IMPORTANT!!!

Taking care of your Soundbeam 5 Sensors

Storage…. If the sensors need to be packed away, leads should be LOOSELY coiled, tightly coiling the cables may result in the sensors working intermittently and eventually failing.



Taking care of your Soundbeam 5 Wireless Switches

Batteries….Replacing the 3xAA batteries. (always use high quality batteries)



CONTENTS

Updated 20.5.15

Soundbeam – brainchild of composer Edward Williams – was first introduced at the Frankfurt International Music Fair in 1988. Over twenty five years later, and with approaching 5000 enthusiastic user organisations worldwide, we are proud to announce the arrival of the latest version of the technology: SOUNDBEAM 5 – a fully integrated Soundbeam-plus-synthesiser with many exciting new features.

Whatever your interest – education, therapy or just (just!) music making – Soundbeam offers a fabulous way of exploring sound and music which enables and empowers people at all levels of ability to express themselves creatively and to play together as musical equals.

1. CONTACT AND TECHNICAL SUPPORT DETAILS

The Soundbeam Project
Unit 3
Highbury Villas
Bristol BS2 8BY
United Kingdom

For technical support and other information including details of training courses and workshops please phone:

0117 923 7075
(+ 44 117 923 7075 if calling from outside the UK)
or email: tim@soundbeam.co.uk
adrian@soundbeam.co.uk
cindy@soundbeam.co.uk

2. ASSEMBLY

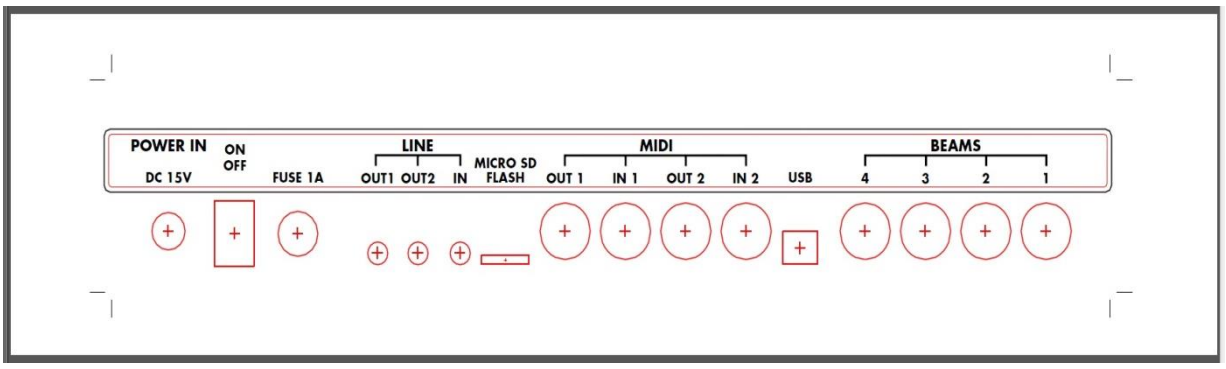
You should have:

- Soundbeam 5
- 1-4 beam sensors with holders and stands
- speakers
- speaker cables
- power supply unit
- 1 - 8 wireless switches (see appendix 5)
- microphone

1. Assemble the boom stand(s) supplied and screw on the sensor holder clips. Fit the sensor(s) to the clip(s).

2. Connect the sensor(s) to the beam output socket(s) on the rear panel of the Soundbeam (if you have one beam, use output 1; two beams, use outputs 1 and 2, etc.)

View of rear panel

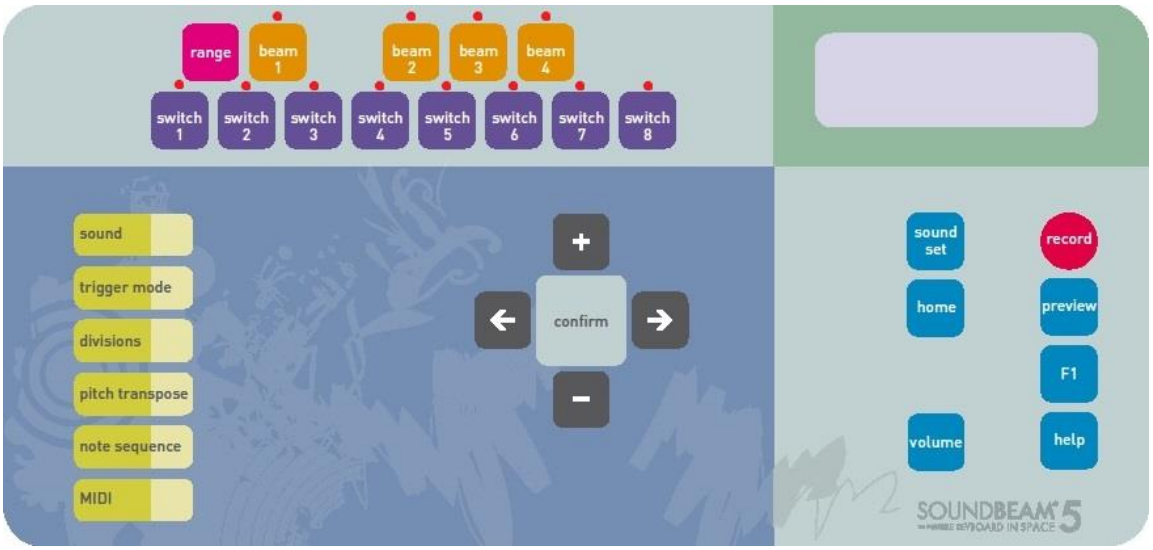


3. Connect your speakers to the ‘line out 1’ socket on the rear panel of the Soundbeam.

4. Connect the power supply unit to the Soundbeam and plug into the room’s electricity supply use the **on/off** switch at the back of the Soundbeam unit.

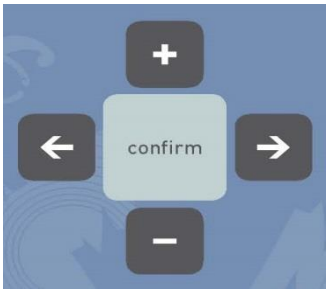
5. The wireless switches are battery powered and will need to be turned on using their **on/off** switch and then tap the coloured panel once to activate. The switch will power down after 15 minutes of non-use to preserve battery life. Tap once to reactivate if you want to keep playing.

3. NAVIGATION BUTTONS



Each button on the control panel has a special function. The feature that you are most likely to want to change, with its currently selected setting, will appear on the display screen when the button is pressed. This value can be changed by using the + or − buttons. Successive *short clicks* on the + or − buttons allows for more detailed 'fine tuning' up and down; *holding* the + or − button down allows for fast scrolling.

The ← and → buttons are used to navigate through the sub-menus available for each function.



It is critical that the functions of the + − ← and → buttons is understood!

4. HOW TO PLAY THE BEAM

With a little practice – and with a lot of people it just comes naturally – it's easy to play the beam in a musically interesting and satisfying way, as long as you follow these seven simple rules:

1. **Remember that no sound will be triggered by movements within 23 cm (9 inches) or so of the beam, directly in front of the sensor**. This portion of the beam is used as the 'chord clear' area when the beam is in a sustain trigger mode (see 'trigger modes'). Get a feel for where the sound starts and then move steadily away in a straight line until you reach the end of the beam, so that you have a sense of where the notes are along the beam's path and you can comfortably play the full range of pitch (low to high) available.

2. **Remember that the beam is quite directional,** like a torch beam. It does fan out in a narrow cone shape the further away you get, but if you picture it as a straight line coming directly out of the sensor (like a light sabre in *Star Wars)* this will help you to play it effectively.

3. **Understand the different trigger modes.** In 'multi' you can stay in the beam and play notes continuously by moving towards and away from the sensor. If one of the 'sustain' trigger modes is used, breaking the beam in the 'chord clear' area (see above) will stop the sound. If one of the 'single' or 'cyclic' trigger modes is used, you need to enter and exit the beam by moving *across* rather than *along* its path.

4. **Think like a musician!** Don’t play all the time; use silence, stop and start, listen to other players if it’s a group activity, or listen and try to play along to the pulse of the backing (if using an accompanying rhythm track). Try playing fast, slow, holding notes, ‘trilling’, or moving out of the beam and re-entering at a different point. If you simply move back and forth in a mechanical way the music will sound repetitive and boring.

5. **Melody Soundsets (19-27) using ‘cyclic’ trigger are harder to play** and may not be suitable as entry-level activities.

6. **Start off using just one beam.**

7. **Enjoy it!**

5. SOUNDSETS

A soundset is a global function: a collection of musical instructions – combinations of different instrumental sounds, musical scales, melodies and harmonies, playing styles (see section on 'trigger modes'), rhythm loops and other settings.

Your Soundbeam's memory can accommodate 128 soundsets. 32 of these are pre-composed into the machine. Nearly all of these include different parts for four beams and eight switches.

Soundbeam starts to get *really* interesting when you move beyond the 32 built-in soundsets and start composing and arranging your own music using the more advanced functions available on Soundbeam. These allow you to experiment with the essential building blocks of music: timbre (sound), pitch, melody, harmony and so forth, as well as exploring the sampling (record) function in order to assemble your own original pieces and sonic environments.

However, these 32 soundsets should give you plenty to get along with as you familiarise yourself with Soundbeam.

To select a soundset press the **soundset** button, then the + or − button. Whilst navigating through the soundsets in this way you can audition the one currently displayed on the screen by pressing the **preview** button to hear how it might sound. Once the desired soundset is displayed on the screen, press the **confirm** button to load it.

(***Note:*** if the previously loaded soundset has been modified, the display screen will prompt you to save your changes before loading the new soundset with successive presses of the **confirm** button. If you are happy to discard the changes you made to the soundset you were using before, press the **home** button to bypass this saving routine and load in the new soundset).

We suggest you start with the improvisations and the themes as these allow for complete expressive freedom; unlike the tunes there is no right or wrong way to play them.

Press the preview button whilst scrolling through the soundsets (before pressing confirm to load) if you want to get a sense of the material before attempting to play it.

Soundbeam 5 soundsets

Improvisations

1. Oh Yeah!
2. April Blues
3. Trench Town
4. Club Time
5. Pop Rocket
6. Cool Street
7. Sleuth
8. Tintern
9. Buena Bristol
10. Arabian Nights
11. Windy Isles
12. Himalaya
13. Drums
14. Shanghai
15. Whole Tone Scales
16. Funky House
17. Noyzee
18. Step Up

Tunes

19. Morning
20. Rainbow
21. Frère Jacques
22. Old MacDonald
23. Twinkle Twinkle
24. Greensleeves
25. Air on a G String
26. Summer Jazz
27. Christmas

Themes

(***Note:*** with all soundsets which utilise samples – and all of the following themed soundsets do – Soundbeam will only allow two samples to be played simultaneously. This prevents the piece from getting too busy and confusing, and also encourages players to listen, take turns and possibly to sequence sounds correctly alongside a narrative structure such as a poem or story. The 'Haunted House' soundset contains material that some may find frightening or offensive.

28. Space
29. English Fields
30. Haunted House
31. Comedy
32. Machines

Improvisations

1. OH YEAH!

In common with many of the other musical soundsets, the backing track is assigned to **switch 1**. ***This only needs to be pressed once (and again at the end). Repetitive start/stop with switch 1 backing loops will not work satisfactorily musically, and if you use key changes (see p.39) the loop will play back at the wrong speed.***

	Sound	Trigger Mode
Beam 1	Lead 6 (voice)	Multi
Beam 2	Pad 5 (bowed)	Multi
Beam 3	Acoustic Bass	Multi
Beam 4	Pad 1 (fantasia)	Multi
Switch 1	Sample – BTDISCO	Latching on/off
Switch 2	Vibraphone	Cyclic single
Switch 3	Vibraphone	Cyclic single
Switch 4	Sample - OHYEAH	On/off
Switch 5	Pad 1 (fantasia)	Cyclic single
Switch 6	Clap	On/off
Switch 7	Conga	On/off
Switch 8	Conga	On/off

2. APRIL BLUES

	Sound	Trigger Mode
Beam 1	Harmonica	Multi
Beam 2	Flute	Multi
Beam 3	Vibraphone	Sustain – single
Beam 4	Piano	Multi
Switch 1	Sample – BTApril	Latching on/off
Switch 2	Bass drum	On/off
Switch 3	Snare	On/off
Switch 4	Ride Cymbal	On/off
Switch 5	Vibraslap	On/off
Switch 6	High Bongo	On/off
Switch 7	Ride Cymbal	On/off
Switch 8	Chinese Cymbal	On/off

3. TRENCH TOWN

	Sound	Trigger Mode
Beam 1	Accordion	Multi clipped
Beam 2	Electric piano	Multi clipped
Beam 3	Agogo	Single
Beam 4	Synth bass 1	Single
Switch 1	Sample – Regnokey	Latching on/off
Switch 2	Percussive organ	On/off
Switch 3	Percussive organ	On/off
Switch 4	Percussive organ	On/off
Switch 5	Percussive organ	On/off
Switch 6	Percussion	Cyclic dbl clipped
Switch 7	Percussion	On/off
Switch 8	Percussion	On/off

4. CLUB TIME

	Sound	Trigger Mode
Beam 1	Lead 2 (sawtooth)	Multi clipped
Beam 2	String ensemble 2	Cyclic sustain
Beam 3	Synth brass 1	Multi
Beam 4	Oboe	Multi
Switch 1	Sample – 120EGFD2	Latching on/off
Switch 2	Sample – AHH	Cyclic dbl clipped
Switch 3	Sample – OOOLALA	Cyclic dbl clipped
Switch 4	Sample – CHEERBIG	Cyclic dbl clipped
Switch 5	Lead 1 (square)	Cyclic dbl clipped
Switch 6	Lead 4 (chiff)	Cyclic dbl clipped
Switch 7	Ocarina	Cyclic dbl clipped
Switch 8	Steel drums	Cyclic dbl clipped

5. POP ROCKET

	Sound	Trigger Mode
Beam 1	Distortion guitar	Multi
Beam 2	Rock organ	Multi
Beam 3	Lead 1 (square)	Multi
Beam 4	Clavi	Multi
Switch 1	Sample – POP	Latching on/off
Switch 2	French horn	On/off
Switch 3	French horn	On/off
Switch 4	French horn	On/off
Switch 5	Tinkle bell	Cyclic dbl clipped
Switch 6	Electric piano 1	Cyclic dbl clipped
Switch 7	Lead 1 (square)	Cyclic dbl clipped
Switch 8	Drawbar organ	Cyclic dbl clipped

6. COOL STREET

Suggestion: because the backing loop is purely percussive, **switch 7** may be effectively used for key changes (see p.39).

