

# TMC SPECIFICATION

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SHEET 1 OF 15

TITLE: Test Procedure AMC-21

TEST PROCEDURE  
FOR  
ANTENNA MULTICOUPLER  
AMC-21

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## 1.2 INTRODUCTION

The Antenna Multicoupler, Model AMC-21 is a broadbanded antenna-to-receiver coupling device which permits the use of a common antenna by a number of communications receivers.

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## 2.0 FREQUENCY RANGE AND VOLTAGE GAIN

### A. Performance Criteria

- \*1. The Multicoupler is capable of passing a frequency range of 100KHZ to 32MHZ.
- 2. The voltage gain of the Multicoupler is a nominal 1 db.

### B. Test Arrangement

#### Relevant Figure

- |                    |     |
|--------------------|-----|
| 1. Frequency Range | 2.0 |
| 2. Voltage Gain    | 2.0 |

### C. Test Equipment Required

#### Schematic Reference

#### Item No. in Appendix 1

#### Required for Arrangement

- |                        |   |   |         |
|------------------------|---|---|---------|
| 1. Level Measuring Set | A | 1 | 1 and 2 |
| 2. Frequency Counter   | B | 2 | 1 and 2 |

### D. Test Procedure

1. Connect the equipment as indicated in Figure 2.0.
2. Adjust the Level Measuring Set to sweep the frequency range of 100KHZ to 32MHZ.
3. Expand the calibrated display on the Level Measuring Set to display 10 db full scale.
4. Observe the Level Measuring Set display throughout the frequency range, and record the maximum / minimum deviation of the output level.
5. Repeat test for all channels.

\*NOTE: If the Multicoupler is to be used in a system for the distribution of a single frequency, it will only be necessary to check its performance at that frequency.

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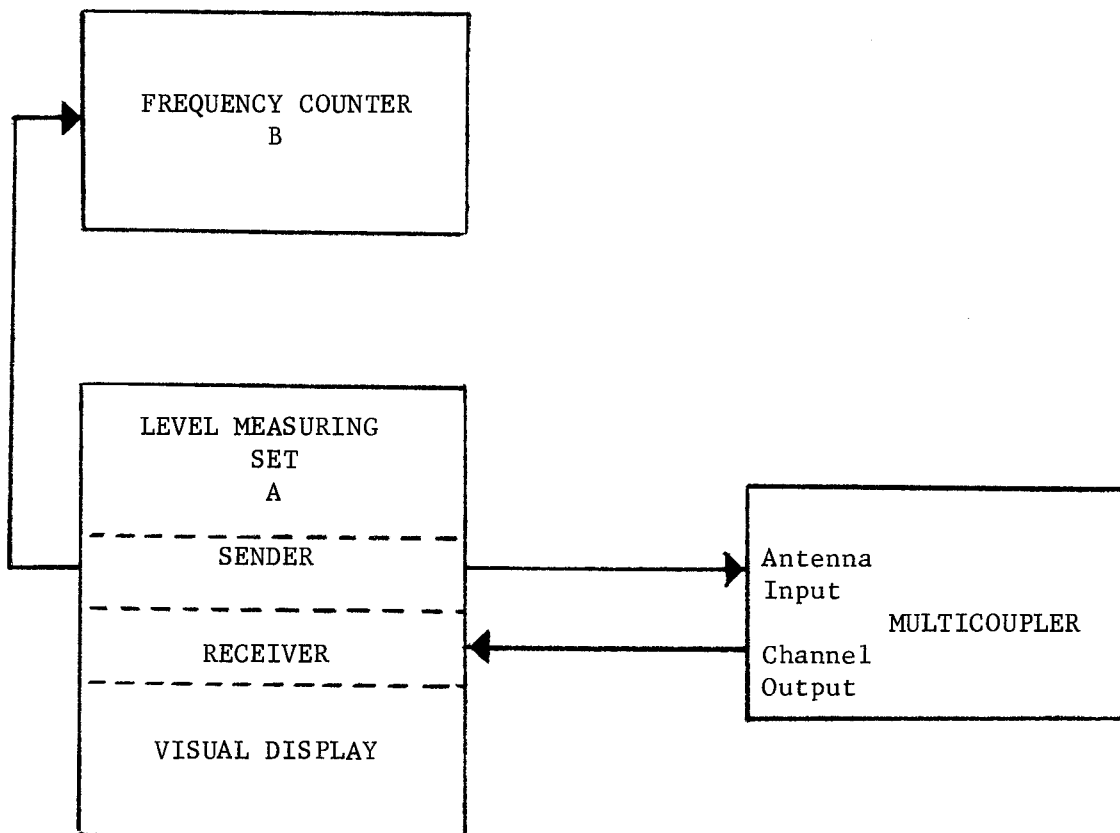


