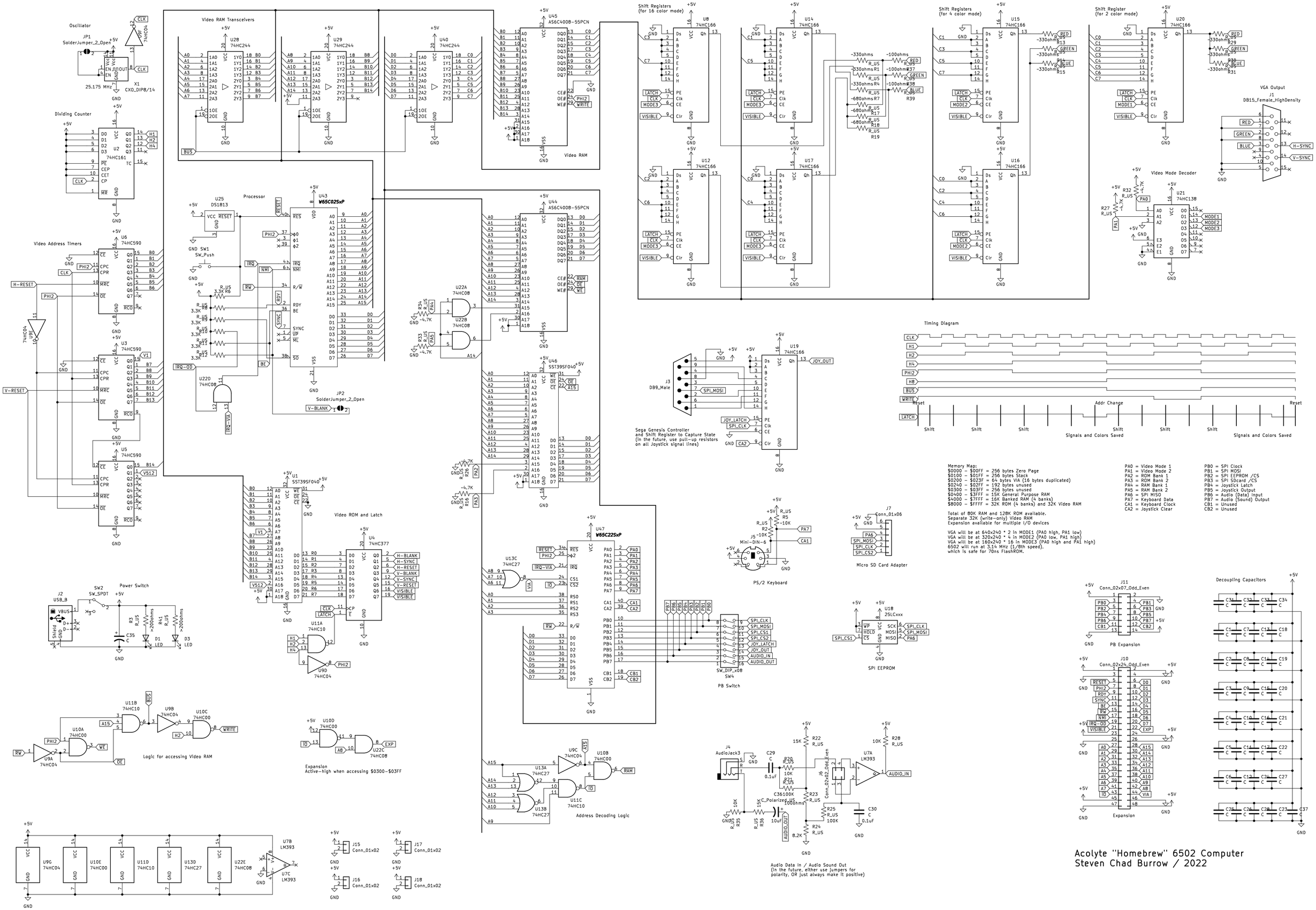
Oscillator
JP1
SolderJumper_2_Open
X1
CXO_DIP8/14
25.175 MHz
Dividing Counter
U2
74HC161
Video Address Timers
U6
74HC590
U3
74HC590
U5
74HC590
Video RAM Transceivers
U28
74HC244
U29
74HC244
U40
74HC244
U45
AS6C4008-55PCN
Video RAM
Processor
U25
DS1813
SW1
SW_Push
U43
W65C02Sxp
U44
AS6C4008-55PCN
U22A
74HC08
U22B
74HC08
U22D
74HC08
JP2
SolderJumper_2_Open
U46
SST39SF040
U1
SST39SF040
Video ROM and Latch
U4
74HC377
U47
W65C22SxP
U13C
74HC27
U11A
74HC10
U9D
74HC04
J2
USB_B
SW2
SW_SPDT
Power Switch
D1
LED
D3
LED
U11B
74HC10
U9B
74HC04
U10C
74HC00
U10A
74HC00
U9A
74HC04
Logic for accessing Video RAM
U10D
74HC00
U22C
74HC08
Expansion
Active-high when accessing $0300-$03FF
U9C
74HC04
U10B
74HC00
U13A
74HC27
U13B
74HC27
U11C
74HC10
Address Decoding Logic
U9G
74HC04
U10E
74HC00
U11D
74HC10
U13D
74HC27
U22E
74HC08
U7B
LM393
U7C
LM393
J15
Conn_01x02
J16
Conn_01x02
J17
Conn_01x02
J18
Conn_01x02
Shift Registers
(for 16 color mode)
U8
74HC166
U14
74HC166
U12
74HC166
U17
74HC166
Shift Registers
(for 4 color mode)
U15
74HC166
U16
74HC166
Shift Register
(for 2 color mode)
U20
74HC166
VGA Output
J1
DB15_Female_HighDensity
Video Mode Decoder
U21
74HC138
J3
DB9_Male
Sega Genesis Controller
and Shift Register to Capture State
(In the future, use pull-up resistors
on all Joystick signal lines)
U19
74HC166
Timing Diagram
Reset
Addr Change
Shift
Signals and Colors Saved
Memory Map:
$0000 - $00FF = 256 bytes Zero Page
