

THE **SOUNDBEAM**[®] 2 HANDBOOK

INTRODUCTION

Soundbeam was first introduced at the Frankfurt International Music Fair in November, 1988. Ten years later, our own experiences with it - together with the growing enthusiasm of many of its, by then, more than 1,000 users worldwide - encouraged us to design a new, radically improved and, we hope, even more user-friendly **Soundbeam 2**, offering greatly enhanced possibilities for imaginative and expressive music making to all ages and abilities, amateur and professional alike.

For one thing, we have tried to make **Soundbeam 2** much more easily accessible to first time users - plain sailing to connect, trouble free to operate, and, if you get lost, simple to get back to where you started from - in fact, fool-proof, we hope, even for the most timid of techno-phobes.

At the same time, **Soundbeam 2** opens up new imaginative horizons for professional users already experienced in MIDI technology - the composers, choreographers, performing musicians and dancers who will be able to explore the greatly enhanced creative and expressive possibilities of this newly expanded MIDI controller and performance instrument.

And, of course, whatever your interests - dance and movement, therapy or just plain music making - don't forget that **Soundbeam** is one of the very few ways of playing a musical instrument which enables people with differing levels of dexterity and physical ability to play together as musical equals.

This 3-part "**Soundbeam[®] 2 Handbook**" - with its Appendix A, "**Set-ups and Pitch Sequences**" - is designed to cover everything that anyone, from beginners to advanced users, might need to know. We have tried to provide, in as simple and logical a way as possible, a comprehensive description of how **Soundbeam 2** works and how to use it, so that you can explore the enjoyable and stimulating expressive possibilities it offers.

Edward and Judy Williams,

The Soundbeam Project, Bristol, January 2002.

SOUNDBEAM® 2 HANDBOOK - PART 1

GETTING STARTED

HOW TO USE THIS HANDBOOK 3

WHAT IS SOUNDBEAM® 4

A. OPENING THE BOX 5

PREPARATIONS 10

MAKING THE CONNECTIONS 11

Sensor to Sensor Driver 11

Sensor Driver to Controller 12

Controller's MIDI Output to
musical instrument's MIDI Input 13

Musical instrument's signal outputs to
amplifier and speakers 14

Musical instrument's power unit
to the mains supply 14

Soundbeam's power unit to
mains supply 14

SWITCHING ON 15

B. A LIGHTNING TOUR OF THE CONTROLS 23

PITCH SEQUENCE 25

RANGE 27

DIVISIONS 30

TRIGGER MODE 33

TRANSPOSE 36

MIDI UTILITIES 38

SENSOR 40

SET-UP 43

TO SUMMARISE - A FEW SIMPLE TIPS 46

FINALLY - IF YOU GET LOST... 47

MAKING MUSIC WITH SOUNDBEAM 2 48

CONTACTING US 50

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HOW TO USE THIS HANDBOOK

PART 1 - GETTING STARTED

The first section, entitled **Opening The Box**, will help you recognise the various components of your new machine, check whether you've been sent everything you need for the kit you ordered, and connect everything up.

After that, follow through **A Lightning Tour of the Controls** in the second half of **Part 1**, trying out the different settings suggested and beginning to get to grips with using Soundbeam for your own purposes.

Once you have started using Soundbeam in earnest, you will probably want to move quickly on from the *Locked Set-ups* and **Pitch Sequences** (pre-set in the factory) - with their various settings for **Sensor, Range, Divisions, Trigger Modes, Transpose** and **MIDI Utilities** - to developing your own new, personal ones, and saving them to the *User Set-ups* and **Pitch Sequences** - ie those defined by you. For this, you can consult

PART 2 - STEP BY STEP

which gives examples of all the procedures you need for any of the Soundbeam operations. It may be useful to try them out first yourself, as they stand, before adapting them for use for your own specific needs.

PART 3 - EXPLANATIONS

has detailed explanations of everything you need to know about how Soundbeam 2 works, together with various practical suggestions, a section on Trouble Shooting and a glossary of many of the terms you'll come across in the course of using Soundbeam to make music with electronic musical instruments.

APPENDIX A - SET-UPS AND PITCH SEQUENCES

has details of all the settings collected in each of the 30 *Locked Set-ups*, and all the sequences of notes or chords in each of the 30 *Locked Pitch Sequences*, as well as those for *User Set-up 31* (repeated in *User Set-ups Nos 32 - 128*). and for *User Pitch Sequence 31* (repeated in *User Pitch Sequences Nos 32 - 100*).

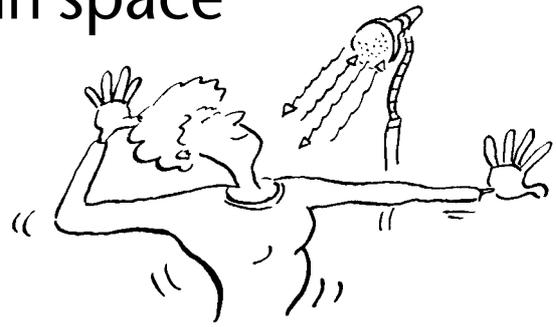
In the folder on the inside back cover of Part 3, you will find 3 blank duplicates of each of the two forms for you to photocopy. They are for recording details of the *User Set-ups* and **Pitch Sequences** you define and Save yourself.

And finally, of course, if you're really in difficulties you can ring Robin Wood's helpline - 01726 883265 (*working hours, weekdays, British time*)

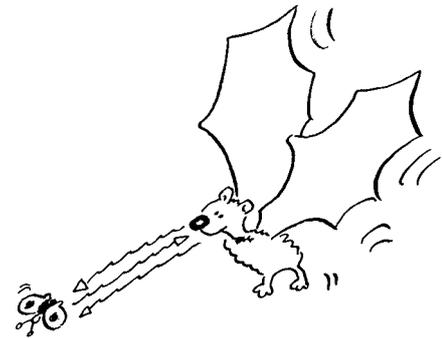
Edward Williams, *The Soundbeam Project, Bristol, England*

WHAT IS SOUNDBEAM®?

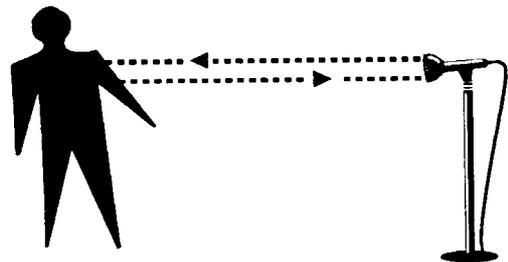
an invisible expanding MIDI keyboard in space



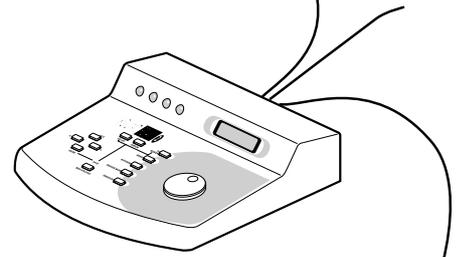
It sends out a 'Beam' of ultra-sonic pulses - like a bat - too high for us to hear,



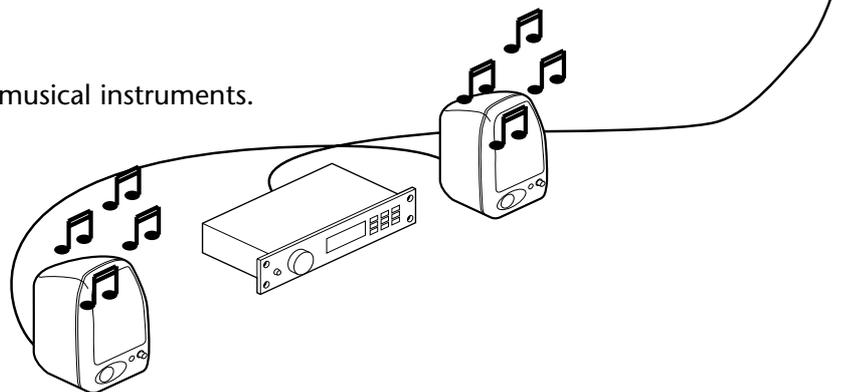
listens for 'echoes' from any interruption of the beam,



and converts them - together with their changing distance from the Sensor and the speed of the movements in the Beam -



into MIDI instructions for playing electronic musical instruments.



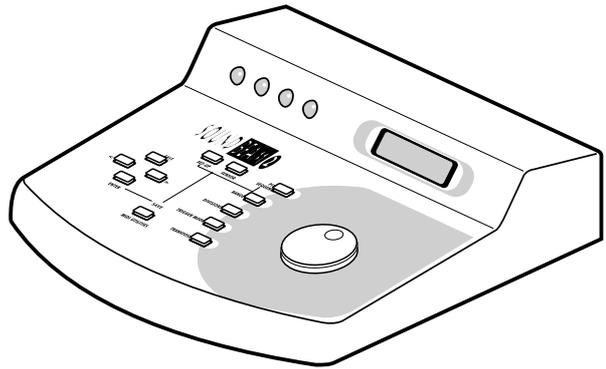
GETTING STARTED

A. OPENING THE BOX

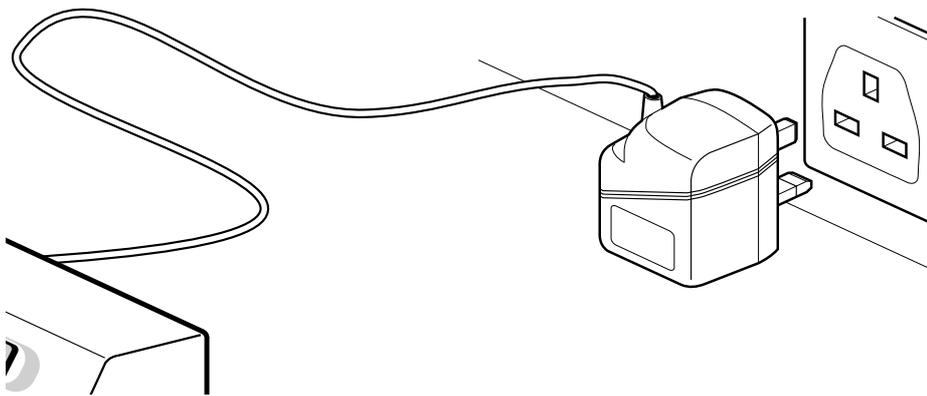


Your new **SOUNDBEAM® 2** kit will contain

a: The Soundbeam 2 Controller



- with a **Power Unit** to connect it to your Mains supply

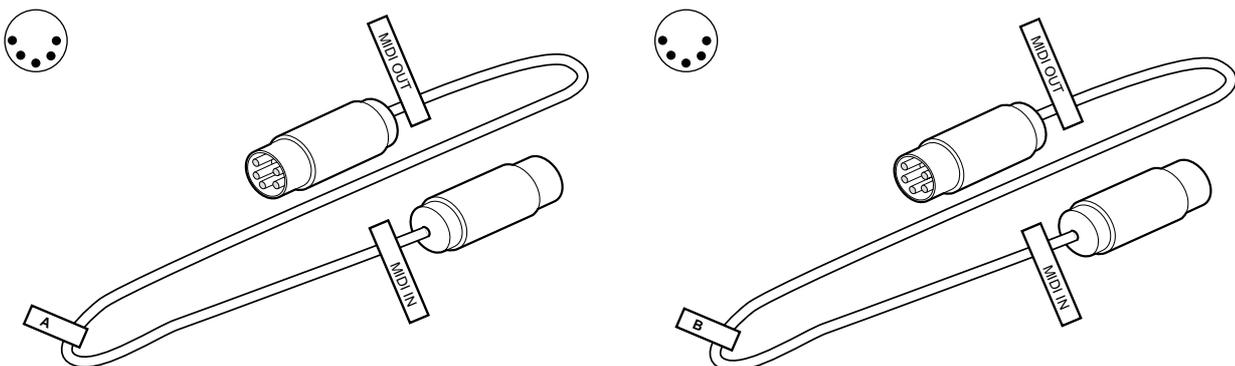


- Kit A ✓
- Kit B ✓
- Kit C ✓
- Kit D ✓

* The ticks indicate the number of each item normally supplied with each Kit

b: 2 MIDI leads, A and B, with 5-pin connectors, each labelled at both ends for connecting the 'MIDI Out' and 'MIDI In' of the **Controller** to the MIDI Input and Output of your MIDI musical instrument.

- Kit A ✓
- Kit B ✓
- Kit C ✓
- Kit D ✓



and

c: The Soundbeam 2 Handbook

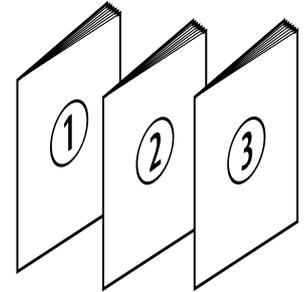
Part 1 - Getting Started,

Part 2 - Step by step

Part 3 - Explanations.

Appendix A - Set-ups and Pitch Sequence

Kit A ✓
Kit B ✓
Kit C ✓
Kit D ✓

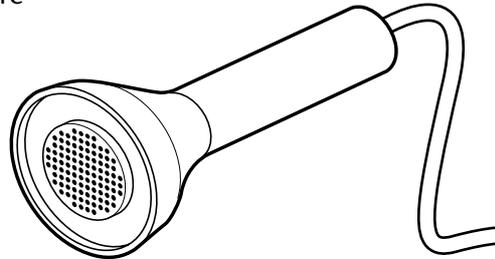


There will also be -

depending on whether you have ordered **Kit A, B, C or D** -

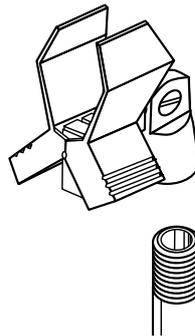
d: One or more

i. **Sensors,**



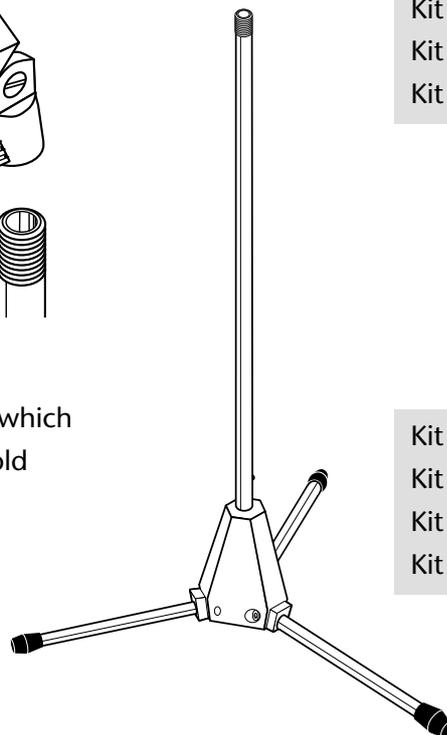
Kit A ✓
Kit B ✓✓
Kit C ✓✓✓
Kit D ✓✓✓✓

ii. **Spring Clips** - to clip **Sensor(s)** to **Stand(s)**



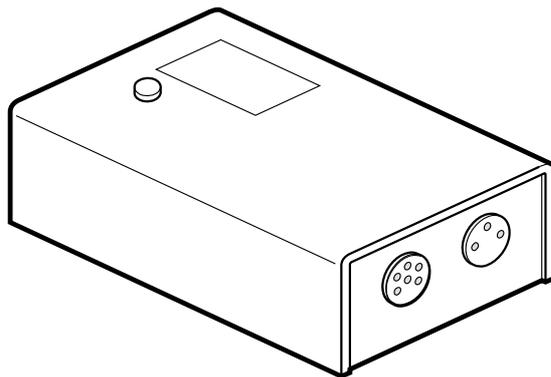
Kit A ✓
Kit B ✓✓
Kit C ✓✓✓
Kit D ✓✓✓✓

iii. **Stands** (optional) - on which
to fix the clips which hold
the **Sensor(s)** on



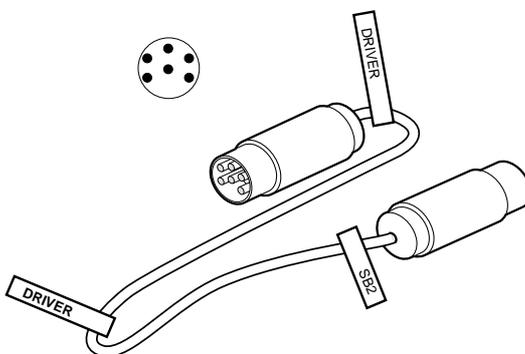
Kit A ✓
Kit B ✓✓
Kit C ✓✓✓
Kit D ✓✓✓✓

iv. **Sensor Drivers** - to power and control the **Sensor(s)** and to send information from them back to the **Controller**.