FIGURE 2.0  
FREQUENCY RANGE AND VOLTAGE GAIN

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## 2.1 ISOLATION

### A. Performance Criteria

1. The Multicoupler has a Back-to-Front Isolation of better than 60 db.
2. The Multicoupler has an average Output-to-Output Isolation of 50 db.

### B. Test Arrangement

#### Relevant Figure

- |                               |      |
|-------------------------------|------|
| 1. Back-to-Front Isolation    | 2.1A |
| 2. Output-to-Output Isolation | 2.1B |

### C. Test Equipment Required

#### Schematic Reference

#### Item No. in Appendix 1

#### Required for Arrangement

- |                        |   |   |         |
|------------------------|---|---|---------|
| 1. Level Measuring Set | A | 1 | 1 and 2 |
|------------------------|---|---|---------|

### D. Test Procedure

1. Connect the equipment as indicated in Figure 2.1A.
2. Adjust the Level Measuring Set to sweep the frequency range of 100KHZ to 32MHZ.
3. Adjust the calibrated display on the Level Measuring Set to display more than 60 db below the reference level.
4. Observe the Level Measuring Set display throughout the frequency range, and record the Back-to-Front Isolation.
5. Repeat steps 1-4 for all channels.
6. Connect the equipment as indicated in Figure 2.1B.
7. Adjust the Level Measuring Set to sweep the frequency range of 100KHZ to 32MHZ.
8. Adjust the calibrated display on the Level Measuring Set to display more than 50 db below the reference level.
9. Observe the Level Measuring Set display throughout the frequency range, and record the Output-to-Output Isolation.
10. Repeat steps 6-9 for all channels.

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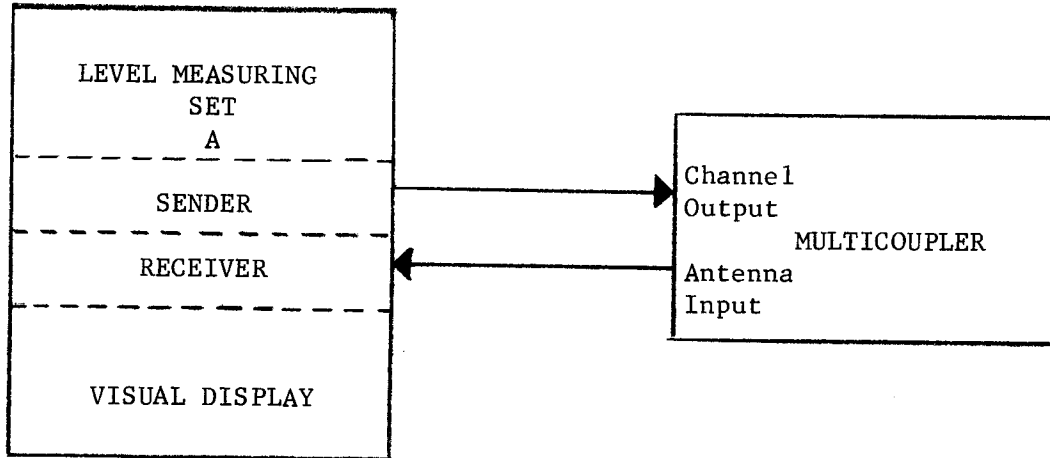


