

BEL • BD80S

The BD80 must be one of the most popular delay/samplers ever produced, it is found in all types of studios from the most modest home set-up to the more prestigious 46 track facility.

The BD80 had two features that enable its use across the wide range of recording studios; an excellent audio quality combined with a modest price. The BD80 now has a successor which also combines these two qualities, welcome to the BD80S "Stereo" Delay/Sampler.

The BD80S enables stereo delay effects and "TRUE STEREO SAMPLING"
- over 6 seconds at 20HZ - 20KHZ band with (13 seconds in mono)

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AUDIO CONNECTIONS

Before powering up the BD80S connect it to your system. Connections are via electronically balanced XLRs with two inputs and two outputs because the machine is a true stereo unit. These connectors have been factory pre-set for pin 3 hot operation but the unit can be configured to work for pin 2 hot (see addendum p. 12).

For unbalanced operation you must connect pin 2 to pin 1

Switching the unit on with the power switch at the right hand side of the front panel the display will initially show '-80-' for several seconds and will then show '2'. This process is carried out every time you power and allows time for the BD80S to clear any random data from the audio memory and boot up its computer. The '2' stands for 2ms, the current rear edit position and means the unit is ready for operation.

FRONT PANEL

If you have ever used a delay unit before you will be acquainted with the controls on the left half of the front panel. Those on the right will need explaining because they perform functions in the delay and sampling modes. If you are in a hurry to use the unit then you will probably have started already so turn to the sections on Delay (p.4) and Sampling (p. 5) although you would do well to read this section at sometime, in case you miss something obvious.

So let's have a look at the front panel in some detail, starting from the left.

Level Indicator

This four LED bar (2 yellow, 1 green, 1 red) gives a visual indication of the input into the unit.

Trim

Recessed inside this hole is a small pre-set that allows you to adjust the trigger threshold when triggering a sample by an incoming signal to the unit. More about this in the section on Triggering (p. 9) but for now be careful not to damage the slot.

This pot adjusts the input into the unit. Use in conjunction with the level indicator to get a level that keeps the green LED on most of the time and occasionally peaks into the red. Keep an eye on the level indicator as maintaining a correct level into the unit is one of the simplest ways of ensuring that you receive the highest performance from the BS80S. Pay particular attention to it when adding regeneration to the delay chain.

Mix

This pot controls the mix of the dry or unaffected signal and the effect, full clockwise gives the delayed signal in isolation. Use the latter when connecting to the effects return on a mixing desk. The pot is notched at the centre where equal amounts of both signals are present.

Feedback

This pot controls the amount of regeneration of the delayed signal i.e. multiple echoes. When using this keep watch of the input level.

This pot controls the output level from the unit and allows you to match it perfectly to your use.

This pot works in conjunction with the Depth pot (next) in the modulation section which is switched in with the MOD button. Clockwise rotation increases the speed of modulation. You will have noticed a yellow LED to the right of this pot and this gives a visual indication of the speed. Turn the knob and see for yourself.

Depth

This pot controls the depth of modulation. With it turned fully clockwise you achieve the maximum depth of modulation. Put a signal through and listen. The next thing we come to is a cluster of 6 buttons.

BYP

Pressing this bypasses the effect section (LED on). Press it again to reverse the procedure.

DEL 0

Pressing this (LED on) causes the phase of the delayed signal to be reversed, allowing some interesting changes in tone. Press again to cancel the procedure.

MOD

This switches in the modulation section (LED on).

TRIG

Pressing this (LED on) allows you to access the trigger circuitry via audio or externally (see Triggering p.9).

FBO

pressing this (LED on) reverses the phase of the feedback and allows for some interesting tonal changes.

MONO

This causes the unit to operate in mono operation in delay or sampler mode on the right channel only and gives you 13.106s to play with (LED on).

Next we get to the 5 digit LED display. This gives read outs for the delay time as well as giving prompts during various processes. In the bottom right hand corner of the display is a full stop which gives a visual indication when sampling and looping.

To the right of the display you'll find a large white manual trigger button. This is the front panel way to trigger.

