DELSD-E-R-71

U. S. ARMY ELECTRONICS RESEARCH & DEVELOPMENT COMMAND

Fort Monmouth, New Jersey

ENGINEERING DIVISION
TECHNICAL SUPPORT ACTIVITY

ENVIRONMENTAL TEST REPORT

CUCV CENTER-MOUNT BRACKETS
FOR AN/VRC-12 RADIOS

Prepared By

JOHN V. DENTE

DELSD-E REPORT NO. 71

30 SEPTEMBER 1985

NOTICES

The citation of trade names and names of manufacturers in this report is not to be construed as official Government indorsement or approval of commercial products or services referenced herein.

Disposition

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DELSD-E REPORT NO. 71 30 September 1985

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CUCV CENTER-MOUNT BRACKETS FOR AN/VRC-12 RADIOS

Prepared By
John V. Dente

Environmental Test Branch
Engineering Division
Technical Support Activity

CONCURRED BY: Howard D. Camp Jr.
HOWARD D. CAMP, JR.
Chief, Environmental Test Branch

APPROVED BY: Edward R. Nolan
EDWARD R. NOLAN
Chief, Engineering Division, TSA

U. S. ARMY ELECTRONICS
RESEARCH & DEVELOPMENT COMMAND
FORT MONMOUTH, NEW JERSEY 07703-5301

ENVIRONMENTAL TEST REPORT

CUCV CENTER-MOUNT BRACKETS FOR AN/VRC-12 RADIOS

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SUBJECT: Environmental Test of CUCV Center-mount Brackets for AN/VRC-12 Radios

1. BACKGROUND:

Two developmental brackets for installation of AN/VRC-12 Radios in the CUCV (Commercial Utility Cargo Vehicle) are being considered as replacements for existing mounting brackets. The new brackets, one produced at Ft. Carson, CO, and the other by General Motors, Inc., are installed on the center console between the driver seat and passenger seat in the front of the vehicle's passenger compartment. Both brackets hold the radios in the vertical or nearly-vertical position, as opposed to the horizontal position, for which the radio was designed. It was requested by the Mobile Systems Branch, Engineering Directorate, CECOM, that the two brackets be tested to determine if the brackets and the attached electronic equipment can withstand the shock and vibration environments they are likely to experience under field conditions when mounted in the CUCV. It was also requested that the RT-524/VRC Radio be tested to determine if changed thermal characteristics due to vertical orientation will cause degradation in the performance of the radio.

2. PURPOSE:

The purpose of this test was threefold:

1) To test the ability of the two brackets to survive the CUCV shock and vibration environments.

2) To test the ability of the AN/VRC-12 Radios with their shock mounts, to survive the CUCV shock and vibration environments, as mounted on the two brackets.

3) To test the ability of the RT-524/VRC Radio to survive the thermal environment it will experience in the fielded application, when mounted vertically.

3. DISCUSSION:

a. The environmental tests were conducted by personnel of the Environmental Test Branch, Technical Support Activity, Fort Monmouth, New Jersey. The environmental test laboratories used are located in Building 2704, Fort Monmouth, New Jersey.

b. The AN/VRC-12 Radios used in this test were two RT-524/VRC Receiver-Transmitters (S/N 40032 and S/N 46894) and one R-442/VRC Receiver (S/N 7885). These radios and the mounts which hold them were taken from the field and had been used for a number of years.

c. The vibration level was tailored for the specific application in the CUCV. Because of the absence of the requirement for the Coarse Washboard Section of the Munson Road Test for the CUCV, Curve V from MIL-STD-810C, Method 516.2, Procedure VIII was reduced to 0.5 inches double amplitude (D.A.), from 5 - 7.5 Hz. The basic design shock level from MIL-STD-810C, Method 516.2, Procedure I was 20 G's peak, because of the classification of the CUCV as a truck.

d. The Ft. Carson bracket was first tested with one transmitter mounted on it (See Figures 1 and 2). After this preliminary vibration testing at a reduced level (0.5 G peak sine), the bracket was modified by the addition of rubber pads (See Figure 3), to prevent chattering of the radios against the bracket. The Ft. Carson bracket was then tested at the full level (1.5 G peak sine), with two transmitters attached and the rubber pads in place.

e. Electrical performance testing was done by laboratory personnel, using the following equipment (See Figure 4):

1) Logi Metrics Model 925 Signal Generator.
2) Bird Model 43 Wattmeter, with plug-in module, Model 100A, 25-60 MHz, 100 watt.
3) Dummy Load, Model DA-412A/U.
4) Fluke Model 7260A Frequency Counter.
5) Attenuator, 20db, 50 watt.

4. SINUSOIDAL VIBRATION TEST:

a. Requirement: The equipment shall withstand vibration induced during vehicular transport, as installed within a military vehicle, over all types of roads and cross-country terrain.

b. Test Facility: The radios were tested on the MB Model C-200 Vibration Exciter. An L.A.B. Horizontal Motion Slip Table was utilized for motions other than vertical. The following equipment was also used during the test:

1) Endevco Model 2213E Accelerometer.
2) Endevco Model 2735 Charge Amplifier.
3) Hewlett-Packard Model 5451B Fast-Fourier Analyzer/Vibration Control System.
4) Nicolet Model 660B Dual Channel Analyzer.

c. Test Procedure: The vibration test was performed in accordance with Procedure VIII, Method 514.2 of MIL-STD-810C. The vibration level was in accordance with Curve V, with the exception that the lower end of the curve was reduced to 0.5 inches D.A., in order to simulate the vibration environment in the CUCV. The vibration was applied along each of three mutually perpendicular axes of the test items. The vibration frequency was swept logarithmically from 5-200-5 Hz in 12 minutes. Total cycling time was 3 hours per axis, for a total test time of 9 hours per test item. The Ft. Carson bracket is shown in Figure 5, as mounted for vertical vibration (the bracket is shown without the rubber pads which were used during the test). The GM bracket is shown in Figures 6 & 7 as mounted for front-to-back vibration. Figure 8 shows the shock mounts of the RT-524/VRC in detail.

d. Test Results: There was no damage or degradation in performance to the Ft. Carson bracket or to the two RT-524/VRC Radios attached to it during or after the vibration test. There was no damage to the GM mount or radios during or after the Y-axis or Z-axis vibration. (The R-442/VRC Radio impacted against the bracket during Z- axis vibration). In the X-axis test, the receiver banged loudly against the bracket. After the X-axis test, the receiver was found to have poor sensitivity on all channels and a disabled squelch. The receiver audio and squelch pre-amp module was found to be intermittent.

5. SHAPED PULSE SHOCK TEST:

a. Requirement: The equipment shall withstand shock induced during vehicular transport as installed within a military vehicle over all types of roads and cross-country terrain.

b. Test Facility: The equipment was tested on the Monterey Model 3636 Impac Shock Tester. An Endevco Model 2252 Accelerometer and a Nicolet Model 660B Dual Channel Analyzer with plotter were used to measure, record, and plot the shock pulses.

c. Test Procedure: The equipment was tested in accordance with Method 516.2, Procedure I of MIL-STD-810C. Three terminal peak sawtooth shock pulses of 20 G's nominal peak acceleration and 11 milliseconds nominal duration were applied in both directions along three mutually perpendicular axes of the test items, for a total of 18 shock pulses per test item. Figure 9 is a plot of acceleration vs time for a typical shock pulse. Electrical performance tests were conducted on the radios before and after the shock testing. Figure 10 shows the Ft. Carson Bracket with radios mounted for shock testing. Figure 11 shows the GM Bracket mounted for shock testing.

d. Test Results: In the test of the Ft. Carson Bracket, one of the radios had a receiver and fan which were non-operational before the test. After the test, the radio with the operational receiver and fan lost fan operation, but otherwise operated satisfactorily. No other damage or deterioration was observed. The GM Bracket developed cracks in three of its four legs, near the mounting screw holes (See Figure 12). The radios sustained no damage or deterioration as a result of the testing of the GM Bracket. Figures 13 & 14 show damage to the rear plate of one of the RT-524/VRC Radios which lost fan operation during the test of the Ft. Carson Bracket.

6. THERMAL SURVEY:

a. Test Facility: The thermal survey was conducted in the Webber Model WF-27-100+250v Temperature/Altitude Chamber.

b. Test Procedure: The RT-524/VRC Radio, S/N 46894 was fitted with thermocouples on the following four locations:

1) The power transister Q9402 located on the right side of the chassis, internally (See Figure 15).

2) The cooling fins located in the rear of the case adjacent to the power tube (See Figure 16).

3) The C9009 Capacitor (see Figure 17).

4) The inside of the case near the front of the radio, attached to component P8001 (see Figure 18).

The radio was given a pre-test electrical check and it operated normally. The radio was then placed inside the chamber in the horizontal position and initial temperature readings were taken in the chamber and in the four locations on the radio. The chamber temperature was nominally room temperature, and gradually drifted upward over the hour of testing from +77.2°F to +86.3°F due to the heat generated by the radio. The radio was operated using a 10:1 duty cycle (10 minutes receive/1 minute transmit). Temperature readings were taken at the end of transmission (every 11 minutes). The test was repeated for the vertical orientation (controls facing upward). Chamber temperature drifted from +75.6°F to +86.2°F during this test. Temperature readings were again taken 11 minutes apart at the end of transmission. The radio was given a post-test electrical check and operated normally (see page C-7 for electrical data).

c. Test Results: The temperature variations at the different locations in the radio are plotted in Figure 19. From the plots it can be seen that after 44 minutes of operation there was no more than 3°F difference in temperatures at the same location, for horizontal vs vertical orientation. The starting temperatures for the horizontal orientation were 2°F to 4°F higher than in the vertical orientation, and this difference generally persisted throughout the test.

7. SUMMARY:

TEST	RESULT	
Thermal Survey	Satisfactory	
	FT. CARSON BRACKET	GM BRACKET
Vibration	Satisfactory	Unsatisfactory
Shock	Unsatisfactory	Unsatisfactory

8. CONCLUSIONS:

a. Ft. Carson Bracket.

(1) The Ft. Carson Bracket, as fitted with rubber pads, passed the vibration test.

(2) The bracket failed the shock test due to the loss of the cooling fan operation in one radio. This occurred when the radio pushed downward against the louvers of the MT-1029/VRC Mount, deforming a thin metal plate in the rear of the radio, causing interference of the plate with the cooling fan of the radio.

b. GM Bracket.

(1) The GM Bracket failed the vibration test due to the failure of the receiver. This failure was the result of impacting of the receiver against the bracket.

(2) The bracket failed the shock test because of the appearance of cracks in three of the four mounting screw holes.

c. Thermal Survey of RT-524/VRC Radio.

(1) The RT-524/VRC Radio operated satisfactorily in the vertical orientation.

(2) Operation of the radio in the vertical orientation did not appear to cause an increase in temperature in any of the four locations monitored, compared to operation in the horizontal orientation.

9. RECOMMENDATIONS:

a. Ft. Carson Bracket. The bracket should be fitted with rubber vib-x type pads, as shown in Figure 3. The four pads should be attached by means of an adhesive.

b. GM Bracket.

(1) The bracket should be fitted with rubber vib-x type pads to prevent impacting of the receivers against the sides of the bracket. A pad also may be required between the two receivers when two receivers are used.

(2) The design of the feet of the bracket also should be changed to prevent development of cracks near the mounting screw holes.

c. RT-524/VRC Radio with MT-1029/VRC Mount. One-sixteenth inch thick washers should be inserted between the RT-524/VRC Radio and the MT-1029/VRC Mount. These washers should be placed on the two alignment studs and secured by adhesive or another means. This is a field-fix done in lieu of a redesign of the MT-1029 Mount, in order to prevent interference of the rear plate with the fan.

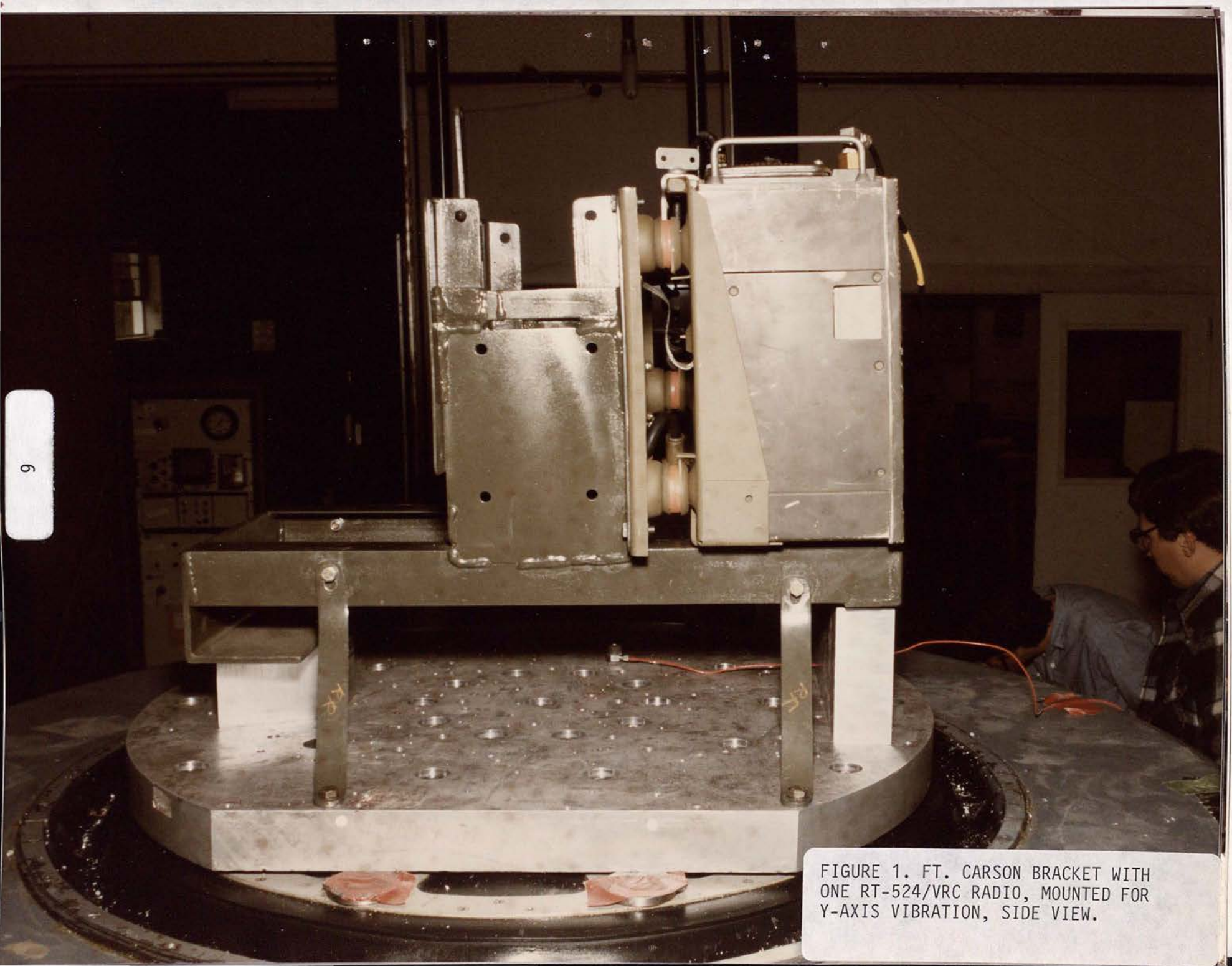


FIGURE 1. FT. CARSON BRACKET WITH ONE RT-524/VRC RADIO, MOUNTED FOR Y-AXIS VIBRATION, SIDE VIEW.

