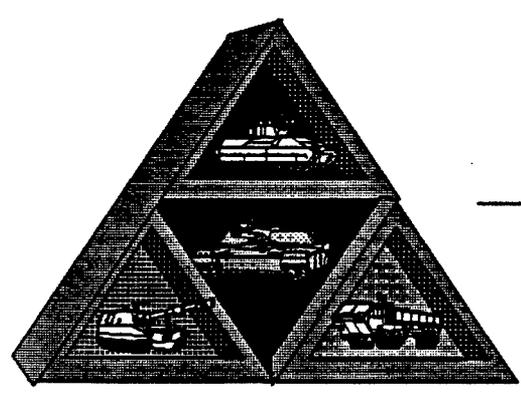


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TARDEC



Technical Report

No. 13572

MANNED DEMONSTRATION OF TARDEC's
CREW STATION/TURRET MOTION BASE SIMULATOR,
CUSTOMER DAY 1992

NOVEMBER 1992

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13. ABSTRACT (Maximum 200 words) This is a report documenting all manned tests done for Customer Day using the Crew Station/Turret Motion Base Simulator. This report details each test and is prepared for the Human Use Committee as part of the test protocol.			
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1.0. INTRODUCTION

The U.S. Army Tank-Automotive Research, Development and Engineering Center (TARDEC) has temporary safety certification from the U.S. Army Test-Evaluation Command (TECOM) for the Crew Station/Turret Motion Base Simulator (CS/TMBS). This certification allows the use of test subjects in the turret during simulation. For Customer Day (Sep. 16, 1992), the first simulations using test subjects were conducted at TARDEC on the CS/TMBS.

Prior to conducting a simulation using test subjects, approval for the test plan must be obtained from the Human Use Committee (HUC) and the commander of TARDEC. After approval was obtained, the test was conducted and this report, summarizing the test results, will be submitted to the HUC to finalize this test.

2.0. OBJECTIVE

The objective of this report is to summarize the results of the first manned simulation using the CS/TMBS. This report will be submitted to the Human Use Committee and describes the tests conducted, results and comments of the test subject. The tests were performed as part of TARDEC's Customer Day, held on September 16, 1992. The tests also include trial runs conducted during the week prior to Customer Day.

3.0. CONCLUSION

The tests were completed without incident to the test subject. A minor hardware problem was identified and fixed during the first preliminary run. No other problems were incurred.

4.0. RECOMMENDATIONS

The CS/TMBS is safe for human use. The large amount of safety precautions taken during the conception of the simulator has made it virtually hazardproof. The simulator can be used for a wide variety of testing ranging from light crew stations to heavy combat turrets. It provides an excellent alternative to field testing in certain cases.

5.0. DISCUSSION

All trial runs and the actual customer day test are listed below.

TEST #1

Date: 9/2/92

Time: 1300 hrs

Test Subject: Alexander Reid

Test Protocol: A simulation of the M1A1 traversing the cross-country course Leternou 4 located at the Waterways Experiment Station in Vicksburg, MS at 20 mph was used as the input signal to the CS/TMBS.

Comments: The test was not conducted because of a failure of the motion enable switch located in the turret. The switch was replaced, but no testing occurred this day.

TEST #2

Date: 9/8/92

Time: 0900 hrs

Test Subject: Alexander Reid

Test Protocol: A simulation of the M1A1 traversing the cross-country course Leternou 4 located at the Waterways Experiment Station in Vicksburg, MS at 20 mph was used as the input signal to the CS/TMBS.

Comments: The test went smoothly. It was run for about 10 minutes with no problems. The scenario is a little dull, so for the next test, a different scenario will be used.

TEST #3

Date: 9/14/92

Time: 1000 hrs

Test Subject: Alexander Reid

Test Protocol: A simulation of the M1A1 traversing the cross-country course APG IV located at the Aberdeen Proving Grounds at 10 mph was used as the input signal to the CS/TMBS.

Comments: This test also went smoothly. It was run for about 15 minutes with no problems. The scenario is a bit more exciting and challenging.

TEST #4

Date: 9/16/92

Time: 1000, 1030 and 1100 hrs

Test Subject: Alexander Reid

Test Protocol: A simulation of the M1A1 traversing the cross-country course APG IV located at the Aberdeen Proving Grounds at 10 mph was used as the input signal to the CS/TMBS.

Comments: These were the Customer Day runs. Each run lasted about three minutes and there were no problems encountered. The occupant remained atop the turret during the time in between runs.

TEST #5

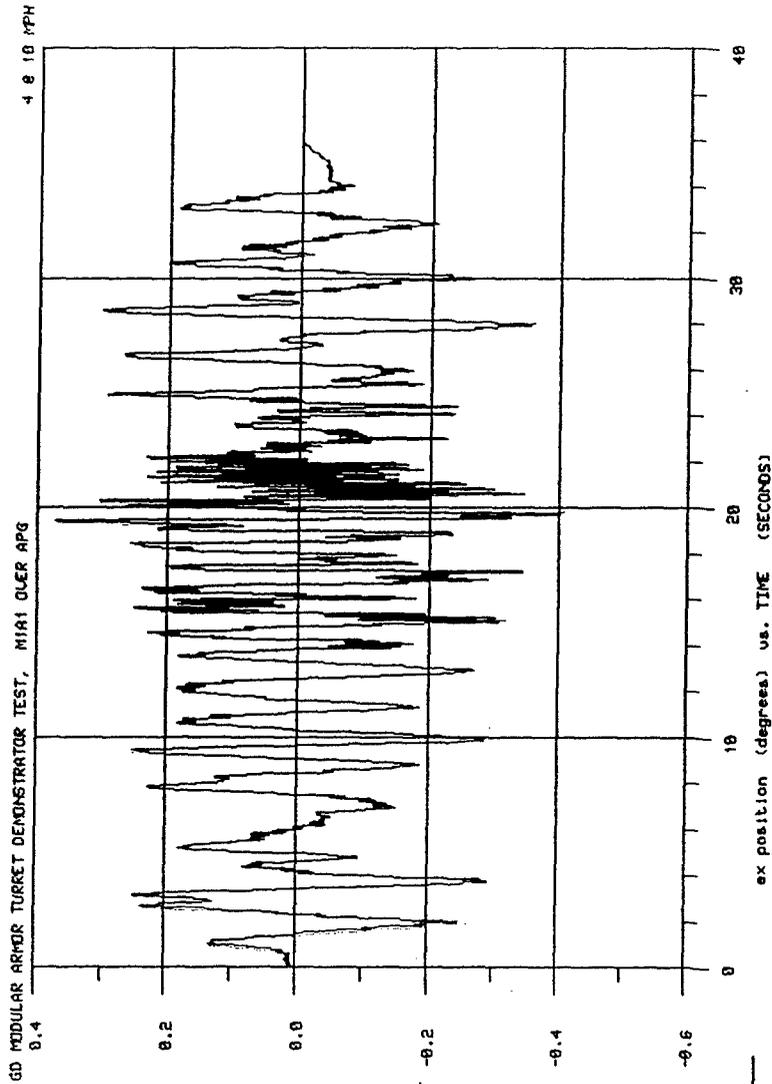
Date: 9/30/92

Comments: This was for a videotape made as part of the Customer Day runs. The run lasted about eight minutes and there were no problems encountered.

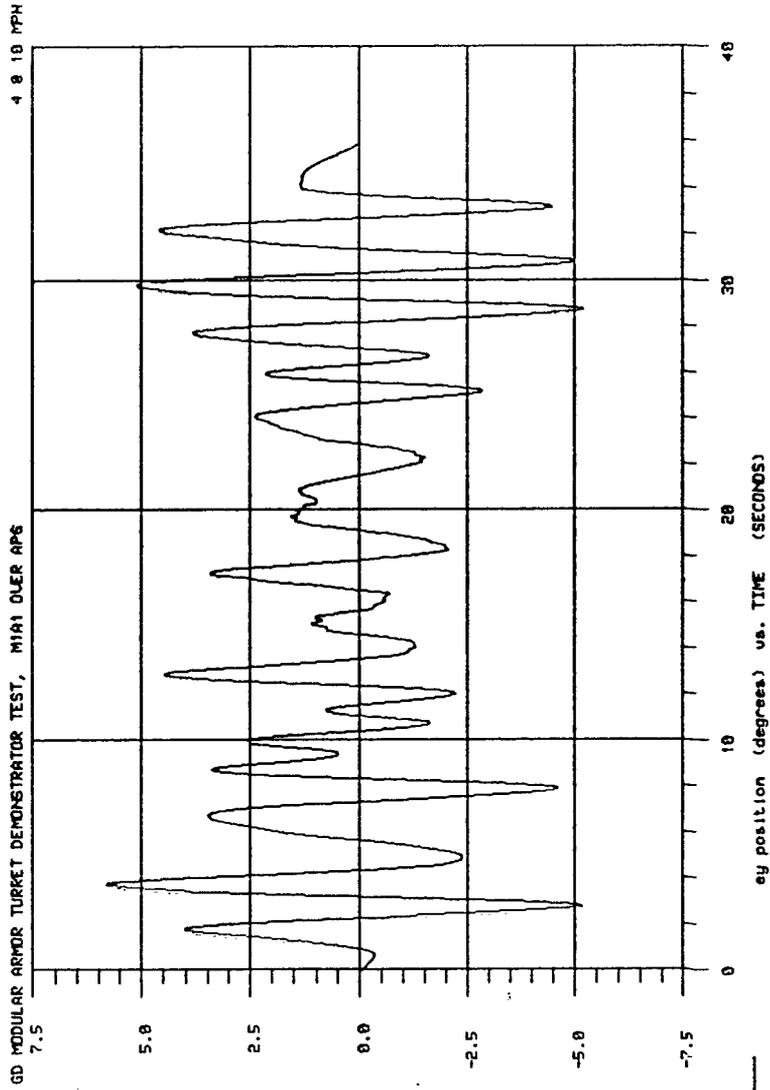
Appendix A contains position and acceleration plots of the dynamic scenarios used. As you can see, even the harsher APG IV courses at 10 mph only pulled 0.5 Gs of acceleration in vertical. In summary, through all testing, no problems were incurred. The test subject reported no ill effects from the runs and rather enjoyed himself during the testing.