The cluster of eight buttons to the right of this are involved with a number of functions, some of which are exclusive to sampling.

↑ and ↓ increment buttons

These increment the delay time or available sampling time and are also used during editing and pitch shifting. They increment in lms steps (except in fine edit, see Editing) when pressed in single nudges. However, holding down one of these buttons will cause the time to increase slowly at first for about 2 seconds (real time) and will then accelerate to rear time entry i.e. one second of delay entry per one second of real time. Practice this, it may take some getting used to but you will find that it becomes a very convenient way to work.

ED-F

Pressing this (LED on) allows the editing of the sample's front via the T and ~ buttons.

PTCH

When activated this button allows a sample to be pitch changed, its LED will light.

HOLD

This allows a sample to be stored in memory for editing or playback (LED on).

SHFT

This is a non-latching type button for instigating various shift functions. While it is pressed its LED illuminates.

This button when depressed (LED on) is used in recording and playback of samples.

SYNC

This button executes a number of functions depending on the mode of operation but is involved with sample record and playback. Its LED lights.

DELAY

The BD80S is capable of achieving all the popular delay effects with a maximum stereo delay/time of 6.553s. The delay time is set using the up/down increment buttons and the number of repeats is varied using the feedback control. When using extreme feedback settings be especially careful about the input level. Reverse the phase of the feedback by pressing the FB0 button and listen to the difference.

As very rough guide lines, double tracking effects can be obtained with settings up to about 60ms but use your own ears. Modulation effects can be created by switching in the modulation section (press MOD button) and selecting a delay time between 2 and 20ms. By altering the modulation speed and depth controls together with the feedback control you will be able to achieve some very rich chorus and flange effects. By switching in feedback phase reverse (FB0) and delay reverse (DEL0) you will be able to explore other tonal possibilities. The secret is to use your own ears. BEL are offering you great flexibility so make the most of it. After using this method of delay control you will find other 'digital access' methods cumbersome. Use the mix control to mix the dry signal with the effect signal. Press the BYP button to kill the effect. You can summon up a delay time of 13.106s by pressing the MONO button but the output will only be from the right channel.

SAMPLING

The BD80S allows you to sample up to 6.553s of stereo material or 13.106s of mono material output through the right hand output. It also lets you store any number of samples in memory provided that their total time does not exceed that of the available memory. The unit can also sample into the right and left channels separately. Samples can also be treated with the modulation section.

There are two methods of sampling: variable length and fixed length.

When listening to the material to be sampled either have the mix control set to the dry setting or better still have the mix control set to delay but press BYP (bypass). This allows you to hear the incoming signal while sampling and cancelling the bypass after finishing lets you hear the sample in the delay portion of the mix. The feedback control should be turned fully anti-clockwise as otherwise the memory contents will be feedback into the sampling process, creating an overdubbing effect, which can be useful in certain instances.

Variable sample length.

Press the * button, its LED will come on as will that for SYNC, the display will read 'reed' meaning that it is ready to record. When you reach the bit that you want to sample press the manual trigger button and hold it down for the duration of the bit you want, the display shows real time, release when finished, the * LED goes out. You have now made your first sample on the BD80S and lock into memory by pressing the HOLD button (LED on). To hear your sample press the manual trigger button. To edit refer to the section on editing (p.6).

Fixed length sampling

This method of sampling allows you to select a section of memory, say 2 s, and fill it with a sample. Sampling can be activated by manual trigger or audio (see Triggering (p. 9)). Choose a length of memory using the up/down increment buttons and the display. Press SYNC (LED on) when you get to the bit you want to sample, press the manual trigger button and exactly the length of memory specified by you will be filled. Note that the full stop at the bottom right of the display goes out during sampling. Lock the sample into memory by pressing HOLD (LED on). To hear the sample press the manual trigger button. To edit see Editing (p.6).

Separate left and right channel sampling

Press SHFT and MONO, the display shows 'Stereo'. Use the up/down buttons to scroll through right channel, left channel and stereo. Once selected you can record into the chosen channel in the ways outlined above. This facility allows you to sample different things into the left and right channels and play them back simultaneously. When editing, both channels are edited by the same amount.

