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Results of the ESP Scheduling Effort for the Skylab 1/2 Experiments and Operations

MSC/TRW Task AA-27

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INTRODUCTION

The Experiment and Operations (EXOP) Scheduling Procedure (ESP) Program is a man-machine interactive event scheduling system programmed and running on the Univac 1107. A Sanders Model 720 Communicator provides the desired man-machine interface.

In order to evaluate ESP in a "real world" environment, an effort was initiated to define and schedule those EXOP's planned for operation on the Skylab 1/2 mission. The purpose of this report is to outline the development of the Skylab crew activities schedule and to present the results of the ESP evaluation effort based on this schedule development.

DISCUSSION

This report represents part of the total effort being made to thoroughly evaluate the ESP program. The approach used for this study was to define and schedule experiments and operations for the Skylab 1/2 mission (SL 1/2) and evaluate the results. The ESP-produced schedule of crew activities for Skylab 1/2 is presented and discussed, and the associated procedures that were necessary to achieve this schedule are outlined. The present capabilities

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of the ESP program are then evaluated in light of the development of this realistic schedule.

Development of Schedule

The initial, and most laborious, step in the development of this experiment and operations schedule was to compile the most up-to-date Skylab experiment data available and condense it for use in ESP. Detailed authoritative information concerning the individual experiment requirements were found in the respective Experiment Requirements Documents (ERD) for the medical, corollary, and Apollo Telescope Mount (ATM) experiments. Operational requirements are summarized in the Mission Requirements Document (MRD) (Reference 2). Additional planning requirements were found in Sections 3, 4, and 9 of the Baseline Reference Mission (BRM) (Reference 3). Experiments and operations assigned to the Skylab 2 mission that were considered in this study are listed in Table I and are described in detail in Appendix A. The experiment data has been condensed to include only that information necessary to define an operation for scheduling, i.e., the experiment objectives, operational procedures, planning limitations and/or major constraints, performance (crew and time) requirements, and pointing and control requirements. With each experiment description is a summary print from ESP of how each experiment or operation (EXOP) was eventually defined for the scheduler via input cards. It should be noted that, since numerous experiment operational and performance requirements are still TBD (to be determined), the EXOP data used to define operations for this schedule may not reflect the latest Skylab requirements.

Before the ESP scheduler can process all the defined experiments, a trajectory opportunity tape must be built which contains those times for which there exist non-occulted lines of sight between the spacecraft and the sun, moon, a given star, or a landmark. These opportunities are produced by propagating a vehicle's state forward in time and considering the relative positions of the vehicle and the celestial body or landmark in question.

The rise/set times contained on this tape constitute time intervals during which activities of photographic, scientific, and ATM experiments having particular trajectory constraints may be performed. The trajectory tape built for this study was generated from the following Skylab state vector:

- Base GMT time (midnight prior to launch) 15 March 1972
- Time of liftoff (referenced to base GMT) 20 hr
- Time of state vector (referenced to base GMT) 40 hr 40 min

a = 22353621.8 ft (semi-major axis) g = 0.0 deg (argument of perigee)
e = 0.00 (eccentricity) h = 1.7 deg (longitude of ascending node)
i = 50.0 deg (inclination) l = 0.0 deg (mean anomaly)

Rise/set times were generated for a total of seven landmarks, one star (α Arietis), and the sun and moon. Those landmarks selected included possible landmass targets for earth resources photography, and high latitude sites and the South Atlantic Anomaly for radiation measurements required in certain scientific experiments. The large number of rise/set times associated with these 10 targets prohibits the inclusion of the trajectory generation printout in this document; information on the contents of this tape can be obtained from the author.

Via card input, the astronaut, attitude, and equipment baselines are specified for the 29-day Skylab mission; also, the initial supply of non-replenishable resources is defined. The EXOP definitions (on cards) and the trajectory opportunities (on tape) complete the input necessary to initialize the scheduler. The following ESP program capabilities were then utilized to build a crew activities schedule which ostensibly satisfied all operational constraints:

- automatic scheduling
- deleting and scheduling
- deleting and rescheduling
- modifying and rescheduling

A first attempt at the schedule was accomplished by selecting and automatically scheduling all experiments defined in the system. For those experiments that did not schedule initially, the cause of failure had to be determined by executing certain route options on the scope (Reference 4) or by studying the offline failure print at the end of the session. If the definition of the EXOP was inaccurate (keypunch error, unrealistic temporal constraints, etc.), the EXOP was modified on-line and rescheduled. If an EXOP was initially constrained to occur at a certain time, but the crew or equipment was now unavailable, the time constraint could either be relaxed and the EXOP rescheduled, or the experiment already on the timeline could be deleted (in part or entirely) and both EXOP's rescheduled. The schedule was expanded as more experiments were defined and selected for scheduling. If in the last experiments to be defined, situations arose where specified times of the mission were needed but were already committed, experiments already scheduled for that time were deleted before attempting to schedule the new EXOP. As the timelines became full, the deleting, modifying and rescheduling capabilities of the program were used more extensively to fit all required crew activities into the schedule.

Figure 1 presents the crew activities schedule for the 29-day Skylab 1/2 mission as developed by ESP. It is to be emphasized that this schedule does not represent a proposed flight plan for the Skylab mission. It is acceptable only to the extent of the accuracy of the experiment data and the program user's knowledge of operational procedures. The ESP schedule presented in Figure 1 establishes a typical crew day, defining the duration of the day, sleep periods, eat periods, experiment periods and systems and housekeeping activities. Some of the criteria used to establish the typical crew day are listed below:

- Simultaneous sleep periods of 8 hours duration
- Simultaneous eat periods of 1 hour duration, 3 per crewmen per day; additional time is allocated to each eat period for medical experimentation.

- Systems housekeeping of 4½ man-hours per day was assumed adequate for workshop-related functions.
- Personal housekeeping of 1½ hours per crewman per day was assumed adequate for crew hygienic-related functions.
- Conducting experiments as required.

Crew duty cycles were based on a 24-hour day. It should be noted that the typical crew day was not followed for the days of launch and recovery (Days 1 and 29, respectively).

Table II presents a summary of crew utilization for the Skylab 1/2 activities schedule depicted in Figure 1. Information includes both the total mission time and the man-hours necessary for the performance of all the medical, corollary, and ATM experiments. Included also is the total uncommitted time (greater than 0.5 hour) and total unusable time (less than 0.5 hour) on the timelines. At the conclusion of the scheduling sessions, an ESP summary baseline print of the astronaut, equipment and attitude profiles for the 29-day mission was obtained, and is presented in Appendix B. Another ESP summary print option was utilized to develop individual scheduling histories of each experiment and operation on the timelines; these histories are presented in Appendix C.

Program Evaluation

Throughout the course of development of this Skylab crew activities schedule, the capabilities of the ESP program were tested and further evaluation of the program was accomplished. Certain shortcomings of the program encountered during this scheduling effort were already known (Reference 5); modifications are presently being implemented to improve ESP capability but were not incorporated in time for use in this study.

As Figure 1 and Appendices A, B, and C illustrate, the ESP program developed a realistic crew activities schedule for the Skylab 1/2 mission.

All experiments and operations known to be assigned to this mission were defined with minimum difficulty via the ESP input scheme. ESP was able to place every defined Skylab operation on the timelines by initially using the automatic scheduling process, and then when necessary, exercising the delete, modify, and reschedule capabilities. All astronaut, trajectory, equipment and attitude requirements were successfully met for each EXOP. If a particular astronaut was not specified for an activity, the scheduler was given all three candidate timelines to explore and assigned the task to the one with the lightest work load. Activities having trajectory-related constraints were placed on the timelines within the rise/set times of the desired target. Timelines of equipment such as the ergometer, VKG vest, and movie camera were maintained to prevent two different experiments requiring the same equipment from scheduling simultaneously even though the astronaut requirements were met.

When the automatic scheduling capability was exercised on the initial group of experiments chosen for the scheduler, 16 of 19 EXOP's scheduled successfully. Computer scheduling time has decreased to less than a minute per EXOP on the average; presently, effort is under way to shorten this even further. The man-machine interface via the scope aided the development of the schedule by offering on-line modifying, deleting, and rescheduling capability. Once the experiments were completely defined for ESP, only a few scheduling sessions at the scope were necessary to achieve the presented schedule. The most time-consuming operation in the schedule development was the initial compilation and reduction of experiment data; to one already familiar with the operational and performance requirements of these experiments, this task is very much simplified.

The ESP scheduler successfully imposed all defined operational constraints when placing the EXOP's on the timelines. These constraints included scheduling EXOP's away from meal periods, heavy exercise and other EXOP's, and scheduling within the rise/set times of celestial and earth landmark targets when required. M092 and M093, for example, are both medical experiments which require that they not be scheduled prior to three hours after a meal.

M093 is further constrained in that it can be performed no sooner than ½ hour after any severe exercise and/or experiments M092 and M131. Similarly, a minimum of two hours must elapse after M093 or heavy exercise before M171 may be scheduled. Trajectory constraints were varied. D008 requires operation during a minimum of two passes through the South Atlantic Anomaly and during a minimum of two passes outside the Anomaly at the highest north latitude reached by the spacecraft. S190 requires photography of prescribed land masses with the sun elevation angle greater than 30 and 20 degrees in the summer and winter hemispheres, respectively. To satisfy this constraint, the landmark local time option was used when searching for acceptable rise/set times on the trajectory tape. For S020, solar photography must be performed between 5 minutes after OA sunrise and 5 minutes before OA sunset. Finally, the stellar astronomy operations of S019 require performance during dark side passes only. It should be noted that these and all other operational constraints imposed on the Skylab experiments are summarized in the detailed EXOP descriptions of Appendix A.

Although the current prototype version of ESP is capable of developing a realistic crew activities schedule, additional modifications are suggested which might aid in the definition and scheduling of experiments and operations. The on-line failure table, which displays the names of all experiments that fail to schedule, presently has insufficient information for the user to discern the cause of the scheduling failure. The off-line failure print (Reference 6) that has been incorporated into the scheduling route was invaluable in the development of the Skylab crew activities schedule. This print should be used as an evaluation tool to determine the type of on-line failure print needed in an interactive scheduling system. Because of the core limitation existent with the current prototype system, the total number of different timelines (astronaut, trajectory, equipment, and attitude) that can be loaded into the scheduler for any one EXOP definition is limited to seven. This problem would automatically be alleviated if the ESP program were to be made operable on a larger system. The capability to reschedule a previously-deleted part of an EXOP (i.e., one activity or activity group) is needed during any schedule development. Presently, if

it is desired to delete part of an EXOP to make room for a more important operation, the entire EXOP must be deleted and rescheduled after the new experiment is scheduled in order to place the entire EXOP back on the timelines. It should be noted that, in most instances, all activities prior to the segment of the timeline being reorganized will reschedule in the same interval in which they were previously scheduled if no other experiments are selected for scheduling at that time. During the process of EXOP definition, another program deficiency was noted. An EXOP definition is comprised of activities (time dependent entities) and activity groups (time independent groupings of activities) as discussed in Reference 5. Problems in EXOP definition arose where an experiment required set up, performance, and stow (time dependent) operations, with the performance requirements of the experiment comprised of time-independent events. For example, the performance of S190, Multispectral Photography, requires pictures of prescribed land mass targets which need not be taken in a specified order. This scheduling capability could be added by modifying the logic to include an option specifying whether or not an activity is time dependent or independent of the other activities in the activity group.

ESP presently has a precursor option which instructs the scheduler to schedule the start time of the first repetition of an EXOP after the time of the last repetition of a precursor EXOP in mission time. It was found to be desirable to have an EXOP-dependency option which would prohibit any part of a particular EXOP from being scheduled within a given time after any operation of another specified EXOP. This constraint was satisfied in this study by extending the use of a major piece of equipment common to both EXOP's for the length of time required between the two EXOP's. It was also found that these constraints could be satisfied by selecting the order in which specific EXOP's were called to the scheduler. Another option presently available to the user is the ability to designate whether an activity is required during, before, or after a specified baseline operation (e.g., eat, sleep), and the minimum and maximum time before or after the operation which scheduling can occur. If an EXOP is scheduled <u>during</u> one of these operations, the capability to specify the minimum and

and maximum times from the start of the operation is desirable also. Finally, the capability of ESP can be extended by including additional options at the activity definition level. Variable length activities would aid in the scheduling of certain operations which might be required to fill all uncommitted time for a particular segment of the astronaut timeline. An input reflecting the maximum, as well as minimum, time between activities within a group is also recommended. This constraint would simplify the preventing of set up operations from being scheduled much earlier in the mission than the actual performance of the experiment.

SUMMARY

Presently, the prototype ESP Scheduling System is operative on the UNIVAC 1107 at MSC. Under this study the program has been shown capable of generating a realistic Skylab 1/2 crew activities schedule which satisfies all known operational constraints. The enclosed schedule does not represent a proposed flight plan for the Skylab mission. It is acceptable only to the extent of the accuracy of the experiment data supplied to the scheduler and the program user's knowledge of operational procedures.

The present capabilities of the ESP program were evaluated in light of the development of the Skylab crew activities schedule. All known Skylab experiments and operations were successfully defined and scheduled by ESP with minimal difficulty. During the development process, certain program limitations were uncovered which somewhat hampered experiment definition and scheduling. These deficiencies, including insufficient on-line information for the user to discern the cause of scheduling failure, lack of desirable temporal constraints at the activity level in EXOP definition, and the inability to reschedule parts of an EXOP that have been previously deleted, are important enough to warrant further attention before the scheduling algorithm is finalized.

TABLE I. SKYLAB EXPERIMENTS AND OPERATIONS

NUMBER		NAME
ATM		Apollo Telescope Mount
D008		Radiation in Spacecraft
D021		Expandable Airlock Technology
D024		Thermal Control Coatings
M092		In-flight Lower Body Negative Pressure
M093		Vectorcardiogram
M131	Mode A Mode B	Human Vestibular Function
M071	M17134	Mineral Balance
M073	M17134	Bio-assay of Body Fluids
M074	M17134	Specimen Mass Measurement
M151		Time and Motion Study
M171	Mode A Mode B Mode C	Metabolic Activity
M172		Body Mass Measurement
M487		Habitability/Crew Quarters
M507		Gravity Substitute Workbench
M508		Astronaut EVA Hardware Evaluation
M509		Astronaut Maneuvering Equipment
S009		Nuclear Emulsion
S015		Zero-G Single Human Cells
S019		UV Stellar Astronomy
S020		UV/X-RAY Solar Photography
S149		Particle Collection
S190		Multispectral Photographic Facility
T003		In-flight Aerosol Analysis
T020		Foot Controlled Maneuvering Unit
T027		ATM Contamination Measurement
CDS		Cluster Deactivation Storage
RR/PHK		Rest, Relaxation/Personal Housekeeping
SHK		Systems Housekeeping

TABLE II. SKYLAB CREW UTILIZATION SUMMARY

	Mission Time (Hours:Minutes)	Man-Hours (Hours:Minutes)
Total Medical Experiment Time[1]	136:00	207:00
1 Man	65:00	
2 Men	71:00	
Total ATM Time (Daylight/Darkness)[2]	149:30	189:45
1 Man	109:15	
2 Men	40:15	
Total Corollary Experiment Time [3]	108:15	190:45
1 Man	68:30	
2 Men	39:45	
3 Men	14:15	
Total Unscheduled Time (>0.5 hr)	84:45	136:30
1 Man	48:00	
2 Men	36:45	
3 Men	05:00	
Total Unusable Time (<0.5 hr)	28:00	28:00

(1) Does not include unscheduled sample collections (e.g., urine, feces); estimated time for such operations is 5 minutes per crew member six times a day, or a total of approximately 35 additional hours for the one-man experiment time.

(2) The minimum time period for one-man ATM experiment operations that was placed on the crew activities schedule was 1 hour, 45 minutes; the total one-man ATM time could be substantially increased if the minimum 90-minute operation period was considered. This would also reduce the total unscheduled (or uncommitted) time in the schedule.

(3) Corollary experiments consist of all those experiments not categorized as either medical or ATM.