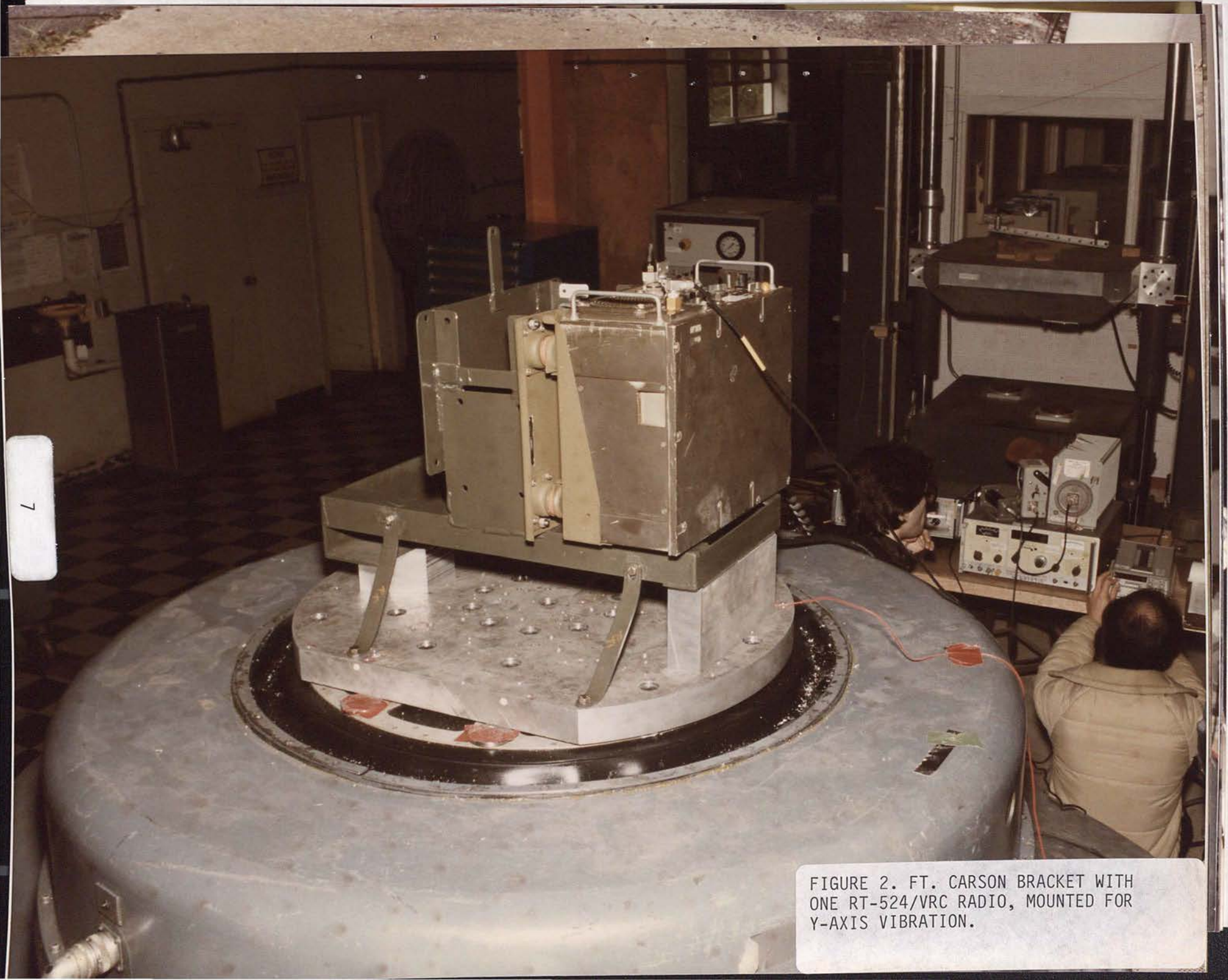


FIGURE 2. FT. CARSON BRACKET WITH ONE RT-524/VRC RADIO, MOUNTED FOR Y-AXIS VIBRATION.

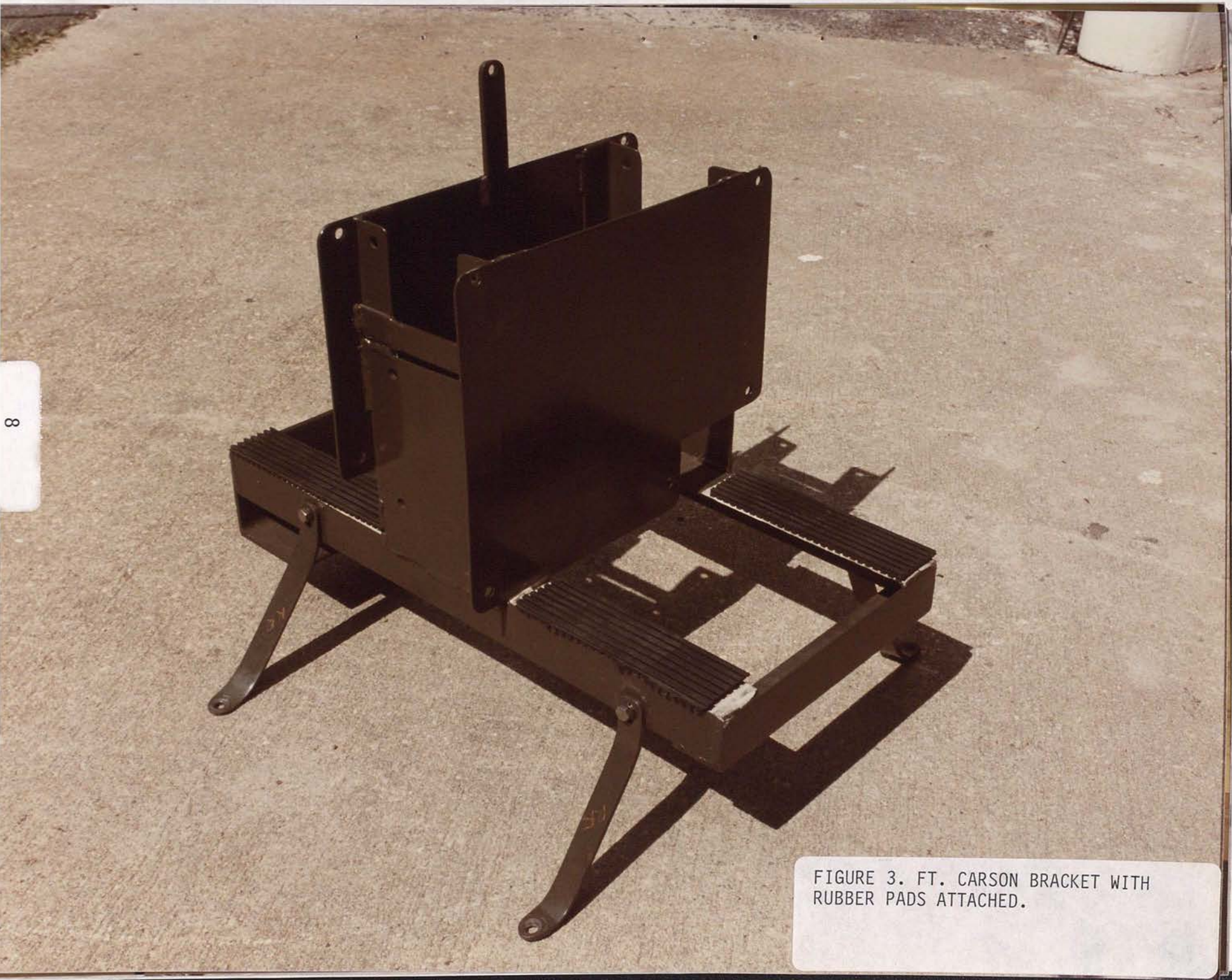


FIGURE 3. FT. CARSON BRACKET WITH RUBBER PADS ATTACHED.

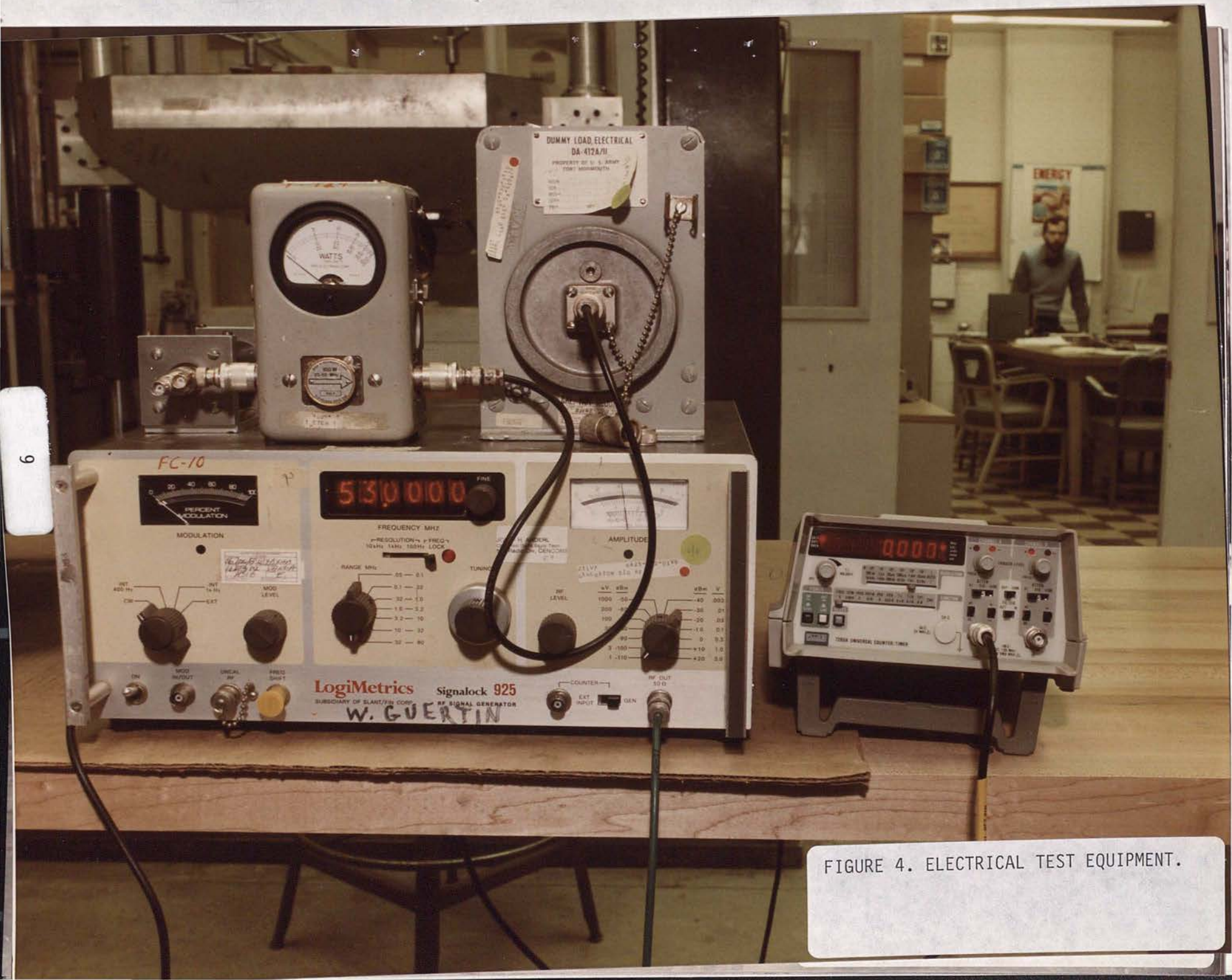


FIGURE 4. ELECTRICAL TEST EQUIPMENT.

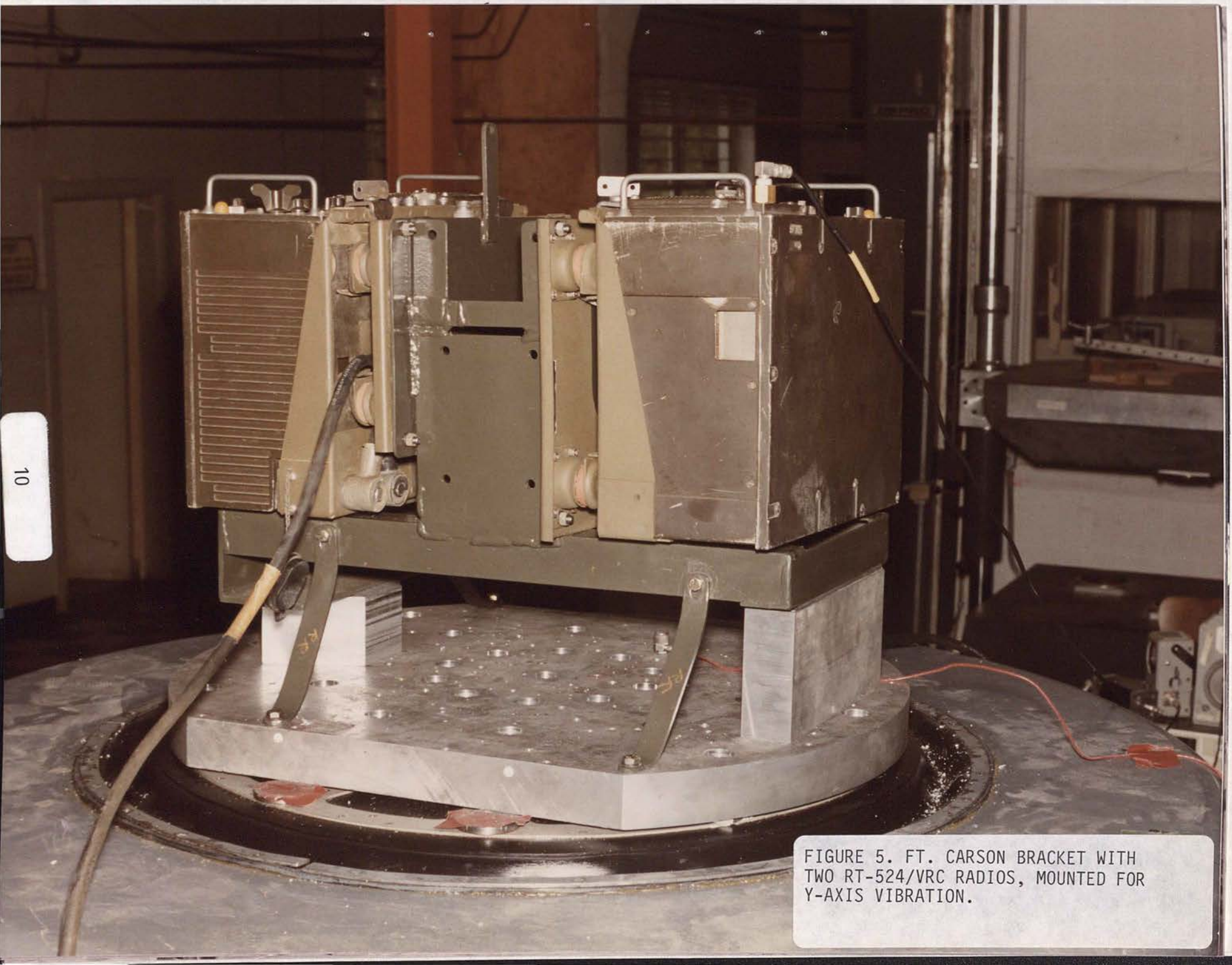


FIGURE 5. FT. CARSON BRACKET WITH TWO RT-524/VRC RADIOS, MOUNTED FOR Y-AXIS VIBRATION.

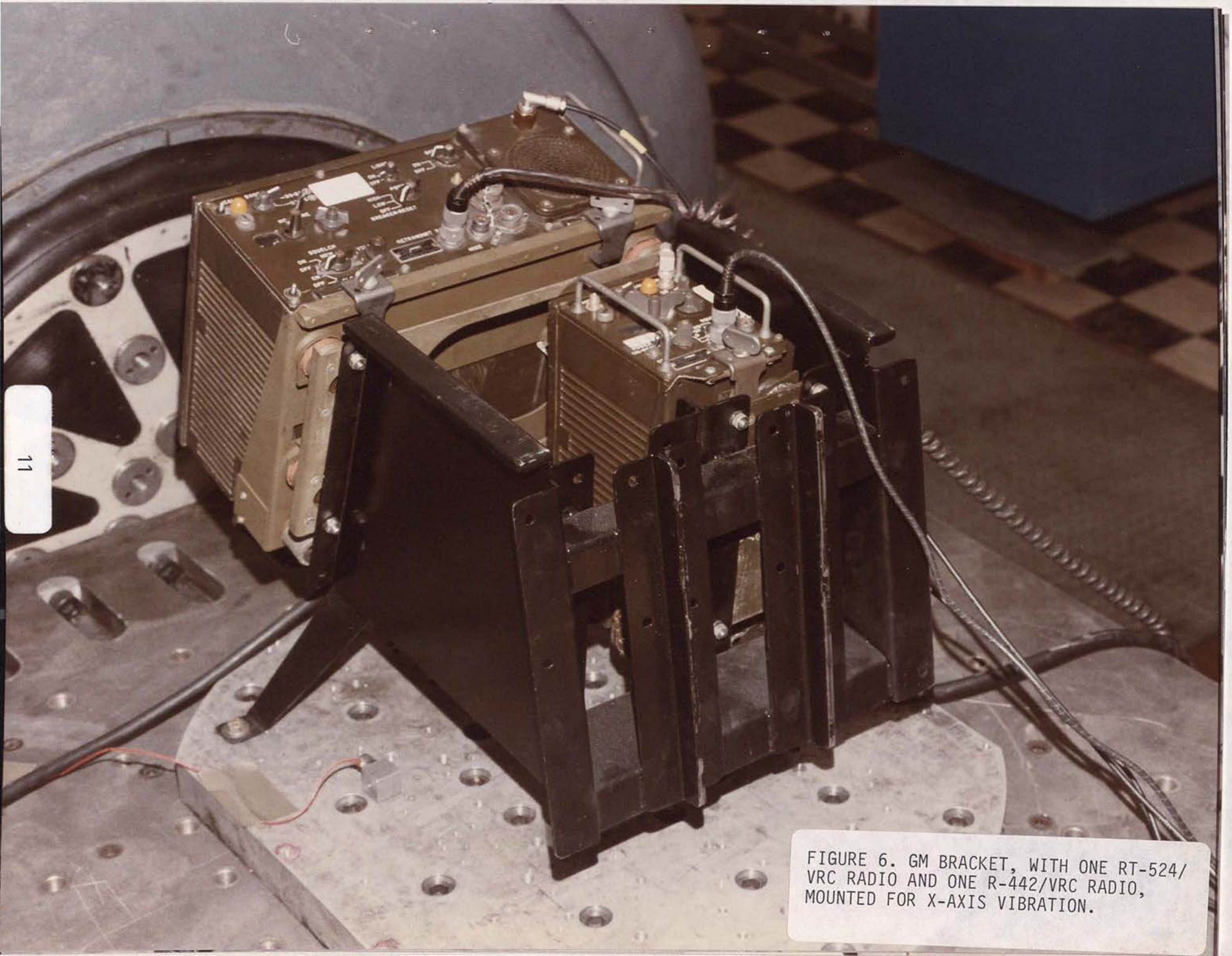


FIGURE 6. GM BRACKET, WITH ONE RT-524/VRC RADIO AND ONE R-442/VRC RADIO, MOUNTED FOR X-AXIS VIBRATION.

