OVER-THE-HORIZON RADIO SYSTEMS
ITTL 12A-1 OVER-THE-HORIZON RADIO SYSTEM
NUS 3298 RECEIVER
NUS 3300 DIPLEXER-PRESELECTOR
TEST AND ADJUSTMENT

This section contains the test and adjustment procedures for the NUS 3300 diplexer-preselector. The NUS 3300 diplexer-preselector assemblies are aligned to the receiver frequencies by the manufacturer. The control positions are secured by lock screws and should be maintained unless the results of tests clearly indicate the need for realignment.

The test and adjustment procedures described in this section require the system receivers to be operated in quadruple diversity as described in Section 403-413-301, with service being maintained through one of two branches in each of two associated receivers.

CHART **PAGE**

1—Preliminary 2

2—Test and Adjustment 3

APPARATUS:

1—Signal Generator, General Radio Co. 1021

1—Low-Pass Filter, Microlab LA 1ON

1—Directional Coupler, Hewlett-Packard 775D

1—Crystal Detector, Hewlett-Packard 423A

1—Coaxial Short, Hewlett-Packard 11511A

1—Standing Wave Indicator, Hewlett-Packard 415B

1—Coaxial Attenuator, Hewlett-Packard 8491A-6, 6 dB

2—Coaxial Terminations, Hewlett-Packard 908A

1—Electronic Frequency Counter, Hewlett-Packard 5245L with frequency converter 5254B

CHART 1

PRELIMINARY

The procedures in this chart must be completed before the procedures in Chart 2 are started.

STEP	PROCEDURE
1	Arrange the test equipment as shown in Fig. 1. Use option (X).
2	On the electronic counter, set each of the controls to the indicated position.

CONTROL	POSITION
SAMPLE RATE	Midrange
SIGNAL INPUT	AC—PLUG IN
TIME BASE	1 ms
STORAGE	OFF
FUNCTION	FREQUENCY

3 On the signal generator, set each of the controls to the indicated position.

CONTROL	POSITION
POWER	POWER
MODULATION	OFF
METER READS	CARRIER
250-920 MEGACYCLES	Receiver frequency

4 On the standing wave indicator, set each of the controls to the indicated position.

CONTROL	POSITION
POWER	ON
CRYSTAL	200 ohm
EXPAND-NORMAL	NORMAL
GAIN	Fully clockwise
RANGE	50

