Low-Pass Filters (LPF) of HF Transceiver

The LPF low-pass filters are used to filter harmonics at the output of the power amplifier. These filters have proven themselves in the Druzhba, Desna, Druzhba-M, Rosa, Klopik, Sloboda transceivers, but due to their versatility they can be used in any design.

Operation

The board uses six two-section low-pass filters, the switching of the filter sections during the transition from one band to another is carried out by a relay, with an operating voltage of 12V to 27V.

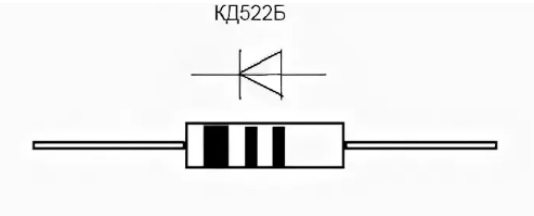
Relay P1 with an operating voltage of 12V and is used to connect the low-pass filter output to a power amplifier (PA) and bandpass filters (BPF). The 7 and 10 MHz, 18 and 21 MHz, 24 and 28 MHz bands are combined, and have common low-pass filters; relay switching of these ranges is carried out through a diode decoder VD3-VD8.

Features of installation and configuration

Low-pass filters are mounted on a single-sided printed circuit board 90x62 mm. For the building of a low-pass filter, toroid cups (diameter 12mm) are used.

As blocking capacitors C3, C7, C11, C15, C19 and C23, the LPF board provides for the installation of both output series K10-17 and SMD capacitors 0805 or 1206.

The kit uses diodes VD1-VD8 series КД522Б (spell KD522). Please pay attention to the pinout of the diodes - it differs from its analogues - 1N4148.



Attention! There are two types of cups in the kit: 6 pieces with a thread, 6 pieces without a thread. Due to the different inner diameters and the amount of winding, it is more convenient to use threaded cups for L7-L12, and non-threaded cups for L1-L6.

Cups are quite fragile, so it is not recommended to pull the wire strongly during winding. Without fanaticism! It is enough, just a little effort to fix the next turn. Winding is carried out with a uniform pitch with the distribution of turns along the entire length of the ring.

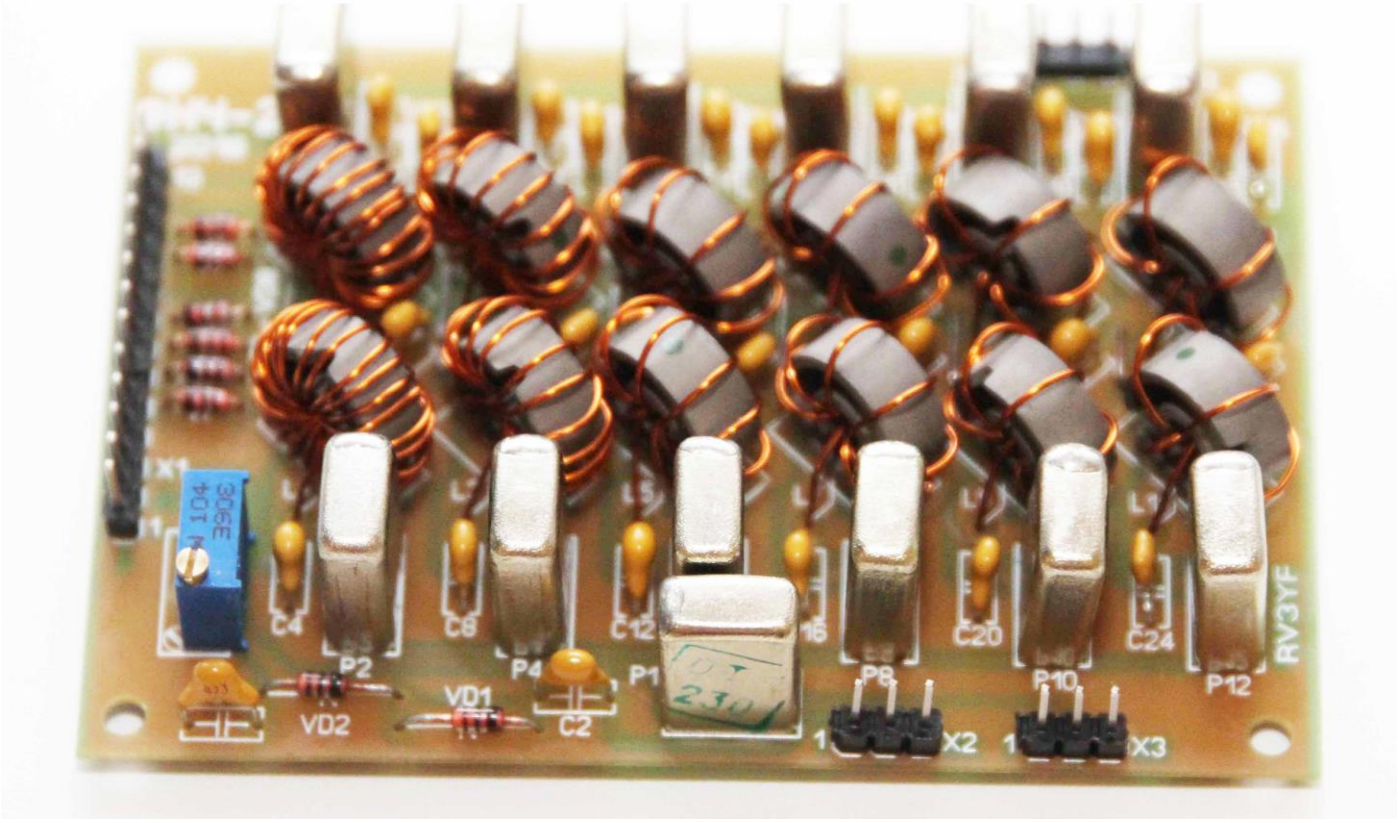
The winding data of the inductors are given in the table.