Mono Sampling

Pressing MONO (LED on) gives you 13.106s to play with on the right channel. Sample as before. Changing from a program recorded in stereo to mono will cause a decrease in pitch of one octave. Changing from a program in mono to stereo will cause an increase in pitch of one octave.

Looping Playback

You can get the sample to loop by pressing SYNC (LED off). You will hear continuous looping which can be stopped by pressing SYNC again (LED on).

EDITING

The BD80S permits you to edit the front and rear of a sample, with a fine edit facility (33 μ s per nudge) available on the front edit.

If you have a sample which contains sounds towards the end that you do not want you can 'home in' on the area of interest, then edit the front and rear, and then fine edit the front of the recording.

Homing In

After making a recording and pressing the HOLD button (LED on) and with the SYNC LED on, press *(LED on). The display will read 'PLAY' then press the manual trigger button and listen to the sample playing back and release the button after you have heard the place you want. The display will have incremented in real time and will now be showing the new end point for the sample. On releasing the manual trigger button the *LED will have gone out and pressing the manual trigger button again allows you to hear how you have truncated the sample. Try it.

Edit Front and Rear

You are now free to make more accurate adjustments to the displayed rear end point by using the up/down buttons and listening to what you are doing by pressing the manual trigger button. Once you are happy with the end point you can start on the front of the sample by pressing the ED-F button (LED on) and the display will show 0, which is the original front point of the sample. Increment this value as need be and listen to what you are doing by pressing the manual trigger button. (When you are happy with the front of the sample refer to the section on Triggering to work out how you want to use it. If you think the front needs a little more editing, then fine edit it (see Fine Edit p.7).

The BD80S lets you edit the front and rear of a sample while the unit is looping the recording. Press the SYNC button (LED off), you will hear the sample looping. To edit the front press ED-E (LED on) and the display will show the current front point readout (N.B. the BD80S will automatically set up a 300ms window i.e. front point plus 300ms, which is fixed relative to any new front points you choose). Increment the front point using the up/down keys and you will hear the recording looping through from your new front point when you release the increment button. When you are happy with the front point press ED-F (LED off) and you can do the same for the rear end point. Here the BD80S sets up a fixed 300ms window again but this time at the rear point minus 300ms. Increment the end point with the up/down buttons and listen to the result.

Single lms edits can be executed by pressing the increment buttons with single pushes as opposed to keeping the button pressed, 2ms is the minimum loop length after editing and you can listen to the sample in single bursts by switching on the SYNC LED and pressing the manual trigger button. Needless to say that you are not tied down to any particular order for editing. For example, you can ignore the 'homing in' procedure and go straight to this section if you wish especially as it may be most suitable in a lot of cases. It's up to you.

Fine Edit

This allows accurate splicing (30 μ s) of looped material and is available on front edit only.

Press ED-F (LED on). Press SHFT and an increment button (either up or down) This causes a change in the front edit point of 30 μ s. Holding down an increment button while pressing SHFT causes the ms display to change very slowly as you are now dealing with 30 **ms** steps. Listen to the recording by pressing the manual trigger button.

Multiple samples can be stored in the memory. For each successive sample move the new sample's front point to the end point of the previous one and carry on as normal. Repeat this procedure until you run out of memory. To hear all the samples played back one after the other, set the front point to the beginning of the memory and the end point to the end of the very last sample. To reset edit points, both front and rear (0 and 2ms), press SHFT and ED-F.(This also sets pitch to concert '60').

Once you are satisfied with your sample turn to the section on Triggering (p.9:) or if you want to .pitch change it refer to the section on Pitch Change (P.8).

PITCH CHANGE

To pitch change a sample in semitones press PTCH (LED on). The display shows '60' this is the sample original pitch and can be altered by the increment buttons where one nudge equals one semitone. The maximum variation is one octave down (48) and one octave up (72).

To cancel pitch change (return to concert pitch) press ↑ and ↓ simultaneously (PITCH MODE ONLY).

