Random Interval Generator v.3.x

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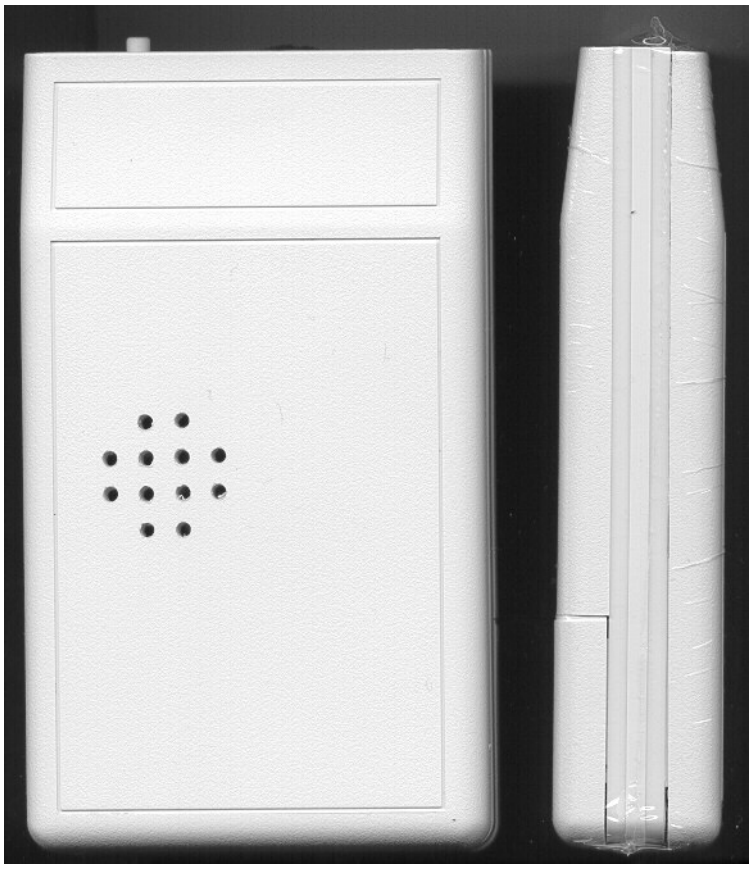
Specifications

The random interval generator v.3.x. creates either random or fixed intervals that are terminated by audible beeps. The beep is a 700hz tone that is delivered through a switchable onboard speaker or an external earphone, both controlled by a volume control. Random-interval or fixed-interval mode is selected by a switch inside the case. The interval lengths are easily programmable by switches inside the case from a mean length of 5 minutes to a mean length of 4 hours. If the device is left unattended, it enters a battery-saving "chirp" mode. Dimensions (inches): 4.15 X .85 X 2.40. Weight including batteries: 4.5 oz.

The end and side views shown below are actual size.



Controls outside the case (left to right):

1. *Control button*: Has two functions.
   a) If the device beeps to signal the interval, the button terminates the beep.

   b) At any other time, the button initiates a test (intermittent) beep to allow volume to be set and to ensure that unit is operating. (Model v.3.M and later: See also Switch Bank Report Mode below.)
2. *On/Off/Volume thumbwheel*: Volume of both the onboard and earphone speaker are adjustable.
3. *Earphone Jack*: accepts standard (1/8 inch) transistor radio earphones (Radio Shack 33-175B or equivalent). [Note that earphones have jacks that come in two sizes; the required one is the larger (and more common) of the two.]

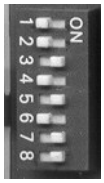
Onboard speaker: Volume is adjustable by On/Off/Volume thumbwheel. The onboard speaker is disabled if an earphone is plugged into the earphone jack. The volume range is selectable either High or Low by Switch #8 inside the case. Replacing one (but not both) of the batteries with a Lithium 3V "CRAA" cell will enable the beeps to be louder.

Battery compartment: Two standard AA cells are required. Either one (but not both) of the batteries may be replaced by a Lithium 3V "CRAA" cell will enable the beeps to be louder.

Controls (inside the case):

To open the case: Remove the battery cover (grasp device with both thumbs on battery cover and slide cover toward you) and batteries. Remove the two screws revealed by removing the battery cover (if fitted). Slide the bottom half of the case down about 1/8". Pull the two halves carefully apart. [To close, reverse these steps.]

The operation of the device is controlled by the bank of switches shown at right.



- *Interval selector*: switches #1 through #5. Choose the desired interval characteristics from the proper column at right in the Interval Selection Table below. Then set the switches according to that table.
- *Mode selector*: switch #6. You may operate this device in either of two modes:
  1) random interval mode (switch #6 = ON). Device creates intervals that are uniformly distributed between about zero and a selectable maximum interval; and
  2) fixed interval mode (switch #6 = OFF). Device creates intervals that are always the same length (that length is selected by switches #1 through #5).

  Select the desired mode by sliding switch 6 to ON for random intervals or to OFF for fixed intervals.
- *External device switch*: switch #7. When switch #7 = ON, device beeps only when signaled by an optional external accessory such as radio transmitter. (This switch has no effect unless the device is specifically configured for an external accessory.)
- *Onboard speaker High/Low switch*: switch #8. Enables High volume (switch #8 = ON) or Low volume (switch #8 = OFF) of the onboard speaker. The volume of the onboard speaker is controllable by the On/Off/Volume thumbwheel. Inserting the jack for an external earphone completely disables the onboard speaker. Replacing one (but not both) of the batteries with a Lithium 3V "CRAA" cell will enable the beeps to be louder.

An example. Suppose you want random intervals with the maximum interval one hour (= 60 minutes). Set switch #6 to **ON** to select random interval mode. Then consult the interval selection table, entering the second column from the right at 60 minutes. The table then indicates that switches #1–#5 should be set to **Off On Off On On**. Disable the external device by setting switch #7 to **OFF**. If you desire the device to beep loudly through the onboard speaker, set Switch #8 to **ON** and unplug the earphone.

Operation

1. Set the desired interval characteristics using the switches inside the case (see above). Close case.
2. Insert two AA batteries. To open the battery cover, grasp device with both thumbs on battery cover and slide cover toward you. Insert two AA batteries, being sure to position the batteries according to the "+" and "–" signs marked inside the case. One lithium 3V "CRAA" cell may replace one of the AA cells if you desire the beep's maximum volume to be louder.
3. Turn the device on by rotating the On/Off/Volume control. The device comes on beeping. The beep will automatically sound through the earphone if one is plugged in; otherwise the beep will sound through the onboard speaker. Set the volume as desired and then push the control button to stop the beep.
4. At any time you may check the volume and verify that the unit is operating by pushing the control button – an intermittent signal will sound. The intermittent signal indicates that the unit is functioning correctly. You may reset the volume at this time.
5. At the end of the (fixed or random) interval, a beep will sound. This beep will continue until terminated by pushing the control button. Terminating the beep begins the next interval.
6. If the device beeps and continues to beep for 80 seconds with no response, the device will enter a battery-saving "chirp" mode, during which a high-pitched chirp will sound every 12 seconds. The device must be turned off and back on to exit this mode.

Switch Bank Report Mode
(Model v.3.M and later)

This feature allows the user to ascertain the positions of the control switches without opening the case.

1. Ensure that the device is turned off.
2. Hold down the control button while turning the device On (with the On/Off/Volume control).
3. The device will emit a series of seven tones indicating the positions of the first seven control switches in the bank of switches inside the case. A high tone indicates that the corresponding switch is On, a low tone indicates it is Off.
4. Switch #8 is not reported. Switch #8 is the *Onboard speaker switch*, and you can tell immediately from the volume of the onboard speaker whether that switch is on or off.
5. If no *External device* is fitted, switch #7 has no effect and the seventh tone is unpredictable. The tone does not depend on the position of switch #7 unless the device is specifically fitted for an external accessory.
6. After the series of tones is completed, release the control button and the device operates as if it had just been turned on in the normal way.

