

EW53 FILE COPY

TL797.P47 H93

JSC-09548

SKYLAB EXPERIENCE BULLETIN NO. 14

PERSONAL HYGIENE EQUIPMENT

DISTRIBUTION AND REFERENCING

This paper is not suitable for general distribution or referencing. It may be referenced only in other working correspondence and documents by participating organizations.



*National Aeronautics and Space Administration*  
**LYNDON B. JOHNSON SPACE CENTER**  
*Houston, Texas*

JANUARY 1975

THIS PAGE INTENTIONALLY  
LEFT BLANK

MAN-MACHINE ENGINEERING DATA APPLICATIONS  
OF  
SKYLAB EXPERIMENTS M487/M516

BULLETIN NO. 14

PERSONAL HYGIENE EQUIPMENT

This document is the fourteenth in a series of releases which are intended to make available to NASA and contractor personnel those results from the Skylab Man-Machine Engineering Experiments which have design and requirements relevance to current projects and programs. This method of data distribution has been instituted as a convenient way to provide early access to Skylab experience.

Prepared by: Malcolm L. Johnson  
Malcolm L. Johnson

REVIEWED AND APPROVED BY:

Robert L. Bond  
Robert L. Bond, Head  
Man-Machine Engineering Section

George C. Franklin  
G. C. Franklin, Assistant  
Chief for Crew Station  
Spacecraft Design Division

January 1975







## TABLE OF CONTENTS

Section	Page
SUMMARY . . . . .	1
PRE-SKYLAB EXPERIENCE . . . . .	2
SKYLAB DESIGN . . . . .	4
SKYLAB EXPERIENCE . . . . .	7
Windup Shaver . . . . .	7
Safety Razor . . . . .	9
Shaving Cream . . . . .	10
Oral Hygiene . . . . .	11
Skin Emollient . . . . .	13
Hairbrush . . . . .	14
Haircomb . . . . .	14
Nail Clippers . . . . .	14
Antiperspirant . . . . .	16
Rucksacks . . . . .	17
Styptic Pencil, Safety Swabs, and Mirror . . . . .	18
CONCLUSIONS/RECOMMENDATIONS . . . . .	19
RAW DATA APPENDIX . . . . .	21



## PERSONAL HYGIENE EQUIPMENT

PRE-SKYLAB EXPERIENCE

### SUMMARY

The equipment within the personal hygiene kits functioned adequately and provided necessary hygienic support. The major problems encountered with the personal hygiene kits were attributed to exposure to temperatures significantly higher than anticipated. The personal hygiene equipment affected had been launched aboard SL-1. The heat caused the tubes of hand cream to rupture. Also, some of the shaving cream, toothpaste, and antiperspirant sticks dried out, making use difficult. Replacements for the damaged items were brought up by the SL-3 crew.

The more notable observations about the personal hygiene equipment centered about the following:

- The personal hygiene equipment should have been more personalized.
- The hand cream was used frequently to counter the effect of the dry Skylab atmosphere on the skin.
- Aerosol cans for dispensing shaving cream and deodorants were desired, but not available.
- Shaving was troublesome and time consuming.



## PRE-SKYLAB EXPERIENCE

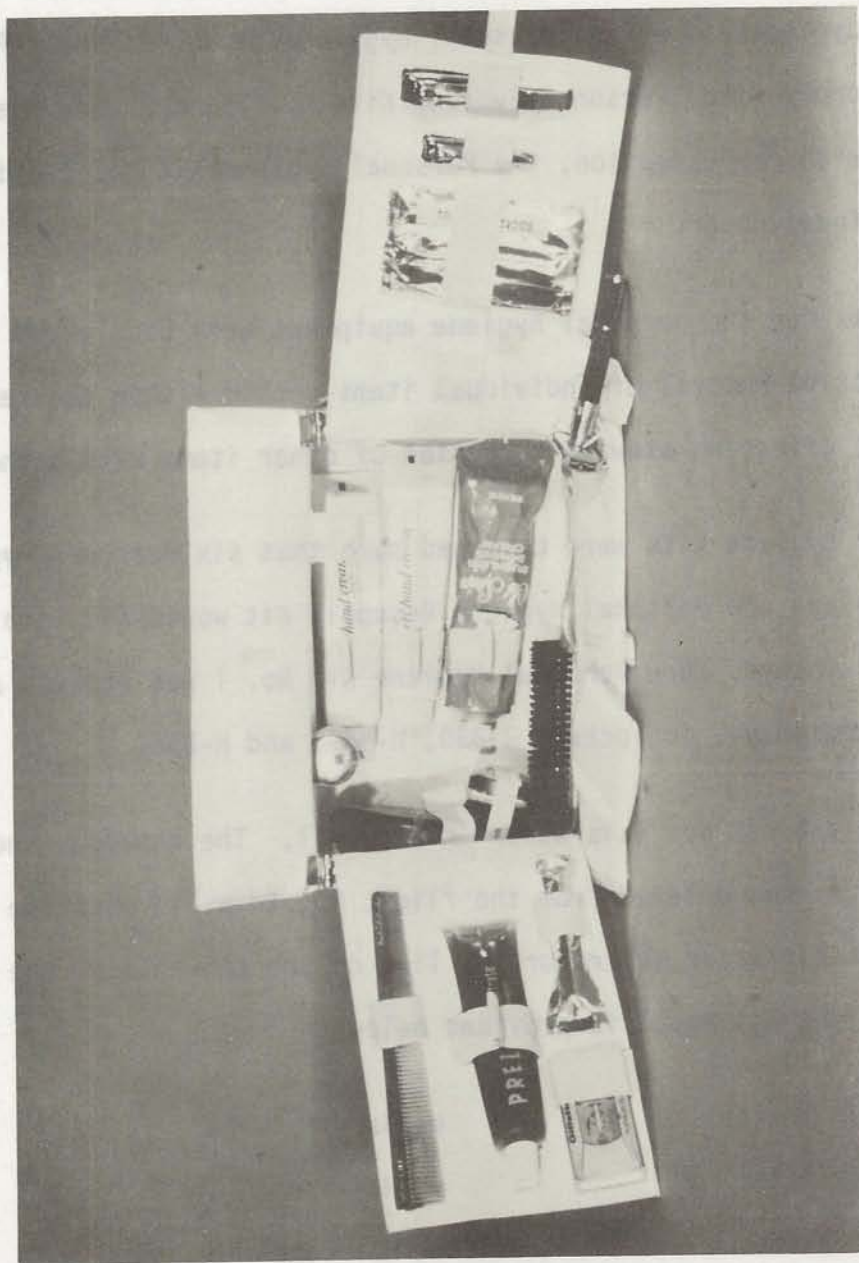
Personal hygiene provisions were not used for the short duration Mercury missions.

The requirement for personal hygiene provisions became apparent during the longer duration Gemini missions. Because of weight and space limitations, few hygienic provisions were available. An unshaven face was symbolic of a returning crewmember. A toothbrush, toothpaste, and chewing gum were provided for oral hygiene.

The Apollo provisions represented considerable improvement in satisfying the personal hygiene needs of the individual crewmembers. The necessary articles for shaving and oral hygiene were provided. The personal preference kits contained a windup shaver, safety razor, razor blades, shaving cream, hand cream and comb. Brands and types were selected by individual crewmembers and bought "off-the-shelf" at a local store in some cases. (All items were tested for compatibility with the spacecraft requirements.)

Toothbrushes and toothpaste were stowed with the food. Dental floss was added for some of the later Apollo flights.

For Apollo 17, these personal hygiene articles were relocated and stowed in a personal hygiene kit similar to the hygiene kit (Figure 1) provided for the later Skylab missions.



PERSONAL HYGIENE KIT NO. 1

FIGURE 1



## SKYLAB DESIGN

The personal hygiene equipment consisted of three separate subassemblies; a Personal Hygiene Kit No. 1, Personal Hygiene Kit No. 2, and a Personal Hygiene Resupply Kit. Personal Hygiene Kits No. 1 and 2 were identical in content with one exception; the Personal Hygiene Kit No. 2 did not contain a windup razor.

The rucksacks for the personal hygiene equipment were configured to permit selective removal of individual items packed within the respective kits without affecting stowage retention of other items within the kit.

The personal hygiene kits were designed such that six Personal Hygiene Kits (No. 2) and one Personal Hygiene Resupply Kit would fit into a standard OWS locker. One Personal Hygiene Kit No. 1 was stowed, along with other equipment, in lockers H-830, H-832, and H-834.

Personal Hygiene Kit No. 1 is shown in Figure 1. The shampoo, shown in this figure, was deleted from the flight kit to avoid possible harm to the shower air/water separator. A list of the contents of the Personal Hygiene Kit No. 1 is provided below:

- Windup Shaver
- Safety Razor
- Razor Blades
- Shaving Cream
- Safety Swabs
- Hairbrush
- Haircomb
- Trim Comb



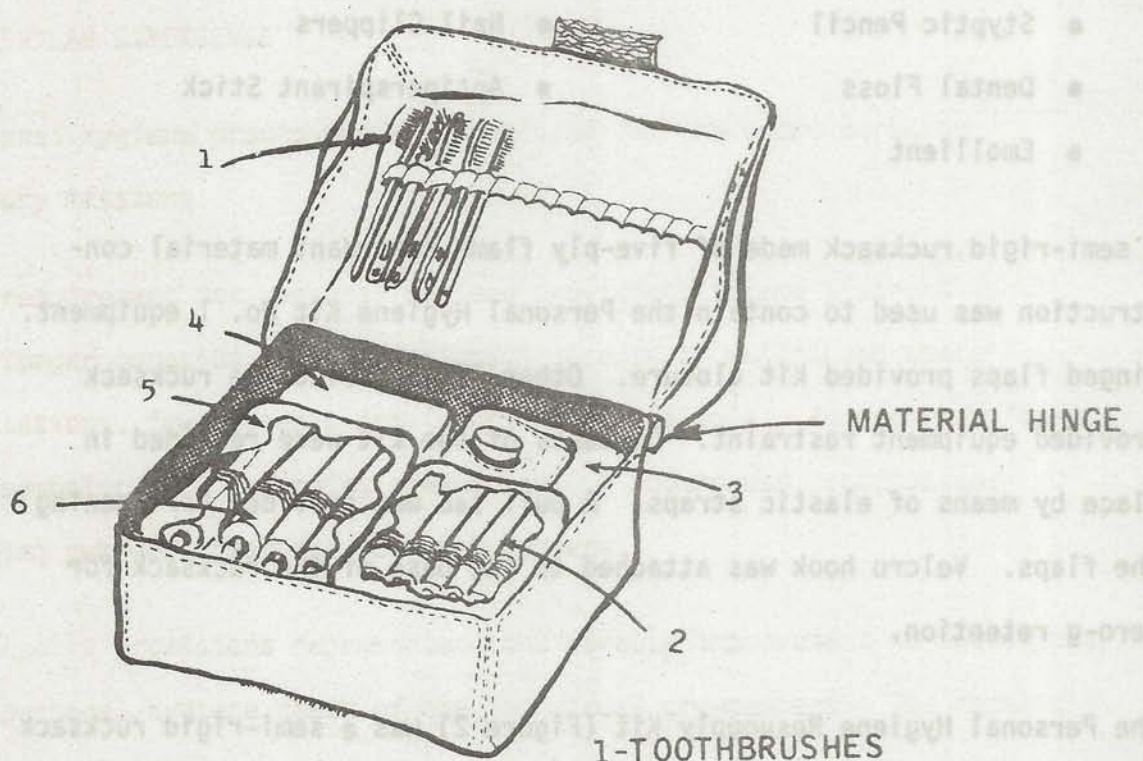
- Styptic Pencil
- Dental Floss
- Emollient
- Nail Clippers
- Antiperspirant Stick

A semi-rigid rucksack made of five-ply flame retardant material construction was used to contain the Personal Hygiene Kit No. 1 equipment. Hinged flaps provided kit closure. Other flaps inside the rucksack provided equipment restraint. Contents of the kit were retained in place by means of elastic straps. A pull tab was provided for opening the flaps. Velcro hook was attached to the base of the rucksack for zero-g retention.