- Kit A ✓
- Kit B ✓✓
- Kit C ✓✓✓
- Kit D ✓✓✓✓

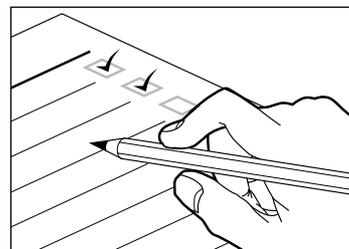
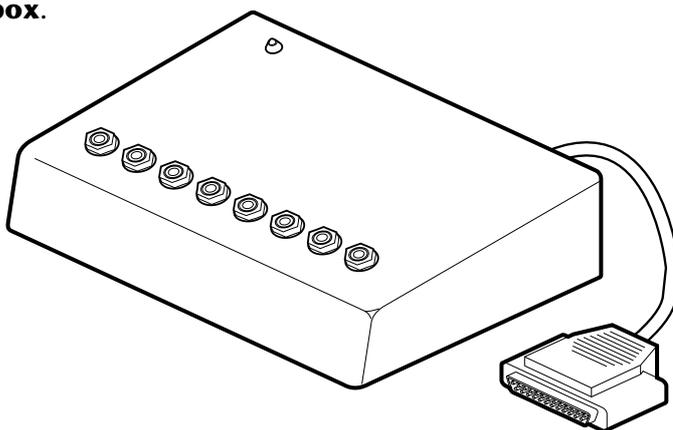
v. **Driver Leads** - to connect the **Sensor Driver(s)** to the **Controller**



- Kit A ✓
- Kit B ✓✓
- Kit C ✓✓✓
- Kit D ✓✓✓✓

and lastly - if you've ordered it - there will be-

e: the 8-input **Switchbox**.



Please make sure that all the items for the Kit you have ordered are present - let Robin Wood, of EMS, Cornwall, know immediately if there are any omissions or breakages.

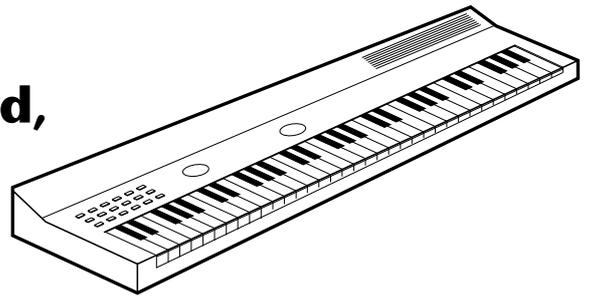
FINALLY - DON'T FORGET

*Soundbeam is **not** itself a musical instrument -
it's an exciting new and expressive new way
of playing one -*

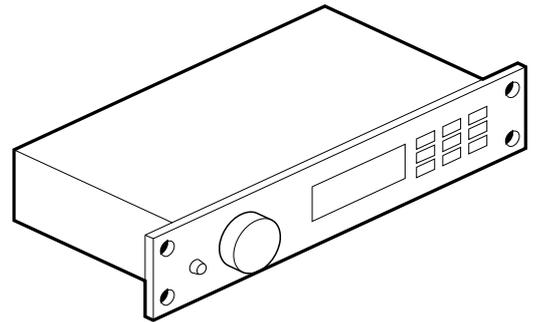
so...

**you will need
an electronic musical instrument -**

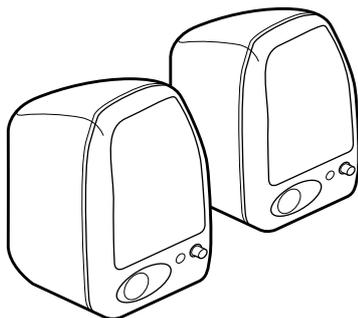
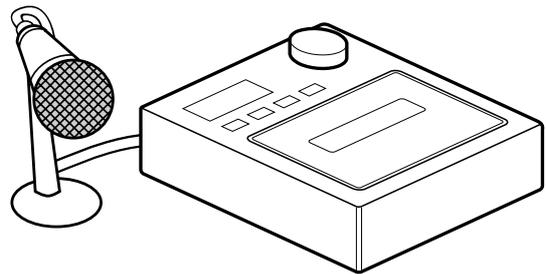
a MIDI Keyboard,



Sound Module



or Sampler.



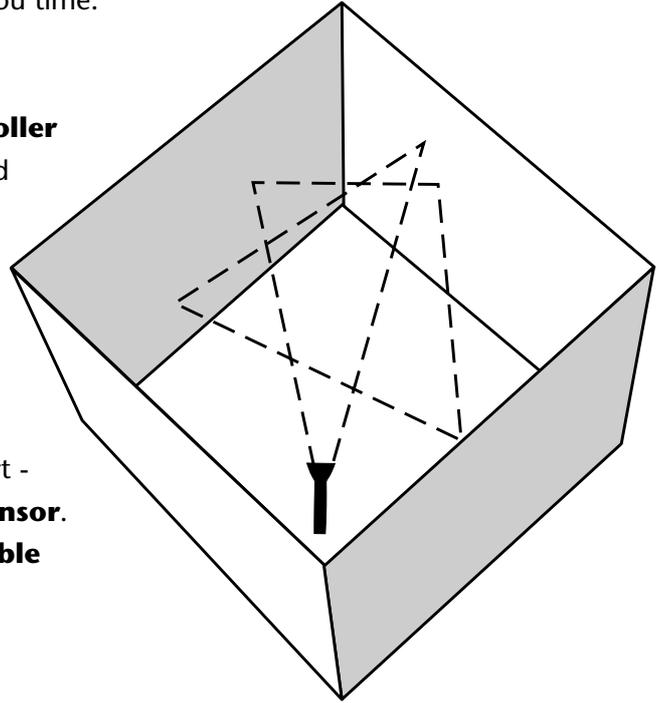
And, unless you are using a keyboard synthesiser with built-in amplifier and speakers, you will also need an amplifier and a pair of speakers - or a pair of self-powered speakers with their own internal amplifier.

PREPARATIONS

A: Some **consideration of the space** in which you intend to use your new **SOUNDBEAM 2** will save you time.

Setting up the **Sensor(s)**, **Sensor Driver(s)** and **Controller** in a clear space (minimum, say, 2m by 3m, unobstructed by furniture, within a larger room) will help to avoid unwanted interruptions of the **Beam(s)** and the confusions they can easily cause.

Just as hard, shiny wall surfaces produce reverberant acoustics, similarly, the echoes of ultra-sonic pulses may perform multiple bounces - like the ball in a squash court - some of which may occasionally be picked up by the **Sensor**. (See **Handbook Part 3 "Explanations" 2.1.4. Suitable Spaces for using Soundbeam** pp. 16-17.)

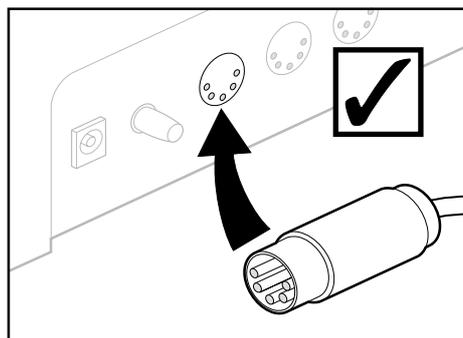
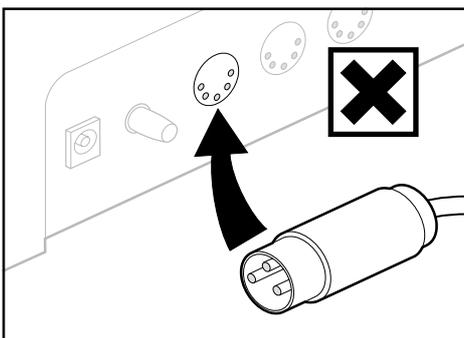


B: Inserting 3-pin, 5-pin and 6-pin plugs into the designated sockets on the **Sensor Drivers, Controller** and MIDI musical instruments

can be tricky

unless care is taken

to identify the proper match of plug to socket.



Then *firm pressure* - **not force** - can be used to push them home.

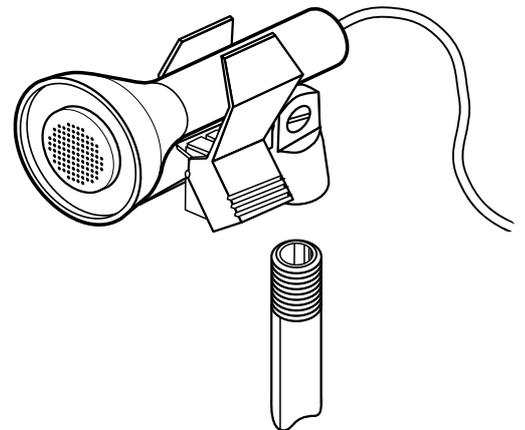
MAKING THE CONNECTIONS

Even if you have ordered a **Soundbeam Kit** with more than one **Beam** (ie more than one **Sensor** and one **Sensor Driver**), we strongly recommend that you **start by exploring Soundbeam with just a single Beam** - connecting more **Sensors** and **Sensor Drivers** later, as you gain experience

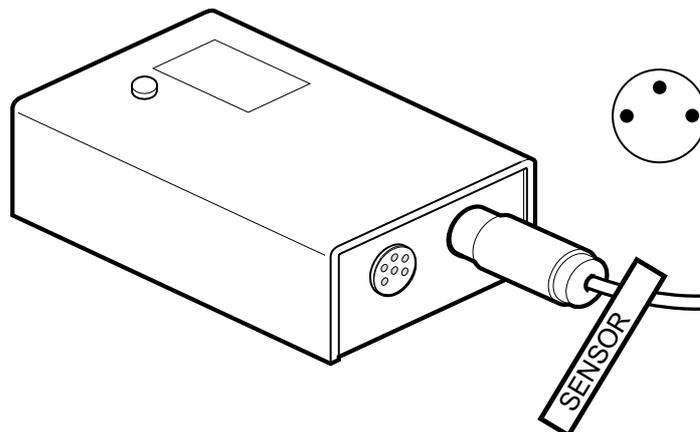
HERE'S HOW TO GET STARTED

Connect the **Sensor** to the **Sensor Driver**

i. Mount the **Sensor** on the Stand using the **Spring Clip** provided

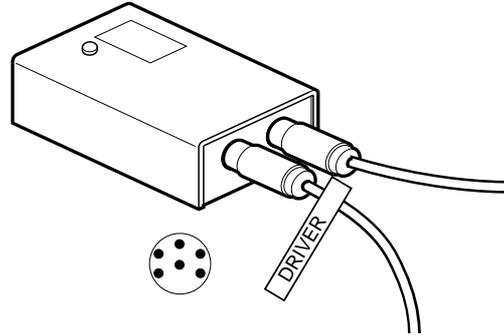


ii. Using the **Sensor's** fixed lead, insert the 3-pin connector plug labelled '**Sensor**' into the socket marked '**Sensor**' on the **Sensor Driver**

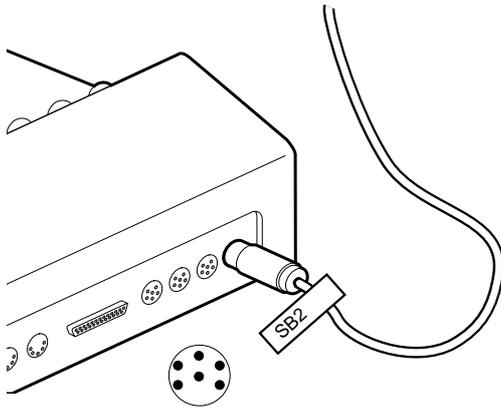


Connect the **Sensor Driver** to the **Controller**

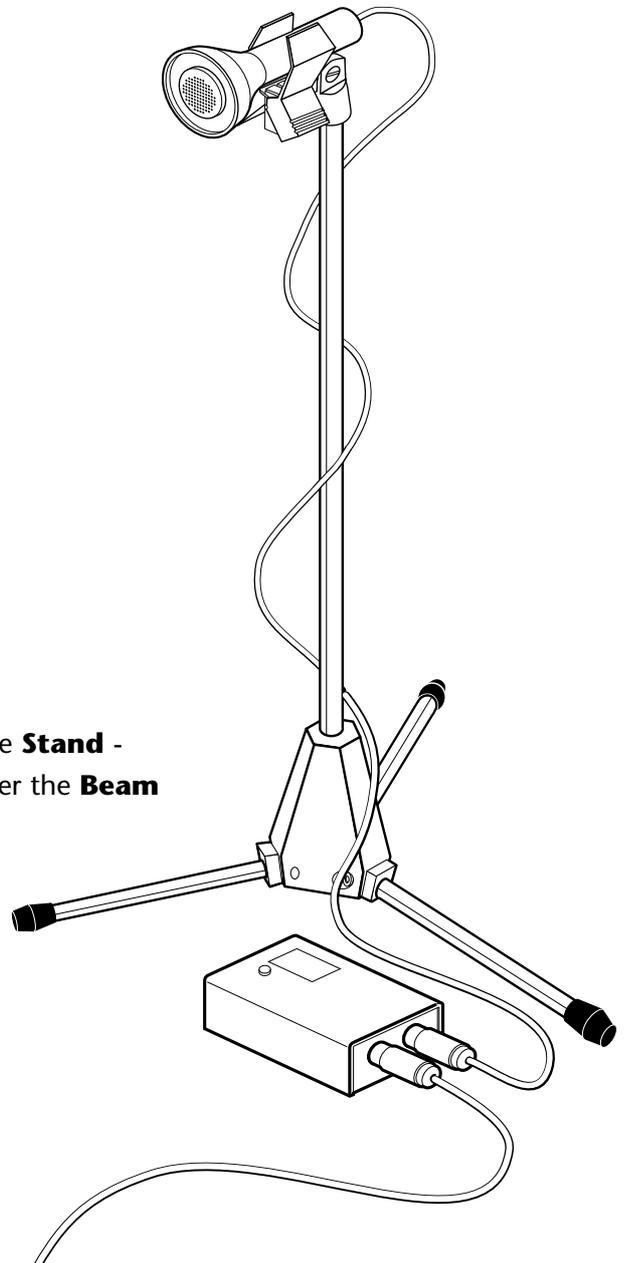
- i. Using the lead labelled '**Driver**', insert 6-pin plug also labelled '**Driver**' into the 6 pin Socket marked '**Controller**' on the **Sensor Driver**.



