

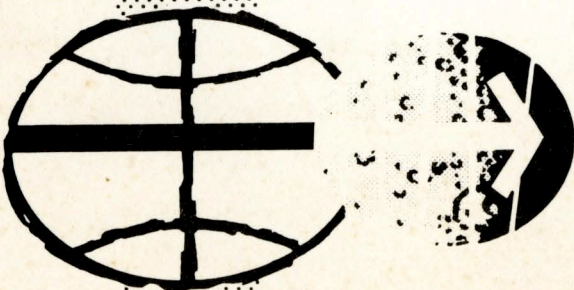


NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

SKYLAB FLIGHT CREW HEALTH STABILIZATION PROGRAM

Prepared by:

Life Sciences Directorate

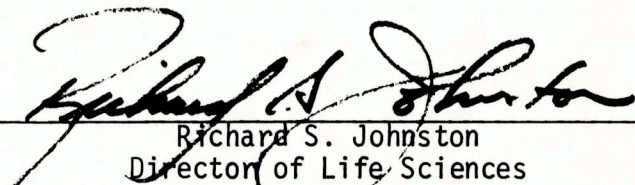


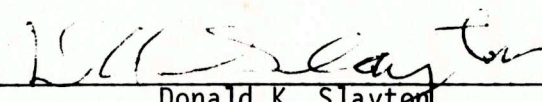
LYNDON B. JOHNSON SPACE CENTER

HOUSTON, TEXAS
March 15, 1973

SKYLAB FLIGHT CREW HEALTH STABILIZATION PROGRAM

Approved by:


Richard S. Johnston
Director of Life Sciences


Donald K. Slayton
Director of Flight Crew Operations

ACKNOWLEDGEMENT

This document includes recommendations made by the National Academy of Sciences Committee on Space Biology and Medicine, and the U.S. Public Health Service Center for Disease Control. These recommendations resulted in significant improvements in the overall program and is hereby acknowledged.

SKYLAB FLIGHT CREW HEALTH STABILIZATION PROGRAM

CONTENTS

	Page
Preface	ii
1.0 Astronaut Preflight and Postflight Activities-----	1
2.0 Primary Contacts and Epidemiological Surveillance-----	7
3.0 Facility Requirements -----	18
4.0 Security Operations-----	21
5.0 Procedures for Primary Contacts who are Carriers of Pathogenic Bacteria-----	25

PREFACE

The purpose of this document is to establish basic requirements within operational constraints to provide a living and working environment for Skylab crewmembers that will minimize their being exposed to infectious disease agents during the preflight and postflight phases of the Skylab Program in accordance with MSC1 8900.2B, as revised.

The informed acceptance of preventive medical principles by management, flight crews, and their primary contacts is absolutely essential for this plan to succeed in minimizing infectious disease exposure of the flight crew.

1. Crew Health will be stabilized by limitation of the number of personal contacts during the immediate preflight and postflight periods.

2. Those individuals requiring personal contact with the crew for mission essential functions will be medically examined to ascertain freedom from infectious disease and identified as class A and class B primary contacts. (See Section C-2.1)

3. The major scope of crew preflight activities will be limited to JSC Primary Areas. Primary Areas are defined as areas required for crew activity and areas that contain only medically approved primary contacts during crew occupancy. Some Primary Areas have specially designed air handling systems for contamination control. JSC Primary Areas are: Mission Simulation and Training Facility (Bldg. 5), Crew Quarters (Bldg. 228), Skylab Mobile Laboratories (SMLS, outside Bldg. 36), Astronaut Gym and the Ellington AFB flight line. The crew will require transfer to KSC for support of CDDT, suit checks, and launch. KSC Primary Areas required are: Crew Quarters (MSOB), Suit Rooms (MSOB), White Room (Pad), and the Patrick AFB flight line.

4. Access to primary areas during crew occupancy will be limited to properly badged primary contacts, or by waiver from the Director of Flight Crew Operations and the Director of Life Sciences. A single badge will be issued to primary contacts and it will be valid for access to primary areas at JSC and KSC.

5. Access to primary areas utilized by crewmembers will be controlled by the JSC and/or KSC security forces while occupied by flight crews.

6. When going from one primary area to another (outside a building) crewmembers will use personal vehicles, except when going to the launch pad and when returning to JSC postflight from EAFB. For these transfers, a Security Van will be used. Only primary contacts will have access to crewmembers during these transfers.

7. Crewmembers (prime and backups) will reside solely in the JSC or KSC Crew Quarters for a period of 21 days prior to launch and 7 days following splash down. An option is made for the returning crew to reside at home under security surveillance after they return to JSC if clinically indicated. No children will be in residence until after this 7 day period.
8. Crew access to areas, other than above, for emergency or recreational purposes will require approval of the Director of Flight Crew Operations and notification of the Director of Life Sciences. This includes emergencies to go home during the isolation periods.
9. Postflight isolation will be initiated immediately after recovery aboard the Primary Recovery Vessel (PRV) and continued for a period of 7 days. Residence on the PRV will be in isolated quarters. During the R+0 to R+7 period, crew personal contacts will be limited to primary contacts within operational capabilities. After their return to JSC the crew will restrict their activities to primary areas during the day and may reside at home, under security surveillance, if clinically indicated, while limiting their contacts to medically approved primary contacts. No children will be in residence until after this 7 day period. All debriefings will be conducted from the Mission Simulation and Training Facility (Bldg. 5) at JSC. Following the R+7 period, crewmembers will reside at home if all household members are in good health. Large crowds will be avoided until R+18.
10. Mission essential personnel (non-primary contacts) may only occupy primary areas when these areas are not occupied by the flight crews, subject to the restrictions outlined in Section C-2.3 (Non-Primary Contacts).
11. To insure full understanding of the procedures to be used, the reasons for using them, and the importance of personal integrity in the satisfactory implementation of this program, briefings provided by Life Sciences Directorate personnel will be mandatory for the flight crew and all primary contacts prior to F-21.
12. Reporting of illness events and exposures to illnesses will be accomplished by the primary contacts. They will call the Medical Surveillance Office (713-483-6151) at JSC each time an illness event or exposure occurs. (See section C-2.1 for additional preventive measures.)
13. The Chief, Health Maintenance Branch, JSC, will coordinate all medical interfaces with the JSC and KSC Clinics and be responsible for medical approval/disapproval of the primary contacts.
14. JSC and KSC Security and individual supervisors will be notified immediately when ill primary contacts are medically disqualified.

C-1.0 ASTRONAUT PREFLIGHT AND POSTFLIGHT ACTIVITIES

The Director of Flight Crew Operations has the responsibility to schedule, implement, and enforce the following elements of the SFCHSP.

