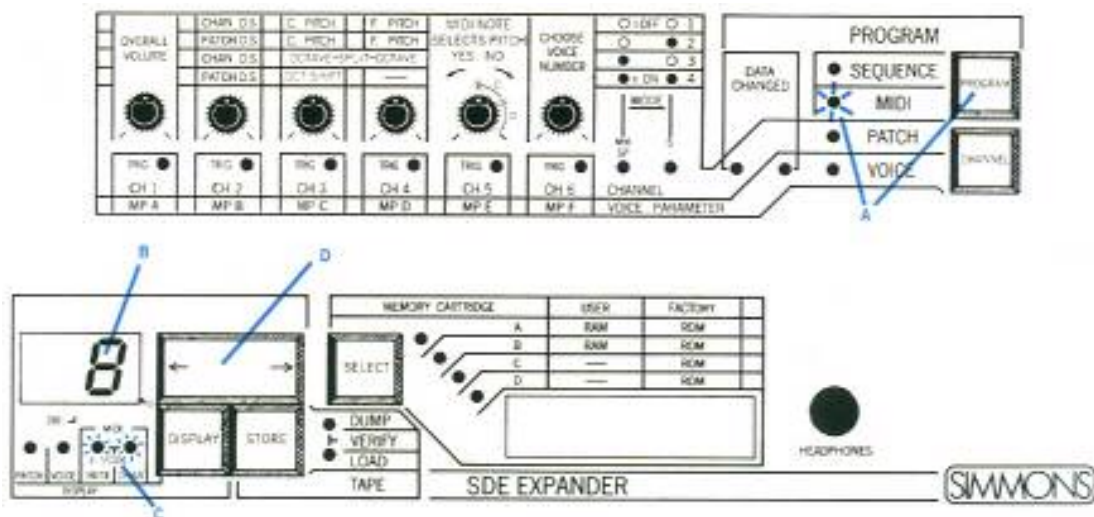
Confusion can arise where, for example - the SDS 9 when in transmit mode 6 can send a different set of midi notes for each kit number, i.e. kit 1 may be sending midi note 60 on the bass drum, kit 2 may be sending note number 80 (C).

So if you had SDE switched to receiving the global notes then the SDS 9 bass drum will play the SDE when the SDS 9 is selected to play kit 1(A), but when you switch to kit 2 (B) the bass drum will send note 80 - to which no SDE channel has been assigned. However, if SDE is using a patch where midi notes selects pitch (E) then all that would happen is the bass drum would play a different pitch (kit 1 would play middle C, kit 2 would play a high pitched G sharp - see midi note table for conversion between midi note number and chromatic scale). For more information on the use of the SDE with the SDS 9 see relevant chapter. The combinations of Omni, Receive Program Change and Global Notes gives us eight options. These are the eight midi modes numbered one to eight.



## MIDI MODES 1-8

SDE midi mode				OMNI	PROG CHANGE	GLOBAL NOTES
1	Receive midi on selected channel only	Ignore program change instruction	mid notes programmed per patch	NO	NO	NO
2	Receive midi on selected channel only	Ignore program change instruction	1 set of midi notes for SDE	NO	NO	YES
3	Receive midi on selected channel only	Respond to program change instruction	mid notes programmed per patch	NO	YES	NO
4	Receive midi on selected channel only	Respond to program change instruction	1 set of midi notes for SDE	NO	YES	YES
5	Receive midi on all midi channels	Ignore program change instruction	mid notes programmed per patch	YES	NO	NO
6	Receive midi on all midi channels	Ignore program change instruction	1 set of midi notes for SDE	YES	NO	YES
7	Receive midi on all midi channels	Respond to program change instruction	mid notes programmed per patch	YES	YES	NO
8	Receive midi on all midi channels	Respond to program change instruction	1 set of midi notes for SDE	YES	YES	YES



## PROGRAMMING THE MIDI MODES

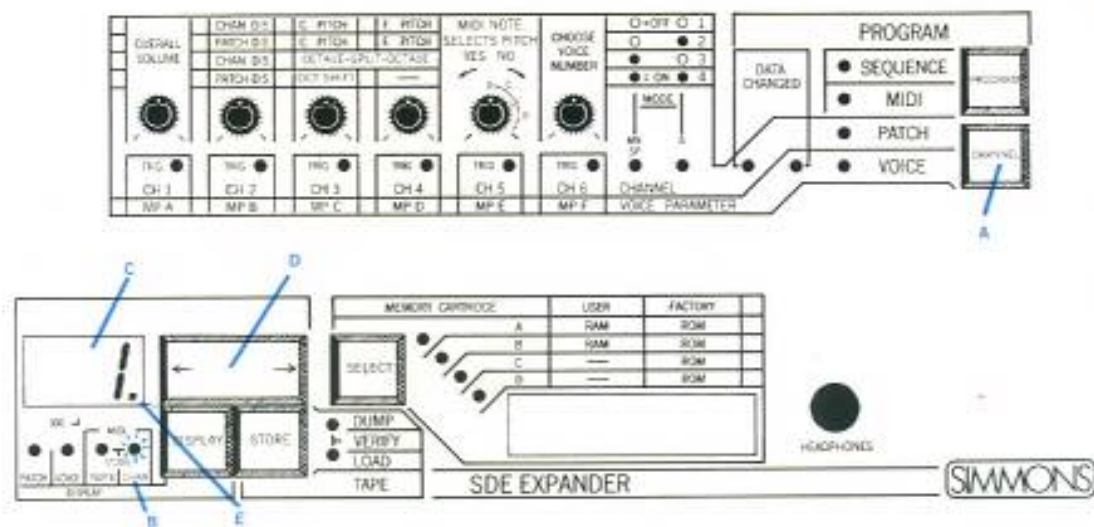
The SDE will always be using one of the eight midi modes. All that is necessary for you to do is to decide which midi mode you want SDE to use and then program that mode number into the SDE.

From the playback mode press 'PROGRAM' four times until the program midi LED is lit (A). The display will now be telling you the current SDE midi mode (B). Note that both the mid note and channel LEDs are on, telling you that you are programming the midi mode. You change the mode by using the UP/DOWN button (D).

You will be allowed to change the midi data in any of the modes even though some of the data will not be used in some of the modes (for example in midi mode 1 the global notes are ignored - SDE will use the midi notes that are programmed in the individual patches).

To change MIDI CHANNEL or the MIDI GLOBAL NOTES press 'CHANNEL'. To exit from program mode press 'PROGRAM'. The last mode number that was selected is then stored away. This is the mode number that SDE will use from now on.

To recap. To change midi modes press 'PROGRAM' until program midi LED is lit. Press 'UP/DOWN' to change the mode number and then press 'PROGRAM' again to exit to playback mode.



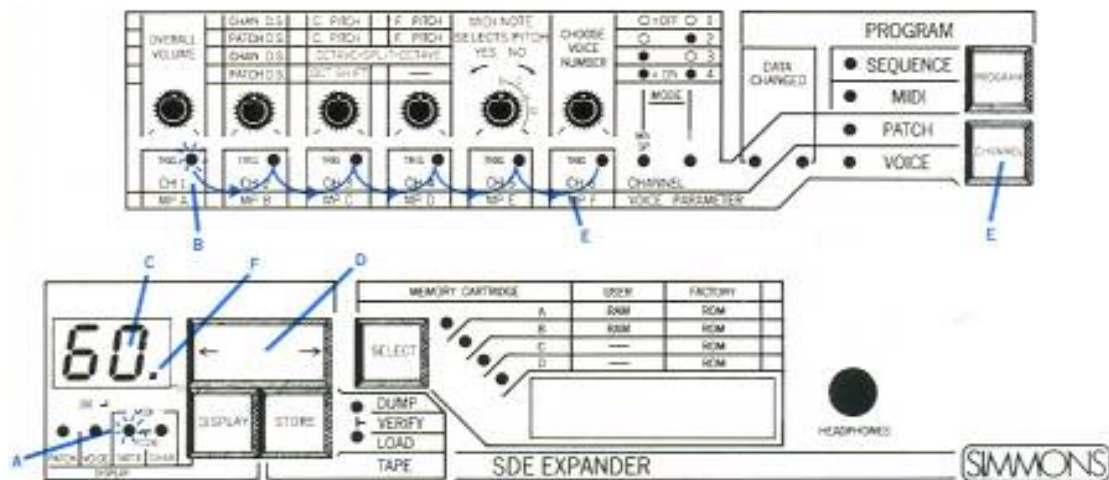
## PROGRAMMING MIDI CHANNELS - THE BUTTON PUSHING

Enter program mid as described above so that the display is showing midi mode with both midi note and channel LEDs lit and displaying the particular mode.

Press 'CHANNEL' (A) and you will see that the midi channel LED comes on (B) and the display is telling you which midi channel (one of sixteen) that SDE is receiving (C). You can change this channel with the UP/DOWN buttons (D).

If you are in midi mode 5 to 8 the dot in the display will be off (E). In other words, although you are setting up the midi channel that SDE will be receiving on, this channel information is not being used because for midi modes from 5 to 8 Omni is switched on. Therefore the SDE ignores midi channel information and receives midi on all channels. Press 'PROGRAM' to return to playback mode-the new midi channel number will be stored away and this is the channel that SDE will use.

Press 'CHANNEL' to program the SDE global notes.



## PROGRAMMING GLOBAL NOTES - THE BUTTON PUSHING

Following on from the previous page: You will see that the midi notes LED has come on in the display (A) and that channel 1 LED is lit (B). The global midi note for channel 1 is now being displayed (C). You can change this note with the UP and DOWN buttons (D). Remember this is the midi notes that need to be sent to SDE to play channel 1 when MNSP is off.

To program the midi note for channel 2 press 'CHANNEL' (E). Use the UP and DOWN Button to change the midi note for channel 2 if required - remember this is the mid note that will have to be sent to SDE for it to play channel 2 (those SDE patches where MNSP is off). You can continue to select the rest of the six channels with the 'CHANNEL' button and change the midi global note for each channel with the UP/DOWN button.

The dot in the display will be on (F), meaning that the global notes are used in modes 2, 4, 6 and 8. If the dot is off then you are in 1 of SDEs modes 1, 3, 5, and 7 (in this case the global notes are ignored and the ones you have programmed in the individual patches are used. Press 'PROGRAM' to return to the playback state.

## • SDE AND THE SDS9

The SDS 9 is the perfect electronic drum kit to drive the SDE expander. The SDS 9 is a six channel drum kit comprising of bass drum, snare drum, snare rim, high, medium and low tom-toms, which is the ideal combination to drive the six channels of the SDE.

Connect the SDS 9 midi out socket to the SDE midi in socket with the midi cable supplied. Connect the audio output of the SDE to one channel of your amplifier and the output of the SDS 9 to another channel. Enable the SDS 9 midi interface as described in the SDS 9 manual (remember the SDS 9 powers up with midi disabled).

### **Set the SDS9 mid modes as follows:**

Transmit mode 0 should be on and the midi notes corresponding to the SDS 9 channels set up as per the default in page 35 of the manual, ie. Bass channel sends note 43, snare note 50, rim note 55, high tom note 59, medium tom note 62 and low tom midi note 65. The SDE is initialised to recognise these numbers as referring to channel 1-6 respectively (you can of course change both sets of notes).

Switch transmit mode 1 on.

Switch transmit mode 2 on. -this sends midi program changes to the SDE so that the 2 units will change patch together. All the other modes can be off. Make sure transmit mode 6 is off.

If you have not reprogrammed the SDE, the SDE will now respond when you play the SDS 9.

For this set-up the SDE using mode 8, in other words SDE accepts all midi data on all midi channels and is using a global set of notes to choose the channels that are played and if you change kits on the SDS 9, different patches will be selected on the SDE.

