

# KEYBOARD

FOR IBM\* & ITS COMPATIBLE **PC\*/XT\*/AT\***

**BTC-5060**

**OPERATOR'S MANUAL**

# FEDERAL COMMUNICATION COMMISSION GUIDELINES

WARNING: THIS EQUIPMENT HAS BEEN CERTIFIED TO COMPLY WITH THE LIMITS FOR A CLASS B COMPUTING DEVICE, PURSUANT TO SUBPART J OF PART 15 OF FCC RULES. ONLY COMPUTER AND PERIPHERALS (COMPUTER INPUT/OUTPUT DEVICES, TERMINALS, PRINTERS, ETC.) CERTIFIED TO COMPLY WITH THE CLASS B LIMITS MAY BE ATTACHED TO THIS KEYBOARD. OPERATION WITH NON-CERTIFIED PERIPHERALS IS LIKELY TO RESULT IN INTERFERENCE TO RADIO AND TV RECEPTION.

To insure compliance to FCC non-interference regulations, peripherals attached to this computer required shielded I/O cables.

This equipment generates and uses radio frequency energy and if not installed and used properly, that is, 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 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 FCC 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.

## NOTICE:

1. In order to insure continued compliance to the FCC emission limits for this keyboard, it is necessary to use computer and I/O cables which are shielded. This shield must be terminated to the metallic cabinet at both ends to guarantee adequate suppression of undesirable emissions.
2. BTC Corp. reserves the right to make changes or improvements in the product(s) described in this manual without notice at any time.
3. BTC is a registered trademark of Behavior Tech Computer Corporation.

# INTRODUCTION

The BTC-5060 keyboard is a direct replacement for the IBM PC, XT and At Personal Computer keyboards.

There are no software modifications or special interfaces needed. Its use is the same as that described in the Personal Computer Guide to Operations Handbook you received with your Personal Computer.

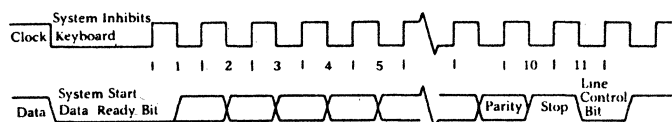
## ELECTRICAL DATA (for AT)

### INPUT/OUTPUT

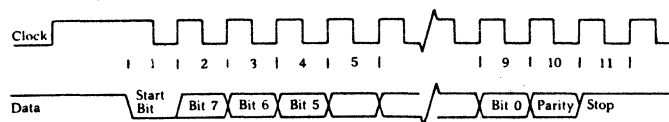
The keyboard will check the status of the "Clock" line and the "Data" line prior to every data transmission. If the "Clock" line is low, then keyboard is disabled; If the "Clock" line is high but the "Data" line is low, then it will do a keyboard input from the PC/AT. If both lines are high, then the keyboard will initiate a serial transmission by setting the "Data" line low. It will clock the start bit to the host computer on the falling edge of that clock pulse. The keyboard will then clock the 8 data bits to the host computer on the falling edge of each clock pulse. During transmission the keyboard will check to see if the "Clock" line is still in high. If it is not, then the keyboard will terminate the data trans-

odd parity bit and raise the "Data" line to high. then clocking the stop bit to complete the transmission.

### DATA GOING INTO KEYBOARD



### DATA COMING FROM KEYBOARD



## **KEY OPERATION**

All the keys on the keyboard are Make/Break and typematic. The most significant bit of each scan code is low for a key depression and high level for a key release.

When a key is depressed, the keyboard will transmit its assigned scan code. If the key is held down longer than the repeat delay time, its scan code will be transmitted at an assigned repeat rate (the repeat delay and rate are both variable for as long as the key is held depressed or until another key is operated).

Depression of a second key will cause the first key to stop repeating. The scan code of the second key will be transmitted, and a delay sequence will be restarted.

## **LED OPERATION**

The LEDs are "toggled". First depression of the key turns the LED on. The second depression turns the LED off and so on. LEDs are OFF on power-up and software Reset, but will flash during power-on initialization.

## **KEYSTROKE BUFFER**

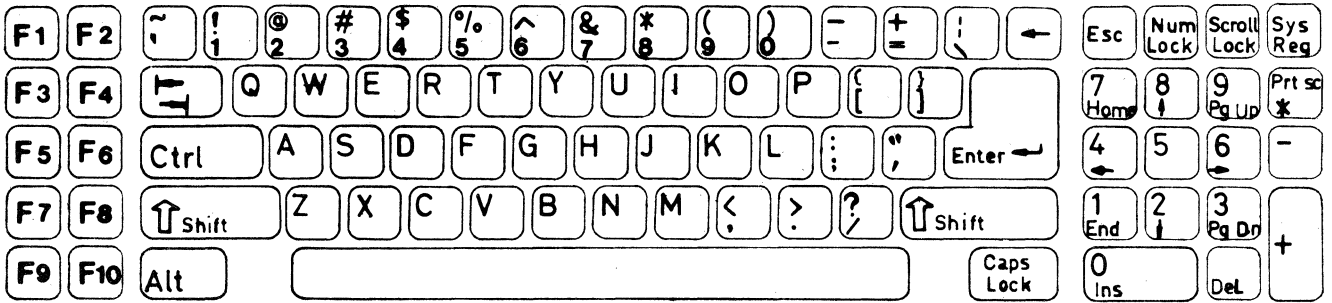
A 16-character (First-in, First-out) keystroke buffer is provided to prevent loss of keystrokes. An "00 HEX" will be inserted into the overflow buffer if the keystroke buffer overflows. The keyboard will transmit this code once it has reached the top of the buffer.

## **KEYBOARD DIAGNOSTIC**

The keyboard microprocessor will perform a diagnostic self-test after Power-Up or after the host system signals the keyboard to perform a software Reset. The microprocessor will check its data memory locations, do a sum-check, internal ram check and check for any depressed keys. If the diagnostic test is correct, the keyboard will transmit an "AA HEX" code. This will be the first transmission following a Power-Up condition. If the diagnostic test was unsuccessful, then the keyboard will transmit an "FD/FC HEX" code. In either case, after the diagnostic check the keyboard will begin normal operation.

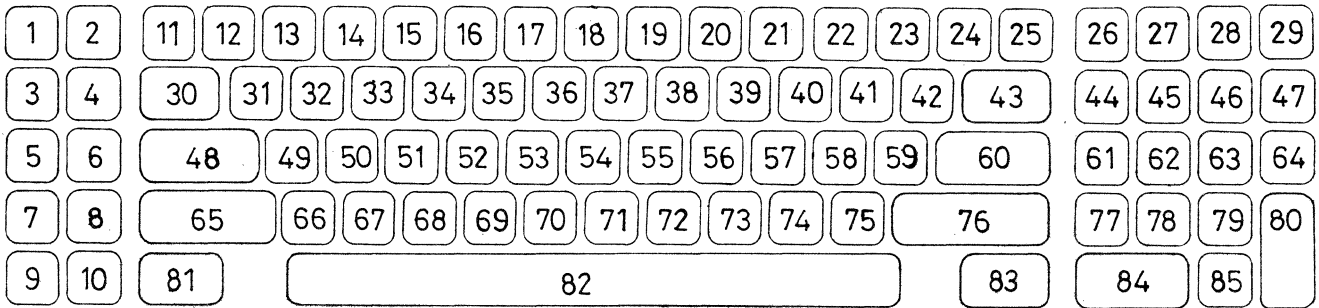
# CHARACTER ARRAY ASSIGNMENTS

The layout of this keyboard is completely same as that of IBM PC/AT keyboard, but PC and PC/XT can correspond to it also.