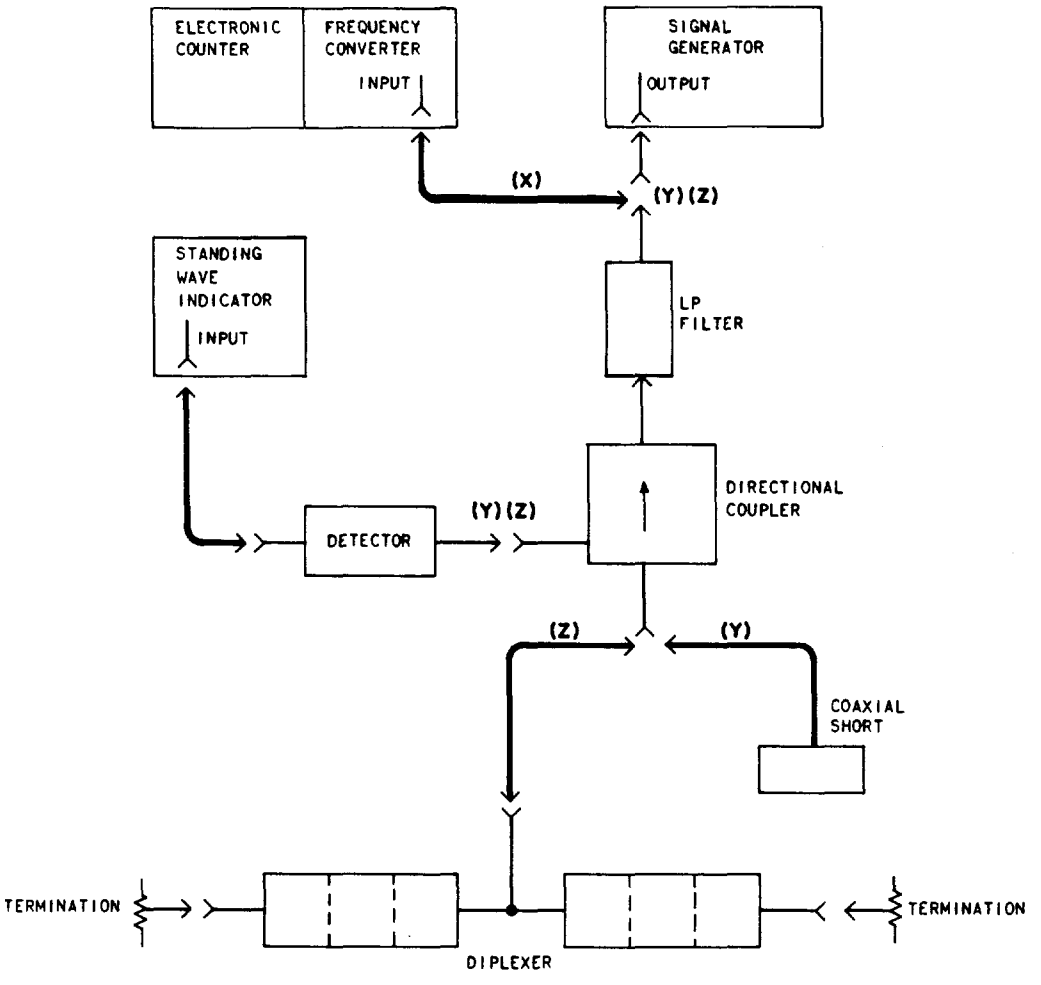

Fig. 1—Measurement of Diplexer-Preselector Return Loss—Test Setup Diagram

CHART 2

TEST AND ADJUSTMENT

The test and adjustment procedures in this chart are designed to verify the performance of the diplexer-preselector assembly.

STEP	PROCEDURE
1	Calibrate the attenuator on the signal generator against the generator output meter. Adjust the ATTENUATOR control to 0 dBm.

CHART 2 (Cont)

STEP	PROCEDURE
2	On the electronic counter frequency converter, adjust the dial to the first multiple of 0.05 GHz below the receiver frequency.
3	Adjust the signal generator frequency control to obtain a counter indication at the selected receiver frequency $\pm$100 kHz.
	Note: Determine the generator output frequency by adding the counter display (kHz) to the converter dial number (GHz). Observe correct positioning of decimals.
	Example: CONVERTER DIAL NUMBER .75 GHz COUNTER DISPLAY +.034567 GHz GENERATOR FREQUENCY .784567 GHz
4	Arrange the test equipment as shown in option (Y), (Fig. 1). Use the least possible number of connections and transitions.
5	On the signal generator, adjust the ATTENUATOR control to -25 dBm. Operate the MODULATION switch to 1 KC and adjust the modulation variable control to obtain the closest possible standing wave indicator meter reading to 0 DB.
	Note: Record the meter indication obtained.
6	Remove the coaxial short from the output terminal of the directional coupler and connect the coupler to the input terminal of the diplexer as shown in option (Z). Use the least number of connections possible.
7	Adjust the signal generator attenuator control to obtain the same standing wave indicator meter reading as noted in Step 5. The difference between the two attenuator values represents the return loss of the diplexer plus the small directivity deficiency of the coupler.
	Requirement: The indicated return loss of the diplexer at the receiver center frequency is greater than 25 dB.
	Note: If the requirement is met, proceed to Step 9. If the requirement is not met, proceed to Step 8.
8	Verify all measurements and the condition of test components. Carefully note the setting of the micrometer control on the middle cavity of the diplexer filter branch associated with the receiver operating at the test frequency. If necessary, make a small adjustment of the center cavity tuning control to meet the requirement.

CHART 2 (Cont)

STEP	PROCEDURE
	Note 1: In addition to the filter cavity tuning controls, there are many inconspicuous adjustable components, such as sliding cavity taps, which are locked in position and should not be disturbed except under the direction of the transmission engineer responsible for the system performance. ***Note 2:*** Failure to meet the requirement indicates the need for major alignment.
9	Revert to the test arrangement indicated as option (X) and repeat Steps 1 through 8 using signal generator frequencies at the receiver frequency +14 MHz and −14 MHz. ***Requirement:*** The indicated return loss of the diplexer should be greater than 15 dB at the receiver frequency ±14 MHz. ***Note:*** Failure to meet this requirement indicates the need for filter alignment which should be done under the direction of the transmission engineer responsible for the system performance.
10	Repeat the entire test at and around the frequency of the second diplexer branch.