Notes:

The Z80 and 62256 SRAM would be a lot happier
if you used a 74HC245 (or an actual LED driver)
to buffer the adress bus and data bus.

Decoupling capacitors (~0.1µF) on the power rails
probably wouldn't be a bad idea.

There will be a few µs of bus contention
at the beging of the deposit operation.
See Write cycle (2) in HM622568 Series
datasheet for details. This could be cured
by using another monostable multivibrator to
give a delay between the DEP (RAM) and
~[DEP (BUS) signals. But this is just a play
computer so I'm just ignore it :p

Unused Gates

VCC
U7C 74HC32
U7D 74HC32
U5B 74HC74
U6B 74HC08
U6C 74HC08
U3A 74HC14
U3F 74HC14
U3B 74HC14
U3E 74HC14

R1–R16 1k
D1–D16 LED
A15 A14 A13 A12 A11 A10 A9 A8 A7 A6 A5 A4 A3 A2 A1 A0
R17–R24 1k
D17–D24 LED
D7 D6 D5 D4 D3 D2 D1 D0

Full Can Clock Oscillator (1 – 20MHz) optional.
Do not connect the output of both oscillators at
the same time!

X1 CXO_DIP14 — VCC, GND, CLK

The frequency of the clock is given by:
f = 0.8/(RC)
E.g. R = 68kΩ and C = 22µF, f = 1.5Hz

R26 1k
U3C 74HC14
C1 22uF
D25 LED
R43 1k

SW1 RESET
R25 1k

U1 Z80CPU
RESET CLK NMI INT M1 RFSH WAIT HALT RD WR MREQ IORQ BUSRQ BUSACK
A0–A15 D0–D7

U2 HM62256BLP
A0–A14 D0–D7 CS OE WE

Examine next circut

SW2 EXM NEXT
R28 1k
R27 68k
C2 22uF
R29 1k
C3 22pF
U4B 74HC123
U4A 74HC123
U5A 74HC74
Holds Z80 in a Constant WAIT State Untill the EXM NEXT Button is Pressed
Button Debounce

M1
U3D 74HC14
WAIT
MREQ
WR
EXM NEXT
U7B 74HC32
U6A 74HC08
U7A 74HC32
CS
U6D 74HC08
WE

Deposet Circut

SW3 DEP
R30 1k
R31 22k
C4 1nF
R32 22k
C5 10nF
U8B 74HC123
U8A 74HC123
DEP (BUS) Must be Held Active longer than DEP (RAM)
Holds 62256 (SRAM) Write Enable pin Active
Puts DIP Switch Value on the Data Bus

DEP (RAM)
DEP (BUS)

U9 74HC245
SW4 SW_DIP_x08

RUN/STOP Circut

SW5 RUN
SW6 STOP
R33 1k
R34 1k
U10B 74HC74
U10A 74HC74
M1
RUN
RUN
Overrides the WAIT signal from the EXM NEXT Flip-Flop
Flip-Flop Starts in Unknown State so RESET and STOP Must be pressed together on Power up

Data Bus Pull Down Resistors

D7 D6 D5 D4 D3 D2 D1 D0
R35 R36 R37 R38 R39 R40 R41 R42 1k
Forces NOP instruction onto Data Bus during Examine Next operation

Cheapo Altair 8800 using a Z80, Videos 1 – 4
https://www.youtube.com/playlist?list=PL7sHYqeQyNqtKROFxeEsVbBl1TOaobbE_
Dr Budgie and the Human Man

Sheet: /
File: budguter_breadboard_basic.kicad_sch

Title: Budguter minimal (videos 1 – 4)

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