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13. ABSTRACT (Maximum 200 words) This grant was awarded to the Microwave Remote Sensing Laboratory (MIRSL) under the DoD University Research Instrumentation Program (DURIP) and was intended for the purchase of equipment to integrate a Radio-Acoustic Sounding System (RASS) into the Turbulent Eddy Profiler, a volume-imaging 915 MHz radar wind profiler. In addition, monies to update components of the Cloud Profiling Radar System (CPRS), a millimeter-wave radar operated by UMass, were cost-share with Univeristy matching funds. MIRSL purchased an Aerovironment Model 3000 Doppler Sodar and necessary equipment to interface it to the TEP radar system for RASS use. All needed millimter-wave components for the CPRS radar system were also purchased.				
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# Final Report

**ARO Grant: DAAD19-99-1-0103**  
**Equipment to Construct an Integrated Radio-Acoustic Sounding**  
**System for the Turbulent Eddy Profiler**

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## 1 Introduction

This report summarizes activities performed under ARO grant DAAD19-99-1-0103, for the period Mar 1, 1999 to Sep 30, 2000. This grant was awarded to the Microwave Remote Sensing Laboratory (MIRSL) under the DoD University Research Instrumentation Program (DURIP) and was intended for the purchase of equipment to integrate a radio-acoustic sounding system into the Turbulent Eddy Profiler, a volume-imaging 915 MHz radar wind profiler. In addition, moneys to update components of the Cloud Profiling Radar System (CPRS), a millimeter-wave radar operated by UMass, were cost-shared with University matching funds. The following sections outline the equipment needs identified in the DURIP grant proposal and report the equipment purchased during the grant period.

## 2 Equipment Purchases

Tables 1 and 2 outline purchases made under this grant with DoD funds and UMass matching funds respectively. Equipment purchased under DURIP support included an Aerovironment Model 3000 Doppler Sodar modified to operate also as a Radio Acoustic Sounding System (RASS) source for use with the Turbulent Eddy Profiler (TEP). Also required to implement this capability were frequency and timebase sources, a host computer, and a VXI interface to communicate with the TEP system. Minor modifications to the VXI-based TEP receiver control boards were needed to support RASS operations. These modifications are underway. The Doppler sodar and TEP combination were recently fielded for the VTMX experiment supported by DOE.

Purchases made for the CPRS radar system included latching ferrite switches and miscellaneous W-band and Ka-band components. The vendor MA/com was unable to deliver the originally quoted high-power switches, and the DSP processors originally quoted for the CPRS system became obsolete parts before they could be purchased. These funds were used instead to purchase lower power ferrite switches and to purchase the host computer and VXI interface for the RASS/TEP combination.

## 3 Publications

None.

## 4 Participating Scientific Personnel

None. DURIP funds purchases only.

Table 1: DURIP Purchases (DoD): \$125,605

Item	Source	Cost (\$)
<u>Sodar System/RASS Source</u>		
Model 3000 Doppler Sodar	Aerovironment, Inc.	\$56,265
Sodar Host Computer	ASL workstations	\$3,385
VXI-MXI2 Interface	National Instruments	\$9,435
Wireless Modem Link	Freewave Technologies	\$2,652
Timebase Card	Brandywine Communications	\$3,570
Phase-Locked Oscillators	Miteq	\$1,053
Crystal Oscillator	Miteq	\$1,000
Control Board Fab.	misc vendors	\$2,371
<u>CPRS Components</u>		
Ka-band Latching Ferrite Switches (2)	MA/com	\$15,299
Attenuators, couplers	Aerowave	\$2,988
Travelling Wave Tube	Applied Systems	\$15,287
W-band Latching Ferrite Switches (90%)	Electromagnetic Sciences	\$12,300
Total		125,605

Table 2: DURIP Purchases (UMass Matching): \$20,000

Item	Source	Cost (\$)
<u>Mm Wave Components</u>		
W-band Latching Ferrite Switches (10%)	Electromagnetic Sciences	\$1,210
Active x6 Frequency Multipliers (2)	MPI	\$12,450
Phase-Locked Oscillators (2)	Miteq	\$2,200
Directional Couplers (2)	Narda	\$2,190
1.2 GHz Amplifiers (3)	JCA Technology	\$1,950
Total		20,000

## 5 Inventions

None.