

Tuning Procedure for Two-Transmitter Combiners DB4351, DB4381, DB4352, DB4382, DB4384

PRODUCT DESCRIPTION

Decibel Products' two-transmitter combiners are normally supplied pre-tuned to the customer's operating band. Due to possible impedance differences between laboratory test conditions and the actual antenna system, the customer may desire to optimize the combiner for operation at the installation site.

EQUIPMENT REQUIRED

- Transmitter at desired frequency.
- Standard receiver tuned to the transmitter frequency or equivalent equipment capable of measuring power levels approximately 40 dB below the transmitter power.
- Wattmeter capable of indicating maximum transmitter power and low values of reflected power.

TUNING THE HYBRID COUPLER

Part 1 - Tuning Procedure

(Refer to Figures 1 and 2 on page 2.)

- Disconnect the cables from the filters (shown as Item 3).
- Connect the antenna to the antenna connector.
- Connect the transmitter to cable A.
- Connect the receiver to cable B.
- With the receiver adjusted to minimum sensitivity, key the transmitter at low power (less than five watts). *Caution: Avoid excessive transmitter power to prevent possible damage to receiver. Use of external attenuation is recommended.*
- Increase the receiver sensitivity until a signal is evident.
- Tune "antenna matching" adjustments alternately while noting the signal drop at the receiver. As the received signal decreases, increase the receiver sensitivity. Continue tuning "antenna matching" adjustments until a *minimum* signal level is obtained.
- Reconnect the cables to points A and B.

The hybrid coupler is now tuned to the antenna system and no further adjustments are necessary for operation.

If the frequency of one or both transmitters is changed, the following isolator tuning procedures must be accomplished *in addition* to the above.

Part 2 - Isolation Adjustment

(Refer to Figure 3 on page 2.)

- Remove the antenna from the antenna connector.
- Connect the transmitter to the antenna connector.

- Connect the receiver to Tx 1 connector; leave Tx 2 open.
- With the receiver tuned to minimum sensitivity, key the transmitter at low power (less than five watts). *Caution: Avoid excessive transmitter power to prevent possible damage to receiver. Use of external attenuation is recommended.*
- Tune Port 3 of the isolator for a minimum signal at the receiver. Increase transmitter power as required to a maximum of 30 watts.

Part 3 - Input VSWR

(Refer to Figure 4 on page 2.)

- Connect the antenna to the antenna connector.
- Connect the wattmeter to Tx 1 connector to read reflected power from the isolator.
- Connect the transmitter to the wattmeter.
- Turn on the transmitter at full power.
- While observing the reflected power on the wattmeter, tune Port 1 of the isolator for minimum power reflected from the isolator.

Part 4 - Insertion Loss

(Refer to Figure 5 on page 2.)

- Remove the wattmeter from Tx 1 connector and connect the transmitter directly.
- Connect the wattmeter between the antenna connector and the antenna cable so as to indicate forward power.
- Turn on the transmitter at full power.
- Peak Port 2 of the isolator for *maximum* forward power as read by the wattmeter.

Repeat Parts 2, 3, and 4 for Channel 2 of the combiner.

TUNING PROCEDURE FOR DB4352, DB4382, AND DB4384 COMBINERS

The DB4352, DB4382, and DB4384 combiners utilize two isolators in each channel, rather than one. They obtain transmitter-to-transmitter isolation in excess of 80 dB for the DB4384 or 100 dB for the DB4352 and DB4382.

The following modifications or additions to the tuning procedure outlined above must be performed.

In Part 2 - Isolation Adjustment: Tune Port 3 of *each* isolator for minimum signal at the receiver

In Part 3 - Input VSWR: Tune Port 1 of the *input* isolator.

In Part 4 - Insertion Loss: Tune Port 2 of the input isolator and Ports 1 and 2 of the second isolator.

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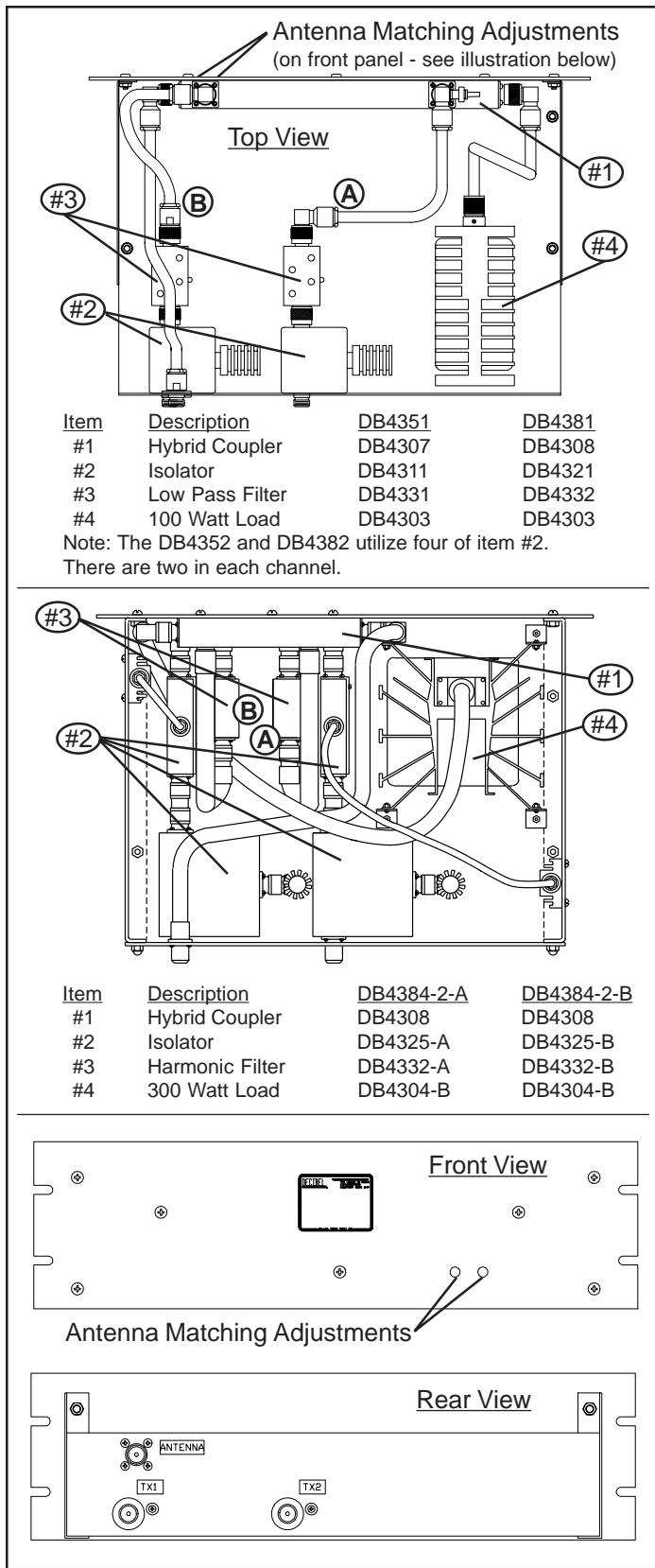