- **SDE AND MTM**

The SDE and MTM combination has more possibilities for the musician than any combination of midi controller and expander currently available. You can program MTM with bass lines, echoes, layered chords, glissando's etc.

All of these effects will be reproduced by the SDE. Because of the split facility on SDE and the ability to program a different voice for each channel on the SDE, you can set up many combinations of different sounds per patch, and remember that patch one on MTM can equal any set of effects and routes and as you step through the different patches on MTM the SDE will match its sounds with whatever effects you have set up on MTM.

A few examples:

A bass line with bass sound is running on pad 1, pads 2, 3 and 4 have brass 'stabs' - more notes being added in the chords as you play the pads harder.

The next MTM patch uses single wood block sounds plus 'glissando bells' - an effect similar to a bell tree.

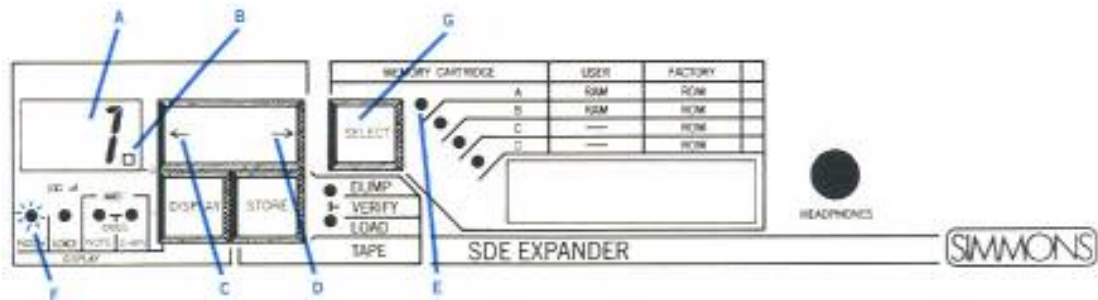
The next MTM patch has 6 different sounds, 1 on each drum responding dynamically, a bell, a cowbell, a wood block, a marimba etc.

- **SDE AND TMI**

The SDE can be driven from TMI which can be hooked up to 8 Simmons mono pads or 4 Simmons stereo pads. When using the stereo pads, different sounds can be assigned to the playing area and the rim of the drum. TMI can store 50 patches of different tunings and of course even more sounds and tunings can be stored within the SDE memory. This is the ideal set up for the percussionists wishing to add complex and authentic percussion sounds to his drum kit.

TMI also has paralleled outputs from the first 5 channels to drive other Simmons drum products, such as the SDS 1000, SDS 800/400 or 200 voice unit so that with the 3 instruments hooked up together you will be able to play exciting electronic drum sounds along with the digital percussion sounds of the SDE.

## • PLAYBACK



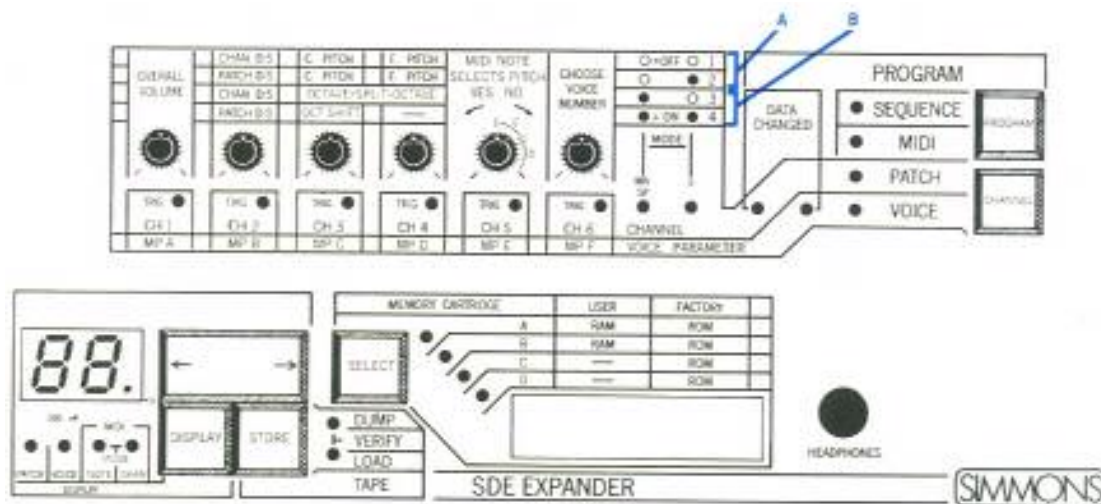
When you switch on the unit the display will show 1 (A). The 'dot' in the second segment will be off (B), this is telling you that you are in the factory sound area, in other words, whilst this dot is off you cannot change the sounds, you are using the factory sounds. To the right of the display is a button labelled '← →' pressing the left hand side of the button (C) changes the display by one in a negative sense, pressing the right hand side of the button will increase the display by one (D).

Holding the button down will change rapidly on through the display, so if you press the right hand side of the button you will see the display step through two, three, four, five etc. When it reaches twenty the dot will come on and the display will count up one, two, three. The dot has come on showing that you are in the user area, you can change any of these sounds or patches. When the display reaches 20 the dot will go out again and the LED 'A' next to the cartridge socket will come on (E), indicating that the SDE expects to retrieve data from the cartridge. If the cartridge is not plugged in then the cartridge LED will flash obviously SDE cannot load up non-existent data. In this case the sound SDE uses will be the previous sound. Continuing to press the data button will cycle the unit back eventually to factory 01 where the cycle can start again. You can use the select button (G) to swap quickly between the user, factory and cartridge banks A, B, C, D.

Whilst you have been cycling you will note that the patch LED is on in the display area (F), this is telling you that the display is displaying the patch numbers, - one to twenty being the factory patches, one to twenty (dot on) being the user patches, cartridge patches 1 to 20 when A, B, C or D is lit (RAM cartridge = 20 in A, 20 in B. If it's a factory ROM cartridge then there are 20 in A, 20 in B, 20 in C, and 20 in D). Each one of these patches consists of a group of sounds or voices. All of these sounds or voices are stored in one area called the library. There are three areas in this library the factory library sounds, the user library sounds and the cartridge library sounds. Any user patch can pick up a sound from any area in the library. Use the data buttons to return you to patch one.

- **PROGRAMMING A PATCH**

## THE FOUR MODES 1, 2, 3, 4



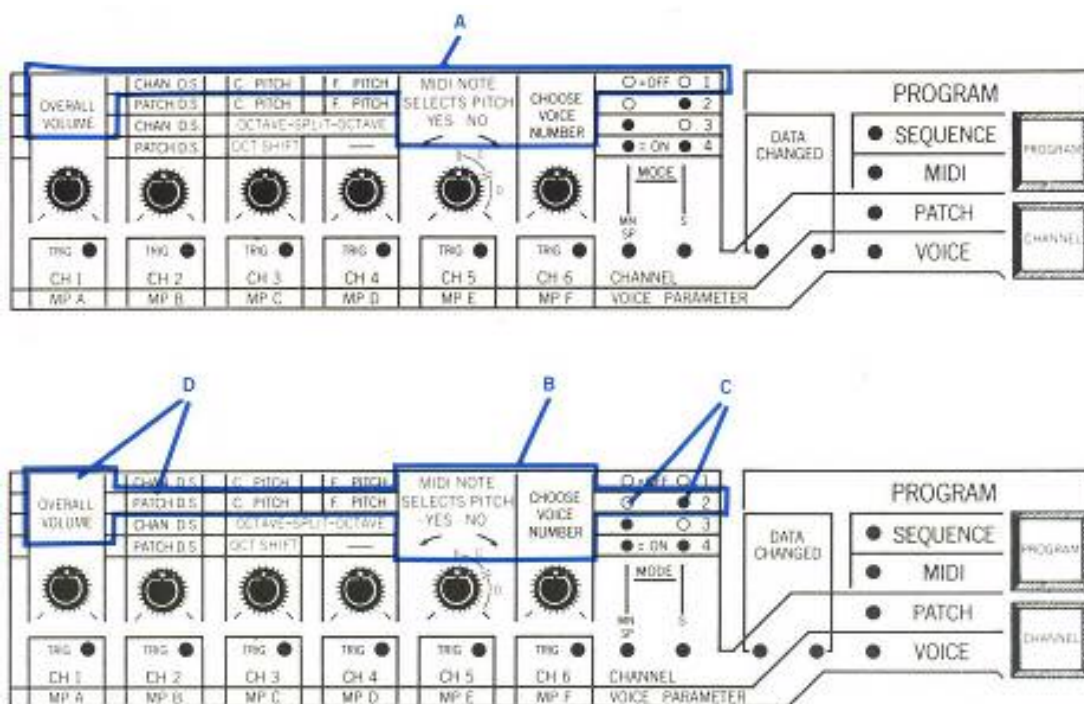
The SDE is programmed so that each patch chooses six different 'voices' or sounds and each one of these voices can be set off i.e. triggered by a different drum (this manual assumes that the SDE is being triggered by hitting a pad on an electronic drum kit via MIDI). In this case the drum itself does not choose the pitch of the voice as it would if it were a keyboard. The pitch of the voice is programmed in that patch, -so that each patch not only has six voices but also six pitches associated with the patch.

For example, patch number one may have a bell voice, a cowbell voice and three wood blocks. Patch number two may have exactly the same voices but at different pitches. Patch number three, may have six voices all the same but at different pitches and patch number four may have those same voices but at a new tuning.

This mode in the SDE is termed MNSP off 'when the incoming midi note does not choose pitch', in other words, the pitch of the voices is programmed in the patch. There are two versions of this mode - single and multiple. Single is when all the six channels use the same voice (the SDE is using a single voice) MODE 2, and multiple when one or more of the voices being used are different - MODE 1 (A).

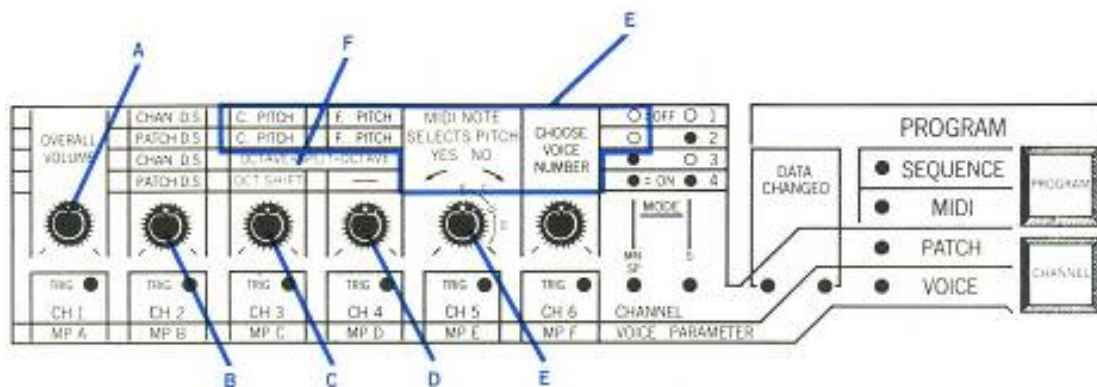
In MODE 3 and 4 it is the incoming midi notes that choose the pitch not those that have been stored with the patch. There is an indicator on the SDE which will tell you whether you are in keyboard or percussion mode. This indicator is called MNSP i.e. - Midi Note Selects Pitch. In this mode midi notes coming into the expander will select the pitch of the sound to be played, rather than those programmed in the patch. This would be used for example with the SDS 9 which can have a different midi note assigned for each drum in each different kit. MNSP has been included for those synthesizers that don't have this feature. MODE 4 is MNSP single, and MODE 3 is MNSP splits (B).

Although the incoming midi note is selecting the pitch that each channel in the SDE plays, you can shift the pitch in octaves, this is especially useful in the split mode, where you can shift each side of the split up or down up to 3 octaves.



