

DB4057 and DB4058

150-174 MHz Band Pass / Band Reject Rack Mount Duplexers Installation and Tuning Instructions

PRODUCT DESCRIPTION

DB4057 - A three-cavity duplexer designed for the 150-174 MHz band. Tx and Rx frequencies are separated by at least 5 MHz. The two cavities in the transmitter section provide at least 86 dB transmitter noise protection to the receiver. The single cavity in the receiver section provides 50 dB protection for receiver desensitization. The 150-174 MHz band is covered in two sub-bands: 150-162 MHz and 160-174 MHz.

DB4058W - A four-cavity duplexer also in the 150-174 MHz band. It offers a narrower frequency separation (3 MHz) than the DB4057W. The transmitter cavities provide at least 85 dB transmitter noise protection to the receiver, and the receiver cavities provide at least 86 dB protection against receiver desensitization.

DB4058N - Like the DB4058W except that it offers 2 MHz minimum frequency separation and it has slightly better transmitter noise protection to the receiver (86 dB minimum).

FIELD TUNING

The duplexers are factory-tuned to the exact operating frequencies and shipped ready for immediate installation. No further field tuning or adjustment is required.

Should it become necessary, however, to change the operating frequencies of a duplexer, it may be returned to the factory for retuning or it can be field-tuned if the following equipment is available:

1. A signal generator (50 ohm) capable of producing a signal at the transmitter and receiver frequencies.
2. A receiver tuned to the desired receiver frequency.
3. A receiver tuned to the desired transmitter frequency.
4. One 50 ohm pad.
5. One 50 ohm termination.

FIELD TUNING PROCEDURE

1. Connect the equipment as shown in Figure 3a.
2. On each cavity, loosen the hex nut that locks the threaded tuning rod (see Figures 1 and 2). On the DB4058N, also remove the outer set screw and loosen the inner set screw on each cavity.
3. Pre-tune the notching adjustment as follows. (Note: The notching adjustment tool *must* be nonmetallic.)

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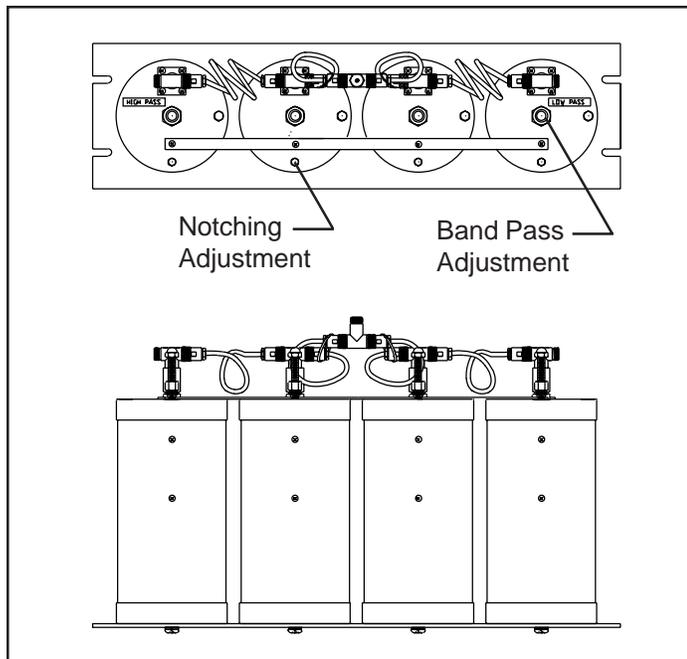


Figure 1 - DB4058W Duplexer.
(The DB4057 has only one low pass cavity.)

