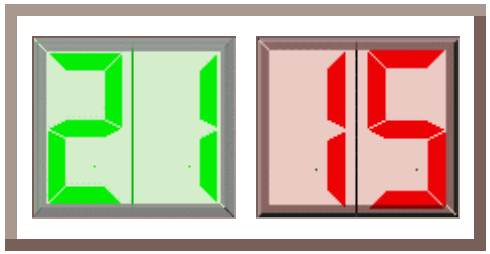
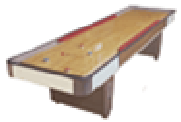


Table Shuffleboard Counter



If you own a Shuffleboard and do not have a scoring board you most likely have looked into purchasing such a board and found out that the asking price for a set of scoring boards would set you back hundreds of dollars . With a bit of experience and skill you or/and a friend can build this automatic scoring board for less than $100.00 and a bit more for two . Two would be required , one for each team of players .

I originally designed this system a few years back for a local shuffle board manufacturer . The original design provided for each player to insert a quarter to set up the scoring logic . A short time after delivery of the prototype to the customer , his business went under . So it was never used until now . While I was writing these web pages on counters it occurred to me that it would make a good project so I dug up the old design , updated and modified the logic circuit with fewer components and elimited a few bells and whistles .

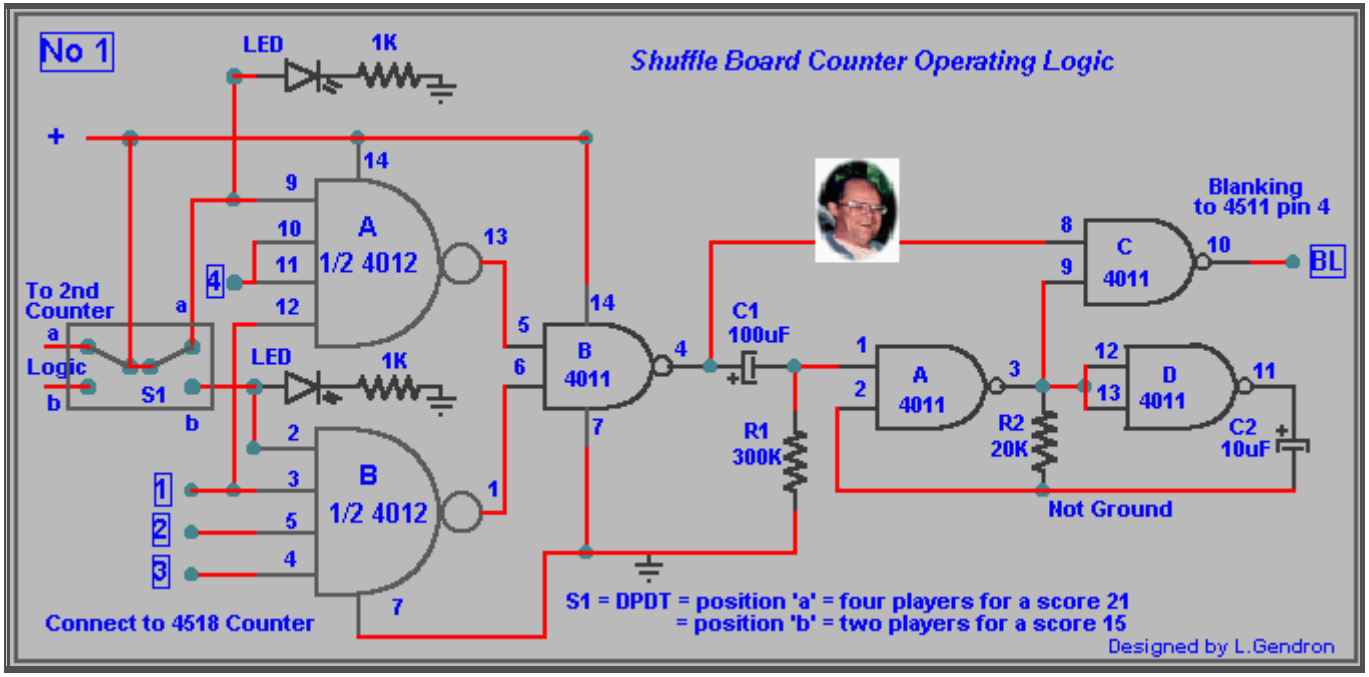
The Logic Control Circuit

Below is the circuit for the Logic Control circuit . You may chose not to include it in your project but it is really simple and cheap to build , beside it would surely impress your friends and guests as it is completly automatic in function .

Here is what it will do for you

After setting S1 to position 'a' for 2 teams of two players or more the Logic Control will be programmed to count up to a winning score of "21", or position 'b' for just two players for a winning score of 15 .

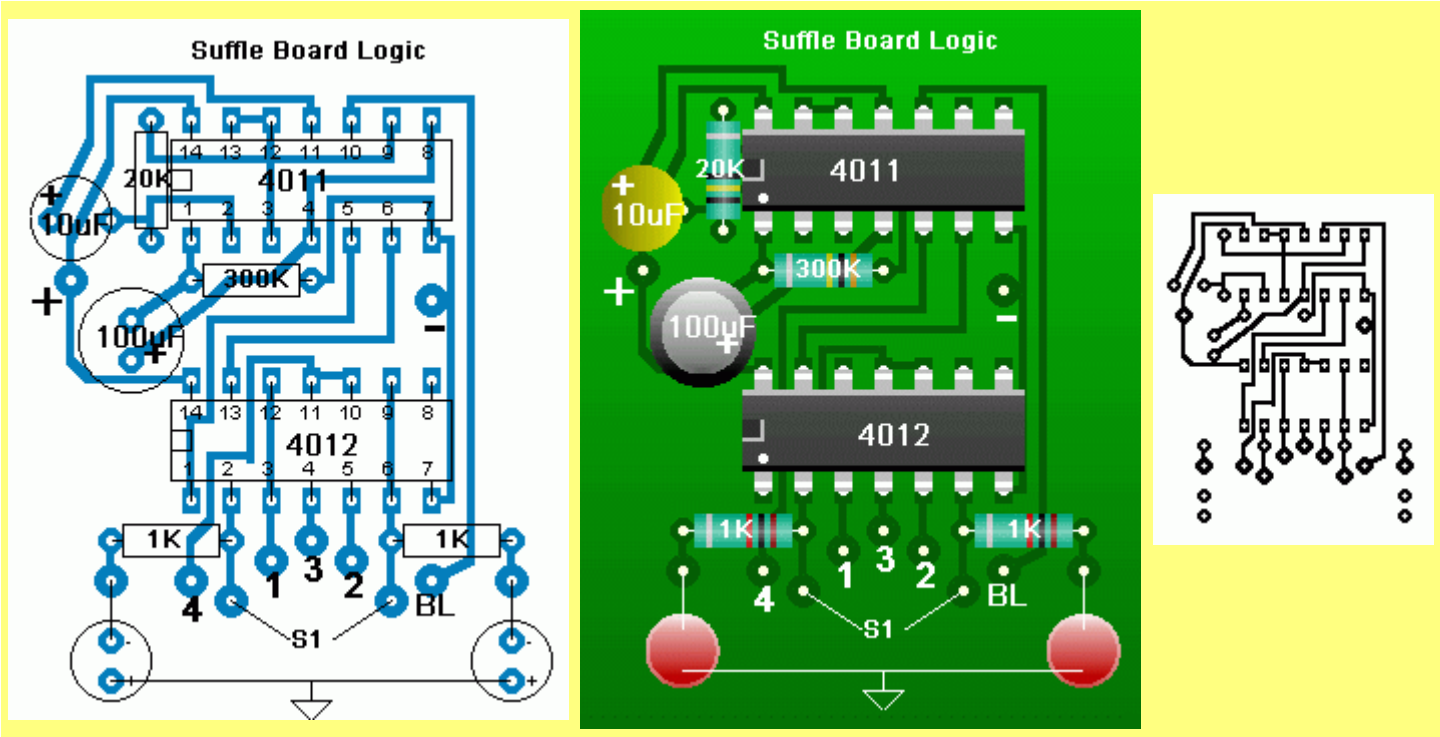
- S1 is a DPDT switch with one side connected to Scoring Logic board #1 and the other side to Logic board #2 , so that both scoring board are programmed with the same winning scoring set-up .
- Each team enters their score on their respective scoring board and as soon as the winning team reaches the set winning score the display will start flashing for a few seconds then resets both counters to zero ready for the next game .



How does it works

- When S1 being connected from the + supply is set to 'a' or 'b' it enter a high bit (1) into the selected inputs of the CMOS 4012 which is a Dual 4-input "NAND" Gate IC . Some of the inputs of the 4012 are connected as shown on # 2 circuit to monitor the BCD logic of the CMOS 4518 . Those connections points are indicated by boxed numbers 1 to 4 .
- Until all the inputs of gates A and B of the 4012 are not at logic (1) the two gates output will remain at a logic High (1) . As soon as two of the BCD logic are detected as high (1) corresponding to a dispay of 15 or 21 the two gates outputs will change to a low (0) .
- The two low logic from the gates A and B of the 4012 are connected to gate "B"of the CMOS 4011 which is a Quad 2-input "NAND" Gate . The output of gate "B" will change from a logic (0) to a (1) and charge the 100uF (C1) capacitor combined with the 300K (R1) resistor form a timer and at the same time activate a slow cycle oscillator made of gates "A" and "D" and associated resistor (R2) and capacitor (C2) . At he same time gate "C" being connected to monitor the output of Gate "B" which is at a logic (1) and the junction of gates "A" and "D" the logic of which is fluctuating between high and low will also produce a fluctuating logic at the output of gate "C" which is connected to the Blanking inputs (pin 4) of both 4511 decoder which in turn will flash the displays on-off .
- As soon as the capacitor is discharged throught R1 the output logic (1) of gate "B" will change to (0) and the oscillator will stop .

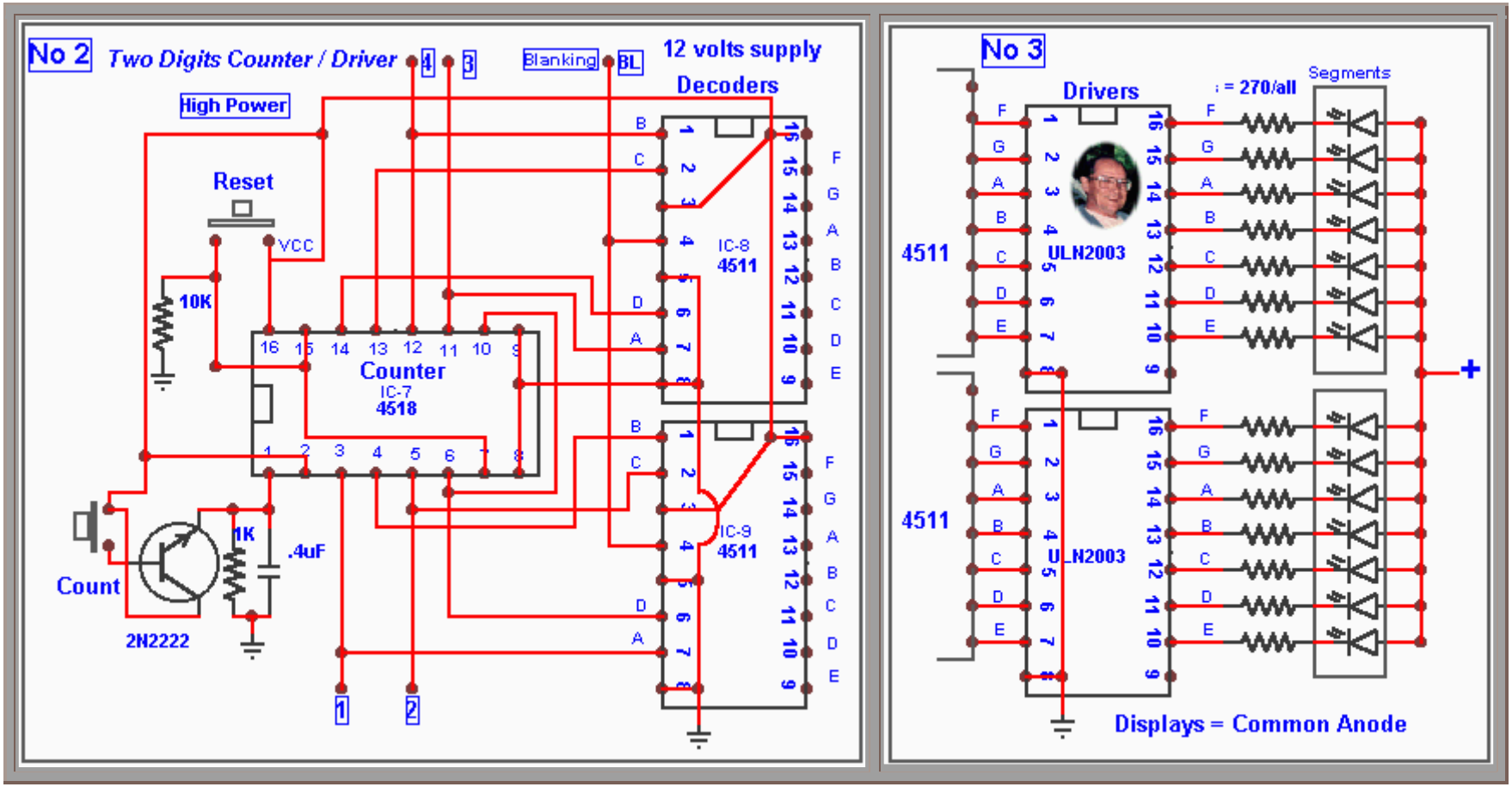
Gate "C" inputs will now be low (0) and its output will be high (1) and reset the displays to '00' ready to resume counting .
The LEDs are used to indicate the setting of S1 'a' or 'b' and therefore the scoring set-up . Other types of indicators may be used .



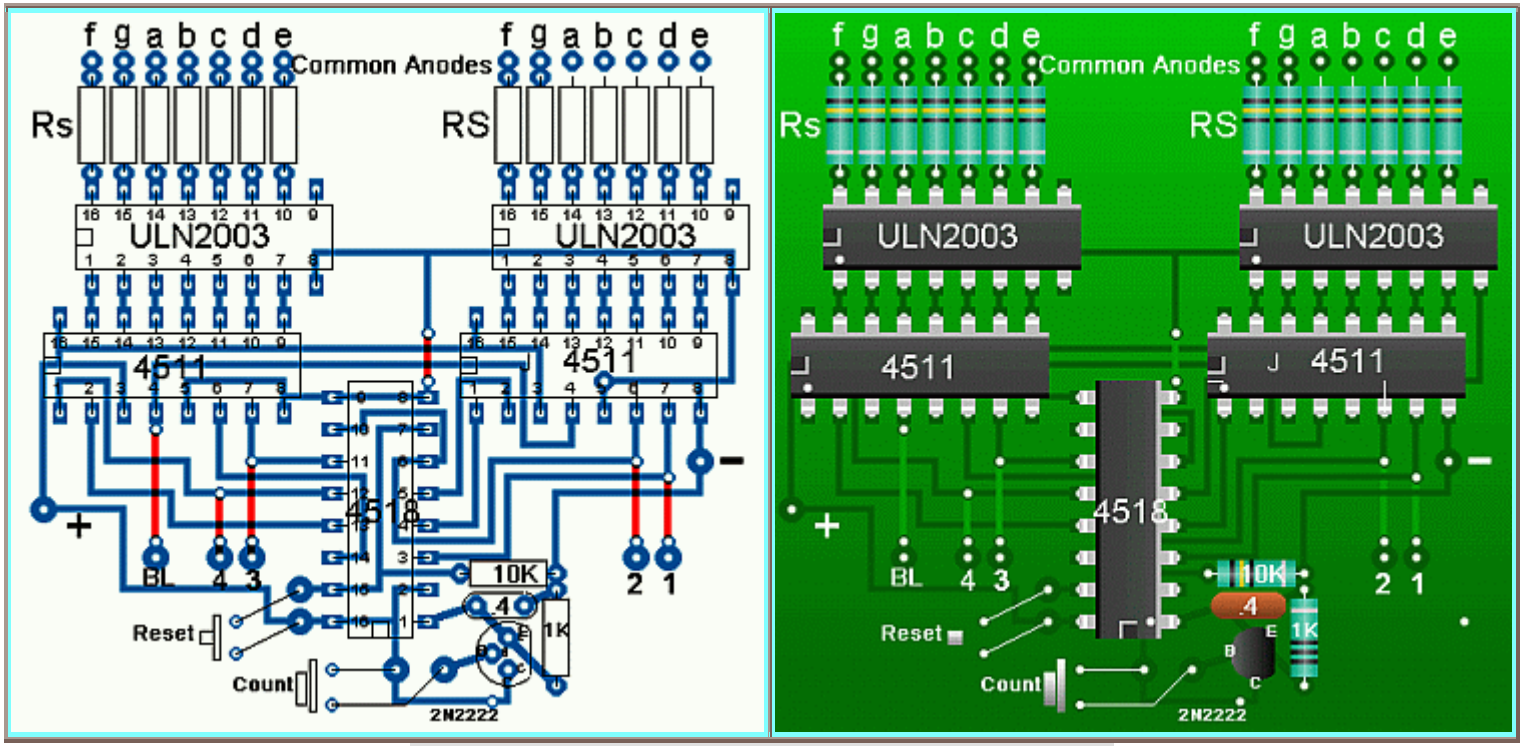
The Counter

Following the same principles used previously , a two digits counter , circuit # 2 is shown below with the CMOS 4518 . Building the Two Digit Counter requires that we use both counters and one half each of the two available counters is used to drive a CMOS 4511 Decoder / Driver IC to activate each one of the two displays . In this application Common Anodes LEDs Displays are used and Circuit # 3 showing a ULN2003 or MC1413 Darlington Arrays Transistors both ICs are interchangeable and must be added to the 4511 to drive large Common Anode displays .

The two digit counter is the same as previously described . Connecting points indicated by the boxed numbers 1 to 4 have been added as well has a connection point from both pins 4 of the 4511 decoders for display blanking as described in the logic set-up . The Reset is made available so that the counter cand be reset at any time during a count .



The suggested layout of the counter includes the ULN2003 or MC1413 .



PCB layout is actual size