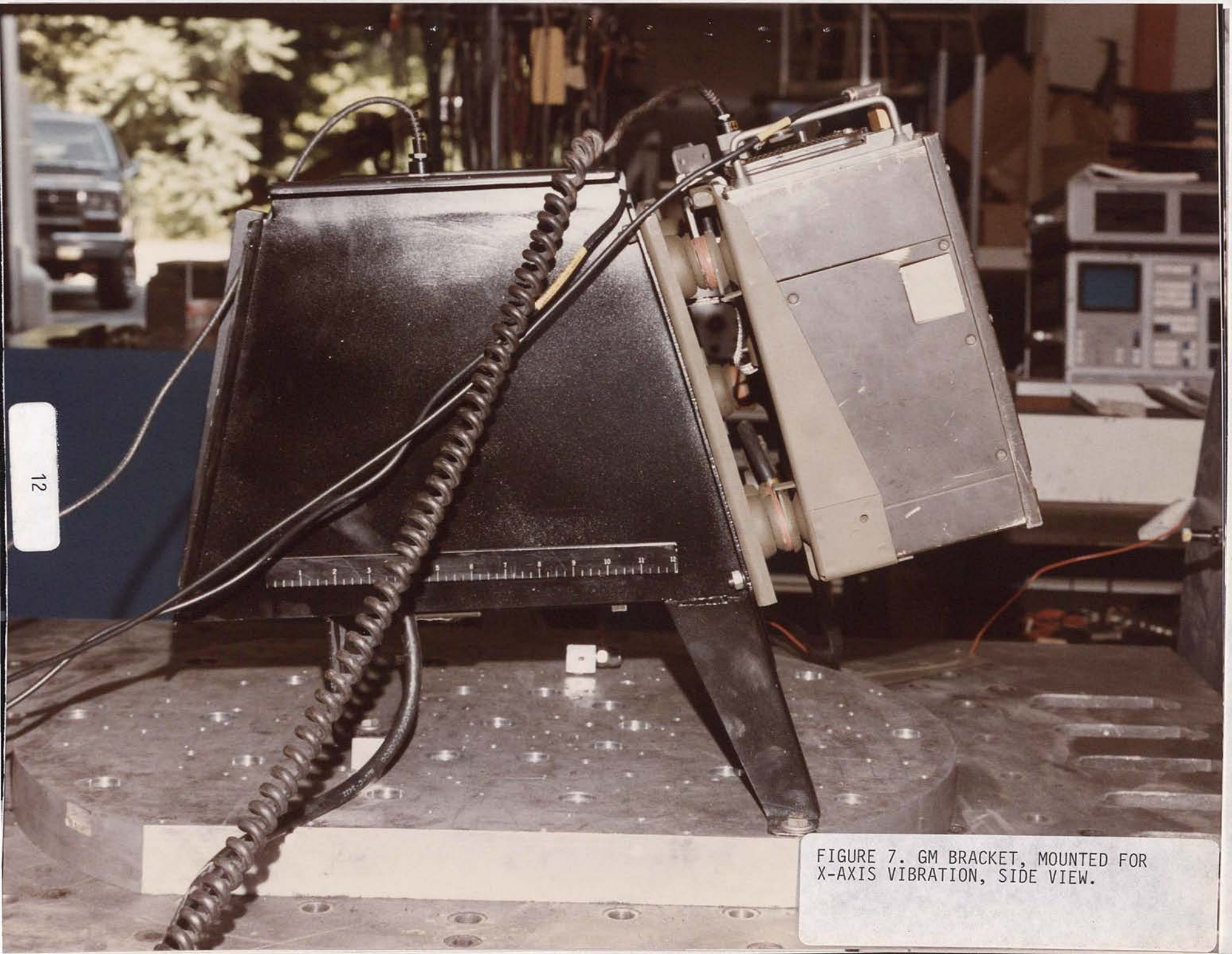


FIGURE 7. GM BRACKET, MOUNTED FOR X-AXIS VIBRATION, SIDE VIEW.

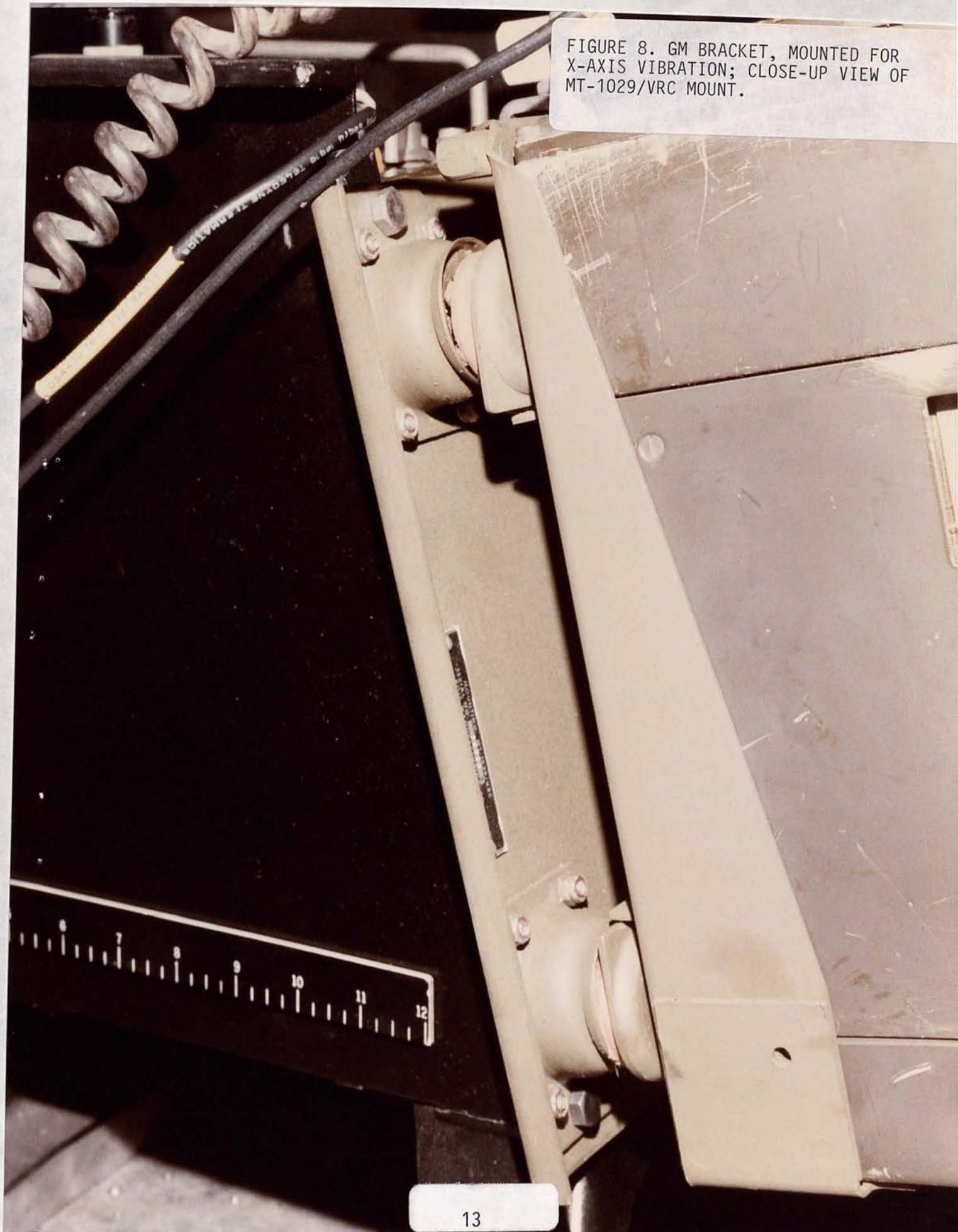


FIGURE 8. GM BRACKET, MOUNTED FOR X-AXIS VIBRATION; CLOSE-UP VIEW OF MT-1029/VRC MOUNT.

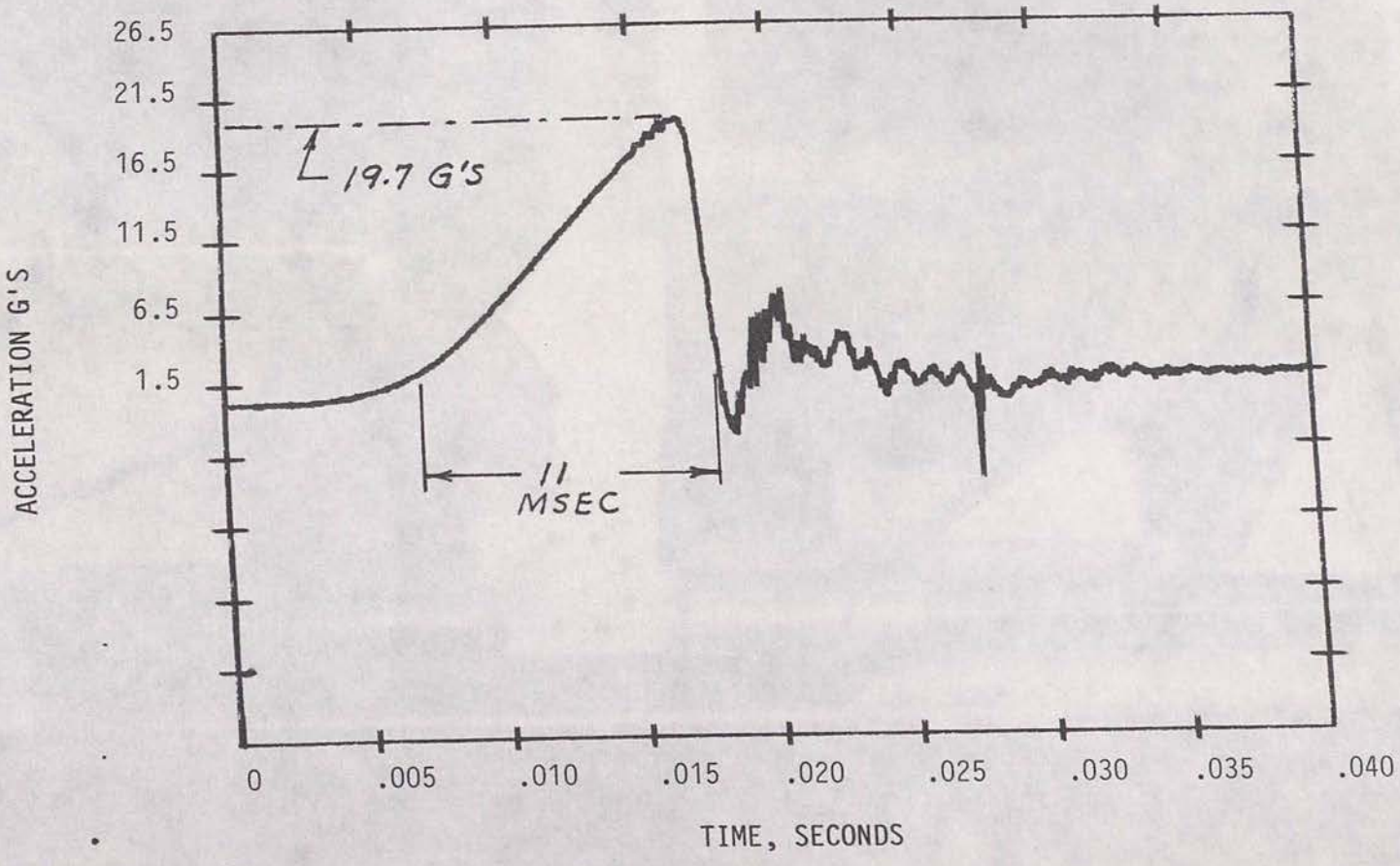


FIGURE 9. ACCELERATION VS. TIME, SHAPED PULSE SHOCK, -Z AXIS, FT. CARSON BRACKET.

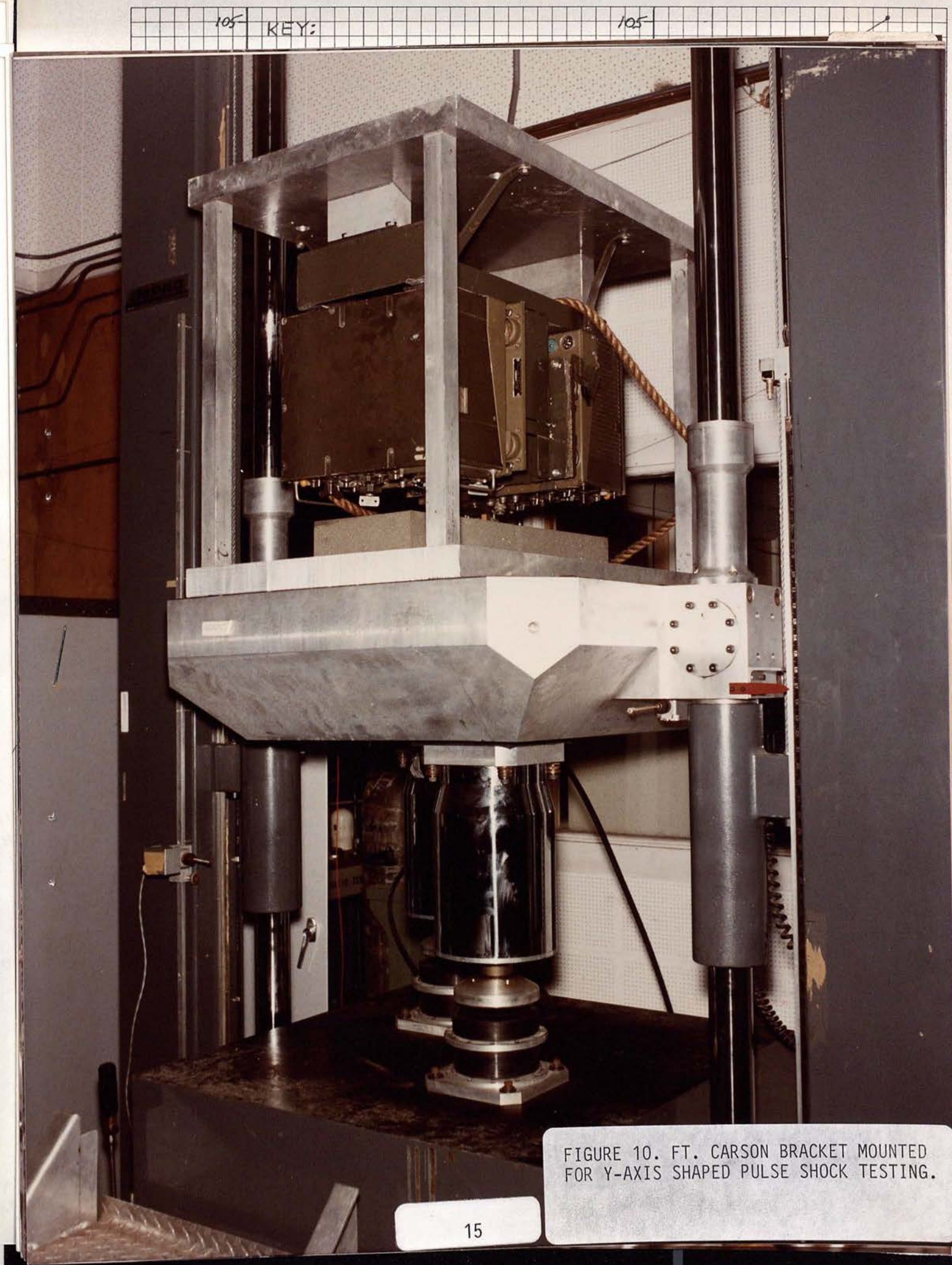


FIGURE 10. FT. CARSON BRACKET MOUNTED FOR Y-AXIS SHAPED PULSE SHOCK TESTING.