$0100 - $01FF = 256 bytes Stack
$0200 - $023F = 64 bytes VIA (16 bytes duplicated)
$0240 - $02FF = 192 bytes unused
$0300 - $03FF = 256 bytes unused
$0400 - $3FFF = 15K General Purpose RAM
$4000 - $7FFF = 16K Banked RAM (4 banks)
$8000 - $FFFF = 32K ROM (4 banks) and 32K Video RAM
Total of 80K RAM and 128K ROM available.
Separate 32K (write-only) Video RAM
Expansion available for multiple I/O devices
VGA will be at 640x240 * 2 in MODE1 (PA0 high, PA1 low)
VGA will be at 320x240 * 4 in MODE2 (PA0 low, PA1 high)
VGA will be at 160x240 * 16 in MODE3 (PA0 high and PA1 high)
6502 will run at 3.14 MHz (1/8th speed),
which is safe for 70ns FlashROM.
PA0 = Video Mode 1
PA1 = Video Mode 2
PA2 = ROM Bank 1
PA3 = ROM Bank 2
PA4 = RAM Bank 1
PA5 = RAM Bank 2
PA6 = SPI MISO
PA7 = Keyboard Data
CA1 = Keyboard Clock
CA2 = Joystick Clear
PB0 = SPI Clock
PB1 = SPI MOSI
PB2 = SPI EEPROM /CS
PB3 = SPI SDcard /CS
PB4 = Joystick Latch
PB5 = Joystick Output
PB6 = Audio (Data) Input
PB7 = Audio (Sound) Output
CB1 = Unused
CB2 = Unused
J5
Mini-DIN-6
PS/2 Keyboard
J7
Conn_01x06
Micro SD Card Adapter
SW4
SW_DIP_x08
PB Switch
U18
25LCxxx
SPI EEPROM
J4
AudioJack3
Audio Data In / Audio Sound Out
(In the future, either use jumpers for
polarity, OR just always make it positive)
U7A
LM393
J11
Conn_02x07_Odd_Even
PB Expansion
J10
Conn_02x24_Odd_Even
Expansion
Decoupling Capacitors
Acolyte "Homebrew" 6502 Computer
Steven Chad Burrow / 2022