BOOMERANG +®

Phrase Sampler

Version 2

User's Manual

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Welcome to the World of Phrase Sampling

Congratulations on your purchase of a Boomerang® Plus Phrase Sampler. I think you will be pleased and surprised by the musical versatility of this little powerhouse. It was created because we wanted a unit that does what the Boomerang® Plus Phrase Sampler does, and there wasn't anything on the market like it. The Rang™ sampler was truly invented by musicians for musicians!

No one likes to read manuals, but I suggest you at least read the sections on **Connections** and **How the Buttons Work**. If, however, you just can't wait to play with it, go ahead. I understand about new toys.

Short Hand for this Manual - life will be easier if you read this section NOW!

To make this easier to read I'm going to use some conventions. The following words refer to the 5 gray buttons: ***RECORD***, ***PLAY*** or ***STOP***, ***A/B*** or ***ONCE***, ***DIRECTION***, ***STACK*** or ***SPEED***. Instead of "the RECORD button", I will write only ***RECORD***.

The following words refer to the LED's (small colored lights above buttons): ***clip***, ***record*** or ***loop start***, ***play***, ***loop 'b'*** or ***once***, ***reverse***, ***stack*** and ***slow***. Instead of "the PLAY LED", I will write only ***play***.

Overview of the Rang™ Looper

The Boomerang® Plus Phrase Sampler is essentially a digital audio recorder in a stomp box with several interesting capabilities and unique control features.

- You can create loops that will play indefinitely.
- 2 independent loops are available, each can have its own decay rate.
- Multiple parts can be layered to make a complex loop.
- Loops can be played in reverse and layers can be added in forward or reverse.
- The Rang™ sampler has a mode for playing reverse leads live.
- 5 slow playback rates are available.
- 12 sample rates are available from 8 to 24KHz; all samples are 16 bits.
- 7 decay rates are available, including no decay and slapback (1 repeat).
- The behavior of several of the buttons can be changed to suit your style.
- The Rang™ sampler is a great pure delay effect, as well as a looper.

Quick Reference (for those allergic to reading manuals)

If you want to:	Do this:
Record a loop & have it play back	***RECORD*** at start of lick; ***RECORD*** at end of lick
Record, play back, add a part immediately	***RECORD*** at start of lick; ***STACK*** at end of lick
Record a loop & save it; no playback	***RECORD*** at start of lick; ***STOP*** at end
Play a loop	***PLAY***
Stop playback	***STOP***
Select loop A or B	***A/B***
Play a loop in reverse	***PLAY*** then ***DIRECTION*** or ***DIRECTION*** then ***PLAY***
Add a part to a loop	With loop playing, ***STACK*** to start & stop adding
Go to slow playback	With loop not playing, ***SPEED***
Play a reverse lead	With loop not playing, ***DIRECTION***, ***RECORD*** twice

LED's

When powered up, all five of the green LED's will be dimly lit. This is simply an indication that the unit is on and ready to go. We call this the idle mode, because the unit is just waiting to be told what to do. The LED's come on at

different times to indicate what the Rang™ sampler is doing. A detailed description of the 1 red LED (***slow***) and 5 green LED's is given in **How the Buttons Work**. The meaning of the yellow one (***clip***) is explained in **Setting Levels**.

Connections

Analog Inputs & Outputs

The main input and output are quarter inch phone jacks and are labeled IN and OUT; clever, huh? The most obvious way to connect your Rang™ sampler is to plug your guitar, microphone or whatever into the IN jack and run a cable from the OUT jack to the input of your amplifier or mixer. If your amp has an effects loop, you may get better sound by plugging your instrument directly into the amp and connecting the effects send to the IN jack and the effects return to the OUT jack.

The auxiliary input and output are RCA jacks, and are labeled AUX IN and AUX OUT. AUX IN is provided to allow connection to a disk or tape player for recording a tune you want to learn. AUX OUT is provided to allow connection to a recorder for saving your musical creations. These ports allow you to make these connections and have your instrument connected to your Rang™ sampler and amp at the same time. **Please Note:** None of the main IN signal comes out the AUX OUT jack, only the recorded sounds. This makes the AUX OUT a natural for connecting to a drummer's monitor; he will be able to clearly tell whether a loop is playing or not.

