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OFFICE MEMORANDUM

TO Biomedical Control Committee

712903

DATE November 25, 1975

FROM J. A. Helland, Chairman

SUBJECT BCC MEETING MINUTES - November 14, 1975

SYMBOL MP-5

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The meeting was opened for discussion about items the members felt were important. Paciotti raised the question of a password for the Biomed computer. Helland explained why passwords are necessary, that they will be changed nearly daily and that Vander Beken will have his own privileged UIC with his own password. The pros and cons of passwords were discussed and the final decision was to keep passwords on privileged UIC's; however, if someone needs a password, e.g. to reset a terminal "interrupt enable", either Kittell or Helland can reveal the password. Lundy suggested that a task should be written to reset "interrupt enable" for any terminal.

Knapp commented about the fact that the DIVA disks have been down so much. Helland explained some of the problems -- power transistors on one Trident drive burned out, the disk cleaning brush wasn't operating properly, etc. He noted that it wasn't the same problem recurring again and again, but a whole series of different problems. The fact that tuf dust collects on electrical components was discussed. Paciotti asked if the tuf dust might be responsible for disk head crashes. Kittell said the air entering the disk drives is filtered adequately to avoid head crashes. He thought we were having fewer head crashes because E-5 had cleaned all of our disk packs. Helland thought the decrease in smoking in the control room led to a decrease in head crashes.

Helland noted that when the memory on the computer was reduced by 12K many users had to wait for available memory in order to run their tasks. (This happens when four or more persons use the computer at the same time.) Swenson asked if the Q-tasks were large and would represent a heavy burden on the system. Vander Beken said they were relatively small.

Vander Beken asked what the working policy of this committee is. Helland stated that the memo from Knapp, which originally chartered the committee, spells out what we should be doing. The agenda of the next meeting and general strategy were briefly discussed. Paciotti and Vander Beken both felt that the overall goals of the committee should be discussed. Kittell felt that the software that he was going to discuss later shouldn't be gone into in great detail until we know where we are headed. Smith said that we had to be informed about what we have before we can decide what we want to do with it. Vander Beken and Paciotti disagreed and felt we need to start by deciding what kind of a system we want to establish. Knapp pointed out that we don't have enough money to build another system, so we should quickly go over the existing system and then we'd get on with the

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problems that we have to solve, e.g. what are we building the control system for? Swenson felt that this meeting should be the last meeting for reviewing what we have and at the next meeting we should get on with the question of basic goals of the committee. Paciotti suggested that the members of the BCC come up with specific recommendations to the BCC as to what is needed, and then the BCC should set priorities and assign people to work on those tasks.

The question of what Vander Beken should discuss about the Q system at the next meeting was brought up and discussed. Knapp felt that the Q system should be briefly discussed to give us a general view of what it can do, but a discussion of the needs of the Biomedical program should also be on the next agenda. Lundy suggested that Vander Beken discuss the (Q system) needs of users such as Dicello, Amols and Richman before he describes the Q system to the BCC. Knapp again emphasized that the BCC should get on with the scope and philosophy of the control system -- what are the uses which it will be put to and what methods of interaction of the control system with the hardware do we think are suitable.

Swenson commended Kittell for the clear and concise statement of the status of the software that was in his memo. He also reviewed a discussion between Helland and himself concerning time slicing versus priorities for a computer system. (RSX 11-D version 6A has a priority system but not time slicing. Version 6B will incorporate time slicing.) Kittell pointed out that two tasks that have the same priority (number) are still ranked in priority according to which was started first. This can lead to problems if the first task is CPU bound, in which case the second task will just have to wait. Time slicing would allow both tasks (of the same priority) to share the available time equally. Most tasks do some I/O, during which time other tasks can run. This is not true for a CPU bound task. An artificial time-slicer task can be written to overcome this problem for the number crunchers. This can be written so as to automatically give those tasks performing considerable I/O a higher priority. Swenson pointed out that some tasks, such as those responding to knobs and buttons, should be run at higher priorities. Barnard asked if there really are very many number-crunching programs that are run on the computer. He suggested that it would be easier to alter priorities when one program hogs the CPU time. He has a time slicer if we really need one. He said there were many other projects that should have higher priority for completion.

Kittell noted that the Version 6A operating system is quite stable. We haven't had nearly as many system crashes as we had on Version 4. We haven't had any crashes that were due to the operating system.