- ii. Insert 6-pin plug at the other end of the '**Driver**' lead - labelled '**SB2**' - into the sockets on the **SB2 Controller's** rear panel marked '**Sensor Driver 1**'.

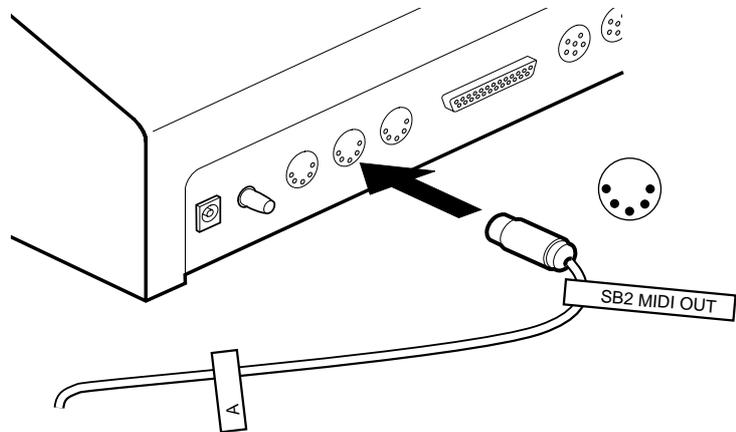


- iii. Place the **Sensor Driver** on the floor by the base of the **Stand** - or anywhere you can easily see its LED flashing whenever the **Beam** is interrupted.

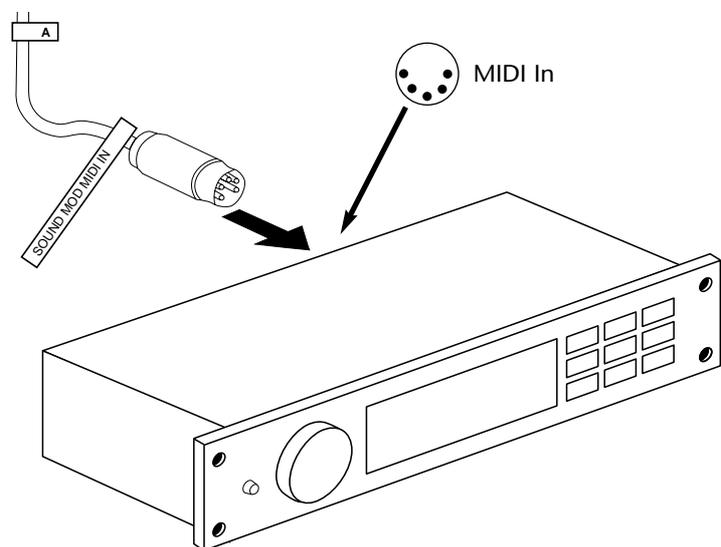


Connect the **Controller's** MIDI output to the MIDI input of your MIDI musical instrument

- i. Using **MIDI Lead A**, insert 5-pin plug labelled '**SB2 MIDI OUT**' into 5-pin socket labelled '**MIDI Out**' on **Controller** back panel.

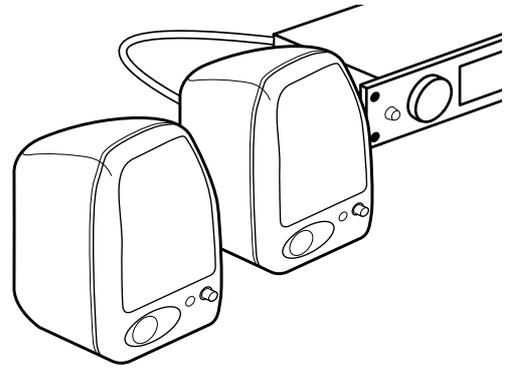


- ii. Insert 5-pin plug at other end of **MIDI Lead A** - labelled '**SOUND MOD MIDI IN**' - into 5-pin socket on sound module, sampler or MIDI keyboard marked '**MIDI IN**'

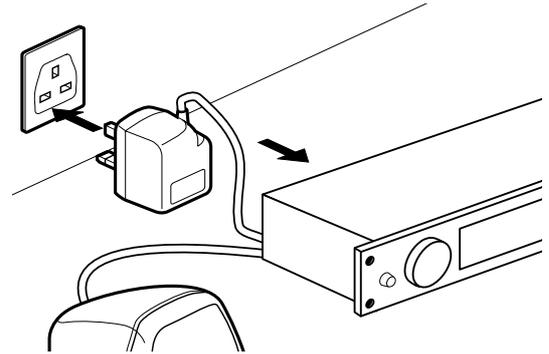


You won't need to use **MIDI Lead B** (to connect the **MIDI Out** socket of a MIDI keyboard to the **MIDI In** socket of your Soundbeam 2 **Controller**) until you want to start recording your own User **Pitch Sequences**, as described in **Handbook Part 2 "Step by Step" 3.2.4. To Record the Notes of a Pitch Sequence** p. 39. Meanwhile, keep **MIDI Lead B** in a safe place.

Connect the signal output(s) of your MIDI musical instrument to an amplifier and speakers - or to a pair of self-powered speakers

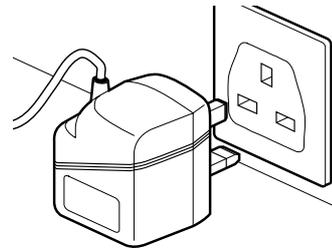


Connect the Power Unit of your MIDI musical instrument to your room's mains supply

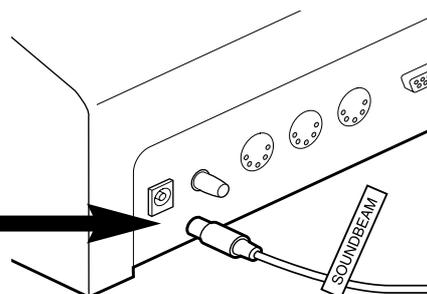


Connect your **Soundbeam Controller's Power Unit** to the mains supply

- i. Insert plug of **Power Unit** into Mains Socket



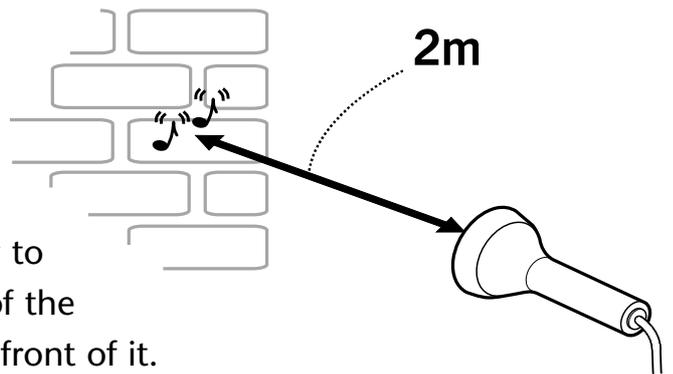
- ii. Insert connector labelled '**SOUNDBEAM**' on **Power Lead** into socket on **Controller** rear panel labelled '*Power 9v AC*'



SWITCHING ON

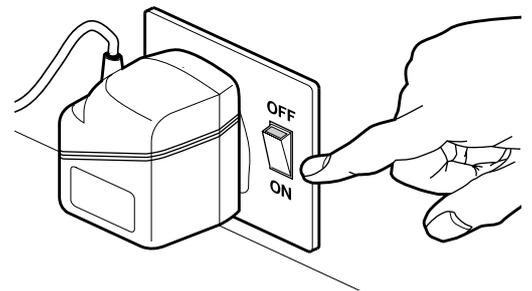
First

make sure that there's nothing likely to interrupt the Beam of the Sensor within 2m in front of it.

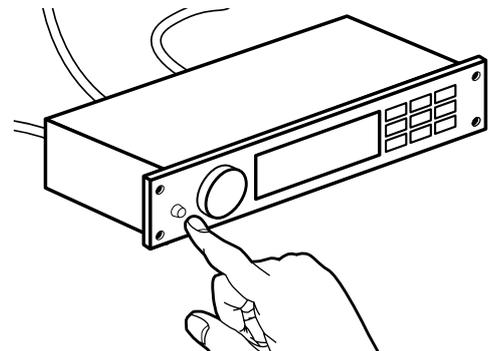


Then

- i. If there is a switch for your room's mains supply, switch it on.



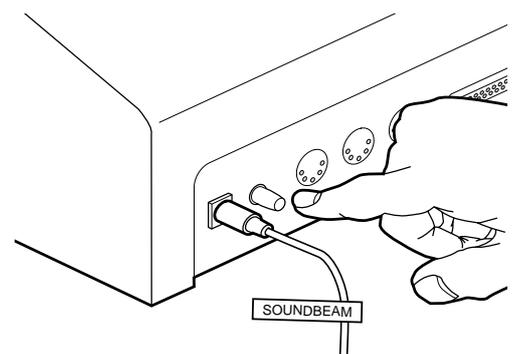
- ii. Switch on the 'Power' switch of your MIDI musical instrument.



Wait a second or two until the instrument has finished its 'start up' routine -

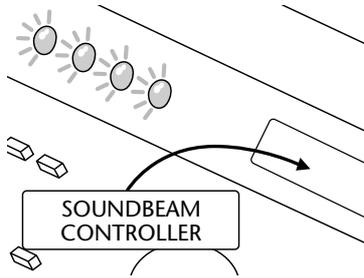
then

- iii. press the 'Power' switch of your SOUNDBEAM 2 Controller



YOU SHOULD SEE

A: The 4 red indicator lights (on the left-hand side of the **Controller's** upper surface) light up for about 3 seconds

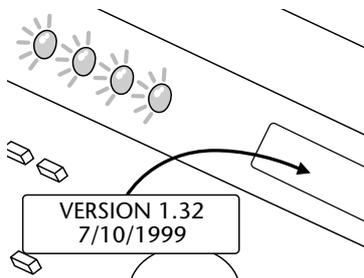


and, simultaneously,

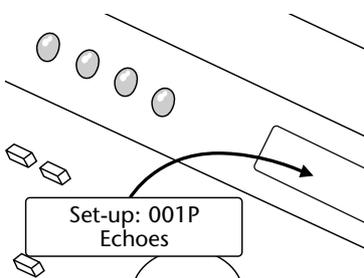
B: On the LCD Screen (on the right-hand side of the upper part of the **Controller's** upper surface)



followed a second later by
(something like - but not exactly)



followed a second later by

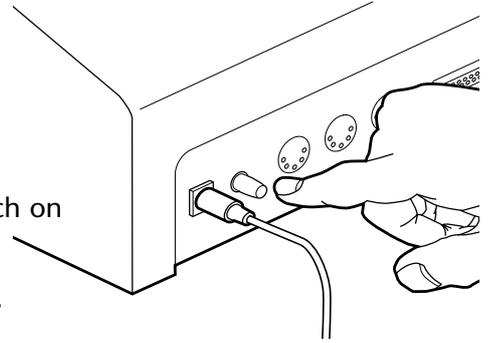


At the same time you should hear a quiet buzzing sound. This is a by-product of the mechanism of the **Sensor**, as it alternates rapidly between acting as a loudspeaker (sending out ultra-sonic pulses) - and as a microphone (listening for the echoes).

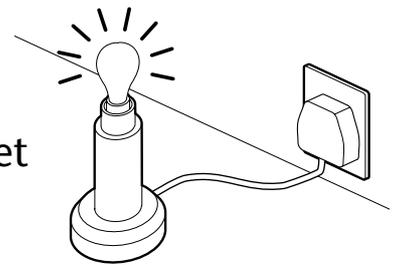
IF NOT (1)

If you **Don't** see the lights and screens described above

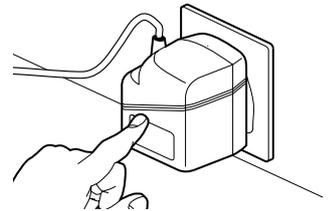
1. **Press** (to release) the Power Switch on the **Controller's** back panel and switch off the current...



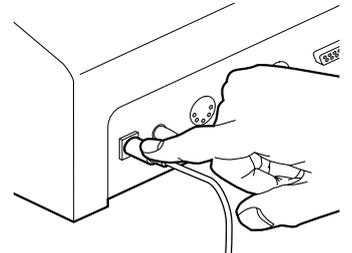
2. **Check** that current is actually being supplied to the room mains supply socket you are using. **Try plugging another device into this socket** - a lamp or electric fan, for example - and switching it on to make sure.



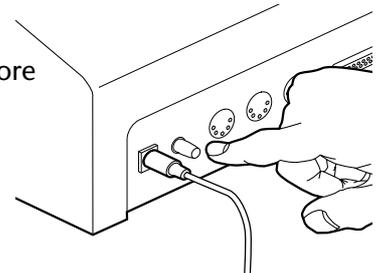
3. **Check** that the Soundbeam Power Unit plug is properly pressed home into the room mains supply socket



4. **Check** that the Soundbeam **Power Unit** connection is properly pressed home into the Power supply socket on the back panel of the **Controller**

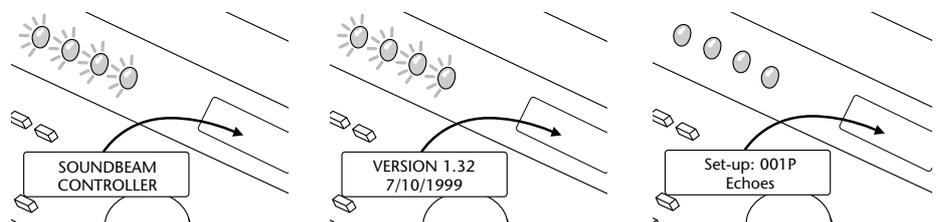


5. **Press Controller's** Power Switch once more to switch on current to **SOUNDBEAM 2**



If they still do not show, try repeating the whole connecting procedure once more, very carefully, step by step as described above, before ringing Robin Wood on the helpline - 01726 883265 during working hours (British time) on weekdays.

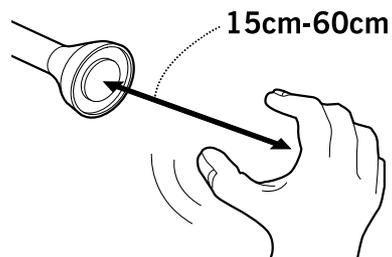
You should now see the 4 Indicator Lights and the 3 Screens shown on the previous page - and hear the 'buzz'.