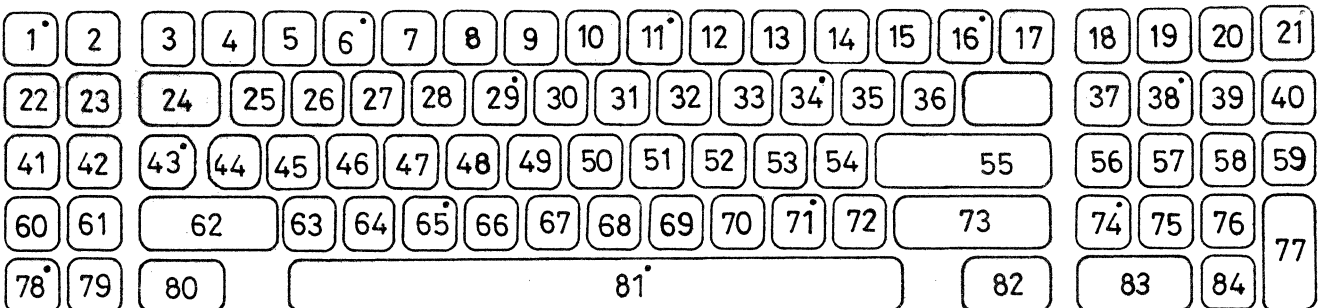
## KEY POSITION (A)

The following figure is used as a reference for BTC-5060 Rev. 3.X, 4.X and 5.X CIRCUIT DIAGRAMS. See pages 7 thru 13 for details of these diagrams.



## KEY POSITION (B)

The figure shown below is a reference for BTC-5060 Rev. 7.X, 8.X and 9.X CIRCUIT DIAGRAMS. See pages 15 thru 19 for details of these diagrams.



## KEYSWITCH SCAN CODE

The keys shown in the code chart below will output a 8-bit code for a depression (make) and release (break). They are electrical compatible with the IBM PC, XT (shown on fig. 1), and AT (shown on fig. 2).

The bit assignments for each key are shown in hexadecimal. Hexadecimal means a numbering system using a base of 16. It is a commonly used notation for expressing binary bit patterns.

|          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 3B<br>BB | 3C<br>BC | 29<br>A9 | 02<br>82 | 03<br>83 | 04<br>84 | 05<br>85 | 06<br>86 | 07<br>87 | 08<br>88 | 09<br>89 | 0A<br>8A | 0B<br>8B | 0C<br>8C | 0D<br>8D | 2B<br>AB | 0E<br>8E | 01<br>81 | 45<br>C5 | 46<br>C6 | ••       |
| 3D<br>BD | 3E<br>BE | 0F<br>8F | 10<br>90 | 11<br>91 | 12<br>92 | 13<br>93 | 14<br>94 | 15<br>95 | 16<br>96 | 17<br>97 | 18<br>98 | 19<br>99 | 1A<br>9A | 1B<br>9B | •        |          | 47<br>C7 | 48<br>C8 | 49<br>C9 | 37<br>B7 |
| 3F<br>BF | 40<br>C0 | 1D<br>9D | 1E<br>9E | 1F<br>9F | 20<br>A0 | 21<br>A1 | 22<br>A2 | 23<br>A3 | 24<br>A4 | 25<br>A5 | 26<br>A6 | 27<br>A7 | 28<br>A8 | 1C<br>9C |          | 4B<br>CB | 4C<br>CC | 4D<br>CD | 4A<br>CA |          |
| 41<br>C1 | 42<br>C2 | 2A<br>AA | 2C<br>AC | 2D<br>AD | 2E<br>AE | 2F<br>AF | 30<br>B0 | 31<br>B1 | 32<br>B2 | 33<br>B3 | 34<br>B4 | 35<br>B5 | 36<br>B6 |          | 4F<br>CF | 50<br>D0 | 51<br>D1 | 4E<br>CE |          |          |
| 43<br>C3 | 44<br>C4 | 38<br>B8 | 39<br>B9 |          |          |          |          |          |          |          |          |          | 3A<br>BA | 52<br>D2 | 53<br>D3 |          |          |          |          |          |

|          |             |
|----------|-------------|
| xx<br>xx | ← UP CODE   |
| xx<br>xx | ← DOWN CODE |

Fig. 1. PC and XT scan code

### Notes:

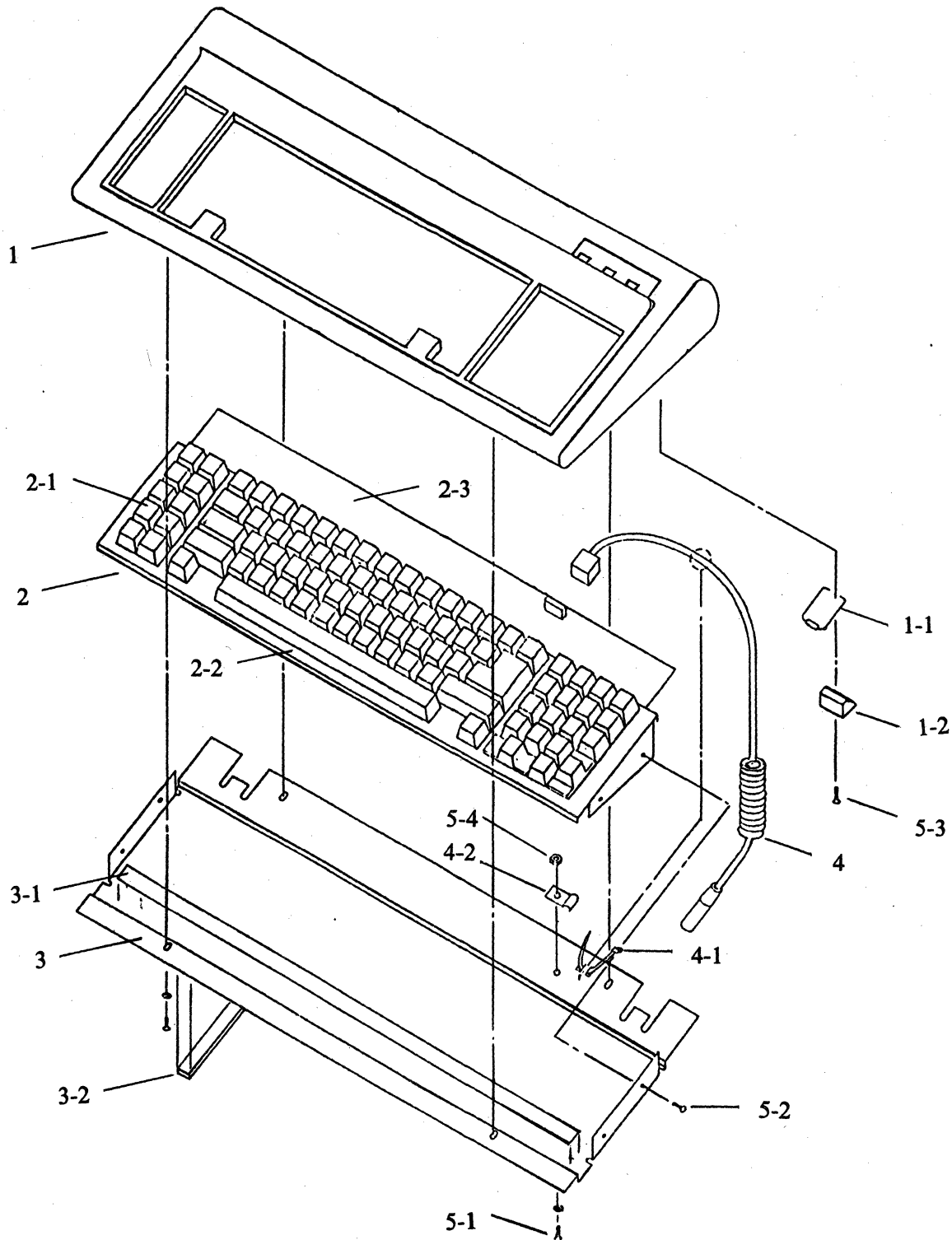
- = No code generated.
- = When this key is pressed with "Ctrl" simultaneously, it will generate function equal to "Ctrl" + "Alt" + "Del".