	Sound	Trigger Mode
Beam 1	Percussive organ	Multi
Beam 2	Lead 2 (sawtooth)	Multi-Clipped
Beam 3	Flute	multi
Beam 4	Piano	Multi
Switch 1	Sample – 124Beat (looped)	Latching on/off
Switch 2	Rock organ	Cyclic Single
Switch 3	Rock organ	Cyclic Single
Switch 4	Rock organ	Cyclic Single
Switch 5	Warm pad	Cyclic Single
Switch 6	Warm pad	Cyclic Single
Switch 7	Warm pad	Cyclic Single
Switch 8	Acoustic bass	Cyclic Single

7.SLEUTH

	Sound	Trigger Mode
Beam 1	Harpsichord	Multi
Beam 2	Synth brass 2	Multi
Beam 3	Alto sax	Multi
Beam 4	Flute	Multi
Switch 1	Sample – LITEJAZZ	Latching on/off
Switch 2	Sample – RAIN 1	On/off
Switch 3	Gunshot	On/off
Switch 4	Sample – SIREN	On/off
Switch 5	Telephone	On/off
Switch 6	Helicopter	On/off
Switch 7	Sample - WIND	On/off
Switch 8	Sample – DOG BARK	On/off

8. TINTERN

Suggestion: Lovely opportunity for duets using either Switches 2 & 3 or beams

	Sound	Trigger Mode
Beam 1	Flute	Multi
Beam 2	Clarinet	Multi
Beam 3	Harp	Single
Beam 4	String ensemble 3	Multi
Switch 1	Sample – STRINGS 3	Latching on/off
Switch 2	‘Cello	Cyclic single
Switch 3	Clarinet	Cyclic single
Switch 4	Vibraphone	Cyclic single
Switch 5	Marimba	Cyclic single
Switch 6	Timpani	On/off
Switch 7	Timpani	On/off
Switch 8	Timpani	On/off

9. BUENA BRISTOL

	Sound	Trigger Mode
Beam 1	Tango accordion	Multi
Beam 2	Piano	Multi
Beam 3	Voice oohs	Multi
Beam 4	Guitar nylon	Single clipped
Switch 1	Sample – FLAMLOOP	Latching on/off
Switch 2	Whistle	Cyclic single
Switch 3	Piano	On/off
Switch 4	Percussion	On/off
Switch 5	Percussion	On/off
Switch 6	Percussion	On/off
Switch 7	Percussion	On/off
Switch 8	Percussion	On/off

10. ARABIAN NIGHTS

	Sound	Trigger Mode
Beam 1	Shanai	Multi
Beam 2	Shakuhachi	Multi
Beam 3	Santur	Multi
Beam 4	Breath noise	Multi
Switch 1	Sample – ARABIAN	Latching on/off
Switch 2	Pad 8 (sweep)	Latching on/off
Switch 3	Pad 8 (sweep)	Latching on/off
Switch 4	Steel drums	Cyclic single
Switch 5	Percussion	On/off
Switch 6	Percussion	On/off
Switch 7	Percussion	On/off
Switch 8	Percussion	On/off

11. WINDY ISLES

	Sound	Trigger Mode
Beam 1	Tinkle bell	Multi
Beam 2	Synth voice	Sustain multi
Beam 3	Ocarina	Multi
Beam 4	FX1 – rain	Sustain single
Switch 1	Accordion	Cyclic single
Switch 2	Sample – WIND	On/off
Switch 3	FX7 – echoes	Latching on/off
Switch 4	FX7 – echoes	Latching on/off
Switch 5	FX7 – echoes	Latching on/off
Switch 6	FX7 – echoes	Latching on/off
Switch 7	Sample – WAVES	On/off
Switch 8	Sample – SEAGULL	On/off

12. HIMALAYA

The samples on **switches 2 - 6** and **switch 8** are quite busy and work best if used sparingly. This is a richly textured soundset and needs room to breathe. Because the backing loop is purely percussive, **switch 7** may be effectively used for key changes (see p.39).

	Sound	Trigger Mode
Beam 1	FX4 (atmosphere)	Sustain multi
Beam 2	Pad 7 (halo)	Cyclic sustain
Beam 3	Lead 3 – calliope	Multi
Beam 4	Fretless bass	Multi
Switch 1	Sample – 75G TABLA	Latching on/off
Switch 2	Sample – BELLS 6	On/off
Switch 3	Sample – CHANTING	On/off
Switch 4	Sample – BELLAMBI	On/off
Switch 5	Sample – GAMELAN 4	On/off
Switch 6	Sample – CHANT	On/off
Switch 7	Seashore	On/off
Switch 8	Sample – BELLS 4	On/off

13. DRUMS

	Sound	Trigger Mode
Beam 1	Drums and percussion x 40	Multi
Beam 2	Drums and percussion x 4	Multi
Beam 3	Percussion x 2	Multi
Beam 4	Percussion x 1	Single
Switch 1	Low tom	On/off
Switch 2	Mid tom	On/off
Switch 3	Tambourine	On/off
Switch 4	Low bongo	On/off
Switch 5	Claves	On/off
Switch 6	Closed triangle	On/off
Switch 7	Whistle	On/off
Switch 8	High bongo	On/off

14. SHANGHAI

Try developing improvised rhythm patterns using the pentatonic scales with tuned percussion on all beams and switches 1 and 2, this can fit nicely with sequenced chords on switches 3 – 8.

	Sound	Trigger Mode
Beam 1	Vibraphone	Cyclic single
Beam 2	Vibraphone	Cyclic single
Beam 3	Xylophone	Cyclic single
Beam 4	Music box	Cyclic single
Switch 1	Steel drums	Cyclic single
Switch 2	Tubular bells	Cyclic single
Switch 3	FX2 – soundtrack	On/off
Switch 4	FX2 – soundtrack	On/off
Switch 5	FX2 – soundtrack	On/off
Switch 6	FX2 – soundtrack	On/off
Switch 7	FX2 – soundtrack	On/off
Switch 8	FX2 – soundtrack	On/off

15. WHOLE TONE SCALE

The work of Professor Phil Ellis at the University of Warwick and latterly at the University of Sunderland and the evolution of his ‘sound therapy’ model has been a highly influential factor in the widespread adoption of Soundbeam in special schools in the UK and elsewhere. This is an open-ended approach allowing individuals to explore sound without being musically or culturally prescriptive. The whole tone scale is central to this philosophy as it contains no ‘root’ note and is aesthetically neutral. (See Appendix 6).

	Sound	**Trigger Mode**
Beam 1	Marimba	Multi
Beam 2	Piano	Multi
Beam 3	Voice oohs	Multi
Beam 4	Flute	Multi
Switch 1	Honky Tonk piano	Cyclic single
Switch 2	Celeste	Cyclic single
Switch 3	Xylophone	Cyclic single
Switch 4	Accordion	Cyclic single
Switch 5	Slap bass 1	Cyclic single
Switch 6	‘Cello	Cyclic single
Switch 7	Clarinet	Cyclic single
Switch 8	Ocarina	Cyclic single

16. FUNKY HOUSE

	Sound	**Trigger Mode**
Beam 1	Ocarina	Multi
Beam 2	Synth strings 2	Cyclic sustain
Beam 3	Lead 7 (fifths)	Multi clipped
Beam 4	Synth drum	Single
Switch 1	Sample – 115EGBS2	Latching on/off
Switch 2	Atmosphere	Cyclic single
Switch 3	Sample – BIRDS 4	Latching on/off
Switch 4	Sample – PIGS	On/off
Switch 5	Reverse cymbal	On/off
Switch 6	Percussion	On/off
Switch 7	Percussion	On/off
Switch 8	Percussion	On/off

17. NOYZEE

	Sound	Trigger Mode
Beam 1	FX7 (echoes)	Multi
Beam 2	Grand Piano	Cyclic sustain
Beam 3	Lead 1 (square)	Multi
Beam 4	Celeste	Multi
Switch 1	Sample – FCDRUMS	Latching on/off
Switch 2	Sample – FCBASS3	On/off
Switch 3	Sample- FCBASS2	On/off
Switch 4	Sample – FCMUS8	On/off
Switch 5	Sample – FCMUS10	On/off
Switch 6	Sample – FCMUS10	On/off
Switch 7	Sample FCMUS10	On/off
Switch 8	Sample – UFO4	On/off

18. STEP UP

	Sound	Trigger Mode
Beam 1	Whistle	Multi
Beam 2	Celeste	Multi
Beam 3	Piano	Multi
Beam 4	Lead 1 (square)	Multi
Switch 1	Sample – FCBIC4	Latching on/off
Switch 2	Sample – FCBIC2	On/off
Switch 3	Sample – FCBIC7	On/off
Switch 4	Sample – FCBIC8	On/off
Switch 5	Sample – FCBIC1	On/off
Switch 6	Sample – FCBIC3	On/off
Switch 7	Sample – FCBIC6	On/off
Switch 8	Sample FCBIC2	On/off

Tunes

Note: It is essential to understand cyclic trigger (pp.36-37) before attempting the tunes.

19. MORNING

A simple arrangement of the traditional song *Morning Has Broken*.

The melody is played on **beam 1** (or **beam 3**) using cyclic single.

The chords are played on **beam 2** (or **beam 4**) using cyclic sustain. They should be played on the first syllable of the last word in each line:

bro-ken, ***mor***-ning, ***spo***-ken

Listen to the **preview** if you're not sure.

Switch 1 gives a sample of birdsong. The melody can be played using different instruments on **switches 2 - 5** with the chords on **switches 6 - 8**.

Note: As with all tunes using cyclic trigger, if you make a mistake and the two beams or switches get out of phase the easiest thing to do is reload the soundset (by pressing soundset and confirm), and start again.

	Sound	Trigger Mode
Beam 1	Clarinet	Cyclic sustain
Beam 2	Pad 2 – warm	Cyclic sustain
Beam 3	Flute	Cyclic single
Beam 4	Synth voice	Cyclic sustain
Switch 1	Sample – BIRDS 1	Latching on/off
Switch 2	Accordion	Cyclic single
Switch 3	Violin	Cyclic single
Switch 4	'Cello	Cyclic single
Switch 5	Whistle	Cyclic single
Switch 6	Piano	Cyclic single
Switch 7	String ensemble 1	Cyclic single
Switch 8	Flute	Cyclic single

20. RAINBOW

Some- where over the rainbow

Way up high ……

There's a land that I heard of

Once in a lul la- by. Some…

day I'll wish u- pon a star and wake up where the clouds are far be-

-hind me …… where… troubles melt like lemon drops a-

way above the chimney tops that's where you'll

find me

Each block of colour represents one touch of **switches 1 and 2**. Note that in lines 4 and 7-8 the chords are not played in a steady pulse. Listen to the **preview** if this is unclear.

There is alternative melodic instrumentation on **beams 2 – 4** and alternative harmonic instrumentation on **switches 3 and 4**, **switches 5 and 6**, and **switches 7 and 8**.

	Sound	**Trigger Mode**
Beam 1	Pad 1 – fantasia	Cyclic single
Beam 2	Clarinet	Cyclic sustain
Beam 3	Flute	Cyclic sustain
Beam 4	Accordion	Cyclic single
Switch 1	Pad 1 – fantasia	Cyclic single
Switch 2	Pad 1 – fantasia	Cyclic single
Switch 3	Pad 2 – warm	Cyclic single
Switch 4	Pad 2 – warm	Cyclic single
Switch 5	Piano	Cyclic single
Switch 6	Piano	Cyclic single
Switch 7	Accordion	Cyclic single
Switch 8	Accordion	Cyclic single

21. FRÈRE JACQUES

This works well as a round. Players may share the tune by taking turns using switches 1-4 as follows:

Frè..	re	Ja..	cques	frè..	re	Ja..	cques
Dor..	mez-	vous?		Dor…	mez-	vous ?	
Son.. nez	les ma..	tin..	es !	Son.. nez	les ma..	tin..	es !
Ding	daing	dong		Ding	daing	dong.	

All beams and switches 5 – 8 contain the full melody, but on switches 1 – 4 the ‘start at’ division (see. P. 39) has been adjusted so that the note sequence begins at different points in the tune.

	Sound	**Trigger Mode**
Beam 1	Piano	Cyclic single
Beam 2	Celeste	Cyclic single
Beam 3	Glockenspiel	Cyclic single
Beam 4	Music box	Cyclic single
Switch 1	Marimba	Cyclic single
Switch 2	Harp	Cyclic single
Switch 3	‘Cello	Cyclic single
Switch 4	Tinkle bell	Cyclic single
Switch 5	Xylophone	Cyclic single
Switch 6	Flute	Cyclic single
Switch 7	Clarinet	Cyclic single
Switch 8	Honky Tonk piano	Cyclic single

22. OLD MACDONALD

The piano accompaniment on **switches 6, 7 and 8** can be tricky. As with *Rainbow* and *Frère Jacques* use the colour matching 'score' to help, and listen to the **preview** if you're not sure.

Old	Mac	Don	ald
had	a	farm	…….
Eee	ay	ee	ay
Oh	……	…….	and
On	that	farm	he
had	a	dog	…….
Ee	ay	ee	ay
Oh	……..	…….	…….

	Sound	Trigger Mode
Beam 1	Trombone	Cyclic single
Beam 2	Tuba	Cyclic single
Beam 3	Sample – ROOSTER	Single
Beam 4	Sample – SHEEP	Single
Switch 1	Harmonica	Cyclic single
Switch 2	Sample – COW	Cyclic single
Switch 3	Sample - PIG	Cyclic single
Switch 4	Sample – HORSE	Cyclic single
Switch 5	Sample – DUCK	Cyclic single
Switch 6	Piano	Cyclic single
Switch 7	Piano	Cyclic single
Switch 8	Piano	Cyclic single

23. TWINKLE TWINKLE

The chords on **beam 2** and **beam 4** are played at a steady 4/4 beat. Listen to the **preview** if unsure.