The Personal Hygiene Resupply Kit (Figure 2) was a semi-rigid rucksack sized to accommodate toothbrushes, toothpaste, a resupply of expendable articles, and spare shaving equipment. The rucksack had a fold-over top that was secured in place with Velcro hook and pile. Inside, compartments and elastic straps were provided for stowing the contents.

The Resupply Kit consisted of the following items:

<u>Item</u>	<u>Quantity</u>
● Toothpaste	15
● Toothbrush	15
● Emollient	12
● Windup Shaver	1
● Windup Shaver Head	6
● Mirror	1
● Rucksack	1



- 1-TOOTHBRUSHES
- 2-TOOTH PASTE
- 3-WIND UP RAZOR
- 4-WIND UP RAZOR HEADS
- 5-MIRROR
- 6-SKIN EMOLLIENT

PERSONAL HYGIENE RESUPPLY KIT

FIGURE 2

Item	Quantity
• Toothpaste	12
• Toothbrush	12
• Emollient	12
• Windup Shaver	1
• Windup Shaver Head	12
• Mirror	1
• Rucksack	1



## SKYLAB EXPERIENCE

### Windup Shaver

Most crewmembers felt the windup shaver (Figure 3) was marginally adequate. It would not provide a close shave and it would not cut whiskers that were more than a day old. The SL-3 PLT described his typical procedure for use of the shaver and removal of long whiskers:

"I would use the windup shaver all week long. If you miss any hair, it had grown too long the next day to get picked up in his thing. So any hair that got missed the first day just grew for a whole week and never got cut. So at the end of every week, why I'd use the safety razor to get all those and start all over again with the windup." (Ref. 2.13)

The windup shaver, after a few uses, tended to be a little rough on the face. Alpha kerri cream was used in some cases to soothe the skin. The crewmembers replaced the head for the windup shaver more frequently than the scheduled use rate of one every 28 man-days. The shaver head was cleaned by tapping against the screen of the WMC ventilator.

Crew comments about the windup shaver are provided in the following:

<u>Reference</u>	<u>Appendix Page Number</u>
1.7	A-8
1.8	A-11
2.3	A-17
2.6	A-20
2.7	A-22



SKYLAB EXPERIENCE

Windup Shaver

Most crewmembers felt the windup shaver (figure 3) was marginally

adequate. It would

whiskers that were

typical procedure

"I would use

hair, it had

his thing.

grew for a w

every week,

and start al

The wind shaver,

face. As the hair

crews had to replace

than the scheduled

was cleared by the

Crew comments about

Reference

- 1.7
- 1.8
- 2.1
- 2.6
- 2.7



USE OF WINDUP SHAVER  
FIGURE 3

2.10	SE-A	A-26
2.11	OP-A	A-27
2.13	IP-A	A-31
3.5	AD-A	A-40

### Safety Razor

The safety razor performed quite satisfactorily. However, the blades used in the safety razors were not good for more than two shaves. As soon as the blade became dull, shaving was painful. This sometimes occurred during the second shave. Some of the crewmembers felt that the blades dulled quickly due to cleaning the blades using wipes. Cleaning the razor was a problem. A technique used by several crewmembers to reduce the cleaning problem was to apply water and shaving cream to the face and then wipe most of the shaving cream off before shaving. Some of the crewmembers elected to throw the used blade away after the first shave rather than attempt to clean the blade. Several crewmembers suggested that a covered wash basin would have been very useful for shaving and razor cleanup.

Crew comments about the safety razor are provided in the references listed below:

<u>Reference</u>	<u>Appendix Page Number</u>
1.7	A-8
1.9	A-12
2.6	A-20



2.13	AS-A	A-32	2.10
3.5	AS-A	A-40	2.11
3.6	TE-A	A-41	2.12
3.9	AS-A	A-44	2.2

Shaving Cream

The shaving cream launched aboard SL-1 was quite hard. This was probably due to exposure to high temperature.

Several crewmembers commented that an aerosol foam shaving cream is highly desirable. The SL-4 CDR expressed his thoughts on the use of aerosol cans in flight during the Technical Crew Debriefing:

"Somehow we got locked into brushless shave. In the future we should not be afraid to use aerosols in space flight. Maybe there's something I don't understand about the physics of aerosol cans, but I proved to myself that foam works because the fire extinguisher worked like a champ. Nobody can tell me that you can't use an aerosol foam up there." (Ref. 3.7)

Additional crew comments about the shaving cream are provided below:

<u>Reference</u>	<u>Appendix Page Number</u>
1.3	A-3
1.4	A-4
1.8	A-11
3.6	A-41
3.7	A-42



## Oral Hygiene

The Nasadent toothpaste was made to swallow but the crewmembers were requested not to swallow it. Instead of swallowing, the crewmembers would spit into a wipe and then dispose of the wipe.

Not all crewmembers were fully satisfied with the Nasadent as evidenced in the following comment made during SL-3:

"This goes to Jerry Carr, Bill Pogue, and Bill Frome and Ed Gibson. Suggestion: Why don't you fellows bring up some regular toothpaste, the kind that you like, instead of using this Nasadent? You don't need to swallow it. You can brush with it, just a little bit of water out of the water gun, and then spit it in a towel or a wipe, and then throw it away. And then you can drink the rest. This Nasadent doesn't feel like it's cleaning your teeth; it doesn't leave a good flavor in your mouth. And at the end of the meal, when you taste this, it kind of spoils the meal, whereas regular toothpaste leaves you nice and fresh. There's nothing wrong with this stuff, except it just doesn't have a--much of a zing to it and, personally, I'd prefer to have the other. That's the end of message." (Ref. 2.1)

Most of the tubes of toothpaste on board were hard. This made squeezing the tubes difficult. Most of the tubes launched aboard SL-1 were ruptured. Additional quantities of Nasadent toothpaste were sent up with the SL-3 crew. However, even some of these tubes were hard when used by the SL-4 crew:

"Yes. And that's the one [SL-3 resupplies] we used. It had about two or three tubes in it that were hard as bricks. And poor old unlucky Ed was the guy who would select that tube of toothpaste every time, and I couldn't understand why he was in there grunting and squeezing on the toothpaste tube." (Ref. 3.12)

The only comment about the toothbrush was related to hardness. The SL-4 CDR preferred a harder toothbrush than was available onboard.

The dental floss was used by only some crewmembers, usually depending upon whether or not this item was used by the individual when on the ground. Some crewmembers used the dental floss only when food was caught between teeth. The SL-3 CDR reported the highest frequency of use; twice daily.

Crew comments about the oral hygiene activities are provided in the references below.

<u>Reference</u>	<u>Appendix Page Number</u>
1.1	A-1
1.4	A-4
1.6	A-7
2.1	A-14
2.3	A-17
2.5	A-19
2.8	A-24
2.9	A-25
2.12	A-29
3.2	A-36
3.7	A-42
3.10	A-45
3.12	A-48



### Skin Emollient

The alpha keri lotion was used frequently to soothe skin that had been dried by the very dry Skylab atmosphere. Several crewmembers experienced cracked lips and fingers before they decided to use the alpha keri. However, once the skin became cracked healing was slow, even using the alpha keri.

The SL-2 PLT used alpha keri as an after shave lotion to soothe the skin after using the windup razor. After shave lotion was brought by the second and third mission crewmembers as a result of suggestions from the first mission crewmembers.

Additional quantities of alpha keri were brought up by the SL-3 crew to replace the tubes that the SL-2 crew discovered that had ruptured. The SL-2 PLT provided his observation as to why the tubes ruptured:

"Tonight we dug out the personal hygiene kit spares container and found that every tube of keri hand cream in there had ruptured. I don't know why. It must have been a combination of the temperature and the pressure, because the ones that were stowed in our individual hygiene kits in the waste management compartment are intact." (Ref. 1.1)

Crew comments about the skin emollient are provided in the following:

#### Reference

#### Appendix Page Number

1.1

A-1

1.2

A-2

<u>Reference</u>	<u>Appendix Page Number</u>
1.3	A-3
1.4	A-4
2.11	A-27

### Hairbrush

The hairbrush received very few comments since some crewmembers did not use this item. The SL-3 SPT reported that he used the hairbrush daily. An item that was mentioned as desirable but not available was a head massager.

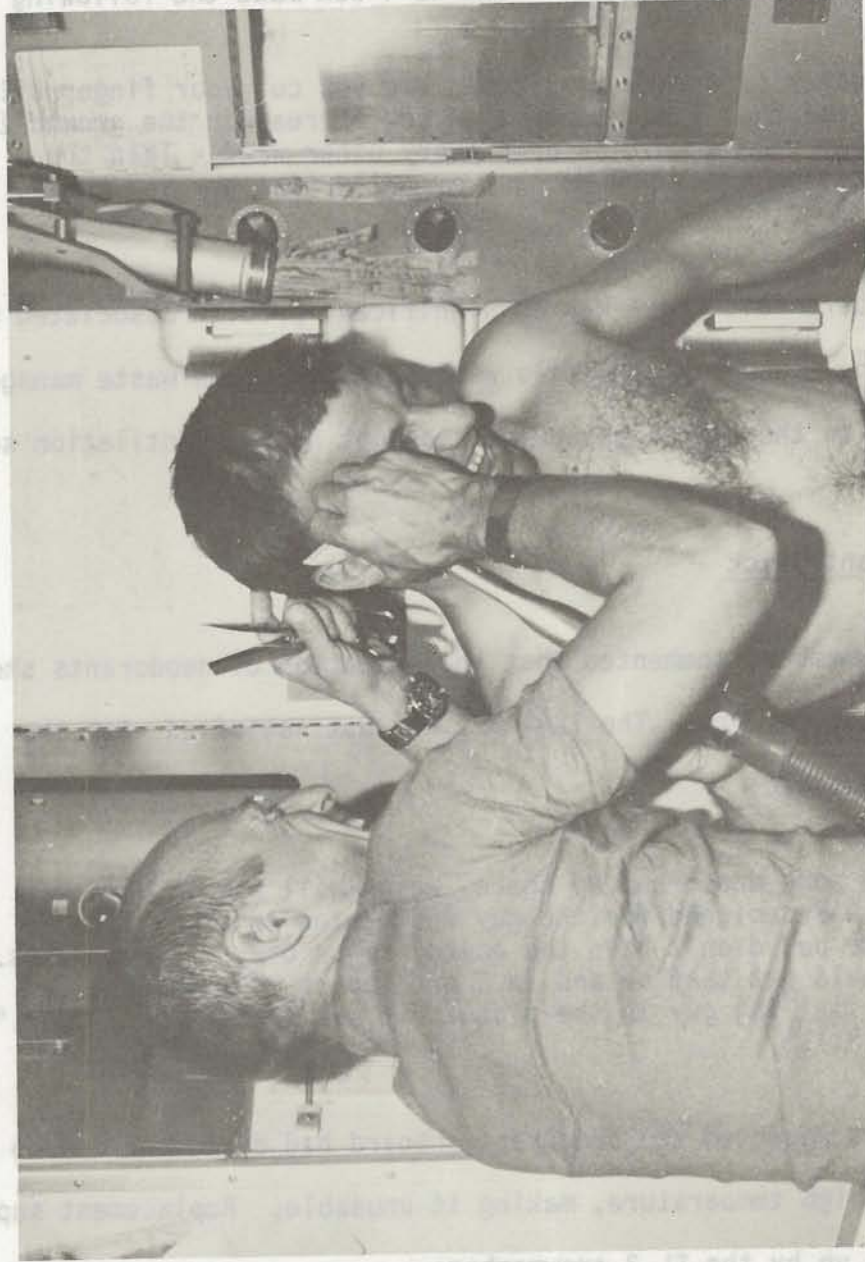
### Haircomb

The comb was considered satisfactory by the crewmembers using this item. The comb, trim comb, and scissors (Figure 4) were used routinely for haircuts. The crewmembers would cut each other's hair and although they felt it fell short of a professional job, they judged the haircuts adequate. Crew comments about haircuts are contained in reference 3.10, page A-46.