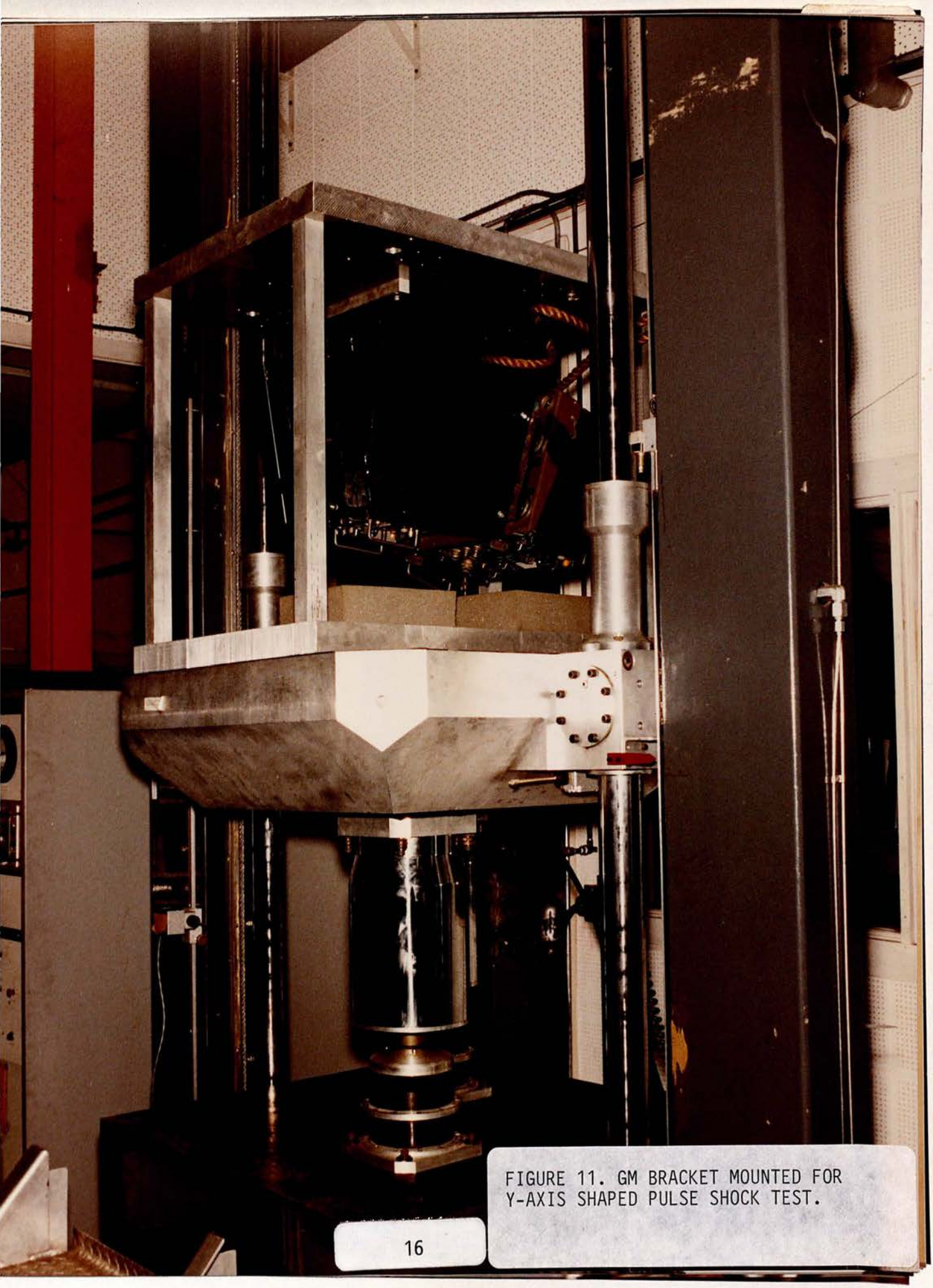


FIGURE 11. GM BRACKET MOUNTED FOR Y-AXIS SHAPED PULSE SHOCK TEST.

16

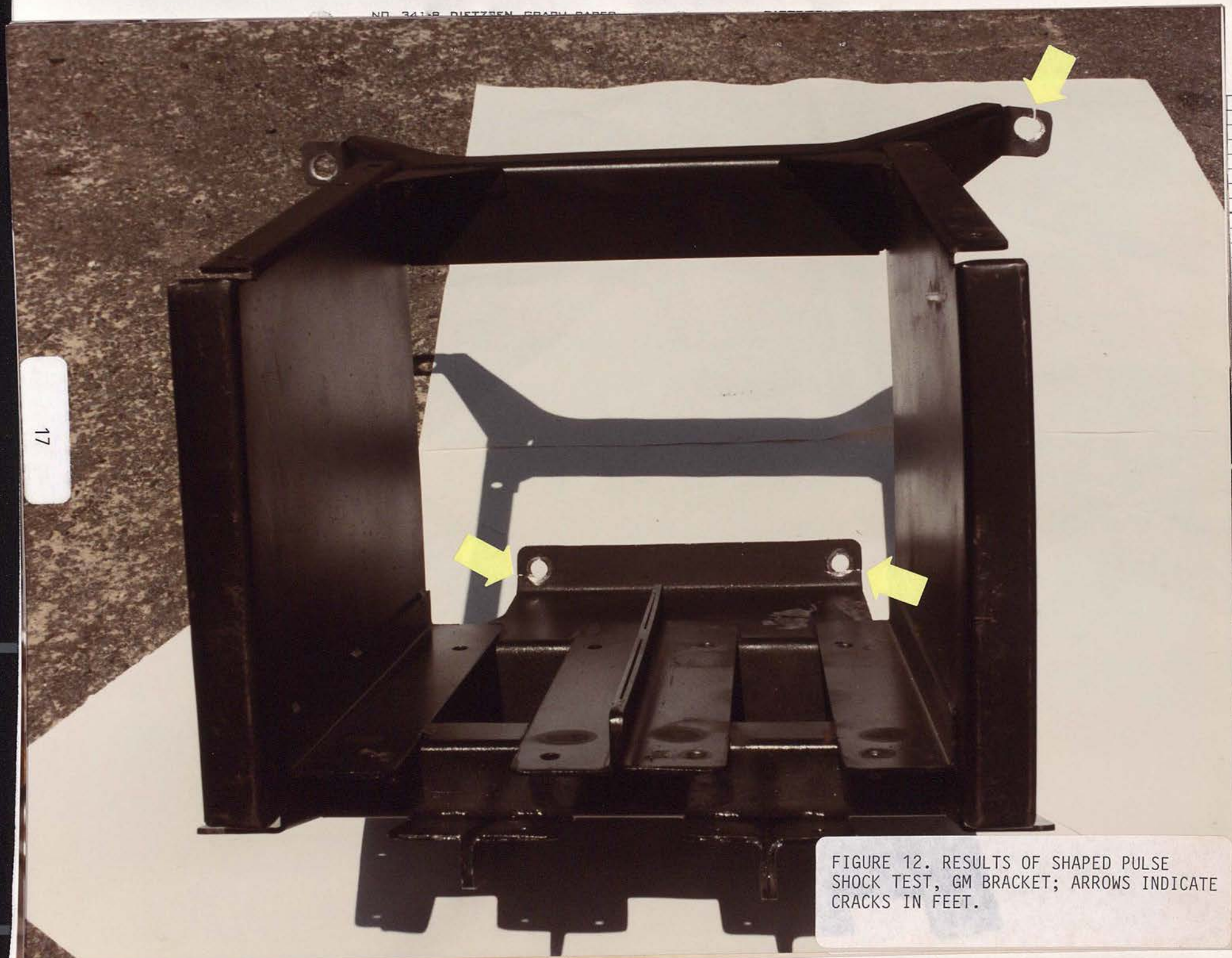


FIGURE 12. RESULTS OF SHAPED PULSE SHOCK TEST, GM BRACKET; ARROWS INDICATE CRACKS IN FEET.

FIGURE 13. RT-524/VRC RADIO WITH MT-1029/VRC MOUNT, REAR PLATE REMOVED, SHOWING FAN LOCATION; ARROW POINTS TO DENT ON PLATE.

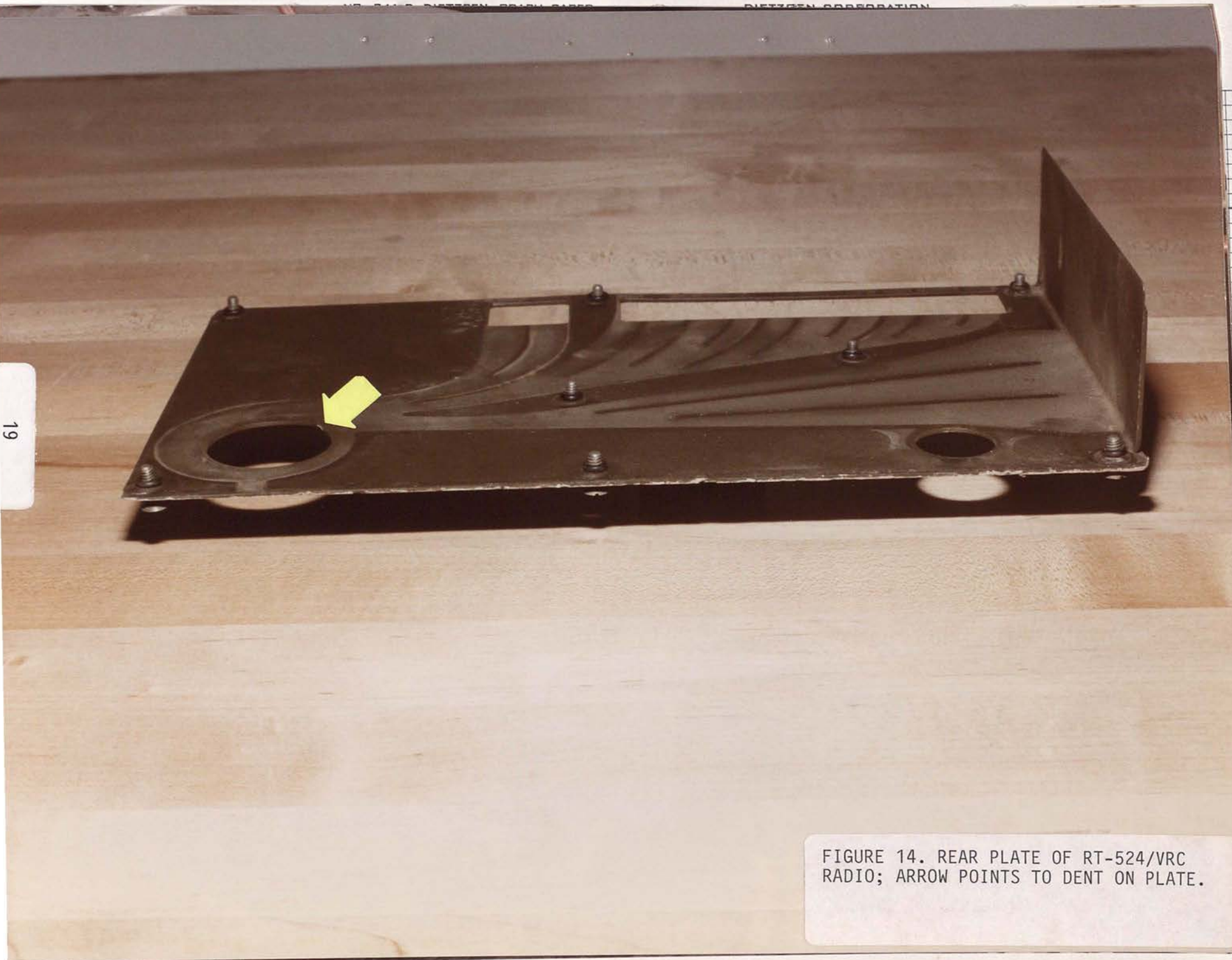


FIGURE 14. REAR PLATE OF RT-524/VRC RADIO; ARROW POINTS TO DENT ON PLATE.

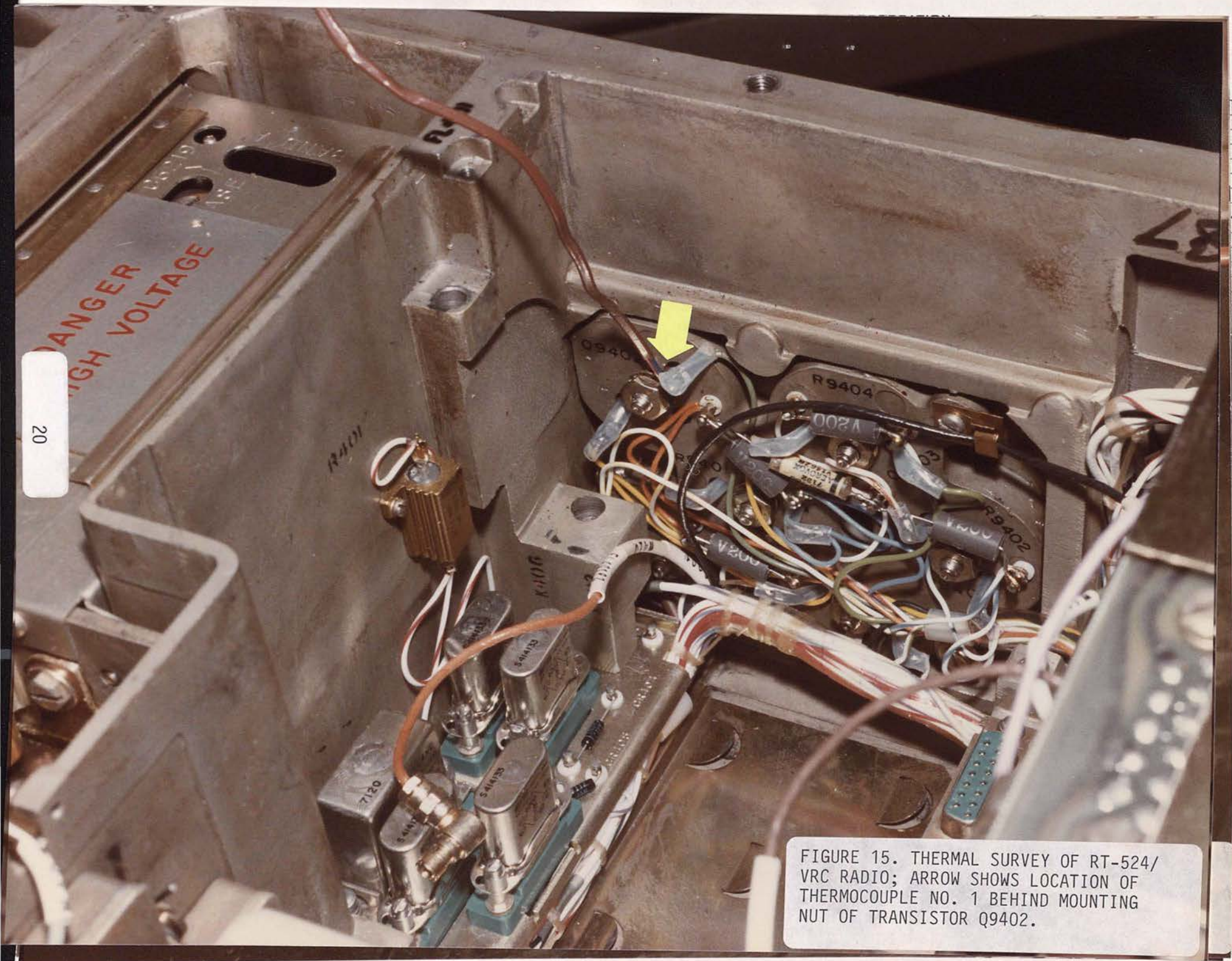


FIGURE 15. THERMAL SURVEY OF RT-524/ VRC RADIO; ARROW SHOWS LOCATION OF THERMOCOUPLE NO. 1 BEHIND MOUNTING NUT OF TRANSISTOR Q9402.