	Sound	Trigger Mode
Beam 1	Flute	Cyclic sustain
Beam 2	Accordion	Cyclic sustain
Beam 3	Marimba	Cyclic sustain
Beam 4	Steel drums	Cyclic sustain
Switch 1	Clarinet	Cyclic single
Switch 2	Clarinet	Cyclic single
Switch 3	Clarinet	Cyclic single
Switch 4	Clarinet	Cyclic single
Switch 5	'Cello	Cyclic single
Switch 6	'Cello	Cyclic single
Switch 7	'Cello	Cyclic single
Switch 8	'Cello	Cyclic single

24. GREENSLEEVES

The melody is on **beam 1** and **beam 2** with chords on **switch 1** and **switch 2** (some liberties have been taken with the harmony).

Alas, my love, you do me wrong, to

cast me off dis.. …courteously, for

I have loved you well and long, de…

…lighting in your company

Greensleeves was all my joy

Greensleeves was my delight

Greensleeves was my heart of gold and

who but my lady Greensleeves.

	Sound	Trigger Mode
Beam 1	Accordion	Cyclic sustain
Beam 2	Flute	Cyclic sustain
Beam 3	Guitar	Cyclic sustain
Beam 4	Fiddle	Cyclic sustain
Switch 1	Accordion	Cyclic single
Switch 2	Pad 2 – warm	Cyclic single
Switch 3	Sample – BIRDS 4	Latching on/off
Switch 4	Sample – BIRDTR 1	On/off
Switch 5	Harpsichord	Cyclic
Switch 6	Vibraphone	Cyclic
Switch 7	Church Organ	Cyclic
Switch 8	Harp	Cyclic

25. AIR ON A G STRING

	Sound	Trigger Mode
Beam 1	'Cello	Cyclic sustain
Switch 1	Acoustic bass	Cyclic single

26. SUMMER JAZZ

	Sound	Trigger Mode
Beam 1	Alto sax	Cyclic sustain
Beam 2	Vibraphone	Sustain single
Beam 3	Alto sax	Cyclic single
Beam 4	Piano	Multi
Switch 1	Sample – SUMMER 1	Latching on/off
Switch 2	Harmonica	Cyclic
Switch 3	Percussion	On/off
Switch 4	Percussion	On/off
Switch 5	Cello	Cyclic
Switch 6	Percussion	On/off
Switch 7	percussion	On/off
Switch 8	Guitar	Cyclic

27. CHRISTMAS

The chord accompaniment on switches 1 – 3 (or 4 – 6) to the '*Silent Night'* melody on beams 1 - 4 are played as follows:

Silent	night	holy	night
All is	calm	all is	bright
Round yon	Virgin	Mother and	Child
Holy	Infant so	tender and	mild
Sleep in	heavenly	peace	
Sleep in	heavenly	peace	

	Sound	Trigger Mode
Beam 1	Synth voice	Cyclic sustain
Beam 2	Harpsichord	Cyclic sustain
Beam 3	Piano	Cyclic sustain
Beam 4	Fantasia	Cyclic sustain
Switch 1	Piano	On/off
Switch 2	Piano	On/off
Switch 3	Piano	On/off
Switch 4	Pad 1 – fantasia	On/off
Switch 5	Pad 1 – fantasia	On/off
Switch 6	Pad 1 – fantasia	On/off
Switch 7	Sample – BELLS 1	Latching on/off
Switch 8	Sample – BELLS 2	Latching on/off

Themes

All of the soundsets in this section require planning and organisation to make sense. They could be best used to accompany a narrative structure such as a story, poem or song, or to reinforce concepts from other various curriculum areas. The key is to enable players to **sequence** the sounds in an appropriate and logical way, to **combine** pairings of sounds effectively, and to **listen and take turns** appropriately. Having a 'conductor' and using cues and objects of reference or pictures can help teachers and others to approach the material methodically.

Remember that only TWO samples may be played simultaneously.

28. SPACE

	Sound	Trigger Mode
Beam 1	FX7 – Echoes	Multi
Beam 2	Pad 8 – sweep	Cyclic sustain
Beam 3	FX1 – rain	Multi
Beam 4	Pad 6 – metallic	Cyclic sustain
Switch 1	Sample – UFO VISIT	On/off
Switch 2	Sample – GAMES FX!	On/off
Switch 3	Sample – GAMES FX4	On/off
Switch 4	Sample – BLAST 1	On/off
Switch 5	Sample – LASER 3	On/off
Switch 6	Sample- GAMES FX4	On/off
Switch 7	Sample – MAD LAB 1	On/off
Switch 8	Sample – UFO – SLOW	On/off

29. ENGLISH FIELDS

	Sound	Trigger Mode
Beam 1	Clarinet	Multi clipped
Beam 2	String ensemble 2	Cyclic sustain
Beam 3	Tuba	Multi
Beam 4	Viola	Multi
Switch 1	Sample – BIRDS 1	On/off
Switch 2	Sample – SHEEP 1	On/off
Switch 3	Sample – GEESE 2	On/off
Switch 4	Sample – DUCK 1	On/off
Switch 5	Sample – ROOSTER	On/off
Switch 6	Sample- HORSE	On/off
Switch 7	Sample – COW 2	On/off
Switch 8	Sample – BROOK	On/off

30. HAUNTED HOUSE

Important note: assess the appropriateness of this soundset before using it (especially switch 7).

	Sound	Trigger Mode
Beam 1	Honky Tonk piano	Sustain – multi
Beam 2	FX6 – goblins	Sustain – single
Beam 3	Synth strings 2	Sustain – single
Beam 4	Sample – BELLS 6	Sustain – single
Switch 1	Sample – LAUGH 2	On/off
Switch 2	Sample – WOLFHOWL	On/off
Switch 3	Sample – THUNDER 2	On/off
Switch 4	Sample – MONSTER 1	On/off
Switch 5	Sample – SCARYS 1	On/off
Switch 6	Sample- HEHEHE	On/off
Switch 7	Sample – VOMIT	On/off
Switch 8	Timpani	On/off

31. COMEDY

	Sound	Trigger Mode
Beam 1	Sample – OOAAOOAA	Single
Beam 2	Sample – OOOLALA	Single
Beam 3	Sample – BLIPLOOP	Single
Beam 4	Sample – SPLASH	Single
Switch 1	Sample – TV SHOW	On/off
Switch 2	Sample – SNORE	On/off
Switch 3	Sample – LAUGH 2	On/off
Switch 4	Sample – WOBBLE	On/off
Switch 5	Sample – PLAYER 2	On/off
Switch 6	Sample- OPERA AH	On/off
Switch 7	Sample – NOSEBLOW	On/off
Switch 8	Sample – SPIT	On/off

32. MACHINES

	Sound	Trigger Mode
Beam 1	Sample – CAR RACE 2	Single
Beam 2	Sample – TRUCKS 1	Single
Beam 3	Sample – RACING CAR	Single
Beam 4	Sample – HELICOPTER	Single
Switch 1	Sample – FACTORY 1	On/off
Switch 2	Sample – FACTORY 2	On/off
Switch 3	Sample – FACTORY 3	On/off
Switch 4	Sample – FACTORY 4	On/off
Switch 5	Sample – FACTORY 5	On/off
Switch 6	Sample- FACTORY 7	On/off
Switch 7	Sample – CONSTRUCTION	On/off
Switch 8	Sample – METAL 1	On/off

Soundset sub-menus

Note: If you get lost here, press* soundset *to return to the main screen.

Press **soundset** then
Press → (once): Copy/Save Soundset.

(Soundbeam will already have prompted you to save any new or modified soundsets. What this sub-menu allows you to do is to copy and save a soundset to a specified location (soundset number). You may, for example, want to make changes to existing preset or user-composed soundsets by playing the music using different sounds. Use the + or – buttons to select the new soundset location number and **confirm**).

Press → → (twice): Rename Soundset.
Press **confirm** to start. Use the + and – buttons to scroll through and select from the alphabet and other characters, and the → button to move the cursor along to the next space. Press **confirm** to complete.

Press → → → (three times): Lock User Soundset.
Use the + and – buttons to toggle on/off. Lock 'on' to prevent accidental overwriting of the soundset **(*Note: if changes have been made to the soundset, these need to be saved before the soundset is locked 'on'*)**.

Press the **soundset** button to return to main screen.

Press ← ← (twice): Default power up
When Soundbeam is switched on it will normally load soundset 1. To change this use the +/– buttons to select soundsets between 1 and 128 (or, between 128 and 1, 'last used').

Press ← (once): Soundset Sequence Using Switch 8.

You can use **switch 8** to navigate through a series of soundsets. This (along with 'Transpose Sequence Using Switch 7' – see 'Pitch transpose sub-menus' below) – gives the Soundbeam player virtually total control over the changing musical material available to them, doing away with the need for a 'pilot' supervising the controls.

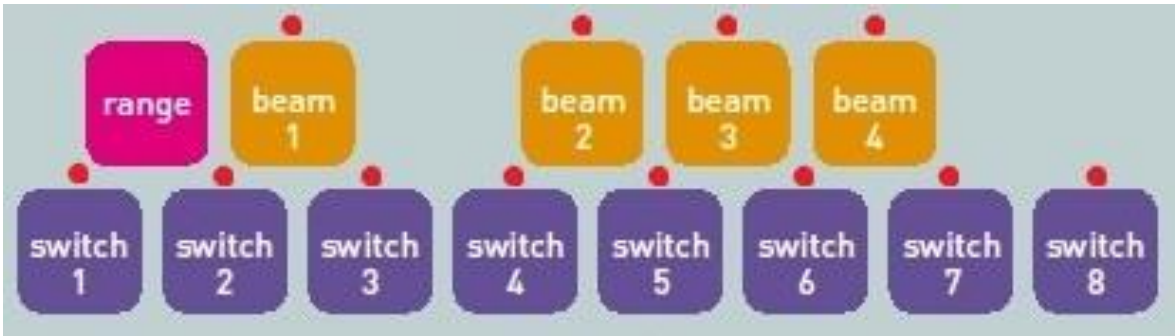
Use the +/– buttons to toggle between on/off. If this function is 'off' **switch 8** will function in the same way as other switches (playing sounds). If it is 'on', the switch will not play in the usual way but will rather allow you to load a sequence of soundsets with successive presses of the switch.

With this function 'on' use the +/– buttons and the → button to compose your soundset list. Press **confirm** to finish editing the list. This feature is automatically disabled on power-up so that users are not confused by silent switches.

HOME

Pressing **home** returns you to the main soundset screen.

6. BEAM/SWITCH



Use these to change settings for a specified beam or switch. For example, to change the musical scale, melody or chords on beam 3, press the **beam 3** button, then the **note sequence** button, and use the + or – button. Any other adjustment you make will be applied to beam 3 specifically until another beam or switch is selected.

The lights flash to indicate when the beams/switches are in play.

7. RANGE

Variations in the length of the beams are possible using this feature. This means that you can define the active playing area in space in accordance with the requirements of your performance or in order to accommodate the physical capabilities or limitations of the player.

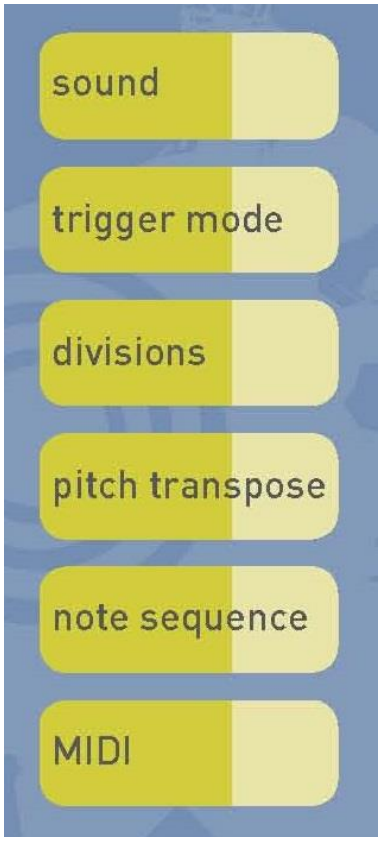
Press the beam button corresponding with the beam you want to change, then the range button. The + and – buttons now allow you to extend or reduce the active playing length of the beam. End at on the display screen refers to the furthest point away from the sensor at which sounds will be activated by interruptions of the beam. (The ← / → buttons can be used to select the start at feature which allows you to define the closest point to the sensor at which sounds will be triggered).

To use Soundbeam at long range (over 2 metres) the playing space needs to be as open and uncluttered as possible. Under normal conditions the beams should perform reliably up to 2 metres away from the sensor though care always needs to be taken to ensure that there are no objects along the path of the beam. It is best to start with the shortest range and then extend it as required by the player.

Note: The 'chord clear' area (see 'sustain' trigger modes p.36.) between the sensor and the 'start at' point can be made larger or smaller by adjusting the 'start at' setting.

8. SOUND

Soundbeam's internal synthesiser contains a library of 128 sounds, with some additional variations between 129 and 256 (see Appendix 1). The sound selected on the display screen (via the + or – button) will be assigned to the currently selected beam or switch (as identified on the display screen and also by the flashing light).



Sub menus

The unit's SD card also contains samples and rhythm loops in various styles and can be used to record samples.

To assign a rhythm loop or sample to a beam or switch, press the **beam** or **switch** button corresponding the one you want to assign the sample to, press the **sound** button, then the – button to select 'Midi program off' (one click before *001 piano*. This disables the internal synthesiser chip). Now press → to get into the sample sound library, and use the +/– buttons to select the sample.

Press → again then + /– to toggle between loop (for continuous play) or once.

9. TRIGGER MODES - beams

single To play a note, break the beam. To play another note, come out of the beam and re-enter it. The note heard will depend on the point along the beam's path at which the interruption occurs.

multi Movement within the beam will trigger a continuous succession of notes with movement towards and away from the sensor. Sensitivity/note activity can be varied by adjusting **range** and **divisions**.

sustain – single Like single, but the sound (providing it's a 'long' sound like an organ or violin, or a sound with a slow decay like a piano, but not a 'short' sound like a xylophone) will continue to play even when you move out of the beam. Enter and exit the beam at other points along its path to create a sustaining chord. Use the 'chord clear' area directly in front of the sensor to stop the sound.

sustain – multi Like multi, with the notes held until cleared as in 'sustain – single' above. Use the 'chord clear' area directly in front of the sensor to stop the sound.

single – clipped Single notes will sound for a fixed duration which is set by using the → button from the 'Single-clipped' screen and then using the + or – button to select the clip time.

multi – clipped Movement within the beam will trigger a continuous succession of notes which will sound for a fixed duration set by using the → button from the 'Multi-clipped' screen and then using the + or – button to select the clip time.

cyclic – single Successive interruptions of the beam, irrespective of where it is interrupted along its path, will play a sequential series of notes or chords in the correct order. The sound will stop when the beam is exited.

cyclic – sustain Successive interruptions of the beam, irrespective of where it is interrupted along its path, will play a sequential series of notes or chords in the correct order, with the note or chord held until the next one is triggered. Use the 'chord clear' area directly in front of the sensor to stop the sound.

trigger OFF This has the effect of muting the sensor and also silences its 'buzz'.