APPENDIX A

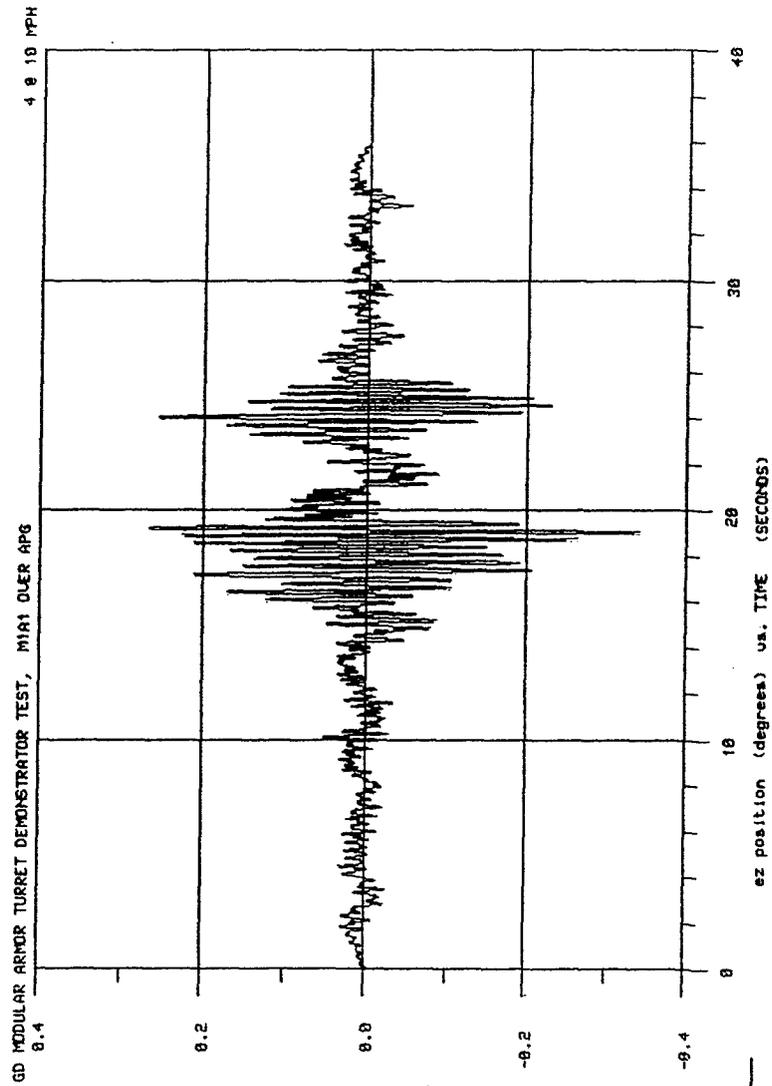
SCENARIO PLOTS



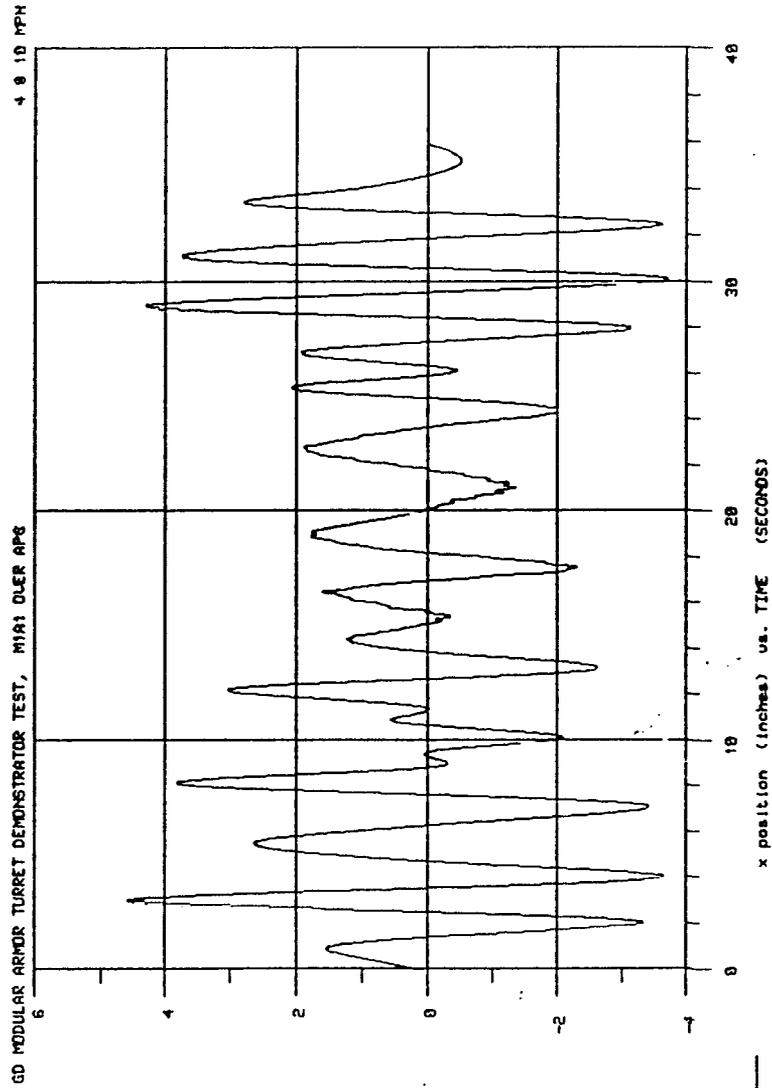
APG IV at 10 mph
ROLL position



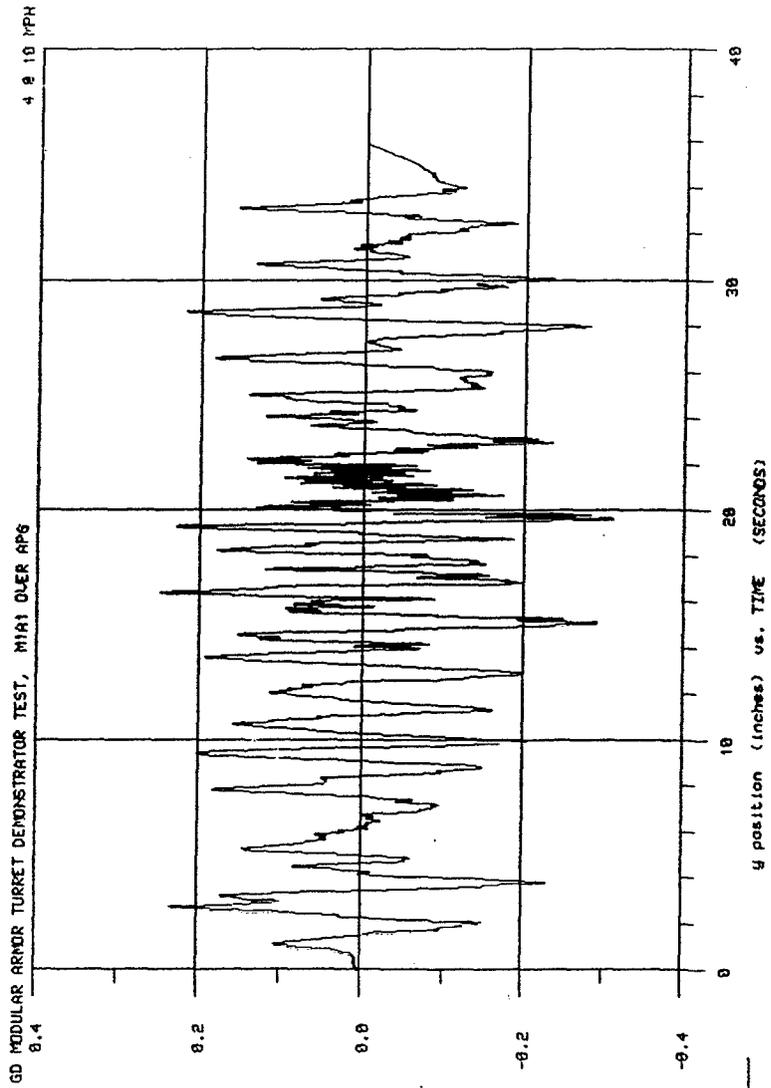
APG IV at 10 mph
PITCH position



