

# Building a Back Beat Relay

by Allen Miller

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It has often been said that if competition between theatre organ manufacturers had continued as it did during the Golden Age of the theatre organ, any number of gadgets and conveniences for the organist might have developed. Indeed, such devices as second touch, melody touch, melody octave couplers, second touch stopkeys which cancel all other stops on the same manual, automatic glissando, pizzicato, and many others might have been developed further. But "talkies" cut off research.

Now theatre organ is enjoying a renaissance, not only as a reincarnation of the instrument it was, but as a legitimate musical instrument perfectly suited for playing the music of today. If you don't believe it, then you haven't heard George Wright or Billy Nalle! Now research and development of improvements have been taken up by the pipe enthusiast.

Part of the enjoyment one gets from installing or owning a theatre organ, is adding that extra little "gadget", whether it's a Sizzle Cymbal, Toy Counter Positive, Reiterator, or Martha Lake's "Abyssinian Stringed Oboe". The device described here is easy to build and add to any organ (it might even be used to play Sanctus bells in church). It will cost less than ten dollars. It is a "back beat" relay. It will play a trap on the "up-beat", when the pedal is released.

Theatre organs usually had a Cymbal in the pedal division, but its inclu-

sion as a manual Accompaniment stop was rare. Often, the enthusiast will install a Cymbal with the Accompaniment manual percussions and traps for a back beat effect.

With the device described here you can add a back beat to the Pedal, leaving the Accompaniment manual free for an off-beat cymbal, if desired. If you have several different cymbals, you may wish to play them separately for an authentic jazz effect. Coupled with a unique piano sustain circuit which we will describe later, this back beat relay will provide an automatic piano sustain which will imitate closely the pedalling of a pianist as he plays.

To build the back beat relay, you will need two single-pole double-throw relays with fairly high resistance windings. A Potter & Brumfield type RS5D 6 volt DC type with a 335 ohm coil will work well. Don't be afraid of the 6-volt rating, as this is "pull-in" voltage, and the relay will not overheat or burn out on higher voltages encountered in pipe organ supplies. You will also need a 100 mfd electrolytic capacitor with a 25 volt DC rating. Wired as shown in figure 1, the capacitor will charge when the pedal is depressed. When the pedal is released, the capacitor is discharged through the second relay, which operates momentarily. This closes a contact every time a pedal key is released, thus keying the "back beat". Traps are wired into the circuit shown in figure 1 as if it were another pedal or manual traps buss.

There is a drawback to this circuit. It will not operate the same trap on both down-beat and back-beat. Do not connect any reiterating traps, such as Kettle Drum to this new line, as they would only operate when you first pressed the key.

There is a circuit which may be added to the Accompaniment Traps

line, if desired, which will kill reiterating traps. To do this, you need a "momentary traps" relay in the regular pedal traps line as shown in figure 2. The circuit shown in figure 2 will operate the same traps on regular as well as back-beat touches.

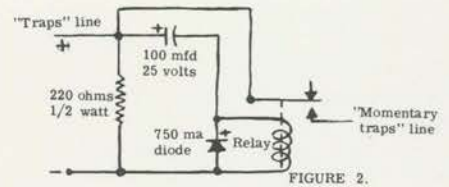


FIGURE 2.

If you are fortunate to have a piano connected to your organ, you have probably wished you had an extra foot so you could work the sostenuto pedal. Using the back-beat relay just described, you can add an automatic piano sustain. Your piano probably has a sustain pneumatic which lifts the dampers off the strings when operated. By adding a "piano sustain" stop to the fall board, and adding another single-pole double throw relay, you can make a device which will release the sostenuto damper each time you remove your foot from a pedal key. This will release the damper between each bass note, just as you would if you were playing the piano. During legato passages, when you do not release any pedals, the damper will remain on. It may be desirable to wire the sustain unit so that it operates only when a piano stop is on. Additional circuitry for this is shown in figure 3, and consists of a relay plus a three-Quarter ampere diode for each piano stop key. □

**The following was omitted from "Releathering a Regulator" (October, 1969 TOB, Pg. 14):**  
**"A knife made expressly for skiving leather is available from GRAPHIC ARTS, INC., 529 Main Street, Hartford, Conn. 06013. It is Catalog #6L SKIVING KNIFE SET which sells for \$2.00, with replaceable blades at \$.35 each."**

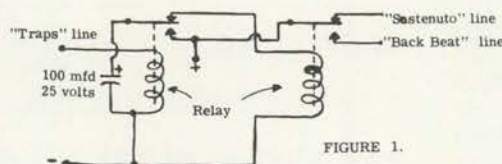


FIGURE 1.

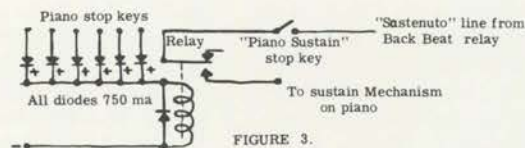


FIGURE 3.