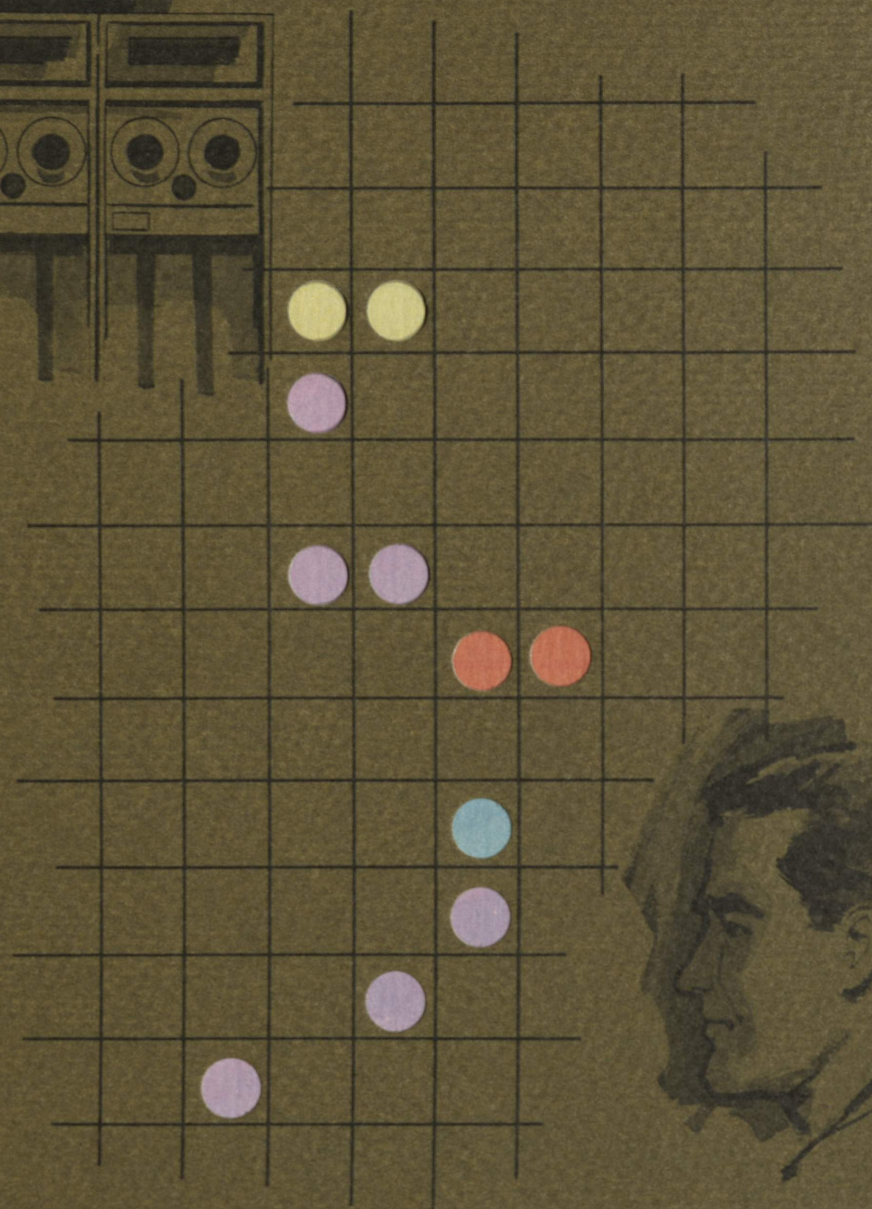
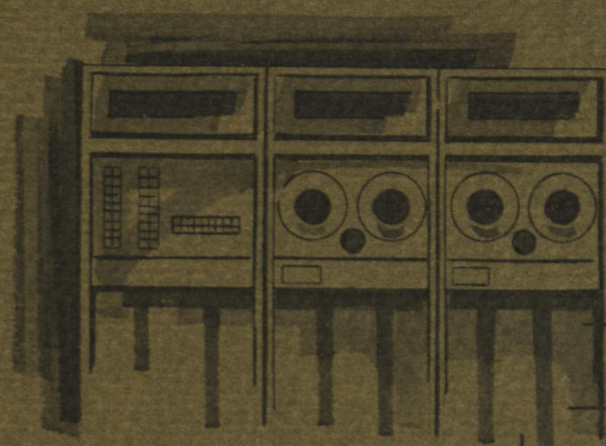


Introducing the
MICRO SWITCH

kb



SWITCH/DISPLAY MATRIX

NEW!

