



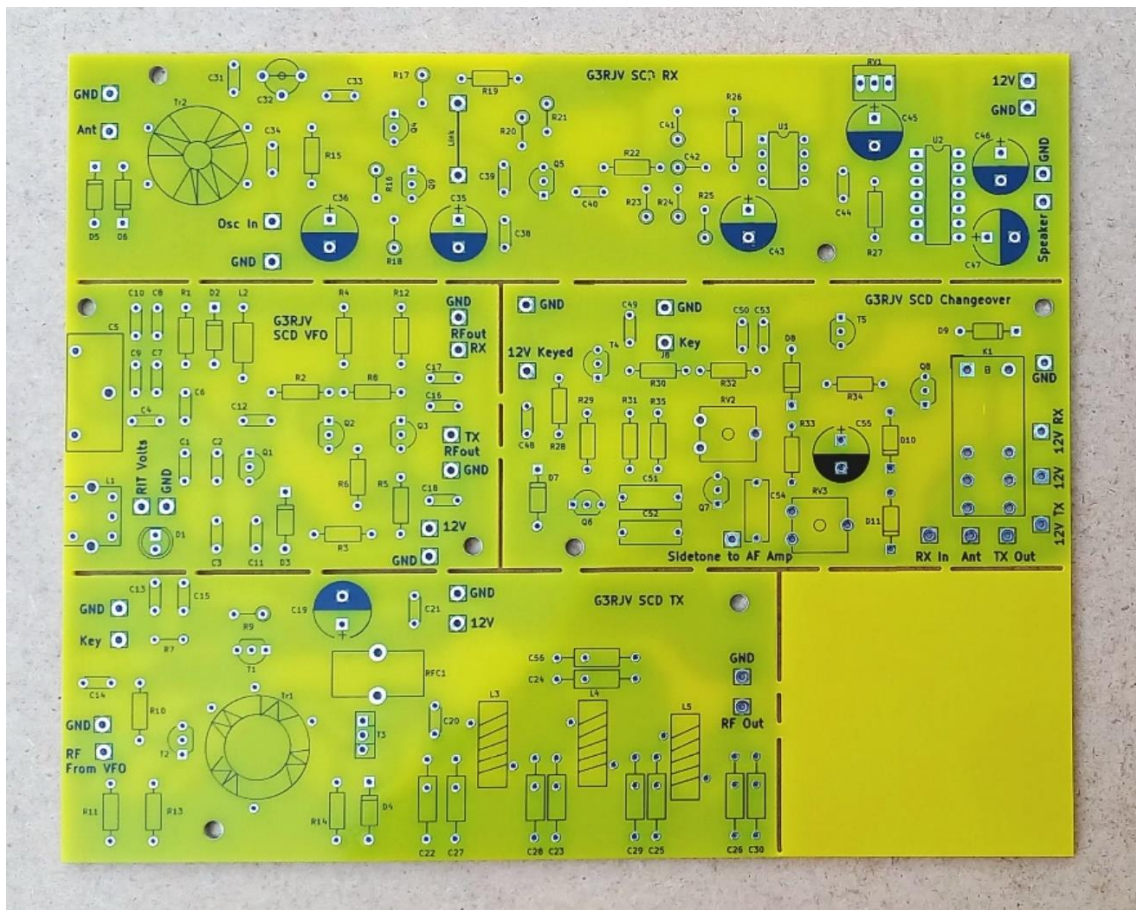
THE G3RJV SCD PROJECT REVISITED



SHORT FORM INSTRUCTIONS v1.1

The SCD project was first seen in print in the January 1980 edition of Short Wave Magazine. It started as a crystal-controlled transmitter but by the June 1981 edition of Short Wave Magazine it had become a more 'feature rich' VFO controlled transceiver, with accessories.

George revisited the SCD a number of times and it was suggested that it should be updated to be buildable with readily available parts in the 2020s. That update is being published in Practical Wireless magazine from the April 2024 edition. G-QRP Club members can purchase a commercial PCB set, and most of the 'hard to find' parts, from Club Sales.



These 'short form' instructions are intended for those who know their way around QRP construction and should allow the commercial PCBs to be populated, or your own scratch build techniques to be used. Below you will find circuit diagrams, parts lists and a few key photos for each of the modules.