Placing the Rang™ sampler after other effects processors allows for the maximum flexibility. This way different effects can be recorded; for example, the first part can be recorded with chorus, the second with reverb & the third with delay. If you play along with your creation while it's looping, you can select yet another effects patch. If the Rang™ sampler is placed in front of your effects processor, all parts will use the same effects patch.

Setting Levels

The incoming signal is passed through the unit unaltered. Neither the INPUT LEVEL switch nor TRIM knob affects the through signal. However, the THRU MUTE foot switch, on the upper-left front panel, turns the through signal on and off. **Please Note:** There is no indicator to show which position the THRU MUTE switch is in. Typically the through signal will be enabled, but for special situations it can be turned off allowing only the sampled audio to be heard.

The INPUT LEVEL switch and TRIM knob do affect the sampled signal and must be adjusted to provide the best signal to noise ratio. The main input & output jacks can accommodate a wide variety of signal levels by adjusting these controls. The INPUT LEVEL switch sets the range of input sensitivity and the TRIM knob adjusts sensitivity within that range. The LINE setting is the least sensitive, the INST (instrument) setting is more sensitive and the MIC (microphone) setting is the most sensitive. These controls should be set so that only occasional flickering of ***clip*** occurs when your highest levels are input. You can't hurt the Rang™ sampler by setting these inappropriately, but you won't get the best sound.

The AUX IN and AUX OUT jacks are permanently set for operation at -10dBu and are compatible with most standard consumer audio equipment.

The OUTPUT LEVEL roller on the front panel controls playback volume but has no effect on the through signal.

All in all you should find sufficient flexibility to place the Rang™ sampler anywhere in your signal path. Experiment to find what works best for you.

How the Buttons Work

While most of the functions provided by the Rang™ sampler are fairly obvious, it is helpful to describe each button's behavior in some detail as there are several hidden features you will want to know about. In particular, the order of button presses alters some of the functions, and a brief read through the descriptions may save you some time.

Just so we are all on the same page, the buttons with a second label in parentheses may be referenced by either name.

RECORD

This button is probably the most used of all. When it's pressed, recording begins and ***record*** lights up brightly. A second press terminates recording and playback begins; ***play*** lights up brightly to indicate the change. If no other buttons are pressed, playback will continue indefinitely. ***record*** will blink at the start of the loop each time it comes around.

During playback, ***RECORD*** is disabled. To record a new loop, press ***STOP*** and then ***RECORD***. **Please Note:** Recording erases any previously stored sounds. ***RECORD*** can be programmed so that it is not disabled while playback is happening. How to change this is explained in **Programming Modes** (Program Mode 1).

If the Rang™ sampler reaches the end of available memory during recording, all LED's will turn on brightly; then you have two options. ***RECORD*** will begin a new recording and the previous one will be lost. ***PLAY*** starts playback and preserves the recorded material.

PLAY (STOP)

This button has different functions depending on what the Rang™ sampler is currently doing, hence the two-part name. If the Rang™ sampler is idle, pressing ***PLAY*** starts playback of whatever was last recorded. During playback, ***play*** will be on and ***record*** will blink at the beginning of each pass through the loop.

If the Rang™ sampler is recording, ***STOP*** halts recording and the unit becomes idle; your music is recorded and ready for playback. If the Rang™ sampler is playing back, ***STOP*** halts playback and the unit becomes idle.

A/B - ONCE

This button can be programmed to be in one of 3 modes: Once, A/B or A/B1. Out of the box this button is set to the Once function. How to change modes is explained in **Programming Modes** (Program Mode 1).

Once

While recording, ***ONCE*** will halt recording and start playback, but the loop will playback only one time. During playback, ***ONCE*** tells the Rang™ sampler to finish playing the loop and then stop. If the Rang™ sampler is idle, ***ONCE*** will play your recorded loop one time. In all of these cases ***once*** will turn on to let you know this is the last time through your loop.

There is an interesting twist in the way ***ONCE*** works. Pressing it while ***once*** is on will immediately restart the loop. Repeated presses produce a stutter effect sort of like record scratching.