Flexibility in
alpha-numeric
arrangements

NEW!

Flexibility in
data entry
(inputs)

NEW!

Flexibility in
control and
lighted display

Unique
**MODULE-
MATRIX**
mounting
technique



MICRO SWITCH

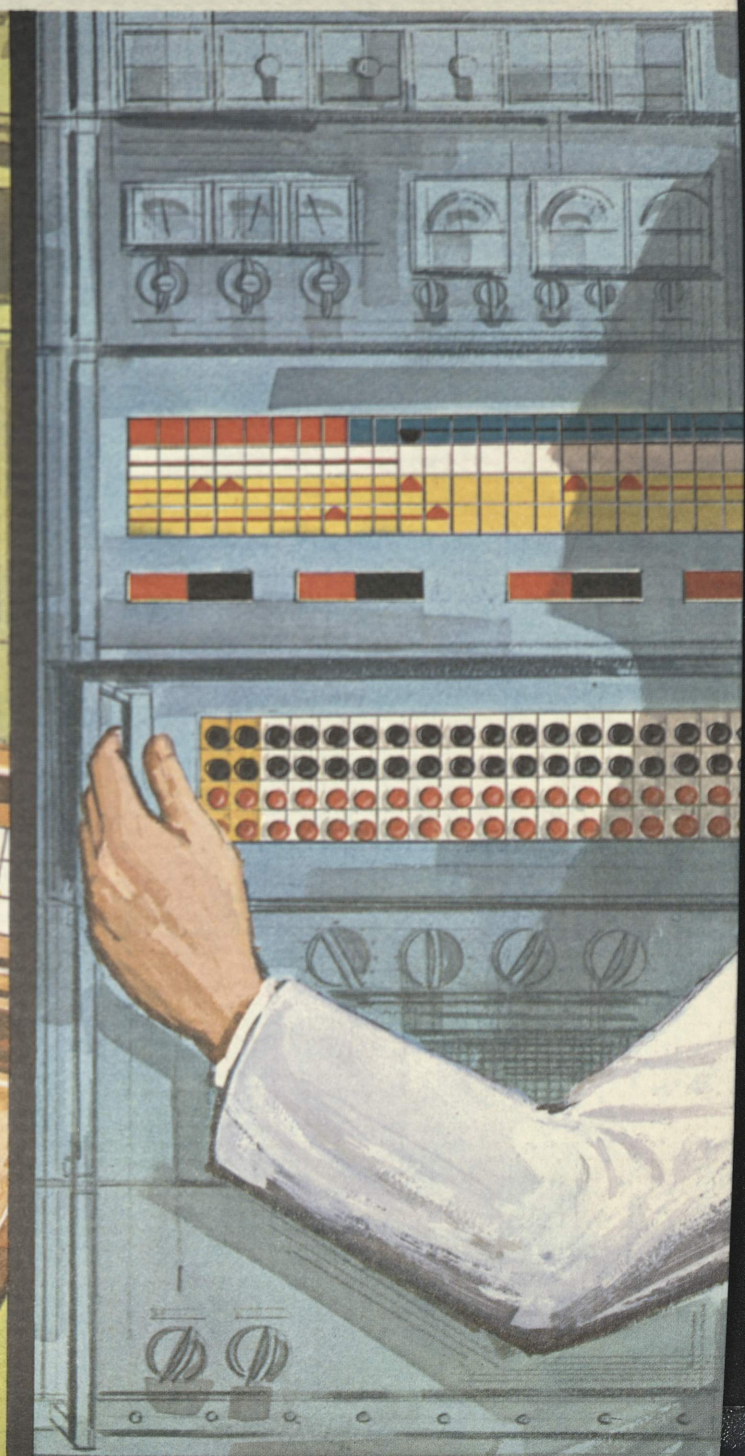
FREEPORT, ILLINOIS, U.S.A.

