CHAPTER 6
EXTERNAL TRIGGERING

OVERVIEW

External triggering has three main uses:

- Driving DM5 sounds from electronic drum pads. Some electronic drum pads provide MIDI triggers when hit; these can feed directly into the DM5 s MIDI input. Other pads generate analog triggers, which can interface with the trigger inputs.

- Using contact transducers (triggers) mounted on acoustic drums to trigger sounds from the DM5. These transducers can be plugged directly into the DM5 trigger input, which will convert the trigger's signal to MIDI information.

- Drum substitution. If the drum sounds on a tape are poorly recorded, and the sounds to be substituted are on different tracks (or sufficiently far apart in pitch that equalization can help separate the sounds), these drum sounds can trigger the high-fidelity drum sounds inside the DM5.

All of these applications present certain challenges. With electronic drum pads, crosstalk from one drum hit can leak into another drum pad and trigger it accidentally. Acoustic drum pickups are much more finicky than electronic pads. They are subject to extraneous Noise pickup, varying gain, and system Noise, all of which make reliable triggering difficult.

The DM5 includes five editable parameters that let you electronically tailor the DM5 trigger inputs to the characteristics of your drum transducers. It may take considerable experimentation to achieve reliable triggering then again, it may not. At some point, you ll hit on the right combination of transducer placement and DM5 parameter values necessary for proper triggering.

The external trigger function contains six pages of parameters. When you first press the Ext Trig button, it calls up the first page. Pressing the Ext Trig button again calls the second page, a third time calls the third page, and so on. You can also use the [◀] and [▶] buttons to go from one page to another by cursoring past the parameters on the current page. For more details, see page 26.

For the remainder of this chapter, we ll assume you know how to select the appropriate page.

ABOUT TRIGGER PARAMETERS

The DM5 now offers five user controllable trigger parameters. These are:

- **VCrv.** (Velocity Curve). This represents the velocity curve, or the sensitivity of the trigger input. There are eight separate curve tables, 0 through 7. Using these settings it is possible to adjust the DM5 s triggers to accompany a wide variety of playing styles, and to help compensate for sensitivity variances between different brands of drum pads and triggers.

  The lower the setting, the less sensitive the velocity curve and the higher the setting, the more sensitive. For example, a pad using a setting of 7 will reach a MIDI velocity of 127 with just a moderate strike. For a pad whose velocity curve setting is 1, only a very hard hit would generate such a velocity.

  For average type of play (striking pads with velocities ranging from very soft to very hard) the default setting of 4 is ideal in achieving the full range of sensitivity which corresponds to MIDI velocities of 1 through 127.

Note: Curve 0 is named Unassigned . The function of this curve is explained fully in the section entitled Velocity Curve on page 44.

- **Xtalk.** (Crosstalk). Sometimes hitting one pad will cause a nearby pad to false trigger or crosstalk . This is generally due to stand vibrations which can affect the other pads. These vibrations send signals to the nearby pads which can cause false triggering. The Xtalk adjustment acts as a suppression control.

