FP-2010

INSTALLATION AND TUNING INSTRUCTIONS MR - SERIES MOBILE DUPLEXERS CM-1010

ENCLOSURES

SINCLAIR 1995
Sinclair Technologies Inc., 55 Oriskany Drive, Tonawanda, New York 14150 (716) 874-3682 (800) 288-2763 Fax: (716) 874-4007

MR - Series
Mobile Duplexers

Description

The MR-Series of Mobile Duplexers are fabricated from lightweight, rugged aluminum extrusion which afford maximum structural integrity and are temperature-compensated to minimize variations due to changing operating environments.

The tuning instructions for all models described in this manual apply to all models of the MR-Series which also include any not listed or those which are special orders.

The Duplexers listed are standard units. Variations on connector types, mounting, and cavity configurations are available on special order.

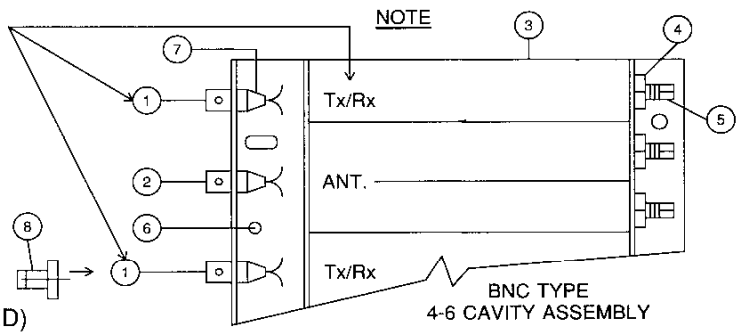
Consult your Sinclair Representative or Sales to determine the best solution for your special system requirements.

All MR-Series Duplexers can be retuned within their specific sub-bands for which the unit was designed.

Pages CI-1080 and CI-1081 describe three alternate methods for field retuning procedures.

PARTS IDENTIFICATION

1. INPUT/OUTPUT CONNECTORS
2. ANTENNA CONNECTOR
3. 4-6 CAVITY ASSEMBLY
4. 8-32 TUNING ROD LOCK NUTS
5. 8-32 THD'D TUNING RODS
6. IC CABLE AREA
7. CONNECTOR HOODS
8. 50 OHM BNC LOAD (NOT FURNISHED)



REPLACEMENT PARTS

1. BNC CONNECTORS UG-1094/U
4. LOCK NUTS 8-32 (KEPS) TITE LOCKS
5. TUNING RODS 247586-( )
7. HOODS 247602-( )
8. "BNC" 50 OHM LOADS T50-01

WHEN ORDERING, SPECIFY MODEL NO. AND FREQUENCY OF THE DUPLEXER

NOTE: THE Tx/Rx PORTS ARE INTERCHANGABLE. WHEN PROPERLY TUNED FOR THE TWO FREQUENCIES REQUIRED - EITHER OF THE TWO Tx/Rx PORTS CAN BE INTERCHANGED AS FOLLOWS WITHOUT RETURNING:
(A) ONE EACH Tx AND Rx
(B) BOTH Tx
(C) BOTH Rx

MR-Series
Mobile Duplexers
136-952 MHz

CI-1079

Electrical Specifications MODEL	NOTE 1		NOTE 2		NOTE 3	
	MR-254	MR-256	MR-354	MR-356	MR-454	MR-456
FREQUENCY RANGE MHz	148-174		406-512		806-952	
FREQUENCY SEPARATION MHz	4.5 MIN. - 10 MAX.		5 MIN. - 10 MAX.		UP TO 45	
INSERTION LOSS dB	1.2 MAX.	1.5 MAX	1.0 MAX	1.4 MAX	1.0 MAX	1.5 MAX
ISOLATION dB	60 MIN.	80 MIN.	50 MIN.	75 MIN.	50 MIN.	60 MIN.
MAXIMUM INPUT VSWR	1.5:1 REFERENCED TO 50 OHMS					
INPUT POWER WATTS	50 MAX.					
TEMPERATURE RANGE	-30°c to +60°c					
TERMINATION	"BNC" FEMALE (STANDARD)					

NOTES: The above models are tuned and delivered in the following frequency bands. If changes in the field are required from one band to another, internal adjustments will be required and in such case Sinclair should be contacted for the changes to be made.