C-1.1 Housing Provisions

- a. For each mission, the prime and backup crews will reside and sleep in the JSC or KSC Crew Quarters from F-21 until launch. At JSC, two house trailers will be utilized and located in Bldg. 228. Access to Bldg. 228 will be controlled by cipher lock. At KSC, the Crew Quarters will be located in the MSOB.
- b. Only those primary contacts who have been designated as essential for Crew Quarters operations during the F-21 day periods and/or the R+7 day periods will be admitted to the Crew Quarters. These primary contacts will be appointed by the Director of Flight Crew Operations.
- c. If additional primary contacts require access to the Crew Quarters, entrance may be obtained through the Director of Flight Crew Operations, or his designee and the Director of Life Sciences will be notified.
- d. Only Skylab food and water will be consumed by the crewmembers during the preflight and postflight periods. See MSC-07705 for specific requirements of the Food and Nutrition Skylab Support Program.

C-1.2 Crew Activities

a. Preflight

1. During the period from F-21 until launch, the crews (prime and backups) will limit their activities to the approved primary areas noted in paragraph 3 and 8 of the Preface.
 - (a) Movement between JSC Bldg. 228 and other areas can be accomplished by utilizing personal vehicles. Special parking areas will be provided for the crews at Bldgs. 228 and 5.
 - (b) Crews will enter and exit JSC Bldg. 5 only through the crew entrance on the north side of the building.
 - (c) The Astronaut Gym will be utilized for maintaining flight physical conditioning. The gym will be thoroughly cleaned prior to the F-21 period for each mission and access will be limited to only astronaut crewmembers and astronaut primary contacts.

- (d) The SMLS will be operational outside Bldg. 36 and crew use will be coordinated with the Chief, Health Maintenance Branch. All non-primary contacts will be cleared from the area two hours prior to crew use.
 - (e) When the crewmembers are to exit the MSOB at KSC, they will do so by transferring from the third floor to the first floor utilizing the protected stairwell adjacent to the Crew Quarters. After reaching the first floor, the crew will exit through the nearest outside door and enter their vehicle. Return to the Crew Quarters is by the reverse route. The protected stairwell will open only on the third and fourth floors and to the outside. Special keys will be issued to each of the crew.
 - (f) When the crewmembers require access to the Suit Rooms, KSC security will clear the area of all personnel except primary contacts at least one hour before crew entrance.
 - (g) During the Count Down Demonstration Test (CDDT) at KSC and prior to launch, the crewmen will remain "bubbled up" and suited up during transfers from the van to the White Room.
 - (h) For any unsuited activity at Complex 39, Pad A or B, biorespirators will be worn at all times by the prime and/or backup crewmembers.
 - (i) Final suit fit checks will be scheduled to occur during the day the crew is at KSC for CDDT. Other fit checks will be at KSC if required or the crew can wear biorespirators to and from JSC Bldg. 7 suit shops. Biorespirators are not required by the crew while inside the suit area (which is a class 100,000 clean room). Only primary contacts will be allowed inside during crew use.
2. During the period from F-21 until launch, the crewmembers will insure that they do not contact anyone other than properly badged primary contacts.

b. Postflight

1. Mode of Operation

During the first 7 days following splashdown, strict control procedures will be implemented to protect the returning crewmembers from exposure to infectious disease agents. Where operationally feasible crew contact will be limited to

medically approved primary contacts. Primary contact status and activities will be controlled in the same manner as utilized during the preflight period except that the crew may reside at home, under security surveillance, if clinically indicated and only the wife will be in residence. No children will be in residence until after R+7.

2. Nominal Recovery

- (a) During a nominal recovery the crewmembers will be brought aboard the Primary Recovery Vessel (PRV) by either helicopter or in the Command Module (CM). The helicopter or CM will be placed on a hangar deck elevator and lowered to the hangar deck. Prior to crew exit, the helicopter or CM will be moved to an area adjacent to the SMLs. The transporting vehicle will be opened and the crewmembers transferred immediately, without any ceremony, to the SMLs by means prescribed by the Flight Surgeon at the scene.
- (b) While onboard the primary recovery vessel only primary contacts will be in the SML area during crew occupancy and only primary contacts will be permitted access to the Crew Quarters.
- (c) At dock side in San Diego, a brief departing ceremony may be conducted by the flight crew as long as no one other than primary contacts are within 100 feet of the crew.
- (d) The crew will be carried by helicopter from the primary recovery vessel to an adjacent flight line for return to JSC. Only primary contacts, the flight crew, and the aircraft crew will be permitted aboard the plane from San Diego to EAFB. At Ellington, a brief ceremony may also be conducted as long as no one other than primary contacts are within 100 feet of the crewmen.
- (e) Transportation from Ellington to the JSC Crew Quarters will be by Security van driven by a primary contact. Residence at JSC will be established in the Crew Quarters or at home as described above until approximately R+7. Crew activities will be controlled in the same manner as utilized during the preflight period.
- (f) Following R+7, if approved by Chief, Health Maintenance Branch, strict medical control of the crew will be relaxed.
- (g) Large crowds and contact with ill individuals will be carefully avoided by the crewmen until post-mission activities are completed.

3. Secondary Recovery

- (a) If splashdown occurs in a secondary recovery zone, the crewmembers will exit the CM and be flown to the nearest land base by helicopter.
- (b) Upon arrival, the helicopter will be moved adjacent to the awaiting C-5A aircraft. The crew will be transported without ceremony by means prescribed by the Flight Surgeon in attendance from the helicopter to the SMLs contained in the C-5A.
- (c) An area of at least 100 feet around the C-5A will be roped off and guarded to prevent access to the area by anyone other than primary contacts, the flight crew, and the aircraft crew.
- (d) Following completion of the initial medical examinations, a brief departing ceremony may occur as long as no one other than primary contacts are within 100 feet of the astronauts. Crew and primary contact residence will be maintained inside the C-5A until return to EAFB. Only the flight crew, primary contacts and the aircraft crew will be onboard the C-5A.
- (e) EAFB activities, return to JSC, and other postflight activities will be conducted as described above.

C-1.3 Special Training and Emergency Procedures

Special training and/or emergency procedures may be required for mission success. All such situations will require approval of the Director of Flight Crew Operations and notification to the Director of Life Sciences.

- a. If local T-38 aircraft flying is necessary during the F-21 day period, it may be permitted from Ellington AFB or Patrick AFB under the following conditions:
 - 1. Suiting up for T-38 flying will be accomplished in a primary area.
 - 2. The filing of flight plans, weather briefings, traffic clearances, etc. will be accomplished by telephone.
 - 3. Crewmembers will notify the Security Office so that proper clearance will be provided.
 - 4. Crewmembers will travel directly to and from the flight line in personal vehicles without contacting anyone other than primary contacts.