TRIGGER MODES – switches

on – off The sound plays when the switch is operated.

latching On-Off The sound (long sound or sample loop) plays when the switch is operated and stays on. Operate switch a second time to switch off.

cyclic Press the switch repeatedly to play a sequential series of notes or chords in the correct order.

controller only Instead of using the switch to play sounds, it can be used like an effects pedal to change the qualities (e.g. vibrato) of sounds being played on other beams or switches. This is an advanced application for using with external software or hardware synthesisers.

cyclic dbl clipped A sound plays on press *and again* on release. Press and release the switch repeatedly to play a sequential series of notes or chords.

trigger OFF Mutes the switch.

10. DIVISIONS

Each beam or switch can contain up to 250 single notes and/or chords (containing up to ten notes). Use the + and – buttons to increase or decrease the number of divisions.

Sub menus

Press → (once): Start note sequence at note number

This allows you to utilise different portions of a note sequence. For example, you might have a progression of nine chords in your note sequence and want to use, perhaps for composing a new soundset, the fourth, fifth and sixth ones in the sequence in cyclic trigger on a switch. Selecting three divisions and using the + button to start the note sequence at number 4 will achieve this.

Press → → (twice): Max polyphony

In ‘sustain’ and ‘sustain – multi’ trigger modes, this function determines the number of notes that can be played simultaneously. A low value (e.g. 3 or 4), using the + / - buttons, will make for clean distinct chords, higher values will give a denser harmonic texture.

11. PITCH TRANSPOSE

The note sequence can be transposed in pitch independently for each beam and switch by up to three octaves up or down. Use the + and - buttons to transpose in semitonal increments. For example an adjustment to the pitch transpose setting from +0 to +12 will raise the pitch of the note sequence by one octave.

Sub menus

Press → (once): Global Transpose
This shifts the pitch for all beams and switches together.

Press → → (twice): Transpose Sequence using Switch 7
With this screen displayed, use the + / - buttons to select 'off' (between 128 and 1) to use the switch in the normal way. Alternatively, to use the switch in order to effect a sequence of global key changes, choose a note sequence and select the number of divisions that corresponds with the number of key changes you want (not more than three or four we would suggest). If the note sequence contains chords, the lowest note of the chord will be used to determine the key. This feature is automatically disabled on power-up so that users are not confused by silent switches.

12. NOTE SEQUENCE

Soundbeam contains 128 ***note sequences*** – musical scales, chord sequences and tunes. Note sequences which are named are preset in Soundbeam's memory and cannot be erased. User note sequences can be programmed in by the user either using an external MIDI keyboard or by using the **range**, **beam** and **switch** buttons which are arranged on the control panel like a simple keyboard.

Sub menus

In preset note sequences

Press → (once): Replay Division

Hold down the **confirm** button and press the + / - buttons to audition the selected note sequence.

In user note sequences

Press ← (once): Lock user note sequence

In order to make all the edit functions available the note sequence needs to be unlocked. Use the + / - button to select 'off'.

Having done this press the **note sequence** button to return to the main screen.

Press → (once): Record Division

From here you can record your own sequence of notes and/or chords. Use a MIDI lead to connect MIDI IN 1 from Soundbeam to the MIDI OUT socket on a piano-style keyboard (not a qwerty keyboard). Play notes or chords with clear separation between divisions - if you play too smoothly with a 'legato' style individual notes will be recorded as chords. If touch-sensitivity is available and enabled on the keyboard, Soundbeam will record the dynamics (loud and soft) too.

To record simple material from the ‘record division’ screen without the need for an external keyboard use the **range**, **beam** and **switch** buttons (in combination with the ← and → buttons to move up and down the octaves). Notes are arranged as follows:

C	switch 1
C#	range
D	switch 2
Eb	beam 1
E	switch 3
F	switch 4
F#	beam 2
G	switch 5
G#	beam 3
A	switch 6
Bb	beam 4
B	switch 7
C	switch 8

If you make a mistake use the - button to scroll back to the division containing the mistake and re-record.

On completion use the **confirm** button and the + / - buttons to save and name the note sequence, following the prompts on the screen.

Press → → (twice): Replay Division
Hold down the **confirm** button and press the + / - buttons to audition the selected note sequence.

Press → → → (three times): Play Direction
With a linear low-to-high note sequence you might wish the higher notes to be closest to the sensor, or the lower ones. Use + / - to toggle between ‘forward’ and ‘reverse’. (If using cyclic trigger with play direction set to ‘reverse’ the note sequence will play backwards). This feature is not available in locked note sequences including all preset note sequences.

13. MIDI

This feature allows you to choose to use Soundbeam alongside external MIDI or USB devices instead of or in addition to the internal synthesiser, to change MIDI channel defaults, and to transfer your Soundset data onto a computer or another Soundbeam 5 unit.

Sub menus

Press → (once): MIDI to (global)
Information from all beam and switches can be sent – using the + / - buttons – to Soundbeam's internal synthesiser, MIDI OUT 1, MIDI OUT 2, USB, or any combination of these.

Press → → (twice): Beam/Switch MIDI to
Information from specified beams and switches can be sent – using the + / - buttons – to Soundbeam's internal synthesiser, MIDI OUT 1, MIDI OUT 2, USB, or any combination of these. For example to play a sound from Soundbeam's internal sound library on beam 1 and a sound from an external keyboard or sound module (via MIDI OUT 1) on beam 2, set beam 1 to 'int' and beam 2 to '01'

Press → → → (three times): Beam/Switch MIDI channel
Use this to change the MIDI channel default settings for beams and switches.

Press → → → → (four times): MIDI Bulk Dump
Use + / - to select all soundsets, a specified soundset, all note sequences or a specified note sequence for transfer (dump) into another Soundbeam 5 unit or onto a computer. Press **confirm** to implement.

14. VOLUME

This button accesses Soundbeam's internal amplifier functions. Use the ⬅ and ➡ buttons to navigate through the following functions:

- global volume
- bass
- treble
- balance
- reverb level
- input volume (for recording samples)
- internal synth volume (for balancing levels with sampler volume)
- beam/switch volume levels with graphic display

and use the + and − buttons to increase or decrease the selected value.

To MUTE all sound press **volume** then **F1**. To resume play, press **home**.

15. RECORD/PREVIEW

A ***sample*** is an audio recording, usually with a short duration.

How to make a sample using a microphone.

1. Insert powered condenser microphone into the back panel of the Soundbeam unit (line in). Hold the microphone away from the speakers to avoid feedback. Switch on the microphone.

2. Press the **record** button and use the + − and **confirm** buttons to select Record Sample (not *session*).

3. Check that a visible response is seen on the display screen when talking or singing into the microphone, and when ready press the **record** button to begin recording.

4. Now make your sounds (vocal, instrumental, percussive, experimental etc.)

5. When you wish to stop the recording press the **record** button again.
Note that as soon as the recording is stopped it is automatically given a number (example – 005) and allocated a place on the SD card – it will be found at the end of the list of samples already on the SD card.

You can listen to the sample immediately by pressing and holding the **preview** button, and as prompted you can use the **F1** button, ← → + - to rename the sample. It is advisable to name samples as you build your library. They will be listed on the card alphabetically and numerically.

To delete the sample if you're not happy with it, press the **F1** button, page right and follow onscreen instructions

The sample is now created and ready to be assigned to a beam or switch.

To assign a sample to a beam, a few settings will need to be changed.

Select beam 1 (by pressing the beam 1 button), then press the **sound** button and select MIDI Program off listed immediately before 001 piano *(this disables any sound coming from the internal synthesiser which would otherwise be triggered in parallel with sample playback)* then page right → to the sample: OFF screen. Use the + - buttons to scroll through the list of available samples until you find the one you require.

Unless renamed the most recently recorded sample will be at the very bottom of the list, and the quickest way to reach the end of the list is to use the + (page up) button.

Page right again → will call up the Sample play mode.
There are two options here: either play once or loop.
If 'play once' is selected the sample will stop when it reaches the end.
If 'loop' is selected the sample will immediately start again once it reaches the end.
Fine adjustments can be made to the start and end points of a sample, this is a

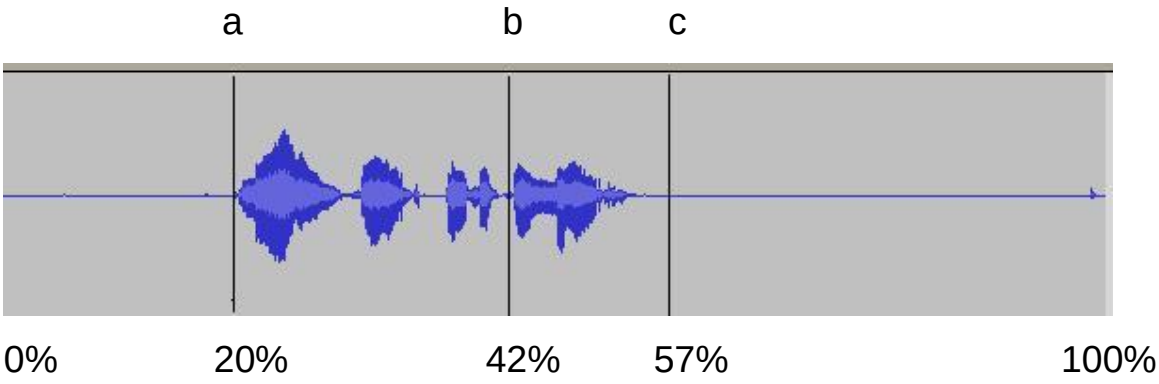
very important and useful feature enabling you to remove silence from the beginning.

Editing the sample

It is usually important to remove any silence from the beginning of a sample, so that when it is played using a beam or switch there is no pause before the sound is heard. If the silence is not removed it is likely that the player will not have the best opportunity to have control of the sound, and in some instances the user may mistakenly believe that there is no sound on the beam or switch.

Page right ➔ from the play sample mode takes us to the sample start at screen, here adjustments to the percentage % value enable us to select where in the recording we want our selection to begin.
A further page right ➔ takes us to the end at screen. Here adjustments to the percentage % value enable us to select where in the recording we want our selection to end.

In the illustration you can see a visualisation of a recording of someone saying “Mary had a little lamb”.
Notice how the start point (a) might be used to remove the silence at the beginning of the recording, and how point (b) might be used to select “Little Lamb” and how point (c) might be selected to remove excessive silence from the end.



(When applied – these settings are assigned for the beam or switch, and if a different sample is allocated to the same sensor/switch the start/end points will be applied to the new sample.

What notes to use

Once the sample has been selected and trimmed in this way, some consideration should be given as to how the sample is to be triggered in the beam.

The trigger mode, divisions, transpose, and range will all have some effect on the way the sample behaves in the beam. For example – if the trigger mode selected is 'multi', the number of divisions 64, the note sequence chromatic, and “Mary had a little lamb” is selected, you might find that at one end of the beam it sounds like Mickey Mouse is talking and at the other end a giant.

True Note (or Root Note)

To hear the sample played back at the same pitch as it was recorded, the note C3 should be played. There are many ways to assign C3 to a beam or switch and perhaps the easiest is to select note sequence 29 sample note C3. Subsequent adjustments can be made to the pitch of the sample using the transpose button and + / – Alteration of the pitch will also affect the speed at which it is played.

Looping a percussive sample

Several of the samples supplied with Soundbeam work effectively as a backing drum loop. And in many of the factory soundsets supplied with the unit samples are triggered using a switch, so that the first press starts the sample which will continue (looped) until the second press which will stop the loop.

Of course the sample needs to be set to **loop** in the sample play mode – but also the trigger mode for the switch (or beam) will need to be set to 'latching on/off'.

Adjustment to the loudness or volume for the sample can be achieved via the **volume** button (p. 43) and by pressing ← or → and navigating to the screen

which shows a visual representation of the levels for each beam and switch, so by selecting the beam or switch to which the sample has been allocated, and adjusting the level using the + - buttons, the volume of the sample can be altered.

Record Session

This function allows you to record an entire performance as played using the beams switches and microphone.

Press the **record** button and use the + - and **confirm** buttons to select Record Session (not *sample*).

Check that a visible response is seen on the display screen when beams and switches are activated, press the **record** button to begin recording.

Now perform the piece using the beams and switches and microphone (if wanting to add a vocal part to the piece).

When you wish to stop the recording press the **record** button again as prompted on the display screen.

Note that as soon as the recording is stopped it is automatically given a number (example: 006) and allocated a place on the SD card. It will be found at the end of the list of samples already on the SD card.

You can listen to the sample immediately by pressing the **preview** button, and as prompted you can use the **F1** button, ← → + - to rename or delete the sample.

SD card reading

The samples on the SD card can be reviewed, added to, renamed or deleted on a computer if a suitable card reader is used (SD card adapter on inside back cover). The sample name can only be 8 characters long and made up of numbers, letters or a limited number of symbols.

When you record a sample /session it will automatically be saved as a number (e.g., 001, 002 etc.). You can rename it. Your sample will then be found at the end of the library list after sample _DEMO030. The next time you switch on

Soundbeam it will reorder and list your sample numerically/alphabetically. If you didn't rename it, and it was automatically saved as a number 001, 002 and so forth, you will now find it at the beginning of the list (e.g., before sample 110disco).