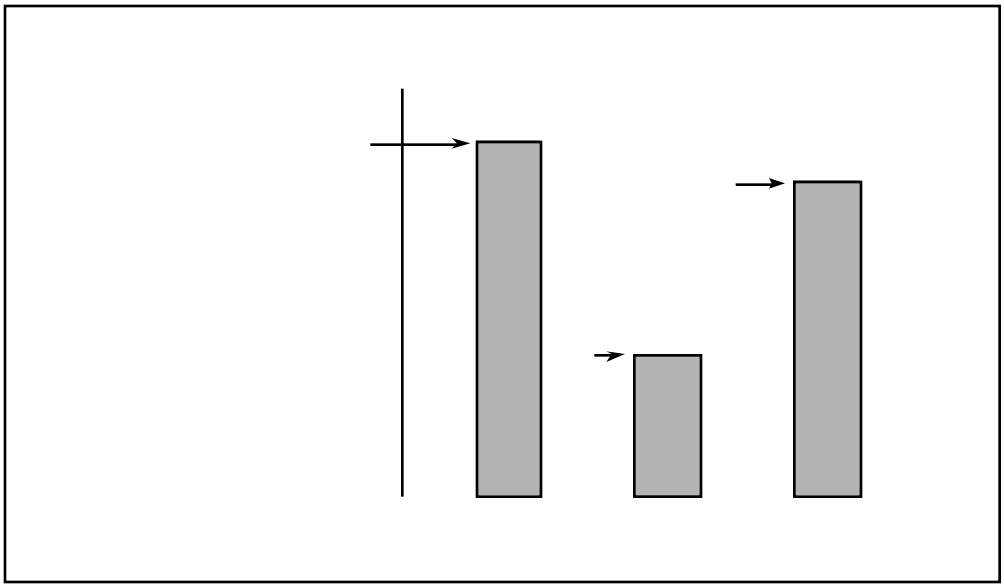
  A higher value adjustment equals greater suppression of the signal, a lower value equals less suppression. Therefore, the higher the value setting, the less likely the nearby pad (or drum) will trigger from stand or head vibrations.

  This is how it works:

  First, you strike a pad and the DM5 triggers its sound. Shortly after this hit the DM5 receives a secondary, softer signal from a nearby pad. Before the DM5 will play this softer signal, it will scan the other inputs to determine whether this was a legitimate hit, or simply a vibration from a stand or head.

  It does this by comparing the level of this soft signal with the threshold level set in the Xtalk parameter. If this secondary signal level is greater than the allowable threshold level, the DM5 will trigger its sound. If the signal is less than the allowable threshold level, the DM5 will ignore it.

  By adjusting the crosstalk level to a higher value, you set a higher threshold for the signal to exceed, and reduce the ability of a pad (drum) to crosstalk. The following chart shows a scenario with a properly adjusted Xtalk level.



This chart represents three signals which are seen by the DM5. Signal 1 is a legitimate hit from the snare pad. Signal 2 is the Tom 1 pad, but it is not a hit. It is the pad being triggered by stand vibrations from the first snare hit. Signal 3 is a second "real" hit from the snare pad.

As you can see the Xtalk threshold is set at a value of 30 (represented by the dotted line). The two snare hits (signals 1 and 3) both register well above the Xtalk threshold. However, the tom (signal 2) registers too soft (at 20), and is correctly ignored by the DM5.

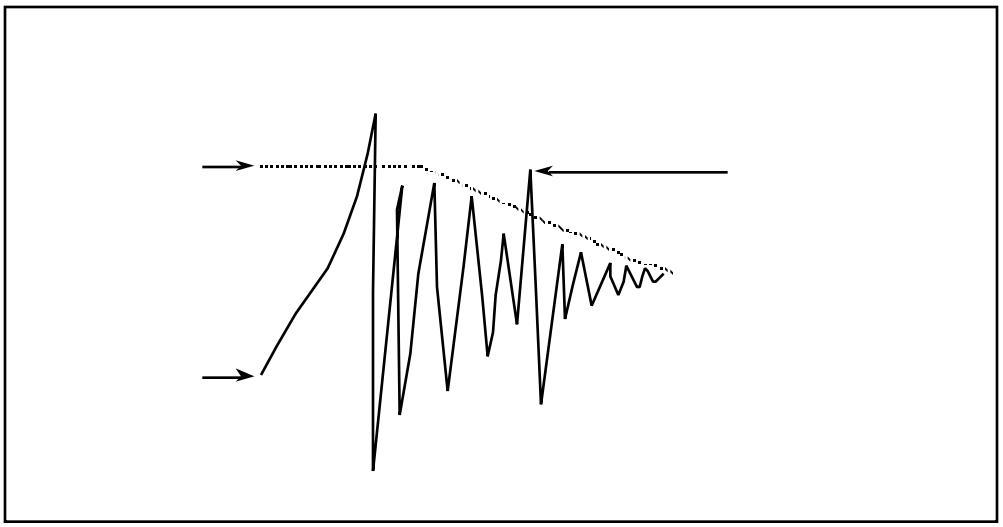
If the Xtalk level had been set at an improper value (in this case lower than 20), signal 2 would exceed the Xtalk threshold, and the DM5 would have triggered the sound. This illustrates how proper adjustment of the Xtalk parameter will result in the elimination of this interaction between the pads.

