# vintageTEK Demo Board   Version June 2025

The new and improved demo board has been designed to allow additional parts to be added for full functionality. The board is sold in a basic configuration with a pre-programmed processor and requires +5V and two switches (not supplied) for basic display of the images. Two 10K potentiometers or joysticks (also not supplied) need to be added to play the games. A USB-C connector, two 5K1 resistors, and an on/off switch (also not supplied) can be used for convenient +5V power. These extra parts can be added directly to the PCB and pads have been added for ease of wiring to external components. Part numbers for the additional on-PCB parts are indicated on the rear.

Connect the oscilloscope X, Y, and ground to the indicated pads. Use short leads to connect to the oscilloscope, or use X10 probes. If you use X10 probes, make sure they are correctly compensated. Set the oscilloscope input to DC coupling. Some oscilloscopes have a short input time-constant in AC coupling that will distort the images. Most digital oscilloscopes do not work as well in X-Y mode, so an analog oscilloscope is recommended.
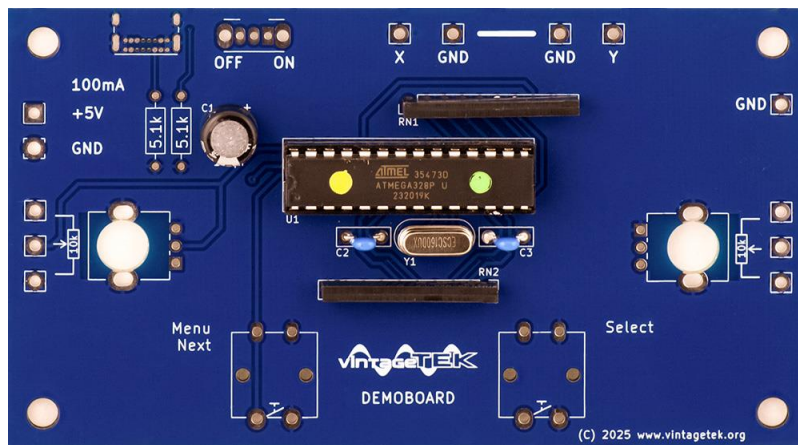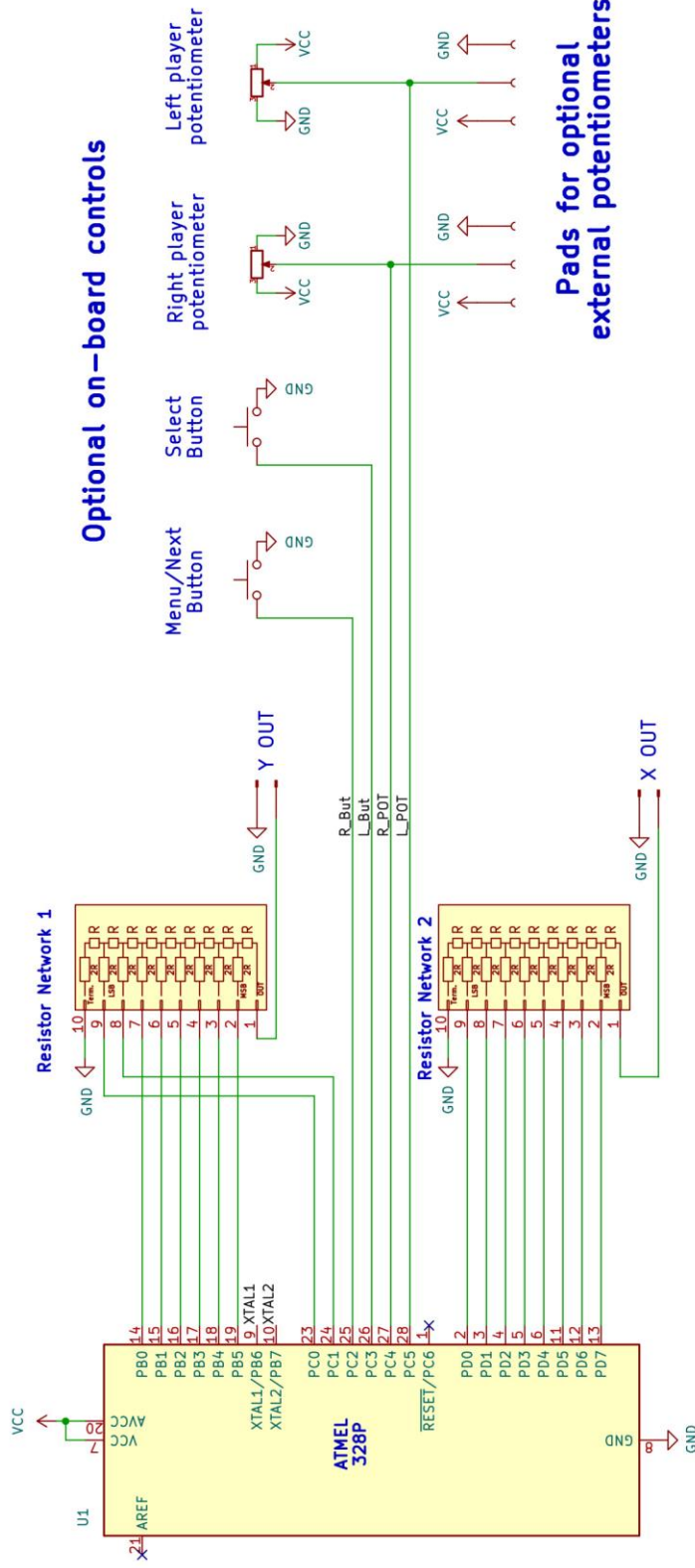