Band (MHz)	Labeling	Winding	Wire
1,9	L1, L2	24	0.45 mm
3,5	L3, L4	15	
7,0-10	L5, L6	8	
14	L7, L8	6	
18, 21	L9, L10	5	
24, 28	L11, L12	4	

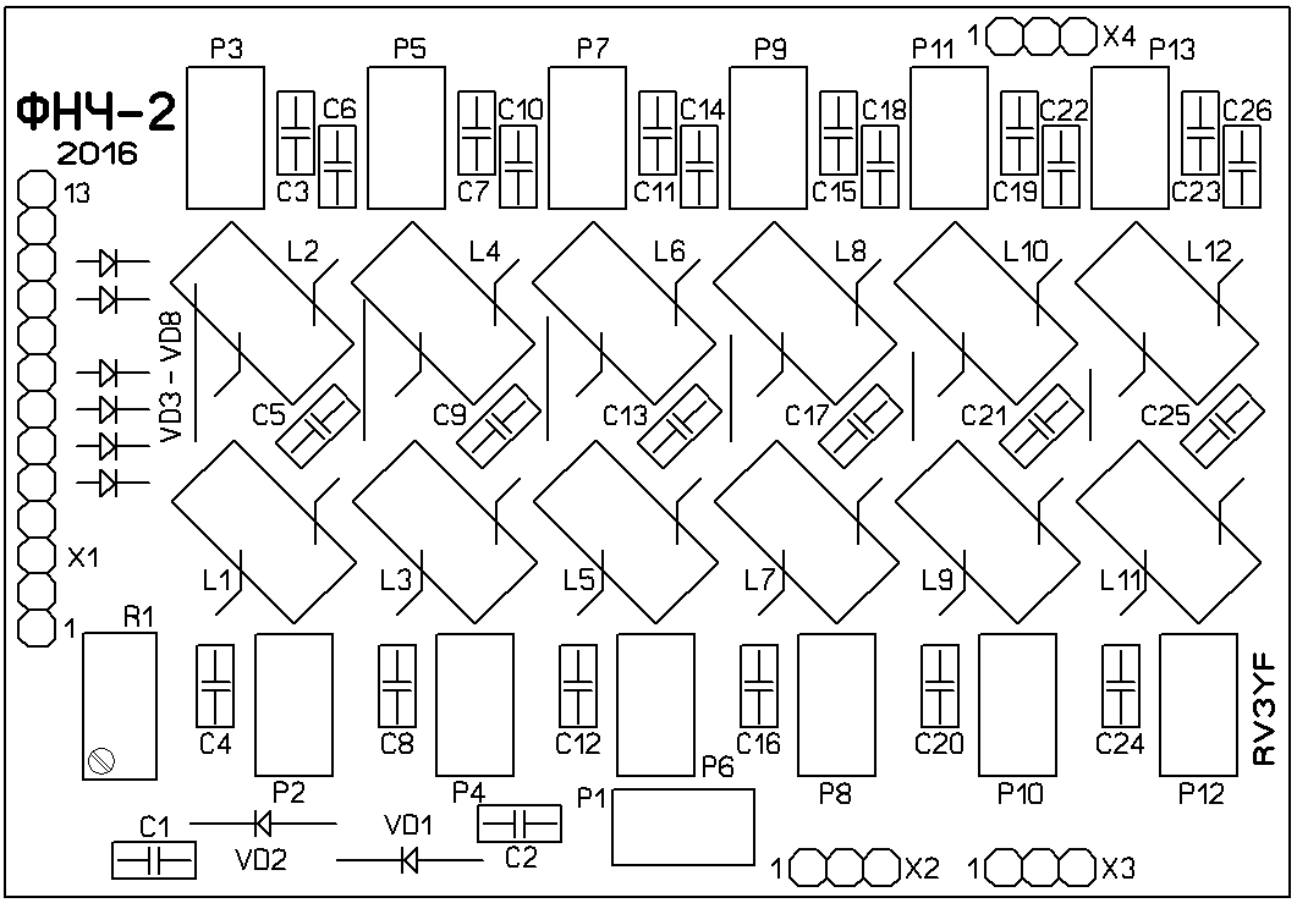
Upon completion of the installation, it is necessary to “wash” the board from rosin and flux residues, visually check the integrity of the tracks after soldering for the presence of trailing parts of the solder (“snot”), especially pay attention to the relay contacts - the distance between the contacts is small.

