

Schematic	Package	Manufacturer	Description	Part Number	DigiKey Part	Qty	Notes
Transistors/MOSFETS							
Q1-8	SOT-23-3	International Rectifier	MOSFET N-CH 20V 4.2A SOT-23	IRLML2502TRPBF	IRLML2502PBFCT-ND	8	Aux, headlight, brake, machine gun, IR transmit, hit-notify LEDs, AND recoil motor driver.
Q9	SOT-23	Diodes, Inc	TRANS PNP 60V 1A SOT23-3	DPBT8105-7	DPBT8105DICT-ND	1	PNP for High Intensity Muzzle Flash trigger
Q10	SOT-23-3	Diodes, Inc	TRANS NPN 30V 0.1A SOT23-3	BC848C-7-F	BC848C-7FDICT-ND	1	NPN to invert SBUS signal
Q11	TO-252-3 (DPAK)	Infineon	MOSFET N-CH 30V 40A TO252-3	IPD090N03LGATMA1	IPD090N03LGATMA1TR-ND	1	40A logic-level MOSFET, SMD, for Heng Long Smoker
Switches							
S1		C&K Components	SWITCH SLIDE DPDT 300MA 6V	JS202011CQN	401-2001-ND	1	DPDT slide switch - for Fight/Repair selection
S2	219-5	CTS Electrocomponents	SWITCH TAPE SEAL 5 POS SMD 50V	219-5MST	CT2195MST-ND	1	5-pos dipswitch
S3	4.9x4.9mm	E-Switch	SWITCH TACTILE SPST-NO 0.05A 12V	TL3342F160QG/TR	EG2531CT-ND	1	Square tactile input button switch.
S4	4.60mm x 2.80mm	C&K Components	SWITCH TACTILE SPST-NO 0.05A 32V	KMR231NG ULC LFS	CKN10284CT-ND	1	Reset switch
Resistors, Arrays							
RN1	1206 (3215 metric)	Panasonic Electronic Compon	RES ARRAY 4 RES 150 OHM 1206	EXB-38V151JV	Y9151CT-ND	1	150 ohm - 4 package. Aux, headlight, machine gun, and IR transmit notify MOSFET gate current limiters. 5v/150 ohm = 33mA max pin current (pins can handle up to 40 mA)
Resistors, Individual							
R1-7	0805	Panasonic - ECG	RES SMD 150 OHM 1% 1/8W 0805	ERJ-6ENF1500V	P150CCT-ND	7	150 ohm base resistors MOSFETS/transistors
R8-15	0805	Panasonic - ECG	RES 1.00K OHM 1/8W 1% 0805 SMD	ERJ-6ENF1001V	P1.00KCCT-ND	8	1k
R16,R34	0805	Panasonic - ECG	RES SMD 4.7K OHM 1% 1/8W 0805	ERJ-6ENF4701V	P4.70KCCT-ND	2	4.7k resistor for one-half of voltage dividers (battery monitor, and Tx-1 out)
R17	0805	Panasonic - ECG	RES SMD 8.2K OHM 1% 1/8W 0805	ERJ-6ENF8201V	P8.20KCCT-ND	1	The blue is too bright. 8k tones it down.
R18-29	0805	Panasonic - ECG	RES 10.0K OHM 1/8W 1% 0805 SMD	ERJ-6ENF1002V	P10.0KCCT-ND	12	10k - various, including MOSFET GND hold-downs
R30	0805	Panasonic - ECG	RES SMD 18K OHM 1% 1/8W 0805	ERJ-6ENF1802V	P18.0KCCT-ND	1	18k - for SBUS inverter
R31	0805	Panasonic - ECG	RES SMD 47K OHM 1% 1/8W 0805	ERJ-6ENF4702V	P47.0KCCT-ND	1	47k - for SBUS inverter
R32	2512 (6432 metric)	Panasonic - ECG	RES SMD 3.3 OHM 5% 1W 2512	ERJ-1TYJ3R3U	PT3.3XCCT-ND	1	3.3 ohm resistor, 1 watt, for IR emitter.
