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CHERRY®

CHERRY ELECTRICAL PRODUCTS CORP.

3600 Sunset Avenue, Waukegan, Illinois 60085—312/689-7600—TWX 910-235-1572

CHERRY® switches & keyboards

CATALOG C-74

ELECTRONIC DATA ENTRY KEYBOARDS . . . . KEYBOARD SWITCHES . . . MATRIX KEYBOARDS

the complete line of keyboard switches

FOR MODERN ELECTRONIC DESK TOP CALCULATORS... COMPUTER TERMINALS...CREDIT CARD VALIDATORS

KEY MODULE:

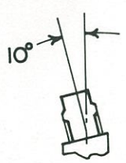
Another CHERRY design first. Gold "Crosspoint" Contact Switch (two Gold prisms at right angles to each other) has provided highly reliable keyboard switching for several years in thousands of the most sophisticated electronic desk top calculators and computer terminals.

This proven design concept (crossed knife edge contact configuration) provides high force per unit of contact area and virtually eliminates contact closure interference by contaminates.

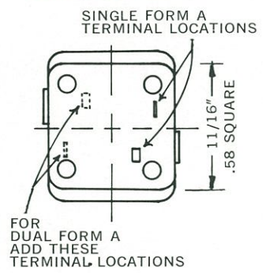
Precious metal contact material (W/E Alloy #1) consists of 69% Gold, 25% Silver and 6% Platinum. Contact interfaces are inert to chemical action with resultant low contact resistance (typically 25 milliohms).

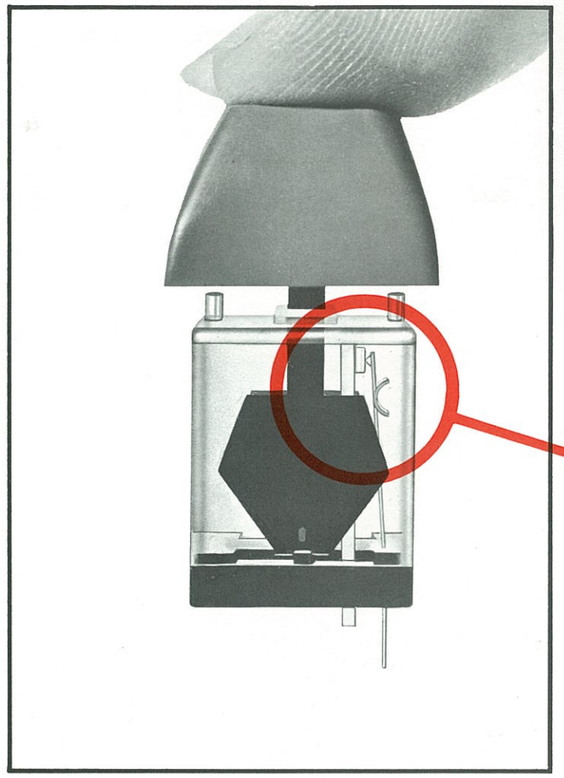
Lower profile key module (¾") reduces overall keyboard height to 1½" from key top to printed circuit board.

10° OFFSET KEY STEM
for Stepped Keyboards
(OPTIONAL)

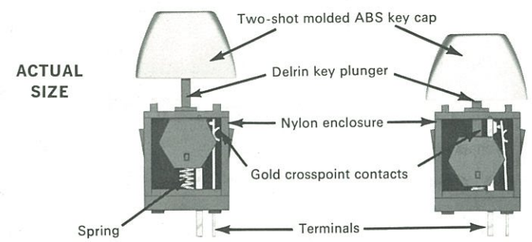


KEY MODULE BASE





CHERRY LOW PROFILE KEY SWITCHES WITH GOLD "CROSSPOINT" CONTACTS

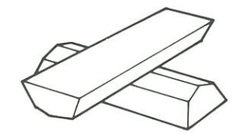


CONTACT INNOVATION

Cross Section of Contact

W/E #1 69% Gold, 25% Silver, 6% Platinum

Crosspoint Configuration

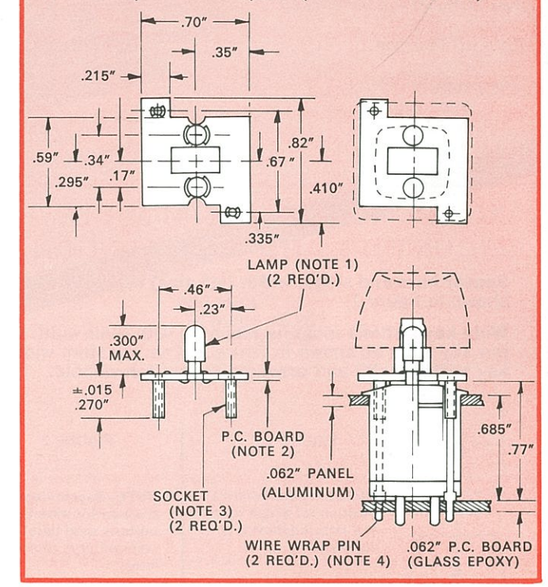


A proven design concept—the new gold "crosspoint" contact innovation provides positive switching of low energy solid state circuits.

Contacts are normally held apart for greatest shock resistance. No microphonics or bounce during turn-off or at rest.

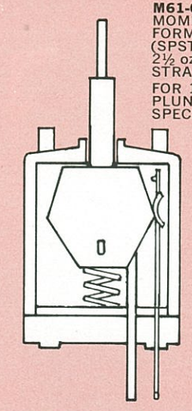
SPECIAL LAMP SWITCH.

