

Owners Manual

Issue 2

FEDERATION

BPM FX - PRO



CONTENTS

Introduction	1
Front Panel	2
Front Panel-Features	3
Rear Panel	4
Connections - All Effects Mode	5
Connections - Single Effects Mode	6
Quick Start	7
Operation	8
Effects Configuration	8
Getting Started / Synchronisation Source	8
Input Level	9
BPM Display	9
Synchronisation Indicator	10
Activating The Effects - Master ON/OFF	11
SUPERKILL	11
FILTER/LFO	12
FLANGER	14
CUTTER	15
DELAY	17
PANNING	18
Setting The BEATS	21
TAP/Clear	22
NUDGE Control	23
FX Mixer Joystick Control	25
PROGRAMS	28
USER BEATS	29
UTILITY	35
MIDI control	40
Audio to MIDI sync	41
Headphone Monitoring	42
Hints & Tips	42
Specification	43
MIDI Implementation	44

This operation manual uses the following symbols for identifying indicator conditions:

 = INDICATOR ON

 = INDICATOR FLASHING

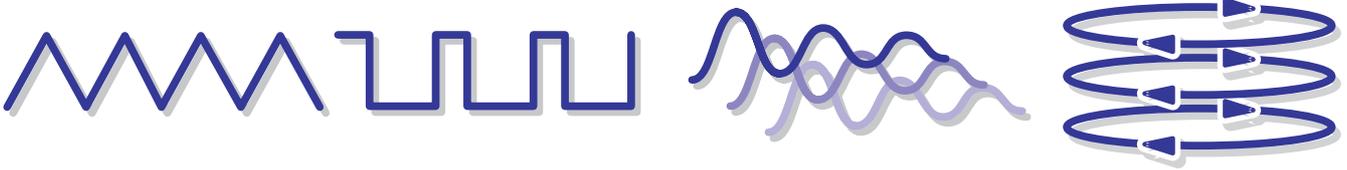
www.redsound.com

© Copyright / Software Copyright / Design Right RED Sound Systems Ltd. 2001

Printed in England - Issue 2

Front Panel Features

WELCOME TO THE FEDERATION



Congratulations! By purchasing the FEDERATION BPM FX, you have joined an exclusive new club of musicians, remixers and Djs who have discovered a new level of power and control over the effects in their music. Previously, to make effects happen in time with music was a matter of painstaking analysis of the source signal and time-consuming tweaking of parameters on effects units to make sure that the tempo inherent in the effects did not clash with or break up the tempo of the music.

In one fell swoop the FEDERATION does away with all that tedious messing about (matching milliseconds to BPMs and hooking multiple effects units together) by assembling everything you need in one unit to filter/flange, gate, delay and pan in perfect synchronisation with your music.

At the heart of the FEDERATION is Red Sound's acclaimed 'V2' BPM Analysis Engine (developed through ground-breaking products like the Voyager 1 and Micro-BPM), which shoulders the responsibility of calculating the tempo of the music. This leaves you free to concentrate on the real-time controls of the simultaneous effects the FEDERATION offers.

Four of these effects have been available in various forms before, but never in such an easy-to-use and innovative form. By triggering the filter in time with the music, you can seriously alter the harmonic shape of the sound without destroying the beat, or perhaps choose the radical flanger, for a classic sweep that's right out there. The cutter makes gating and shaping the overall volume of the music in time a breeze but perhaps the greatest timesaving is in the automatic synchronization of delays to the tempo of the music. No more look-up tables for BPM equivalents in milliseconds, or complicated formulas that need a calculator. You just decide which beats you want to hear the delays coincide with and then you can move on to more creative decisions such as whether the delays should sound like a clinical 90's digital delay, a warm 60's tape delay or a more extreme 'grunge'.

But even the unique combination of these facilities is dwarfed by the FEDERATION's ability to split the audio input into three bands (Low, Mid and High) which can then be panned around independently in the stereo field. Patented under the name of Spatial Panning System (SPS), this is a genuine first and will enable entirely new effect textures and beat-related movements in the music of the future.

In addition, the innovative SUPERKILL feature lets you take re-mixing to new dimensions with advanced DSP phase shift vocal elimination, with or without bass kill.

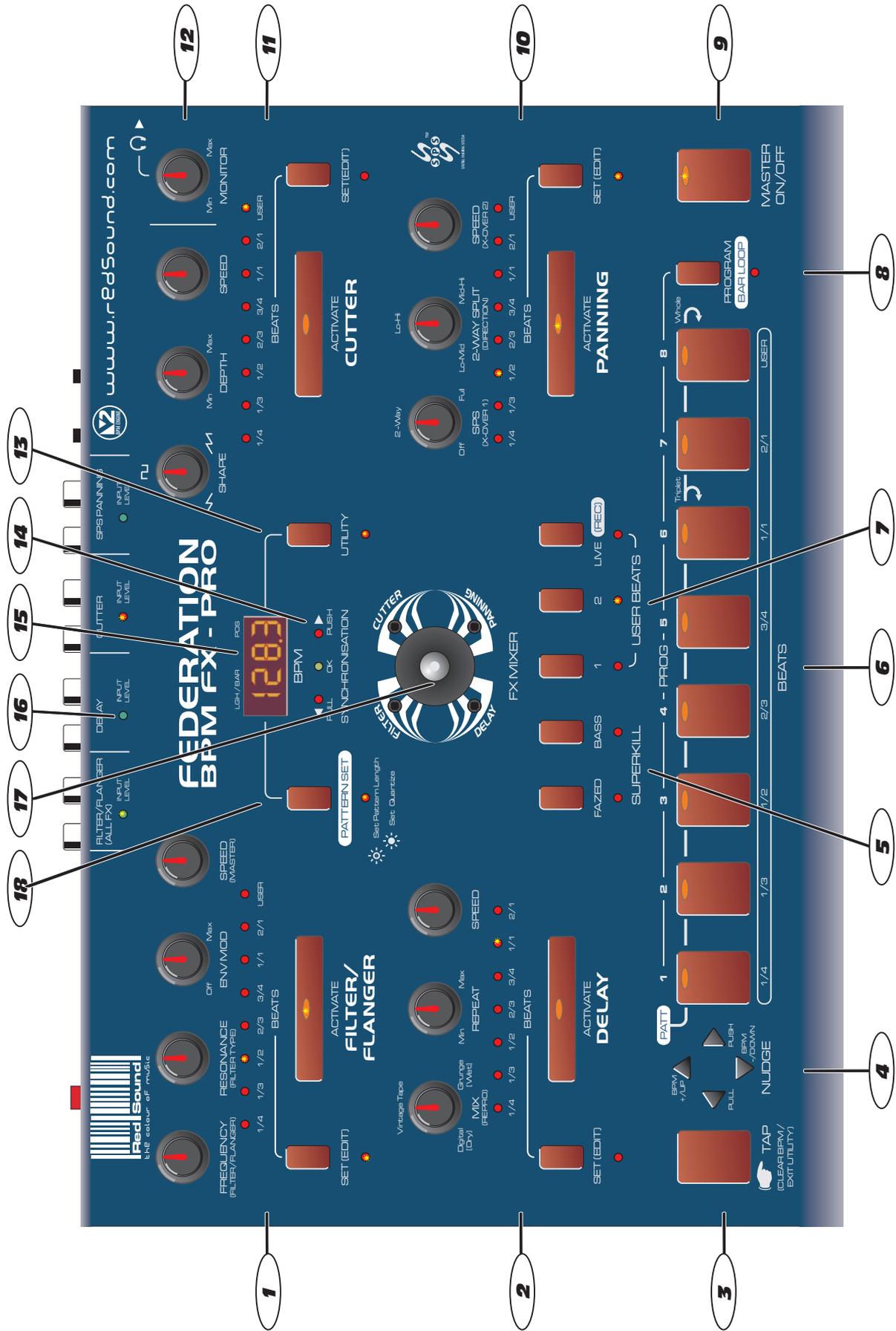
This manual is designed (like the FEDERATION itself) to get you using the effects and sync'ing them to the music as quickly as possible. The simple real-time operation of the effects parameters and beat assignment is described in detail, but at no time does it try and define how these effects should be used. We tell you how the FEDERATION BPM FX PRO works but never how to use it. That's down to you!

OPERATING CRITERIA

This product has been designed to operate most effectively with dance music - i.e. music based on strong regular beats and patterns. However, as the range of pre-recorded dance material is virtually limitless (and the audio mix of individual tracks unknown) we cannot guarantee the performance of the FEDERATION BPM FX with every style of dance music.

The FEDERATION's synchronisation performance may be affected if the beat information is either unavailable or indefinable within the audio track. Please note this when selecting your audio material.

Front Panel

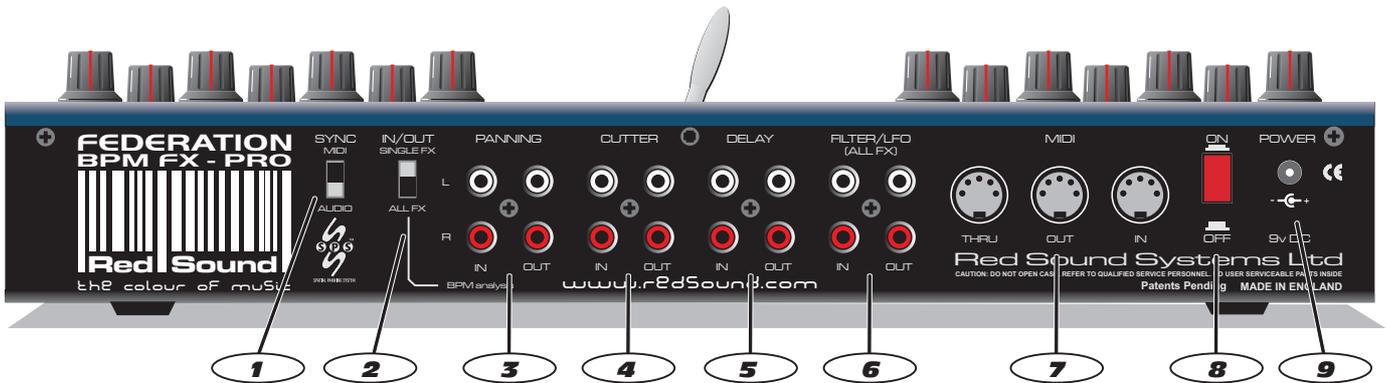


Front Panel Features

FRONT PANEL FEATURES

- 1. FILTER/LFO (FLANGER):** This section features FREQUENCY, RESONANCE, ENVELOPE MOD and SPEED controls for the filter/flanger effects. The ACTIVATE button switches the effect on and off. The SET button can be used to change the BEATS trigger value or access the edit features of the FILTER/FLANGER.
- 2. DELAY:** This section features LEVEL (REPRO), REPEAT and SPEED controls for the delay effect. The ACTIVATE button switches this effect on and off. The SET button can be used to change the BEATS trigger value or access the edit features of the DELAY.
- 3. TAP (CLEAR BPM):** This button is used to manually 'tap' in a tempo or clear the current BPM reading.
- 4. NUDGE:** These buttons are used to make fine, manual adjustments to the BPM value and shift the audio/effect trigger sync point. Also used for general data entry.
- 5. SUPERKILL:** These two buttons select the DSP Fazed and Bass filtering.
- 6. BEATS:** This section features 8 buttons. In Select mode, they are used to set the BEATS synchronisation setting of the effects. In Program mode they are used to recall, compare and save the effect programs. In Pattern Record mode they are used to record, delete and edit events.
- 7. USER BEATS:** This section features 3 buttons. Buttons 1 and 2 store and recall the custom user patterns. When the 'LIVE' button is selected, the TAP button can be used to manually trigger effects 'on the fly'.
- 8. PROGRAM (BAR LOOP):** This button is used to select Program mode and MIDI clock control mode. In USER BEATS record mode, this button also selects BAR LOOP mode.
- 9. MASTER ON/OFF:** This button is used to switch the activated (or cued) effects on and off.
- 10. PANNING:** This section features SPS, 2-WAY SPLIT and SPEED controls for the panning effect. The ACTIVATE button switches this effect on and off. The SET button can be used to change the BEATS trigger value or access the edit features of the PANNER.
- 11. CUTTER:** This section features SHAPE, DEPTH and SPEED controls for the cutter effect. The ACTIVATE button switches this effect on and off. The SET button is used to change the BEATS trigger value of the CUTTER.
- 12. MONITOR:** This feature lets you monitor the activated effects at the pre-Master on stage, allowing you to check the effects setup before committing it to the master output. The MONITOR control adjusts the output level.
- 13. UTILITY:** This button lets you access utility parameters such as Input Gain, Effects Configuration, BPM range, MIDI Channel etc.
- 14. SYNCHRONISATION:** This 3-way indicator shows any audio/effect synchronisation adjustments.
- 15. BPM Display:** The four digit BPM reading of the audio signal will be displayed here. Also, information will be displayed in Pattern, Program, Utility and Effect edit modes.
- 16. INPUT LEVEL:** The four bi-colour input indicators are used to check the audio input level status.
- 17. FX MIXER:** This joystick control adjusts the relative balance between the activated effects. At the centre position, all activated effects will be heard equally. Moving the joystick about its axis will vary the balance of the activated effects.
- 18. PATTERN SET:** In USER BEATS record pause mode, this button selects between SET PATTERN LENGTH (LED flashing) and SET QUANTIZE (LED on).

Rear Panel



1. SYNC - Switch

This switch selects AUDIO or MIDI synchronisation.

2. IN/OUT - Switch

This switch selects ALL FX(DJ MODE) or SINGLE FX input/output operation.

3. PANNING - Connectors

When the IN/OUT switch is set to 'SINGLE FX', use these connectors to process a signal through the PANNING effect only. When the IN/OUT switch is set to 'ALL FX', the IN connectors can be used to analyse beat information from a separate source to that which is being processed by the effects (effects can be used to process non beat related sounds such as vocals etc. whilst the BPM is derived from drummers beat information in real-time)

4. CUTTER - Connectors

When the IN/OUT switch is set to SINGLE FX, use these connectors to process a signal through the CUTTER effect only. The terminals will be inoperative when the IN/OUT switch is set to 'ALL FX'.

5. DELAY - Connectors

When the IN/OUT switch is set to SINGLE FX, use these connectors to process a signal through the DELAY effect only. The terminals will be inoperative when the IN/OUT switch is set to 'ALL FX'.

6. FILTER/LFO (ALL FX) - Connectors

When the IN/OUT switch is set to 'ALL FX', use these connectors to process a master audio signal through all four effects modules. When the IN/OUT switch is set to SINGLE FX, use these connectors to process a signal through the FILTER/LFO or FLANGER effects only.

7. MIDI IN/OUT/THRU - Connectors

MIDI data will be transmitted and received by these connectors.

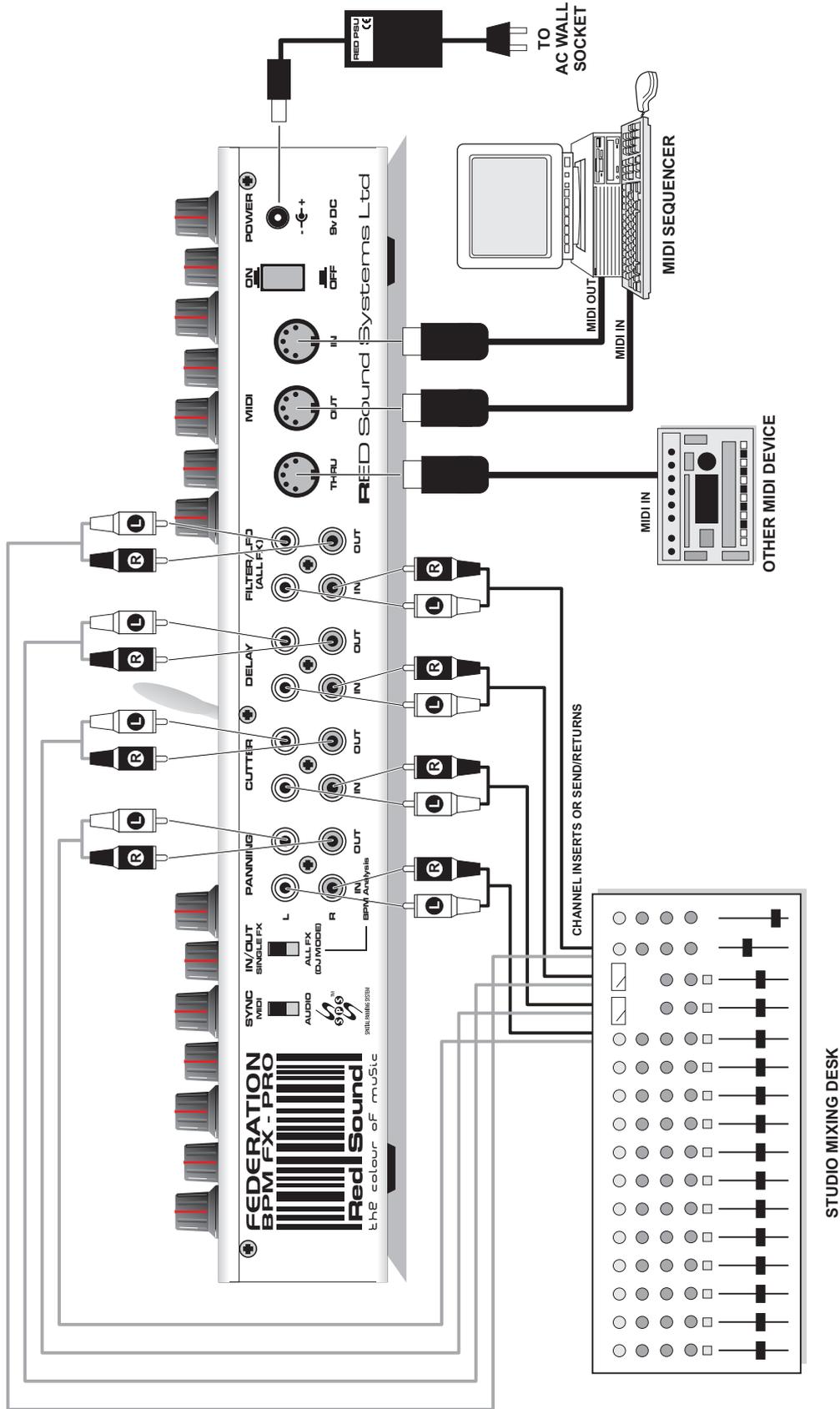
8. POWER - Switch

This turns the power on and off.