Note: If you need detailed instructions, you should follow the articles in Practical Wireless; we do not have space in SPRAT for such detailed instructions. Each part focuses on one module and provides lots of stage-by-stage construction and testing advice.

Please remember that this current offering still uses 1980s technology. It is not a 'top of the range' flying machine but it is still capable of making contacts and is still buildable without any complex test equipment. I am sure that Club members will find ways to improve the basic design and share them through the pages of SPRAT.

The suggested order of build is as follows:

- VFO
- Receiver
- Changeover and sidetone
- Transmitter
- (TBC: Digital VFO and Keyer)

And finally...

Good luck with the SCD Revisited project. If you have success with the SCD, or you find any issues or errors in these short form instructions, please let me know via gOfuw@ggrp.co.uk

73, Steve, GOFUW

Chairman

G-QRP Club

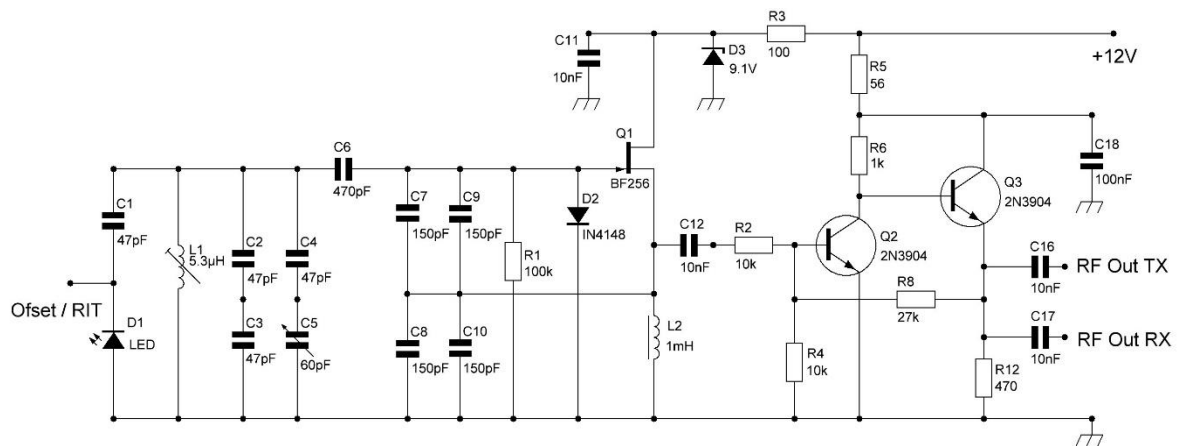
April 2024

The VFO with values for 5MHz

Parts List:	QTY	Part Numbers
Resistors (0.25W)		
56 Ω	1	R5
100 Ω	1	R3
470 Ω	1	R12
1K Ω	1	R6
10k Ω	2	R2, R4
27K Ω	1	R8
100K Ω	1	R1
Capacitors		
47 pF**	1	C1**
47 pF *	3	C2, C3, C4
150 pF *	4	C7, C8, C9, C10
470 pF *	1	C6
10 nF	4	C11, C12, C16, C17
100 nF	1	C18
6-60 pF polyvaricon = 1	1	C5
Semi-conductors		
2N3904 NPN BJT transistor	2	Q2, Q3
BF256 FET transistor (or 2N3819)	1	Q1
9.1V Zenner diode	1	D3
1N4148 diode	1	D2
5mm red LED**	1	D1*
Miscellaneous		
Printed Circuit Board	1	
Spectrum 'High Spec' 10mm Coil 5u3 *	1	L1
1mH pre-wound RFC	1	L2
Knob	1	
Note: parts shown in red and marked * are band specific. See table below. Parts shown in blue and marked ** are only fitted when the RIT control is added (see later)		

The 5u3 'High Spec' coil from Spectrum Communications works well enough, but if you see any Toko KANK3334 coils at a rally, grab one; they really are very good in this application. The more experienced constructor may choose to wind their own coils using their own tried and tested methods; dust iron toroid cores can give very good results. For example, 18 turn of 26swg enamelled copper wire on a T-50-7 toroid worked rather well on 10MHz.