1. *Lamp*—T-1 Unbased Industry No. (USASI) 683 5 Volts—.060 Amps. Candle Power M.S.C.P. .050 + 15% Rated Avg. Lab Life 100 M Hours
2. *PC Board*—3/64" Thick Glass Epoxy Clad on 1 side
3. *Socket*—Berg Part No. 47796 or 75302-1
4. *Wire Wrap Pin*—.025 Square (AMP. PART 86144-3)

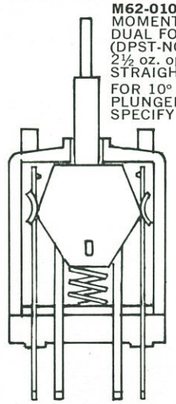


CHOOSE FROM THESE FIVE TYPES....WITH STRAIGHT OR ANGLED STEMS FOR SLOPED OR STEPPED KEYBOARDS

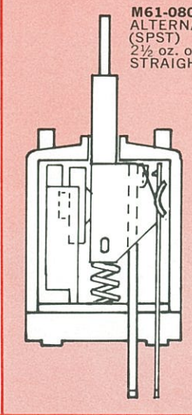
M61-0100
MOMENTARY
FORM A
(SPST-NO)
2½ oz. operating force
STRAIGHT PLUNGER STEM
FOR 10° ANGLE
PLUNGER STEM
SPECIFY PART NO. M61-0110



M62-0100
MOMENTARY
DUAL FORM A
(DPST-NO)
2½ oz. operating force
STRAIGHT PLUNGER STEM
FOR 10° ANGLE
PLUNGER STEM
SPECIFY PART NO. M62-0110



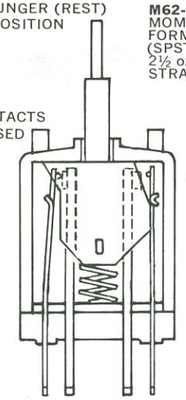
M61-0800
ALTERNATE ACTION
(SPST)
2½ oz. operating force
STRAIGHT PLUNGER STEM



PLUNGER (REST) POSITION

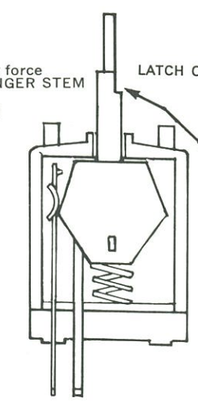
M62-0900
MOMENTARY
FORM A Plus FORM B
(SPST-NO Plus SPST-NC)
2½ oz. operating force
STRAIGHT PLUNGER STEM

CONTACTS CLOSED

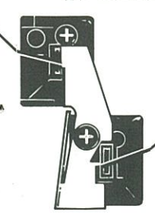


CONTACTS OPEN

SHIFT
M61-0300
MOMENTARY
FORM A
(SPST-NO)
2½ oz. operating force
STRAIGHT PLUNGER STEM
FOR 10° ANGLE
PLUNGER STEM
SPECIFY PART
NO. M61-0310

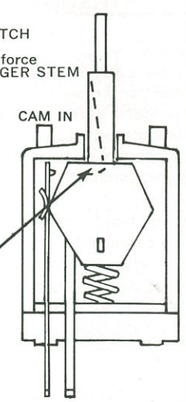


LATCH OUT



SHIFT LOCK
M61-0500
MOMENTARY/LATCH
(SPST-NO)
2½ oz. operating force
STRAIGHT PLUNGER STEM
FOR 10° ANGLE
PLUNGER STEM
SPECIFY PART
NO. M61-0510

CAM IN



mechanical & electrical specifications

MECHANICAL

Operating Force.....2½ oz. ± ½ oz. Std. (Also available with 6 oz. Oper. Force)

Pretravel.....085 ± .030 Std. (Alternate action version pretravel .030 ± .055)

Total Travel..... .160 ± .020 Std.

Key Module Case Material.....Thermoplastic (Nylon)

External Terminal.....Tin Plated Brass Alloy

Temperature
- Operating.....0°/60°C
- Storage.....—35°C/65°C

ELECTRICAL

Contact Rating (Form A contacts)
- DC Resistive.....3W max.
- AC Resistive.....3VA max.
- Current.....0.125 amp. max. switching
  0.5 amp. max. carry
- Voltage.....28V max.

Initial Contact Resistance.....200 milliohms max. (typically 25 milliohms)

KEY BUTTON & KEY MODULE MOUNTING AND INSTALLATION

Spacer bars and single width (¾" size) key buttons should be mounted as shown in figure 1.

Wide key buttons must be mounted with their width along the wide axis of the key stem as shown in figure 2. The key stem width supports the extra key button width and prevents key button wobble.

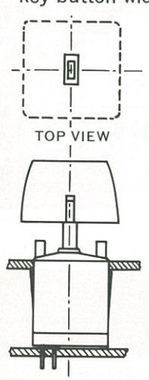
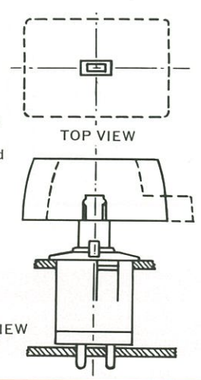


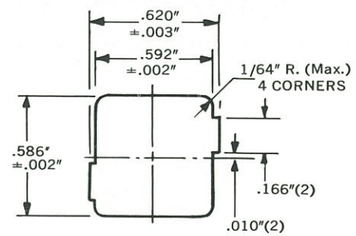
FIGURE 1

NOTE: Recommended position for single width key button (shown) or spacer bar.

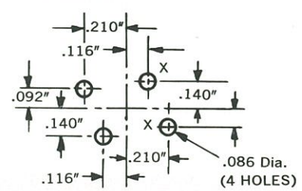
FIGURE 2

NOTE: Recommended position for wide key buttons solid (line) and stepped keys (dotted line).