In the AT, the break code of each key is transmitted a "F0 HEX" followed by that key's make code. For example, the make code of character "A" is "1C HEX", so its break code is "F0, 1C HEX".

|    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 05 | 06 | 0E | 16 | 1E | 26 | 25 | 2E | 36 | 3D | 3E | 46 | 45 | 4E | 55 | 5D | 66 | 76 | 77 | 7E | 84 |
| 04 | 0C | 0D | 15 | 1D | 24 | 2D | 2C | 35 | 3C | 43 | 44 | 4D | 54 | 5B | •  |    | 6C | 75 | 7D | 7C |
| 03 | 0B | 14 | 1C | 1B | 23 | 2B | 34 | 33 | 3B | 42 | 4B | 4C | 52 | 5A |    | 6B | 73 | 74 | 7B |    |
| 83 | 0A | 12 | 1A | 22 | 21 | 2A | 32 | 31 | 3A | 41 | 49 | 4A | 59 |    | 69 | 72 | 7A |    | 79 |    |
| 01 | 09 | 11 | 29 |    |    |    |    |    |    |    |    |    | 58 | 70 | 71 |    |    |    |    |    |

Fig 2. AT scan code

# BTC-5060 KEYBOARD ASSEMBLY



1 Enclosure

1-1 Leg, Adjustable

1-2 Enclosure, Bail Block

2 Keyboard assembly

2-1 Keytop Set

2-2 Mounting Plate

2-3 Printed Circuit Board

3 Base Plate

3-1 Strip, Adhesive

3-2 Foot, Rubber Black

4 Cable Assembly

4-1 Cable Tie No 4 inches

4-2 Cable Clip

5 Mounting Hardware

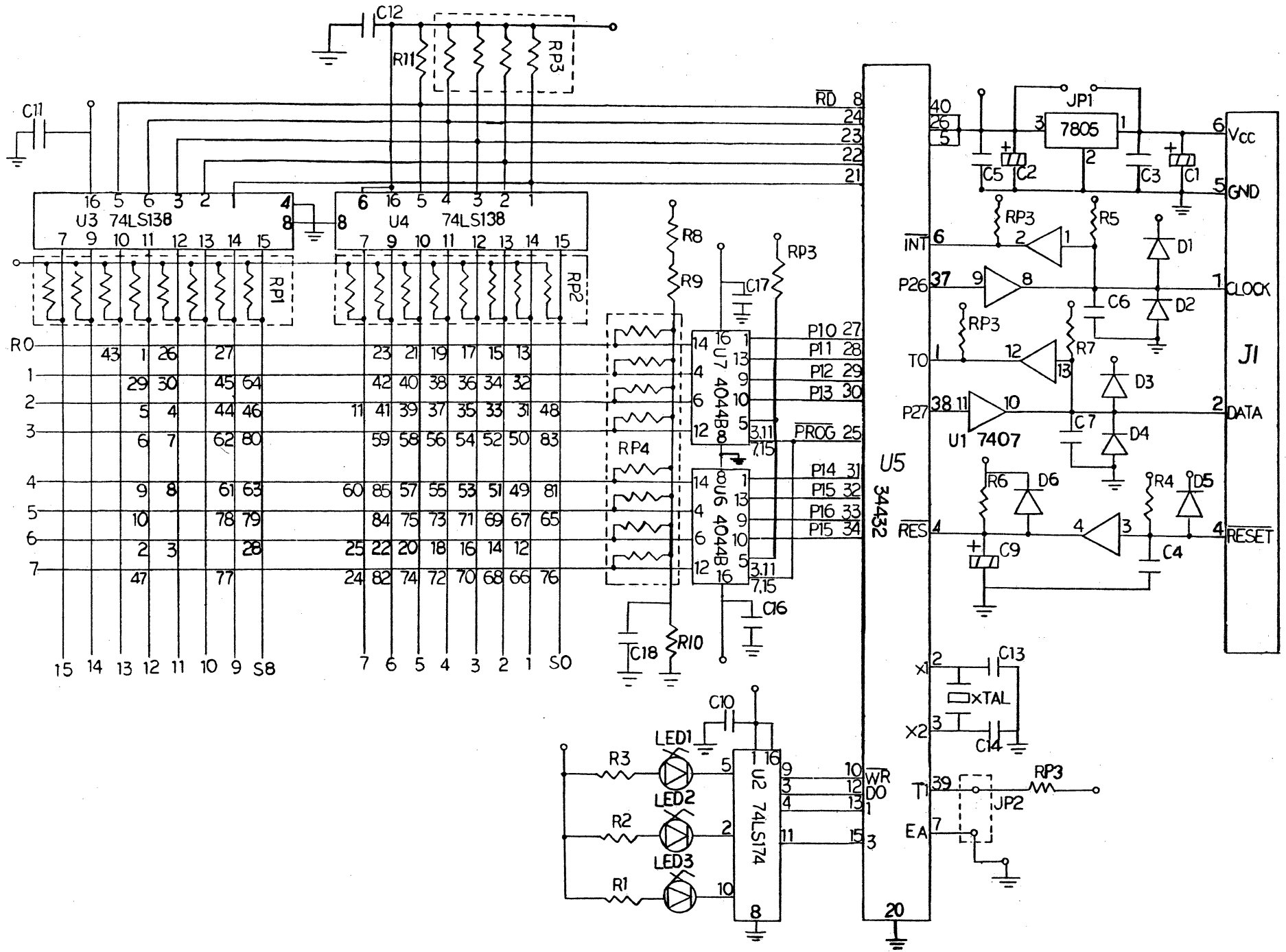
5-1 Screw M4 x 6 p=0.7

5-2 Screw 1/8-40 x 0.312

5-3 Screw M3 x 12 p=0.5

5-4 NUT M4. P=0.7

BTC-5060 Rev. 3.0 CIRCUIT DIAGRAM





# BTC-5060 Rev. 3.0 PARTS LIST

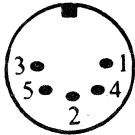
## PART ONE

| QTY | LABEL-ID  | DESCRIPTION                               | REMARKS  |
|-----|---|---|--|
| 1   | U1  | 7407                                      | HEX BUFFER/DRIVER<br>(OPEN COLLECTOR)<br>SIX EDGE-TRIGGERED<br>D-TYPE FLIP-FLOPS<br>1-OF-8 DECODER<br>CPU<br>CMOS RS-LATCH<br>REFER TO 4044A-1<br>16-LEVEL TEST MANUAL |
| 1   | U2  | 74LS174                                   |  |
| 2   | U3, U4  | 74LS138                                   |  |
| 1   | U5  | 34432                                     |  |
| 2   | U6, U7  | 4044B                                     |  |
| 5   | D1, D2, D3<br>D4, D5                            | DIODE 1N4001                              |  |
| 1   | D6  | DIODE 1N4148                              |  |
| 3   | R8, R9, R10                                     | +/-1% 1/4W RESISTOR<br>DEPENDING ON 4044B |  |
| 3   | R1, R2, R3                                      | 150 OHM +/-5% 1/4W<br>RESISTOR            |  |
| 5   | R4, R5, R6<br>R7, R8                            | 10K OHM +/-5% 1/4W<br>RESISTOR            |  |
| 3   | RP1, RP2  | 10K OHM +/-5% *8                          | RESISTORS BETWEEN<br>100 OHM & 150 OHM MAY<br>BE USED  |
| 1   | RP3   | PARALLEL RESISTOR                         |  |
| 1   | RP4   | 100K OHM +/-5% *8<br>PARELLEL RESISTOR    |  |
| 9   | C3, C8, C10<br>C11, C12<br>C15, C16<br>C17, C18 | CERAMIC CAPACITOR<br>0.1UF 50V            |  |
| 2   | C13, C14  | CERAMIC CAPACITOR<br>10PF 50V             |  |
| 3   | C4, C6, C7                                      | CERAMIC CAPACITOR<br>33PF 50V             |  |
| 2   | C1, C9  | ELECTROLYTIC<br>CAPACITOR 10UF 16V        |  |
| 1   | XTAL  | 6.144 MHZ CRYSTAL                         |  |
| 1   | J1  | 6 PIN WAFER 90<br>DEGREE                  |  |
| 1   |   | 5060 REV 3.0 PCB                          |  |
| 153 |   | JUMPER WIRE                               |  |

