

DATE 2-4-66
SHEET 1 OF 8

TMC SPECIFICATION NO. S 541

2

R. R. HAY
COMPILED CHECKED

TITLE:

APPROVED

TRC-3500-50/600 TEST PROCEDURE

TRC

DATE _____
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TMC SPECIFICATION NO. S - 541

COMPILED

CHECKED

TITLE: TRC-3500-50/600 TEST PROCEDURE

APPROVED

I. TEST EQUIPMENT REQUIRED

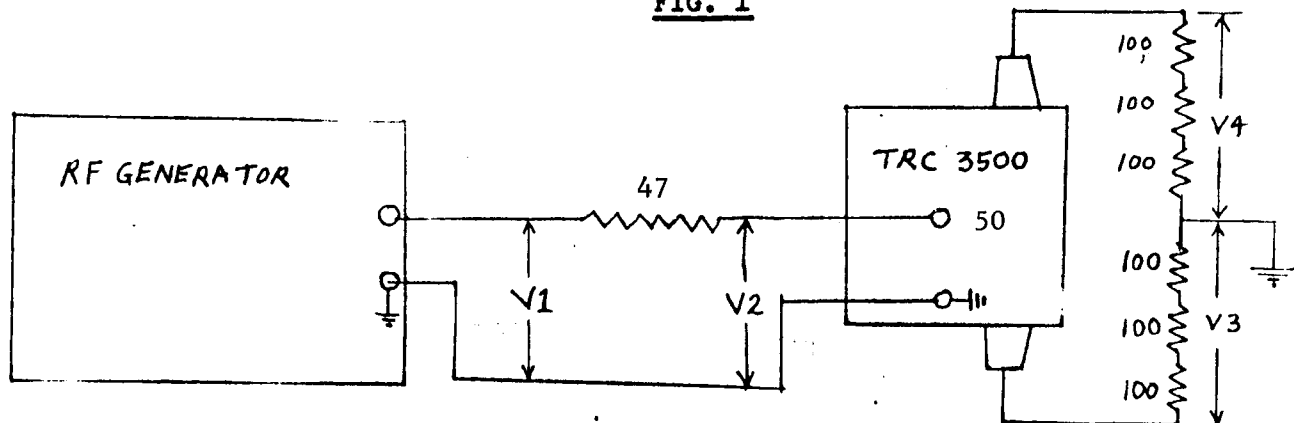
- 1 - VTVM Hewlett-Packard Model 410B or equivalent.
- 1 - RF Generator, Measurements Model 82 or equivalent.
- 1 - RF Bridge, General Radio Model 916A or equivalent.
- 1 - GPR-90RXD Receiver (TMC) or equivalent.
- 1 - 47 ohms, 1/2 watt, 5% carbon resistor.
- 6 - 100 ohms, 1/2 watt, 5% carbon resistor. (Connect 100 ohms resistors in series to form load. Interconnecting leads should be very short. Do not cut the end leads.)

II. FREQUENCY RESPONSE

1. Test Set-up

- a) Connect instruments as per Fig. 1. Leads between RF generator and TRC to be as short as possible. Check TRC as per Chart A.

FIG. 1



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CHART A

TYPICAL TEST DATA

FR 5Q	V1	V2	V3	V4
2	1.0 volt	.66	.80	.81
4	1.0 volt	.67	.81	.81
8	1.0 volt	.65	.81	.84
16	1.0 volt	.57	.78	.86
24	1.0 volt	.53	.82	.90
30	1.0 volt	.56	.82	.78

The unbalance between V3 and V4 should be within $\pm 10\%$.

NOTE

If available, a HP4815 RF voltage vector impedance meter may be used for impedance measurement in lieu of methods listed below.