R33	0805	Panasonic - ECG	RES SMD 2.4K OHM 1% 1/8W 0805	ERJ-6ENF2401V	P2.40KCCT-ND	1	2.4k resistor for other half of Tx-1 out voltage divider
Capacitors, Individual							
C1-2	0805	AVX Corp	CAP CER 18PF 50V NP0 0805	08055A180JA2A	478-1307-1-ND	2	18pf for SMD crystal
C3-4	0805	AVX Corp	CAP CER 10000PF 100V X7R 0805	08051C103K4T4A	478-10823-1-ND	2	(0.01uf = 10,000 pf) For r/c filter on trigger input, and batt voltage monitor
C5-12	0805	AVX Corp	CAP CER 0.1UF 50V X7R 0805	08055C104KAT2A	478-1395-1-ND	8	0.1uf
C13	1206 (3216mm)	AVX Corp	CAP TANT 10UF 16V 10% 1206	F931C106KAA	478-8235-1-ND	1	10uF cap, for 5v input from USB. Tantalum 1206.
C14	5.3x5.3 mm (0.209")	Panasonic - ECG	CAP ALUM 10UF 35V 20% SMD	EEE-1VA100SR	PCE3947CT-ND	1	10uF cap, for output of 5V LDO (as per Micrel spec sheet). Panasonic Size "C"
C15	6.6x6.6 mm (0.26")	Panasonic - ECG	CAP ELECT 100UF 35V VS SMD	EEE-1VA101XP	EEE-1VA101XP	1	100uF cap, for input to 5V LDO. Panasonic Size "D"
Crystal							
XT1	ASE	Abracon	Crystal 16.000MHz 20ppm 18pF 80 Ohm ABM8G-16.000MHZ-18-D2Y-T		535-10267-1-ND	1	SMD Crystal, 18pf
Diodes							
D1-8	DO214-AC (SMA)	ON Semi	DIODE SCHOTTKY 40V 1A SMA	MBRA140T3G	MBRA140T3GOSCT-ND	8	Back-EMF protection for L298 motor driver
D9	DO-214AA (SMB)	ON Semiconductor	DIODE SCHOTTKY 40V 2A SMB	MBSR2040LT3G	MBSR2040LT3GOSCT-ND	1	Schottky, for HL Smoker MOSFET flyback diode. SMB is slightly wider than SMA (SMC is even wider), but same pads.
D10-11	1206 (SOD-123)	AVX Corp	DIODE SCHOTTKY 40V 2A 1206	SD1206S04OS2R0	478-7906-1-ND	2	Schottky, recoil motor and Aux output flyback diodes
D12	TO-277 (SMP)	Vishay	DIODE SCHOTTKY 12A 100V SMP	V12P10-M3/86AGICT-ND	V12P10-M3/86AGICT-ND	1	Input polarity diode, 12A schottky. 0.35-0.6 forward voltage drop depending on current, so very low.
D13	SOT23-3	ON Semiconductor	DIODE ARRAY SCHOTTKY 30V SOT23-3BAT54SLT1G		BAT54SLT1GOSCT-ND	1	Dual schottky diode - input protection for recoil trigger
LEDs							
D14	0805	Lite-On, Inc	LED RED CLEAR LTST-C170 0805 SMD	LTST-C170KDKT	160-LTST-C170KDKT	1	Red, 1.8 fv, 10mA, 10mcd. Board light. Green dots represent cathode (bar side).
D15	0805	Lite-On, Inc	LED GREEN CLEAR 0805 SMD	LTST-C170GKT	160-1179-1-ND	1	Green, 2.1 fv, 10mA, 6mcd. Board light. Green dots represent cathode (bar side).
D16-17	0805	Lite-On, Inc	LED YELLOW CLEAR 0805 SMD	LTST-C170YKT	160-1175-1-ND	2	Yellow 2.1 fv, 10mA, 6mcd. USB serial indicator. Green dots represent cathode (bar side).