## PART TWO

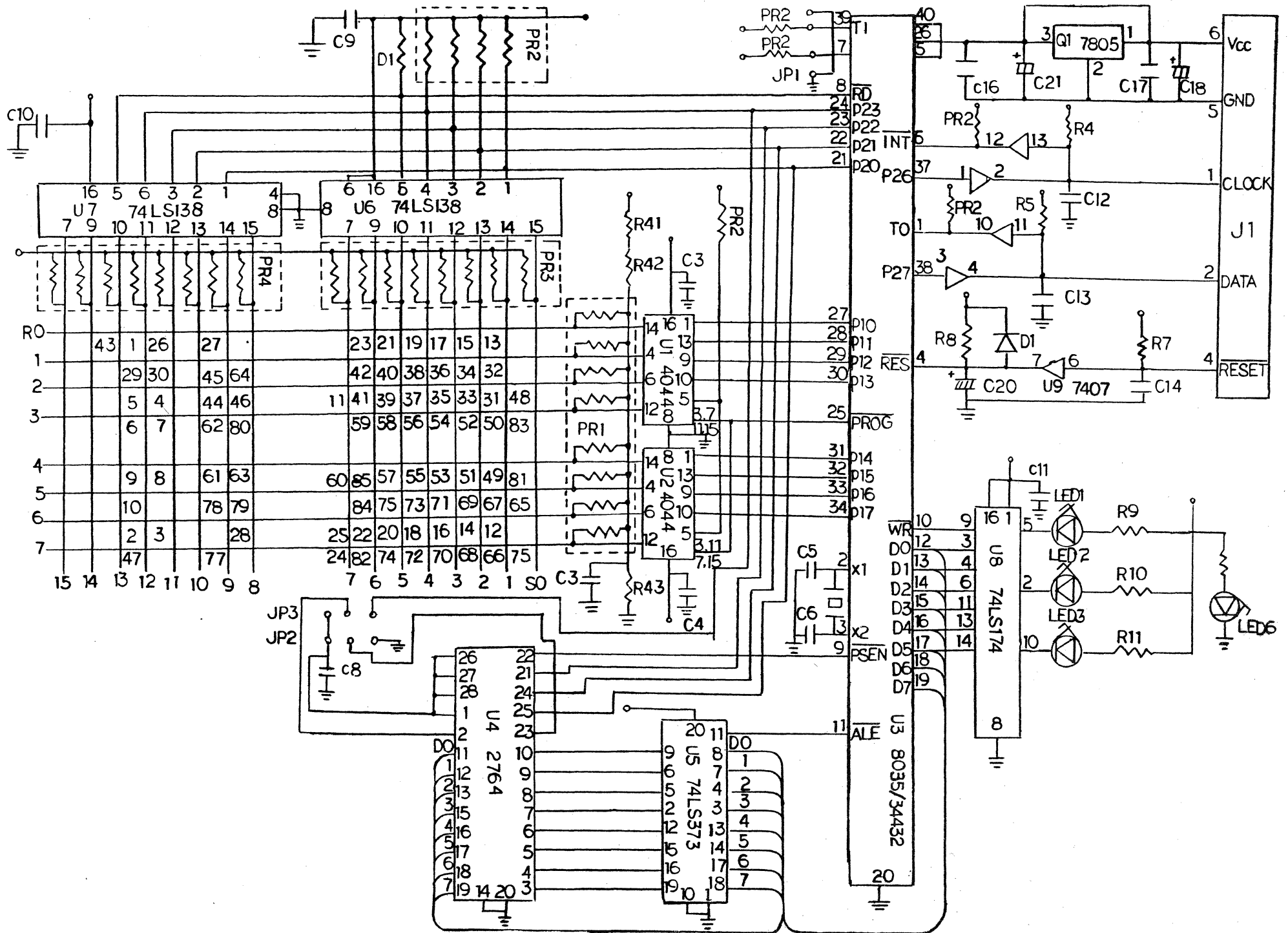
|   |                    |                 |  |
|---|--------------------|-----------------|--|
| 3 | LED1, LED2<br>LED3 | GREEN 2*5mm LED |  |
| 1 | J1                 | BLACK CABLE     |  |

## KEYBOARD INTERFACE CONNECTOR

| DESCRIPTION    | VOLTAGE       | PINS | CONNECTOR   |
|----------------|---------------|------|---|
| Keyboard Clock | + 5VDC Signal | 1    |  |
| Keyboard Data  | + 5VDC Signal | 2    |   |
| Keyboard RESET | 0             | 3    |   |
| Ground         | 0             | 4    |   |
| Power Supply   | + 5 VDC       | 5    |   |

5 Pin DIN at PC System Input

BTC-5060 Rev. 4.1 CIRCUIT DIAGRAM



# BTC-5060 Rev. 4.1 PARTS LIST

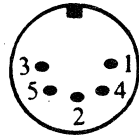
## PART ONE

| QTY | LABEL-ID                               | DESCRIPTION                            | REMARKS   |   |
|-----|--|--|---|---|
| 2   | U1, U2                                 | 4044B                                  | CMOS RS-LATCH REFER TO 4044A 16-LEVEL TEST MANUAL<br>IF 34432 IS NOT USED, FOLLOWING ARE THE ALTERNATE CPUS<br>1) U3-AU8035**00 (8035)<br>2) U5-AT7A373*00 (74LS373)<br>3) U4-AM2764**00 (2764 EPROM WITH ATPC-3.5 PROGRAM)<br>4) FKS28D21*D (28 PINS SOCKET, USE TO PLUG 2764)<br>1-OF-8 DECODER<br>SIX EDGE-TRIGGERED D-TYPE FLIP-FLOPS<br>HEX BUFFER/DRIVER (OPEN COLLECTOR) |   |
| 1   | U3                                     | 34432 CPU                              |   |   |
| 2   | U6, U7                                 | 74LS138                                |   |   |
| 1   | U8                                     | 74LS174                                |   |   |
| 1   | U9                                     | 7407                                   |   |   |
| 2   | C18, C20                               | ELECTROLYTIC CAPACITOR 10 UF 16V       |   |   |
| 3   | C12, C13, C14                          | CERAMIC CAPACITOR 33PF 50V             |   |   |
| 2   | C5, C6                                 | CERAMIC CAPACITOR 10PF 50V             |   |   |
| 8   | C1, C3, C4, C7<br>C10, C11<br>C15, C17 | CERAMIC CAPACITOR 0.1UF 50V            |   |   |
| 3   | R9, R10, R11                           | 150 OHM +/-5% 1/4W RESISTOR            |   | RESISTORS BETWEEN 100 OHM & 150 OHM MAY BE USED |
| 2   | D2, R8                                 | 10K OHM +/-5% 1/4W RESISTOR            |   |   |
| 3   | R4, R5, R7                             | 3.3K OHM +/-5% 1/4W RESISTOR           |   |   |
| 3   | R41, R42, R43                          | +/-1% 1/4W RESISTOR                    |   |   |
| 1   | PR1                                    | 100K OHM +/-5% *8 PARALLEL RESISTOR    |   |   |
| 3   | PR2, PR3, PR4                          | 10K OHM +/-5% *8 PARALLEL RESISTOR     |   |   |
| 1   | XTAL1                                  | 6.144 MHz CRYSTAL                      |   |   |
| 1   | J1                                     | 6 PIN WAFER 90 DEGREE 5060 REV 4.1 PCB |   |   |
| 1   |  | 5060 REV 4.1 PCB                       |   |   |
| 1   | JP1                                    | JUMPER WIRE                            |   |   |
| 1   | D1                                     | DIODE 1N4148                           |   |   |