To the left of these legends is the key to how the controls work in each of the four modes, for example, if MNSP is off and SINGLE is off then the unit is being used in mode 1 - at least one of the voices is different and incoming midi notes do not choose the pitch of the voice. In other words, each channel for that patch has its own pitch and so you would use the top line of information for programming each channel in that patch. For example, the left hand control would adjust the overall volume, the second would adjust the dynamic sensitivity for that channel, and the third and fourth controls would choose the pitch for that voice for that channel. At any time you can turn the fifth control to switch on or off MNSP, and use control 6 to choose a different voice for the channel you are programming (A). If you were to then switch MNSP on, you can now tell from the legend that the third and fourth controls no longer vary the pitch. This is because incoming midi notes will control the pitch (B).

Supposing MNSP is off and SINGLE is on (C) - this would be telling you that the patch contains the six pitches for the voices and incoming midi notes do not choose the pitch, and that all six voices are the same and therefore the left hand control varies the entire volume of the patch, and the second control varies the 'dynamic sensitivity' for the entire patch (D).



## VOLUME AND DYNAMIC SENSITIVITY

Volume of each patch is set by the left hand control 'OVERALL VOLUME' (A) - this is essential to match up the different spectral energies of the sound i.e. a high sound will sometimes sound quieter than a beefy bass sound. In 'program patch' (the patch is in single mode- i.e. all the voices are the same) the 'channel 2' control (B) can be adjusted to set the overall 'dynamic sensitivity' of that patch. If the sounds are different (single = off) you can set the dynamic sensitivity individually for each of the channels. The four modes are the combinations of the voices being single or multiple and whether the midi note selects pitch or not. These four modes are indicated by the two LEDs, MNSP and SINGLE. Above these LEDs are legends which refer to the functions of the left hand controls depending upon the state of the MNSP and S(ingle) LEDs.

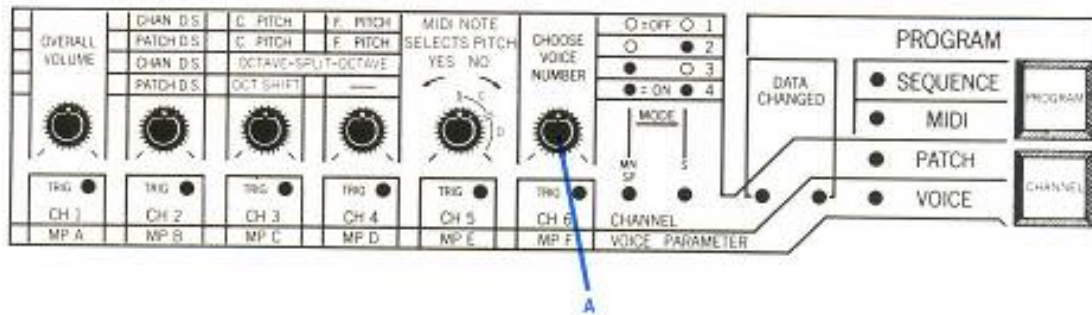
## PITCH

The pitch of each channel is set by two controls-coarse pitch (C. PITCH) (C) which will alter the pitch of the sound over many octaves, and fine pitch (F. PITCH) (D) - this only applies when MNSP is off (E) as the midi note selects pitch when it is on.

## MNSP

To switch MNSP on and off you use the fifth control - clockwise turns MNSP off (NO), anti clockwise turns MNSP on YES).

When MNSP is on -the incoming midi note selects the pitch of the voice (i.e. midi note no. 60 is middle C, 61 is C# 62 is D etc.), -although you can set the octave that the voice is pitched at with the octave shift controls (F), when MNSP is switched off, then the pitch of each channel is set up by the coarse and fine pitch controls.



## CHOOSING A VOICE

The SDE stores its voices in an area called the 'voice library'. In this area are 20 factory voices, 20 user voices (you can program these). There is also library areas in the cartridge area, 20 each in banks A, B, C, and D.

It is important to understand how the SDE deals with its sounds and its channels. Many patches use the same sound, so changing sounds in one patch can effect the sound in other patches. Each 'patch' (or set of 6 channels) picks up a set of sounds from this library, - change any voice in the library, and any patch that uses that voice will sound different.

You choose a voice for each channel in each patch by choosing a 'voice number' (factory voice 1,2,3 - 20, user voice 1, 2, 3 - etc.) with the 'choose voice number' control (A). Rotating the control clockwise chooses high voice numbers, anti-clockwise chooses lower numbers. (A dot lighting in the display tells you it is a 'user' voice). Use the select button to change from factory to user or cartridge.

A 'user' patch may use voices stored in the cartridge or the factory libraries - press select to cycle around the three areas.

So, a patch consists of the following data:

**PATCH NUMBER**

<b>CHANNEL NUMBER</b>	<b>VOICE NUMBER</b>	<b>CHANNEL DYN. SENS (SINGLE-OFF)</b>	<b>CHANNEL PITCH (MNSP = OFF)</b>
1	NN	NN	NN
2	NN	NN	NN
3	NN	NN	NN
4	NN	NN	NN
5	NN	NN	NN
6	NN	NN	NN
PATCH DYNAMIC SENS (SINGLE = ON)			NN
OVERALL VOLUME			NN

NN = A different value.

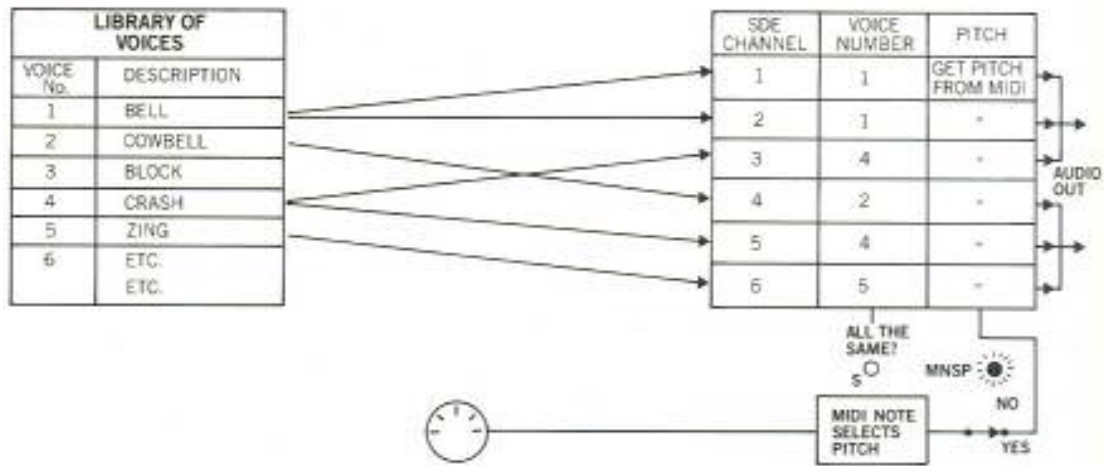
As you can see from the above table if the incoming midi note does not select pitch (MNSP = off) then you can set up a different pitch for each channel in the patch.

You can also see that if the patch is in single mode (S = on) then only one voice number has to be chosen for the entire patch. This also applies to dynamic sensitivity. If the SDE is in single mode then the dynamic sensitivity is the same for the entire patch. Remember dynamic sensitivity is how your playing dynamics effects the sound of the voice.

Here are two examples of data that might have been programmed for patches 16 and 18.

### EXAMPLE SDE PATCH MODE 3

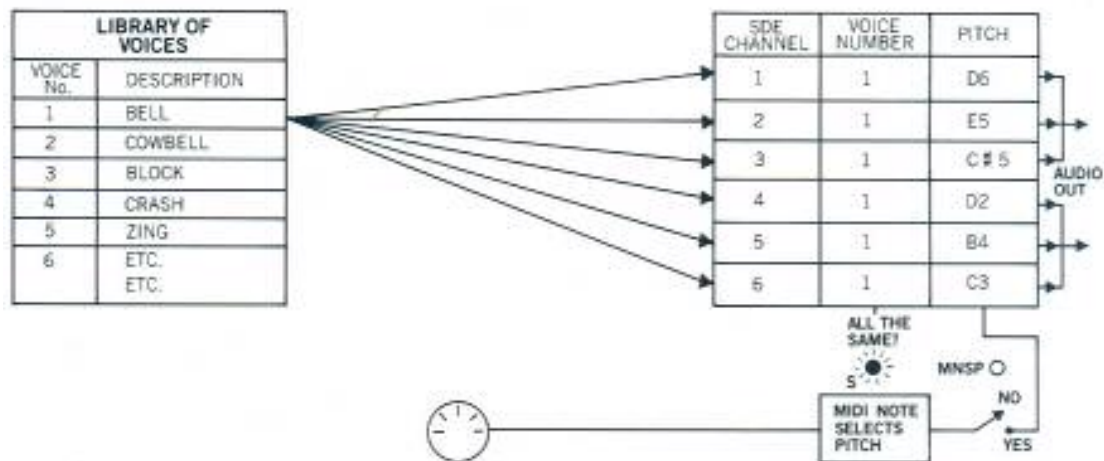
#### PATCH No.16



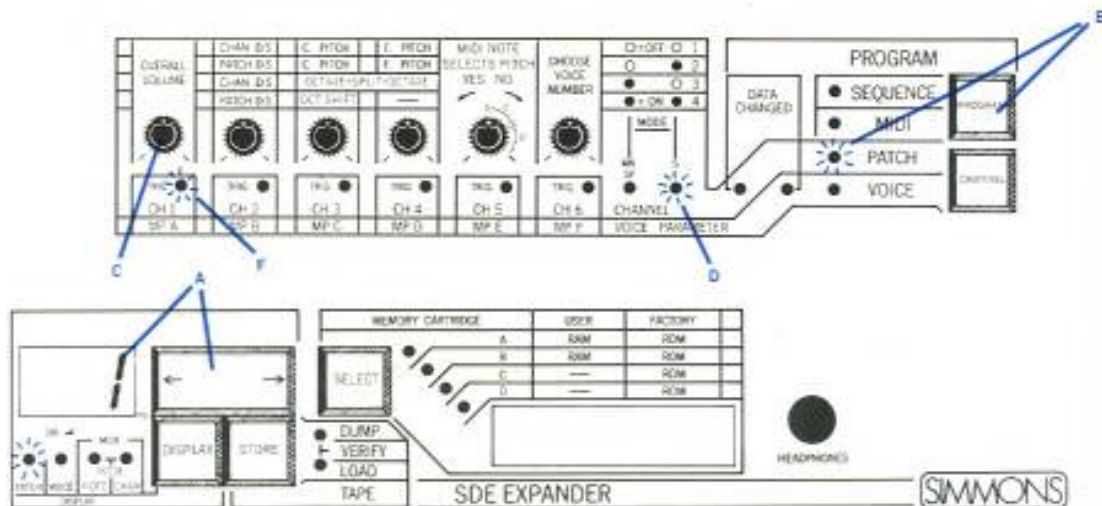
In this example the patch 16 uses different voices, - a bell, a cowbell, a crash and a zing. The pitch of each of these sounds is derived from the incoming midi note number (midi note selects pitch).

### EXAMPLE SDE PATCH MODE 2

#### PATCH No.18



In this example the patch 18 uses the same voice - a bell, so the 'single' LED is on - MNSP is off, so the pitch of the bells is programmed in the patch.



