

**Pipe Line Control** The array of tanks, pipes and valves in the photo below is a petroleum tank farm in Georgia, part of a petrochemical pipe line system that moves refined petroleum products from Texas and Louisiana to the mid-Eastern seaboard.

The same pipes handle a number of different products, such as gasoline, kerosene, jet fuel or fuel oil. The fluids are temporarily stored in tanks, pumped into the pipes in turn and routed to other way stations along the pipe line. The complex job of controlling, measuring and monitoring fuel flow is accomplished automatically by a computerized control and communications system which incorporates multiple space technologies.

Developed by SCI Systems, Inc., Huntsville, Alabama, the pipe line's brain is known as the Remote Data Acquisition Control System II (RDACS II). A departure point for its development was SCI's Remote Automatic Calibration System, which provided measurements used to calibrate telemetry equipment in the Saturn launch vehicles that boosted NASA's Apollo spacecraft. Digital data transfer techniques developed by SCI for NASA's Space Shuttle are also incorporated in RDACS II, as is space-derived "redundancy management"—automatic takeover by a backup system when a primary unit malfunctions.

The RDACS II shown in the small photo is one of six located at hub control centers along the pipe line. A seventh at Atlanta, Georgia—called the "granddaddy"—oversees the operation of the other six. Collectively, the RDACS control the entire fuel-movement function: turning valves to feed fuel from tanks into the line, checking to make sure that the proper valves are open or closed, measuring fuel flow, assuring maximum efficiency of the pumping equipment, and generally monitoring the progress of the fluids in the pipe line to make sure that the right amount of the right fuel gets to the proper destination.