## PART TWO

|   |                    |                 |  |
|---|--------------------|-----------------|--|
| 3 | LED1, LED2<br>LED3 | GREEN 2*5mm LED |  |
| 1 | J1                 | BLACK CABLE     |  |

## KEYBOARD INTERFACE CONNECTOR

| DESCRIPTION    | VOLTAGE       | PINS | CONNECTOR   |
|----------------|---------------|------|---|
| Keyboard Clock | + 5VDC Signal | 1    |  |
| Keyboard Data  | + 5VDC Signal | 2    |   |
| Keyboard RESET | 0             | 3    |   |
| Ground         | 0             | 4    |   |
| Power Supply   | + 5 VDC       | 5    |   |
|                |               |      | 5 Pin DIN at PC System Input  |



# BTC-5060 Rev. 5.0 PARTS LIST


## PART ONE

| QTY | LABEL-ID                        | DESCRIPTION                               | REMARKS  |   |
|-----|---------------------------------|---|--|---|
| 2   | U1, U2                          | 4044B                                     | <b>CMOS RS-LATCH<br/>REFER TO 4044A-1<br/>16-LEVEL TEST MANUAL<br/>ALTERNATE CPU AO35342*<br/>40 (35342) MAY BE USED<br/>SIX EDGE-TRIGGERED<br/>D-TYPE FLIP-FLOPS<br/>HEX BUFFER/DRIVER<br/>(OPEN COLLECTOR)</b> |   |
| 1   | U3                              | 35116 CPU                                 |  |   |
| 1   | U4                              | 74LS174                                   |  |   |
| 1   | U5                              | 7407                                      |  |   |
| 6   | D1, D2, D3<br>D4, D5, D6        | DIODE 1N4001                              |  |   |
| 1   | D7                              | DIODE 1N4148                              |  |   |
| 3   | R2, R4, R5                      | +/-1% 1/4W RESISTOR<br>DEPENDING ON 4044B |  |   |
| 3   | R6, R7, R8                      | 150 OHM +/-5% 1/4W<br>RESISTOR            |  | RESISTORS BETWEEN<br>100 OHM & 150 OHM MAY<br>BE USED |
| 2   | R9, R10                         | 10K OHM +/-5% 1/4W<br>RESISTOR            |  |   |
| 2   | PR2, PR3                        | 10K OHM +/-5% * 8<br>PARALLEL RESISTOR    |  |   |
| 1   | PR1                             | 100K OHM +/-5% * 8<br>PARALLEL RESISTOR   |  |   |
| 7   | C1, C2, C3<br>C4, C7, C8<br>C12 | CERAMIC CAPACITOR<br>0.1UF 50V            |  |   |
| 2   | C5, C6                          | CERAMIC CAPACITOR<br>10PF 50V             |  |   |
| 3   | C9, C10<br>C11                  | CERAMIC CAPACITOR<br>33PF 50V             |  |   |
| 2   | C14, C17                        | ELECTROLYTIC<br>CAPACITOR 10UF-16V        |  |   |
| 1   | XTAL                            | 6.144 MHz CRYSTAL                         |  |   |
| 1   | J1                              | 6 PIN WAFER 90<br>DEGREE                  |  |   |
| 1   |                                 | 5060 REV 5.0 PCB                          |  |   |
| 123 |                                 | JUMPER WIRE                               |  |   |

## PART TWO

|   |                     |                 |  |
|---|---------------------|-----------------|--|
| 3 | LED1, LED2<br>LED 3 | GREEN 2*5mm LED |  |
| 1 | J1                  | BLACK CABLE     |  |

## KEYBOARD INTERFACE CONNECTOR

| DESCRIPTION    | VOLTAGE       | PINS | CONNECTOR   |
|----------------|---------------|------|---|
| Keyboard Clock | + 5VDC Signal | 1    |  |
| Keyboard Data  | + 5VDC Signal | 2    |   |
| Keyboard RESET | 0             | 3    |   |
| Ground         | 0             | 4    |   |
| Power Supply   | + 5 VDC       | 5    |   |

5 Pin DIN at PC System Input



# BTC-5060 Rev. 5.1 PARTS LIST


## PART ONE

| QTY | LABEL-ID                                    | DESCRIPTION                             | REMARKS   |
|-----|---|---|---|
| 1   | U1  | 7407                                    | HEX BUFFER/DRIVER<br>(OPEN COLLECTOR)<br>SIX EDGE-TRIGGERED<br>D-TYPE FLIP-FLOPS<br>ALTERNATE CPU AO35342*<br>40 (35342) MAY BE USED<br>QUAD-CMOS RS-LATCH<br>REFER TO 4044A-1 16-<br>LEVEL TEST MANUAL<br><br>RESISTORS BETWEEN<br>100 OHM & 150 OHM MAY<br>BE USED<br><br>TRIMMING RESISTORS<br>TO MATCH SELECTED<br>4044 THRESHOLD |
| 1   | U2  | 74LS174                                 |   |
| 1   | U3  | 35116 CPU                               |   |
| 2   | U4, U5                                      | 4044B                                   |   |
| 1   | C3  | ELECTROLYTIC<br>CAPACITOR 10UF 16V      |   |
| 1   | C9  | ELECTROLYTIC<br>CAPACITOR 1UF 16V       |   |
| 7   | C4, C7, C10, C11<br>C14, C15, C16           | CERAMIC CAPACITOR<br>0.1UF 50V          |   |
| 3   | C5, C6, C8                                  | CERAMIC CAPACITOR<br>33PF 50V           |   |
| 2   | C12, C13                                    | CERAMIC CAPACITOR<br>10PF 50V           |   |
| 3   | R1, R3, R4                                  | 150 OHM +/-5% 1/4W<br>RESISTOR          |   |
| 9   | R2, R5, R6, R7<br>R8, R10, R11,<br>R12, R13 | 10K OHM +/-5% 1/4W<br>RESISTOR          |   |
| 1   | RP2   | 100K OHM +/-5% * 8<br>PARALLEL RESISTOR |   |
| 1   | RP1   | 10K OHM +/-5% * 8<br>PARALLEL RESISTOR  |   |
| 3   | R14, R16<br>R18                             | +/-1% 1/4W RESISTOR                     |   |
| 1   | XTAL1                                       | 6.144 MHZ CRYSTAL                       |   |
| 6   | D1, D2, D3<br>D4, D5, D6                    | DIODE 1N4001                            |   |
| 1   | D7  | DIODE 1N4148                            |   |
| 1   | J1  | 6 PIN WAFER 90 DEGREE                   |   |
| 1   |   | 5060 REV 5.1 PCB                        |   |
| 109 |   | JUMPER WIRE                             |   |

