



**CALIFORNIA STATE SCIENCE FAIR
2003 PROJECT SUMMARY**

Name(s) Kenny Sharma	Project Number S0217
Project Title Artificially Replicated Movement (ARM)	
Abstract Objectives/Goals The purpose of ARM was to create an effective system that could handle materials without a direct user interface. The user would be free to be in a remote location during use. Methods/Materials The equipment used in this project is divided into several parts. The actual arm consists of dc motors, plastic gears, plastic rods and beams, several screw mounts for the motors, and electrical wire. The base of the project consists of two plastic sheets, plastic cubes, an on/off button, and several terminals for the motor power connections. The driving system consists of a solder-less breadboard, a power supply, a db-25 cable, a db-25 connector, and the power posts. The board has an octal buffer and several alternating PNP and NPN transistors. The procedures of this experiment were simply to construct the components of the experiment. The breadboard had to be built from the various transistors and jumpers. The base was constructed out of plastic cement and the pieces of plastic. The power terminals were drilled into the frame and led out. The leads from the power supply were lead to the motors resting on the limb. The limb itself was made by using plastic rods to act as axels. The axels allowed from the shoulder and elbow rotation. The hand was constructed by simple mounting a plastic rod onto a rotating gear. The power leads were connected to the power switch and all of the other wiring was completed. Results The results of this experiment show the system was effective at a distance. The system was able to respond quickly at a distance. The data shows there was only a slight delay between command file transfer. Conclusions/Discussion The results of this experiment sucessfully completed what the project was intended to do. It also taught me the basics of robotics and some fundamental techniques. It was a learning experience and a success.	
Summary Statement ARM is a system designed to handle materials without a direct user interface.	
Help Received Father helped to drill holes	