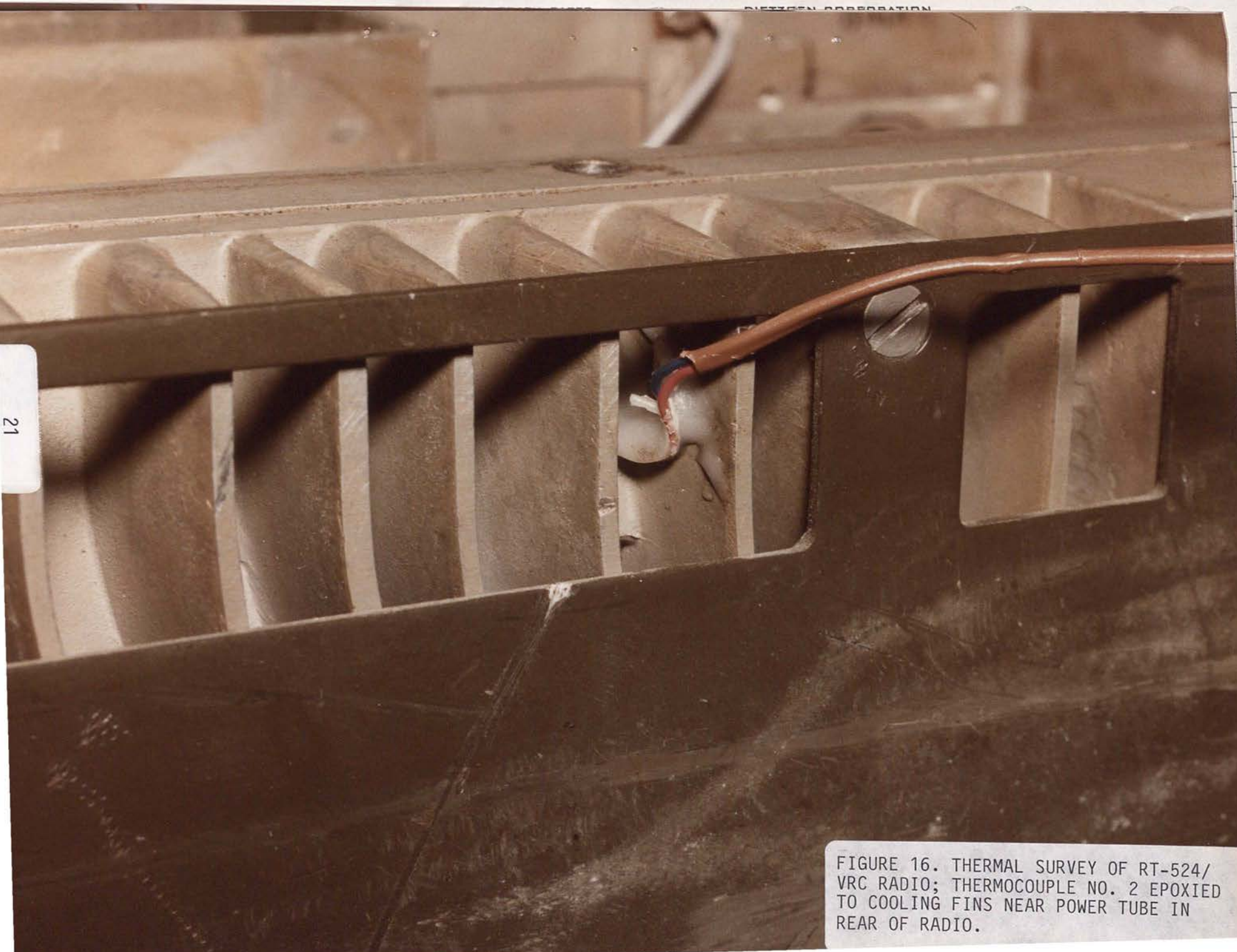


FIGURE 16. THERMAL SURVEY OF RT-524/ VRC RADIO; THERMOCOUPLE NO. 2 EPOXIED TO COOLING FINS NEAR POWER TUBE IN REAR OF RADIO.

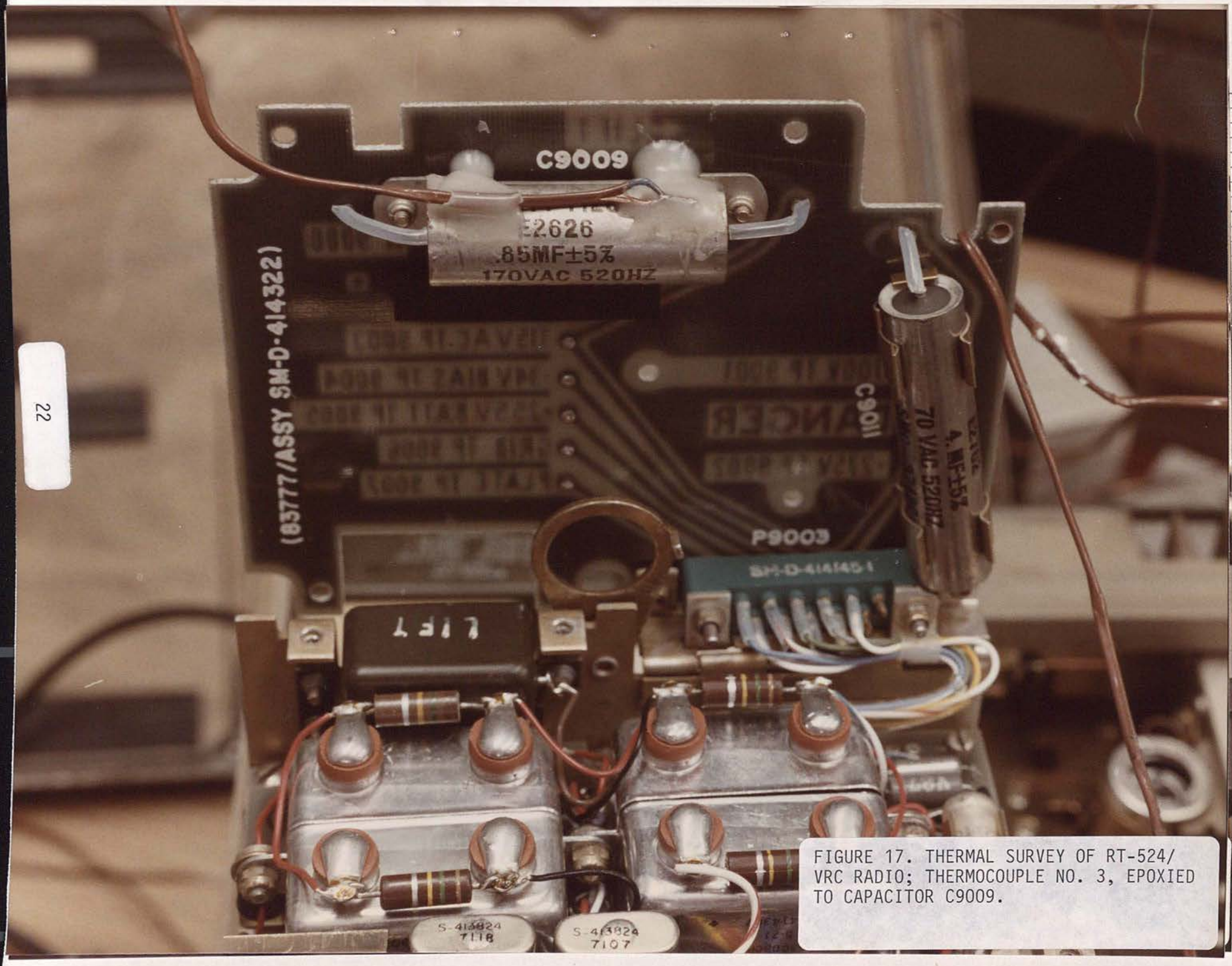


FIGURE 17. THERMAL SURVEY OF RT-524/ VRC RADIO; THERMOCOUPLE NO. 3, EPOXIED TO CAPACITOR C9009.

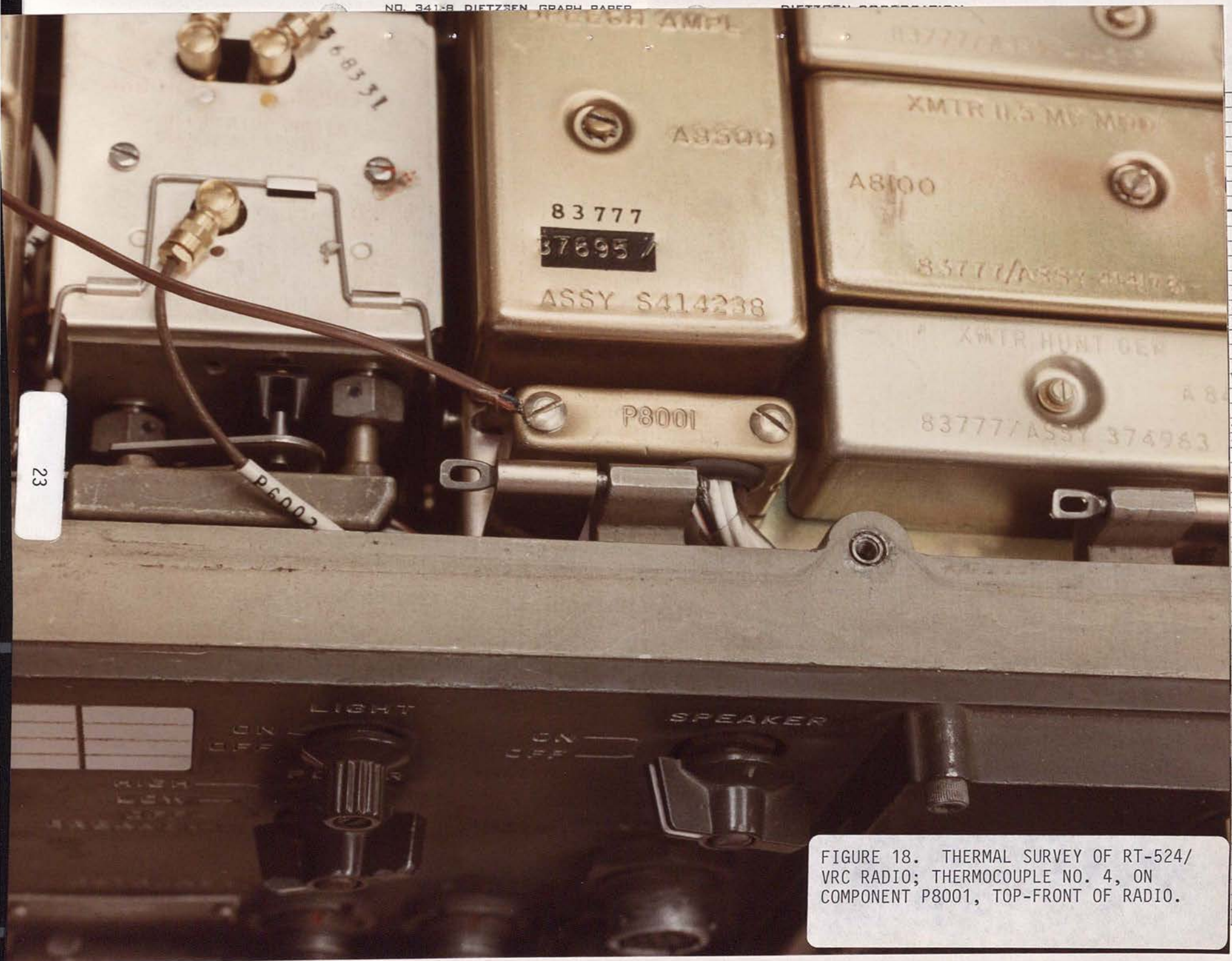


FIGURE 18. THERMAL SURVEY OF RT-524/VRC RADIO; THERMOCOUPLE NO. 4, ON COMPONENT P8001, TOP-FRONT OF RADIO.

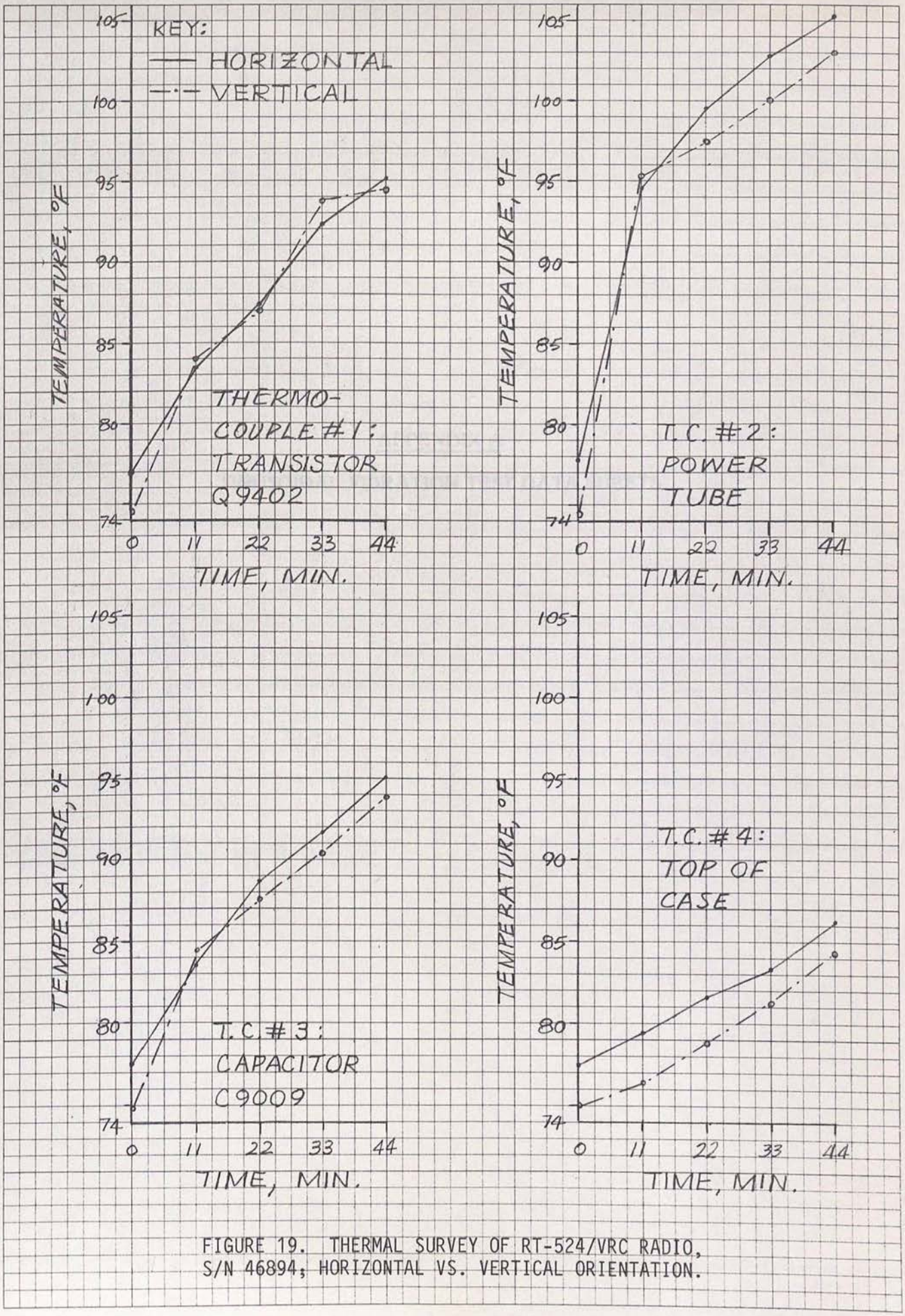


FIGURE 19. THERMAL SURVEY OF RT-524/VRC RADIO, S/N 46894; HORIZONTAL VS. VERTICAL ORIENTATION.

APPENDIX A

SINUSOIDAL VIBRATION TEST DATA SHEETS

ENVIRONMENTAL TEST LABORATORY TEST LOG

TEST NO. 84-6 DATE 6/22/84

CUSTOMER ORGAN. DRSEL-ED-SM PROJECT ENGINEER GFISKE

TEST ENGINEER JVD TEST TECH. KJL.

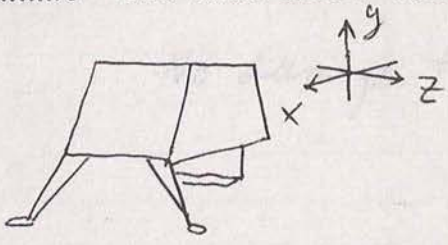
NOMENCLATURE MODEL RT-524/VRC & R-442/VRC SERIAL # 40032 (R-T) 7885 (RCVR)

TEST CONDITIONS POWERED 10 min/hr { 19 min RCV / 1 min XMTR } ROOM TEMP:

DESCRIPTION GM-Mount w/ One XMTR, One RCVR
Sine Vibration, 4 axis
5-200-5 Hz. 1.5 G's cut off at 0.5 inches DA.

DATE	TIME	EVENT	INITIAL
6/22	1025	Pre test Ops. chk OK	JVD
	1305	Test start, Y-AXIS SHAKE	KJL
		Both RCVR's operational - power on.	
	1315	RCVR's off, XMTR ON	
		41 MHz @ Power out: 44 watts	
		RCVR Sensitivity: (R-442): .40 µv	
		(RT-524): .84 µv	
	1316	XMTR OFF	
	1405	RCVR's ON	
	~~1415~~	RCVR sens.: (R-442): .40 µv	
		(RT-524): .84 µv	
	1415	XMTR ON	
		POWR OUT.: 44 watts	
	1416	XMTR OFF	
	1505	RCVR'S ON	
		RCVR SENS. (R-442): .40 µv	

REMARKS: SEE DATA SHEET NUMBER _____



ENVIRONMENTAL TEST LABORATORY TEST LOG

TEST NO. 84-6 DATE 6/22/84

CUSTOMER ORGAN. DRSEL-ED-SM PROJECT ENGINEER GF

TEST ENGINEER JVD TEST TECH. KJL

NOMENCLATURE MODEL RT 524 / R442 SERIAL # 40052 / 7885

TEST CONDITIONS Powered 10 min/hr ROOM TEMP:

DESCRIPTION GM - Mount
Sine Vibra. - 4 axis.

DATE	TIME	EVENT	INITIAL
6/22	1515	X MTR ON	
		POWR OUT: 44 watts	
	1516	XMTR OFF	
	1605	END TEST.	JVD
		Electrical Check OK.	

REMARKS: SEE DATA SHEET NUMBER _____

bracket
No damage to radio or mounts is evident.