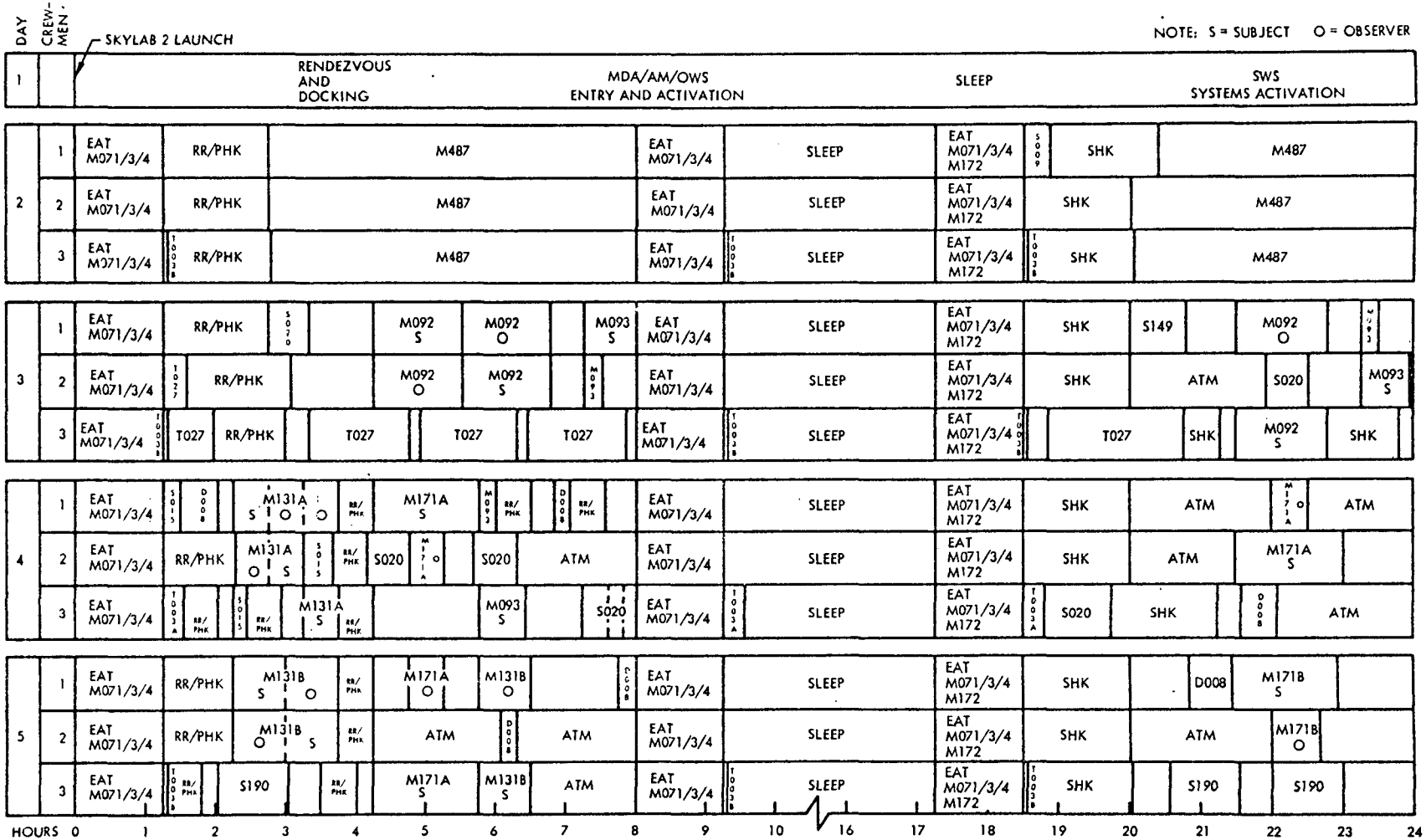

Figure 1. ESP Crew Activities Schedule for the Skylab 1/2 Mission

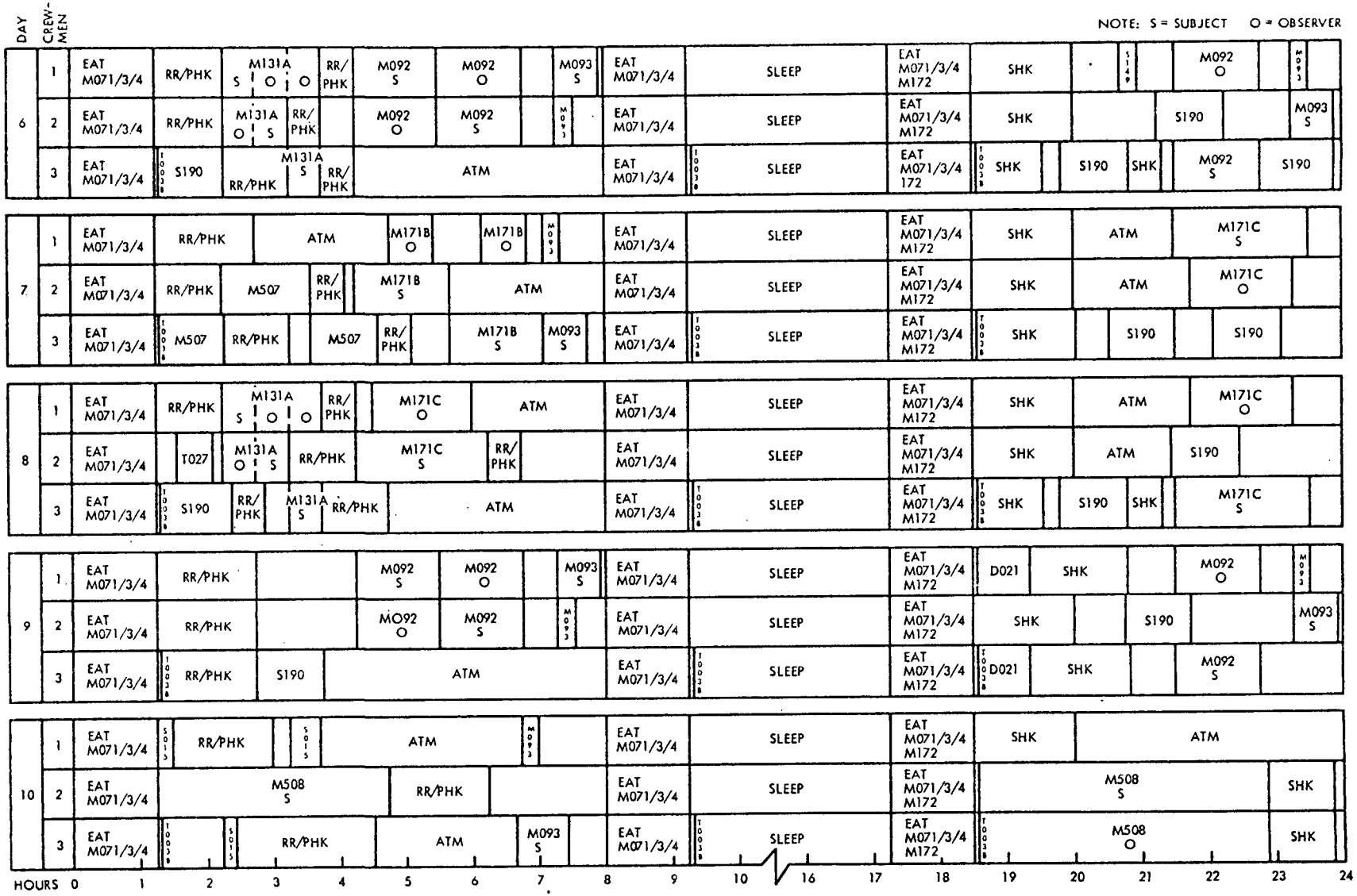

Figure 1. ESP Crew Activities Schedule for the Skylab 1/2 Mission, Continued

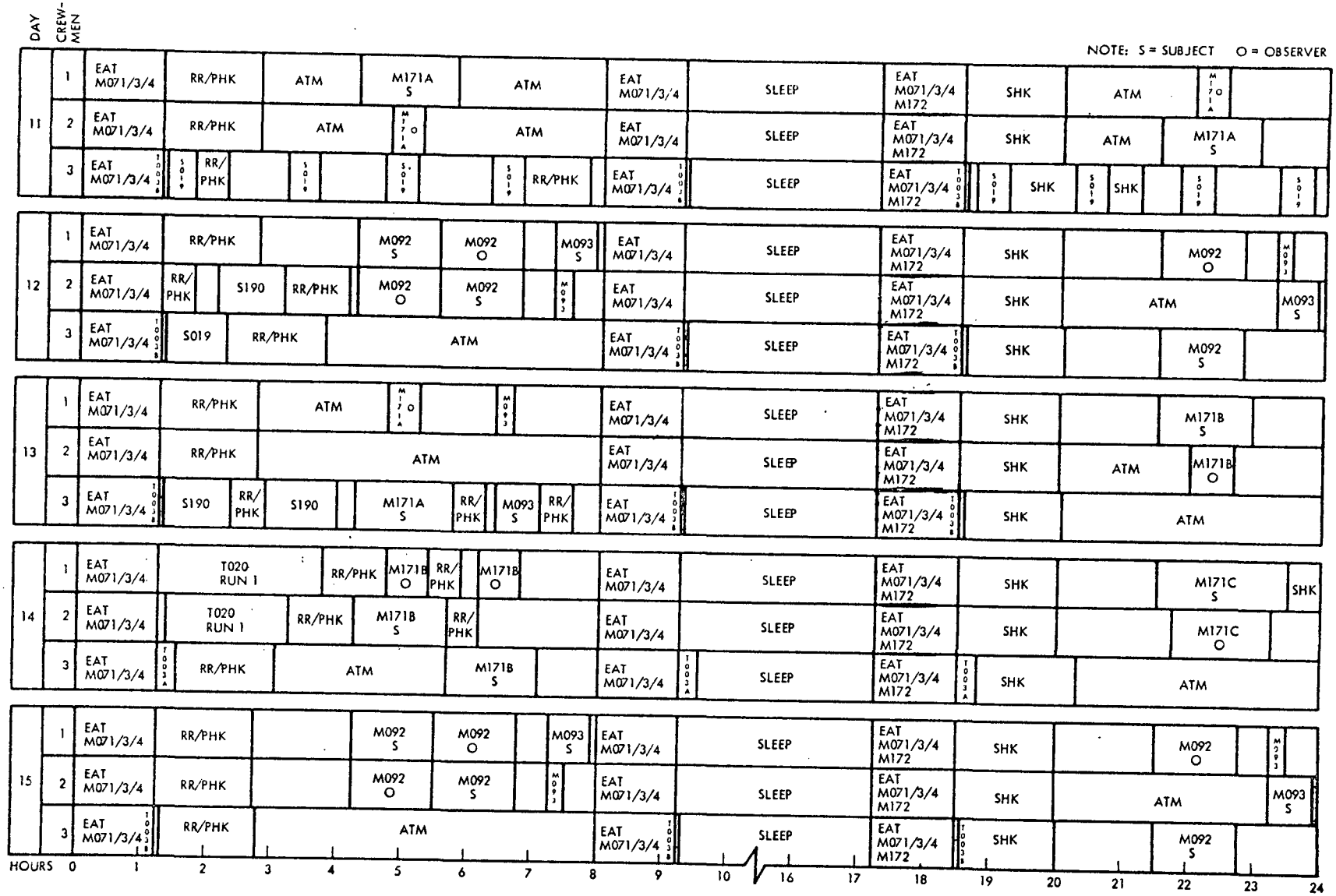

Figure 1. ESP Crew Activities Schedule for the Skylab 1/2 Mission, Continued

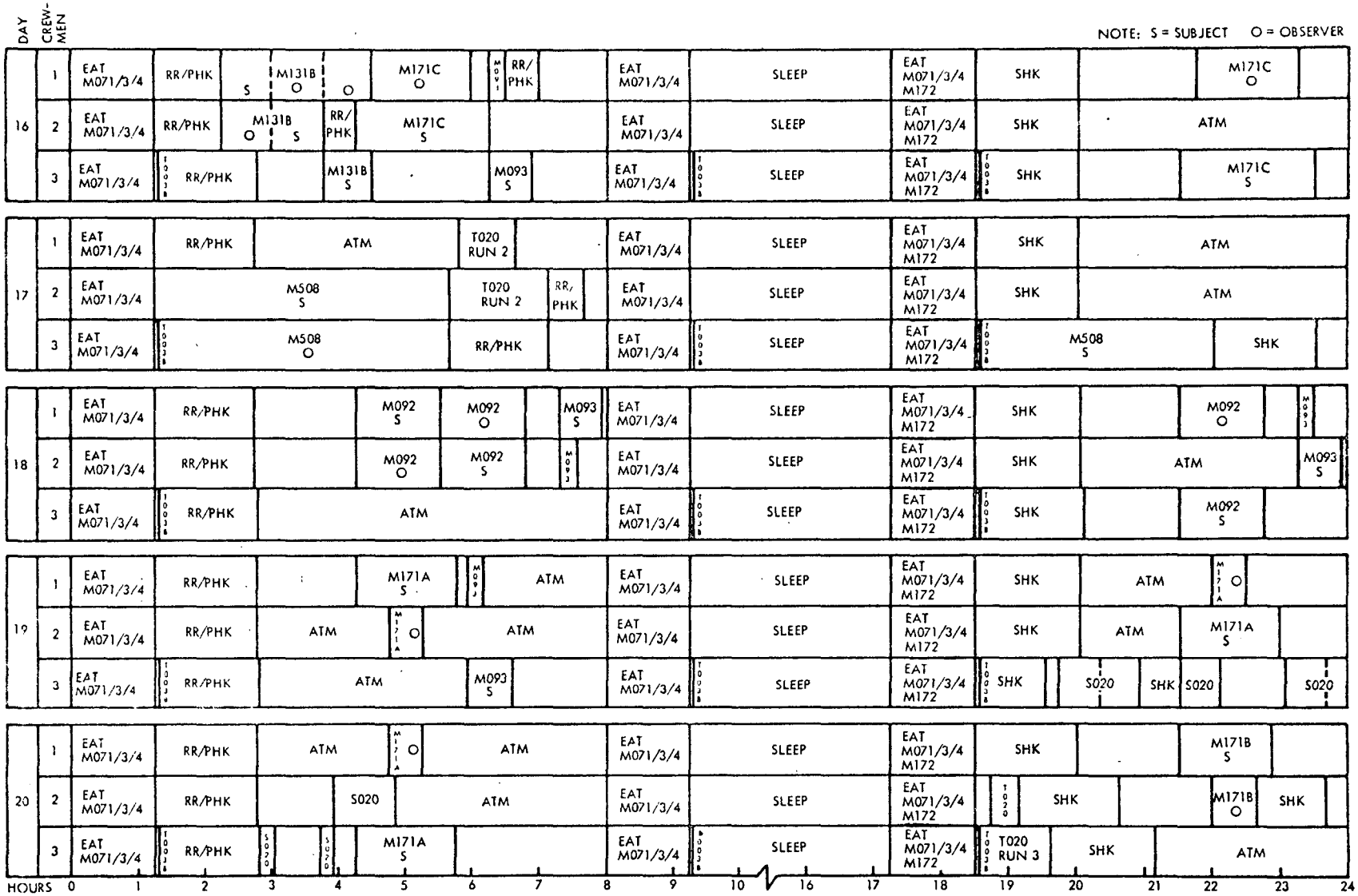

Figure 1. ESP Crew Activities Schedule for the Skylab 1/2 Mission, Continued

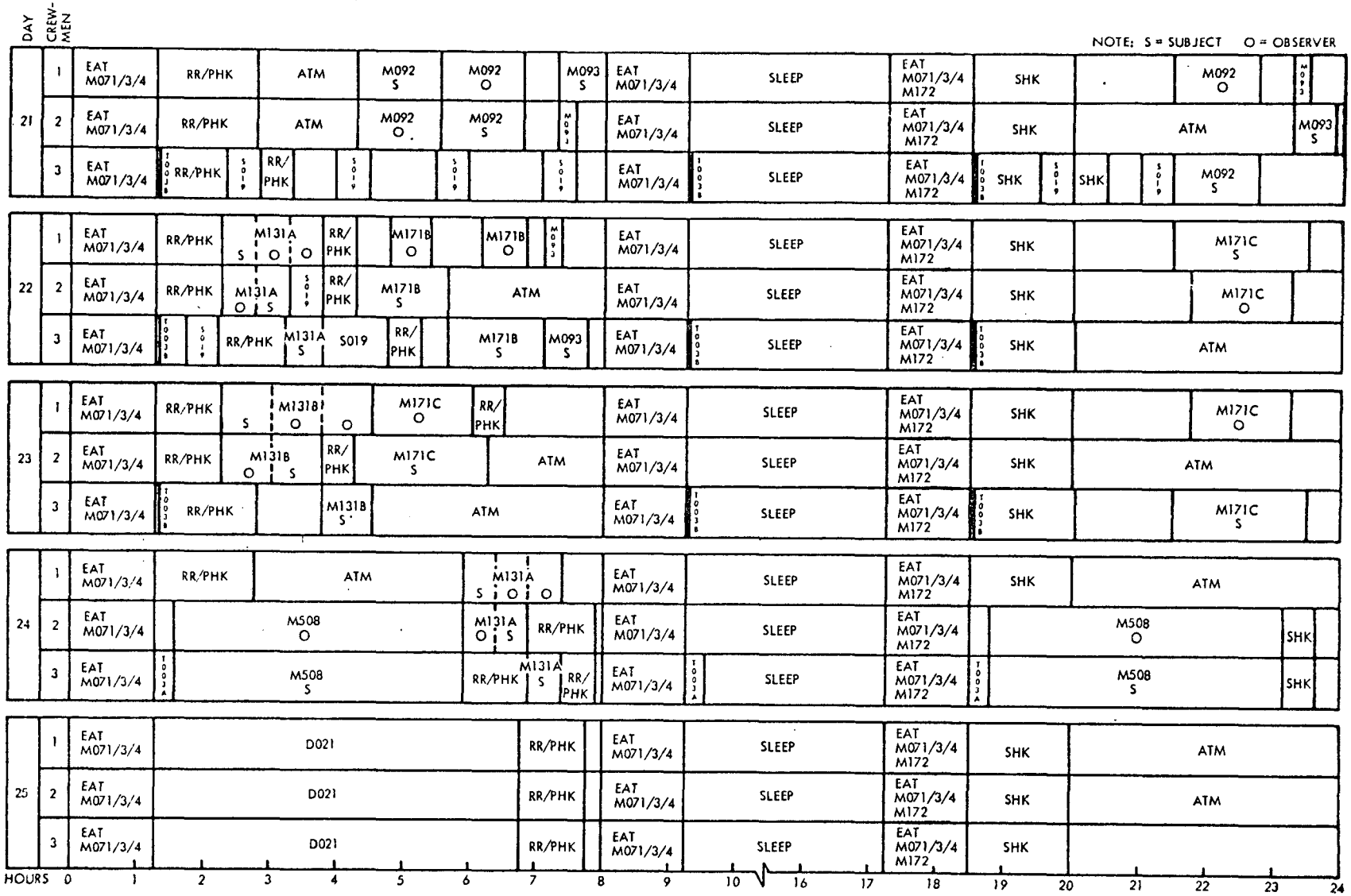

Figure 1. ESP Crew Activities Schedule for the Skylab 1/2 Mission, Continued

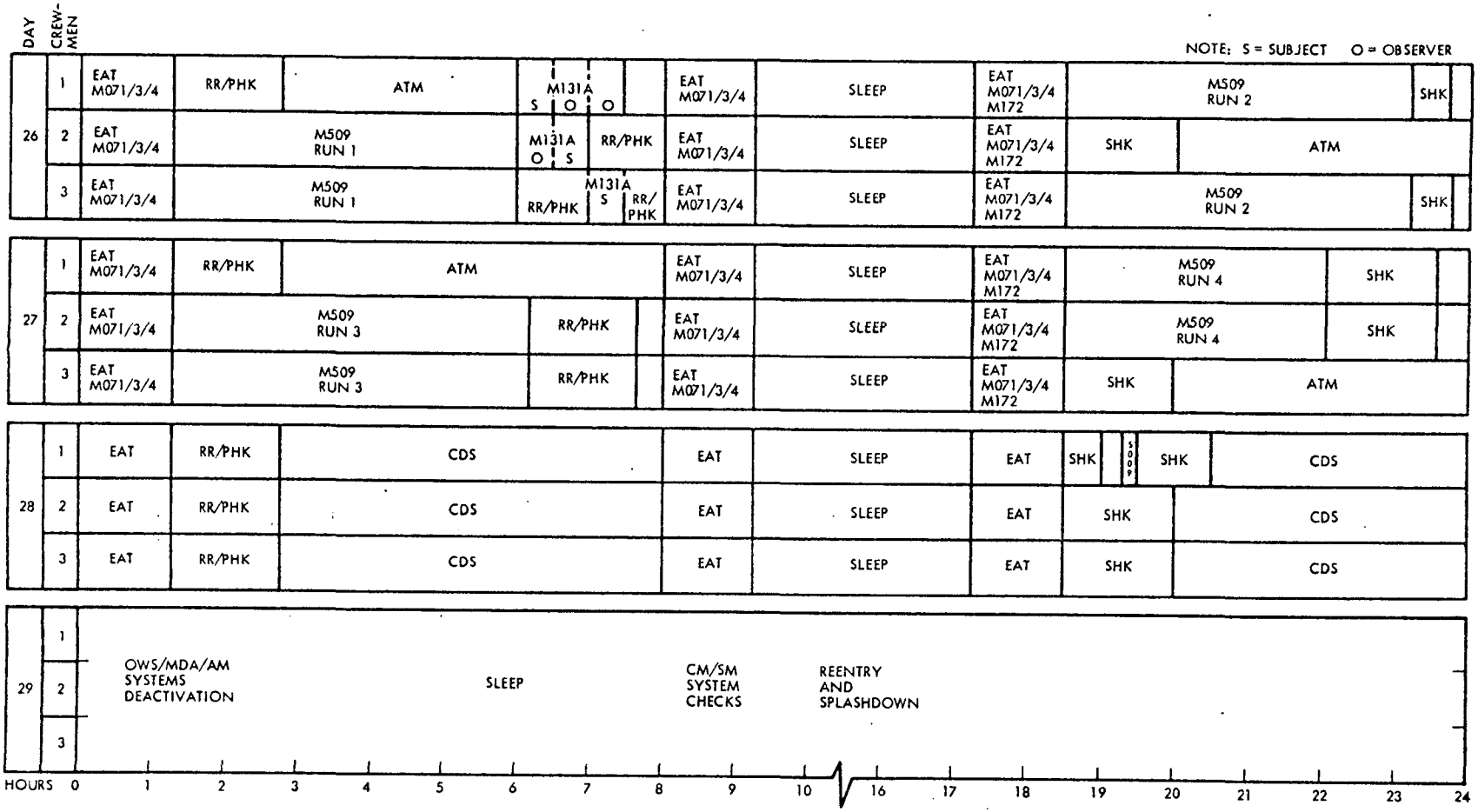

Figure 1. ESP Crew Activities Schedule for the Skylab 1/2 Mission, Continued

A P P E N D I X A

SKYLAB EXPERIMENT AND OPERATIONS DATA

The Skylab experiment and operations data contained herein were compiled from the Mission Requirements Document (Reference 2), the Baseline Reference Mission (Reference 3), and the associated Experiment Requirements Documents. These data have been condensed to include only that information pertinent to the defining of an operation for scheduling. Information includes the experiment objectives, operational procedures, planning limitations and/or major constraints, performance (crew and time) requirements, and pointing and control requirements. Following each experiment or operation description, a corresponding detailed EXOP definition display illustrates how this EXOP was defined for input into ESP. The detailed descriptions of the EXOP's are in ESP nomenclature; the ESP User's Manual (Reference 4) contains a complete list of the EXOP data variables and their definitions. Because of the nature of the study no attempt will be made to justify or explain the activity breakdown for each of the Skylab EXOP's. Strengths and weaknesses of the input procedure have been pointed out in the discussion of this scheduling effort. Any questions regarding the activity composition of a particular EXOP should be directed to the author.