RECORD ON TEST DATA SHEET

III. IMPEDANCE MEASUREMENTS *

1. Test Set-up

- a) Connect instruments as per Fig. 2.
- b) The RF Generator output is connected to the GEN connector on the bridge through coax cable.
- c) The Receiver input is connected to the DET connector on the bridge through a coax cable.
- d) The VTVM to the diode load terminals of the receiver (remove jumper on terminals).
- e) The 600 ohm load is connected across the 600 ohm terminals of the TRC, with as short a lead as possible. Ground the TRC to the bridge ground post with as short a lead as possible.
- f) Set L-C switch on bridge to "L" position.

*Rho-Tector method may be used as per QA-5009.

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III. IMPEDANCE MEASUREMENTS - cont'd

2. Procedure

- a) Tune RF generator and receiver to 2 mc. Adjust level of generator and receiver for 40 VDC on VTVM.
- b) Set "R" dial of bridge to zero and "X" dial to 500 on "L" scale.
- c) Connect unknown terminal of bridge to 70 ohm terminal of TRC with as short a lead as possible.
- d) Short 50 ohm terminal to ground, (close to the terminal) and balance the bridge using the "R" and "X" dials for a minimum reading on the VTVM.
- e) To check for perfect balance, remove cable on bridge GEN connector. Seventy ohm terminal on TRC remains shorted to ground. The VTVM reading should remain the same. If not, rebalance bridge.
- f) Re-connect RF generator cable. Remove short on TRC and proceed to checks per Chart B. The +J readings are above 500 on the "X" dial and the -J readings are below 500. (Plot readings on test data sheet #2 as per method described in Step g.)

Example: "X" dial reading 580 at 2 MC 320 at 10 MC

$580 - 500 = 80$	$500 - 320 = 180$
$\frac{80}{2MC} = +J 40$	$\frac{180}{10 MC} = -J 18$

g) How to plot impedance measurements on Smith Chart (Chart B readings plotted on Sheet 6):

(1) The R/X_0 coordinate of $R_g = 85$ is 1.7 according to the conversion table.

(2) The $+JX/Z_0$ coordinate of $+J40$ is .8 according to the table.

(3) The two coordinates are plotted on the Smith Chart and intersect inside the circle. If X_g is a +J reading, the intersect will be on the inductive side of the chart. If it is a -J reading, it will intersect on the capacitive side.

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III. IMPEDANCE MEASUREMENTS - Cont'd