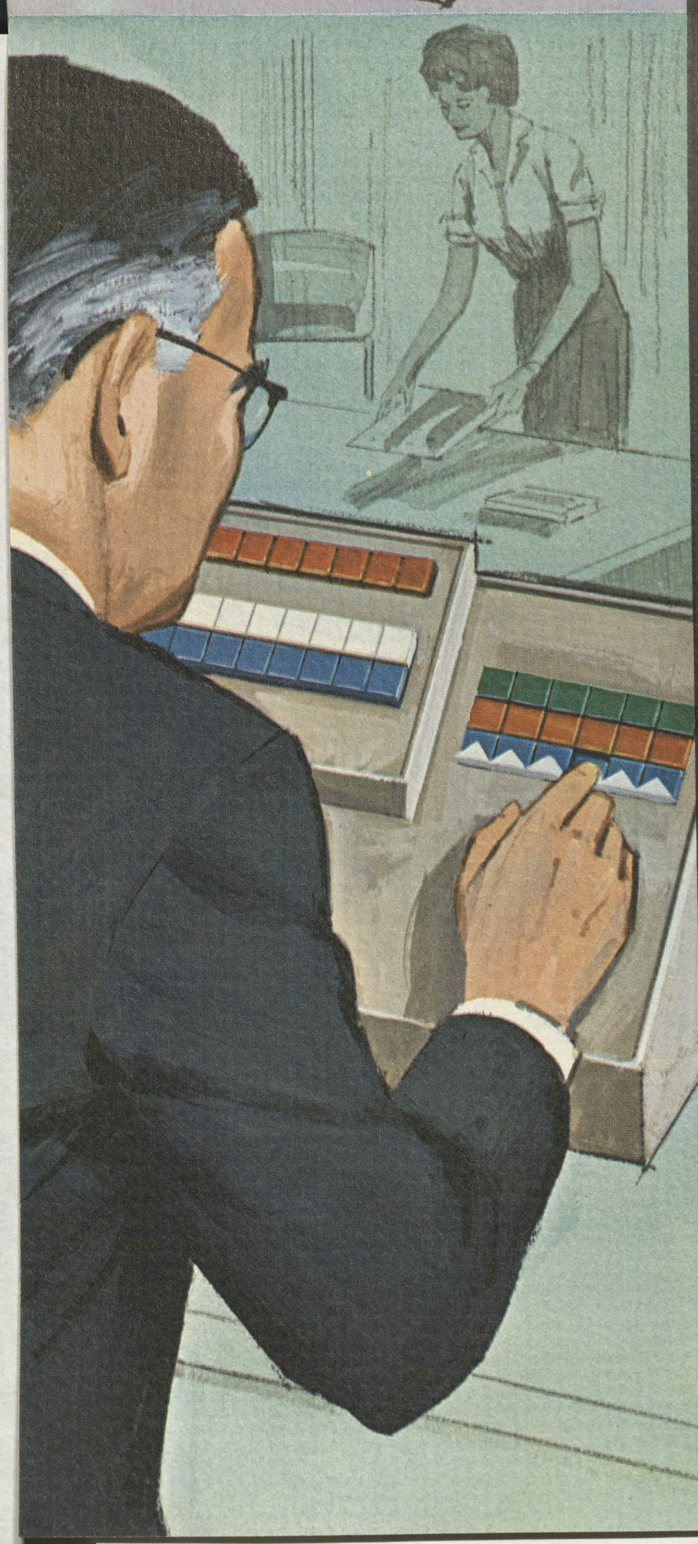
A DIVISION OF HONEYWELL

IN CANADA: HONEYWELL CONTROLS LIMITED, TORONTO 17, ONTARIO

h

...freedom for designers of man/machine interface



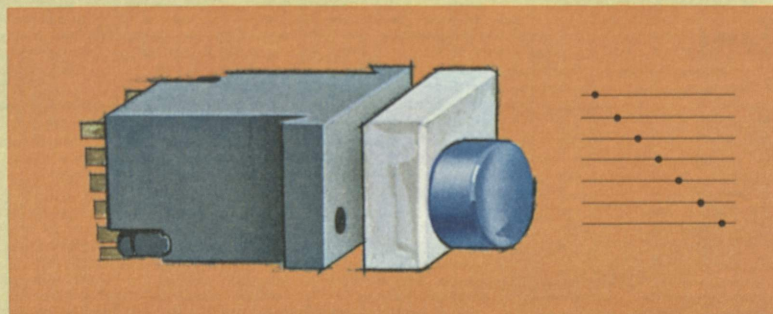


LIGHTED DISPLAY—in pushbutton switch modules and indicators; never before available in matrixed controls.

