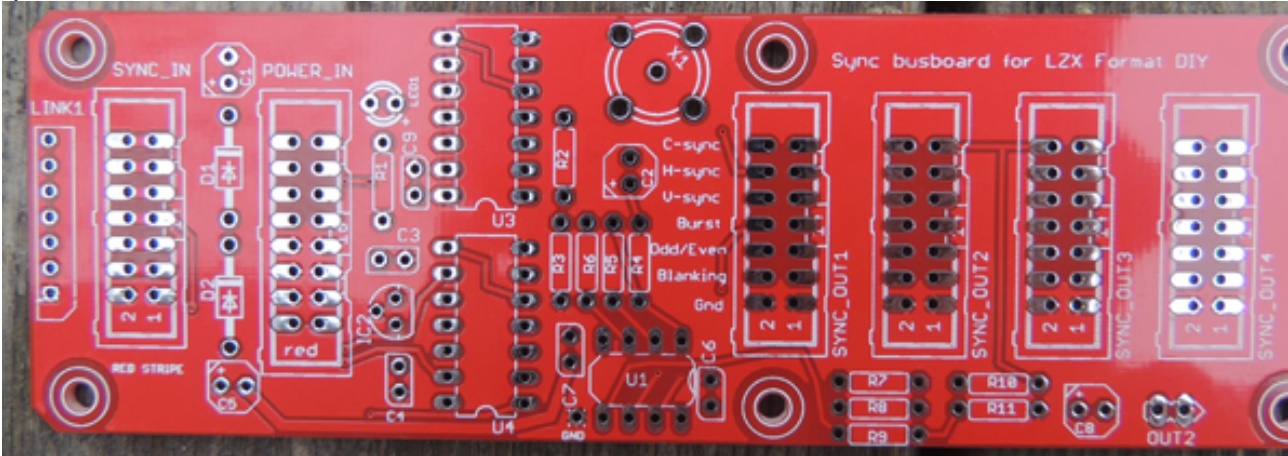# Buffered video sync busboard for (DIY) LZX or other video synthesizers.

syncbus version 2 - 2019 - document version 1.2

This buffered sync busboard is designed for connecting several Cadet / DIY modules
that use the 14 pin sync bus. You need a Cadet Sync Generator or Visual Cortex as sync source.

Features:
There is one 14pin sync input and nine sync outputs.
The busboard has two C-sync outputs for LZX modules that use RCA connections.
One of these RCA outputs has a vertical RCA socket, the other one has solderpads.
This board needs to be powered and has one 16pin power header.
For more custom systems there are also 2 "screw terminal" type connectors.

Resistors:
Start your build with the resistors.
R1: 3k (this sets the brightness of the LED)
R2, R10: 130k
R3, R11: 18k
R4, R8: 75r
R5, R6, R7, R9: 499r (yellow-white-white-black-brown)

Diodes:
These are for the reverse power protection.
D1, D2: 1n4001
LED: a yellow LED. (If you have another color, adjust R1 for brightness. 10K for red)

IC's & sockets:
U1: 8pin socket + LM6172 (C-sync output buffer)
IC2: 78L05 (the 5v regulator)
U3, U4: 14pin socket + 74HC14N (the buffers for the sync signal)

Connectors:
Put all the headers in, flip the board and lay the pcb on a flat surface.
Solder 2 pins of each header. Now flip the board and check if all headers are aligned correctly.
Correct by reheating the soldered pads. Now solder all pins.
Sync in & sync out: 14pin shrouded headers
Power in: 16pin shrouded header

Capacitors:
Start with the smaller ones!
C3: 330nF
C4, C6, C7, C9: 100nF (mount these 'standing up')
C1, C5: 10uF (longer leg = PLUS)
C2, C8: 100uF (longer leg = PLUS)

RCA output:
Solder the vertical RCA socket at the X1 location. Make sure it is aligned correctly!

Testing:
The Sync Busboard needs power.
Plug a 16 pin powercable from your eurorack busboard to the sync busboard "power in" header.
Turn on the power supply. The yellow led should light up.
Turn off the powersupply.

Connect a Sync source module (Cadet Sync Generator or a Visual Cortext) to the "Sync in"header.
Connect a module that needs sync (VCO, Ramps or Video input) to the 14pin "sync output" header.
Turn of the power supply and test if the VCO is synced.

The RCA (C-Sync) output can be connected to LZX modules that use this kind of sync method.

note:
If you have a Visual Cortex and a Cadet Sync Generator , use the Visual Cortex as master.

Original design thread:

https://community.lzxindustries.net/t/sync-busboard-design-for-cadet-diy-systems/602_1

__Sync Busboard BOM__   v2

resistors

r1	3k	1
r2, r10	130k	2
r3, r11	18k	2
r4, r8	75r	2
r5, r6, r7, r9	499r	4

Capacitors

c3	330nF	1
c4, c6, c7, c9	100nF	6
c1, c5	10uF	2
c2, c8	100uF	2

Diodes

d1, d2	1n4001		2
LED1	3mm led	yellow	

Sockets

14pin	DIL	2
8pin	DIL	1

IC's

u1	LM6172	1
IC2	78l05	1
u3, u4	74HC14n	2

Connectors

sync in, sync out	14pin		10
power in	16pin		1
X1	BTOR 1	lumberg	