- **Decay.** This parameter represents the signal decay time, or the amount of time between once a pad has been struck and triggers, to when it will trigger again from another hit. This is one of the more tricky issues of triggering. Here s why:

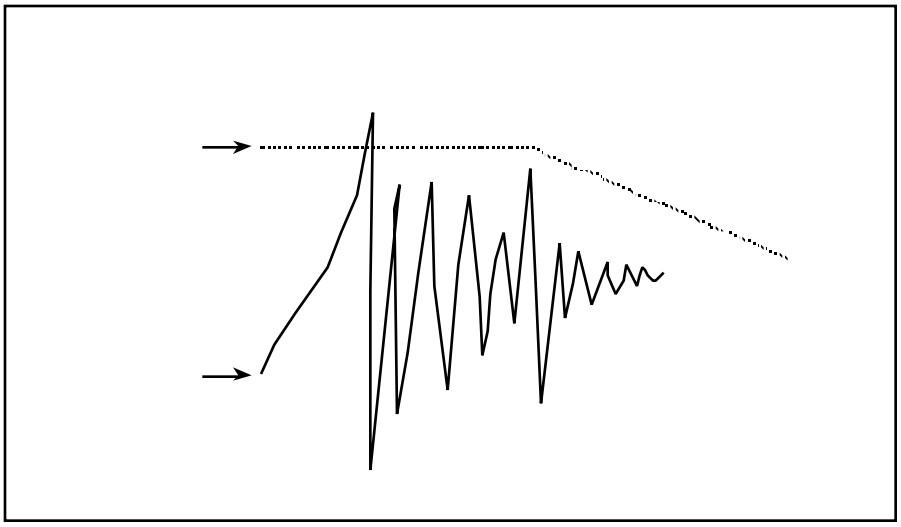
  When hits are spaced 2 or more seconds apart, the first signal has plenty of time to decay completely, making it easy to determine the second signal as an actual hit. However, when playing quick, repetitive hits it is much more difficult to determine where one hit ends and the next one begins. To further complicate things, some drum sounds (especially acoustic drums) take a long time to decay. During this period, part of the decay can be interpreted as another closely-spaced hit.

  This is where the Decay control comes in. The Decay control adjusts the time and threshold of the signal decay making it possible for the DM5 to correctly determine whether closely spaced signals are real hits or just decay. Selecting a higher Decay value (long decay times) will allow for the most reliable triggering but may miss quickly repeated hits. Lower Decay values (shorter times) will respond to quickly repeated hits but may be more prone to false triggering. Experimentation with these levels is necessary to achieve the proper results.

Example:



This chart simulates the waveform of a snare drum hit. The first big point in the signal is the actual hit, the rest of the waveform is all decay. Since the Decay time threshold is adjusted too low, the Decay level curves off too soon allowing a second point, during the signal s decay, to exceed the threshold. Once this happens the DM5 will trigger the sound.



On the other hand, this chart shows the same hit but with the Decay parameter set at a higher value. Notice how the Decay threshold is slightly higher and stays consistent for a longer time before it tapers off. Now only the initial strike of the drum triggers the DM5.

- **Nois.** (Noise). The Noise floor is the signal level threshold a vibration or sound must exceed before it can trigger a drum sound. When selecting lower values, very soft signals (hits) will trigger the DM5. While this allows for the greatest sensitivity, there s a chance that unwanted, exterior signals such as vibrations from drum risers, bass cabinets, or even people jumping up and down on the dance floor may trigger a sound.