9. DC POWER IN - Connector

Only use the PSU supplied with the FEDERATION to power the unit.

Connections - Single FX Mode



QUICK START

If you want to quickly try out the performance of the FEDERATION, please read the following points carefully:

CONNECTIONS: Before making any connections, make sure that the power on all your equipment is turned OFF. Connect the power supply (included) to the 'power in' socket on the rear panel of the FEDERATION and plug it into a suitable AC outlet. Connect the audio cables for a basic system setup as shown on page 5.

TURNING ON THE POWER: Make sure all connections have been made correctly and the volume controls on the mixing desk and amplifier system are turned completely down. Press the rear panel power switch on the FEDERATION. Turn on the power of the mixing desk and then turn on the power of the amplifier system.

START UP INDICATIONS: When the FEDERATION is powered up, the BPM display will briefly show the software version and then change to show four illuminated centre bars. If this does not happen, check the power supply is of the correct type and the unit is switched on as above.

SELECTING A PROGRAM: We've already stored a selection of typical effects setups in the FEDERATION. To select one of the eight factory presets, press and hold down the 'PROG' button (LED on) and then press one of the main BEATS/PROG buttons marked 1-8.

SYNCHRONISATION: For this quick start, set the FEDERATION to operate in 'ALL FX' mode. Ensure the IN/OUT switch on the rear panel is set to the 'ALL FX' position and the SYNC switch is set to 'AUDIO'.

INPUT LEVELS: Select a suitable audio track (dance orientated music with defined beat information), start the playback on the connected sound source and check the status of the front panel bi-colour level indicator marked 'FILTER/LFO (ALL FX)'. The audio inputs of the FEDERATION are set to work with normal line level output signals therefore, the level indicator should now be coloured green, occasionally flashing red. If the indicator is off or constantly red, adjust the gain and/or output levels on the mixing desk. (Also see the "Input Gain" section in UTILITY mode on page 35)

ACTIVATING THE EFFECTS: The BPM display should now be reading the tempo of the selected audio track in beats per minute.

Press the 'MASTER ON/OFF' button. The audio signal will now be processed through the effects as defined by the selected program.

Try adjusting the controls on the activated effect (LED on within 'Activate' buttons) to hear how they alter the sound in real-time. To change a 'BEATS' trigger setting, simply press the 'SET' button (LED on) of the desired effect and then press one of the main 'BEATS' buttons near the front of the main panel (also used to select programs). The timing of the effect triggering will instantly change to the new setting. Try the whole range of preset timings to hear the way they can completely change the feel or 'groove' of the music (always press the SET button first before attempting to select a new BEATS setting).

Now try editing the other effects in a similar manner (use the ACTIVATE buttons to select or de-select each effect) and, when you're ready, activate all four at once with different BEATS trigger settings.

As a final touch, try moving the FX MIXER joystick about it's axis to hear the effects blend into each other and interact in a myriad of combinations.

Please read the following "OPERATION" section fully to totally appreciate the range of features and facilities the FEDERATION BPM FX-PRO has to offer.

Operation

EFFECTS CONFIGURATION

DJ Mode (FX in series)

For those who are new to the world of digital FX, or will be using the FEDERATION in a high-pressure situation such as live gigs, this is probably the best mode to start with. All four effects are chained together into a single signal path, automatically taking the output of the first effect and feeding it to the second, the second to third etc. We have arranged the effects in a logical order; Filter, Cutter, Delay, Panning. This means that you are unlikely to end up with a later effect upsetting what you have already setup for an earlier one in the chain (if you are worried about this restricting your creativity, read "Setting the effects configuration" in the "UTILITY" section on page 35).

DJ Mode is also the simplest way to hook the FEDERATION into your sound system. Simply take the FX send of your mixer and plug this into the pair of inputs labelled 'ALL FX IN' on the rear panel of the FEDERATION. Then connect the outputs back to the FX return on the mixing desk - see page 5 for full details. Now all the effects are connected together and you can use whichever combination you like straight away. Alternatively, you can connect the FEDERATION in-line between a single sound source (line level only) and the mixing desk input. With this setup, the effects will only operate on the single sound source - see 'Alternative Setup' on page 5.

Producer Mode (FX in parallel)

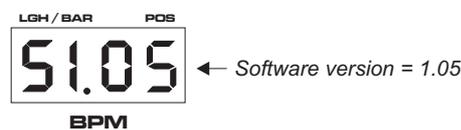
In the recording studio, where getting a great effect setup isn't under such intensive time pressure as in a DJ'ing or live gig situation, you may want to use the FEDERATION effects selectively on different elements in your music. For example, you may wish to add the Filter to the bass line, Cutter to the percussion, Delay to the vocals and SPS Panning to the ambient synthesizer sounds. For this reason the FEDERATION-PRO model gives you 4 separate stereo inputs and outputs so that you can access each effect independently.

To use the FEDERATION-PRO in Producer Mode, it is best to have a mixing desk with (up to) 4 effect send/return paths (if your desk has less than four then you won't be able to access all four effects independently). Connect each stereo input/output to a separate send/return loop on your desk and note down which send corresponds to which FEDERATION effect. This will allow you to send different groupings of sounds to each of the effects. If you don't have enough send/returns, but you do have insert loops on your desk, then you can use these to apply the effects independently to individual sources coming in, but not to mixable groups of sources as you can with aux send/returns.

If you don't have either send/returns or insert loops, then you can feed the signal from individual instruments directly into the separate stereo inputs of the FEDERATION and then mix the separate outputs through a simple line mixer.

GETTING STARTED / SYNCHRONISATION SOURCE

After connecting the FEDERATION to your system as detailed above, press the power switch on the rear panel to turn the power on. The version of software fitted to your unit will now be shown briefly on the main display:



Afterwards, the four centre bars will illuminate to indicate the 'IDLE' status of the BPM engine or MIDI clock input.



The FEDERATION BPM FX-PRO has two main operating modes for synchronising the effects to the audio. In the first mode the BPM analysis 'engine' is used to calculate the tempo of the incoming audio. This mode can be used for live DJ or studio applications alike. The second mode uses incoming MIDI clock data to constantly define the BPM value which will appeal more to the studio user.

To engage the FEDERATION's BPM engine, set the rear panel 'SYNC' switch to the 'AUDIO' position (down). Any incoming MIDI clock data will now be ignored. To dis-engage the FEDERATION's BPM engine, set the rear panel SYNC switch to the 'MIDI' position (up). The tempo of the incoming audio will NOT be used to control the tempo of the FEDERATION's effects.

NOTE: If you want to individually process vocals, instruments etc. from non-MIDI based music (no MIDI clock available for synchronisation), use the inputs marked 'BPM ANALYSIS' (PANNER section - 'ALL FX' mode selected) to feed in beat information from the drum or backing track for correct BPM calculation. This input works in parallel with the master input when ALL FX mode is selected.

INPUT LEVELS

The four bi-colour 'INPUT LEVEL' indicators at the top edge of the front panel monitor the input levels for each effect when 'SINGLE FX' mode is selected. When 'ALL FX' mode is selected, only the 'FILTER/LFO (ALL FX)' indicator will be in use. Each indicator can show three input level conditions as follows:

OFF	-	No signal / low signal level
BRIGHT GREEN	-	Normal line level signal present - Ideal working level
RED	-	Overloaded signal - Level too high

ALL FX: (IN/OUT switch set to 'ALL FX')

With the FEDERATION connected to your DJ system as detailed on page 5, play a suitable upbeat track on any connected sound source and ensure the mixing desk's gain/level controls are set correctly (0dB).

If you have connected the FEDERATION to the master outputs of a mixing desk, move the desk's master output fader to it's normal working position (0dB indication on output level meters) and observe the FEDERATION's input level indicator. The indicator should be illuminated GREEN, occasionally flashing RED. If the level indication is incorrect, adjust the FEDERATION's Master input gain up or down accordingly - see UTILITY mode 1 on page 35.

SINGLE FX: (IN/OUT switch set to 'SINGLE FX')

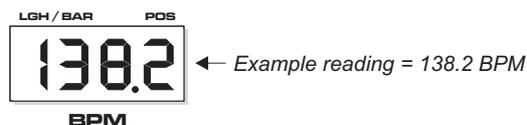
With the FEDERATION connected to your studio system as detailed on page 6, play a suitable track on the connected multi-track sound source and ensure the gain/level controls for each channel are set correctly (0dB). Turn up the Aux send controls on the relevant channels and observe the FEDERATION's input level indicator(s) for the connected effect. e.g. If the channel 2 insert/aux send on your mixing desk is connected to the CUTTER in/outs, observe the input level indicator in the CUTTER section whilst adjusting the channel 2 send level. The indicator(s) should illuminate GREEN, occasionally flashing RED at peak signal levels. If the indicator(s) show a different condition, check and adjust the send levels on your mixing desk.

NOTE1: The UTILITY mode 'GAIN' adjustment has no function when SINGLE FX mode is selected i.e. all four channels are setup to receive +4dB line level signals.

NOTE2: If the input level is set incorrectly, the performance of the BPM engine and audio quality may be affected.

BPM DISPLAY

SYNC = AUDIO mode (rear panel SYNC switch 'down'): Start the playback of a suitable audio track (containing definable beat information). The BPM display should now show the tempo of the track in beats per minute as in the following example:



The indicator in the MASTER ON/OFF button (and any selected ACTIVATE buttons) will now flash at the detected BPM rate to indicate 'PAUSE' mode.

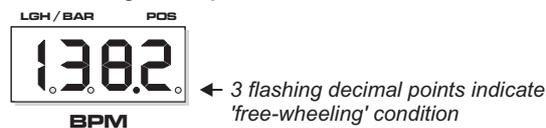
Operation

NOTE: If the BPM engine has picked up on the off-beat information in the track (LEDs flashing on the off-beats) from a prominent Hi-Hat etc., you can use the NUDGE control's Pull/Push feature to adjust the synchronisation to the on-beat position - for further information see page 23.

During tempo analysis of the audio track, the right-hand digit in the display may fluctuate slightly as the BPM reading is constantly updated in real-time. Any major shift in tempo (changing the playback speed using a CD/vinyl deck's pitch control) will be tracked and displayed by the FEDERATION.

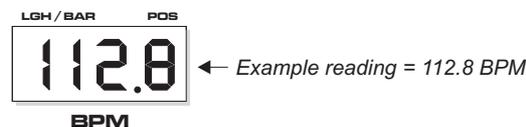
IMPORTANT NOTE: In this mode, the FEDERATION's BPM engine will continue triggering the effects indefinitely at the last detected BPM rate if the strong regular beats in the audio track become unavailable. This feature allows the effects to continue operating through quite passages in the audio track.

If the strong regular beats in the audio track become unavailable, the 3 remaining decimal point indicators in the BPM display will flash continuously, as shown in the following example:



This will occur approximately 5 seconds after the last valid BPM reading was taken to warn you that the FEDERATION is now 'free-wheeling' and the BPM display is no longer being updated from the audio track. When the strong regular beats in the audio track return, the FEDERATION will automatically detect the BPM information and make any necessary adjustments, at which time the flashing decimal point indicators will go out to indicate a 'locked-in' condition.

SYNC = MIDI mode(rear panel SYNC switch 'up'): Start the connected MIDI sequencer. The BPM display should now show the tempo of the MIDI sequencer in beats per minute, as in the following example:



The indicator in the MASTER ON/OFF button (and any selected ACTIVATE buttons) will flash at the BPM rate to indicate 'PAUSE' mode.

In MIDI sync mode, the BPM display and timing of the FEDERATION will simply reflect the tempo setting of the connected MIDI sequencer regardless of any musical content. Changes in tempo (master tempo changes within a MIDI composition etc) will be instantly tracked and displayed by the FEDERATION.

SYNCHRONISATION INDICATOR

This 3-way indicator shows the synchronisation status between the audio and effect beat position. The BPM engine constantly analyses the accuracy of the relative downbeat positions and will either 'PULL' or 'PUSH' the effect triggering to maintain the synchronisation.

When the audio and effects are *synchronised* the green 'OK' indicator will light, as follows:



If the effects are *ahead* of the audio, the red 'PULL' indicator will light, as follows:



If the effects are *behind* the audio, the red 'PUSH' indicator will light, as follows:



NOTE: The synchronisation display will show a constant 'OK' indication when SYNC mode is set to 'MIDI'.

ACTIVATING THE EFFECTS - MASTER ON/OFF

Each effect can be selected independently or collectively using the 4 ACTIVATE buttons and the MASTER ON/OFF button.

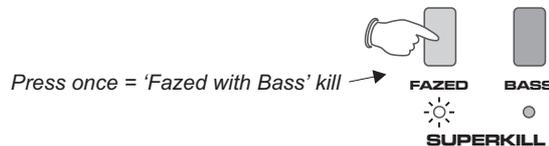
To cue the effect(s), press the ACTIVATE button(s) once in PAUSE mode (BPM detected, MASTER ON/OFF indicator flashing at BPM rate). The indicator(s) in the ACTIVATE button(s) will now also flash at the BPM rate. Press the MASTER ON/OFF button once to output the activated effects. The indicators in the ACTIVATE buttons will stay ON when the MASTER button is set to 'ON' and flash when set to 'PAUSE'. To switch the effects on individually, first press the MASTER ON/OFF button (LED on) and then press the desired ACTIVATE button(s) to output the effects.

The functionality of the MASTER ON/OFF button depends on the rear panel SYNC switch setting. In **AUDIO** mode, this button acts as a Start, Pause and Continue control for the internal USER BEATS patterns as well as switching the effects on and off. In **MIDI** mode, the MASTER ON/OFF button simply switches the effects on and off, the USER BEATS patterns now being controlled by the external MIDI sequencer connected to MIDI IN.

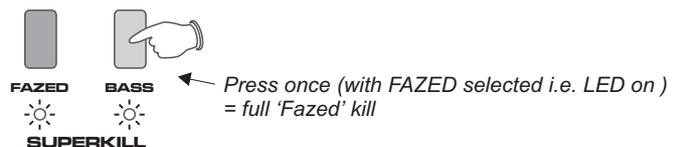
SUPERKILL

The SuperKill section allows you to radically alter audio with or without the main effects in operation (totally independent of the BPM engine). By phase inverting the stereo signal, the vocal/instrument levels in the audio are dramatically remixed, often revealing previously unheard elements within the music. You can choose between full FAZED kill, BASS kill or even FAZED WITH BASS kill which adds the rhythmical bass frequencies back into the FAZED mix to keep the groove going.

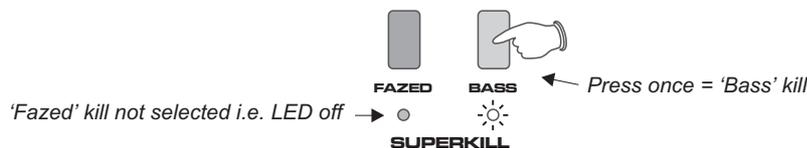
For Fazed with Bass kill, select 'FAZED' button:



For full Fazed kill, now select 'BASS' button:



For Bass kill only, select 'BASS' button:



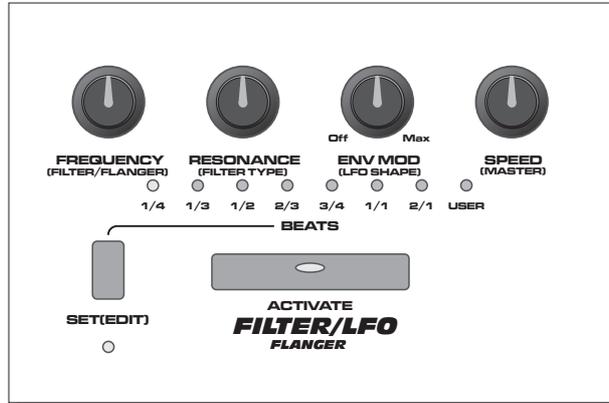
To de-select the SuperKill function, simply press the relevant button again (LED off). The SuperKill settings can be stored with each program.

NOTE 1: SuperKill requires a mixed STEREO input signal for satisfactory operation.

NOTE 2: SuperKill will be disabled when the rear panel 'IN/OUT' switch is set to the 'SINGLE FX' position.

Effects

THE FILTER /LFO



This effect recreates the most essential part (for many dance music producers and remixers) of a classic analogue synthesizer, the filter, and puts it under the direct control of the tempo of the source music via the synchronised Low Frequency Oscillator (LFO).