NEXT

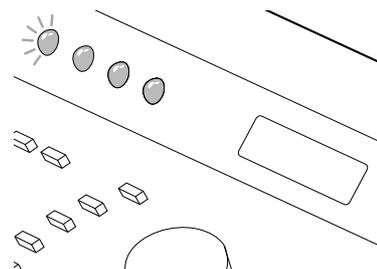
if you now see the Indicator Lights and Screens described on page 16

Move your hand backwards and forwards - between about 15cms and 60cms away from the **Sensor**.



YOU SHOULD SEE

The 1st (on the left) of the four indicator lights flashing on and off to indicate that something is interrupting the **Sensor's Beam**.



YOU SHOULD HEAR

A rising and falling sequence of musical notes



Success!

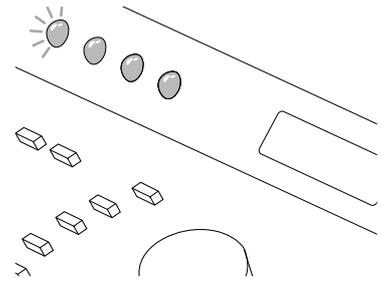
Your **Soundbeam 2** is working - and your movements in the **Beam** are triggering sounds from your MIDI musical instrument.



IF NOT (2)

If, however, you **DO SEE** the left-hand indicator lamp flashing

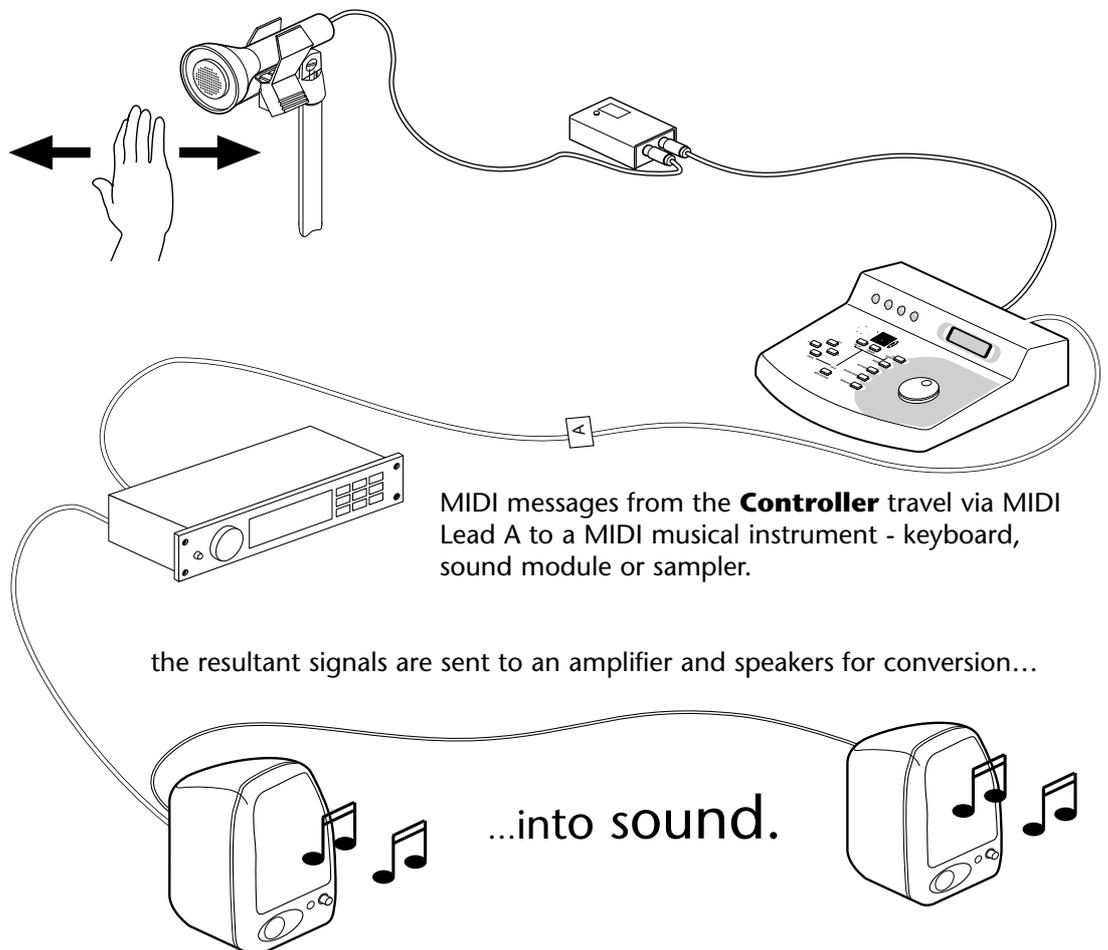
but **DON'T HEAR** the music



then your Soundbeam 2 is probably working properly but failing to activate your MIDI musical instrument.

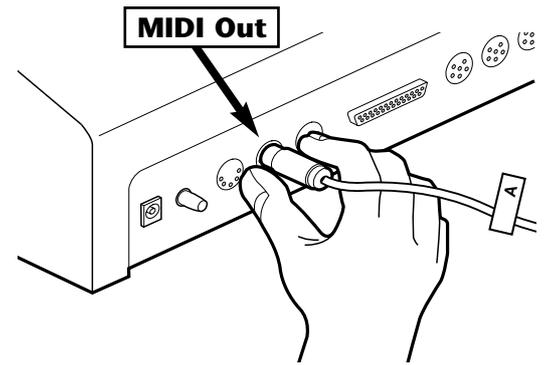
This may be because of a failure in the chain that conveys Soundbeam's MIDI messages from the **Controller** to your MIDI musical instrument and then on to amplifier and speakers.

These links are

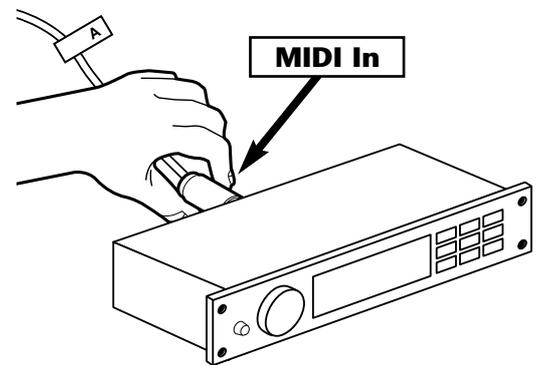


SO CHECK THAT

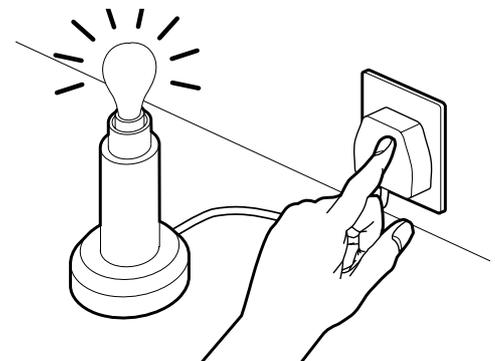
i. The correctly labelled 5-pin MIDI Out plug on **MIDI Lead A** is pushed firmly home into the **MIDI Out** socket on the **Controller's** back panel



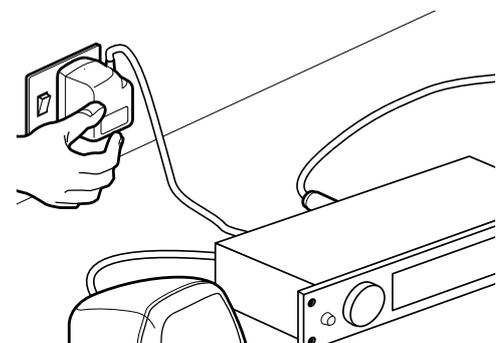
ii. The correctly labelled 5-pin MIDI In plug on **MIDI Lead A** is pushed firmly home into the **MIDI In** socket of your musical Instrument



iii. Current is actually being supplied to the socket of your room's mains supply - ie. try plugging in a lamp or a fan as above.

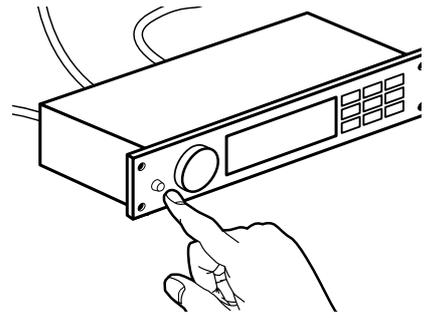


iv. The plug of the Power Unit of your musical instrument is firmly pushed home into the socket of your room's mains supply

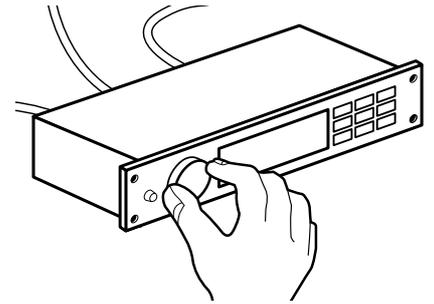


SO CHECK THAT...CONT

- v. The Power switch on your musical instrument is **switched ON**.

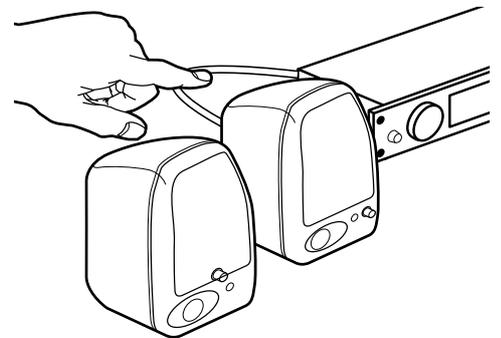


- vi The volume control of the signal outputs of your musical instrument is turned up high enough for you to hear any output.



- vii. Unless you have a keyboard with internal amplifier and speakers - the lead(s) carrying the (sound) signal from your musical instrument, either
- to an amplifier, and then on from the amplifier to the speakers
 - or
 - directly to a pair of self-powered speakers,

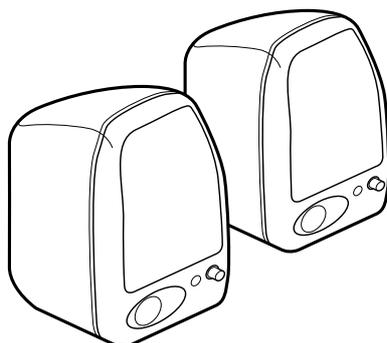
are properly connected at each end



and finally

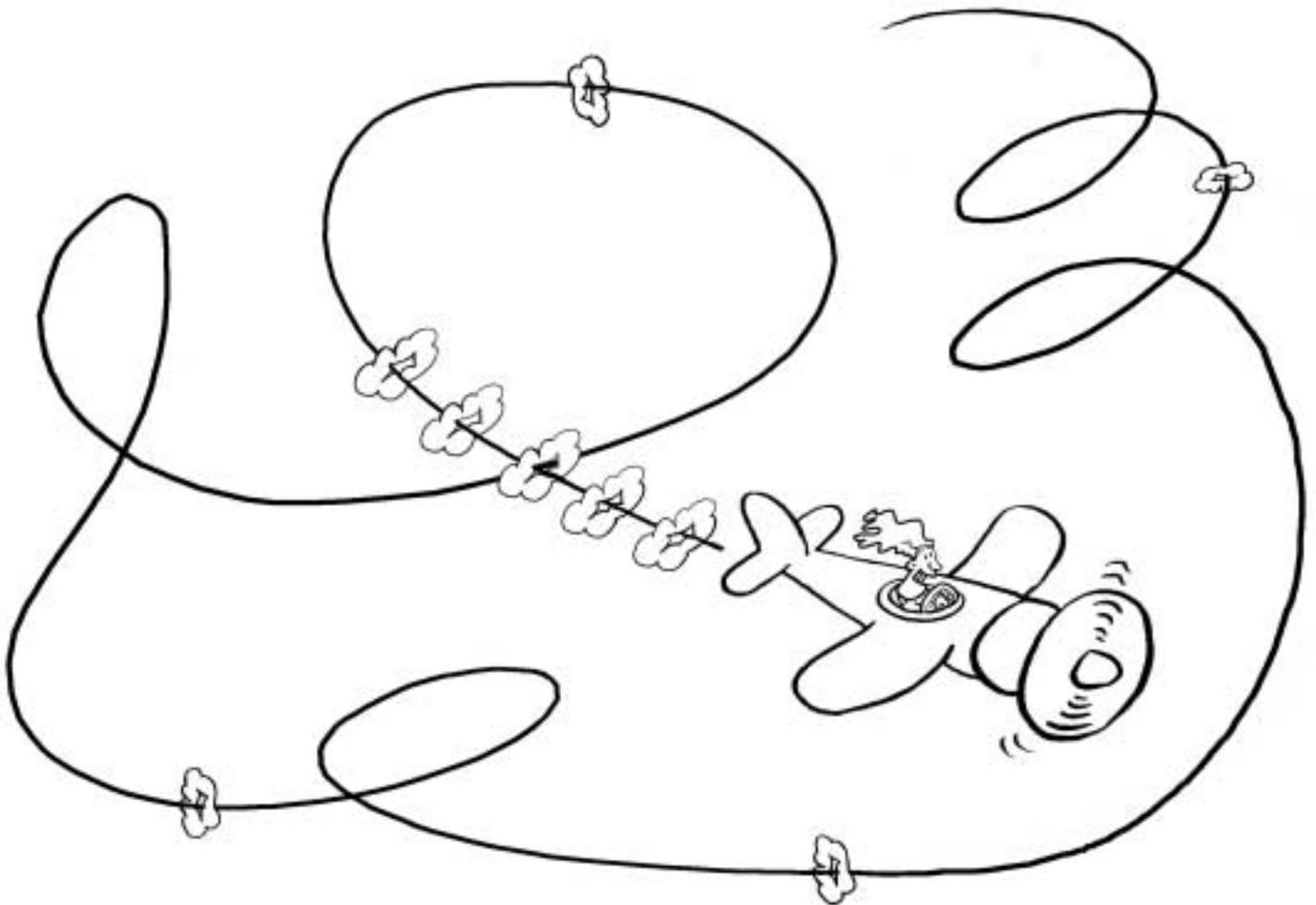
- viii Your amplifier and speakers - or your self-powered speakers - are connected to the mains supply and

switched on with the volume turned UP



THE SOUNDBEAM® 2 HANDBOOK PART 1

B. A LIGHTNING TOUR OF THE CONTROLS



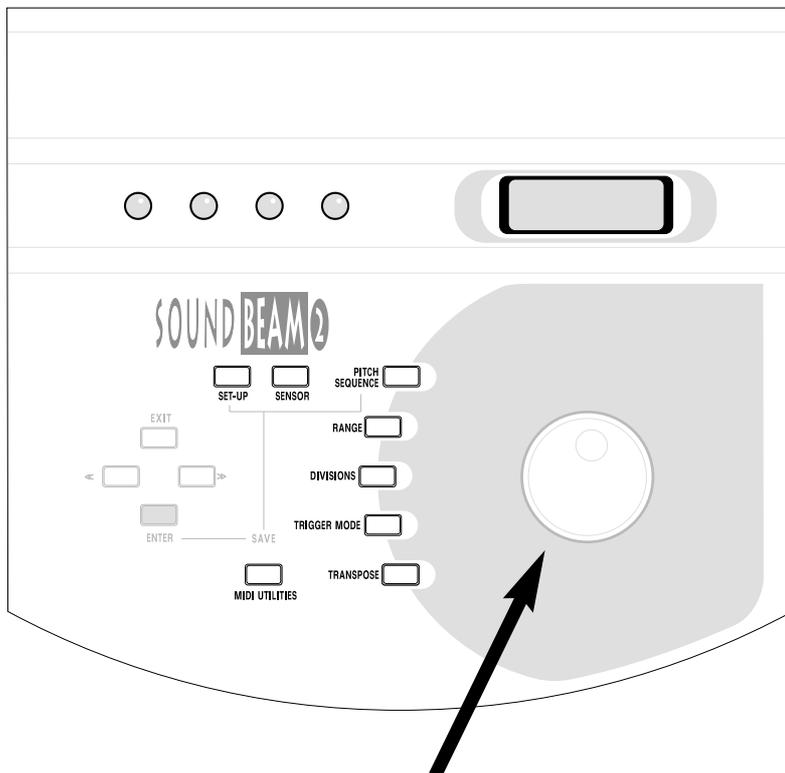
After you have had a preliminary try-out with **Soundbeam 2** and your MIDI keyboard, sampler or sound module, by moving your hand, head, foot - or anything else - in the **Beam**, you could begin the following guided tour to give you an idea of some of Soundbeam's other possibilities - and how to get to them.

