



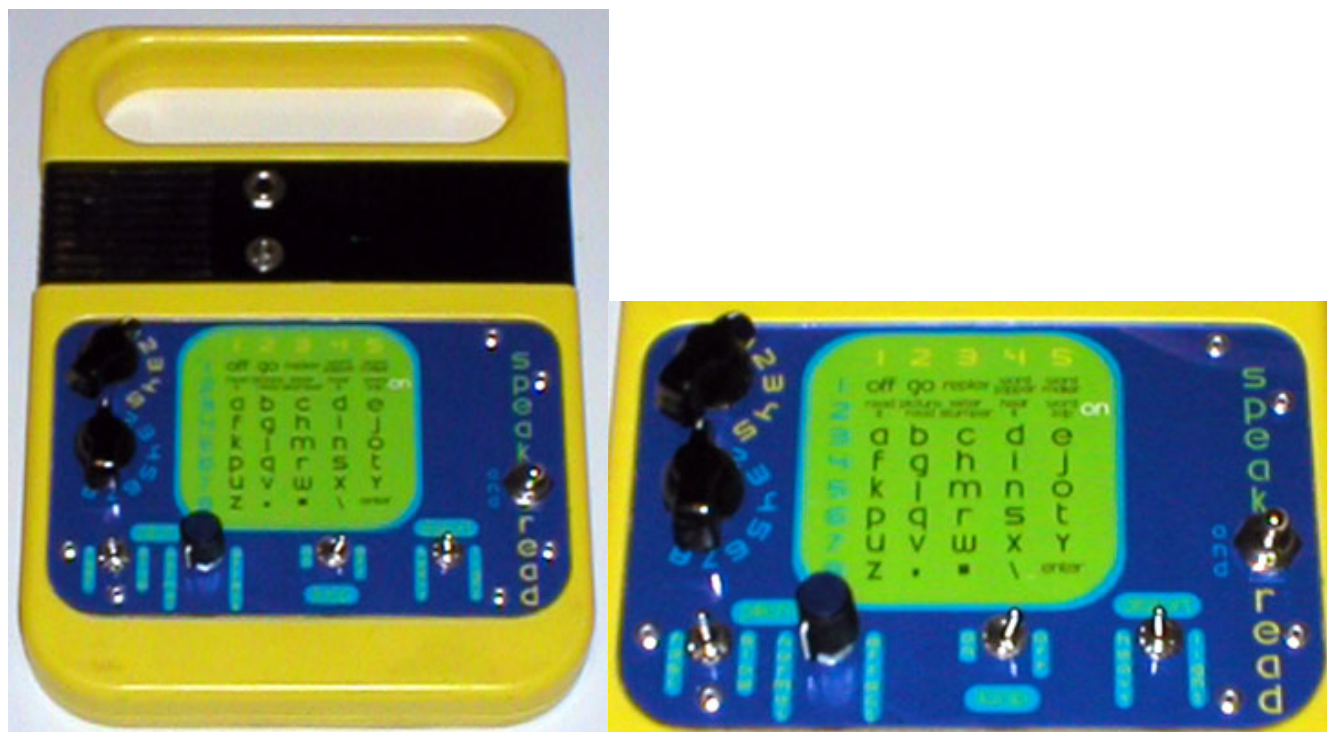
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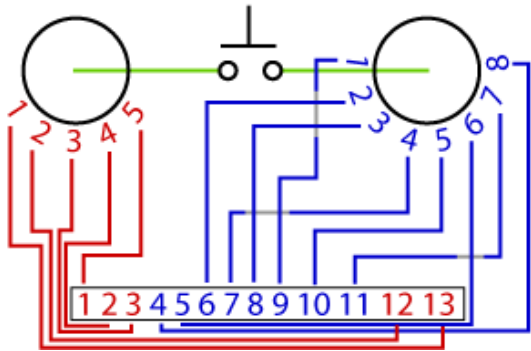
### [Bending Index](#)

This is long and can be daunting or just boring and probably confusing.