Circuit with values for 5MHz



Band Specific Parts

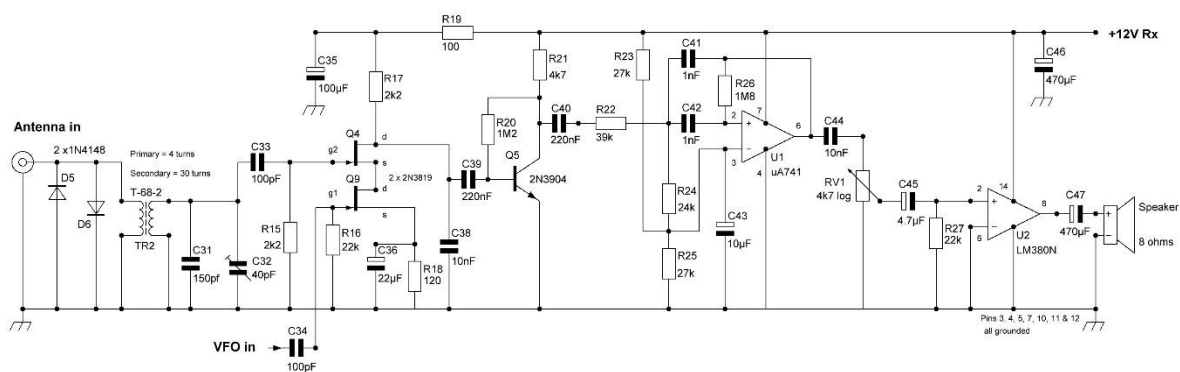
Part	3.5MHz	5MHz	7MHz	10MHz	14MHz
C2	220pF	47pF	47pF	120pF	47pF
C3	220pF	47pF	47pF	wire link	wire link
C4	wire link	47pF	33pF	4.7pF	6.8pF
C6	560pF	470pF	270pF	82pF	82pF
C7	1nF	150pF	470pF	100pF	68pF
C8	1nF	150pF	470pF	100pF	68pF
C9	not used	150pF	not used	100pF	150pF
C10	not used	150pF	not used	100pF	150pF
L1	5.3uH	5.3uH	2.6uH	1.2uH	1.2uH

The Receiver Board with values for 5MHz

Parts List:	QTY	Part Numbers
Resistors (0.25W)		
100Ω	1	R19
120Ω	1	R18
4.7kΩ, sometimes shown as 4k7	1	R21
2.2kΩ, sometimes shown as 2k2	2	R15, R17
4.7kΩ, Log potentiometer sometimes shown as 4k7	1	RV1
22kΩ	2	R16, R27
24kΩ	1	R24
27kΩ	2	R23, R25
39kΩ	1	R22
1.2MΩ, sometimes shown as 1M2	1	R20
1.8MΩ sometimes shown as 1M8	1	R26
Capacitors		
60pF or 40pF Pre-set Trimmer	1	C32
100pF	2	C33, C34
150pF (*see band specific parts)	1	C31
1nF	2	C41, C42
10nF	2	C38, C44
220nF	2	C39, C40
4.7uF 25v electrolytic	1	C45
10uF 25v electrolytic	1	C43
22uF 25v electrolytic	1	C36
100uF 25v electrolytic	1	C35
470uF 25v electrolytic	2	C46, C47
Semi-conductors		
2N3819 FET	2	Q4, Q9
1N4148 diode	2	D5, D6
2N3904 NPN	1	Q5
uA741 IC	1	U1
LM380 IC	1	U2
Miscellaneous		
14 pin IC socket	1	
8 pin IC socket	1	
PCB	1	
T-68-2 Toroidal Coil Former (*see band specific parts)	1	TR2
24 swg enamelled copper wire	50cm	

Parts List continued:	QTY	Part Numbers
Hook-up wire (3 different colours, e.g. red, black, yellow)	20-30cm each	To make or wire up: TR2, RV1 & Speaker/Headphone socket
Knob for AF Gain control	1	
8 Ω speaker	1	
3.5mm speaker/headphone socket	1	