If you have just finished the procedure in "Getting Started" - or if you have just switched on Soundbeam 2 - the display will be showing the default* screen -



First, then, try changing some of the settings assigned to **Beam 1** in the default **Set-up No. 001 P**.

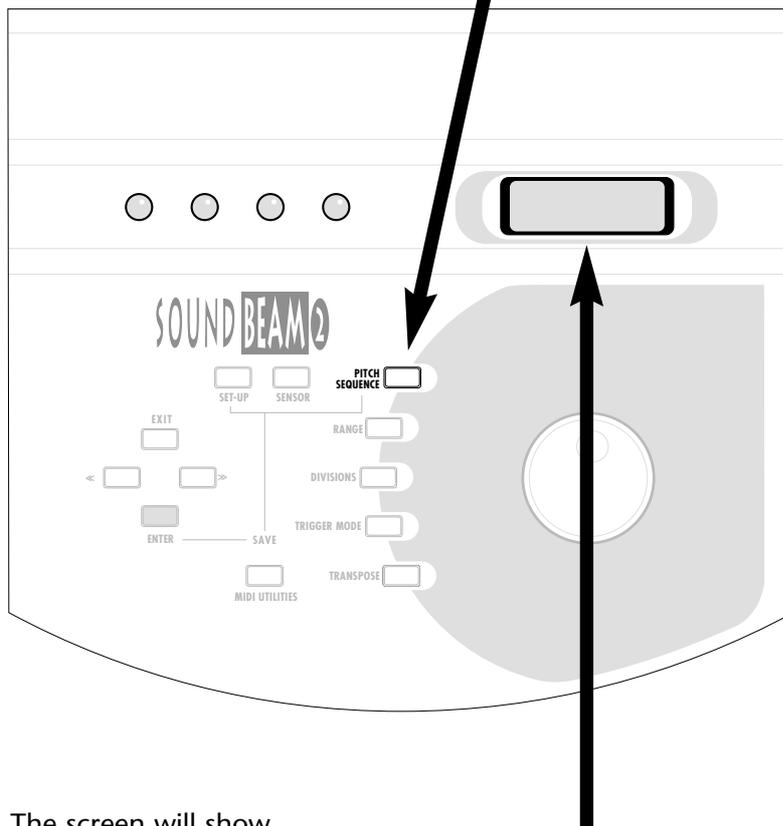
This is done by pressing one of the keys - **Pitch Sequence, Range, Divisions, Trigger Mode, Transpose, MIDI Utilities** - to access the specific setting you want to modify



and then using the **Rotary Control Wheel** to change it.

*The "Default" settings for **Set-up, Sensor, Pitch Sequence, Range** and so on, are those which have been chosen (and held in Soundbeam's memory) to re-appear each time Soundbeam is switched on. The *default* settings in the *User Set-ups* and **Pitch Sequences** can be changed and preserved by *Saving* the **Set-up** or **Pitch Sequences** in which changes have been made.

Start by pressing the
Pitch Sequence Key



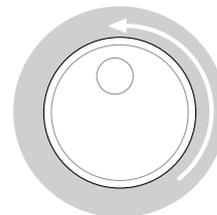
The screen will show
the default **Pitch
Sequence** assigned
to **Beam 1** in
Set-up 001



A **Pitch Sequence** is any sequence - scales, arpeggios, tunes - of up to 64 single notes or 2-, 3- or 4-note chords. They can be assigned to up to 64 **Divisions** of the **Beams** (at any **Range**). Soundbeam can store a library of 100 **Pitch Sequences**. 30 of these are **Locked Pitch Sequences** (preset in the factory). You, yourself, can define the other 70 **Pitch Sequences** by using a MIDI keyboard to play the notes or chords into Soundbeam's memory via the **Controller's MIDI IN** input.

Note the cursor under the '5'. This denotes the number or letter which will be changed when you turn the Rotary Control Wheel.

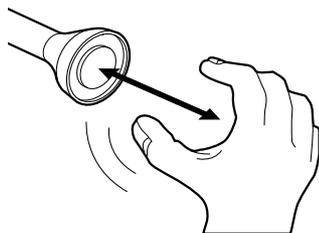
Now turn the **Rotary Control Wheel** anti-clockwise - a step at a time (you can feel a click at each of the 4 steps) to **Pitch Sequence 1**.



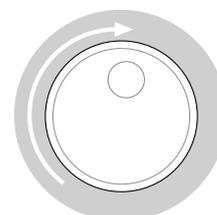
The screen will show



Move your hand backwards and forwards in the **Beam** - between about 15cms and 60cms away from the **Sensor** - to hear the notes of a major chord rippling up and down.



Next turn the **Rotary Control Wheel** clockwise to **Pitch Sequence 002** - then move your other hand in the **Beam** to hear the new set of pitches.



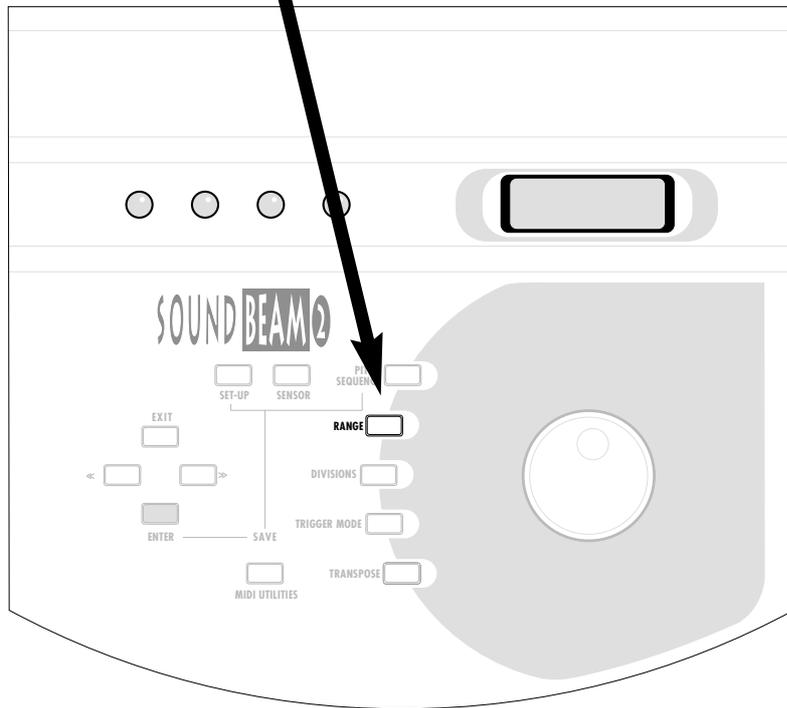
Then slowly work through the remaining *Locked Pitch Sequences, Nos. 01 to 27*, triggering and listening to them in the same way. End by returning to



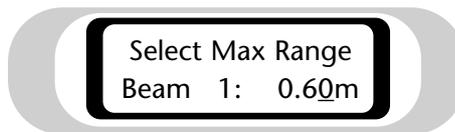
A **Pitch Sequence** is one of the two components of Soundbeam's musical output which can be defined by the user and **Saved** to Soundbeam's memory for use whenever required. The other is the **Set-up**.

N.B. Any **Pitch Sequence** can be assigned to any **one** SENSOR – or **several** SENSORS – or even **all 12** SENSORS
in
any **one** SET-UP – or **several** SET-UPS – or even in **all 128** SET-UPS

Now
Press the
Range Key

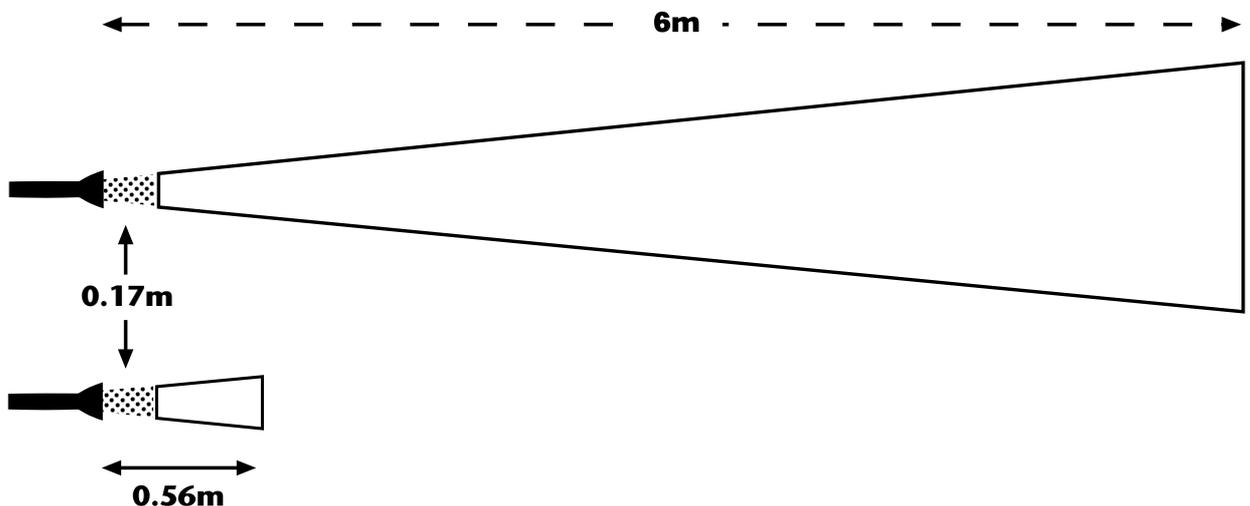


The display will show



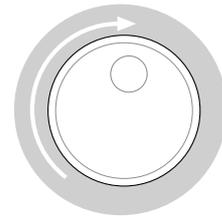
The **Maximum Range** of Soundbeam is the furthest distance from the **Sensor** within which interruptions of the **Beam** will be detected. It can be set to any distance from 0.56m to 6.00m. The **Default Range** is 0.60m and, unless you change the **Default Range** setting, 0.60m will be selected each time you power up **Soundbeam 2**.

NB. Interruptions of the first 17cms of the Beam from the Sensor will not usually result in any notes being triggered.

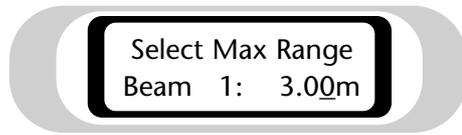


At this point, there are two possibilities you might like to try.

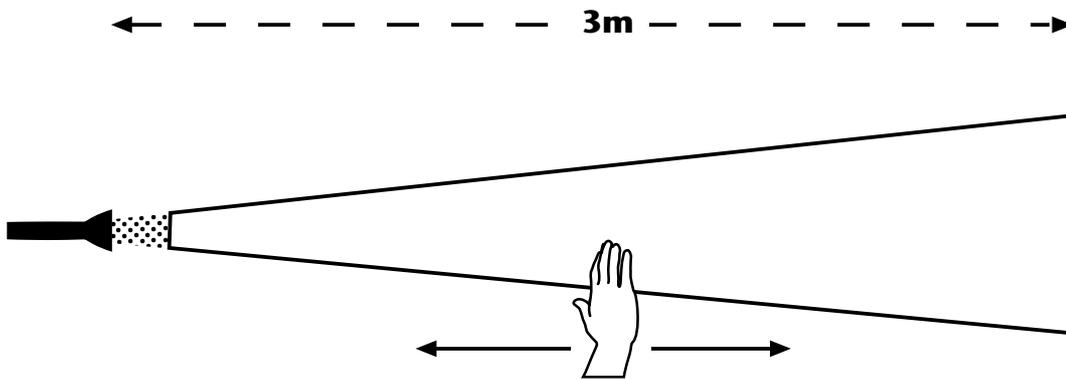
I: First, If you have plenty of unencumbered space - 5m x 5m, say - turn the **Rotary Control Wheel** clockwise to a setting of around 3.00m (10')



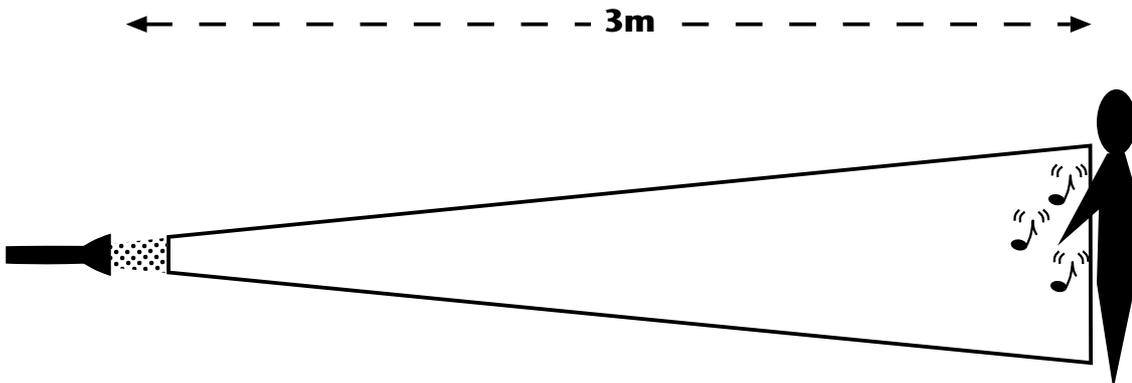
The display will show



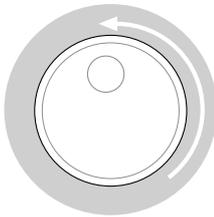
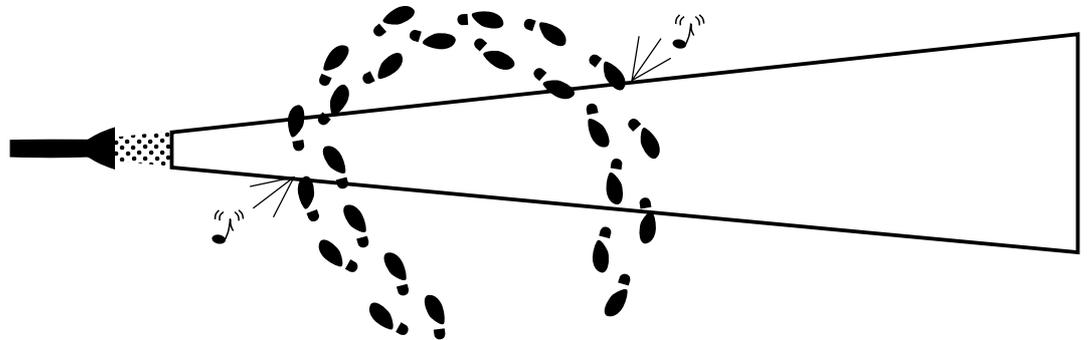
And the **Sensor** will now send pulses to - and listen to echoes from - interruptions of the **Beam** up to 3m away.



