MOSN-253

TO: Distribution
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SUBJECT: New DSU-170 DIM

This MOSN obsoletes MOSN-243

A new DSU-170 Device Interface Module (DIM) is being installed which enables the DSU-170 disk subsystem to handle bursts of heavy disk traffic more rapidly. Under light loads, response time of the DSU-170 subsystem is virtually unchanged. Under heavy loads (several read or write requests queued up), the effective channel capacity of the DSU-170 subsystem is increased by performing all possible seek operations concurrently, and by reordering data transfers to achieve best channel utilization. This results in smoother and less severe degradation of subsystem response time to bursts of requests.

The features of this DIM are controlled by several new parameters on the D170 configuration card, as follows:

D170 frec nrec gioc channel area areamap cqmax prior spint

The new parameters are as follows:

cqmax controls the amount of reordering of requests that the DIM will do to optimize channel usage. cqmax should be 2 or 3 for the drives currently in use. cqmax will be set by the programming staff.
prior is a switch to turn the DIM priority mechanism on and off for experimental purposes. prior should be 1 for normal Multics operation.

spint controls the use of the seek_completion special interrupt from the DSU-170 controller. If spint = 0, the special interrupt is ignored. If spint = 1, the special interrupt is used. If used, the SPI switch on the DSU-170 controller must be in the SPI EN position. SPECIAL INTERRUPTS MAY NOT BE USED (YET) ON A GIOC SYSTEM.

At present, cqmax, prior, and spint are 3, 1, and 0 respectively.

Programming Note

cqmax must be in the range 0 ≤ cqmax ≤ area, where area is the number of areas (DSU-170 disks) in the configuration. If cqmax < 0, no seek overlap is performed. The choice of this parameter value is made from the formula:

$$c_{q_{\text{max}}} = \left[ \frac{t_s}{t_1 + t_t} \right] + 1$$

where [...] stands for "integer part of", \(t_s\) is the mean observed seek time for the drives, \(t_1\) is the mean observed rotational latency, \(t_t\) is the transmission time of a page.

WARNING - making cqmax unnecessarily large may induce multiprogramming anomalies.