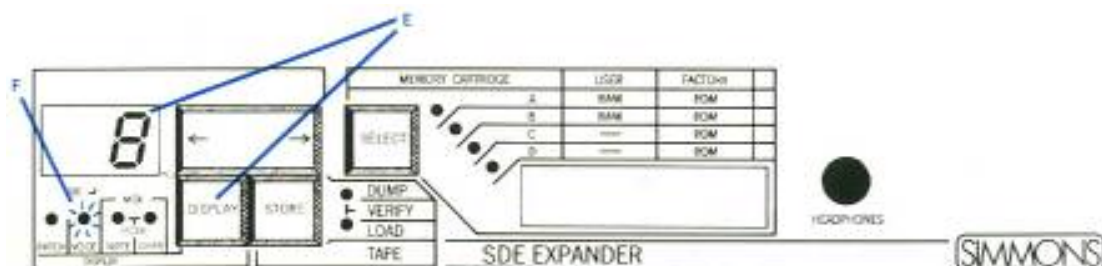
## PROGRAMMING A PATCH - THE BUTTON PUSHING

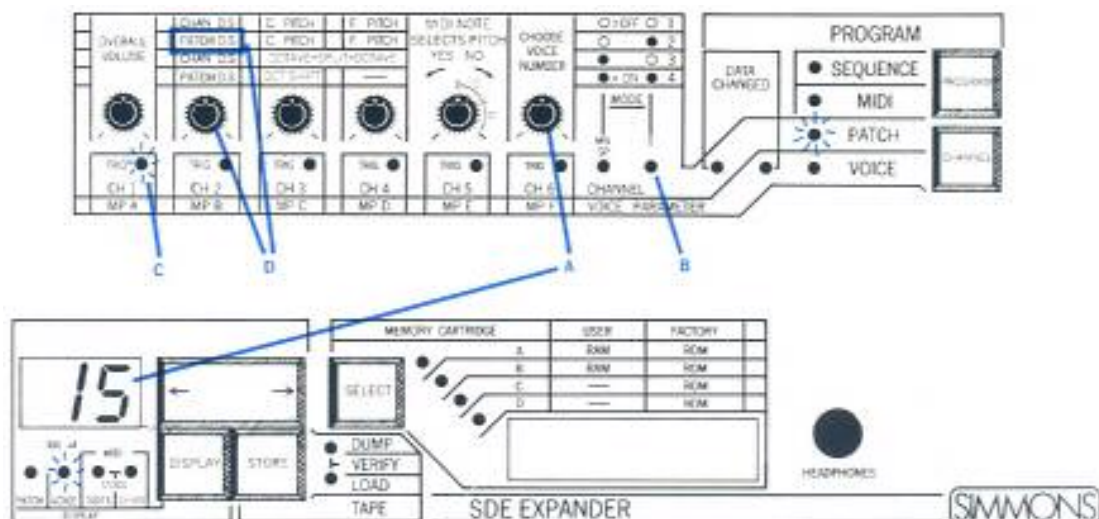
Let's now try and program a new patch. We will start by programming patch number 1.

(NOTE: this is a factory patch but you are still allowed to re-program it. What you will not be allowed to do is store it back as factory patch 1. You can however, store it back in the user area). So select factory patch 1 by using the 'UP/DOWN' button (A).

Press 'PROGRAM' and you see that the program patch LED lights up (B) and channel 1 select (trigger) LED comes on. Whilst striking the drums try changing the overall volume by turning the left-hand control (C). Note that you have to activate the pots by turning them past the previous value program for that patch, so turning the pot fully clockwise and anti-clockwise will ensure that the pot is activated. Note that you can set the overall volume of patch 1 with this control.

You can see that the single mode LED is lit (D). This means that all the voices in patch 1 use the same voice number. If you want to see the voice number that is being used press the display button to the right of the display, you will see that the LED moves from patch to voice telling you that the voice number is now being displayed (F). You can see that patch number 1 uses voice number 8 (E).





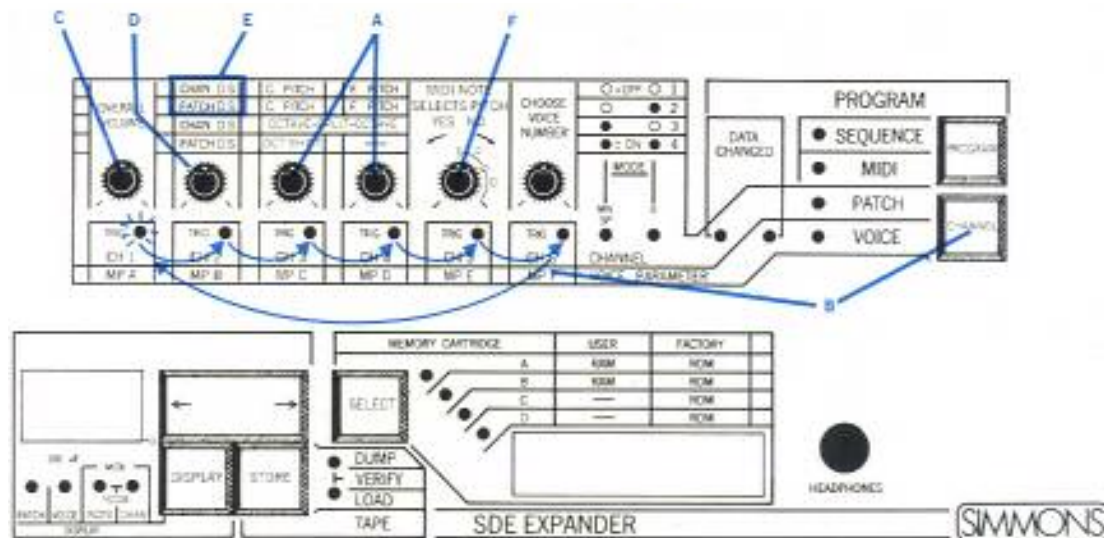
## CHANGE VOICE NUMBER

If you want to change the voice number turn pot number 6 'CHOOSE VOICE NUMBER' and you will see that the display changes as you turn the control (A). Each new number represents a new voice number in the library. You will notice as soon as you choose a voice number that is not 8, that the SINGLE (S) LED goes out (B) - this is because you have now got a mixture of voices in patch 1 - channels 2 to 6 using voice 8, channel 1 using the new voice number (channel 1 SELECT (TRIGGER) LED is lit - you are programming channel 1 in patch 1) (C).

Whilst you are hitting channel 1 you will be able to hear the different sounds of the different voice numbers. There is a list of the voice numbers stored in the factory library at the end of this manual. Turn the control to choose voice number 8 once again (the SINGLE led will come on again). Note: You can use the 'UP/DOWN' buttons to change voice number, while the display voice LED is on.

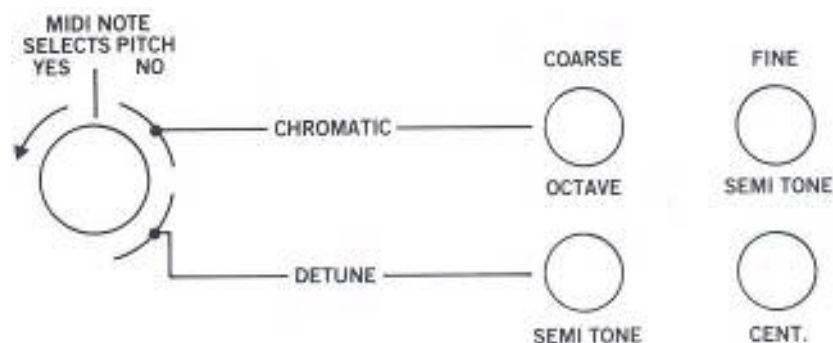
## DYNAMIC SENSITIVITY

Try changing control number 2. This is the DYNAMIC SENSITIVITY for the entire patch (D). Whilst striking the drum turn this control up and down. You will find when the control is fully anti-clockwise, the sound is the same when hit softly as when it is struck hard. This means the dynamic sensitivity is 0. Turning the control progressively clockwise introduces more dynamic sensitivity into the sound. This means that the sound will change as you strike the drum harder. Note: the volume of the sound is always controlled by how hard you strike the drum.



## COARSE PITCH AND FINE PITCH

Next controls, 3 and 4 are COARSE PITCH and FINE PITCH (A). These two controls are used to set the pitch of each of the channels. Obviously you cannot do all six channels at once, so you will have to choose which channel you want to change the tuning of by pressing the 'CHANNEL' button. Pressing the 'CHANNEL' button cycles around the channel LEDs, channel 1, 2, 3, 4, 5 and 6 and then back to channel one again (B). The TRIGGER LEDs become CHANNEL SELECT LEDs in this mode. For example, leaving channel 1's select LED lit whilst striking the drum assigned to channel 1, change the COARSE and FINE PITCH of the sound then move onto channel two by pressing the 'CHANNEL' button. Channel two SELECT LED will light. Strike the drum assigned to channel two and use the same controls (COARSE AND FINE) to change the pitch of channel two. There are two ranges for the tuning controls - 'Chromatic' and 'Detune' which is chosen by the MNSP control (No. 5).



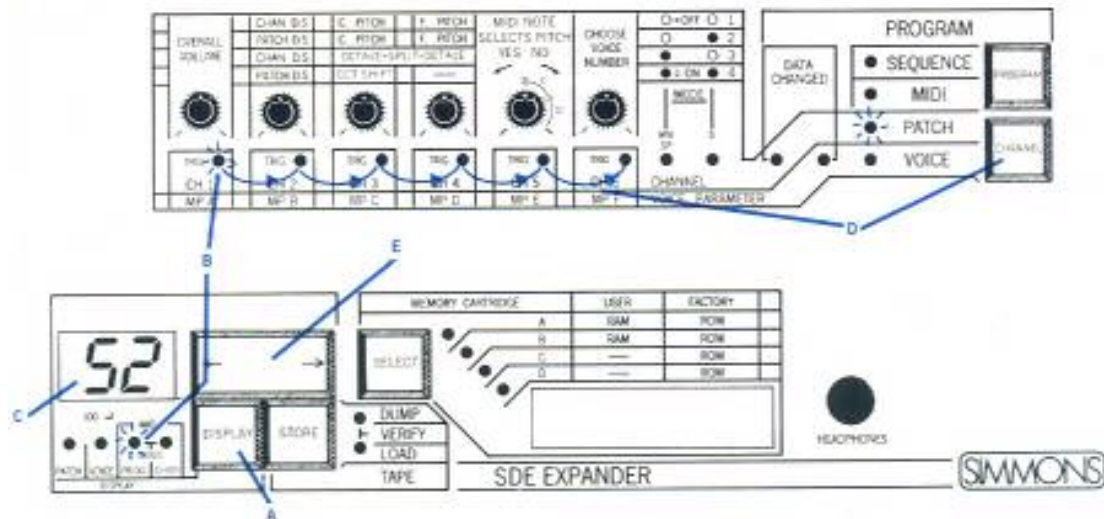
## CHROMATIC TUNING AND DE-TUNING

Turning MNSP to 'NO' you can see there are two sections 'C' (for Chromatic) and 'D' (for Detune). With the control in the chromatic position the coarse tuning will change the tuning of the selected channel in steps of an octave, whilst the fine pitch control will change in steps of a semitone.

When the MNSP control is turned to detune then the coarse tune control varies the pitch in semi4one steps, while the fine tune varies tuning in fractions of a semi-tone.

You can repeat this around all six channels -setting the relative pitches for all the channels. At any time you can adjust the OVERALL VOLUME (C) and the DYNAMIC SENSITIVITY (control two) (D) to change the sound of the entire patch. You can also select new voice numbers for each channel, but then the DYNAMIC SENSITIVITY applies individually for each channel rather than for the entire patch (E). If you want to have the pitches of the channels controlled by the incoming midi note, control five can be used to switch midi note selects pitch (MNSP) to 'YES' (F). This means that the pitch information set up in this patch will be ignored. The SDE is expecting the incoming midi note number to be the pitch of the channels, although the octave shift control can be used to shift the pitch by up to 3 octaves.

When MNSP is off the incoming midi notes choose the channel to be played to program these notes press display.