The Filter allows you to remove or accentuate frequencies in the source signal, the Frequency knob controlling the frequencies to which the changes will be applied. Resonance allows you to boost the frequencies around the current cut-off Frequency, accentuating the action of the Filter, especially under the control of the LFO. This can be set to subtly emphasise the movement or exaggerate it into a squealing monster. Envelope Mod controls the amount of change to the cut-off frequency when under LFO control. The greater the Envelope Mod amount, the more the filter is quickly opened from and closed back to the Frequency knob setting at each trigger from the BPM analyser. If the Frequency knob is set closed (fully anti-clockwise) and the Env Mod to max (fully clockwise) this will produce the most marked effect, especially if Resonance is set fairly high as well.

FREQUENCY (FILTER/FLANGER)

This control has two functions determined by the Filter's SET(EDIT) button.

Under normal operating conditions (when the SET(EDIT) button is *NOT* pressed down) this control sets the basic cut-off frequency of the filter. The affect this has on the sound depends on the type of filter selected (low, band or high-pass), as detailed in the next section titled 'RESONANCE'.

When the SET(EDIT) button is pressed and held down (LED flashing), this control can be used to select the filter (also selects the Flanger effects - please see page 14 for further details). As the control is moved between the fully anti-clockwise and 12 o'clock position the Filter will be selected.

RESONANCE (FILTER TYPE)

This control has two functions determined by the Filter's SET(EDIT) button.

Under normal operating conditions (when the SET(EDIT) button is *NOT* pressed down) this control sets the boost level of the frequencies around the cut-off point as set by the FREQUENCY control. At the fully anti-clockwise position there is no boost. As the control is moved in a clockwise direction the frequencies will be gradually boosted. At the fully clockwise position, the resonance will reach self-oscillation producing a new pitched element similar to acoustic feedback.

When the SET(EDIT) button is pressed and held down (LED flashing) this control sets the filter type. There are three filter types to choose from, each having their own individual characteristics and subsequent affect on the music.

LOW-PASS: This type of filter allows the low frequency elements to pass whilst reducing the higher frequencies as the FREQUENCY control is moved *anti-clockwise*.

BAND-PASS: This type of filter allows a limited band of frequencies to pass whilst reducing the remaining high and low frequencies, the filtered frequency band being set by the position of the FREQUENCY control. Try positioning the control to isolate parts of the music such as vocals, bass etc.

HIGH-PASS: This type of filter allows the high frequency elements to pass whilst reducing the lower frequencies as the FREQUENCY control is moved *clockwise*.

Between the fully anti-clockwise and 10 o'clock positions, the LOW-PASS filter type will be selected. Between the 10 o'clock and 2 o'clock positions, the BAND-PASS filter type will be selected. Between the 2 o'clock and fully clockwise positions, the HIGH-PASS filter type will be selected. The main BPM display will indicate the settings as follows:



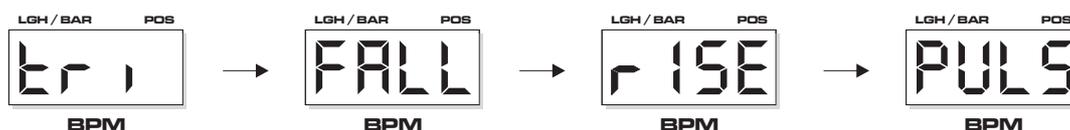
ENVELOPE MOD

This control has two functions determined by the Filter's SET(EDIT) button.

Under normal operating conditions (when the SET(EDIT) button is *NOT* pressed down) this control sets the amount of change (depth) of the cut-off frequency as set by the FREQUENCY control. At the fully anti-clockwise 'Off' position there will be no change to the filter cut-off frequency which is useful for making 'manual' sweeps with the filter's FREQUENCY and RESONANCE controls. As the control is moved in a clockwise direction the filter will be increasingly opened by the audio modulation.

When the SET(EDIT) button is pressed and held down (LED flashing) this control sets the LFO wave shape. There are four types to choose from, each having their own individual characteristics and subsequent affect on the music.

Between the fully anti-clockwise and 10 o'clock positions, the TRIANGLE shape will be selected. Between the 10 o'clock and 12 o'clock positions, the FALLING SAWTOOTH shape will be selected. Between the 12 o'clock and 2 o'clock positions, the RISING SAWTOOTH shape will be selected. Between the 2 o'clock and fully clockwise positions, the PULSE shape will be selected. The main BPM display will indicate the settings as follows:

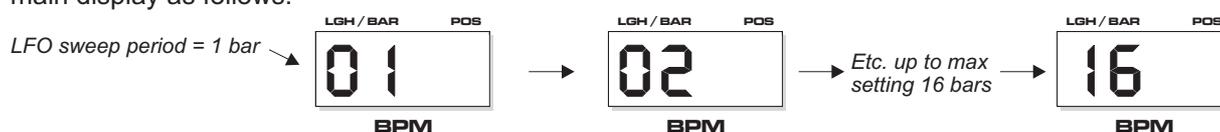


SPEED (MASTER)

This control has two functions determined by the Filter's SET(EDIT) button.

Under normal operating conditions (when the SET(EDIT) button is *NOT* pressed down) this control can be used to manually set the trigger rate of the LFO. To override any of the preset BEATS settings, simply turn the SPEED control to make the necessary adjustment. The BEATS indicators will light in sequence as this control is moved past each preset value, with two LEDs on indicating a speed setting between any two values.

The Speed control can be used to set the LFO to much slower, synchronised rates than the maximum preset BEATS trigger of every other beat (2/1). When the 2/1 setting is passed, all indicators in the BEATS display will be off and the special 'slow sync'd' feature will be introduced. The knob movement is thereafter divided into preset 'zones', each related to musical bars derived from the current BPM value. The settings will be shown briefly on the main display as follows:



RANGE = 01, 02, 03, 04, 08, 12, 16 BARS. The LFO can be re-started from the beginning of the wave shape each time the MASTER or filter ACTIVATE button is pressed.

Effects

When the SET(EDIT) button is pressed and held down (LED flashing) this control becomes the 'master' speed control for any activated effects. This feature can be used to change the trigger rate of up to four effects at once in real-time producing dramatic speeding up / slowing down effects. The speed of the 'slaved' effects will 'jump' to the value of this control as soon as it is moved.

Also, when the SET(EDIT) button is pressed and held down (LED flashing), you can set the BEATS on all four effects simultaneously. See "Setting the BEATS" on page 21 for more information.

BEATS

These indicators show the automatic BEATS setting (if selected) for the FILTER/LFO or FLANGER effect. See "Setting the BEATS" on page 21.

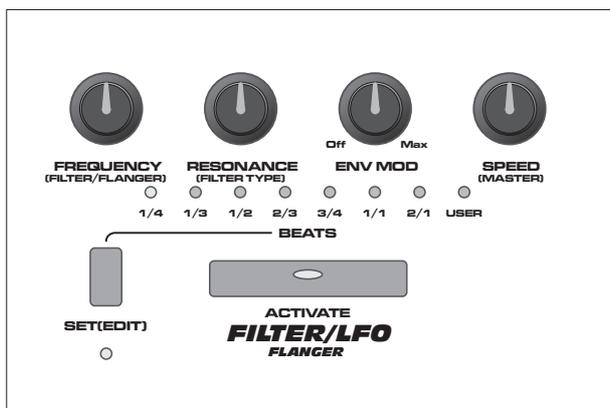
SET (EDIT)

This button selects the automatic BEATS setting mode for the FILTER/LFO or FLANGER effect. See "Setting the BEATS" on page 21.

ACTIVATE

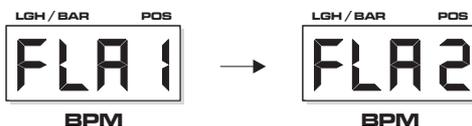
This button switches the FILTER/LFO or FLANGER effect on and off (or to 'cue' if MASTER ON/OFF is set to OFF). See "Activating the effects" on page 11.

THE FLANGER



The Flanging effect's name was derived from the way it was first produced back in the sixties, by manually slowing a tape spool (touching the sides or 'flanges' of the spool) on a delay tape machine. This produced the classic 'whooshing' sound, which has been reproduced digitally with a greater degree of reliability and flexibility on the BPM FX - 'PRO'. This can be used as an alternative to the Filter, giving you a different way to sweep through the frequencies in time with the tempo. By feeding more or less of the signal back in on itself, the flanging effect can be exaggerated or made more subtle.

We have included two types of flanger in the FEDERATION PRO. Flanger 1 accentuates notch frequencies across the range, the most obvious being from 0-250Hz resulting in a boost to low frequency sounds such as the bass drum. Flanger 2 accentuates the opposite frequency bands, resulting in a cut to the low frequencies. To select the flanger effects, press and hold down the SET(EDIT) button and move the FREQUENCY knob past the 12 o'clock position. As the control is moved between the 12 o'clock position and 2 o'clock position, Flanger 1 will be selected. Between the 2 o'clock and fully clockwise position, Flanger 2 will be selected, the main display confirming the settings as follows:



When you have selected the flanger characteristics you want, release the SET(EDIT) button. Now you can use the controls in this section to alter the settings of the selected flanger.

FREQUENCY

This control sets the frequency of the 'sweeping' element modulated by the trigger setting. This lets you fine tune which frequencies the flanging process will bring out. At the fully anti- clockwise position only the lower frequencies will be affected. As the control is moved in a clockwise direction the higher frequencies will be more affected until, at the fully clockwise position, only the higher frequencies will be affected.

RESONANCE

This control now sets the amount of feedback present in the flange effect, which determines just how exaggerated it becomes. At the fully anti-clockwise position the amount of feedback is at it's lowest. As the control is moved in a clockwise direction the feedback level gradually increases until, at the fully clockwise position, the feedback is at it's maximum resulting in some extreme flanging textures.

DEPTH (marked ENV MOD)

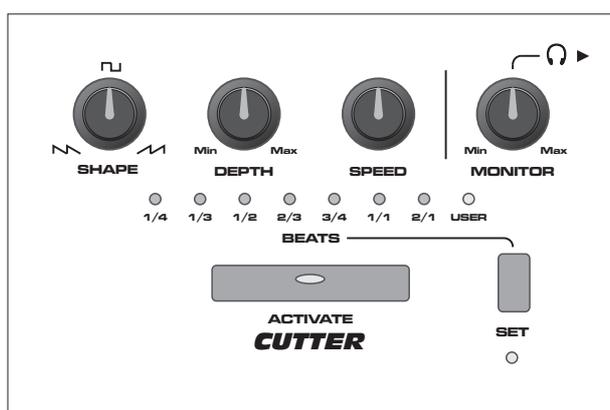
This control now actually governs the overall depth of the flange effect. At the fully anti-clockwise position the flange effect is at it's most subtle. As the control is moved in a clockwise direction the flanging becomes more and more pronounced until, at the fully clockwise position, the depth of flanging will be at it's greatest.

SPEED

This control can be used to manually set the trigger rate of the FLANGER. To override any of the preset BEATS settings, simply turn the SPEED control to make the necessary adjustment. The BEATS indicators will light in sequence as this control is moved past each preset value, with two LEDs on indicating a speed setting between any two values. The Speed control can be used to set the Flanger to much slower rates than the maximum preset BEATS trigger of every other beat (2/1). When the 2/1 setting is manually passed, all indicators in the BEATS display will be off.

BEATS / SET (EDIT) / ACTIVATE - See headings in Filter section on previous page for details.

THE CUTTER



This effect operates in a similar fashion to the filter but on the overall volume of the signal. The cutter can be set to operate either as a conventional 'gate' which, each time it is triggered opens instantly to allow signal through but then after a short period closes completely to cut off the signal, or as a fade-in/fade-out control with a relatively short period of operation.

Effects

When the Shape control is set to the left of centre, the volume will rise instantly to full on each triggered Beat, giving a very fast attack (with the release becoming increasingly sudden as the centre position is reached). This is ideal for making the beat of the music even more marked. To the right of centre, the rise of the volume is progressively slowed down (and the release being instantaneous). This slowing of the attack of the sound can make the beat sound 'lazy' or even 'backwards' and will give more esoteric results. The Depth control allows you to adjust from subtle to extreme as you turn from left to right.

SHAPE

This control selects the shape of the cutter effect. At the fully anti-clockwise position (↶) the overall volume of the audio will rise quickly and fall slowly. As the control is moved in a clockwise direction the change in volume will become more severe, quickly rising and falling to form a 'gated' effect, reaching it's maximum at the 12 o'clock position (⊞). As the control is moved towards the fully clockwise position (↷) the effect will become more subtle, the volume rising slowly and falling away quickly for a 'backwards' effect.

DEPTH

This control has two functions depending on the position of the SHAPE control.

When the SHAPE control is set to the square position (⊞), this control sets the length of the 'open' or 'on' period of the gate, the period in which the audio signal can be heard.

At the fully anti-clockwise position (Min), the gate is open for its maximum duration allowing most of the audio signal to pass. As the control is moved in a clockwise direction the open period becomes increasingly shorter, allowing less and less of the audio signal to pass until, at the fully clockwise position (Max), the duration of the open period is extremely short, allowing through just a brief section of the audio signal.

When the SHAPE control is set to the falling or rising sawtooth positions, (↘ ↗) this control sets the volume level of the sawtooth's low point in relation to it's fixed maximum peak (0dB). At the fully anti-clockwise position (Min), the volume of the low point will be just below that of the peak, giving a soft, subtle tremolo effect. As the control is moved in a clockwise direction the volume of the low point will become increasingly quieter, the difference between the two points becoming more and more pronounced until, at the fully clockwise position (Max), the low point volume will be at infinity or 'off'.

SPEED

This control can be used to manually set the trigger rate of the CUTTER. To override any of the preset BEATS settings, simply turn the SPEED control to make the necessary adjustment. The BEATS indicators will light in sequence as this control is moved past each preset value, with two LEDs on indicating a speed setting between any two values.

BEATS

These indicators show the automatic BEATS setting (if selected) for the CUTTER effect. See "Setting the BEATS" on page 21.

SET

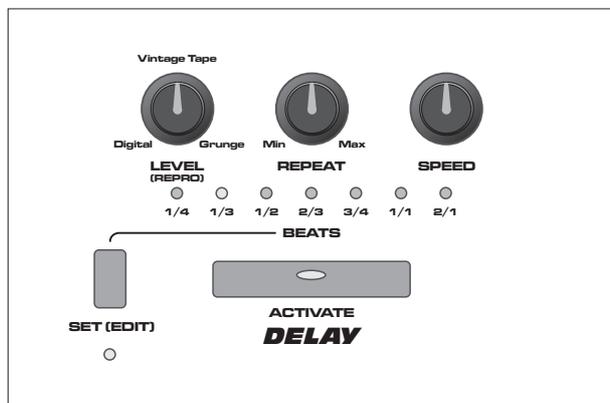
This button selects the automatic BEATS setting mode for the CUTTER effect. See "Setting the BEATS" on page 21.

ACTIVATE

This button switches the CUTTER effect on and off (or to 'cue' if MASTER ON/OFF is set to OFF). See "Activating the effects" on page 11.

MONITOR SECTION: Please see page 42 for details.

THE DELAY



This effect makes a copy of the source signal and then adds it back into the signal after a period of time as set by the BPM analyser. The level, fidelity and number of repeats can be set to determine how much this affects the original signal. The delayed signal can be a perfect copy of the original, thanks to the high quality of digital technology in the FEDERATION, but this is not always what the user wants. The Repro control is provided to allow the fidelity of the delayed signal to be reduced to that of a classic tape echo machine of the sixties/seventies or beyond to extreme 'grunge'. The number of repeats can be varied from one to increasingly numerous repeats which, although decaying in volume, will still threaten to drown out the source signal (which may be exactly what you want). Use the Max repeat position with caution!

LEVEL (REPRO)

This control has two functions determined by the delay's SET(EDIT) button.

Under normal operating conditions (when the SET(EDIT) button is *NOT* pressed down) this control sets the wet/dry mix level of the delay effect. At the fully anti-clockwise position only the original 'dry' signal will be heard. As the knob is moved towards the 12 o'clock position the delayed or 'wet' signal will be gradually introduced. As the knob is moved past the 12 o'clock position the dry signal will be gradually reduced until, at the fully clockwise position only the wet signal will be heard.

When the SET(EDIT) button is pressed and held down (LED flashing) this control sets the audio reproduction quality of the delayed signal. At the DIGITAL setting the reproduction quality will be at its highest (44.1kHz CD quality). At the VINTAGE TAPE position the high and low frequency content has been limited whilst harmonic distortion and speed variations (chorus) are also introduced to create the classic sound of a vintage analogue tape machine. At the GRUNGE position all these elements are exaggerated to an extreme.

Between the fully anti-clockwise and 10 o'clock positions, DIGITAL reproduction will be selected. Between the 10 o'clock and 2 o'clock positions, VINTAGE TAPE reproduction will be selected. Between the 2 o'clock and fully clockwise positions, GRUNGE reproduction will be selected. The main BPM display will indicate the settings as follows:



REPEAT

This control sets the number of times the delayed signal is repeated. At the fully anti-clockwise position (Min), there will just be a single repeat or echo of the signal (no feedback). As the control is moved in a clockwise direction the

Effects

delayed signal will be increasingly fed back into the delay to create more and more repeats, the multiple repeats slowly decaying in volume over a period of time. At the fully clockwise position (Max), the number of repeats feeding back into the delay will be sufficient to maintain the looped section indefinitely.