TEST ITEM: AN/[illegible]

TEST NO: 84-6

TYPE OF TEST: PRE- Y-AXIS VIBRATION

FREQ DIAL SETTING (MHZ)		RECIEVER Sensitivity OLD SQUELLI (µV)		Power output (WATTS)		OUTPUT Frequency (MHZ)
30.00		.52		N/A		N/A
41.00		.40				
52.95		.56				
53.00		.58				
64.00		.48				
75.95		.74				
Sidetone YES	N/A	NO				
Dial Lamp YES	✓	NO				
	R 442	Reciever SN 7885				
		D.C INPUT		25.0 volts		
30.00		.80 ①		44		29.999
41.00		.80		45		40.999
52.95		.30		36		52.949
53.00		.63		42		53.000
64.00		.74		32		64.000
75.95		<.1 ①		36		75.950
Sidetone YES	✓	NO	RT-524 SN 40032			
Dial lamp YES	✓	NO	D.C INPUT	25.0 volts		

REMARKS: ① Recieves some type of local interference

DATE: 6/22/84 SIGNATURE: John V. Dento DATA SHEET NO. ___ OF ___

TEST DATA SHEET

TEST ITEM: AN/VRC-12 GM-MOUNT	PERFORMED BY: K. LaSala
TYPE OF TEST: POST Y-AXIS VIBRATION	TEST NO: 84-6

FREQ DIAL SETTING (MHZ)		RECIEVER Sensitivity OLD SQUELCH (μV)		Power output (WATTS)		OUTPUT Freqency (MHZ)
30.00		<.1 ①				
41.00		.35				
52.95		.45		N/A		N/A
53.00		.4				
64.00		.35				
75.95		.45				
Sidetone	YES N/A	NO				
Dial Lamp	YES ✓	NO				
	R-442	RCVR	S/N 7885			
30.00		<.1 ①		44		29.999
41.00		.9		44		41.000
52.95		.6		36		52.949
53.00		.8		42		53.000
64.00		.85		33		64.000
75.95		.4		38		75.950
Sidetone	YES ✓	NO				
Dial lamp	YES ✓	NO				
	RT-524	XMTR	S/N 40032			

REMARKS: ① Receive local interference

DATE: 6/22/84	SIGNATURE: John V. Dente	DATA SHEET NO. ___ OF ___

ENVIRONMENTAL TEST LABORATORY TEST LOG

TEST NO. 84-6 DATE 6/25/84

CUSTOMER ORGAN. DRSEL-ED-SM PROJECT ENGINEER KE.

TEST ENGINEER JVD TEST TECH. KJL

NOMENCLATURE MODEL RT 442 524 - GM Mount SERIAL # 40032 7885

TEST CONDITIONS Powered 10 min ROOM TEMP:

DESCRIPTION Sine Vibration Z-axis

DATE	TIME	EVENT	INITIAL
6/25/84	1005	Pre-test operational check OK	JVD.
		START Z-AXIS TEST. *	
		Both units on (recvrs).	
	1015	XMTR ON, RCVRS OFF	
	1016	XMTR PWR: 44 watts	
		XMTR OFF, RCVRS OFF	
	1105	RCVRS ON, RCVR SENS:	
		(R442) .4 μV } 41MHZ.	
		(RT524) .82 μV. }	
	1115	XMTR ON, RCVRS OFF	
		XMTR PWR: 44 watts.	
	1116	XMTR OFF	
	1205	RCVRS ON ~~RCVR SENS:~~	
		RCVR SENS: (R442): .4 μV	
		(RT524): .7 μV	
	1215	XMTR PWR ON: 44 watts	

REMARKS: SEE DATA SHEET NUMBER 1305 END TEST

* RT mount bottoms at low frequencies. Loud noise Receiver bangs against side of Aton Bracket.

TEST DATA SHEET

TEST ITEM: AN/URC-12 | **PERFORMED BY:** K. LaSala

TYPE OF TEST: Pre-Test Z-Axis Vib. | **TEST NO:** 84-6

FREQ DIAL SETTING (MHZ)			RECIEVER Sensitivity OLD SQUELCH (μv)		Power output (WATTS)		OUTPUT Frequency (MHZ)
30.00			.45		N/A		N/A
41.00			.35				
52.95			.45				
53.00			.45				
64.00			.35				
75.95			.5				
Sidetone	YES	N/A	NO				
Dial lamp	YES	✓	NO				
			R-442	Serial	# 7885		
30.00			1.0		44		29.999
41.00			.97		44		40.999
52.95			.85		36		52.949
53.00			.9		42		53.000
64.00			.96		32		64.000
75.95			.75		36		75.950
Sidetone	YES	✓	NO		RT-524	Serial #	40032
Dial lamp	YES	✓	NO				

REMARKS:

DATE: 25 June 84 | **SIGNATURE:** K. LaSala | **DATA SHEET NO.** ___ **OF** ___

TEST DATA SHEET

TEST ITEM: AN/VRC-12 | **PERFORMED BY:** K. LaSala

TYPE OF TEST: Post-Test Z-Axis Vib. | **TEST NO:** 84-6

FREQ DIAL SETTING (MHZ)		RECIEVER Sensitivity OLD SQUELCH (μV)		Power output (WATTS)		OUTPUT Frequency (MHZ)
30.00		.45				
41.00		.35		N/A		N/A
52.95		.50				
53.00		.45				
64.00		.37				
75.95		.56				
Sidetone	YES N/A	NO				
Dial Lamp	YES ✓	NO				
			R442	Serial	#7885	
30.00		1.1		42		29.999
41.00		1.1		44		40.999
52.95		.80		36		52.949
53.00		.95		42		52.999
64.00		.95		31		64.000
75.95		.85		36		75.950
Sidetone	YES ✓	NO				
Dial lamp	YES ✓	NO				

REMARKS:

DATE: | **SIGNATURE:** | **DATA SHEET NO. ___ OF ___**

ENVIRONMENTAL TEST LABORATORY TEST LOG

TEST NO. 84-6 DATE 6/25/84

CUSTOMER ORGAN. DRSEL-ED-SM PROJECT ENGINEER GF

TEST ENGINEER JVD TEST TECH. KJL

NOMENCLATURE MODEL RT524 VRC/R442, GM Mnt. SERIAL # 400722-7885

TEST CONDITIONS Powered 10 min/hr ROOM TEMP:

DESCRIPTION Sine Vibra., X axis

DATE	TIME	EVENT	INITIAL
6/25/84		Pre-test, electrical chk OK	
	1355	BEGIN X-AXIS TEST	
		RCVRS ON	
		RCVR SENS: R-442 : .4 μV	
		RT524 : .84 μV	
	1405	XMTR ON	
	1406	XMTR OFF	
		XMTR POWER: 44 watts	
		@ 41 MHZ.	JVD.
	1455	RCVRS ON.	
		RCVR SENS R442 .4 μV	
		RT524 .84 μV	
		@ 41 MHZ.	
	1505	XMTR ON	
		POWER OUT: 44 watts	
	1555	RCVRS ON	

REMARKS: SEE DATA SHEET NUMBER _____

ENVIRONMENTAL TEST LABORATORY TEST LOG

TEST NO. 84-6 DATE 6/25

CUSTOMER ORGAN. ORSEL ED SM PROJECT ENGINEER GF

TEST ENGINEER JVD TEST TECH. KSL

NOMENCLATURE MODEL RT 524 / R442 / GM Mnt. SERIAL # 40032 7885

TEST CONDITIONS Powered 10 min/hr ROOM TEMP:

DESCRIPTION Sine Vibra., X-AXIS

DATE	TIME	EVENT	INITIAL
6/25/84	1555	Rcvr Sens: R442 - .4 μv	
		RT 524 - .84 μv	
	1605	XMTR on	
		Power out: 44 watts	
	1606	Power off	
	1645	Test interrupted after	
		28 completed sweeps @ 5 Hz.	
6/26/84	0832	test resumed *	
		Radio Check: RT-524 RCVR Sens.: .76 μv	
		XMTR out pwr: 44 watts	
		Freq. accuracy: 40.999 (@ 41 MHZ)	MHZ
		Receiver bangs loudly (either shock isolators are bottoming or unit is banging against side of bracket.)	±

REMARKS: SEE DATA SHEET NUMBER 0845 HRS TEST END.

* R-442 has problems: RCVR sensitivity is ~~bad~~ no good (all channels)
also, squelch is broken (does not function): only static is heard.
RCVR Audio & Squelch Pre-amp assy Module is bad.

± Banging is severest between 9-15 Hz.

TEST DATA SHEET

TEST ITEM: AN/VRC-12 FM-Mount | **PERFORMED BY:** [illegible]

TYPE OF TEST: Post Test X-Axis Vib. | **TEST NO:** 24-9

FREQ Dial setting (MHz)		Reciever sensitivity Old squelch (μv)		Power output (watts)		output Frequency (MHz
30.00		.65		43		29.999
41.00		1.1		44		40.999
52.95		.45		36		52.949
53.00		.9		42		53.000
64.00		.8		30		64.000
75.95		.4		35		75.950
Sidetone	OK		RT-524	Serial	#40032	
Dial lamp	OK					
	RCVR	R-442	Serial	#7885		
	SQUELCH CIRCUIT INOPERABLE					
	Extremely Poor sensitivity all channels (> 5μv)					

REMARKS:

DATE: 26 June 84 | **SIGNATURE:** [signature] | **DATA SHEET NO.** ___ **OF** ___

ENVIRONMENTAL TEST LABORATORY TEST LOG

TEST NO. 84-6 DATE 15 May 84

CUSTOMER ORGAN. DRSEL-ED-SM PROJECT ENGINEER G. Finke

TEST ENGINEER J. Dente TEST TECH. K. LaSala

NOMENCLATURE MODEL AN/VRC-12 // FT. CARS, BRACKET SERIAL # 64010 40032

TEST CONDITIONS Powered 10 min/hr. ROOM TEMP: 70°F

DESCRIPTION 1.5 G. Sine Vibr., modified

Y-AXIS Mil-810C - Meth 516.2, Proced. VIII

Curve V, modified (cut off @ ½" D.A.)

DATE	TIME	EVENT	INITIAL
5/15/84	1409	⅓ Level (0.5 G) sweep START	
		(preliminary) mild chattering	
		at 14 Hz, 29 Hz. Radio is	
		operational for last ⅔ of sweep	
	1421	5-200-5 Hz. END SWEEP *	JD.
5/15	1443	⅔ level (1.0 G) sweep START	
	1455	END SWEEP - ‡	
5/15	1515	FULL LEVEL sweep start (1.5 G)	
	1527	END SWEEP.	

REMARKS: SEE DATA SHEET NUMBER _____

* RADIO HAS PROBLEMS: RECVR SENSITIVITY HAS APPARENTLY INCREASED BY FACTOR OF 10.

‡ VOICE DID NOT BREAK UP DURING SWEEP

RT524 DIAL SETTING 64.00 MHZ RESULTS IN ACTUAL OUTPUT FREQ. OF 63.0 - 64.0

TEST DATA SHEET

TEST ITEM: AN/ARC-12 | **PERFORMED BY:** K. Lessig

TYPE OF TEST: FIRST PRELIM. SWEEP. | **TEST NO:**

FREQ DIAL Setting (MHZ)	RECVR SENS. w 30% modulation (μv) AFTER	Reciever Sensitivity CW (μv) BEFORE AFTER	Power out (WATTS)	Power out (watts) BEFORE	OUTPUT Frequency (MHZ) AFTER	OUTPUT Frequency (MHZ) BEFORE
30.00	5.1	.3	34	41	30.0	30.08
41.00	5.0	.38	36	40	40.99	41.00
52.95	6.0	.5	28	36	52.95	52.95
53.00	5.1	.46	30	35	53.00	53.00
64.00	4.0	.3	24	28	62.4-64.0	63.80
75.95	2.8	.36	21	28	75.95	76.05
	RCVR sens 90% Mod	RCVR sens CW				
30.00	5.0μv	1.4μv				
41.00	4.6μv	1.6μv				
52.95	5.8μv	1.6μv				
53.00	5.0μv	1.6μv				
64.00	4.0μv	1.0μv				
75.95	3.1μv	.54μv				

REMARKS: RT-524 serial # 40032

DATE: 5/15/84 | **SIGNATURE:** [signature] | **DATA SHEET NO.** ___ **OF** ___

ENVIRONMENTAL TEST LABORATORY TEST LOG

TEST NO. 84-6 DATE 5/17/84

CUSTOMER ORGAN. DRSEL-ED-SM PROJECT ENGINEER G. FISKE

TEST ENGINEER J. DENTE TEST TECH. K. LASALA

NOMENCLATURE MODEL AN/VRC-12 RADIOS SERIAL # 40032 46894 * (RT524)

TEST CONDITIONS #1 RADIO POWERED, #2 UNPR ROOM TEMP:

DESCRIPTION SINE VIBRATION, USING 2 ea RT-524 RADIOS VERTICAL DIRECTION (Y-AXIS), PRELIMINARY SWEEPS. RUBBER PADS PLACED BETWEEN MOUNTS & BRACKET.

DATE	TIME	EVENT	INITIAL
5/17/84	1023	1/3 Level (0.5 G) SWEEP START.	JD.
		RADIOS ~~is~~ are quiet (chattering is eliminated by rubber pads under mounts.	
	1035	END SWEEP NO damage observed	
	1040	3/3 Level (1.0 G) SWEEP START.	
		Displacement of old mount is greater than that of new mount.	
		no chattering. Max Resonance	
		occurs between 11 Hz and 28 Hz	
	1052	END Sweep	
		ELECTRICAL TEST PERFORMED	
		BOTH RADIOS CHECK OK	

*REMARKS: SEE DATA SHEET NUMBER _____

MOUNT S/N 58978B (W/ RADIO S/N 46894) (RADIO # 2)(OLD MOUNT)

MOUNT S/N 56303B (W/ RADIO S/N 40032) (RADIO # 1)(NEW MOUNT)

OLD MOUNT HAS 3/8" MORE CLEARANCE WITH BOTTOM OF RADIO THAN NEW MOUNT TO ALLOW FOR ADDITION OF J-BOX.

RADIO #1 IS FULLY OPERATIONAL BEFORE TEST

RADIO #2 DOES NOT TRANSMIT IN B-BAND.

TEST DATA SHEET

TEST ITEM: AN/VRC-12/FT. CARSON BRACKET | **PERFORMED BY:** K. Zaleski

TYPE OF TEST: Y-Axis Pre-Test Sine Vib. 2 Radios, Prelim sweep | **TEST NO:** 84-6

FREQ DIAL SETTING (MHZ)		RCVR SENSITIVITY (μv)		POWER OUT (Watts)		output Frequency (CMHZ)
30,00		1.5		36		30.000
41,00		1.0		38		41,000
52,95		1.1		30		52,950 ③
53,00		.66		32		52,999
64,00		1.0		28		64,000
75,95		.62		23		75,950
SideTone	YES ✓	NO		0900	HRS 17 MAY 84	
Dial lamp	YES ✓	NO				
		RT-524	Serial	#40032		
		D.C.	Input to	Radio -	25.0 vdc	
30,00		*		41		29,998
41,00		.58		9,5		40.999
52,95		.95		12.0		52,950
53,00		.80 ①		0 ②		— ②
64,00		.68		0 ②		— ②
75,95		.40		0 ②		— ②
Sidetone	YES ✓	NO		1000 HRS	17 MAY	84
Dial lamp	YES ✓	NO				
		RT-524	Serial	# 46894		
		D.C	Input to	Radio -	25,0 vdc	

REMARKS: * Reciever call lamp illuminates without appling input signal.
① 3-ev scale
② B Band has no output power across band.
③ OUTPUT Frequency would drift on every channel tested.