RECOMMENDED PANEL CUT-OUT



TERMINAL LOCATION
M-62-0100
FOR M-61-0100
OMIT "X" HOLES

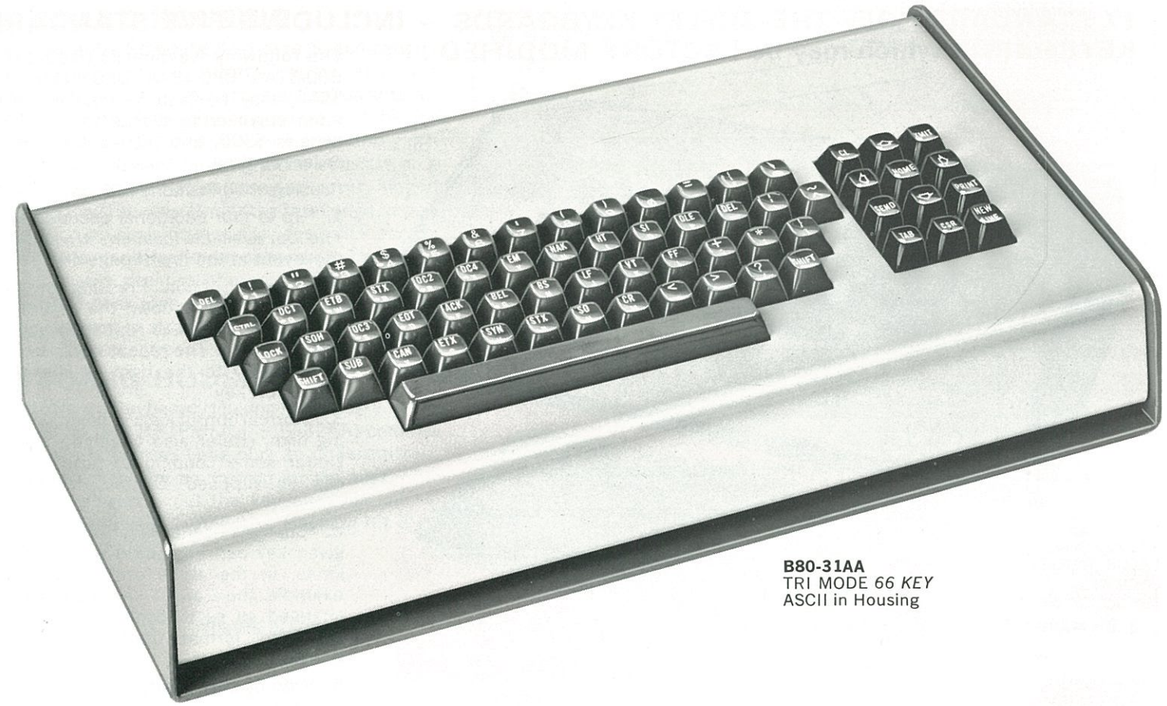
ORDERING INFORMATION

Cherry Key Modules are ideal for electronic desk top calculators. To install individual Cherry Key Modules in a calculator, care is necessary when soldering to avoid contamination of switch contacts.

Some helpful hints on soldering are contained in Cherry's *Detailed Procedure for Process Control on Wave Solder Machine.* Copies are available upon request. Just write or phone New Products' Manager.

PART NUMBERS		DESCRIPTION		
Straight Stem	10° Offset Stem			
M61-0100	M61-0110	MOMENTARY	FORM A	(SPST-NO)
M62-0100	M62-0110	MOMENTARY	DUAL FORM A	(DPST-NO)
M61-0800	M61-0810	ALTERNATE ACTION		(SPST)
M61-0300	M61-0310	SHIFT	MOMENTARY	(SPST-NO)
M61-0500	M61-0510	SHIFT LOCK	MOMENTARY/LATCH	(SPST-NO)
M01-0005	M01-0005	ADAPTER FOR LIGHTS		

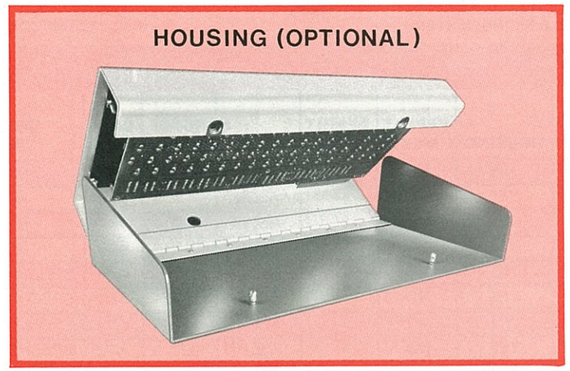
17 standard cherry keyboards...



B80-31AA
TRI MODE *66 KEY*
ASCII in Housing

STOCKED FOR IMMEDIATE "OFF-THE-SHELF" DELIVERY SAVE TIME AND MONEY

HOUSING (OPTIONAL)



Standard hinged type Keyboard Housing. *See page 41 for details.*

- No Tooling Costs to Pay
- No Engineering Time Required
- No Artwork or Set-up Charges
- No Turn-Around Time Involved

Choice of several formats, key arrays, 1 to 4 modes, sloped or stepped keyboards, basic or enclosed in stand-alone housing, fully encoded or nonencoded plus many optional features possible at nominal extra cost.

FOR COMPLETE SPECIFICATIONS & ORDERING INFORMATION INCLUDING PARTS NUMBERS AND PRICES ON KEYBOARDS AND HOUSING SEE NEXT PAGE

the complete line of standard stocked electronic data entry keyboards

17 STANDARD "OFF-THE-SHELF" KEYBOARDS — INCLUDING FIVE STANDARD KEYBOARDS which may be FACTORY MODIFIED . . .

B70-54AA
53-Key QUAD MODE
ASCII (ASR33)
Housed

B70-4753
53-Key QUAD MODE
ASCII (ASR33) Without Housing

The following Keyboards (B80-3766; B80-31AA; B80-48AA; B80-49AA; B80-35AA) may be factory modified. Minimum engineering charge for modifications is $300, and 50 piece minimum order required.

Possible modifications include:

1. *Up to four additional encoded keys. The four available locations are shown in the layout at the top of page 44.

2. *A repeat option. Pressing any data key while holding down the repeat key causes the strobe to repeat at approximately 12 Hz. The repeat key is located immediately to the right of the right-hand shift key.

3. *Normal output logic is negative, resting high. (Refer also to timing charts). Under some conditions, positive logic can be supplied. Contact factory for details.

4. *Changes in the code delivered by a given key can be made, within certain limits, in the alpha section only. For example, the Z and Y keys can be interchanged so as to conform to German typewriter format. Contact factory for details.

5. *Odd or even parity can be supplied.

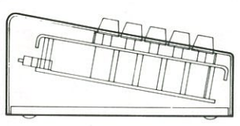
6. *High force keys can be provided at any position.

7. *Special legends can be provided at all locations.

8. *Special keycap colors can be provided.