## PROGRAM PATCH - MIDI NOTES

Press 'DISPLAY' (A) and you will see that the mid note LED is lit as well as channel 1's select LED (B). The display will now be displaying the mid note number that has been assigned to SDE channel 1(C). You can change this number with the UP/DOWN button (E). Remember this is the note that will have to be sent to SDE to play channel 1 in this particular patch. This is not to be confused with the global notes that are set up in the SDE midi modes.

Press channel to move onto channel 2 (D). Use the up down button to change the midi note number for channel 2 if required. Press 'DISPLAY' to display the patch operating modes.

## • PATCH OPERATING MODES

The patch operating modes is a set of rules that tells SDE how to manage its six voices. This is sometimes termed 'Note Robbing'.

SDE has six voices. This means it can only ever play six sounds all at once. It can, however, play more than six notes one after the other. If you were using a patch where MNSP is on then incoming midi notes will choose a pitch for the various channels, so if you had eight pads connected to TMI or MTM and you played up the pads SDE channels would be assigned as follows: Pad 1- channel 1, pad 2 - channel 2 etc, through to pad 6 channel 6. Pad 7 would rob channel 1 and pad 8 would rob channel 2.

Another example is the MTM "echo up in l's" where you hit a pad and MTM sends a chromatic scale to the expander. This can be 30 or 40 notes sent one after the other (it sounds a bit like a bell tree). Obviously if you are restricted to just six notes only six notes would sound, but what SDE can do is continually rob previously used channels so that you are fooled into thinking there are more than six voices.

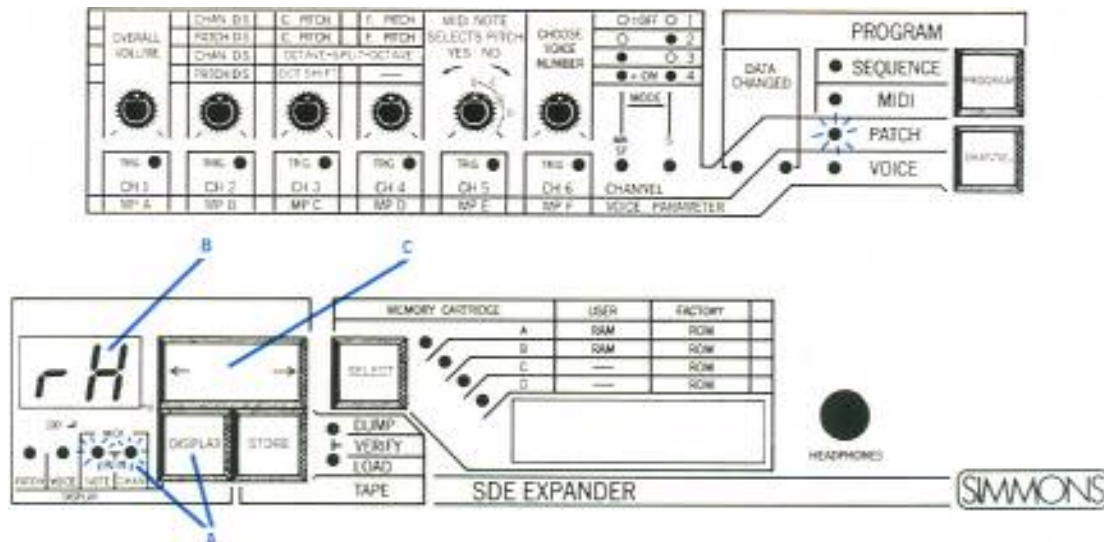
There are four robbing modes:

1. No robbing.
2. Rob highest note.
3. Rob lowest note.
4. Cycle.

### **OPERATION MODE - NO ROBBING**

This means that SDE is not allowed to rob any notes. This is the mode that would normally be used for MTM in its chord layering mode. MTM can send more notes in the layered chord than SDE is capable of playing simultaneously. If SDE was allowed to rob the first note that it received (this is always the fundamental of the chord), as you played the drum harder, and more notes were layered, the fundamental would disappear, which is undesirable. What would happen in "no robbing mode" is that some of the notes will be lost off the top of the chord.

This will be most noticeable if you are using SDE channels in split mode (see splits below) and MTM requires more voices to build its chord, i.e. you have four voices available (2 of the voices are playing a bass line and MTM requests a six note chord. What will happen is the bass notes will carry on in the rift (not robbed) and you will get a four note chord rather than six notes as requested.



### ROB HIGHEST NOTE

This would be used when you have a chord plus a solo voice, in other words, SDE has received a six note chord from MTM and while this chord is being played it receives more requests for notes. In this case notes will be robbed off the top of the chord leaving the root and lower notes of the chord intact, thus producing a solo effect on top of a backing chord.

### ROB LOWEST NOTE

This is exactly the inverse as described above for Rob Highest Note. If a chord is being played that uses all six channels, new requests for channels will be assigned the channels playing the lowest notes.

### CYCLE

In this mode SDE will rob the next channel in sequence i.e. 1, 2, 3, 4, 5, 6, 1, 2 etc.

### PATCH OPERATION MODE - THE BUTTON PUSHING

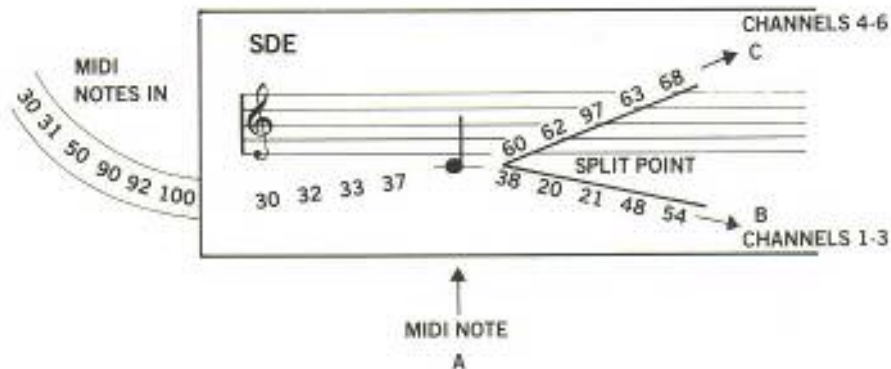
Enter program patch. Press the 'DISPLAY' button three times so that the mode LEDs are lit (A). The display will show one of four codes:

- nr = no robbing,
- rh = rob highest,
- rl = rob lowest,
- c = cycle (B).

You can choose which operating mode this particular patch uses by pressing the UP/DOWN button (C). You will see that the display cycles around the four modes, nr, rh, rl, c.

Press 'DISPLAY' to return to program patch or 'CHANNEL' to choose 'PROGRAM SPLITS'.

- **SPLITS**



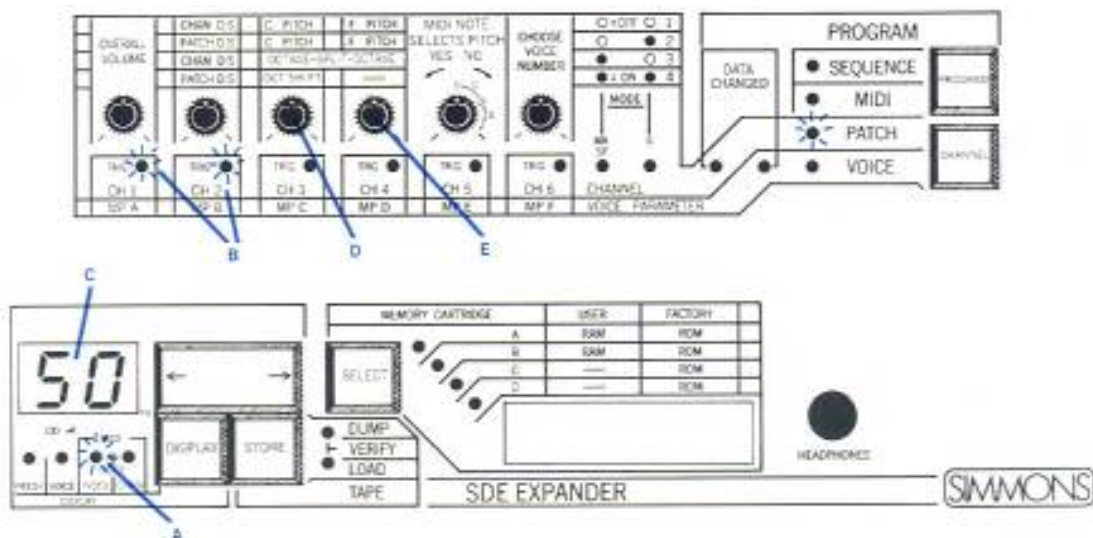
For those patches where 'mid note selects pitch' you may want different ranges of midi notes to use different SDE sounds. For example you may want the lower octaves to be a bass sound whilst the higher octaves use a bell-like sound. This is particularly useful with the MTM where you can program a bass riff (set off by hitting a pad) and then chords programmed on different pads. With other expanders you would have to have all the sounds the same (an alternative is to buy two expanders, - one expander switched to one sound and the other expander switched to the other sound).

With the SDE you can just program the point at which the midi note chooses a different set of sounds. Those below this point would choose one sound, those above this point would choose another sound.

You choose the split point to be in between two SDE channels, in other words you can have one channel playing below the split and five channels above, or two channels below and four above, or three below and three above or four below and two above or five below and one above. You then assign different voices to the channels in the patch so as to arrange different voice numbers to be either side of the split.

**Example:** You program the split to be between channels three and four and the split point is midi note 60 (A). This means that midi notes 0 to 59 will use channels one to three (and whatever voice has been programmed for those channels) (B). Above midi note 60 SDE will assign channels 4 to 6 (which can have a different voice) (C).

If you then program voice 1 to 3 to have a brass sound and 5 to 6 to have a bell sound all the lower notes up to midi note 60 (middle C) will have a brass sound and all notes above middle C will have the bell sound. Note: This can be set up on a patch by patch basis so that you can have a different split in every patch. The note robbing or operational mode for each side of the split is as described above.



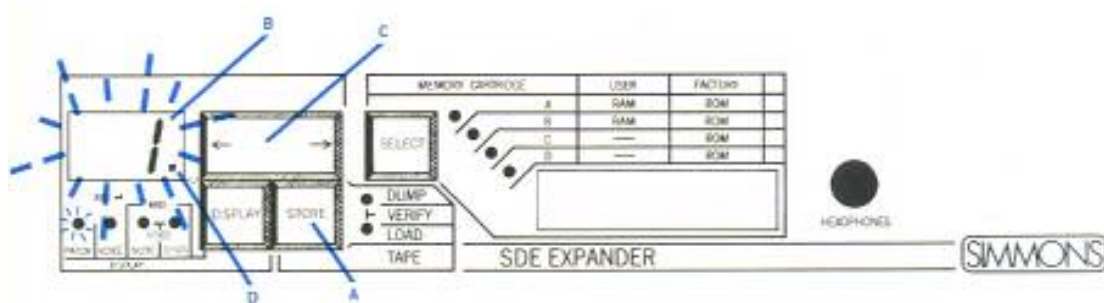
## SPLITS - THE BUTTON PUSHING

The splits are programmed in program patch with the midi note LED lit, and two channel LEDs are lit, so press 'PROGRAM' until the program patch LED is lit, then press 'DISPLAY' until 2 channel LEDs (B) and the midi note LED (A) are lit. The 2 channel LEDs (B) refer to the SPLIT MODE ie how many voices are assigned to each side of the split. If the 2 LEDs are not adjacent then no split has been set up. If 2 LEDs are adjacent then the channels up to the 1st LED are assigned to the bottom half of the split, and the other channels are assigned to the top half of the split. The number displayed (C) is the midi note of which the split appears. If no split is selected then - will appear in the display and the 'USER' dot will be off. The note at which the split occurs can be changed by the UP/DOWN button. Pressing 'CHANNEL' moves the split position to the right all the time. So it can be between channel 3 and channel 4, channel 4 and channel 5, or channel 5 and channel 6.