Fine Pitch Change

This allows the sample's pitch to be increased or decreased in 1/50th of a semitone steps. Press PTCH (LED on), press SHFT and either the up or down increment buttons, 50 is the original pitch of the sample (after standard pitch change, if any) and the range here is one semitone up and down. To cancel fine pitch change without affecting standard pitch change, press SHFT and the up and down increment buttons simultaneously.

Sample pitch can be controlled from a MIDI keyboard where the original sample pitch is accessed at middle C. Connect MIDI out on keyboard to MIDI in on BS80S, make sure sending and receiving channels are the same (MIDI p. 10 and triggering p. 9)

TRIGGERING

The BD80S has two trigger modes: single trigger and repeat trigger.

Single Trigger

Once the first trigger has occurred, recording or playback will run unaffected by further triggers until the end point has been reached whereupon it can be triggered again.

Repeat Trigger

Playback will restart each time a new trigger occurs and will only run through the recording when either the trigger stops or when the time between successive triggers is greater than the recording length. Single trigger mode is automatically selected in record mode. Automatic repeat trigger mode is automatically selected in playback. Press SHFT and SYNC to change between the two trigger modes (display exits after 2s).

Sources

Manual Trigger

This is the front panel way to trigger samples and recording.

Audio Trigger

Press TRIG (LED on) press SYNC (LED on). Any audio at either or both audio inputs will trigger recording or playback. Threshold is set via the front panel trim control. Audio trigger has no effect in loop mode. Audio trigger response can be set - press SHFT and TRIG. The display will show 10ms - this means the audio trigger will respond to a trigger every 10ms - and this value can be changed using the up/down buttons. This does not effect the speed of trigger only the frequency. Press SHFT and TRIG to exit.

Make sure there is not a jack in the external trigger feed socket on the back panel as this will over-ride the audio trigger.

External

These triggers are fed into the rear jack socket and disconnect the audio trigger. Press TRIG (LED on) and SYNC (LED on) and adjust threshold with the trim control. Trigger response is set in the same way as for audio trigger above. Suitable external sources include drum machines, audio and click tracks.

MIDI TRIGGER

The unit can be triggered into recording from any instrument with MIDI trigger transmit. Single and repeat trigger can also be used on MIDI playback. With repeat trigger-key down = play start, key up = play stop. With single trigger-key down = play start, key up has no effect, key down again = restart playback. If next key down is before program has played through then the program will restart.MIDI

MIDI

Press SHFT and DEL0, display shows 'ALL' which means receive on all channels. Press increment up button to read 'OFF' which means MIDI off. Pressing the down increment button sets any one of the 16 available receiving channels. Mode exits after 5s. Powers up in ALL mode.

QUICK FUNCTION LIST

↑ and ↓

ED-F

*

PTCH

HOLD

SYNC

BYP

DELO

FB0

MOD

MONO

TRIG

Up and down increment buttons

Change display to edit front

Quick record or playback (real time)

Pitch change chromatic

Store recorded program

Ready to record/playback

Bypass delay/(unity gain)

Change phase of delay

Change phase of feedback

Modulation on

Right channel, full memory in mono

Audio/external trigger on

Fine edit front

In Pitch Mode

SHFT+ ↑ or ↓

SHFT+ ↑ and ↓
(simultaneously)

↑ and ↓

Fine pitch change

Cancel fine pitch change

Cancel pitch set (return to concert)

Reset edit points and pitch to concert

Repeat/single trigger select

Audio/external trigger response set

Left channel, right channel, stereo select

SHFT+ ED-F

SHFT+ SYNC

SHFT+ TRIG

SHFT+ MONO

SHFT+ DELO

MIDI on and channel select

Addendum

XLR hot pin select. Factory set to pin 3.

Pin 3 hot

R302 = 39K 1% .

R303 =not fitted

R304 = 39K 1%

R305 = not fitted

LK301 shorting link

LK302 not fitted

LK303 not fitted

LK304 shorting link

L = left channel, R right channel

Pin 2 hot

R302 = not fitted

R303 = 39K 1%

R304 = not fitted

R305 = 39K \1%

LK301 not fitted

LK302 shorting link

LK303 shorting link

LK304 not fitted