

# Bill Of Materials for Voltage Controlled Angle Generator Plus

<b>Design Title</b>	Voltage Controlled Angle Generator Plus
<b>Author</b>	Dustin Stroh J3RK
<b>Document Number</b>	
<b>Revision</b>	3.1
<b>Design Created</b>	Monday, August 11, 2025
<b>Design Last Modified</b>	Monday, August 11, 2025
<b>Total Parts In Design</b>	130

## 0 Modules

<u>Quantity</u>	<u>References</u>	<u>Value</u>	<u>PCB Package</u>	<u>Notes</u>
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Sub-totals:

## 14 Capacitors

<u>Quantity</u>	<u>References</u>	<u>Value</u>	<u>PCB Package</u>	<u>Notes</u>
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1	C1	68nF	CAP20	Main Timing Capacitor (can be adjusted within reason) C0G/NP0 or Polypropylene Film
2	C2,C10	10nF	CAP10	C0G/NP0 MLCC / Ceramic / Film
1	C3	47pF	CAP20	C0G/NP0 MLCC / Ceramic / Film
2	C4,C8	100pF	CAP10	C0G/NP0 MLCC / Ceramic / Film
4	C5-C7,C9	1200pF	CAP10	C0G/NP0 MLCC / Ceramic / Film
1	C11	330pF	CAP10	C0G/NP0 MLCC / Ceramic / Film
1	C12	1uF	CAP20	Secondary SLOW MODE Timing Capacitor (can also be adjusted within reason) C0G/NP0 or Polypropylene Fim
1	C13	470pF	CAP10	C0G/NP0 MLCC / Ceramic / Film
1	C14	100nF	CAP10	C0G/NP0 MLCC / Ceramic / Film

Sub-totals:

## 44 Resistors

<u>Quantity</u>	<u>References</u>	<u>Value</u>	<u>PCB Package</u>	<u>Notes</u>
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1	R1	14k	RES40	1% Resistor (50PPM / 100PPM)
2	R2-R3	4.99k	RES40	1% Resistor (50PPM / 100PPM)
13	R4-R8,R32-R33, R40-R42,R44-R46	10K	RES40	1% Resistor (50PPM / 100PPM)
3	R9,R47-R48	100R	RES40	1% Resistor (50PPM / 100PPM)
2	R10,R23	49.9K	RES40	1% Resistor (50PPM / 100PPM)
2	R11,R17	10k	RES40	1% Resistor (50PPM / 100PPM)
2	R12-R13	4.7R	RES40	1% Resistor (50PPM / 100PPM)
1	R14	470R	RES40	1% Resistor (50PPM / 100PPM)
2	R15,R25	150K	RES40	1% Resistor (50PPM / 100PPM)
4	R16,R20,R22,R24	220R	RES40	1% Resistor (50PPM / 100PPM)
4	R18,R27,R29-R30	39K	RES40	1% Resistor (50PPM / 100PPM)
2	R19,R21	390K	RES40	1% Resistor (50PPM / 100PPM)
1	R26	49.9k	RES40	1% Resistor (50PPM / 100PPM)
1	R28	100K	RES40	1% Resistor (50PPM / 100PPM)
1	R31	680R	RES40	1% Resistor (50PPM / 100PPM)
1	R34	3.01K	RES40	1% Resistor (50PPM / 100PPM)
1	R35	330R	RES40	1% Resistor (50PPM / 100PPM)
1	R43	8.06K	RES40	1% Resistor (50PPM / 100PPM)

Sub-totals:

## 10 Integrated Circuits

<u>Quantity</u>	<u>References</u>	<u>Value</u>	<u>PCB Package</u>	<u>Notes</u>
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1	U1	4001	SO14	Any brand CD4001 is fine.
2	U2-U3	DG418	SOIC127P600X175-8	DG418LDY SOIC8 version widely available, and works perfectly here.

1	U4	LF347	SO14	Most standard quad op amps are fine here. However, something a bit more DC accurate with high slew rate (Maybe OP4180 or the like) may improve performance.
1	U5	J2164	SO16	Sound Semiconductor SS12164 Quad VCA (SSI version only.)
1	U6	OPA2134UA	SO8	OPA 2134 / OPA 2132 / LF412 or any decent DC accuracy, fast slew rate, op amp.
1	U7	LM4040-5	TO92	LM4040 5V (A, B, or C version fine.)
1	U8	TLE2062	SO8	This Buffers the Voltage References, and needs to supply decent current. TLE2062 (or similar high output with wide swing op amp REQUIRED)
1	U9	TL074	SO14	Any standard quad op amp here. This is just for the OR Mixer circuit.
1	U10	TLE2061	SO8	TLE2071 / TLE2081 / AD8033 / LF356 / CA3140 Highly Recommended here. (TLE2061 is not recommended here, but works fine.)

Sub-totals:

#### 5 Transistors

Quantity	References	Value	PCB Package	Notes
5	Q1-Q5	2N3904	TO92	2N3904 or Equivalent NPN (EBC Pinout Used on PCB)

Sub-totals:

#### 14 Diodes

Quantity	References	Value	PCB Package	Notes
14	D1-D14	1N4148	DIODE30	Small Signal Diode 1N4148 or Equivalent

Sub-totals:

#### 43 Miscellaneous

Quantity	References	Value	PCB Package	Notes
14	+5,+12,-5,-12,0V, ACV,DCV,EOC,IN, OAL,OBL,OIO, ORO,OUT	CONN-SIL1	CONN-SIL1	PCB PADS
3	AD AR SW,OS CY SW,RATE SW	SW-SPST	CONN-SIL2	SPST / SPDT Toggle Switch (NKK Recommended)
4	ALVL,ASCEND, BLVL,DESCEND	100K	CONN-SIL3	Panel Pots
15	BP1-BP15	100nF	0805	Decoupling / Bypass 0805 Capacitors C0G/NP0
2	FB1-FB2	0R	RES40	Ferrite Beads
1	J1	SIL-156-04	SIL-156-04	MTA-156 Friction Lock Power Header
2	LED1-LED2	LED- YELLOW	CONN-SIL2	Any Single Color LED
2	PF1-PF2	10uF	ELEC-RAD10	Electrolytic Power Filtering Capacitors

Sub-totals:

Totals:

Monday, August 11, 2025 8:55:37 AM