

The circuit diagrams in the 5150 PC Technical Reference by IBM are your best source of information for identifying and understanding the parts used on the PC-Retro. The PC-Retro is identical except for the cassette delay line chip. (DS1000M-125)

Finding parts for the PC-Retro has become very difficult. Often, finding a suitable part requires locating an equivalent substitute by doing research. Jameco originally was a pretty good supplier, but their stock of vintage parts is dwindling. Digi-Key has also been a good supplier, but they are phasing out through hole components and tin-lead devices.

The most likely source for finding parts today is on EBAY. This often involves ordering from all over the world. Beware of counterfeit vintage parts coming from China. (Blank IC's labeled to look correct.)

MTM Scientific, Inc 4/3/2019

### **IC's on IBM 5151 PC MOTHERBOARD (64KB-256KB CPU)**

U1, MC1741, 8 pin  
U2, 8259A, 28 pin  
U3, 8088 CPU, 40 pin  
U4, 8087 MATH PROCESSOR, EMPTY, 40 pin  
U5, LS30, 14 pin  
U6, 8288, 20 pin  
U7, LS373, 20 pin  
U8, LS245, 20 Pin  
U9, LS373, 20 pin  
U10, LS373, 20 pin  
U11, 8248A, 18 pin  
U12, LS245, 20 pin  
U13, LS245, 20 pin  
U14, LS245, 20 pin  
U15, LS244, 20 pin  
U16, LS244, 20 pin  
U17, LS244, 20 pin  
U18, LS373, 20 pin  
U19, LS670, 16 pin  
U20, RN1 THIS LOCATION, 4.7 K Ohm, 16 pin (See below)  
U21, SW1 DIP SWITCH THIS LOCATION, 16 pin (See below)  
U22, RN2 THIS LOCATION, 8.2 K Ohm, 16 pin (See below)

U23, LS244, 20 pin  
U24, LS322, 20 pin  
U25, SW2 DIP SWITCH THIS LOCATION, 16 pin (See below)  
U26, LS175, 16 pin  
U27, LS02, 14 pin  
U28, ROM, EMPTY, 24 pin  
U29, ROM, BASIC, 24 pin  
U30, ROM, BASIC, 24 pin  
U31, ROM, BASIC, 24 pin  
U32, ROM, BASIC, 24 pin  
U33, ROM, BIOS, 24 pin (Use a 27128 EPROM in an Adapter Socket)  
U34, 8253-5, 24 pin  
U35, 8237A-S, 40 pin  
U36, 8255A-5, 40 pin  
U37, RAM, BANK0, 16 pin, MB8264-20 (Numerous Substitutes)  
U38, RAM, BANK0, 16 pin  
U39, RAM, BANK0, 16 pin  
U40, RAM, BANK0, 16 pin  
U41, RAM, BANK0, 16 pin  
U42, RAM, BANK0, 16 pin  
U43, RAM, BANK0, 16 pin  
U44, RAM, BANK0, 16 pin  
U45, RAM, BANK0, 16 pin  
U46, LS138, 16 pin  
U47, LS138, 16 pin  
U48, LS138, 16 pin  
U49, S08, 14 pin  
U50, LS02, 14 pin  
U51, LS04, 14 pin  
U52, LS00, 14 pin  
U53, RAM, BANK1, EMPTY, 16 pin, MB8264-20 (Numerous Substitutes)  
U54, RAM, BANK1, EMPTY, 16 pin  
U55, RAM, BANK1, EMPTY, 16 pin  
U56, RAM, BANK1, EMPTY, 16 pin  
U57, RAM, BANK1, EMPTY, 16 pin  
U58, RAM, BANK1, EMPTY, 16 pin  
U59, RAM, BANK1, EMPTY, 16 pin  
U60, RAM, BANK1, EMPTY, 16 pin  
U61, RAM, BANK1, EMPTY, 16 pin  
U62, LS158, 16 pin

U63, LS38, 14 pin  
U64, LS20, 14 pin  
U65, S138, 16 pin  
U66, LS138, 16 pin  
U67, LS74, 14 pin  
U68, RN3 THIS LOCATION, 4.7 K Ohm, 16 pin (See below)  
U69, RAM, BANK2, EMPTY, 16 pin, MB8264-20 (Numerous Substitutes)  
U70, RAM, BANK2, EMPTY, 16 pin  
U71, RAM, BANK2, EMPTY, 16 pin  
U72, RAM, BANK2, EMPTY, 16 pin  
U73, RAM, BANK2, EMPTY, 16 pin  
U74, RAM, BANK2, EMPTY, 16 pin  
U75, RAM, BANK2, EMPTY, 16 pin  
U76, RAM, BANK2, EMPTY, 16 pin  
U77, RAM, BANK2, EMPTY, 16 pin  
U78, RN4 THIS LOCATION, 30 Ohm, 16 pin (See below)  
U79, LS158, 16 pin  
U80, LS125, 14 pin  
U81, S00, 14 pin  
U82, S74, 14 pin  
U83, LS04, 14 pin  
U84, LS10, 14 pin  
U85, RAM, BANK3, EMPTY, 16 pin, MB8264-20 (Numerous Substitutes)  
U86, RAM, BANK3, EMPTY, 16 pin  
U87, RAM, BANK3, EMPTY, 16 pin  
U88, RAM, BANK3, EMPTY, 16 pin  
U89, RAM, BANK3, EMPTY, 16 pin  
U90, RAM, BANK3, EMPTY, 16 pin  
U91, RAM, BANK3, EMPTY, 16 pin  
U92, RAM, BANK3, EMPTY, 16 pin  
U93, RAM, BANK3, EMPTY, 16 pin  
U94, S280, 14 pin  
U95, 75477, 8 pin  
U96, LS74, 14 pin  
U97, S08, 14 pin  
U98, LS175, 16 pin  
U99, LS04, 14 pin  
U100, NO SOCKET, EMPTY SPACE, 20 pin  
U102, See Miscellaneous List (See below)

## **Resistors on IBM 5151 PC Motherboard**

(64KB-256KB CPU) “Model B”

Cross checked with board and the circuit diagram.