The experiments in this appendix are listed in alphabetical order by experiment number (e.g., D008, M509, T020; see Table I of the report for the complete listing). The six experiments associated with ATM operation were combined as one EXOP and presented first. Three Skylab operational tasks (personal and systems housekeeping, and cluster deactivation) were also defined and are included as the last entries of the appendix.

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ATM EXPERIMENTATION

A. OBJECTIVE

- Collect extensive data describing solar behavior in the form of plague, sunspots, filaments, prominences, geomagnetic effects, radio flux, radio bursts, and flares.

B. OPERATIONS

- The Apollo Telescope Mount (ATM) consists of a package of six experiments mounted in a cluster in the ATM rack; each of these experiments has a number of data collection operational modes:

  S052, White Light Coronagraph - purpose is to photograph the corona from 1½ to 6 solar radii and record the intensity distribution.

  S054, X-Ray Spectrographic Telescope - purpose is to obtain X-ray images of sun in the 3 to 100 Angstrom range with specified spatial and spectral resolutions.

  S055, UV Scanning Polychrometer/Spectroheliometer - purpose is to make spectral and spatial scans of emission lines in the upper chromosphere and lower corona for telemetry.

  S056, Dual X-Ray Telescopes - purpose is to obtain high resolution X-ray spectroheliograph of solar regions and digital spectral data.

  S082A, UV Coronal Spectroheliograph - purpose is to photograph spectrally dispersed solar images in the upper chromospheric and coronal emission lines.

  S082B, UV Spectrograph - purpose is to obtain high spectral and spatial resolution spectrograms in the UV and XUV on the disc and limb of the sun.

C. PLANNING LIMITATIONS

- All experiments require daylight; however, the darkness period can be used for experiment preparation and selection of modes of operation, and the daylight period used for experimentation.
- No contamination near open aperture.

D. PERFORMANCE

- ATM is considered operable by one crewman; however, it is assumed that two crewmen would be available during periods of high solar activity (assumption is implemented by scheduling ATM experiments as a two-man operation at least 25% of the experiment time).
- Minimum time period considered for ATM experiment operations is approximately 90 minutes or one revolution.
- Total ATM time (daylight/darkness) tentatively planned to be approximately 170 hours (i.e., 115 hours sun time).

E. POINTING REQUIREMENTS

- Pointing and control requirements vary with ATM experiment being performed; however, ATM experiments and corollary experiments requiring pointing and control are assumed to be compatible and may be scheduled simultaneously.

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     DETAILED EXOP DEFINITION
ATM
PRIOTY=     11 DES    =     10 PRO    =    100 DIF    =    22
NAGXOP=  6 NXOPCM=  1 NXOPCD=  1 CODE   = 1
IBFOR1=        PRET1 =  0 IBFOR2=        PRET2 = 0
TMNTR=  3  0  0  TMXTR= 28  0  0  DTMNRC=  0  0  0

 ACTIVITY GROUP 1  NAG= 1 DTMXAG= 25  0  0
  ACTIVITY 1 ACTIVITY GROUP 1
  DTACT =  0  4  0 DTAMRC=   0  0  0 DTMNNA=  0  0  0
  NARCM = 0      NARCD = 3      ICODE = 0
  IASETS= 1      ITSETS= 0      IATT  = 0
  IRES  = 1      IFIXRS= 0      VT    = 0
   ASTRONAUT SET 1 ACTIVITY 1 ACTIVITY GROUP 1
   NASRQD=2 NCAN  =3
   ICAN  =1 2 3 * * *
   TRS   =  0  0  0  DTD   =  0  4  0
   CPO   = 0   CD = 0   SDTCD= 0
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   RESNO =  4      QUNREQ=       1.000
   TRS   =  0  0  0 DTD   =   0  4  0

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  ACTIVITY 1 ACTIVITY GROUP 2
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  IASETS= 1      ITSETS= 0      IATT  = 0
  IRES  = 1      IFIXRS= 0      VT    = 0
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   NASRQD=2 NCAN  =3
   ICAN  =1 2 3 * * *
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   CPO   = 0   CD = 0   SDTCD= 0
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   RESNO =  4      QUNREQ=       1.000
   TRS   =  0  0  0 DTD   =   0  2  0

 ACTIVITY GROUP 3  NAG= 1 DTMXAG= 25  0  0
  ACTIVITY 1 ACTIVITY GROUP 3
  DTACT =  0  4  0 DTAMRC=   0  0  0 DTMNNA=  0  0  0
  NARCM = 0      NARCD =15      ICODE = 0
  IASETS= 1      ITSETS= 0      IATT  = 0
  IRES  = 1      IFIXRS= 0      VT    = 0
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   NASRQD=1 NCAN  =3
   ICAN  =1 2 3 * * *
   TRS   =  0  0  0  DTD   =  0  4  0
   CPO   = 0   CD = 0   SDTCD= 0
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  RESNO =  4      QUNREQ=       1.000
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 ACTIVITY 1 ACTIVITY GROUP 4
 DTACT =  0  3  0 DTAMRC=   0  0  0 DTMNNA=   0  0  0
 NARCM = 0      NARCD =12      ICODE = 0
 IASETS= 1      ITSETS= 0      IATT  = 0
 IRES  = 1      IFIXRS= 0      VT    = 0
  ASTRONAUT SET 1 ACTIVITY 1 ACTIVITY GROUP 4
  NASRQD=1 NCAN  =3
  ICAN  =1 2 3 * * *
  TRS   =  0  0  0  DTD   =  0  3  0
  CPD   = 0   CD = 0   SDTCD= 0
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  RESNO =  4      QUNREQ=       1.000
  TRS   =  0  0  0 DTD   =   0  3  0

ACTIVITY GROUP 5  NAG= 1 DTMXAG= 25  0  0
 ACTIVITY 1 ACTIVITY GROUP 5
 DTACT =  0  1 30 DTAMRC=   0  0  0 DTMNNA=   0  0  0
 NARCM = 0      NARCD =12      ICODE = 0
 IASETS= 1      ITSETS= 0      IATT  = 0
 IRES  = 1      IFIXRS= 0      VT    = 0
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  ICAN  =1 2 3 * * *
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  CPD   = 0   CD = 0   SDTCD= 0
  LOCAL RESORC SET 1 ACTIVITY 1   ACTIVITY GROUP5
  RESNO =  4      QUNREQ=       1.000
  TRS   =  0  0  0 DTD   =   0  1 30

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 ACTIVITY 1 ACTIVITY GROUP 6
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 IRES  = 1      IFIXRS= 0      VT    = 0
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  NASRQD=1 NCAN  =3
  ICAN  =1 2 3 * * *
  TRS   =  0  0  0  DTD   =  0  1 45
  CPD   = 0   CD = 0   SDTCD= 0
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RADIATION IN SPACECRAFT (D008)

A. OBJECTIVE

- To obtain dose, depth dose, and linear energy transfer data for test of theoretical radiation effects transport codes.
- To test advanced active and passive dosimetry systems for future aerospace vehicles.

B. OPERATIONS

- Passive unit: measures total dosage and is removed from CM at end of mission.
- Active unit: portable sensing head placed in different locations on astronaut for radiation readings.

C. PLANNING LIMITATIONS

- Operate active unit during a minimum of two orbits in the South Atlantic Anomaly and during a minimum of two orbits outside the Anomaly at the highest latitude reach by the spacecraft (primary cosmic).
- Do not allow radiation sources in close proximity to dosimeters.

D. PERFORMANCE

Operations	Minimum No. of Performances	Duration of Performance	No. of Crewmen
• Active Dosimeter (SAA)	2	15 min	1
• Active Dosimeter (primary cosmic)	2	30 min	1

E. POINTING REQUIREMENTS

None

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```
     DETAILED EXOP DEFINITION
0008     RADIATION IN S
PRIORTY=    92 DES   =    74 PRO   =   100 DIF   =    24
NAGXOP=   2 NXOPCM=   2 NXOPCD=   3 CODE  = 1
IBFOR1=        PRET1 = -0 IBFOR2=        PRET2 = *
TMNTR=  4   0   0  TMXTR= 27   0   0  DTMNRC=   0   0   0

 ACTIVITY GROUP 1  NAG= 1 DTMXAG=   0   0 20
  ACTIVITY 1 ACTIVITY GROUP 1
  DTACT =   0   0 15 DTAMRC=    0   0   0 DTMNNA=   0   0   0
  NARCM =  1      NARCD =  1      ICODE =  0
  IASETS=  1      ITSETS=  1      IATT  =  0
  IRES  =  2      IFIXRS=  0      VT    =  0
   ASTRONAUT SET 1 ACTIVITY 1 ACTIVITY GROUP 1
   NASRQD=1 NCAN  =3
   ICAN  =1 2 3 * * *
   TRS   =  0   0   0  DTD   =  0   0 15
   CPO   = 0   CD = 0   SDTCD= 0
   TRAJECTORY SET 1 ACTIVITY 1 ACTIVITY GROUP  1
   BODY  = LANDMK BODNAM= ANOMLY ITF   = 0
   TRS   =  0   0   5     DTD   =  0   0   5
   LOCAL RESORC SET 1 ACTIVITY 1   ACTIVITY GROUP1
   RESNO =  1      QUNREQ=       1.000
   TRS   =  0   0   0 DTD   =   0   0 15
   LOCAL RESORC SET 2 ACTIVITY 1   ACTIVITY GROUP1
   RESNO =  7      QUNREQ=       2.000
   TRS   =  0   0   0 DTD   =   0   0 15

 ACTIVITY GROUP 2  NAG= 1 DTMXAG=   0   0 40
  ACTIVITY 1 ACTIVITY GROUP 2
  DTACT =   0   0 30 DTAMRC=    0   0   0 DTMNNA=   0   0   0
  NARCM =  1      NARCD =  1      ICODE =  0
  IASETS=  1      ITSETS=  1      IATT  =  0
  IRES  =  2      IFIXRS=  0      VT    =  0
   ASTRONAUT SET 1 ACTIVITY 1 ACTIVITY GROUP 2
   NASRQD=1 NCAN  =3
   ICAN  =1 2 3 * * *
   TRS   =  0   0   0  DTD   =  0   0 30
   CPO   = 0   CD = 0   SDTCD= 0
   TRAJECTORY SET 1 ACTIVITY 1 ACTIVITY GROUP  2
   BODY  = LANDMK BODNAM= GANDER ITF   = 0
   TRS   =  0   0 13     DTD   =  0   0   4
   LOCAL RESORC SET 1 ACTIVITY 1   ACTIVITY GROUP2
   RESNO =  1      QUNREQ=       1.000
   TRS   =  0   0   0 DTD   =   0   0 30
   LOCAL RESORC SET 2 ACTIVITY 1   ACTIVITY GROUP2
   RESNO =  7      QUNREQ=       2.000
   TRS   =  0   0   0 DTD   =   0   0 30
```

EXPANDABLE AIRLOCK TECHNOLOGY (D021)

A. OBJECTIVE

- Validate design of expendable, elastic recovery airlock.
- Evaluate packaging, deployment, and astronaut ingress/egress.
- Evaluate effect of space environment on material samples.

B. OPERATIONS

- Deployment, proof pressure test, and leakage test of D021 airlock.
- Crewmen ingress/egress maneuvers and material sample retrieval.

C. PLANNING LIMITATIONS

- Sunlight desired for D021 and D024 panels; D021 airlock positioning on orbital assembly may be constrained.

D. PERFORMANCE

Operation	Minimum No. of Performances	Duration of Performance	No. of Crewmen
• Deployment/pressure test	1	50 min	2
• Leakage test	1	15 days	None
• EVA and sample retrieval*	1	5hr 30min	3

E. POINTING REQUIREMENTS

None

* Including EVA preparation, donning suit, and post EVA.

```
     DETAILED EXOP DEFINITION
D021     EXPANDABLE AIR
PRIOTY=   131 DES   =     80 PRO   =   100 DIF   =    32
NAGXOP=   1 NXOPCM=  1 NXOPCD=  1 CODE  = 1
IBFOR1=        PRET1 = -0 IBFOR2=        PRET2 = *
TMNTR=  9 12   0  TMXTR= 27   0   0  DTMNRC=   0   0   0

 ACTIVITY GROUP 1  NAG= 2 DTMXAG= 19   0   0
  ACTIVITY 1 ACTIVITY GROUP 1
  DTACT =  0   0 50 DTAMRC=    0   0   0 DTMNNA= 15   0   0
  NARCM = 1       NARCD = 1       ICODE = 0
  IASETS= 1       ITSETS= 0       IATT  = 0
  IRES  = 2       IFIXRS= 0       VT    = 0
   ASTRONAUT SET 1 ACTIVITY 1 ACTIVITY GROUP 1
   NASRQD=2 NCAN  =3
   ICAN  =1 2 3 * * *
   TRS   =  0   0   0  DTD    =  0   0 50
   CPO   = 1    CD = 0    SDTCD= 0
   LOCAL RESORC SET 1 ACTIVITY 1   ACTIVITY GROUP1
   RESNO =  1       QUNREQ=      26.000
   TRS   =  0   0   0 DTD    =   0   0 50
   LOCAL RESORC SET 2 ACTIVITY 1   ACTIVITY GROUP1
   RESNO =  8       QUNREQ=       1.000
   TRS   =  0   0   0 DTD    =  19   0   0
  ACTIVITY 2 ACTIVITY GROUP 1
  DTACT =  0   5 30 DTAMRC=    0   0   0 DTMNNA=  0   0   0
  NARCM = 1       NARCD = 1       ICODE = 0
  IASETS= 1       ITSETS=-0       IATT  =-0
  IRES  = 2       IFIXRS= 2       VT    = 0
   ASTRONAUT SET 1 ACTIVITY 2 ACTIVITY GROUP 1
   NASRQD=3 NCAN  =3
   ICAN  =1 2 3 * * *
   TRS   =  0   0   0  DTD    =  0   5 30
   CPO   = 1    CD = 0    SDTCD= 0
   LOCAL RESORC SET 1 ACTIVITY 2   ACTIVITY GROUP1
   RESNO =  1       QUNREQ=      75.000
   TRS   =  0   2   0 DTD    =   0   3   0
   LOCAL RESORC SET 2 ACTIVITY 2   ACTIVITY GROUP1
   RESNO =  6       QUNREQ=       1.000
   TRS   =  0   2   0 DTD    =   0   3   0
   FIXED RESORC SET 1 ACTIVITY 2   ACTIVITY GROUP 1
   IFIXNO=  2       UNREQ =       1.000
   FIXED RESORC SET 2 ACTIVITY 2   ACTIVITY GROUP 1
   IFIXNO=  3       UNREQ =      48.000
```

THERMAL CONTROL COATINGS (D024)

A. OBJECTIVE

- Determine space environment effect on selected thermal control coatings and correlate these effects to laboratory simulated exp[redacted]

B. OPERATIONS

- Retrieve D024 sample panel from D021 airlock base asse[redacted]ing EVA.

C. PLANNING LIMITATIONS

None

D. PERFORMANCE

- Performed concurrently with D021 EVA activities.

E. POINTING REQUIREMENTS

None

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MINERAL BALANCE/BIO-ASSAY OF BODY FLUIDS (M071/M073)*

A. OBJECTIVE

- Medical evaluation of the crewmen before, during, and after the mission related to calcium and endocrine balance.

  M071: Determine the effects of space flight on the muscle and skeletal body systems by quantitative assessment of the gains or losses of pertinent biochemical constituents.

  M073: Evaluate the endocrinological adaptation resulting from extended exposure to space flight environment.

B. OPERATIONS

- Inflight: Collection of urine, feces, sweat pads, and vomitus samples which are returned for biochemical analysis.
- Pre- and postflight: Blood samples.

C. PLANNING LIMITATIONS

- Urine collection before eating after sleep.

D. PERFORMANCE

- Where possible, collections to be made three times daily per crewman during the 75-minute eat periods.

E. POINTING REQUIREMENTS

None

*Experiments M071,M073, and M074 are defined in ESP as one EXOP called M17134.

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SPECIMEN MASS MEASUREMENT (M074) *

A. OBJECTIVE

- Demonstrate feasibility of mass measurement in zero-g.
- Validate design and function of mass measurement device.
- Support biomedical experiments requiring mass measurement.

B. OPERATIONS

- Calibration of mass measurement devices.
- Designated specimen mass measurements.

C. PLANNING LIMITATIONS

- No spacecraft maneuvers except those associated with Attitude Hold.

D. PERFORMANCE

- Calibration and measurement operations are to be repeated TBD times; performance by each crewman should be three times per day during the 75-minute eat periods.

E. POINTING REQUIREMENTS

None

*Experiments M071,M073, and M074 are defined in ESP as one EXOP called M17134.