Higher settings are useful when trying to extract drum sounds from tape where other sounds are present; often the snare or kick drum will be louder than other sounds, so setting the threshold above the other sounds will allow the snare or kick to trigger the DM5. However, the higher the threshold, the more likely that the instrument s full dynamic range won t be captured and some soft hits to the pad may not be recognized.

Note: The Noise parameter in the DM5 is similar to Xtalk in that the level you set determines whether the trigger will fire on softer signals. But there is a difference. The Noise parameter looks only at exterior causes of the signal, whereas the Xtalk parameter looks at all of the other triggers in the DM5 to determine whether the soft signal it is receiving is actually a real hit .

- **GAIN.** This is the signal strength that the transducer is sending to the triggers in the DM5. It s adjustment is very similar to that of a tape recorder s Peak meter. With the gain set too low, soft hits may never be recognized. With the gain set too high, you may experience false or double triggering. A properly adjusted gain setting will allow the highest dynamic range for the pad being used. The gain is the most important parameter in the DM5. It must be correctly set for the remaining parameters to work properly, and to assure reliable triggering with the DM5.

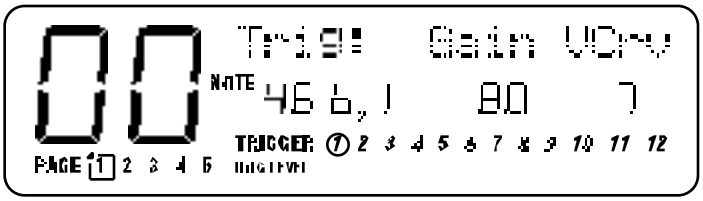
TRIGGER SELECTION

There are 12 input triggers with corresponding rear panel jacks. Each is edited independently, so it is first necessary to select a trigger input for editing.

Note: The MIDI note number default settings for the DM5 triggers can be found in the DM5 Factory Drum Set Reference Chart.

Editable parameters are identical for all 12 triggers. With the exception of the Trigger Note Assignments (see page 44), the trigger set up is global for all drum sets.

Ext Trig page 1 shows four parameters, including: Trigger (***1 12***), Note, Gain and Velocity Curve (VCrv).



As with the other screens, the [◀] and [▶] buttons let you move between the four parameters.

With **t**he **TRIGGER** parameter selected (circle flashing around one of the 12 triggers), turn the [**VALUE**] knob to select the desired trigger for editing (***1 12***).

TRIGGER NOTE ASSIGNMENT

Each trigger can be assigned to any MIDI note number, which is associated with a corresponding drum sound (programmed according to the instructions on page 27).

Trigger note assignments are the only trigger settings that are recalled as part of a Drum Set whenever a new set is selected.

With **t**he **NOTE** parameter selected (flashing), turn the [**VALUE**] knob to select the note that will be assigned to the selected trigger input.

GAIN

To compensate for differences in transducer outputs, the gain for each trigger can be set independently.

With **t**he Gain parameter selected (flashing), turn the [**VALUE**] knob to select the desired amount of gain (00 is minimum gain, 99 maximum gain).

To aid in the adjustment of this parameter, strike the pad or drum whose transducer is plugged into the selected input. The **TRIG LEVEL** bar-graph meter at the bottom of the display will show the peak strength of the transducer signal. Adjust the gain so that a powerful strike results in the meter reaching the right-most side of the display This indicates that the input is reaching it s full dynamic range. When a trigger s Gain is properly adjusted, this will occur only on the strongest hits.

VELOCITY CURVE

The velocity sensitivity of each trigger input can be adjusted to accompany a wide variety of playing styles, and to help compensate for sensitivity variances between various brands of drum pads and transducers.

Example: A hard hitting player might have a difficult time in playing the softer velocity sounds available in the DM5 due to the high impact of most of his hits. Using a lower Velocity Curve setting (1 - 3) would require a much harder strike to generate a full MIDI velocity of 127, and make it much easier to obtain the more subtle velocity sounds when playing the drum pad. When using a higher Velocity Curve setting (5 - 7) the opposite applies, or a much softer hit would generate a MIDI velocity of 127.