Format: ***At time of print (Autumn 2013) Soundbeam 5 can only make use of samples that are Stereo, 16 bit wav files and can only support micro SD cards up to and including 32GB capacity. The SD card needs to be formatted as FAT 32. The card must be Class 10 type. Please contact us for technical support if required.***

APPENDIX 1: SOUNDBEAM 5 SOUND LIBRARY

Off (select this if using a sample)

1 Grand Piano
2 Bright Piano
3 Piano 3
4 Honky-tonk Piano
5 E. Piano 1
6 E. Piano 2
7 Harpsichord
8 Clavinova
9 Celesta
10 Glockenspiel
11 Music Box
12 Vibraphone
13 Marimba
14 Xylophone
15 Tubular Bells
16 Dulcimer
17 Drawbar Organ
18 Percussive Organ
19 Rock Organ
20 Church Organ
21 Reed Organ
22 Accordion
23 Harmonica
24 Tango Accordion
25 Acoustic Guitar (nylon)
26 Acoustic Guitar (steel)
27 Electric Guitar (jazz)
28 Electric Guitar (clean)
29 Electric Guitar (muted)
30 Overdriven Guitar
31 Distortion Guitar
32 Guitar harmonics
33 Acoustic Bass
34 Finger Bass
35 Picked Bass
36 Fretless Bass
37 Slap Bass 1
38 Slap Bass 2
39 Synth Bass 1
40 Synth Bass 2
41 Violin
42 Viola
43 Cello
44 Contrabass
45 Tremolo Strings
46 Pizzicato Strings
47 Orchestral Harp
48 Timpani
49 String Ensemble 1
50 String Ensemble 2
51 Synth Strings 1
52 Synth Strings 2
53 Choir Aahs
54 Voice Oohs
55 Synth Choir
56 Orchestra Hit
57 Trumpet
58 Trombone
59 Tuba
60 Muted Trumpet
61 French Horn
62 Brass Section
63 Synth Brass 1
64 Synth Brass 2
65 Soprano Sax
66 Alto Sax
67 Tenor Sax
68 Baritone Sax
69 Oboe
70 English Horn
71 Bassoon
72 Clarinet
73 Piccolo
74 Flute
75 Recorder
76 Pan Flute
77 Blown Bottle
78 Shakuhachi
79 Whistle
80 Ocarina
81 Lead 1 (square)
82 Lead 2 (sawtooth)
83 Lead 3 (calliope)
84 Lead 4 (chiff)
85 Lead 5 (charang)
86 Lead 6 (voice)
87 Lead 7 (fifths)
88 Lead 8 (bass + lead)
89 Pad 1 (new age)
90 Pad 2 (warm)

91 Pad 3 (polysynth)
92 Pad 4 (choir)
93 Pad 5 (bowed)
94 Pad 6 (metallic)
95 Pad 7 (halo)
96 Pad 8 (sweep)
97 FX 1 (rain)
98 FX 2 (soundtrack)
99 FX 3 (crystal)
100 FX 4 (atmosphere)
101 FX 5 (brightness)
102 FX 6 (goblins)
103 FX 7 (echoes)
104 FX 8 (sci-fi)
105 Sitar
106 Banjo
107 Shamisen
108 Koto
109 Kalimba
110 Bag pipe
111 Fiddle
112 Shanai
113 Tinkle Bell
114 Agogo
115 Steel Drums
116 Woodblock
117 Taiko Drum
118 Melodic Tom
119 Synth Drum
120 Reverse Cymbal
121 Guitar Fret Noise
122 Breath Noise
123 Seashore
124 Bird Tweet
125 Telephone Ring
126 Helicopter
127 Applause
128 Gunshot
129 Piano 1
130 Piano 2
131 Piano 3
132 Detuned EP 1
133 E. Piano 1
134 E. Piano 2
135 Detuned EP 2
136 Honky Tonk
137 Organ 1
138 Organ 2
139 Organ 3
140 Detuned Organ 1
141 Church Organ 2
142 Church Organ
143 Church Organ
144 Accordion French
145 Harpsichord
146 Coupled Harps
147 Coupled Harps
148 Clavinova
149 Clavinova
150 Clavinova
151 Celesta
152 Celesta
153 Synth Brass 1
154 Synth Brass 2
155 Synth Brass 3
156 Synth Brass 4
157 Synth Brass 1
158 Synth Brass 2
159 Synth Brass 3
160 Synth Brass 4
161 Fantasia
162 Syn Calliope
163 Choir Aahs
164 Bowed Glass
165 Soundtrack
166 Atmosphere
167 Crystal
168 Bagpipe
169 Tinkle Bell
170 Ice Rain
171 Oboe
172 Pan Flute
173 Saw Wave
174 Charang
175 Tubular Bells
176 Square Wave
177 Strings
178 Tremolo Strings
179 Slow Strings
180 Pizzicato Strings
181 Violin
182 Viola
183 Cello
184 Cello
185 Contrabass
186 Harp
187 Harp
188 Nylon String Guitar

189 Steel String Guitar
190 Chorus Guitar
191 Funk Guitar
192 Sitar
193 Acoustic Bass
194 Fingered Bass
195 Picked Bass
196 Fretless Bass
197 Slap Bass 1
198 Slap Bass 2
199 Fretless Bass
200 Fretless Bass
201 Flute
202 Flute
203 Piccolo
204 Piccolo
205 Recorder
206 Pan Flute
207 Soprano Sax
208 Alto Sax
209 Tenor Sax
210 Baritone Sax
211 Clarinet
212 Clarinet
213 Oboe
214 English Horn
215 Bassoon
216 Harmonica
217 Trumpet
218 Muted Trumpet
219 Trombone
220 Trombone
221 French Horn
222 French Horn
223 Tuba
224 Brass
225 Brass 2
226 Vibraphone
227 Vibraphone
228 Kalimba
229 Tinkle Bell
230 Glockenspiel
231 Tubular Bell
232 Xylophone
233 Marimba
234 Koto
235 Taisho Koto
236 Shakuhachi
237 Whistle
238 Whistle
239 Bottle Blow
240 Pan Flute
241 Timpani
242 Melo Tom
243 Concert BD
244 Synth Drum
245 Melo Tom
246 Taiko
247 Taiko
248 Reverse Cymbal
249 Castanets
250 Tinkle Bell
251 Orchestra Hit
252 Telephone
253 Bird
254 Helicopter
255 Bowed Glass
256 Ice Rain

APPENDIX 2: DRUM AND PERCUSSION SOUNDS

- Select beam or switch to which the drum is to be assigned
- Select note sequence 29
- Select 1 division
- Select Midi channel 10 (press MIDI and right arrow twice. Note: this is the default setting for switch 6)
- Press ‘pitch transpose’ and use the +/- buttons to select the instrument using the settings listed below

-25 Bass Drum 2
-24 Bass Drum 1
-23 Side Stick/Rimshot
-22 Snare Drum 1
-21 Hand Clap
-20 Snare Drum 2
-19 Low Tom 2
-18 Closed Hi-hat
-17 Low Tom 1
-16 Pedal Hi-hat
-15 Mid Tom 2
-14 Open Hi-hat
-13 Mid Tom 1
-12 High Tom 2
-11 Crash Cymbal 1
-10 High Tom 1
-9 Ride Cymbal 1
-8 Chinese Cymbal
-7 Ride Cymbal 2
-6 Tambourine
-5 Crash Cymbal 2
-4 Cowbell
-3 Crash Cymbal 3
-2 Vibraslap
-1 Ride Cymbal 3
0 High Bongo
+1 Low Bong0
+2 Mute High Conga
+3 Open High Conga
+4 Low Conga
+5 High Timbale
+6 Low Timbale
+7 High Agogô
+8 Low Agogô
+9 Cabasa
+10 Maracas
+11 Short Whistle
+12 Long Whistle
+13 Short Güiro
+14 Long Güiro
+15 Claves
+16 High Wood Block
+17 Low Wood Block
+18 Mute Cuíca
+19 Open Cuíca
+20 Mute Triangle
+21 Open Triangle

APPENDIX 3: SOUNDBEAM 5 SAMPLE LIBRARY

(see also Appendix 4: Sample library by category)

OFF **(No Sample)**
110DISCO
110HERTS
110TINCN
115EGBAS
115EGBS
115EGBS3
120ART
120EGFD2
120EGGFD
120EGLP3
120EGLUP
120FLFTB
120FULFT
120SQELCH
120UPBEAT
124BEAT
140HARDH
140HIPHO
155HARDY
75ATABLA
75BTABLA
75CTABLA
75DTABLA
75ETABLA
75FTABLA
75GTABLA
88CRUNCH
88SWEET
91GLITCH
98BLEEP
98DRUNK
98DUBBLE
98RHODES
98SCRATCH
98SQELCH
AHH
AHH_CLAP
AIRPLAN1
AIRPLANAMBI
APPLAUSERUPT
APPLAUSL
APPLAUSMEDIUM
ARABIAN
BELLAMBI
BELLS_1
BELLS_2
BELLS_3
BELLS_4
BELLS_5
BELLS_6
BELL_BIG
BIG_THUMPS
BIRDS_1
BIRDS_2
BIRDS_3.
BIRDS_4
BIRDTROPICAL
BLAST_LASER
BLIPLOOP
BROOK
BT1STJNY
BTAPRIL
BTATUNE4
BTBREEZE
BTCHOIR
BTCLSKY
BTDISCO
BTDUBSTEP
BTEUROPOP
BTGANGSTA
BTGROOVY
BTHUMAN
BTMANDOLIN
BTPIANO
BTRAINY
BTTULSA
BTWILD
BUSY_CORNER
CARRACE1
CARRACE2
CAR_REV
CAT MEOW
CHANT
CHANTFOOT
CHANTING
CHANT_2
CHEERBIG
CHEERS2
CHEERSB2
CHICNKID
CHINESNY
CHINESNY3
CHOIRDISTANT
CIRCUS_1
CONSTRUCTION
COUGH
COW_1
COW_2
CROWDRM
CROWD_MUSIC
DIDGEDOO
DOGGROANS
DOG_BARK
DOOR
DUCK_1
DUCK_2
EARTH PEOPLE
ELEPHANT
ETHNIC_1
ETHNIC_2
EXCITED1
EXPLOSION
FACTORY1
FACTORY2
FACTORY3
FACTORY4
FACTORY5
FACTORY6
FACTORY7
FCBASS1
FCBASS2
FCBASS3
FCBASS4
FCBASS5
FCBASS6
FCBIC1
FCBIC2
FCBIC3
FCBIC4
FCBIC5
FCBIC6
FCBIC7
FCBIC8
FCDRUM1
FCDRUM2
FCDRUM3
FCDRUM4
FCDRUM5
FCDRUM6
FCDRUM7
FCMUS1
FCMUS2
FCMUS3
FCMUS4
FCMUS5
FCMUS6
FCMUS7
FCMUS8
FCMUS9
FCMUS10
FIREWORKS
FLAMLOOP

FOOSTEPS
FOOTBALL
FROGNITE
FROGS_1.WAV
GAMELAN1.WAV
GAMELAN2
GAMELAN3
GAMELAN4
GAMESFX1
GAMESFX4
GEESE_1
GEESE_2
GROAN
HEHEHE
HELICOP2
HELICOPTER
HOOTNIGHT
HORSE
HOUSE_1
HOUSE_2
HOUSE_3
HOUSE_4
HOUSE_5
HOUSE_6
JUNGLENIGHT
JUNGLE_1
JUNGLE_2
JUNGLE_3
LASERBLAST
LASER_2
LASER_3
LAUGH_1
LAUGH_2
LION_1
LITEJAZZ
MAD_LAB1
METAL_DESTRUCTION
MISSILE
MONSTER1
MONSTER2
NOSEBLOW
OHYEAH
OOAAOOAA
OOHYEAH
OOOLALA
OPERA_AH
OWLS
PAPERSRED
PIANOOLD
PIGS.
PLANEWA2
PLANEWAR
PLAYERPIANO1
PLAYERPIANO2
PLAYERPIANO3
PLAYERPIANO4
PLAYERPIANO5
POP
PSYCHOPIANO
RACINCAR
RAINJUNGLE
RAIN_1
RAIN_2
RAINJUNGLE
REGGAE 123
REGNOKEY
ROOSTER
SCARYSINGING
SEAGULL1
SEAGULL2
SEASIDE1
SEASIDE2
SEAWAVES
SHEEP_1
SHEEP_2
SIREN
SLURPSQUELCH
SNORE
SPIT
SPLASH
STRING3
SUMMERJAZZ
SWIMLAPS
TALKING
TENNIS
THANK YOU
THUNDER1
THUNDER2
THUNDER3
TIGER_1
TIGER_2
TRACTOR
TRAFFIC
TRUCKSTART
TRUCKS_3
TRUCK_1
TRUCK_2
TV_SHOW
UFOLANDING
UFOSLOW
UFOVISIT
UFO_1
UFO_2
UFO_3
UFO_4
UFO_5
UFO_6
UTTEROT
VOMIT_1
VOMIT_2
VOMIT_3
VOMIT_4
VOMIT_5.
VOMIT_6
VOMIT_7
VOMIT_8
WAR
WAVESBOAT
WHALES
WHOACROWD
WIND
WOBBLE
WOLFHOWL
_DEMO001
_DEMO002
_DEMO003
_DEMO004
_DEMO005
_DEMO006
_DEMO007
_DEMO008
_DEMO009
_DEMO010
_DEMO011
_DEMO012
_DEMO013
_DEMO014
_DEMO015
_DEMO016
_DEMO017
_DEMO018
_DEMO019
_DEMO020
_DEMO021
_DEMO022
_DEMO023
_DEMO024.
_DEMO025
_DEMO026
_DEMO027
_DEMO028
_DEMO029
_DEMO030
_DEMO031
_DEMO032

APPENDIX 4: SAMPLE LIBRARY BY CATEGORY

The samples are organised alphabetically on Soundbeam's SD card. For ease of identification and retrieval they are arranged here in subsets based on various themes. Note that some sounds can work well in more than one category. For example, a lot of the *bell* samples have an exotic or 'ethnic' feel, the *applause* sounds in the 'human' category can also work well in 'sport', *fireworks* in 'festivals',etc.

All samples which start with a number are rhythm loops. The number refers to beats per minute (BPM) of the loop.