```
     DETAILED EXOP DEFINITION
M17134   MINERAL BAL/BI
PRIOTY=   203 DES   =    91 PRO   =   100 DIF   =   44
NAGXOP=   1 NXOPCM= 24 NXOPCD= 26 CODE  = 1
IBFOR1=        PRET1 = -0 IBFOR2=        PRET2 = *
TMNTR=  2  0  0  TMXTR= 28  0  0  DTMNRC=  0  5  0

 ACTIVITY GROUP 1  NAG= 2 DTMXAG=  0 20  0
  ACTIVITY 1 ACTIVITY GROUP 1
  DTACT =  0  1 15 DTAMRC=   0  6  0 DTMNNA=  0  6  0
  NARCM = 2      NARCD = 2      ICODE = 0
  IASETS= 1      ITSETS= 0      IATT  = 0
  IRES  = 2      IFIXRS= 1      VT    = 0
   ASTRONAUT SET 1 ACTIVITY 1 ACTIVITY GROUP 1
   NASRQD=3 NCAN  =3
   ICAN  =1 2 3 * * *
   TRS   =  0  0  0  DTD   =  0  1 15
   CPO   = 0   CD = 2   SDTCD= 0
   LOCAL RESORC SET 1 ACTIVITY 1   ACTIVITY GROUP1
   RESNO =  1     QUNREQ=       4.000
   TRS   =  0  0  0 DTD   =   0  1 15
   LOCAL RESORC SET 2 ACTIVITY 1   ACTIVITY GROUP1
   RESNO =  6     QUNREQ=       1.000
   TRS   =  0  0  0 DTD   =   0  0 57
   FIXED RESORC SET 1 ACTIVITY 1   ACTIVITY GROUP 1
   IFIXNO=  2     UNREQ =       1.000
  ACTIVITY 2 ACTIVITY GROUP 1
  DTACT =  0  0 57 DTAMRC=   0  0  0 DTMNNA=  0  0  0
  NARCM = 1      NARCD = 1      ICODE = 0
  IASETS= 1      ITSETS= 0      IATT  = 0
  IRES  = 2      IFIXRS= 1      VT    = 0
   ASTRONAUT SET 1 ACTIVITY 2 ACTIVITY GROUP 1
   NASRQD=3 NCAN  =3
   ICAN  =1 2 3 * * *
   TRS   =  0  0  0  DTD   =  0  0 57
   CPO   = 0   CD = 2   SDTCD= 0
   LOCAL RESORC SET 1 ACTIVITY 2   ACTIVITY GROUP1
   RESNO =  1     QUNREQ=       4.000
   TRS   =  0  0  0 DTD   =   0  0 57
   LOCAL RESORC SET 2 ACTIVITY 2   ACTIVITY GROUP1
   RESNO =  6     QUNREQ=       1.000
   TRS   =  0  0  0 DTD   =   0  0 57
   FIXED RESORC SET 1 ACTIVITY 2   ACTIVITY GROUP 1
   IFIXNO=  2     UNREQ =       1.000
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IN-FLIGHT LOWER BODY NEGATIVE PRESSURE (M092)

A. OBJECTIVE

- To detect changes in the cardiovascular system and functions during spaceflight which degrade performance and to detect when these changes occur.

B. OPERATIONS

- Subject is placed under stress by means of an LBNP device at which time specific medical data are collected by an observer and instrumentation.

C. PLANNING LIMITATIONS

- One of crew must be an astronaut physician.
- Experiment must not be scheduled prior to three hours after meals.
- Experiment shall not be conducted on a subject when unduly fatigued, after severe physical or other stress, or when subjected to high environmental temperatures.
- Each crewman must perform as subject once every three days, and must be scheduled for approximately the same time of day throughout the mission; observer is required.

D. PERFORMANCE

Operation	Minimum No. of Performances	Duration of Performance	No. of Crewmen
• LBNP experiment	5/Cm	76 min(subject)	1
		76 min(observer)	1

E. POINTING REQUIREMENTS

None

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     DETAILED EXOP DEFINITION
M092      INFLIGHT LBNP
PRIOTY=   225 DES   =    98 PRO   =   100 DIF   =   45
NAGXOP=   3 NXOPCM=   5 NXOPCD=   7 CODE   = 1
IBFOR1=        PRET1 = -0 IBFOR2=        PRET2 = *
TMNTR=  3   0   0  TMXTR= 27   0   0  DTMNRC=   2 22   0

 ACTIVITY GROUP 1  NAG= 1 DTMXAG=   0   1 16
  ACTIVITY 1 ACTIVITY GROUP 1
  DTACT =   0   1 16 DTAMRC=    0   0   0 DTMNNA=   0   0   0
  NARCM = 1       NARCD = 1       ICODE = 0
  IASETS= 2       ITSETS= 0       IATT  = 0
  IRES  = 4       IFIXRS= 2       VT    = 0
   ASTRONAUT SET 1 ACTIVITY 1 ACTIVITY GROUP 1
   NASRQD=1 NCAN  =1
   ICAN  =1 * * * * *
   TRS   =  0   0   0  DTD   =  0   1 16
   CPO   = 0    CD = 2   SDTCD= 1
   DTMNCD=  0   3   0  DTMXCD=  0   A   0
   ASTRONAUT SET 2 ACTIVITY 1 ACTIVITY GROUP 1
   NASRQD=1 NCAN  =2
   ICAN  =2 3 * * * *
   TRS   =  0   0   0  DTD   =  0   1 16
   CPO   = 0    CD = 0   SDTCD= 0
   LOCAL RESORC SET 1 ACTIVITY 1   ACTIVITY GROUP1
   RESNO =  1      QUNREQ=       5.000
   TRS   =  0   0   0 DTD   =   0   1 20
   LOCAL RESORC SET 2 ACTIVITY 1   ACTIVITY GROUP1
   RESNO =  5      QUNREQ=       1.000
   TRS   =  0   0   0 DTD   =   0   1 20
   LOCAL RESORC SET 3 ACTIVITY 1   ACTIVITY GROUP1
   RESNO =  6      QUNREQ=       1.000
   TRS   =  0   0   0 DTD   =   0   1 20
   LOCAL RESORC SET 4 ACTIVITY 1   ACTIVITY GROUP1
   RESNO =  8      QUNREQ=       8.000
   TRS   =  0   0   0 DTD   =   0   1 20
   FIXED RESORC SET 1 ACTIVITY 1   ACTIVITY GROUP 1
   IFIXNO=  2      UNREQ =       1.000
   FIXED RESORC SET 2 ACTIVITY 1   ACTIVITY GROUP 1
   IFIXNO=  3      UNREQ =       1.000

 ACTIVITY GROUP 2  NAG= 1 DTMXAG=   0   1 20
  ACTIVITY 1 ACTIVITY GROUP 2
  DTACT =   0   1 16 DTAMRC=    0   0   0 DTMNNA=   0   0   0
  NARCM = 1       NARCD = 1       ICODE = 0
  IASETS= 2       ITSETS= 0       IATT  = 0
  IRES  = 4       IFIXRS= 2       VT    = 0
   ASTRONAUT SET 1 ACTIVITY 1 ACTIVITY GROUP 2
   NASRQD=1 NCAN  =1
   ICAN  =2 * * * * *
   TRS   =  0   0   0  DTD   =  0   1 16
   CPO   = 0    CD = 2   SDTCD= 1
   DTMNCD=  0   3   0  DTMXCD=  0   A   0
```

```
 ASTRONAUT SET 2 ACTIVITY 1 ACTIVITY GROUP 2
 NASRQD= 1 NCAN  =2
 ICAN  =1 3 * * * *
 TRS   =  0  0  0  DTD   =  0  1 16
 CPO   = 0   CD = 0   SDTCD= 0
 LOCAL RESORC SET 1 ACTIVITY 1   ACTIVITY GROUP2
 RESNO =  1      QUNREQ=       5.000
 TRS   =  0  0  0 DTD   =   0  1 20
 LOCAL RESORC SET 2 ACTIVITY 1   ACTIVITY GROUP2
 RESNO =  5      QUNREQ=       1.000
 TRS   =  0  0  0 DTD   =   0  1 45
 LOCAL RESORC SET 3 ACTIVITY 1   ACTIVITY GROUP2
 RESNO =  6      QUNREQ=       1.000
 TRS   =  0  0  0 DTD   =   0  1 20
 LOCAL RESORC SET 4 ACTIVITY 1   ACTIVITY GROUP2
 RESNO =  8      QUNREQ=       8.000
 TRS   =  0  0  0 DTD   =   0  1 20
 FIXED RESORC SET 1 ACTIVITY 1   ACTIVITY GROUP 2
 IFIXNO=  2      UNREQ =       1.000
 FIXED RESORC SET 2 ACTIVITY 1   ACTIVITY GROUP 2
 IFIXNO=  3      UNREQ =       1.000

ACTIVITY GROUP 3  NAG= 1 DTMXAG=  0  1 16
 ACTIVITY 1 ACTIVITY GROUP 3
 DTACT =  0  1 16 DTAMRC=   0  0  0 DTMANA=  0  0  0
 NARCM = 1      NARCD = 1      ICODE = 0
 IASETS= 2      ITSETS= 0      IATT  = 0
 IRES  = 4      IFIXRS= 2      VT    = 0
 ASTRONAUT SET 1 ACTIVITY 1 ACTIVITY GROUP 3
 NASRQD= 1 NCAN  =1
 ICAN  =3 * * * * *
 TRS   =  0  0  0  DTD   =  0  1 16
 CPO   = 0   CD = 2   SDTCD= 1
 DTMNCD=  0  3  0  DTMXCD=  0  8  0
 ASTRONAUT SET 2 ACTIVITY 1 ACTIVITY GROUP 3
 NASRQD= 1 NCAN  =2
 ICAN  =1 2 * * * *
 TRS   =  0  0  0  DTD   =  0  1 16
 CPO   = 0   CD = 0   SDTCD= 0
 LOCAL RESORC SET 1 ACTIVITY 1   ACTIVITY GROUP3
 RESNO =  1      QUNREQ=       5.000
 TRS   =  0  0  0 DTD   =   0  1 20
 LOCAL RESORC SET 2 ACTIVITY 1   ACTIVITY GROUP3
 RESNO =  5      QUNREQ=       1.000
 TRS   =  0  0  0 DTD   =   0  1 45
 LOCAL RESORC SET 3 ACTIVITY 1   ACTIVITY GROUP3
 RESNO =  6      QUNREQ=       1.000
 TRS   =  0  0  0 DTD   =   0  1 20
 LOCAL RESORC SET 4 ACTIVITY 1   ACTIVITY GROUP3
 RESNO =  8      QUNREQ=       8.000
 TRS   =  0  0  0 DTD   =   0  1 20
 FIXED RESORC SET 1 ACTIVITY 1   ACTIVITY GROUP 3
 IFIXNO=  2      UNREQ =       1.000
 FIXED RESORC SET 2 ACTIVITY 1   ACTIVITY GROUP 3
 IFIXNO=  3      UNREQ =       1.000
```

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VECTORCARDIOGRAM (M093)

A. OBJECTIVE

- Detect changes in the electrical activity of the heart that are associated with weightlessness and other stress conditions of space flight.

B. OPERATIONS

- Take vectorcardiogram measurements of each crewman, during exercise and after resting, at periodic intervals during the mission.

C. PLANNING LIMITATIONS

- Allow one-half hour after severe exercise and three hours after meals prior to start of experiment; allow one-half hour following experiments M092 and M131.
- Each crewman must perform as subject once every third day; subject and observer will be scheduled to start at the same time.

D. PERFORMANCE

Operation	Minimum No. of Performances	Duration of Performance	No. of Crewmen
• Vectorcardiograms during rest/exercise/rest cycle	7/Cm	40 min(subject) 15 min(observer)	1 1

E. POINTING REQUIREMENTS

None

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```
     DETAILED EXOP DEFINITION
M093      VECTORCARDIOGR
PRIOTY=   208 DES    =     94 PRO    =    100 DIF    =     44
NAGXD=    3 NXOPCM=   7 NXOPCD=   7 CODE   = 1
IBFOR1=         PRET1 = -0 IBFOR2=         PRET2 = *
TMNTR=  3   0   0  TMXTR= 27   0   0  DTMNRC=   2 23   0

 ACTIVITY GROUP 1  NAG= 1 DTMXAG=   0   0 40
  ACTIVITY 1 ACTIVITY GROUP 1
  DTACT =   0   0 40 DTAMRC=    0   0   0 DTMNNA=   0   0   0
  NARCM = 1      NARCD = 1      ICODE = 0
  IASETS= 2      ITSETS= 0      IATT  = 0
  IRES  = 4      IFIXRS= 1      VT    = 0
   ASTRONAUT SET 1 ACTIVITY 1 ACTIVITY GROUP 1
   NASRQD=1 NCAN  =1
   ICAN  =1 * * * * *
   TRS   =  0   0   0  DTD    =  0   0 40
   CPO   = 0    CD = 2   SDTCD= 1
   DTMNCD=  0   4   0  DTMXCD=  0   0   0
   ASTRONAUT SET 2 ACTIVITY 1 ACTIVITY GROUP 1
   NASRQD=1 NCAN  =2
   ICAN  =2 3 * * * *
   TRS   =  0   0   0  DTD    =  0   0 15
   CPO   = 0    CD = 0   SDTCD= 0
   LOCAL RESORC SET 1 ACTIVITY 1   ACTIVITY GROUP1
   RESNO =  1     QUNREQ=      50.000
   TRS   =  0   0   0 DTD    =  0   0 40
   LOCAL RESORC SET 2 ACTIVITY 1   ACTIVITY GROUP1
   RESNO =  2     QUNREQ=       1.000
   TRS   =  0   0   0 DTD    =  0   0 40
   LOCAL RESORC SET 3 ACTIVITY 1   ACTIVITY GROUP1
   RESNO =  5     QUNREQ=       1.000
   TRS   =  0   0   0 DTD    =  0   0 40
   LOCAL RESORC SET 4 ACTIVITY 1   ACTIVITY GROUP1
   RESNO =  6     QUNREQ=       1.000
   TRS   =  0   0   0 DTD    =  0   0 15
   FIXED RESORC SET 1 ACTIVITY 1   ACTIVITY GROUP 1
   IFIXNO=  2     UNREQ =       1.000

 ACTIVITY GROUP 2  NAG= 1 DTMXAG=   0   0 40
  ACTIVITY 1 ACTIVITY GROUP 2
  DTACT =   0   0 40 DTAMRC=    0   0   0 DTMNNA=   0   0   0
  NARCM = 1      NARCD = 1      ICODE = 0
  IASETS= 2      ITSETS= 0      IATT  = 0
  IRES  = 4      IFIXRS= 1      VT    = 0
   ASTRONAUT SET 1 ACTIVITY 1 ACTIVITY GROUP 2
   NASRQD=1 NCAN  =1
   ICAN  =2 * * * * *
   TRS   =  0   0   0  DTD    =  0   0 40
   CPO   = 0    CD = 2   SDTCD= 1
   DTMNCD=  0   4   0  DTMXCD=  0   0   0
```

```
 ASTRONAUT SET 2 ACTIVITY 1 ACTIVITY GROUP 2
 NASRQD=1 NCAN  =2
 ICAN  =1 3 * * * *
 TRS   = 0  0  0  DTD   =  0  0 15
 CPO   = 0   CD = 0   SDTCD= 0
 LOCAL RESORC SET 1 ACTIVITY 1   ACTIVITY GROUP2
 RESNO =  1     QUNREQ=     50.000
 TRS   =  0  0  0 DTD   =   0  0 40
 LOCAL RESORC SET 2 ACTIVITY 1   ACTIVITY GROUP2
 RESNO =  2     QUNREQ=      1.000
 TRS   =  0  0  0 DTD   =   0  2 40
 LOCAL RESORC SET 3 ACTIVITY 1   ACTIVITY GROUP2
 RESNO =  5     QUNREQ=      1.000
 TRS   =  0  0  0 DTD   =   0  0 40
 LOCAL RESORC SET 4 ACTIVITY 1   ACTIVITY GROUP2
 RESNO =  6     QUNREQ=      1.000
 TRS   =  0  0  0 DTD   =   0  0 15
 FIXED RESORC SET 1 ACTIVITY 1   ACTIVITY GROUP 2
 IFIXNO=  2     UNREQ =      1.000

ACTIVITY GROUP 3  NAG= 1 DTMXAG=  0  0 40
 ACTIVITY 1 ACTIVITY GROUP 3
 DTACT =  0  0 40 DTAMRC=   0  0  0 DTMANA=  0  0  0
 NARCM = 1      NARCD = 1      ICODE = 0
 IASETS= 2      ITSETS= 0      IATT  = 0
 IRES  = 4      IFIXRS= 1      VT    = 0
  ASTRONAUT SET 1 ACTIVITY 1 ACTIVITY GROUP 3
  NASRQD=1 NCAN  =1
  ICAN  =3 * * * * *
  TRS   =  0  0  0  DTD   =  0  0 40
  CPO   = 0   CD = 2   SDTCD= 1
  DTMNCD=  0  4  0  DTMXCD=  0  0  0
  ASTRONAUT SET 2 ACTIVITY 1 ACTIVITY GROUP 3
  NASRQD=1 NCAN  =2
  ICAN  =1 2 * * * *
  TRS   =  0  0  0  DTD   =  0  0 15
  CPO   = 0   CD = 0   SDTCD= 0
  LOCAL RESORC SET 1 ACTIVITY 1   ACTIVITY GROUP3
  RESNO =  1     QUNREQ=     50.000
  TRS   =  0  0  0 DTD   =   0  0 40
  LOCAL RESORC SET 2 ACTIVITY 1   ACTIVITY GROUP3
  RESNO =  2     QUNREQ=      1.000
  TRS   =  0  0  0 DTD   =   0  2 40
  LOCAL RESORC SET 3 ACTIVITY 1   ACTIVITY GROUP3
  RESNO =  5     QUNREQ=      1.000
  TRS   =  0  0  0 DTD   =   0  0 40
  LOCAL RESORC SET 4 ACTIVITY 1   ACTIVITY GROUP3
  RESNO =  6     QUNREQ=      1.000
  TRS   =  0  0  0 DTD   =   0  0 15
  FIXED RESORC SET 1 ACTIVITY 1   ACTIVITY GROUP 3
  IFIXNO=  2     UNREQ =      1.000
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HUMAN VESTIBULAR FUNCTION (M131)

A. OBJECTIVE

- To determine the effects of prolonged absence of gravity on the crewman's inner ear and his gravity receptors, and on the crewman's judgement of spatial coordinates.

B. OPERATIONS

- Subject performs semicircular canal test and spatial localization test utilizing rotating litter chair and associated equipment

  Mode A: dynamic test Mode B: spatial localization test

C. PLANNING LIMITATIONS

- For each crewman, Modes A and B shall not be performed on same day; all crewmen shall perform as subjects for either mode within a 16-hour period of each other.
- Mode A: perform no sooner than every other day for the same subject; three times early and three times late in the mission.
- Mode B: perform once early, once mid and once late in mission.
- No testing shall be done until one hour after completion of a meal.
- Schedule to avoid carryover symptoms from M092 and M093.

D. PERFORMANCE

Operation	Minimum No. of Performances	Duration of Performance	No. of Crewmen
• Mode A - dynamic test	6/Cm	30 min (subject)	1
		30 min (observer)	1
• Mode B - spatial test	3/Cm	45 min (subject)	1
		45 min (observer)	1

E. POINTING REQUIREMENTS

None

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     DETAILED EXOP DEFINITION
M131A .  HUMAN VESTIBUL
PRIOTY=   174 DES   =    86 PRO   =   100 DIF   =   40
NAGXOP=   3 NXOPCM=   6 NXOPCD=   6 CODE  =  3
IBFOR1=        PRET1 = -0 IBFOR2=        PRET2 = *
TMNTR  TMXKR
  4  0  0   4 16  0

 ACTIVITY GROUP 1  NAG= 1 DTMXAG=  0  0 30
  ACTIVITY 1 ACTIVITY GROUP 1
  DTACT =  0  0 30 DTAMRC=   0  0  0 DTMNNA=  0  0  0
  NARCM = 1      NARCD = 1      ICODE = 0
  IASETS= 2      ITSETS= 0      IATT  = 0
  IRES  = 3      IFIXRS= 0      VT    = 0
   ASTRONAUT SET 1 ACTIVITY 1 ACTIVITY GROUP 1
   NASRQD=1 NCAN  =1
   ICAN  =1 * * * * *
   TRS   =  0  0  0  DTD   =  0  0 30
   CPO   = 0   CD = 2   SDTCD= 1
   DTMNCD=  0  1  0  DTMXCD=  0  6  0
   ASTRONAUT SET 2 ACTIVITY 1 ACTIVITY GROUP 1
   NASRQD=1 NCAN  =2
   ICAN  =2 3 * * * *
   TRS   =  0  0  0  DTD   =  0  0 30
   CPO   = 0   CD = 0   SDTCD= 0
   LOCAL RESORC SET 1 ACTIVITY 1   ACTIVITY GROUP1
   RESNO =  1     QUNREQ=    180.000
   TRS   =  0  0  0 DTD   =   0  0 30
   LOCAL RESORC SET 2 ACTIVITY 1   ACTIVITY GROUP1
   RESNO =  7     QUNREQ=      9.000
   TRS   =  0  0  0 DTD   =   0  0 30
   LOCAL RESORC SET 3 ACTIVITY 1   ACTIVITY GROUP1
   RESNO =  8     QUNREQ=      7.000
   TRS   =  0  0  0 DTD   =   0  0 30

 ACTIVITY GROUP 2  NAG= 1 DTMXAG=  0  0 30
  ACTIVITY 1 ACTIVITY GROUP 2
  DTACT =  0  0 30 DTAMRC=   0  0  0 DTMNNA=  0  0  0
  NARCM = 1      NARCD = 1      ICODE = 0
  IASETS= 2      ITSETS= 0      IATT  = 0
  IRES  = 3      IFIXRS= 0      VT    = 0
   ASTRONAUT SET 1 ACTIVITY 1 ACTIVITY GROUP 2
   NASRQD=1 NCAN  =1
   ICAN  =2 * * * * *
   TRS   =  0  0  0  DTD   =  0  0 30
   CPO   = 0   CD = 2   SDTCD= 1
   DTMNCD=  0  1  0  DTMXCD=  0  6  0
   ASTRONAUT SET 2 ACTIVITY 1 ACTIVITY GROUP 2
```

```
 NASRQD=1 NCAN  =2
 ICAN  =1 3 * * * *
 TRS   = 0  0  0  DTD   =  0  0 30
 CPO   = 0   CD = 0   SDTCD= 0
 LOCAL RESORC SET 1 ACTIVITY 1   ACTIVITY GROUP2
 RESNO =  1     QUNREQ=    180.000
 TRS   = 0  0  0 DTD   =   0  0 30
 LOCAL RESORC SET 2 ACTIVITY 1   ACTIVITY GROUP2
 RESNO =  7     QUNREQ=      9.000
 TRS   = 0  0  0 DTD   =   0  0 30
 LOCAL RESORC SET 3 ACTIVITY 1   ACTIVITY GROUP2
 RESNO =  8     QUNREQ=      7.000
 TRS   = 0  0  0 DTD   =   0  0 30

ACTIVITY GROUP 3  NAG= 1 DTMXAG=  0  0 30
 ACTIVITY 1 ACTIVITY GROUP 3
 DTACT =  0  0 30 DTAMRC=   0  0  0 DTMANA=  0  0  0
 NARCM = 1     NARCD = 1     ICODE = 0
 IASETS= 2     ITSETS= 0     IATT  = 0
 IRES  = 3     IFIXRS= 0     VT    = 0
  ASTRONAUT SET 1 ACTIVITY 1 ACTIVITY GROUP 3
  NASRQD=1 NCAN  =1
  ICAN  =3 * * * * *
  TRS   = 0  0  0  DTD   =  0  0 30
  CPO   = 0   CD = 2   SDTCD= 1
  DTMNCD=  0  1  0  DTMXCD=  0  6  0
  ASTRONAUT SET 2 ACTIVITY 1 ACTIVITY GROUP 3
  NASRQD=1 NCAN  =2
  ICAN  =1 2 * * * *
  TRS   = 0  0  0  DTD   =  0  0 30
  CPO   = 0   CD = 0   SDTCD= 0
  LOCAL RESORC SET 1 ACTIVITY 1   ACTIVITY GROUP3
  RESNO =  1     QUNREQ=    180.000
  TRS   = 0  0  0 DTD   =   0  0 30
  LOCAL RESORC SET 2 ACTIVITY 1   ACTIVITY GROUP3
  RESNO =  7     QUNREQ=      9.000
  TRS   = 0  0  0 DTD   =   0  0 30
  LOCAL RESORC SET 3 ACTIVITY 1   ACTIVITY GROUP3
  RESNO =  8     QUNREQ=      7.000
  TRS   = 0  0  0 DTD   =   0  0 30
```

```
     DETAILED EXOP DEFINITION
M131B    HUMAN VESTIBUL
PRIOTY=   145 DES   =    86 PRO   =   100 DIF   =   33
NAGXOP=  3 NXOPCM=  3 NXOPCD=  3 CODE  = 3
IBFOR1=       PRET1 = -0 IBFOR2=       PRET2 = *
TMNTR  TMXKR
  5  0  0   5 16  0

 ACTIVITY GROUP 1  NAG= 1 DTMXAG=  0  0 45
  ACTIVITY 1 ACTIVITY GROUP 1
  DTACT =  0  0 45 DTAMRC=   0  0  0 DTMNNA=  0  0  0
  NARCM = 1      NARCD = 1      ICODE = 0
  IASETS= 2      ITSETS= 0      IATT  = 0
  IRES  = 0      IFIXRS= 0      VT    = 0
   ASTRONAUT SET 1 ACTIVITY 1 ACTIVITY GROUP 1
   NASRQD=1 NCAN  =1
   ICAN  =1 * * * * *
   TRS   =  0  0  0  DTD   =  0  0 45
   CPO   = 0   CD = 2   SDTCD= 1
   DTMNCD=  0  1  0  DTMXCD=  0  0  0
   ASTRONAUT SET 2 ACTIVITY 1 ACTIVITY GROUP 1
   NASRQD=1 NCAN  =2
   ICAN  =2 3 * * * *
   TRS   =  0  0  0  DTD   =  0  0 45
   CPO   = 0   CD = 0   SDTCD= 0

 ACTIVITY GROUP 2  NAG= 1 DTMXAG=  0  0 45
  ACTIVITY 1 ACTIVITY GROUP 2
  DTACT =  0  0 45 DTAMRC=   0  0  0 DTMNNA=  0  0  0
  NARCM = 1      NARCD = 1      ICODE = 0
  IASETS= 2      ITSETS= 0      IATT  = 0
  IRES  = 0      IFIXRS= 0      VT    = 0
   ASTRONAUT SET 1 ACTIVITY 1 ACTIVITY GROUP 2
   NASRQD=1 NCAN  =1
   ICAN  =2 * * * * *
   TRS   =  0  0  0  DTD   =  0  0 45
   CPO   = 0   CD = 2   SDTCD= 1
   DTMNCD=  0  1  0  DTMXCD=  0  0  0
   ASTRONAUT SET 2 ACTIVITY 1 ACTIVITY GROUP 2
   NASRQD=1 NCAN  =2
   ICAN  =1 3 * * * *
   TRS   =  0  0  0  DTD   =  0  0 45
   CPO   = 0   CD = 0   SDTCD= 0

 ACTIVITY GROUP 3  NAG= 1 DTMXAG=  0  0 45
  ACTIVITY 1 ACTIVITY GROUP 3
  DTACT =  0  0 45 DTAMRC=   0  0  0 DTMNNA=  0  0  0
  NARCM = 1      NARCD = 1      ICODE = 0
  IASETS= 2      ITSETS= 0      IATT  = 0
```

```
IRES  = 0     IFIXRS= 0     VT     = 0
 ASTRONAUT SET 1 ACTIVITY 1 ACTIVITY GROUP 3
 NASRQD=1 NCAN  =1
 ICAN  =3 * * * * *
 TRS   =  0  0  0  DTD   =  0  ñ 45
 CPO   = 0    CD = 2   SDTCD= 1
 DTMNCD=  0  1  0  DTMXCD=  0  4  0
 ASTRONAUT SET 2 ACTIVITY 1 ACTIVITY GROUP 3
 NASRQD=1 NCAN  =2
 ICAN  =1 2 * * * *
 TRS   =  0  0  0  DTD   =  0  ñ 45
 CPO   = 0    CD = 0   SDTCD= 0
```

