I would like to point out here on the aircraft servicing this is done on a daily program basis with very sophisticated equipment.

(2) Lack of shoreside facilities.

(3) Restrictive capacity—When the tank became filled the unit was no longer usable.

(4) Cost—Due to fact existing toilets were eliminated.

It should be noted a recirculating toilet can be equipped with self-pumpout capability. While this eases the servicing problem for the boater, it doesn't help the pollution problem because the sewage from a recirculating toilet is not properly treated for overboard discharge. Here again I might interject that this is taking place within our Nation today.

Development of a treatment device that could be used with the half million or so existing marine toilets; namely, a macerator/chlorinator that would meet the requirements prescribed by the National Sanitation Foundation and the American Boat and Yacht Council and would pass the test program of the Yacht Safety Bureau has involved considerable time and expense.

Such a unit must macerate the sewage to a fine particule size so that no identifiable solids can be discharged, and more importantly, that the chemical treatment assures a reduction in coliform bacteria to level below 240 MPN per 100 MI, and this is considered by public health authorities to be an acceptable limit.

Extensive in-house testing has provided evidence that the Carlson Mark VI macerator/chlorinator typically reduces the B.O.D. of the influent by two-thirds. Navy testing at Annapolis indicated comparable reuslts.

We are prepared to cooperate with any regulatory or testing agency to verify these findings, and thereby hopefully remove the onus which has been placed on the macerator/chlorinator in some quarters.

Another criticism that has been leveled at the macerator/chlorinator is that it does not remove or reduce nutrients—that is, nitrates and phosphates. This is true. However, neither do the vast majority of municipal and industrial sewage disposal plants, nor will they for many years to come.

Therefore it appears totally unfair to prevent the boater from discharging properly treated sewage into waters that receive effluent from municipal and industrial treatment plants on the basis that the nutrients are not removed. Admittedly, there are a few experimental plants in the country today that are attacking the problem of nutrient removal, but their installation universally is a long time off. In the meantime, given the opportunity and with continued research, the macerator/chlorinator manufacturers may find the solution to nutrient removal.

Another deterrent to effective shoreside disposal of sewage from boats are the marinas and docks remotely located from sewage disposal plants whose septic systems, if they have them, would be unable to handle the additional load of sewage from boats.

A new safety feature not mentioned in most reports, but is specified in the previously referenced standards; namely, NSF and ABYC, is the so-called fail-safe. This means that the macerator/chlorinator when out of disinfecting chemical would automatically prevent the