

Diplexer HF + 6m / 2m + 70cm

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The following DIPLEXER separates the following bands:

- HF and 6m on one side (= 0 - 52 Mc).
- 2m and 70cm on the other side.

It allows the simultaneous operation of 2 different equipments (HF and VHF/UHF) over one coax cable,

or the use of 2 antennas of the corresponding bands with one coax cable.

That means, you can operate on HF and listen or transmit at the same time on VHF or UHF, all through the same coax cable.

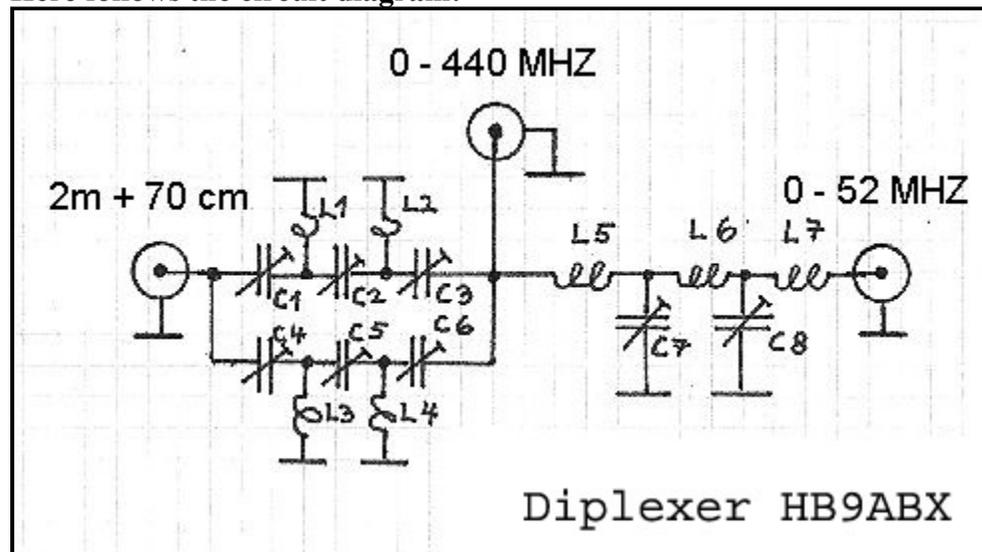
It is also suitable to connect a 3 band antenna (uhf/vhf/6m) with the antenna connectors of a transceiver as IC-706, FT-100, or TS-2000 transceiver.

The following data was measured at 50 Ohm input and output:

- Attenuation of the other band is very high (over 60 db)
- Insertion loss is negligible (less than 0.3 db)

The circuit may be built easily into a metallic box measuring abt. 11 cm x 5,5 cm x 3 cm.

Here follows the circuit diagram:



Component list:

all coils 1mm dia enameled copper wire

L1 = 1 turn 5 mm (id)

L2 = same as L1, orientation 90 degr in respect to L1

L3 = 1 1/2 turn 6 mm (id)