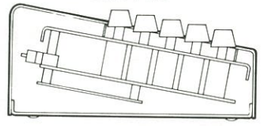
A CHOICE OF TWO KEY BUTTON PLUNGER TYPES

SLOPED



STRAIGHT PLUNGER STEM

STEPPED



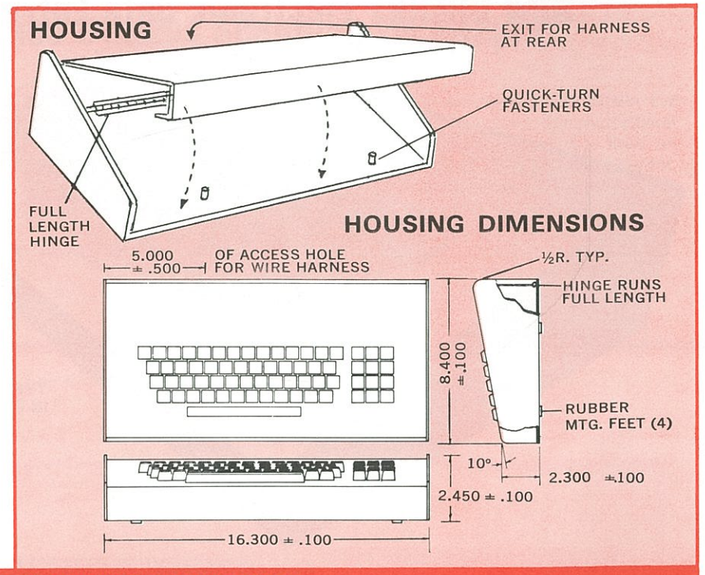
10° ANGLE PLUNGER STEM

KEYBOARD HOUSING

As shown in the Standard Keyboard Specifications Chart several Cherry keyboards are available in a housing. This housing converts any keyboard to an attractive, stand-alone desk instrument, suitable for office or lab use. Colors are blue-gray and "off-white." The keyboard housing alone consists of a formed 1/8-inch aluminum base and cover, hinged together along the rear. Under the front edge, a pair of quarter turn Dzus fittings provides quick access to the interior for attachment of harness. The housing has a cable strain-relief, and rubber base pads that protect desk-tops against scratching. The operating surface is sloped at approximately 10° to the desk-top.

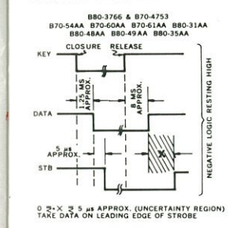
KEYBOARD HOUSING KIT

Cherry offers a Keyboard Housing Kit for low volume applications. The Kit (Part No. B99-82AA) consists of a blue-gray painted base plus an unassembled, unpainted cover with *no opening for the keys.* This enables the user to cut the key openings as required. All hardware is included. Housing Kit B99-82AA is priced at $50.