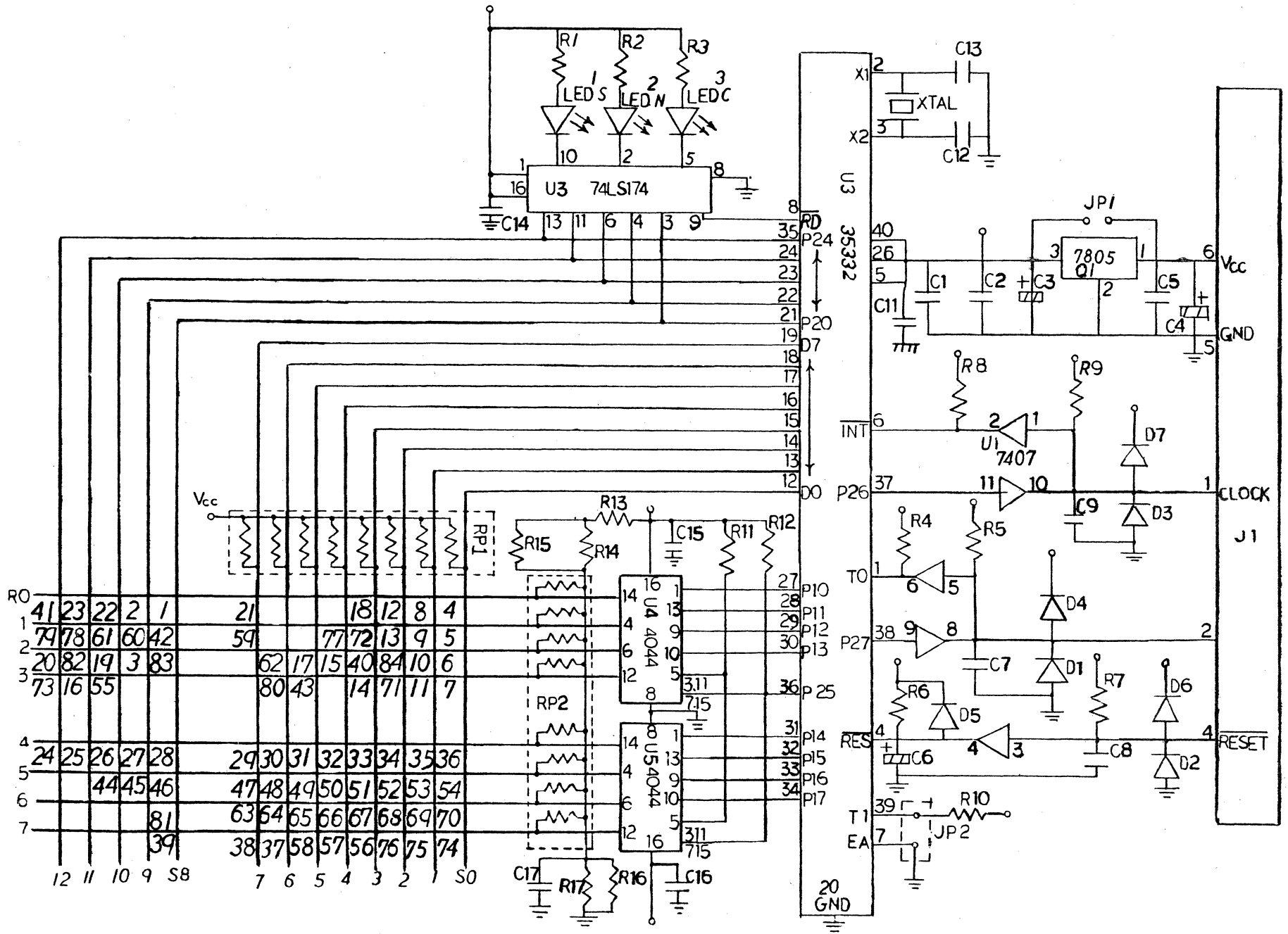
## PART TWO

|   |                    |                  |  |
|---|--------------------|------------------|--|
| 3 | LED1, LED2<br>LED3 | GREEN 2*5 mm LED |  |
| 1 | J1                 | BLACK CABLE      |  |

## KEYBOARD INTERFACE CONNECTOR

| DESCRIPTION    | VOLTAGE       | PINS | CONNECTOR   |
|----------------|---------------|------|---|
| Keyboard Clock | + 5VDC Signal | 1    |  |
| Keyboard Data  | + 5VDC Signal | 2    |   |
| Keyboard RESET | 0             | 3    |   |
| Ground         | 0             | 4    |   |
| Power Supply   | + 5 VDC       | 5    |   |
|                |               |      | 5 Pin DIN at PC System Input  |

BTC-5060 Rev. 8.0 CIRCUIT DIAGRAM





# BTC-5060 Rev. 8.0 PARTS LIST


## PART ONE

| QTY | LABEL-ID                      | DESCRIPTION                             | REMARKS   |   |   |
|-----|-------------------------------|---|---|---|---|
| 1   | U1                            | 7407                                    | HEX BUFFER/DRIVER<br>(OPEN COLLECTOR)<br>SIX EDGE-TRIGGERED<br>D-TYPE FLIP-FLOPS<br>ALTERNATE CPU A05339A*<br>26 (BTC5339A) OR<br>A05339B* 26 (BTC5339B)<br>MAY BE USED<br>QUAD-CMOS RS-LATCH<br>REFER TO 4044A-1<br>16-LEVEL TEST MANUAL |   |   |
| 1   | U3                            | 74LS174                                 |   |   |   |
| 1   | U2                            | 35332 CPU                               |   |   |   |
| 2   | U4, U5                        | 4044B                                   |   |   |   |
| 1   | C3                            | ELECTROLYTIC<br>CAPACITOR 10UF 16V      |   |   |   |
| 1   | C6                            | ELECTROLYTIC<br>CAPACITOR 1UF 16V       |   |   |   |
| 7   | C2,C10,C11,C14<br>C15,C16,C17 | 0.1UF 50V                               |   |   |   |
| 3   | C7, C8, C9                    | CERAMIC CAPACITOR<br>33PF 50V           |   |   |   |
| 2   | C12, C13                      | CERAMIC CAPACITOR<br>10PF 50V           |   |   |   |
| 3   | R1, R2, R3                    | 150 OHM +/-5% 1/4W<br>RESISTOR          |   | RESISTORS BETWEEN<br>100 OHM & 150 OHM MAY<br>BE USED |   |
| 8   | R4,R5,R7,R8<br>R9,R10,R11,R12 | 10K OHM +/-5% 1/4W<br>RESISTOR          |   |   |   |
| 1   | RP2                           | 100K OHM +/-5% * 8<br>PARALLEL RESISTOR |   |   |   |
| 1   | RP1                           | 10K OHM +/-5% * 8<br>PARALLEL RESISTOR  |   |   |   |
| 3   | R13, R14<br>R17               | +/-1% 1/4W RESISTOR                     |   |   |   |
| 1   | XTAL1                         | 6.144 MHZ CRYSTAL                       |   |   | TRIMMING RESISTORS<br>TO MATCH SELECTED<br>4044 THRESHOLD |
| 6   | D1, D2, D3<br>D4, D6, D7      | DIODE 1N4001                            |   |   |   |
| 1   | D5                            | DIODE 1N4148                            |   |   |   |
| 1   | J1                            | 6 PIN WAFER 90 DEGREE                   |   |   |   |
| 1   |                               | 5060 REV 8.0 PCB                        |   |   |   |
| 109 |                               | JUMPER WIRE                             |   |   |   |

