

# THE ECONOMY RUN

A report from one of Caltech's student observers

by WILLIAM V. WRIGHT

**E**ARLY LAST JANUARY Caltech senior Mechanical Engineering students trooped into Peter Kyropoulos' Hy II lab expecting to begin the usual grind of lab tests and reports for the next ten weeks. To their surprise they found an opportunity to become AAA (American Automobile Association) official observers for the Mobilgas Grand Canyon Economy Run, and the door was opened for an exciting and interesting experience to give these boys a lift from the usual routine.

After last year's Economy Run, A. C. Pillsbury, Regional Director of the Contest Board of the AAA, decided that a new system of appointing impartial observers for the event was in order. Mr. Pillsbury, a graduate of MIT, has a high regard for the honor system and its operation. He reasoned that CIT students would be the most impartial, objective, and honest men for the job.

The Institute approved the idea, but it was not made an official function. Students had to take their own time off for the job and make up all work missed.

The purpose of the Mobilgas Grand Canyon Economy Run is to measure the gasoline mileage for stock 1951 model automobiles of American manufacture on an 840-mile indirect trip from Los Angeles to the south rim of the Grand Canyon, through Death Valley and Las Vegas.

The trip duplicates, in two days, all the conditions

the average motorist will encounter in a full year's driving. Altitudes vary from 280 feet below sea level to 7,005 feet above. Temperatures may range from below zero to the high eighties. There are 70 miles of city driving, 345 miles of mountain driving, and 425 miles of level driving.

To insure that the cars are stock, they are picked at random from manufacturers' assembly lines and impounded by the AAA Contest Board. From that time on the car is driven only while an AAA observer is along—and this is where the Caltech students come in.

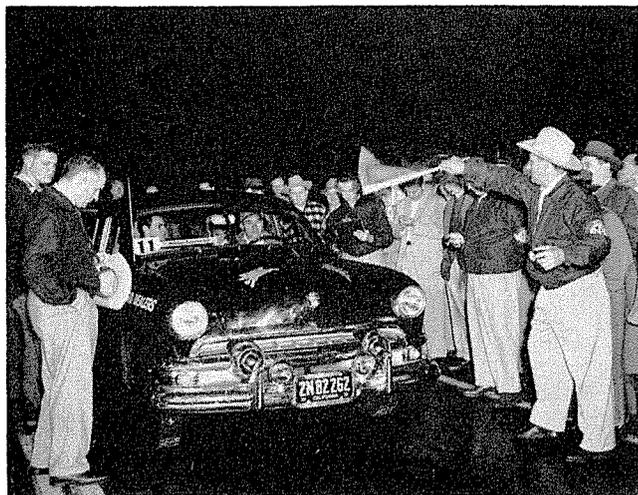
One observer rides with each car during the break-in period (4500-miles maximum), and during the final run. He must see that the car is not tampered with in violation of AAA regulations, that it is not driven in a "trick" manner, and he must record everything that happens in connection with the car while it is under his observation. For this he receives 10 dollars a day and his expenses.

During the break-in period (January 20 to February 23) about 60 students took one or more trips, from one to five days long, to the far corners of California, Arizona, and Nevada.

This was quite an experience for the fellows. They rode usually with two or three other people, including the driver and representatives of the manufacturer or dealer entering the car. These people know all the ways to get extra economy from an automobile, including illegal ones like putting additives in the gas tank or crankcase or tampering with the carburetor or manifold.

For many of these men, winning the event meant promotion and bonuses, while losing it meant demotion or losing their jobs. It was the responsibility of the CIT students to see that no illegal work was done on the cars at any time. They had lead wire seals which were applied to all engine openings, gas tank openings, the hood and the doors. They had to make sure that none of these seals were broken or tampered with. They had to record where the cars went, where they were fueled, and everything that was done to them enroute.

Considering that some of the cars covered 2,500 miles in five days at a stretch, the boys had quite a time. Some of them felt like WCTU members in a brewery.



Start of the run—3 a.m. March 6, downtown Los Angeles

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But they travelled through some of the most scenic country of the west, stayed at the finest hotels, and occasionally sampled some of the more virtuous diversions of Las Vegas. This, after all, was a pleasant sojourn from the rigors of campus life, even though nerve-racking and tedious at times.

As the time rolled around for the final run the fellows burned plenty of midnight oil making up work they had missed. The run came on the week before finals and lasted from Tuesday, March 6 to Friday, March 9.

At 7 o'clock Monday evening, March 5, 19 CIT students went to the General Petroleum garage—the starting point—in L. A. to observe the fueling and preparation of the cars for the run. At 1 o'clock Tuesday morning 32 more students arrived. They were the riding observers for the run. They were furnished with official armbands, windbreaker jackets, and kits containing special instructions and information. They were then assigned to their cars—the assignments being secret until then.