With **t**he VCrv parameter selected (flashing), turn the [**VALUE**] knob to select the sensitivity value desired to suite the style of play, or the pads being used. The default setting of 4 is the median Velocity Curve . For average play (hits ranging from very soft to very hard) this curve gives you the full range of sensitivity which corresponds to MIDI velocities 1 through 127.

Note: The setting of 0, Unassigned, is selected by rotating the [**VALUE**] knob fully counterclockwise. This is a special case Velocity Curve setting which allows a trigger input to contribute to the DM5 s master suppression threshold. However, it will not trigger any sounds or MIDI note messages. In certain circumstances this setting can help suppress false triggering on the other inputs.

Example: Suppose three drum pads are mounted on a single drum stand while set up on a noisy stage. Normally, a higher Xtalk setting would be used to eliminate

interaction between the pads, and a high Noise floor setting would be selected to reject the high level of ambient Noise and vibration. In certain cases with crosstalk and Noise floor settings too high, softer hits might become rejected because the DM5 assumes that they are Noise.

Instead of compromising between the two parameters, there are two methods which can improve this scenario.

Method One:

① First, attach an inexpensive contact transducer to the center of the drum stand and plug it into a DM5 input.

② Next, go to Ext Trig page 1 and select the Velocity Curve setting of 0 (Unassigned) for this trigger.

③ Go to the next page and set the Xtalk, Decay and the Noise levels all to 00. This low level will allow the maximum amount of Noise and stand vibrations to be detected by the DM5.

④ Using the **TRIG LEVEL** meter (at the bottom of the display), adjust the level to select a hotter than usual Gain setting. Since in this case the gain is effected only by the stand vibrations, a very strong signal is needed to maximize the trigger's performance.

⑤ Now as the stage vibrates, or when other signals trigger the drum stand transducer, the suppression function will note this signal and determine that any softer signals coming from the other three pads must be crosstalk. Also, if the suppression function sees a soft signal from the three main pads but little or no signal from the drum stand transducer, it will assume that the pad signals are valid hits and trigger the DM5 sounds.

Method Two:

In severe cases, this is another way in which the Unassigned feature can be used. For this scenario lets use the bass as the reason the surrounding Noise level is making proper triggering difficult. Each time the bass player pops a string, the vibration triggers the tom 1 pad.

① First, take a direct out from the bass amplifier, and plug it into an unused trigger input on the DM5.

② Next, go to Ext Trig page 1 and select the Velocity Curve setting of 0 (Unassigned) for this trigger.

③ Go to page 2 and set the Xtalk, Decay and Noise levels all to 00. This low level will allow the maximum signal to be detected by the DM5.

④ Using the **TRIG LEVEL** bar graph meter, adjust the level according to the severity of the false triggering. If notes are constantly triggering, use a high gain. If only occasional, select a lower level.

⑤ Now when the DM5 receives a signal (from the tom 1 pad) which was generated by the string pop from the bass, not only will it compare this signal to the other drum pads, it will also compare it to the bass. In essence, the DM5 isolates the bass from the Noise floor and thinks the bass is a another drum pad. It will now treat it the same as any other pad and filter out the unwanted signals.

Note: Note Chase will not follow any trigger that has been set to Unassigned. To view an Unassigned trigger s VU-style bar graph meter in order to adjust gain (page 44), use the [**VALUE**] knob to select the corresponding trigger input (page 43).

CROSSTALK

If several pads are mounted on one stand or rack it is possible to experience interaction or crosstalk problems. Adjustment of the Xtalk parameter makes it possible to resolve these problems.

Note: In configurations where some pads are individually mounted, the default setting of 30 may be sufficient, making it unnecessary to adjust this parameter. In that case, skip this section and go on to the next section, Decay .

With **t**he Xtalk parameter selected (flashing), turn the [**VALUE**] knob to select the desired level of crosstalk suppression necessary to stop the problem pad from triggering (00 is minimum, 99 maximum). This level will depend entirely on your current pad or drum configuration.

