Hybrid Electric Vehicles IPRO 342
Simulation, Design and Implementation
http://www.iit.edu/~ipro342s06/index.html

CTA BUS
School Bus

Goals and Objectives:
- Conventional Simulations of the CTA Bus and School Bus
- Parallel Retrofit Design and Simulation of the CTA and School Bus
- Parallel New Design and Parallel ISA Designs and Simulations for the School Bus
- Drivetrain 3-D Models for the Conventional and Hybrid CTA Bus and School Bus

Using ADVISOR:
At the core of IPRO 342 is ADVISOR, an acronym for Advanced Vehicle Simulator for systems analysis.
ADVISOR is complete with files containing information about different vehicles and their layouts, components, and weights.
This software allows us to simulate our different designs for the buses and optimize the results they produce.

Results:

CTA BUS

Motors: 250kW; 460V; 100 HP; 60 Hz; 3600 RPM.
Total Weight = 1480 kg.
3-phase; 460V; 100 HP; 60 Hz; 3600 RPM.
Full Load Current = 109 Amperes.
Total Weight = 1480 kg.
Model: General Motors AP 902
Picture Courtesy General Electric Co.

School Bus

Model: Odyssey PC 2150
Picture Courtesy West Coast Batteries, Inc.
- 12V Module; Short Circuit Current > 5000 Amperes.
- Capacity = 100 Amp-hours; Weight = 75 lbs.
- Designed Life = 12 yrs.

Model: Saminco M1-250
Picture Courtesy Saminco, Inc.
- Cost effective solution: Cost of hybridization = $3000; Payback = 1 – 2 years
- Hybrid CTA Bus: Achieved between 35 – 45% fuel economy improvement
- Hybrid School Bus: Achieved between 45 – 70% fuel economy improvement
- Future: Optimization of hybridization factors
- Future: Practical implementation of the proposed models
- Future: Strong proposal to the “City of Chicago”

Conclusions and Future Work: