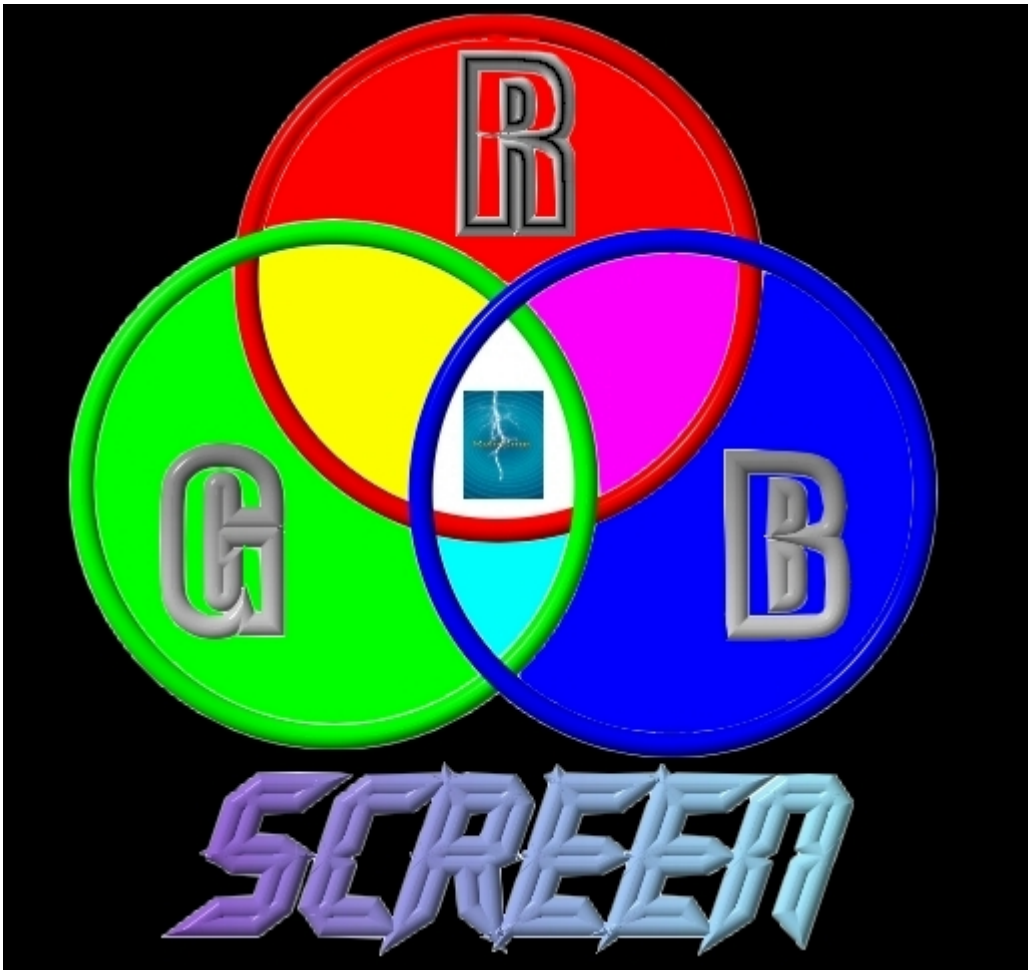
KyleCorp.
TI83+ Experimental Color Screen
Code Name “The RGB Screen”



I have designed a circuit that will flash a red, blue and green light LED at different intervals and will be controlled by an ASM program on a TI83+ or other compatible calculator. This is a hardware add-on that will be placed next to or under a TI83+ compatible LCD screen and is connected to the linkport. The included files in this zip file are:

ION (Folder)
- RGBION.8xp
- RGBION.z80

MirageOS (Folder)
- RGBMOS.8xp
- RGBMOS.z80

TIOS (Folder)
- BOOT.8xp
- BOOT.txt

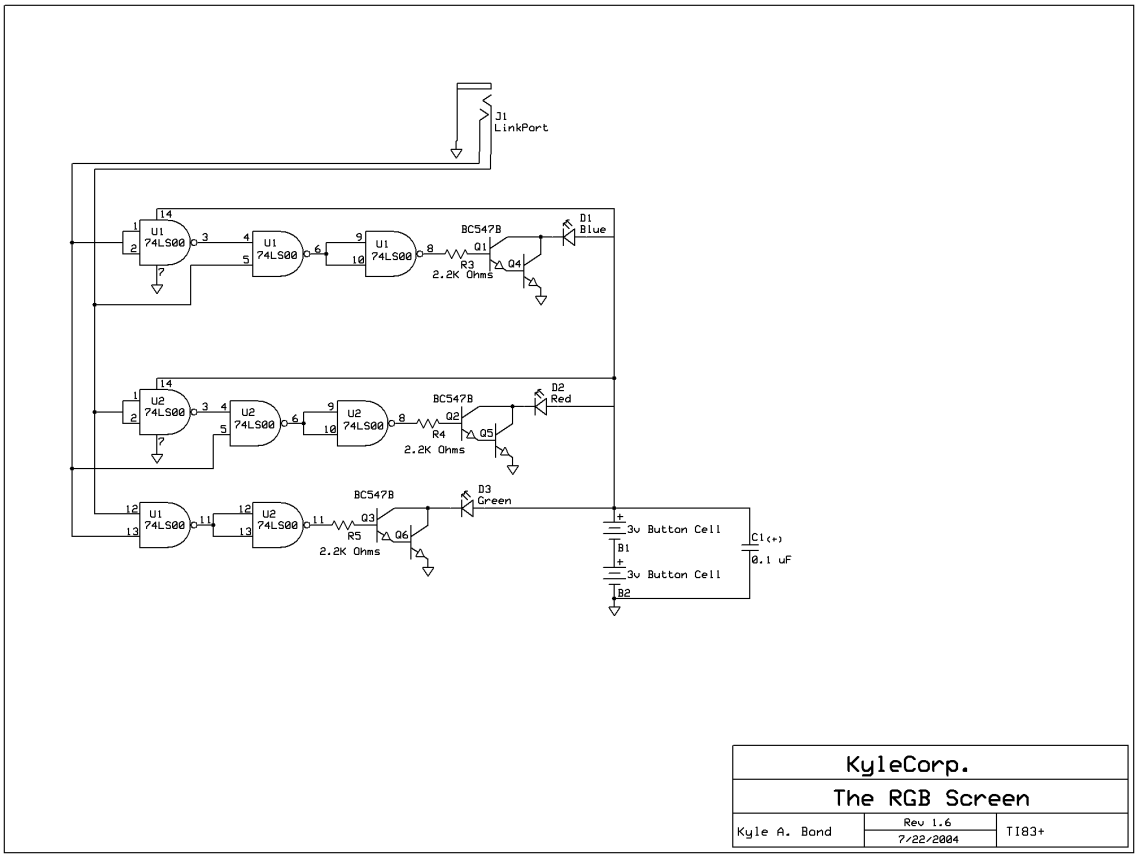
RGBTIOS.8xg
RGBTIOS.8xp
RGBTIOS.z80

KyleCorp.TK (Internet Shortcut for those that can reach .TK Domains)
KyleCorp Homepage Direct Link (Internet Shortcut for those that can't reach .TK Domains; Subject To Change)
KyleCorp Forum (Internet Shortcut)
KyleCorp RGB Screen.pdf
KyleCorp RGB Screen.wpd
KyleCorp The RGB Screen PCB.jpg
KyleCorp The RGB Screen PCB Layout.jpg
KyleCorp The RGB Screen SCH.jpg
RGBDrive.inc

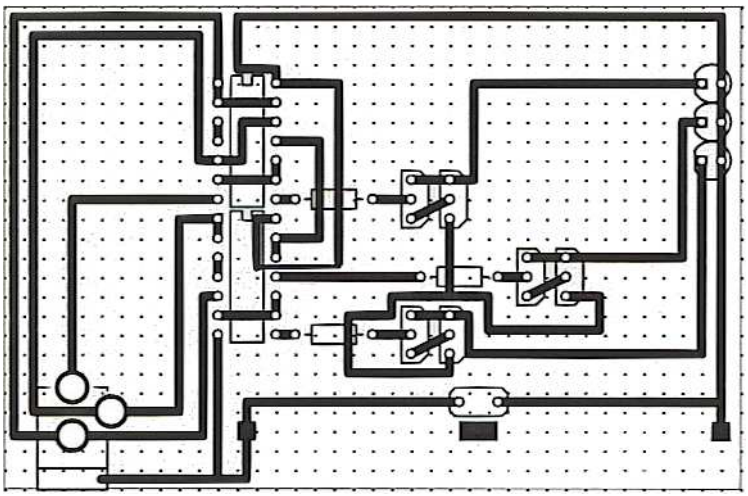
Universal Parts List:
1 2.5mm stereo audio jack
2 3v button cell type batteries (like the CR2032)
2 3v button cell type battery holder (To house the 2 batteries)
1 0.1 µF Capacitor
3 2.2K Ω ¼ Watt Resistors
6 BC547B NPN Transistors or equivalent (make sure you have the pinouts correct!)
2 74AC00PC Quad 2-Input NAND Gate IC's or equivalent
1 Super Bright High Intensity Non-Diffused Red LED
1 Super Bright High Intensity Non-Diffused Blue LED
1 Super Bright High Intensity Non-Diffused Green LED
1 Red Colored LED Holder
1 Blue Colored LED Holder
1 Green Colored LED Holder
1 Copper Clad Board
Solder

Mouser Parts List:
161-2505
658-CR2032
593-4000G
593-4000B
593-4000R
604-L7113PBCH
638-333-2SURCS5306
638-383-2SUGCS400
614-SMTU2032-1
512-74ACT00PC
71-CCF07-G-2.2K
512-BC547BTFR
(You provide your own solder and copper clad board)

The schematic is shown below:

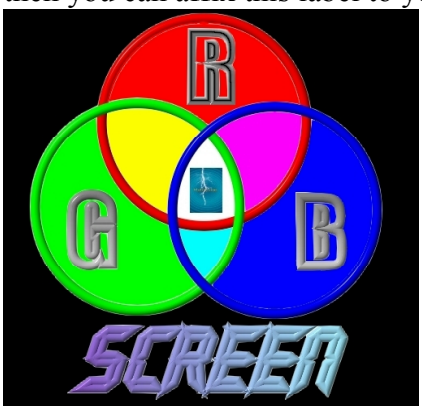


The PCB is shown below:



Note: Do not mirror the image prior to printing; just print the image (it's already scaled correctly), transfer it to your copper clad board, drill & etch, and attach the components to the side opposite the copper traces (except for the battery holders; they are SMT battery holders so they are soldered onto the same side where all of the copper traces are.) Use KyleCorp The RGB Screen.jpg image to etch the board; use the picture above as a guide to where you should place the components. If you want, you can also attach this to

your slide case so that when you put your calculator in your slide case ready for use the LED's will hang over the top of the screen. Once you fully assemble The RGB Screen, then you can affix this label to your calculator's battery cover:



There are pictures of the completed circuit on my website at www.kylecorp.tk or www.agility.frandt.com/kylecorp.

The RGB Screen is rather simple once it is setup hardware wise. First, you send "RGB.8xg" to your calc's Archive and from there you ungroup it to RAM and run BOOT.8xp from TIOS or MirageOS or send "RGBMOS.8xp" to RAM and run it from MirageOS or you can send "RGBION.8xp" to RAM and run it from an Ion Compatible Shell. The Include File (RGBDrive.inc) and the Source Codes (BOOT.txt, RGBTIOS.z80, RGBMOS.z80, and RGBION.z80) are all self-explanatory. If you will use my source code in any way you must give me credit for it. To turn on the Red LED, the tip is set high and the ring is set low. To turn on the Blue LED, the tip is set low and the ring is set high. To turn on the Green LED, the tip and the ring of the linkport are both set high.

Truth Table for the Inhibited AND Logic Gate (Connected to Red LED):

Input A	Input B	Output B'	Output Z
0	0	1	0
0	1	0	0
1	0	1	1
1	1	0	0

Truth Table for the Inhibited AND Logic Gate (Connected to Blue LED):

Input A	Output A'	Input B	Output Z
0	1	0	0
0	1	1	1
1	0	0	0
1	0	1	0

Truth Table for the AND Logic Gate (Connected to Green LED):

Input A	Input B	Output Z
0	0	0
0	1	0
1	0	0
1	1	1

7 colors are supported: Red, Green, Blue, Yellow, Cyan, Magenta, and White. As we all know "Black Light" does not exist because black is the absence of light. However I will add support for this novelty "Black Light" in version 1.7 of The RGB Screen. The truth table for that is:

Red LED	Green LED	Blue LED	Output Color
0	0	0	Black
0	0	1	Blue
0	1	0	Green
0	1	1	Cyan
1	0	0	Red
1	0	1	Magenta
1	1	0	Yellow
1	1	1	White

Now for some screenshots of the completed RGBScreen:

The two CR2032 batteries are the power supplies for the two logic gate IC's. The Source code for the TI83+ is:
The Source Code(s) can be adapted to probably all TI calculators, and pretty much anything that can send high low signals. If you have questions or comments please visit KyleCorp.TK for more information (for those of you who can't connect to a .tk domain, use http://agility.frandt.com/kylecorp instead.) A forum is located at http://agility.frandt.com/forumboard for those of you who would like to ask questions and talk about this product. That will be the Official Forum Board for The RGB Screen project. I would like to thank my Dad for teaching me all of the electronics skills I needed to make this project possible and to all of those who have written online tutorials you help people like me accomplish great things. Thank you all. This has been a development of KyleCorp.

-Kyle Bond
Chief Executive of KyleCorp.