SPEED

This control can be used to manually set the trigger rate of the DELAY. It's operation models the classic tape echo machines of the past, smoothly changing the speed up and down (without a digital glitch) as would the motor driven machines of the 60's and 70's. The inherent speed control time lag of these older tape echo units has also been included, just try moving the speed control quickly from minimum to maximum (with REPEAT control set to multiple repeats) to hear the delay repeats catch up in a lazy manner.

IMPORTANT NOTE - PLEASE READ: The relationship between the Delay's SPEED control and BEATS setting differs to that of other effects. Using the analogy of the classic tape machine, the BEATS setting determines the 'tape length' whilst the SPEED control sets the 'tape speed', this having a 4 to 1 range centred about the current BEATS setting. When a new BEATS setting is selected a new 'tape length' is calculated for the current 'tape speed' setting. This means that the SPEED control is always in the correct position and never jumps to a new BEATS setting, which would result in sudden 'out of tune' echos. Therefore, the BEATS indicators will not always light in full sequence as do the other effects.

To override any of the preset BEATS settings, simply turn the SPEED control to make the necessary adjustment. The BEATS indicators will light in sequence as the control is moved past each preset value, with two LEDs indicating a speed setting between any two values. The range of selectable settings, when using the SPEED control, will always be governed by the current BEATS setting (i.e. a 4/1 range about a mid-point BEATS value).

BEATS

These indicators show the automatic BEATS setting for the DELAY effect. See "Setting the BEATS" on page 21.

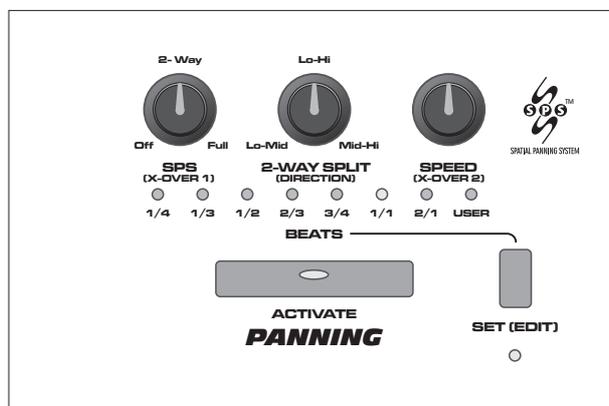
SET (EDIT)

This button selects the automatic BEATS setting mode for the DELAY effect. See "Setting the BEATS" on page 21.

ACTIVATE

This button switches the DELAY effect on and off (or 'cue' if MASTER ON/OFF is set to OFF).

THE PANNER



This part of the FEDERATION is quite revolutionary. There have of course been auto-panning devices before, which could use an LFO to move a signal around the stereo field, but none which could trigger this LFO from a BPM analyser and certainly none which could move different frequency bands to different pan positions at the same time.

The unique Spatial Panning System (SPS), featured for the first time ever on the FEDERATION BPM FX, can actually split the incoming signal into three bands (low, mid and hi - as normally used by DJs) and then move these bands' pan positions independently. The crossover points between low/mid and mid/high are also user-definable.

With SPS Off, the Panner works in a more conventional fashion on the entire signal, moving it around the stereo position at the determined speed, giving you a standard auto-pan controlled by the BPM analyser. As you increase the SPS amount, it will start to move two bands around in the stereo field whilst holding the third user-definable band stationary and as SPS reaches Full, all three bands will be constantly cycled to different places in the stereo field.

SPS (X-OVER 1)

This control has two functions determined by the Panning SET(EDIT) button.

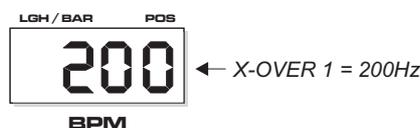
Under normal operating conditions (when the SET(EDIT) button is *NOT* pressed down) this control sets the amount of Spatial Panning and how the split frequencies are moved about the stereo field. At the fully anti-clockwise position (Off), all the audio frequencies are locked together and are panned as one. As the control is moved in a clockwise direction the audio signal will become increasingly split into high, mid and low frequency elements until, at the 12 o'clock position (2-Way), the separation will be at its maximum. The '2-Way' setting of SPS shifts two frequency bands from left to right whilst holding the third in a central position. As the control is moved further clockwise the movement of the split frequency bands increasingly changes, the three bands now starting to 'chase' each other in a left, right, centre, left, right, centre... pattern (or opposite direction - see 'DIRECTION' control on following page) on each triggered pulse until, at the fully clockwise position (Full), the Spatial Panning effect will be at its maximum. See *example 1 & 2 on page 19*.

When the SET(EDIT) button is pressed and held down (LED flashing) this control sets the low/mid crossover point, the dividing point that designates which frequencies are grouped into the low and mid frequency bands. You can use the crossover 1&2 adjustments to 'tune-in' the frequency bands to a specific instrument or vocal sound, thus isolating it within the panning effect. At the fully anti-clockwise position the crossover point will be at its lowest and only frequencies below 20Hz will be grouped into the low band.

As the control is moved in a clockwise direction the crossover frequency rises, increasing the 'width' of the low frequency band and 'squeezing' the mid band until, at the fully clockwise position the crossover point will be at its maximum and all frequencies below that setting will be grouped into the low band.

NOTE: The maximum setting of X-OVER 1 depends on the minimum setting of X-OVER 2 and vice-versa, the two settings never able to meet, so avoiding total mid frequency band elimination.

The main BPM display will show the frequency setting in Hz, as shown in the example below:



2-WAY SPLIT(DIRECTION)

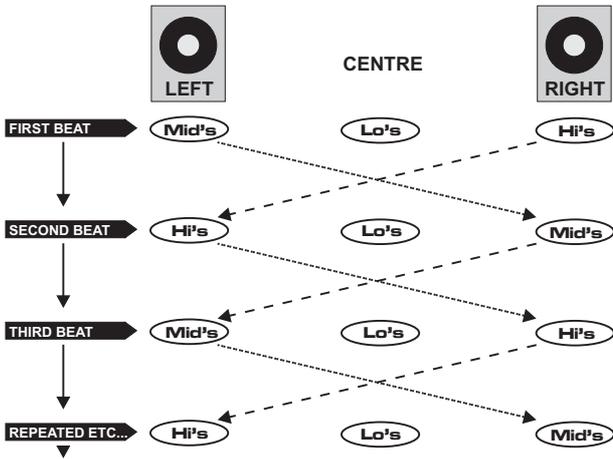
This control has two functions determined by the Panning SET(EDIT) button.

Under normal operating conditions (when the SET(EDIT) button is *NOT* pressed down) this control sets the configuration of 2-Way Spatial Panning. At the fully anti-clockwise position (Lo-Mid), the HIGH frequency band will be held in a central position with the low and mid frequencies panning from left to right in opposing directions. At the 12 o'clock position (Lo-Hi), the MID frequency band will be held in a central position with the low and high frequencies panning from left to right in opposing directions. At the fully clockwise position (Mid-Hi), the LOW frequency band will be held in a central position with the mid and high frequencies panning from left to right in opposing directions. See *example 1 over*.

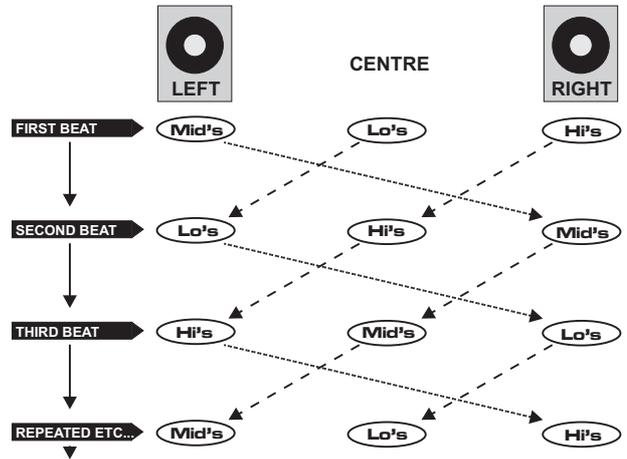
Effects

Example 1: Frequency band movement when SPS control = '2-Way' (2-Way Split control set to 'Mid-Hi' position)

Example 2: Frequency band movement when SPS control = 'Full', SPS DIRECTION = 'Right-Centre-Left' (2-Way Split control has no function when SPS set to full)

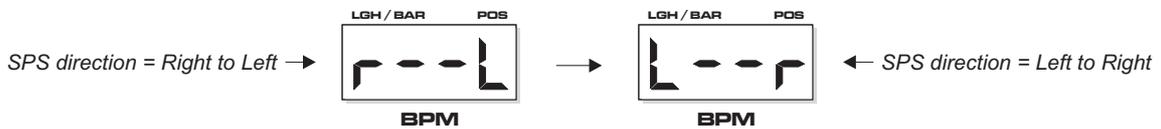


EXAMPLE 1



EXAMPLE 2

When the SET(EDIT) button is pressed and held down (LED flashing) this control sets the directional movement of Spatial Panning (when SPS is set to 'Full'). Between the fully anti-clockwise and 12 o'clock position the SPS movement will be RIGHT - to - LEFT. Between the 12 o'clock and fully clockwise position the SPS movement will be opposite, LEFT - to - RIGHT. The main BPM display will indicate the settings as follows:



SPEED(X-OVER 2)

This control has two functions, again determined by the Panning SET(EDIT) button.

Under normal operating conditions (when the SET(EDIT) button is *NOT* pressed down) this control sets the trigger rate of the PANNER. To override any of the preset BEATS settings, simply turn the SPEED control to make the necessary adjustment. The BEATS indicators will light in sequence as this control is moved past each preset value, with two LEDs on indicating a speed setting between any two values.

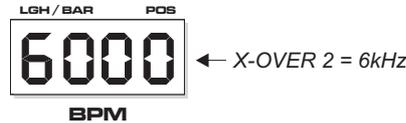
The Speed control can be used to set the Panning to much slower, synchronised rates than the maximum preset BEATS trigger of every other beat (2/1). When the 2/1 setting is passed, all indicators in the BEATS display will be off and the special 'slow sync'd' feature will be introduced. The knob movement is thereafter divided into preset 'zones', each related to musical bars derived from the current BPM value. The settings will be shown briefly on the main display as follows:



RANGE = 01, 02, 03, 04, 08, 12, 16 BARS.

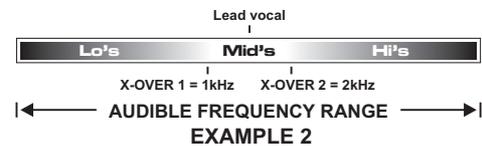
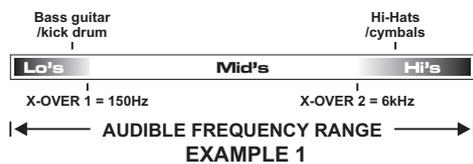
When the SET(EDIT) button is pressed and held down (LED flashing) this control sets the second SPS crossover point, Mid/High, the dividing point that designates which frequencies are grouped into the mid and high frequency bands. At the fully anti-clockwise position the crossover point will be at its lowest, the minimum setting now being determined by the X-OVER 1 value (to avoid mid band elimination).

As the control is moved in a clockwise direction the crossover frequency rises, increasing the 'width' of the mid frequency band and 'squeezing' the high band until, at the fully clockwise position the crossover point will be at its maximum and all frequencies below will be grouped into the mid band. The main BPM display will show the frequency setting in Hz, as shown below:



Crossover example 1: X-OVER 1 set to minimum, X-OVER 2 set to maximum. This compresses the Low and High frequency bands to 'tune-in' to the bass and percussion sounds.

Crossover example 2: X-OVER 1 set to maximum, X-OVER 2 set to minimum. This compresses the Mid frequency band to 'tune-in' to the vocal sound.



BEATS

These indicators show the automatic BEATS setting (if selected) for the PANNER effect.

SET (EDIT)

This button selects the BEATS setting mode for the PANNER effect. See "Setting the BEATS" on page 21

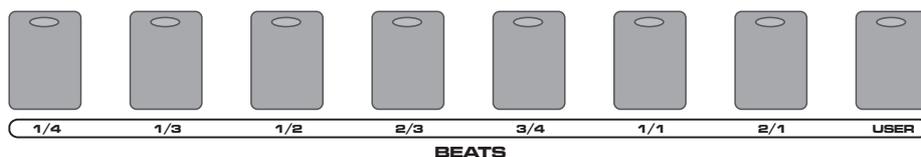
ACTIVATE

This button switches the PANNER effect on (or 'cue' if MASTER ON/OFF is set to OFF) and off.

SETTING THE BEATS

This is where you set the preset trigger rates for each effect.

The eight master 'BEATS' buttons at the front edge of the FEDERATION are used to instantly call up the musically correct trigger timings derived from the current audio input (rear panel SYNC switch set to 'AUDIO') or MIDI clock tempo (rear panel SYNC switch set to 'MIDI').



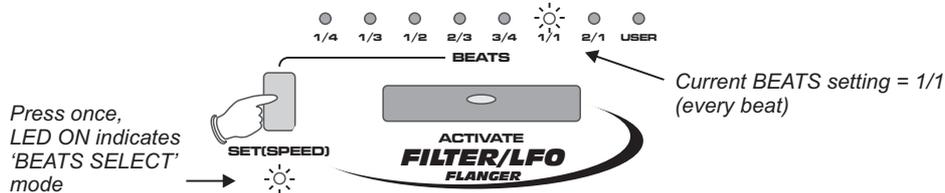
The labelling under each button designates the divisions or multiples of triggers per musical beat as follows:

- 1/4 = Four times every beat
- 1/3 = Every third of a beat
- 1/2 = Twice every beat
- 2/3 = Every two thirds of a beat
- 3/4 = Every three quarters of a beat
- 1/1 = Every beat
- 2/1 = Every other beat
- USER (please see the USER BEATS section on page 29)

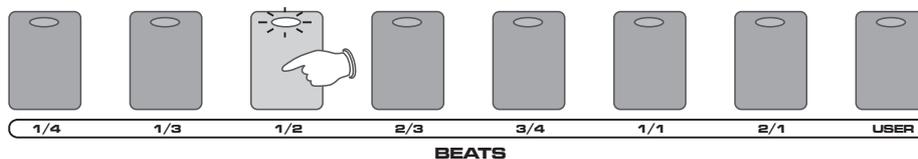
Each effect module features a 'SET' button. These buttons allow trigger settings implemented with the master BEATS buttons to be routed to the effects independently or collectively. A row of status indicators labelled 'BEATS' give visual confirmation of the current trigger setting for each effect.

Operation

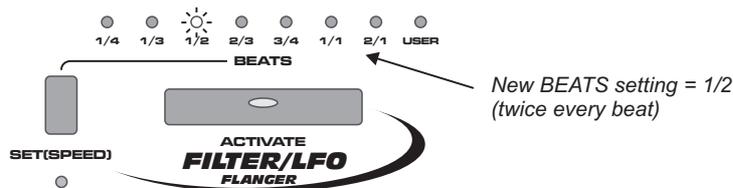
Before attempting to set or change the BEATS value on any effect, ensure the FEDERATION is displaying a BPM reading from the AUDIO or MIDI input. To change a BEATS setting, press the effect SET button once and check that the indicator comes on, as in the following example:



Ensure the FEDERATION is in main SELECT mode i.e. 'PROGRAM' or user beats 'PATTERN RECORD' modes are inactive. Now, press one of the master BEATS buttons, as in the following example:



The trigger timing of the effect will instantly change and the BEATS indicator will confirm the new setting, as in the following example:



You can use the BEATS buttons to change the trigger settings on any combination of effects simultaneously. Simply press the SET button (LED on) for each effect you wish to change - e.g. If all effects SET buttons are set to 'ON', pressing one of the master BEATS button will change the trigger timing of all four effects.

Alternatively, you can use the FILTER/LFO 'SET' button as a MASTER to change all four effects at once. Press and hold down this SET button, then press any of the main BEATS buttons.

TAP (CLEAR BPM) Button

This multi-function button allows you to manually enter a tempo by hand, 'clear' the current BPM reading or reset the internal USER BEATS pattern back to the beat1/bar1 start point (also controls the connected MIDI sequencer's pattern/song - see page 41 for further information). The TAP feature can be used to set the BPM rate when there is no audio signal present or when the beat information becomes unavailable during a quiet passage of the audio track (intro, middle eight etc). The CLEAR feature can be used to cancel the current BPM reading, which automatically de-activates the effects.

TAP - Tempo Edit: To enter a BPM rate from an 'IDLE' condition (no audio beat detected) use a finger to tap in a tempo (within the FEDERATION's current BPM range) on the TAP button. After 3-4 taps the tempo will be shown on the main BPM display. The 'MASTER ON/OFF' and any selected 'ACTIVATE' indicators will flash at the BPM rate to indicate 'PAUSE' mode.

The TAP feature can also be used to override the BPM engine whilst it is detecting a BPM or 'free-wheeling'. Use a finger to tap in the tempo. After 3-4 taps the new tempo will be shown on the main BPM display and the effect triggering will immediately change to the new BPM rate.

NOTE: Subsequent valid beat information detected by the BPM engine may override manual changes made with the TAP function.

The TAP function can also be used to assist the BPM engine as it analyses more complex rhythm tracks. Tapping along with the tempo of the track can help the software to recognise patterns within the music and so lock-in and adjust the BPM and/or synchronisation itself.