FIGURE 2.1A  
BACK-TO-FRONT ISOLATION

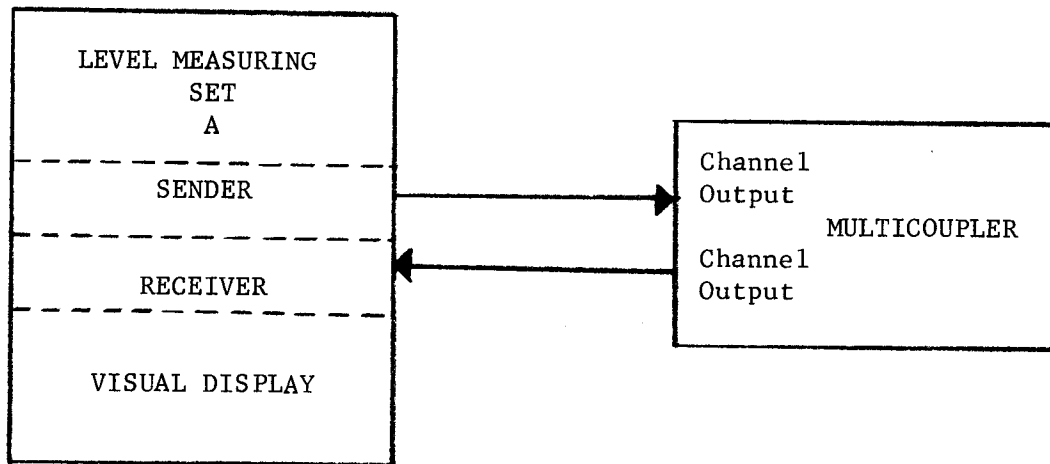


FIGURE 2.1B  
OUTPUT-TO-OUTPUT ISOLATION

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## 2.2 VSWR

### A. Performance Criteria

1. The Voltage Standing Wave Ratio of the Multicoupler is better than 1.5 to 1.

### B. Test Arrangement

#### Relevant Figure

1. VSWR 2.2

### C. Test Equipment Required

	<u>Schematic Reference</u>	<u>Item No. in Appendix 1</u>	<u>Required for Arrangement</u>
1. Sweep Generator	A	3	1
2. Oscilloscope	B	4	1
3. VSWR Bridge with Loads (1:1 and 1.5:1)	C	5	1

### D. Test Procedure

1. Connect the equipment as indicated in Figure 2.2.
2. With the 1:1 loads connected, observe the output on the Oscilloscope. There should be no deviation from a straight line.
3. Replace the Z-1 load on the VSWR Bridge with the 1.5:1 load.
4. Set the Oscilloscope controls to conveniently display the deflection.
5. Remove the Z-1 load and connect the VSWR Bridge to the antenna input of the Multicoupler using a short 50 ohm cable.
6. Observe the sweep waveform on the scope. The VSWR should not exceed the calibrated line on the scope representing 1.5:1 VSWR. Record the VSWR.
7. Repeat the same test on all channel output jacks.



