

Operator's Manual

KB5149jr NUMERIC DATA
ENTRY PAD
for the IBM-PCjr

by **key tronic**
The Responsive Input Company

for warranty information see back cover

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KTC 98-00058-000

A word about R.F. interference from the FCC . . .

This equipment generates and uses radio frequency energy and if not installed and used properly, i.e., in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation. However there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures.

- Reorient the receiving antenna.
- Relocate the computer away from the receiver.
- Move the computer with respect to the receiver.
- Move the computer away from the receiver. Plug the computer into a different outlet so that computer and receiver are on different branch circuits.

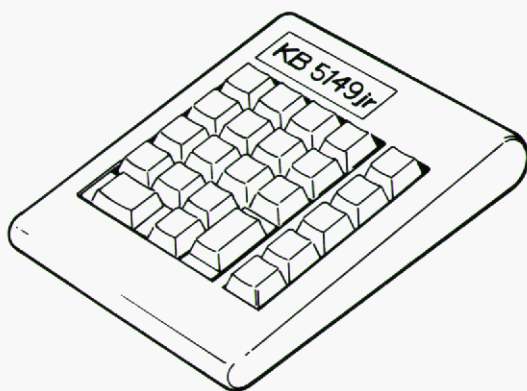
If necessary the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful:

"How to Identify and Resolve Radio-TV Interference Problems"

This booklet is available from the U.S. Government Printing Office, Washington, D.C. 20402. Stock No. 004-000-00345-4.

Introduction

The Key Tronic KB5149jr Numeric Data Entry Pad is a dedicated numeric function-cursor control keypad that is plug compatible with the IBM* PCjr Personal Computer. Requiring only the IBM cable that links the PCjr computer to its keyboard, there are no software or hardware modifications necessary. The Numeric Data Entry Pad is installed as an accessory between the computer and keyboard.



The Numeric Data Entry Pad provides a greater degree of flexibility by making data entry easier. Since numeric entries are at finger tip reach, numeric data can be entered with one hand while leaving the other free to manipulate documents or reports.

The Cursor Control keys add versatility and convenience by minimizing hand movement between pad and keyboard. The cursor control function keys are particularly beneficial to spread sheet applications.

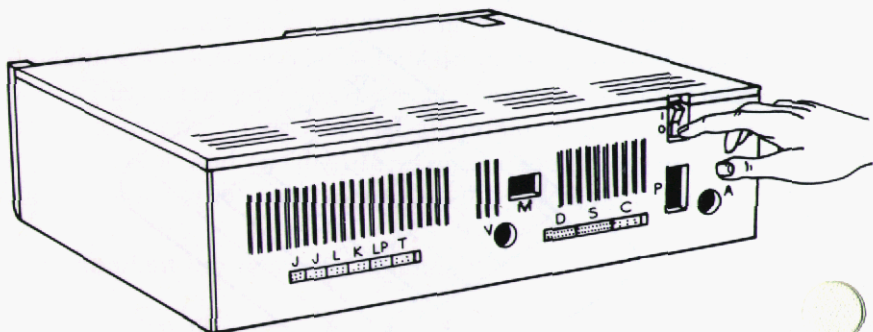
Altogether, these features make the Numeric Data Entry Pad one of the most powerful enhancements you can get for the PCjr keyboard.

*IBM is a registered trademark of the International Business Machine Corporation.

Installation

To install the KB5149jr, Proceed as follows.

1. Place the IBM PCjr computer power switch to "O" (Off).



2. In order to operate the KB5149jr Numeric Data Entry Pad with the IBM PCjr Personal Computer, it is necessary that you have the IBM cable that links the PCjr computer to its keyboard. You can purchase this cable from your IBM Distributor.