### Nail Clippers

The SL-4 CDR and SPT stated during the Technical Crew Debriefing that nail growth appeared to slow down in the Skylab environment. The SPT





USE OF TRIM COMB

FIGURE 4

Applicable crew comments are provided in the references below:

were brought up by the SL-3 crewmembers.

temperature, making it unusable. This meant supplies

The SL-5 crew

(Ref. You worse which we had

deodorant

personal

Several crew

compartment

hair clipper

The crewmembers

slowly

cut

I resp

"The d

mission he cut his nails twice. The SL-4 crew made the following comments: stated that he cut his nails once a week on the ground. During the

stated that he cut his nails once a week on the ground. During the mission he cut his nails twice. The SL-4 CDR made the following comment:

"The doctor said 'How many times did you cut your fingernails?' I replied that I had done it twice, whereas on the ground I cut them once a week or once every other week. Then the realization came upon me that my nails were growing very slowly." (Ref. 3.11)

The crewmembers felt there was no significant problem associated with nail clipping. Usually the nails were trimmed in the waste management compartment so the clippings would be caught by the ventilation screen.

#### Antiperspirant Stick

Several crewmembers commented that the selection of deodorants should be personal preference. The SL-4 SPT was not satisfied with the deodorant supplied:

"We had some deodorant up there, which will remain unnamed, which was designed for the guy who wanted to smell like an athlete but didn't have the energy to be one. It was gross. You would put that on and in 2 or 3 hours you were the worse-smelling guy in the place. It was instant body odor." (Ref. 3.11)

The SL-2 crew reported the deodorant onboard had dried out due to exposure to high temperature, making it unusable. Replacement supplies were brought up by the SL-3 crewmembers.

Applicable crew comments are provided in the references below:



<u>Reference</u>	<u>Appendix Page Number</u>
1.3	A-3
1.8	A-11
3.7	A-42
3.11	A-47

### Rucksacks

Removal of individual items from the rucksacks proved to be rather difficult because the tabs on the elastic loops were not long enough to easily grasp. The SL-3 CDR suggested the use of Velcro to stow the personal hygiene equipment within the rucksacks in "O-G". He also felt that the number of flaps on the rucksacks was excessive, complicating stowage/removal of the contents:

"Another thought on the box is that it's way too safely designed to prevent things floating out. It's got two inner flaps, two outer flaps. What should have been done or maybe what could be done now is to take the scissors and remove the inner flaps. That leaves the outer flaps. Then when you want to get in it, just flip them open and you're right in the box. Having two additional flaps doesn't keep the items particularly in there. All it does is make you have to work harder to remove them."  
(Ref. 2.2)

Additional crew comments about the rucksacks are provided in the following references:

<u>Reference</u>	<u>Appendix Page Number</u>	<u>Reference</u>	<u>Appendix Page Number</u>
2.2	A-11		A-15
3.1	A-12		A-34
3.3	A-13		A-37
3.4			A-39

Styptic Pencil, Safety Swabs, and Mirror

No specific crew comments were offered on these three items and they were assumed to have performed adequately, if used.

"Another thought on the box is that it's way too easily designed to prevent things floating out. It's got two inner flaps, two outer flaps. What should have been done or ways that could be done now is to take the scissors and remove the inner flaps. That leaves the outer flaps. Then when you want to get in it, just flip them open and you're right in the box. Having two additional flaps doesn't keep the items particularly in there. All it does is make you have to work harder to remove them."  
 (Ref. 5.2)

Additional crew comments about the rucksacks are provided in the following references:



## CONCLUSIONS/RECOMMENDATIONS

1. Most crewmembers were not fully satisfied with the performance of the windup shaver. Consideration should be given to improving the design of the windup shaver or replacing it with an electric shaver.
2. The use rate for the replacement heads for the windup shaver was higher than anticipated. It is suggested that the shaver head be better designed or replaced after fourteen uses.
3. The blades for the safety razor should be disposed of after each use rather than cleaned for reuse using wipes. The use of wipes dulls the blade and is time consuming.
4. A wash basin with removable enclosure would be very useful for shaving, razor cleanup, and oral hygiene activities.
5. Aerosol cans for dispensing foam shaving cream and deodorants is desirable.
6. Consider letting each crewmember select his own commercial brand of toothpaste and toothbrush.
7. A skin cream was definitely needed in the dry spacecraft environment to soothe the skin, particularly the hands and face. The alpha keri served that purpose nicely.

8. Personalize the hygiene equipment by allowing each crewmember to select, within limits, brands and types of articles.
9. The antiperspirant stick was not very satisfactory. Consider providing additional choices for the crewmembers.
10. After shave lotion should be included in the personal hygiene kit.
11. Consider reconfiguring the personal hygiene kits as necessary to make stowage/removal of the personal hygiene items easier.
12. The growth rate of fingernails and toenails appeared to slow down in the Skylab environment. Nail clippers may not be required for missions of short duration.



(U) RAW DATA APPENDIX

<u>REFERENCE</u>	<u>SOURCE</u>	<u>PAGE</u>
1.1 -A	SL 1/2 Dump Tape 148-007, page 1	A-1
1.2 -A	SL 1/2 Dump Tape 157-01, page 1	A-2
1.3 -A	SL 1/2 Dump Tape 161-02, page 1	A-3
1.4 -A	SL 1/2 Dump Tape 171-11, page 2,3	A-4
1.5 -A	SL 1/2 Dump Tape 172-04, page 1	A-6
1.6 -A	SL 1/2 Technical Crew Debriefing, page 23-19	A-7
1.7 -A	SL 1/2 Technical Crew Debriefing, page 23-23, 23-24, 23-25	A-8
1.8 -A	SL 1/2 M-487 Debriefing, page 67	A-11
1.9 -A	SL 1/2 M-487 Debriefing, page 69, 70	A-12
2.1 -A	SL 1/3 Dump Tape 219-03, page 1	A-14
2.2 -A	SL 1/3 Dump Tape 223-06, page 6,7	A-15
2.3 -A	SL 1/3 Dump Tape 223-08, page 6	A-17
2.4 -A	SL 1/3 Dump Tape 227-02, page 3	A-18
2.5 -A	SL 1/3 Dump Tape 239-02, page 2	A-19
2.6 -A	SL 1/3 Dump Tape 245-09, page 7,8	A-20
2.7 -A	SL 1/3 Dump Tape 261-01, page 2,3	A-22
2.8 -A	SL 1/3 Technical Crew Debriefing, page 23-31	A-24
2.9 -A	SL 1/3 Technical Crew Debriefing, page 23-32	A-25
2.10 -A	SL 1/3 Technical Crew Debriefing, page 23-36	A-26
2.11 -A	SL 1/3 Technical Crew Debriefing, page 23-37, 23-38	A-27
2.12 -A	SL 1/3 Corollary Experiments Debriefing, page 11, 12	A-29
2.13 -A	SL 1/3 M-487 Debriefing, page 96, 97, 98	A-31

<u>REFERENCE</u>	<u>SOURCE</u>	<u>PAGE</u>
3.1	SL 1/4 Dump Tape 338-02, page 7, 8	A-34
3.2	SL 1/4 TAG Tape 341-04, page 2	A-36
3.3	SL 1/4 Dump Tape 344-06, page 7, 8	A-37
3.4	SL 1/4 Dump Tape 344-06, page 19	A-39
3.5	SL 1/4 Dump Tape 365-10, page 11	A-40
3.6	SL 1/4 Dump Tape 007-11, page 4	A-41
3.7	SL 1/4 Technical Crew Debriefing, page 12-67	A-42
3.8	SL 1/4 Technical Crew Debriefing, page 12-68	A-43
3.9	SL 1/4 Technical Crew Debriefing, page 12-70	A-44
3.10	SL 1/4 Technical Crew Debriefing, page 14-134, 14-135	A-45
3.11	SL 1/4 Technical Crew Debriefing, page 14-136	A-47
3.12	SL 1/4 SWS-Systems Debriefing, page 361	A-48
A-18	SL 1/3 Dump Tape 227-02, page 3	A-4
A-19	SL 1/3 Dump Tape 228-02, page 5	A-5
A-20	SL 1/3 Dump Tape 229-08, page 7, 8	A-6
A-22	SL 1/3 Dump Tape 227-07, page 2, 3	A-7
A-24	SL 1/3 Technical Crew Debriefing, page 23-27	A-8
A-26	SL 1/3 Technical Crew Debriefing, page 23-28	A-9
A-28	SL 1/3 Technical Crew Debriefing, page 23-29	A-10
A-30	SL 1/3 Technical Crew Debriefing, page 23-31	A-11
A-32	SL 1/3 Technical Crew Debriefing, page 23-32	A-12
A-34	SL 1/3 Technical Crew Debriefing, page 23-33	A-13
A-36	SL 1/3 Technical Crew Debriefing, page 23-34	A-14
A-38	SL 1/3 Technical Crew Debriefing, page 23-35	A-15
A-40	SL 1/3 Technical Crew Debriefing, page 23-36	A-16
A-42	SL 1/3 Technical Crew Debriefing, page 23-37	A-17
A-44	SL 1/3 Technical Crew Debriefing, page 23-38	A-18
A-46	SL 1/3 Technical Crew Debriefing, page 23-39	A-19
A-48	SL 1/3 Technical Crew Debriefing, page 23-40	A-20
A-50	SL 1/3 Technical Crew Debriefing, page 23-41	A-21
A-52	SL 1/3 Technical Crew Debriefing, page 23-42	A-22
A-54	SL 1/3 Technical Crew Debriefing, page 23-43	A-23
A-56	SL 1/3 Technical Crew Debriefing, page 23-44	A-24
A-58	SL 1/3 Technical Crew Debriefing, page 23-45	A-25
A-60	SL 1/3 Technical Crew Debriefing, page 23-46	A-26
A-62	SL 1/3 Technical Crew Debriefing, page 23-47	A-27
A-64	SL 1/3 Technical Crew Debriefing, page 23-48	A-28
A-66	SL 1/3 Technical Crew Debriefing, page 23-49	A-29
A-68	SL 1/3 Technical Crew Debriefing, page 23-50	A-30
A-70	SL 1/3 Technical Crew Debriefing, page 23-51	A-31
A-72	SL 1/3 Technical Crew Debriefing, page 23-52	A-32
A-74	SL 1/3 Technical Crew Debriefing, page 23-53	A-33
A-76	SL 1/3 Technical Crew Debriefing, page 23-54	A-34
A-78	SL 1/3 Technical Crew Debriefing, page 23-55	A-35
A-80	SL 1/3 Technical Crew Debriefing, page 23-56	A-36
A-82	SL 1/3 Technical Crew Debriefing, page 23-57	A-37
A-84	SL 1/3 Technical Crew Debriefing, page 23-58	A-38
A-86	SL 1/3 Technical Crew Debriefing, page 23-59	A-39
A-88	SL 1/3 Technical Crew Debriefing, page 23-60	A-40
A-90	SL 1/3 Technical Crew Debriefing, page 23-61	A-41
A-92	SL 1/3 Technical Crew Debriefing, page 23-62	A-42
A-94	SL 1/3 Technical Crew Debriefing, page 23-63	A-43
A-96	SL 1/3 Technical Crew Debriefing, page 23-64	A-44
A-98	SL 1/3 Technical Crew Debriefing, page 23-65	A-45
A-100	SL 1/3 Technical Crew Debriefing, page 23-66	A-46
A-102	SL 1/3 Technical Crew Debriefing, page 23-67	A-47
A-104	SL 1/3 Technical Crew Debriefing, page 23-68	A-48
A-106	SL 1/3 Technical Crew Debriefing, page 23-69	A-49
A-108	SL 1/3 Technical Crew Debriefing, page 23-70	A-50
A-110	SL 1/3 Technical Crew Debriefing, page 23-71	A-51
A-112	SL 1/3 Technical Crew Debriefing, page 23-72	A-52
A-114	SL 1/3 Technical Crew Debriefing, page 23-73	A-53
A-116	SL 1/3 Technical Crew Debriefing, page 23-74	A-54
A-118	SL 1/3 Technical Crew Debriefing, page 23-75	A-55
A-120	SL 1/3 Technical Crew Debriefing, page 23-76	A-56
A-122	SL 1/3 Technical Crew Debriefing, page 23-77	A-57
A-124	SL 1/3 Technical Crew Debriefing, page 23-78	A-58
A-126	SL 1/3 Technical Crew Debriefing, page 23-79	A-59
A-128	SL 1/3 Technical Crew Debriefing, page 23-80	A-60
A-130	SL 1/3 Technical Crew Debriefing, page 23-81	A-61
A-132	SL 1/3 Technical Crew Debriefing, page 23-82	A-62
A-134	SL 1/3 Technical Crew Debriefing, page 23-83	A-63
A-136	SL 1/3 Technical Crew Debriefing, page 23-84	A-64
A-138	SL 1/3 Technical Crew Debriefing, page 23-85	A-65
A-140	SL 1/3 Technical Crew Debriefing, page 23-86	A-66
A-142	SL 1/3 Technical Crew Debriefing, page 23-87	A-67
A-144	SL 1/3 Technical Crew Debriefing, page 23-88	A-68
A-146	SL 1/3 Technical Crew Debriefing, page 23-89	A-69
A-148	SL 1/3 Technical Crew Debriefing, page 23-90	A-70
A-150	SL 1/3 Technical Crew Debriefing, page 23-91	A-71
A-152	SL 1/3 Technical Crew Debriefing, page 23-92	A-72
A-154	SL 1/3 Technical Crew Debriefing, page 23-93	A-73
A-156	SL 1/3 Technical Crew Debriefing, page 23-94	A-74
A-158	SL 1/3 Technical Crew Debriefing, page 23-95	A-75
A-160	SL 1/3 Technical Crew Debriefing, page 23-96	A-76
A-162	SL 1/3 Technical Crew Debriefing, page 23-97	A-77
A-164	SL 1/3 Technical Crew Debriefing, page 23-98	A-78
A-166	SL 1/3 Technical Crew Debriefing, page 23-99	A-79
A-168	SL 1/3 Technical Crew Debriefing, page 23-100	A-80