5. All ground crewmen, who will come in personal contact with members of the flight crew, will be specified previously and meet the requirements of a primary contact.
- b. If emergencies occur during the isolation periods affecting crew welfare, the Director of Flight Crew Operations can authorize the crew to go home, etc. Notification of this emergency will be made to the Director of Life Sciences immediately.

C-1.4 Other Activities

- a. The Director of Flight Crew Operations will insure that only primary contacts visit the Remote Auxiliary Training Site at KSC.
- b. Crewmen will utilize their own personal vehicles for transportation between the primary areas. The crew's personal vehicles must be serviced (i.e., gas and oil) daily or as necessary when the vehicle is not in use by a crewman. This function will be performed by the Astronaut Office support personnel who are medically approved as primary contacts.
- c. Areas to be visited by the flight crew, not considered previously, must be approved by the Director of Flight Crew Operations who will notify the Director of Life Sciences and the Security Office at JSC and/or KSC in sufficient time prior to the visit to insure adequate control of the area. This includes recreational areas requested by crewmembers.
- d. If an area, as above, is approved, the Director of Life Sciences will notify the Chief, Health Maintenance Branch and the Medical Surveillance Office.

C-1.5 Surveillance of Crew Families

- a. During the 60 days prior to a flight, inflight, and the 7 days postflight, all illnesses in a family member of the prime, backup, or support crews will be evaluated by a physician at JSC. All illnesses regardless of severity will be reported to the Chief, Health Maintenance Branch by calling 483-4021 at JSC.
- b. Illness occurring in close contacts of the above families will also be reported to the Chief, Health Maintenance Branch by calling 483-4021 at JSC.
- c. All pertinent epidemiological data will be maintained on record in the Medical Surveillance Office at JSC, which is a secured area.

C-1.6 Crew Wives and Support Crewmembers

- a. Crew wives and all support crewmembers will be class A primary contacts.

Physical exams, illness evaluation, and treatment will be conducted by the Chief, Health Maintenance Branch at JSC. Reporting procedures will be as in Item C-1.5 above. (See Section C-2.0 for definition and detailed requirement description.)

- b. Crew wives must be examined by the Chief, Health Maintenance Branch and be declared in a healthy state prior to release of the flight crew to go home during the R+7 isolation period.

C-1.7 Children

- a. Immunizations will be made available to children of crewmembers.
- b. Children of prime and backup crewmembers will not come in direct contact with prime and backup crewmembers during the 21 days preflight period. Children of prime crewmembers will not come in direct contact with prime crewmembers during the 7 day postflight period.

C-2.0 PRIMARY CONTACTS AND EPIDEMIOLOGICAL SURVEILLANCE

C-2.1 Personal Contacts

a. Responsibilities

Two of the prime factors in reducing the possibility of crewmembers being exposed to infectious agents are to minimize the number of persons that they contact and to insure that those persons they do contact are healthy. Responsibilities for implementing the above are as follows:

1. The Director of Flight Crew Operations will plan crew activities for the F-21 and R+7 periods for each mission in a manner that will minimize the number of personnel involved, and will insure that crewmembers do not have contact with anyone other than medically approved primary contacts.
2. The Director of Life Sciences will provide a medical program to minimize the probability of crew exposure to primary contacts with infectious disease.

b. Definitions

1. Primary contacts are defined as individuals who require access to primary work areas where the prime or backup crew are located to perform mission essential functions during the 21 days immediately prior to launch and/or during the 7 days immediately following recovery. Only these individuals may occupy primary areas while crewmembers are present. Personal contact with crewmembers will be limited to these individuals. Two classes of primary contacts shall be identified.
 - (a) Class A - individuals who must approach to within 2 meters of the crewmembers for oral communication, equipment manipulation, personal contact, or food handling.
 - (b) Class B - individuals who must work in an area where crewmembers are present, but have no direct contact with the crewmembers.
2. Non-primary contacts are defined as all persons other than primary contacts. These individuals may not be in any primary area while crewmembers are present, and may not have any direct contact with the flight crews during the 21 day preflight period or the 7 day postflight period.

c. Primary Contact Appointment

The Director of Flight Crew Operations will be responsible for providing a complete list of primary contacts to the Director of Life Sciences on or before F-90 days. Primary contacts will be identified as either Class A or B on this list. A set of forms will be distributed to the primary contacts to complete and return to the Medical Surveillance Office after receipt of the initial listing.

d. Training Session

A training session will be held at JSC and KSC for all primary contacts to insure full understanding of the procedures to be used, the reasons for using them, and the importance of personal integrity. Attendance is a requirement to become qualified as a primary contact.

e. Primary Contact Medical Examinations

1. The personnel selected as prospective primary contacts will have medical examinations with emphasis on the detection of infectious diseases. These examinations will be completed for all primary contacts between 60 and 45 days prior to each Skylab flight, and results reported on Form 368C by 30 days prior to each flight. All Class A primary contacts will be reexamined before F-21 for each mission by the JSC or KSC Clinic physicians. Food handlers will be reexamined at F-14 and F-7. All KSC Class A primary contacts will also be reexamined at F-7. Class B primary contacts will not be reexamined at these intervals. The prospective primary contacts will be approved by the Chief, Health Maintenance Branch for access to the crew after F-21 only after a review of the medical examinations, laboratory and personal and family medical history data.
2. The Occupational Medicine Clinics at JSC and KSC will accomplish the medical requirements for primary contacts, except the Astronaut group and their dependents.
 - (a) The JSC Occupational Medicine Dispensary will support the medical requirements of primary contacts located at JSC. The Dispensary will be informed at F-75 days by the Medical Surveillance Office of the names of primary contacts to be examined. This facility will maintain medical records on all primary contacts.
 - (b) The medical requirements for primary contacts at KSC will be supported by the KSC Occupational Health Facility who will be informed at F-75 days by the Medical Surveillance Office of the names of primary contacts to be examined.

3. Laboratory Tests

(a) To accomplish all serology and bacterial screening on primary contacts in a timely manner, all specimen materials must be collected at the time of medical examinations. Basic clinical, routine serology and bacteriology analyses will be accomplished by the JSC Medical Support Laboratories or the KSC Occupational Health Facility. Virology and other serology will be accomplished only by the JSC Medical Support Laboratories.