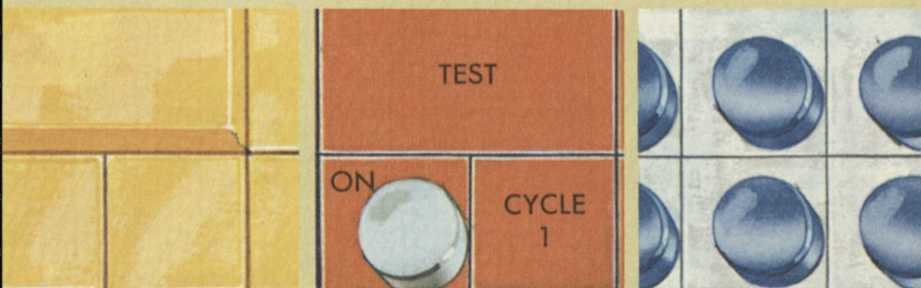
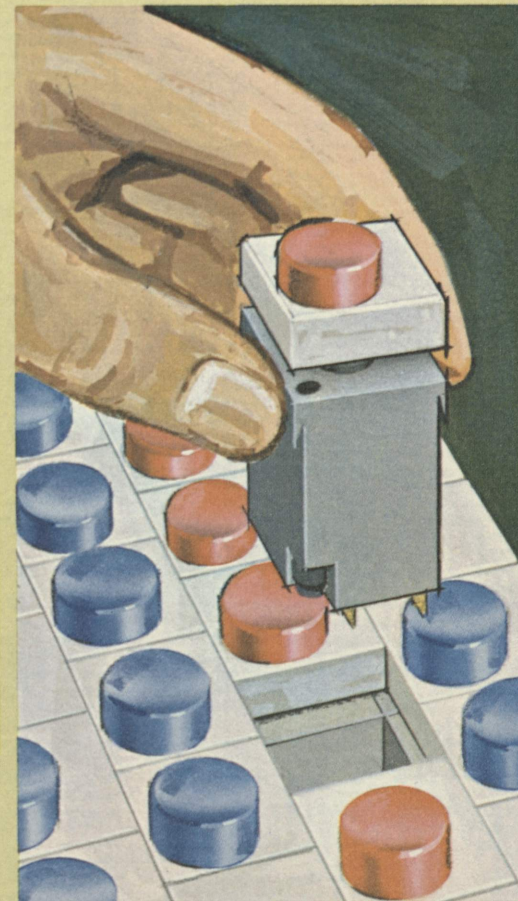


MICRO SWITCH "KB" offers a fresh approach to design and building of keyboards and control panels

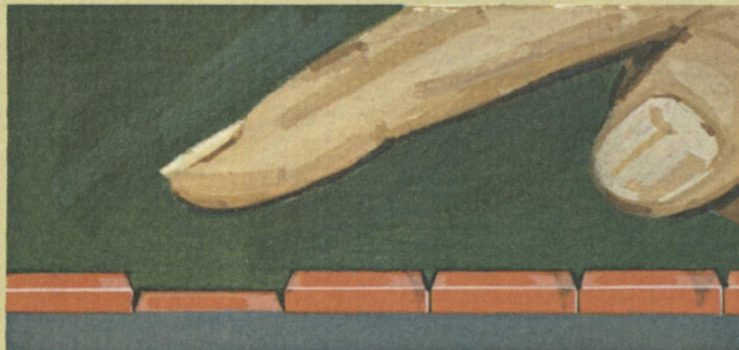
"AUTO ENCODING"—encoding switches enable encoding-by-connection; eliminates diode matrices, and associated cables and connections.