A/B

Selecting this mode provides you with two loops, say for a verse and a chorus. We call the main loop "A", and "B" is the secondary loop. **Please Note:** The two loops are different. Whenever A is recorded, B is deleted. The reverse is not true. B can be recorded and re-recorded without affecting A. Once they are both recorded you can go back and forth between them, stack additional parts, play, stop, play in reverse and generally freak out anyway that pleases you, but remember… when you record A you replace what was in A and B is deleted.

While recording A, ***A/B*** concludes recording of A and immediately starts recording B, and ***loop 'b'*** turns on. While recording B, ***A/B*** concludes recording of B and immediately starts playback of A, and ***loop 'b'*** turns off.

If both loops have been recorded, then ***A/B*** behaves like this. With loop A playing, ***A/B*** causes ***loop 'b'*** to blink; at the end of loop A, a smooth transition to B will occur, and ***loop 'b'*** turns on solidly. If loop B is playing, ***A/B*** causes ***loop 'b'*** to blink; at the end of loop B, a smooth transition to A will occur, and ***loop 'b'*** turns off. If no loop is playing, ***A/B*** chooses which loop to work with. A is selected if ***loop 'b'*** is off; B is selected if ***loop 'b'*** is on.

A/B1

This mode is the same as A/B with one exception. With loop A playing, ***A/B*** causes loop B to play once and then return to loop A.

DIRECTION

This button does just what you think... most of the time. During playback, ***DIRECTION*** immediately causes reverse playback. ***DIRECTION*** can be pressed any number of times during playback causing a change of direction with each press. Try this with recorded speech; it'll crack you up!

If ***DIRECTION*** is pressed so ***reverse*** is on before recording begins, a special *continuous-reverse* mode will be entered where the Rang™ sampler is continually recording new sounds while simultaneously playing the previously recorded sounds in reverse. This is the way to play a reverse lead live on stage. While jamming, press ***RECORD*** twice to define a phrase length. Both ***record*** and ***play*** will be brightly lit, along with ***reverse***, to denote this unique mode. Turn off the through signal by pressing the THRU MUTE switch so that only the reversed signal is present and you can play a reverse solo live! It is usually best to define a relatively short loop for this purpose so you are playing just a little ahead of the accompaniment and chord changes can be anticipated. I recommend one or two measures. But, as with all features of the Rang™ sampler, there are no rules and experimentation is the name of the game.

Press ***DIRECTION*** during recording and the Rang™ sampler will enter reverse playback mode immediately at the second press of ***RECORD***.

STACK (SPEED)

If the unit is idle, ***SPEED*** selects the sample rate: normal or slow. ***slow*** turns on to denote slow speed. Sounds recorded on normal but played at the slow rate will sound an octave lower and be half as fast. This is handy when trying to learn difficult licks from a CD or tape. Sounds recorded on slow speed but played back at normal speed will sound an octave higher and be twice as fast.

The interval that the sound drops can be changed from an octave to a lower 2^{nd}, 4^{th}, 5^{th} or 7^{th}. Selecting the interval is explained in **Programming Modes** (Program Mode 2).

During playback, ***STACK*** will add what you're playing to the existing loop, and ***stack*** will turn on. A second tap turns off ***stack*** and stops adding sound to your loop. This stacking of parts will continue for as long as ***stack*** is on. There is no hard limit to the number of parts that can be added, in fact a whole song can be created in just a few minutes by stacking on various parts, one by one. If the Rang™ sampler is connected to a small mixing console, different instruments and voices can be added to the mix. By controlling the relative levels of each new part the final result will sound well balanced; this is an experience thing. The stacking feature works during reverse playback so any part can be recorded forward or reversed.

Using the Rang™ Looper as a Delay

Looping aside, the Boomerang® Plus Phrase Sampler is a great tap tempo delay effect. Select a decay rate as described in **Programming Modes** (Program Mode 1). Tap ***RECORD*** twice to set the tempo, then tap ***STACK*** once; ***stack*** will turn on. The level roller controls the wet/dry mix. To turn the effect off, just move the foot roller all the way down, or press ***STOP***. Try the different decay rates; the slapback setting is particularly cool.

Please Note: You can set different decay rates for loop A and B. This feature enables you to have two delay settings and switch between them by simply pressing ***A/B***. The decay rate settings are preserved when the unit is turned off.