(b) Laboratory tests will be conducted only on primary contacts unless family histories indicate some family members should be checked by laboratory tests. The basic philosophy of testing will be oriented toward screening for subclinical infectious disease. If abnormalities occur in the initial medical evaluation, follow-up testing will be done at the discretion of the examining physician, or Chief, Health Maintenance Branch.

(c) The laboratory tests will include:

White cell count with differential count if WBC is greater than 10,000 or less than 5,000

Urinalysis

Serology for CRP, SGOT, mumps, rubella, rubeola and RPR (RPR will not be repeated on those who have had this determination as part of their annual physical exam within the past six months)

Throat culture for pathogenic bacteria (food handlers only)

Stool specimen for pathogenic bacteria (for food handlers only)

(d) Specimen requirements for above tests are as follows:

Blood - 12 ml sample of whole blood

5 ml of whole blood for WBC, and differential

7 ml of whole blood for RPR, CRP and serology samples for determining titers for mumps, rubella, and rubeola

Urine sample

Throat culture for bacteriology - 1 immersed in 2 ml of TSB

Stool specimen

Other specimens - number and type to be predicated on findings - i.e., at the discretion of the examining physician, or the Chief, Health Maintenance Branch.

- (e) Serologic studies to be accomplished by the JSC Virology Laboratory will include screening tests (by HI or NT) for rubeola, rubella and mumps.
 - (f) Bacteriology performed on primary contacts who handle food shall include examination for respiratory pathogens (Type A Beta-hemolytic Streptococci, Staphylococci, Pneumococci, Klebsiella, and Haemophilus). Specimens for phage typing will be sent to JSC for analysis. Microbiology for food handlers will also include feces analysis for bacteriology (Salmonella, Shigella), ova, and parasites.
 - (g) Screening for tuberculosis will be accomplished with a yearly PPD (Federal stock No. 6505-105-0102, biologically equivalent to PPD-S).
4. X-ray of the chest. In those individuals with a previously positive skin test for TB, follow-up screening will be done with a chest X-ray only. X-ray will not be repeated on candidates with negative PPD who have had negative chest X-rays within six months.
5. All primary contacts will have current immunizations according to the following schedule:

Disease	Immunization Required	Immunization Duration
Diphtheria	*	10 years
Tetanus	*	10 years
Influenza	*	6 months
Polio	*	6 years
Mumps	1*	1 year
Rubella	1*	10 years
Rubeola	1*	10 years

*Immunize if no serologic response or history of immunization

1 Serological examination unless previously accomplished

6. Physician Review

- (a) The examining physician will review the laboratory analyses, temperature, TB skin test, chest x-ray, hands, face, neck, scalp, skin, eyes, ears, nose, throat, and feet to determine absence of infectious diseases.
 - (b) The examining physician will make a recommendation for medical approval/disapproval on Form 368C and submit the form to the Medical Surveillance Office.
- f. Management of primary contact illnesses after F-30 of SL-2. The principal aim of this program is to isolate sick primary contacts from the crew. However, since there is a lack of backup capability in certain mission essential positions, an attempt will be made to return the sick primary contact to good health and function as quickly as possible. In such cases, if clinically indicated, treatment will be instituted by the responsible Occupational Medicine physician at JSC or KSC.

1. Procedures

After reporting an illness to the Medical Surveillance Officer, the primary contact will be directed to the JSC or KSC Occupational Medicine Clinic for evaluation, disposition and clinical recommendation. No further crew contact is permitted until an adequate medical evaluation has been completed.

2. The ill primary contact will be seen by an Occupational Medicine physician who will perform an examination to detect the etiology of the illness with special emphasis on infectious disease.
3. An initial laboratory screen will be done which will include, in addition to any specific studies ordered by the physician, a WBC, differential, C-reactive protein, acute serum for viral studies, and any indicated bacterial cultures. The appropriate samples will be obtained by Occupational Medicine Laboratory personnel and analyzed in either the KSC Occupational Health Facility or the JSC Medical Support Laboratories. Laboratory personnel will report WBC, differential and CRP results as quickly as possible to the examining physician.
4. The pertinent findings of the visit will be made by the examining physician on a Report Epidemiology Form (Form 368D). A summary of the report is telephoned to the Medical Surveillance Officer along with the clinical recommendation regarding PC status by the clinic personnel.

5. If the Chief, Health Maintenance Branch, or the examining physician decides that a primary contact should be denied access to the crew, the Medical Surveillance Officer will authorize clinic personnel to place the primary contact badge in the individual's medical records, and notify the individual's supervisor and the Security Office.
6. The ill primary contact will be re-evaluated by the Occupational Medicine Clinic at no greater than 72 hour intervals. A patient may be seen at more frequent intervals if clinically indicated. At each revisit, a blood sample for WBC, differential, and C-reactive protein tests will be drawn and handled as detailed above. At each revisit, a summary report of the clinical evaluation and laboratory results will be telephoned to the Medical Surveillance Officer by clinic personnel.
7. When the patient is determined to be healthy and is recommended for return to full primary contact status, the findings will be reviewed by the Chief, Health Maintenance Branch. If he concurs, the Medical Surveillance Officer will contact the appropriate authorities and the cleared Primary contact will pick up the primary contact badge from the JSC or KSC Clinic. The completed Report Epidemiology Form will be copied and forwarded by the Clinic to the Medical Surveillance Office.
8. After F-0 of SL-2 and SL-3 it will be necessary to continue strict routine follow-up on laboratory sampling. Primary contacts will still be required to report illness and illness contacts to the Medical Surveillance Officer and will be directed to the JSC or KSC Clinic for evaluation as the preflight epidemiological surveillance for SL-3 and SL-4 continues the program.
9. On R+7 of SL-4, the Skylab Flight Crew Health Stabilization Program will terminate.

g. Additional medical examinations for Class A Primary Contacts

1. Class A primary contacts will be reexamined for signs of infectious disease during the F-21 day period.
 - (a) Johnson Space Center
 - (1) All Class A primary contacts will be scheduled by the JSC Clinic for a medical examination from F-28 to F-21 for each mission.
 - (2) All food handlers will be reexamined and specimens will be taken at F-21, F-14 and F-7 by the JSC Clinic for each mission.

- (3) If epidemiologically indicated, specimens will be taken. Laboratory tests will include:
- a) White cell count with differential count if WBC is greater than 10,000 or less than 5,000.
 - b) Urinalysis (for food handlers only).
 - c) Throat culture and stool specimens for pathogenic bacteria (for food handlers only).
- (4) Specimen requirements for above tests are:
- a) Blood - 5 ml of whole blood for WBC and differential.
 - b) Urine sample.
 - c) Throat culture - 1 immersed in 2 ml of TSB.
 - d) Stool specimen.
 - e) Other specimens - number and type to be predicated on findings - i.e., at the discretion of the examining physician or the Chief, Health Maintenance Branch.