Dump Tape 148-007  
Time: 04:34:37 to 05:37:16  
Page 1 of 1

04 34 37 CDR Hello, friendly recorder. On page 2-144 of the checklist, the PRD reading of the PRD in drawer A of F510 is 13017. And the PRD reading stowed in B-1 of the command module is 49017. Out.

05 23 53 SPT Anybody know what happened to the CSM ..., I mean the checklist book?

PLT Joe, I assumed that you moved it.

CDR I know where it is. It's up on the ACS panel. We had a ... out of it.

05 37 16 PLT Tape recorder, this entry concerns stowage, if you'll pass to them. Tonight we dug out the personal hygiene kit spares container and found that every tube of Keri hand cream in there had ruptured. I don't know why. It must have been a combination of the temperature and the pressure, because the ones that were stowed in our individual hygiene kits in the waste management compartment are intact. Also, about two-thirds of the toothpaste, which is stowed - which is all the toothpaste on board - which is stowed in the overage kit, as it were, has burst. And some of it has been cooked to the point where it is very, very thick and unusable anymore, although some of it still is usable. And it appears that that will be a re-supply problem for the next mission.

END OF TAPE

Final  
Dump Tape 157-01  
Time: 02:56:29 to 04:16:09  
Page 1 of 1

02 56 29 CREW End of message.

TIME SKIP

04 16 09 SPT

Friendly B channel, here's a note for the stowage people and the flight planners. The Captain discovered, upon investigating the hygiene resupply kit tonight, that all the Alpha Keri and all the other kits in that locker have blown up. The tops have exuded, and it's a mess in there. I want you to know that, so that you can (a) plan on resupply as required and (b) work into our housekeeping tasks sometime in the next few days to go in there and clean that stuff up. Good night.

END OF TAPE



Reference 1.3

Final

Dump Tape 161-02

Time: 02:34:37 to 03:07:54

Page 1 of 2

02 34 17 PLT ... field of view. So I don't really know ... field of view of the monitor here; however, I could observe no immense - no transience at all in the corona observing it for - let's say on the order of a minute. That's the end of the message.

PLT Hello, B channel. For ATM people. I'm going to put about 30 seconds worth of WHITE LIGHT CORONAGRAPH on the tape recorder now.

02 41 56 PLT Hello, friendly B channel. This is the H - correction, the ATM film status at the end of this day. H-alpha has 11485; S056, 3986; S082A, 186; S082B, 944; S052, 4345; and S054 is 3150. End of message.

02 58 33 CDR Hello, friendly tape recorder. The old CDR at 02:58 with the evening questions. Okay. Question number 1: Describe color of parasol as observed during EVA. It is the concensus of opinion of both the CDR and the SPT, who viewed it, that it is essentially the same color as it was when it was deployed, except it looks a little faded and perhaps not as lustrous, a little flat. But the color is essentially the same. Question number 2: You have gotten a little confused with a statement that was made by us earlier, and I'll try and straighten it out. Have you cleaned your hygiene kits? Should we resupply any items for SL-3 and 4? Just hold 1 second.

03 00 12 CDR To go back to question number 2, friendly tape recorder. Have you cleaned your hygiene kits? Should we resupply any items for SL-3 and 4? In locker S935, the lower locker in the Commander's bedroom, is the six kits for SL-3 and 4 and the resupply kit. Now, that resupply kit, all the Alpha Keri hand lotion tubes ruptured from the heat, and so did the Alpha Keri in the SL-3 and 4 crew kits, also. Along with that, the heat was intense enough that it - whatever liquid was in the antiperspirant was cooked out of it. And also the shaving cream is kind of hard. So the answer to your question is, I think you should start from zero with anything that was cream or liquid that was in the hygiene kits that were stowed at S935, because they pretty well got wiped out by heat.



think you got time this evening to get the optics brush out of 524 and dust off the lens of both the external portion, and if you could remove it and get the internal portion too, we'd appreciate it.

CDR Okay.

CC Thank you.

20 32 16 CDR Say Crip, you still there?

CC Affirmative.

CDR Say, the other thing I haven't checked theirs, but none of them broke open, but our shaving cream was awfully hard. And I have a suspicion that that was due to heat, also. I get the feeling that shaving cream - there is no toothpaste in the individual kits; so I've thrown away all the toothpaste. They are going to have to bring more of that. I've got the feeling that shaving cream, toothpaste, and hand cream have all gone bad, too.

CC Okay, it's on note.

CDR Yes, I won't throw away the shaving cream because it's not broken open, but I get the suspicion of something sneaky.

CC Copy.

CDR Hey, a hand cream from that dropped in the head. It was the only place I could open it up to use the sand - sand collector to collect all the hand cream particles.

CC Okay. None of the cream got out in the individual kits. It's felt that - you ought to just throw them all away and resupply the whole kit, Pete.

CDR Well, we can do that because in - inside everybody's kit - yes, it broke open inside everybody's kit. I was just pulling the ... down in the - in the thing. If you think you can resupply kits, I just as soon get rid of them, because they're all dirty inside and so is the resupply module. It's filthy.



Reference 1.4

Final  
TAG tape 171-11  
171:20:02 to  
171:20:30  
Page 3 of 7

CC Okay. Why don't we take that under advisement down here, and probably make some recommendation before you leave.

CDR Okay, well, until you do, I'm going to stop throwing stuff away. I got other things I can do.

CC Okay.

20 34 08 CDR I've already thrown away everything in the resupply kit, and I just finished Al Bean's and Joe Pogue's kits. And I'll stop right there.

CC Okay.

20 36 54 CC Hey, Crip, you still there?

CC Say again, please.

CDR I said, are you still there? Question, I have the TV lens, and it looks clean as a whistle inside, and outside, I think, and how about if I change it out with the last that I stowed to leave on board and the busted camera?

CC Let us check that out, please.

CDR Well, let me tell you this. I can see where the dirt is, and I'm not going to be able to get at it. It's on the next lens in from the front lens - that's causing the spot.

CC Roger. Understand it's the dirt on one of the lens that you haven't got access to.

CDR That's right. And let me make a suggestion that I bring both lens home use the good one and bring this one home, you clean them up and send them back.

CC Roger. I think they intended to bring both - both lens back down anyhow.

20 38 07 CDR That's not my instructions, but if you say so, but I haven't gotten that word, yet. I've already stowed the other lens.





Inflight Oral Hygiene. I thought brushing teeth up there was just like it was down on the ground. I didn't use dental floss.

CONRAD

I did.

KERWIN

Because I never use it in my life, and I'm just not in the habit.

CONRAD

When we had the filet, I used it like I do on the ground.

We had plenty of toothbrushes. I used one for 28 days.

WEITZ

Sunglasses, I didn't use them even though I wear them all the time on the ground. I think it was a combination of factors. I had enough things in my pocket without carrying the sunglasses around with me. It didn't bother me that much to look out the window without them. Plus I am used to the grey ones, and it seems to me that the green ones just don't do the job, even though they probably do. The few times I tried to use them looking out the window, I felt that I always want to take them off when looking inside.

CONRAD

I used them strictly for the rendezvous which I expected to use them for work coming up on the SWS; otherwise I never used them in flight on orbit.

KERWIN

I carried my prescription specs around with me most of the time but I used them very seldom. Occasionally I used them for looking out the window and once, or twice at the ATM panel. They weren't required and I just didn't use them.

CONRAD  
(CONT'D) can see spots of food. We just automatically kept taking them off as we saw them. But the biocide is something you still have to schedule to keep that at the right frequency.

WEITZ Shaving soon became relegated to an evening task because nobody wanted to take the time in the morning.

KERWIN I planned on that preflight.

WEITZ I had planned to shave in the morning.

KERWIN The problem is serial time use of the bathroom in the morning. Everybody has to get in there and urinate, wash, brush teeth, and service their urine drawer, and tidy up in there. It takes awhile to get into a routine. You don't have time to sit in there and sing in the mirror. As far as the technical aspects of shaving, my opinion is that the windup razor does a poor but reasonable job if you use it every day, provided that the head doesn't get dinged and start to pull or tug on you. I went through one head in about a week. And I wound up borrowing Paul's razor to use the last week. It's more satisfactory, and more comfortable to wet shave. However, I used a Wilkinson razor and I found that the second shave with that blade was generally unsatisfactory. It was painful. I then spent a lot



KERWIN  
(CONT'D)

of time cleaning my last blade after I used it the first time. I spent 10 or 15 minutes - with tissue paper really trying to get all of the stuff out from behind it.

KERWIN

And the second shave went better with that. I don't think they're good for more than two shaves.

CONRAD

Along that line, I used the double-blade Gillette, Track 2 and what I would do was put hot water on my face, let that sit for awhile, then wash my face with soap. I would put hot water back on there again, to try and soften things up. I put the shaving cream on and let it sit for awhile, and then take good hot water to take it off. I would shave with just water on my face, as a lubricant to move the blade. By shaving a couple of strokes, and sliding the razor across the towel gently that kept it from jamming up. But, it does dull the razor. I can get 15 or 20 shaves with a Track 2 on the ground, without that thing ever pulling hair.

KERWIN

I can get 10 with a Wilkinson.

CONRAD

I could get two or three up there. I used all my blades and then I got on the right frequency and rationed it out. I did the same thing you did. I shaved for 3 or 4 days with the windup and then I'd really give myself a good clean shave with the wet razor, when I had time. Then I'd go back to the windup.

KERWIN I agree with your technique. Lots of water and wipe most of the shaving cream off.

WEITZ I used a variation. I would put hot water on, let it soak awhile, and then put the shaving cream on. Then I slapped on some more hot water. So it was kind of gooey. And I didn't wipe it all off at once. I would take a tissue and wipe off an area and shave it, essentially dry. It worked quite satisfactorily. I just keep wiping the shaving cream off and shaving as I went. And, I just flat didn't try to salvage any blades. I had five blades and I shaved five times. I threw each one away.