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TIME AND MOTION STUDY (M151)

A. OBJECTIVE

- To film selected tasks performed in flight for time and motion comparisons with tasks performed on the ground.

B. OPERATIONS

- Selected portions of the following experiments will be filmed: M171, M093, M092, M074, M487, M508 and M509.

C. PLANNING LIMITATIONS

- Supplemental lighting during filming will be required.

D. PERFORMANCE

- Filmed during actual operation of above experiments; camera and film requirements are specified in definition of M093, M092, M074, M487, M508 and M509.

E. POINTING REQUIREMENTS

None

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METABOLIC ACTIVITY (M171)

A. OBJECTIVE

- Determine if an astronaut's metabolic rate, while doing mechanical work, is progressively altered by exposure to zero gravity and to space flight environment.

B. OPERATIONS

- Metabolic rate is measured while resting, while using ergometer, and while performing maintenance tasks in both a suited and unsuited mode - measurements are made on each crewman at periodic intervals during the mission.

  Mode A: Resting metabolic rate and bicycle ergometry.
  Mode B: Unsuited maintenance and constant work task.
  Mode C: Suited maintenance and constant work task.

C. PLANNING LIMITATIONS

- Must be a two-hour delay if M093 is performed before M171.
- Perform no sooner than three hours after a meal.
- Perform no sooner than two hours after severe exercise; Modes B and C are restricted from occurring from within two hours after Mode A.
- Experiment is to be repeated three times by each crewman; occurrences arranged to allow one early, one mid, and one late in the mission; the experiment period should be scheduled at the same time of day for each crewman.

D. PERFORMANCE

Operation	Minimum No. of Performances	Duration of Performance	No. of Crewmen
• Mode A - resting/ergometry	3/Cm	90 min(subject)	1
		30 min(observer)	1
• Mode B - Unsuited maintenance	3/Cm	85 min(subject)	1
		40 min(observer)	1
• Mode C - Suited maintenance	3/Cm	120 min(subject)	1
		90 min(observer)	1

E. POINTING REQUIREMENTS

None

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```
     DETAILED EXOP DEFINITION
M171A :  METABOLIC ACTI
PRIOTY=   206 DES   =     96 PRO   =   100 DIF   =   43
NAGXOP=   3 NXOPCM=  3 NXOPCD=  3 CODE  = 1
IBFOR1=        PRET1 = -0 IBFOR2=        PRET2 = *
TMNTR=  3  0  0  TMXTR= 27  0  0  DTMNRC=  6 22  0

 ACTIVITY GROUP 1  NAG= 1 DTMXAG=  0  1 30
  ACTIVITY 1 ACTIVITY GROUP 1
  DTACT =  0  1 30 DTAMRC=   0  0  0 DTMNNA=  0  0  0
  NARCM = 1      NARCD = 1      ICODE = 0
  IASETS= 2      ITSETS= 0      IATT  = 0
  IRES  = 4      IFIXRS= 2      VT    = 0
   ASTRONAUT SET 1 ACTIVITY 1 ACTIVITY GROUP 1
   NASRQD=1 NCAN  =1
   ICAN  =1 * * * * *
   TRS   =  0  0  0  DTD   =  0  1 30
   CPO   = 0   CD = 2   SDTCD= 1
   DTMNCD=  0  3  0  DTMXCD=  0  A  0
   ASTRONAUT SET 2 ACTIVITY 1 ACTIVITY GROUP 1
   NASRQD=1 NCAN  =2
   ICAN  =2 3 * * * *
   TRS   =  0  0 30  DTD   =  0  0 30
   CPO   = 0   CD = 0   SDTCD= 0
   LOCAL RESORC SET 1 ACTIVITY 1   ACTIVITY GROUP1
   RESNO =  2     QUNREQ=       1.000
   TRS   =  0  0  0 DTD   =  0  1 30
   LOCAL RESORC SET 2 ACTIVITY 1   ACTIVITY GROUP1
   RESNO =  5     QUNREQ=       1.000
   TRS   =  0  0  0 DTD   =  0  1 30
   LOCAL RESORC SET 3 ACTIVITY 1   ACTIVITY GROUP1
   RESNO =  6     QUNREQ=       1.000
   TRS   =  0  0 30 DTD   =  0  0 30
   LOCAL RESORC SET 4 ACTIVITY 1   ACTIVITY GROUP1
   RESNO =  9     QUNREQ=       1.000
   TRS   =  0  0  0 DTD   =  0  3 30
   FIXED RESORC SET 1 ACTIVITY 1   ACTIVITY GROUP 1
   IFIXNO=  2     UNREQ =       1.000
   FIXED RESORC SET 2 ACTIVITY 1   ACTIVITY GROUP 1
   IFIXNO=  3     UNREQ =      10.000

 ACTIVITY GROUP 2  NAG= 1 DTMXAG=  0  1 30
  ACTIVITY 1 ACTIVITY GROUP 2
  DTACT =  0  1 30 DTAMRC=   0  0  0 DTMNNA=  0  0  0
  NARCM = 1      NARCD = 1      ICODE = 0
  IASETS= 2      ITSETS= 0      IATT  = 0
  IRES  = 4      IFIXRS= 2      VT    = 0
   ASTRONAUT SET 1 ACTIVITY 1 ACTIVITY GROUP 2
   NASRQD=1 NCAN  =1
   ICAN  =2 * * * * *
   TRS   =  0  0  0  DTD   =  0  1 30
   CPO   = 0   CD = 2   SDTCD= 1
   DTMNCD=  0  3  0  DTMXCD=  0  A  0
```

```
 ASTRONAUT SET 2 ACTIVITY 1 ACTIVITY GROUP 2
 NASRQD=1 NCAN  =2
 ICAN  =1 3 * * * *
 TRS   =  0  0 30  DTD   =  0  0 30
 CPO   = 0   CD = 0   SDTCD= 0
 LOCAL RESORC SET 1 ACTIVITY 1   ACTIVITY GROUP2
 RESNO =  9     QUNREQ=      1.000
 TRS   =  0  0  0 DTD   =   0  3 30
 LOCAL RESORC SET 2 ACTIVITY 1   ACTIVITY GROUP2
 RESNO =  2     QUNREQ=      1.000
 TRS   =  0  0  0 DTD   =   0  1 30
 LOCAL RESORC SET 3 ACTIVITY 1   ACTIVITY GROUP2
 RESNO =  5     QUNREQ=      1.000
 TRS   =  0  0  0 DTD   =   0  1 30
 LOCAL RESORC SET 4 ACTIVITY 1   ACTIVITY GROUP2
 RESNO =  6     QUNREQ=      1.000
 TRS   =  0  0 30 DTD   =   0  0 30
 FIXED RESORC SET 1 ACTIVITY 1   ACTIVITY GROUP 2
 IFIXNO=  2     UNREQ =      1.000
 FIXED RESORC SET 2 ACTIVITY 1   ACTIVITY GROUP 2
 IFIXNO=  3     UNREQ =     10.000

ACTIVITY GROUP 3  NAG= 1 DTMXAG=  0  1 30
 ACTIVITY 1 ACTIVITY GROUP 3
 DTACT =  0  1 30 DTAMRC=   0  0  0 DTMNNA=  0  0  0
 NARCM = 1     NARCD = 1     ICODE = 0
 IASETS= 2     ITSETS= 0     IATT  = 0
 IRES  = 4     IFIXRS= 2     VT    = 0
  ASTRONAUT SET 1 ACTIVITY 1 ACTIVITY GROUP 3
  NASRQD=1 NCAN  =1
  ICAN  =3 * * * * *
  TRS   =  0  0  0  DTD   =  0  1 30
  CPO   = 0   CD = 2   SDTCD= 1
  DTMNCD=  0  3  0  DTMXCD=  0  4  0
  ASTRONAUT SET 2 ACTIVITY 1 ACTIVITY GROUP 3
  NASRQD=1 NCAN  =2
  ICAN  =1 2 * * * *
  TRS   =  0  0 30  DTD   =  0  0 30
  CPO   = 0   CD = 0   SDTCD= 0
  LOCAL RESORC SET 1 ACTIVITY 1   ACTIVITY GROUP3
  RESNO =  2     QUNREQ=      1.000
  TRS   =  0  0  0 DTD   =   0  1 30
  LOCAL RESORC SET 2 ACTIVITY 1   ACTIVITY GROUP3
  RESNO =  9     QUNREQ=      1.000
  TRS   =  0  0  0 DTD   =   0  3 30
  LOCAL RESORC SET 3 ACTIVITY 1   ACTIVITY GROUP3
  RESNO =  5     QUNREQ=      1.000
  TRS   =  0  0  0 DTD   =   0  1 30
  LOCAL RESORC SET 4 ACTIVITY 1   ACTIVITY GROUP3
  RESNO =  6     QUNREQ=      1.000
  TRS   =  0  0 30 DTD   =   0  0 30
  FIXED RESORC SET 1 ACTIVITY 1   ACTIVITY GROUP 3
  IFIXNO=  2     UNREQ =      1.000
  FIXED RESORC SET 2 ACTIVITY 1   ACTIVITY GROUP 3
  IFIXNO=  3     UNREQ =     10.000
```

```
     DETAILED EXOP DEFINITION
M171B    METABOLIC ACTI
PRIOTY=   193 DES   =    90 PRO   =   100 DIF   =    43
NAGXOP=   3 NXOPCM=   3 NXOPCD=   3 CODE  = 1
IBFOR1=        PRET1 = -0 IBFOR2=        PRET2 = *
TMNTR=   4   0   0  TMXTR= 28   0   0  DTMNRC=   5 22 30