Circuit with values for 5MHz



Band Specific Parts

Part	3.5MHz	5MHz	7MHz	10MHz	14MHz
TR2	4+30 turns T-68-2	4+30 turns T-68-2	4+30 turns T-68-2	3+21 turns T-50-6	3+19 turns T-50-6
C31	330pF	150pF	56pF	120pF	47pF

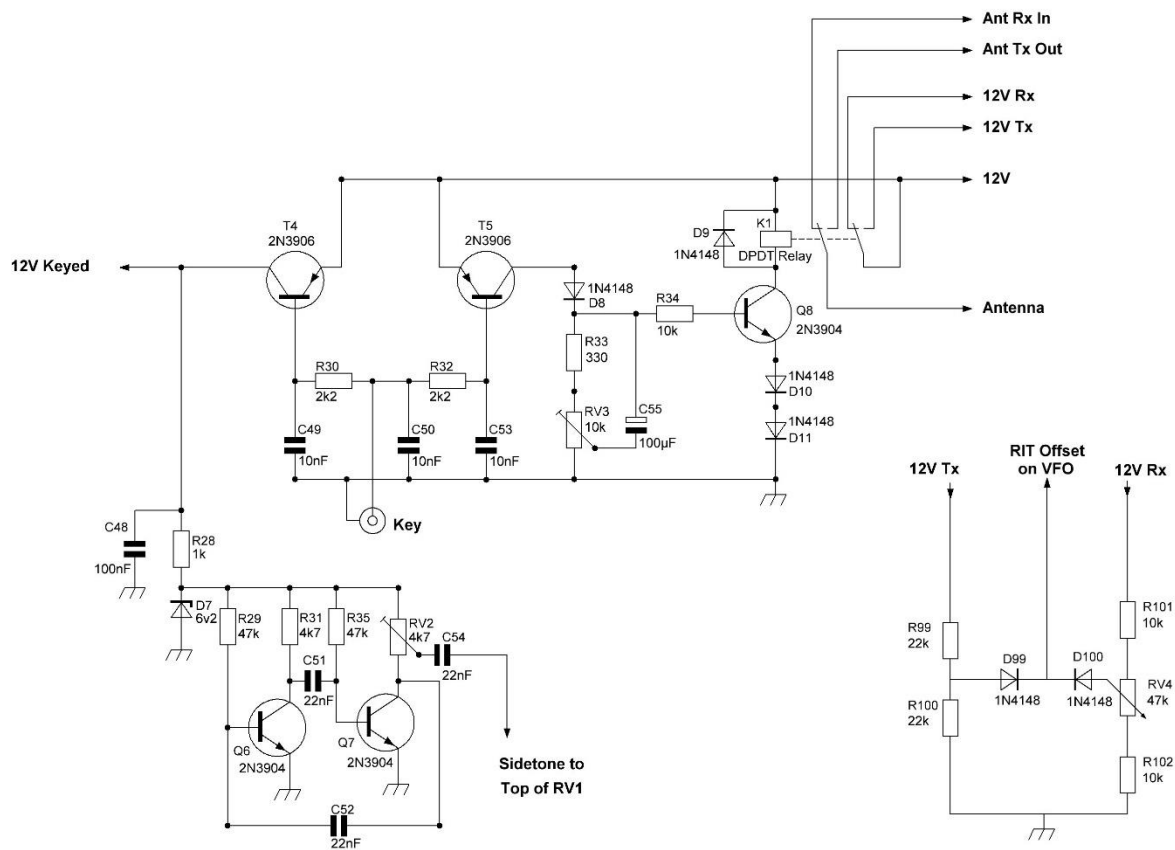
Band Pass Filter Detail



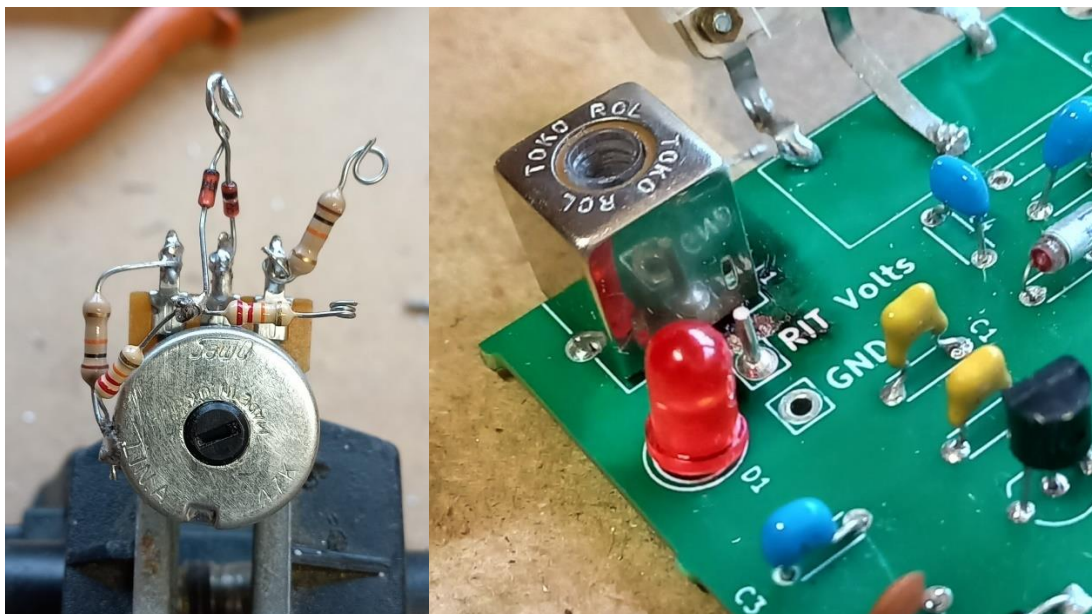
The Changeover & Sidetone Board (and RIT Control)

Parts List:	QTY	Part Numbers
Resistors (0.25W)		
330Ω	1	R33
1kΩ	1	R28
2.2kΩ, sometimes shown as 2k2	2	R30, R32
4.7k, sometimes shown as 4k7	1	R31
10kΩ	3	R34, R101*, R102*
22kΩ	2	R99*, R100*
47kΩ	2	R29, R35
4.7kΩ pre-set resistor	1	RV2
10kΩ pre-set resistor	1	RV3