KERWIN Radiation Dosimetry. I thought wearing the passive dosimeter quickly became accustomed to.

WEITZ Completely innocuous, so I didn't mind a bit. I wore it on my watchband with my watch, and you wore it on ...

CONRAD I wore it on a separate watchband on my other arm. It got to be habit to have it on there, and I never thought about it.

KERWIN Again, reading the personal dosimeters, putting them each in a specified place, reading them every morning, was a five-minute task. It was easy to do.



SPEAKER

Additions or deletions at all to the personal hygiene kit?  
anything that---

CDR

I think that any problems we have with that personal hygiene kit, you can attribute directly to the heat that got put into them. I think that the shaving cream got dried out, of course, we had the problem of a couple of hand creams busting. The deodorant stick, obviously it dried out. I mean, it was like trying to rub concrete under your arms.

PLT

No, there were several items that I didn't use, but other people might. I think that you get down to personal preference, if you want the content to be the same I think it was good.

CDR

Yeah

SPT

Right

SPEAKER

Do you have any recommendations on improvements that we could possibly make on the shower?

PLT

Wait, let me get-excuse me I got one--Yes, I do have an item for addition which is some sort of after shave stuff.

CDR

Yeah, that would be nice

PLT

Whether it be a lotion or even a--somebody makes an aftershave stick I think. It seems to me I've seen them. Because those little wind up razors, after about five times they kind of chew your face up a little bit. I as a matter of fact, would use the carry cream and rub on my face afterwards, just of kind of help soothe it. I was also surprised to find that that wasn't water soluble, not that it bothered me, necessarily. But you couldn't wash it off your hands if you wanted to, although you could rub it in.



## SL-2 Crew Debriefing - Systems - Tape 2 - Side 2

CDR

We might comment on using the blade, razors. I took along that Trac II, and in Apollo, the guys had commented on how it got clobbered up with the shaving cream when you shaved. I had seen that problem with other type razors that we carried in Apollo, it was a pain in the neck to clean, too. It was one of those ribbon blades -

PLT

Band

CDR

That you crank around. But I elected to go ahead and take the Trac II, because I find that if I put a hot enough towel on my face, and put the shaving cream on and then pretty well wipe it down, but just leave my face wet, you can go ahead and shave and it gives you a good, just as good as leaving the lather on there for that matter. So that's the method I used, but you still get stuff between the blades. I had the feeling, we all had the feeling, I think, that we were wiping the blades on the towels to clean whatever them out and that apparently dulls the blades. Something dulls those blades, because I can take one of those things and shave 25 times on the ground and its good and sharp. Up there, we used up all our blades and usually the second go around, it would be really pulling them out by the roots so you would go put a new blade in there and it would be ok. Now, I don't know whether wiping it with the towel is dulling them, or whether they are getting a little corrosion on them that you couldn't see, or what. But it sure does something up there it doesn't do down here, and I don't know why.

Speaker

Noticed that in the transcripts Joe went through the same thing about the blades that he had.



PLT

Yes, and he had the Wilkerson razor, which I was in preflight, kind of wishing I had just because you could clean it. But Joe said that he would clean it when he was done, being, trying to be careful to not wipe along the edge of the blade and he said he had the same remark. Now, I was in a different mode. I didn't attempt to clean the blade while I was using it, nor afterward, I just used the same approach that Pete used in that I would wipe the lather off and then shave and just let, in that case you are only collecting whiskers and a very small amount of shave cream and just let it fill up. Then I would throw the blade away, when I was done with it. But Joe tried to clean his Wilkerson blades, and he could get them clean. But he said the second shave was totally unsatisfactory with them.

Speaker

Hum ---

Speaker

On the water system -----

PLT

Not yet, we have an unanswered question on the shower.

Speaker

I just wondered if you had nay recommendations to improve the shower, possibly, any comments you might have addressing that.

CDR

Well, the thing that took the amount of time was cleaning the water up out of it. I think if you were trying to improve the procedures that you have right now its entirely possible, depending on crew preference. I think we had the feeling if we were going to do it again maybe we would have done three showers and one guy have the duty for that day, the last guy, to slop up all the water and, you know, rotate that way. That would have speeded up the process,



Final Dump Tape 219-03/D-122  
 Time: 219:04:36 to 219:05:04  
 Page 1 of 1

219 04 37 52 PLT Hello, space fans; this is Jack on channel A. The subject is M509 battery check for my friends Ed Whitsett, Bruce McCandless, and Lou Ramon. Battery number 7 was checked on day 219 at 04:20. I got the following readings, starting with cell number 1. Cell number 1, 1.311, 1.308, 1.308, 1.311, 1.306, 1.309, 1.309, 1.310, 1.307. Cell number 10, 1.308, 1.308, 1.312, 1.310, 1.306, 1.309, 1.305, 1.308, 1.314, 1.315, 1.314. Cell 21, 1.307, 1.307, 1.313. Total battery was 30.1

219 04 29 00 PLT And that's enough of that.

TIME SKIP

219 05 00 34 CDR

This goes to Jerry Carr, Bill Pogue, and Bill Frome, and Ed Gibson. Suggestion: Why don't you fellows bring up some regular toothpaste, the kind that you like, instead of using this Nasadent? You don't need to swallow it. You can brush with it, just a little bit of water out of the water gun, and then spit it in a tow - a towel or a - a wipe, and then throw it away. And then you can drink the rest. This Nasadent doesn't feel like it's cleaning your teeth; it doesn't leave a good flavor in your mouth. And at the end of the meal, when you take - taste this, it kind of spoils the meal, whereas regular toothpaste leaves you nice and fresh. There's nothing wrong with this stuff, except it just doesn't have a - much of a zing to it and, personally, I'd prefer to have - no, re - rephrase that and say, personally, I think you'd prefer to have the other. That's the end of message.

219 05 01 30 CDR CDR out.

END OF TAPE







Final Dump Tape 223-06/D-161  
Page 7 of 15

prevent things floating out. It's got two inner flaps, two outer flaps. What should have been done or maybe what could be done now is to take the scissors and remove the inner flaps. That leaves the outer flaps. Then when you want to get in it, just flip them open and you're right in the box. Having two additional flaps doesn't keep the items particularly in there. All it does is make you have to work harder to remove them. These restraints are definitely - eliminate that - if it were possible.

223 19 33 12 CDR

Let's talk a few minutes about the wardroom table. The wardroom table has the advantage of being the main meeting place of the - of the flight. It's nice to sit around it. It's convenient. The handhold - I mean the legholds, the foot - leg restraints, the footholds seem to be very good about keeping you in position. And the general layout of the table is good. I think that the idea of having hot water and cold water right in the middle where everyone can get at it equally is good. I think maybe we should of had some sort of same thing there where everybody could get at his food just as easy. We've got the food in the pantry. And the pantry idea is good if you put everything in there and then you go get the ones you want out. Now we've got everything that dispersed in individual - type drawers. And we could have very simply put each person's food near him. Now I'm not in favor of doing that. I'm in favor of having a true pantry, so when it comes time to eat, you go and look in the orange place to get out your orange and all that other. I think that would facilitate not only getting dinner ready, but it would facilitate changing the menu and it would definitely facilitate stowage because then you could wander out when something ran low and just find a big box of orange juice - let's say. Pick a bunch of orange juices then and put it back in stowage, instead of having to wait a certain amount of time, and put them in sequence. In other words, we'd operate just as we do the towels - washrags, which have worked out well.



Final Dump Tape 223-08/D-163  
Page 6 of 13

my elbows up against the other wall. The foot restraints in there are almost nonexistent with triangle shoes. Little wider or new straps - installed to use with the triangle shoes really don't do the job either because the triangle foot's on that floor and your toe comes out real easy. The foot restraints often get in the way of yanking out the urine drawers to the point of frustration sometimes and pinching fingers other times. So foot restraints for triangle shoes in the wardroom or waste management compartment are unacceptable.

223 23 22 55 PLT Drying stations work very well. I give them an excellent.

223 23 23 01 PLT The shower I haven't had a chance to use yet; just haven't had time.

223 23 23 05 PLT Personal hygiene kit. I like that hygiene kit. I've used toothpaste, toothbrush, comb, the dental floss, the safety razor, the shaving cream. I've used the shaving lotion every day. The shaving lotion that we brought up, Old Spice, I like very much and use it every day. And I used primarily the windup shaver to shave with; although it's - has certain deficiencies, too. If you ever let any of your whiskers grow out a little bit long or you miss some, why they're going to keep on growing because that windup shaver doesn't catch anything but real short whiskers. So at - I've still got the same head I put on when we got here. It's been 2 weeks, now; it's still working pretty good. And every once in a while you've got to clean it out using the overhead ventilator and - and the windup shaver is working very well. Well, once a week I use a safety razor and the shaving cream to get all those extra, longer whiskers near the sideburns that the - the mechanical shaver can't get. One thing that's not on here is the vent overhead in the waste management compartment. It's very good for collecting things. It collects most everything up there, and if you ever want to hang onto a checklist or anything, why you just put it up there and it'll stay there. All the junk stays up there very well until we vacuum it off. We leave it on all the



want. The whole hand washer, as I talked before is - needs to be re-thought through. Ceiling handrail - didn't know there was one. Light-duty foot restraints, lousy. The whole idea of foot restraints in the head needs to be re-thought through. Three of them are in front of the urine trays where they either mess up the trays or have to be removed as we've done, and the whole idea of foot restraints in there is very poor.

227 02 18 21 SPT

Shower - we haven't even gotten around to using one here because first of all we haven't had time; secondly, we didn't think we needed it. So we

don't need it very often. Personal hygiene kit should be personalized. Not this blanket, cotton-picking thing that's got a set of stuff that probably nobody wants more than 50 percent of. They should have been tailored to each individual. It wouldn't have been much trouble to do that. Now we would have liked very much to have the things that I want in there.

227 02 18 45 SPT

I'm still up here trying to figure out how to trim my moustache, and it's been 18 blinking days. And I'm still not sure how I'm going to do it. As a matter of fact, I haven't even trimmed it yet, and until I figure out how, I won't. And so I hope to figure out something. If I'd had my own personalized hygiene kit I'd have had a pair of either short tweezers - short scissors in there like I have at home, or better yet I'd have had a proper razor with a - with a moustache trimmer on one edge or whatever they're called. I thought one was going to be on board but it apparently didn't make it. But the personal hygiene kit should have been personalized, and I think it's an oversight, a significant oversight, that it was not.

227 02 19 34 SPT

And I guess I got some more on food management: wardroom table, not bad; thigh restraints aren't bad; wardroom light-duty foot restraints, hardly ever use them. Every time I put my shoe in that triangle that's down there on the floor, try and unlock it, it unlocks halfway and then I have to



Final Dump Tape 239-02/D-310  
Page 2 of 3

- 239 02 54 23 SPT Sanitation problems: Really nothing. I think Al surely mentioned the place for food waste - dumping these cans and things like that.
- 239 02 54 35 SPT Personal hygiene: Well, I'm annoyed because there's no place to brush my teeth. I get around that by just sort of brushing them in water and chewing gum. I'm annoyed because I can't wash my hair very well. There's no place that you can really scrub your head down. I tried it a little bit with that soap for the showers, and that's no good. Should have had shampoo, and I think Jack mentioned that.
- 239 02 55 13 SPT It might be possible to put a little bag over your - top of your head sort of like a woman's - hairnet or dryer enclosure. And you put a little water and soap in and then just, you know, right - reach right through that to scrub your scalp. That might work and then you could squirt water in there and somehow get the water out. Anyway, a possibility.
- 239 02 55 41 SPT How adequate the ATM chair? (Chuckle) I needed it once and sat in it and found that it - it didn't fit at all. The grid to put your feet through is far better. Toebar, didn't even know there was one. No, we've never used the chair, we just got to find a better place to stow it, as Jack said.
- 239 02 56 06 SPT Garments are pretty comfortable. I haven't modified any of them. Too bad that the knife [sic] won't hold the knife; too small, slightly. Too bad the - no place to put the scissors. Sort of handy to have those scissors along. But it seems that every time you use them you got to unroll them because there's no place to - keep that string rolled up. I'm not quite sure what we ought to say on that - on the scissors. I just toss them in one of my pockets.
- 239 02 56 52 SPT The trousers do not doff easily enough because of the triangle shoes. You do need to hop in and out of your trousers every now and then. And it would be better if probably they didn't have that cuff in the bottom. I am going to try cutting mine out for a while. No, they don't wear; they don't abrade; they don't snag.



