



**CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY**

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Project Title Encrypted Parallel FM Transmission Using Arduino Chipsets	
Abstract Objectives/Goals The objective was to develop a prototype that used a low-level architecture that not only established a faster and a more secure wireless connection but also demonstrated the feasibility and efficiency of using parallel transmissions to increase the bit transfer speeds of wireless connections. Methods/Materials The system used multiple Arduino Pro microcontrollers for data processing and hardware control. Two FM transmissions were established using NS73M and AR1010 FM transmitters and receivers. For the encryption system, a 128-bit Camellia S-block cipher was implemented. Among other hardware, a multiplexer/demultiplexer device was employed to handle the multiple of data connections. A sample connection using 5-byte packets and 4-bit data chunks was created for data analysis and testing. Results There was approximately a 80 percent increase in data transfer speed with the use of two parallel FM transmissions. Conclusions/Discussion The use of the Camellia encryption allowed for a suitable method of security. Additionally, the usage of low-level architecture improved the overall functionality and security of the device. The use of low-level structure permitted optimal data handling and transfers. The simple and low-level nature of the device allows for a system with less vulnerabilities. The device clearly demonstrated the practicality of parallel transmissions.	
Summary Statement Two chips were developed that established an encrypted wireless connection that used multiple FM transmissions to communicate at faster speeds.	
Help Received Parents gave me funding and garage; Ivan Sergeev and David Eldon gave advice on the signal filtering and encryption	