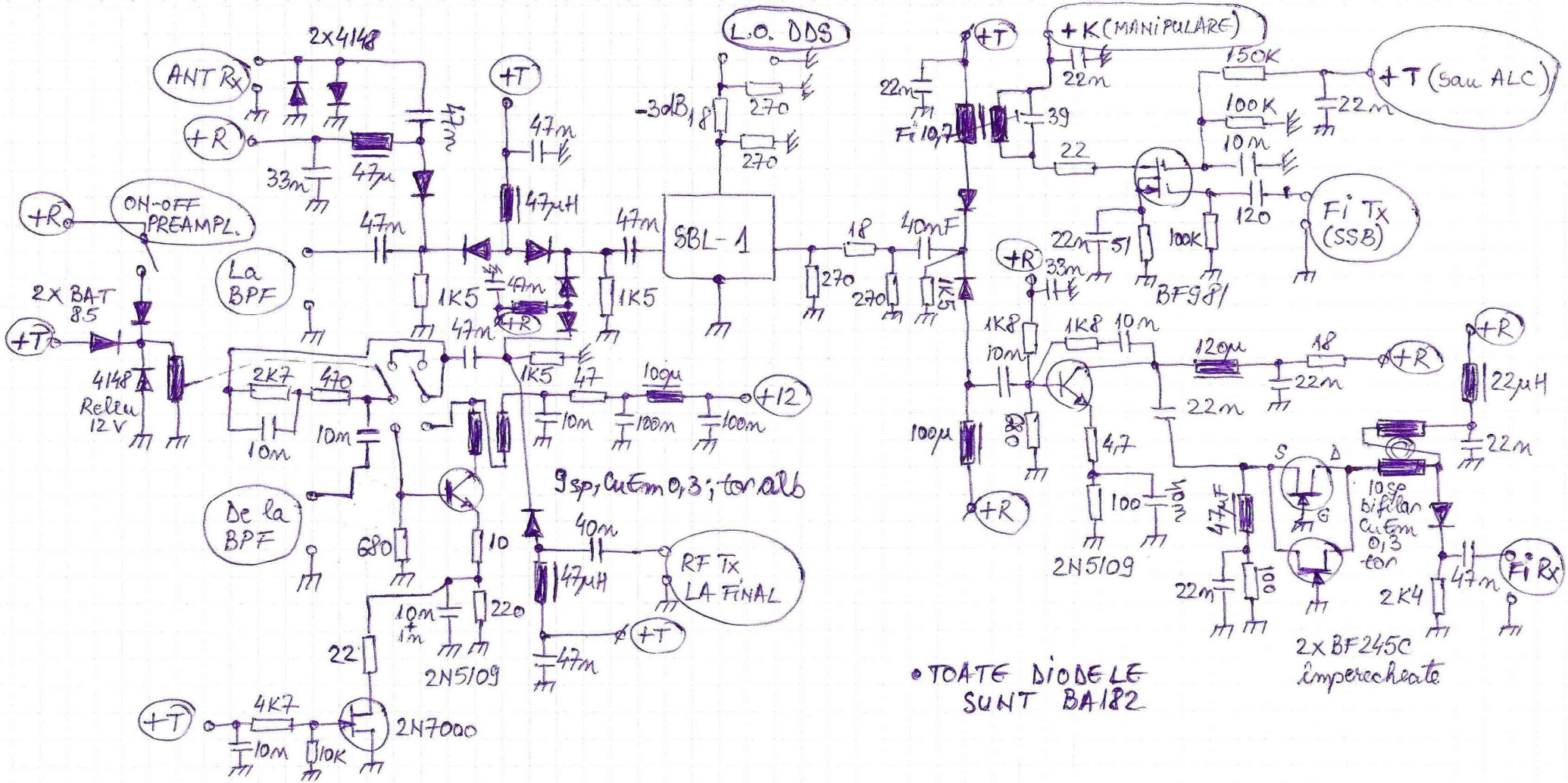
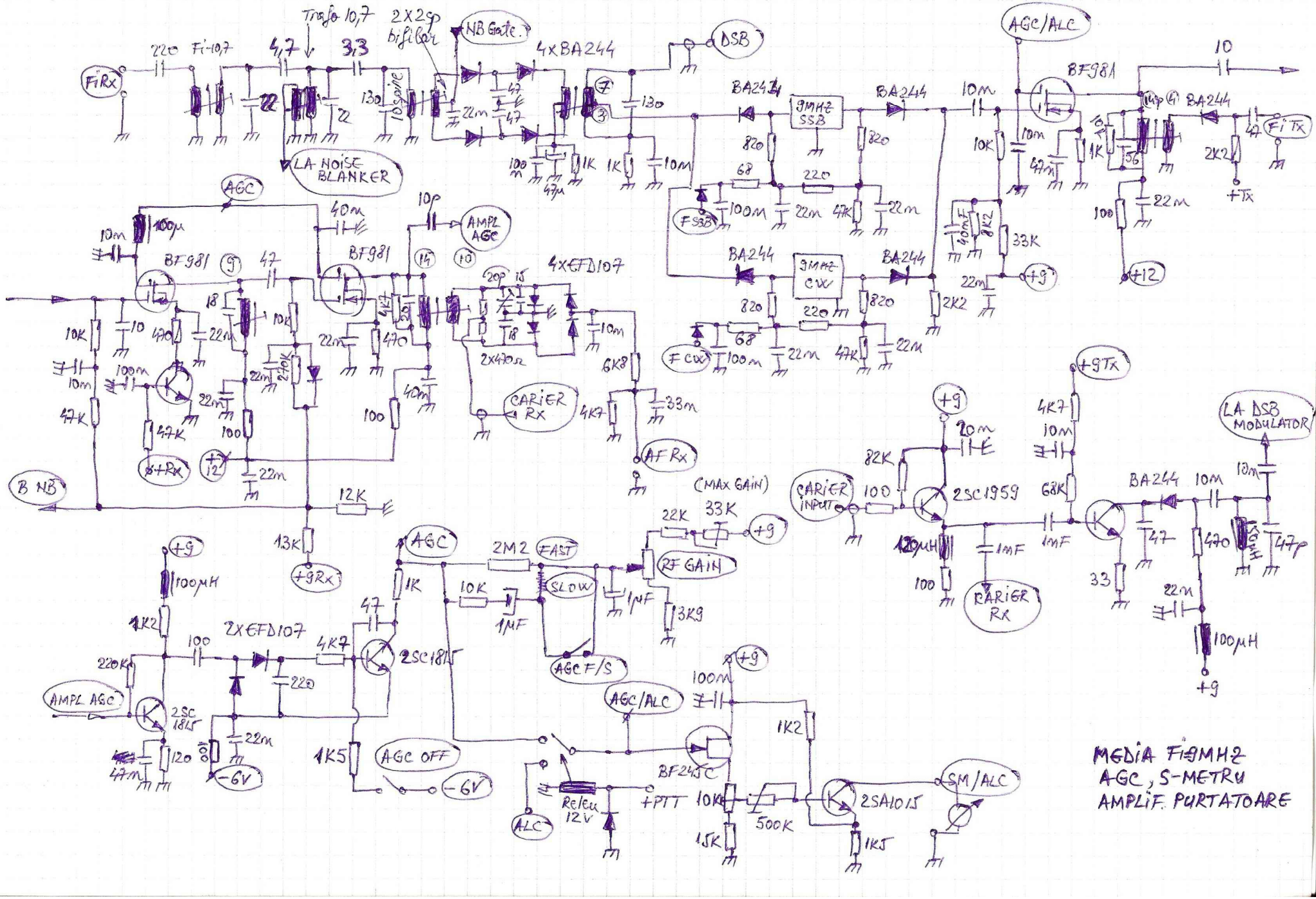
