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entomologists and ecologists, as are patterns of human illness for a given location. Then the team considers prior attempts to prevent and treat the disease, such as the use of drugs and bed netting during field campaigns.

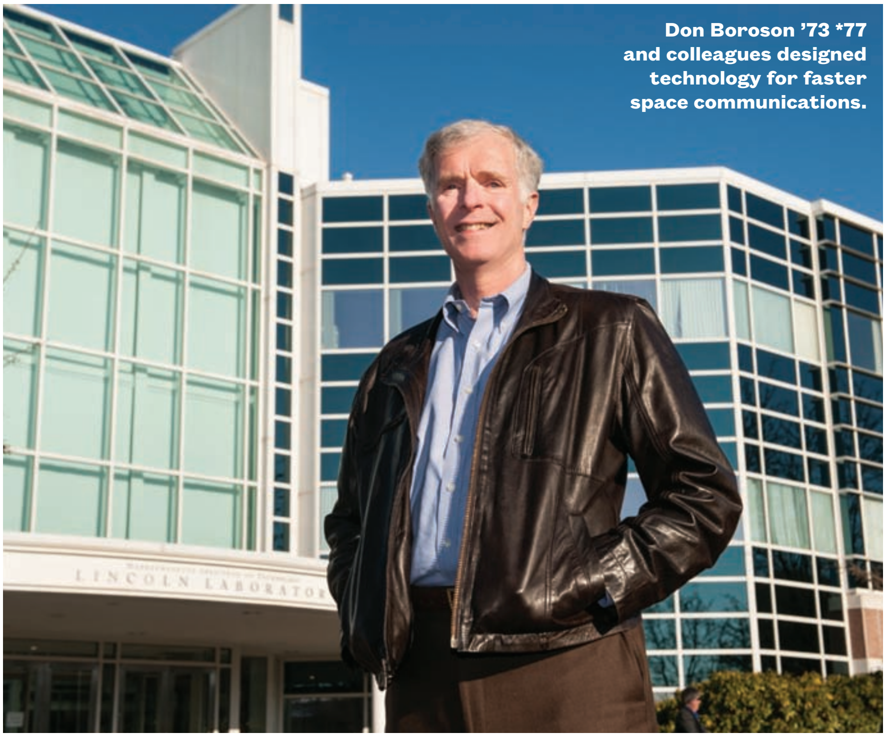
Eradicating polio within five years and ending malaria in most countries within 20 to 30 years are realistic goals, Eckhoff says.

The models are used to predict how the disease will spread in a certain area, for example, or the impact of a treatment. IDM works closely with health organizations and governmental agencies, sharing recommendations and helping them design programs to be implemented in the field.

In Zambia, IDM is working with a division of the country's Ministry of Health — the National Malaria Control Center — and the Malaria Control and Evaluation Partnership in Africa. These organizations helped suppress malaria by providing protective bed nets and free testing and treatments. Part of IDM's work, Eckhoff says, involves traveling to remote communities and partnering with community workers going door to door.

IDM modeling helped the organizations to understand why malaria remains high in some areas despite diagnosis and treatment efforts. Based on the IDM models, the organizations have adjusted their treatment approaches in these regions by varying the antimalarial drugs they offer, the treatment schedules, and the times during the year when people are screened.

Eradicating polio worldwide within five years and ending malaria in most countries within 20 to 30 years are realistic goals, Eckhoff says. But he adds that the institute's work is only part of the solution: "No matter how many times we eradicate malaria or another disease in our simulation models, unless the recommendations are put into practice at the local level, we won't effect change." *By Anna Azvolinsky *09*



Don Boroson '73 *77 and colleagues designed technology for faster space communications.

Brian Smith

PROFILE: DON BOROSON '73 *77

FASTER DOWNLOADS – FROM THE MOON

Spacecraft to Earth When NASA launches spacecraft and satellites, the data generated, such as scientific measurements, images, and video, are sent to ground stations using radio waves. But this soon may be changing. Don Boroson '73 *77 and his team at MIT's Lincoln Laboratory designed a communications system using laser beams, which was tested last fall as it flew on NASA's Lunar Atmosphere and Dust Environment Explorer satellite. Their laser system transmitted data from the moon-orbiting spacecraft to the ground station on Earth more than six times faster than what had been done using radio waves. It transmitted data from the ground station to the spacecraft 5,000 times faster. The system also set a record for the longest two-way laser communication: the 239,000 miles between Earth and the moon. The new laser space terminal weighs less than half of the best previous radio system and uses only three-fourths of the power.

RÉSUMÉ
System engineer of laser communications and laboratory fellow at MIT's Lincoln Laboratory in Lexington, Mass. Bachelor's and doctoral degrees in electrical engineering.

Laser-focused "A lot of the science NASA wants to do is constrained by how much data and how many pictures they can bring back," says Boroson. Radio waves spread out and become relatively weak as they travel long distances. Laser beams spread out much less, so they deliver brighter signals that can carry large amounts of data more quickly.

Beyond the moon "When NASA ultimately sends astronauts to Mars, this technology would be an excellent way to transmit the high-definition and perhaps even 3-D videos that the public will demand," says Boroson. "Knowing that the signals we were creating and catching were coming from the moon was a real thrill." *By Anna Azvolinsky *09*