FIG. 2

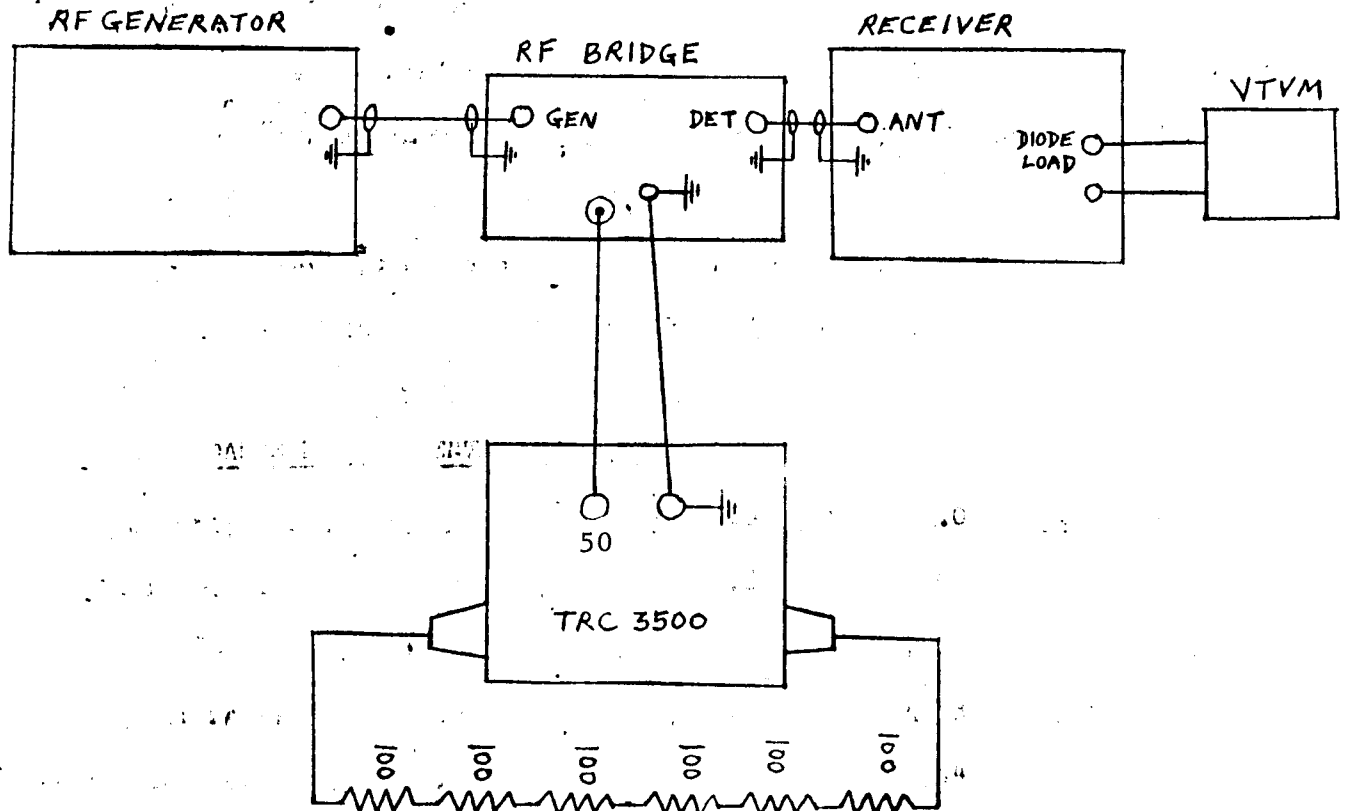


CHART B

TYPICAL TEST DATA

<u>MC</u>	<u>RS</u>	<u>XS</u>
2.0	85.0	+J40.0
10.0	89.8	-J3.6
15.0	77.5	-J6.14
20.0	66.4	+J2.53
25.0	59.2	+J15.4
30.0	56.6	+J32.9

