nificant cost of shipping is indicated by the fact that the Federal Coordinator of Transportation found packing costs on rail shipments which ran as high as $98.40 a ton.

The cargo glider could unquestionably reduce these costs materially. The trip would require less time than either surface carrier or plane and there would be no trucking operation. There would be no shifts between vehicles in transit. Packing could almost certainly be lighter and less expensive. Refrigerating costs on the railroads would also be saved by flying at high altitudes.

The third significant advantage of the cargo glider is the smaller investment required in relation to the job to be done than required by the conventional airplane operation. This advantage arises from (1) the higher utilization of the tug which is possible and (2) the lower cost of gliders as compared with planes.

For illustration, let us take a simple example of a glider versus airplane operation. We can suppose that the glider and the plane are competing on a route 200 miles long. Cargo is loaded on board the plane at one end of the route, unloaded at the other end, whereupon the plane is reloaded at that end and the return cargo flown to the point of origin. This process is repeated over and over during a 12-hour day. The plane speed is 200 miles an hour. The unloading and reloading operation can reasonably be expected to take 30 minutes. During the day, eight one-way trips are made by the plane. The distance covered is 1600 miles. The time spent on the ground unloading and reloading is four hours, or one-third the total elapsed time and one-half the time spent in actual flying.

The cargo glider train, on the other hand, can operate continuously for the entire 12 hours. As soon as a glider is delivered, another is picked up, and while the latter is being towed to its destination, the first is being unloaded and reloaded in anticipation of the return of the tug. To be sure, it is entirely possible that the glider train with the same capacity and power rating as the airplane will operate slower. However, whereas the cruising speed of the plane is 200 miles an hour, the time lost on the ground reduces the average speed to 133 miles an hour. It seems that such a loss would well offset any aerodynamic inefficiency of the cargo glider train. In other words, it is likely that the glider train would perform more ton-miles a day per dollar of investment than would the plane.

As points are added to a cargo glider route, nevertheless, the investment in the cargo glider operation reaches the investment in the plane because each point

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