BACKING TRACKS/DRUM LOOPS:

110disco
110herts
110tincn
115egbas
115egbs
115egbs3
120art
120egfd2
120eggfd
120eglp3
120eglup
120flftb
120Fulft
120Sqelch
120Upbeat
124beat
155Hardy
75aTabla
75bTabla
75cTabla
75dTabla
75eTabla
75fTabla
75gTabla
88Crunch
88Sweet
91Glitch
98bleep
98drunk
98dubble
98Rhodes
98scratch
98sqelch
ARABIAN
BLIPBLOOP
BTAPRIL
BTATUNE4
BTBREEZE
BTCHOIR
BTCLSKY
BTDISCO
BTDUBSTEP
BTHUMAN
BTMANDOLIN
BTEURO
BTGANGSTA
BTGROOVY
BTPIANO
BTRAINY
BTTULSA
BTWILD
DIGEDOO
FCBASS1
FCBASS2
FCBASS3
FCBASS4
FCBASS5
FCBASS6
FCBIC1
FCBIC2
FCBIC3
FCBIC4
FCBIC5
FCBIC6
FCBIC7
FCBIC8
FCDRUM1
FCDRUM2
FCDRUM3
FCDRUM4
FCDRUM5
FCDRUM6
FCDRUM7
FCMUS1
FCMUS2
FCMUS3FCMUS4
FCMUS5
FCMUS6
FCMUS7
FCMUS8
FCMUS9
FCMUS10
FLAMLOOP
HOUSE 1-6
LITEJAZZ
POP
REGGAE 123
STRING3
SUMMERJAZZ
UTTEROT
140HARDH
140HIPHO

BELLS

BELLAMBI
BELLS 1-6
BELLS BIG

CONFLICT SOUNDS

MISSILE
PLANEW 2
PLANEWAR
WAR

ETHNIC SOUNDS/FESTIVALS

CHANT
CHANTING
CHANT 2
CHINESNY
CHINES 1
EHTNIC 1-2
GAMELAN 1-4

HUMAN SOUNDS

AHH
AHH-CLAP
APPLAUSEL
APPLAU>1-2
CHICNKID
CHOIRD>1
CIRCUS-1
COUGH
CROWDRM
CROWD>1
EXCITED1
FOOTSTEPS
GROAN
HEHEHE
LAUGH1-2
NOSEBLOW
OHYEAH
OOAAOOAA
OOHYEAH
OOLALA
OPERA AH
SNORE
SPIT
TALKING
THANK YOU
VOMIT 1-7

ENVIRONMENT/ NATURE SOUNDS

BIRDS1-4
BIRDTR-1
BROOK
COW 1-2
CAT MEOW
DOGGRO>1
DOG BARK
DUCK1-2
ELEPHANT
FROGNITE
FROGS1
GEESE1-2
HOOTNI>1
HORSE
JUNGLE 1-3
LION 1
OWLS
PIGS
RAINJU 1
RAIN 1-2
ROOSTER
SEAGULL 1-2
SEASIDE 1-2
SEAWAVES
SHEEP 1-2
SPLASH
THUNDER 1-3
TIGER 1-2
WAVES
WHALES
WIND
WOLFHOWL

SPORT SOUNDS

CHANTF 1
CHEERBIG
CHEERS 2
CHEERSB 2
FOOTBALL
SWIMLAPS
TENNIS
WHOACR 1

INDUSTRIAL SOUNDS

BIGTH 1
BUSY-C 1
CONSTR 1
FACTORY 1-7
METAL 1
PAPERS 1

SCARY SOUNDS

MONSTER 1-2
PSYCHO1
SCARYS 1
SLURPS 1

SCI-FI SOUNDS

BLAST 1
EARTH PEOPLE
LASERB 1
LASER 2-3
MADLAB 1
UFOLAN 1
UFOSLOW
UFOVISIT
UFO 1-6
WOBBLE

TRANSPORT

CARRACE 1
CAR REV
AIRPLA 1
HELICOP 2
HELICOP 1
RACINCAR
SIREN
TRACTOR
TRAFFIC
TRUCKS 3
TRUCKS 1
TRUCK 1-2

MISCELLANEOUS SOUNDS

DOOR
FIREWORK 1
GAMES FX 1
GAMES FX 4
TV SHOW
PIANOOLD
PL50FD1
PLAYER 1-4

APPENDIX 5: Wireless switches

Ideal for solo work and for group music making or story based activities, these switches can be moved around, shared and repositioned easily

Supplied in sets of 1-4 with option to add switches 5-8

6.35mm (1/4") jack input so that other wired switches such as Big Macs, Jelly Beans etc. can be connected

- Turn on with on/off switch at back
- tap once to activate
- noiseless touch contact operation with excellent sensitivity
- range (line of sight) up to 20 metres
- 3 x AA batteries
- dedicated RF switch channels and colour coding

APPENDIX 6: Sound Therapy research paper

Living sound: human interaction and children with autism

Phil Ellis / Lieselotte van Leeuwen

Introduction
Annette is fourteen years old. She has very few self-help skills and cannot communicate with words. She can be a danger to herself and to other children who are smaller than she is, who lack self-confidence or are in any way vulnerable. Annette does not always co-operate with teachers and will often remain quite isolated. She has to be provided with a full-time carer throughout the school day.

Walking into her classroom at about the same time, on the same day each week, Annette will often see me, look up with a welcoming smile, get up from her desk or chair and almost run from the classroom to the library, the room where Sound Therapy sessions are always held. During the past two years Annette has chosen to use a synthesizer in her sessions with me. This is kept on a trolley, with two loudspeakers set at ear height. Annette sits down in front of the synthesizer, invites me to sit next to her at the keyboard, takes my hand and uses this to 'play' her music. This music has a beauty of its own: there is no tune, nor is there a steady beat or pulse, but the music clearly comes from inside the child and is deeply felt. After a time she indicates that she wants a different instrument to sound on the synthesizer. She does this by pointing to the panel on the top of the keyboard. I select another instrument which she has learnt to enjoy during previous sessions. She plays the keys again, but this is not the instrument she had in mind. I select another, and this time it is the right one. Again she plays her music, holding and using *my* right hand on the keyboard. After a time she turns to me, looks deeply into my eyes and smiles, her face about six inches from mine. No words have been spoken or sung – none need to be.

It was not always like this. Annette has Cornelia de Lange syndrome, a condition affecting perhaps one in 10,000 live births (Gilbert, 1996). She has physical mobility of a stilted kind, has severe developmental delay and lacks communication skills. Coming close to Annette can be hazardous for anyone wearing spectacles, as she may snatch them and throw them across the room. Annette enjoys music at home. She spontaneously went to the keyboard synthesizer in the initial sessions of Sound Therapy and through experimentation discovered the characteristics of a number of different sounds which are available. These range from percussion instruments to pizzicato-type sounds (harps, koto, plucked strings for example) to vocal sounds, traditional-sounding orchestral instruments, instruments which combine piano-type beginnings and sustained string-like endings, long drones which sustain even when a key is no longer depressed, and so on.

A two-year case study with Annette reveals clear progression and development. This falls into three distinct phases:

1. Months 1 - 8
Solitary and individual exploration at the keyboard: there is a gradual development of different playing styles and responses to different instrumental characteristics and timbres.

Annette's initial approaches to the keyboard are experimental and exploratory. Over time she clearly develops several ways of playing and of responding to the different sounds. A slow sounding, sustained voice encourages her to play in a very contemplative way, for example – very slowly and carefully – whereas percussive sounds are played more staccato, with bouncy and vigorous movements, and not at all sustained. Her facial expression mirrors what she plays, indicating internal emotional response. A marked increase in eye-to-eye contact with me as an uninvolved observer, often accompanied by big open smiles suggests a desire to share, and possibly communicate her explorations.

2. Months 9 - 18
During this phase, having invited me to sit beside her at the keyboard, Annette took my right hand and guided it, to play her own music, either by placing my whole hand on various areas of the keyboard, or by selecting my index finger to play specific single notes. There is a developing friendliness, and I am able to sit beside her safely and participate in her music in a passive way as I do not impose my ideas (musical or

otherwise) on her activities. There is a growing frequency of eye contact and smiling, all of which is reciprocated.

3. Months 19 - 24
The development of interactive duet playing, with 'question and answer' passages and expressive and responsive playing.

During this phase Annette frequently asks me to sit beside her at the keyboard She controls my playing by moving my hands on the keyboard as *she* wants, and also by playing duets with me in an interactive and sensitive way. Although I allow her to lead most of the time, there are occasions where she will wait for me to play, and then make her response to that.

Annette often seems extremely well motivated in these sessions and is very engrossed in what she is doing for extended periods of time. Outside of Sound Therapy sessions it is very difficult to involve her in any type of activity. The Head Teacher observes that

> "normally this young girl is not self motivated apart from aggression towards others or in manipulating people. She finds little enjoyment in life apart from her dolls, a little book, and occasionally somebody singing to her. In the environment provided by Sound Therapy we see the management of a very difficult child. When looking at the video of her sessions there is clear evidence of progress in behaviour, control, response and communication".

There are frequent moments of real inner happiness or joy – the 'aesthetic resonation' which is a cornerstone of this approach.

Her mother described her observations towards Annette's activities:
"it is very difficult to teach a child to play set pieces, especially children like Annette, and I think it's nice that they can express themselves. I don't think that there are any hard and fast rules as to what music should be. Providing that the person making the music is getting something from it, and they get obvious enjoyment from making their music, then I can't see why they can't just express themselves. It opens up a whole doorway for Annette, and because she's got very limited speech it's another form of expression. It's a way of her expressing her feelings to other people".

Sound as Therapy
The above example of Sound Therapy in its early stages of development is representative of the response from children with severe learning difficulties (SLD), including those on the autistic spectrum. There are moments of inner delight shown perhaps through a wiggle of the shoulders, a smile, a light in the eyes. The importance of this 'inner' joy (Ellis, 1995), or 'Flow experiences' (Csikszentmihalyi 1992) – what I refer to as 'aesthetic resonation' – cannot be overestimated. Izard (1989) has identified three aspects which reinforce this importance, describing it as:

- a motivational force facilitating personal growth or self-actualisation:
- interacting with perception, cognition and action:
- creating openness and receptivity associated with intuition and creativity:

These aspects underpin the nature of Sound Therapy, its non-interventionist, non-invasive nature in practice, and its use of sound as the medium for experience and interchange. The approach has been developed over a number of years by working with a number of children with special educational needs. The therapy is grounded in a non-invasive philosophy of education in which the child is placed at the centre of learning activity. A carefully controlled acoustic environment is created within which children with severe learning difficulties (SLD), and profound and multiple learning difficulties (PMLD) have been able to take control of their world, sometimes for the only time in their lives, and gradually learn and develop a range of skills – physical, cognitive, expressive and communicative. This is made possible partly through the use of carefully chosen technology, through the creation of a special and highly controlled sonic environment, and through a focus on aesthetic resonation – the inner world of the child.

There is no need for the 'therapist' to be musically trained in any formal way, and indeed a traditional musical training can be a hindrance to this approach. All sound has musical (expressive) potential, and all people have sound as a fundamental experience of life. From the moment of birth to the time of death we are surrounded by sound. Even if we are deaf, we still experience sound as vibration. It is central to our human condition with a unique importance recognised in many different areas. (Goddard, (1996), Storr, (1992, 1972), Springer and Deutsch, (1998), Truax, (1984)). Sound Therapy utilizes this, and the 'therapist' needs to be open to the expressive potential of sound, to recognising responses, and to be able to change the Sound Therapy environment so as to maximise the effectiveness for any particular activity the child is enjoying. The development of this new approach has been well documented elsewhere, (Ellis, 1994, 1995, 1997), but the essential features are worth summarising here:

A prerequisite for Sound Therapy is a (small) room which is quiet and not too acoustically resonant. A crucial part of this therapy is silence. Unlike other approaches, the child is allowed to be silent, to be within silence itself. No 'commentary' is imposed by the therapist, no 'interpretation' in sound or 'music' of the therapist's view of the child's mental state is offered. If a child wishes to sit still and experience quiet this is respected. There have been numerous occasions where I have sat motionless in the Sound Therapy room for several minutes whilst a child also sits very still. During this period I rely on peripheral vision to observe, as making direct eye contact would be another form of intrusion. Only after such a period of stillness can some children become ready to communicate from within – and this communication may best remain 'private' at this stage. Any response from me could easily stop or even destroy the process. Being present at these sessions can be viewed as a privilege and the individual has to be respected at all times, without intrusive intervention on the part of an outsider.

Electrifying Sound

Within the Sound Therapy environment there are three examples of sound (or music) technology which are essential:

a synthesizer as mentioned above, a sound processor and microphone, and a Soundbeam.

The Soundbeam (web site: www.soundbeam.co.uk).has been available for a number of years From April this year a new model has been released which greatly enhances the possibilities for working with children with disabilities. The Soundbeam sends out an invisible ultrasonic beam. Any physical movement which is made in this beam causes a sound to be 'played'. Moving a hand or fingers in space can result in the sound of a harp, the sea, an ensemble of voices, or bells for example. As the instruments 'played' by the beam are available in the synthesizer, there are several hundred different sounds available for the child to explore and choose from. Limiting the therapeutic soundscape to a piano, cymbal and drum does not always provide for imaginative and sensitive response to sound. Moving in the Soundbeam can result in almost any timbre being played – a wide choice is available and so a set of sounds can be customised for each individual child according to their preferences, and not imposed from outside. The standard form of Western music – diatonic tuning, the 'doh, ray, mi' scale – which results when playing on a piano keyboard – is culturally laden, and may not accurately reflect a child's needs. We can be expressive with this language, but the Western tonal system has to be learnt, including the acquisition of performing skills. Arguably such skills can be barriers to communication. Throughout the seven years of developing Sound Therapy I have used a whole-tone setting from the Soundbeam. This means that any note is as important as any other – there is no right or wrong – no pre-set, externally determined beginning or end. Again, the philosophy of non-invasion is being kept at the forefront.

A new research project, (CARESS) begun in January this year, is developing further possibilities through the development of new sensors to enable more direct, physical interaction to complement the beam itself (Web details: 'www.bris.ac.uk/caress/). Some of these developments may well be applied to the work with autistic children in the future.

The use of the synthesizer has already been described above, but it is important to realise that this instrument need not 'sound like' traditional instruments, nor need it be played in conventional ways. Some of the available sounds have real beauty, but without any specific pitch. The black and white keys of the keyboard belong to a former era (dating from the 1700s), and each key is merely a switch to turn on different sounds, or different pitches. These switches can be operated by fingers, or by the forehead, chin, elbow, toe, or any part of the anatomy a child cares to use. There need be no 'right or wrong' way to articulate sound from a keyboard, only appropriate ways for the individual. It is possible, with synthesizers, to make most expressive

statements in sound by playing the keyboard in unconventional ways. New technology provides for variety of access and aural stimulation in ways not available when using conventional acoustic instruments.