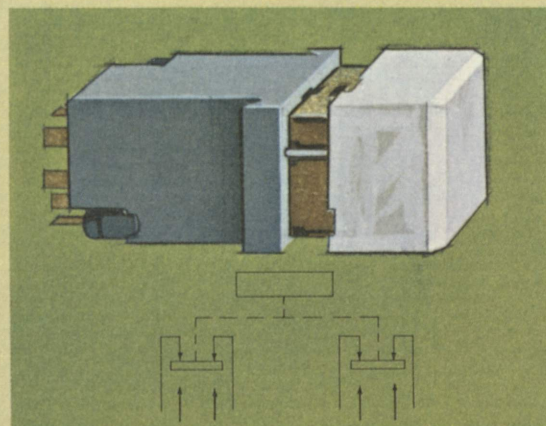
NEW TECHNIQUES—individual plug-in mount allows pre-wired switches to be inserted or removed from front of panel.



CUSTOMIZED APPEARANCE—vivid colors and different shapes to solve your own interface problems or design requirements.



MECHANICAL INTERLOCK—for bailing or lockout functions; one-by-one actuation, "key-down memory" feature.



FUNCTION CONTROL—power switches in choice of momentary or alternate-action. Has lighted display option.

**MICRO
SWITCH**

kb

SWITCH/DISPLAY
MATRIX

What is the "KB" Switch/Display Matrix?

The revolutionary new "KB" Switch/Display Matrix signals an advance in the state-of-the-art that offers a fresh approach to the design and construction of keyboards and control panels. The "KB" introduces a unique modular mounting technique which enables the entire matrix to be bench assembled! Vivid colored pushbuttons assemble into compact matrix and offer lighted display options.

Data entry, control, and indicating elements can be placed in the best positions and arrays without tooling or custom engineering. The compatible and unrestricted intermix of all components permits the human factors engineer and industrial designer to use the optimum configuration to solve his specific man/machine interface problem.

Two switch types are available—the encoding switch—and the power switch module.

"Auto Encoding"—a MICRO SWITCH exclusive—enables encoding-by-connection. The encoding switch produces an 8-bit binary output which is field variable. This provides a completely modular data entry element without the usual diode matrix and cabling, thus eliminating the high cost of encoding the raw keyboard contact closures.

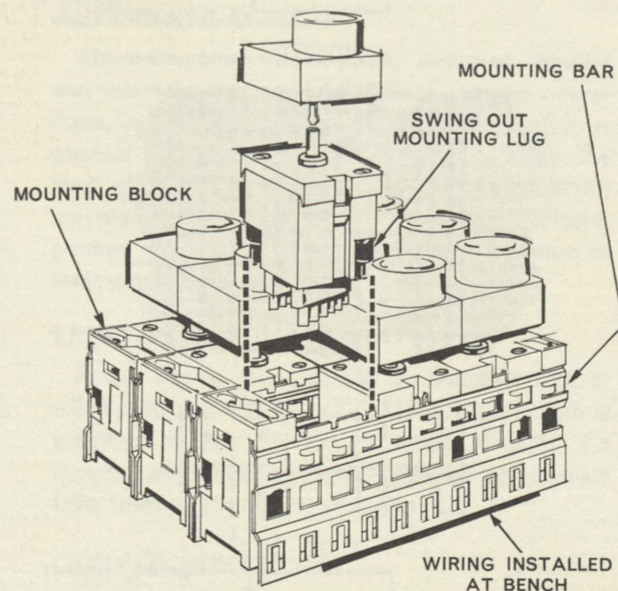
Typical "KB" uses include general business machines, scientific and military computer directed equipment, commercial control panels, stock market inquiry stations, cash registers, tape and card perforators, scientific panels, inventory systems, airline traffic control and reservation equipment, computer programmed (or directed) machine tools, calculators, and other data input and control applications that demand vivid color display and flexibility of mounting.

Versatile Modular Mounting System

A "KB" matrix can have an unlimited number of switches (up to 256 units per square foot).

