

Assembly Instructions:

Use water washable organic solder for the next steps:

Step #1

Put solder on ALL the board's vias

Place and solder (in the same color code direction) the following parts:
Resistors carbon 5%

17	7	R1,R4,R20,R27,R28,R29,R33	10K	Yageo CFR-25JB-52-10K
18	3	R2,R16,R17	100K	Yageo CFR-25JB-52-100K
20	2	R6,R35	1M	Yageo CFR-25JB-52-1M0
25	2	R15,R18	47K	Yageo CFR-25JB-52-47K
27	1	R23	15K	Yageo CFR-25JB-52-15K
28	5	R24,R26,R34,R44,R54	1K	Yageo CFR-25JB-52-1K0
29	1	R25	4K7	Yageo CFR-25JB-52-4K7

Wash the board with hot water and brush both sides of the board
with a soft brush, rinse and dry with blower.

Step #2

Place and solder (in the same color code direction) the following parts:
Resistors carbon 5%

30	2	R30,R52	220K	Yageo CFR-25JB-52-220K
31	1	R31	680R	Yageo CFR-25JB-52-680R
32	1	R32	3K3	Yageo CFR-25JB-52-3K3
34	1	R38	560K	Yageo CFR-25JB-52-560K
35	1	R39	390K	Yageo CFR-25JB-52-390K
37	1	R43	62K	Yageo CFR-25JB-52-62K
38	2	R49,R106	22K	Yageo CFR-25JB-52-22K
39	2	R51,R53	43K	Yageo CFR-25JB-52-43K

Wash the board with hot water and brush both sides of the board
with a soft brush, rinse and dry with blower.

Step #3

Place and solder (in the same color code direction) the following parts:
Resistors carbon 1% and 0.1% (EXCEPT R42, TEMPCO 1k)

19	7	R3,R19,R22,R41,R101,R105, R107	10K0 1%	Yageo MFR-25F52-10K0
21	1	R7	1K50 1%	Yageo MFR-25F52-1K5
22	1	R8	3K01 1%	Yageo MFR-25F52-3K01
23	1	R13	27K4 1%	Yageo MFR-25F52-27K4
24	5	R14,R45,R48,R57,R58	100K 1%	Yageo MFR-25F52-100K
26	2	R21,R104	20K0 1%	Yageo MFR-25F52-20K
33	1	R37	150K 1%	Yageo MFR-25F52-150K
40	2	R55,R100	69K8 1%	Yageo MFR-25F52-69K8
41	1	R56	44K2 1%	Yageo MFR-25F52-44K2
42	2	R102,R113	205K 1%	Yageo MFR-25F52-205K
43	1	R103	51K1 1%	Yageo MFR-25F52-51K1

Wash the board with hot water and brush both sides of the board
with a soft brush, rinse and dry with blower.

Step #4

Place and solder the following parts:
Capacitors (EXCEPT C15, 0.01uF POLY)

1	3	C2,C27,C28	0.01uF	KEMET C410C103K5R5TA7200
2	20	C4,C6,C7,C8,C12,C18,C19, C20,C21,C22,C25,C100, C101,C102,C103,C104,C106, C107,C108,C109	0.1uF	KEMET C420C104K5R5TA
3	3	C5,C16,C17	10uF 16V	CORNELL DUB. SK100M025ST

4	1	C10	470pf	KEMET C410C471J1G5TA7200
5	1	C13	22pf	KEMET C410C220J1G5TA7200
6	4	C14,C23,C24,C26	100pf	KEMET C410C101K1G5TA

Wash the board with hot water and brush both sides of the board with a soft brush, rinse and dry with blower.