RECORD ON TEST DATA SHEET

DATE _____
 SHEET 6 OF 8

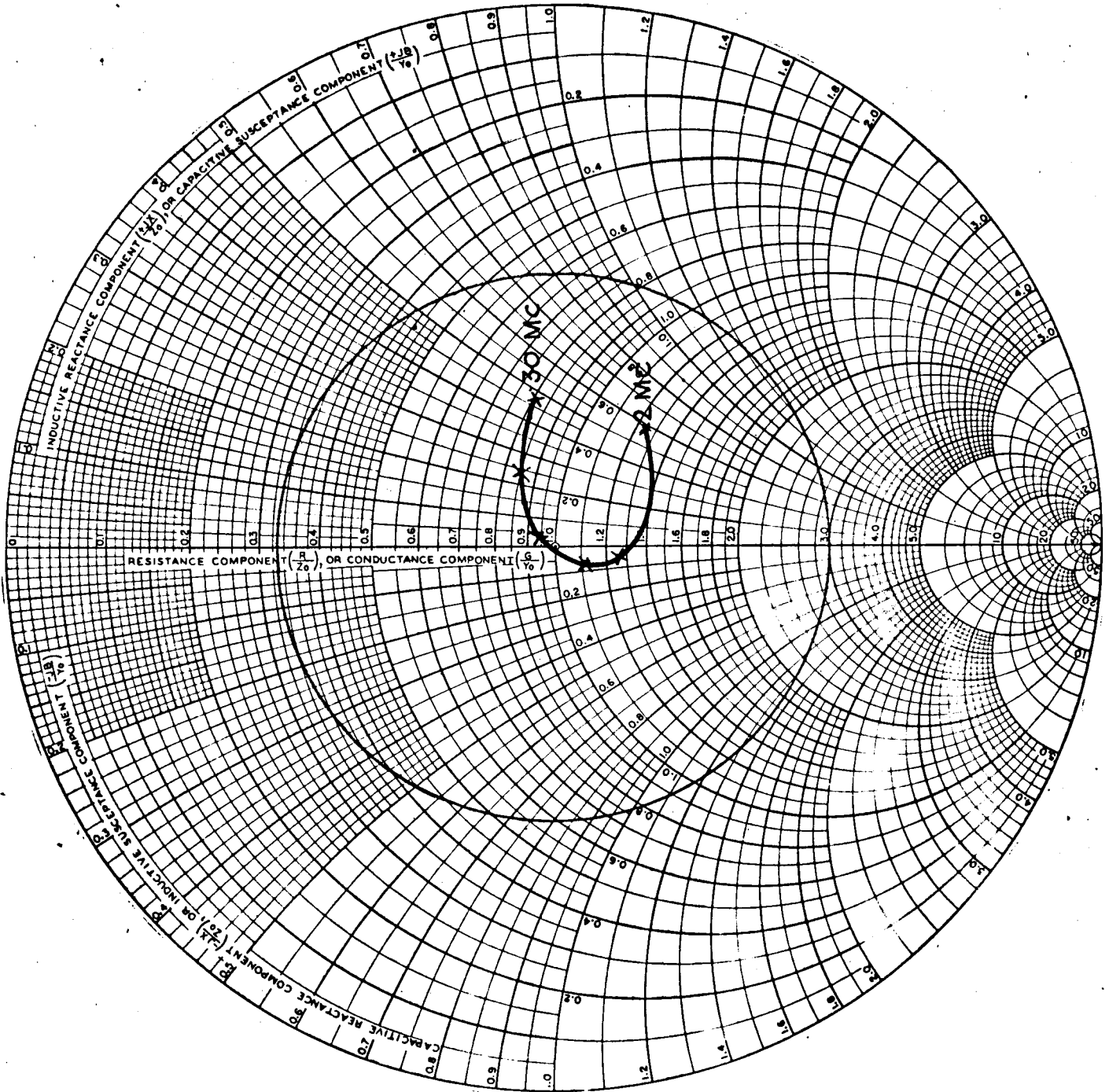
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(SMITH CHART)



CONVERSION TABLE

R or X	R or X
50	50
.40	.40
.50	.50
.60	.60
.70	.70
.80	.80
.90	.90
1.00	1.00
1.10	1.10
1.20	1.20
1.30	1.30
1.40	1.40
1.50	1.50
1.60	1.60
1.70	1.70
1.80	1.80
1.90	1.90
2.00	2.00
2.10	2.10
2.20	2.20
2.30	2.30
2.40	2.40
2.50	2.50
2.60	2.60
2.70	2.70
2.80	2.80
2.90	2.90
3.00	3.00
3.10	3.10
3.20	3.20
3.30	3.30

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THE TECHNICAL MATERIEL CORPORATION
MAMARONECK N.Y.

TRC-3500-50/600 TEST DATA SHEET # 1

SERIAL NO. _____
MFG. NO. _____

II. FREQUENCY RESPONSE

FMCS	V1	V2	V3	V4	% OF UNBALANCE
2.0	1.0				
4.0	1.0				
8.0	1.0				
16.0	1.0				
24.0	1.0				
30.0	1.0				

The unbalance between V3 and V4 should be less than 10%.

III. IMPEDANCE MEASUREMENTS*

Plot on test data sheet #2 as per method described on sheet 4.

DATE _____
TESTED BY _____

SWR
RHO-TECTOR
METHOD

FREQ	RATED	ACTUAL
2 mc	2:1	
4 mc	2:1	
8 mc	2:1	
16 mc	2:1	
24 mc	2:1	
30 mc	2:1	

* If Rho-Tector Method is used, Test Data sheet 2 may be omitted.

