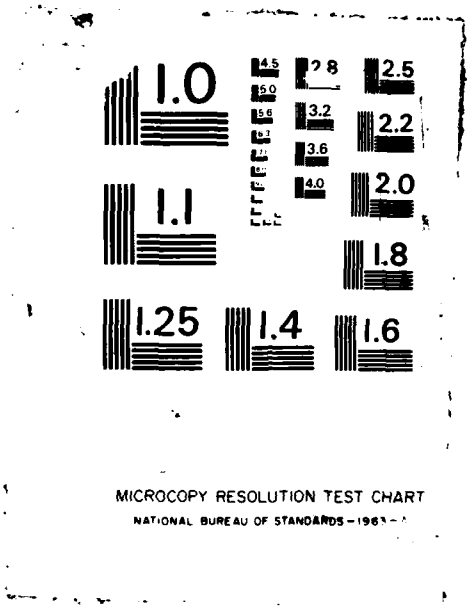
AD-A190 043 INSTRUMENTATION TO PROVIDE AN ACTIVE CONTROL CAPABILITY 1/1
FOR DISTRIBUTED PARAMETER SYSTEMS(U) WISCONSIN
UNIV-MADISON D RUSSELL 04 FEB 88 AFOSR-TR-88-0164
UNCLASSIFIED AFOSR-86-0254 F/G 20/11 NL


1.0
1.1
1.25
1.4
1.6
1.8
2.0
2.2
2.5
2.8
3.2
3.6
4.0
4.5
5.0
5.6
MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

UNCLASSIFIED DTIC FILE COPY

SECURITY CLASSIFICATION OF THIS PAGE

(2)

REPORT DOCUMENTATION PAGE

1a. REPORT SECURITY CLASSIFICATION	1b. RESTRICTIVE MARKINGS
AD-A190 043	3. DISTRIBUTION/AVAILABILITY OF REPORT Approved for public release; distribution unlimited.
	5. MONITORING ORGANIZATION REPORT NUMBER(S) AFOSR-TR- 88-0164

6a. NAME OF PERFORMING ORGANIZATION University of Wisconsin	6b. OFFICE SYMBOL (If applicable)
6c. ADDRESS (City, State, and ZIP Code) Center For Mathematical Sciences University of Wisconsin Madison, WI 53705	7a. NAME OF MONITORING ORGANIZATION AFOSR/NM
	7b. ADDRESS (City, State, and ZIP Code) AFOSR/NM Bldg 410 Bolling AFB DC 20332-6448
8a. NAME OF FUNDING/SPONSORING ORGANIZATION AFOSR	8b. OFFICE SYMBOL (If applicable) NM
8c. ADDRESS (City, State, and ZIP Code) AFOSR/NM Bldg 410 Bolling AFB DC 20332-6448	9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER AFOSR-86-0254

10. SOURCE OF FUNDING NUMBERS			
PROGRAM ELEMENT NO.	PROJECT NO.	TASK NO.	WORK UNIT ACCESSION NO.
61102F	2917	A5	

11. TITLE (Include Security Classification)

Instrumentation to Provide an Active Control Capability for Distributed Parameter Systems

12. PERSONAL AUTHOR(S)
David Russell

13a. TYPE OF REPORT	13b. TIME COVERED	14. DATE OF REPORT (Year, Month, Day)	15. PAGE COUNT
Final	FROM 7/30/86 TO 10/27/87	880204	4

16. SUPPLEMENTARY NOTATION

17. COSATI CODES			18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)
FIELD	GROUP	SUB-GROUP	

19. ABSTRACT (Continue on reverse if necessary and identify by block number)

This final report describes the purpose and details of the equipment purchased under a University Research Instrumentation Program (URIP) grant. Equipment includes instruments for remote sensing of vibrations, for modal analysis of vibrating structures, and for active vibration suppression of viscoelastic beams.