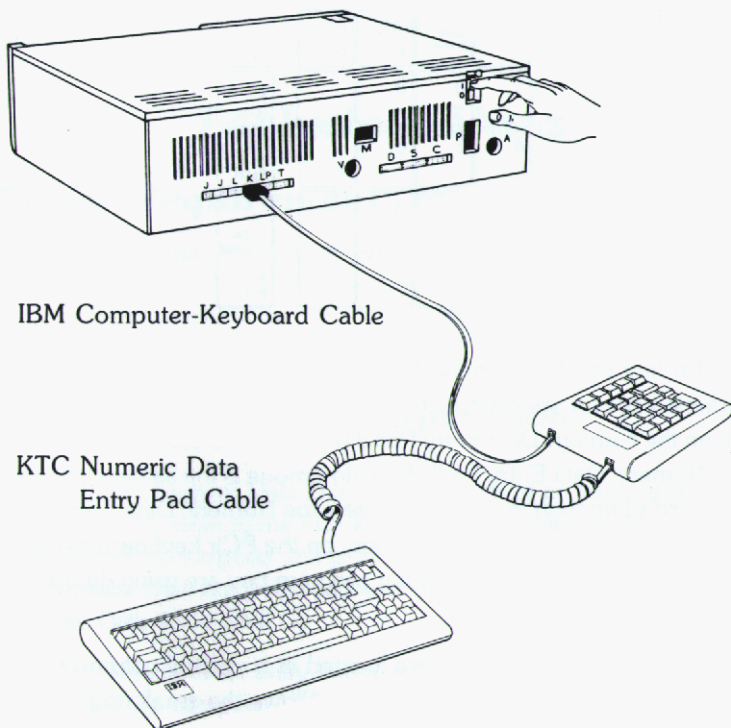
If your IBM PCjr keyboard is attached to the PCjr computer by cable, place the computer power switch to "O" (Off).

Detach the keyboard from the computer by unplugging the IBM cable at the keyboard end.

Reroute the IBM cable and insert the cable connector into the Numeric Data Entry Pad as shown.

3. Insert the connector end of the coiled cable supplied with the Numeric Data Entry Pad in the PCjr keyboard.

Reposition the computer, keyboard and Numeric Data Entry Pad for normal use.

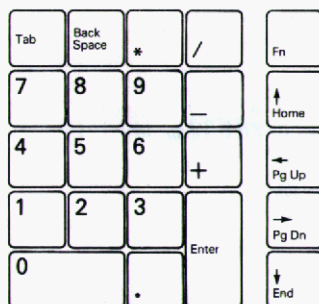


Place your computer program diskettes into the proper drives.

Place the PCjr power switch to "I" (On), and your keyboard and Numeric Data Entry Pad are ready to use.

Features

The KB5149jr Numeric Data Entry Pad was designed to enhance the use of your IBM PCjr Personal Computer. Note that the numeric keys are located in the standard "Center 5" cluster for ease of reach. The tactile homing bump on the "5" permits touch-only operation for the experienced pad operator.



The Fn key on the Numeric Data Entry Pad can be used with the numeric keys for special function purposes. When you press the Fn key on the Numeric Data Entry Pad it is placed into the Function Mode. The Numeric Data Entry Pad's Function mode is the same as the PCjr keyboard's Function mode. If you press the Numeric Data Entry Pad's Fn key by mistake, press the Shift key on the PCjr keyboard to cancel the Function mode. The computer program you are using determines what the Function keys do.

The cursor control functions are located in a vertical column format to the right of the numeric keys. This allows the small finger of the hand to control cursor movement.

The Home, Pg Up, Pg Dn, and End keys are added for editing purposes (operation of these keys are dependent on the computer program you are using). See your *PCjr Guide To Operations* handbook for information concerning the operation of these keys.

The editing keys: Tab and Back Space, are included on the Numeric Data Entry Pad to reduce hand movement between Numeric Data Entry Pad and keyboard.

Maintenance

The KB5149jr Numeric Data Entry Pad is designed and manufactured to operate without preventive maintenance. The exterior may be cleaned with a mild household cleaner and a soft, damp, lintfree cloth or paper towel.

NEVER use a petroleum base solvent which could damage the plastic or painted surfaces of the keyboard. Be careful not to wipe dust into the keypad. Do not allow spray cleaner to run into the keypad.

Technical Data

Power Requirement Interface Protocol

+5VDC @ 40ma.
Maximum

See the KB5149jr Schematic
for pin out information.
Protocol is Serial TTL.

Theory of Operation

The KB5149jr Numeric Data Entry Pad functions as an auxiliary keyboard and is linked by cable to the PCjr keyboard and computer. The Numeric Data Entry Pad computer link is the IBM cable purchased by the user. The Numeric Data Entry Pad-keyboard link is the cable supplied with the Numeric Data Entry Pad.

Both the Numeric Data Entry Pad and keyboard use the +5 volt power supplied by the computer. When power is on, the depression of a key on the keyboard or Numeric Data Entry Pad will send a code to the PCjr computer. If a key on the Numeric Data Entry Pad is held down for more than 500 milliseconds (ms), the Numeric Data Entry Pad repeats the keycode to the computer every 100 ms.