(b) Kennedy Space Center

- (1) All Class A primary contacts will be reexamined by the OHF just prior to F-21 and at F-7 for each mission.
- (2) All food handlers will also be reexamined at F-14 by the OHF for each mission.
- (3) If epidemiologically indicated, specimens will be taken as above.

h. Primary Contact Responsibilities

- 1. All primary contacts must realize and remember that it is their responsibility not to be a source of infectious disease for the flight crew, or other primary contacts.
- 2. After a primary contact is appointed, any of the following events must be reported to the Medical Surveillance Officer from F-60 of SL-2 through R+7 of SL-4.
 - (a) Illness of the primary contact.
 - (b) Illness of a family member of the primary contact.
 - (c) Contact by the primary contact with an ill person whether a family member or another individual.

This report will be made prior to any further exposure to the crew even if it involves the primary contact exiting the areas occupied by the crew.

3. During normal duty hours at JSC, reporting to the Medical Surveillance Officer may be accomplished by telephoning 483-6151. Primary contacts are requested to call the code-a-phone (number to be provided) if after duty hours.
4. During normal duty hours at KSC, reporting to the Medical Surveillance Officer may be accomplished by telephoning by FTS, dial 9-713-483-6151 or, if after duty hours, call the next day.
5. Class A primary contacts will wear disposable surgical masks while working with the flight crewmembers. These masks will be discarded after a maximum period of 4 hours and a new mask obtained if needed for a longer period or after once removing. Food handlers will be required to use masks and sterile rubber gloves when preparing and serving food to the flight crewmembers. All other individuals requiring actual crew direct contact (Flight Surgeon, Medical Tech, etc.) will be required to wear mask and sterile gloves when contacting the crew. Class B primary contacts will not be required to wear masks or gloves.
6. If deemed necessary by the Medical Surveillance Officer, a primary contact may be sent to the JSC or KSC Occupational Medicine Clinic for examination. After reporting to the above clinics, the examining physician will complete the Report Epidemiology Form (Form 368D). Definitive treatment will be available if indicated. The Chief, Health Maintenance Branch will determine if such an incident will require removal of a person from primary contact status after clinical and laboratory examination.
7. If it is determined that an employee must be removed from primary contact status for medical reasons, he or she will be given either another assignment where crew contact or access to a primary work area is not required, or will be given administrative leave.
8. Individuals not receiving primary contact status under paragraphs C-2.1 c and C-2.1 e, and who require crew contact during postflight operations aboard PRV must be medically approved 30 days prior to crew recovery. A minimum ship residence time of 72 hours will be required for all primary contacts aboard the PRV.

C-2.2 Epidemiological Surveillance Program

- a. The epidemiological surveillance program will be a key factor in preventing the exposure of crewmembers to infectious diseases.
- b. The epidemiology surveillance will begin at JSC and KSC two months prior to launch of SL-2.

1. The surveillance program will start at F-60 by gathering pertinent epidemiological data from local health authorities in the JSC area.
2. Each primary contact will be required to fill out the Work Agreement Form (Form 368A), in addition to the Medical History Form (Form 368B), and an Initial Epidemiology Questionnaire (Form 368E). These forms will be completed and submitted to the Medical Surveillance Office prior to the time the primary contact receives the initial medical examination.
- c. The Medical Surveillance Office will be located in Room 158 of Bldg. 37 at JSC. This post will be activated at F-60 and manned, one 8-hour shift per day until F-21 when it will be manned 12 hours/day by a Medical Surveillance Officer. All activities and information relating to the crew activities; health status of crewmembers, primary contacts and families, and community; and other pertinent information will be reported to this location.
- d. The Medical Surveillance Office will maintain records of current disease events, and all medical records of primary contacts and families which might have impact on the primary contacts, their families, and the flight crews.
- e. Information for the surveillance records will be obtained from:
 1. Reports received from primary contacts.
 2. Reports from NASA and local physicians.
 3. Reports from local school officials.
 4. Reports from local health authorities in Houston and in Galveston County.
 5. At the close of each work day, the Director of Flight Crew Operations, or his representative will provide the Chief, Health Maintenance Branch, Medical Surveillance Officer, and Security with a summary report describing crew activities for the next day.
- f. The medical records of the primary contacts and other pertinent epidemiological data will be entered onto a computerized magnetic tape after the completion of program requirements for summary data retrieval.
- g. The Medical Surveillance Officer will keep the Chief, Health Maintenance Branch informed on the epidemiological status of the primary contacts, their families, and their communities. This information will be transmitted in the form of a daily meeting.

- h. The Chief, Health Maintenance Branch, or his designee, will evaluate the crew food handling facilities daily for proper food procurement, storage, handling, and service techniques.
- i. It is the responsibility of the Director of Flight Crew Operations to notify the Chief, Health Maintenance Branch, of any occurrences with the flight crew that may affect their health status or exposure.
- j. The Medical Surveillance Officer will keep the following personnel informed as to program status by providing each with a weekly activity report.
 1. Director of Life Sciences, NASA-JSC.
 2. Director of Flight Crew Operations.
 3. Chief, Health Services Division.
 4. Chief, Medical Support Branch.
 5. Chief, Health Maintenance Branch.
 6. Chief, Crew Training and Simulation Division.
 7. Manager, Skylab Program Office.
 8. Chief, JSC Security Office.
 9. Chief, KSC Security Office.
 10. Director, Epidemiology Program, USPHS-CDC.
- k. An active surveillance program will be carried out during the F-21 day period on Class A primary contacts only. The voluntary reporting system will function as usual. The active surveillance will depend upon pharyngeal examinations to detect early signs of upper respiratory infections. A doctor and nurse will be stationed at the entrance to Building 5 from 7:00 to 9:00 a.m. and from 3:00 to 5:00 p.m. The physician will examine the pharynx of each Class A primary contact as he or she enters for work. The nurse will take an oral temperature. Any contact whose pharynx appears abnormal or whose temperature is abnormal will be referred to the JSC Clinic for further evaluation and indicated laboratory studies.

C-2.3 Non-Primary Contacts

As described previously, one main factor to control sources of infectious disease is to control the number and types of personnel that have contact with flight crewmembers. This section is written to summarize the activities of non-primary contacts that must be enforced by the Director of Flight Crew Operations.