47kΩ Linear potentiometer	1	RV4*
Capacitors		
10nF	3	C49, C50, C53
22nF	3	C51, C52, C54
100nF	1	C48
100uF 25v electrolytic	1	C55
Semi-conductors		
1N4148 diode	6	D8, D9, D10, D11, D99*, D100*
6v2 Zenner diode	1	D7
2N3904 NPN	3	Q6, Q7, Q8
2N3906 PNP	2	T4, T5
Miscellaneous		
PCB	1	
Double Pole Double Throw (DPDT) Relay 12v coil, 5A switching	1	K1
Hook-up wire (3 different colours, e.g. red, black, yellow)	20-30cm each	
3.5mm mono key socket	1	
*These components are fitted together off the PCB (see photo below)		

Circuit



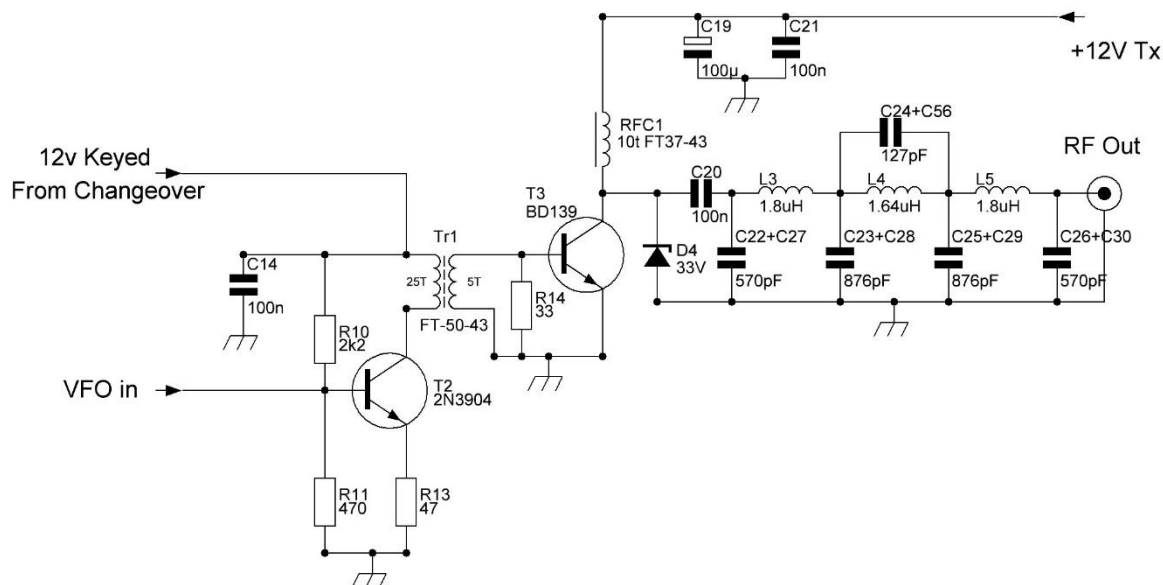
RIT Detail - some RIT parts are fitted on the back of the RIT pot, C1 and D1 are on the VFO PCB