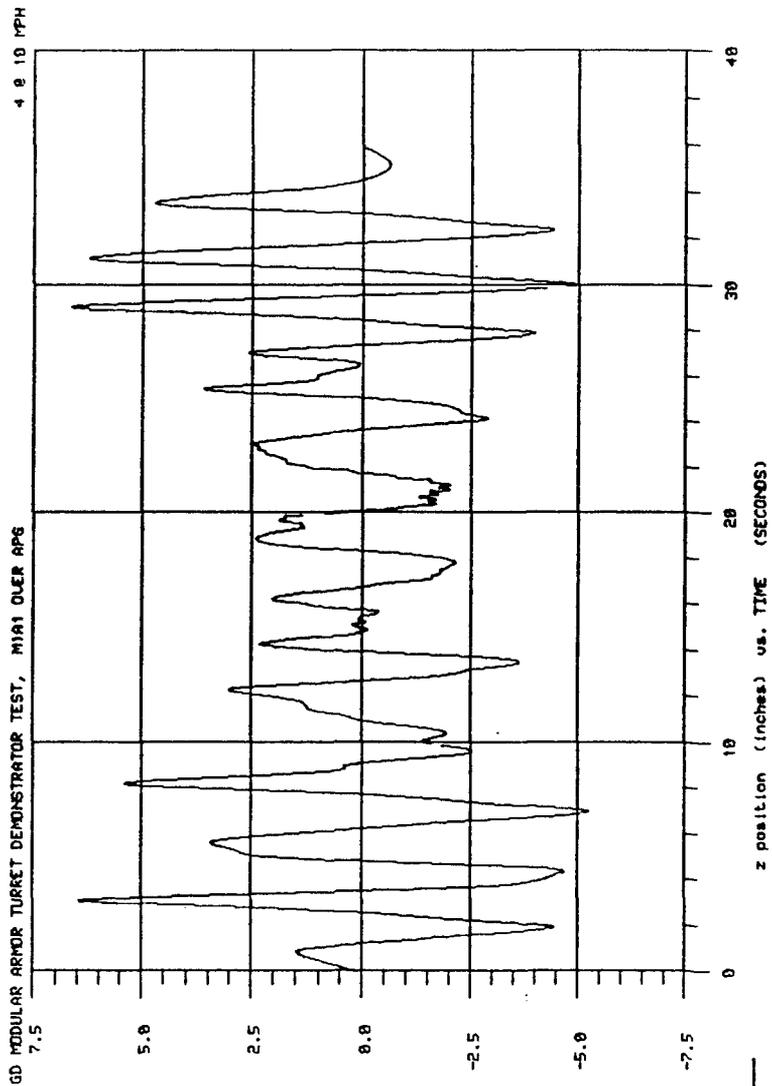
APG IV at 10 mph
 YAW position



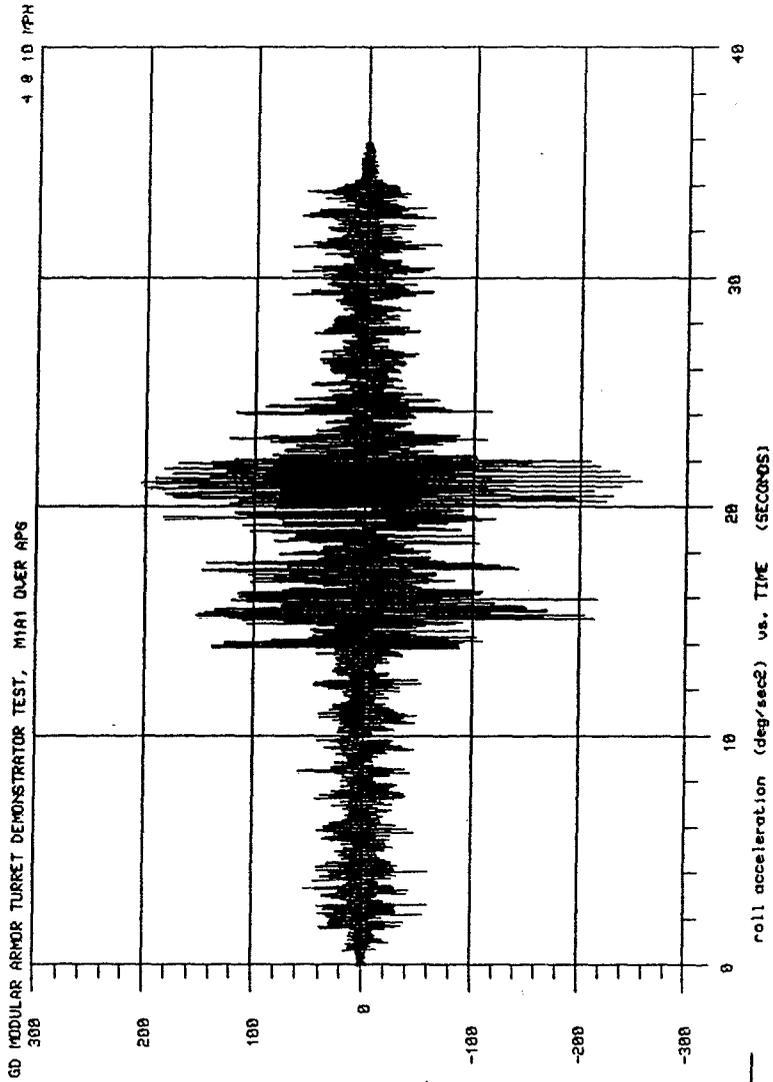
APG IV at 10 mph
X position



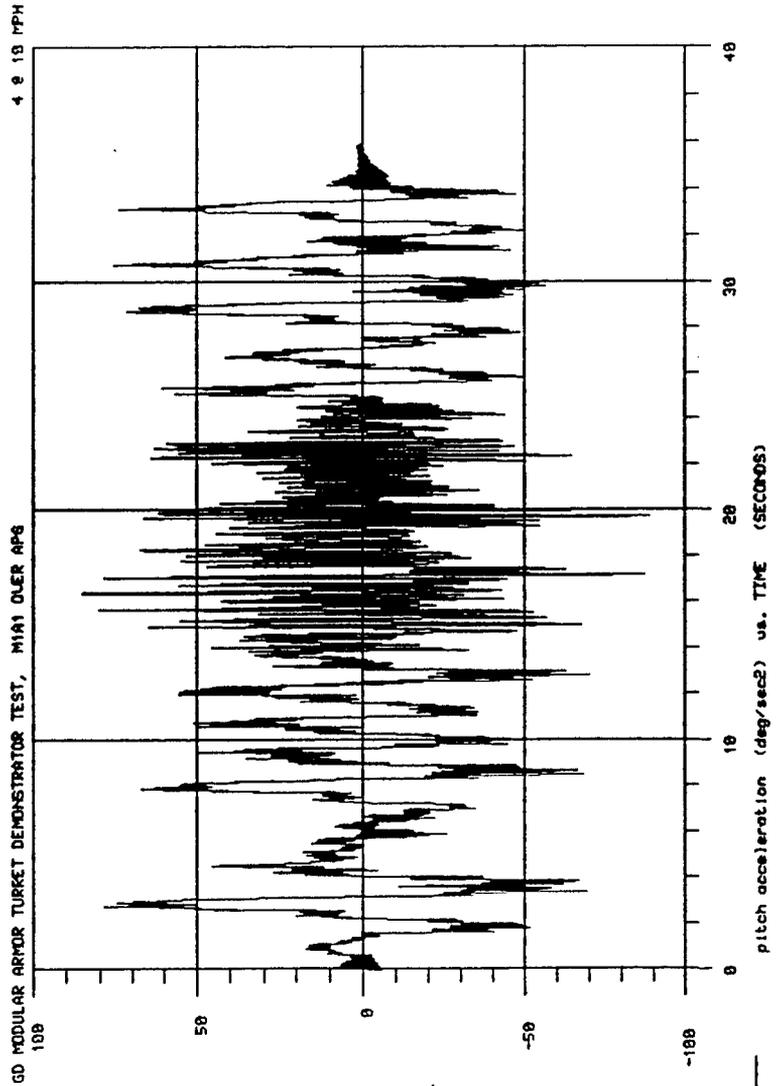
APG IV at 10 mph
 Y position