The board does not need to be configured. Checking the board's performance is carried out by applying a control voltage to the appropriate inputs for switching ranges and the RX / TX relay. If you have a sweeper or analyzer, you can check the frequency response of the filters. The pinout of all inputs and outputs is shown in the circuit diagram

Example of complete unit.



Монтажная схема



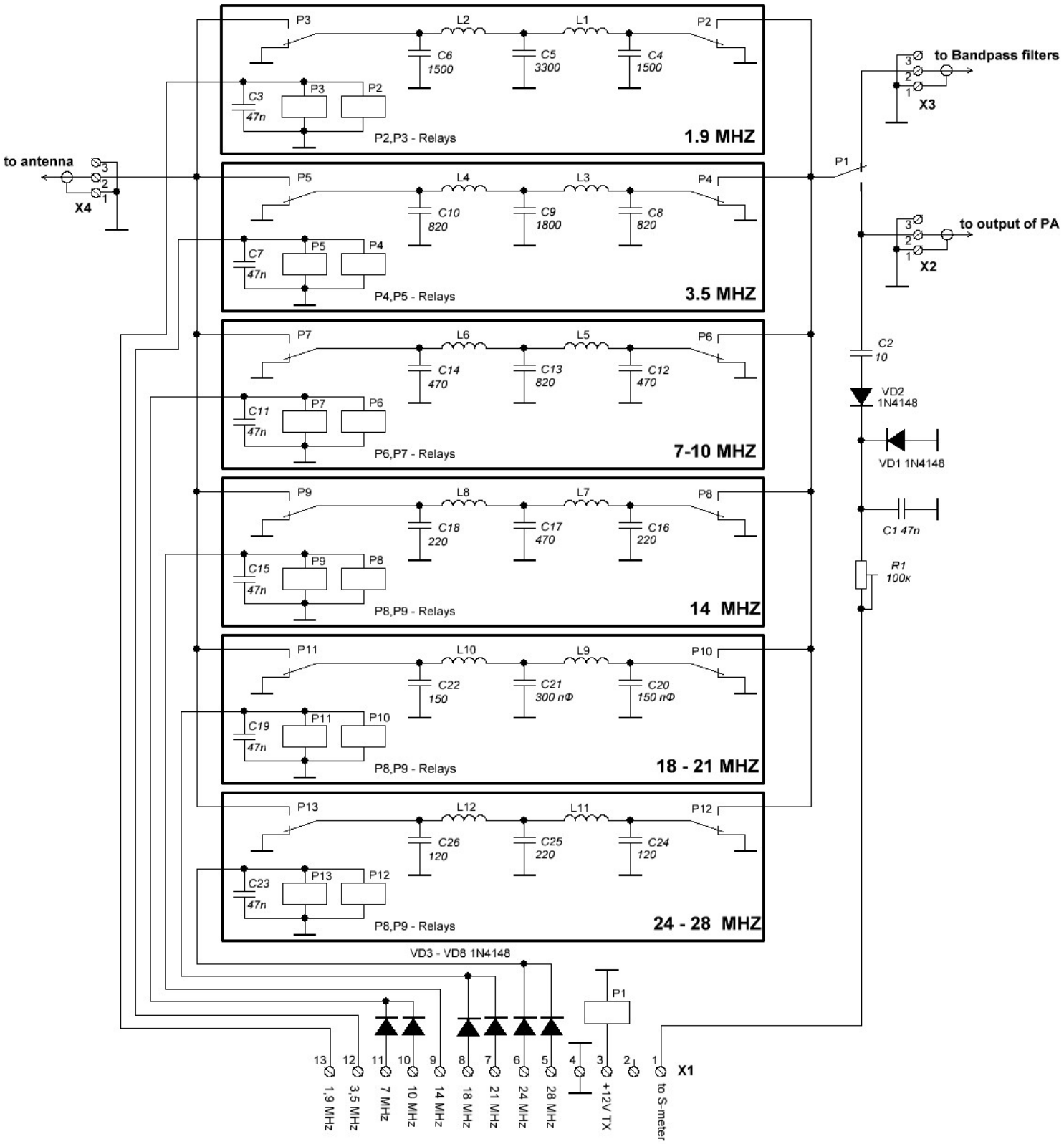
Element	QTY	Place on the board	check ✓
Diodes КД522	8	VD1-VD8	
Capacitor 10 pF (marking 100)	1	C2	
Capacitor 120 pF (marking 121)	2	C24, C26	
Capacitor 150 pF (marking 151)	2	C20, C22	
Capacitor 220 pF (marking 221)	3	C16, C18, C25	
Capacitor 300 pF (marking 301)	1	C21	
Capacitor 470 pF (marking 471)	3	C12, C14, C17	
Capacitor 820 pF (marking 821)	3	C8, C10, C13	
Capacitor 1500 pF (marking 152)	2	C4, C6	
Capacitor 1800 pF (marking 182)	1	C9	
Capacitor 3300 pF (marking 332)	1	C5	
Capacitor 47nF (marking 473)	7	C1,C3,C7,C11.C15,C19,C23	
Resistor 3296W 100K (104)	1	R1	
PIN Header	22	X1, X2, X3, X4	
Relay RX/TX 12V	1	P1	
Band relays 12-27V	12	P2-P13	
Cups with a thread	6	L7-L12	
