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TECHNICAL NOTE: A SIMPLE CALCULATOR TO COUNTER CONVERSION

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Lindsley (1968) has noted an inexpensive mechanical counter now widely available, and McGreevy (1981) has listed a series of devices that may be used as counters.

When it is desired to have a behavioral event counted without a separate "push the counter" movement, or when the frequency of the behavior is greater than a mechanical counter will accommodate, an option to consider is an electronic counter. Any calculator with a "repeat function" feature (usually part of the "equals" key) can be so used by simply entering the key sequence -1, +1, =; and every subsequent depression of the "=" key will increment the total by 1.

However, this method requires a mechanical depression and release of the "=" key. For some clients, a larger keypad surface may be desired, and for some applications, e.g. wheelchair pressure relief push-ups or refrigerator door openings, a mechanical arrangement to physically push the "=" key may be clumsy or unreliable. Instead, wires may be added to a calculator "=" key contacts such that simply shorting the wires increments the counter. That arrangement permits a wide variety of switches and types of contact devices to be used.

An inexpensive (about \$10.00) calculator, the Unsonic 1541L, is very readily converted to such a counter without disturbing any of its calculator functions. With the calculator turned off, the case may be pried open by gently working a screwdriver blade around the joint at the perimeter of the case. Small cracking sounds will indicate that the latches holding the case together are breaking, which is normal. The bottom of the case will come off, exposing a printed circuit board attached at both ends by bare gold wires. At the bottom end of the calculator (away from the display), 17 wires join the printed circuit board to the keyboard back. Strip 1/8" of insulation from two wires of any length or gauge desired (#22 stranded, insulated wire is convenient) and solder one of them to

the 7th gold wire and one to the 11th gold wire, counting from either end of the array (see Diagram 1). Pencil marks on the edge of the board next to the appropriate wires will mark the ones to be soldered. Do not allow solder drops or any other contact with the remaining gold wires. The two soldered wires will be separated by 3 untouched ones. If you use #22 stranded wire, then 2 small 1/16" holes drilled anywhere convenient in the case will permit egress of your new leads. Gently lead the new wires out of the calculator case. Make sure that no extraneous contacts or shorts can occur.

Replace the back cover and turn the calculator on. Enter -1, +1, =, and then touch your two new leads together several times. The display will increment each time you short and release the two wires, as you are simulating a depression of the "=" key. These new leads may then be attached to any sort of switching device that makes and breaks contact, and you have an electronic counter with a wide variety of applications.

REFERENCES

Lindsley, O. R. A reliable wrist counter for recording behavior rates, *Journal of Applied Behavior Analysis*, 1968, 1, 77-78.

McGreevy, P. *Teaching and learning in plain English*. Kansas City, Missouri: Plain English Publications, 1981.

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Chart-sharing

THE KEY TO SUCCESS

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The client is a 27-year-old mentally retarded male named Cliff. Cliff lives with six other

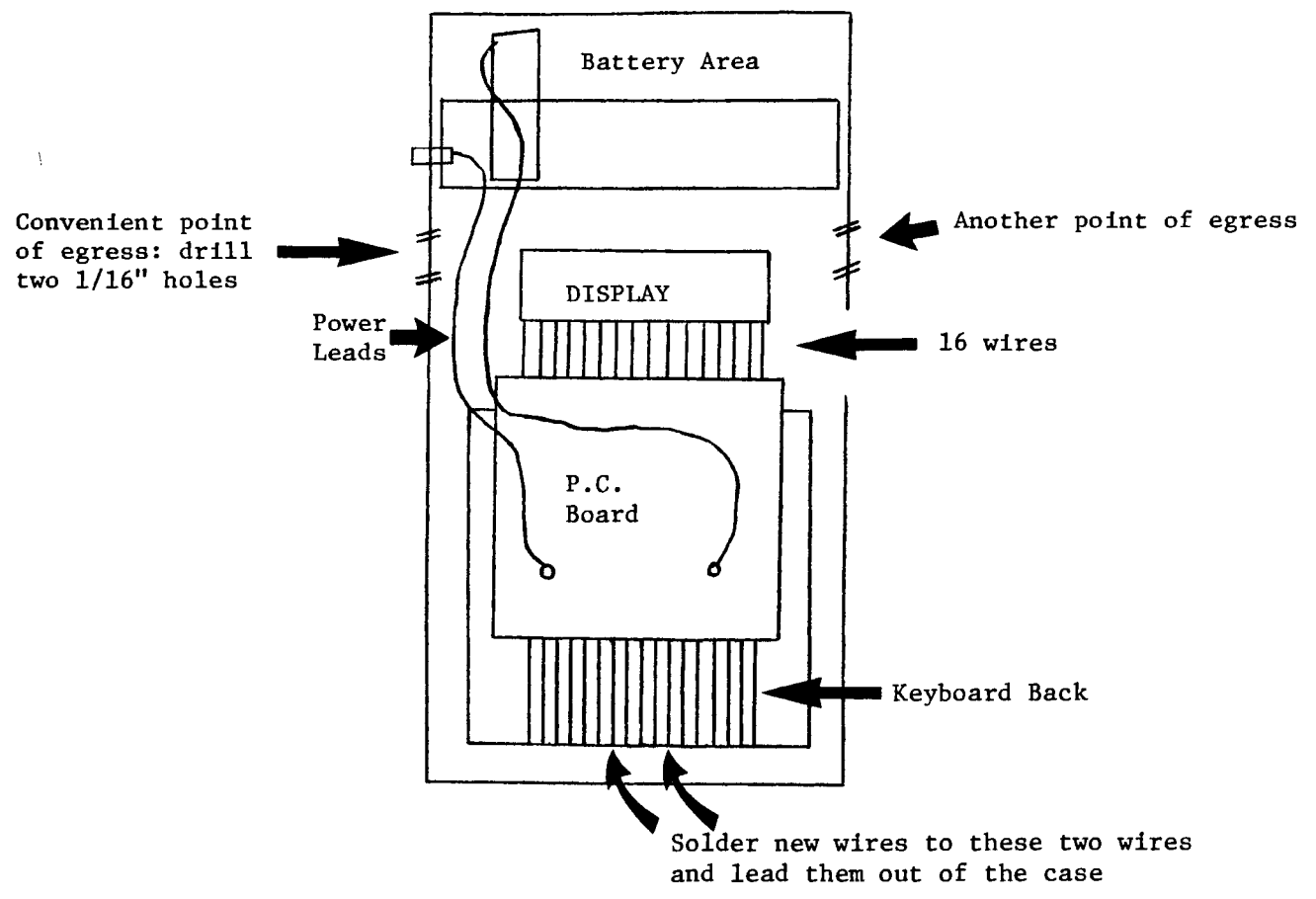


Diagram 1. Converting a Unisonic 1541L Calculator to a Counter with a Wide Variety of Applications