Remember: When experiencing an interaction problem, the trigger that needs adjustment is the pad that is false triggering, not the pad being struck. One easy way to remedy an interaction problem is to silence the pad(s) which are not false triggering .

Example: Suppose you hit the snare pad and the tom 1 pad triggers.

① First, press [**MIX**] and reduce the volume of the snare pad to 00. Now when you hit the snare pad you won t hear it, but you ll hear the tom 1 pad false triggering.

② Next, press the [**EXT TRIG**] button twice (which gets you to the Xtalk parameter on page 2) and select the tom 1 trigger to edit.

③ Press the [▶] button once to select the Xtalk parameter. While you hit the snare pad (false triggering the tom pad) gradually raise the crosstalk level of the tom 1 pad. Continue to raise the level until the tom pad stops triggering when you apply hard hits to the snare pad. By using this technique, you have isolated the problem drum, and made it easy to dial in the proper Xtalk value without the sound from the other drum becoming distracting or confusing.

④ Finally, press [**MIX**] again and reset the volume of the snare pad to it s original level.

Note: Always increase the Xtalk value in small amounts for two reasons. The values are very sensitive, so an increase of as little as 2 or 3 can make a difference in suppression. Also, an unnecessarily high Xtalk setting actually suppresses the sensitivity of the trigger input, resulting in the occasional loss of softer hits.

If a situation where a high Xtalk setting is necessary to stop false triggering, but pad sensitivity loss is noticeable, try this combination. Start by slightly lowering the Gain setting for the pad. This should make it possible to lower the Xtalk value, which will allow the pad sensitivity to increase. With some experimentation and time, you should be able to find the right combination.

Decay

If a pad or drum double triggers when it is struck, it may be necessary to adjust the Decay level. This is evident when shortly after the initial strike to a pad, a second trigger from the same pad is generated, or it double triggers . *Note:* With certain pads it may not be necessary to adjust this parameter.

With **t**he Dec parameter selected (flashing), turn the [**VALUE**] knob to select the desired level of decay suppression necessary to stop the pad from double triggering (00 is minimum, 99 maximum). This level will depend on your current set up, including the mounting configurations and the type of pads used.

When triggering from acoustic drums, the factors involved are staggering. Not only do the type and size of drum make a big difference. Whether the drum is single or double headed, the tension of the head(s), the muffling, and the trigger placement all play very important roles in getting good results and proper tracking of your play. For more detailed tips and suggestions in these areas please refer to Tips On Triggering From Acoustic Drums, on page 49.

Noise

When in a high Noise floor level situation such as playing live on a stage with bass cabinets nearby, it may be necessary to adjust the Noise parameter level.

With **t**he Nois parameter selected (flashing), turn the [**VALUE**] knob to select the desired level of suppression necessary to stop the pad from false triggering (00 is minimum, 99 maximum). Stage Noise and rumble, the stability of drum risers and platforms, volume, and crowd vibrations are all factors in choosing the proper level.

Remember: In keeping potential problems to a minimum, it is a good idea to try to keep some distance between your pad or drum kit, and nearby speaker cabinets (especially bass cabinets). Whenever possible, try to aim them so they are not facing directly towards your set up. Also, avoid unsteady drum risers and hardware.

Footswitch Mode

There are two footswitch options, **Hi Hat Pedal** (which lets a footswitch act like a hi hat pedal) and **Drum Set Advance** (pressing the footswitch increments the Drum Set to the next higher number; past 20, it wraps around to 00 again).

You can use either a normally closed or normally open momentary contact footswitch. Plug it in to the rear panel [**FOOTSWITCH**] jack before powering up the DM5; on power up, it will automatically sense the footswitch polarity and calibrate itself accordingly. If your footswitch seems to respond backwards, make sure the footswitch plug is fully inserted into the footswitch jack, then turn power off and on.

① Press the [**EXT TRIG**] button repeatedly until page 3 is selected.