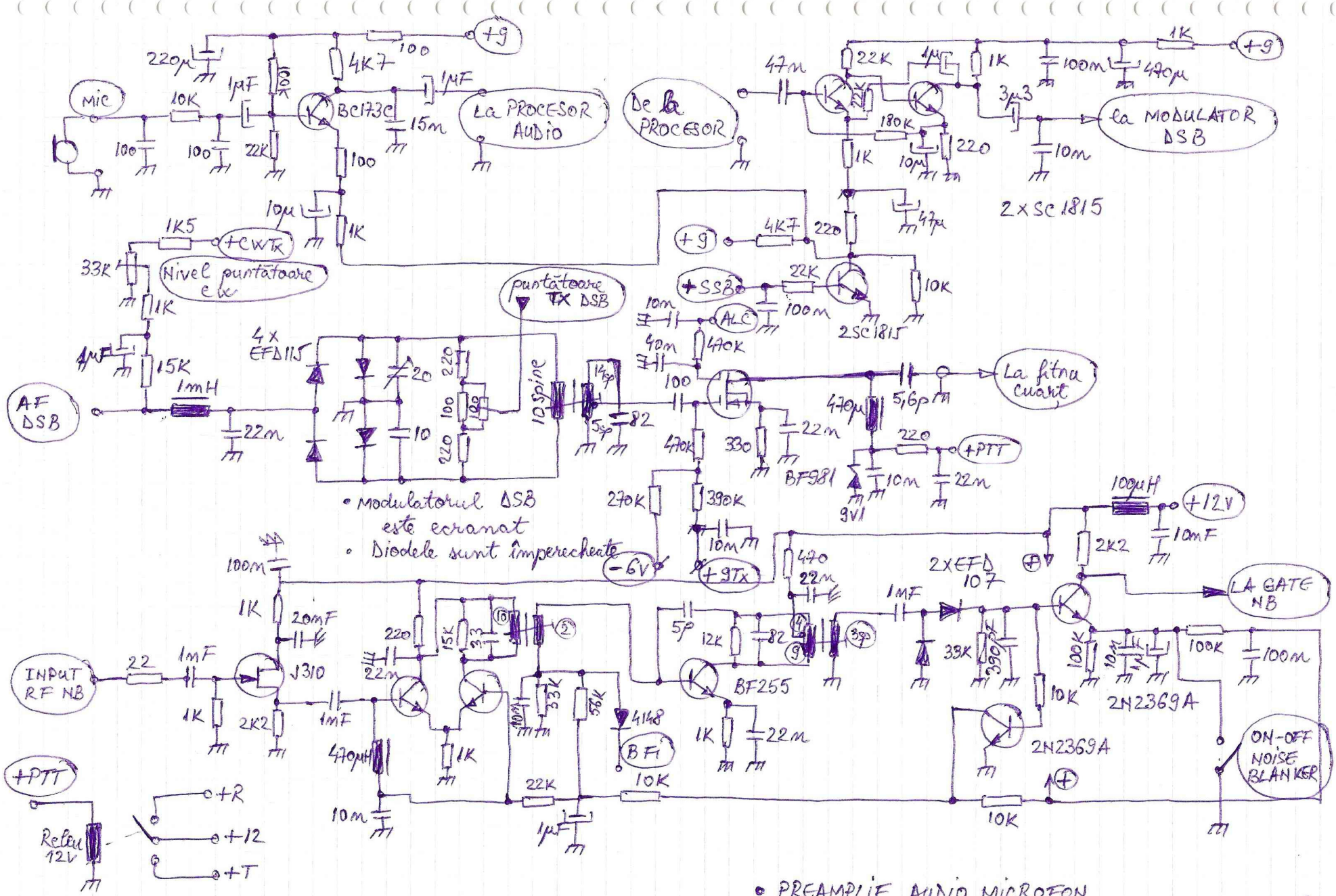
DDS HF TRANSCEIVER