You can only have one split per patch and pressing 'CHANNEL' one more time so that select channel 1 is lit as well as channel 6, means there are no splits for that patch, (the display will display two dashes). You can program an octave shift for each set of channels, each side of the split the left hand control sets the octave shift for the left hand side (D), the right hand control sets the octave shift for the right hand side (E).



- STORING A PATCH



You have now edited factory patch number 1. If you want to store this patch you can press the 'STORE' button to the right of the display (A). Note that the display starts to flash (B) on the first press of 'STORE'. This means that your edited patch has been temporarily saved. You can now change the patch number with the UP/DOWN buttons if you want (C).

Pressing 'STORE' again will then store the new edited patch into whatever patch number you have chosen. Note: You will not be allowed to store it in the factory area or in a factory cartridge. You will only be allowed to store in the user area or a user cartridge. You can tell whether you are in the user area because the dot in the seven segment display (U) will be lit (D).

When you press 'STORE' in a user area the display will flash "S-T-O-R-I-N~O" - STORI NO. If you attempt to store in the factory area or in a factory cartridge the display will flash "N-O"-NO.

- **MEMORY MAP FOR SDE PATCHES**

PATCH NUMBER	
1.....20 FACTORY PATCHES	(MIDI PROG CHANGE) (21-40)
You cannot change these. You can use them as a starting point for your own patches.	
1.....20 (DOT ON) USER PATCHES-	(MIDI PROD CHARGE) (1-20)
You can change any of these. Store your modified factory patches here.	

**CART CP3**

CARTRIDGE - SECTION A	(MIDI PROG 41-60)
CARTRIDGE - SECTION B	(MIDI PROG 61-80)
CARTRIDGE - SECTION C	(MIDI PROG 81-100)
CARTRIDGE - SECTION D	(MIDI PROD 100-120)
PATCH NUMBER	
1.....20	FACTORY PATCHES - ROM
You cannot change these. You can use them as a starting point for your own patches.	

OR

**CART CP2**

CARTRIDGE - SECTION A	(MIDI PROG 41-60)
CARTRIDGE - SECTION B	(MIDI PROG 61-80)
PATCH NUMBER	
1.....20	FACTORY PATCHES - ROM
You cannot change these. You can use them as a starting point for your own patches.	

OR

**CART CP1**

CARTRIDGE - SECTION A	(MIDI PROG 41-60)
CARTRIDGE - SECTION B	(MIDI PROG 61-80)
PATCH NUMBER	
1.....20	FACTORY PATCHES - RAM
You cannot change these. You can use them as a starting point for your own patches.	

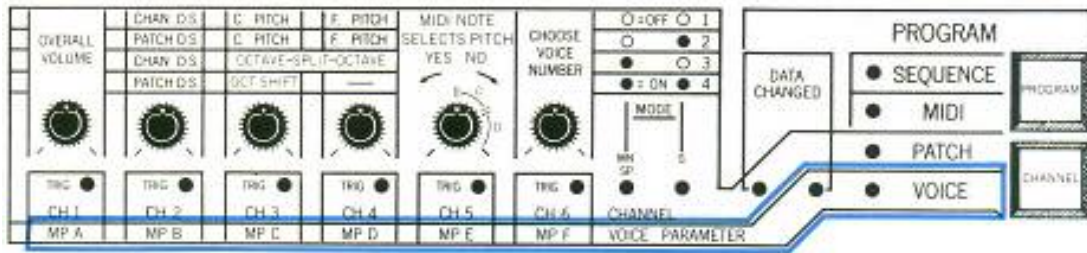
## • VOICING

The voices themselves are generated by a complex mathematical formula and have a vast range of sounds, however the control of all the parameters have been tied together wherever possible to conform to the general understanding of sound parameters. The parameters are controlled by simple manipulation of six controls and are easily understood in terms of brightness, modulation, decay, attack, harmonic content etc.

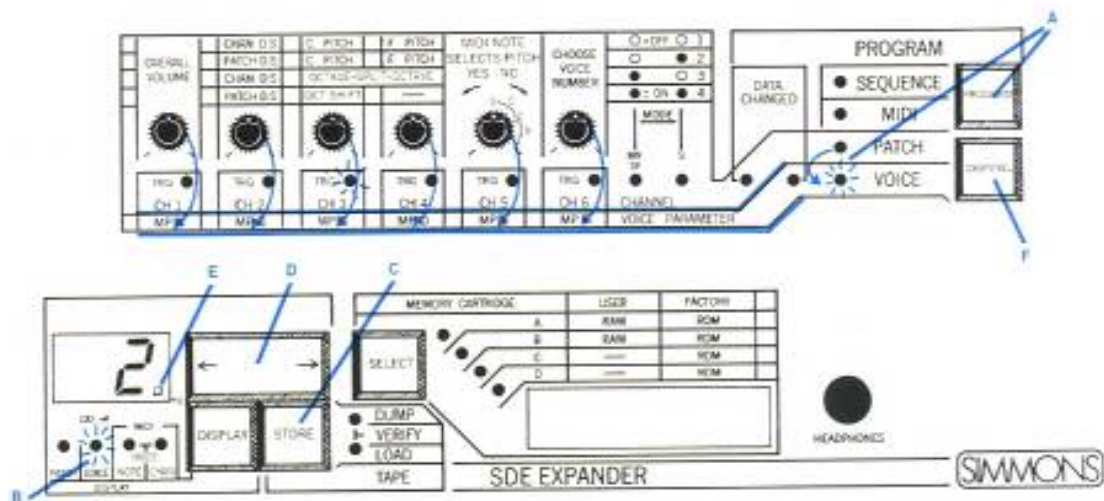
The parameters are arranged in such a way that is no longer necessary for the musician to deal with a vast array of numbers, all he has to do is to choose the particular range of sounds that he wants, recall that pre-programmed sound from the SDE memory and then use the six controls to vary the parameters within certain limits. It is simply a matter of 'playing' with the controls to achieve the desired effect. The musician is freed from mathematics to experiment aurally with the possibilities of these complex sounds.

The SDE has forty sounds on board. Twenty of these are the factory sounds and these cannot be altered. The other twenty are the user sounds and you change these to suit your own taste. SDE also has a slot for a cartridge. The cartridge can contain up to eighty extra sounds. These cartridges can contain factory sounds or you can purchase user cartridges to store your own sounds. With a cartridge entered in the SDE the unit has one hundred and twenty different voices or sounds available for use. The six channels on the SDE can call up any one of these sounds so you can have six different sounds, each one being assigned a different channel, or alternatively you could have the same sound assigned to all six of the channels or any combination of these.

- **PROGRAMMING VOICES - M.P.C's**



Each patch in SDE uses one or more (a maximum of six) different voices from the library. You can change the sound of any of these voices using the six MULTIPLE PARAMETER CONTROLS, (MPC A, B, C, D, E and F). These parameters have been chosen to be 'musically useful' depending on the sound you are trying to make. The definition of the multi-parameter controls can be found in the back of the manual and are grouped by the type of sound being produced. The best way to use these controls is to start with a library sound that is somewhere near what you are trying to create. For example if you have a brass type sound but you actually want to obtain a tubular bell sound it is better to start with a bell-like sound rather than the brass sound. It may not be possible to obtain the bell sound from the brass sound with the MPC's that have been chosen to suit brass type sounds, which will obviously be something to do with 'brightness' and 'attack' rather than 'modulation' and 'clanginess'.



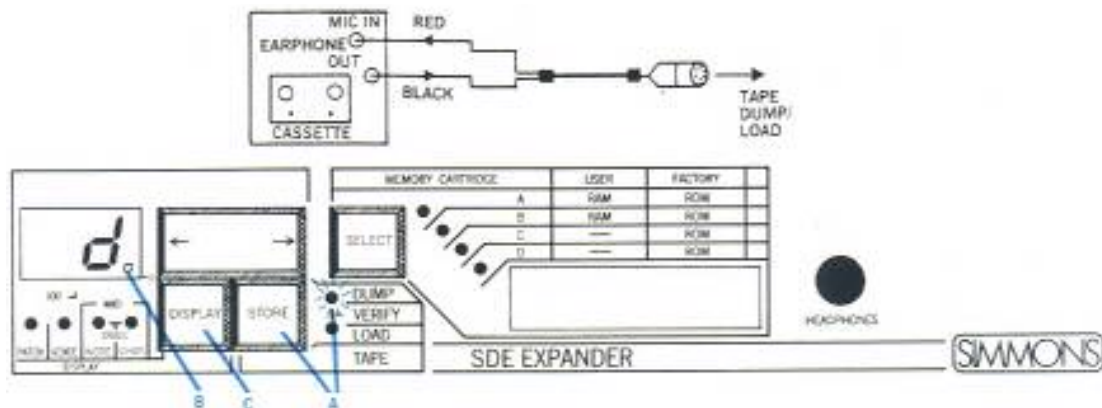
### PROGRAM VOICE-THE BUTTON PUSHING

You can program a voice whilst you are programming a patch. For example, you have entered factory patch 1 and you are programming channel 3. Whilst you are programming channel 3 you choose a new VOICE NUMBER, say, voice number 2. When you do this you will see that the SINGLE LED that was previously on has gone off, this is because the patch now uses two voices, channel 3 uses voice 2, the rest of the channels, 1, 2, 4, 5 and 6 uses voice 1. Whilst you are programming channel 3 you can press 'PROGRAM' which will light PROGRAM VOICE LED (A). The six MPC's can now be used to change the sound of voice 2. So whilst hitting channel 3 try changing some of the controls. You will hear drastic changes in the quality of the sound. The MPC's are changing many parameters at once in the sound. When you have reached the desired sound you can store it in a similar way as you did your modified patch. Remember that you can only store in the user area.

Make sure the display is displaying voice (B), press display if it isn't. Press the 'STORE' button, you will see that the display flashes meaning that the edited voice is temporarily saved. Use the UP/DOWN buttons (D) to choose where you want to store the new voice and then press 'STORE' again. If you are in the user area the display will flash 'STORING'. If you are attempting to store in the factory area the display will flash 'NO'. (User = Dot On-or Cartridge User RAM) (E).

Note that you have now changed what was previously stored at the voice number. Supposing you stored your edited voice at voice number user 10, any SDE patch that used voice number user 10 will obviously get the new sound. The other thing to remember at this stage is that you were editing patch number 1. You programmed channel 3 to have a new voice but you did not save the new version of the patch, so if you want to save this new patch (channels 1, 2, 4, 5 and 6 using voice number 1 and channel 3 using voice number 15) you will have to store this patch in the user area somewhere. Press channel (F) to go back to programming the patch.

## • TAPE DUMP/LOAD



Once you have programmed your own patches and voices into the SDE it would be wise to make a cassette copy of the data. You can use the cassette dumping facility to build a library of patches and voices to suit every occasion. Once you have a copy of SDE's data on cassette you can load it back into the SDE at any time using the 'CASSETTE LOAD' option. There are three options that you can use that are associated with the cassette. They are CASSETTE DUMP, CASSETTE LOAD and CASSETTE VERIFY.

### CASSETTE DUMP

During cassette dump SDE converts the data into a serial stream consisting of two tones and sends this signal out to the cassette socket (on the back of the unit). The cassette recorder records the data as normal.