Final Dump Tape 245-09/D-381  
Page 7 of 10

245 23 42 54 PLT

Work - Let's see. Work activities requiring assistance from another crewman. Really, you very seldom need another crewman to move anything around. You can usually do it by yourself. Handling equipment, heavy loads like S073 is no problem here. Just one guy can do that with no problem at all. Or S183 - any of those things that we used two crewman for in one g, and it called on the checklist to use two guys here, are unnecessary. If we got one guy working on another one to, say, suit him up or something like that, you got to get him in his suit restraints - the foot restraint, and the other guy will have his legs wrapped around him somewhere, zipping him up. And so activities involving two crewman are less of a pain in the neck than they are in one g.

245 23 43 48 PLT

Personal main - maintenance activities: personal hygiene, donning/doffing garments, and so forth. We found that it's easy to get your legs in a suit and that you can get it over your head, but that it's very difficult to get it zipped up compared to one g. That's one thing that's tougher, is to get your suit zipped up. Donning outer garments. I guess this is one of the few places in the world, and some of the few personnel in the world that are able to say with a straight face that this is the only environment in which you can put your pants on two legs at a time. And that's different than anybody else. So we're not like everybody else. We don't put our trousers on one leg at a time. We put them on two at a time. And it's quick!

245 23 44 41 PLT

Okay, doffing garments: Its easy to get out of your suit - out of your - your spacesuits. Lot easier than in one g. But there are other things like personal hygiene that are no problem at all. The - You have trouble cleaning your razor, but I guess that's not so much a function of



Final Dump Tape 245-09/D-381  
Page 8 of 10

zero g as that you don't have a lot of water to blast over it, but you can get that done, too. I use the shaver - the safety razor once a week and the little shaver, the - the mechanical shaver the rest of the time; so personal hygiene is not a big deal.

245 25 45 16 CC

Skylab. ... and we'll be ... over the solar.

245 23 45 20 PLT

And I'll be back later.

#### TIME SKIP

245 23 54 52 SPT

Okay, SPT on channel A with information to ATM PIs and planners, and in particular to Dr. George Withbroe. George, we are just now talking more about this business of scheduling on the ATM activities. Now Al would like to have a little bit of time to look around on his schedule, but basically he likes to have the ground-thought-out plans as carefully made as possible. Now the present schedule, if we really hustle, normally has about 5 minutes or so free time in it. And so what Al was asking for is pretty close to the way you're scheduling right now. Maybe a little bit of more time in it so he'd have a chance to - say, if something's interesting, go pick up an extra building block or - or shopping list item. But pretty close to the way you're scheduling now for Al.

245 23 55 40 SPT

Now for myself, I wouldn't mind having 20 minutes on each orbit more or less free to look around and do whatever appears to be the most desirable or opportune target at the moment. Now particularly the next few weeks, it looks to me like this is especially true because it would appear that we've got two weeks of pretty good activity ahead of us on the Sun right now. Now I think that shopping list items can be used without an expensive expenditure of film. We'll of course, have to watch that carefully, particularly on 82B, I think, because we just can't touch off



Final Dump Tape 261-01/D-528

Page 2 of 4

261 10 42 43 PLT Boy, that'd be nice of you. Okay, don't move too - don't move too rapidly now; you'll get your - oh, boy! Oh, boy, that's super ...

CDR Turn it on, O.

PLT Now we got to turn that light off, the top one. Yes, that one. Yes, I'm ready.

CDR ...

261 10 43 54 PLT You got to turn one more light off in there, Al. The back one toward the left. The back one toward the left. The other one; that one. No, the other one. All right. Okay, I believe that'll be better. Okay. No, I think you turned the front one back on again. Front one. Yes, just a minute. Not quite. I got the ... Okay. Take that rag and tuck it in, would you, please?

PLT (Whistling)

261 10 45 02 PLT Hey! Okay, space fans, here we are in Skylab, orbiting about 275 miles above the Earth's weightless condition. But that doesn't change the fact that everyday we've got to go through the daily routine, as far as brushing teeth and shaving and what not is concerned. We have the convenience that it takes to do the job. Okay, we have a picture of Al Bean getting out his little windup razor to do some shaving. Good mechanical device. We also have safety razors, but they're very difficult to rinse off up here and to clean up. It takes longer to shave with a safety razor; so we've got this little mechanical, windup razor shaver we can use to do the job. Of course, one thing that could happen is all the little whiskers could float all over; so we also have to have a shaver that contains the little whiskers. They don't fly around and float all over; they're just contained within the shaver. And when the spring runs out of tension, why you can wind it up again, as you see him doing now. First, he has to fasten himself down. Puts his feet - his legs - Wedges himself in between the walls of the waste management compartment and positions himself very nicely in front of the mirror.



261 10 47 18 PLT Of course, we don't have anything that's made out of glass up here. Could break and fly all over. So our mirrors are polished metal. See here? Been cleaned today, especially for this show. We each little have - we each have a little overnight kit, much as you would travel with on the ground. Has our shaver in it, other items required for personal hygiene - toothbrush, comb, toothpaste, and so forth. Takes the little head off the shaver now and cleans it out by tapping it against the screen in front of the fan or the blower. We'll collect it on this little screen, and then later on, why we can clean the screen off. Okay, O., would you turn the VTR off, please?

261 10 48 23 PLT I'll get it. Don't worry.

261 10 48 28 PLT We'll come back.

SPT ... turn that light off.

SPT ... turning them off, are you?

SPT Jack, you want the VTR off, right?

SPT Jack? Jack? Want the VTR off?

PLT No, leave it on.

261 10 49 42 PLT Now you see him, with the aid of a flashlight, doing a better job. Okay, get down in there where he can see what's going on. Taking a close look with a flashlight to make sure he's got them all.

261 10 50 14 PLT Okay. As soon as he's about done, he's going to clean the head out, put it away, put it in his little, secret compartment up there where he has a number of other things stored. Okay, he's getting towels and washcloths right there to clean up with. He gets the red one.

261 10 50 49 PLT There's a little, hot water dispenser right there. That's our sink. See, the bar of soap has a little metal piece in it to hold it to the magnet that's in there. He squirts a little water on his rag. We have a vat - hot water heater. See the little drops of water flying all over? Water



GARRIOTT Inflight Oral Hygiene: I had no mouth discomforts. The brushing frequency of sorts was only once a day. I never used any toothpaste the whole time I was in orbit. We weren't supposed to swallow it.

BEAN No baths and no toothpaste!

GARRIOTT I never wanted to go to the trouble of finding some empty bag to go spit it into. So, I just brushed my teeth with water and a toothbrush and apparently that was satisfactory based upon the reports coming back from our good friend Dr. Bill Frome.

Dental Floss: I used three or four times as required when I thought I had some food caught between a couple of teeth. I thought the toothbrush was adequate and was appropriate for massage of the gums, which is essentially the main purpose of brushing, anyway, and particularly the way I was using it.

Sunglasses; other Eye Protecting Devices: I never took them out of their pocket. I didn't need them. I never had any problem without the sunglasses in regard to visibility of instruments and controls. No unexpected visual phenomena relating to the eye such as focusing or double vision. I never noticed any change from preflight to spaceflight



GARRIOTT  
(CONT'D)

in terms of eye performance. No change during rapid acceleration and deceleration.

BEAN

I used the toothbrush and the NASA dent and went around and spit the thing out in that bag. Did it twice a day. I would have much preferred to can the NASA dent and used some regular toothpaste. I would recommend that the SL-4 crew just take up a small tube of their favorite toothpaste, not swallow it, just spit it out and drink a nice drink of water. I enjoyed the toothbrushing everyday. It tasted good and I felt like it was doing a good job. I used dental floss at all times twice a day. That worked okay too, just like it does on Earth.

LOUSMA

I had no mouth discomfort. I brushed twice a day with the NASA dent. I used the dental floss. It worked in space just like it does on Earth. I never felt like the Nasa dent was getting my teeth clean, but I guess it was doing all right. The NASA dent, of course, was made to swallow. We were requested not to swallow it. I never used my

sunglasses up there. The only time I thought I might have used them was looking out the wardroom windows, when there was lots of clouds down below, with Sun reflecting off of them. Otherwise, I didn't need them at all.

LOUSMA  
(CONT'D)

need, and that is iodine. I had a couple of cuts up there, mostly on my hands. When your hands sweat, they just don't seem to heal very well up there. What I really wanted to have for that and for the hangnails that developed, and didn't seem to heal either, was some iodine. I noticed when I put iodine on those kinds of things at home, they dry up; the infection goes away, and they get well.

BEAN

Housekeeping: We're going to go over the housekeeping book and try to redefine some of the times and also some of the cycles. Some of the housekeeping you do more frequently, but a lot of it you do less frequently. This will probably help the the SL-4 crew. It will be up to Crew Procedures to search us out with the book, ask us to do it, and we'll be glad to do it.

Shaving: no remarks here.

LOUSMA

There was a head in the shaver when I went up there that was kind of dull. I used two more. It takes about one head every 28 days. The wind-up shaver I used was quick, although it doesn't do a very good job. You miss one hair and it never gets cut with that little shaver, so by the end of the week you got lots of long hairs that the shaver won't get. So once a week I used the safety razor to cut those off.



BEAN

Concerning the personal hygiene resupply kits: Both resupply kits, the one that was launched in there and it has "old" written on there or something like that, in pink, and then the one that we brought up has "new" written on it. Everything looked good. The only thing I noticed that could have been in short supply was razor heads. They should take a quick inventory to make sure that those windup razors have at least a head for every 28 days for each of the guys up there.

LOUSMA

I think you'd probably need three of them for the mission. One every 2 weeks would be your best bet.

BEAN

They are light and ought to be looked at to see what's there now and then, enough additional taken up to provide one every couple of weeks. The rest of the kit looks like you've got tons of everything else.

GARRIOTT

I'd encourage the use of the Alpha Keri lotion. I used one whole tube of it while I was up there. In that dry atmosphere I rubbed a little on my lips because my lips had a tendency to get chapped. I also tried to get some all around on my face, hands, and arms occasionally. I think that Alpha Keri really helped holding down some of the skin dryness; lips, nose, face, arms, hands, anywhere.

LOUSMA

I had a split lip that I got about 10 days prior to entry. I kept putting stuff on there and it kept cracking and bleeding all the time. It never did get well; I should have used it.

BEAN

My fingers got in awful bad shape. I had hang nails, they dried out and cracked. I started using Alpha Keri lotion but it was too late. I believe if you applied it daily particularly to your hands and maybe some on your lips just before you go to bed then you could keep from getting behind the curve. Once your skin dries out, it then appears to take a long time to recover. That ought to be

part of your daily personal hygiene routine. I had a swelling under my arm a couple of times, a little node. I don't know why I had it. I assumed may be the deodorant so I quit using it. That didn't seem to help it because a second one came. I started wearing a looser shirt, Jack's undershirts instead of my own. That felt better but it didn't seem to help it. I not sure it just wasn't the environment up there. Perhaps the chemical content of the food. Actually it was very healthy up there. We had a total of 180-mandays and nobody had a cold, nobody had diarrhea, nobody had anything to speak of. It's healthy up there if you can keep your eating sleeping habits correct.



BEAN Yes, it did. Therefore, Owen or Jack had to answer the squawkbox, and I just used a utility light.

QUERY You mentioned at one point that you had to sew up your sleeping bag and use some safety pins on it; what happened to it?

BEAN One of the disadvantages of the design was that there was excess material on the end, creating a large volume of air around the feet. In order to be warmer, I used safety pins to make the bag fit more closely and thus decreased the amount of total air to be heated while I slept.