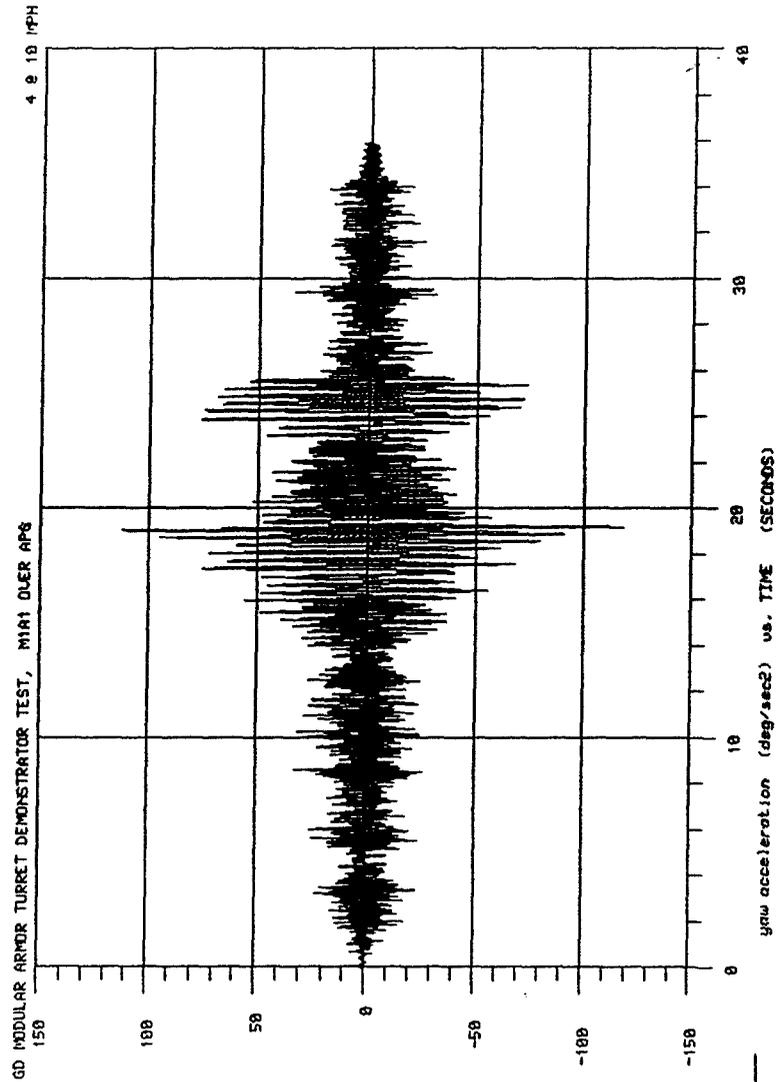
APG IV at 10 mph
z position



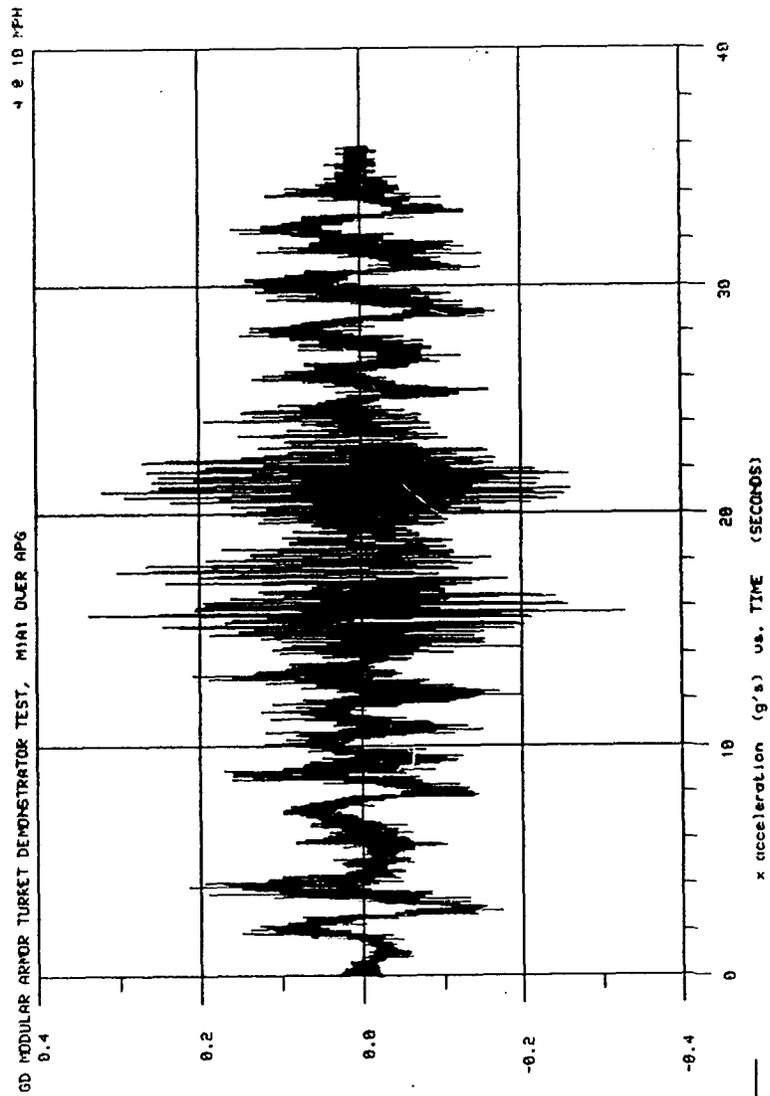
APG IV at 10 mph
ROLL acceleration



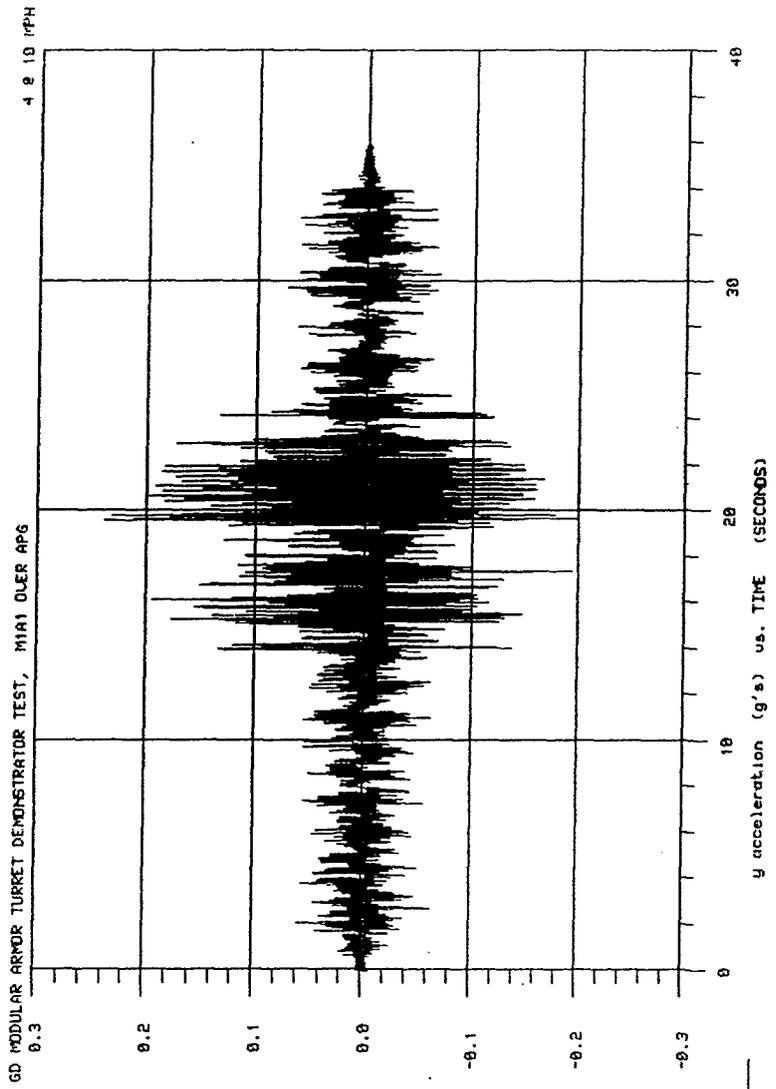
APG IV at 10 mph
PITCH position