 ACTIVITY GROUP 1  NAG= 1 DTMXAG=   0   1 25
  ACTIVITY 1 ACTIVITY GROUP 1
  DTACT =  0   1 25 DTAMRC=    0   0   0 DTMNNA=   0   0   0
  NARCM = 1      NARCD = 1      ICODE = 0
  IASETS= 2      ITSETS= 0      IATT  = 0
  IRES  = 4      IFIXRS= 2      VT    = 0
   ASTRONAUT SET 1 ACTIVITY 1 ACTIVITY GROUP 1
   NASRQD=1 NCAN  =1
   ICAN  =1 * * * * *
   TRS   =  0   0   0  DTD   =  0   1 25
   CPO   = 0    CD = 2    SDTCD= 1
   DTMNCD=  0   3   0  DTMXCD=  0   8   0
   ASTRONAUT SET 2 ACTIVITY 1 ACTIVITY GROUP 1
   NASRQD=1 NCAN  =2
   ICAN  =2 3 * * * *
   TRS   =  0   0 30  DTD   =  0   0 40
   CPO   = 0    CD = 0    SDTCD= 0
   LOCAL RESORC SET 1 ACTIVITY 1   ACTIVITY GROUP1
   RESNO =  1      QUNREQ=      37.000
   TRS   =  0   0   0 DTD   =   0   1 25
   LOCAL RESORC SET 2 ACTIVITY 1   ACTIVITY GROUP1
   RESNO =  9      QUNREQ=       1.000
   TRS   =  0   0   0 DTD   =   0   1 25
   LOCAL RESORC SET 3 ACTIVITY 1   ACTIVITY GROUP1
   RESNO =  5      QUNREQ=       1.000
   TRS   =  0   0   0 DTD   =   0   1 25
   LOCAL RESORC SET 4 ACTIVITY 1   ACTIVITY GROUP1
   RESNO =  6      QUNREQ=       1.000
   TRS   =  0   0 30 DTD   =   0   0 40
   FIXED RESORC SET 1 ACTIVITY 1   ACTIVITY GROUP 1
   IFIXNO=  2      UNREQ =       1.000
   FIXED RESORC SET 2 ACTIVITY 1   ACTIVITY GROUP 1
   IFIXNO=  3      UNREQ =      10.000

 ACTIVITY GROUP 2  NAG= 1 DTMXAG=   0   1 25
  ACTIVITY 1 ACTIVITY GROUP 2
  DTACT =  0   1 25 DTAMRC=    0   0   0 DTMNNA=   0   0   0
  NARCM = 1      NARCD = 1      ICODE = 0
  IASETS= 2      ITSETS= 0      IATT  = 0
  IRES  = 4      IFIXRS= 2      VT    = 0
   ASTRONAUT SET 1 ACTIVITY 1 ACTIVITY GROUP 2
   NASRQD=1 NCAN  =1
   ICAN  =2 * * * * *
   TRS   =  0   0   0  DTD   =  0   1 25
   CPO   = 0    CD = 2    SDTCD= 1
   DTMNCD=  0   3   0  DTMXCD=  0   8   0
```

```
 ASTRONAUT SET 2 ACTIVITY 1 ACTIVITY GROUP 2
 NASRQD=1 NCAN  =2
 ICAN  =1 3 * * * *
 TRS   =  0  0 30  DTD   =  0  0 40
 CPD   = 0   CD = 0   SDTCD= 0
 LOCAL RESORC SET 1 ACTIVITY 1   ACTIVITY GROUP2
 RESNO =  1     QUNREQ=     37.000
 TRS   =  0  0  0 DTD   =   0  1 25
 LOCAL RESORC SET 2 ACTIVITY 1   ACTIVITY GROUP2
 RESNO =  9     QUNREQ=      1.000
 TRS   =  0  0  0 DTD   =   0  1 25
 LOCAL RESORC SET 3 ACTIVITY 1   ACTIVITY GROUP2
 RESNO =  5     QUNREQ=      1.000
 TRS   =  0  0  0 DTD   =   0  1 25
 LOCAL RESORC SET 4 ACTIVITY 1   ACTIVITY GROUP2
 RESNO =  6     QUNREQ=      1.000
 TRS   =  0  0 30 DTD   =   0  0 40
 FIXED RESORC SET 1 ACTIVITY 1   ACTIVITY GROUP 2
 IFIXNO=  2     UNREQ =      1.000
 FIXED RESORC SET 2 ACTIVITY 1   ACTIVITY GROUP 2
 IFIXNO=  3     UNREQ =     10.000

ACTIVITY GROUP 3  NAG= 1 DTMXAG=  0  1 25
 ACTIVITY 1 ACTIVITY GROUP 3
 DTACT =  0  1 25 DTAMRC=   0  0  0 DTMNNA=  0  0  0
 NARCM = 1     NARCD = 1     ICONE = 0
 IASETS= 2     ITSETS= 0     IATT  = 0
 IRES  = 4     IFIXRS= 2     VT    = 0
  ASTRONAUT SET 1 ACTIVITY 1 ACTIVITY GROUP 3
  NASRQD=1 NCAN  =1
  ICAN  =3 * * * * *
  TRS   =  0  0  0  DTD   =  0  1 25
  CPD   = 0   CD = 2   SDTCD= 1
  DTMNCD=  0  3  0  DTMXCD=  0  8  0
  ASTRONAUT SET 2 ACTIVITY 1 ACTIVITY GROUP 3
  NASRQD=1 NCAN  =2
  ICAN  =1 2 * * * *
  TRS   =  0  0 30  DTD   =  0  0 40
  CPD   = 0   CD = 0   SDTCD= 0
  LOCAL RESORC SET 1 ACTIVITY 1   ACTIVITY GROUP3
  RESNO =  1     QUNREQ=     37.000
  TRS   =  0  0  0 DTD   =   0  1 25
  LOCAL RESORC SET 2 ACTIVITY 1   ACTIVITY GROUP3
  RESNO =  9     QUNREQ=      1.000
  TRS   =  0  0  0 DTD   =   0  1 25
  LOCAL RESORC SET 3 ACTIVITY 1   ACTIVITY GROUP3
  RESNO =  5     QUNREQ=      1.000
  TRS   =  0  0  0 DTD   =   0  1 25
  LOCAL RESORC SET 4 ACTIVITY 1   ACTIVITY GROUP3
  RESNO =  6     QUNREQ=      1.000
  TRS   =  0  0 30 DTD   =   0  0 40
  FIXED RESORC SET 1 ACTIVITY 1   ACTIVITY GROUP 3
  IFIXNO=  2     UNREQ =      1.000
  FIXED RESORC SET 2 ACTIVITY 1   ACTIVITY GROUP 3
  IFIXNO=  3     UNREQ =     10.000
```

```
     DETAILED EXOP DEFINITION
METIC    METABOLIC ACTI
PRIORTY=   193 DES    =     90 PRO    =    100 DIF    =    43
NAGXDP=  3 NXOPCM=  3 NXOPCD=  3 CODE  = 1
IBFOR1=        PRET1 = -0 IBFOR2=        PRET2 = *
TMNTR=  6 12  0  TMXTR= 28  0  0  DTMNRC=  5 22  0

ACTIVITY GROUP 1  NAG= 1 DTMXAG=  0  2  0
 ACTIVITY 1 ACTIVITY GROUP 1
 DTACT =  0  2  0 DTAMRC=   0  0  0 DTMNNA=  0  0  0
 NARCM = 1      NARCD = 1      ICODE = 0
 IASETS= 2      ITSETS= 0      IATT  = 0
 IRES  = 4      IFIXRS= 2      VT    = 0
  ASTRONAUT SET 1 ACTIVITY 1 ACTIVITY GROUP 1
  VASRQD=1 NCAN  =1
  ICAN  =1 * * * * *
  TRS   =  0  0  0  DTD   =  0  2  0
  CPO   = 0   CD = 2   SDTCD= 1
  DTMNCD=  0  3  0  DTMXCD=  0  8  0
  ASTRONAUT SET 2 ACTIVITY 1 ACTIVITY GROUP 1
  VASRQD=1 NCAN  =2
  ICAN  =2 3 * * * *
  TRS   =  0  0 15  DTD   =  0  1 30
  CPO   = 0   CD = 0   SDTCD= 0
  LOCAL RESORC SET 1 ACTIVITY 1   ACTIVITY GROUP1
  RESNO =  1     QUNREQ=      37.000
  TRS   =  0  0  0 DTD   =   0  2  0
  LOCAL RESORC SET 2 ACTIVITY 1   ACTIVITY GROUP1
  RESNO =  9     QUNREQ=       1.000
  TRS   =  0  0  0 DTD   =   0  2  0
  LOCAL RESORC SET 3 ACTIVITY 1   ACTIVITY GROUP1
  RESNO =  5     QUNREQ=       1.000
  TRS   =  0  0  0 DTD   =   0  2  0
  LOCAL RESORC SET 4 ACTIVITY 1   ACTIVITY GROUP1
  RESNO =  6     QUNREQ=       1.000
  TRS   =  0  0 15 DTD   =   0  1 30
  FIXED RESORC SET 1 ACTIVITY 1   ACTIVITY GROUP 1
  IFIXNO=  2     UNREQ =       1.000
  FIXED RESORC SET 2 ACTIVITY 1   ACTIVITY GROUP 1
  IFIXNO=  3     UNREQ =      10.000

ACTIVITY GROUP 2  NAG= 1 DTMXAG=  0  2  0
 ACTIVITY 1 ACTIVITY GROUP 2
 DTACT =  0  2  0 DTAMRC=   0  0  0 DTMNNA=  0  0  0
 NARCM = 1      NARCD = 1      ICODE = 0
 IASETS= 2      ITSETS= 0      IATT  = 0
 IRES  = 4      IFIXRS= 2      VT    = 0
  ASTRONAUT SET 1 ACTIVITY 1 ACTIVITY GROUP 2
  VASRQD=1 NCAN  =1
  ICAN  =2 * * * * *
  TRS   =  0  0  0  DTD   =  0  2  0
  CPO   = 0   CD = 2   SDTCD= 1
  DTMNCD=  0  3  0  DTMXCD=  0  8  0
```

```
ASTRONAUT SET 2 ACTIVITY 1 ACTIVITY GROUP 2
NASRQD=1 NCAN  =2
ICAN  =1 3 * * * *
TRS   =  0  0 15  DTD   =  0  1 30
CPO   = 0   CD = 0   SDTCD= 0
LOCAL RESORC SET 1 ACTIVITY 1   ACTIVITY GROUP2
RESNO =  1     QUNREQ=     37.000
TRS   =  0  0  0 DTD   =   0  2  0
LOCAL RESORC SET 2 ACTIVITY 1   ACTIVITY GROUP2
RESNO =  9     QUNREQ=      1.000
TRS   =  0  0  0 DTD   =   0  2  0
LOCAL RESORC SET 3 ACTIVITY 1   ACTIVITY GROUP2
RESNO =  5     QUNREQ=      1.000
TRS   =  0  0  0 DTD   =   0  2  0
LOCAL RESORC SET 4 ACTIVITY 1   ACTIVITY GROUP2
RESNO =  6     QUNREQ=      1.000
TRS   =  0  0 15 DTD   =   0  1 30
FIXED RESORC SET 1 ACTIVITY 1   ACTIVITY GROUP 2
IFIXNO=  2     UNREQ =      1.000
FIXED RESORC SET 2 ACTIVITY 1   ACTIVITY GROUP 2
IFIXNO=  3     UNREQ =     10.000

ACTIVITY GROUP 3  NAG= 1 DTMXAG=  0  2  0
 ACTIVITY 1 ACTIVITY GROUP 3
 DTACT =  0  2  0 DTAMRC=   0  0  0 DTMNNA=  0  0  0
 NARCM = 1      NARCD = 1      ICODE = 0
 IASETS= 2      ITSETS= 0      IATT  = 0
 IRES  = 4      IFIXRS= 2      VT    = 0
 ASTRONAUT SET 1 ACTIVITY 1 ACTIVITY GROUP 3
 NASRQD=1 NCAN  =1
 ICAN  =3 * * * * *
 TRS   =  0  0  0  DTD   =  0  2  0
 CPO   = 0   CD = 2   SDTCD= 1
 DTMNCD=  0  3  0  DTMXCD=  0  8  0
 ASTRONAUT SET 2 ACTIVITY 1 ACTIVITY GROUP 3
 NASRQD=1 NCAN  =2
 ICAN  =1 2 * * * *
 TRS   =  0  0 15  DTD   =  0  1 30
 CPO   = 0   CD = 0   SDTCD= 0
 LOCAL RESORC SET 1 ACTIVITY 1   ACTIVITY GROUP3
 RESNO =  1     QUNREQ=     37.000
 TRS   =  0  0  0 DTD   =   0  2  0
 LOCAL RESORC SET 2 ACTIVITY 1   ACTIVITY GROUP3
 RESNO =  9     QUNREQ=      1.000
 TRS   =  0  0  0 DTD   =   0  2  0
 LOCAL RESORC SET 3 ACTIVITY 1   ACTIVITY GROUP3
 RESNO =  5     QUNREQ=      1.000
 TRS   =  0  0  0 DTD   =   0  2  0
 LOCAL RESORC SET 4 ACTIVITY 1   ACTIVITY GROUP3
 RESNO =  6     QUNREQ=      1.000
 TRS   =  0  0 15 DTD   =   0  1 30
 FIXED RESORC SET 1 ACTIVITY 1   ACTIVITY GROUP 3
 IFIXNO=  2     UNREQ =      1.000
 FIXED RESORC SET 2 ACTIVITY 1   ACTIVITY GROUP 3
 IFIXNO=  3     UNREQ =     10.000
```

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BODY MASS MEASUREMENT (M172)

A. OBJECTIVE

- Demonstrate feasibility of body mass measurement in zero-g.
- Validate design and function of body mass measurement device.
- Support biomedical experiments requiring mass measurements.

B. OPERATIONS

- Calibration of mass measurement devices.
- Body mass measurement of an individual crewman at specified intervals.

C. PLANNING LIMITATIONS

- Body mass measurements performed every day during meal period after sleep with M071, M073, and M074; calibration measurements taken three times: early, middle, and late in mission.

D. PERFORMANCE

Operation	Minimum No. of Performances	Duration of Performance	No. of Crewmen
• Body mass measurement	Once a day/Cm	5 min	1
• Calibration measurements	3	15 min	1

E. POINTING REQUIREMENTS

None

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```
    DETAILED EXOP DEFINITION
M172     BODY MASS MEAS
PRIORITY=   189 DES   =    92 PRO   =   100 DIF   =   41
NAGXOP=   1 NXOPCM= 24 NXOPCD= 26 CODE  = 1
IBFOR1=       PRET1 = -0 IBFOR2=       PRET2 = *
TMNTR=  2 16  0  TMXTR= 28  0  0  DTMNRC=  0 22  0

 ACTIVITY GROUP 1  NAG= 1 DTMXAG=  0  1 20
  ACTIVITY 1 ACTIVITY GROUP 1
  DTACT =  0  1 15 DTAMRC=   0  0  0 DTMNNA=  0  0  0
  NARCM = 1     NARCD = 1     ICODE = 0
  IASETS= 3     ITSETS= 0     IATT  = 0
  IRES  = 1     IFIXRS= 0     VT    = 0
   ASTRONAUT SET 1 ACTIVITY 1 ACTIVITY GROUP 1
   NASRQD=1 NCAN  =1
   ICAN  =1 * * * * *
   TRS   =  0  0 57  DTD   =  0  0  7
   CPO   = 0   CD = 2   SDTCD= 0
   ASTRONAUT SET 2 ACTIVITY 1 ACTIVITY GROUP 1
   NASRQD=1 NCAN  =1
   ICAN  =2 * * * * *
   TRS   =  0  1  4  DTD   =  0  0  5
   CPO   = 0   CD = 2   SDTCD= 0
   ASTRONAUT SET 3 ACTIVITY 1 ACTIVITY GROUP 1
   NASRQD=1 NCAN  =1
   ICAN  =3 * * * * *
   TRS   =  0  1  9  DTD   =  0  0  6
   CPO   = 0   CD = 2   SDTCD= 0
   LOCAL RESORC SET 1 ACTIVITY 1   ACTIVITY GROUP1
   RESNO =  1     QUNREQ=      4,000
   TRS   =  0  0 59 DTD   =   0  0 15
```

HABITABILITY/CREW QUARTERS (M487)

A. OBJECTIVE

- Evaluate OWS crew quarters and habitability in large volume spacecraft.
- Provide baseline data for design criteria for advanced space stations.
- Support physiological and physical well-being of astronauts.

B. OPERATIONS

- Provide astronauts' operational waste management, water management, personal hygiene, food, sleep restraint, and other habitability systems.
- Habitability Support System (HSS) is preinstalled in the OWS.

C. PLANNING LIMITATIONS

None

D. PERFORMANCE

- Time of performance is not defined; activation activities are included in this experiment and are scheduled to occur on the first and second mission days.

E. POINTING REQUIREMENTS

None

```
     DETAILED EXOP DEFINITION
M487     WORKSHOP ACTIVA
PRIOTY=   621 DES   =    99 PRO   =   100 DIF   =   24
NAGXOP=  1 NXOPCM=  1 NXOPCD=  1 CODE  = 1
IBFOR1=        PRET1 = -0 IBFOR2=        PRET2 = *
TMNTR=  1  8  0  TMXTR=  3  0  0  DTMNRC=  0  0  0

 ACTIVITY GROUP 1  NAG= 2 DTMXAG=  1  6  0
  ACTIVITY 1 ACTIVITY GROUP 1
  DTACT =  0  5 15 DTAMRC=   0  0  0 DTMNNA=  0  0  0
  NARCM = 2      NARCD = 2      ICODE = 0
  IASETS= 1      ITSETS= 0      IATT  = 0
  IRES  = 0      IFIXRS= 0      VT    = 0
   ASTRONAUT SET 1 ACTIVITY 1 ACTIVITY GROUP 1
   NASRQD=3 NCAN  =3
   ICAN  =1 2 3 * * *
   TRS   =  0  0  0  DTD   =  0  5 15
   CPO   = 0   CD = 0   SDTCD= 0
  ACTIVITY 2 ACTIVITY GROUP 1
  DTACT =  0  3 45 DTAMRC=   0  0  0 DTMNNA=  0  0  0
  NARCM = 1      NARCD = 1      ICODE = 0
  IASETS= 1      ITSETS= 0      IATT  = 0
  IRES  = 0      IFIXRS= 0      VT    = 0
   ASTRONAUT SET 1 ACTIVITY 2 ACTIVITY GROUP 1
   NASRQD=3 NCAN  =3
   ICAN  =1 2 3 * * *
   TRS   =  0  0  0  DTD   =  0  3 45
   CPO   = 0   CD = 0   SDTCD= 0
```

GRAVITY SUBSTITUTE WORKBENCH (M507)

A. OBJECTIVE

- Explore the merits of using aerodynamic and electrostatic forces as gravity substitutes.

B. OPERATIONS

- Two different astronauts disassemble and reassemble an M508 Task Module using the aerodynamics workbench (AWB) and the electrostatic workbench (EWB).

C. PLANNING LIMITATIONS

- Experiment will be performed in three sessions by two different crew members; one astronaut will perform sessions 1 and 3, the other will perform Session 2.