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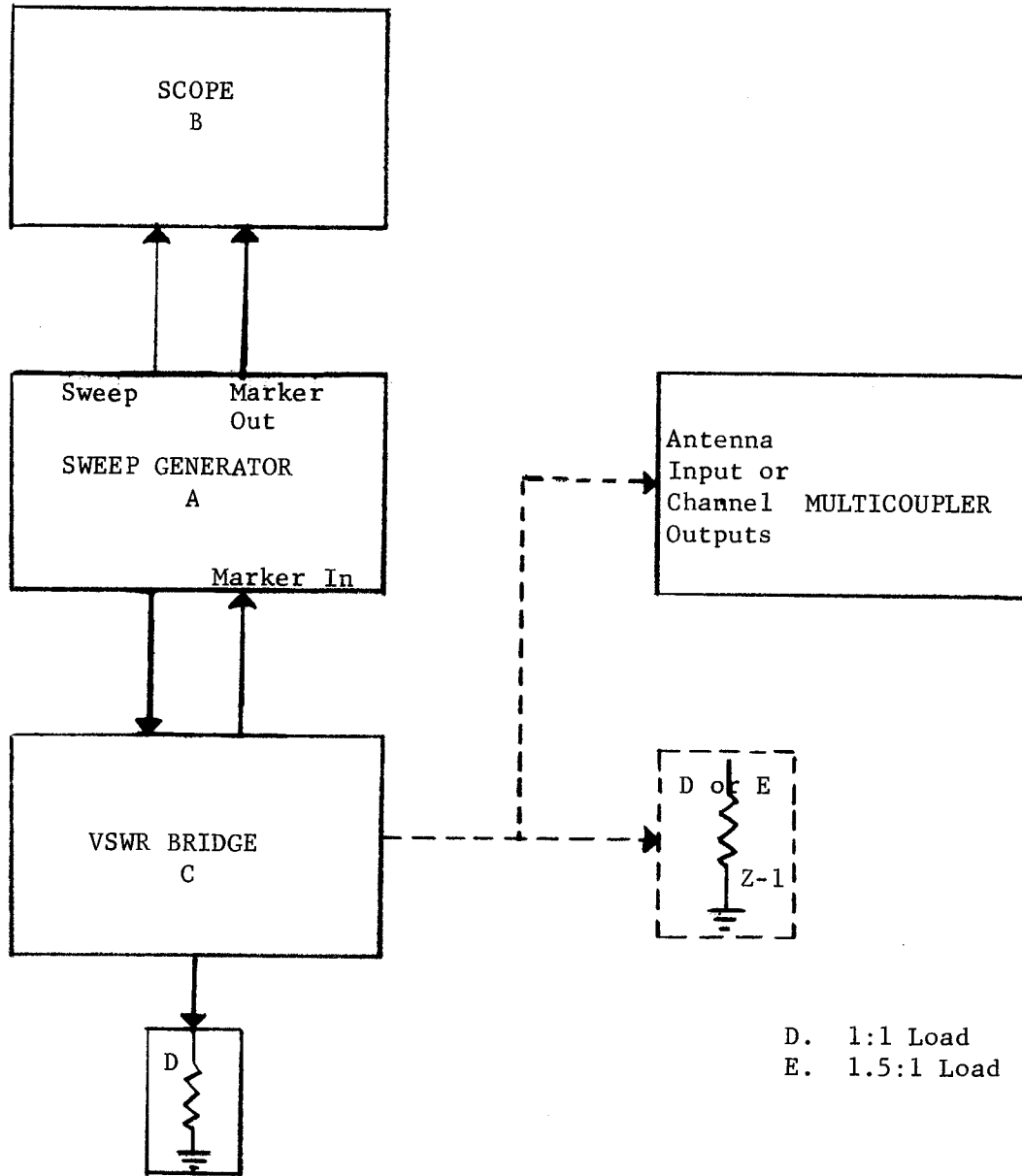


FIGURE 2.2  
VSWR

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## 2.3 INTERMODULATION DISTORTION

### A. Performance Criteria

1. The Intermodulation Distortion level of the Multicoupler is less than 70 db below two 0.5 V RMS signals applied at the input.

### B. Test Arrangement

#### Relevant Figure

1. Intermodulation Distortion 2.3

### C. Test Equipment Required

#### Schematic Reference

#### Item No. in Appendix 1

#### Required for Arrangement

- |                             |         |   |   |
|-----------------------------|---------|---|---|
| 1. 2 Signal Generators      | A and B | 6 | 1 |
| 2. Signal Combining Network | C       | 5 | 1 |
| 3. Field Intensity Meter    | D       | 7 | 1 |

### D. Test Procedure

1. Connect the equipment as indicated in Figure 2.3.
2. Set Signal Generator A output to 10.3MHZ at 0.5 V RMS.
3. Set Signal Generator B output to 3.9MHZ at 0.5 V RMS.
4. Tune the Field Intensity Meter to one of the fundamental frequencies, and observe the signal level.
5. Tune the Field Intensity Meter to the intermodulation frequency to be measured, and observe the signal level.
6. Record the intermodulation distortion level with respect to the fundamental frequency level.

NOTE: Filters should be added to the Test Arrangement, if the inherent harmonics of the test equipment interfere with actual test measurement.