- a. Non-primary contacts must not have direct contact with the flight crew.
- b. All areas to be visited by crewmembers must be cleared of non-primary contacts at least two hours prior to crew entrance.
- c. Non-primary contacts are not permitted access to the Crew Quarters.
- d. Non-primary contacts may not enter any area while it is occupied by a crewmember. An area is defined as that portion of a facility that is supplied and exhausted by the same air conditioning system that supplies and exhausts the immediate vicinity of a crewmember.
- e. Non-primary contacts are not permitted to be in the vicinity of the Remote Auxiliary Training Site.
- f. Non-primary contacts who are ill must not have direct contact or expose any primary contacts during the 21 day period, inflight period, or the 7 day postflight period. Supervisors will relocate ill non-primary contacts to another work area so that exposure to the primary contacts is eliminated.

C-3.0 FACILITY REQUIREMENTS

To provide a clean environment for crewmembers, and to control access, certain facility requirements are outlined below:

C-3.1 Johnson Space Center

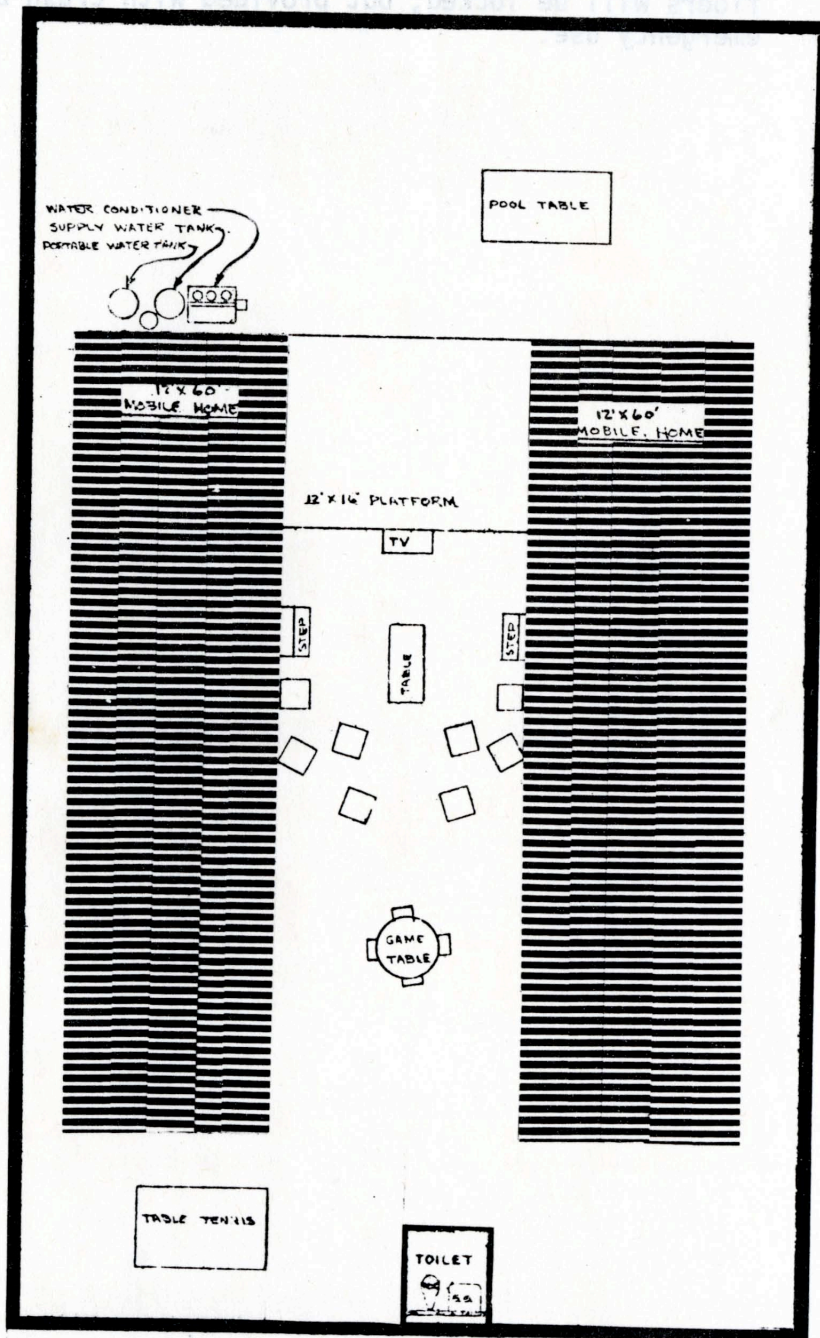
- a. The air conditioning system for Bldg. 5 will contain biological filters that are capable of removing at least 80 percent of all particles of 0.7 microns, or larger, from the air.
 1. The air conditioning system will be balanced to provide at least 0.1 inch water gauge positive pressure.
 2. All but a minimum number of doors will be locked and sealed to insure that positive pressure is maintained and that no backflow of air occurs.
- b. A Crew Debriefing Room will be provided in Bldg. 5 for the crewmembers to use preflight and postflight. Closed circuit television will be linked to the Bldg. 1 Auditorium for press interviews and postflight debriefings. Only primary contacts will be allowed in the Crew Debriefing Room.
- c. Access to Bldg. 5 will be limited to the main entrance on the west side. All other doors, except the crew entrance door on the north side, will be locked and sealed.
- d. The observation balcony of Bldg. 5 will be locked and sealed during the entire surveillance program. Access to this area will not be permitted to anyone.
- e. All keys to outside doors of Bldgs. 5 and 228 will be collected and managed by the Director of Flight Crew Operations.
- f. Two mobile homes will be located in Bldg. 228. A supply of Skylab potable water, a waste management system, a galley area and tables, and recreation equipment will be provided. See detailed floor plan on page 19.

C-3.2 Kennedy Space Center

- a. Air conditioning systems for the Crew Quarters and the Suit Rooms will contain biological filters that are capable of removing at least 95 percent of all particles of 0.3 microns, or larger, from the air.
 1. The air conditioning system will be balanced to provide at least 0.1 inch water gauge positive pressure.
 2. All but a minimum number of doors will be locked and sealed to insure that positive pressures are maintained and that no backflow of air occurs.

Flavorator 44 in the MSB that leads to the Crew Quarters will be programmed not to stop on the third floor when the crew is occupying the Suit Rooms.