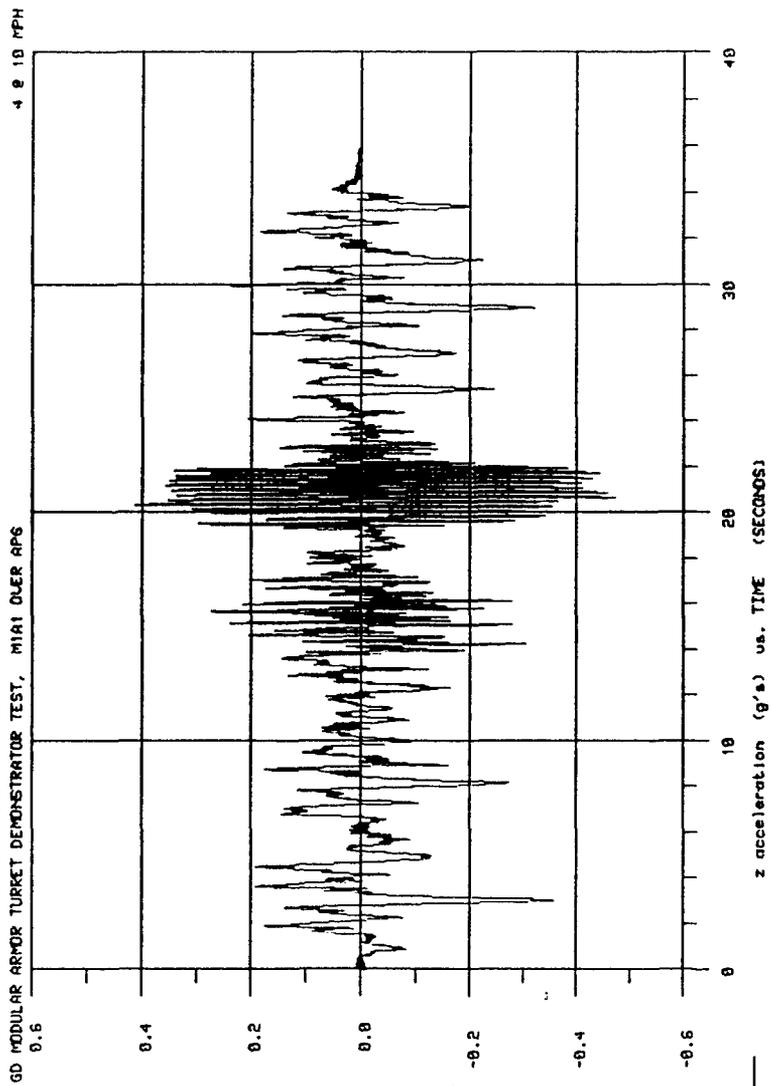
APG IV at 10 mph
 YAW acceleration



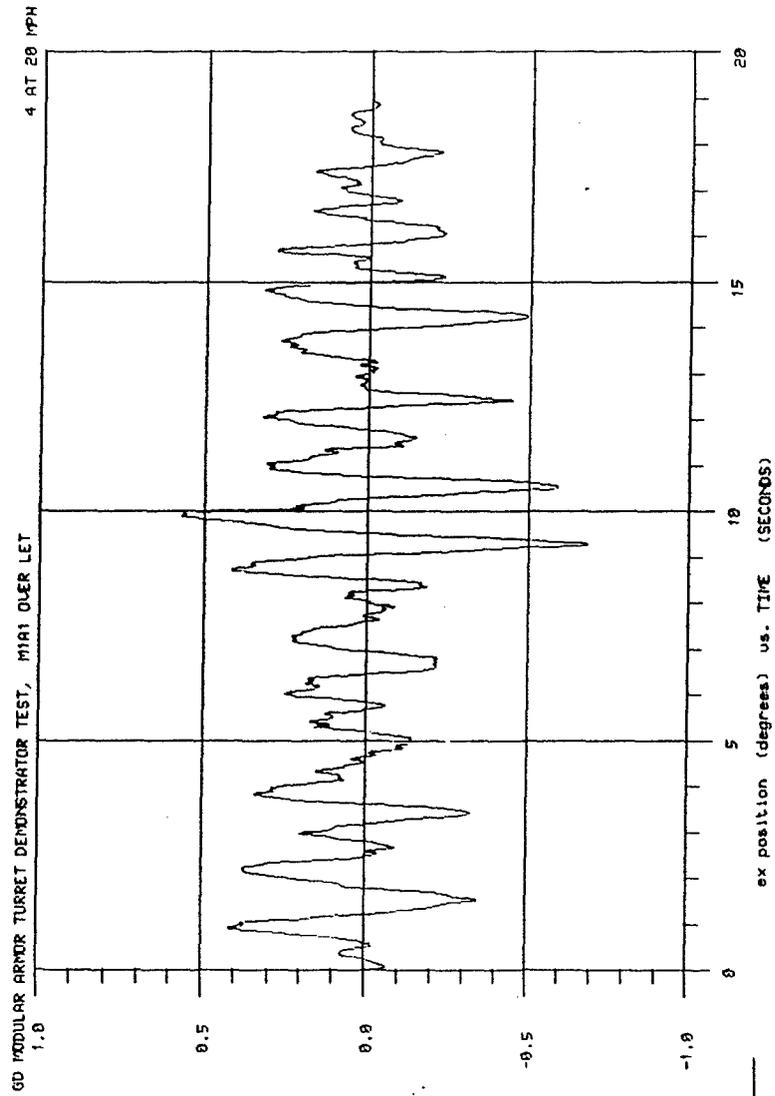
APG IV at 10 mph
X acceleration



APG IV at 10 mph
 y acceleration

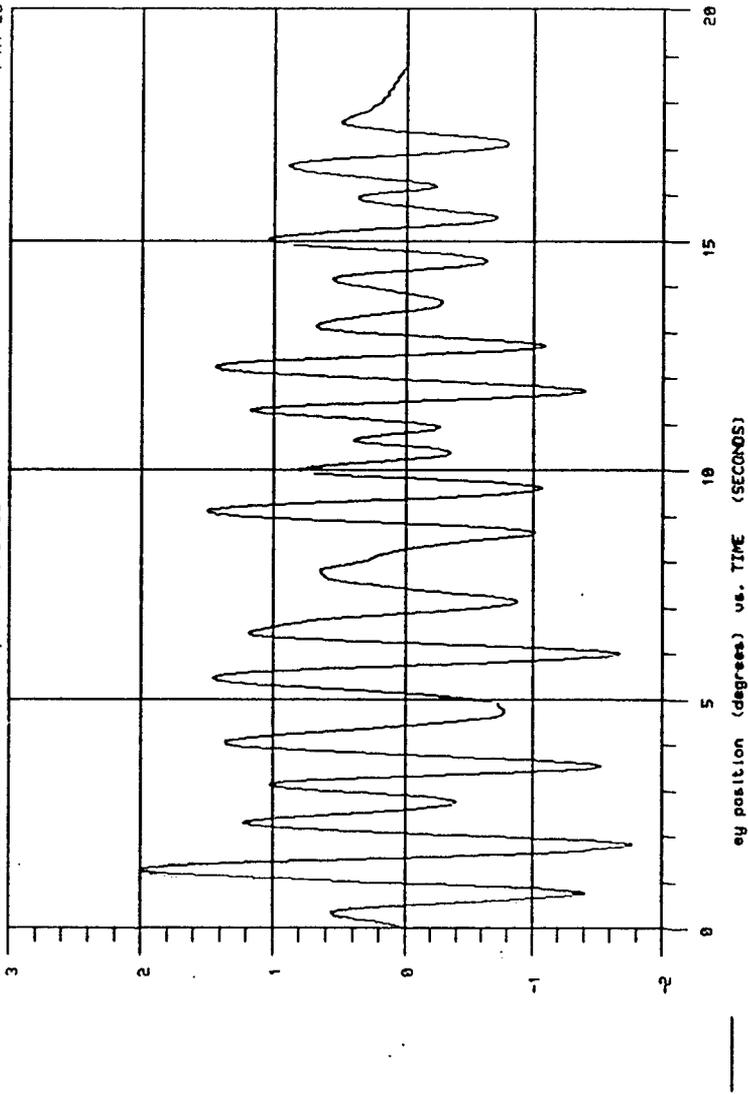


