

PRINCIPAL INVESTIGATOR REPORT

EXPERIMENT M113

SKYLAB III
R +21

Shown in Table 1 are the red cell mass and plasma volume values for this mission. All three crewmen showed a drop in red cell mass postmission. At R +14 the red cell mass showed an increase compared to the recovery value. At recovery the plasma volumes of the three crewmen were decreased. By R +14 the plasma volume had increased to values greater than pre-flight.

Table 1 shows also these data corrected for body weight. Since this is ml/kg, it can be considered as concentration. The three crewmen showed decreased red cell concentration at recovery. At R +14 Commander Bean's value had actually surpassed his preflight value. The other two crewmen showed an increase when compared to their recovery day values. The plasma volume concentrations were decreased at recovery in all three crewmen. The plasma volume concentration had increased by R +14 so that the value is greater than preflight for 2 of the 3 crewmen.

Between recovery and R +4 there was a drop in total serum protein concentration. The changes in total protein can be used to calculate the changes in plasma volume. These derived plasma volumes shown in Table 2 indicate that most of the

change in plasma volume measured between recovery and R +14 occurred during the first 3 days.

Table 3 shows the percentage change in the red cell mass and plasma volume. On recovery day the mean change in the red cell mass is -12.2% and the R +14 mean decrease is 7.5%. The mean plasma volume decrease was 13.1% at recovery and the R +14 plasma volume was 5.6% greater than the preflight values.

Table 4 shows the percentage change in red cell mass and plasma volume concentration. These show changes of -8.6% in red cell mass and -9.8% in plasma volume on recovery day.

The data to the present suggest:

1. Something in the environment or in the response of the crew to the mission produced a decrease in red cell mass and plasma volume.

2. The magnitude of these changes are similar to that found after other missions indicating that the greater duration of Skylab III did not produce a greater change in these measurements.

3. Nothing in the current data would contraindicate flying an eighty (80) day mission.

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Table 1

SKYLAB I/III

VOLUMES

	BEAN	GARRIOTT	LOUSMA	BUCHANAN	BURCHARD	WHITTLE
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Red Cell Mass (ml)

F -20 (189)	1841	1780	2608	2237	2250	1932
R +0 (268)	1728	1427	2332	2154	2259	1899
R +14 (282)	1791	1534	2454	2122	----	1883

Plasma Volume (ml)

F -20 (189)	3157	2798	3885	3122	3802	3070
R +0 (268)	2577	2542	3426	3061	3809	2966
R +14 (282)	3160	3209	3963	3351	----	3096

Red Cell Mass (ml/kg)

F -20 (189)	26.9	28.9	30.0	28.0	30.0	29.5
R +0 (268)	26.7	24.3	27.2	27.3	30.2	28.2
R +14 (282)	27.2	25.1	27.6	26.6	----	28.3

Plasma Volume (ml/kg)

F -20 (189)	46.2	45.4	44.8	39.1	50.8	46.9
R +0 (268)	39.8	43.2	40.0	38.8	51.0	44.1
R +14 (282)	48.0	52.4	44.6	41.9	----	46.6

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Table 2

PLASMA VOLUME
MEASURED AND DERIVED

	BEAN	GARRIOTT	LOUSMA
	<u>VOLUME IN ML</u>		
PRE	3157	2798	2335
R	2577	2542	3426
R +1*	2792	2613	3678
R +3*	2956	2850	3848
R +14	3160	3209	3963
	<u>ML/KG BODY WEIGHT</u>		
PRE	46.2	45.4	44.8
R	39.8	43.2	40.0
R +1*	43.6	44.8	43.7
R +3*	45.0	47.9	44.8
R +14	48.0	52.4	44.6

*DERIVED FROM CHANGES IN PLASMA PROTEIN CONCENTRATION.

Table 3

SKYLAB I/III

% CHANGE FROM F -21 VALUE

	BEAN	GARRIOTT	LOUSMA	MEAN	BUCHANAN	BURCHARD	WHITTLE	MEAN
				<u>Red Cell Mass (ml)</u>				
R +0 (268)	- 6.1	-19.8	-10.6	-12.2	-3.7	+0.4	-1.7	-1.7
R +14 (282)	- 2.7	-13.8	- 5.9	- 7.5	-5.1	----	-2.5	
				<u>Plasma Volume (ml)</u>				
R +0 (268)	-18.4	- 9.1	-11.8	-13.1	-2.0	+0.2	-3.4	-1.7
R +14 (282)	+ 0.1	+14.7	+ 2.0	+ 5.6	+7.3	----	+0.8	