20. DISTRIBUTION/AVAILABILITY OF ABSTRACT	21. ABSTRACT SECURITY CLASSIFICATION
☒ UNCLASSIFIED/UNLIMITED ☐ SAME AS RPT ☐ DTIC USERS	Unclassified

22a. NAME OF RESPONSIBLE INDIVIDUAL	22b. TELEPHONE (Include Area Code)	22c. OFFICE SYMBOL
James M Crowley, Maj, USAF	(202) 767-5025	AFOSR/NM

DD FORM 1473, 84 MAR — 83 APR edition may be used until exhausted. All other editions are obsolete.

SECURITY CLASSIFICATION OF THIS PAGE

UNCLASSIFIED

UW MIPAC

Center for Mathematical Sciences
University of Wisconsin
610 N. Walnut St.
Madison, WI 53705

MODELLING, INFORMATION PROCESSING AND CONTROL

2 - 4 - 1988

Lt. Col. James Crowley, Director
Mathematics and Information Science
AFOSR, Bldg. 410, Bolling AFB, DC 20332

Dear Colonel Crowley:

I shall ask you to accept this letter as the final scientific report for AFOSR 86 - 0254, which funded acquisitions to the UW MIPAC Facility under the DoD Universities Instrumentation Program. The grant was in effect from July 30, 1986 through July 29, 1987, with an extension through October 27, 1987. A complete financial report will be provided by the University of Wisconsin's Office of Research Administration, Financial. The final negotiated amount of the grant was $219,923.

The purpose for which the grant was funded was that of providing UW MIPAC with an active control capability and with improved vibration sensing for very accurate experiments connected with studies on internal damping in elastic structures. These objectives have been realized with acquisition of virtually all of the items originally asked for in the grant proposal. There have been some minor modifications, deletions and additions due to changed requirements as compared with those originally envisioned.

UW MIPAC now has complete facilities for remote sensing of elastic vibrations via a non-contact, laser based system. This is being used in current experiments. We have also acquired computing hardware and software for modal analysis of vibrating structures, which has been used by the writer on his own and also in collaboration with Professors Luther White and Goong Chen of the University of Oklahoma and Texas A & M University, respectively. Prof Chen has, along with others, recently published a paper acknowledging laboratory assistance provided by UW MIPAC.

A capability for active vibration control is now almost complete. The main unit, an MTS hydraulically actuated vibration test platform, is now in place in the UW MIPAC laboratory and is in the process of final assembly. Testing of the platform will be carried out during the present semester (Sem. II, 1987, 1988).

Most of the equipment provided by the subject grant is expected to be used in connection with a UW MIPAC Workshop, to be convened May 16, 17, 18, 1988, and supported, in part, by NSF, as well as by AFOSR Grant 85 NM 263.

What follows is a list of equipment purchased under the grant. In most cases we have listed as one acquisition a complete system consisting of several closely related parts. The total of requisitioned costs shown exceeds the grant amount of $219,925 (which, of course, is $\geq$ the amount actually spent) because billed costs in some cases were less than the costs indicated on the requisitions. The details of these corrections will appear on the final financial report.

Equipment Purchased Under AFOSR Grant

	Item	Requisitioned Costs
1.	MTS High Frequency Vibration Platform and related peripheral equipment	$147583.20
2.	SMS Modal Analysis Package for use with MTS Platform	$ 8600.00
3.	IBM PC / AT Microcomputer, related Peripherals and software	$ 7314.81
4.	Hewlett Packard Dynamic Signal Analyzer and related peripheral equipment	$ 29451.00
5.	Dantec Laser Vibrometer and Related Equipment	$ 29370.00
	Total	$222319.01

Further details of UW MIPAC operation with this equipment will be given in the final report for AFOSR Grant 85 -0263, which supports operation of UW MIPAC.

Thank you for your attention to this report.

Sincerely yours,

David L. Russell

David L. Russell
UW MIPAC Coordinator

END

DATE

FILMED

APRIL

1988

DTIC