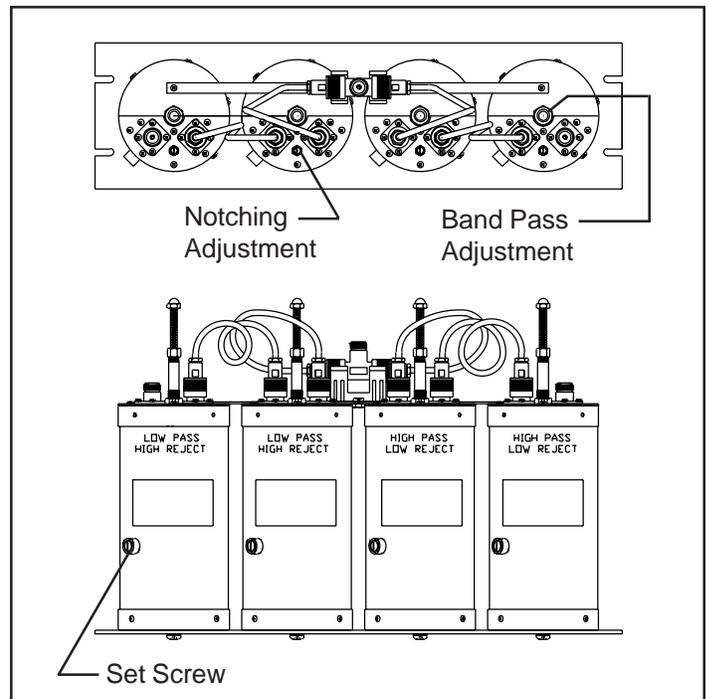


Figure 2 - DB4058N



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- a. For High Frequency Pass and Low Frequency Reject: Turn the notching adjustment(s) clockwise until the screw bottoms out. Then, turn the notching adjustment(s) counterclockwise nine turns.
- b. For Low Frequency Pass and High Frequency Reject: Turn the notching adjustment(s) clockwise until the screw bottoms out.
4. Tune the signal generator to the desired higher frequency.
5. Tune each band pass adjustment of the duplexer's high frequency cavity while observing the limiter reading of receiver #1. Tune for a maximum limiter reading. To prevent receiver limiter saturation, adjust first one cavity, then the other, while reducing the signal generator output. (Turn the tuning screw clockwise to increase the resonant frequency of the cavity.)
6. Lock the tuning shaft nut after tuning each cavity.
7. Disconnect receiver #1 and connect receiver #2.
8. Tune the signal generator to the desired lower frequency.
9. Tune the notching adjustment(s) of the high pass cavities for a minimum signal into receiver #2.
10. Connect the equipment as shown in Figure 3b.
11. Tune the signal generator to the desired lower frequency.
12. While observing the limiter reading of receiver #2, tune the band pass adjustment(s) of each low frequency cavity. Tune for a maximum limiter reading. To prevent receiver limiter saturation, adjust first one cavity, then the other, while reducing the signal generator output.
13. Lock the tuning screw shaft nut after tuning each cavity.
14. Disconnect receiver #2 and connect receiver #1.
15. Tune the signal generator to the desired higher frequency.
16. Tune each low pass cavity notching adjustment for a minimum signal into receiver #1.
17. The duplexer is now tuned.
18. To summarize: Tune the band pass adjustments of the high pass cavities so they pass the higher frequency and the notching adjustments so they reject the lower frequency. Tune the band pass adjustments of the low pass cavities so they pass the lower frequency and the notching adjustments so they reject the higher frequency.

Figure 3a - Field Tuning

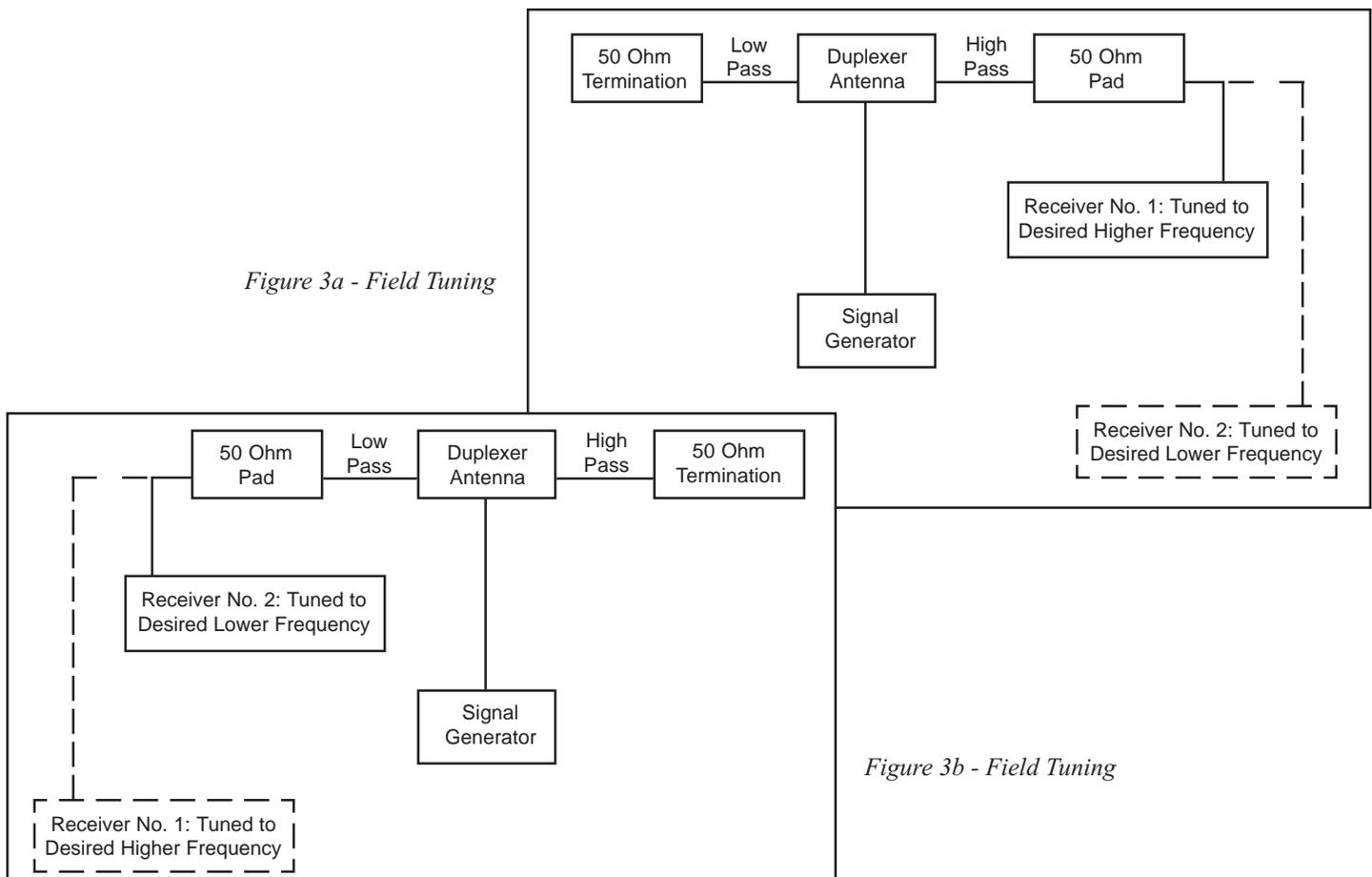


Figure 3b - Field Tuning