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TMC SPECIFICATION NO. S-541

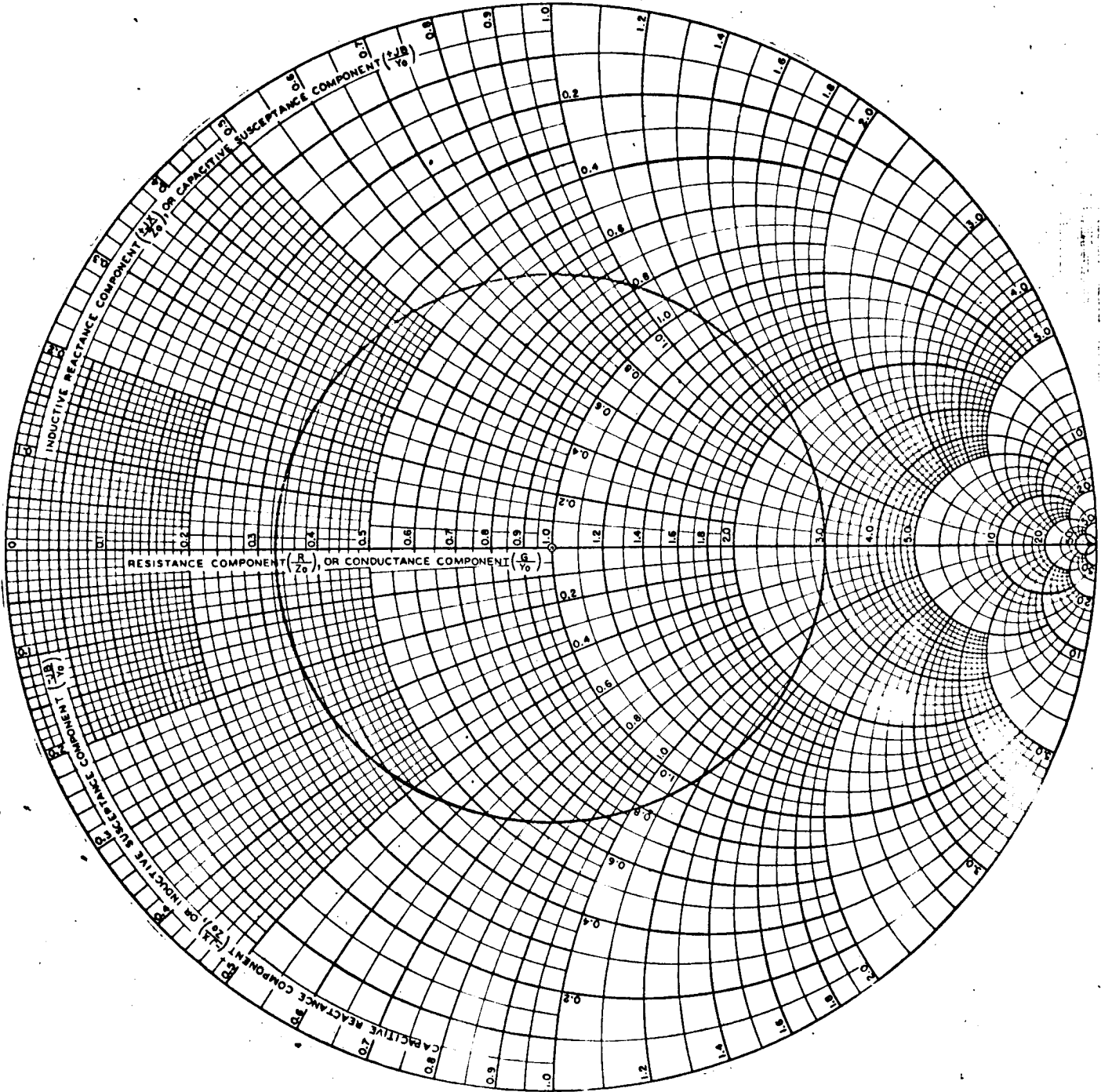
D

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TITLE: TRC-3500-50/600 TEST PROCEDURE