Compactness of "KB" design is illustrated in this typical matrix. Nine pushbutton switches can be

fitted in a 2-1/4 inch square panel opening. Entire matrix is bench assembled from interchangeable modules. Individual switches can be easily installed or removed without demounting matrix or disturbing adjacent switches.



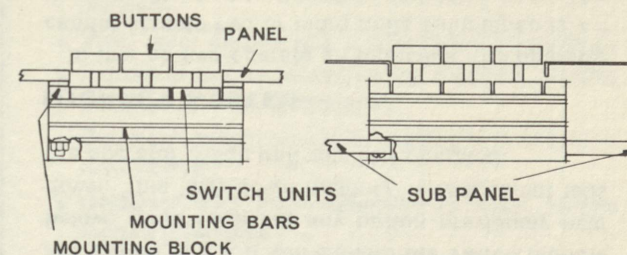
MOUNTING BARS are the basic support structure in the "KB" mounting assembly concept. They provide the backbone for the other "building block" elements in the matrix.

MOUNTING LUGS on the switch hold it secure in the matrix. By turning a screw on the top surface, these lugs (see illustration) are engaged or disengaged from slots in the mounting bars to enable easy installation or removal from front of panel.

Individual row subassemblies locked together in matrix have a high degree of panel strength. A 16 x 16 unit matrix will support itself in the cutout, without additional bars or strengthening members. The matrix actually adds strength to the panel.

MOUNTING SCHEMES—Panel installation of the "KB" matrix is quick and easy. It can be bolted to the back of the front panel or mounted on a subpanel.

Only a single hole cutout is necessary. Switch unit can be mounted individually, where required.



PANEL MOUNTING

SUB PANEL MOUNTING

Panel Display Flexibility

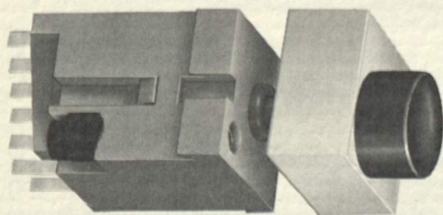
In addition to conventional single-level rectangular and square button shapes, "KB" has a new 2-level button design that offers four important user benefits: (1) raised operator knob is inset on button base to provide an attractive, interesting panel look, (2) human factored display shapes tell at a glance the difference between pushbutton and indicator only, (3) use of separate colors for button extension and base permits wide range of color adaptability—by merely varying color combinations, the complete appearance of the panel can be altered, (4) legend on pushbutton base is on lower level, protected against wear and visible during operation. Standard buttons are 1/2" round cylinders on a 3/4" x 3/4", 3/4" x 1-1/8" or 3/4" x 1-1/2" base. Other shapes could be used.

PUSHBARS in various lengths can be used with an individual switch module or group of switch modules. Pushing the bar at any point along its surface will actuate the switch module(s) mounted underneath.

SPACER hardware in high and low level heights is available to complete the matrix or allow for future expansion. The high level type can be used as barriers against accidental operation.

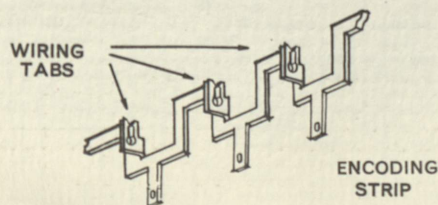
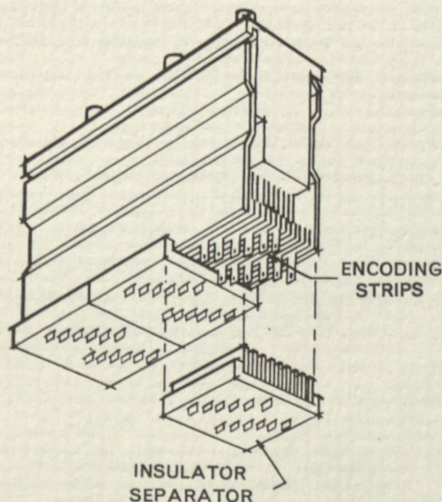
LIGHTED DISPLAY is offered in a wide choice of colors and color-combinations. Miniature T-1 long life lamps provide illumination. Lamps can be installed or removed quickly without tools.