The first of the 32 cars entered in the run started at 3:00 A.M. on March 6, with the others following at two-minute intervals. Each car follows exactly the same route, and must arrive at Las Vegas (at the end of the first day's travel) in 13 hours 30 minutes elapsed time. At no time during these 13 hours 30 minutes may the observer leave the car. Actually he is with the car about 15 hours without relief, and during this time he must be constantly watching for any trick driving or unusual occurrences which might give one contestant

an unfair advantage. He must see that all speed limits and other traffic laws are strictly obeyed. Above all he must not go to sleep—and this is pretty hard not to do on a continuous 15 hour journey at moderate speed.

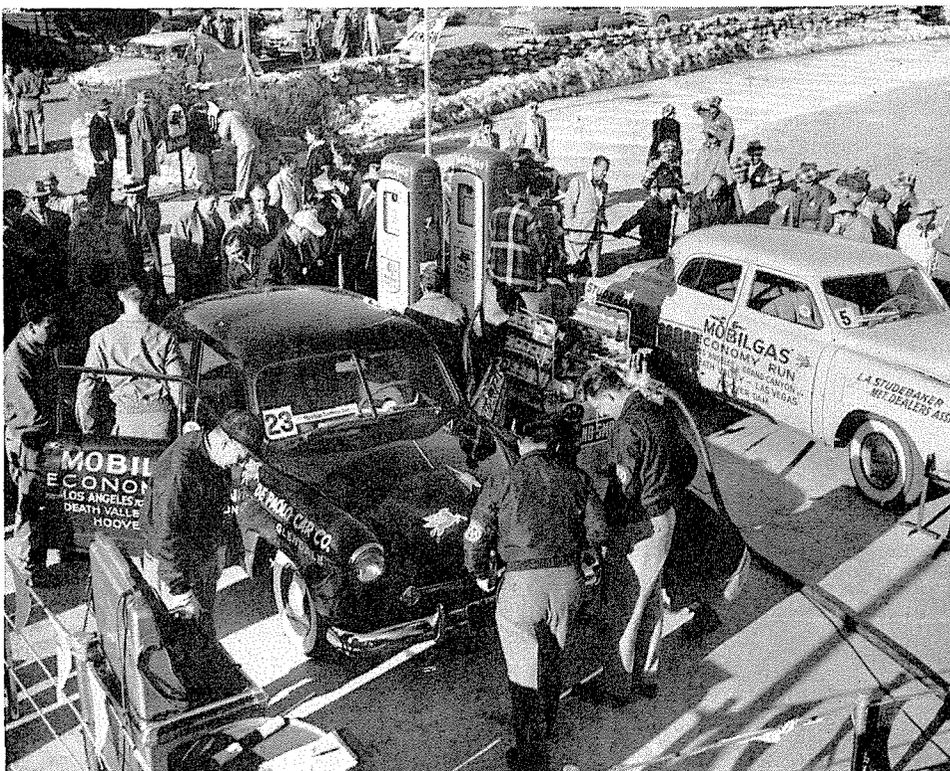
The first refueling stop came at Lone Pine, Calif., about five and a half hours from Los Angeles. Here the observers had to watch the refueling operation and resealing of the gas tank by AAA officials, and record the amount of gas taken on.

From here the cars proceeded across the Argus and Panamint ranges to Death Valley. On the long downgrades from Argus Pass and Townes Pass the drivers in over-drive equipped cars are permitted to use the free wheeling available with these units. Speed limits are enforced to keep the drivers from ignoring all safe and sane driving judgement, but even so, many observers grew a little grey going around sharp mountain turns on screeching, smoking tires. The situation got a little more tense when brakes began to get hot and fade out, but fortunately the only casualties were a few brake linings.

The cars wound through Death Valley for several hot uncomfortable hours, passing the lowest elevation in this hemisphere ( $-279.6$  ft.). 13 hours and 30 minutes out of L. A. the cars reached the quiet, peaceful health resort of Las Vegas, Nevada. Here the cars were parked in a special impound area, and guarded all night by AAA officials, and the 19 non-riding observers mentioned earlier. Meanwhile the 32 riding observers were relieved (at last!).

That night while the 19 non-riding observers were guarding the cars, the other men were busily visiting the museums, art galleries, concert halls, and other cultural spots for which Las Vegas is so well known.

