LOS ALAMOS SCIENTIFIC LABORATORY
UNIVERSITY OF CALIFORNIA
LOS ALAMOS, NEW MEXICO 87544

OFFICE MEMORANDUM

TO : Biomedical Controls Committee

DATE: February 9, 1976

712911

FROM : J. A. Helland

SUBJECT : MINUTES OF MEETING - FEBRUARY 3, 1976

SYMBOL : MF-3

MAIL STOP: 844

- Lundy memo
- Scanner
- Van den Berken memo
- MBD problem

Discussion of minutes of meeting of January 27, 1976: Berardo noted that the swap of 4010's with Dick Thomas will be bypassed. The latest plan is to modify one of the Biomed 4010's in about six weeks for use on KRONOS. This terminal is to be switchable between KRONOS and the Biomed computer, and switchable in baud rate. A new 4010-1 will be purchased for dedicated use for treatment planning, if funds are available.

Terminals, in general, were discussed. The Biomed remote terminals are disliked because of the lack of "page full" on the character-scope terminals and the large consumption of paper on the TI terminal. It was decided that the present conference room be converted to a "terminal room" and that the records room be converted to a conference room.

The Biomed Xerox machine should be exchanged for one that can be used to copy books.

The assignment of priorities to the Biomedical Controls activities was skipped, with the understanding that Helland will assign priorities as necessary. Helland was asked to write a memo listing the tasks involved in the "priority one" assignments of the previous meeting, along with the number of man-hours required to complete each task. (This memo is attached.)

The memo, "Activities of the Biomedical Control Committee" from Henry vander Beken, dated January 30, 1976, was discussed. The committee agreed that it has spent too much time discussing short-term policies instead of long-term policies. The committee should give general guidance for Helland, and should review the short-term plans that result. vander Beken volunteered to convert the "original" Knapp memo (dated November 3, 1975) into a list of specific tasks to be discussed at future meetings. This list will be ready for the meeting on February 17, 1976.

Cycle R should occur around March 8, 1976. The memo, "Cycle Zero Checkout of Biomed" from Bradbury and Paciotti, dated November 5, 1975, was discussed briefly.

Disk (and system) back-up policy was brought up. It was decided to discuss this in more detail at a later meeting.

The agenda (one item) for the next meeting was decided on, and the meeting was adjourned.

Distribution:
J. A. Helland, MS 809 (2)
A. Lundy, MS 809
R. Kittell, MS 809
H. vander Beken, MS 828
D. Swenson, MS 844
E. Knapp, MS 844
J. Bradbury, MS 844
M. Paciotti, MS 844
A. Smith, UNM, MS 809
R. Barnard, UNM, MS 809
MP-3 File

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LOS ALAMOS SCIENTIFIC LABORATORY
UNIVERSITY OF CALIFORNIA
LOS ALAMOS, NEW MEXICO 87544

OFFICE MEMORANDUM

TO : Distribution

DATE: February 11, 1976

FROM : Jim Wing JDW

SUBJECT : Meeting to discuss Biomed slit operation including the slit, pulse motor and pulse motor driver (ref. M. Paciotti memo 9/30/75 on slit 1 software)

SYMBOL : MP-3

MAIL STOP: 844

A meeting is scheduled for Tuesday, February 17 at 9:30 A.M. in the Biomed library to discuss the proposed operation of Biomed slit SL01 and the implications this may have to general pulse motor applications at LAMPF.

The Biomed slit SL01 is driven by an M093 type pulse motor with a type II linear actuator driver module (60Y-126582 with a MKIV stepper board 63Y-125914) in conjunction with a Kinetic Systems KS3360 pulse train generator (CAMAC module) for computer operation. During the assembly and testing of this slit by MP-8 and MP-3 personnel, the following changes have been agreed upon and made: (1) exchange of flexible shaft couplings with more rigid ones, (2) the use of slit limit switches instead of motor limits for in/out control; (3) the modification of the motor limit detent cam to both protect the position pot (analog slit position data) and to give a backup slit control, and (4) the addition of a magnetic damper to the rear extension of the pulse motor shaft.

MP-3 personnel have also made some changes to the model MKIV stepper board to increase torque holding time after pulses have stopped (i.e. slit has reached a limit or desired position). Originally, this torque holding time was about 0.37 sec, modified to 1.25 sec and finally to 130 seconds. This was done to allow our slit software programmed pulse sequence (e.g. 200 pulses followed by a data check) to continue without an interruption of holding torque on the motor. Initially, the slight windups of both the flexible couplings and the mechanical slit system during a pulse sequence step was released at the time of the 1.0 sec software update (Biomed computer DATA SCAN), thus causing a small backtracking of the motor shaft. Since the slit jaws open half-aperature of 1.0 inch per 800 pulses (2.0 inches full-aperature), by the time they had moved several inches or centimeters we had accumulated several of these shaft backtracks giving us the appearance of having lost an equivalent amount of pulses. With the longer torque holding time, this problem disappears and also gives the slit control program a greater working time range.

Without the flexible couplings, the system still has about 3 pulses worth of mechanical slack (3 pulses @ 2.5 mil/p = 7.5 mils or 0.19mm of equivalent slit jaw full-aperature motion). If the slit jaws move to their physical limits (a mode we plan on using for initial slit calibration and if necessary for recalibration when the slit is in the beam line and out of sight), the pulse motor will drive 3 more pulses (winding up the mechanical slack) before slipping. At this point the shaft rotor permanent magnets cannot move but the motor windings still change polarity thus causing a drop in torque as the shaft rotor moves backward in search of a winding with the attracting opposite polarity. We plan to bypass the position limits and move into the physical limit of the jaw during calibration. This last sequence will be run at a 1 pps rate with a backup command time-out feature that will allow for a data check after each series of 10 or so pulses.

The analysis of these shaft motions (including the holding torque and flexible shaft coupling motions described earlier) was made possible by Roger Schamaun's addition of a round disc marked with 200 angular divisions (200 radii) of 1.8° per division (1.8°/pulse or 200 pulses per motor revolution) attached to the rear motor shaft extension and a pointer mounted on the motor housing. With this visual pulse indicator we have been able to accurately observe motor shaft motion in relation to supplied pulses.

We now feel that we will be able to position the Biomed SL01 jaws with acceptable accuracy. Attached is a copy of M. Paciotti's memo relating to this slit and its software control.

Attach: Memo

Distribution:
R. Kittell, MS 809, w/o attach
J. Little, MS 828, w/attach
J. Wilmarth, MS 810, w/attach
J. Bradbury, MS 844, w/o attach
A. Chavez, MS 844, w/o attach
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