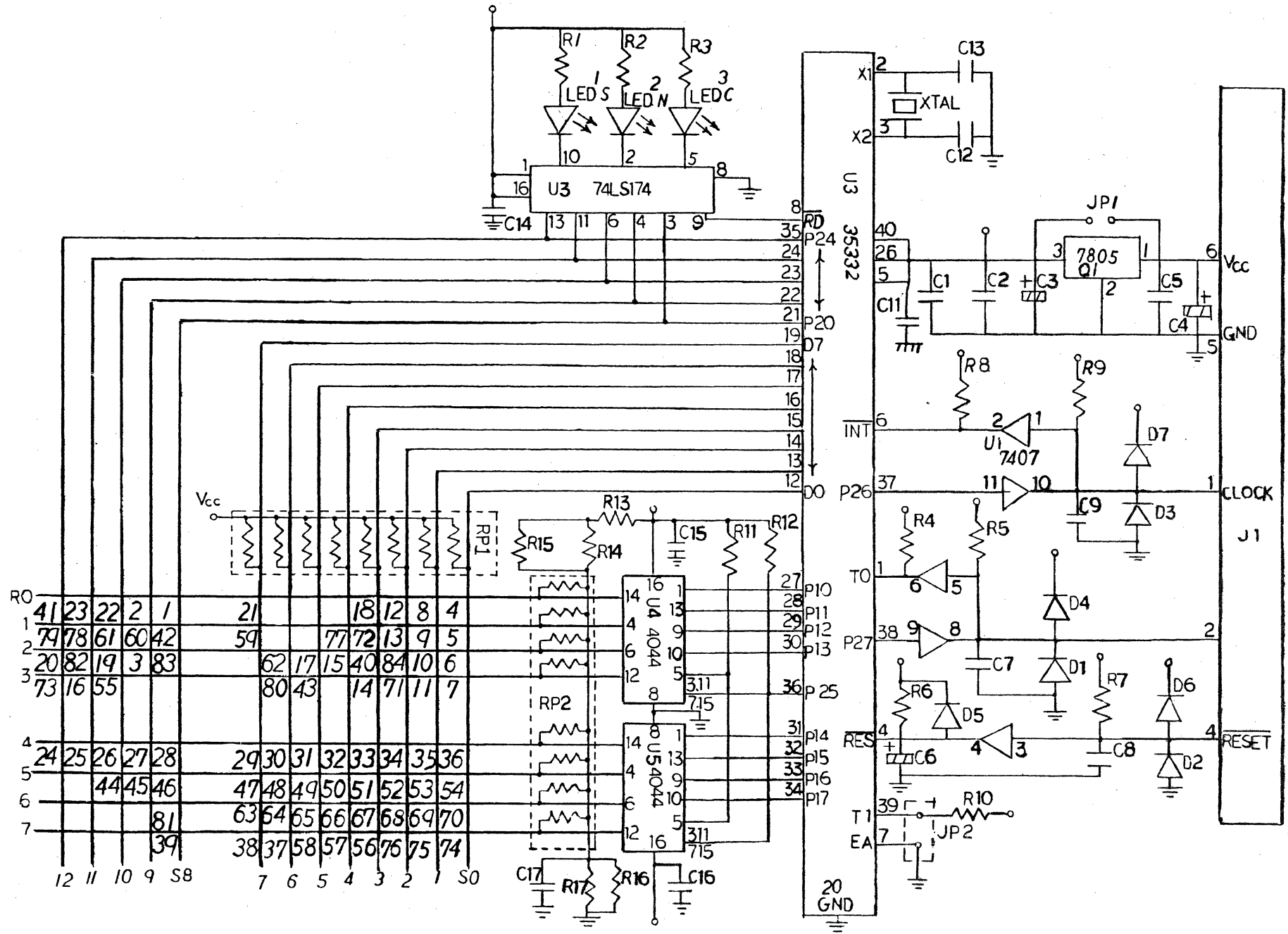
## PART TWO

|   |                    |                  |  |
|---|--------------------|------------------|--|
| 3 | LED1, LED2<br>LED3 | GREEN 2*5 mm LED |  |
| 1 | J1                 | BLACK CABLE      |  |

## KEYBOARD INTERFACE CONNECTOR

| DESCRIPTION    | VOLTAGE       | PINS | CONNECTOR   |
|----------------|---------------|------|---|
| Keyboard Clock | + 5VDC Signal | 1    |  <p style="text-align: center;">5 Pin DIN at PC System Input</p> |
| Keyboard Data  | + 5VDC Signal | 2    |   |
| Keyboard RESET | 0             | 3    |   |
| Ground         | 0             | 4    |   |
| Power Supply   | + 5 VDC       | 5    |   |

BTC-5060 Rev. 8.1 CIRCUIT DIAGRAM



# BTC-5060 Rev. 8.1 PARTS LIST


## PART ONE

| QTY | LABEL-ID                      | DESCRIPTION                          | REMARKS   |   |
|-----|-------------------------------|--------------------------------------|---|---|
| 1   | U1                            | 7407                                 | HEX BUFFER/DRIVER (OPEN COLLECTOR)<br>SIX EDGE-TRIGGERED D-TYPE FLIP-FLOPS<br>ALTERNATE CPU A05339A* 26 (BTC5339A) OR A05339B*26 (BTC5339B)<br>MAY BE USED<br>QUAD-CMOS RS-LATCH REFER TO 4044A-1<br>16-LEVEL TEST MANUAL |   |
| 1   | U3                            | 74LS174                              |   |   |
| 1   | U2                            | 35332 CPU                            |   |   |
| 2   | U4, U5                        | 4044B                                |   |   |
| 1   | C3                            | ELECTROLYTIC CAPACITOR 10UF 16V      |   |   |
| 1   | C6                            | ELECTROLYTIC CAPACITOR 1UF 16V       |   |   |
| 7   | C2,C10,C11,C14<br>C15,C16,C17 | CERAMIC CAPACITOR 0.1UF 50V          |   |   |
| 3   | C7, C8, C9                    | CERAMIC CAPACITOR 33PF 50V           |   |   |
| 2   | C12, C13                      | CERAMIC CAPACITOR 10PF 50V           |   |   |
| 3   | R1, R2, R3                    | 150 OHM +/-5% 1/4W RESISTOR          |   | RESISTORS BETWEEN 100 OHM & 150 OHM MAY BE USED     |
| 8   | R4,R5,R7,R8<br>R9,R10,R11,R12 | 10K OHM +/-5% 1/4W RESISTOR          |   | TRIMMING RESISTORS TO MATCH SELECTED 4044 THRESHOLD |
| 1   | RP2                           | 100K OHM +/-5% * 8 PARALLEL RESISTOR |   |   |
| 1   | RP1                           | 10K OHM +/-5% * 8 PARALLEL RESISTOR  |   |   |
| 3   | R13, R14<br>R17               | +/-1% 1/4W RESISTOR                  |   |   |
| 1   | XTAL1                         | 6.144 MHZ CRYSTAL                    |   |   |
| 6   | D1, D2, D3<br>D4, D6, D7      | DIODE 1N4001                         |   |   |
| 1   | D5                            | DIODE 1N4148                         |   |   |
| 1   | J1                            | 6 PIN WAFER 90 DEGREE                |   |   |
| 1   |                               | 5060 REV 8.1 PCB                     |   |   |
| 109 |                               | JUMPER WIRE                          |   |   |