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*End of the run—4 p.m. March 7, the final refueling station at the southern rim of the Grand Canyon*

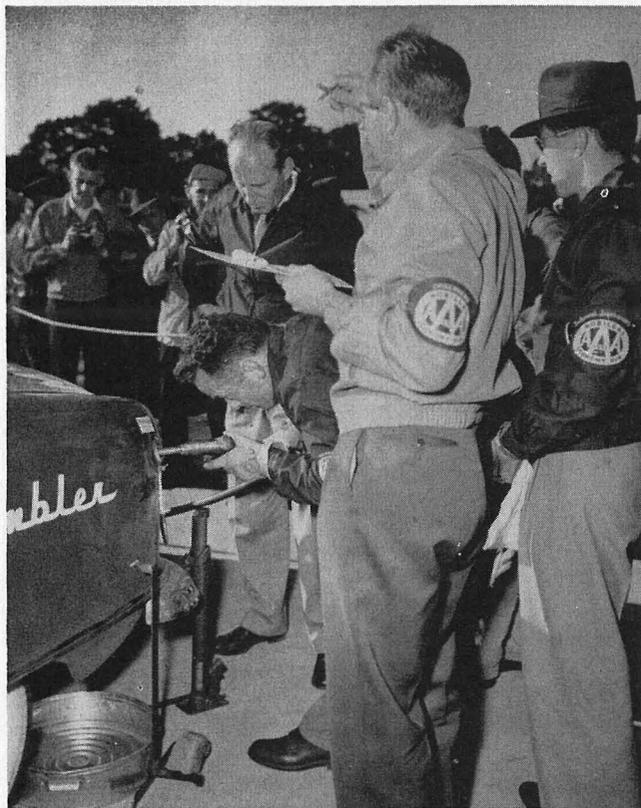
## ECONOMY RUN . . . CONTINUED

This intellectual activity was so engrossing that some earnest students did not retire until early morning.

Arising at the happy hour of 5:30 on Wednesday morning the fellows ate breakfast, showed up at the impound area at 6:30 A.M., and were reassigned to different cars. After refueling, the first car left at 7 A.M. and the others followed at two minute intervals. An hour's drive brought the cars to Hoover Dam, which is still called Boulder Dam by the residents of Boulder (Hoover) City (Democrats). Crossing the massive structure the boys reverently bowed and kissed their slide-rule cases.

The caravan proceeded through Arizona toward the Grand Canyon via Kingman, Seligman, and Williams, Arizona. It is interesting to note that one of the highest tributes of faith, trust, and confidence was paid us by the State of Arizona. They allowed the cars to pass through the Arizona Agricultural Inspection Station on the strength of a mere certificate stating "This car does not carry any fruits, honey, plants, shrubs, or bulbs in violation of Arizona State Law." This was signed by the driver, riding observer, and Contest Board AAA official in charge of state affairs. Fortunately, the President's signature was not necessary—an amazing example of trust in these troubled times.

The drive through Arizona was relatively pleasant and short. The cars arrived at the south rim of the Grand



Caltech Observer Jens Stavnes, records gas consumption of the Nash Rambler at the end of the run

Canyon 7 hours and 25 minutes after leaving Las Vegas. The total elapsed driving time allowed for the 840 mile trip from Los Angeles was 20 hours and 55 minutes, or an average speed of 40.16 mph. The payload for the trip was accurately set at 750 pounds, made up of the observer's, driver's, and passengers' weights, plus lead to make up the difference. The cars were accurately weighed before the run started, so that final results could be computed on the basis of ton-miles per gallon.

At the Grand Canyon the cars were carefully topped off. This consists of painstakingly filling the gas tank to a predetermined level in the filler tube neck. This was also done at Los Angeles before the start. The cars are carefully leveled by jacks during this operation so that refueling conditions will be identical. By adding the exact amount of gasoline taken on at the Grand Canyon to the amount taken on en route, the total gasoline consumption can be computed to within a thousandth of a gallon.

After refueling, the cars were impounded and carefully checked by AAA mechanics to see that no seals had been broken, and that the car had not been tampered with during the run. The observers' written reports were carefully read to see there had been no infraction of the rules.

### The wind-up

While the final checking of cars and data was keeping some of the officials busy most of the night, the canyon was bursting with activity. Several hundred people, including top executives of General Petroleum and the nation's auto industry, had arrived by plane, bus, and special train. There were dinners, speeches, and private parties testifying to the importance of this event—which is considered second only to the classic Indianapolis Memorial Day race in the automotive industry.

Above this atmosphere ran a hum of speculation.

Rumors went around about the performance of the entrants, and several contestants were considered favorites during the evening. Most of the observers, thoroughly worn out, retired from the scene for a good night's rest.

At ten o'clock Thursday morning, March 8, the official results were read. To Caltech's credit the observing job was well done; not a single protest was lodged by one contestant against any other contestant for the first time in several years.

Dr. Kyropoulos, the AAA technical advisor for the trip, returned to Las Vegas with the Sweepstakes-winning car for a thorough check of its parts. The observers boarded a train at the Grand Canyon, Thursday night, for the return trip to Pasadena. They had spent the day sightseeing in the Canyon.

The 51 Beavers rolled home that night with mixed emotions. They were tired, both glad and sorry it was all over, and faced the dirge of finals the very next week. But they were unanimous in feeling it was one of the most interesting experiences of their CIT careers.