② Use the [**VALUE**] knob to select the desired Footswitch function (HAt or Adv).

Two additional parameters (located in pages 4 and 5) are used when the Footswitch Mode is set to HAt. Ext Trig page 4 shows the MIDI note number that the footswitch will trigger when it is pressed. Page 5 shows the MIDI note number that Trigger Input #1 will play when that pad is hit while the footswitch is held closed.

Understanding Hi Hat Pedal Mode

This is a feature for hardcore drummers. It s a little complicated, but hang in there the DM5 finally gives you a way to get truly realistic hi hat effects with electronic drums.

An acoustic hi hat produces three main types of sound:

- **Open hi hat.** The pedal is up so that the upper and lower cymbals do not touch. Striking the upper cymbal causes it to ring until it is struck again, or until the pedal begins closing.
- **Foot closed hi hat.** This is the sound generated by pushing down on the pedal; it is not initiated by hitting the hi hat with a drum stick, but by the sound of the upper cymbal striking the lower one.
- **Closed hi hat.** Once the hats are closed (pedal down), then striking the upper cymbal with the drumstick produces the closed hi hat sound.

To replicate these individual effects:

① Patch a drum pad (the hi hat striking surface) into DM5 Trigger input 1 and a footswitch (for opening and closing the hi hat) into the footswitch input. Hi Hat Pedal must be selected for the footswitch mode.

② If it isn t assigned already, assign an open hi hat sound to the note triggered by Trigger Input 1.

③ Press the [**EXT TRIG**] button until the display shows the Footswitch Close note. This is the note that will be played when the footswitch is pressed. If it hasn't been assigned already, assign a closing hi hat sound to this note. This will give the hi hat a realistic closing sound, as opposed to an abrupt switch from an open sound to a closed sound.

Note that you don t necessarily *have* to use hi hat sounds while using this mode. If you wish, you can use any sound available in the DM5.

④ Press the [**EXT TRIG**] button until the display shows the Footswitch Held note. This is the note that will be played when Trigger 1 is struck AND the footswitch is held. If it hasn't been assigned already, assign a closed hi hat sound to this note.

⑤ Using the Group function (see page 31), assign all the hi hat sounds to Group 1 so that you can t have two different hi hat sounds ringing at the same time. (The hi hat sounds could be assigned to Group 2 if you re already using Group 1 for other drum sounds.)

If you strike the hi hat pad while the footswitch is not pressed, you ll hear the open hi hat sound. Pressing the footswitch triggers the foot closed sound (at the same velocity as the most recent open hi hat hit); just like a real hi hat, you don t have to strike the pad simply closing the hi hat by pressing the footswitch triggers the sound.

Striking the pad while the footswitch is held down plays the closed hi hat sound.

Tips On Triggering From Acoustic Drums

When triggering from an acoustic drum, that is using a contact pick up (transducer) mounted to the head or shell, the same general set-up procedures and parameter principles of triggering from pads apply. However, due to extreme head vibrations and resonance of acoustic drums, keeping the factors under control is considerably more difficult. These tips should help you in eliminating potential problems.

There are several things to consider when purchasing transducers (triggers), and when mounting them to your drums.

Output Sensitivity

The difference in output levels between transducers is considerable. While a really hot trigger might work great on the snare, it may not work as well on a bass drum. For example, a high sensitivity trigger will detect the softer grace notes on a snare drum and provide the best tracking in a tight pressed roll. On a bass drum however, because that same trigger is so sensitive, it may be overdriven due to the sheer velocity of each impact from the beater on the head. Overdriving the trigger can allow it to detect every slight vibration as you hit the bass drum. This results in double triggering and contributes to cross talk problems. It can also reduce the life of the trigger itself.

When considering trigger output sensitivity towards applications, generally these tips will apply.

① Use hotter triggers for shell mounting. Sensitive triggers can detect signals through the shell more accurately than others.

② For direct head mounting use less sensitive triggers. When possible use a trigger that contains a built-in sensitivity adjustment. There are several types available.