Now, try walking towards the **Sensor** from, say, 4m away (in the direction which the **Sensor** is pointing) - listening for the exact place where your body meets the furthest end of the **Beam** from the **Sensor** and starts to generate sounds.



Next, walk in and out of the 3m long **Beam**, listening to what happens and trying to judge when you're interrupting the **Beam** and when you're outside it.



Finally, turn the **Rotary Control Wheel** anti-clockwise to a setting of about 1.00m.

*This is a **Range** - a length of **Beam** - which will spread the notes out a bit more than the default setting (0.60m), so that when you move your arm in front of the **Sensor** you can more easily hear each one separately.*

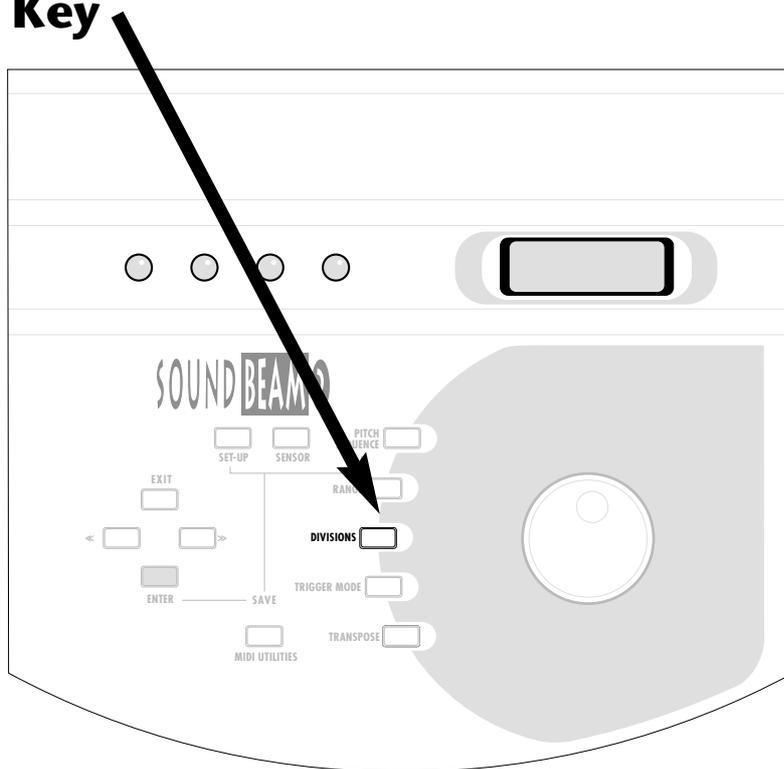
The screen will show



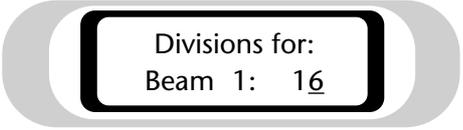
It is also possible to select a **Minimum Range** which defines the distance between the **Sensor** and the nearest part of the **Beam** which will respond to interruptions. For an explanation of **Range** and its applications, see **Handbook Part 3 "Explanations" 2. Gathering Information from Movement - 2.1. to 2.2.3** pp. 12-26.

Now we can turn to the

Divisions Key



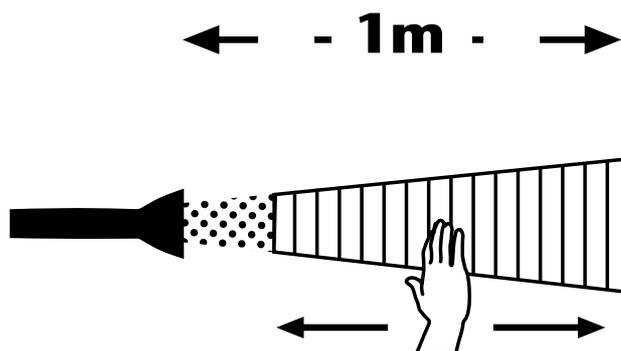
When you press this, the display will show

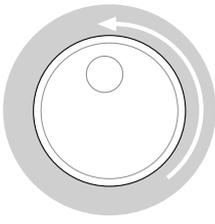


Divisions are the numbers of equal sections (from 1 to 64) into which the **Beam's** length - at any **Range** - can be divided. Each of the notes or chords of a **Pitch Sequence**, can be assigned to one of these sections.

If you move your hand slowly along the **Beam** from the nearest point to the **Sensor** to furthest away and back again (with the **Range** setting as you left it above - at around 1m), you should be able to count the number of separate notes you trigger - 16 of them, in fact, about 1cm apart along the **Beam**.

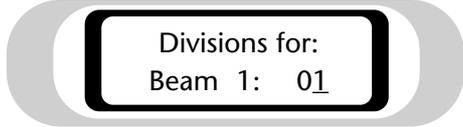
16 Divisions





Now, turn the **Rotary Control Wheel** anti-clockwise until the number of **Divisions** of the **Beam** is reduced to 1.

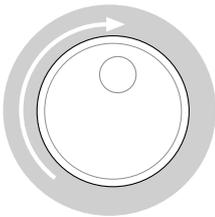
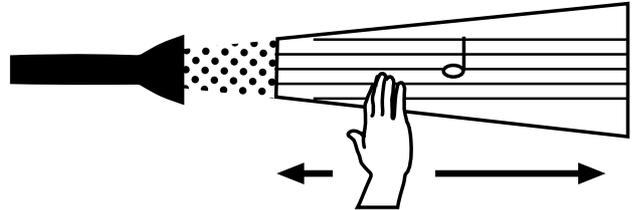
The screen will show



This time, moving your arm along the **Beam** - or interrupting it at any place along it - will produce the same note.

1 Division

← - 1m - →



Next, turn the **Rotary Control Wheel** clockwise to 02

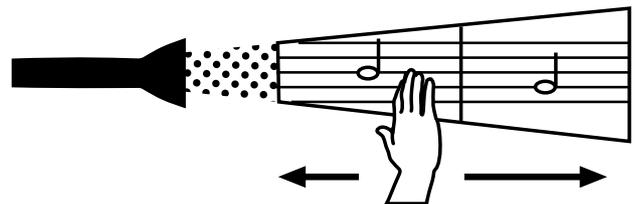
The screen will show



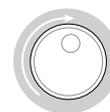
This time, moving your arm along the **Beam**, or interrupting it either side of halfway, will give you two different notes - one for each half of the length of the **Beam**.

2 Divisions

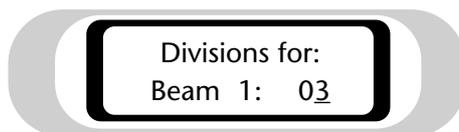
← - 1m - →



Once more,
turn the **Rotary Control Wheel** clockwise, this time on to 03

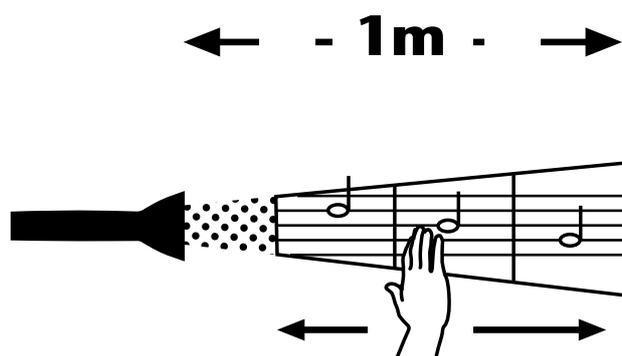


The screen will show

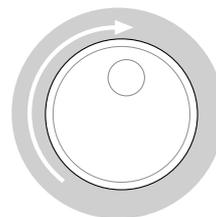


This time, moving your arm along the **Beam** will give you three different notes - one for each third of the **Beam's** length.

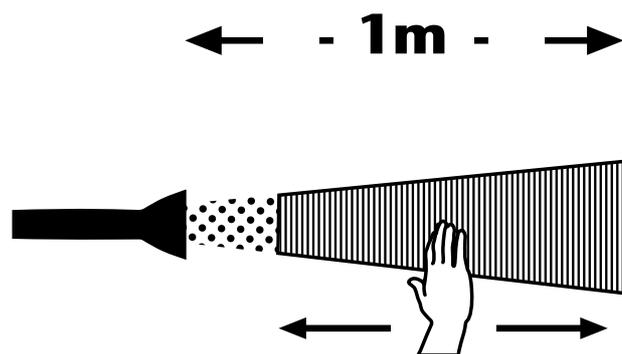
3 Divisions



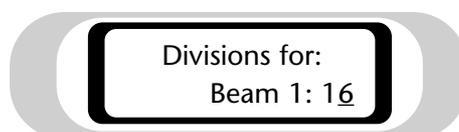
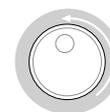
Next, use the **Rotary Control Wheel** to select successively 4, 5, 6, 7 and so on - any number up to 64 **Divisions**. You will find your interruptions of the **Beam** producing sequences of more and more audible notes of different pitches within the same length of **Beam** (or **Range**).



64 Divisions

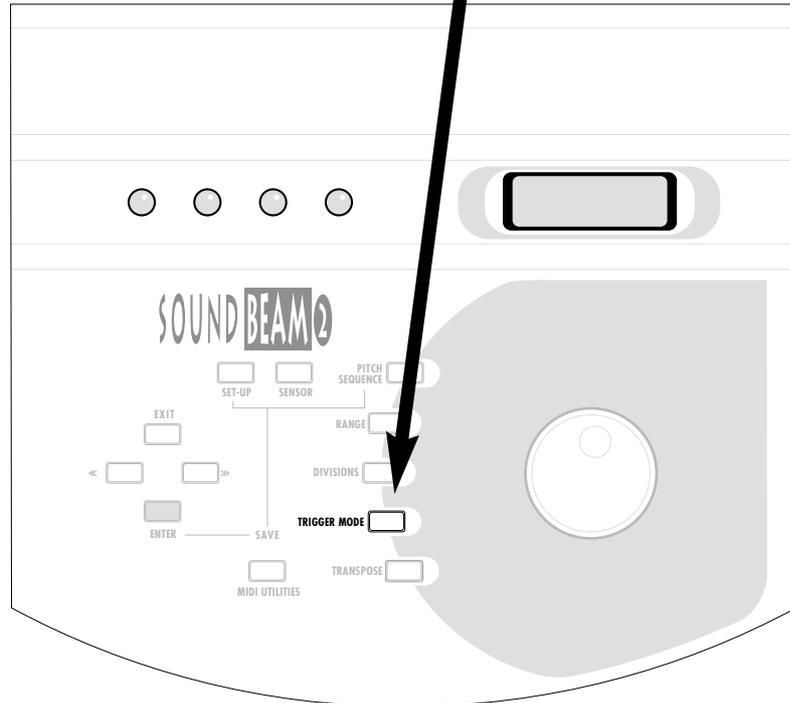


Now, turn the **Rotary Control Wheel** anti-clockwise back to 16.



Turn to the

Trigger Mode Key

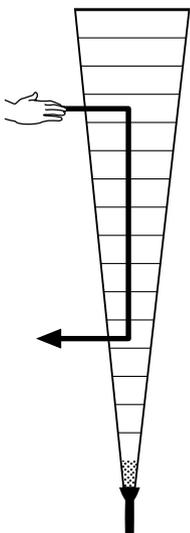


The Trigger Modes are the different ways of starting and stopping the notes sounded by interruptions of the Beam. You will find a full description of the effects of the various articulations listed below in Handbook Part 3 "Explanations" 9. Trigger Modes pp. 85-90.

For the moment, listen to the effect - on the sounds produced by movements of your hand in the **Beam** - of one or two different **Trigger Modes**.

Press the **Trigger Mode** Key, and the Display will show the default setting.

Re-trigger



The screen will show



Trigger Beam 1
Re-Trigger

As you will have noticed already, with this **Trigger Mode** setting, a new note is played every time your hand enters the **Beam**, or moves within the **Beam** towards or away from the **Sensor**.

Now, turn the **Rotary Control Wheel** clockwise to select "**Poly Sustain**"

The screen will show



Trigger Beam 1
Poly Sustain

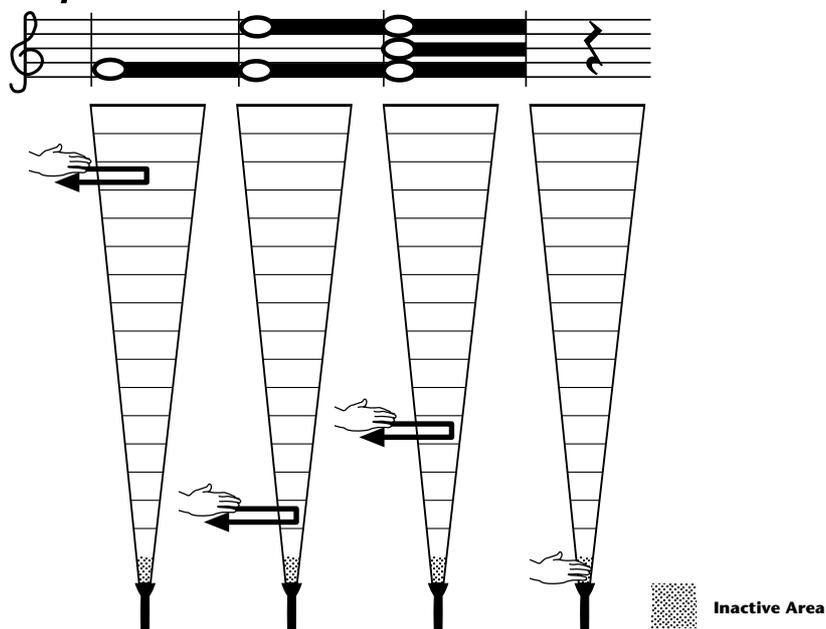
In **Poly Sustain** Mode - if you are using sounds which can be sustained indefinitely (e.g. organ, choir, bowed strings, wind instruments) - each time you make a fresh interruption of the **Beam**, a new note will be sounded and sustained, even when the interruption ceases.

Each new interruption adds a note to a growing chord or cluster of notes, which will continue to sound until you silence it by passing your hand through the **Inactive Area** of the **Beam**, close to the **Sensor**.