QUERY How did you rig that bag for sleeping in the MDA those two nights?

BEAN I tied it down rigidly with four pieces of line.

QUERY In one of the M487 debriefings, Jack commented that he did his morning shower-shaving-tooth brushing exercise just like he did at home, but Owen, you said that you couldn't find a good place to brush your teeth. Why?

GARRIOTT I didn't spend as much time on that as Jack did. I never used toothpaste because it could not be ingested, and it was time consuming to find a place to spit it out. As a result, whenever there was a convenient time during the

GARRIOTT  
CONT'D)

day, I'd put water in my mouth with the squirt gun and brush my teeth for a few minutes, then put my toothbrush back. I considered it more from a standpoint of maintaining good gum conditions than of cleansing the teeth.

QUERY

During one of the M487 debriefings, you mentioned that you had some ideas on how the urine collection equipment might be improved, but that you would defer the remarks until postflight. Do you have any recommendations?

GARRIOTT

I don't have any major complaints about the urine collection system. I had less trouble with spills, for example, than either Jack or Al did, but I think I may have taken a little longer in the process. The method of getting bubbles out of the urine, however, was never clear to us. We did not know if it was necessary to hold down forcefully until the sample had filled and there was no more fluid or bubbles coming in or being stirred. It would be better to have air suction to each individual drawer, so that one drawer does not lose all its air suction if one of the other drawers is open a bit. We all would have preferred a little larger flow rate, in order to increase the simulated gravity.

QUERY

Al, you had mentioned the need for a different set of restraints located in different places in the waste management compartment, and you had some remarks concerning the



think it played pretty well after that didn't it Owen?

SPT: Uh huh. I think so.

PLT: What happened, the little drive wheel that fits up next to capstan drive gets dirty very rapidly and if you don't keep it clean it just doesn't work and I might have roughed it up a little bit too. I scrubbed real hard on it and it might have been a little slick. I'm not sure but that seemed to do the job.

SPEAKER: So all the tape recorders are now functional then.

PLT: We've got one there that plays with a real funny sound and I think it plays too fast. There's one that's not functioning quite but it's not the one in the wardroom.

SPT: I don't remember.

PLT: Yeah. There's one that's just not playing right. We've cleaned it and fooled around with it and it seems like the drives, the speed at which it drives is no longer correct because that distorts the sound.

SPEAKER: Do you use batteries very much?

PLT: Never. We always plugged them in.

SPEAKER: Jack, I've got one other question. It's on the personal hygiene kit. In the technical debriefing you were saying that on the personal hygiene kit resupply with all the razors, you recommend two, possibly three heads per man per 28 days. You said you had one that didn't shave so you used three of



them. Do you know about how many is still left up there? If my records are right, there should be somewhere around four. Which means we'll have to send up some more for the next flight.

PLT: I used two heads in the 56 days--two months.

SPT: I only used one.

SPEAKER: You only used one?

PLT: We didn't have quite as many as we thought we should and I think we recommend we have one replacement every fourteen days. So that would be four for our mission but I don't think I said that one of them didn't work. All the mechanical shavers--

SPEAKER: No, I think what happened was you were talking about it wouldn't shave close.

PLT: Oh, OK.

SPEAKER: You used the regular safety razor then you decided to go to another one.

PLT: No. Here's what I did. I prefer the safety razor because it does a better job but it takes more time and more a mess. So I would use the windup shaver all week long. If you miss one hair or any hair that you did miss, I mean whisker, it had grown too long the next day to get picked up in this thing. So any hair that got missed the first day just grew for a whole week and never got cut. So at the end of every week, why I'd use the safety razor to get all those and start all over again with the windup.



SPEAKER: Do you still feel it's necessary to have that since Owen used only one head? Do you think that this should send up two per 28 day?

PLT: I'd check with the guys that are going to go and I'm sure that they are all going to use the windup razor too and our recommendation is that you have one head per man per fourteen days. That would be a maximum I guess and you could probably get by with three. These guys are going to be there longer too, you have to remember that.

SPEAKER: Do you know how many A1 used? I think he used a couple didn't he?

SPT: I think so.

SPEAKER 2: That's on that tape recorder. We sent up a pad on private listening. Did you all ever use it?

SPT: On private listening?

SPEAKER: When you put the headset on. You were talking about you couldn't cut the music off. Did you ever get the input on how to cut that off? The switch on the side of it, it says off and 1, 2.

SPT: I think we got that. Yeah. You see we very seldom, if ever, used the head phones and that's because of the time it takes to read it and the fact that you have to haul it around and the fact that you may not hear some other things that are going on, although I know they were designed to enable you to hear it. So we just really never got around to use of the head phones. Not because you couldn't cut off the speaker.



I think we ought to retain that. Drying: Okay.  
Light-duty foot restraints: Well, here I - hold  
on; I'm moving on.

338 03 27 24 SPT

WMC Ceiling handrail: Don't use it very much. I  
guess it's adequate for - but I just flat don't use  
it very much at all. I guess when you ever need it,  
you might - you might find it convenient, but I'm  
usually using the walls. WMC light-duty foot re-  
straints: Okay, going back to that ceiling handrail,  
I'd give it a inadequate also because it really  
doesn't have that much job to perform.

SPT

Okay, the light-duty foot restraints: I'd give  
those - I'd give those inadequate also. The prob-  
lem is they're - they're not big enough or they're  
not small enough. They ought to be smaller if  
you're going to use your stocking feet in them, and  
they ought to be bigger if you're going to use  
triangle shoes in them.

338 03 28 16 SPT

Drying stations: I think they're too crowded to-  
gether, so I - I'd give them - inadequate. They  
do the job, but it's just, I guess, too - too packed  
together.

SPT

Shower: have not used it yet. I use sponge baths,  
and what's the difference. I guess I really can't  
give you a rating; I guess I'd give it an adequate,  
but what scares me off is all the frapping time it  
takes just in order to get the - the thing set up  
and to clean up after it. I find I can go on in  
and give myself a good sponge bath and can do the  
job just about as well as that shower in about half  
the time. We've been pushed for time up here, so  
I just haven't had the - haven't had the time to -  
the luxury to go on in there and try that. Looks  
like fun and I'll probably - I'm sure I will try it  
quite a few times.

338 03 29 11 SPT

Personal hygiene kit: It's all right, except the  
place that they have it stowed is inside a small  
locker. I'd much rather find a place that we could  
stow it permanently outside so you wouldn't have to  
dig into a small locker and fiddle with it all the



time. I find that kind of inconvenient. So I guess the kit itself is very good, but the location is poor.

SPT Towels and washcloths: I guess I'd give those a poor. I think the fire guys really got away with something when they made us go with that kind of material. I don't think it's absorbent enough, and I think it's too hard.

SPT General utility wipes: Okay, those are all right, except they're a little bit hard to get out of the container. I'd give them a very good. Again, we don't have enough of them.

SPT Wet wipes: I think they're too hard to open up; I'd give those an adequate. They're good once you get them open. Biocide wipes: I'd give those a poor. No one wants to go on in and get that biocide all over your hands whenever you want to clean up one simple thing. I think we ought to have a plastic handle on a sponge which has got something - which has got a way of getting biocide into the sponge, and then can be kept at a location where it won't dry out.

338 03 30 40 SPT Utensil wipes: Adequate. Again, tough getting the bag open.

SPT Trash and plenum bags: I'd give those an excellent; I think they work real well.

SPT Urine/fecal bags: I'd give those a very good. Only thing is they do tend to - a little bit hard to roll up and get them all squared away.

338 03 31 06 SPT Wardroom table, eating space: I - I guess I'd give that, oh, an excellent. I think that works pretty well. Thigh restraints: Adequate; they don't really hold you in there. You got to work at it pretty hard; what we really need is a good pair of foot restraints in there. Wardroom light-day - light-duty foot restraints: They're unacceptable. They just - they don't hold your shoes; they're too - way too small and you really can't get your stocking feet in them because you can't hold yourself that well



SPT Sounds like a threat.

341 11 14 23 SPT Crip, you haven't lived until you've tried to get toothpaste out of the bottom of a container in which you've got around 24 loose items.

CC Sounds like fun.

CC What did you say you were trying to get on it? Toothpaste?

CC Some day you're going to have to tell me how you do that. How you keep them all in.

341 11 15 00 SPT I wish I knew, it took three men and a small boy.

CC Say, Ed, you'll never believe this, but we've finally got around to uplinking you the message that I promised you about 2 nights ago on maneuver monitoring. And some time today we might talk about it a little bit before we get into this EREP.

SPT In our leisure time, Crip.

CC Sure you've got lost of that, don't you?

CC We're going to come back on and help you execute your next day off, and we'll - we'll make sure that's lots of leisure time.

SPT Our last day off already was executed.

CC Gullotined is probably a good word.

341 11 17 07 SPT It's going to one of those days, Crip. There's more coming out of the bottom of the tube than there is the top.

341 11 17 26 CC You could get somebody else to get their toothbrush out.

PLT We've got a massive failure in the toothpaste tube.

CC We'll put that down on our malfunction update.

SPT That's what happens to guys that squeeze the tube in the middle.



344 21 49 02 PLT

The lap strap and the handholds are not - They're essential. They - In fact, I would say that they are very good. But I think that the whole thing is designed for an improper posture. WMC hand washer handrail: I find that very useful. WMC foot restraints: I don't know where they are. They're - As far as I'm concerned, there aren't any WMC foot restraints. Those two straps in there are not very useful for anything. In fact, we're always ricocheting all over the place in the head. In fact, I would say that the foot restraints in the WMC are unacceptable and even worse than that. That looks like very little thought was given to that problem. And you're - you do an awful lot of work in the head that requires thrashing about, - dumping urine bags, putting urine bags in and doing all the - the measuring and - of the urine and sampling of the urine - and you have no foot restraints for this. The head is very, very bad as far as foot restraints are concerned. In fact, I think that they really - somebody really deserves a thumbs down on the efforts in there as far as foot restraints are concerned. WMC ceiling handrail, I never use unless I'm out of control.

344 21 50 13 PLT

WMC light-duty foot restraint: Well, I would guess that's - Again, they sort of flattered themselves to call them foot restraints because they're - they're highly unusable. There was not enough Velcro on there to - to open them up. To use the loops as large as they ought to be, you run out of your Velcro match points. I just think that there was very little thought given to those WMC foot restraints, if you - you want to call them that.

344 21 50 42 PLT

Drying stations: I don't know what that is other than the electric towel holders, and they're excellent. Shower, I would say, is very good to excellent. Personal hygiene kit: Well, the loop - the elastic loops in there have little pads on them, but they are not long enough. I find that I end up just sticking stuff in from the side in the loops. It'd be nice if the little pull tab on the elastic loop was a little longer because - and also there was just a little bit more limit to



Final Dump Tape 344-06/D-250  
Page 8 of 29

the extent to which you could pull the elastic to put things back in. And I - I find that those loops are very difficult to use in the hygiene kit. Towels and wash cloths: Well, I prefer cotton, of course. These are okay the way they are. I would say they are adequate. And they're sort of like drying off with padded steel wool - not quite that bad, but they are not as absorbent as cotton. And also, they - there's a slight uncomfortable feel to them. I'm used to them now, and they are adequate.

344 21 51 52 PLT

General utility wipes, wet wipes: I would say both these are great. Man, we use a lot of them, and any other effort - Well, you've got to have a lot of wipes around. And one of the things that's concerned me since day 1 is, if we ever ran out of wipes, we'd really be in trouble. We'd probably have to work some deal with wash cotton and towels. Biocide wipes: Well, of course, it's just that they're unpleasant to use because of the color, but for the purpose they serve, I'd say they were adequate. Trash and plenum bags, we ran out of. But it looks like we're very low on the regular urine disposal bags which are very convenient to have around because of that spring top on them, that flap. We ran - We don't have any regular disposal bags. I guess they were all used in - You use a lot of bags. Great consideration should be given for long-term space stations in that you've got to have either some other way of disposing the trash, like a trash masher or something like that, or you do have to have plenty of bags.