Mounting

One of the most important aspects of triggering is mounting. For any trigger to work properly it must be correctly mounted to the drum. Always use some type of a foam tape, and make certain the trigger is firmly mounted with little or no movement. In addition to forming a solid foundation for the trigger, the foam tape also acts as a shock absorber which helps to deter double triggering. Most of the trigger manufacturers supply several pieces of mounting tape with their trigger products. It is also very important to be certain that no part of the trigger wire, which connects the trigger to the audio jack, is touching or resting on any part of the drum or rim. This wire is sensitive enough to trigger signals from the drum vibrations which would then cause double triggering.

Trigger Placement

Placement is another very important part of triggering performance, but unfortunately there is no right or wrong set of rules. It simply takes a lot of experimentation to arrive at the correct combination for the type and size of drum, and the drum kit configuration you are using. These tips will help you get started with a step in the right direction.

BASS DRUM

① Mount the trigger directly on the impact head.

② Place the trigger approximately 2-4 inches in from the rim, and level with the beater.

③ Slightly reduce the sensitivity of the trigger if it has an adjustment.

SNARE DRUM

If you play with a fairly tight batter head, try this:

① Mount the trigger on the batter head.

② Place the trigger approximately one inch from the rim, on the opposite side of the drum from the player.

③ Slightly reduce the sensitivity of the trigger if it has an adjustment.

If you play with a looser head, try this:

① Firmly mount the trigger to the shell approximately one-half inch from the batter rim.

② Placement of the trigger should be on the players side of the drum, within a lug or two of where the stick would hit if you played a rimshot.

③ Use a high sensitivity setting if the trigger has an adjustment.

SMALL TOMS 8"-13"

With smaller toms it is possible to get proper tracking using either head or shell mounting. You will need to experiment with both to determine which will work best in your situation.

For head mounting:

① Mount the trigger so that it is within one and one-half inch from the batter rim.

② Placement of the trigger should be on the players side of the drum, within a lug or two of where the stick would hit if you played a rimshot. (In some cases the opposite side of the drum, directly across from the player may work well).

③ Slightly reduce the sensitivity of the trigger if it has an adjustment.

For shell mounting:

① Firmly mount the trigger to the shell so that it is approximately one inch from the batter rim.

② Placement of the trigger should be on the players side of the drum, within a lug or two of where the stick would hit if you played a rimshot.

③ Use a mid to high sensitivity setting if the trigger has an adjustment.

LARGE TOMS 14"-18"

In most cases shell mounting will work the best. However, you might experiment with head mounting and find great results.

① Firmly mount the trigger to the shell so that it is approximately one inch from the batter rim.

② Placement of the trigger should be near the side you sit, within a lug or two of where your stick would hit if you played a rimshot.

③ Use a mid to high sensitivity setting if the trigger has an adjustment.

Note: In most cases when shell mounting triggers, internal permanent mounting will provide the best results. This permanent form of mounting allows the trigger to be more firmly attached to the shell, which tends to improve the performance. However, when using this technique it is usually necessary to install an audio jack into the drum shell to connect the audio cable to the trigger.

MUFFLING

Another important part of triggering from acoustic drums is the degree of muffling you apply to your drums. The amount a head vibrates when it is struck is what causes most of the problems related to triggering from an acoustic drum. Often most drummers don't want to put a lot of tape or muffling on their heads, but the degree of improvement it makes may be well worth at least a little sacrifice. A slight amount of muffling can make a huge improvement in any triggering unit s ability to properly track your playing.

MOUNTING HARDWARE AND CONFIGURATION

The quality and sturdiness of your hardware will make a big difference in eliminating potential problems. When you use unsteady hardware, it is an open invitation to crosstalk problems. Toms that are mounted on the bass drum, and drums which share a stand with other instruments such as cymbals, are areas where you should be sure your hardware and mountings are solid and sturdy. Always check to be certain that none of your stands or drums are leaning up against, or touching any other drums or piece of hardware. To sum it up, the more heavy-duty your hardware is, the better.