The Numeric Data Entry Pad contains a microprocessor that detects Numeric Data Entry Pad key depressions, encodes the keys depressed, and sends the encoded keycodes to the computer. The Numeric Data Entry Pad microprocessor also receives data from the PCjr keyboard, buffers this data, and sends it to the PCjr computer.

Theory of Operation Cont'd.

The Numeric Data Entry Pad keyswitch matrix is interrogated through buffer/drivers and a custom made IC receiver attached to the microprocessor. Change in capacitance associated with key depression is sensed by the receiver and then forwarded to the microprocessor where it is processed to an IBM scan code and forwarded to the IBM computer.

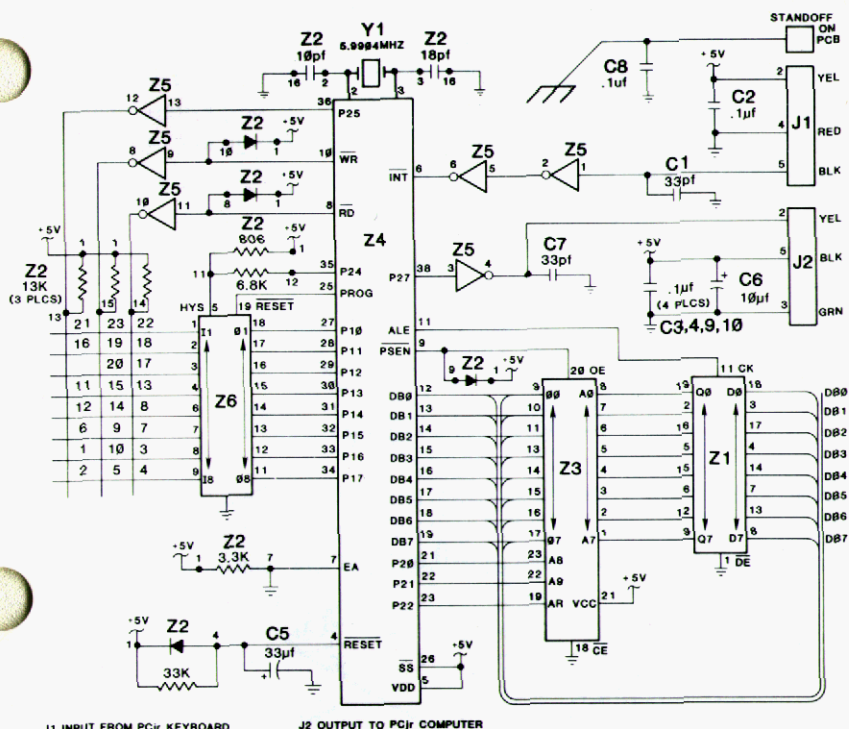
The following is the Numeric Data Entry Pad code chart showing the scan codes generated by the Numeric Data Entry Pad keys.

Key Scan Code Chart

1 $\frac{8F}{0F}$	2 $\frac{8E}{0E}$	3 ①	4 $\frac{85}{35}$	5 $\frac{D4}{54}$
6 $\frac{88}{08}$	7 $\frac{89}{09}$	8 $\frac{8A}{0A}$	9 $\frac{CA}{4A}$	10 $\frac{C8}{48}$
11 $\frac{85}{05}$	12 $\frac{86}{06}$	13 $\frac{87}{07}$	14 $\frac{CE}{4E}$	15 $\frac{CB}{4B}$
16 $\frac{82}{02}$	17 $\frac{83}{03}$	18 $\frac{84}{04}$	19 $\frac{9C}{1C}$	20 $\frac{CD}{4B}$
21 $\frac{8B}{0B}$	22 $\frac{B4}{34}$	23 $\frac{D0}{50}$		

- ① When pressed, this key will generate the code string "2A, 09"; on release, the scan code generated is "89". On the first keypress after this key has been depressed, a preface code of "AA" will precede the scan code of the key pressed.