SCD Transmitter with values for 5MHz

Parts List:	QTY	Part Numbers
Resistors (0.25W)		
33	1	R14
47 * band specific 47 ohms is good for 80 & 60m Try 27 for 40m Try 10 for 30m & 20m	1	R13
470	1	R11
2.2k, sometimes shown as 2k2	1	R10
Capacitors		
100nF	3	C14, C20, C21
100uF 25v electrolytic	1	C19
27pF * band specific	1	C56
56pF * band specific	2	C28, C29
100pF * band specific	3	C24, C27, C30
470pF * band specific	2	C22, C26
820pF * band specific	2	C23, C25
Semi-conductors		
33v Zenner diode	1	D4
2N3904 NPN	1	T2
BD139, 2N3866, 2SC1096 NPN	1	T3
Miscellaneous		
PCB	1	
Toroid FT-50-43	1	Tr1
Toroid FT37-43	1	RFC1
Toroid T-50-2 * band specific	3	L3, L4, L5
Enamelled copper wire 24 or 26SWG	1m	TR1, RFC1, L3, L4, L5
Hook-up wire (3 different colours, e.g. red, black, yellow)	20-30cm each	Interconnects
Miniature coax, e.g. RG174	20-30cm	Interconnects
RF socket, e.g. SO239, BNC	1	Antenna socket