APG IV at 10 mph
Z acceleration

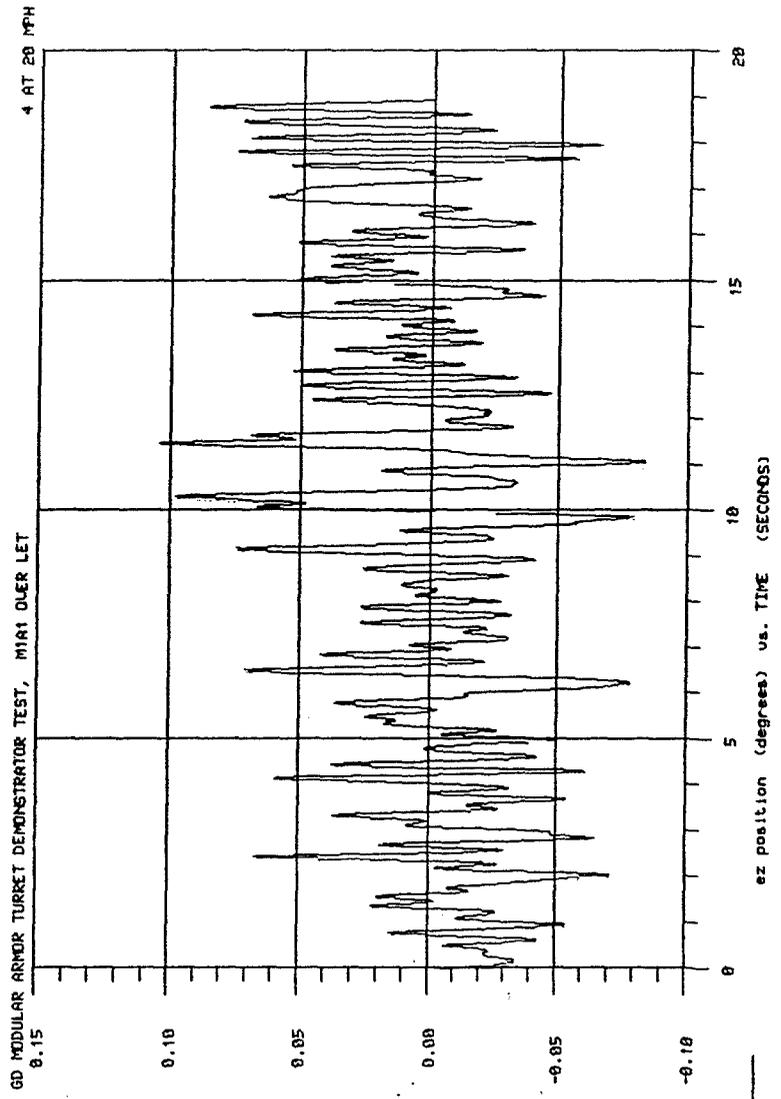


LETENOU 4 at 20 mph
 ROLL position

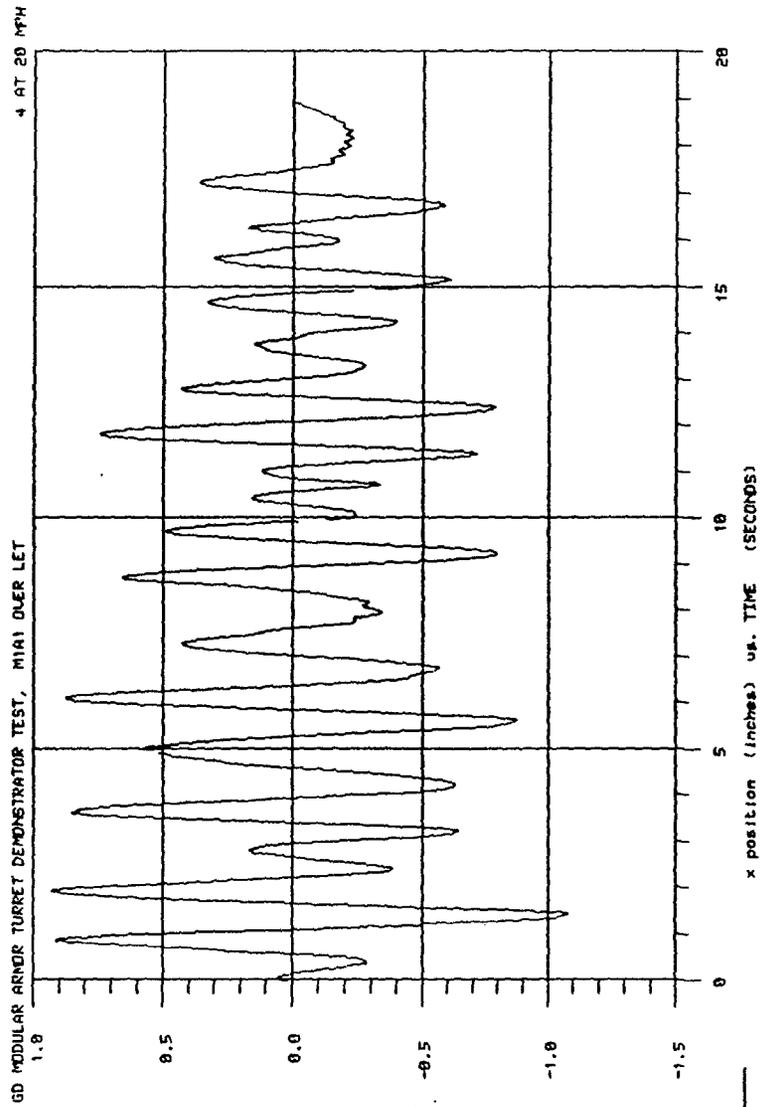
GD MODULAR ARMOR TURRET DEMONSTRATOR TEST, M1A1 OVER LET 4 AT 20 MPH