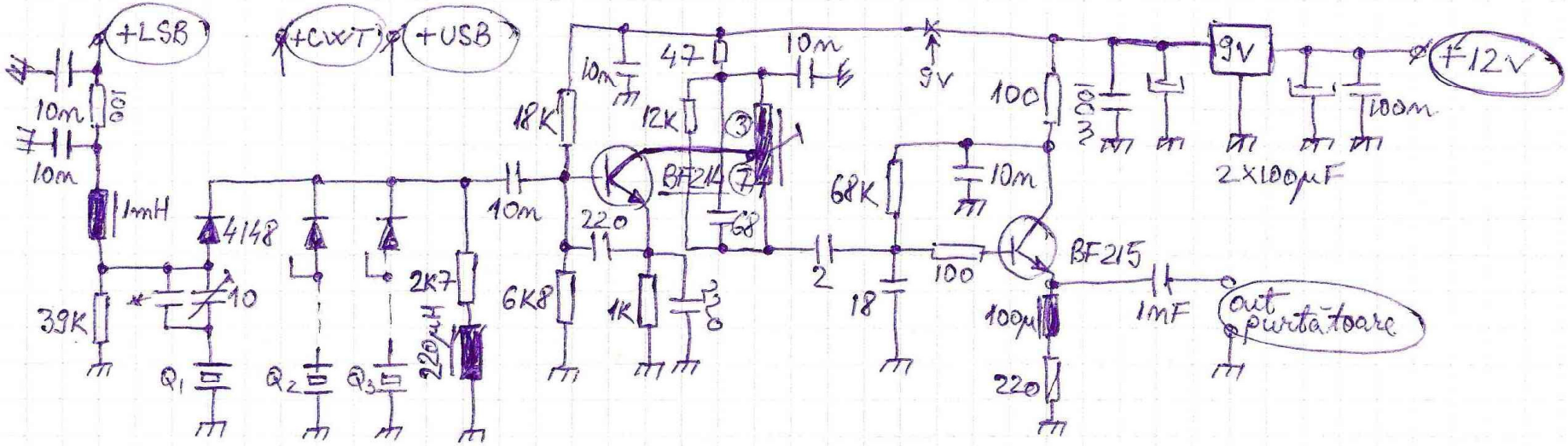
ALL BAND SSB-CW

YO4HFU-2009

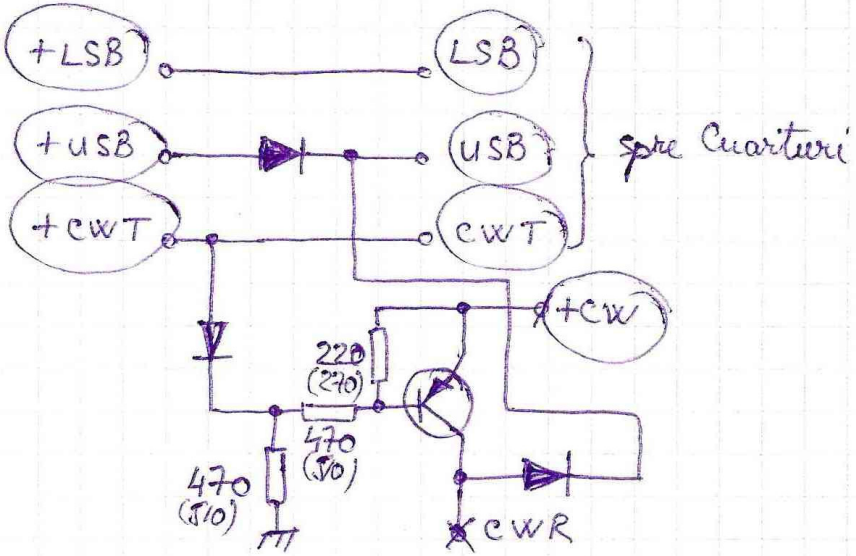

2x4148
ANT Rx
+R
+T
47n
33n
47µ
47µH
L.O. DDS
-3dB 18
270
270
+R
ON-OFF PREAMPL.
2X BAT 85
4148
Releu 12V
La BPF
47n
1K5
47n
SBL-1
1K5
18
270
270
40nF
2K7
470
10m
10m
1K5
47
100µ
10m
100m
100m
+12
De la BPF
680
10
40n
47µH
RF Tx LA FINAL
10m
1n
220
22
2N5109
47n
4K7
10m
10K
2N7000
9sp, CuEm 0,3; tor alb
+T
22n
Fi 10,7
+K (MANIPULARE)
22n
39
22
150K
100K
10m
+T (sau ALC)
22n
120
Fi Tx (SSB)
22n
51
100K
BF981
33n
1K8
10m
1K8
10m
120µ
18
+R
22n
22µH
22n
100µ
47
22n
4,7
100
100
2N5109
47µF
100
22n
S
D
G
10sp bifilar CuEm 0,3 tor
2K4
47n
Fi Rx
2x BF245C
împerecheate
• TOATE DIODELE SUNT BA182
yo4HFU
• PREAMPLIFICATOR Rx
Mixer
AMPLIF. Fi 9MHz
• ARF Tx
ARF Fi
MIXER


MEDIA FI 9MHz
AGC, S-METRU
AMPLIF. PURTATOARE


MIC
La PROCESOR AUDIO
De la PROCESOR
La MODULATOR DSB
2 x SC 1815
Nivel purtătoare CW
purtătoare TX DSB
4 x EFD115
AF DSB
La filtru cuart
• Modulatorul DSB este ecranat
• Diodele sunt împerecheate
INPUT RF NB
J310
BC173C
BF981
BF255
2N2369A
2N2369A
2 x EFD 107
LA GATE NB
ON-OFF NOISE BLANKER
Releu 12V
+PTT
+R
+12
+T
• PREAMPLIF. AUDIO MICROFON
• MODULATOR DSB
• NOISE BLANKER
Y04HFU 2008-2009