D18	0805	Lite-On, Inc	LED BLUE CLEAR 0805 SMD	LTST-C170BKTK	160-1579-1-ND	1	Blue, 3.3 fv, 20mA, 104mcd. Motor serial indicator. Green dots represent cathode (bar side).
PTC							
F1	1812 (4532 Metric)	Bourns	PTC RESETTABLE .50A 15V 1812	MF-MSMF050-2	MF-MSMF050-2CT-ND	1	500mA protection for USB port
ICs							
U1	100-TQFP	Atmel	ATMEGA2560-16AU	ATMEGA2560-16AU	ATMEGA2560-16AU-ND	1	Atmega 2560
U2	28-SSOP	FTDI	IC USB FS SERIAL UART 28-SSOP	FT232RL-REEL	768-FT232RNL-REELTR-ND	1	FTDI
U3	PowerSO20	STMicro	IC DRIVER FULL DUAL 20-PWRSOIC	L298P013TR	497-3624-1-ND	1	Dual bridge motor driver, 2amps per channel.
U4	TO-263-3	Micrel	IC REG LDO 5V 3A TO263-3	MIC29300-5.0WU	576-1122-ND	1	5v LDO, 3 Amps. Only 0.37 voltage drop, 26 volts max
Connectors							
JP1-JP5	Header	JST	CONN HEADER PH TOP 2POS 2MM	B2B-PH-K-S(LF)(SN)	455-1704-ND	5	Top entry through hole 2 position. Aux, Light 1, Light 2, Brake/light, Machine gun LED connectors
JP6	Header	JST	CONN HEADER PH SIDE 3POS 2MM SM	S3B-PH-SM4-TB(LF)(SN)	455-1750-1-ND	1	Surface mount side entry for Serial 2
JP7	Header	JST	CONN HEADER PH TOP 3POS 2MM	B3B-PH-K-S(LF)(SN)	455-1705-ND	1	Top entry through hole 3 position. For LCD connector.
JP8, 9, 10	Header	JST	CONN HEADER XH TOP 2POS 2.5MM	B2B-XH-A(LF)(SN)	455-2247-ND	3	2 position header. Power, Heng-Long Smoker, IR Transmit.
JP11, 12	Header	JST	CONN HEADER XH TOP 3POS 2.5MM	B3B-XH-A(LF)(SN)	455-2248-ND	2	3 position header. Mechanical recoil, High-intensity flash unit.
JP13	Header	JST	CONN HEADER XH TOP 5POS 2.5MM	B5B-XH-A(LF)(SN)	455-2270-ND	1	5 position header. Apple connector (IR receiver, hit-notify LEDs)
JP14 (1,2,3)	Header	Samtech	CONN HEADER R/A 24POS 2.54MM	TSW-108-08-G-T-R-A	TSW-108-08-G-T-R-ND	1	3x8 servo connectors, right angle.
JP15	Header						3x2 SPI connector - not populated
JP16	Header						1x4 I2C connector - not populated
JP17-19	Header	Sullins Connector	CONN HEADER .100" SNGL STR 20POS	PRPC020SAAN-RC	S1011EC-20-ND	1	20 position header - break apart for J17, J18, J19
JP17	Header		Construct from above				1x6 Serial 1 connector
JP18, 19	Header		Construct from above				1x3 Aux A and Aux B connectors
JP20	Header	Sullins Connector	CONN HEADER .100" DUAL STR 6POS	PRPC003DAAN-RC	S2011EC-03-ND	1	2x3 radio input header. Sandwich board between pins (one row on board top, one row on board bottom)
JP21, 22	Terminal	On Shore Tech.	TERM BLOCK 3.5MM VERT 2POS PCB	OSTTE020161	ED2635-ND	2	3.5mm dual screw terminals for motor outputs.
X1	USB Micro-B Jack	Amphenol FCI	USB - micro B USB 2.0 Receptacle Conne	10118194-0001LF	609-4618-1-ND	1	USB Micro-B jack