The ATmega328P processor supplied with your demo board has already been programmed. The menu provides the various display options: vintageTEK logo, Tek Bug, Wizard, 511, all four images, and the games Tennis and Target Ball. The Menu/Next switch selects a menu option, and the Select switch executes. The selected mode will be remembered when power is removed and restored. To exit the current mode and return to the menu, press the Menu Next switch.
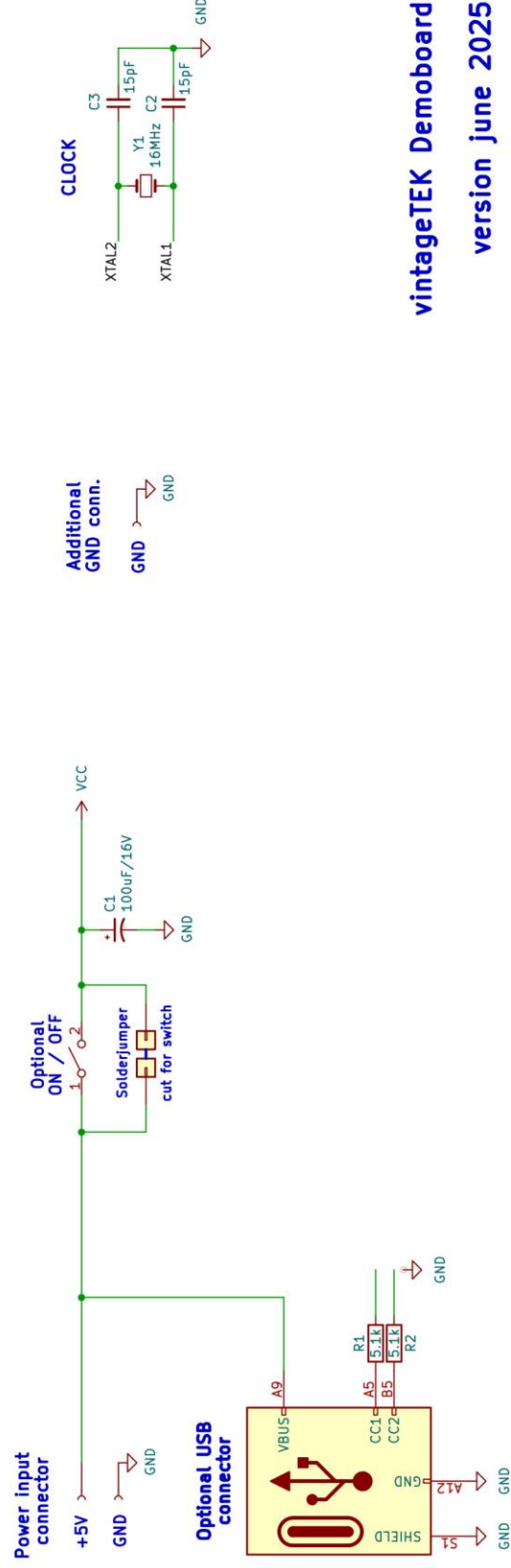
The tennis game starts with the ball in the center moving toward the right paddle. The paddles are drawn straight, but are slightly curved in effect. The angle at which the ball rebounds off the paddle depends on where it strikes the paddle. If the ball misses a paddle and hits a left or right wall, a point is scored for the opposite side and the game restarts with the ball in the middle, headed toward the side that scored the last point. As each side scores a point, its score is incremented, but once a score reaches 9, it does not increment. To restart the game and reset the score, cycle the power to the board.

The target ball game starts with only the right paddle. A solid wall is shown on the left with a gap. The object is to hit the ball, similar to Tennis, to exit through the gap. The gap moves to a new position each time, and decreases in size to increase the difficulty. Again, to restart the game and reset the score, cycle the power to the board.

More information and the latest status is on vintagetek.org/vintagetek-demo-board/

Optional on-board controls

Left player potentiometer
Right player potentiometer

VCC
GND
GND
VCC
VCC
GND
GND
VCC
GND
VCC
GND
VCC

Pads for optional external potentiometers

Select Button
GND

Menu/Next Button
GND

Y OUT
GND

R_But
L_But
R_POT
L_POT

X OUT
GND

Resistor Network 1
GND
10 9 8 7 6 5 4 3 2 1
Term. R R R R R R R R
LSB 2R 2R 2R 2R 2R 2R MSB 2R
OUT

Resistor Network 2
GND
10 9 8 7 6 5 4 3 2 1
Term. R R R R R R R R
LSB 2R 2R 2R 2R 2R 2R MSB 2R
OUT

U1
VCC
AREF 21
7 VCC
20 AVCC
14 PB0
15 PB1
16 PB2
17 PB3
18 PB4
19 PB5
9 XTAL1/PB6   XTAL1
10 XTAL2/PB7 XTAL2
23 PC0
24 PC1
25 PC2
26 PC3
27 PC4
28 PC5
1 RESET/PC6
2 PD0
3 PD1
4 PD2
5 PD3
6 PD4
11 PD5
12 PD6
13 PD7
GND 8
GND

ATMEL 328P

CLOCK

XTAL2
XTAL1

C3
Y1 16MHz
C2
15pF
15pF
GND

Additional GND conn.
GND
GND

Power input connector
+5V
GND
VCC

Optional ON / OFF
1 2
Solderjumper
cut for switch

C1 100uF/16V
+
GND

Optional USB connector
VBUS A9
CC1 A5
CC2 B5
R1 5.1K
R2 5.1K
GND
GND A12
SHIELD S1
GND

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