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BAND-REJECT DUPLEXER FOR 500 KHz FREQUENCY SPACING

DB-4048
140-174 MHz

Model DB-4048 is designed for use with duplexing with voice frequencies located in the 140-174 MHz band. This duplexer includes the use of quarter-wave coaxial cables interconnected in a bandpass configuration with double stranded coaxial cables. Frequency stability over a wide temperature range is achieved by use of a threaded fiber rod to control the length of the center conductor in each cavity. It is designed to handle transmitter power up to 400 watts. A sturdy steel cabinet is included.

The DB-4048 is a 6-cavity duplexer with three cavities in the transmitter section, two in the receiver section. It is generally suitable for use with most tube type and many solid state tube stations when the separation between transmit and receive frequencies is 0.5 MHz or more.

The duplexer response curves illustrate the typical isolation provided by the duplexer when operated at minimum frequency separation. Another curve shows the transmitter and receiver insertion loss at maximum frequency separation. As greater separation between transmit and receive frequencies, the rejection remains the same but the transmitter and

receiver losses are less.

In any duplex system, it is important that the duplexer and other components provide and maintain a high degree of isolation between the transmitter and receiver in order to prevent degraded receiver performance. Isolation between even more closely spaced frequencies is difficult. Accordingly, it is mandatory that double stranded coaxial (or solid state conductor coaxial) be used to interconnect the duplexer to the transmitter and receiver chassis. Double stranded cables will minimize the coupling of RF energy between the interconnecting cables. A full data sheet for interconnecting coaxial cable (DB-1162) is available as an optional item.

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

COMING. Under certain conditions the DB-4048 is suitable for coupling two transmitter, transmitter or two receiver stations (up to a maximum antenna when the two frequencies involved are separated by 0.5 MHz or more.



DB-4048

ELECTRICAL DATA

Frequency range	140-174 MHz
Frequency separation	0.5 MHz or more
Maximum power input (continuous duty)	400 watts
Insertion loss transmitter to antenna	1.5 db
at 0.5 MHz separation	1.5 db
Insertion loss receiver to antenna	1.5 db
at 0.5 MHz separation	1.5 db
Transmitter return suppression	80 db
at the receive frequency	80 db
Receiver isolation at	80 db
inserted frequency	1.5 to 1
Maximum VSWR (calculated at 60 phas)	1.5 to 1
Temperature range	-20° to 50° C
Number of cavity filters	6

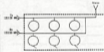
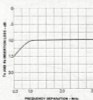
MECHANICAL DATA

Cabinet dimensions	
Height	30"
Width	40.250"
Depth	14"
Transmitter terminals	500-Pin Panel
Receiver terminals	500-Pin Panel
Net Weight	55 lbs
Shipping Weight	100 lbs

TYPICAL DUPLEXER RESPONSE CURVES



INSERTION LOSS VS FREQUENCY SEPARATION



TYPICAL OPERATION

The block diagram illustrates the use of a DB-4048 close spacing duplexer in a duplex system with a separation of only 500 kHz between transmit and receive frequencies.

TRANSMIT OPERATION

The transmitter section of the Duplexer consists of three quarter-wave cables and is adjusted to pass the transmitter carrier signal to the antenna with a low insertion loss while rejecting that part of the transmitter carrier signal which occurs at the receive frequency.

RECEIVE OPERATION

The receiver section of the Duplexer also consists of three quarter-wave cables and is adjusted to pass the received signal from the antenna to the receiver with a low insertion loss while rejecting the transmitter carrier which would otherwise pass through the receiver circuit impedance to the transmitter and cause interference and overloading.

OPERATING INFORMATION

DB-4048 Duplexer: Exact frequency of the transmitter and the receiver must be specified.
DB-4048 W200-0028 Duplexer: Refer to DB-1162.
R.F. carrier received output: 1000W