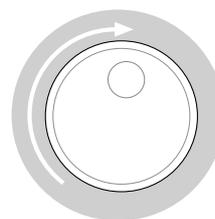
Note, however, that - unlike **Re-Trigger** - if, after interrupting the **Beam**, you move your hand towards or away from the **Sensor**, no new notes will be sounded until you remove your hand from the **Beam**, and then re-enter it again.

Try moving your hand in the **Beam** at various distances from the **Sensor**.

Poly Sustain



Next, turn the **Rotary Control Wheel** clockwise again to select "**Re-trig Sustain**"



The screen will show

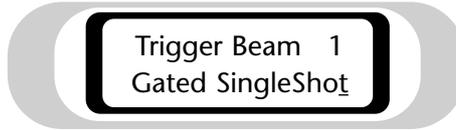


This has the same effect as **Re-Trigger** - as you move your hand in the **Beam** towards and away from the **Sensor**, again you articulate a series of notes, but this time all the notes you trigger go on sounding until you pass your hand through the inactive area close to the **Sensor** - or switch to the next **Trigger Mode**.



try the other **Trigger Modes** by turning the **Rotary Control Wheel** clockwise again

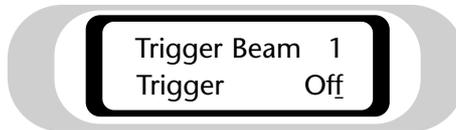
The screen will show



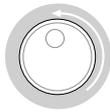
*Separate interruptions of the **Beam** will trigger notes which are sustained (if no other notes are triggered) for a variable length of time, set by the user.*



*Same as **Re-Trigger** (p.33), except that the last note triggered is sustained for a variable specific time, set by the user.*



*Here, interruptions of the **Beam** don't produce notes. The **Beam** is 'muted', and although the **Sensor** continues to operate, information derived from interruptions of the **Beam** is ignored.*



Now, turn the **Rotary Control Wheel** anti-clockwise as far as it

will go to



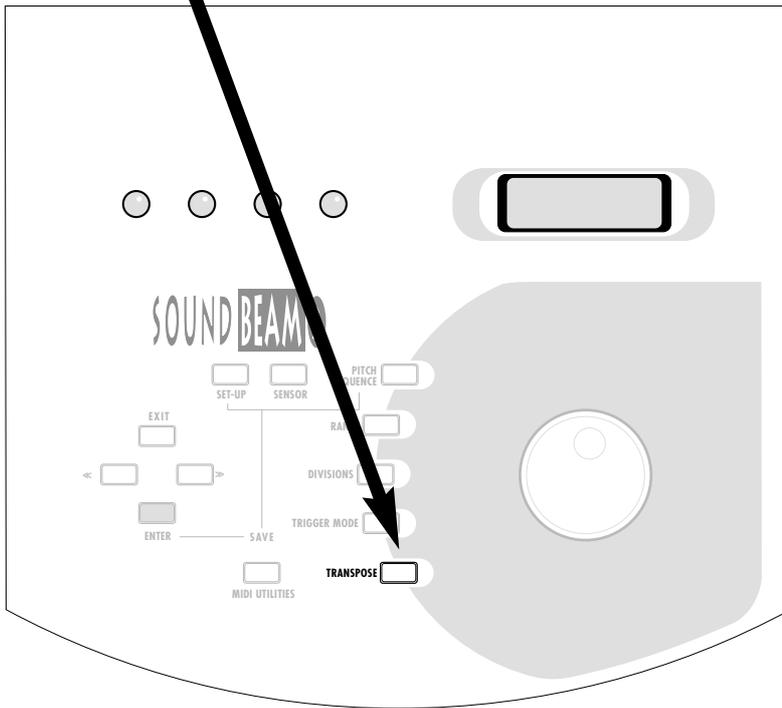
*Only separate interruptions of the **Beam** trigger notes.*

and finally, with one last clockwise turn, back to

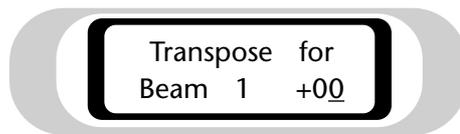


Now press

Transpose Key

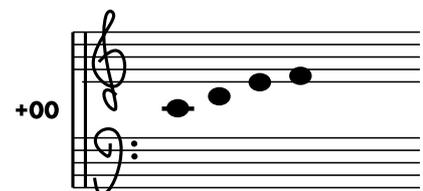
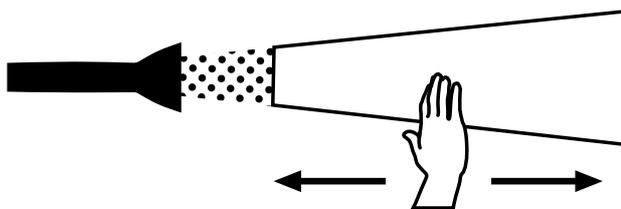


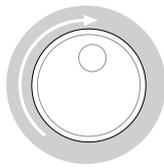
The screen will show



This enables the whole Pitch Sequence - the sequence of notes which is heard when you move your hand backwards and forwards to and from the Sensor - to be shifted up (+) or down (-) by the number of semitones you set with the Rotary Control Wheel.

To try this out, move your hand backwards and forwards in the **Beam** (towards and away from the **Sensor**).



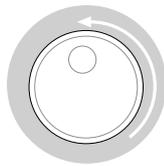
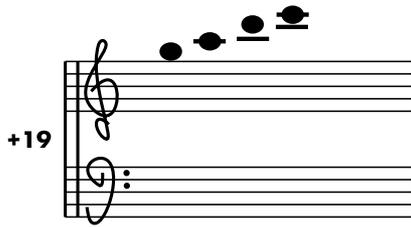


Turn the **Rotary Control Wheel** clockwise to change the **Transpose** setting - first to "+19".

The screen will show

Transpose for
Beam 1 +19

and you will hear the notes of the **Pitch Sequence** shifted an octave and a fifth above the original pitch.

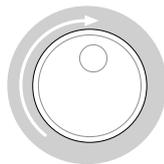
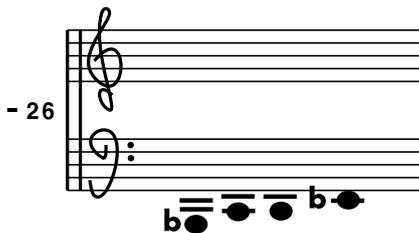


Next turn the **Rotary Control Wheel** *anti*-clockwise again to change the **Transpose** setting to "-26".

The screen will show

Transpose for
Beam 1 -26

and the whole **Pitch Sequence** will sound 2 octaves and a tone below the original pitch.

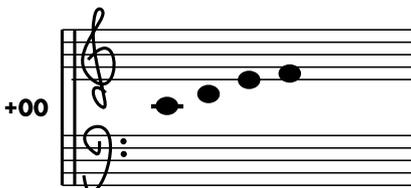


Finally, turn the **Rotary Control Wheel** clockwise once more to return the **Transpose** setting to "+00".

The screen will show

Transpose for
Beam 1 +00

and the whole **Pitch Sequence** will sound once more at the original pitch.

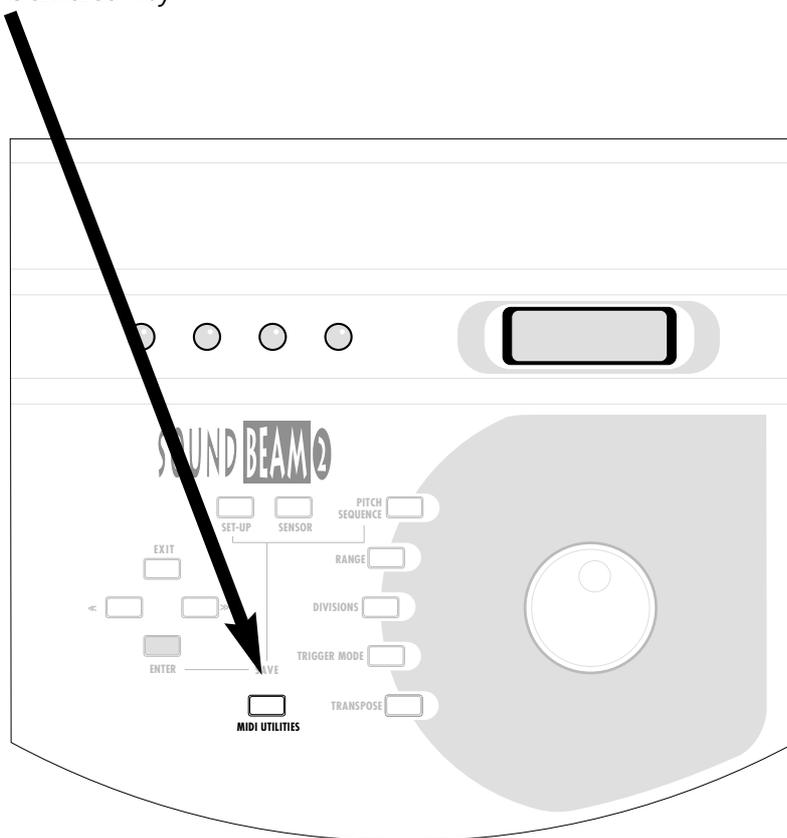


MIDI Utilities Key

This key is used to access settings for a number of different Soundbeam 2 possibilities - most of them to do with assigning sources and destinations for MIDI messages and instructions. For the moment you can disregard them. They are fully explained in the **Handbook Part 3 "Explanations" 11. MIDI** pp. 95-105.

However, you might like to try just one of these **MIDI Utilities**, since you can use it to explore the various sounds stored in your MIDI musical instrument, and which you could select to use in your own music-making.

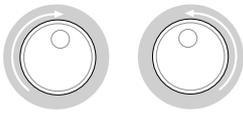
Press the **MIDI Utilities** Key



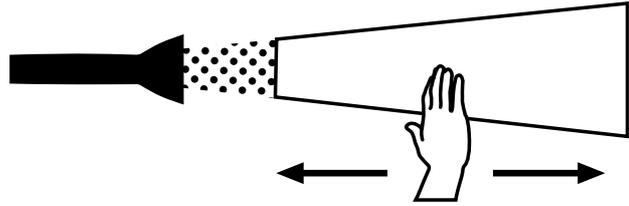
The screen will show



MIDI Program Nos. denote the various sounds - or timbres - available in your MIDI musical instrument.



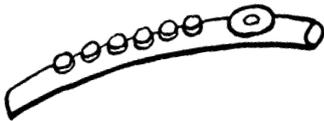
Next, use the **Rotary Control Wheel** to scroll through the changing sounds from **"001"** to **"128"** and back to **"092"** - using your other hand (or your head or foot) in the **Beam** to hear them.



As you scroll through, the screen will show the **MIDI Program Nos.** denoting the sounds you will hear in turn

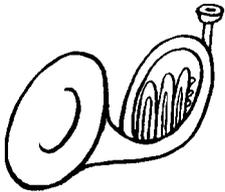


Sensor Beam 1
MIDI Program 001



to

Sensor Beam 1
MIDI Program 128



and finally, once more

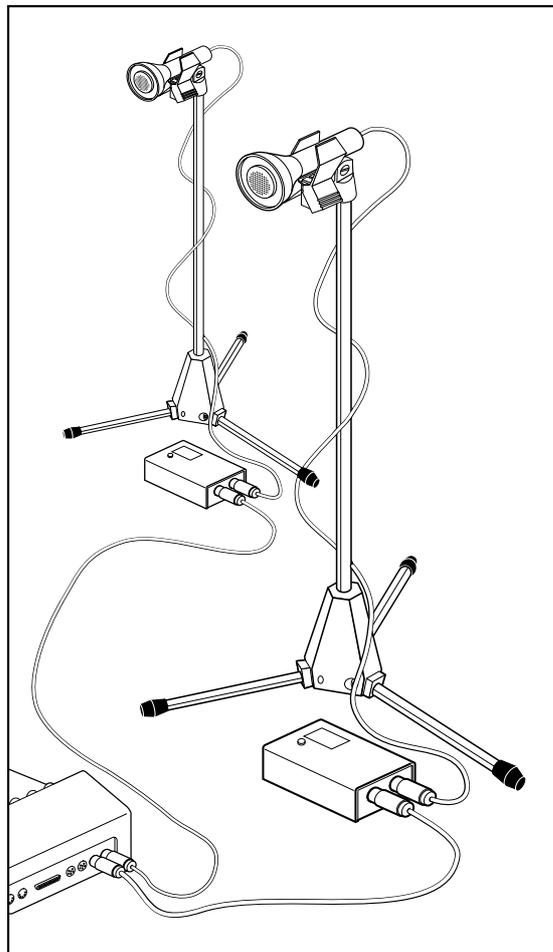
Sensor Beam 1
MIDI Program 092



All the settings we have looked at so far - **Pitch Sequence, Range, Divisions, Trigger Mode, Transpose, MIDI Utilities** - have been those assigned to **Beam 1**, the first of the 12 possible **Sensors** (4 ultra-sonic **Beams** and 8 **Switches**) available in the default **Set-up 001**

However, before we look at the **Sensor Key**, now is the time - if, you have ordered a Soundbeam Kit B with 2 ultra-sonic **Sensors** - to connect your second **Sensor** to your second **Sensor Driver**, and then connect that to the **Sensor 2** input on the back panel of your Soundbeam **Controller**. Use the labelled leads supplied in exactly the same manner as described in the first section of **Part 1 "Opening the Box" Making the Connections** pp. 11-14 (above).

NB. The single MIDI Lead A connecting the MIDI output of your Soundbeam Controller to your MIDI musical instrument will carry ALL the MIDI messages from all 4 Beams and 8 Switches.