CLEAR BPM: To clear a BPM reading and reset the FEDERATION to 'IDLE' mode, press and *hold down* this button for approximately 1 second. Four centre bars will replace the BPM reading in the main display and any activated effects will be de-activated.

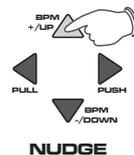
RESET PATTERN: To reset the USER BEATS pattern back to the start (or the external MIDI sequencer's pattern/song - see page 41 for further information), press this button once in 'PAUSE' mode (MASTER ON/OFF LED flashing). The USER BEATS pattern will now play from the beginning when the MASTER is next switched to ON.

NOTE: The CLEAR function detailed above WILL NOT OPERATE in MIDI SYNC mode or when USER BEATS are set to 'LIVE' mode - see page 29. The TAP button is also used to exit UTILITY mode.

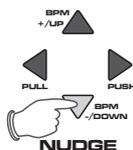
NUDGE Control

The 4-button NUDGE control lets you make fine adjustments to the BPM rate and audio/effect (or audio to MIDI clock) synchronisation.

BPM adjustments using BPM+/UP and BPM-/DOWN buttons: During normal operation the BPM engine will automatically detect and adjust itself to the correct BPM value. However, if the BPM engine is 'free-wheeling' or you wish to adjust a 'tapped in' tempo, you can use the North/South positions of the NUDGE control to increase or decrease the BPM value in 0.1 BPM steps. To increase the BPM reading by 0.1 BPM, press the top button once (BPM +/UP).



To decrease the BPM reading by 0.1 BPM, press the lower button once (BPM-/DOWN).



Press and hold down either button to scroll through the BPM values. Further valid beat information detected by the BPM engine will override any manual changes made with these buttons.

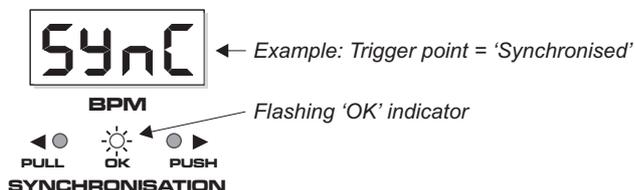
Setting the default BPM value: The BPM+/UP and BPM-/DOWN buttons can also be used to quickly enter a default BPM value. When the BPM engine is in IDLE mode (no audio signal present - BPM display showing four centre bars), simply press either button once to enter the default setting of 120 BPM. The FEDERATION is now in PAUSE mode and ready to run the effects/MIDI clock at 120 BPM. You can adjust this setting with the TAP or NUDGE (BPM+/UP or BPM-/DOWN) buttons.

NOTE: the BPM+/UP and BPM -/DOWN buttons are also used for general data entry in PATTERN RECORD, MIDI CHANNEL modes etc.

SYNC Adjustments (using PULL and PUSH buttons): Under normal circumstances the BPM engine will automatically detect and adjust the audio/effect (MIDI) trigger point to either the on-beat or off-beat position depending on whichever is more prominent in the audio track. You can use the PUSH/PULL feature to make fine adjustments to the synchronisation (if the effects or MIDI sequencer sound slightly ahead or behind the beat of the audio) or complete ½ beat steps (if the BPM engine has locked to the off-beat when you require synchronisation to be on the beat or vic-versa).

Operation

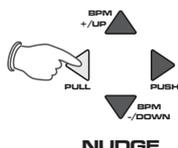
To check the current trigger synchronisation setting, press either the 'PULL' or PUSH' button once. The main BPM display and SYNCHRONISATION indicators will now show the current setting, as in the following example:



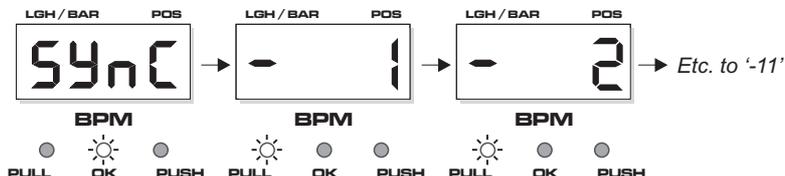
After 4 seconds the BPM display and SYNCHRONISATION indicators will revert to their normal operation.

To *adjust* the trigger synchronisation setting, again press one of the buttons marked 'PULL' or 'PUSH' and then, during the 4 second display period, press either button again to change the setting. Each half beat measure has 12 interim settings which allow very fine adjustments to be made to the synchronisation.

PULL: To 'Pull' the MIDI clock backwards, press the left button (PULL) during the 4 second display period.



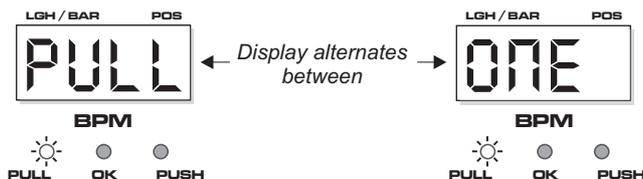
The display reading will change for each single press as follows:



After the '-11' setting, the synchronisation will be pulled back exactly 1/2 beat, as indicated by the following display:

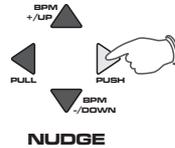


Further adjustments can be made beyond the 'PULL 1/2 beat' point (display reads from '-13' down to '-23') until the synchronisation is pulled back by one complete beat (maximum PULL adjustment). For this setting the display will show the following:

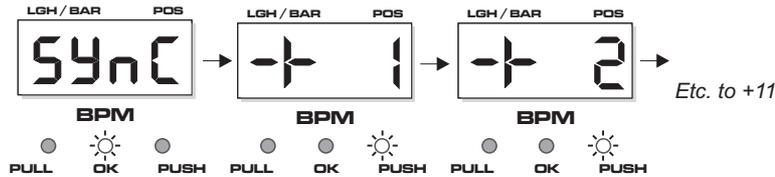


1/2 BEAT ADJUSTMENTS: You can adjust the PULL setting in 1/2 beat steps by pressing and *holding down* the PULL button for 1 second.

PUSH: To 'Push' the MIDI clock forwards, press the right button (PUSH) during the 4 second display period.



The display reading will change for each press as follows:



After the '+11' setting, the synchronisation will be pushed forwards exactly ½ beat, as indicated by the following display:



Further fine adjustments can be made beyond the 'PUSH ½ beat' point (display reads from '+13' up to '+23') until the synchronisation is pushed forwards by one complete beat (maximum PUSH adjustment). For this setting the display will show the following:

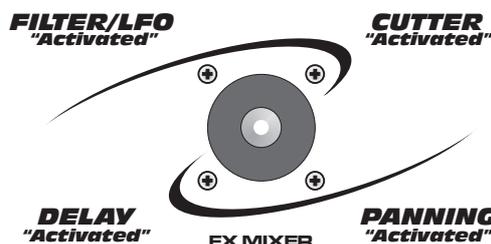


½ BEAT ADJUSTMENTS: You can adjust the PULL setting in ½ beat steps by pressing and *holding down* the PULL button for 1 second.

FX MIXER Joystick Control

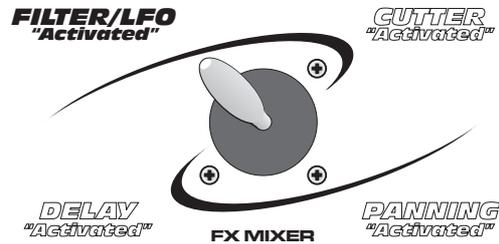
The FX MIXER joystick control can be used to adjust the balance level between the activated effects in real-time. At the central 'upright' position, all the effect levels will be equal. As the joystick is moved in the 'direction' of an effect (see diagrams over) the audio level of the remaining effects will become increasingly quieter until, with the knob pointing at the effect and hard-up against the edge of the joystick aperture, the other effects will be at their lowest level.

To hear all activated effects equally, always ensure the joystick is in the upright position, as in the following example:

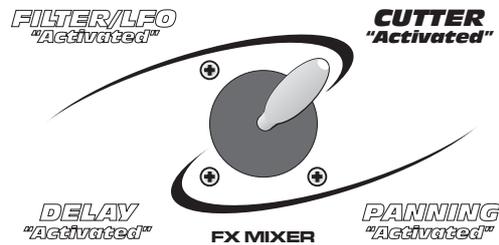


Operation

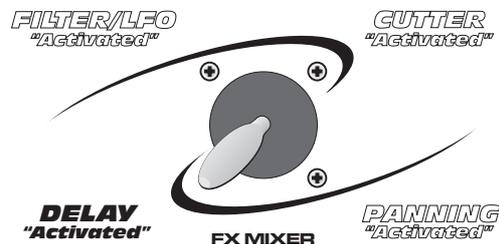
To mainly hear the FILTER or FLANGER effects, move the joystick to the North/West position, as in the following example:



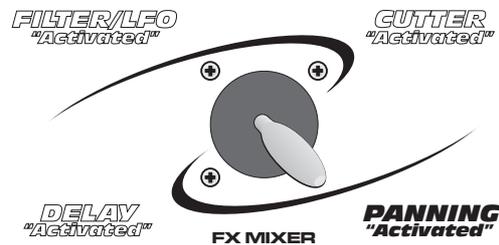
To mainly hear the CUTTER effect, move the joystick to the North/East position, as in the following example:



To mainly hear the DELAY effect, move the joystick to the South/West position, as in the following example:

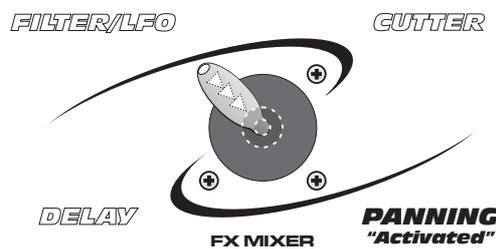


To mainly hear the PANNING effect, move the joystick to the South/East position, as in the following example:

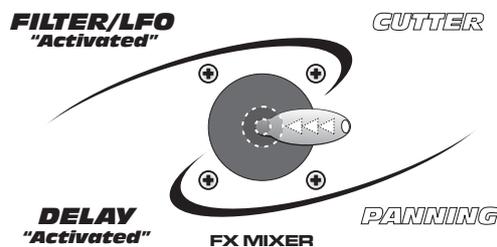


When the joystick is placed in a position other than those detailed above the result will be a unique blend of the activated effects. With all four effects activated, try moving the joystick around to get a feel of the different variations possible. You can also use the FX MIXER to 'fade-in' / 'fade-out' one, two or three effects, as detailed in the following examples:

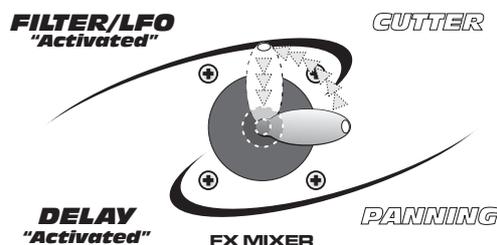
Example 1 - Fade-In/Out the PANNING effect: Position the joystick in the FILTER/LFO position as shown below and ensure all effects are de-activated. Activate the PANNING effect and select the MASTER to ON. The audio track will be un-effected until the joystick is moved away from the FILTER/LFO position. You can move the joystick in any direction to fade-in the PANNING effect, either in a straight line towards the centre or around the edge of the aperture. At the central 'upright' position the PANNING effect level will be at it's maximum i.e. moving the joystick past the upright position on towards the PANNING position will have no further effect. To fade-out the effect simply return the joystick to the FILTER/LFO position.



Example 2 - Fade-In/Out the FILTER/LFO and DELAY effects: Position the joystick over to the right, in between the CUTTER and PANNING positions as shown below and ensure all effects are de-activated. Activate the FILTER/LFO and DELAY effects and then select the MASTER to ON. The audio track will be un-effected until the joystick is moved away from the mid CUTTER/PANNING position. To fade-in both effects simultaneously, move the joystick in a straight line towards the centre position.



To fade-in one effect before the other, move the joystick around the edge of the aperture towards the preferred effect and then inwards to bring in the second effect.



At the central 'upright' position, the level of both effects will be at their maximum i.e. moving the joystick past the upright position towards the FILTER/LFO or DELAY positions will have no further effect.

To fade-out the effects simply return the joystick to the mid CUTTER/PANNING position.

Operation

PROGRAMS

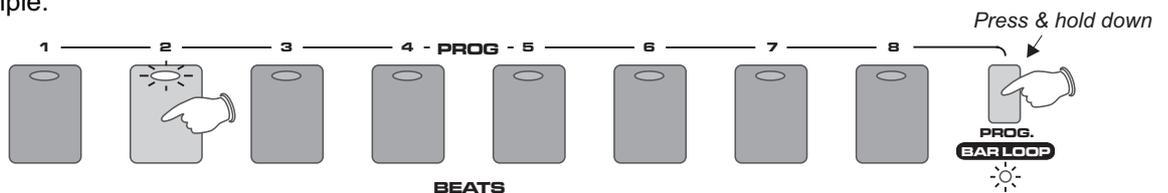
This feature allows you to store all the FEDERATION effect settings in memory for instant recall of your favourite effect 'scenes'. The position of every knob and switch, the trigger settings, the user beats patterns, utility mode parameters and even the joystick position can be memorised in eight user definable program locations.

The main BEATS buttons are used to recall, compare and store the programs. To enter 'PROGRAM' mode, press *and hold down* the 'PROG' button (LED on), as in the following example:



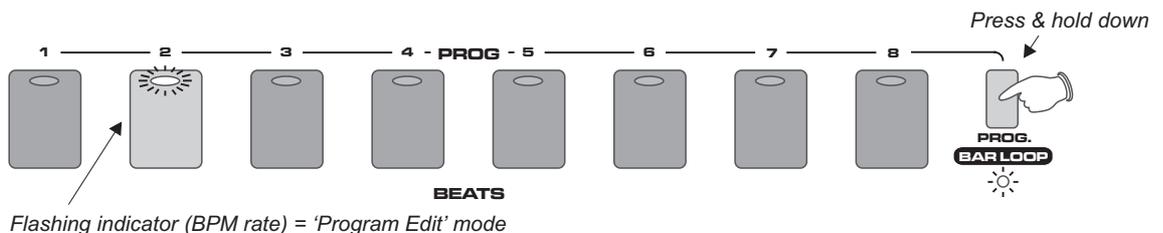
The functions within program mode can only be accessed whilst the 'PROG' button is held down. The labelling above each button designates the program number from 1 to 8.

RECALL: To recall a program, press any of the main BEATS buttons whilst holding down the 'PROG' button, as in the following example:



The FEDERATION is shipped with 8 factory presets. Try recalling all eight programs to hear how the effects can be setup.

EDIT: To edit the selected program simply adjust the controls. When the first control or switch is moved, the indicator within the selected PROGRAM button will start to flash to indicate 'EDIT' mode, as in the following example:



If you *don't* want to keep the parameter changes made during editing, simply select another program number or exit program mode (release PROG button).

COMPARE: To hear the original settings of the selected program press and hold the PROG button, then press the flashing program button once. The indicator in the selected program button will now flash at twice the BPM rate to indicate 'Compare' mode, the effects setup reverting back temporarily to the pre-edit condition. You can switch from 'Edit' to 'Compare' modes as often as you like, simply press the button again to jump from one mode to the next.

STORE IN SELECTED PROGRAM: If you want to store the new settings, they can be saved into the selected program (any previous settings will be overwritten). To store the new settings, press and hold down the selected program button (whilst holding down the PROG button) for approximately 2 seconds. The indicator in the program button will flash rapidly and 'SAVE' will appear briefly in the main display when the store operation is complete.

STORE IN ANOTHER PROGRAM: If you want to keep the existing program *and* still save the edited setup, you can store it in any of the other program locations. Press and hold down the PROG button and select another program number, **KEEP THE PROG BUTTON HELD DOWN** and then press the new program button a second time. The previously edited setup will now be recalled into this program. If you are happy to overwrite the program,

press and hold down the selected program button (whilst still holding down the PROG button) for approximately 2 seconds. The indicator in the program button will flash rapidly and 'SAVE' will appear briefly in the main display when the store operation is complete. You can try any amount of program locations before saving the new setup by repeating this procedure. To exit PROGRAM mode at any time simply release the 'PROG' button (LED off).

The eight factory presets can be re-loaded into memory at any time either individually or simultaneously.

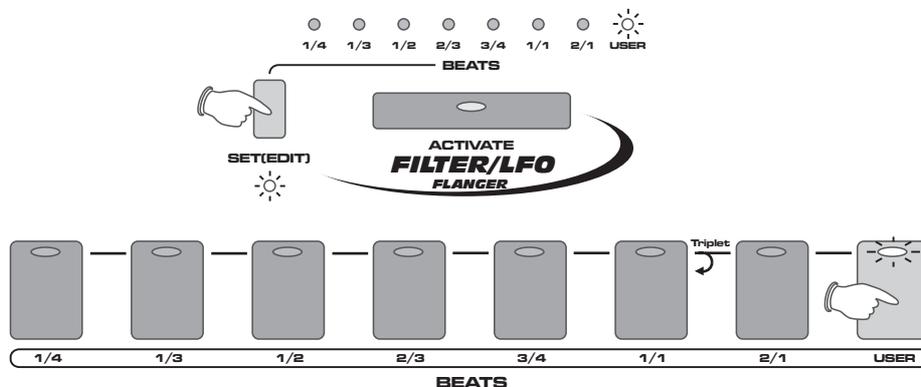
RE-LOAD ALL 8 FACTORY PRESETS: With the FEDERATION's power switched off, simply press and hold down the 'PROG' button and turn the power back on. The display will show 'SURE' to prompt confirmation of the load. Press the NUDGE button marked 'BPM+/up' to confirm this operation ('LOAD' appears briefly in display).