Figure 1 - Top, Front, and Rear Views

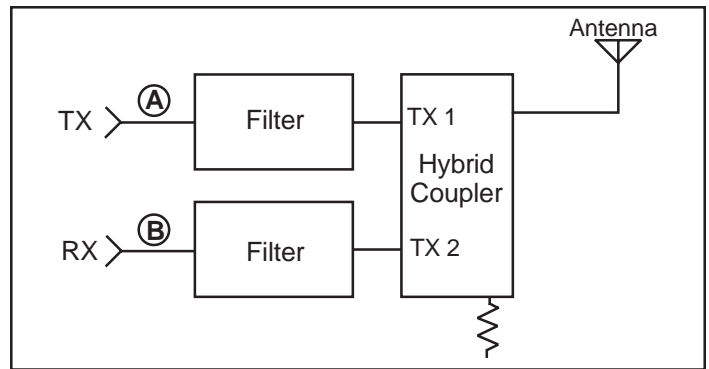


Figure 2 - Adjusting Hybrid for Antenna Match

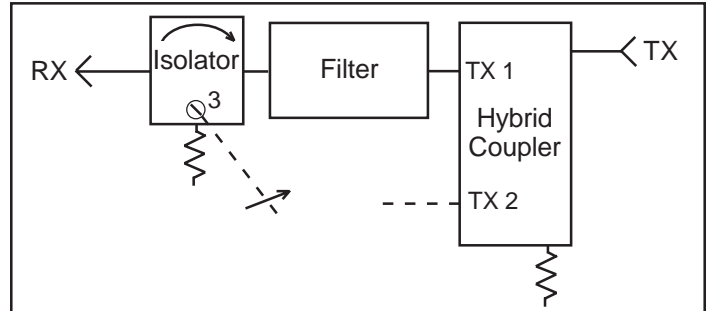


Figure 3 - Adjusting Channel 1 Isolation

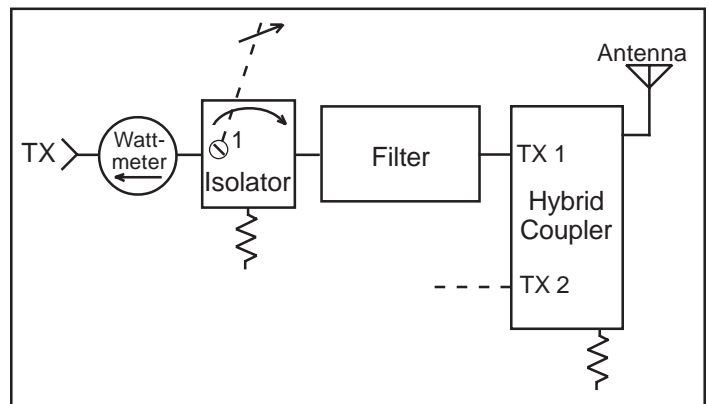


Figure 4 - Adjusting Channel 1 Input VSWR

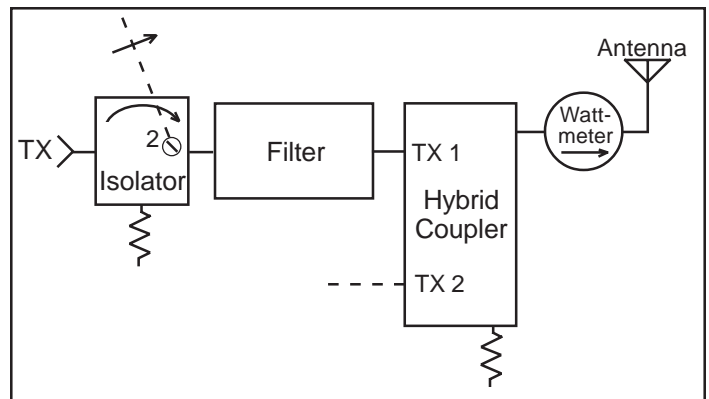


Figure 5 - Adjusting Channel 1 Insertion Loss