OSCILATOR PURTATOARE

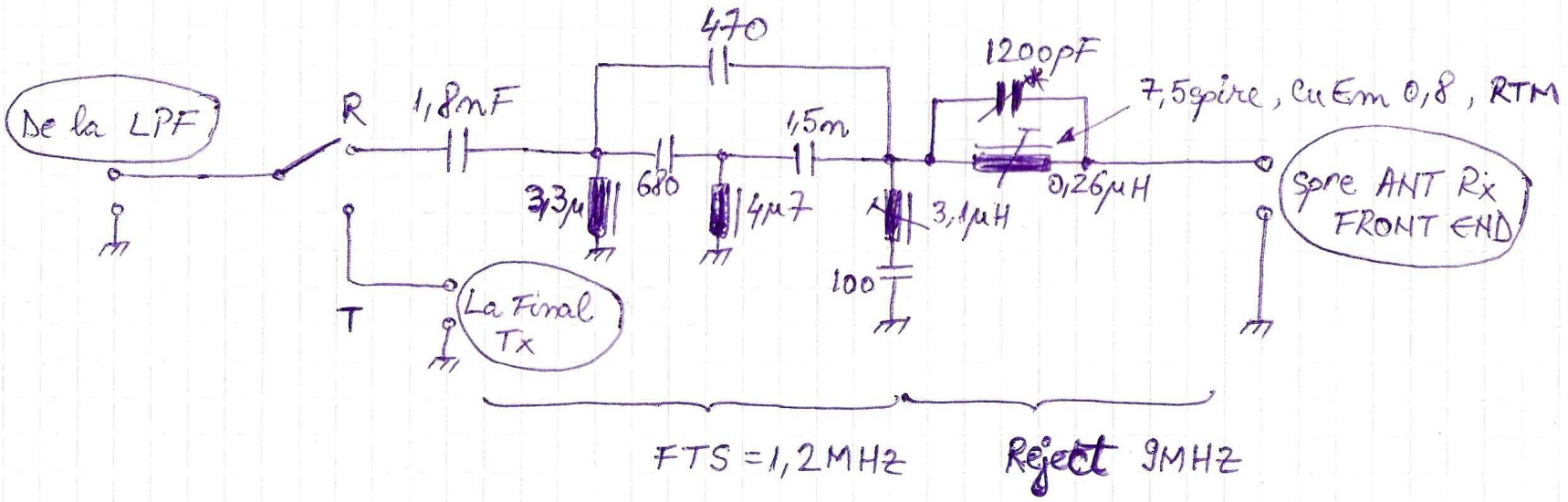


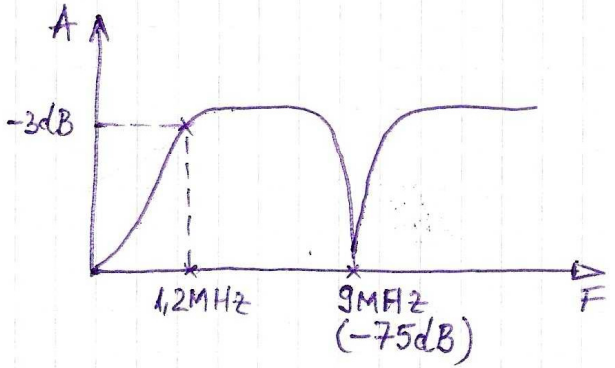
3xBAT49
BC251

INVERSOR CW Tx/Rx

CWT = 9,000485
USB = 9,001285 } -800Hz
LSB = 8,998386

CWT = USB -800Hz

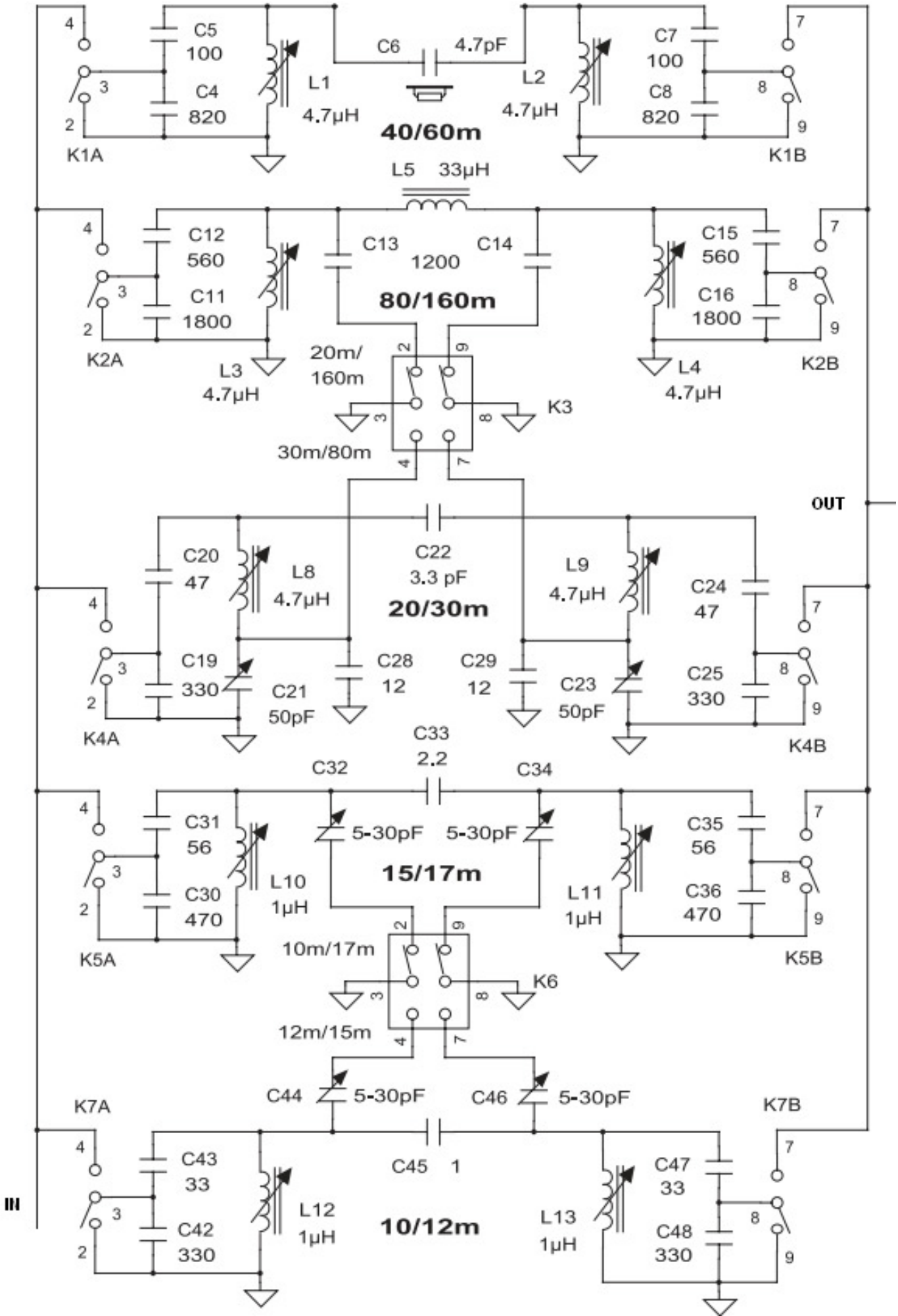




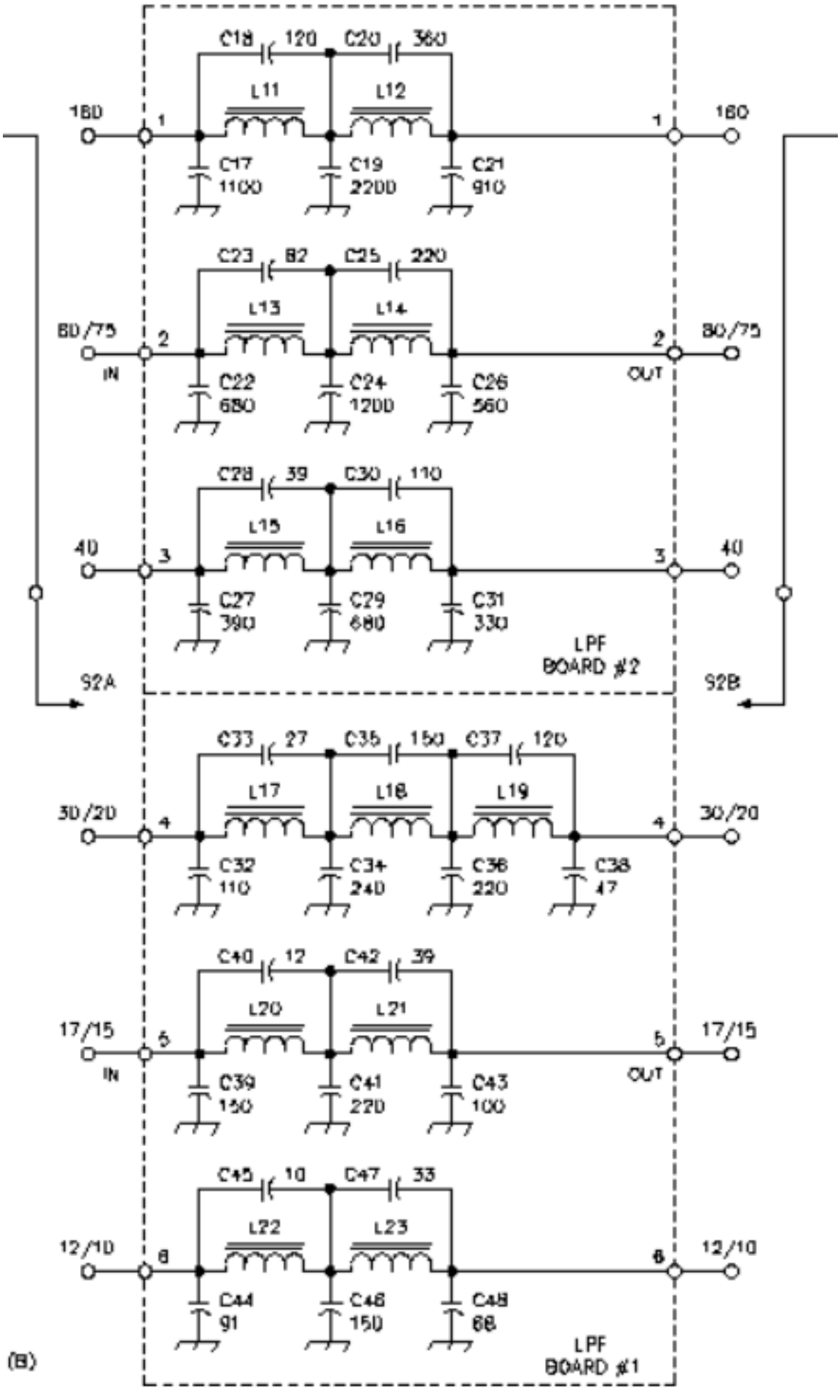
Filtru intrare
Rx

yo4HFU

4.7uH=35 spire, CuEm 0.25mm
1uH=14 spire ,CuEm 0.35mm bobinate pe carcase RTM



LOW PASS FILTERs for RX-TX



meet several additional design requirements besides harmonic reduction. A compact layout was needed to keep the overall amplifier reasonably small. Standard-value capacitors were used along with toroidal inductors. The use of toroids eliminates stray magnetic coupling between filter sections without elaborate shielding. Only two different cores and one wire gauge are used in the filters.