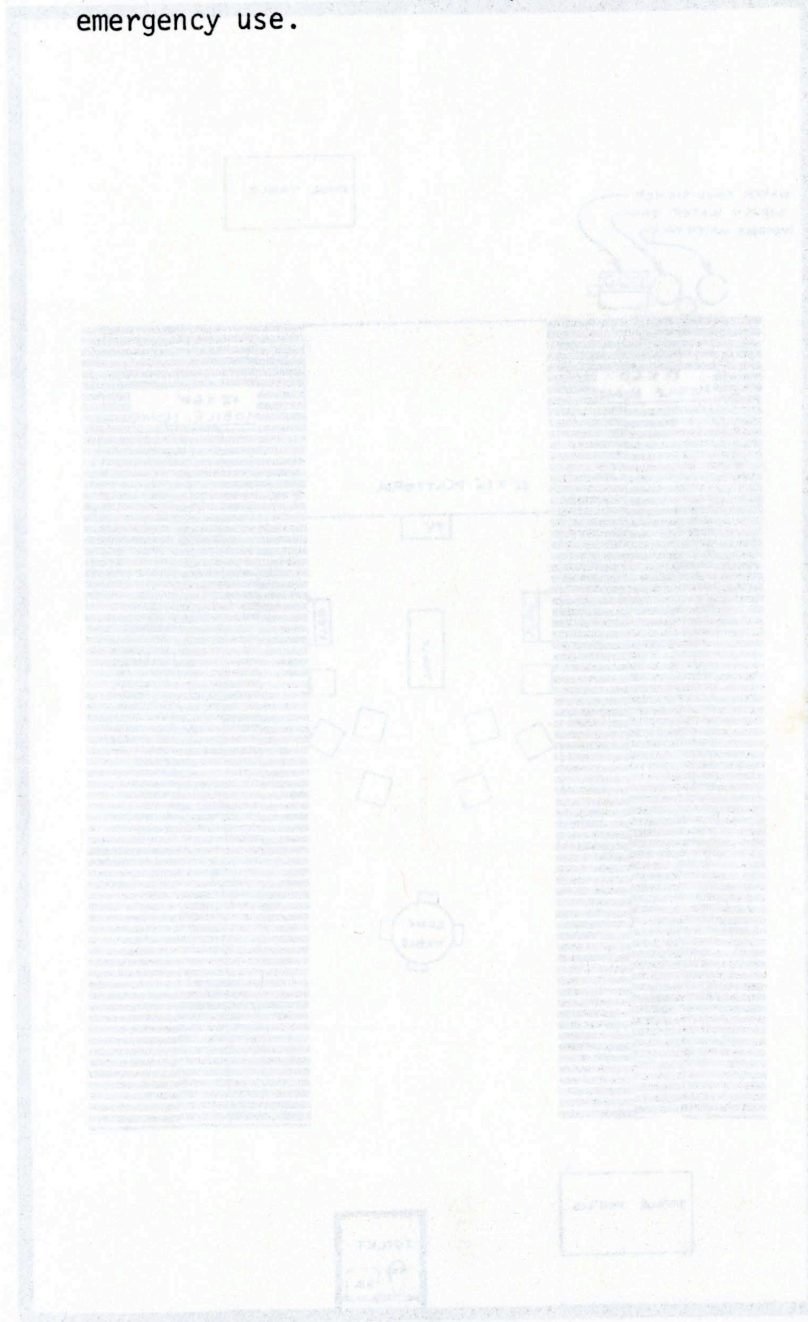
The stairwell leading from the Crew Quarters to the outside will open on the third and fourth floors. The doors on other floors will be locked but provided with crash bars for emergency use.



JSC Crew Quarters
Bldg. 228
FLOOR PLAN



- b. Elevator #4 in the MSOB that leads to the Crew Quarters will be programmed not to stop on the third floor when the crew is occupying the Suit Rooms.
- c. The stairwell leading from the Crew Quarters to the outside will open on the third and fourth floors. The doors on other floors will be locked, but provided with crash bars for emergency use.



C-4.0 SECURITY OPERATIONS

C-4.1 Johnson Space Center

a. General

1. These procedures and supporting efforts are based on the assumption that the movements of the prime and backup crews during the 21 day isolation period will be limited to Bldg. 5, Bldg. 228, the SMLS, the astronaut gym, and the flight line at Ellington Air Force Base. The same assumption applies to the movements of the flight crew during the 7 day post-mission isolation period. Movements to other locations, if any, requiring security support will be handled on an individual request basis.
2. A badge system which will identify primary contacts will be established and enforced by the Security Office. Personnel who require entry into isolation areas, during activity periods and 2 hours prior to each activity period, and are not primary contacts, will be cleared by designated personnel and while in the area will be required to wear biorespirators, which filter exhaled air.
3. Reserved parking spaces for each crewmember will be established and rigidly enforced at each of the facilities visited by the flight crews.
4. Public visitors to the Center will not be authorized to enter isolation areas.
5. Security guard functions will be performed outside the isolation facilities and, except for emergency conditions that might arise, the guards will not enter the facilities. When required to enter, the guards will comply with the requirements for special breathing equipment.

b. Building 5

1. With the exception of the west door, all exterior doors to Bldg. 5 will be locked during the 21 day isolation period preceding the flight and the 7 day period of isolation following the flight. The west door will be manned by a security guard 12 hours a day, five days a week. All other doors will be available for emergency exits.

2. Between the hours of 6 a.m. and 6 p.m., Monday through Friday, and at other times when crew activity is planned in the building, access to the building will be limited to personnel who are identified as primary contacts.
 3. Between the hours of 6 p.m. and 6 a.m., Monday through Friday and 24 hours a day on weekends, unless crew activity is planned in the building, any badged personnel will be authorized to enter the building. At 6 a.m., Monday through Friday, and approximately two hours prior to other planned activity periods, the security guards will determine if there are personnel in the building who are not primary contacts. The public address system will be used to inform all personnel who are not primary contacts that they must leave the building and within a reasonable period of time, a security guard will check the building and escort non-primary contacts to the main entry point. They will be required to depart the building or obtain special entry authorization and don the special breathing equipment.
 4. In the event it becomes necessary to open other doors to the building in order to accommodate special deliveries, a second security guard will open the door and stand by to enforce building access procedures.
 5. Building keys to the northeast pedestrian door will be issued to each of the prime and backup crews in order that they may have free and continuous access.
 6. In the event of fire or other emergencies requiring building evacuation during the training period, the flight crewmembers will proceed by the nearest available exit to Bldg. 228.
- c. Building 228 (see page 19)
1. Bldg. 228 will be established as living quarters for the prime and backup crewmembers during the 21 day isolation period and the 7 day postflight period. Two mobile homes will be positioned inside the building and a recreation area will be established in the center portion of the building.
 2. A cipher lock will be installed in the west pedestrian door and it will be used for personnel access. All other doors will remain locked at all times, except as may be required for emergency exit.

3. A security patrol will visit the area frequently to assure that unauthorized personnel are not present in the vicinity of the building.