RE-LOAD SINGLE FACTORY PRESETS: With the FEDERATION's power switched off, simply press and hold down one program button (1 to 8) and turn the power back on. The display will show 'SURE' to prompt confirmation of the load. Press the NUDGE button marked 'BPM+/up' to confirm this operation ('LOAD' appears briefly in display). Only single programs can be loaded in this manner. Example: To re-load three of the factory presets this operation must be repeated three times, a different program button pressed for each power on procedure.

USER BEATS

The on-board 8 step sequencer allows you to create your own customised trigger patterns for linking the effects to more complex rhythmical patterns within the music. The two USER BEATS memories in each program store patterns of up to 8 bars in length whilst the 'LIVE' feature allows you to trigger the effects 'on the fly' using the TAP button. The USER BEATS feature cannot be selected for the DELAY effect.

To select the USER BEATS function, press the effect 'SET' button and then select the button marked 'USER', as in the following example:



To select the 'LIVE' setting, press the 'LIVE(REC)' button in the USER BEATS section, as in the following example:



Activate the FILTER (or FLANGER) effect, check the MASTER is set to ON and that the FX MIXER joystick is pointing towards the effect or in the central upright position. Now, use the TAP button to trigger the FILTER effect in time with a particular part within the music, perhaps the bass line.

Try adjusting the FILTER controls to change the sound in real-time as you tap along to the musical pattern. Each time the TAP button is pressed and released the FILTER will open and close back to the setting as set by the 'FREQUENCY' and 'ENV MOD' controls. To 'hold open' the FILTER, press and *hold down* the TAP button. To close the FILTER again simply release the button.

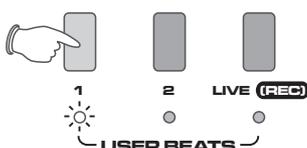
Operation

The CUTTER effect will operate like the Filter/Flanger, 'opening up' when the TAP button is pressed (or held down) to allow the music through and closing when released. The PANNING effect will operate in a similar manner, the SPS frequencies moving to new pan positions with each press however, there will be no further panning movement when the TAP button is pressed and held down.

NOTE1: You can also trigger the effects from an external MIDI keyboard/device - see 'MIDI control' on page 40 for further information.

NOTE2: The TAP(clear BPM) function for the main BPM engine WILL NOT OPERATE when the USER BEATS 'LIVE' function is selected.

To program your own trigger patterns, first select one of the USER BEATS memories from the buttons marked 1 and 2, as in the following example:

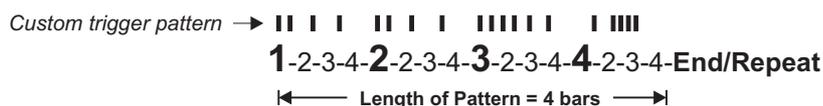


The FEDERATION is shipped with two factory USER BEAT patterns in each program for you to try out before proceeding with the recording process detailed in the next section.

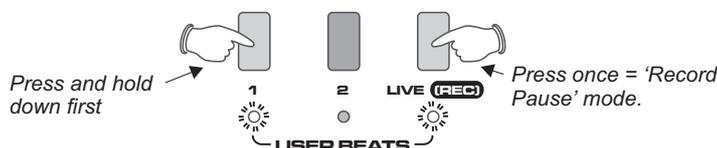
ERASE: To clear a USER BEATS memory before starting a totally new pattern, first press and *hold down* the selected button (1 or 2) and then press the TAP (CLEAR BPM) button for approximately 1 second. The indicator below the selected memory button will flash rapidly and 'ErAS' will appear briefly in the main display to confirm this function.



RECORDING: Before attempting to record your own pattern, try practising along with the music (using the 'LIVE' function) and count-out the number of bars needed, as in the following example:

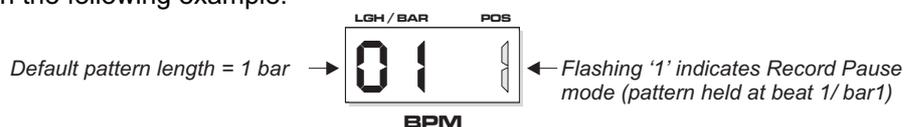


To setup the definable parameters of the pattern, first press and *hold down* the selected memory button and then press the 'LIVE(REC)' button, as in the following example:

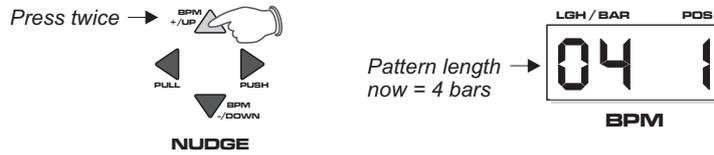


The indicators of the selected memory (1) and LIVE(REC) buttons will now flash at the current BPM rate to indicate 'Record Pause' mode.

In this mode the main BPM display shows information relating to the recording process. The two left-hand digits show the length of the pattern in musical bars. The right-hand digit shows the current beat position within each bar. After erasing a USER BEAT memory as detailed in the ERASE section above, the default settings will be automatically set, as in the following example:



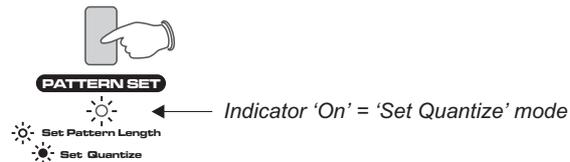
PATTERN LENGTH: Set the length to coincide with the number of bars you require for your pattern. When you have decided on the length of the pattern, ensure the 'PATTERN SET' indicator is flashing, then use the 'BPM+/Up' and 'BPM-/Down' buttons on the NUDGE control to change the value, as in the following example:



QUANTIZE: The 'Quantize' feature automatically corrects the timing of the 'tapped-in' trigger events to the nearest beat (see page 33) and also sets the scale of the pattern. The 'recording input area' (see page 32) is therefore determined by the quantize value. You should set the quantize resolution to the shortest beat value that will occur in the pattern you wish to record. The available quantize settings are:

- 16 - sixteenth note / Record input area = buttons 1 to 8 ^{Whole} ↻
- 16 t - sixteenth note triplet / Record input area = buttons 1 to 6 ^{Triplet} ↻
- 8 - eighth note / Record input area = buttons 1 to 8 ^{Whole} ↻
- 8 t - eighth note triplet / Record input area = buttons 1 to 6 ^{Triplet} ↻

To change the quantize value, press the 'PATTERN SET' button and ensure the indicator is constantly 'on' (not flashing), as in the following example:



The PATTERN SET button toggles between 'set pattern length' and 'set quantize value' when 'Record Pause' mode is active. The default quantize setting will now be shown on the main display, as in the following example:

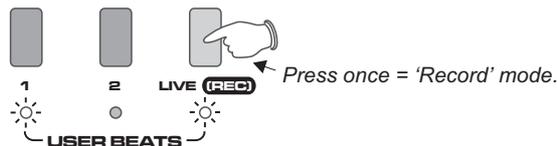


To change the quantize value, use the 'BPM+/Up' and 'BPM-/Down' buttons on the NUDGE control.

Having set the pattern length and quantize value, you are now ready to record your own trigger pattern into the FEDERATION (If you want to exit 'Record Pause' mode at any time, simply press the selected memory button).

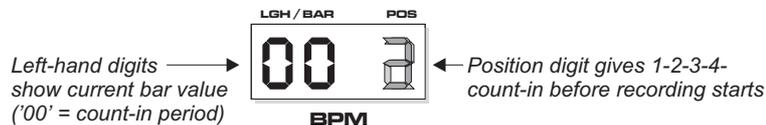
You can monitor the effect your new trigger pattern has on the music as you record it by playing the audio track and ensuring the desired effect(s) are activated prior to starting the recording process. Once you get familiar with recording trigger patterns you may choose to input them without the music playing.

In 'Record Pause' mode, press the 'LIVE(REC)' button once (in time with the music) to start the recording process, as in the following example:



In 'Record' mode, the selected Memory / LIVE(REC) indicators will change to 'on'. The FEDERATION gives you a 4 beat count-in (with audible 'beep' if required) before recording starts. The 'POS' (beat position) digit in the main BPM display will stop flashing '1' and change to show the count-in, as in the following example:

The audio 'Beep' click track can be switched on/off in UTILITY mode - see page 38.



Operation

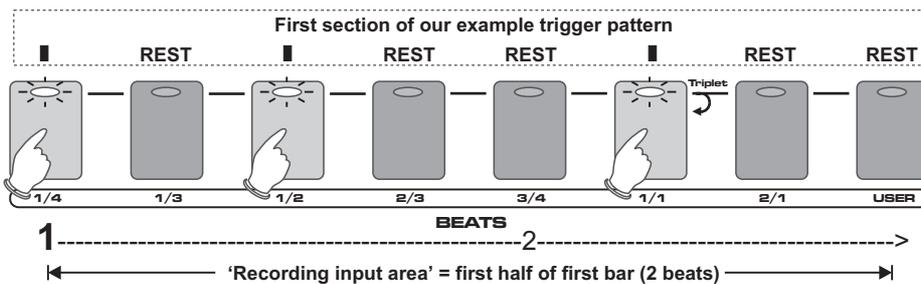
The two left-hand digits will show the bar position of the pattern as it loops around it's set length. The 'bar' and 'beat count' displays will be updated throughout the recording process for confirmation of the exact bar/beat position within the pattern.

Before entering any trigger events, watch the main BPM display and the indicators within the main BEATS buttons to familiarise yourself with the recording environment. Notice the pattern 'loops' around it's preset length (view 'LGH/BAR' digits and left-to-right 'chasing' indicators across the BEATS buttons), repeating the number of bars indefinitely with a constant beat position indication (view 'POS' digit). With the pattern repeating in this manner you should find it easy to enter and monitor trigger events and quickly create the desired pattern.

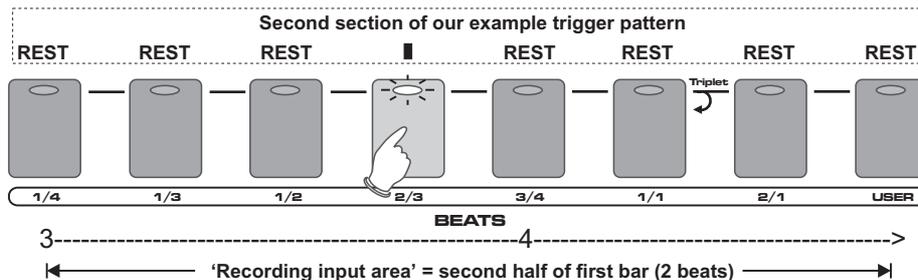
The FEDERATION has two main recording methods. The first uses the eight main BEATS buttons to record/delete events and is based on a classic 'step-time' system found in many MIDI sequencer products whilst the second method is a popular manual 'tap-in' method for entering events in real-time.

STEP-TIME RECORDING: The eight main BEATS buttons/indicators represent the 'recording input area' for the current bar section, as shown by the 'LGH/BAR' and 'POS' digits. As the pattern plays through it's set number of bars, so the 'recording input area' moves on, always displaying the events of the current bar within the pattern.

To input trigger events, press the button(s) that coincide with your particular pattern. The indicator(s) will come on and a trigger event will occur at that point in the pattern, as shown in the following examples:

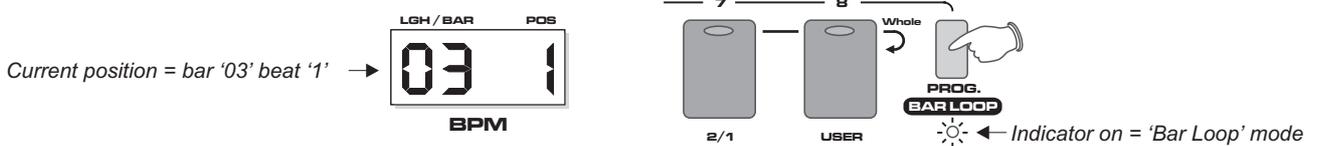


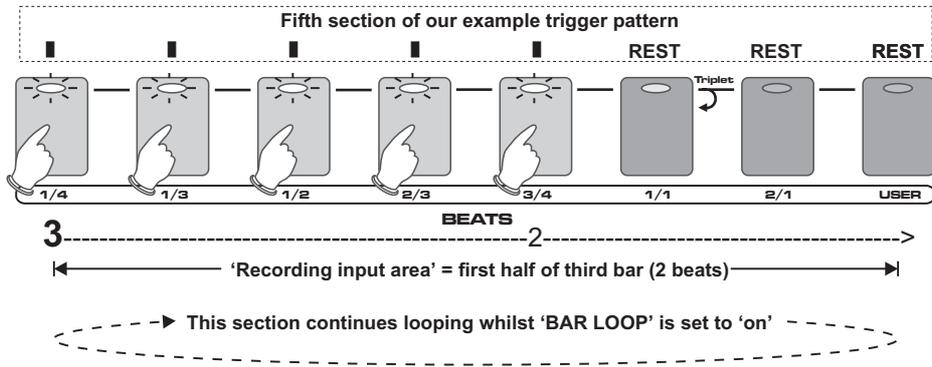
To remove an event, simply press the highlighted button(s) again and the indicator will go out. After showing the first 2 beats of the first bar, the BEATS buttons will show the second 2 beats of the bar, as in the following example:



Once again, press the buttons to match your trigger pattern.

BAR LOOP: If you find the event display is moving from one section to the next too rapidly (medium to high BPM rates will make the available 'window' for entering/ deleting events change very fast), you can use the 'BAR LOOP' feature to isolate any section and edit the events at leisure. Press the 'BAR LOOP' button when the section you want to edit is visible within the 'recording input area', as shown in the following example:

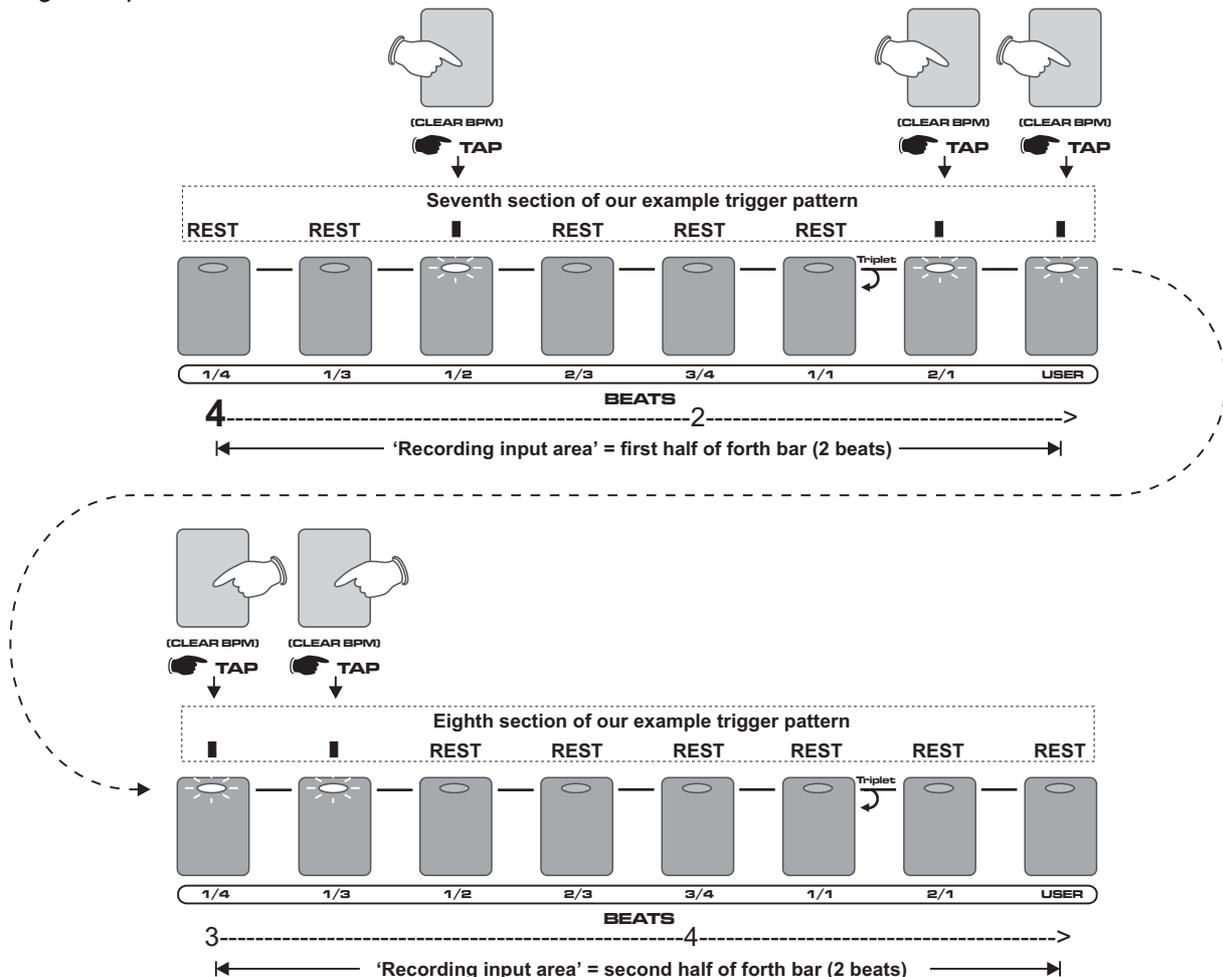




To exit 'BAR LOOP' mode simply press the 'BAR LOOP' button again (LED off). The pattern will now continue to play onwards from the end of the current loop section.

