From the memory I/O map, I observe that the memory area between 6000~6FFFF are used to store data and there are 0FFF+1 which is 4096 address available for data storage. Thus, we can totally manage to store the 1000 bytes within this memory area. The Program I came up with is shown below. LDS instruction requires 5 cycles and the LDAA and PSHA combination requires 3+4 = 7 cycles and JSR instruction requires 6 cycles. The entire process will take 5 + 7 *1000 + 6 = 7011 cycles.

ORG 0000
LDS 6FFFF ; load stack pointer to 6FF (beginning of Data and Stack area)
LDAA 8000 ; read 1000 bytes from the input port
PSHA ; push the input data into stack
LDAA 8000
PSHA
..... repeated LDAA& PSHA for 1000 times
JSR C000 ; return to monitor