Step #5

Place and solder the following parts:

Ferrite beads, MTA156, diodes, transistors, resistor network, IC's, trim pots

8	5	D1,D2,D3,D4,D5	1N4148	ON SEMI 1N4148
9	1	H1	MTA-156	640445-6
	2	L1,L2	FERRITE	Panasonic EXC-ELSA35
13	1	Q1	2N3904	matched pair (2 x ON SEMI 2N3904TFR)
14	2	Q2,Q3	2N3904	ON SEMI 2N3904TFR
15	1	Q6	2N4856	InterFET 2N4856 (Mouser)
16	1	U1	10K network	Bourns 4116R-1-103LF
44	1	U2	TL074	Texas TL074CN
45	1	U3	LM311	Texas LM311P
46	4	U4,U10,U11,U13	LF412	Texas LF412CP
47	2	U5,U7	OP275	Analog Devices OP275GPZ
48	1	U6	LM78L05	Texas LM78L05ACZ/LFT1
49	1	U8	CA3080AE	** Obsolete ** Replacement LM3080N, CA3080N
50	1	U9	REF02	Analog Devices REF02CPZ
51	1	U12	LM555	Texas LM555CN/NOPB
52	1	U14	CA3140	Renesas Elect. CA3140AEE
53	1	VR30	100K 1T	Bourns 3386P-1-104LF
55	1	VR101	25K 25T	Bourns 3296Y-1-253LF
56	2	VR102,VR103	20K 25T	Bourns 3296Y-1-203LF

Wash the board with hot water and brush both sides of the board with a soft brush, rinse and dry with blower.

Step #6

Place and solder the following parts:

Very delicate parts Q1 2N3904 matched pair, C15 0.01uf POLY, R42 TEMPCO

7	1	C15	0.01uf POLY	XICON 23PS310 Polystyrene cap 50v 5% *** www.Mouser.com ***
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Pull gently down Q1 both matched 2N3904 pair down to around 1/4inch from the PCB..

DO NOT PULL COMPLETELY DOWN !!!

13	1	Q1	2N3904 matched pair (2 x ON SEMI 2N3904TFR)
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Wash the board with hot water and brush both sides of the board with a soft brush, rinse and dry with blower.

From here use standard resin core solder for the next steps:

Step #7

Place and solder the following part on top of Q1 2N3904 matched pair:

Use heatsink compound for thermal transfer between both parts.

39	1	R42	1K 0.05%	PT146-35 TEMPCO 1k 0.05% +/-3500ppm/deg C. 1/4w (ELI MANIS INC.)
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Next solder all the wirings on the PCB for the pots and jacks
2 triple twisted wires (FREQUENCY pot, PWM pot)
3 double twisted wires (SYNC IN jack, 1V/oct jack, FM IN jack)
5 Shielded BELDEN RG-174 (5 outputs)

Next, put these components on the frontpanel

11	8	J1,J2,J3,J4,J5,J6,J7,J8	JACK 1/4"	Switchcraft 112AX 1/4" jack phone norm. closed
54	1	VR100	1KB LIN	Bourns 6639S-1-102 (1K 15%, 2%lin)
57	1	VR104 PULSE WIDTH POT	100KB	Alpha linear pot (Mouser RV24AF-10-15R1-B100K-3LA)

Solder resistor R113 205k 1% in parallel with C109 0.1uf

between pin GND and cursor of VR100 (1KB LIN FREQUENCY precision pot)

For the 3 SYNC IN, 1V/oct & FM IN input jacks:

Solder one small wire linking the "NORMALLY CLOSE contact" lug of the jack to its GND lug.

Solder the 5 coax cables to the wave outputs (J1,J2,J3,J4,J8)

Solder all the remaining wires to the pots and the LED.

Hardware:

58	1	Cosmo knob 7603 1 1/4" dia	www.groveaudio.com (clones) or real one at www.synthesizers.com
59	1	Cosmo knob 7602 1" dia	(Available at www.smallbear.com item item: 0808B or and www.synthesizers.com item:794)
60	4	Round Standoffs 4-40 .250"	Digikey 3478K-ND (KEYSTONE 3478)
61	4	Stain. Steel screws 4-40 1/2"	Pièces machinerie Delisle
62	4	Locking hex nuts 4-40 nickel	Pièces mach. Delisle (SPAENAU N-180K-RC)
63	1	LED black plastic holder	Avago 6mm LED holders
64	1	Aluminium 1/16" thick front panel (1U Moog style)	
65	1	Auto-adhesive silkscreen front panel artwork	
66	-	Wiring AWG#22, RG-174 coax	