Transforming Voices

The sound processor is used for the development of vocal communication, providing a range of different acoustics which can encourage the use of the voice in different ways (see also Ellis & Laufer, 2000). The creation of specific acoustic environments through using a digital sound processor can be a powerful tool when working with children with special needs. Reverberation is a wonderful effect, encountered naturally in everyday life, and this can significantly affect both children and adults. For example, many people will change their normal behaviour and sing or hum when in an acoustically 'live' bathroom environment. If a group of young children are taken for a walk and go through a tunnel, when in this reverberant space they will naturally vocalise, explore many different ways of making sounds and listen with enjoyment and delight. On a more fundamental level, take a very young child into the acoustic provided by an empty cathedral or abbey. The first time this is experienced can be revelatory, with the child being delighted and entranced by the results of sounds received, made and subsequently transformed by the acoustic environment. The attention span is likely to be extended significantly and the child may well become totally absorbed in this soundscape. We may also see signs of the aesthetic resonance which underpins Sound Therapy in changes in facial expression and body movement. Many adults will be indifferent, unmoved, unaware or non-responsive to such changes in sound. It is a sad reflection of the desensitising effects which can be observed as a result of our noisy world, and the general quality of life and experience is often sadly diminished.

Happily many children and young people still retain a naive or spontaneous response to such aural phenomena, and the use of reverberation, delay (echo) and other transformations form an important and powerfully effective part of Sound Therapy. These, and other 'effects' can be easily achieved through the use of a sound processor when used in conjunction with a microphone. The quietest vocalised sound, the smallest nuances, can be captured and become powerfully expressive, and also be given a high volume level if required. This can lead to the enhancement of self confidence, simultaneously enriching the expressive and communicative capability of the individual. The environment itself becomes a 'live' part of the communication in which the child has control of greatly extended and enhanced expressive vocal capabilities.

I have stored six programmes in a sound processor for use in this project:

Programme 1 reproduces the acoustic of a large hall and has a reverberation time of 19 seconds, the maximum possible with the equipment. Accordingly, even very short sounds will be extended over long periods of time, slowly dying away. The development of keen listening skills and aesthetic response is often clearly visible when using this programme.

Programme 2 is a simple delay programme. It is designed to give approximately 5 repetitions of any sound, each one being quieter than the last. This five-repetition cycle repeats a few times, each cycle being quieter than its predecessor.

Programme 3 is a fairly complicated pitch shifter. This means that a single sound is transposed to form a chord and there is in addition a slight delay function so that if a short sound is made this is transposed ever upwards fairly rapidly through a delay pattern. If a sustained vocal sound is made then a chord builds from the bottom up. When the sound stops it disappears in an ascending sequence.

Programme 4 is also a pitch shifter but without any delay. It is acoustically very 'dry', having no reverberation or delay characteristics. Because of this it only sounds when somebody is using their voice. Therefore if the resulting effect is pleasing, vocal sounds have to be made in 'real time'. As there is no repetition or reverberation to listen to, this tends to encourage an increase in vocal activity and can be particularly effective when interacting with another person. It can lead to the development of inflection, control of pitch and volume, and also to the exploration of more sustained vocal activity and timbral changes, as here the results of making long sounds are more powerful than short sounds.

Programme 5 is a long delay pattern having a delay time of 2000 milliseconds (in other words a 2 second delay). The 'feedback' control is set so that there is no reduction in volume. The result is that all sounds repeat every 2 seconds and will continue to do so without becoming quieter. It thus becomes possible to

easily build up very large and complex textures, to explore 'question and answer', humour, and other qualities through inflection, volume, pace, use of vowels, phonemes, etc.

Programme 6 is a multi delay setting. In this a rhythmic pattern lasting perhaps four seconds is created from a single sound. An additional feature is the stereo result, with rapid oscillation of sound between left and right loudspeakers, effectively exercising the neurological hearing mechanism.

Using a microphone and sound processor is of course far more interactive than the individualised activities using the Soundbeam and synthesizer. Nevertheless, the 'therapist' has to always adopt a listening mode wherever possible, allowing the child to initiate, listen, respond, express, and carefully resist the temptation to dominate in any way. Communication skills can be developed without the use of words. Indeed, the amount of meaning communicated between people in normal conversation is interesting: about 35-40% of meaning is taken from the words themselves with the remainder coming from use of inflection, volume, pace, timbre, physical gesture and body language. These latter attributes provide a telling focus to the work with non-verbal, as opposed to non-vocal, means of communication (Philipott, Feldman and McGee, (1992), Vargas, M.J. (1986)).

Feeling Sound

The remaining aspect of Sound Therapy is exploiting the physical vibrations which are caused by sound. Vibroacoustic Therapy is a relatively new area of research (Wigram, Saperston and West, (1996), Wigram and Dileo (1997), Williams, (1997)), and for the last two years aspects of this therapy have been introduced into the Sound Therapy environment. A Soundbox (also produced by the Soundbeam Project) measures approximately 4 feet by 3 feet, being about 6 inches deep. Inside is a resonant cavity below which are two loudspeakers. The base of the box contains sound absorbing material so that all the energy from the loudspeakers is directed to the upper surface of the box.

In Sound Therapy sessions this box is connected to the amplifiers used, resulting in all sound made by the synthesizer, the Soundbeam or from the sound processor not only being heard through the loudspeakers, but also being felt as vibrations from the surface of the Soundbox. Standing or sitting directly on the surface of the box or sitting in a chair or wheelchair placed on the box means that any sound will be heard as normal, and also 'felt' throughout the body. This provides an additional powerful physical and psychological stimulus. You not only hear your own voice, or the sounds you are controlling through physical movements, you feel them directly as well. You are enveloped in a bath of sound, and cause and effect is significantly reinforced. This additional stimulation, caused only by the individual involved in Sound Therapy, is proving to be highly effective across a range of disabilities, including the autistic child.

Research Methodology

As every child with special needs is unique, great care has been taken to record and analyse data from the field in order to substantiate claims made with regard to the value of Sound Therapy. A longitudinal, qualitative research tool, *Layered Analysis* (Ellis, 1996a), has been developed as a way of disassembling video recordings made over several months, and reassembling the data in order to reveal a picture of developmental progression. By identifying particular physical movements, patterns of responses, or qualities of sound which provide a clear response in a child, it is possible to extract only data relevant to one particular phenomenon and to assemble a sequential account of that aspect of activity. Looking at several such 'layers' reveals a clear picture, providing an unambiguous and detailed record of developmental progression in various previously identified modes. In summary, the methodology involves:

1. recording on video each session of Sound Therapy;

2. copying extracts from each child's session onto a 'master' tape, so gradually building up a picture of behaviour for each individual. These tapes provide particular focus regarding significant or repeating/developing patterns of behaviour;

3. identifying different types of behaviour, reaction or response and occasionally isolating these. Developments over a period of months can be studied separately and in chronological order, and a detailed and comprehensive picture can be reassembled.

4. selecting only one extract every month or so from the available tapes and assembling these on another tape to create a sequence of 'snapshots' which can show progression most clearly. We can view four years' activity in perhaps ten minutes, and this focused compression of data can be very telling.

Evaluation of this data has been achieved by focusing analysis under a number of headings (first published in Ellis, 1994). These headings were devised for the work with children with SLD and PMLD:

- from involuntary to voluntary
- from accidental to intended
- from indifference to interest*
- from confined to expressive*
- from random to purposeful
- from gross to fine
- from exploratory to preconceived*
- from isolated to integrated*
- from solitary to individual*

These headings encapsulate the overall picture of development for each individual. Every child is different, and children have responded to Sound Therapy in different ways, according to their individual personalities and abilities. From this list, perhaps those marked * might be the most appropriate for evaluating behaviour with autistic children. Revisions and refinements will be made as more data become available.

Case study

John is a 13 year old boy who has been diagnosed as being severely autistic. In addition he has severe learning difficulties and developmental delay associated with hypotonic muscles, first recognised when he was 5 months old. He requires an individually planned educational programme to help him develop skills in all areas: physical, social communication and cognitive. He needs to be helped towards developing some independence.

As a focused case study into the effectiveness of Sound Therapy with this condition, John attended sessions for more than 6 months during 1999. Prior to the programme he was very tense, would grip people and objects with some ferocity, would make little eye contact nor show much concentration or co-operation. There were not many smiles in evidence. His walking gait was very stiff-legged and he would need constant encouragement both to walk, and also to leave objects untouched as he moved along corridors.

For these sessions two chairs were placed on the Soundbox, one for John and one for the therapist. All sounds made in the session, either through the sound processor and microphone, or generated from the Soundbeam, were both heard aurally and also experienced as vibration through the chairs. Significant feedback is thus experienced with every sound being felt physically and quite distinctly.

The positioning of the Soundbeam itself is of interest to this case study. With SLD and PMLD children the best place to focus the beam has been always on the back of the head. In experience with a number of autistic children (see below) the best place seems to be for the beam to be pointing towards the chest, face or the front/side of the head. The reason for this remains obscure, but observing many sessions with autistic children, and trying several different beam positions, placing the beam in front, and slightly to the side of the child invariably seems to be successful.

At his first Sound Therapy session he was in a very, very disturbed, tense almost aggressive state and it was an achievement to get him to leave the classroom. The sessions were held in another room some distance from his classroom, but having arrived he stayed for over 18 minutes – a significant achievement. There was quite a lot of lateral head movement and almost hyper-ventilation in this session and he seemed very tense at moments. But there were also moments of smiling and laughter, and these were interesting as this response was not common. He became extremely tense when we arrived back in the classroom at the end of the session.

Two weeks later he was very willing alert and happy during the session, which lasted for 20 minutes. There were lots of smiles and laughter, lots of vocalisation, eye contact and controlled physical movement as well.

Another month later and John seems to be developing a much more receptive approach to the sessions. He clearly anticipates the Sound Therapy time when collected from the classroom and often stands up from his chair with little or no 'encouragement' being needed. This is unusual for him, and shows a high degree of motivation. Sometimes there are also smiles and deliberate eye-contact when I arrive to collect him. Walking from the classroom to the Sound Therapy room has also become far less of a trial. Whereas at first his gait was very stiff-legged and awkwardly slow, progressively he walks more smoothly, with a flowing gait. Also, at first he would grip my hand with real force, quite painfully too, and try to tear pictures from the walls. This too gradually became less of a feature of his behaviour, and progressively he would hold my hand in a more 'normal' way as I led him to the room where we would work.

This growing relaxation and positive behaviour was increasingly mirrored during and beyond the Sound Therapy sessions. For example, in the fifth month prior to one session John had been very distressed during his lunchtime. He had been crying and was generally showing signs of discomfort and unhappiness. However he was quite acquiescent when he sat on the chair on top of the sound box ready to start the session. He quickly became quiet and seemed to have less difficulty with his breathing, particularly when the sound beam was turned on towards the end of the session. At the end of the session he patted the chair that I had been using and when he was told it was time to go he stood up and walked out without any fuss. He seemed a lot quieter, calmer and less troubled than before the session, and this mental state did not change significantly when he returned to his classroom.

Since starting Sound Therapy sessions Jack has made progress in a number of areas. Often when walking to and from the library he will now walk almost normally for a few steps rather than with stiff legs. He will be more cooperative on these journeys, holding one of my hands and without the painful grip of early times. During the sessions he has shown an increase both in eye contact and smiles. He will vocalise on occasion and clap his hands with evident pleasure. He is also showing increasing interaction with the Soundbeam through controlled and deliberate physical movements. There seems to be an increasing awareness and subtle interaction throughout the session. These changes in behaviour have been noticed beyond the Sound Therapy sessions where there has been an increase in eye-contact, in smiling, responding to others, more relaxed physical movements and an increase in co-operative behaviour.

Observing change from the perspective of developmental psychology

The introduced concept of sound therapy requires methods of data analysis, which allow describing emerging patterns of behaviour and discovering the space for potential development. Since one goal of sound therapy is to scaffold self-discovery as a process controlled by the child, the direction and kind of change is not pre-determined by the therapist.

The Sound beam environment offers potential for a wide spectrum of action and interaction. In the beginning incidental movements lead to changes in sound. Becoming aware of the mutuality between action (e.g. head movement) and perception (hearing the sound) forms the seed and the cause for action control and with this the seed for self-awareness. Body movement becomes the means to a goal chosen by the child him or herself.

Through the years of intensive work in Sound Therapy behavioural changes became observable in the areas of

- Movement control
- Social interaction
- Expression and spectrum of emotions
- Attention span and focus
- Nesting of actions into higher-level units

Being able to describe those changes in the framework of developmental psychology will on one hand help to validate sound therapy as a method and on the other hopefully contribute to its refinement and deeper understanding of ways it can trigger self discovery.

Description of change
From the wide spectrum of concepts describing developmental processes we have chosen those that describe development as

- a changing relationship between an individual and its physical and social environment
- a participatory process
- a process of co-regulation
- a dynamic and non-linear process

Our efforts are imbedded in the work of numerous scientist but mainly by the works of Alan Fogel, Elenor & James Gibson, and Lev Vygotsky.

A main source of inspiration for our approach is the relatively young field of infancy research. Infants challenge our perception and communication skills because their action capacities differ largely from ours. In order to describe and understand early developmental processes we need to be able to observe the emerging relationship to the world around them in terms of their own action capacities. This claim holds very strongly for any understanding of change in severely disabled children or adults. Sound Therapy gives us the opportunity to support and become aware of the emergence of new relationships between disabled children and their sounding environment – the development of new action capacities.

Alan Fogel (1993) proposed three levels of describing change in the area of infant-mother interaction:

Level 1:
Local changes in the performance of movement patterns, which don't change the basic structure or outcome of this action. *Example: grasping an object is performed every time it happens slightly differently but the overall structure and outcome of grasping is the same.*
Level 2:
Qualitatively new action structures for achieving already existing goals**.** *Example; being able to grasp a cup with one hand instead of two.*
Level 3:
Qualitatively new action structures which expand the action system towards new goals. *Example: being able to walk as compared to crawl.*

The three levels describe the influence new emerging patterns of action can have for the functioning of the entire action system of an individual. In the context of sound therapy changes at Levels 1 and 2 are observable within the therapy sessions. Level 3 changes, however, extend towards more general action patterns outside the sessions.

In the following we'll demonstrate our way of working with an example of one case of a severely autistic child.