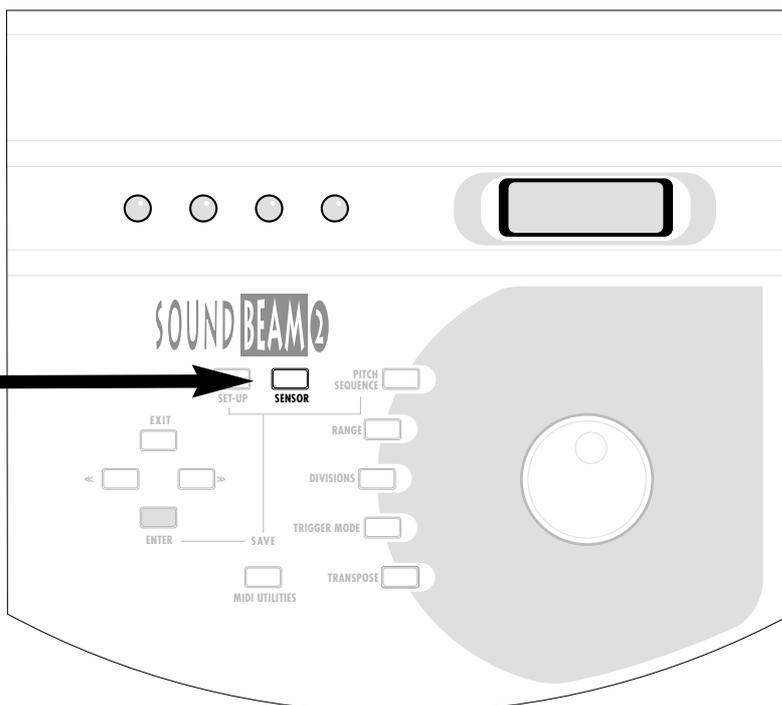


Interference

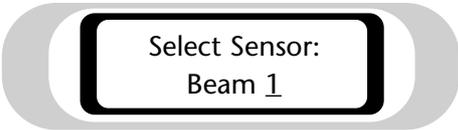
If you are using 2 or more **Beams**, you will find that directing them towards each other - or even inadvertently allowing the widening edges of two parallel **Beams** to overlap - will generate some interesting (but usually unwelcome) interference patterns. You might find them worth trying - and they're easy to avoid

Now press

Sensor Key

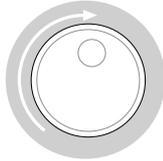


and the screen will show



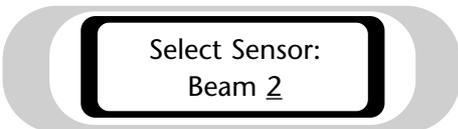
Select Sensor:
Beam 1

*This means that any changes you make to settings accessed via other Keys - **Range, Division, Trigger Mode, Transpose, Pitch Sequence** or **MIDI Utilities** - will affect only the settings applied to information derived from **Beam 1**.*



Turn the **Rotary Control Wheel** clockwise

to



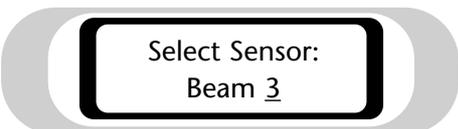
Select Sensor:
Beam 2

Next, using the Keys and the **Rotary Control Wheel**, try out the default settings for **Pitch Sequence, Range, Divisions, Trigger Mode, Transpose** and **MIDI Utilities** assigned to interpreting your movements in **Beam 2**. They will nearly all be different from the settings you experienced as you followed '**A Lightning Tour of the Controls**' using **Beam 1** and the settings assigned to it.

Of course, if you only have one **Sensor** and no switches, there will be no response to any **Sensor** other than **Beam 1**. However, you could still try out the settings for **Beam 2** by unplugging the **Sensor/Driver** connections to **Sensor Input 1** and re-connecting it to **Sensor Input 2**.

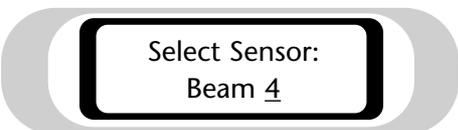


Then turn the **Rotary Control Wheel** clockwise to scroll on through



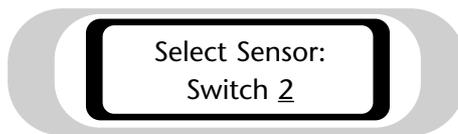
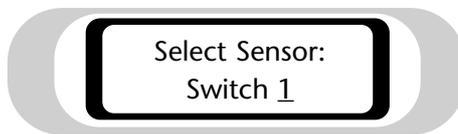
Select Sensor:
Beam 3

and



Select Sensor:
Beam 4

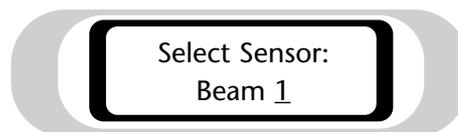
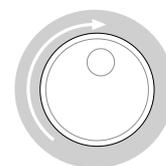
to



and on through to



Finally - one more step clockwise -
back to where we started at



All the settings that you have used so far in this '**A Lightning Tour of the Controls**' - **Sensor, Pitch Sequence, Range, Divisions, Trigger Mode, Transpose** and **MIDI Utilities** - have been assigned, by the currently selected **Sensor** number, to the control of one of two channels of information derived from interruptions of **Beam 1** or **Beam 2** in **Set-up 001**.

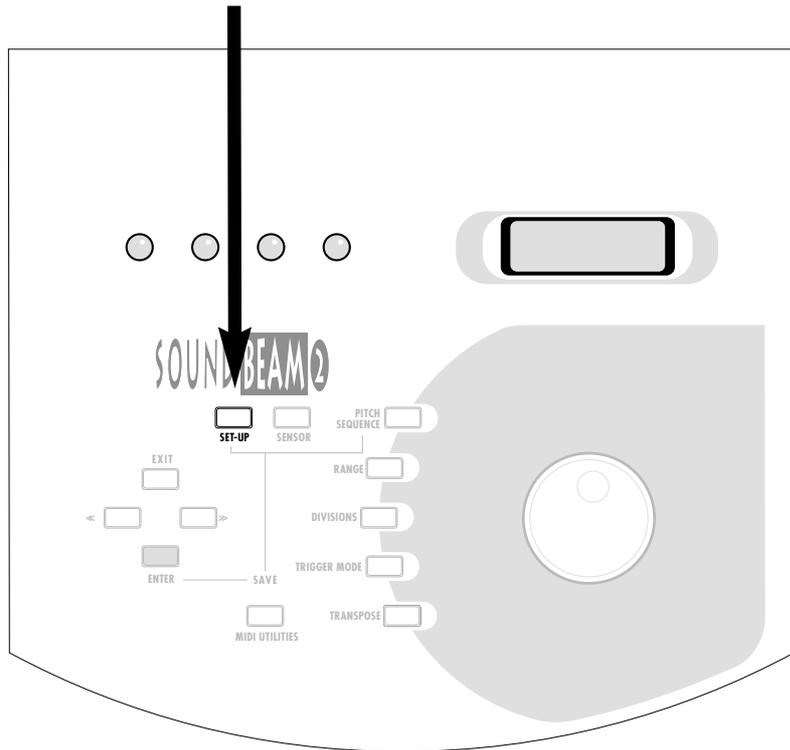
In addition, there are a further 10 channels of information - 2 more **Beams** and, via the **Switchbox**, 8 **Switches** - all offering the same range of control setting possibilities (except for **Range** in the case of **Switches**) as those for **Beams 1** and **2** we have been exploring.

Complete collections of **all** the settings available for **each** of the 4 **Beams** and 8 **Switches** can be saved as a **Set-up**. There are a total of 128 possible **Set-ups**. 30 of these are preset in the factory, and '**Locked**' so that any subsequent changes you make to the settings are lost when another **Set-up** is selected, or when Soundbeam is switched off - and are replaced once more by the original factory preset settings.

You are currently using the **Locked Set-up No. 001 - "Echoes"**.

So now, press

Set-up Key



The screen will show



NB. The letter **M** after the **Set-up** number **001** shows that some of the default settings of the **Set-up** have been **Modified** - but not **Saved** (which, in any case, is not possible for **Locked Set-ups**). If none of the settings of **Set-up 001** had been changed, the **Set-up** number would have been followed by a **P** for **Preset**

Locked Set-ups

The first 30 of the 128 **Set-ups** available in Soundbeam 2 - **Nos 001 to 030** - are pre-set in the factory, and *Locked* to protect them from being altered by mistake - though they can be altered if you really want to. (See **Handbook Part 3 “Explanations” 5 Set-ups** pp. 45-50 for how to do it.) We have tried to design these **Set-ups** to offer a wide range of possibilities - music making pure and simple, dance, special and mainstream education for both classroom and one-to-one teaching, as well as sound and music therapy.

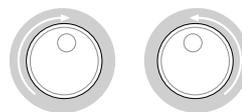
So, while you can make changes during your Soundbeam session to any of the default settings of these 30 *Locked Set-ups*, they can't be **Saved**; and if you select another **Set-up**, and then return to the current one - or, later, when you power-up Soundbeam again after switching off - all the original default settings will be back in operation again.

However, you can copy your altered settings to a *User Set-up* (see **Handbook Part 2 “Step by Step” 1.3. To Copy the Modified Settings of a Locked Set-up to a User Set-up** pp. 11-13)

User-defined Set-ups

All the default parameter settings assigned to **Beams 1 - 4** and **Switches 1 - 8** in each of the remaining 98 *User Set-ups* - **Nos. 31 - 128** - can be re-defined by the user and **Saved**. They will re-appear in the new form when you return to them after a change of **Set-up** - or when Soundbeam is powered up again after being switched off.

Try using the **Rotary Control Wheel** to select another **Set-up**, say **No. 015 “Cine Dream”** -



The screen will show



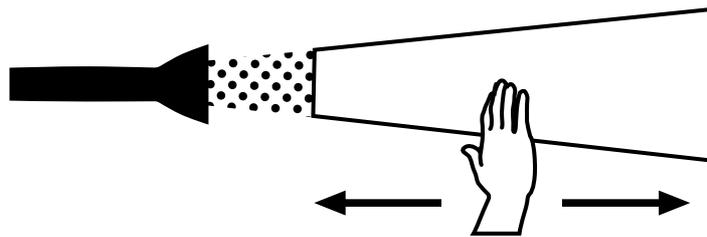
NB. When you scroll through the various **Set-up** names using the **Rotary Control Wheel**, although the screen will show the name and numbers of a **Set-up**, the new **Set-up** (and its settings) won't actually be activated until **Enter** is pressed.

Now press the **Enter** Key

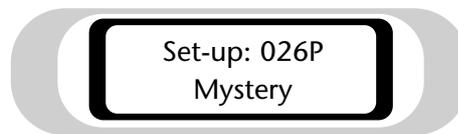
The screen will show



Try some movements - in both **Beams** if you have two - to find out what this set-up offers -



then - press **Set-up** again, and use the **Rotary Control Wheel** - followed by **Enter** - to try another one



and another



and another



To Summarise - A Few Simple Tips

- I:** If you want to change the sequence of notes generated by your movements in the selected **Beam** or by your operation of the selected **Switch**
- press **PITCH SEQUENCE** and use the **Rotary Control Wheel** to try out other possibilities.
- II:** If you want to make the selected **Beam** longer or shorter,
- press **RANGE** and use the **Rotary Control Wheel** to set a longer or shorter **RANGE**.
- III:** If you want to get more (or less) notes into whatever length (**Range**) of the selected **Beam** you have chosen -
- press **DIVISIONS** and use the **Rotary Control Wheel** to increase (or decrease) the number of **Divisions**.
- IV:** If you want to change the articulation - the way the sounds start, stop or overlap each other - to build up chords, for example,
- press **TRIGGER MODE** key and use the **Rotary Control Wheel** to change to "**Poly Sustain**", perhaps, or to "**Re-Trigger Sustain**".
- V:** If you want to make the notes of your **Pitch Sequence** sound higher (or lower)
- press **TRANSCOPE** and use the **Rotary Control Wheel** to move the whole **Pitch Sequence** up or down.
- VI:** If you want to change to a different sound
- press **MIDI UTILITIES** and use the **Rotary Control Wheel** to change the **MIDI Program No.** Then, scroll through the possibilities, listening to the changing sounds articulated by the movements of your other hand in the **Beam**.
- VII:** If you have more than one **Sensor (Beam or Switch)** connected, and you want to adjust the settings on a different one from the one you are currently using
- press **SENSOR** and use the **Rotary Control Wheel** to select the one you want.
- VIII:** If you want to try out a different collection of settings for **SENSOR, PITCH SEQUENCE, RANGE, DIVISIONS, TRIGGER MODE, TRANSCOPE or MIDI UTILITIES**
- press **SET-UP** and use the **Rotary Control Wheel** to select different **Set-up No.**, then press **ENTER** to try it out.

FINALLY, if you get lost or confused by Soundbeam 2's many possibilities - or simply want to go back to where you started

Switch off Soundbeam - then, after a short pause, switch it on again.

After the start-up sequence, you'll find yourself back where you were when you first powered up

with the display showing



The settings will include

the default **Sensor** ... Beam 1

the default **Pitch Sequence** ... No. 005 - "Maj Triad +6th"

the default **Range** setting ... 0.60m

the default number of **Divisions** ... 16

the default **Trigger Mode** ... Re-Trigger

the default **Transpose** ... +00

the default MIDI Program ... 092 - "Pad 4 (Choir)"

all part of

the default **Set-Up** ... No. 001 - "Echoes"

MAKING MUSIC WITH SOUNDBEAM 2 A NOTE FOR BEGINNERS

It's important to realise that Soundbeam is not *in itself* a musical instrument, but a ground-breaking new way of *playing* one – a sound module, perhaps, an electronic keyboard, or a sampler. Effective, expressive use of Soundbeam will very much depend on your understanding and management of whichever musical instrument you decide to use. So, to begin with, if you haven't already done so, you should try to get to know the particular MIDI musical instrument that YOU are going to use.

Whatever it is, - keyboard, expander module, sampler, drum machine or any other electronic musical instrument - it will have to have a MIDI Input and Output if it is to be used with Soundbeam - so check this first!

(MIDI is the code which enables a Roland keyboard, for example, to communicate with a Yamaha sound module)

If the instrument you will be using is a sound module supplied by us - the Yamaha MU 50, for example - then you can easily explore a good deal of it from the Soundbeam Controller. As soon as your sound module is connected to the **MIDI Out** from the Soundbeam Controller, and to the signal input(s) of your amplifier (and speakers) - or to your self-powered speakers - you can use the Controller's **MIDI Utilities** Key to select the **MIDI Program No.** page and the **Rotary Control Wheel** to scroll through them while you move the other hand in the *Active Area* of the **Beam**. In this way you can try out all 128 of the available sounds assigned to **MIDI Program Nos 001 to 128**. (see pp. 38-39 above)

If the instrument belongs to the school or institution in which you work, perhaps you could take it home for a few days or at weekends, so that you can try it out at your leisure. Spend as much time as you possibly can exploring and playing about with it - the design of modern electronic musical instruments means that playing music is much easier than it used to be - and it's fun!

Begin by finding out how to use the press buttons, sliders, switches, wheels and other controls to try out as many as you can of the various sounds it has to offer.

Most MIDI musical instruments, nowadays, have a large range of sounds they can make and store - and many possibilities for combining them. It will take you a long time to explore them all - but, in the meanwhile, we have tried to make some of the best of them available to you by way of the *Locked Set-ups* on your Soundbeam 2

Listen to the difference between the short sounds (piano, xylophone, guitar) which die away very quickly however long you hold down the keys - and the long sustained sounds (organ, violin, saxophone) which go on sounding until you take your finger off the key. Make a note of those - of both kinds - that you like best.

Many electronic keyboards can play a number of different percussion rhythms - fast or slow - and these can often be used to give a lively rhythmic framework to whatever melodic or harmonic ideas you are developing with hand or other body movements in the beam.

You can also usually put accompanying chords to these rhythms simply by adjusting the appropriate controls (consult your instrument's handbook) and then touching one of a dozen or so notes at the bottom (left hand) end of the keyboard.

Some keyboards can be set up so that body movements in Soundbeam can be used to change these chords too. Try out this amazing new way of using your own body movements in the beam (without touching the keyboard) to make music!

Finally, it's important to remember that, as with any other musical technique, you won't become a virtuoso in 10 minutes. A good deal of time, application, exploration and practice will be needed - both with Soundbeam 2, and with the sounds of the various MIDI musical instruments it can be connected to - to find out which of its many possibilities will ultimately help you to achieve your own personal musical goals.

**Remember,
your most important bits of musical equipment
are still your own ears.
What sounds right to them will (probably!) be right**

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