

# DIPLEXER 2m / 70cm

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## DUPLEXER - DIPLEXER

The names Duplexer and Diplexer are very similar and frequently confused. The Duplexer is a device which separates 2 frequencies within the same band while the Diplexer is a device which separates 2 different bands. The Duplexer requires much more selective circuits while the Diplexer normally requires only low pass and high pass circuits.

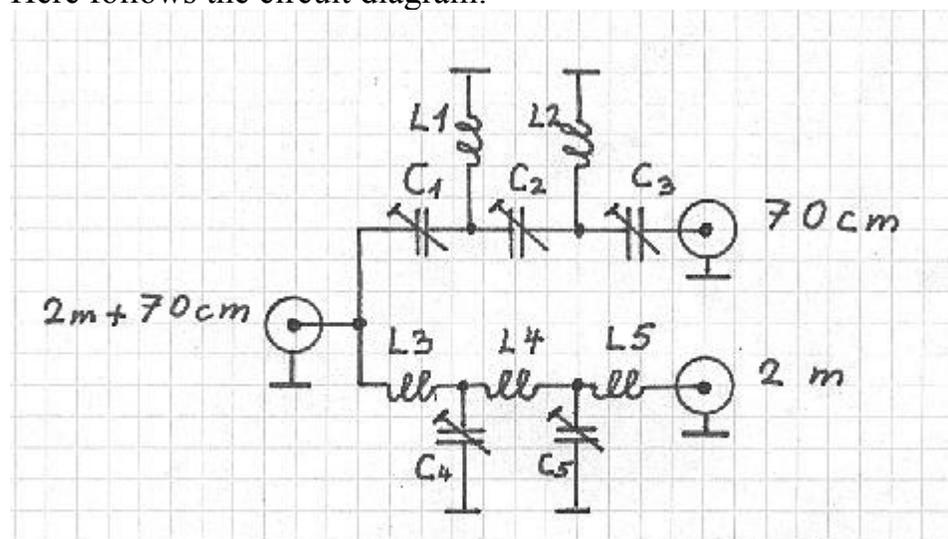
This DIPLEXER separates 2m from 70cm on the same coax cable. It allows to use 2 antennas over the same cable and permits transmission on one band and simultaneous reception on the other band, when connected on the side of the antennas. Or use 2 equipments (one VHF and one UHF) when used on the side of the transceivers.

The following data have been measured on 50 Ohm input and 50 Ohm output:

- Separation of the two bands is very high (over 70 db)
- Insertion loss is negligible (less than 0.3 db)

Its easily built into a metallic box measuring 8cm x 4cm x 2cm or similar (E.g. TEKO 372)

Here follows the circuit diagram:



