

SERVICE MANUAL

DUPLEXER

MODEL DPLX U250

1227 S. PATRICK DR. SATELLITE BEACH, FL. 0300-4134-400

9-81

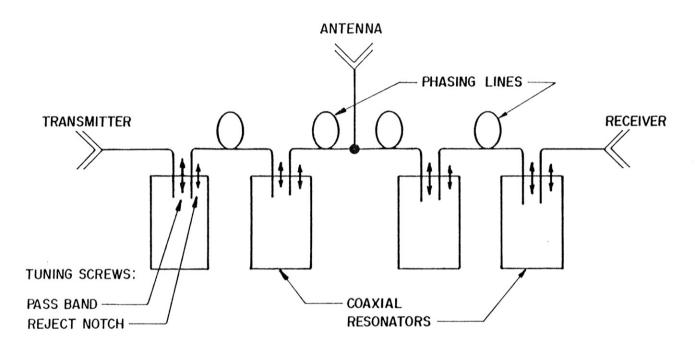
INSTRUCTION SHEET DUPLEXER DPLXU250

This 250-watt duplexer assembly is configured for $5\frac{1}{4}$ " x 19" rack space mounting and is recommended for use with the Regency ACU45 or ACU100 power amplifiers. The unit employs 4 high-Q bandpass/reject cavities which provide additional selectivity over that obtainable with band-reject resonators. Maximum isolation between the transmitter and receiver is obtained simultaneously with minimum insertion losses for the transmit and receive functions. The circuit block diagram is shown in Figure 1 and typical Tx and Tx channel response curves are shown in Figure 2. Electrical and mechanical specifications are tabulated in specification drawing 104-250.

These duplexers are factory tuned with a network analyzer to customer's specific transmitter and receiver frequencies and should require no further adjustment during station installation. If duplexer realignment becomes necessary, it is important that the reflections at the transmitter port be viewed simultaneously as the isolation notches are optimized so that transmitter-to-receiver isolation is not obtained at the expense of excessive VSWR's at the transmitter port.

!WARNING!

DUPLEXERS SHOULD NEVER BE TUNED WITH TRANSMITTER POWER APPLIED!



DPLX U250 CIRCUIT BLOCK DIAGRAM

FIG 1

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PART NO.			2703-5	5428-001]					
FREQ RANGE - MI	1z		406-	470						
FREQ SEPARATION	N-MHZ		5 OR	MORE						
MAX. POWER INPUT	ZTTAW-		250)	1					
INSERTION LOSS	TX-ANT -	- dB	0.8	3	1					
INSERTION LOSS			0.6	3]					
TX NOISE SUPPRESS			85	<u> </u>						
RX ISOLATION AT	TX FREQ	-dB	1 85							
MAX VSWR			1.3;]					
FREQ. STABILITY			0.5 PP							
TEMPERATURE R		-	-40°C t							
RACK MOUNTING S	CONTRACTOR OF THE PARTY NAMED AND POST OF THE PARTY.	-	10-32		-					
MAX. DIMENSIONS	(M-D-H)		19 x12 x 5							
WEIGHT CONNECTORS		L L'ya	17 LBS							
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		ZX	UHF F							
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117	250	FINISH	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~							
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APPLICATION		DO NOT SCA	LE DRWG			- Comments of the control of the con	\sim T		SHEET	OF
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APPLICATION

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REVISIONS

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R-211 11/179 Paul

II. Test Interconnection Diagram Connection #1: H.P. 8502 T/R OUTPUT 50 ohm ANT H.P. 8754A termination Channel B Tx DUPLEXER RX Input Connection #2: H.P. 8502 T/R OUTPUT ANT 50 onm H.P. 8754A TxDUPLEXER RX termination Channel B Input III. Measurement Procedure A. Connect the H.P. 8502 Transmission/Reflection test set to the H.P. 8754A Network Analyzer and turn the power switch on for a 7 hour warm-up period. B. Channel A will show the reflection loss at the T/R test set output port, and Channel B will show the transmission through the duplexer port under test. C. With the T/R output open-circuited, adjust Channel A gain to center screen which then becomes the reference line for zero VSWR return loss. D. Adjust the center frequency to the center of operational band with the help of the 50 MHz and 10 MHz markers. Set the sweep width to 100 MHz. E. Terminate the T/R output with the 50 ohm termination and verify the return loss to be greater than 32dB. F. Connect the T/R output to Channel B input and adjust Channel B gain to the top display line, which then becomes the reference line for zero transmission loss. G. Connect the duplexer to the Network Analyzer and T/R test set as shown in Test Interconnection Diagram #1. H. Tune the duplexer cavities in the Rx arm for minimum loss in the pass band with the pass adjustment. Then with the reject notch adjustment place the rejection notches approximately at the transmitter frequency.

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- I. Change the Channel B input to the Tx port as shown in Test Interconnection Diagram #2.
- J. Tune the duplexer cavities in the Tx arm for minimum loss in the pass band with the pass adjustment. Then with the reject notch adjustment place the rejection notches approximately at the receiver frequency.
- K. Reduce the sweep width to 20 MHz and repeat steps G through J while simultaneously observing the VSWR reflection losses on Channel A.
- L. The duplexer is now approximately tuned and ready for final adjustment of the notch frequencies, isolation and VSWR performances.
- Reduce the sweep width to 5 MHz and activate the 1 MHz markers.
- N. Refer to the table of test limits in Section IV and note the expected values and limits of the six parameters which characterize a properly tuned duplexer.
- O. Repeat steps G through J making precise adjustments of notch frequencies and simultaneously tuning for maximum isolations and maximum VSWR return losses and minimum insertion losses.

IV. Table of Test Limits

A. Definition of parameters:

RLTx = VSWR return loss of terminated transmitter port

RLRx = VSWR return loss of terminated receiver port

ILRxT = Isolation loss of receiver port at the transmitter carrier frequency ILTxR = Isolation loss of transmitter port at the receiver frequency ILRx = Insertion loss of receiver port at the receiver frequency

ILTx = Insertion loss of transmitter port at the transmitter frequency

B. Parameter limits DPLXU45:

PARAMETER	MIN.	TYP	MAX.
RLTx	14dB	16dB	
RLRx	14dB	16dB	
ILRxT	75dB	77dB	
ILRXR	75dB	80dB	
ILRx		1.2dB	1.4dB
ILTx		1.0dB	1.4dB

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	TLTx			0.8dE	1.0d	В
	ILRx			0.8d	1.0di	В
	ILTxR		85dB	90dE	3	
	ILRxT		85dB	90dE	3	
	RLRx		14dB	16dE	3	
	RLTx		14dB	16dE	3	
	PARAMETER		MIN.	TYP	MAX.	
C.	Parameter	limits	DPLXU250	:		

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V. Mechanical Specifications

Mechanical specifications are shown on Regency drawing 104-249 for DPLXU45 and on Regency drawing 104-250 for DPLXU250.

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