## PART TWO

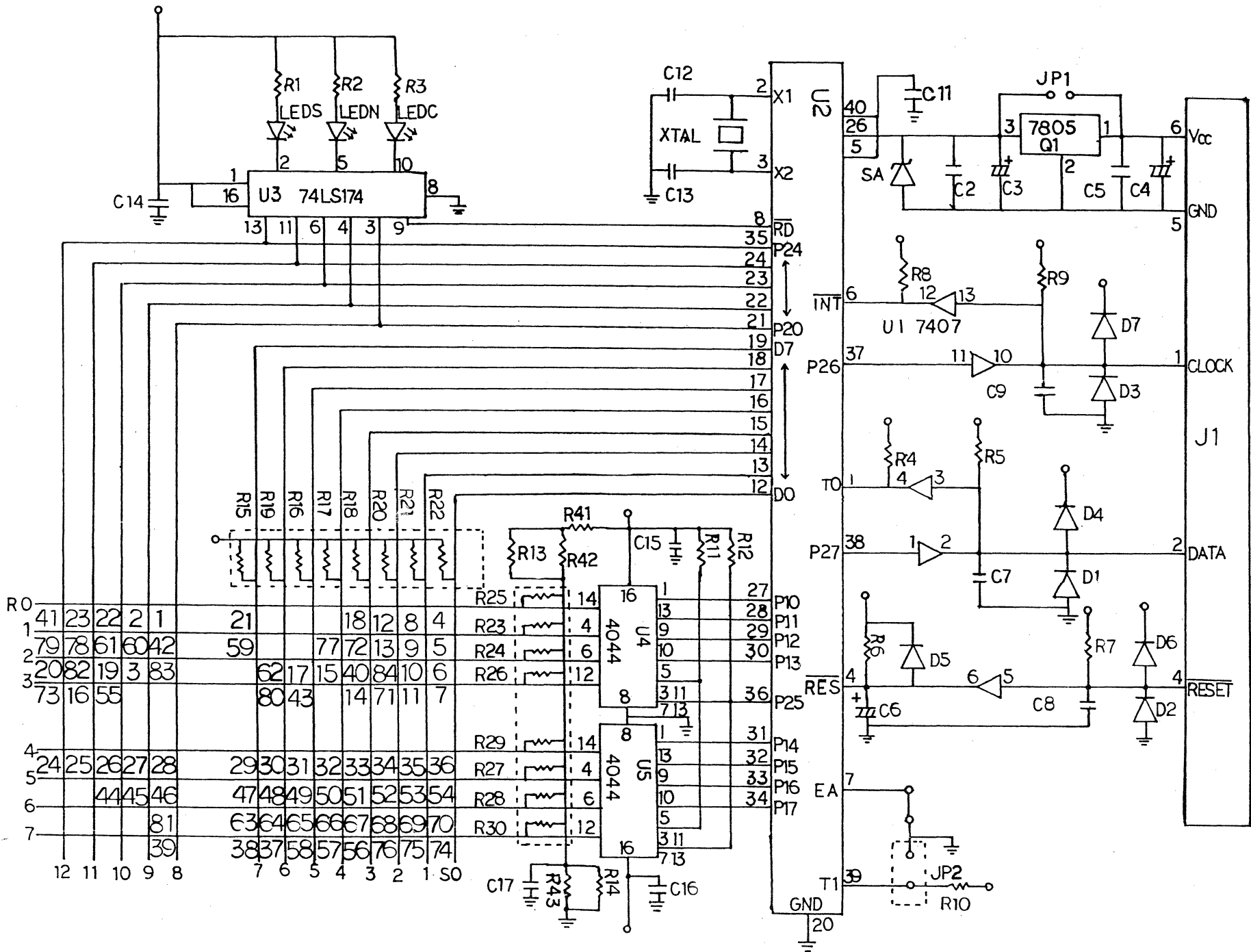
|   |                    |                  |  |
|---|--------------------|------------------|--|
| 3 | LED1, LED2<br>LED3 | GREEN 2*5 mm LED |  |
| 1 | J1                 | BLACK CABLE      |  |

## KEYBOARD INTERFACE CONNECTOR

| DESCRIPTION    | VOLTAGE       | PINS | CONNECTOR   |
|----------------|---------------|------|---|
| Keyboard Clock | + 5VDC Signal | 1    |  |
| Keyboard Data  | + 5VDC Signal | 2    |   |
| Keyboard RESET | 0             | 3    |   |
| Ground         | 0             | 4    |   |
| Power Supply   | + 5 VDC       | 5    |   |

5 Pin DIN at PC System Input

BIC-5060 Rev. 8.2 CIRCUIT DIAGRAM



# BTC-5060 Rev. 8.2 PARTS LIST

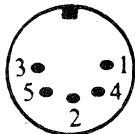
## PART ONE

| QTY | LABEL-ID  | DESCRIPTION                     | REMARKS   |
|-----|---|---------------------------------|---|
| 1   | U1  | 7407                            | HEX BUFFER/DRIVER (OPEN COLLECTOR)<br>ALTERNATE CPU A05339A*<br>26 (BTC5339A) OR<br>A05339B*26 (BTC5339B)<br>MAY BE USED<br>SIX EDGE-TRIGGERED<br>D-TYPE FLIP-FLOPS<br>QUAD-CMOS RS-LATCH<br>REFER TO 4044A-1<br>16-LEVEL TEST MANUAL |
| 1   | U2  | 35332 CPU                       |   |
| 1   | U3  | 74LS174                         |   |
| 2   | U4, U5  | 4044B                           |   |
| 1   | C3  | ELECTROLYTIC CAPACITOR 10UF 16V |   |
| 1   | C6  | ELECTROLYTIC CAPACITOR 1UF 16V  |   |
| 7   | C2, C10, C11<br>C14, C15<br>C16, C17  | CERAMIC CAPACITOR 0.1UF 50V     |   |
| 3   | C7, C8, C9  | CERAMIC CAPACITOR 33PF 50V      |   |
| 2   | C12, C13  | CERAMIC CAPACITOR 10PF 50V      |   |
| 3   | R1, R2, R3  | 150 OHM +/-5% 1/4W RESISTOR     |   |
| 16  | R4, R5, R7<br>R8, R9, R10, R11<br>R12, R15, R16<br>R17, R18, R19<br>R20, R21, R22 | 10K OHM +/-5% 1/4W RESISTOR     |   |
| 8   | R23, R24, R25<br>R26, R27, R28<br>R29, R30  | 100K OHM +/-5% 1/4W RESISTOR    |   |
| 3   | R41, R42<br>R43   | +/-1% 1/4W RESISTOR             |   |
| 1   | XTAL1   | 6.144 MHZ CRYSTAL               |   |
| 6   | D1, D2, D3<br>D4, D6, D7  | DIODE 1N4001                    |   |
| 1   | D5  | DIODE 1N4148                    |   |
| 1   | J1  | 6 PIN WAFER 90 DEGREE           |   |
| 1   |   | 5060 REV 8.2 PCB                |   |
| 142 |   | JUMPER WIRE                     |   |

## PART TWO

|   |                    |                  |  |
|---|--------------------|------------------|--|
| 3 | LED1, LED2<br>LED3 | GREEN 2*5 mm LED |  |
| 1 | J1                 | BLACK CABLE      |  |

## KEYBOARD INTERFACE CONNECTOR

| DESCRIPTION    | VOLTAGE       | PINS | CONNECTOR   |
|----------------|---------------|------|---|
| Keyboard Clock | + 5VDC Signal | 1    |  |
| Keyboard Data  | + 5VDC Signal | 2    |   |
| Keyboard RESET | 0             | 3    |   |
| Ground         | 0             | 4    |   |
| Power Supply   | + 5 VDC       | 5    |   |

5 Pin DIN at PC System Input



## **TECHNICAL DATA**

### **POWER REQUIREMENT.**

+5VDC @240mA nominal

### **INTERFACE PROTOCOL**

See Schematic for pinout  
data Protocol is serial format TTL

### **MECHANICAL DATA**

Total Travel :  $3.8\text{mm} \pm 0.2\text{mm}$

Pretravel :  $1.9\text{mm} \pm 0.2\text{mm}$

Operating life : 50 mega cycles

### **ENVIRONMENTAL DATA**

Operating temperature:  $0^{\circ}$  to  $55^{\circ}\text{C}$

Relative humidity : 20%—95% non-condensing

Altitude : -1000ft to 10000ft