Cups without a thread	6	L1-L6	

Attention!

Before starting installation, please check the availability of all elements according to the list of equipment.

Claims for the complete set are accepted within 14 calendar days from the date of receipt of the order.

If you have any questions, feedback and suggestions, you can contact us by e-mail SALES@RV3YF.RU or through the contact window on our website WWW.RV3YF.STORE


P3
L2
L1
P2
C6
1500
C5
3300
C4
1500
C3
47n
P3
P2
P2,P3 - Relays
1.9 MHZ
to Bandpass filters
X3
to antenna
X4
P1
P5
L4
L3
P4
C10
820
C9
1800
C8
820
C7
47n
P5
P4
P4,P5 - Relays
3.5 MHZ
to output of PA
X2
P7
L6
L5
P6
C14
470
C13
820
C12
470
C2
10
C11
47n
P7
P6
P6,P7 - Relays
7-10 MHZ
VD2
1N4148
VD1 1N4148
P9
L8
L7
P8
C18
220
C17
470
C16
220
C1 47n
C15
47n
P9
P8
P8,P9 - Relays
14 MHZ
R1
100к
P11
L10
L9
P10
C22
150
C21
300 пФ
C20
150 пФ
C19
47n
P11
P10
P8,P9 - Relays
18 - 21 MHZ
P13
L12
L11
P12
C26
120
C25
220
C24
120
C23
47n
P13
P12
P8,P9 - Relays
24 - 28 MHZ
VD3 - VD8 1N4148
P1
13
12
11
10
9
8
7
6
5
4
3
2
1
X1
1,9 MHz
3,5 MHz
7 MHz
10 MHz
14 MHz
18 MHz
21 MHz
24 MHz
28 MHz
+12V TX
to S-meter