- d. Ellington AFB Flight Line

Crewmembers will be assured that only primary contacts will have access to aircraft on the flight line at EAFB. Flight plans will be filed by telephone prior to departing the isolation facility.

- e. Skylab Mobile Laboratories (SMLS)

Access to this area during pre-and post-mission periods will be limited to crewmembers and primary contacts. The area will be barricaded and signs posted to indicate that this area is off limits to all personnel except crewmembers and primary contacts. Locking and unlocking of the laboratories will be the responsibility of the supervisor and the occupants will control access to their work areas. The laboratories will be locked at all times and frequent after hour checks will be made by the guard force to assure that each unit is secured. In the event a security guard finds a unit unlocked, the person responsible for the area will be notified and the security guard will stand by until his arrival. It is not anticipated personnel other than primary contacts will have a need to enter this facility. In the event of an emergency requiring entry by other personnel, bio-respirators will be required.

- f. Transportation

Crewmembers will use their personal vehicles for transportation between isolation facilities.

- g. Crew Residence at Home During Postmission Period

If the flight crews choose to reside at home after they return to JSC following recovery, and this option is medically approved, a security guard will maintain surveillance of each residence while occupied by the crewman and escort the crewman to and from JSC in separate cars. The purpose of this surveillance is to keep non-primary contacts from entering the residence while occupied by the crewman.

C-4.2 Kennedy Space Center

- a. General

1. The primary contact badges issued at JSC will be utilized for access to controlled areas at KSC. KSC Security will be notified of those primary contacts who have become ill and must be disqualified from crew contact.

2. Security guards at all gates will collect Health Surveillance Forms from class A primary contacts daily from F-30 to launch. The Security Office will call the Medical Surveillance Office (713-483-6151) daily to report the content of the forms received.

b. MSOB

1. Access to the crew offices and quarters will be controlled by keys issued only to primary contacts badged for that area. When crewmembers require access to the suit rooms or bonded storage area, the third floor stairwell will be controlled. KSC Security will clear the area of all except primary contacts at least one hour prior to crew entrance, and a patrolman will be at both posts. The elevator will be locked out until the crew returns to the office area.
2. The door leading out of Room 3266 to the third floor hallway will be locked at all times. Crew Quarters key controls access.
3. Crewmembers will be permitted to play handball in the MSOB court after working hours. Access to the court will be controlled by Crew Quarters keys. The Director of Flight Crew Operations will insure that no secondary contacts will contact crewmembers while going to, or returning from, the court. No secondary contacts will be permitted access to the handball court.

c. Pad A and B

For any unsuited activity at Complex 39, Pad A and B, by flight or backup crewmembers, bio-respirators will be worn at all times with no special security controls required.

d. Flight Line - Patrick Air Force Base

The area at Patrick Air Force Base where crewmembers' aircraft are parked will be cleared of all but primary contacts prior to the arrival of crewmembers. Crewmembers will travel to and from PAFB in their personal vehicles and a controlled parking area has been established for their use.

C-5.0 PROCEDURES FOR PRIMARY CONTACTS WHO ARE CARRIERS OF PATHOGENIC BACTERIA

C-5.1 The following procedures are to be used as guidelines by the physicians implementing the Skylab Flight Crew Health Stabilization Program to qualify or disqualify the primary contacts. The guidelines apply to all primary contact personnel:

- a. Throat cultures which are positive for the following bacteria are included in the scope of these guidelines. Clinical illnesses are to be given individual consideration by the examining physician and are out of the scope of these guidelines.

The included bacteria are:

1. Streptococcus, Beta Hemolytic, Group A
2. Staphylococcus aureus, Phage types:

(a) 80/81

(b) 52A/79

(c) 52/52A/80/81

(d) 83A

(e) 6/7/47/54

(f) 7/77

(g) 7/47/53/51/177

(h) 54

C-5.2 Treatment Procedures and Primary Contact Status

Positive throat culture evidence of the absence of the stated bacteria is a requirement for a primary contact. Treatment of the carrier state with the appropriate antibiotic is sometimes the most effective and the fastest way to clear these pathogenic bacteria from the nose or throat. If treatment is recommended by the Chief, Health Maintenance Branch, utilizing these guidelines, it is voluntary. The alternatives are to obtain a waiver or to be withdrawn from the primary contact list.

- a. Procedures for carriers of Streptococcus, Beta Hemolytic, Group A:

1. An appropriate antibiotic will be administered for a period of 10 days.

2. A reculture of the throat will be obtained 48 hours after the initiation of antibiotic therapy (if rapid qualification is required).
 3. A negative culture report from 2. above will allow the patient to be instated as a primary contact for 10 days (terminated automatically in the absence of further reports).
 4. A positive culture from 2. above will require further therapy as individualized by the treating physician.
 5. A negative culture 48 hours after the last antibiotic dose of a waiver is mandatory to instatement as a primary contact.
- b. Procedures for carriers of Staphylococcus aureus (of the Phage Types specified).
1. An appropriate antibiotic will be administered for a period of 4 days.
 2. A reculture of the throat will be obtained 48 hours after cessation of antibiotic therapy.
 3. A negative culture from 2. above will allow instatement of primary contact status and terminate follow-up.
 4. A positive culture from 2. above will require further therapy as individualized by the treating physician.
 5. A negative culture 48 hours after the last antibiotic dose of a waiver is mandatory to instatement as a primary contact.
- c. Procedures for carriers of Salmonella and Shigella
1. With detection of these bacteria, the Primary Contact will be contacted and verification made that his is asymptomatic.
 2. If symptomatic, primary contact status will be withheld until free of symptoms or culture clears.
 3. If asymptomatic, the primary contact will be instructed regarding the spread of these potentially pathogenic organisms. If his contact with the flight crew does not constitute a potentially serious risk of communicating the organism of concern, waiver may be granted. The physician may elect to treat the patient with antibiotic therapy (example, S. typhosa).

4. Primary contacts residing or working in the Crew Quarters may be treated with antibiotics or removed from the Crew Quarters, depending on the judgment of the Flight Surgeon.

C-5.3 Administrative Procedures

- a. The Occupational Medicine Clinics at JSC and KSC will treat the primary contacts for the carrier state if deemed necessary. Primary contact dependents will be referred to the families' physician with the primary contact's laboratory information when requested by the primary contact or when recommended by the examining physician.
- b. Waivers under special circumstances may be given by the Chief, Health Maintenance Branch .
- c. Upper respiratory tract pathogenic bacteria carriers who have no physical contact with the crews may wear biorespirators modified to filter exhaled air if deemed necessary by the Chief, Health Maintenance Branch .