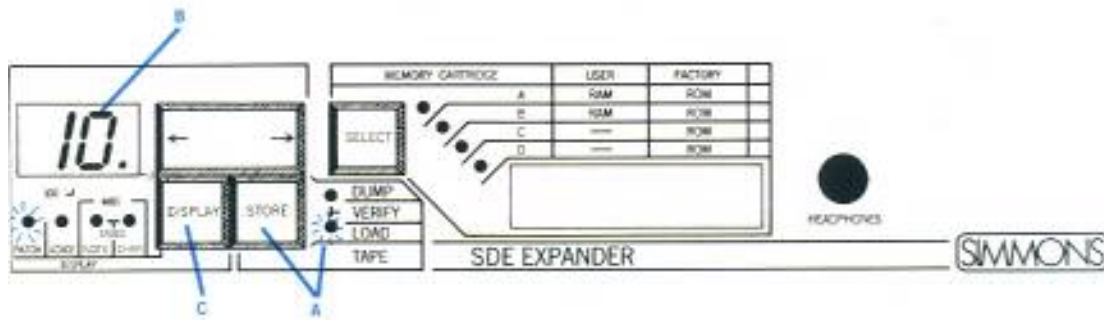
Connect SDE to your cassette recorder's mike input and earphone output using the din to midi jack lead supplied.

Once you have connected up your cassette recorder press 'STORE' (make sure you are in patch playback mode and not in any of the programming modes). The dump LED will light, after a few seconds SDE will send a header tone to the cassette player (the display will show 'd.'). After a few seconds of this header tone SDE will start to dump its user area to the cassette tape (the display will show the patch and voice numbers 1 to 20, the six sequences and midi data). After the SDE's memory has been saved on the cassette it will return to the 'Playback state'.

So the following actions are needed to dump SDE's user area: Plug the cassette in. Make sure SDE is in playback mode. Start the cassette recording by pressing 'PLAY' and 'RECORD' and then press SDE's 'STORE' button.

If you want to add a longer 'header tone' or separate voice and patch or sequence data with a header press the STORE button whilst the SDE is dumping. Whilst the store button is held down the SDE does not send the data -only the 'header signal'. Press 'DISPLAY' to abort the dump (C).

This is useful as the header forms an audible key' in the dumped data. You may have a tape with four sets of data - the only way to find where one set ends and the next begins is to listen for the header tone. This can be recognised as a constant high pitched note as against the warbling sound that is made by the data stream.



## LOADING FROM CASSETTE

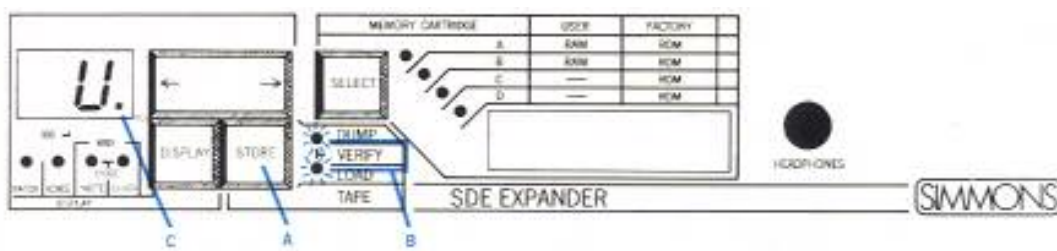
**WARNING - If you successfully load from a cassette, any voices and patches stored in user area will be over-written by the new data.**

Make sure SDE is in playback mode. Rewind your tape to the start of the information that you wish to load. Press the 'PLAYBACK' button on your tape recorder, then press 'STORE' twice on SDE so that the LOAD LED is lit (A). SDE will then read from the cassette recorder and store the data into its user area -over-writing any data that was there before. The display will show an 'L' whilst the SDE is reading the header tone, and the patch, voice, and sequence numbers plus the midi data when it is loading the user area (B).

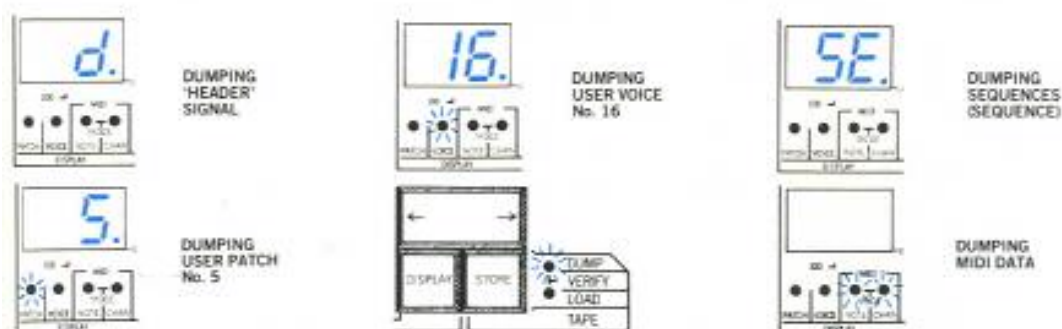
At the end of the data SDE will return to the playback mode if everything is alright. If it has found an error in the data stored on the tape then it will display 'E'.

Note: SDE will not load unless the tape recorder is running.

Press 'DISPLAY' to abort the load (C).



EXAMPLES OF DISPLAY DURING TAPE DUMP/LOAD/VERIFY



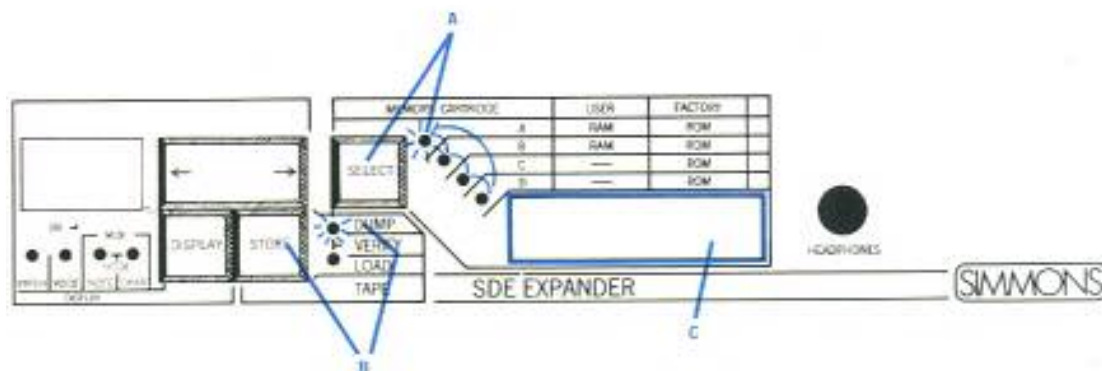
## VERIFY

Once you have dumped the user area to cassette you can check (or verify) that the data has been successfully recorded. Rewind the tape to the start of the header tone. Make sure SDE is in playback mode. Press the 'PLAY' button on your tape recorder. Press the 'STORE' button on SDE three times (A). You will see that both the dump and load LEDs come on (B). This means that SDE is in verify mode. Your tape recorder is now playing back the data into the SDE and SDE is checking that the data it is reading from your cassette player matches what is in its memory.

If all is going well then SDE will be displaying the various patch, voice and sequence numbers plus the midi data and header tone 0/) as it checks them (C).

If it has found a discrepancy between the data it is reading from the tape, and the data stored in the SDE's user area then it will display an "F" (FAIL). This normally means that you have changed some of the data in the SDE's memory at some time, but have forgotten to update the cassette tape, or you are checking the wrong tape.

If it finds a tape error then it will display "E" (ERROR). This normally means that the data is not being played back at the correct level, or the tape has been damaged in some way or the original data was not recorded at the correct level. If you get the 'ERROR' message you will have to attempt to dump your data once again. It is always wise to make multiple copies of things that you want to keep permanently, as cassette tapes are notoriously bad for storing computer data.



## LOADING TO AND FROM THE MEMORY CARTRIDGE

As well as saving and loading to the user area inside SDE you can save and load to the memory cartridge. All the actions are as described above for the main user area except that you select the memory cartridge with the select button (A). When any of the areas A, B, C or D are lit then you are loading and dumping to and from the memory cartridge rather than the user area. So the following actions are taken when dumping from the memory cartridge: Make sure SDE is in the playback state. Switch your recorder into record mode and press the 'STDRE' (B) button. Select memory cartridge section A, B, C or D (this will depend upon the type of cartridge you are using - obviously you cannot load into a "factory" cartridge) (A). The dump LED will light and SDE will send the data in the memory cartridge to the cassette.

Verify and load are as described for the SDE's main memory above.

The SDE comes supplied with a factory cartridge which contains 2 banks of factory sounds for you to experiment with. Bank A has 20 patches and 20 sounds, bank B has 20 patches and 20 sounds. There are three types of cartridges available:

CARTRIDGE PACK 1 (CP1) = Ram pack that can store 40 voices and 40 patches. 20 in each of banks A and B.

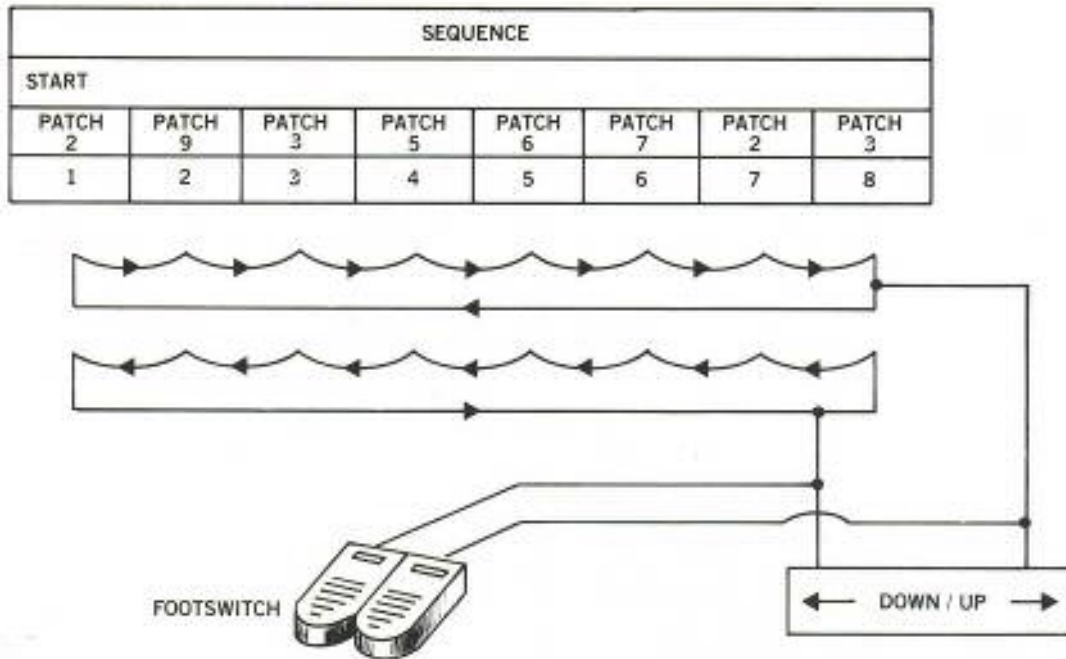
CARTRIDGE PACK 2 (CP2) = 40 Factory voices and patches. 20 in each of banks A and B.

CARTRIDGE PACK 3 (CP3) = 80 Factory voices and patches. 20 in each of banks A, B, C and D.

The different types of sounds stored in the factory cartridges are listed in the back of this manual.