TAP RECORDING: You can also enter events with the TAP button. This allows you to play along with the music in real-time, tapping in the events to match the music.

To enter the trigger events, press the TAP button at the desired point in the pattern during 'Record' mode, as in the following example:



The quantize setting will automatically correct the timing of any trigger events you tap-in to the nearest set beat.

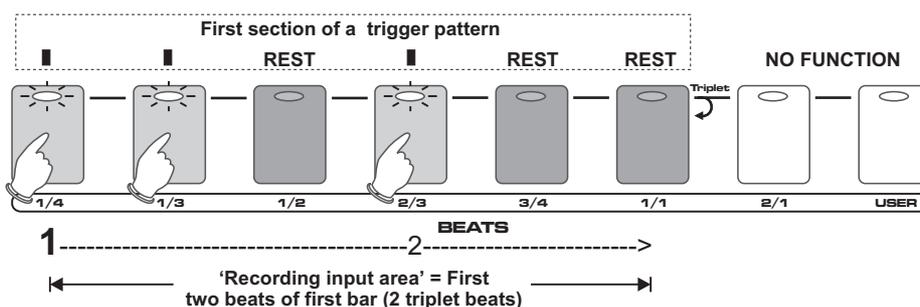
NOTE: if you find some tapped-in trigger events are rejected, always select the sixteenth note QUANTIZE value for the finest resolution.

Operation

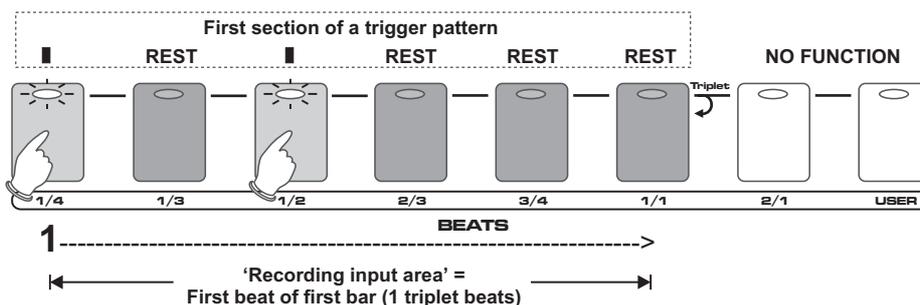
If you want to delete any tapped-in events, simply press the highlighted BEATS button(s) corresponding to the trigger position within the 'recording input area'. The indicator will go out and the event will be removed. When you are satisfied with your recording, press the 'LIVE(REC)' button to exit record mode. You can go back and edit the pattern at any time by entering 'Record Pause' then 'Record' mode directly without carrying out the erase function.

RECORDING TRIPLET PATTERNS: The 'recording input area' changes length when the 'triplet' quantize settings are selected, as shown in the following examples:

Quantize setting = '8 t' (8th note triplet):

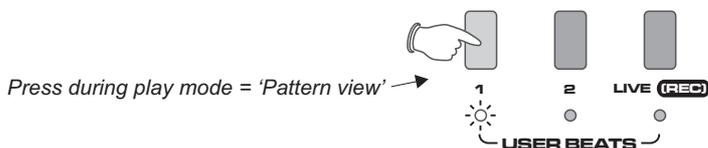


The scale is set to cover 2 bars allowing 8th note values to be input. Here is the same trigger pattern when quantize setting = '16 t' (16th note triplet):

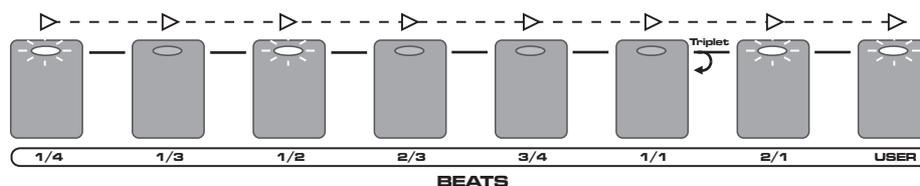


The scale is now set to 1 bar allowing the inclusion of 16th note values.

You can monitor the USER BEATS trigger patterns (1 or 2) in pause or play modes to check the pattern activity and the current position. To view the pattern, press and *hold down* the active memory button during normal 'Play' mode (BPM detected), as in the following example:



The BEATS buttons will show the left to right 'chasing' indicator pattern and any trigger events as they appear over the preset number of bars, as shown in the following example:



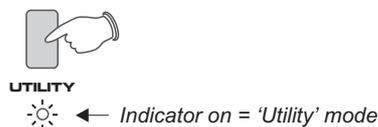
The main BPM display will also show the bar / beat position, as in record mode. To exit 'pattern view' mode simply release the memory button.

UTILITY MODE

The Utility section contains various system parameters that need to be altered less frequently than those on the main panel. Any changes will be stored when the power is turned off. The parameters available in this mode are:

1. Set Master input gain
2. Set effects configuration
3. Set BPM range
4. Set CUTTER sawtooth slope
5. USER BEATS click track on/off
6. Set MIDI channel
7. Save Single program.
8. Save All programs
9. Protect On/Off for loading programs

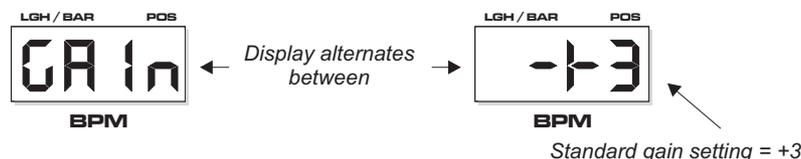
To enter utility mode, press the 'UTILITY' button once, as in the following example:



The indicator will come on and the main display will show the setting of the first utility parameter (or last visited parameter thereafter). Each subsequent press will call up the next parameter, the selection returning to '1' after the last item on the list. To exit UTILITY mode, press the 'TAP (CLEAR BPM)' button once.

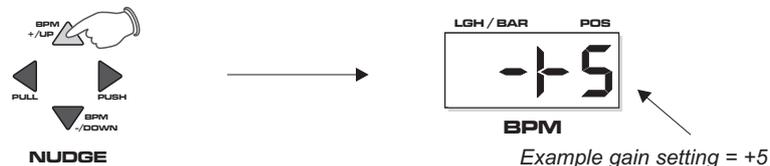
UTILITY 1: INPUT GAIN (MASTER 'ALL FX' CHANNEL)

This is where you adjust the main input gain setting of the FEDERATION to match the output signal level from your DJ mixing desk. With utility mode '1' selected, the display will alternate between:



SETTING RANGE = 0 to +5(max)

This setting will only be applied to the 'ALL FX' channel. Use the NUDGE control 'BPM +/-UP' and 'BPM -/DOWN' buttons to adjust the gain setting.



The lowest gain setting ('0') on the FEDERATION will match the very high output levels from the MASTER output terminals on many DJ mixing desks. If your mixing desk has a lower output level (this would be shown by low level indications on the bi-colour input LED when the mixing desk output is at full), use the gain setting to boost the input signal level to a point where the input LED lights GREEN, occasionally flashes RED.

NOTE 1: This gain setting is for internal DSP purposes only i.e. a change in level will not be audible at the outputs.

NOTE 2: When SINGLE FX mode is selected the GAIN setting has no function, the four channels being automatically setup to work on nominal +4dB studio line level signals only.

Operation

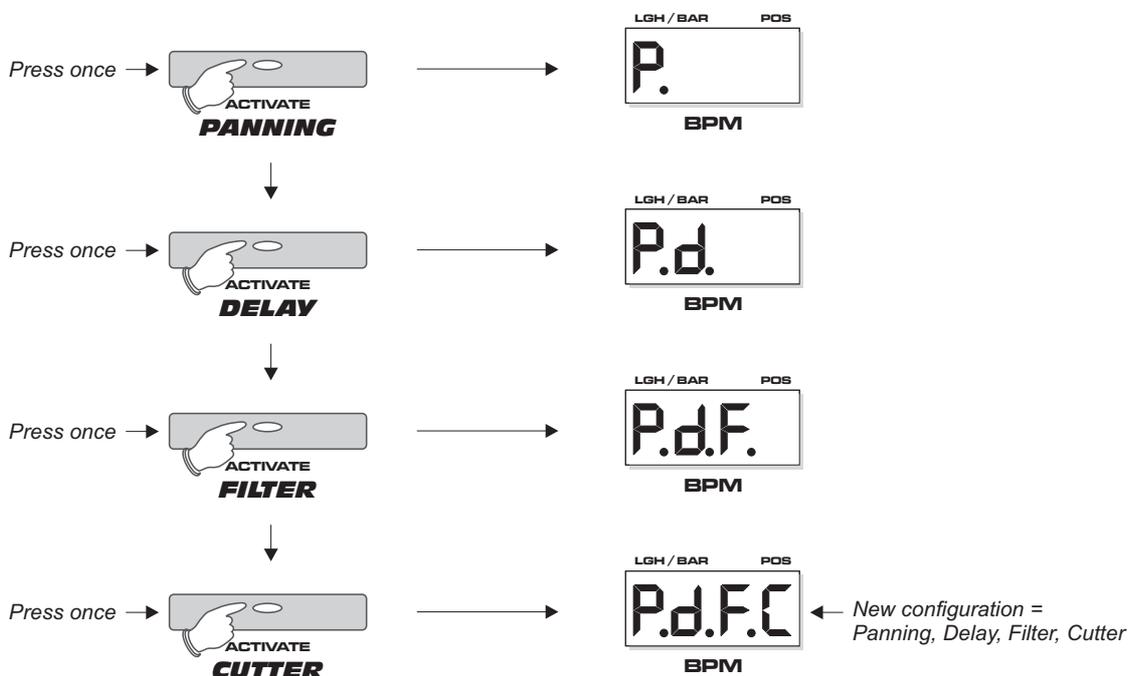
UTILITY 2: EFFECTS CONFIGURATION

This is where you select the order of the effects when using the 'ALL FX' connectors. With utility mode '2' selected, the display will alternate between:



The effects can be arranged one after the other in any order you wish. Try various combinations to hear the way the interaction between the effects changes. To change the configuration, use the effect 'ACTIVATE' buttons to select the effects in the order you want to place them.

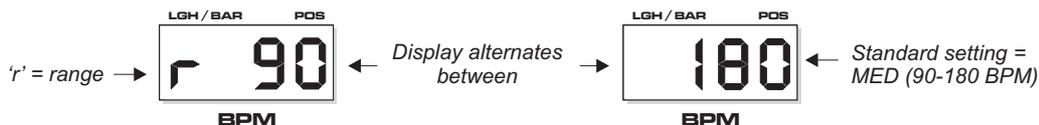
When the first activate button is pressed, the display will change to show the new 'first in line' effect and so on until all four effects have been entered, as in the following example:



Effects cannot be entered twice. After all four effects have been entered correctly, the operating system will automatically exit Utility mode.

UTILITY 3: BPM RANGE

This is where you set the working range of the FEDERATION's BPM engine. There are three operating bands, each specifically designed to complement styles of music from the slowest R&B to the fastest drum & bass. With utility mode '3' selected, the display will alternate between:



SETTING RANGE = LOW (60 to 120BPM), MED (90 to 180BPM), HIGH (115 to 230BPM)

To change the BPM range, use the NUDGE control 'BPM +/-UP' or 'BPM -/DOWN' buttons, as in the following example:

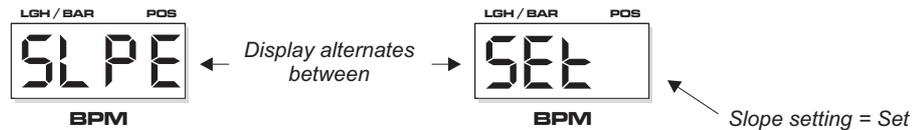


The BPM range setting is global i.e. it will affect all programs.

NOTE: BPM's outside of the selected range limit cannot be analysed. Always check the general tempo of the music you are playing falls well within the selected BPM range. For most applications we recommend the MID range of 90-180BPM.

UTILITY 4: CUTTER SAWTOOTH SLOPE

This is where you set the duration of the cutter's sawtooth slope (rise/fall period between triggers). This setting can only be used when the triggering is set to USER BEATS. With utility mode '4' selected, the display will alternate between:

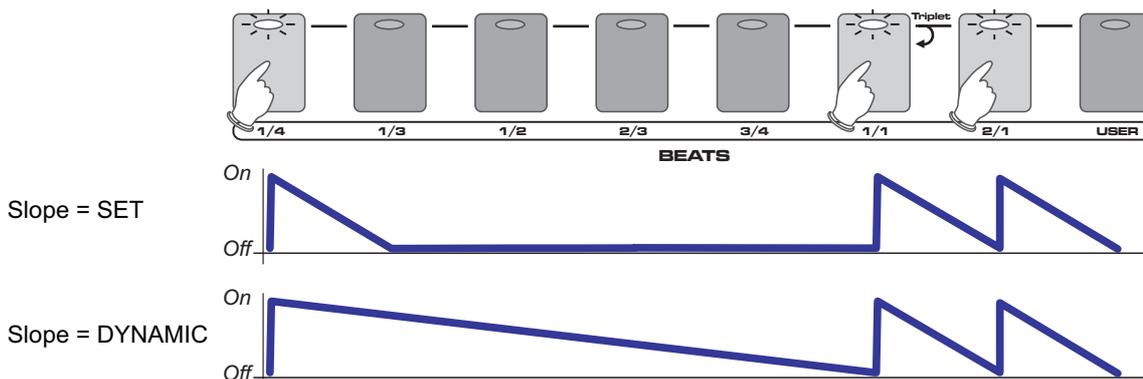


When the 'SET' slope is selected, the rise/fall time will always be equal to the quantize setting e.g. if the quantize is set to 16's, the slope duration will be fixed at 1/16 of the beat. This gives a very short, punchy feel to the trigger pattern.

When the 'dYn' (Dynamic) slope is selected, the rise/fall times will be determined by the next programmed trigger event in the pattern e.g. the audio level will rise/fall at different rates depending on the trigger pattern activity. This gives a more dynamic, 'envelope' feel to the trigger pattern, much the same as from a keyboard synthesizer. Use the NUDGE control 'BPM +/-UP' and 'BPM -/DOWN' buttons to change the setting.



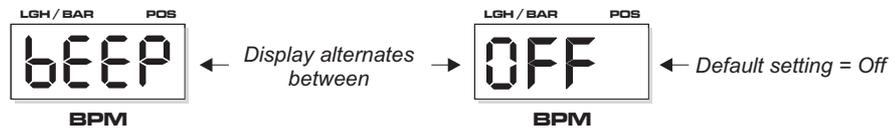
As an example, the following trigger pattern would be changed by the two settings as follows:



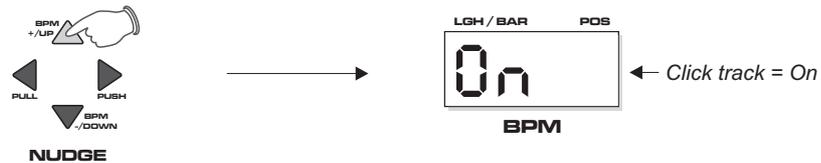
Operation

UTILITY 5: USER BEATS CLICK TRACK

This is where you switch the USER BEATS click track on and off. With utility mode '5' selected, the display will alternate between:



When set to 'On', the audible 'beep' will be heard over the connected audio system (and Headphone output), helping you to keep in time with the music when recording or editing trigger patterns. Use the NUDGE control 'BPM +/UP' and 'BPM -/DOWN' buttons to change the setting.

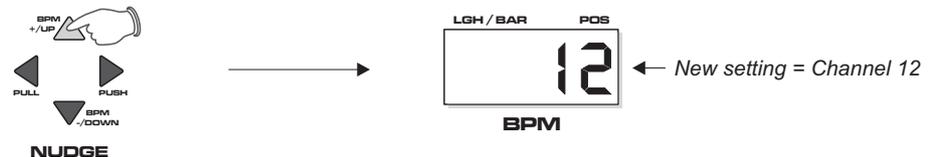


UTILITY 6: MIDI CHANNEL

This is where you select the basic transmit / receive MIDI channel for the FEDERATION. With utility mode '6' selected, the display will alternate between:



SETTING RANGE = 01 to 16. To change the MIDI channel, use the NUDGE control 'BPM +/UP' or 'BPM -/DOWN' buttons, as in the following example:



UTILITY 7: SAVE SINGLE PROGRAM

This is where you save individual programs to an external MIDI storage device as a MIDI sysex dump. With utility mode '7' selected, the display will alternate between:



The program displayed, ready for transmission, will be the last selected program (or edited version of the program if changes were made). Ensure your connected MIDI storage device is ready to accept the data then, use the NUDGE control 'BPM +/UP' button to transmit the single program, as in the following example:



After transmitting the data the operating system will automatically exit Utility mode.