The six filters are mounted on two PC boards located on either side of the rotary band switch. This arrangement minimizes stray inductance associated with switching leads to the desired low-pass filter. The result is a filter assembly with very low passband insertion loss, low SWR in the passband and adequate stop-band harmonic attenuation. Elliptic function filters fulfill these requirements nicely. They also offer advantages in trouble shooting with simple ham shack test equipment.

All nine HF ham bands, except for the 30-m band, can be adequately filtered using only six, two-section elliptic filters. The 30-m band is separated from the 40 and 20-m bands far enough that a two-section elliptic filter will not provide adequate harmonic suppression. The solution requires either seven two-section filters or a three-section filter (with a steeper roll off) for the 30 and 20-m bands. The latter was chosen because it is more cost effective.

The main amplifier board contains T/R relays that bypass the amplifier during receive. The relays are controlled by an external PTT line to allow transceiver operation. By simply disconnecting the PTT line or the 12 V dc power, the amplifier is automatically bypassed to allow QRP transceiver operation. The low-pass filters are placed between the antenna and the T/R relays for two reasons: the filters provide some measure of receiver protection from strong out-of-band signals, and placing the T/R relays on a PC board connected with microstrip transmission line eliminates expensive coaxial relays and associated cable interconnects.

Table 17.6—Low-Pass Filter Coil Data

Notes:

1. All inductors wound with AWG #22 enameled wire

2. Toroidal Cores: Red = T-68, μ = 10 Black = T-68, μ = 6

3. Number of turns refers to the number of times the wire passes through the center of the core.

4. The coverage angle refers to the arc of core circumference occupied by the winding; that is 90° means that one quarter of the core is covered by the winding, with the turns evenly spaced within that area.

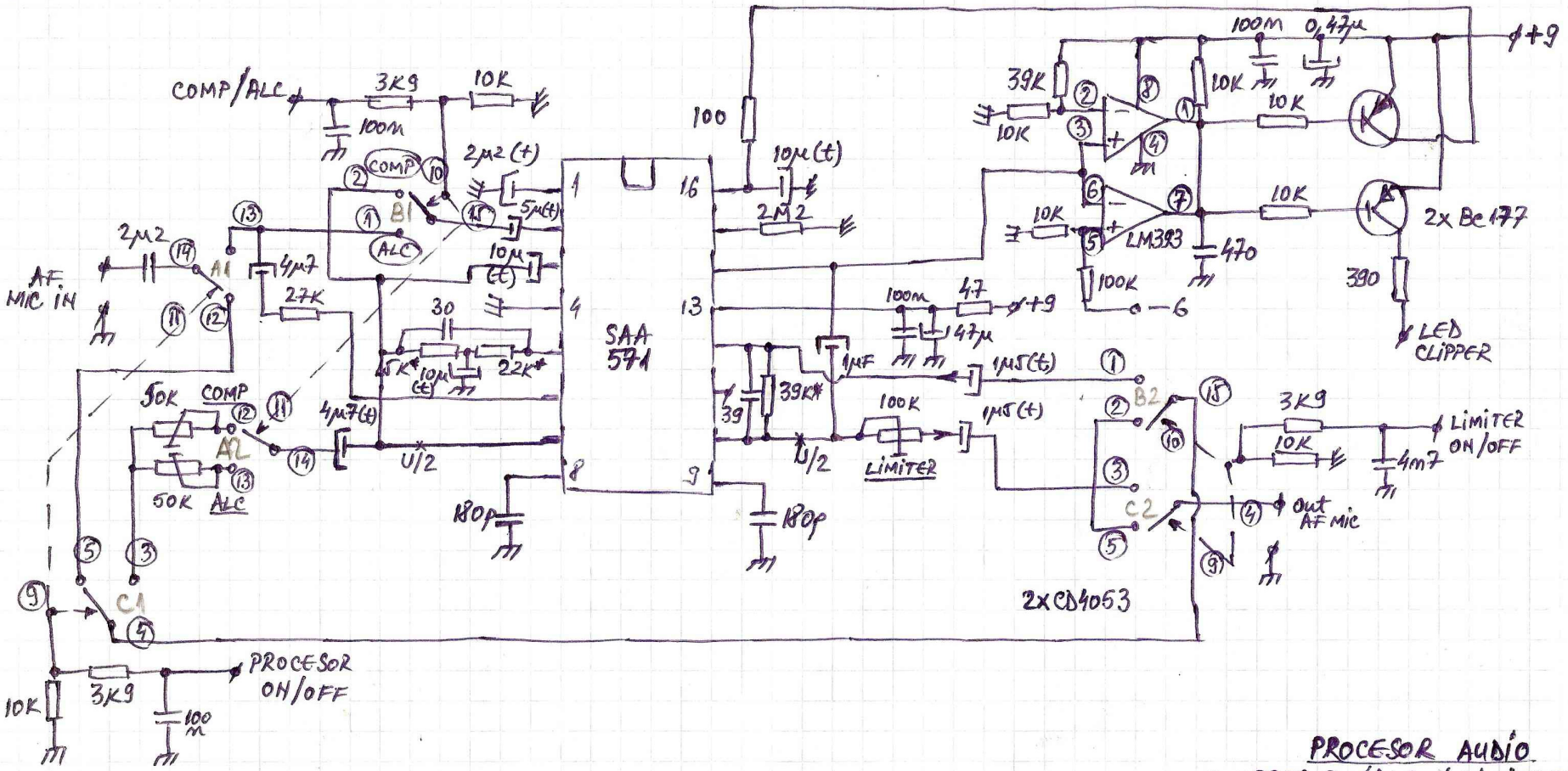
5. Inductance is given in μH.