Circuit with values for 5MHz



Band Specific Parts

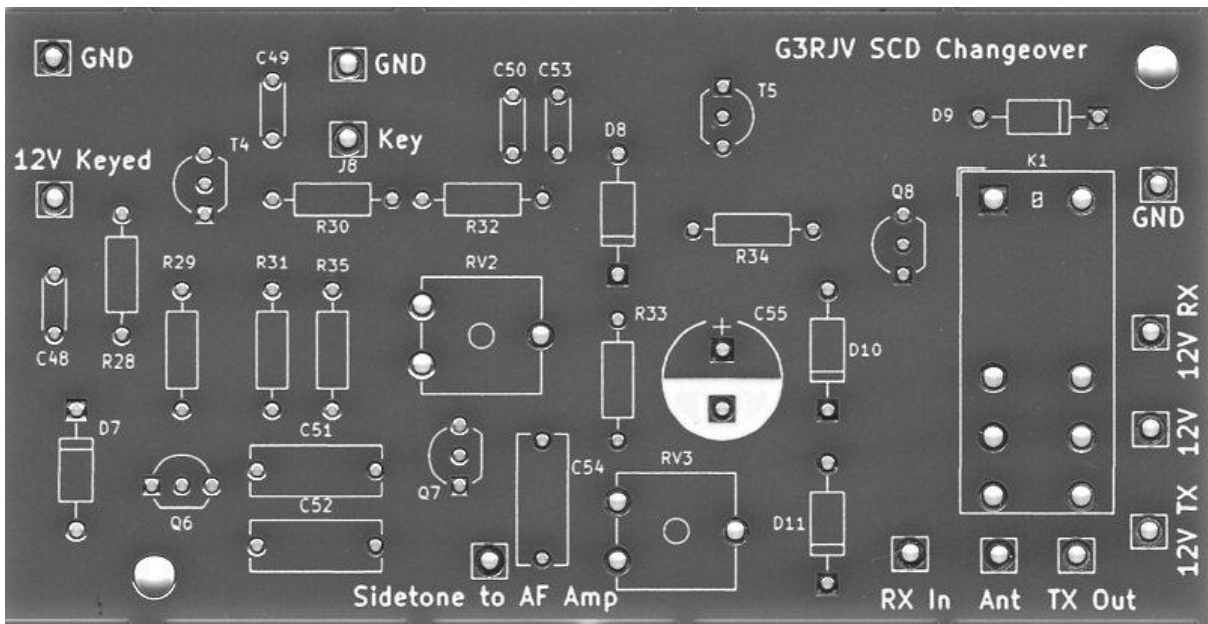
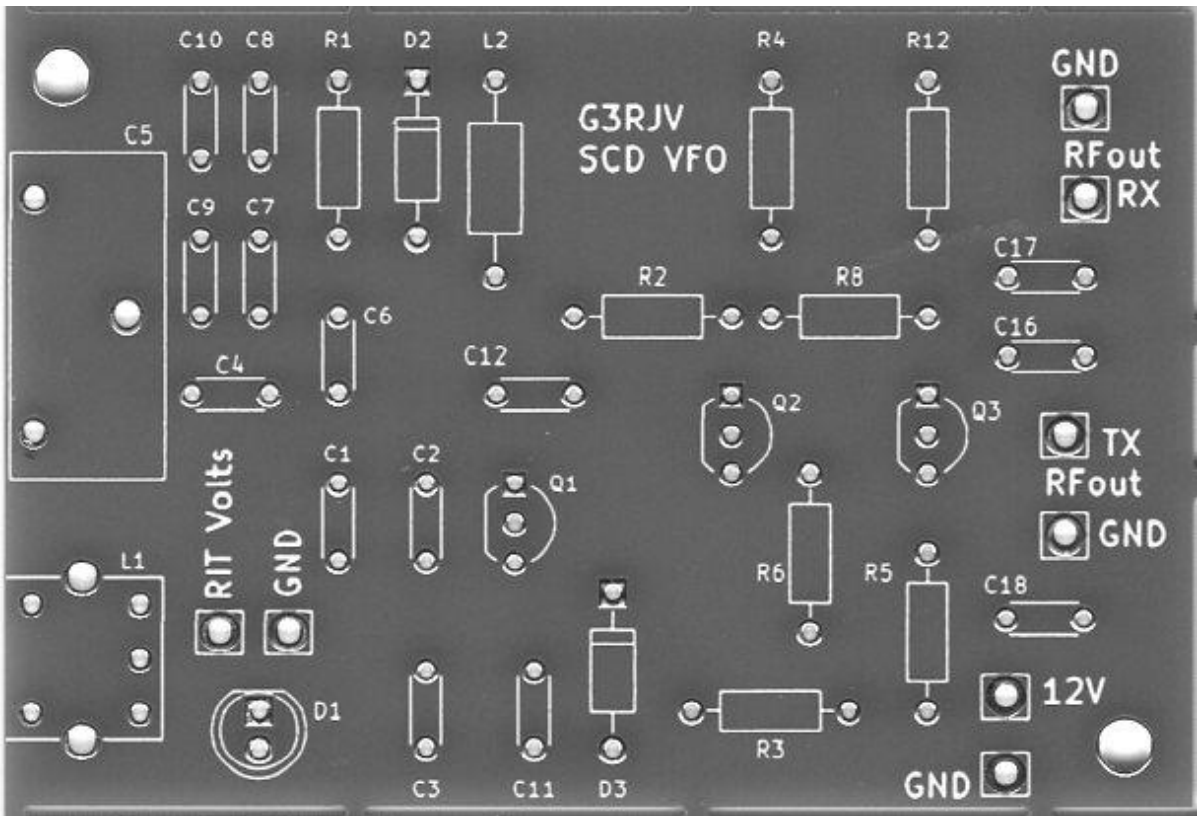
R13 may need changing depending on band and your active devices; see parts list above. Don't be tempted to push it too far or the PA transistor is likely to 'pop'. 2-3W RF Out is about right.