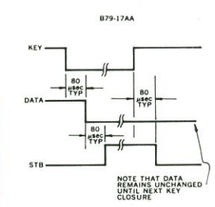


KEYBOARD TIMING CHARTS

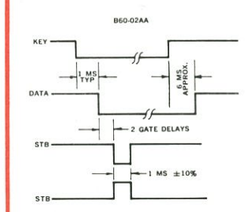
TIMING DIAGRAM NO. 1



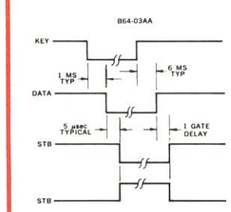
TIMING DIAGRAM NO. 2



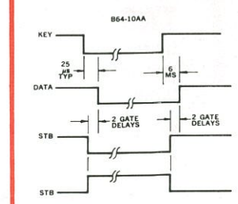
TIMING DIAGRAM NO. 3



TIMING DIAGRAM NO. 4



TIMING DIAGRAM NO. 5



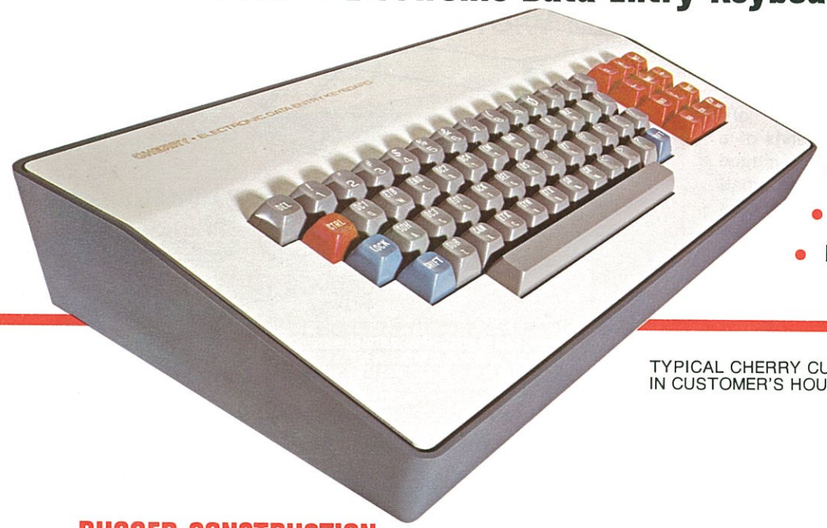
STANDARD KEYBOARDS SPECIFICATIONS CHART

CHERRY PART NO.	SEE FOOT-NOTES	SIMILAR TO	NO. OF KEYS	SLOPED OR STEPPED	HOUSING	REPEAT KEY	REPEAT FREQ.	CODE	NO. OF MODES	DATA BITS	PARITY BIT	STROBE GOES	LOGIC	POWER REQ.	DRIVE CAPABILITY	ROLL-OVER	TYPE OF COMPONENTS	CONNECTOR MATES WITH	TIMING DIAGRAM NO.	ASK FOR SCHEMATIC NO.	PRICE 1-249 PIECES
B70-4753		ASR-33	53	SL	NO	NO	—	ASCII	4	7	NONE	LOW	NEG	5 V 350 MA	10 STD TTL LOADS	2 Key	TTL	VIKING #2VH15/1AB	1	120-0032	$119.00
B70-54AA		ASR-33	53	SL	YES	NO	—	ASCII	4	7	NONE	LOW	NEG	5 V 350 MA	10 STD TTL LOADS	2 Key	TTL	VIKING #2VH15/1AB	1	120-0032	$169.00
B70-60AA		ASR-33	53	ST	NO	NO	—	ASCII	4	7	NONE	LOW	NEG	5 V 350 MA	10 STD TTL LOADS	2 Key	TTL	VIKING #2VH15/1AB	1	120-0032	$119.00
B70-61AA		ASR-33	53	ST	YES	NO	—	ASCII	4	7	NONE	LOW	NEG	5 V 350 MA	10 STD TTL LOADS	2 Key	TTL	VIKING #2VH15/1AB	1	120-0032	$169.00
B80-3766	#	ASCII TRI-MODE	66	SL	NO	NO	—	ASCII	3	7	SPECIAL ORDER	LOW	NEG	5 V 350 MA	10 STD TTL LOADS	2 Key	TTL	CINCH #250-22-30-260	1	120-0044	$127.00
B80-31AA	#	ASCII TRI-MODE	66	SL	YES	NO	—	ASCII	3	7	SPECIAL ORDER	LOW	NEG	5 V 350 MA	10 STD TTL LOADS	2 Key	TTL	CINCH #250-22-30-260	1	120-0044	$177.00
B80-48AA	#	ASCII TRI-MODE	66	ST	NO	NO	—	ASCII	3	7	SPECIAL ORDER	LOW	NEG	5 V 350 MA	10 STD TTL LOADS	2 Key	TTL	CINCH #250-22-30-260	1	120-0044	$127.00
B80-49AA	#	ASCII TRI-MODE	66	ST	YES	NO	—	ASCII	3	7	SPECIAL ORDER	LOW	NEG	5 V 350 MA	10 STD TTL LOADS	2 Key	TTL	CINCH #250-22-30-260	1	120-0044	$177.00
B80-35AA	#	ASCII TRI-MODE	67	SL	NO	YES	12 Hz	ASCII	3	7	SPECIAL ORDER	LOW	NEG	5 V 350 MA	10 STD TTL LOADS	2 Key	TTL	CINCH #250-22-30-260	1	120-0071	$131.00
B79-17AA		IBM 029	54	SL	NO	NO	—	SPECIAL	2	7	NONE	HIGH	POS	5 V 450 MA	1 STD TTL LOAD	N Key	TTL + MOS	AMP #582763-4	2	120-0041	$152.00
B60-02AA	*	TOUCH TONE	12	SL	NO	NO	—	ASCII	1	7	NONE	1 HIGH 1 LOW	POS	5 V 150 MA	10 STD TTL LOADS	2 Key	TTL	SCOTCH-FLEX 3421	3	120-0060	$54.90
B64-03AA		—	11	SL	NO	NO	—	BCD	1	4	NONE	1 HIGH 1 LOW	POS	5 V 150 MA	10 STD TTL LOADS	2 Key	TTL	CINCH #251-15-30-170	4	120-0021	$43.70
B64-10AA		—	12	SL	NO	NO	—	BCD	1	4	NONE	1 HIGH 1 LOW	NEG	5 V 150 MA	10 STD TTL LOADS	2 Key	TTL	HAS SOLDER HOLES	5	120-0057	$40.30
B65-1712		3 x 4	12	SL	NO	NO	—	NONE	—	—	—	—	—	—	—	—	—	CINCH #250-15-30-170	—	—	$18.05
B65-52AA		3 x 4	12	ST	NO	NO	—	NONE	—	—	—	—	—	—	—	—	—	CINCH #250-15-30-170	—	—	$18.05
B65-1716		4 x 4	16	SL	NO	NO	—	NONE	—	—	—	—	—	—	—	—	—	CINCH #250-18-30-170	—	—	$23.00
B65-53AA		4 x 4	16	ST	NO	NO	—	NONE	—	—	—	—	—	—	—	—	—	CINCH #250-18-30-170	—	—	$23.00

*Trade Mark of AT&T #Can be Factory Modified (See above list of available options).

a new kind of keyboard...a uniquely simple design...low profile

New CHERRY Electronic Data Entry Keyboards Feature



- Low cost
- Long life
- Low profile
- Inherent 2 Key Rollover
- Wire "OR"able output
- Low power consumption

TYPICAL CHERRY CUSTOMIZED KEYBOARD IN CUSTOMER'S HOUSING

RUGGED CONSTRUCTION Keys are mounted in rugged metal frame for increased protection of printed circuit board against mechanical abuse.

TWO KEY ROLLOVER Standard keyboard units have 2 key rollover between all data keys, control, shift, and shift lock keys to simulate true typewriter sequencing.

KEYBOARD FLEXIBILITY Standard keyboard units include:

66 Key Tri Mode ASCII, negative logic (with provision to add 4 extra keys)

53 Key Quad Mode ASCII (ASR 33), positive logic

12 Key Numeric, straight output

16 Key Numeric, straight output

All electronic components are Standard MSI and available from multiple sources. Electronics are mounted on a single pc board.

In addition, custom designs in mono, dual, tri and quad mode operation available on volume applications, with modest engineering, tooling, and artwork charges.

SPECIAL FEATURES AVAILABLE:

Positive logic resting "low" outputs or Negative logic resting "high" outputs. Open collector buffer outputs for hard wire "OR"ing available at no extra cost. Buffer output capable of driving terminated twisted pair or 90 ohm coaxial is optional. Repeating strobe is optional. Key locations may be geographically mixed. Special mono mode encoded keys may be added to configuration. Any of parity and/or data outputs optional may be later changed for modest revision charges.

WE CAN CUSTOM DESIGN YOUR KEYBOARD

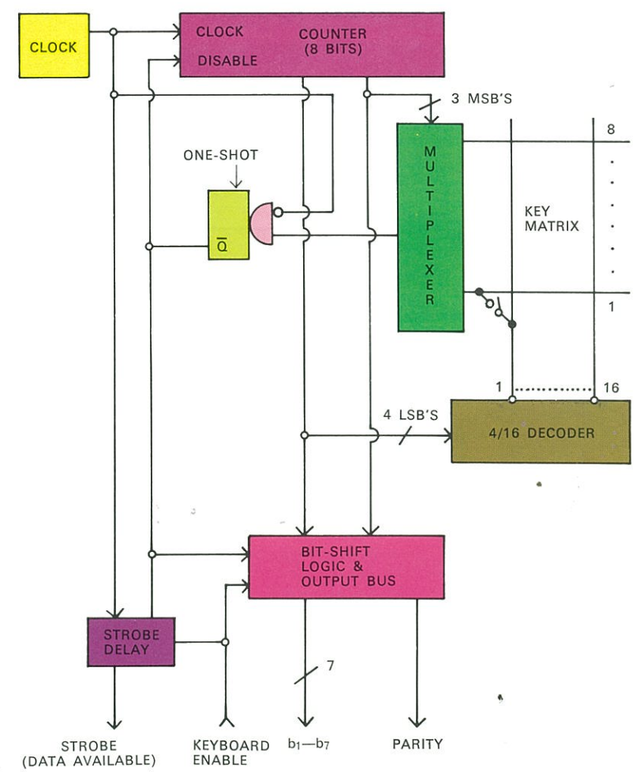
If you do not see the keyboard you want among the standard stock units shown here, why not check our custom design capabilities. We specialize in custom designed units and make all our own key caps, switches, printed circuit boards and hardware. Our keyboard electronics utilizes a scanning technique which readily adapts to any keyboard configuration and format. Because of this, and our in-house capability, we can usually provide a custom designed keyboard to meet your application requirements at less than the cost of a standard.