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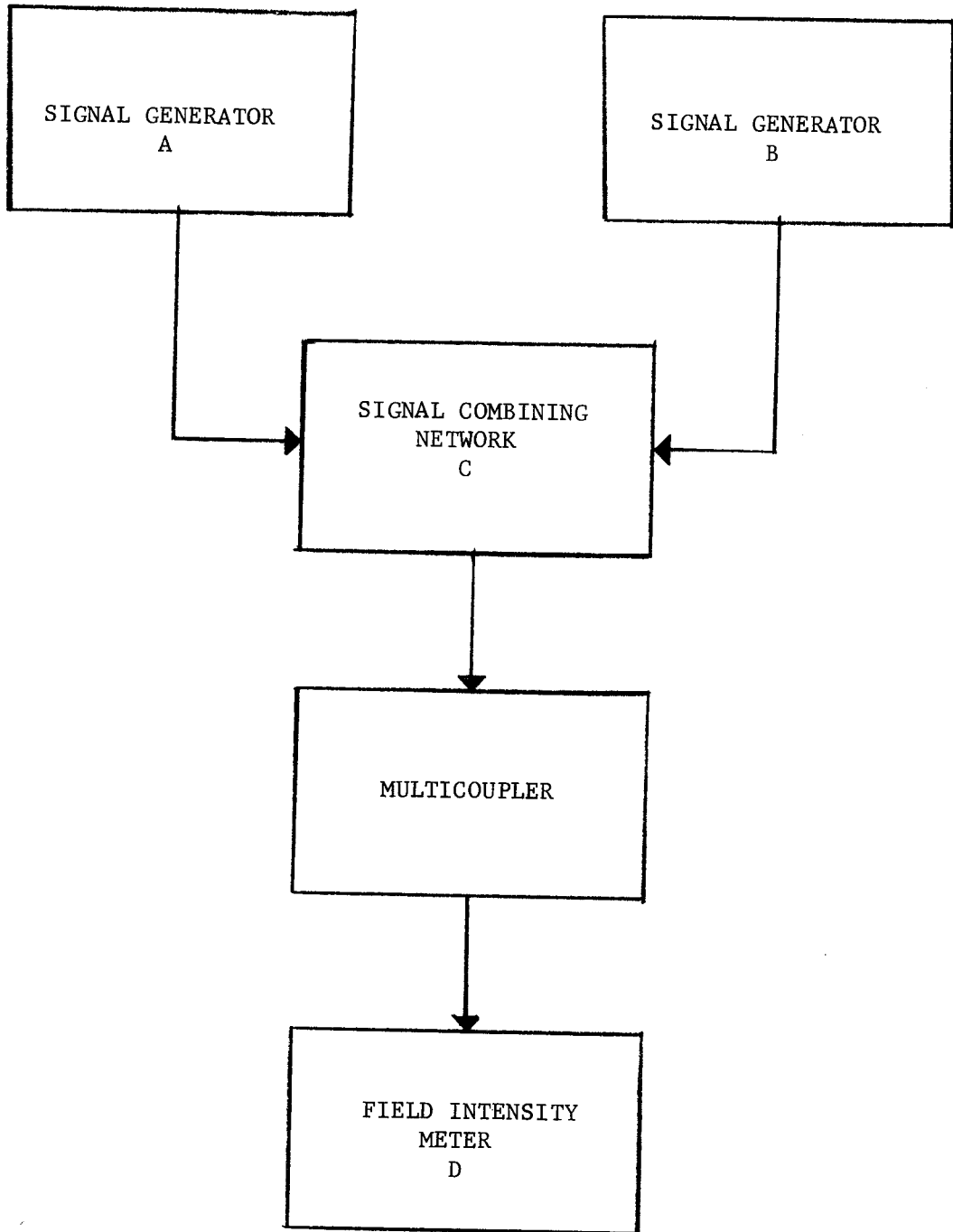


FIGURE 2.3  
INTERMODULATION DISTORTION

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## 2.4 OUTPUT PHASE

### A. Performance Criteria

1. The Output Phase between jacks on the Multicoupler differs no more than  $\pm 1$  degree.

### B. Test Arrangement

#### Relevant Figure

1. Output Phase 2.4

### C. Test Equipment Required

#### Schematic Reference

#### Item No. in Appendix 1

#### Required for Arrangement

- |                     |   |   |   |
|---------------------|---|---|---|
| 1. Signal Generator | A | 6 | 1 |
| 2. Vector Voltmeter | B | 8 | 1 |
| 3. 2 50 ohm loads   | C | 9 | 1 |

### D. Test Procedure

1. Connect the equipment as indicated in Figure 2.4.
2. Adjust the Signal Generator for a frequency within the range of the Multicoupler and for a convenient signal level.
3. Measure the phase difference between the Multicoupler output jacks. Record the Output Phase Difference.
4. Repeat test for the remaining channel output jacks.

