



NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
LYNDON B. JOHNSON SPACE CENTER
HOUSTON, TEXAS 77058

REPLY TO
ATTN OF: DF

February 28, 1975

MEMORANDUM

TO: DF2/W. E. Feddersen
FROM: DF/W. E. Thornton
SUBJECT: Contract Extension for Shuttle Exercise Device

As we discussed, an existing contract with a San Antonio contractor has been verbally approved by DA.

Background - Whitmore Enterprises of San Antonio currently has two feasibility prototypes under construction and every indication is that they will demonstrate the practicality of a passive treadmill ergometer capable of maintaining muscular and cardiovascular condition with a minimum time requirement in weightlessness. It is desirable to continue, i.e. extend this contract, to produce a flight prototype compatible with Shuttle. This was verbally agreed to by the Chief, Life Sciences Astronaut Office, who indicated \$30K would be available.

Such an extension of the contract would include: one model of this treadmill will be produced and delivered, using where possible, practice and materials compatible with space flight but not built to flight specs. Design goals are a weight of 20# exclusive of harness and instrumentation, ability to be attached to a single point not requiring load carrying but only for positioning, storable in the cabinet dimensions shown on the enclosed sketch and with a maximum use dimension of 36 inches. The device should be capable of accommodating a crewman running or jogging at speeds of at least 8 MPH, preferably more. It must be passive, i.e. no external power, with passive speed indicator of 0-10 MPH and allow jogging walking and running in the range of 4-8 MPH min. at an equivalent elevation angle of 5° min. (0° desired) to 15° max. with this angle being set manually with manual indication to $\pm 1^\circ$. A limit speed will be adjustable over the specified range by a passive brake arrangement. Overall friction losses over the speed range must be determined and provided. Input forces, less friction, will be indicated by a reaction scale from the brake assembly. One simple belt and shoulder restraint harness with elastic elements coupled to the ergometer frame will provide equivalent 1-G loads of 135 to 200 lbs. on the subject treadmill interface and will be delivered. The technical work will be under my

direction and the delivery date should be no more than one year from contract award.

I suggest you contact Mr. Henry Whitmore of Whitmore Enterprises, Rt. 5, Box 369, San Antonio, TX 78211 (Phone: 512-624-2121) with these requirements and getting a bid. I have been over the technical details of this with him and he is well versed on it.

I don't know what the urgency of funding is, but I suggest contacting DA immediately.


William E. Thornton

Enclosure

cc:
DF/J. P. Kerwin

DF/WETHornton:ss:2/28/75:2411