344 21 52 48 PLT

And there ought to be a little bit easier way of sealing them up for a low-bleed leak. It - it's not bad. I'd say they're certainly acceptable, but it is sort of a pain to wrap it around and snap it and snap around the corners and all that because we're worried about venting in the waste tank. Okay, bio - the utensil wipes - the utensil wipes are also very, very useful. Went back up there, and I would say that they're excellent. Urine/fecal bags: Okay. Of course, the urine bag - the UCTA are unpleasant to use. We minimize that, of course, by trying to weight in properly. Fecal



## Reference 3.4

Final Dump Tape 344-06/D-250

Page 19 of 29

I think the soap - the soap dispenser idea is very good, although I think the soap is lousy. There's got to be a better way to give soap than to give us that stuff that smells like dog shampoo. It's very unpleasant stuff to use. And I think that in the future, soap that we use should have some sort of a pleasant odor to it. And I think I mentioned that at the last one, too, and I'll go ahead and say it anyway. The hand soap is not as bad as the shower soap. And I just don't understand why it had to be that, because my wife also uses Nutragena [?] at home and her Nutraena smells quite pleasant.

344 22 29 37 CDR

The Nutragena that was got for us just smells like dog shampoo, and I just don't think that was really necessary. Somebody could have put themselves out a little more and made it a little more and made it a little more pleasant, I think. The only shortcoming of the shower, I would say, is the - is the suction head. It's just not flexible enough, and it doesn't - doesn't flow over the body well enough to remove the water. There's a redesign necessary there, and I don't think that's too difficult a thing. I think it could be very easily redesigned into something quite - quite nice and useful.

344 22 30 17 CDR

I suspect that what we'll need is a selection of heads just like we have for the vacuum cleaner because I think when you start cleaning up the shower and - and scooping up water around the shower, that you probably need a wide head; but for the body, you certainly need a soft head that'll follow the contours of the body a little better and pull the water off of you. The personal hygiene kit, I think is - is very good. I think you could make some minor improvements, but they're not all that necessary. They're large enough to put quite a few items in them. There's quite a few items in them. The towels and washcloths were, unfortunately, saddled with a flammability problem; so we could go for something nice and simple, like cotton or the terrycloth - cotton terrycloth that we're used to. And we find that the towels are really not quite as absorbent as we would like them to be. I think the towels - they should also be bigger.



Another guy might like to eat peanuts. I like peanuts too, but I mean he might like something else. I think that we've really missed the boat on this flight by not putting on some pleasure food like candy bars or whatever a guy likes. They - they - they - we were - had a very strict control over what we could eat and perhaps there were very good - at least they say there's a very good reason for this. I have no reason to question it. I think that the metabolic analysis has to be done, but I think that you - if you continue this, that you really take away something that can provide a lot - a lot of pleasure and at least relief - temporary relief in relieving mental pressure and that sort of thing for a person, and that is eat what you want to. They have - you know, have lots of sort of snack type things that you eat when a person like them.

365 21 50 44 PLT

In terms of your zero-g living and working experiences during this mission, what specific habitability improvements would you recommend for the next Skylab crew; for future programs? In terms of zero-g living and working experiences during this mission, what specific habitability - habitability improvements would you recommend for the next Skylab crew? Okay, I have to think about that for a minute.

365 21 51 08 PLT

One of the big problems is hygiene and washing. I would like to be able to stick my hands into an autoclave of some kind and wash them without having water - you know, really wash them down, without having water fly all over everything.

The same thing with my face. The razors aren't very good. The - that windup razor is - is useless as far as I'm concerned. Jerry can use it, but I can't. The habitability - I think that the food is part of habitability, and I've already mentioned that in the previous question. The - the restraints make it a - the lack of restraints have made it sort of difficult to - to move around in here. Working experience - what specific habitability improvements would you recommend for the next Skylab crew; for future programs?



Final Dump Tape 007-11/D-529

Page 4 of 14

system, I think, is a good system. It's a little bit noisy. If it could be made more quiet, I think it would be nice. It works well; the sampling is fairly easy to do, but again, that's a time consumer. The next evolution, I think, in waste management systems ought to be a system which is more quickly sampled. And I think that will greatly improve the situation there.

007 23 24 17 CDR

The - the next area is in washing. I think that we need - I - I mentioned this before and I'll just reiterate that. I think that something like the little hand sandblaster you find in - in a garage for cleaning spark plugs and cleaning - cleaning equipment would be good in a washing, since - something you could put your hands into, that would get around your wrist and would be sort of a - a canister or something. And you could put water and soap in it. And you could - you could wash your hands in it. Possibly reach something and - and - and flush the water out and bring in more water and rinse. Just like a wash basin, only it would be something you stick your hands into and it has cuffs or something so the water can't get out with you. That would also be very handy for things like cleaning razors after you've shaved. And things like that.

007 23 25 10 CDR

Also in the personal hygiene area I think aerosol shaves and foam shave and stuff like that ought to be made available. I think that most of us don't like the brushless shave because it's too hard to clean up the razor and stuff afterwards. Okay, I am going to have to go off the line again for a couple of minutes. I have a maneuver here, and I'll back.

007 23 27 22 CDR

Okay, this is the CDR again. Picking up - I'll do a few more words here on this, then I have an SO19. And between exposures when we have some time, I'll pump in a few more words about this. But things like shaving equipment, deodorants, and things like that, most of us like aerosols. And I think the aerosol is something that could be used in zero g. I think. Maybe the weightlessness situation will not allow your siphon situation to work. I'd have to think about that, but it seems



## Reference 3.7

GIBSON I second that. I really didn't enjoy that, especially when we ended up working with it in the shower. That was really dog shampoo in there. One item which I wished I had along was a head massager. You can buy them in any store. I suppose the reason we didn't have them was that there were no metallic ones. Quite a few people wouldn't allow us to have plastic.

CARR We made these points in 487, but each man should have the opportunity to choose his own deodorant, his own shaving cream, and the hardness of his toothbrush. I think that the toothbrushes were too soft. We told the folks that before we left and we still feel that way. I was very grateful to get back to my good old hard toothbrush at home. Somehow we got locked into brushless shave. In the future we should not be afraid to use aerosols in space flight. Maybe there's something I don't understand about the physics of aerosol cans, but I proved to myself that foam works because the fire extinguisher worked like a champ. Nobody can tell me that you can't use an aerosol foam up there.

POGUE There's no reason why we couldn't build an aerosol can smasher.

GIBSON Or build an aerosol can holder which, if it does rupture while you're using it, only the business end of it would be exposed.



CARR

That is a useful thing. It comes under general hygiene. I'd have given my right arm for some of that spray can formula 401 or Simonize or whatever those things are in the can that you can use to spray around. They smell good and have antiseptic in them and can be disinfectants for cleaning. That certainly would have been nice in the head and other areas where you see a urine spill on a wall and all you have to clean with is some biocide wipe. It would have been nice if you'd had a can of either a windex type with a plunger-squirter on it or an aerosol.

GIBSON

We could have used a can and a half at the trash airlock.

POGUE

The point that Jerry is making is well taken. I have read previous crew reports where the crew reported a strong subjective pleasure in noticing a familiar odor. Why is it that people are taking measures to deprive us of all the familiar odors? When things stink like a doggone john, it's nice to change that. One of the high points in the flight was when I put the antifog helmet compound inside my helmet. I got a distinct sense of relief and pleasure when I opened up that antifog compound because it smelled like Joy soap. If you're going to be there for a long time, you need to smell something that you like. Why they took all the odor out of that Neutrogena, I'll never know.

CARR Bill and I had a problem cleaning our double-edge safety razors. There's just no way to do it.

GIBSON Probably, the only effective way to do that was to get it wet and then to belt the side of it against something where the impact would dislodge anything inside the razor. That kept it functioning well for a good period of time.

CARR Vacuum Provisions: I think the idea of a modern home where the vacuum system is built into the home is a valid idea for the next space station; that is, make your vacuuming more convenient. We carried that double high-power accessory cord around the spacecraft a lot to do vacuuming. It would have been good if we could have avoided all that. I would say the vacuum cleaner itself was on the edge of being unsatisfactory as far as the amount of vacuum it provided.

GIBSON In many jobs, it was inadequate. You couldn't get into small crevices with it.

CARR Yes, our vacuuming tools were not what they should have been. Bill did a good modification on the crevice tool that did the special job we needed. I think you need more special purpose tools for the end of your vacuum cleaner. There's nothing wrong with having plenty of flexibility on vacuuming provisions.



CARR M487/M516 Habitability/Crew Quarters, Personal Hygiene, Cleaning

Teeth: I found the tooth paste not as bad as I expected and I had no objection to using it.

POGUE The biggest thing about brushing your teeth was having to spit the toothpaste out and getting it all over your beard.

CARR There was nothing worse than getting tooth paste stuck in your whiskers.

GIBSON I didn't have that problem. The only problem I had with the toothpaste was that a couple of tubes were kind of hard. I thought they were all this way and I didn't realize until about halfway through the mission that we had some toothpaste which could actually be squeezed out of the tube, without getting white knuckles.

CARR Ed was the lucky one of the group. He selected the tube that was more like window sash putty than toothpaste.

CARR Shaving: Bill and I don't have much to say about that. We found that the brushless shaves gummed up the razors, and was more trouble than it was worth. I just went ahead and started growing a beard from day 1. Bill fought the shaving game for about 2 weeks and finally gave up and decided to grow a beard himself. And when you've only got a little bit of neck, and a little bit of cheek to shave or trim up, it became less of a problem.

GIBSON I shaved about every third or fourth day but no one would have noticed it anyway.

CARR Haircut: We all three used the trimcomb and it was a reasonable way to solve the problem, short of qualifying one or two of us as barbers, so that we could cut each other's hair. The hair length problem was not too bad. When it got too long, we just used the trimcomb on it. It was not what you would call a professional job but it kept the hair out of our eyes and ears.

GIBSON I did not really do a very sterling job on my own hair, but I thought it was adequate.

CARR Body Odor: If you didn't wash, after a heavy sweat, you could get a little body odor. Other than that we weren't plagued with it very much because we kept ourselves clean.

GIBSON I don't think the problem is as severe up there as it is down here. If you go without a shower here for 1 day, it really shows up; there, it would take a couple of days before it would be obnoxious.

POGUE I noticed my head smelled more up there.

CARR I noticed that, too. When my scalp started getting dirty, I could smell it.



GIBSON We had some deodorant up there, which will remain unnamed, which was designed for the guy who wanted to smell like an athlete but didn't have the energy to be one. It was gross. You would put that on and in 2 or 3 hours you were the worse-smelling guy in the place. It was instant body odor.

CARR In general, there ought to be some variety in deodorants. A crewman should be able to take up the kind he wants.

CARR Nail Clipping: I never really paid much attention to the nail clipping problem. You could locate yourself so that the clippings went up on the screen, either in a waste management compartment or up in the workshop. It wasn't until I got back, and the doctors started asking me, that I realized that my fingernails apparently did not grow fast up there. The doctor said "How many times did you cut your fingernails?" I replied that I had done it twice, whereas on the ground I cut them once a week or once every other week. Then the realization came upon me that my nails were growing very slowly.

GIBSON I had that same realization. Here, I cut my nails once a week and up there I cut them only about twice. I don't think I cut my toe nails up there. For some reason they seem to slow down in their growth.

QUERY (Laughter)

POGUE It was a nice device.

QUERY With respect to the hard toothpaste tubes, what resupply kit did you get those out of? Was it the one ... or was it one of the ones you took out of one of the other, earlier ...?

CARR Well, you didn't send any supply kit up with us that I know of. We - -

QUERY Okay. We sent one up on SL-3.

CARR Yes. And that's the one we used. It had about two or three tubes in it that were hard as bricks. And poor old unlucky Ed was the guy who would select that tube of toothpaste every time, and I couldn't understand why he was in there grunting and squeezing on the toothpaste tube. And I just worked mine ... - -

QUERY But it is the one we took from SL-3?

CARR Yes.

QUERY Okay. Garment pockets - You had a lot to say in the debriefing.

CARR Yes.