

Test technician **develops carplot system**

Brian 170 senior test technician, CGAD Production Operations has developed and installed a computerized monitoring system in his 1983 Chevy van. The system, called "CARPILOT" (Computerized Automotive Relative Performance Indicator and Location of Transit) utilizes a Commodore 64 computer, 12-Vdc to 5-Vdc converter, video player/recorder, cassette player, and a TV monitor. The system or program has two "pages," Page 1 acting as the "Performance Indicator" and Page 2 serving as the "Location of Transit." The functions of each page are as follows:

Page 1 display:

The functions monitored and displayed are battery voltage, water temperature, engine oil pressure, fuel level, vehicle speed, engine rpm, lock/no-lock condition of the automatic transmission torque converter, and on/off condition of the air conditioning clutch. All of these, with the exception of the latter two, are incorporated with a "Buzzer" alarm warning system to indicate malfunction of any of these critical vehicle functions. Also incorporated is a 24-hour clock incrementing by 1 second, estimated time of arrival decrementing by 1 second, miles traveled incrementing every 0.05 mile, and estimated distance to arrival decrementing every 0.05 mile.

Page 2 display:

While still monitoring all of the above vehicle functions and displaying the clock and distance functions, the vehicle function display is replaced by a digital map which displays vehicle location along the map. Vehicle location indication is calculated from distance traveled. Since accuracy of vehicle location is dependent on the accuracy of the digital map construction and the accuracy of the local map used to construct the digital map, the "best hoped for" accuracy is within 1/2 mile. Although this is true, accuracy

of one car length in 22 miles traveled has been realized.

Brian says, "Other than the Commodore 64, I designed and constructed all the necessary hardware and wrote the software. Assembly language was necessary to maintain compatibility with the speed of the hardware and computer." Brian continues "One of the advantages of this setup is the ability to construct your own digital maps, as plain or as complex as you wish, eliminating the necessity to purchase new maps for every trip. For ease of writing and operation, the software to accomplish this is written in BASIC." Brian also mentions, "One note of interest is the installation of a video recorder incorporated along with this system. This not only enables recording on videotape the displayed page, but also gives the option of allowing the passengers to watch prerecorded movies while still giving the driver the ability to monitor vital vehicle functions via the buzzer alarm." Brian concludes by saying, "I would not have been able to develop such a system had it not been for the knowledge I received through the division sponsored Microprocessor training. The most recent course, Microprocessor Software, helped me develop the software for the system."



Brian is one of over seventy Production Operations test techs who are participating in the various technical training programs sponsored by CGAD.



CARPILOT hardware configuration pictured includes TV monitor, Commodore 64 computer, cassette player, and video player/recorder. Not pictured is a 12-V dc to 5-V dc converter which enables the computer to operate on 12-V dc power source.