also take care of calling passengers to check in for flights and displaying arrival and departure information, for instance.

Before the passengers have even arrived at the airport the pilot will have filed a detailed flight plan with Air Traffic Control. Surprisingly, the ATC's task is only partially computer-aided. Thanks to radar transponder systems, controllers no longer have to rely on the pilot to communicate his position verbally. They see each blip on their radar screens identified by a flight number, along with a computer-interpreted altitude reading and destination code transmitted automatically from the aircraft.

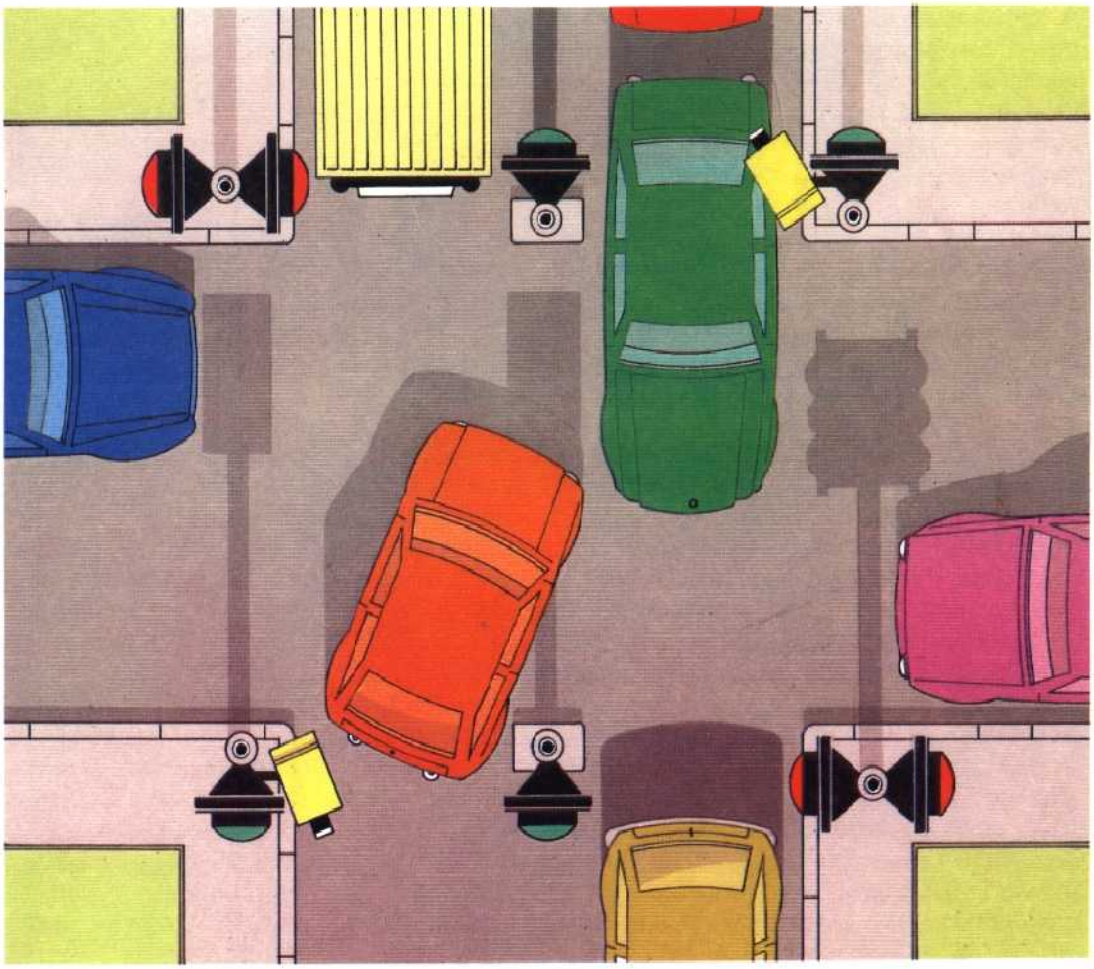
A further degree of computer assistance is available to the controller in the form of printed slips, each of which covers a segment of the planned route, derived from the pilot's flight plan. These slips, which include information about the flight path, height, payload and aircraft type, help the controller to guide the flight through his area in the quickest, most economical way.

Another area of transportation in which computers are widely used is rail transport. The railway signalman's job, although not as complex as the air traffic controller's, has some things in common with it. He too is employed to guide freight and passenger traffic through his area, safely and at the lowest possible cost. British Rail has been using computer control systems since the mid-1970's, following pioneering work undertaken in the United States by the Southern Pacific Railroad. Its Total Operations Processing System (TOPS) performs all aspects of freight control, from maintaining an accurate, up-to-the-minute inventory of each locomotive and piece of rolling stock, to assembling these units into complete trains and determining their routes.

Each goods wagon has a unique identifying number, which is recorded along with its location by the TOPS computer. When a wagon of that type is needed at some other location, the wagon is assigned to a particular train and its destination noted. When it arrives there its new status is noted by the TOPS, which can then re-assign it. Considering the volume of freight traffic that British Rail runs (there were 185,000 wagons in service at the end of the 1970's, making up almost 2,000 trains a day), such computer control systems are clearly imperative.

Many of the problems of airport operation are also shared by railway stations, and many of the same solutions have been employed. However, railways have a further factor to take into account — the increasing use of unmanned stations. There have been a number of experiments conducted using microcomputers to answer travellers' enquiries — and in some cases to make train arrival and departure announcements using synthesised speech. Computerisation also makes it possible to contemplate unmanned trains. London Transport's underground Victoria Line, for example, has this capability, although it is not used in practice because driverless trains running under

Green For Go
The phasing of traffic signals has been employed by highway engineers for some time in an attempt to regulate the flow of vehicles — especially through main city streets. Nowadays, individual traffic lights can monitor the density of traffic in their immediate vicinity by means of doppler radar detectors and pass this data to a computer system. The frequency of the changing of the lights can then be adjusted to suit prevailing conditions



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