Here is my S&R that had a damaged membrane pad trace. I replaced it with rotary switches and a momentary switch. I was able to print an overlay with a chart for the keys, and label other controls which were mounted where they could not have been before. I made a plexi cover for the overlay which has 2 rivets in each corner



From the [button matrix](#) info we can see there are 13 wires in two groups. Each button on the pad is a combo of one "red" wire and one "blue" wire. Instead of using the membrane pad or momentary hard switches you can use two rotary switches and one momentary switch/button. I have 12 position rotary switches which can be set to a maximum number of positions with a special washer. For S&\* I set one to 5 positions, and the other to 8 positions. Then I wire the outer terminals to the corresponding group of wires, so I have one rotary with "red" wires and the other with "blue" wires. Lastly I wire each center terminal to a leg of the momentary switch/button. Now dial in positions on the rotaries and hit the switch/button. This is highly inefficient functionality, but you can gain room to mount other controls where you otherwise would not be able to. You get faster at dialing-in if you layout for the switches with some planning.



Making a chart for your buttons can be tricky. To make my chart I referenced the original list of wire combo codes for the buttons.  
First I redefined the two groups of wires. 1-3,12,13 becomes 1-5 "red". 4-11 becomes 1-8 "blue". I rewrote the combo codes adjusting 12 and 13 to 4 and 5 "red", and 4-11 to 1-8 "blue".

Now the tricky part. I did not wire 1-5 "red" to the 1-5 positions of the "red" rotary. I wired "red" to "red" like this:  
WIRE 1-2-3-4-5  
POSITION 5-4-3-2-1  
Blue wires/position were done like this:  
WIRE 1-2-3-4-5-6-7-8  
POSITION 8-6-2-4-3-1-5-7

Why wire non-sequentially or in appearantly reverse?  
The ordering of position to wire number depends on your chart layout.  
The original key layout looks like 5 rows of 8 buttons. I made my layout look like 8 rows of 5 buttons. The original 1-13 combos are still being made for each button, but if I wired sequentially my chart would go from this

1 2 3 4 5

1 off go replay word word  
read picture letter hear maker  
t read stumper t zap on

2 a b c d e

3 f g h i j

4 k l m n o

5 p q r s t

6 u v w x y

7 Z . # \ enter

to this

1 2 3 4 5

1 enter \ # . Z

2 t s r q p

3 on word hear letter picture read  
zap t stumper read t

4 j i h g f

5 e d c b a

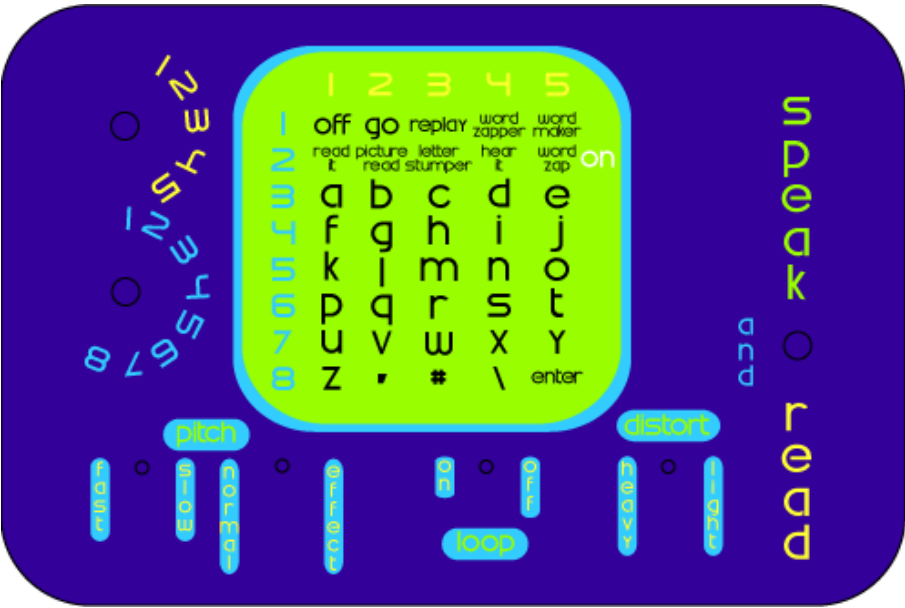
6 word word replay go off  
maker zipper

7 o n m l k

8 Y X W V U

I started my layout by knowing I wanted Modes before Letters, letter "A" first on the left, and 8 rows of 5. I wrote on paper 1-5 horizontally and 1-8 vertically. I knew "A" would be first column 3rd row, so I wrote out the rest of the alphabet from that starting point. "-enter follows after "Z". Then I wrote the original 1-13 wire combo next to each "button". Comparing the new combos (red and blue) with the original combos (1-13) gives the "key" for wiring up the rotaries. If my layout had Modes after/below letters the "key" would be different. If my layout was 5 rows of 8 buttons the "key" would be different.

This is the overlay I made in Illustrator.



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