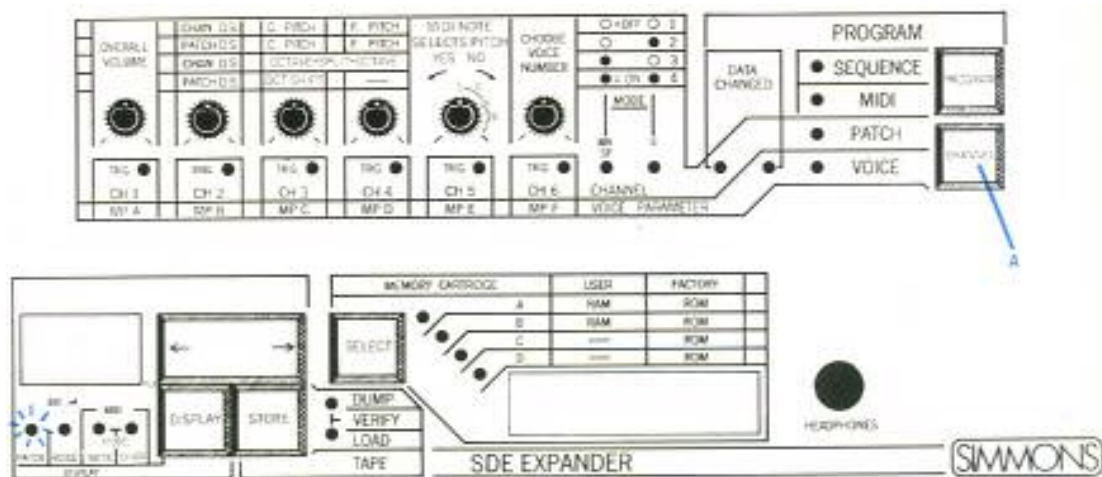
- SEQUENCE (OF PATCHES)

#### EXAMPLES OF A SEQUENCE



You can step forwards and backwards through the various patches in SDE one by one by using the UP/DOWN button or a dual footswitch. In a live performance you may not wish to step logically through the SDE patch numbers in this fashion. You may want patch 2, then patch 9, then patch 3 etc., to suit the particular piece of music you are playing.

You can string together patch numbers in any order you require and store them inside the SDE memory for future recall. This string of SDE patches is called a SEQUENCE. The sequence can be 99 patches long.



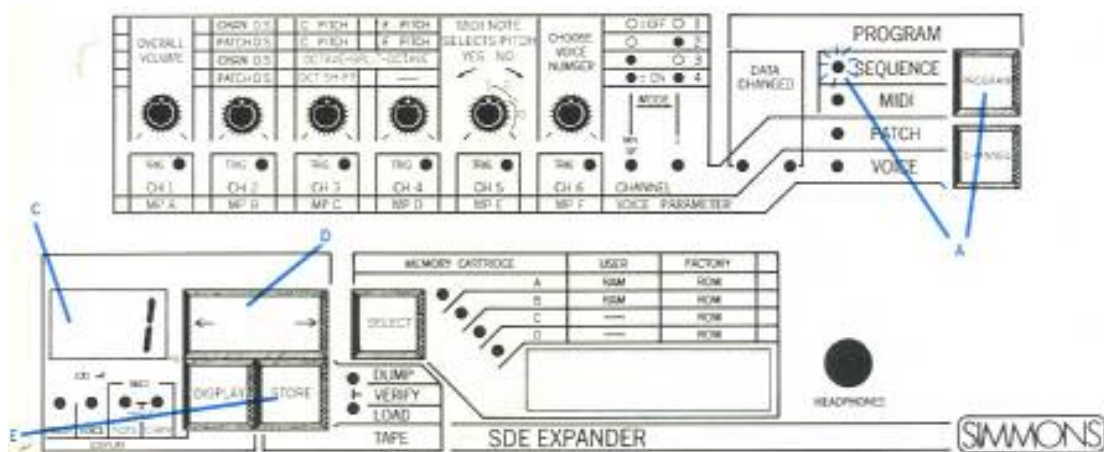
## PLAYING BACK THE SEQUENCES

Whilst you are in playback mode press 'CHANNEL' (A). You are now in 'Playback Sequence' mode. The display shows the patch that has been stored in position 1. This is the starting point for any sequence. From this starting point you can go backwards or forwards through the sequence of patches using the UP or DOWN button (E) or alternatively the dual footswitch. The SDE comes delivered from the factory with the sequence being set to cycle around the factory sounds 1 to 20.

You can then step through each position in the sequence until the end of the sequence. At the end of the sequence the SDE will jump to the first position again. Note that you can go backwards or forwards through the sequence, so if you start from the starting point and press the DOWN button or the left hand footswitch you will start from the end of the sequence and work back towards the beginning.

Press any button (except UP/DOWN) to exit from playback sequence.

- **PROGRAMMING THE SEQUENCE**



You can program the sequence starting from playback patch or playback sequence.

### **PROGRAMMING SEQUENCE FROM SCRATCH**

From the playback patch state press the 'PROGRAM' button until program sequence LED is lit (A). You can see that the display is displaying the first position in the sequence (C). Note: that the starting patch chosen for the first position in the sequence will be the last one that you were using. You can use the UP/DOWN buttons to change the patch number to one that you require (D). Once you have chosen the patch you require for position one press the 'STORE' button (E). The display blinks, and the patch number that was displayed is now stored in position one. You then use the UP/DOWN buttons to choose the next patch you require (D), this will be position two. When you have chosen it enter it by pressing 'STORE' (E). Use the UP/DOWN buttons to choose the next patch, again store position three with the store button.

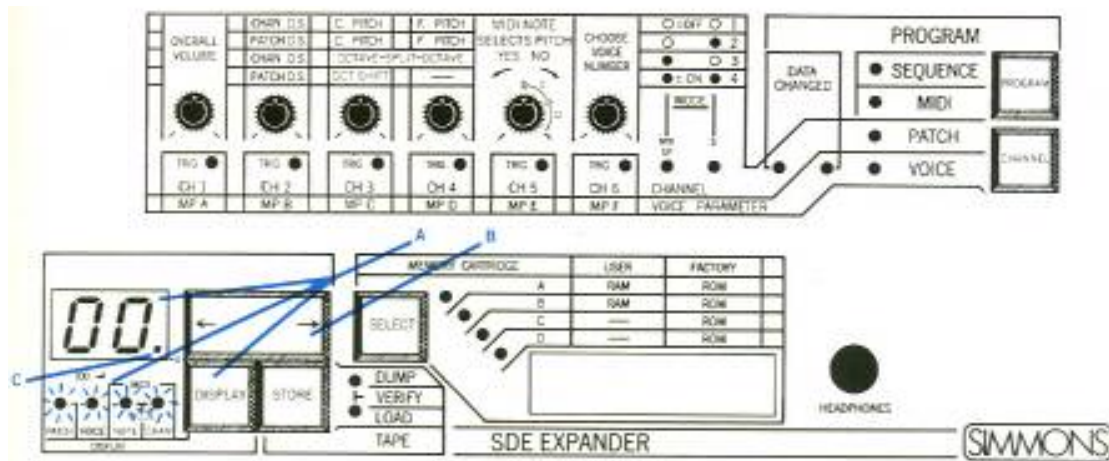
You continue around this loop of choosing the patch number with the UP/DOWN button and storing it with the 'STORE' button until you have completed your sequence of patches. Note that as soon as you store the first position in a sequence any sequence that was there initially will be over written by the new sequence you are programming.

Press 'PROGRAM' to exit from program sequence.

## **ENTER PROGRAMMING SEQUENCE FROM PLAYBACK SEQUENCE**

You can enter into programming a sequence whilst you are playing back the sequence, i.e. you can step half way through the sequence and then go into program and enter new patches from that point. Say you had a sequence that went patch 2, 4, 6, 8 and you wanted to change it to 2, 4, 5 and 6. There are two ways you could achieve this. You could reprogram the entire sequence from scratch, or you could go into playback sequence with the 'CHANNEL' button and then step through to position three which contains patch number 6, press 'PROGRAM' and then use the UP/DOWN Buttons to change the patch number to the new patch number, i.e. patch 6 to patch 5, store this away with the 'STORE' button and then enter patch 6 to complete the sequence.

## • MASTER TUNING



The SDE is tuned to concert pitch A = 440 Hz. You can however, program the SDE to be sharp or flat from standard tuning to match up with other instruments that may not be at concert pitch.

This will effect all the patches and tuning of the voices programmed in SDE. It can be thought of as a master tune. The master tuning will be retained when the power is switched off, so remember - if you have re-tuned SDE to match another instrument, when you switch SDE on again it will still be in that de4uned state.

## THE BUTTON PUSHING

When you are in playback mode press 'DISPLAY' (A), you will see all four display LEDs come on plus 00 in the display. You can use the UP button to tune the SDE sharp and the DOWN button to tune SDE flat (B). The range is 0 to 99 and the dot will be on when you are tuning SDE sharp and the dot will be off when you are tuning SDE flat. Concert pitch is 00 with dot on (0). Press any button to return to playback, any changes that you have made to the master tuning will be stored for future use.

- **MIDI TERMINOLOGY**

The MIDI note numbers which set the note to be played are also accompanied by numbers which tell the synthesizer when the note starts (note on) and when it stops (note off), as well as how loud it is (dynamic).

You can also send a signal down MIDI that will tell the 'listening' synthesizer to change program, i.e. to change its' sound to a new pre-programmed sound.

You won't be surprised to learn that this signal is also a number, and that number is the program that the slave synthesizer will change to. If you send 'program change 34', then the slave synthesizer will change to program 34, whatever that has been programmed to be.

Channel, note, and program information are the three areas that SDE uses. SDE can receive a specific MIDI note, down a specific MIDI channel, at varying dynamic levels, and note lengths (the distance between note on, and note off).

You will come across other aspects of MIDI, sooner or later, here is a brief description of them:

### **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.

**Note information:** when SDE is triggered, information is sent down MID saying that a channel 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 MID 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.

**Omni, Poly, Mono:** these are used to describe how an instrument's voices respond to MID 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.  
**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 719), program change information can be transmitted via MIDI, thus allowing several synths connected together to change patch simultaneously.

**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.

**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. SDE does not use any real time messages.

Here is the chart that converts MIDI note information to the standard chromatic scale:

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 <sup>#</sup> D <sup>#</sup>	F <sup>#</sup> G <sup>#</sup> A <sup>#</sup>	C <sup>#</sup> D <sup>#</sup>	F <sup>#</sup> G <sup>#</sup> A <sup>#</sup>	C <sup>#</sup> D <sup>#</sup>	F <sup>#</sup> G <sup>#</sup> A <sup>#</sup>	C <sup>#</sup> D <sup>#</sup>	F <sup>#</sup> G <sup>#</sup> A <sup>#</sup>	C <sup>#</sup> D <sup>#</sup>	F <sup>#</sup> G <sup>#</sup> A <sup>#</sup>	C <sup>#</sup> D <sup>#</sup>	F <sup>#</sup> G <sup>#</sup> A <sup>#</sup>
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 is

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	

Key

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

As you can see, if a synth received the note number 60, it would know that it was meant to play 'middle C'. Note 66 would mean the F sharp above middle C, 67 and the G above that.

# 1. SPECIFICATION

## SDE - ELECTRICAL/MECHANICAL

### POWER REQUIREMENTS

240V

220V

110V Internally selected AC volts 25VA

100V

Single board computer controlled digital voice generator.

L / R / MONO OUTPUTS - line level 3V p-p

Processor type - 8031

Program ROM 16KB

User RAM 8KB

Expansion cartridge - up to 16KB RAM/ROM

Electronics dimensions including knobs + rack ears + rubber feet. 210x480x55mm

### SDE comprises:- (Sales Reference Number)

1 x percussion expander	(SDE)
1 x factory ROM cartridge	(CP2)
1 x midi cable	(SMC1)
1 x tape dump lead	(TDL1)
1 x guarantee card	

### Packing dimensions

Shipping size/weight 58.5 x 16.5 x 38cms / 3KG

### Accessories available

Factory ROM cartridge 40 sounds (CP2)

Factory ROM cartridge 80 sounds (CP3)

Factory RAM cartridge 40 sounds (CP1)

Dual footswitch (DFS1)

Electronics tray (SET1)

Electronic drum amplifier (SDC200)

### SDE can be used as an expander with:-

MTM percussion interface (MTM)

TMI midi interface (TMI)

SDS 9 drum kit

SDS 800/500/200/5/7 + TMI/MTM,

SDS 1000 + TMI/MTM

SDS 64 + TMI/MTM

Specification subject to change without notice.