Special Functions and Factory Settings

When the Rang™ sampler is powered up, the sample rate is set to 24KHz. This provides 1 minute, 27 seconds of record time on normal speed. Longer times are available by using slow speed. If you hold down ***STACK*** while applying power to the unit, the sample rate will be set to 16KHz, the rate used in earlier software releases (V1.0, V1.1, etc.) This lower sample rate provides 2 minutes, 8 seconds of record time on normal speed.

If you hold down ***DIRECTION*** while applying power to the unit, all of the parameters will be set to their defaults - how the Rang™ sampler comes from the factory. The defaults are: ***RECORD*** is disabled during playback, decay rate is set to *no decay* for both loops, the ONCE function is selected, ***STACK*** is set to latching behavior, and slow speed is set to 1 octave down.

Programming Modes

There are two program modes where parameters can be changed. Changing a parameter is a 3 step process: (1) enter program mode, (2) make any number of changes, (3) exit program mode.

Program Mode 1

Step 1 → Enter *program mode 1* by holding down ***DIRECTION*** for 3 seconds; ***slow*** blinks slowly to let you know you've entered *program mode 1*. In this mode you have control over the behavior of ***RECORD***, ***A/B***, ***STACK*** and the loop decay rates (using ***PLAY***). For decay rate, which ever loop was selected when you entered *program mode 1* is the one affected.

Step 2 → Press ***RECORD*** to see what mode it's in, then press ***RECORD*** to toggle between the two modes.

record dim	***RECORD*** enabled during playback
record bright	***RECORD*** disabled during playback

Please Note: All programmable buttons work this way. The first button press shows you what state the button or parameter is in; subsequent presses move you through the available choices.

Step 2 → Press ***A/B*** to see what mode it's in, then press ***A/B*** to move through the choices.

loop 'B' bright	Once	
reverse bright	AB	NOTE: See "How the Buttons Work"
stack bright	AB1	for a description of these modes.

Step 2 → Press ***STACK*** to see what mode it's in; press ***STACK*** to toggle between the 2 modes.

stack dim	momentary (press & hold to add parts)
stack bright	latching (tap on / tap off).

Step 2 → Press ***PLAY*** to see which decay rate is being used, then press ***PLAY*** to cycle through the 7 choices for decay rate. You can set a different decay rate for each loop, A and B. Which ever loop was selected when you entered *program mode 1* is the one affected.

record bright	no decay	infinite repeat
play bright	original decay, very long	over 20 repeats
play & ***loop 'B'*** bright	long	about 12 repeats
loop 'B' bright	medium long	about 9 repeats
loop 'B' & ***reverse*** bright	medium	about 6 repeats
reverse bright	short	about 4 repeats
stack bright	slapback	only 1 repeat

Step 3 → Press ***DIRECTION*** to exit *program mode 1*. Changes will be saved even when the Rang™ sampler is turned off.

Program Mode 2

Step 1 → Enter *program mode 2* by holding down ***STACK*** for 3 seconds; ***slow*** blinks quickly to let you know you've entered *program mode 2*. In this mode you have control over the interval that ***SPEED*** uses for slow speed.

Step 2 → Press ***PLAY*** to see which interval is being used for slow speed, then press ***PLAY*** to cycle through the 5 choices. Your choice of interval will affect both loops; you cannot have separate intervals for each loop.

record bright	down a musical 2nd
play bright	down a musical 4th
loop 'B' bright	down a musical 5th
reverse bright	down a musical 7th
stack bright	down an octave

Step 3 → Press ***STACK*** to exit *program mode 2*. Changes will be saved even when the Rang™ sampler is turned off. The following table shows the relationship between interval down, sample rate, available recording time & maximum frequency recorded.