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TRC-3500-50/600 TEST DATA SHEET # 2



CONVERSION TABLE

R or X	R or X
20	.50
25	.40
30	.50
35	.60
40	.70
45	.80
50	.90
55	1.00
60	1.10
65	1.20
70	1.30
75	1.40
80	1.50
85	1.60
90	1.70
95	1.80
100	1.90
105	2.00
110	2.10
115	2.20
120	2.30
125	2.40
130	2.50
135	2.60
140	2.70
145	2.80
150	2.90
155	3.00
160	3.10
165	3.20
	3.30



Publication: 603026

Issue Date: June 1990

Test Procedure S-541

TRC-3500/5x Series

Transmitting Antenna Coupler

1. Test Equipment Required

The following test equipment is required for this procedure

- Oscilloscope, Tektronix Model 475A or equivalent
- RF Generator, Measurements Model 82 or equivalent
- Carbon Resistor, 47-ohm, 5%
- Carbon Resistors (6), 100-ohm 5%

Note: Connect 100-ohm resistors in series to form load.
Do not cut end leads. Interconnecting leads should be very short.

2. Frequency Response - Test Set-up

Connect instruments per diagram below. Keep leads between RF generator and TRC coupler as short as possible. Check TRC coupler per Chart A.

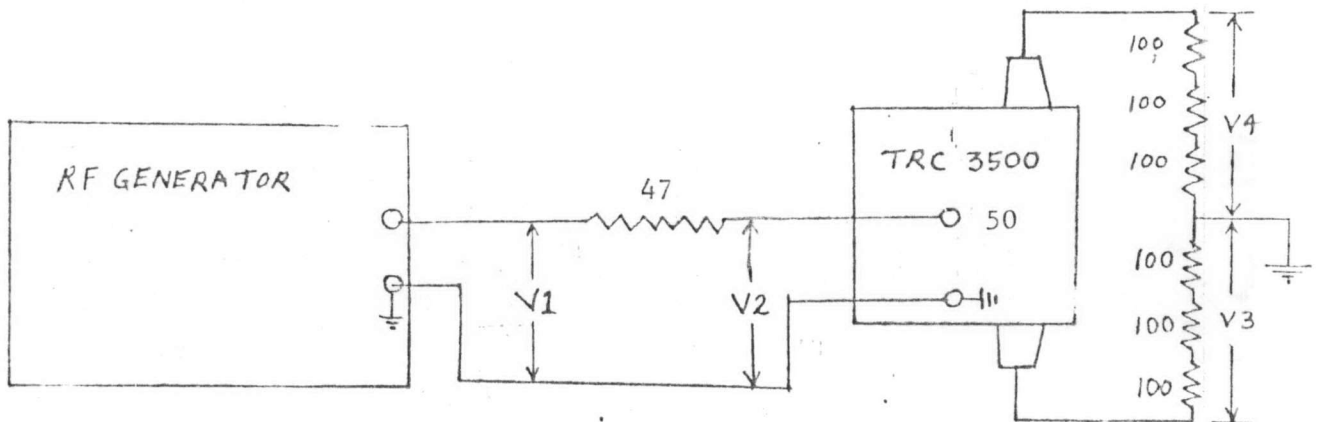


Chart A

Typical Test Data

Frequency	V1	V2	V3	V4
2.0 MHz	1.0 volt	0.6	0.84	0.84
4.0	1.0	0.6	0.84	0.84
8.0	1.0	0.56	0.84	0.82
16.0	1.0	0.55	0.86	0.81
26.0	1.0	0.51	0.61	0.64



Test Data Sheet

TRC-3500/5x Series

Serial Number _____

Frequency Response

Frequency (MHz)	V1	V2	V3	V4
2.0	1.0 V			
4.0	1.0			
8.0	1.0			
16.0	1.0			
26.0	1.0			