DATE: 17 MAY 84 | **SIGNATURE:** Karl J. Zaleski | **DATA SHEET NO.** ___ **OF** ___

TEST DATA SHEET

TEST ITEM: AN/VRC-12	PERFORMED BY: K. LaSala
TYPE OF TEST: Y-Axis Post Test Sine Vib. 2 Radios, Prelim sweep	TEST NO: 84-6

FREQ DIAL SETTING (MHZ)		RECIEVER Sensitivity OLD SQUELCH (μv)		Power output (WATTS)		OUTPUT Frequency (MHZ)	
30.00		1.6		46		30.000	↑
41.00		1.1		36		41.000	①
52.95		1.2		30		52.940	①
53.00		1.3		32		53.000	①
64.00		1.0		26		64.000	①
75.95		.64		24		75.950	↓
Sidetone	YES ✓	NO		1055 HS	17 MAY 84		
Dial lamp	YES ✓	NO					
		RT-524 D.C	Serial input to	#40032 Radio	25.0 vdc		
30.00		*		40		29.998	
41.00		.6		9		40.999	
52.95		.4 ③		13		52.950	
53.00		.6 ③		0 ②		— ②	
64.00		.73		0 ②		— ②	
75.95		.38		0 ②		— ②	
Sidetone	YES ✓	NO					
Dial lamp	YES ✓	NO					

REMARKS: ① OUTPUT Frequency would drift on every channel tested,
② No Power out on band B
③ ON 3mv scale Reciever call lamp illuminates without appling input signal
* Reciever call lamp illuminates without appling input signal

DATE: 17 MAY 84	SIGNATURE: Ralph LaSala	DATA SHEET NO. ___ OF ___

R ORGAN. DRSEL-ED SM — DATE 5/17/84

GINEER J. DENTE — PROJECT ENGINEER ~~J. DENT~~ G. FISA

LATURE MODEL AN/VRC-12 — TEST TECH. K. LASALA

ONDITIONS #1 POWERED, #2 UNPWRD. — RADIOS SERIAL # 40032 (#1) 46894 (#2)

TION SINE VIBRATION — ROOM TEMP:

5) 1.5 G, W/(RUBBER FOAM PADS. — 2 RADIOS, VERT. DIR. (RT-524 RADIOS

	TIME	EVENT	INITIA
/84	1144	FULL LEVEL TEST START	
	1230	Y-AXIS, #1 RADIO CHK: 32 watts)	12:3
		NO CHATTERING HEARD 5336 HZ S	
		RECIVER; CONSTANTLY ON (SENS-	
		ITIVITY CANNOT BE CHECKED).	
	1324	3240 watts, 53 HZ RADIO CHECK	
		RADIO #1 BANGING AGAINST ITS	
		MOUNT AT LOW FREQUENCY -	
		ADDITIONAL RUBBER PAD PLACED	
		UNDER RADIO TO PREVENT DAMAGE.	
	1425	32 Watts @ 53HZ Radio Check	
	1445	Y-AXIS TEST END; OBVIOUS	
		DAMAGE: ONE HANDLE ON	
		RADIO #1 HAS COME OFF,	
		(IT WAS LOOSE AT START OF TEST)	
		PERFORMANCE TEST RESULTS: OK	

S: SEE DATA SHEET NUMBER

TEST DATA SHEET

TEST ITEM: AN/VRC-12 | **PERFORMED BY:** K. LaSalle

TYPE OF TEST: Y-AXIS Post Test Sine Vib 1.5g 3hr. | **TEST NO:** 84-6

FREQ DIAL SETTING (MHZ)		RECIEVER Sensitivity OLD SQUELCH (μv)		Power output (WATTS)		OUTPUT Freqency (MHZ)
30.00		1.8		30		29.995
41.00		1.2		38		40.994
52.95		1.8		37		52.945
53.00		1.3		32		53.004
64.00		1.0		26		64.005
75.95		.6		24		75.953
Sidetone	YES ✓	NO		1450 HRS	17 MAY	84
Dial Lamp	YES ✓	NO				
		RT-524	Serial	# 40032		
		D.C	input to	Radio -	25.0 vdc	
30.00		*		32		29.999
41.00		.52		12		40.999
52.95		.92		14		52.950
53.00		1.0		0 ②		— ②
64.00		.6		0 ②		— ②
75.95		.28		0 ②		— ②
					1510 HRS	17 MAY 84
Sidetone	YES ✓	NO		RT 524	Serial #	46894
Dial lamp	YES ✓	NO		D.C	Input to	radio — 25.0 vdc

① ↑ ↓

REMARKS: ① FREQ output drifts all channels tested
② No power out B BAND
* CALL LAMP illuminated with no input

DATE: 17 MAY 84 | **SIGNATURE:** Karl D. LaSalle | **DATA SHEET NO.** ___ **OF** ___

TEST DATA SHEET

TEST ITEM: AN/VRC-12	PERFORMED BY: K. LaSalle
TYPE OF TEST: Y-AXIS Post Test Sine Vib 1.5g 3hr.	TEST NO: 84-6

FREQ DIAL SETTING (MHZ)		RECIEVER Sensitivity OLD SQUELCH (μv)		Power output (WATTS)		OUTPUT Freqvency (MHZ)	
30.00		1.8		30		29.995	↑ ①
41.00		1.2		38		40.994	
52.95		1.8		37		52.945	
53.00		1.3		32		53.004	
64.00		1.0		26		64.005	
75.95		.6		24		75.953	↓
Sidetone	YES ✓	NO		1450 HRS	17 MAY	84	
Dial Lamp	YES ✓	NO					
		RT-524	Serial	# 40032			
		D.C	input to	Radio -	25.0 vdc		
30.00		*		32		29.999	
41.00		.52		12		40.999	
52.95		.92		14		52.950	
53.00		1.0		0 ②		—	②
64.00		.6		0 ②		—	②
75.95		.28		0 ②		—	②
					1510 HRS	17 MAY 84	
Sidetone	YES ✓	NO		RT 524	Serial #	46894	
Dial lamp	YES ✓	NO		D.C	Input to	radio —	25.0 vdc

REMARKS: ① FREQ output drifts all channels tested
② NO power out B BAND
* CALL LAMP illuminated with no input

DATE: 17 MAY 84	SIGNATURE: Karl LaSalle	DATA SHEET NO. ___ OF ___

ENVIRONMENTAL TEST LABORATORY TEST LOG

TEST NO. 84-6 DATE 5/18/84

CUSTOMER ORGAN. DRSEL-ED SM PROJECT ENGINEER G. FISKE

TEST ENGINEER J. DENTE TEST TECH. K. LASALA

NOMENCLATURE MODEL AN/VRC-12 RADIOS SERIAL # 40032 & 894 (#1 #2)

TEST CONDITIONS SINE VIBE., 2 RT-524's ROOM TEMP: 62°F

DESCRIPTION CURVE V, MODIFIED, TRANSVERSE (SIDE-TO-SIDE DIRECTION) AXIS, (X-AXIS), W VIB-X PADS UNDER MOUNTS.

DATE	TIME	EVENT	INITIAL
5/18/84		FULL LEVEL TEST ~~START~~	JD
		X-AXIS ELECTRICAL PRECHECK:	
	1100	#1 RADIO CHECK: 53 MHZ, 32 WATTS	
		(OK) RECVR SENSITIVITY: 1.3 μV.	
		#2 RADIO CHECK RCVR SENS @	
		41 MHZ .75 μV; XMTR PWR: 8 WATTS	
		@ 41 MHZ.	
	1105	X-AXIS TEST START	
	##	SEVEREST RESONANCE OCCURS	
		BETWEEN 15 HZ & 22 HZ.	
	1125	SHOCK MOUNTS SHOW SIGNS OF	
		WEAR: RUBBER PARTICLES VISIBLE	
		#1 RADIO CHECK: RECVR SENS. 1.5 μV	
		@ 53 MHZ; XMTR POWER: 32 WATTS @	
		53 MHZ; #2 RADIO CHECK: RCVR.	
		SENS: @ 41 MHZ 1.7 μV, XMTR PWR 8.5	

REMARKS: SEE DATA SHEET NUMBER _____ Watts @ 41 MHZ.

ENVIRONMENTAL TEST LABORATORY TEST LOG

TEST NO. 84-6 DATE 5/18/84

CUSTOMER ORGAN. DRSEL-ED-SM PROJECT ENGINEER G. FISKE

TEST ENGINEER J. DENTE TEST TECH. KJL.

NOMENCLATURE MODEL AN/VRC-12 SERIAL # #1 #2

TEST CONDITIONS ROOM TEMP: 62°F

DESCRIPTION 1.5 G SINE VIBE - X AXIS

DATE	TIME	EVENT	INITIAL
5/18/84	1245	#2 RADIO CHK: RECVR SENS: 1.1 μV	JD
		@ 41 MHZ; OUTPUT PWR 9 watts	
		@ 41 MHZ.	
		#1 RADIO CHK: RECVR. SENS: 1.3μV	
		@ 53 MHZ	
		; OUTPUT PWR: 34 watts	
		@ 53HZ.	JD
	1350	#1 RADIO CHK: RECVR SENS: 1.2	
		μV @ 53 MHZ; XMTR POWER	
		32 watts @ 53MHZ.	
		#2 RADIO CHK: RECVR SENS: 1.3μ	
		μV @ 41 MHZ; OUTPUT PWR 9 watts	
		@ 41 MHZ.	
		Shock mounts are bottoming	
		at low frequencies. Rubber	
		particles have come off shock mounts.	

REMARKS: SEE DATA SHEET NUMBER _____

one rubber pad has come out from under Radio #2.

1407 HRS: TEST END, (X-AXIS).

POST TEST ELECTRICAL TEST:

RADIO #2: (OK) W/ some high sensitivity readings

RADIO #1: (OK) W/ " " " "

No mechanical damage is obvious, ~~ess~~ except for rubber worn from shock mounts.

TEST DATA SHEET

TEST ITEM: AN/VRC-12 | **PERFORMED BY:** K. LaSalle

TYPE OF TEST: X-AXIS Post test Sine Vib 1.5g 3HR. | **TEST NO:** 84-6

FREQ DIAL SETTING (MHZ)		RECIEVER Sensitivity OLD SQUELCH (μV)		Power output (WATTS)		OUTPUT Freqvency (MHZ)
30.00		3μv (4)		33		29.998
41.00		2.7 (4)		38		40.999
52.95		1.2 (4)		31		52.949
53.00		1.2μv (3)		33		52.999
64.00		1.6 (4)		26		63.999
75.95		.86		24		75.951
Sidetone	YES ✓	NO		1411 HRS	18 MAY 84	
Dial lamp	YES ✓	NO				
			Rt-524	Serial #	40032	
			D.C. Input to Radio - 25.0			vdc
30.00		1.7 (4)		40		29.998
41.00		1.4 (4)		11		40.999
52.95		2.5μv (4)		14		52.950
53.00		3.0 (4)		0 (1)		— (1)
64.00		1.0 (4)		0 (1)		— (1)
75.95		.5		0 (1)		— (1)
Sidetone	YES ✓	NO		1430 HRS	18 MAY 84	
Dial lamp	YES ✓	NO		Rt-524	Serial #	46894
				D.C input	to Radio -	25.0 vdc

(2) ↑ ↓

REMARKS: (1) NO Power out BAND B.
(2) Frequency output drifts
(3) ON 10μv RANGE
(4) ON 3μv RANGE

DATE: 18 MAY 84 | **SIGNATURE:** K. LaSalle | **DATA SHEET NO.** ___ **OF** ___

CUSTOMER ORGAN. ~~DEL~~ ORSEL-ED-SM | DATE 5/21/84

TEST ENGINEER J. DENTE | PROJECT ENGINEER G. FISKE

NOMENCLATURE MODEL AN/VRC-12 | TEST TECH. KJL

TEST CONDITIONS RADIOS | SERIAL # #1 #2

DESCRIPTION 1.5 G SINE VIBE | ROOM TEMP: 64°F

OF ~~BE~~ VEHICLE) - Z AXIS (FRONT-TO-RACK

DATE	TIME	EVENT	INITIAL
5/21/84	1100	#1 RADIO CHECK OK	JD
		#2 RADIO CHECK OK	JD
	1134	Z-AXIS VIBRATION, TEST START. BRACKET MOVES RELATIVE TO TEST FIXTURE (SLIDING ON FOAM PADS) FROM 7-11 HZ - DISPLACEMENT OF ≈ ½ DA. FOAM PAD IS WEARING AWAY.	
	1200	BRACKET BOLTS WERE LOOSE, WERE TIGHTENED.	
	1211	TEST ABORTED AFTER 6 SWEEPS @ 12 HZ. TO REPLACE PADS ON FIXTURE.	
	1259	RESUME TEST, W VIB-X PADS ON FIXTURE	
	1300	# ABORT.	

REMARKS: SEE DATA SHEET NUMBER

ENVIRONMENTAL TEST LABORATORY TEST LOG

TEST NO. 84-6 DATE 5/21/84

CUSTOMER ORGAN. DRSEL-ED-SM PROJECT ENGINEER G. FISKE

TEST ENGINEER J. DENTE TEST TECH. K J. L

NOMENCLATURE MODEL AN/VRC-12 RADIOS SERIAL # #1 #2

TEST CONDITIONS EACH RECVR IS POWERED HALF THE TIME ROOM TEMP:

DESCRIPTION 1.5 G SINE VIBE - Z-AXIS (FRONT TO BACK.)

DATE	TIME	EVENT	INITIAL
~~1312~~	1312	RESUME TEST.	
5/21/84	1313	ABORT - PADS ARE POPPING OUT.	
	1334	RESUME TEST.	
	1334	ABORT	
	1350	RADIO CHECK #1 OK	
		RADIO CHECK #2 OK	
	1357	RESUME TEST, COMPUTER	
		STARTED CYCLE NEW. 1 HR 11 MIN-	
		UTES OF TESTING COMPLETED.	
		1 HR, 49 MIN. TO GO.	
	1400	ABORT TEST, BOLTS LOOSE	
	1417	RESUME TEST.	
	1500	RADIO CHECK #1 OK #2 OK	
	1505	TEST ABORT - CHANNEL OPEN	
	1514	RESUME TEST	
	1604	TEST END	

REMARKS: SEE DATA SHEET NUMBER _____

TEST DATA SHEET

TEST ITEM: AN/VRC-12 | **PERFORMED BY:** K. LaSala

TYPE OF TEST: Pre-Test Z-Axis Sine Vib. 1.5g 3hr | **TEST NO:** 84-6

FREQ DIAL SETTING (MHZ)		RECIEVER Sensitivity OLD SQUELCH (μv)		Power output (WATTS)		OUTPUT Freqvency (MHZ)
30.00		2.7 ②		38		30.000
41.00		2.4 ②		38		41.000
52.95		1 ①		30		52.950
53.00		1.2 ①		32		53.000
64.00		1.7 ②		28		64.000
75.95		.82		24		75.950
Sidetone	YES ✓	NO				
Dial Lamp	YES ✓	NO		0925	21 MAY 84	
			RT-524	Serial #	40032	
			D.C.	Input to	RADIO	25.0 vdc
30.00		1.5 ②		44		29.999
41.00		1.3 ②		9		40.999
52.95		2.3 ②		12		52.950
53.00		3.0 ②		0		— ④
64.00		1.0 ②		0		— ④
75.95		.54		0		— ④
Sidetone	YES ✓	NO		0940	21 MAY 84	
Dial lamp	YES ✓	NO	RT-524	SN	46894	
			D.C.	Input to	Radio -	25.0 vdc

③

REMARKS: ① on 10μv range
② on 3μv range
③ Output Freqvency drifts
④ NO Power out B-BAND

DATE: 21 MAY 84 | **SIGNATURE:** Karl L. LaSala | **DATA SHEET NO.** ___ **OF** ___

TEST DATA SHEET

TEST ITEM: AN/VRC-12 | **PERFORMED BY:** K. LaSalle

TYPE OF TEST: Post Test Z-AXIS Sine V.b, 2 Radios, 1 Sq | **TEST NO:** 84-6

FREQ DIAL SETTING (MHZ)		RECIEVER Sensitivity OLD SQUELCH (μv)		Power output (WATTS)		OUTPUT Freqency (MHZ)
30.00		2.9 (1)		38		30.000
41.00		2.3 (1)		38		41.000
52.95		1.4 (2)		31		52.950
53.00		1.4 (2)		32		53.000
64.00		1.8 (1)		26		64.000
75.95		.95		24		75.950
Sidetone	YES ✓	NO				
Dial lamp	YES ✓	NO				
			22 MAY	84 0800		
			RT-524	Serial #	40032	
			D.C. Input to Radio	-25.0		vdc
30.00		1.8 (1)		40		29.999
41.00		1.2 (1)		10		40.999
52.95		2.0 (1)		12		52.950
53.00		2.4 (1)		0 (4)		— (4)
64.00		1.0 (1)		0 (4)		— (4)
75.95		.40		0 (4)		— (4)
Sidetone	YES ✓	NO	22 MAY	84 0830		
Dial lamp	YES ✓	NO		RT-524	Serial #	46894
				D.C. Input to Radio	25.0	

(3) output Frequency drifts

REMARKS: (1) on 3av RANGE
(2) on 10av RANGE
(3) output Frequency drifts

DATE: 22 MAY 84 | **SIGNATURE:** Karl J. LaSalle | **DATA SHEET NO.** ___ **OF** ___

APPENDIX B

SHAPED PULSE SHOCK TEST DATA SHEETS

ENVIRONMENTAL TEST LABORATORY TEST LOG

TEST NO. 84-6 DATE 18 JULY 84

CUSTOMER ORGAN. DRSEL-ED SM PROJECT ENGINEER G. FISKE

TEST ENGINEER JVD TEST TECH. TE

NOMENCLATURE MODEL AN/IRC-12 / GM BRACK. SERIAL # (RT) 40032 ; (R) 7885

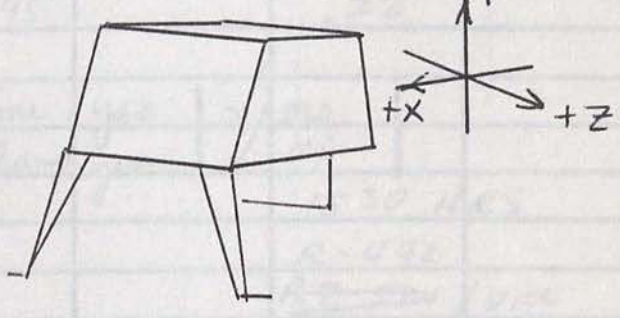
TEST CONDITIONS UNPOWERED ROOM TEMP:

DESCRIPTION 20 G. T.P. SAWTOOTH, BASIS DESIGN SHOCK.