Swenson asked about the specific FORTRAN statements for utilizing the Channel Tables. Kittell felt such a discussion would be too detailed for now, but he did write some examples on the blackboard:

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COMMON/AINFO/SEQ,DES,F,C,N,A,LOC
CALL  CHNFND (RTM6ØØ7AØ1,CHAMB)
CALL  READA
CALL  UNPAKA
CALL  ALGDAT (CHAMB,COUNTS)
CALL  RDSCL (CHAMB,FNUM)
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Swenson asked how one would go about reading the same channel 100 times. Kittell said there are two ways to do that: (1) you could put much of the information in common and index through that, or (2) initialize your channel tables when you start up, get all your data, and include that in the call. Then instead of using the channel table number you would simply use the F,C,N,A of the command. (The channel table lists the F,C,N,A for a given operation.)

Swenson asked about the operation of Data Scan (DSCAN) and the Data Bank. Kittell explained that Data Scan goes out and reads the CAMAC channels once a second. Swenson said that sometimes it's important to read a channel more often than once per second, and he asked if this is possible. Kittell said it is, but not through Data Scan. An important question to consider is what is the optimum way to bring the data in from CAMAC? The system is beginning to get Bus bound, so it's not practical to run Data Scan faster than once per second. The pros and cons of the Data Bank concept were discussed. In general, the Data Bank technique is more efficient, except where the users want only a small fraction of the data read, or where they want the data at a faster rate. Lundy asked how much of a load Data Scan really puts on the Bus. Kittell replied that all other operations on the system seem to halt once a second when Data Scan runs. Lundy said it still may not represent an appreciable part of the total Bus load. The problem of Bus loading should be examined in more detail.

Kittell described the Channel Table some more and explained that there is a program called CTE (Channel Table Editor) which facilitates the editing of the Channel Table entries. This makes it easy to move CAMAC modules around. If something in CAMAC goes bad, Data Scan usually gives the first indication with a message on the screen.

Paciotti said that most things don't have to be read more than once every 10 seconds or so. Kittell agreed. Helland suggested having several different Data Scans running at various time intervals. Kittell felt that if you're looking at something, you want the data to be current, not from 10 seconds earlier. When a target goes out, for example, you want to know right away, not 30 seconds or so later. Paciotti said he will push for many individual data reads, rather than the Data Scan/Data Bank concept. Swenson asked how do the programs know that the data they get from Data Bank are not the same data they already have? Kittell said they set a flag and wait one second for the flag to be cleared and then they "re-read" data from Data Bank. It was suggested that Data Scan toggle a flag, or two flags alternately, to tell other tasks when new data have been read. It was agreed that we need some specific numbers (as to what fraction of the Bus load is due to Data Scan) before we can decide how to change Data Scan or if it should be changed.

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Kittell mentioned that some of the entries in the Channel Table list are included only for inventory, and not for actual use, e.g., Branch Highway terminators. Vander Beken said that the crate/slot number for the Q-trigger module is specified at run time, so its entry can be removed from the Channel Table.

Swenson questioned whether it really is feasible to command a device to seek a specific analog value (Analog Command) because it can get confused with limit switches, noisy data, non-linearities, etc. Kittell agreed that the Analog Command program may have to be rewritten or scrapped.

Kittell discussed the magnet codes. Some of them run many magnets simultaneously. They now utilize the new DVM, once the setting is within one-half percent. (This has to be checked out yet.) Once the magnet codes, in their present form, are running again, we'll see what we don't like and change it, probably in the operator interface. A typical task is named MAGXXX, where XXX is up to 3 letters descriptive of the task, e.g., MAGCYC to cycle magnets, MAGON, MAGOFF, etc. An operator interface task sends an eleven-word array to the task to be performed, indicating which of the eleven magnets are to be operated on. It should be relatively easy to interface those tasks to the buttons. Because of ongoing work on the hardware, we haven't checked out these codes on Version 6A. Paciotti noted that we need codes to change magnets for a change in momentum. Several other desirable features of the operator interface task (or button system) were discussed, e.g., having a library of tunes and being able to select any one and then change momentum for that tune, being able to easily do any operation to any single magnet or all magnets, etc.

The pros and cons of doing the tuning with RSX using the Q-system were discussed. Since Vander Beken is willing to work on the Q-system, and since manpower is limited to get the DOS programs running again, it was agreed that we'll head toward the Q-system tuning. Paciotti asked what other programs Q will be used for, e.g., dosimetry, scanning, PACE interface, etc. These programs should be looked into and planned for.

Knapp brought up the question as to whether or not there would be beam in our channel during Cycle Zero Checkout. Bradbury pointed out that, by definition, Cycle Zero is target cell and channel checkout. Our Cycle Zero will come well after Area A Cycle Zero.

The maintenance of the DIVA disk system was discussed. Knapp said that Harold Butler was working on a contract with E-5 to maintain them.

The meeting was adjourned.

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