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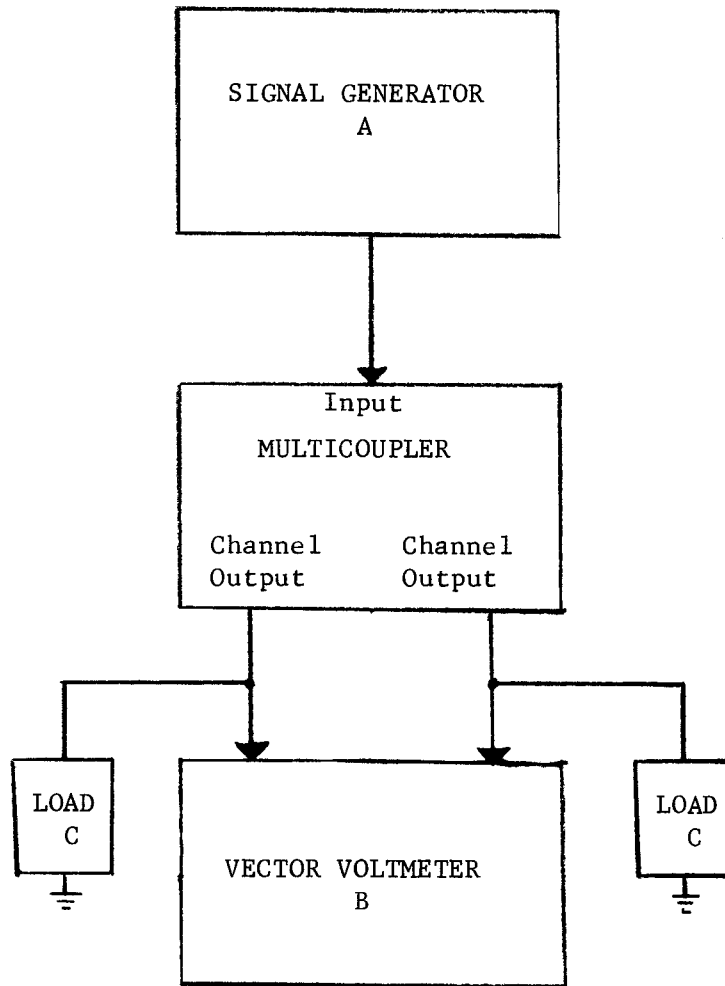


FIGURE 2.4  
OUTPUT PHASE

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## APPENDIX 1 TEST EQUIPMENT REQUIRED

Item No.	Equipment	Model
1.	Level Measuring Set	Wandel and Goltermann WM-50 or equivalent
2.	Frequency Counter	Hewlett-Packard 5245L or equivalent
3.	Sweep Generator	Telonic HD7 or equivalent
4.	Oscilloscope	Tektronix 545 or equivalent
5.	VSWR Bridge / Signal Combining Network	Anzac RB-3 or equivalent
6.	2 Signal Generators	Hewlett-Packard 606A or equivalent
7.	Field Intensity Meter	Singermetrics NF-105 or equivalent
8.	Vector Voltmeter	Hewlett-Packard 8405A or equivalent
9.	Loads (2)	50 ohms

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## TEST DATA AMC-21

### 2.0 Frequency Range and Voltage Gain

Maximum Deviation \_\_\_\_\_ db

Minimum Deviation \_\_\_\_\_ db

### 2.1 Isolation

Back-to-Front, better than 60 db down \_\_\_\_\_ (✓)

Output-to-Output, 50 db average \_\_\_\_\_ (✓)

### 2.2 VSWR

Better than 1.5:1 \_\_\_\_\_ (✓)

### 2.3 Intermodulation Distortion

Less than 70 db \_\_\_\_\_ (✓)

### 2.4 Output Phase

Within  $\pm 1$  degree \_\_\_\_\_ (✓)

CONTRACT NO. \_\_\_\_\_

DATA FOR TEST ON: \_\_\_\_\_

TEST PERFORMED BY: \_\_\_\_\_

DATE: \_\_\_\_\_

