

1-Aug-90

Information sheet for Dr. William Thornton.

DSO 476 - Exercise Component

I. Treadmill testing is only performed pre- and postflight on a standard (active) treadmill utilizing the modified Cunningham protocol (See table 1).

A. The purpose of the preflight test is to:

1. Set the exercise intensity for the inflight aerobic exercise based on the heart rate and oxygen uptake relationship.
2. Assess the functional capacity of the astronauts.
3. Establish the submaximal running economy at speeds of 5, 6, and 7 mph. → 0 %

B. The purpose of the postflight test is to:

1. Assess the functional capacity of the astronauts.
2. Establish the submaximal running economy at speeds of 5, 6, and 7 mph.

C. Physiological monitoring includes respiratory gas parameters, heart rate, and blood pressure.

II. Treadmill exercise using a standard protocol (Table 2).

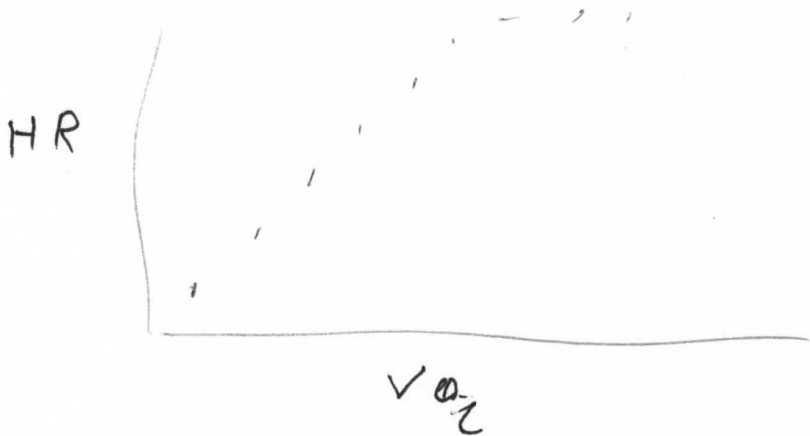
A. Preflight exercise is performed at least once prior to flight on a shuttle treadmill with the training bungees using the standard protocol.

B. Inflight exercise is performed on a daily basis. The crew monitor their heart rate with a tachometer.

Table 1: Modified Cunningham Protocol

The testing protocol is shown below:

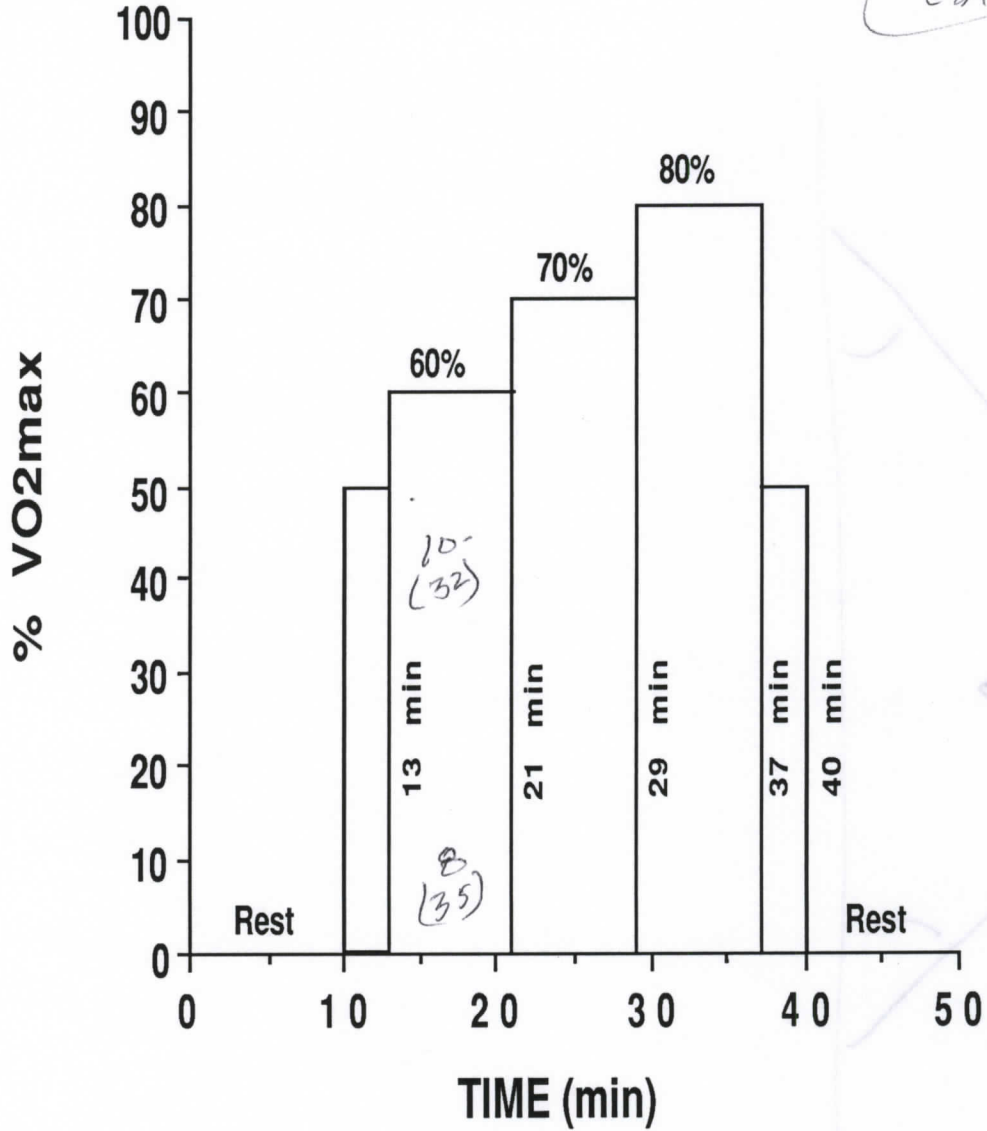
ACTIVITY	STAGE TIME ELAPSED TIME	
	(minutes)	(minutes)
1. Instrumentation of subject	5	5
2. Graded Exercise Testing		
Stage No. Speed    Grade    Estimated VO <sub>2</sub>		
(mph)    (%)    (mL/kg/min)		
Warm-up    3.5    0    12.9	2	7
1    5.0    0    30.3	3	10
2    6.0    0    35.7	3	13
3    7.0    0    41.0	3	16
4    7.0    3    46.1	1	17
5    7.0    6    51.2	1	18
6    7.0    9    56.2	1	19
7    7.0    12    61.3	1	20
8    7.0    15    66.3	1	21
9    7.0    18    71.4	1	22
10    7.0    21    76.5	1	23
3. Recovery walk at 2.0 mph 0% grade	5	28
4. De-instrumentation of subject	2	30



# Figure 476-1. - Modified Exercise Protocol A

## FS 1-30

Cal



32  
- 2 -

Weatherbee Interval

CIC

Linda Barrows

Gardner  
Brand

L1 → R