LETERNOU 4 at 20 mph
PITCH position

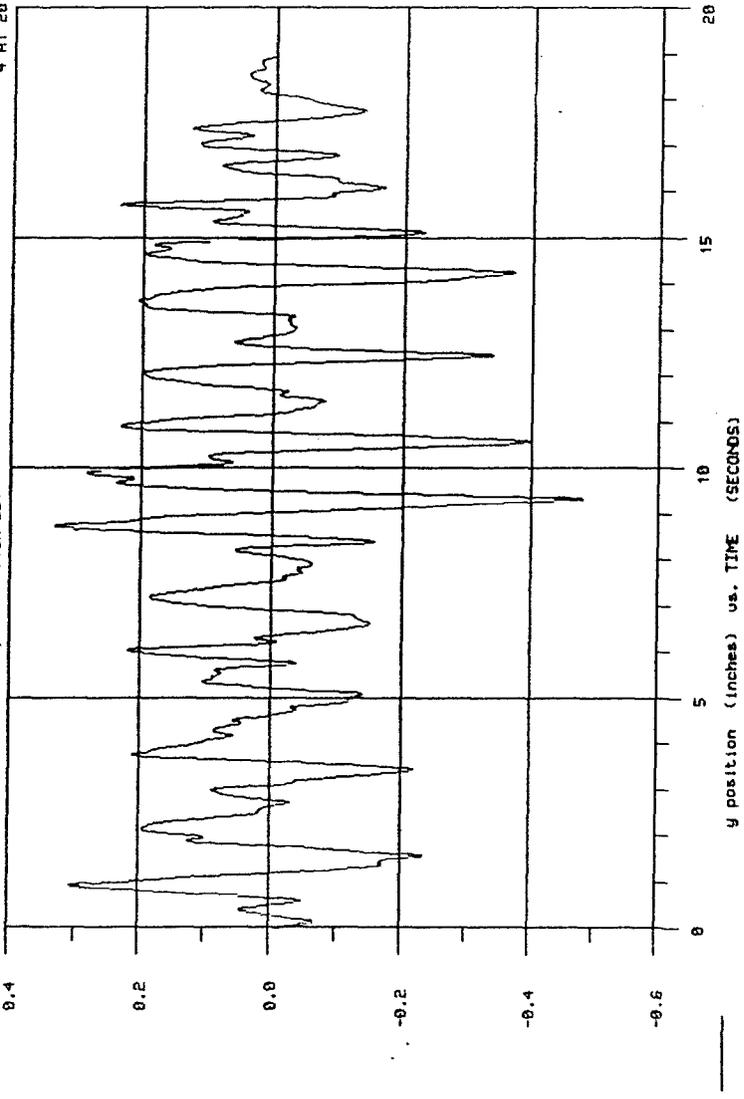


LETERNOU 4 at 20 mph
 YAW position



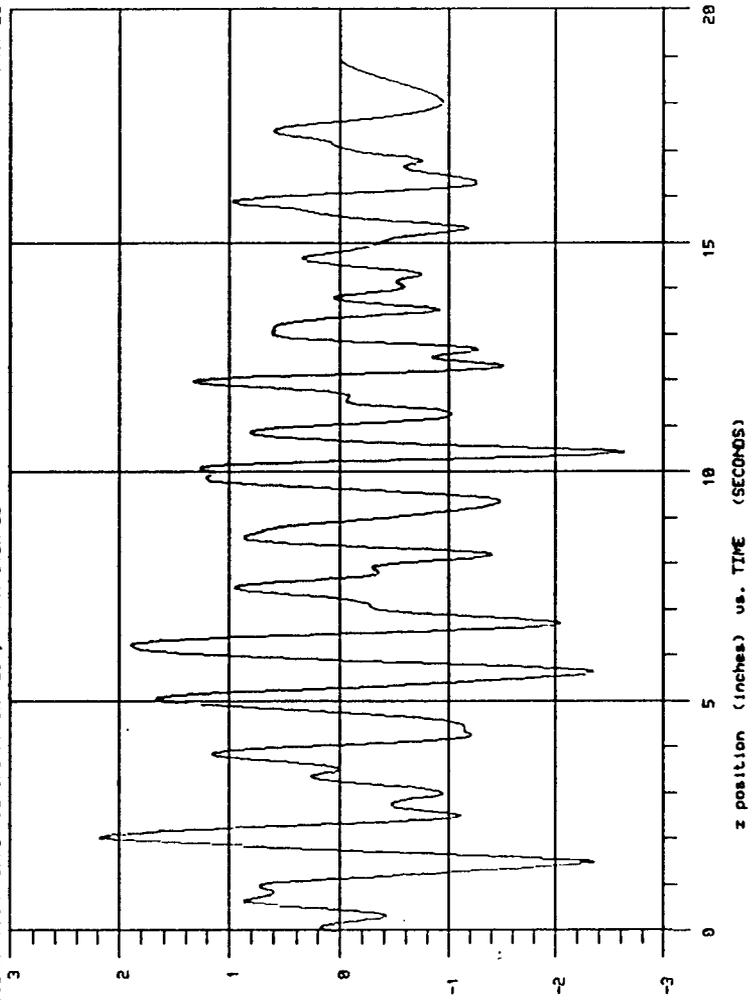
LETTERNOU 4 at 20 mph
X position

GD MODULAR ARMOR TURRET DEMONSTRATOR TEST, MIAI OLER LET
0.4 4 AT 20 MPH

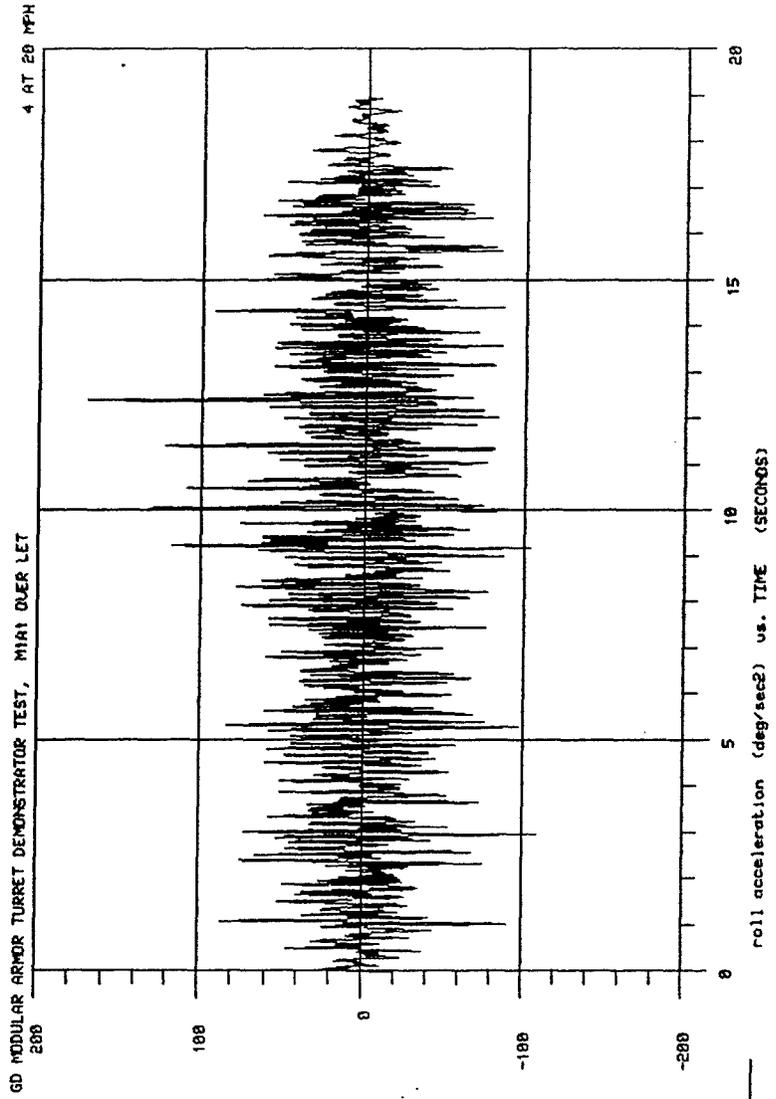


LETTERNOU 4 at 20 mph
Y position

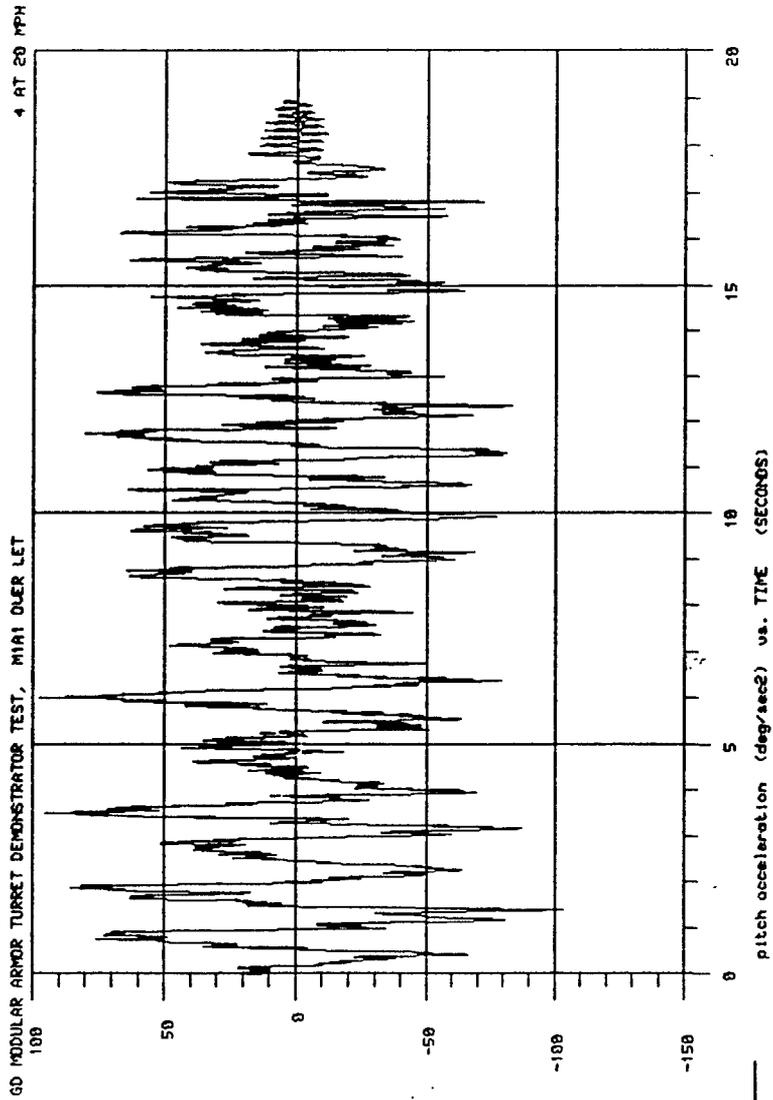
GD MODULAR ARMOR TURRET DEMONSTRATOR TEST, M1A1 OUER LET 4 AT 20 MPH