	Sample Rate in Hz	Interval Down	Record Time Min : Sec	Max Frequency in Hz
V2 Max Rate	24000	-	1 : 26	11760
	21382	2nd	1 : 37	10477
	17980	4th	1 : 55	8810
	16018	5th	2 : 09	7849
	13470	7th	2 : 33	6600
Half speed	12000	octave	2 : 52	5880
V1 Max Rate	16000	-	2 : 09	7840
	14254	2nd	2 : 25	6984
	11986	4th	2 : 52	5873
	10679	5th	3 : 13	5233
	8980	7th	3 : 50	4400
Half speed	8000	octave	4 : 18	3920

Tips & Suggestions

It's difficult to adequately describe the effects you can get using the Boomerang® Plus Phrase Sampler. Like many products you simply must use it for yourself to appreciate how it fits into your way of making music. We encourage you to experiment. The following list contains suggestions for basic Rang™ sampler technique, creative ways to use a Rang™ sampler and ways to care for and get the maximum life out of your unit.

- If you are having trouble creating smooth loops, or said another way, if there is always a little *hiccup* at the end of your loops, then try this. Concentrate on pressing ***RECORD*** along with your natural foot tap; make your button presses on the first beat of the measure.
- The foot buttons and OUTPUT LEVEL roller are designed to be fast and sensitive requiring only a minimal press. Using a light touch will help to insure reliable operation for years to come.
- For lowest noise and maximum headroom select an input/output range that allows the TRIM knob to be as close to +20 as possible without clipping. Because clip indicates clipping only at the input to the A/D converter it is possible for clipping to occur in the pre-amp section and not be indicated by clip. It's also possible for clipping to occur in the output sections even though no clipping was indicated during recording. Both of these situations are generally the result of using signals which are too large for the selected range. If you hear distortion but no clipping is indicated try using a different input/output range setting.
- If you are using a Rang™ sampler live, try giving the drummer the AUX OUT signal. This signal does not include the through sound, and should be easier to follow, like a click track. The drummer hears only the sampled loop playing back.
- Create a bass part by sampling at the normal rate and playing back at the slow rate. This is easiest to do if you play simple, clean parts.
- If you own a keyboard sampler, use the Rang™ sampler to create multi-timbral samples. For example, you could stack a screaming guitar note, a bass note and a percussion hit. When it sounds just right, sample it directly into your keyboard.
- Here's how to create a wacky slapback kind of echo using the continuous reverse mode. Starting with the unit in idle, press ***DIRECTION*** and ***reverse*** will turn on brightly; quickly tap ***RECORD*** twice. ***record*** and ***play*** will light brightly. Leave the through signal enabled and begin playing; this creates an unusual reversed slap-back echo effect. Use the OUTPUT LEVEL foot roller to set effect/clean mix.

- Play in continuous-reverse mode with through enabled and attempt to create a phrase that harmonizes with itself in reverse. The classical composers did stuff like this to keep from getting bored on rainy afternoons!
- I call this “colliding reverse chords”, and it’s a guitar thing. Record a part that is just a series of *one-strum* chords that you let ring out. Play this in reverse and stack on the same chords an octave higher. The trick is to play the second part chords just when the first part chords hit their peak volume. If this makes sense and you get it right, it’s way cool.
- Earlier we recommended that the Rang™ sampler be at the end of the signal processing chain. Well, here’s a time when it would be useful to have it at the very front of the signal processing chain. If you are trying to tweak a desired effect or get that perfect pre-amp setting, let the Rang™ sampler substitute for your playing while you adjust the effect parameters. Just create a loop in the appropriate playing style and let it rip. Put your instrument down and concentrate on tweaking!
- A related idea is to use the Rang™ sampler for sound checks. Lay down a part and then walk around the venue to hear how your instrument sounds.
- The Rang™ sampler is great for learning songs from CD’s or tapes. Record the portion of the song you want to work on. A fast part may be slowed down by playing back on slow speed. This will drop the part an octave (if selected), so it’ll be in the same key. If you want to slow down a part so that it is easier to hear, but maintain the original pitch, here’s a technique that works well. Place a pitch shifter between the Rang™ sampler’s output and your amplifier, and set it to *1 octave up*.

If You're Having Problems

- No sound is coming through your unit → Press the THRU MUTE foot switch
- No sampled sound is playing back → Increase playback volume with the foot roller

- If your pedal needs to be repaired, please contact Lee Hardesty at hardesty@mindspring.com or 940-382-3253.
- If you are going to return your pedal for repair, please include a note describing the problem, a complete return shipping address, your phone number & email.