UTILITY 8: SAVE ALL PROGRAMS

This is where you save all eight programs to an external MIDI storage device as a MIDI sysex dump. With utility mode '8' selected, the display will alternate between:

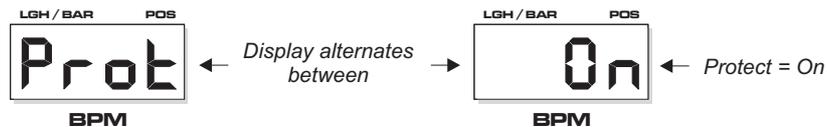


Ensure your connected MIDI storage device is ready to accept the data and then use the NUDGE control 'BPM +/UP' button to transmit all eight programs, as in the following example:



UTILITY 9: PROTECT ON/OFF

This is where you 'enable' the FEDERATION to overwrite existing programs. Sysex bulk dump messages from the external MIDI storage device can be received and stored only when the protect is OFF. With utility mode '9' selected, the display will alternate between:

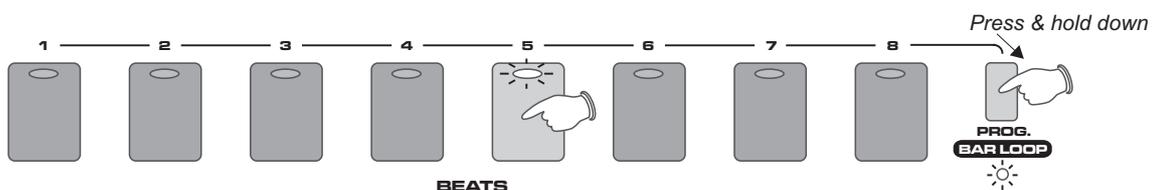


LOADING SINGLE PROGRAMS INTO THE BUFFER MEMORY: When protect is set to 'ON', single program sysex dumps can be received and used by the FEDERATION without overwriting existing programs. The program will be 'held' in buffer memory, just like an edited program, allowing you to use the effect setup in real-time or store wherever you choose at a later stage. You can use the buffer memory to receive multiple sysex program dumps 'on-the-fly' from your MIDI sequencer as a track plays from beginning to end. When power is switched off, data in the buffer memory will be lost. Each time the FEDERATION's power is switched on, the protect feature will be automatically enabled.

LOADING SINGLE PROGRAMS INTO MEMORIES 1- 8: To permanently load back any previously stored programs you must first turn the protect function 'OFF'. Use the NUDGE control 'BPM -/DOWN' button to switch off the protect, as in the following example:

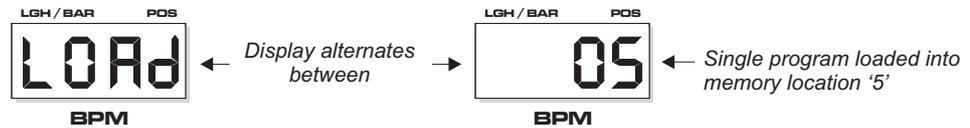


Exit UTILITY mode (press TAP button) and then select the program you wish to overwrite, as in the following example:



MIDI

Ensure the sysex dump is for a single program (always label your sysex dumps for ease of identification) and then transmit the data from the MIDI device. The main display will confirm the download as follows:



Repeat this process using different memory locations to download more programs.

LOADING 'ALL' PROGRAMS INTO MEMORY: If you want to download eight programs simultaneously, ensure that PROTECT is set to OFF and the MIDI storage device is connected to the FEDERATION's MIDI IN socket. Now transmit the MIDI sysex bulk dump. The main display will confirm the download as follows:



IMPORTANT: Always remember to reset the PROTECT function to ON after completing a download procedure to avoid accidentally overwriting programs.

MIDI CONTROLLERS

The comprehensive MIDI specification of the FEDERATION BPM FX-PRO allows you to record and playback changes to the front panel knobs/switches in real-time. This extensive power and control over the effect parameters will allow you to explore totally new areas of effects creativity in the studio. Whenever a control knob is turned, the joystick moved or a button pressed, MIDI controller data is transmitted from the FEDERATION's MIDI Out socket directly into your MIDI sequencer allowing you to record detailed parameter changes for instant, automated playback. You can record simple, 'one-shot' parameter changes or 'over-dub' as many as you like to build up complex, multi-layered effects scenarios.

Example: To record these events, first ensure your MIDI sequencer is connected to the MIDI In/Out sockets on the rear panel of the FEDERATION as detailed on page 6. Check the MIDI transmit/receive channels on the sequencer's record channel match those on the FEDERATION and when you're ready, press RECORD on the sequencer. When the sequencer is recording, move any knobs/switches to transmit the MIDI data. When you're happy with the control changes, STOP the sequencer. Now reset the MIDI sequence to the beginning and press PLAY to hear the changes re-played precisely as you recorded them. See the MIDI implementation chart on page 43 for detailed controller information.

PROCESSING EXTERNAL MIDI DEVICES

You can process the audio output of any connected MIDI keyboard, synth etc. through the FEDERATION's effects in real-time with MIDI note-on, note-off messages from the instrument controlling the triggering of the effects. Use the Filter to warm up a bland digital synth sound or the SPS panning to shift the frequencies around in time as you play your MIDI guitar. Only the effects with a USER BEATS setting can be used for this feature.

To process external MIDI instruments, first set the FEDERATION effect(s) to USER BEATS triggering, then select 'LIVE' mode - see page 29 for further details. Ensure the MIDI Out from your keyboard/device is connected to the MIDI In socket on the rear panel of the FEDERATION and its audio output is connected to the relevant FEDERATION effect input channel(s). Check the MIDI transmit channel on the instrument is the same as the FEDERATION's basic MIDI channel, activate the effect(s) and position the FX MIXER joystick accordingly. Now you can alter the sound and control the effects in real-time as you play your MIDI instrument.

NOTE: In this mode, the Filter/Flanger effect FREQUENCY control is mapped to MIDI note numbers.

MIDI Operation

AUDIO - TO - MIDI SYNCHRONISATION

This feature allows you to control the tempo of any connected MIDI hardware/software sequencer directly from the BPM of the incoming audio. The FEDERATION PRO generates a stable MIDI clock signal derived from the BPM of the audio input allowing you to add MIDI patterns, songs and phrases to the audio in perfect synchronisation.

MIDI SEQUENCER SETTINGS

The operation of this feature requires the external MIDI sequencer to be set to recognise *external* MIDI Clock commands. Please consult the manufacturers operation manual to make the necessary settings. For your information here are some typical examples:

ROLAND MC-303/505

In System Settings, set the 'SYNCHRONIZATION SETTING' to 'Slave' mode.

E-MU Orbit / Planet Phatt etc.

In Master Menu, set 'GLOBAL TEMPO' below 1 BPM to 'External' mode and set the 'BEATS MODE' to 1,2 or 3.

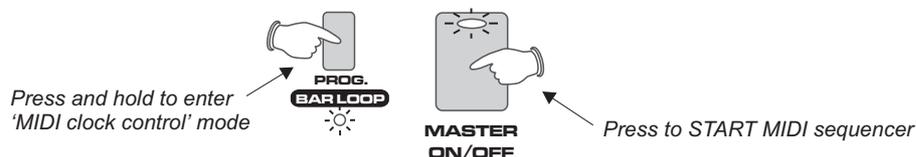
QUASIMIDI RAVE- O- LUTION 309

In the 'EDIT' page press F3 to select 'SYSTEM'. Select page 3 with the 'PAGE' dial. Use the 'EDIT VALUE' wheel to set MIDI SYNC to 'EXT'.

CONTROLLING THE MIDI SEQUENCER

Connect the MIDI Out socket on the FEDERATION to the MIDI In socket on your sequencer and check the MIDI sequencer is set to recognise external MIDI clock commands. The 'PROG' button is used to access 'MIDI clock control' mode which enables the effects and external MIDI sequencer to be controlled individually. Ensure the FEDERATION is detecting a BPM then:

START: To start the MIDI sequencer, *press and hold down* the PROG button, then press the MASTER ON/OFF button once, as shown in the following example:



The pattern or song in the MIDI sequencer should now start playing in synchronisation with the audio track whilst the status of the effects will be unaffected.

NOTE: To set the initial alignment of the MIDI sequencer and audio track, press the MASTER button accurately on the desired beat. Any misalignment error at this stage will be automatically corrected during the first few seconds of operation. This feature allows you to choose the exact start point of the MIDI pattern.

After *releasing* the PROG button you can switch the effects on and off again without disturbing the MIDI sequencer.

PAUSE: To pause the MIDI sequencer at any time, *press and hold down* the PROG button, then press the MASTER ON/OFF button again. The MIDI sequencer's pattern or song will be held at the pause position and will only continue from that point when the MASTER ON/OFF button is pressed again (*with the PROG button held down*).

RESET: If you want to reset the MIDI pattern to it's start point (beat1 / bar1), in pause mode *press and hold down* the PROG button, then press the TAP button *once*. Now press the MASTER ON/OFF button (*whilst holding down the PROG button*) to start the MIDI pattern / song from the beginning.

SYNCHRONISATION ADJUSTMENTS: You can also use the NUDGE control's PULL/PUSH feature to adjust the audio/MIDI clock synchronisation (**NOTE:** This will affect the synchronisation settings of both the external MIDI sequencer and internal effects simultaneously *i.e.* pressing the PROG button is not required for this function)

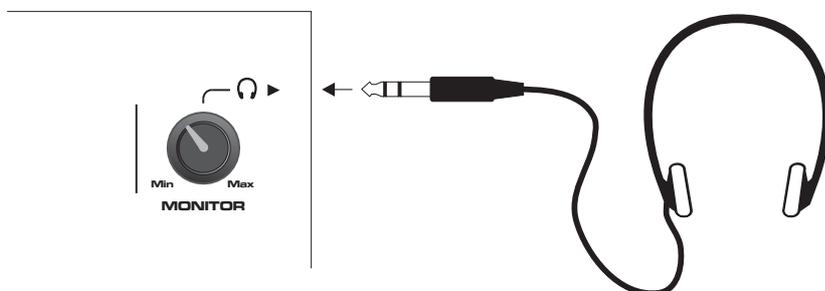
Headphone Monitor

IMPORTANT NOTE: The FEDERATION will continue running the MIDI clock output indefinitely at the last detected BPM rate if the strong regular beats in the audio track become unavailable. This feature allows the connected MIDI sequencer to fill in parts during quite passages in the audio track without interruption or to continue playing after the track has finished.

HEADPHONE MONITORING

The MONITOR feature allows Djs to hear the activated effects setup before committing it to the Master output. The powerful headphone amplifier delivers all the pure power needed for successful DJ monitoring.

This section features a monitor level control and gold-plated ¼" jack output socket located on the right-hand side of the FEDERATION. Ensure the MONITOR control is set to 'Min', then connect a pair of suitable headphones to the output socket, as in the following example:



Slowly turn the MONITOR control clockwise until a comfortable level is reached. If no effects are activated, the unaffected audio signal alone will be heard.

With the MASTER ON/OFF set to off (indicator flashing) try activating one or more of the effects. You should now hear the effects in the headphones but not on the main amplifier system. Setup the effects as required and, when you're ready, select the MASTER to ON. The effects can now be introduced to the master audio signal in full confidence.

HINTS & TIPS

Synchronisation and Tempo Changes:

1. Use the NUDGE feature to manually adjust any synchronisation errors during quite passages (when beat information is unavailable).
2. Always make slow changes when adjusting the sound source pitch control. This will allow the effects to remain in synchronisation during tempo changes.
3. Never make tempo changes during quite passages (when beat information is unavailable) as the FEDERATION will lose synchronisation.

Troubleshooting:

Problem	Check
BPM engine will not read track	Check/reset BPM range Check mixing desk output level and FEDERATION input gain setting
Unable to hear effect	Check position of FX Mixer joystick Is the Effect activated? Check level controls
Effects out of synchronisation	Check NUDGE setting Check mixing desk output level and FEDERATION input gain setting

Specification

FEDERATION BPM FX - PRO

	Audio Freq. Resp'nse: 20Hz to 20kHz (+/-0.5dB) S/N ratio: >85dB THD: <0.015% Input Levels: 1 - 2.5 V		SPS Panning Controls: SPS (X-Over 1), 2-Way Split (Direction), Speed (X-Over 2), Set Beats, Activate Off, 2-Way, Full SPS: Lo-Mid, Lo-Hi, Mid-Hi 2-Way Split: Crossover frequency 1, SPS Direction, Crossover frequency 2 Edit: Crossover frequency 2 Speed range: 20mS - 5S
	BPM engine Ranges: Low (60 -120BPM), Mid (90 -180BPM), Hi (115 - 230BPM) Lock-in time: Typically 1 - 4 sec's (from introduction of readable beat information) Accuracy: 0.1 BPM		Main Features / Controls Super-Kill: Fazed and Bass kill switches FX Mixer: 1 x Joystick control Trigger Beats: 8 x buttons (1/4 -1/3 - 1/2 - 2/3 - 3/4 - 1/1 - 2/1 - USER) User Beats: 3 x buttons (2 memories per program + LIVE) Programs: 8 x Program memories Nudge: 4 x button rubber keypad
	Filter/LFO Controls: Frequency (Filter/Flanger), Resonance (Filter type), Envelope Mod (LFO shape), Speed (Master), Set Beats, Activate Edit: 12dB per octave, Flanger 1&2 - High-pass, Band-pass, Low- pass - Triangle, Rising, Falling, Pulse Speed range: 20mS - 10S		Connectors Filter (All FX), Delay, Cutter, Panning (RCA phono in/out) MIDI (In / Out / Thru) Headphone monitor out (2 watts RMS) DC Power In
	Flanger Controls: Frequency, Resonance, Depth, Speed, Set Beats, Activate Speed range: 20mS - 10S		Power Supply External (9vDC 1,000mA)
	Cutter Controls: Shape, Depth, Speed, Set Beats, Activate Shape: Falling sawtooth, Square, Rising sawtooth		Dimensions / Weight 340x230x50mm (13.4x9x2 inches) 2.35kg
	Delay Controls: Mix Level (Repro), Repeat, Speed, Set Beats, Activate Reproduction: Digital, Vintage tape, Grunge Edit: Reproduction Speed range: 20mS - 1.5S		Optional Accessories Rack-01: 19" rack kit (with headphone monitor extension lead to R/H panel)

* Specification and /or appearance subject to change without prior notice due to product improvement.

Patent Pending.

MIDI Implementation

Function		Transmitted	Recognized	Remarks
Basic Channel	Default Changed	1-16 1-16	1-16 1-16	Memorized
Mode	Default Messages Altered		Mode 4	
Note Number:	True Voice	X	O	For filter if turned on.
Velocity	Note ON Note OFF	X X	X X	
Aftertouch	Key's Ch's	X X	X X	
Pitch Bend		X	X	
Control Change	30	O	O	FX Mixer joystick 'X' (left/right) FX Mixer joystick 'Y' (up/down) Nudge Pull / Push MASTER ON/OFF
	31	O	O	
	32	O	O	
	33	O	O	
	34	O	O	Filter/Flanger - BEATS Filter/Flanger - Frequency Filter/Flanger - Resonance Filter/Flanger - Envelope Mod Filter/Flanger - Speed Filter/Flanger - Effect select/Filter type TAP - USER BEATS live mode Filter/Flanger - LFO shape Filter/Flanger - Activate
	35	O	O	
	36	O	O	
	37	O	O	
	38	O	O	
	39	O	O	
	40	O	O	
	41	O	O	
	42	O	O	
	43	O	O	
	44	O	O	
	45	O	O	
	46	O	O	
	47	O	O	
	48	O	O	
	49	O	O	Delay - BEATS Delay - Repro Delay - Level Delay - Repeat Delay - Speed Delay - Activate
	50	O	O	
	51	O	O	
	52	O	O	
	53	O	O	
	54	O	O	
	55	O	O	Panning - BEATS Panning - SPS Panning - Range Panning - Speed Panning - X-OVER 1 Panning - X-OVER 2 Panning - Direction Panning - Activate
	56	O	O	
57	O	O		
58	O	O		
59	O	O		
60	O	O		
61	O	O		
62	O	O		
63	O	O	USER BEATS - 1, 2, Live SuperKill	
65	O	O		
Program Change	True #	O 0 - 7	O 0 - 7	Program No. 1-8
System Exclusive		O	O	Effect Parameters
System Real Time	Clock Commands	O	O	Clock, Start, Stop, Continue.
Aux Messages	:All sound off :Reset all controllers :Local ON/OFF :All Notes OFF :Active sense :System Reset	X X X X X X	X X X X X X	
Mode 1 : OMNI ON, POLY Mode 2 : OMNI OFF, POLY		Mode 3 : OMNI ON, MONO Mode 4 : OMNI OFF, MONO		

For the USA

FEDERAL COMMUNICATIONS COMMISSION RADIO FREQUENCY INTERFERENCE STATEMENT

This equipment has been tested and found to comply with the limits listed for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Unauthorized changes or modifications to this system can void the users authority to operate this equipment.

This equipment requires shielded interface cables in order to meet FCC class B limit.

For Europe



This product complies with the requirements of European Directive 89/336/EEC

For Canada

CLASS B

NOTICE

This digital apparatus does not exceed the Class B limits for radio noise emissions set out in the Radio Interference Regulations of the Canadian Department of Communications.

CLASSE B

AVIS

Cet appareil numerique ne depasse pas les limites de la Classe B au niveau des emissions de bruits radioelectriques fixes dans le Reglement des signaux parasites par le ministere Canadien des Communications.

www.redsound.com



Red Sound Systems Ltd
*Bourne House, Cores End Road,
Bourne End, Bucks. SL8 5AR. England*

Phone : +44 (0)1628 819191
Fax : +44 (0)1628 819111