D. PERFORMANCE

Operation	Minimum No. of Performances	Duration of Performance	No. of Crewmen
• Session 1 (set up AWB; disassemble/reassemble module)	1	60 min	1
• Session 2 (disassemble/ reassemble module on AWB; assemble EWB; disassemble/ reassemble module on EWB)	1	78 min	1
• Session 3 (disassemble/ reassemble module on EWB; stow)	1	60 min	1

E. POINTING REQUIREMENTS

None

```
     DETAILED EXOP DEFINITION
M307     GRAVITY SUBSTI
PRIORITY=    84 DES   =    55 PRO   =   100 DIF   =   30
NAGXO=5   1 NXOPCM=   1 NXOPCD=  1 CODE  = 1
IBFOR1=        PRET1 = -0 IBFOR2=        PRET2 = *
TMNTR=  7   0   0  TMXTR= 27   0   0  DTMNRC=  0   0   0

 ACTIVITY GROUP 1  NAG= 3 DTMXAG=  0   5 30
  ACTIVITY 1 ACTIVITY GROUP 1
  DTACT =  0   1   0 DTAMRC=    0   0   0 DTMNNA=  0   0   0
  NARCM = 1       NARCD = 1       ICODE = 0
  IASETS= 1       ITSETS= 0       IATT  = 0
  IRES  = 2       IFIXRS= 1       VT    = 0
   ASTRONAUT SET 1 ACTIVITY 1 ACTIVITY GROUP 1
   NASRQD=1 NCAN  =1
   ICAN  =3 * * * * *
   TRS   =  0   0   0  DTD   =  0   1   0
   CPO   = 0    CD = 0    SDTCD= 0
   LOCAL RESORC SET 1 ACTIVITY 1   ACTIVITY GROUP1
   RESNO =  1      QUNREQ=     112,000
   TRS   =  0   0   0 DTD   =   0   1   0
   LOCAL RESORC SET 2 ACTIVITY 1   ACTIVITY GROUP1
   RESNO =  6      QUNREQ=       1,000
   TRS   =  0   0   0 DTD   =   0   1   0
   FIXED RESORC SET 1 ACTIVITY 1   ACTIVITY GROUP 1
   IFIXNO=  2      UNREQ =       1,000
  ACTIVITY 2 ACTIVITY GROUP 1
  DTACT =  0   1  18 DTAMRC=    0   0   0 DTMNNA=  0   0   0
  NARCM = 1       NARCD = 1       ICODE = 0
  IASETS= 1       ITSETS= 0       IATT  = 0
  IRES  = 2       IFIXRS= 1       VT    = 0
   ASTRONAUT SET 1 ACTIVITY 2 ACTIVITY GROUP 1
   NASRQD=1 NCAN  =2
   ICAN  =2 1 * * * *
   TRS   =  0   0   0  DTD   =  0   1  18
   CPO   = 0    CD = 0    SDTCD= 0
   LOCAL RESORC SET 1 ACTIVITY 2   ACTIVITY GROUP1
   RESNO =  1      QUNREQ=     112,000
   TRS   =  0   0   0 DTD   =   0   1  18
   LOCAL RESORC SET 2 ACTIVITY 2   ACTIVITY GROUP1
   RESNO =  6      QUNREQ=       1,000
   TRS   =  0   0   0 DTD   =   0   1  18
```

```
 FIXED RESORC SET 1 ACTIVITY 2   ACTIVITY GROUP 1
 IFIXNO=  2     UNREQ =       1.000
ACTIVITY 3 ACTIVITY GROUP 1
DTACT =  0  1  0 DTAMRC=   0  0  0 DTMANA=  0  0  0
NARCM = 1      NARCD = 1      ICODE = 0
IASETS= 1      ITSETS= 0      IATT  = 0
IRES  = 2      IFIXRS= 1      VT    = 0
 ASTRONAUT SET 1 ACTIVITY 3 ACTIVITY GROUP 1
 NASRQD=1 NCAN  =1
 ICAN  =3 * * * * *
 TRS   =  0  0  0  DTD   =  0  1  0
 CPD   = 0   CD = 0   SDTCD= 0
 LOCAL RESORC SET 1 ACTIVITY 3   ACTIVITY GROUP1
 RESNO =  1     QUNREQ=      37.000
 TRS   =  0  0  0 DTD   =   0  1  0
 LOCAL RESORC SET 2 ACTIVITY 3   ACTIVITY GROUP1
 RESNO =  6     QUNREQ=       1.000
 TRS   =  0  0  0 DTD   =   0  1  0
 FIXED RESORC SET 1 ACTIVITY 3   ACTIVITY GROUP 1
 IFIXNO=  2     UNREQ =       1.000
```

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ASTRONAUT EVA HARDWARE EVALUATION (M508)

A. OBJECTIVE

- Evaluate and/or measure astronaut skills, astronaut performance, and selected pieces of EVA and IVA hardware.

B. OPERATIONS

- Two crewmen will perform the following four mechanical tasks under various conditions of restraint, while wearing different pressurized space suits and in shirtsleeves:
  - Precise hand movement task
  - Two-hand fine manipulative task
  - Gross and precise force and torque application task
  - Operational maintenance task

  The three restraint conditions involve a Flexible Waist Tether, Dutch Shoes, and a combination of both.
- Task sequence will be performed with unlimited and limited access to the work panel.

C. PLANNING LIMITATIONS

None

D. PERFORMANCE

Operation	Minimum No. of Performances	Duration of Performance	No. of Crewmen
• Task sequence-shirtsleeve; lim/unlim access	2	3hrs 30min	1
• Task sequence-operational pressure suit; lim/unlim access	2	4hrs 20min	2
• Task sequence-constant volume pressure suit; lim/unlim access	2	4hrs 20min	2

E. POINTING REQUIREMENTS

None

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```
    DETAILED EXOP DEFINITION
M508     EVA HARDWARE E
PRIORITY=    97 DES   =     65 PRO   =    100 DIF   =    30
NAGXOP=   2 NXOPCM=   1 NXOPCD=   1 CODE  = 1
IBFOR1=        PRET1 = -0 IBFOR2=        PRET2 = *
TMNTR=   9   0   0  TMXTR= 27   0   0  DTMNRC=   0   0   0

 ACTIVITY GROUP 1  NAG= 2 DTMXAG= 10   0   0
  ACTIVITY 1 ACTIVITY GROUP 1
  DTACT =   0   3 30 DTAMRC=    0   0   0 DTMNNA=   0   0   0
  NARCM =  1      NARCD =  1      ICODE = 0
  IASETS=  1      ITSETS=  0      IATT  = 0
  IRES  =  5      IFIXRS=  1      VT    = 0
   ASTRONAUT SET 1 ACTIVITY 1 ACTIVITY GROUP 1
   NASRQD=1 NCAN  =1
   ICAN  =2 * * * * *
   TRS   =   0   0   0  DTD    =   0   3 30
   CPO   =  0    CD =  0    SQTCD=  0
   LOCAL RESORC SET 1 ACTIVITY 1    ACTIVITY GROUP1
   RESNO =   1      QUNREQ=     420.000
   TRS   =   0   0   0 DTD    =    0   3 30
   LOCAL RESORC SET 2 ACTIVITY 1    ACTIVITY GROUP1
   RESNO =   5      QUNREQ=       1.000
   TRS   =   0   0   0 DTD    =    0   3 30
   LOCAL RESORC SET 3 ACTIVITY 1    ACTIVITY GROUP1
   RESNO =   6      QUNREQ=       1.000
   TRS   =   0   0   0 DTD    =    0   3 30
   LOCAL RESORC SET 4 ACTIVITY 1    ACTIVITY GROUP1
   RESNO =   7      QUNREQ=      13.000
   TRS   =   0   0   0 DTD    =    0   3 30
   LOCAL RESORC SET 5 ACTIVITY 1    ACTIVITY GROUP1
   RESNO =   8      QUNREQ=      18.000
   TRS   =   0   0   0 DTD    =    0   3 30
   FIXED RESORC SET 1 ACTIVITY 1    ACTIVITY GROUP 1
   IFIXNO=   2      UNREQ =       2.000
  ACTIVITY 2 ACTIVITY GROUP 1
  DTACT =   0   4 20 DTAMRC=    0   0   0 DTMNNA=   0   0   0
  NARCM =  2      NARCD =  2      ICODE = 0
  IASETS=  1      ITSETS=  0      IATT  = 0
  IRES  =  5      IFIXRS=  2      VT    = 0
   ASTRONAUT SET 1 ACTIVITY 2 ACTIVITY GROUP 1
   NASRQD=2 NCAN  =2
   ICAN  =2 3 * * * *
   TRS   =   0   0   0  DTD    =   0   4 20
   CPO   =  0    CD =  0    SQTCD=  0
   LOCAL RESORC SET 1 ACTIVITY 2    ACTIVITY GROUP1
   RESNO =   1      QUNREQ=     420.000
   TRS   =   0   0   0 DTD    =    0   4 20
   LOCAL RESORC SET 2 ACTIVITY 2    ACTIVITY GROUP1
   RESNO =   5      QUNREQ=       1.000
   TRS   =   0   0   0 DTD    =    0   4 20
   LOCAL RESORC SET 3 ACTIVITY 2    ACTIVITY GROUP1
   RESNO =   6      QUNREQ=       1.000
   TRS   =   0   0   0 DTD    =    0   4 20
```

```
 LOCAL RESORC SET 4 ACTIVITY 2   ACTIVITY GROUP1
 RESNO =  7      QUNREQ=      13.000
 TRS   =  0  0  0 DTD   =    0  4 20
 LOCAL RESORC SET 5 ACTIVITY 2   ACTIVITY GROUP1
 RESNO =  8      QUNREQ=      18.000
 TRS   =  0  0  0 DTD   =    0  4 20
 FIXED RESORC SET 1 ACTIVITY 2   ACTIVITY GROUP 1
 IFIXNO=  2      UNREQ =       2.000
 FIXED RESORC SET 2 ACTIVITY 2   ACTIVITY GROUP 1
 IFIXNO=  3      UNREQ =     140.000

ACTIVITY GROUP 2  NAG= 2 DTMXAG= 10  0  0
 ACTIVITY 1 ACTIVITY GROUP 2
 DTACT =  0  3 30 DTAMRC=   0  0  0 DTMNNA=  0  0  0
 NARCM = 1      NARCD = 1      ICODE = 0
 IASETS= 1      ITSETS= 0      IATT  = 0
 IRES  = 5      IFIXRS= 1      VT    = 0
  ASTRONAUT SET 1 ACTIVITY 1 ACTIVITY GROUP 2
  NASRQD=1 NCAN  =1
  ICAN  =3 * * * * *
  TRS   =  0  0  0  DTD   =  0  3 30
  CPO   = 0   CD = 0   SDTCD= 0
  LOCAL RESORC SET 1 ACTIVITY 1   ACTIVITY GROUP2
  RESNO =  1      QUNREQ=     420.000
  TRS   =  0  0  0 DTD   =    0  3 30
  LOCAL RESORC SET 2 ACTIVITY 1   ACTIVITY GROUP2
  RESNO =  5      QUNREQ=       1.000
  TRS   =  0  0  0 DTD   =    0  3 30
  LOCAL RESORC SET 3 ACTIVITY 1   ACTIVITY GROUP2
  RESNO =  6      QUNREQ=       1.000
  TRS   =  0  0  0 DTD   =    0  3 30
  LOCAL RESORC SET 4 ACTIVITY 1   ACTIVITY GROUP2
  RESNO =  7      QUNREQ=      13.000
  TRS   =  0  0  0 DTD   =    0  3 30
  LOCAL RESORC SET 5 ACTIVITY 1   ACTIVITY GROUP2
  RESNO =  8      QUNREQ=      18.000
  TRS   =  0  0  0 DTD   =    0  3 30
  FIXED RESORC SET 1 ACTIVITY 1   ACTIVITY GROUP 2
  IFIXNO=  2      UNREQ =       2.000
 ACTIVITY 2 ACTIVITY GROUP 2
 DTACT =  0  4 20 DTAMRC=   0  0  0 DTMNNA=  0  0  0
 NARCM = 2      NARCD = 2      ICODE = 0
 IASETS= 1      ITSETS= 0      IATT  = 0
 IRES  = 5      IFIXRS= 2      VT    = 0
  ASTRONAUT SET 1 ACTIVITY 2 ACTIVITY GROUP 2
  NASRQD=2 NCAN  =2
  ICAN  =2 3 * * * *
  TRS   =  0  0  0  DTD   =  0  4 20
  CPO   = 0   CD = 0   SDTCD= 0
  LOCAL RESORC SET 1 ACTIVITY 2   ACTIVITY GROUP2
  RESNO =  1      QUNREQ=     420.000
  TRS   =  0  0  0 DTD   =    0  4 20
```

```
LOCAL RESORC SET 2 ACTIVITY 2   ACTIVITY GROUP2
RESNO =  5      QUNREQ=       1.000
TRS   =  0  0  0 DTD   =   0  4 20
LOCAL RESORC SET 3 ACTIVITY 2   ACTIVITY GROUP2
RESNO =  6      QUNREQ=       1.000
TRS   =  0  0  0 DTD   =   0  4 20
LOCAL RESORC SET 4 ACTIVITY 2   ACTIVITY GROUP2
RESNO =  7      QUNREQ=      13.000
TRS   =  0  0  0 DTD   =   0  4 20
LOCAL RESORC SET 5 ACTIVITY 2   ACTIVITY GROUP2
RESNO =  8      QUNREQ=      18.000
TRS   =  0  0  0 DTD   =   0  4 20
FIXED RESORC SET 1 ACTIVITY 2   ACTIVITY GROUP 2
IFIXNO=  2      UNREQ =       2.000
FIXED RESORC SET 2 ACTIVITY 2   ACTIVITY GROUP 2
IFIXNO=  3      UNREQ =     140.000
```

C.2

ASTRONAUT MANEUVERING EQUIPMENT (M509)

A. OBJECTIVE

- Determine feasibility of, and compare the performance of, several maneuvering methods (direct jet, rate gyro/jet, control moment gyro and hand held maneuvering unit) using the Automatically Stabilized Maneuvering Unit (ASMU).
- Obtain correlation data between ground simulation and space flight.

B. OPERATIONS

- Crewmen will test each maneuvering method while in shirt sleeves and suited, while both tethered and in free flight.

C. PLANNING LIMITATIONS

None

D. PERFORMANCE

Operations	Minimum No. of Performances	Duration of Performance	No. of Crewmen
• Run 1 (Astronauts 2 & 3)	1	4hrs 45min	2
• Run 2 (Astronauts 1 & 3)	1	4hrs 45min	2
• Run 3 (Astronauts 2 & 3)	1	4hrs 55min	2
• Run 4 (Astronauts 1 & 2)	1	3hrs 35min	2

E. POINTING REQUIREMENTS

None

```
     DETAILED EXOP DEFINITION
M509      ASTRONAUT MANE
PRIOTY=     77 DES   =     45 PRO   =    100 DIF   =    34
NAGXOP=   4 NXOPCM=   1 NXOPCD=   1 CODE  = 1
IBFOR1=         PRET1 = -0 IBFOR2=         PRET2 = *
TMNTR= 26   0   0  TMXTR= 28   0   0  DTMNRC=  0   0   0

 ACTIVITY GROUP 1  NAG= 2 DTMXAG=  0   5   0
  ACTIVITY 1 ACTIVITY GROUP 1
  DTACT =  0   0 18 DTAMRC=   0   0   0 DTMNNA=  0   0   0
  NARCM = 1      NARCD = 1      ICODE = 0
  IASETS= 2      ITSETS= 0      IATT  = 0
  IRES  = 0      IFIXRS= 0      VT    = 0
   ASTRONAUT SET 1 ACTIVITY 1 ACTIVITY GROUP 1
   NASRQD=2 NCAN  =2
   ICAN  =2 3 * * * *
   TRS   =  0   0   0  DTD   =  0   0   3
   CPO   = 0    CD = 0    SDTCD= 0
   ASTRONAUT SET 2 ACTIVITY 1 ACTIVITY GROUP 1
   NASRQD=1 NCAN  =2
   ICAN  =2 3 * * * *
   TRS   =  0   0   3  DTD   =  0   0  15
   CPO   = 0    CD = 0    SDTCD= 0
  ACTIVITY 2 ACTIVITY GROUP 1
  DTACT =  0   4 25 DTAMRC=   0   0   0 DTMNNA=  0   0   0
  NARCM = 1      NARCD = 1      ICODE = 0
  IASETS= 1      ITSETS= 0      IATT  = 0
  IRES  = 3      IFIXRS= 1      VT    = 0
   ASTRONAUT SET 1 ACTIVITY 2 ACTIVITY GROUP 1
   NASRQD=2 NCAN  =2
   ICAN  =2 3 * * * *
   TRS   =  0   0   0  DTD   =  0   4  25
   CPO   = 0    CD = 0    SDTCD= 0
   LOCAL RESORC SET 1 ACTIVITY 2   ACTIVITY GROUP1
   RESNO =  1     QUNREQ=    206.000
   TRS   =  0   0   0 DTD   =   0   4 25
   LOCAL RESORC SET 2 ACTIVITY 2   ACTIVITY GROUP1
   RESNO =  3     QUNREQ=      1.000
   TRS   =  0   0   0 DTD   =   0   4 25
   LOCAL RESORC SET 3 ACTIVITY 2   ACTIVITY GROUP1
   RESNO =  6     QUNREQ=      1.000
   TRS   =  0   0   0 DTD   =   0   4 25
```

```
 FIXED RESORC SET 1 ACTIVITY 2   ACTIVITY GROUP 1
 IFIXNO= 2     UNREQ =     10.000

ACTIVITY GROUP 2  NAG= 2 DTMXAG=  0  5  0
 ACTIVITY 1 ACTIVITY GROUP 2
 DTACT =  0  0 18 DTAMRC=   0  0  0 DTMANA=  0  0  0
 NARCM = 1      NARCD = 1      ICODE = 0
 IASETS= 2      ITSETS= 0      IATT  = 0
 IRES  = 0      IFIXRS= 0      VT    = 0
  ASTRONAUT SET 1 ACTIVITY 1 ACTIVITY GROUP 2
  NASRQD=2 NCAN  =2
  ICAN  =1 3 * * * *
  TRS   =  0  0  0  DTD   =  0  0  3
  CPO   = 0   CD = 0   SDTCD= 0
  ASTRONAUT SET 2 ACTIVITY 1 ACTIVITY GROUP 2
  NASRQD=1 NCAN  =2
  ICAN  =1 3 * * * *
  TRS   =  0  0  3  DTD   =  0  0 15
  CPO   = 0   CD = 0   SDTCD= 0
 ACTIVITY 2 ACTIVITY GROUP 2
 DTACT =  0  4 25 DTAMRC=   0  0  0 DTMANA=  0  0  0
 NARCM = 1      NARCD = 1      ICODE = 0
 IASETS= 1      ITSETS= 0      IATT  = 0
 IRES  = 3      IFIXRS= 1      VT    = 0
  ASTRONAUT SET 1 ACTIVITY 2 ACTIVITY GROUP 2
  NASRQD=2 NCAN  =2
  ICAN  =1 3 * * * *
  TRS   =  0  0  0  DTD   =  0  4 25
  CPO   = 0   CD = 0   SDTCD= 0
  LOCAL RESORC SET 1 ACTIVITY 2   ACTIVITY GROUP2
  RESNO =  1     QUNREQ=    206.000
  TRS   =  0  0  0 DTD   =   0  4 25
  LOCAL RESORC SET 2 ACTIVITY 2   ACTIVITY GROUP2
  RESNO =  3     QUNREQ=      1.000
  TRS   =  0  0  0 DTD   =   0  4 25
  LOCAL RESORC SET 3 ACTIVITY 2   ACTIVITY GROUP2
  RESNO =  6     QUNREQ=      1.000
  TRS   =  0  0  0 DTD   =   0  4 25
```