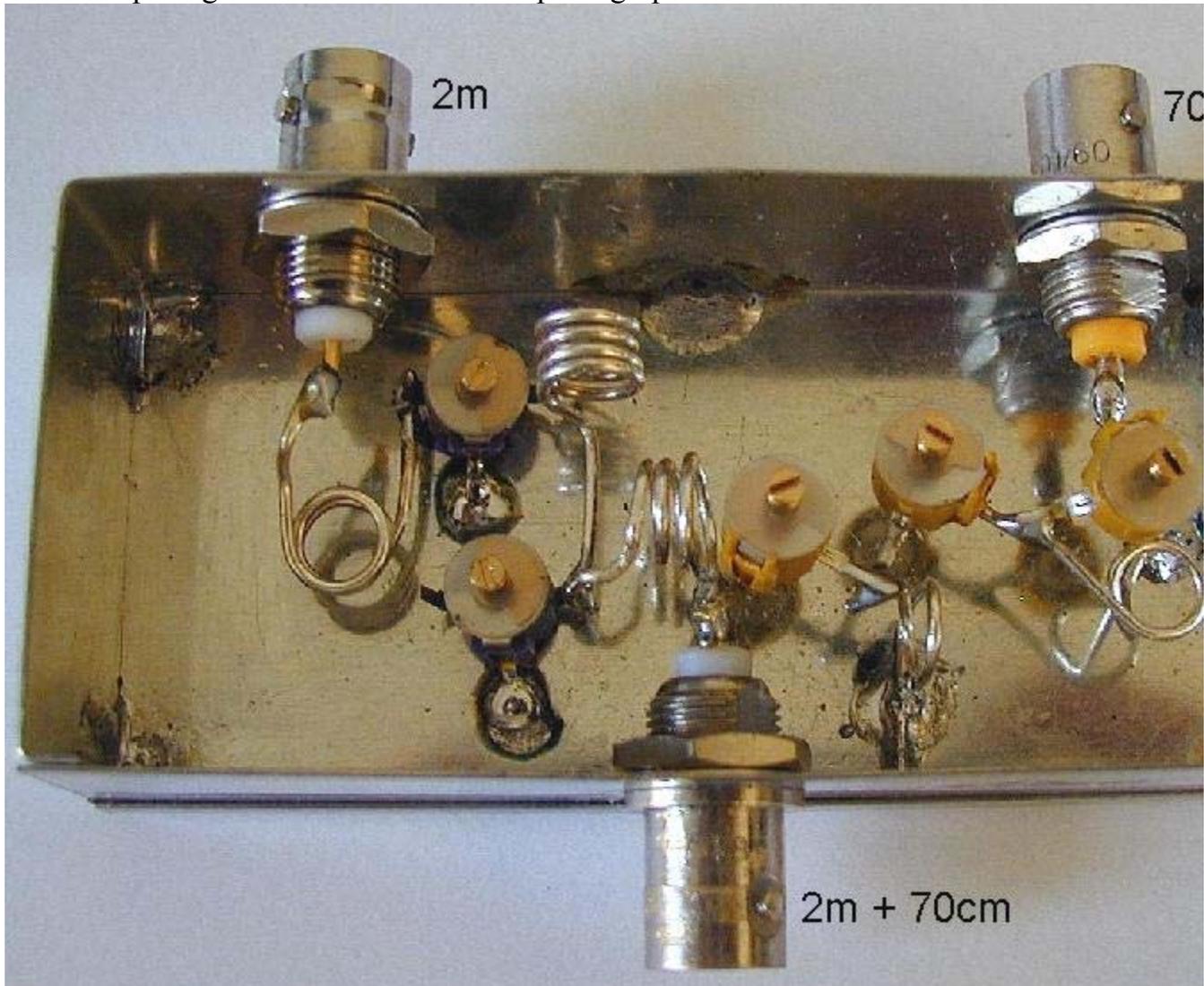
DIPLEXER HB9ABX

### List of components:

- L1 = 1 turn 6mm diameter, 1mm enameled copper wire
- L2 = same as L1 (orientation 90 deg in respect to L1)
- L3 = 3 turns 6mm diameter, 1mm silver wire
- L4 = 4 turns 6mm diameter, 1mm silver wire

- L5 = same as L3
- C1 = foil trimmer capacitor 15pf (3-15pf) see text
- C2 = same as C1
- C3 = same as C1
- C4 = foil trimmer capacitor 40pf (4-40pf)
- C5 = same as C4
- 3 HF chassis plugs 50 Ohm (e.g.BNC)
- 1 metal box e.g. TEKO 372

Observe spacing of coils and location on photograph:



The coils can be made of silver plated copper wire, but enameled copper wire serves equally well.

The coils L3, L4, and L5 have to be oriented in 3 different orientations to avoid coupling between them. Each one 90 degrees turned in respect to the others.

Proper adjustment before use is very important, according to following procedure:  
Before doing the adjustment, verify that the SWR meter is calibrated properly on VHF an UHF,  
that is, it reads 1.0 when terminated by 50 ohm dummy load and fed by TX.

1. Connect a 50 ohm dummy load to the common 2m+70cm plug (make sure that the dummy load is for these frequencies).
2. Connect SWR meter between 70 cm plug and 70 cm TX.  
Now adjust C1, C2, and C3 to obtain SWR of 1.0 while transmitting low power carrier.  
C1 and C3 should finally have the same value.
3. Connect SWR meter between 2m plug and 2m TX.  
Now adjust C4 and C5 to obtain SWR of 1.0 while transmitting low power carrier.  
- repeat steps 2 and 3, as they may interact.

Now your diplexer is ready for use.

Note: The power is limited by the maximum current/voltage of the capacitors.  
Foil trimmers can be very different, depending from model, therefore good elements are required for higher power.  
(With my trimmers I tested the unit up to 50 watts).  
Use capacitors for higher current/voltage ratings at higher power,  
e.g. good air trimmer capacitors.

Comments/questions by eMail to: [hb9abx@tiscali.ch](mailto:hb9abx@tiscali.ch)

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