Unique Encoding Switch Design



- Provision for up to eight output bits
- 256 possible code combinations
- Delayed strobe eliminates contact bounce on output bits
- Momentary-action
- Eliminates need for separate encoding function

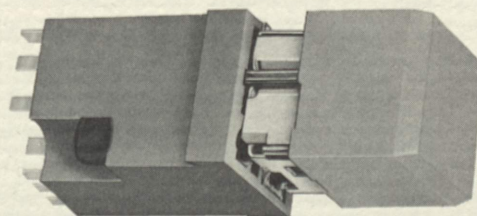
Momentary-action encoding switch modules are primarily for use as a data entry device. They will directly provide a field variable 8-bit output code. Encoding switches also have an electrical monitor which can electrically indicate if two switches have been operated at the same time by mistake.



Power Switch for Function Control

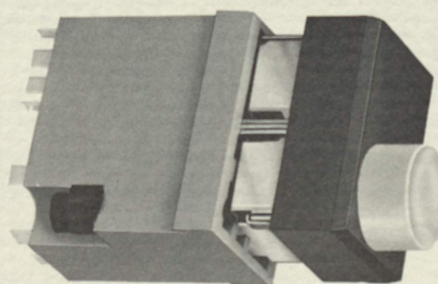
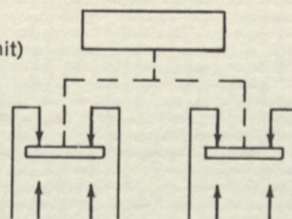
- Also available with lighted display
- Momentary or maintained contacts
- 2-pole or 4-pole circuitry

Designed for use as a function control ("on-off", "total", "cancel", etc.), the power switch modules are size compatible with the encoding switch units and can be combined with them in a common matrix.



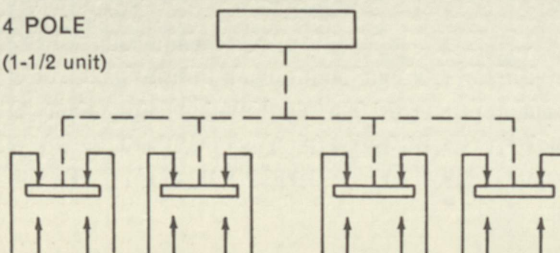
1-UNIT

2 POLE
(1 or 1-1/2 unit)



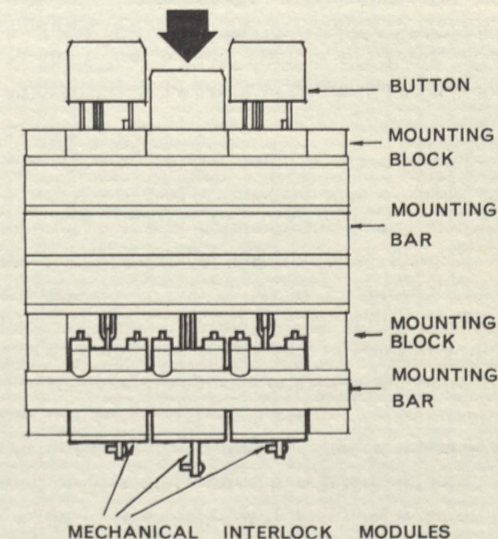
1-1/2-UNIT

4 POLE
(1-1/2 unit)



Mechanical Interlock provides "Key-down memory"

An add-on feature of the "KB" series is the mechanical interlock module. It attaches to an encoding or 1-unit power switch to provide bailing and "no-two-operate" functions (drawing shows its location in modular stack).

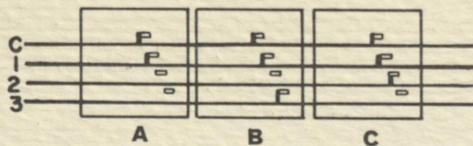


BAILING SYSTEM

Up to 16 switch modules attached to the same mounting bars can be actuated in a one-by-one sequence. With the bailing feature, the pressing of any button in a row will actuate the switch module below, while releasing any button previously held down. This "key-down memory" arrangement tells the operator which unit was last operated.

LOCKOUT SYSTEM

In this no-two-operate arrangement, the operator cannot actuate two or more units simultaneously if they are attached to the same mounting bars. The lockout can function on switch modules in a row of 16 units or less.