Troubleshooting

Symptom	Cause	Remedy
No beep when first turned on	No or dead batteries	Install new batteries
	Batteries installed incorrectly	Match "+" and "– "on battery to "+" and "– " on case
	Wires between halves of case broken	Replace wires
	Defective earphone	Unplug earphone; if onboard speaker now beeps, replace defective earphone
	Chip installed backwards	Reinstall chip with the notched end closest to the thumbwheel
Beep too soft	Volume control incorrectly adjusted	Turn up on/off/volume control
	Onboard speaker switch set to OFF	Turn switch #8 to ON
	Batteries nearly depleted	Replace batteries
	Batteries not adequate	Replace one of the batteries with a Lithium 3 volt "CRAA" cell
Beep continues nonstop	Normal operation	Press control button to stop beep
Device chirps every 12 seconds	Normal battery-saving operation; device previously beeped and continued to beep 80 seconds with no response.	Turn device off and then back on.
Device beeps at erratic intervals when I want fixed intervals	Unit is operating in random interval mode	Set Mode Selector Switch #6 to OFF
Intervals are always the same length when I want random intervals	Unit is operating in fixed interval mode	Set Mode Selector Switch #6 to ON
Intervals are too long or too short	Normal operation in random mode	The nature of randomness is that sometimes you get a series of short or long intervals
	Interval selector switches set incorrectly	Consult Interval Selection Table and reset switches #1–#5
Device never beeps after start-up beep	Interval selector switches set for too-long interval	Consult Interval Selection Table and reset switches #1–#5
	Beeper set in external device mode but external device never signals (or is not attached)	Set External Device switch #7 to OFF

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Interval Selection Table

Switch Positions Switch					Switch 6 = ON Random intervals		Switch 6 = OFF Fixed
					mean[a]	maximum[b]	interval
1	2	3	4	5	(minutes)	(minutes)	(minutes)
On	On	On	On	On	5	10	5
Off	On	On	On	On	10	20	10
On	Off	On	On	On	15	30	15
Off	Off	On	On	On	20	40	20
On	On	Off	On	On	25	50	25
Off	On	Off	On	On	30	60	30
On	Off	Off	On	On	35	70	35
Off	Off	Off	On	On	40	80	40
On	On	On	Off	On	45	90	45
Off	On	On	Off	On	50	100	50
On	Off	On	Off	On	55	110	55
Off	Off	On	Off	On	60	120	60
On	On	Off	Off	On	65	130	65
Off	On	Off	Off	On	70	140	70
On	Off	Off	Off	On	75	150	75
Off	Off	Off	Off	On	80	160	80
On	On	On	On	Off	90	180	90
Off	On	On	On	Off	100	200	100
On	Off	On	On	Off	110	220	110
Off	Off	On	On	Off	120	240	120
On	On	Off	On	Off	130	260	130
Off	On	Off	On	Off	140	280	140
On	Off	Off	On	Off	150	300	150
Off	Off	Off	On	Off	160	320	160
On	On	On	Off	Off	170	340	170
Off	On	On	Off	Off	180	360	180
On	Off	On	Off	Off	190	380	190
Off	Off	On	Off	Off	200	400	200
On	On	Off	Off	Off	210	420	210
Off	On	Off	Off	Off	220	440	220
On	Off	Off	Off	Off	230	460	230
Off	Off	Off	Off	Off	240	480	240

[a] All times plus or minus 5%.

[b] The minimum interval in random interval mode is 1/256th of the maximum interval. In any given random-interval-mode setting, there are 256 possible equally spaced and equally likely interval lengths.

v.3.x Beeper User Instructions

- Insert an earphone into the earphone jack. You may plug in or unplug the earphone at any time.

- Turn the beeper on with the ON/OFF/Volume thumbwheel.

- The beeper comes on beeping; adjust the volume as desired with the ON/OFF/Volume thumbwheel.

- Push the pushbutton to begin operation.

- If you push the pushbutton again and hold it down, the unit will beep for a second, be silent for a second, and continue this alternating beep/silence, allowing you to reset the volume and to be sure the beeper is turned on.

- When the beeper beeps, stop the beep by pushing the button. That also begins the next interval.

- If the beeper hasn't beeped for a long time, push the pushbutton, at which time you should hear the alternating beep/silence. If it does not beep, unplug the earphone. If it beeps without the earphone, the earphone is probably faulty, so replace it. If it still doesn't beep, make sure the device is turned on; if it is, call for assistance.

- When finished, turn the device off with the ON/OFF/Volume thumbwheel.

- If the device beeps and continues to beep for a minute or so (because you do not push the button), the beeper will enter a battery saving mode during which it will "chirp" (a very short, higher pitched beep) about once every 15 seconds. Turn the beeper off and then back on to resume operation.