Send us your specs and we'll be glad to quote. To help you get started ask for our handy six-page Keyboard Designers' Specification Sheet.

Keyboard Electronics Utilizes Scanning Technique

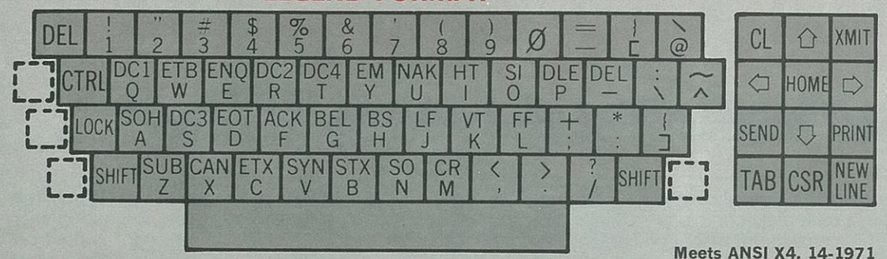
The keyboard encoder is based on a scanning technique employing an 8 bit counter, a multiplexer and a 4 to 16 line decoder. Encoded keys form a crosspoint matrix with each key connected to the decoder output and the multiplexer input. The decoder is addressed by the 4 least significant bits and the multiplexer by the 3 most significant bits of the counter.

When a key is depressed a matrix connection between the decoder and multiplexer is accomplished. When the counter reaches the appropriate key code, the multiplexer output goes high and a retriggerable one-shot is fired on the trailing edge of the counter clock stopping the counter. The one-shot is continually refreshed until the key is released. The bit-shift logic translates the counter address into an upper case data word if the shift and/or control key is depressed.



B80-3766 CHERRY 66-KEY ASCII TRI MODE

LEGEND FORMAT



Meets ANSI X4. 14-1971

LEGEND FORMATS

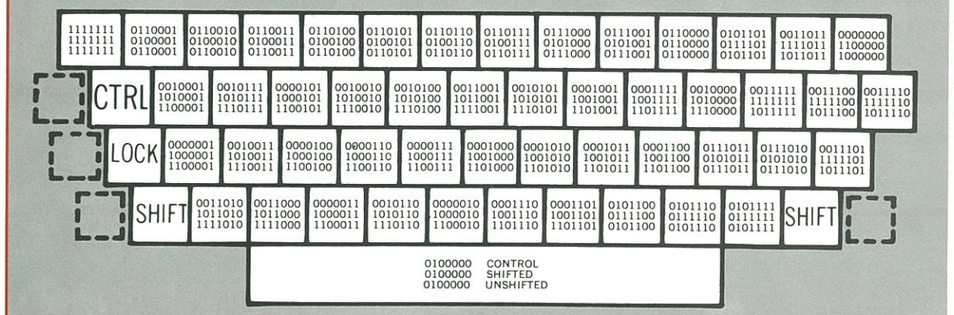
B80-3766 with 66 keys, including 12 Function keys at right hand side. Provisions are made in cover plate for addition of up to four additional key modules (dotted lines). Generates full 128 symbol ASCII character set; can be modified for special applications.

B70-4753 with 53 keys is similar to ASR 33. Standard communications configuration generates ASCII. Can be modified for special applications.

B65-1712 with 12 keys generates straight output.

B80-3766

OUTPUT



CODED OUTPUT

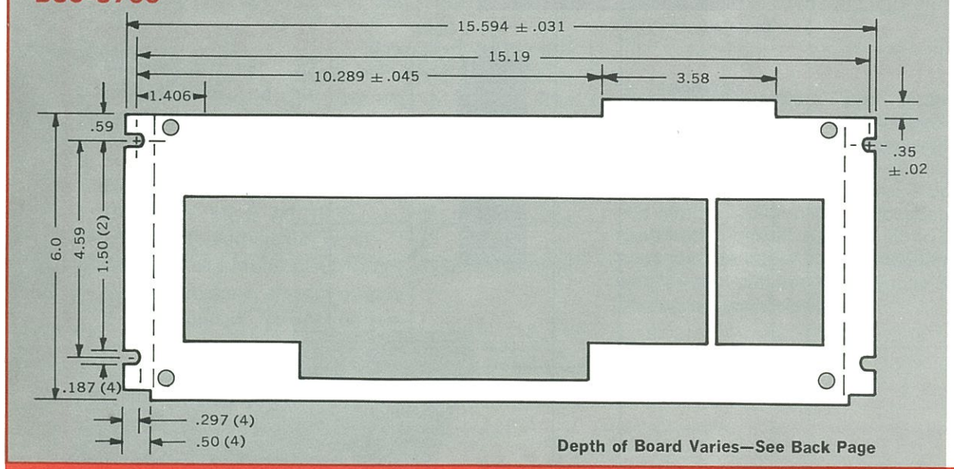
All 7-bit output codes shown are, reading from left to right, **most** significant to **least** significant (765 4321).

B80-3766—The Control key of this keyboard has precedence over the Shift key to produce tri-mode.

NOTE:
The 12-key Function section of the B80-3766 keyboard is not encoded and so is not included in the coding diagram at left.

The 12-key Function section has Normally Open switches that may be represented similarly to the diagram of the 12-key unit to the far right of this section.

B80-3766



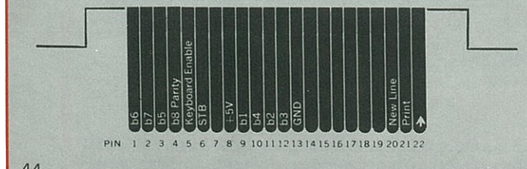
Depth of Board Varies—See Back Page

PANEL CUTOUT and PC BOARD SIZE

Depth from top of faceplate to bottom of printed circuit board varies for each keyboard, depending on the type of key module used. See last page of this brochure.