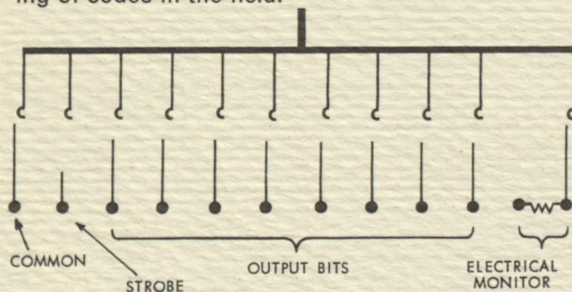
"AUTO ENCODING" FEATURE

This graphic view of the wiring shows how the encoding switch terminals are bussed in a row using the encoding strips.

As supplied, the encoding strip tabs would contact all terminals. In the case of switch module "B", above, the tab that would have made contact with terminal No. 2 has been clipped so that the encoding strip picks up only terminals designated 1 and 3 which give switch module "B" a code value of "4", as in the "BCD" code.

Should a switch module in the matrix become damaged, a new unit can be plugged in its place, bussed automatically to the proper encoding strip connections.

Encoding can also be accomplished by clipping switch terminals. This procedure enables the changing of codes in the field.



ELECTRICAL OUTPUT

All moving contacts are trifurcated (three surfaces) to insure reliability. As the switch module is operated, the common and electrical monitor circuit is made first, followed by up to eight output bit circuits and, lastly, the strobe circuit which is intentionally delayed to allow a stable output from the output bit contacts. (A special contact is available for a "repeat" or sequence action control.)

ELECTRICAL RATING

Up to 60 milliamps at 2-10 vdc (over 10 million operations).

MOMENTARY-ACTION

Momentary-action switch modules transfer the circuit only while the button is manually held depressed. When the finger is removed, the button and contacts return to their unoperated position.

ALTERNATE-ACTION

Alternate-action (push-push) switches transfer and maintain the contact position between operations, in the following cycle: (1) when the button is pushed and released, it remains visibly below the level of other unoperated switches (approx. 3/16") and maintains circuit transfer, (2) when the button is pushed again, both button and contacts return to their original position.

LIGHTED POWER SWITCH

Power switch modules can be supplied with or without lighted display pushbuttons. Illumination is provided by two or four miniature long-life T-1 lamps. Lamps can be easily installed or removed from front of panel without tools.

LIGHTED INDICATOR

Indicator modules, identical in appearance to the power switches but without provision for switching, can be supplied for use as a lighted display unit only.

Lamps used in the lighted power switches and indicators are miniature high reliability (16,000-hour life) #718 (MS24515-718) T-1 type.

ELECTRICAL RATING

28 vdc	3 amps, inductive;
	5 amps, resistive.
115 vac	5 amps, resistive or inductive.

MICRO SWITCH *kb*

Resume of "KB" Features

- Dynamic answer to man-machine interface problem
- Vivid color display in a compact control package
- Individual plug-in mount switch modules simplify installation and maintenance.
- Gives equipment panels an exciting look of tomorrow—today
- Designed with close attention to good human factors principles
- Reliable long-life switching
- Provides designer with wide choice of color, shapes and switching combinations
- Meets the need for a versatile numeric or alpha numeric keyboard and control panel from interchangeable bench assembled modules.
- Encoding switch provides up to 8-bit field variable output.
- Simplified wiring cuts installation time
- Available with or without lighted display feature
- Choice of low energy or medium duty electrical capacities
- Mechanical interlock enables bailing and lockout functions.

For More Information

Call the nearest
MICRO SWITCH
Branch Office for ordering
information or a
demonstration.



Branch offices

Atlanta, Georgia
875-9361

Bettendorf, Iowa
355-6456

Binghamton, New York
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EM 3-5441

Dayton, Ohio
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Wichita, Kansas
LY 1-3435

MICRO SWITCH

FREEPORT, ILLINOIS, U.S.A.

A DIVISION OF HONEYWELL

IN CANADA: HONEYWELL CONTROLS LIMITED, TORONTO 17, ONTARIO