R1, 18 KOhm, Brown Gray Orange

R2, 1 MOhm, Brown Black Green

R3, 18 KOhm, Brown Gray Orange

R4, 18 KOhm, Brown Gray Orange

R5, 18 KOhm, Brown Gray Orange

R6, 150 Ohm, Brown Green Brown

R7, 1200 Ohm, Brown Red Red

R8, 4.7 KOhm, Yellow Purple Red

R9, 3.9 KOhm, Orange White Red

R10\*, 33 Ohm, Orange Orange Black

R11, 180 Ohm, Brown Gray Brown

R12, 220 Ohm, Red Red Brown

R13, 27 Ohm, Red Purple Black

R14, 27 Ohm, Red Purple Black

R15, 27 Ohm, Red Purple Black

R16, 27 Ohm, Red Purple Black

R17, 27 Ohm, Red Purple Black

R18, 27 Ohm, Red Purple Black

R19, 27 Ohm, Red Purple Black

R20, 27 Ohm, Red Purple Black

R21, 27 Ohm, Red Purple Black

R22, 510 Ohm, Green Brown Brown

R23, 30 Ohm, Orange Black Black

R24, Not Present

R25, 510 Ohm, Green Brown Brown

\*R10 is 1/2 Watt. All others are 1/4 Watt.

Resistor Networks (DIP IC)

RN1, 4.7 K Ohm, 16 pin, Bussed (15 resistors) 4116R-002-472 (yellow DIP) or 316A472 AB Note: This part is available from Mouser as 4116R-2-472 (Exact match)

RN2, 8.2 K Ohm, 16 pin, 15 resistors bussed to +5V. Part number from Mouser is 4116R-2-822LF. (Tin/Lead legacy is 4116R-002-822)

RN3, 4.7 K Ohm, 16 pin, Bussed (15 resistors) 4116R-002-472 (yellow DIP) or 316A472 AB Note: This part is available from Mouser as 652-4116R-2LF-4.7K (Exact match)

RN4, 30 Ohm, 16 pin, 8 independent resistors, 916C300X2SR or 316B300 from AB. Mouser only has 27 or 33 ohm available. Arrow has the part though, as 4116R-1-300.

### **Capacitor Parts List / Misc. List**

C3, .047 uF, Qty: 23, Yellow, Ceramic, Marked 'K5M', Digi-Key #BC2686TB-ND, 50V

C5, .01 uF, Tubular, Qty: 1, TRW 630 film capacitor, 50V (Same as C9)

C7, 10 uF, Qty: 13, Yellow, Tantalum, 3 Leads, 16V (Substitute 2 Leads OK)

C8, .047 uF, Tubular, Qty: 1, TRW 630 film capacitor, 50V

C9, .01 uF, Tubular, Qty: 1, TRW 630 film capacitor, 50V (Same as C5)

C10, 47pF, Qty: 3, Yellow, Ceramic, 50V, Digi-Key #BC1038CT-ND

C-12, .047uf, Qty: 1, Yellow, Ceramic (Appears to be the same as C3)

Capacitor Trimmer, 5-30 pF

### **Miscellaneous Components**

Crystal, 14.31818 MHZ, Qty: 1, Jameco #537799

Rocker Switches, Qty: 2, AMP 435640-5 (These are U21 and U25 on IC Listing)

Relay, DPDT, Qty: 1 Omron G5V-2 5VDC

Keyboard Connector, 5 Pin DIN, Qty:2, Jameco #29399

Power Supply Connector, 6 Pin, 0.156, Amphenol, Qty:2 (Modified Key in 1 of 2)

Edge Card Connector, Qty: 5, Jameco #40694

TD1: Time Delay Line, DS1000M-125 Qty: 1, (Substitute is Data Delay Devices #3D7205M-25, 8 Pin IC DIP) On the Stock List as U102.

TD2: Time Delay Line, Qty: 1, Resistor Substitution is 470 Ohm 1/4 Watt, Jameco #690785 . (This was done on some IBM production boards.)

Speaker, 8 Ohm, Qty: 1

Speaker Connector, Qty:1, Right Angle Single Row Male Header, 0.100” (2.54mm). Cut to 4 pins and remove a pin.

2x2 Male Pin Header (Cassette Jumper Select), Qty: 1, Straight Male Header, 0.100” (2.54mm), EBAY.

Mini Jumper Plug, Shorting, Qty: 1, 0.100” (2.54 mm)

Diode, Qty: 1, “D1” on Board, 1N659, FC Type, 50V, Substitute 1N914A (Jameco #655269)

## **IC Socket List**

8 pin, Qty: 3

14 pin, Qty: 19

16 pin, Qty: 51

18 pin, Qty: 2

20 pin, Qty: 14

24 pin, Qty: 7 (Double Wide, 0.600 inches)

28 pin, Qty: 1 (Double Wide, 0.600 inches)

40 pin, Qty: 4 (Double Wide, 0.600 inches)