B80-3766 HAS TWO SIDED TERMINAL

VIEWED FROM TOP OF PRINTED CIRCUIT BOARD



Reverse of Pin 1 . . . . b6
Reverse of Pin 2 . . . . b7
Reverse of Pin 3 . . . . b5
Reverse of Pin 4 . . . . b8 PARITY
Reverse of Pin 5 . . . . KYBD. ENABLE
Reverse of Pin 6 . . . . STB
Reverse of Pin 7 . . . . (blank)
Reverse of Pin 8 . . . . +5V
Reverse of Pin 9 . . . . b1
Reverse of Pin 10 . . . . b4
Reverse of Pin 11 . . . . b2
Reverse of Pin 12 . . . . b3
Reverse of Pin 13 . . . . GND
Reverse of Pin 14 CL
Reverse of Pin 15 . . . . ←
Reverse of Pin 16 . . . . SEND
Reverse of Pin 17 . . . . TAB
Reverse of Pin 18 . . . . ↑
Reverse of Pin 19 . . . . HOME
Reverse of Pin 20 . . . . ↓
Reverse of Pin 21 . . . . CSR
Reverse of Pin 22 . . . . XMIT

TERMINAL CONFIGURATION

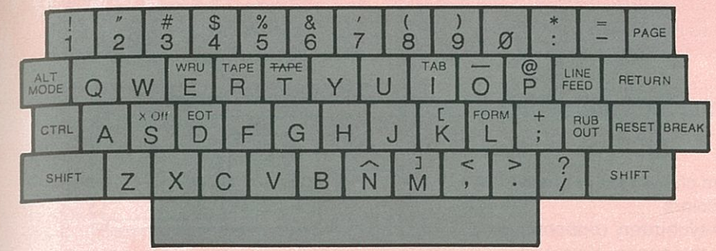
B80-3766 terminal has standard 22-position, 44-pin, 1/16″ thick Card Edge Connector (Cinch #251-22-30-340 or #215-22-30-341; Continental #600-30-3PCDG22; Methode #84-7044).

B70-4753 terminal has standard 15-pin Card Edge Connector. Plated through for redundancy.

B65-1712 terminal has standard 15-pin Card Edge Connector (including two pins that represent blank keys at right and left hand side of bottom row of keys).

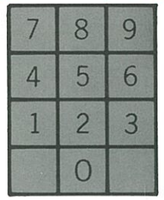
B70-4753 CHERRY 53-KEY ASCII QUAD MODE

LEGEND FORMAT



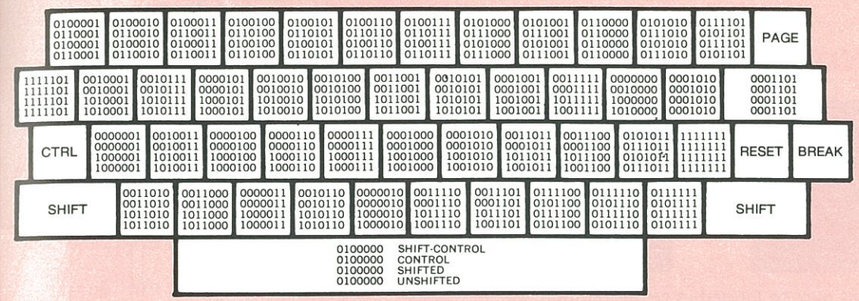
B65-1712 CHERRY 12-KEY NUMERIC

LEGEND FORMAT



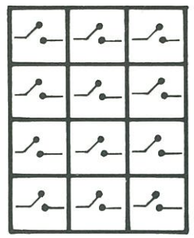
B70-4753

OUTPUT



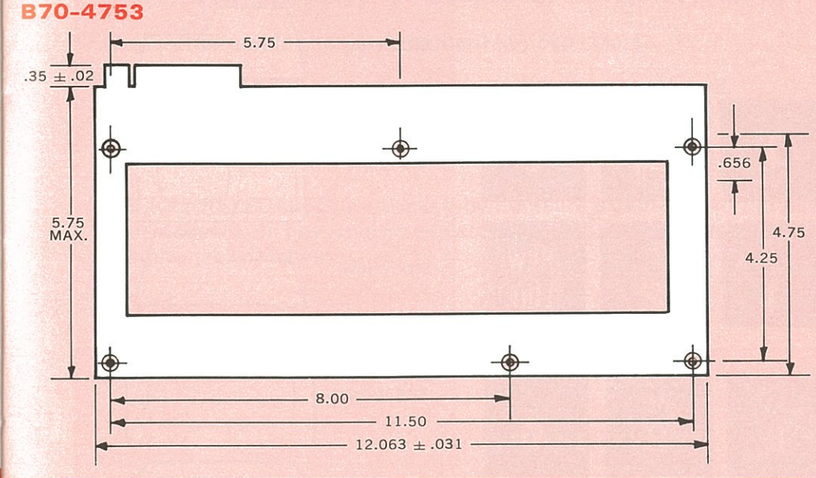
B65-1712

OUTPUT

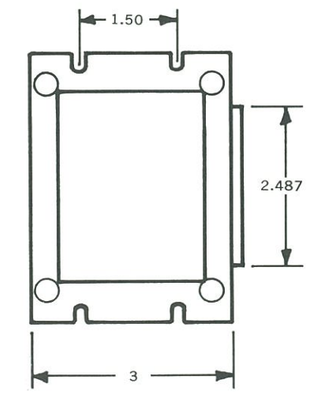


NOTE: B65-1712 is non-encoded. Diagram shows Normally Open key switches.