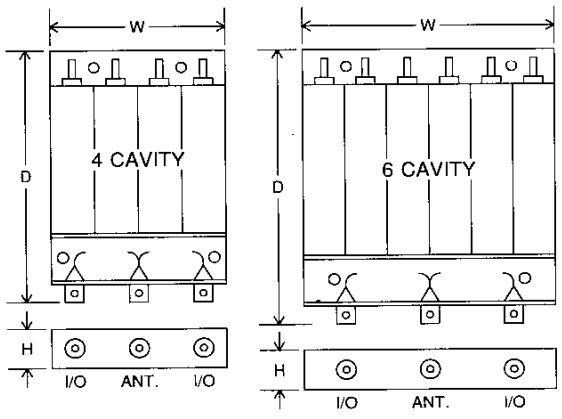
NOTE 1: (148-160) (160-174) MHz

NOTE 2: (406-450) (440-512) MHz

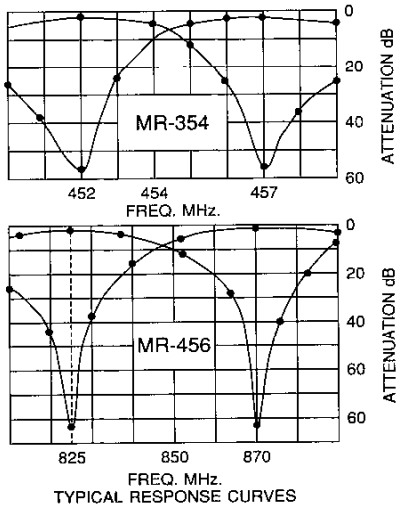
NOTE 3: (806-890) (928-952) MHz

All MR-Series are tuned at the time of delivery to both transmit and receive frequencies and separations as specified by the customer. The duplexer can be field retuned within the sub-bands for which the unit was designed.

Mechanical Specifications Model		HEIGHT (H) IN. (mm)	WIDTH (W) IN. (mm)	DEPTH (D) IN. (mm)
MR-254	4 CAV.	1.31 (33.3)	4.13 (105)	7 (178)
MR-256	6 CAV.	1.31 (33.3)	6.25 (159)	7 (178)
MR-354	4 CAV.	1.31 (33.3)	4.13 (105)	9 (229)
MR-356	6 CAV.	1.31 (33.3)	6.25 (159)	9 (229)
MR-454	4 CAV.	1.31 (33.3)	4.13 (105)	5.8 (147)
MR-456	6 CAV.	1.31 (33.3)	6.25 (159)	5.8 (147)



OUTLINE DIMENSIONS



TYPICAL RESPONSE CURVES

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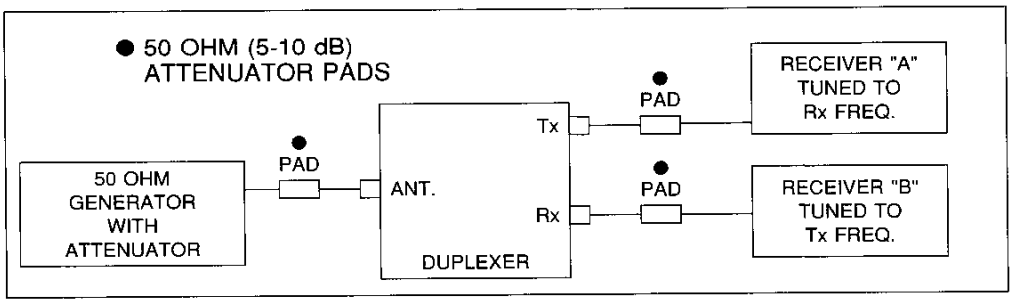
MR-Series
Mobile Duplexers

Tuning Instructions (Equipment Receiver Method)

The duplexer is pre-tuned to the exact operating frequencies. No further tuning or adjustment is required. Tuning instructions are furnished only for the purpose of readjustment in the event of frequency changes in the associated equipment.

Equipment required for the tuning procedure is:

1. A 50 OHM output inpedance signal generator capable of covering the desired transmit and receive frequencies and having an output attenuator.
2. A 50 OHN input receiver tuned to the desired transmitting frequency.
3. A 50 OHM input receiver tuned to the desired receiving frequency. (The same receiver may be retuned and used in both positions as long as a 50 OHM load is maintained at all three points.)
4. Three 50 OHM pads.