KB 5149jr Schematic



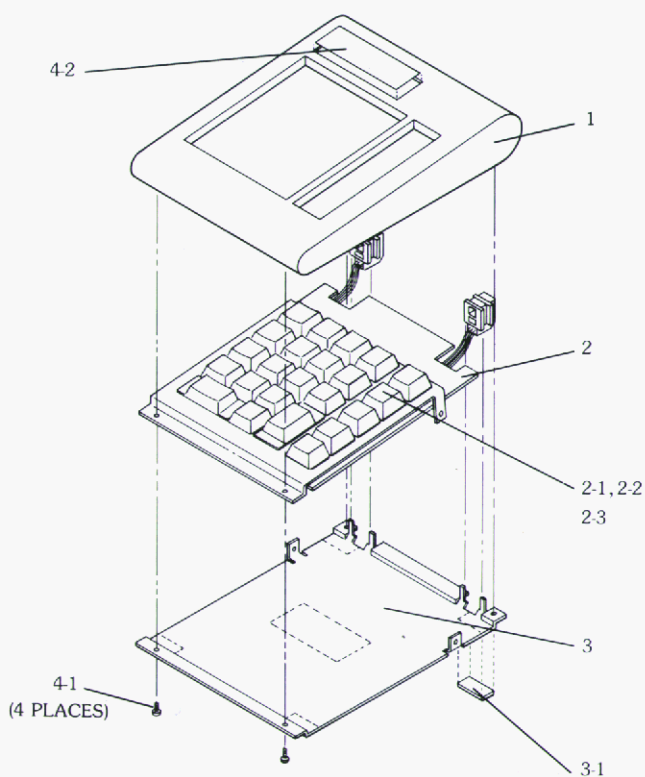
J1 INPUT FROM PCjr KEYBOARD

J2 OUTPUT TO PCjr COMPUTER

REF. DES.	DESCRIPTION	KTC PART NUMBER*	REF. DES.	DESCRIPTION	KTC PART NUMBER*
C1	Ceramic, 33pf	Commercial	J1	Connector	39-00789-000*
C2	Tantalum, 0.1uf	" "	J2	Connector	39-00789-000
C3	Same as C2	" "	Y1	Crystal	48-00300-106
C4	Same as C2	" "	Z1	IC, Latch 74C373	Commercial
C5	Ceramic, 33uf	" "	Z2	KTC Hybird IC	22-00920-000
C6	Tantalum, 10uf	" "	Z3	PROM	22-2758C-570
C7	Same as C1	" "	Z4	Microprocessor	22-8039C-000
C8	Same as C2	" "	Z5	IC, NAND Gate, 74C14	Commercial
C9	Same as C2	" "	Z6	KTC Custom IC	22-00908-003
C10	Same as C2	" "			

*When a part number is given, the item is not readily available except from KTC.


Top Assembly



Parts List


1	Enclosure	44-00290-000
2	Keyboard Assembly	65-02984-051
2-1	Switch	61-04024-001
2-2	Spring	45-00053-020
2-3	Keytop Set	66-02984-001
3	Base Plate	49-01923-000
3-1	Rubber Foot	48-00738-000
4	Hardware	
4-1	Screw	47-00008-002
4-2	Logo	48-00799-014

Technical Assistance




If you should encounter problems with the use of this keyboard, first review your system Owner's Manual. If the problem appears to originate from the keyboard, you are welcomed to contact our Product Support Specialist (PSS) to obtain technical assistance. To reach the PSS, call our toll free line, 1-800-262-6006, or, if in the state of Washington, (509) 928-8000. If calling from outside the continental U.S.A., call Spokane, Washington, U.S.A., (509) 928-8000.

Packaging Notice



Please retain original packaging for reuse should your unit ever need to be returned for service. The bag and box are a custom-designed product to protect the keyboard from electrostatic and mechanical shock in shipment.



Key Tronic Corporation Limited Warranty

Key Tronic Corporation warrants the products which it manufactures to be free from defects in materials and workmanship for a period of 90 (ninety) days from the date of purchase from Key Tronic or an authorized Key Tronic dealer. This warranty is limited to such purchaser and is not transferable.

During the 90 (ninety) day warranty period, Key Tronic will repair or replace, at its option, any defective products or parts at no additional charge, provided that the product is returned, shipping prepaid, to Key Tronic, an authorized dealer or an authorized service location. The purchaser is responsible for insuring any returned product and assumes the risk of loss during shipping. All replaced parts and products become the property of Key Tronic.

Proof-of-purchase with a date must be provided by the purchaser when requesting that warranty work be performed. The purchaser may request information on how to obtain warranty service by contacting an authorized dealer or writing to Key Tronic, P.O. Box 14687, Spokane, WA 99214, U.S.A., or calling 1-800-262-6006, or, if in the state of Washington, (509) 928-8000. If calling from outside the continental U.S.A., call Spokane, Washington, U.S.A., (509) 928-8000.

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THIS LIMITED WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM STATE TO STATE.

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