B70-4753



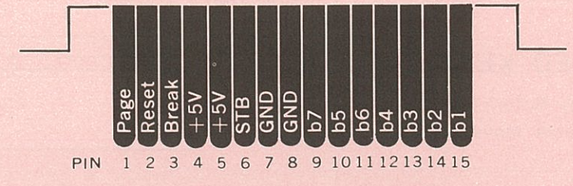
B65-1712



Depth of Board Varies—See Back Page

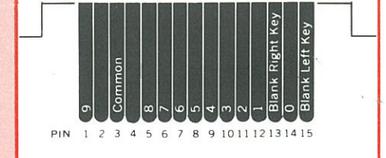
B70-4753 TERMINAL

VIEWED FROM TOP OF PRINTED CIRCUIT BOARD



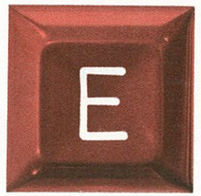
B65-1712 TERMINAL

VIEWED FROM TOP OF PRINTED CIRCUIT BOARD



cherry molded key tops

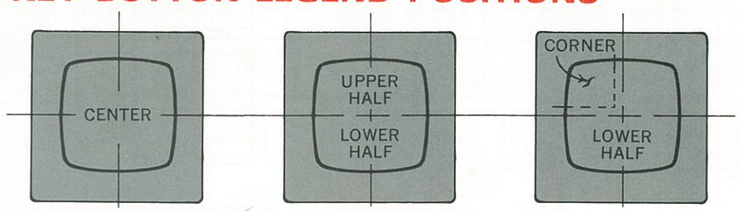
KEY BUTTON:



Many standard and custom characters in broad selection of popular ABS colors.

Contoured, truncated key button (optional) is two-shot molded for permanence. Keys will provide standard array with spacing ¾" center-to-center. Key stems available straight for sloped keyboards or with 10° angle stem for stepped keyboards.

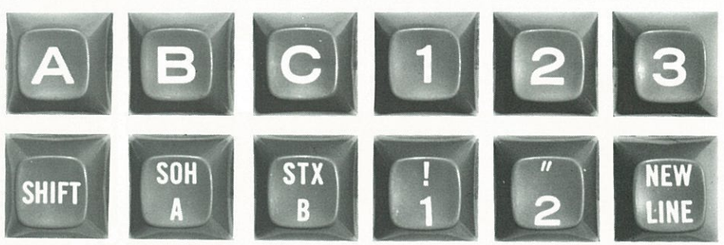
KEY BUTTON LEGEND POSITIONS



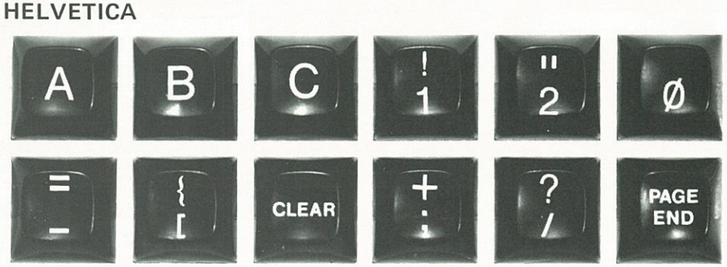
Legends on two-shot molded key buttons may be located in center position, on upper and lower half, or lower half.

LEGEND TYPE STYLES

TRADE GOTHIC BOLD

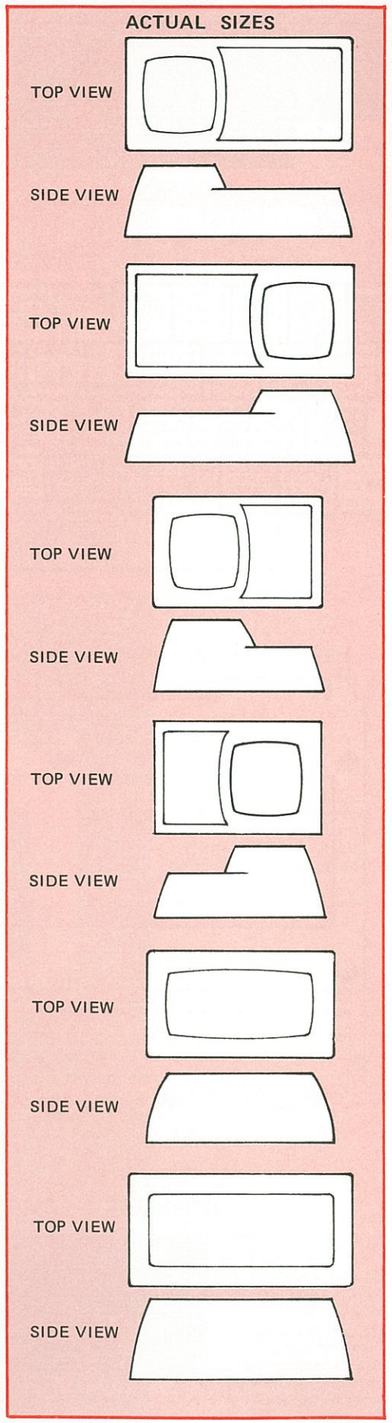


HELVETICA



COMPLETE LIST OF TOOLED KEYS

A brochure illustrating and listing all tooled Key Button legends is available on request. Write or phone New Products' Manager.



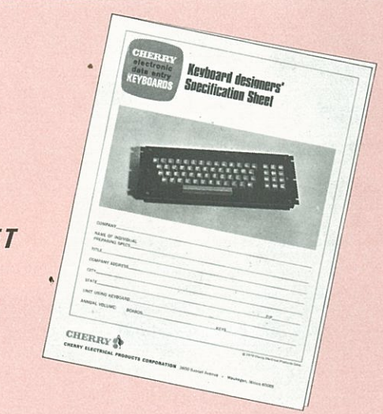
standard and custom designs...

complete in-house keyboard capability

Cherry can design and manufacture a keyboard to precisely meet your application requirements. Often at no more cost than that of a standard unit . . . because we make virtually all of the keyboard components right in our own plant. With complete quality control maintained from incoming material inspection thru fabrication and final assembly.

HERE'S WHY YOU SPECIFY *CHERRY* WITH CONFIDENCE:

1. Cherry makes a full line of keyboard switch modules, including alternate action switches, lighted switches, double pole switches and shift latching mechanisms.
2. Components and assembled keyboards are made under one roof.
3. We make our own printed circuit boards.
4. We make our own two-shot molded key caps.
5. We have a large assortment of tooled key cap legends in two type faces and a variety of sizes.
6. We offer a wide choice of standard key cap colors.
7. We install and wave solder the electronics to the pc board.
8. We provide a choice of MOS or TTL.

CHERRY KEYBOARDS are backed by 20 years experience in the design and manufacture of precision snap-action switches, matrix selector switches, gold "crosspoint" contact switches and leverwheel/thumbwheel switches.

Write for this handy, six-page
KEYBOARD DESIGNERS' SPECIFICATION SHEET