6. The wound cores are mounted with the winding away from the board ground plane (except band-6 cores are mounted with the winding next to the board, minimum lead length).

Ref	*L(μH)*	*Core*	*Turns*	*Coverage*
L11	4.68	Red	28	300°
L12	3.94	Red	25	270°
L13	2.40	Red	19	270°
L14	1.97	Red	17	250°
L15	1.34	Red	14	200°
L16	1.12	Red	11	150°
L17	0.579	Black	11	250°
L18	0.435	Black	9	180°
L19	0.371	Black	8	180°
L20	0.450	Black	9	90°
L21	0.375	Black	8	180°
L22	0.320	Black	6	60°
L23	0.260	Black	5	45°

Stop-band pole frequencies (frequencies with high peak attenuation):

Band	*F1 (MHz)*	*F2 (MHz)*	*F3 (MHz)*
1	4.06	6.78	
2	7.76	12.3	
3	15.7	19.7	
4	20.3	25.3	36.9
5	41.7	68.8	
6	54.2	78.0	

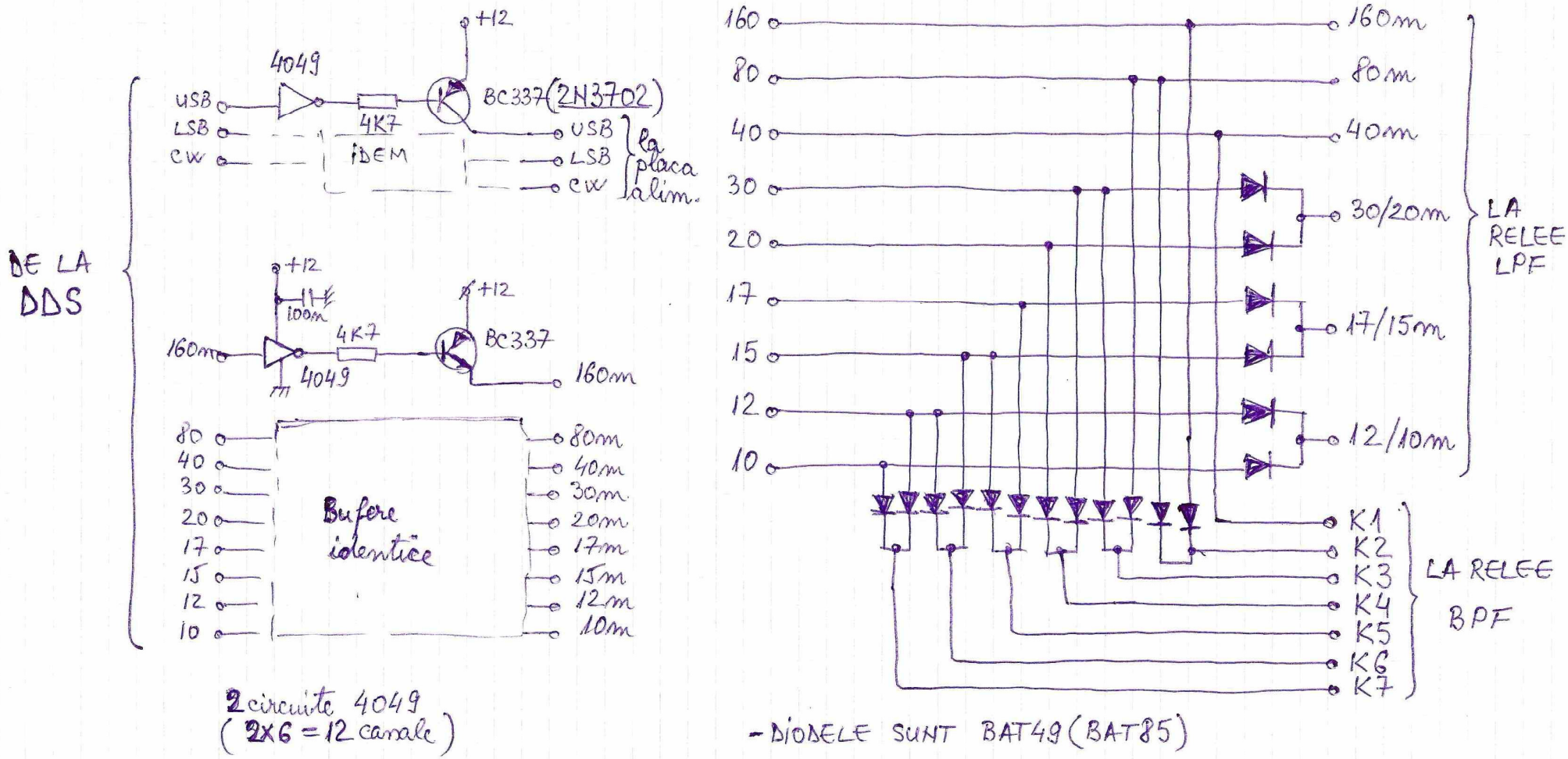


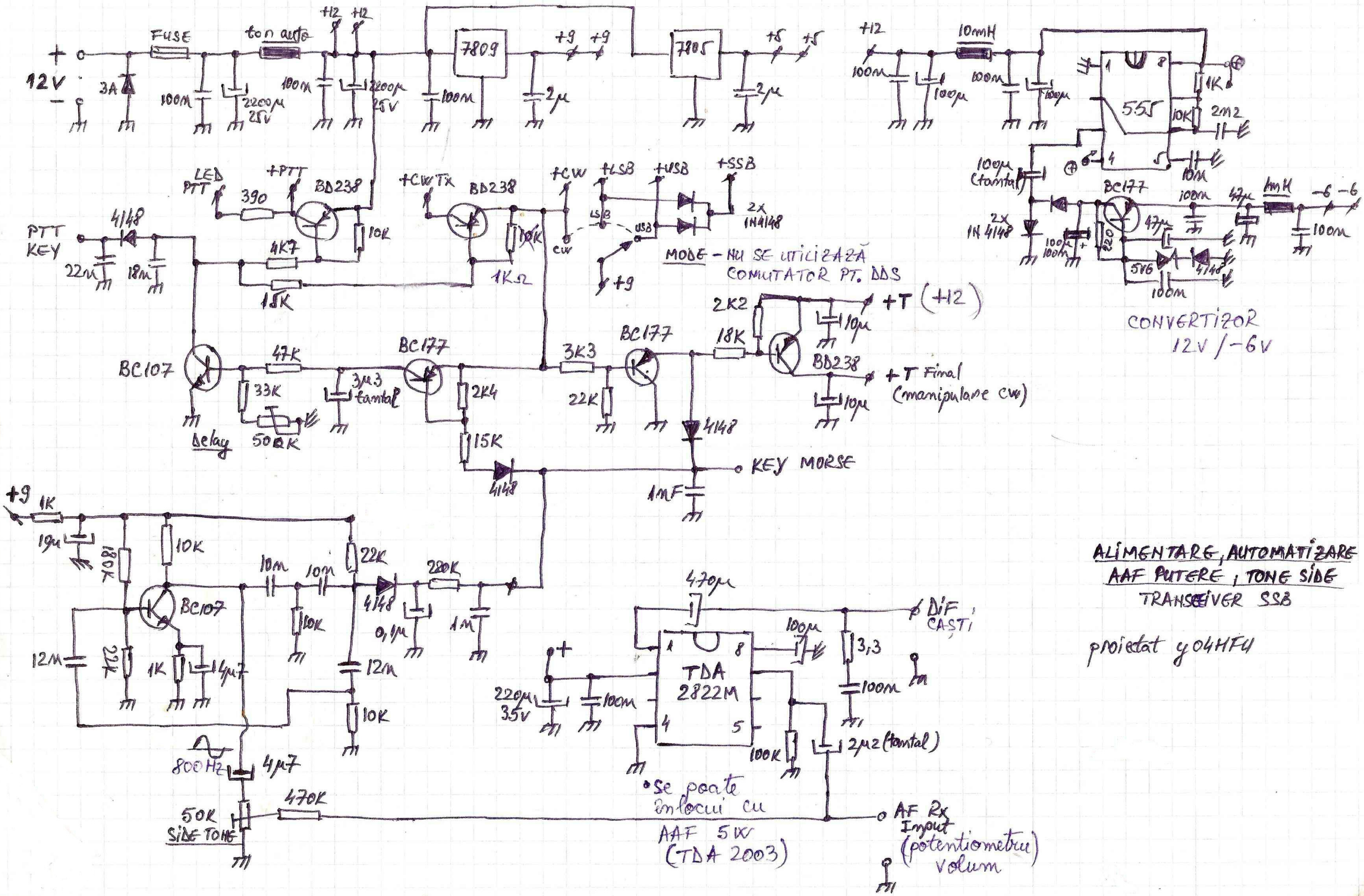
PROCESOR AUDIO

COMPRESOR /ALC / LIMITATOR

TRANSCEIVER SSB

proiectat yo4HFU


DE LA DDS
+12
4049
USB
LSB
CW
4K7
BC337 (2N3702)
IDEM
USB
LSB
CW
la placa alim.
+12
100m
4K7
160m
4049
BC337
160m
80
40
30
20
17
15
12
10
Bufere identice
80m
40m
30m
20m
17m
15m
12m
10m
2 circuite 4049