L4 = same as L3, orientation 90 degr in respect to L3

L5 = 7 turn 6 mm (id), 15 mm long

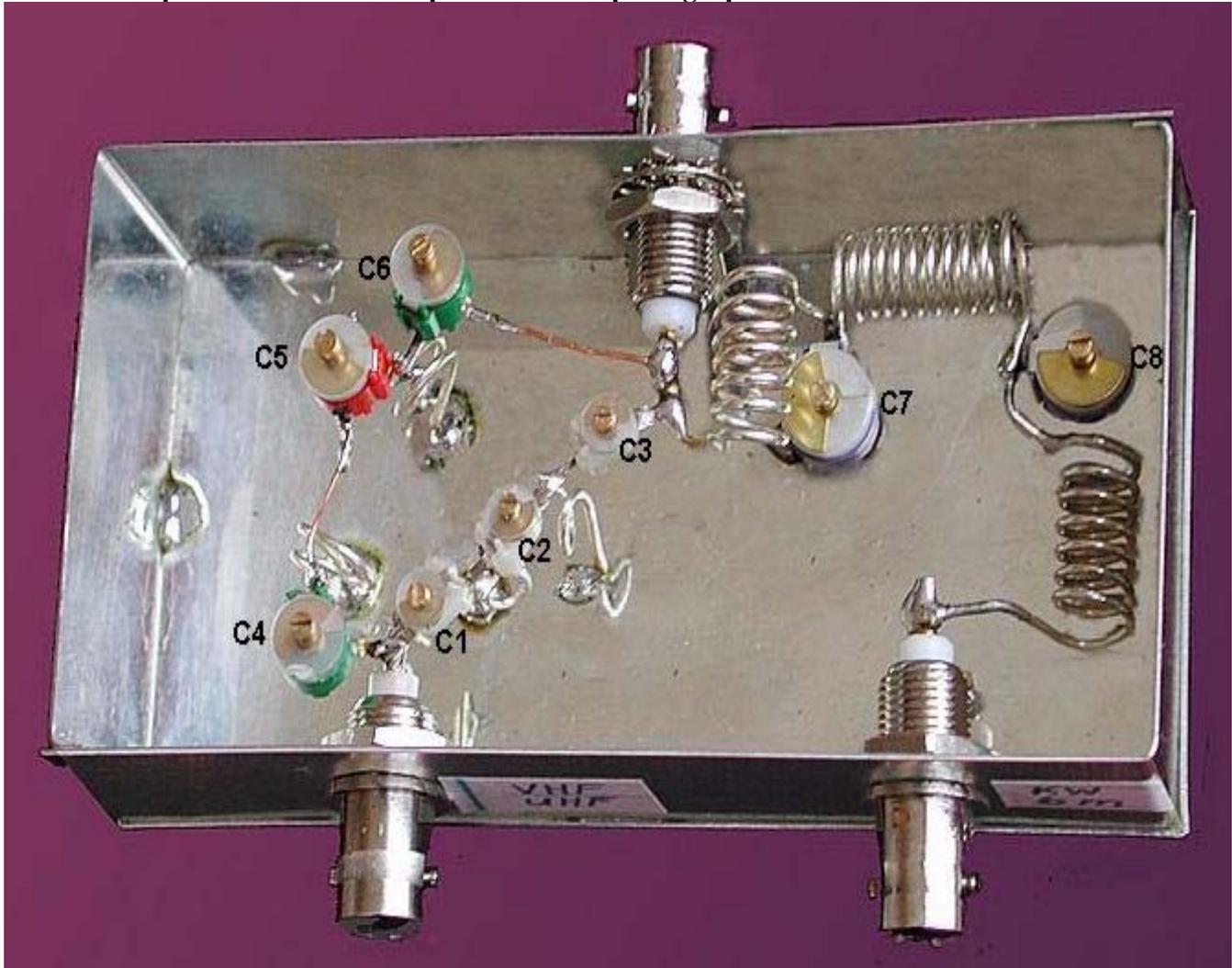
L6 = 11 turn 6 mm (id), 19 mm long

L7 = same as L5

C1 = foil trimmer cap. 9 pf (0.5-9 pf) see note in text

- C2 = same as C1
- C3 = same as C1
- C4 = foil trimmer cap. 32 pf (3-32 pf)
- C5 = same as C4
- C6 = same as C4
- C7 = foil trimmer cap. 135 pf (5-135 pf)
- C8 = same as C7
- 3 HF chassis plugs 50 Ohm (BNC)
- 1 metallic box (solderable)

Observe the placement of the components in the photograph:



Coils may be made of silvered copper wire, but enameled copper wire serves equally well.

The layout should be equal, otherwise undesired coupling may occur which hinders proper operation.

Proper adjustment of the unit is very important. This requires some time and patience. Prior to adjustment, make sure that the SWR meter is calibrated exactly for all measuring frequencies and reads exactly 1.0 when terminated by dummy load and make sure that dummyload is 50 Ohm on each band.

Adjustment procedure:

1. Connect 50 Ohm dummyload to plug 0 - 440 MHZ .
 2. Connect SWR meter between 0 - 52 MHZ plug and TX (51 Mc carrier low power).
(If no 6m TX available addadjust on 10m band)
Adjust C7 and C8 to obtain SWR < 1.1 .
 3. Connect SWR meter between 2 m plug and TX on 2 m (145 Mc carrier low power).
Adjust C4, C5, and C6 to obtain SWR < 1.1 .
C4 and C6 should reach the same value.
 4. SWR meter same as step 3, but TX on 70 cm (435 Mc carrier low power).
Adjust C1, C2, and C3 to obtain SWR < 1.1 .
C1 and C3 should reach the same value.
- Repeat steps 2 - 4 , as adjustment of one band influences the other.
You will need some patiance to reach proper adjustment on all bands!

Now your diplexer is ready for use.

If an antenna analyzer (e.g. MFJ-269) is available use this instead of the SWR meter and TX to make adjustment more easy. Connect analyzer to plug 0 - 440 MHZ and dummy load to plug being adjusted.

Note: Power is limited by the capacitors.

Many foil capacitors burn at low power. Some types are stronger.
With my trimmers I tested up to 100 w on HF and 6m, and 50w on 2m and 70 cm.
Use capacitors with higher current/voltage ratings at higher power,
e.g. good air trimmer capacitors.

Send your comments and questions by e-mail to: hb9abx@tiscali.ch

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