Awakenings of communication – Describing change in Sound Therapy with John

Symptoms of Autism in John:

- Very little eye contact
- No language
- Vocalization infrequently and only as negative expression
- Very infrequent laughter
- Non co-operative behaviour
- Extremely stiff gait
- Body movements are stiff and clumsy
- Patterns of breathing in and out are extremely unbalanced

The symptoms become expressed in different aspects of behaviour. Accordingly, their change needs to be described along those different aspects (See Table 1 for an overview). Note that this description is specific for autistic symptoms of John. For another autistic child or a child with different difficulties the symptoms as well as their appearance in the different aspects of behaviour might be different.

Table 1: John's autism symptoms and their change according to aspects which allow us to observe behavioural change at three levels (see text for further explanation).

Aspects of behaviour	Initial symptoms of John's autism	Changes	Level of change
Movement control	▪ Extremely stiff gait	Episodes of relaxation	3
	▪ Body movements are stiff and clumsy	Episodes of smoother and more integrated movements	3
	▪ Patterns of breathing in and out are extremely unbalanced	Periods of balanced breathing	2
Attention span & focus	Focus mainly self chosen;	20 minutes (sometimes longer) of focused attention in the session	2
	Guided focus only incidental and short	Guided attention	3
Social Interaction	Very little eye contact No language Vocalization infrequent and only as negative expression	Increasing eye contact Vocalizations with positive expression	2
	Non co-operative	Co-operative Responsive Engaging episodes	3
Spectrum and expression of emotions	Occasional laughter in one-to-one situations Anger, high level of disturbance	Smiling and laughter increased Intended vocalizations	3

Goals of the analysis

a) Validation of Sound Therapy as a means to expand the possibilities for action and interaction of disabled people.
b) The analysis can serve as a basis for investigating potential areas of increasing self awareness, action control and expression. We'll explore the possibility to describe the space for proximal development within those areas for an individual child.
c) At the same moment the analysis provides requirements for expanding the sound system according to the needs of long term Sound Therapy .

Kuwait Autism Centre

Although children with various degrees of autism have been involved in the development of Sound Therapy, the opportunity to work exclusively with autistic children in Kuwait, albeit for a short period of time, was very welcome. It provided the opportunity to evaluate the potential for this approach, particularly as all the children involved were from a very different cultural background. During 1999 I was invited to work for one week with a number of severely autistic children in Kuwait. It was possible therefore to see each child on a daily basis, providing an intensive Sound Therapy experience as usually sessions are given weekly in England. The Kuwait Autism Centre was established in 1995 by the Director of the Centre Dr Samira Abdul Latif Al-Saad. The education centre programme seeks:

- to develop student's communication skills, social relationships and self-reliance;
- to develop an environment to accommodate with the student's weak points;
- to develop co-operation with parents;
- to instigate regular testing and measurement for individual training;
- to establish a systematic education;
- to recognise and identify latent and emerging skills and further develop these;
- to introduce behavioural and cognitive treatment.

The centre is located in a suburb of Kuwait city and has up-to-date equipment and facilities providing an educationally appropriate and stimulating environment with a team of caring teachers and support staff.

There is a regular programme of visiting specialists and experts from abroad who sometimes work with the children alongside teachers. The school therefore keeps abreast of current and innovative developments in the field of education and autism, and my invitation was part of this programme..

My visit was for eight days during which I, and staff at the school, were able to evaluate the potential for Sound Therapy in a specialist environment for autistic children. I took with me a sound processor and microphone and the Soundbeam. It was not possible to transport a Soundbox for this visit.

A small room was made available for the therapy sessions. I placed the Soundbeam and sound processor on a table, with amplification and loudspeakers (at ear height) placed on shelving behind the table. Two chairs (for myself and the child) were placed in front of the table, facing the loudspeakers. An observer (usually a teacher) was present throughout, and most sessions were recorded on video tape. There were many challenges here. The children were all diagnosed as severely autistic and this was relatively unknown territory for me. Also, the cultural differences were significant and although great care is taken to make the sound world of the therapy as culturally neutral as possible, this was a real test of the theory that sound is a universal medium of communication and expression. The techniques of music are used, and the stuff of music itself – sound – is the medium, but stripped of traditional or cultural 'musical markers'.

Pilot Study

Eleven children were seen during the week, most on a daily basis. Of these, one child was unresponsive and only attended two sessions. It was then felt that it would be more productive for his time to be used by another child. There is no one way which is suitable for all, and although Sound Therapy has proved to be powerfully effective for many people, there are those for whom other approaches will be more suitable at any given time.

The vast majority of the remaining children were very responsive to the sound processor. Real delight, shown through facial expressions, laughter and extended vocalisms resulted from many of the programmes used, and eye contact, some beautiful facial expressions, and keen and sensitive listening were not uncommon. There is clearly considerable scope for developing the many vocal techniques used in communication, together with accepting and feeling comfortable with the physical presence of another person. A 'language barrier' did not exist in these sessions, and one boy took my hand and moved it towards the sound processor when he wished a new programme to be selected.

The Soundbeam sensor was positioned so as to point at the chest area of the child sitting next to me. By varying the length of the beam itself, any rocking movement from the child would result in sounds being changed (in pitch). The sound module being used gave me a wide range of instruments to choose from, and again children's responses were often of amazement, delight and happiness. Waving a hand in the beam was also another instantly successful way of controlling, exploring and delighting in sound, this delight being revealed through smiles, vocal responses, and repetition of movements to play the sound. A highlight of these sessions was on the last morning, when one boy kept moving into the beam (with an echoing marimba as the instrument sounding) and then hiding his face in my shirt front. When the sound stopped he would look up, smiling, then repeat the process. This continued for several minutes to his obvious delight, with my only regret being the tape having run out in the video recorder.

There is not space to describe the sessions in detail, but there was real potential for development for many of these severely autistic children. Recently the Centre has purchased the equipment needed for Sound Therapy and a room is being set up in the school. A long-term programme of monitoring the effectiveness with these children will then become possible.

Conclusion

Autism presents many challenges for children, teachers, parents and carers alike. The severely autistic child's mind is not 'turned off'. In a recent television broadcast it was likened not so much as having a light switch with on / off positions, but rather like having a dimmer switch which can gradually increase levels of perception, interaction and communication. No one approach can offer a magic cure for autistic children. Sound Therapy appears to have some beneficial effects – it may be a key to open the door, to turn the dimmer switch and provide more illumination which can then lead to further progress in other aspects of their educational experience. This is the task for the future – to explore potential, to develop techniques which seem effective, and to monitor carefully and evaluate the results of this work.

TROUBLESHOOTING

No sound is coming out

- Check the power is on.
- Check that the speakers are connected (and if using powered speakers via the 'line out', that these are on and turned up).
- Check volume is turned up (volume button) and then page left for individual beam and switch volumes, then left again to internal synth volume. This should be at 100%.
- Check to see that the sensors are connected and a red light flashes on the Soundbeam when you move in the beam.
- Try selecting Soundset 1 and press **confirm** and then move in beam to see if it now works.
- Check the internal midi routing (to the soundchip etc.) by pressing the yellow **MIDI** button. The display screen should then read:

  MIDI Set up Midi to (global) nt+1+2+USB

  if it doesn't say this use the **+** or **–** buttons to select **Int+1+2+USB**.

Sensor triggers when there is no obvious interruption

Adjust position of sensor, avoid aiming at reflective surfaces, even if they are further away than the beams set range, as it can still be affected beyond the active section. Restart unit while sensors are plugged in.

Sensor 'ticking' sound is loud at short range

Check that ALL four sensor ranges are below 1m, even if other sensors are not connected. Restart unit while sensors are plugged in.

Sensor doesn't trigger sound under 30cm away from it

The sensors have been designed to have this blank area for chord clearing (see p.37).

The sensors emit a loud buzz – it gets louder if the beam is above 2m.

As the sensors active range is increased, it needs more energy to work properly and this in turn makes the ticking sound louder.

Sample record is very quiet

You may need to increase the input volume and global volume (see p.43).

Session record is very quiet?

You need to increase the global volume (see p.43).

Can't find the sample I just recorded

The sample will be listed at the end of the sample library. The next time you power on the Soundbeam, it will be listed alphabetically/numerically in the sample library.

Delete a sample/session

Press **F1** then page right and follow instructions (see p.45)

Sample is not recorded

If this happens the most likely cause is that there is no further memory available on the SD card. Identify any session recordings or samples which are no longer required and delete them (select sample, press **F1** then → twice, and **confirm** as prompted).

Can't play back the sample I just made

- Try pressing the **preview** button
- Select the beam or switch you want to play it back on (see p.45 no.6)
- Press **note sequence** button, use **+/-** keys to select no. 29:

  Sample Note C3

- Check Transpose is set to 0
- Check Start Note Sequence is set to 1 by pressing **divisions** button and paging right (see p.38).

Midi doesn't get to external computer/sound module

Check the internal midi routing (to the soundchip etc.) by pressing the **MIDI** button, display screen should then read:

MIDI Set up - Midi to (global) Int+1+2+USB

If it doesn't say this use the **+** or **-** buttons to select **Int+1+2+USB** (see page 42).

Chord clear doesn't work

Try increasing the start at range setting to 30cm and increase end at to greater than 70cm (see p.33).

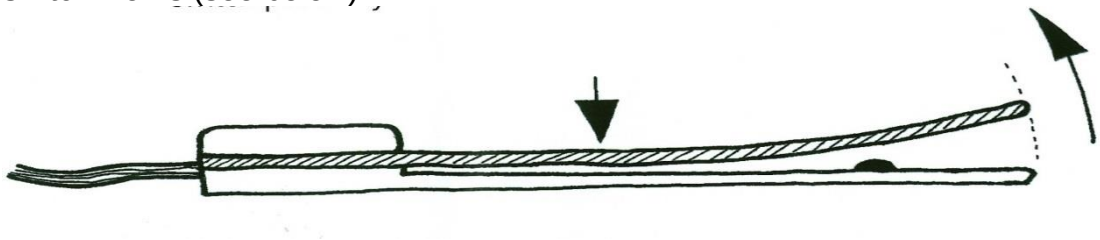
Wireless switch doesn't work

Tap the switch once to activate, if this doesn’t work – switch off Soundbeam and switch on again, select Soundset 1 and tap the switch again, you should see a small green light on the switch illuminate when you touch the switch.

When you touch the switch look for the corresponding red LED light flashing on the Soundbeam, you should also hear a sound. If this fails, change the batteries (3xAA cells) in the switch .

Low Profile (Mike Ayres) switch doesn't click/work

To remedy this, simply press your thumb down firmly on the middle of the plate whilst pulling the end up with your fingers. Flex the plate a few times until the switch works (see below).



When I change the volume of switch 3, switches 5, 6, 7 also change

Because all these switches are assigned to the same midi channel (see p. 42). To enable individual volume control, change midi channel for switch or beam.

When I play the sample on switch 3 – the sample on switch 2 stops

If you already have a sample playing on switch 1, the above will happen as you can only have up to two samples playing at the same time.

When the beam is at 3.5m or so it doesn't pick up my movement

As this is at the very edge of the sensors playing range, it will play best with larger, bolder movements.

GLOSSARY

Terms used in this manual.

Chord clear
In any of Soundbeam's *sustain* trigger modes, interruption of the chord clear area between the sensor and the range 'start at' point will silence the sound.

Divisions
This refers to number of separate notes or chords available on a given switch or beam. A divisions setting of 1 on a beam will give one note regardless of the length (range) of the beam or where it is interrupted along its active length. A divisions setting of, for example, 5 will make 5 notes or chords available to be played either sequentially (cyclic trigger), together at the same time (sustain) or with continuous movement in the beam (multi) (see *Trigger modes*).

Feedback
Audio feedback (also known as the Larsen effect after the Danish scientist, Søren Larsen, who first discovered its principles) is a special kind of feedback which occurs when a sound loop exists between an audio input (for example, a microphone or guitar pickup) and an audio output (for example, a loudspeaker). Most audio feedback results in a high-pitched squealing noise familiar to those who have listened to bands at house parties, and other locations where the sound setup is less than ideal. Usually this occurs when live microphones are pointed in the general direction of the output speakers.

Loop
Samples may be "looped" by defining points at which a repeated section of the sample starts and ends, allowing a relatively short sample to play endlessly. The default setting for the loop points are 0% (start at) and 100% (end at).

MIDI (**Musical Instrument Digital Interface)**
An industry-standard protocol defined in 1982 that enables electronic musical instruments such as keyboard controllers, computers, and other electronic equipment to communicate, control, and synchronize with each other and to exchange system data.

Note sequence
A series of notes and/or chords.

Pentatonic scale
A pentatonic scale is a musical scale or mode with five notes per octave in contrast to a heptatonic (seven note) scale such as major and minor scales. Examples of use of pentatonic scales include Celtic folk music, Hungarian folk music, West African music, African-American spirituals, Gospel music, American folk music, jazz, and American blues music.

Polyphony
The polyphony value when assigned to a beam or switch will govern the maximum number of notes which can be played at the same time using that beam or switch.

Range
Defines the active length of a beam, ‘start at’ being the point closest to the sensor at which sounds will be triggered and ‘end at’ being the point furthest from the sensor at which sounds will be triggered.

Sample
Sounds recorded using microphone or loaded onto SD card using a computer. A reference centre pitch (true note/root note) indicates the actual frequency of the recorded note.

Semitone
A semitone is the smallest musical interval commonly used in Western tonal music.

Session (recording)
In Soundbeam, a *session* recording (as opposed to a *sample* recording) will contain everything played on all beams and switches during a performance, line in/microphone is also captured during a session recording, The recording is stored as a 16bit stereo WAV file on the SD card. These files can be transferred to computer using an SD card reader / adapter.

Soundset
An assembly of between one (for example for one beam) and twelve (for four beams and eight switches) musical or sampled parts either preset or user composed which allow for ensemble or group play using musically or thematically compatible parts.

Transpose
In music, transposition refers to the process of moving a collection of notes or chords (or a combination of both) up or down in pitch by a constant interval, thus shifting a melody, a harmonic progression or an entire musical piece to another key, while maintaining the same tone structure, i.e. the same succession of melodic intervals.

Trigger Mode
This defines the various ways in which sounds are triggered using beams (e.g. towards/away/across) and switches.

Whole tone scale
The whole tone scale has no leading tone because all tones are the same distance (two semitones) apart.

CREDITS

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