Retuning Procedure

1. The block diagram shows the connections to be made to the duplexer for nulling adjustments. Note that the receiver tuned to the transmitter frequency is connected to the duplexer receiver cable, and the receiver tuned to the receiver frequency is connected to the duplexer transmitter cable.
2. The receivers are used as null (minimum signal) indicators. A 20 DB quieting measurement set-up can be used for indication. With some receivers the limiter current can be used for indication as long as limiter saturation is avoided.
3. Unlock the tuning rod lock nuts. (ref. page CI-1078).
4. Tune the signal generator to the receiver frequency. Adjust the tuning screws of the transmitter channel for minimum signal in receiver "A". Lock the tuning rod lock nuts.
5. Tune the signal generator to the transmitter frequency. Adjust the tuning screws of the receiver channel for minimum signal in receiver "B". Lock the tuning lock nuts securely.
6. Repeat steps 3-5 if required for final check.
7. The duplexer is now ready for operation.

WARNING: Do not tune the duplexer with the transmitter keyed into the duplexer.

NOTE: Refer to page C-1081 for other methods of retuning.

CI-1081

MR-Series
Mobile Duplexers

Retuning Instructions

The duplexer is pre-tuned to the exact frequencies as ordered. No further tuning or adjustment is required. Retuning instructions are furnished for the purpose of readjustment in the event of frequency changes in the associated equipment in the field.

Typical test equipment set ups. Test equipment methods.

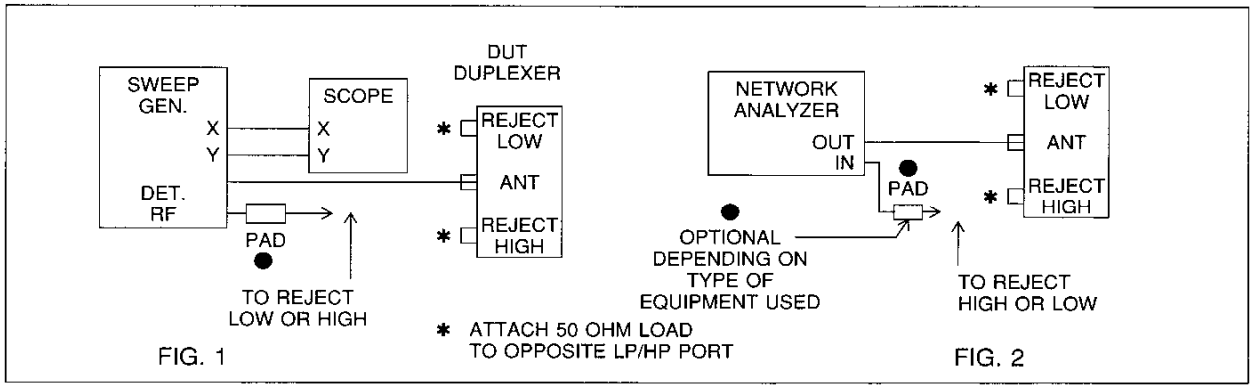
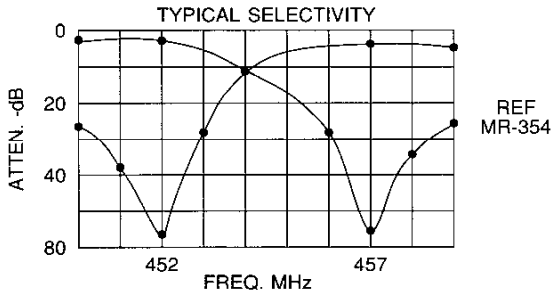


FIG. 1 FIG. 2

The duplexer is tuned using either test setup as shown in Figures 1 or 2. It is recommended to use a 6-10 dB, 50 OHM pad in the input lines in order to reduce VSWR reflections which may be introduced in the test equipment being used.

An optional method of retuning can be accomplished by using a signal generator and receivers as detailed on Page CI-1080

1. To retune the duplexer, loosen the tuning rod lock nuts, reference CI-1078.
2. Set the frequency to be passed into the reject high terminal and detect it at the antenna terminal with the reject low terminal terminated with 50 OHMS. Adjust the reject high tuning rods for maximum signal.
3. Set the frequency to be passed into the reject low terminal and detect it out the antenna terminal with the reject high terminal terminated with 50 OHMS. Adjust the reject low tuning rods for maximum signal.
4. Repeat steps 2 and 3 - then tighten all tuning rod lock nuts securely into position. Finally check that both high and low pass are tuned to the new frequencies and VSWR (return loss) is 1.5:1 or greater at both frequencies.



WARNINGS:

Do not tune the duplexer with the TX keyed into the duplexer.

DO NOT EXCEED 50 WATTS DURING OPERATION

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