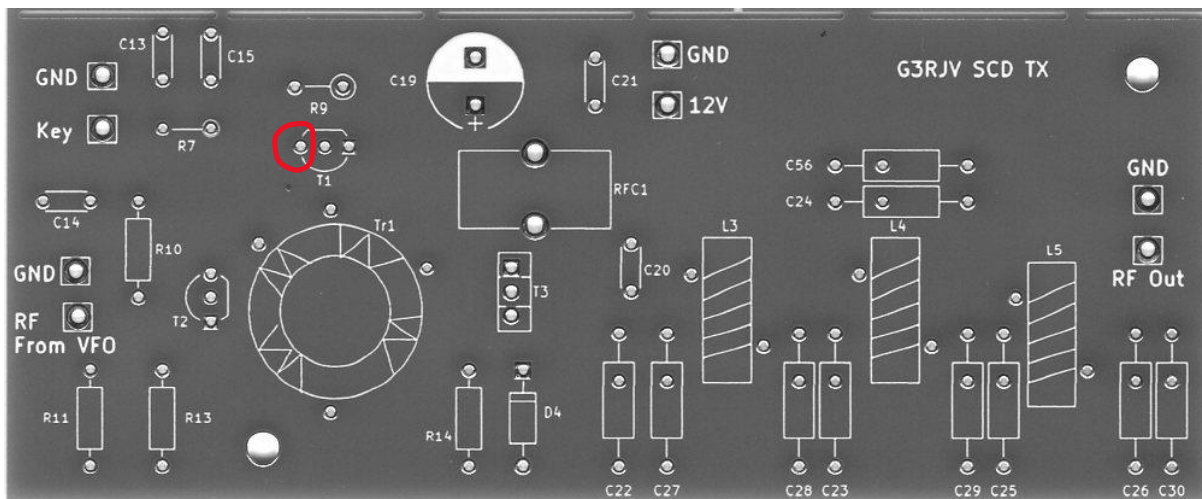
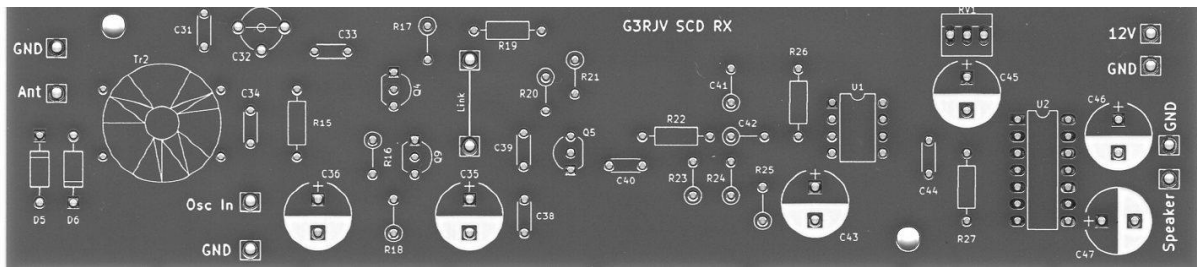
The Low Pass Filter component values shown are for the 5MHz band. If you are building yours for a different band, refer to the W3NQN document here:

https://www.qrp.com/Datasheet_W3NQN.pdf

Note: A number of constructors have reported that the current issue of toroids are giving higher values of L for a given number of turns. If you have the means to measure L, it is best to do so (I use my MFJ antenna analyser in 'inductance' mode). If not, maybe just drop a turn, or two, if the output appears lower than expected.

PCB Layouts (with great thanks to Heather, MOHMO)





A couple of notes about the Transmitter PCB...

Take care with the Low Pass Filter capacitors; each one has three holes to allow for different sized components. Use one of the two holes that are closest together and the one that is furthest away. If in doubt, flip the PCB to confirm.

The PCB was designed to include a keying transistor (T1). If you are using the transmitter PCB with the Changeover & Sidetone module, there is no requirement for another keying transistor. So, just wire the '12v keyed' terminal on the Changeover PCB to the collector hole for T1 (circled in red above).

If you want to use the Transmitter module on its own, or with other modules of your own, you can add T1 and its associated Rs and Cs:

Parts List:	QTY	Part Numbers
1k	1	R7
47k	1	R9
100nF, sometimes marked 0.1 or 104	2	C13, C15
2N3906 or 2N2905 (PNP)	1	T1