DATE	TIME		EVENT		INITIAL
7/18/84	0830	+Y AXIS,	SHOCK #1		JVD
	835		SHOCK #2		JVD
	843		SHOCK #3	11.17	JVD
	955	-Y AXIS	SHOCK #1	19.0G, 11MSEC	
	1008		#2		
	1012		#3	18.5G, 11.68MSEC	
	1053	-Z AXIS	SHOCK #1		
	1116		#2		
	1204		#3	19.5G, 11.57 MSEC	
	1226	+Z AXIS	SHOCK #1		
	1237		#2		
	1245		#3	18.6G,	11.71 MSEC
	1303	+X AXIS	SHOCK #1		
	1304		SHOCK #2		
	1306		#3	20.7G,	12.46 MSEC
	1443	-X AXIS	SHOCK #1		

REMARKS: SEE DATA SHEET NUMBER 1458 HRS. SHOCK #2

1504 HRS SHOCK #3 18.8G, 11.29 MSEC (PLOT MADE)



TEST DATA SHEET

TEST ITEM: AN/VRC-12 Radios ~~FT~~ GM ~~CARSON~~ MOUNT **PERFORMED BY:** JVD

TYPE OF TEST: Elect. Performance ~~HUMIDITY~~ PRE-SHOCK **TEST NO:** 84-6

(MHz) Freq. Dial Setting		RCVR Sensitivity Odd Squelch (μV)		Power Output (watts)		Output Frequency (MHz)
30.00		.60		40		29.999
41.00		.68		43		40.999
52.95		.32		37		52.949
53.00		.53		42		53.000
64.00		.53		32		64.000
75.95		.35		37		75.950
Sidetone	yes ✓	NO				
Dial lamp	yes ✓	NO				
		RT-524	VRC SERIAL #		40032	
		DC INPUT TO RADIO:			25.0 V	
		1400 HRS 7/17				
30.00		.33 ~~.22~~				
41.00		.25				
52.95		.22				
53.00		.37				
64.00		.39				
75.95		.22				
Sidetone	yes ✓	no				
Dial lamp	yes ✓	no				
		1530 HRS				
		R-442				
		~~RT-524~~	VRC SERIAL #		7885	
			DC INPUT: 25.0		V	

REMARKS:

DATE: 7/17/84 **SIGNATURE:** **DATA SHEET NO.** ___ **OF** ___

TEST DATA SHEET

TEST ITEM: AN/VRC-12 Radios GM Mount	**PERFORMED BY:** JVD
TYPE OF TEST: Elect. Performance Post-Shock	**TEST NO:** 84-6

(MHz) Freq. Dial Setting			RCVR Sensitivity 0dB Squelch (μV)		Power Output (watts)		Output Frequency (MHz)
30.00			.40		35		29.999
41.00			.55		43		40.999
52.95			.30		35		52.950
53.00			.44		41		53.000
64.00			.48		31		64.000
75.45			.34		35		75.950
Sidetone	yes	✓	NO				
Dial lamp	yes	✓	NO				
			RT-524 S/N		40032		
			DC INPUT TO RADIO:			25.0 V	
			1617 HRS 7/18/84				
30.00			.36				
41.00			.25				
52.95			.34				
53.00			.41				
64.00			.38				
75.95			.28				
Sidetone	yes	✓	no				
Dial lamp	yes	✓	no				
			R-442 S/N		7885		
			DC INPUT:		25.0 V		
			1632 HRS 7/18/84				

REMARKS:

DATE: 7/18/84	**SIGNATURE:** John V. Dento	**DATA SHEET NO.** ___ **OF** ___

ENVIRONMENTAL TEST LABORATORY TEST LOG

TEST NO. 84-6 DATE 7/19/84

CUSTOMER ORGAN. SKSEL-ED-SM PROJECT ENGINEER G. FISKE

TEST ENGINEER JVD TEST TECH. TE

NOMENCLATURE MODEL AN/VRC-12, FT. CARSON BRACKET SERIAL # 40032 46594

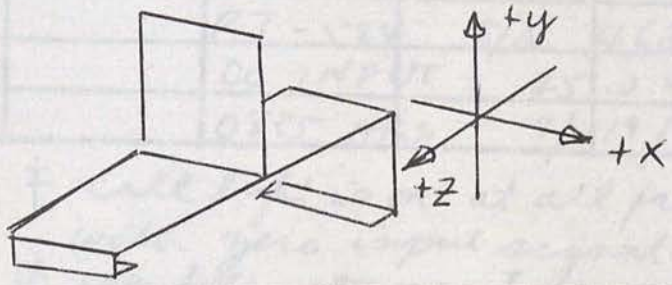
TEST CONDITIONS UNPOWRD. ROOM TEMP:

DESCRIPTION Shaped Pulse Shock, 20G, 11MSec

DATE	TIME		EVENT		INITIAL
7/19/84	1025	+Y AXIS	SHOCK #1	18.1 G's,	11.29 MSEC
	1033		SHOCK #2	18.6 G's	
	1050		SHOCK #3	19.25 G's	13.22 MSEC
	1313	-Y AXIS	SHOCK #1	19.25 G's	12.03 MSEC
	1320		#2	18.30 G's	12.73 MSEC
	1324		#3 *	19.53 G,	11.30 MSEC
	1417	-X AXIS	SHOCK #1	21.0 G	11.60 MSEC
	1421		#2	21.6 G	11.96 MSEC
	1425		#3	20.1 G	11.17 MSEC
	1440	+ X AXIS	SHOCK #1	18.6 G	11.21 MSEC
	1450		#2	18.1 G	10.90 MSEC
	1457		#3	18.0 G	10.82 MSEC
	1520	+Z AXIS	SHOCK #1	20.5 G	11.09 MSEC
	1528		#2	19.7 G	11.72 MSEC
	1530		#3	20.7 G	11.83
		-Z AXIS	#1	19.7 G	11.17
			#2	19.4 G	10.82
			** #3	19.7 G	11.01 MSEC

REMARKS: SEE DATA SHEET NUMBER _____

* MONTEREY TESTER SETTINGS:
475 PSI CHG. PRESS.
1000 PSI SEISMIC "
17" DROP HT.
TEST ITEM + FIXTURE WEIGHT:



** PLOT MADE

John Dente 7/19/84

TEST DATA SHEET

TEST ITEM: AN/VRC-12 Radios FT CARSON MNT	**PERFORMED BY:** JVD
TYPE OF TEST: Elect. Performance PRE-SHOCK	**TEST NO:** 84-6

(MHz) Freq. Dial Setting		RCVR Sensitivity Odd Squelch (μv)		Power Output (watts)		Output Frequency (MHz)
30.00						
41.00						
52.95		*		*		*
53.00						
64.00						
75.95						
Sidetone	yes	NO				
Dial Lamp	yes	NO				
		RT 524 S/N 40032				
	*	(SEE POST SHOCK FOR GM MOUNT TEST)				
30.00		‡		30 ①	①	29.999
41.00		‡		44 ①	①	40.999
52.95		‡		42 ①	①	52.950
53.00		‡		36 ①	①	53.001
64.00		‡		39 ①	①	64.001
75.95		‡		36 ①	①	75.952
Sidetone	yes	no	✓			
Dial Lamp	yes	✓ no				
		RT-524 S/N 46894				
		DC INPUT: 25.0 V				
		0835 HRS 7/19/84				

REMARKS: ‡ call light is on at all frequencies ~~without~~ with zero input signal.
① fan does not operate

DATE:	**SIGNATURE:**	**DATA SHEET NO.** ___ **OF** ___

TEST DATA SHEET

TEST ITEM: AN/VRC-12 Radios FT CARSON MOUNT	**PERFORMED BY:** JVD
TYPE OF TEST: Elect. Performance POST-SHOCK	**TEST NO:** 84-6

(MHz) Freq. Dial Setting		RCVR Sensitivity Odd Squelch (μV)		Power Output (watts)		Output Frequency (MHz)
30.00		.56		38 *		29.999
41.00		.56		43 *		41.000
52.95		.28		35 *		52.950
53.00		.46		42 *		53.000
64.00		.53		~~41~~ 34*		64.000
75.95		.30		35 *		75.950
Sidetone	yes ✓	NO				
Dial Lamp	yes ✓	NO				
		RT-524 S/N		40032		
		DC INPUT:		25.0 V		
		* Fan does not always ~~work~~ operate				
30.00		‡		32 *		29.999
41.00		‡		45 *		40.999
52.95		‡		42 *		52.950
53.00		‡		37 *		53.001
64.00		‡		39 *		64.001
75.95		‡		~~Ø~~ 31*		75.952
Sidetone	yes ✓	no	✓			
Dial Lamp	yes ✓	no				
		RT-524 S/N		48894		
		DC INPUT:		25.0 V.		

REMARKS:

‡ ~~Fan~~ Call light is on at ~~all~~ all frequencies with zero input signal.

* Fan does not operate

DATE: 7/19/84	**SIGNATURE:** John V Dento	**DATA SHEET NO.** ___ **OF** ___

APPENDIX C

THERMAL SURVEY DATA SHEETS

ENVIRONMENTAL TEST LABORATORY TEST LOG

TEST NO. 84-60 | DATE 6/15/84
CUSTOMER ORGAN. DRSEL-ED-SM | PROJECT ENGINEER G. FISKE
TEST ENGINEER J. DENTE | TEST TECH.
NOMENCLATURE MODEL RT-524/VRC | SERIAL # 46894
TEST CONDITIONS HORIZONTAL | ROOM TEMP:
DESCRIPTION RM. TEMP & THERMAL SURVEY
OPERATE 1HR, DUTY CYCLE: 10:1

DATE	TIME	EVENT	INITIAL
6/19/84 (201)	1113	INITIAL READINGS	
		T'COUPLE #1: 76.9°F	
		#2 77.8	
		#3 76.5	
		#4 76.5	
		(inside chamber) #5 78.5	
		(room temp) #6 77.2	
	1118	Radio turned on - 41MHZ,	
		low power, Old squelch	
	1128	Transmit at high power: watts	
		DC input: 25.6 Volts	
	11.28	Recvr. on.	
		Receiver sens. has gone up to	
		.96 μv (from .35 μv)	
		T'couple #1: 83.4°F	

REMARKS: SEE DATA SHEET NUMBER _____

RADIO HAS FUNCTIONS NORMALLY AFTER COOL-DOWN FROM 120°F TEST - UNEXPLAINED.

KEY!
T'COUPLE #1: TRANSISTOR Q9402
#2: PWR. TUBE (REAR OF CASE)
#3: CAPACITOR C9009
#4: TOP FRONT OF CASE, INSIDE.
#5: INSIDE CHAMBER

ENVIRONMENTAL TEST LABORATORY TEST LOG

TEST NO. 84-6 DATE 6/20/84

CUSTOMER ORGAN. DRSEL-ED-SM PROJECT ENGINEER G. FISKE

TEST ENGINEER JVD TEST TECH. KJL

NOMENCLATURE MODEL RT-524/VRC SERIAL # 46894

TEST CONDITIONS HORIZONTAL ROOM TEMP: 77.2 - 77.9 °F

DESCRIPTION ROOM TEMP THERMAL SURVEY.

DATE	TIME	EVENT	INITIAL
6/20	1151	Rcvr on.	
		t'couple #1 92.2°F	
		#2 102.8	
		#3 91.7	
		#4 83.3	
		* #5 84.7	
	1201	Transmit, out pwr: 45 watts	
	1202 ~~210~~	Rcvr on.	
		t'couple #1 95.1	
		#2 105.2	
		#3 95.1	
		#4 86.2	
		‡ #5 86.3	
	1212	transmit, out. pwr: watts	
	1213	Rcvr on	
		t couple #1 97.6	
		#2 107.6	
		#3 98.8	
		#4 87.9	
		⊕ #5 87.3	
		#6 77.9	

REMARKS: SEE DATA SHEET NUMBER _____

* Rcvr sens: .37 μv

‡ Rcvr sens: 2.1 μv.

⊕ Rcvr sens: 0.30 μv.

1218 HRS

END TEST.

ENVIRONMENTAL TEST LABORATORY TEST LOG

TEST NO. 84-6 DATE 6/24/84

CUSTOMER ORGAN. DRSEL-ED-SM PROJECT ENGINEER GF

TEST ENGINEER JD TEST TECH. KL

NOMENCLATURE MODEL RT-524/VRC SERIAL # 46894

TEST CONDITIONS VERTICAL ROOM TEMP: 75.9°F

DESCRIPTION ROOM TEMP. THERMAL SURVEY

DATE	TIME	EVENT	INITIAL
6/21/84	1347	INITIAL READINGS	
		T'COUPLE #1 74.7 °F	
		#2 74.5	
		#3 74.9	
		#4 75.0	
		INSIDE CHAMBER #5 75.6	
		ROOM TEMP #6 76.1	
	1357	RCVR ON; SUPPLY	
		VOLTAGE: 25.6 VDC.	
		RCVR SENS: .45 μV @ 41 MHz	
	1407	TRANSMITTER ON	
		OUTPUT PWR: 48 WATTS	
		T'COUPLE #1 83.9	
		#2 95.1	
		#3 84.4	
		#4 76.4	
		#5 82.0	
		#6 76.9	

REMARKS: SEE DATA SHEET NUMBER

ENVIRONMENTAL TEST LABORATORY TEST LOG

TEST NO. 84-6 DATE 6/21/84

CUSTOMER ORGAN. DRSEL-ED-SM PROJECT ENGINEER GF

TEST ENGINEER JVD TEST TECH. KJL

NOMENCLATURE MODEL RT-524/VRC SERIAL # 46894

TEST CONDITIONS VERT. ROOM TEMP:

DESCRIPTION Room Temp Therm. Survey

DATE	TIME	EVENT	INITIAL
6/21/84	1408	RCVR ON	
	"	RCVR SENS: .38 μV	
	1418	TRANSMITTER ON	
		OUT. PWR: 47.0 watts	
		T'COUPLE #1 87.0 °F	
		#2 97.5 °F	
		#3 87.7	
		#4 78.9	
		#5 82.6	
		#6 76.7	
	1419	RCVR ON	
		RCVR SENS: .47 μV	
	1429	TRANSMITTER ON	
		OUT. PWR. 47.0 watts	
		T'COUPLE #1 93.8 °F	
		#2 100.1	
		#3 90.4	
		#4 81.2	
		#5 85.6	
		#6 77.4	

REMARKS: SEE DATA SHEET NUMBER _____

ENVIRONMENTAL TEST LABORATORY TEST LOG

TEST NO. 84-6 DATE 6/21/84

CUSTOMER ORGAN. DRSEL-ED-SM PROJECT ENGINEER K GF

TEST ENGINEER JVD TEST TECH. KJL

NOMENCLATURE MODEL RT-524/VRC SERIAL # 46894

TEST CONDITIONS VERT. ROOM TEMP:

DESCRIPTION RM. TEMP. THERM. SURVEY

DATE	TIME	EVENT	INITIAL
6/21/84	1430	RCVR ON	
	"	RCVR SENS.: .45 μV	
	1440	TRANSMITTER ON	
		OUT. PWR.: watts	
		T'COUPLE #1 94.2	
		#2 103.0	
		#3 93.9	
		#4 84.3	
		#5 86.2	
		#6 77.1	
	1441	RCVR ON	
		RCVR SENS. .79μV	
	1447	END TEST	

REMARKS: SEE DATA SHEET NUMBER _____

TEST DATA SHEET

TEST ITEM: AN/VRC-12	PERFORMED BY: K. LaSalle
TYPE OF TEST: ELECTRICAL PERF.	TEST NO: 84-6

FREQ DIAL SETTING (MHZ)		RECIEVER Sensitivity OLD SQUELCH (μV)		Power output (WATTS)		OUTPUT Freqvency (MHZ)
30.00		.34		36		29.999
41.00		.35		47		40.999
52.95		.50		44		52.950
53.00		.47		39		53.001
64.00		.38		42		64.001
75.95		.28		36		75.952
Sidetone	YES ✓	NO				
Dial lamp	YES ✓	NO			RM TEMP: 80.4°F	
		RT-524/VRC		SN 46894		
		D.C. INPUT =		25.6 VOLTS		
		19 JUNE 84	20 JUNE	PRE-ROOM TEMP		TEST
					(HORIZONTAL)	
30.00		.40		33		29.999
41.00		.40		44		40.999
52.95		.55		44		52.950
53.00		.62		39		53.000
64.00		.50		41		64.000
75.95		.43		38		75.952
Sidetone	YES ✓	NO				
Dial lamp	YES	NO				
		21 JUNE 84		POST	ROOM TEMP (VERTICAL)	TEST

REMARKS:

DATE: 6/21/84 SIGNATURE: John V Dinto DATA SHEET NO. ___ OF ___