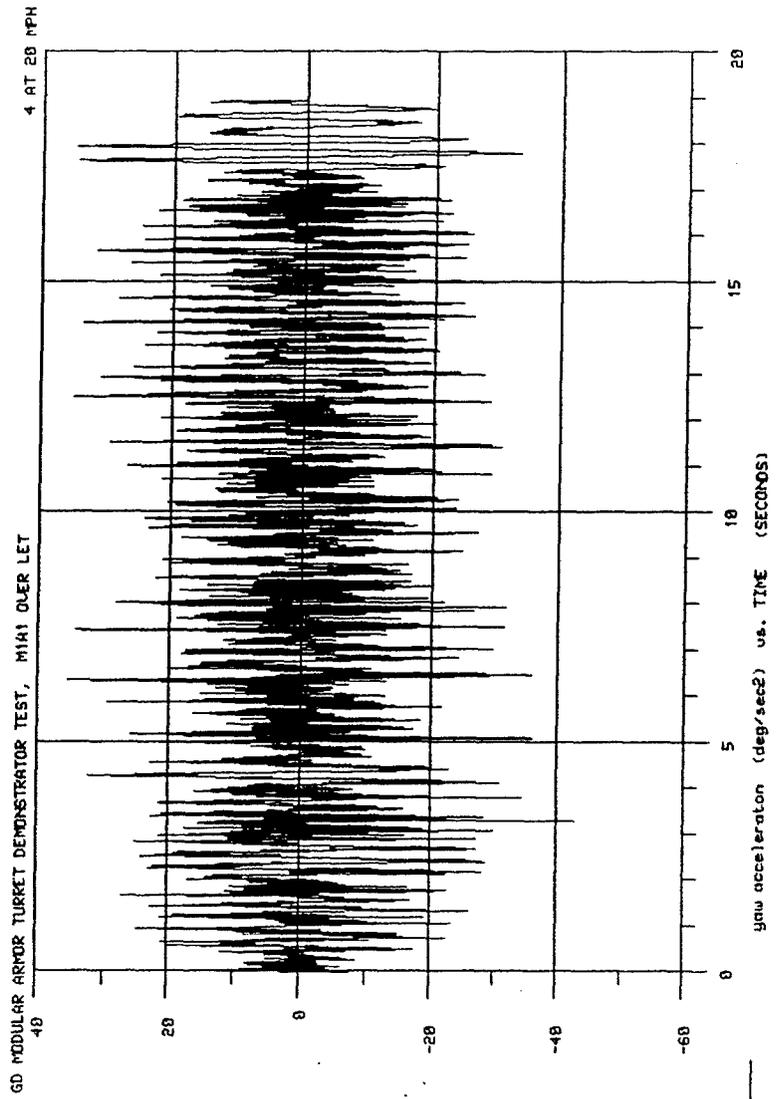
LETERNOU 4 at 20 mph
Z position



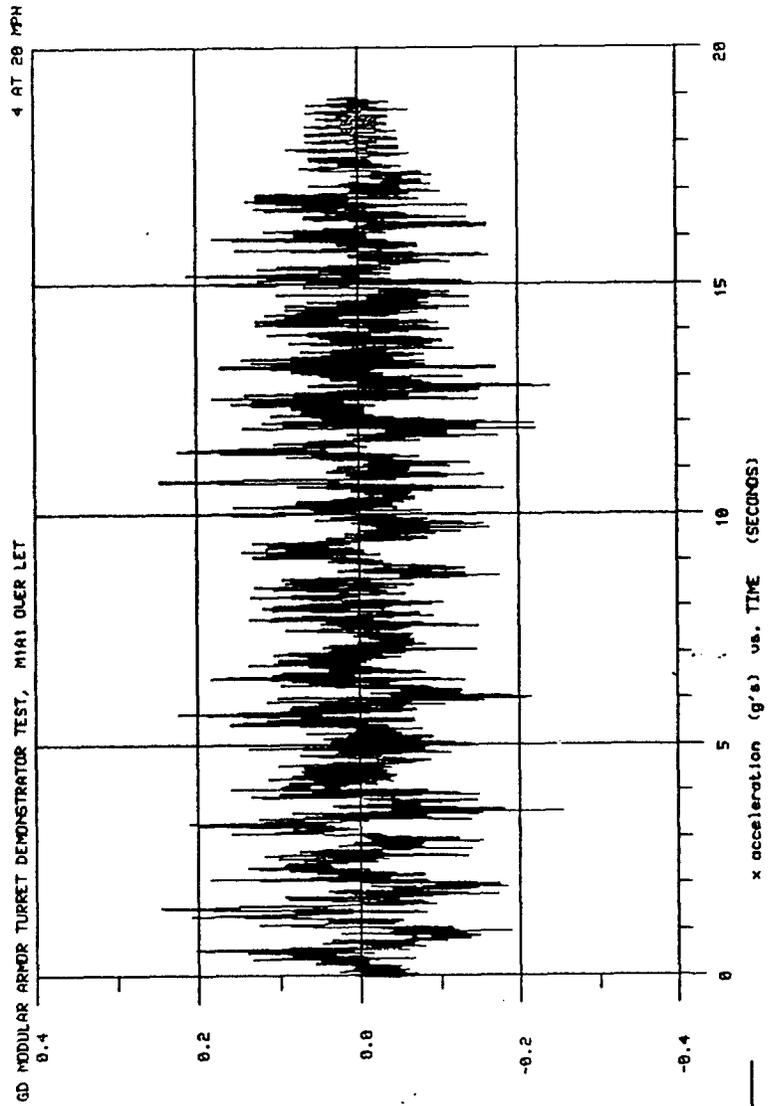
LETERNOU 4 at 20 mph
 -ROLL acceleration



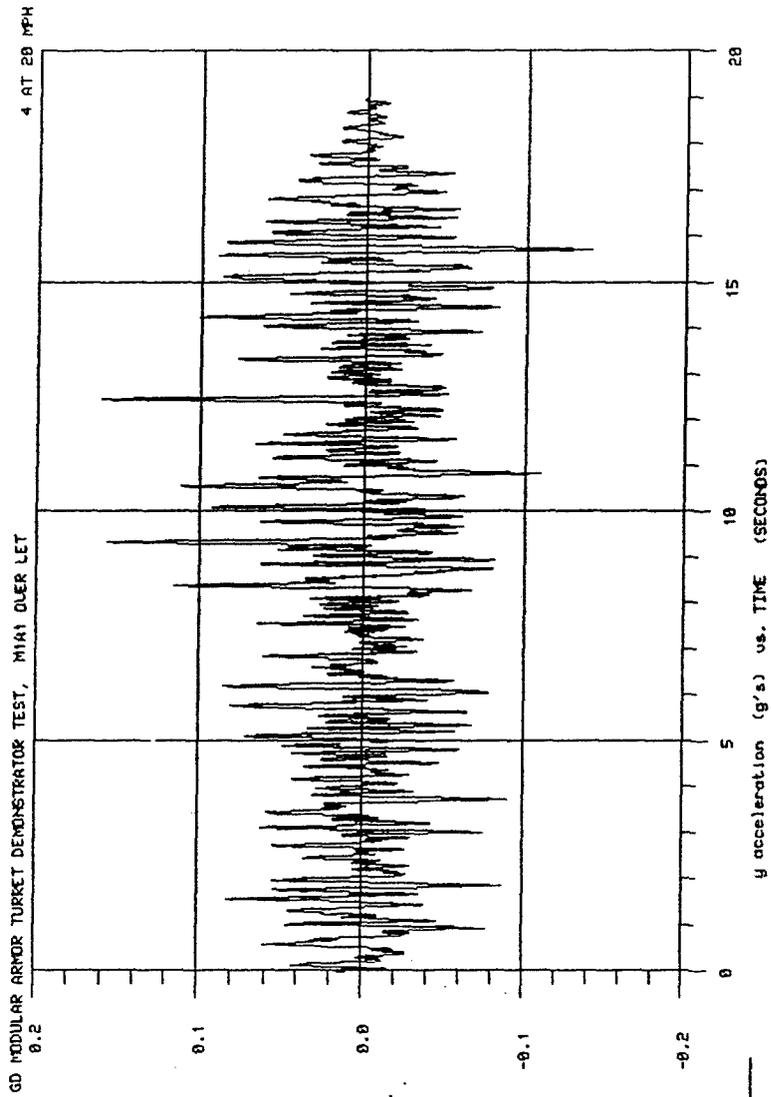
LETERNOU 4 at 20 mph
PITCH acceleration



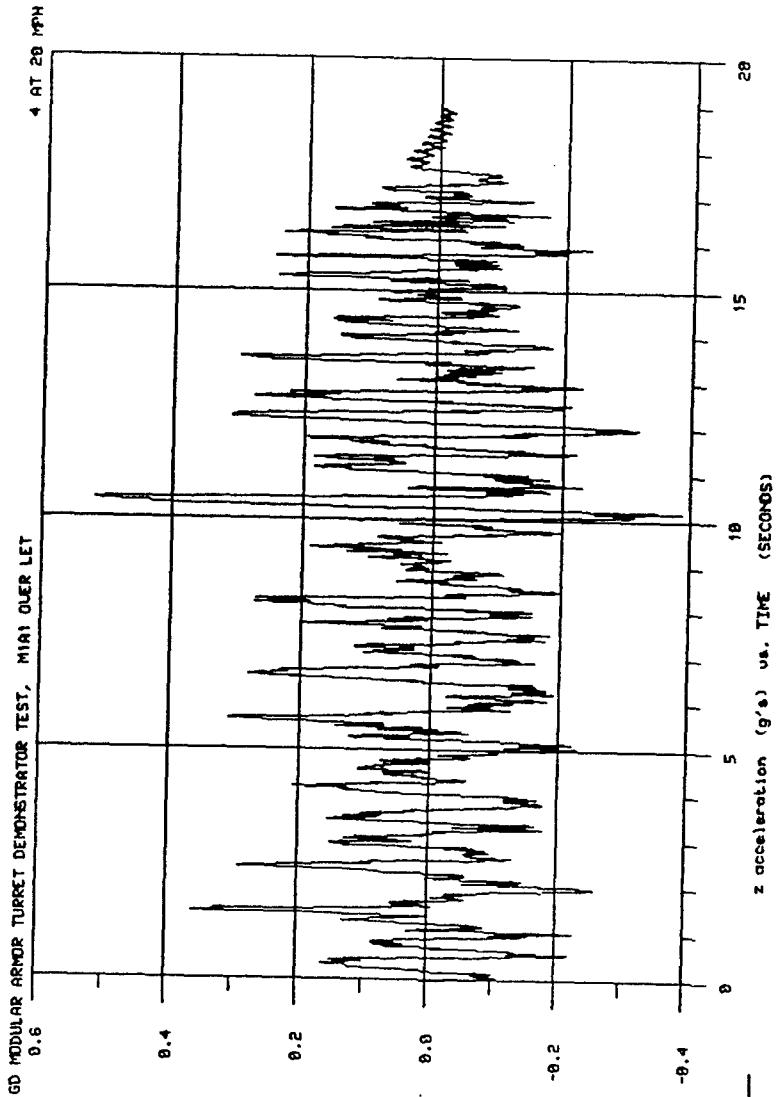
LETERNOU 4 at 20 mph
YAW acceleration



LETERNOU 4 at 20 mph
 X acceleration



LETERNOU 4 at 20 mph
Y acceleration



LETTERNOU 4 at 20 mph
 Z acceleration

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