(2x6 = 12 canale)
160
80
40
30
20
17
15
12
10
160m
80m
40m
30/20m
17/15m
12/10m
LA RELEE LPF
K1
K2
K3
K4
K5
K6
K7
LA RELEE BPF
- DIODELE SUNT BAT49 (BAT85)


+ 12V -
3A
FUSE
100n
2200µ 25V
ton auto
+12 +12
100n
2200µ 25V
7809
100n
+9 +9
2µ
7805
+5 +5
2µ
+12
100n
100µ
10mH
100n
100µ
555
1K
10K
2M2
10n
100µ (tantal)
2x 1N4148
BC177
100µ
100n
220
47µ
5V6
4148
100n
47µ
1mH
-6 -6
100n
CONVERTIZOR 12V / -6V
LED PTT
390
+PTT
BD238
10K
PTT KEY
4148
22n
18n
4K7
18K
+CW Tx
BD238
10K
1KΩ
+CW
+LSB
+USB
+SSB
2x 1N4148
CW
LSB
USB
+9
MODE - NU SE UTILIZEAZĂ COMUTATOR PT. DDS
2K2
+T (+12)
10µ
18K
BD238
+T Final (manipulare CW)
10µ
BC107
47K
33K
50K
Delay
3µ3 tantal
BC177
2K4
15K
3K3
22K
BC177
4148
KEY MORSE
1MF
4148
+9
1K
10µ
180K
10K
22K
10n
10n
280K
BC107
10K
4148
0,1µ
1M
12M
22K
1K
4µ7
12M
10K
800 Hz
4µ7
50K SIDE TONE
470K
470µ
TDA 2822M
100µ
3,3
DIF CĂȘTI
+
220µ 35V
100n
100n
100K
2µ2 (tantal)
AF Rx Input (potentiometru volum)
•Se poate înlocui cu AAF 5W (TDA 2003)

ALIMENTARE, AUTOMATIZARE AAF PUTERE, TONE SIDE

TRANSCEIVER SSB

proiectat yo4HFU