```
  FIXED RESORC SET 1 ACTIVITY 2   ACTIVITY GROUP 2
  IFIXNO=  2      UNREQ =      10.000

ACTIVITY GROUP 3  NAG= 2 DTMXAG=  0  5 15
 ACTIVITY 1 ACTIVITY GROUP 3
 DTACT =  0  0 18 DTAMRC=   0  0  0 DTMINA=  0  0  0
 NARCM = 1      NARCD = 1      ICODE = 0
 IASETS= 2      ITSETS= 0      IATT  = 0
 IRES  = 0      IFIXRS= 0      VT    = 0
  ASTRONAUT SET 1 ACTIVITY 1 ACTIVITY GROUP 3
  NASRQD=2 NCAN  =2
  ICAN  =2 3 * * * *
  TRS   =  0  0  0  DTD   =  0  0  3
  CPO   = 0   CD = 0   SDTCD= 0
  ASTRONAUT SET 2 ACTIVITY 1 ACTIVITY GROUP 3
  NASRQD=1 NCAN  =2
  ICAN  =2 3 * * * *
  TRS   =  0  0  3  DTD   =  0  0 15
  CPO   = 0   CD = 0   SDTCD= 0
 ACTIVITY 2 ACTIVITY GROUP 3
 DTACT =  0  4 35 DTAMRC=   0  0  0 DTMINA=  0  0  0
 NARCM = 1      NARCD = 1      ICODE = 0
 IASETS= 1      ITSETS= 0      IATT  = 0
 IRES  = 3      IFIXRS= 1      VT    = 0
  ASTRONAUT SET 1 ACTIVITY 2 ACTIVITY GROUP 3
  NASRQD=2 NCAN  =2
  ICAN  =2 3 * * * *
  TRS   =  0  0  0  DTD   =  0  4 35
  CPO   = 0   CD = 0   SDTCD= 0
  LOCAL RESORC SET 1 ACTIVITY 2   ACTIVITY GROUP3
  RESNO =  1      QUNREQ=    206.000
  TRS   =  0  0  0 DTD   =  0  4 35
  LOCAL RESORC SET 2 ACTIVITY 2   ACTIVITY GROUP3
  RESNO =  3      QUNREQ=      1.000
  TRS   =  0  0  0 DTD   =  0  4 35
  LOCAL RESORC SET 3 ACTIVITY 2   ACTIVITY GROUP3
  RESNO =  6      QUNREQ=      1.000
  TRS   =  0  0  0 DTD   =  0  4 35
```

```
 FIXED RESORC SET 1 ACTIVITY 2   ACTIVITY GROUP 3
 IFIXNO=  2     UNREQ =     10.000

ACTIVITY GROUP 4  NAG= 2 DTMXAG=  0  4  0
 ACTIVITY 1 ACTIVITY GROUP 4
 DTACT =  0  0 18 DTAMRC=   0  0  0 DTMNNA=  0  0  0
 NARCM = 1      NARCD = 1      ICODE = 0
 IASETS= 2      ITSETS= 0      IATT  = 0
 IRES  = 0      IFIXRS= 0      VT    = 0
  ASTRONAUT SET 1 ACTIVITY 1 ACTIVITY GROUP 4
  NASRQD=2 NCAN  =2
  ICAN  =1 2 * * * *
  TRS   =  0  0  0  DTD   =  0  0  3
  CPO   = 0   CD = 0   SDTCD= 0
  ASTRONAUT SET 2 ACTIVITY 1 ACTIVITY GROUP 4
  NASRQD=1 NCAN  =2
  ICAN  =1 2 * * * *
  TRS   =  0  0  3  DTD   =  0  0 15
  CPO   = 0   CD = 0   SDTCD= 0
 ACTIVITY 2 ACTIVITY GROUP 4
 DTACT =  0  3 15 DTAMRC=   0  0  0 DTMNNA=  0  0  0
 NARCM = 1      NARCD = 1      ICODE = 0
 IASETS= 1      ITSETS= 0      IATT  = 0
 IRES  = 3      IFIXRS= 1      VT    = 0
  ASTRONAUT SET 1 ACTIVITY 2 ACTIVITY GROUP 4
  NASRQD=2 NCAN  =2
  ICAN  =1 2 * * * *
  TRS   =  0  0  0  DTD   =  0  3 15
  CPO   = 0   CD = 0   SDTCD= 0
  LOCAL RESORC SET 1 ACTIVITY 2   ACTIVITY GROUP4
  RESNO =  1     QUNREQ=    206.000
  TRS   =  0  0  0 DTD   =   0  3 15
  LOCAL RESORC SET 2 ACTIVITY 2   ACTIVITY GROUP4
  RESNO =  3     QUNREQ=      1.000
  TRS   =  0  0  0 DTD   =   0  3 15
  LOCAL RESORC SET 3 ACTIVITY 2   ACTIVITY GROUP4
  RESNO =  6     QUNREQ=      1.000
  TRS   =  0  0  0 DTD   =   0  3 15
  FIXED RESORC SET 1 ACTIVITY 2   ACTIVITY GROUP 4
  IFIXNO=  2     UNREQ =     10.000
```

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NUCLEAR EMULSION (S009)

A. OBJECTIVE

- Study charge spectra of cosmic ray particles.
- Obtain detailed composition of heavy primary nuclei.
- Search for rare particles.
- Study these phenomena as function of solar cycle.

B. OPERATIONS

- Emulsion package is activated as soon as possible into the mission, and deactivated at the end of the mission and placed in experiment container and stored in CM for return.

C. PLANNING LIMITATIONS

None

D. PERFORMANCE

Operation	Minimum No. of Performances	Duration of Performance	No. of Crewmen
• Activation of emulsion package	1	23 min	1
• Deactivation and retrieval	1	12 min	1

E. POINTING REQUIREMENTS

- Must point into space, with line-of-sight clear of the earth's atmosphere, for at least 50 percent of the experiment time.

```
     DETAILED EXOP DEFINITION
S009     NUCLEAR EMULSIO
PRIORTY=     75 DES    =     69 PRO    =    100 DIF    =     21
NAGXOP=   1 NXOPCM=   1 NXOPCD=   1 CODE   = 1
IBFOR1=         PRET1 = -0 IBFOR2=         PRET2 = *
TMNTR=   2 12   0  TMXTR= 29   0   0  DTMNRC=   0   0   0

 ACTIVITY GROUP 1  NAG= 1 DTMXAG= 26   2   0
  ACTIVITY 1 ACTIVITY GROUP 1
  DTACT = 26   1   0 DTAMRC=    0   0   0 DTMNNA=   0   0   0
  NARCM = 1       NARCD = 1       ICODE = 0
  IASETS= 2       ITSETS= 0       IATT  = 0
  IRES  = 0       IFIXRS= 0       VT    = 0
   ASTRONAUT SET 1 ACTIVITY 1 ACTIVITY GROUP 1
   NASRQD=1 NCAN  =3
   ICAN  =1 2 3 * * *
   TRS   =  0   0   0  DTD   =  0  ñ 23
   CPO   = 0    CD = 0    SDTCD= 0
   ASTRONAUT SET 2 ACTIVITY 1 ACTIVITY GROUP 1
   NASRQD=1 NCAN  =3
   ICAN  =1 2 3 * * *
   TRS   = 26   0 48  DTD   =  0  ñ 12
   CPO   = 0    CD = 0    SDTCD= 0
```

ZERO-G SINGLE HUMAN CELLS (SO15)

A. OBJECTIVE

- Observe the effects of zero gravity on living human cells in a tissue culture.

B. OPERATIONS

- Perform necessary biopack feed, label, rinse and fix cycle.

C. PLANNING LIMITATIONS

- Perform on fourth and tenth days.

D. PERFORMANCE

Operation	Minimum No. of Performances	Duration of Performance	No. of Crewmen
• Preparation, first label injection	2	15 min	1
• Rinse, second label injection	2	10 min	1
• Rinse, fixative injection, shutdown	2	25 min	1

A 45-minute delay is needed between the first and second operations, and 50 minutes is required between the last two operations.

E. POINTING REQUIREMENTS

None

```
     DETAILED EXOP DEFINITION
S015      ZERO-G SINGLE
PRIORITY=    71 DES   =    60 PRO   =   100 DIF   =    23
NAGXOP=  1 NXOPCM=  2 NXOPCD=  2 CODE  = 3
IBFOR1=       PRET1 = -0 IBFOR2=       PRET2 = *
TMNTR  TMXKR
  4  0  0   5  0  0

 ACTIVITY GROUP 1  NAG= 3 DTMXAG=  0  2 30
  ACTIVITY 1 ACTIVITY GROUP 1
  DTACT =  0  0 15 DTAMRC=   0  0  0 DTMNNA=  0  0 45
  NARCM = 1      NARCD = 1      ICODE = 0
  IASETS= 1      ITSETS= 0      IATT  = 0
  IRES  = 0      IFIXRS= 0      VT    = 0
   ASTRONAUT SET 1 ACTIVITY 1 ACTIVITY GROUP 1
   NASRQD=1 NCAN  =3
   ICAN  =3 2 1 * * *
   TRS   =  0  0  0  DTD   =  0  0 15
   CPO   = 0   CD = 0   SDTCD= 0
  ACTIVITY 2 ACTIVITY GROUP 1
  DTACT =  0  0 10 DTAMRC=   0  0  0 DTMNNA=  0  0 50
  NARCM = 1      NARCD = 1      ICODE = 0
  IASETS= 1      ITSETS= 0      IATT  = 0
  IRES  = 0      IFIXRS= 0      VT    = 0
   ASTRONAUT SET 1 ACTIVITY 2 ACTIVITY GROUP 1
   NASRQD=1 NCAN  =3
   ICAN  =3 2 1 * * *
   TRS   =  0  0  0  DTD   =  0  0 10
   CPO   = 0   CD = 0   SDTCD= 0
  ACTIVITY 3 ACTIVITY GROUP 1
  DTACT =  0  0 25 DTAMRC=   0  0  0 DTMNNA=  0  0  0
  NARCM = 1      NARCD = 1      ICODE = 0
  IASETS= 1      ITSETS= 0      IATT  = 0
  IRES  = 0      IFIXRS= 0      VT    = 0
   ASTRONAUT SET 1 ACTIVITY 3 ACTIVITY GROUP 1
   NASRQD=1 NCAN  =3
   ICAN  =3 2 1 * * *
   TRS   =  0  0  0  DTD   =  0  0 25
   CPO   = 0   CD = 0   SDTCD= 0
```

UV STELLAR ASTRONOMY (S019)

A. OBJECTIVE

- Obtain UV photographic exposures of 27 star fields on celestial sphere.

B. OPERATIONS

- Locate and photograph preselected UV areas.
- Six exposures per star field; programmed exposure times will be 30 seconds, 1 minute, and 2 minutes (2 exposures for each time).

C. PLANNING LIMITATIONS

- Experiment must be performed during dark side passes (experiment will remain on airlock during day portion of orbit but will not require attention of astronaut; experiment should be demounted and stowed between observing periods separated by more than 12 hours to minimize exposure to radiation).
- At least two separate observing periods be allotted to this experiment with an interval of at least five days between the two.
- It is assumed that two target fields (i.e., 12 exposures) may be photographed during one night time pass.

D. PERFORMANCE

Operation	Minimum No. of Performances	Duration of Performance	No. of Crewmen
• Installation of spectograph and mirror system	2	30 min	1
• Photograph star field	27	15 min	1
• Post-operational tasks	2	60 min	1

E. POINTING REQUIREMENTS

- OA orientation: ±2 degrees attitude hold.
- Experiment has mirror system to aid in UV acquisition.

```
     DETAILED EXOP DEFINITION
S019    UV STELLAR ASTR
PRIORITY=    48 DES   =     52 PRO   =    100 DIF   =    18
NAGXOP=   1 NXOPCM=   2 NXOPCD=   2 CODE   = 1
IBFOR1=        PRET1 = -0 IBFOR2=        PRET2 = *
TMNTR= 11   0   0  TMXTR= 27   0   0  DTMNRC=   9   0   0

 ACTIVITY GROUP 1  NAG= 3 DTMXAG=   5   0   0
  ACTIVITY 1 ACTIVITY GROUP 1
  DTACT =   0   0 30 DTAMRC=    0   0   0 DTMNNA=   0   0   0
  NARCM =  1      NARCD =  1      ICODE =  0
  IASETS=  1      ITSETS=  0      IATT  =  0
  IRES  =  0      IFIXRS=  0      VT    =  0
   ASTRONAUT SET 1 ACTIVITY 1 ACTIVITY GROUP 1
   NASRQD=1 NCAN  =3
   ICAN  =3 2 1 * * *
   TRS   =  0   0   0  DTD    =  0   0 30
   CPO   =  0    CD =  0    SDTCD=  0
  ACTIVITY 2 ACTIVITY GROUP 1
  DTACT =   0   1 30 DTAMRC=    0   0   0 DTMNNA=   0   0   0
  NARCM =  7      NARCD =  7      ICODE =  0
  IASETS=  1      ITSETS=  1      IATT  =  1
  IRES  =  0      IFIXRS=  0      VT    =  0
   ASTRONAUT SET 1 ACTIVITY 2 ACTIVITY GROUP 1
   NASRQD=1 NCAN  =3
   ICAN  =3 2 1 * * *
   TRS   =  0   1   0  DTD    =  0   0 30
   CPO   =  0    CD =  0    SDTCD=  0
   TRAJECTORY SET 1 ACTIVITY 2 ACTIVITY GROUP  1
   BODY  = SUN     BODNAM= SUN     LTF   = 0
   TRS   =  0   0   0      DTD    =  0   0 56
   ATTITUDE SET 1 ACTIVITY 2 ACTIVITY GROUP 1
   MODEC = 1
   TRS   =  0   1   0 DTD    =  0   0 30
  ACTIVITY 3 ACTIVITY GROUP 1
  DTACT =   0   1   0 DTAMRC=    0   0   0 DTMNNA=   0   0   0
  NARCM =  1      NARCD =  1      ICODE =  0
  IASETS=  1      ITSETS=  0      IATT  =  0
  IRES  =  0      IFIXRS=  0      VT    =  0
   ASTRONAUT SET 1 ACTIVITY 3 ACTIVITY GROUP 1
   NASRQD=1 NCAN  =3
   ICAN  =3 2 1 * * *
   TRS   =  0   0   0  DTD    =  0   1   0
   CPO   =  0    CD =  0    SDTCD=  0
```

UV/X-RAY SOLAR PHOTOGRAPHY (S020)

A. OBJECTIVE

- Photographically obtain spectograms of solar radiation between 10-200 angstroms over two ranges and resolutions during active and inactive solar conditions.

B. OPERATIONS

- Obtain solar photographs of "quiet" sun using pre-established exposure periods; 10 exposures, two each of the following lengths: 60 minutes, 30 minutes, 15 minutes, 8 minutes and 5 minutes (the 60-minute exposures may be broken down into two 30-minute exposures).
- Obtain additional exposures during periods of solar activity when informed by ground that a solar flare is to occur.

C. PLANNING LIMITATIONS

- Perform during daylight, between 5 minutes after OA sunrise and 5 minutes before OA sunset.
- Preferable to photograph one sequence of each exposure length as early as possible in the mission and the remainder as late as possible.

D. PERFORMANCE

Operation	Minimum No. of Performances	Duration of Performance	No. of Crewmen
• Experiment setup in SAL	2	35 min	1
• 5-exposure sequence (include 6-minute preparation for each exposure)	2	2 hr 30 min	1
• Stow film/shut down system	2	45 min	1

E. POINTING REQUIREMENTS

- Attitude hold: ±-.25 degree when photographing solar disc.

```
     DETAILED EXOP DEFINITION
S020      X-RAY SOLAR PH
PRIOTY=     84 DES    =     58 PRO    =    100 DUR    =    29
NAGXOP=   1 NXOPCM=   2 NXOPCD=   2 CODE   = 1
IBFOR1=         PRET1 = -0 IBFOR2=         PRET2 = *
TMNTR=  3   0   0  TMXTR= 27   0   0  DTMNRC= 15   0   0

 ACTIVITY GROUP 1  NAG= 6 DTMXAG= 26   0   0
  ACTIVITY 1 ACTIVITY GROUP 1
  DTACT =   0   0 35 DTAMRC=    0   0   0 DTMNNA=   0   0   0
  NARCM = 1       NARCD = 1       ICODE = 0
  IASETS= 1       ITSETS= 0       IATT  = 0
  IRES  = 0       IFIXRS= 0       VT    = 0
   ASTRONAUT SET 1 ACTIVITY 1 ACTIVITY GROUP 1
   NASRQD=1 NCAN  =3
   ICAN  =3 2 1 * * *
   TRS   =  0   0   0  DTD   =  0   0 35
   CPO   = 0    CD = 0    SDTCD= 0
  ACTIVITY 2 ACTIVITY GROUP 1
  DTACT =   0   0 36 DTAMRC=    0   0   0 DTMNNA=   0   0   0
  NARCM = 3       NARCD = 3       ICODE = 0
  IASETS= 1       ITSETS= 1       IATT  = 1
  IRES  = 1       IFIXRS= 0       VT    = 0
   ASTRONAUT SET 1 ACTIVITY 2 ACTIVITY GROUP 1
   NASRQD=1 NCAN  =3
   ICAN  =3 2 1 * * *
   TRS   =  0   0   0  DTD   =  0   0 36
   CPO   = 0    CD = 0    SDTCD= 0
   TRAJECTORY SET 1 ACTIVITY 2 ACTIVITY GROUP  1
   BODY  = SUN     BODNAM= SUN     LTF   = 0
   TRS   =  0   0   5      DTD   =  0   0 41
   ATTITUDE SET 1 ACTIVITY 2 ACTIVITY GROUP 1
   MODEC = 1
```

```
 TRS    =  0  0  0 DTD    =  0  0 36
 LOCAL RESORC SET 1 ACTIVITY 2   ACTIVITY GROUP1
 RESNO =  1      QUNREQ=       7.000
 TRS    =  0  0  0 DTD    =  0  0 36
ACTIVITY 3 ACTIVITY GROUP 1
DTACT =  0  0 21 DTAMRC=   0  0  0 DTMANA=     0  0
NARCM = 1      NARCD = 1      ICODE = 1
IASETS= 1      ITSETS= 1      IATT  = 1
IRES  = 1      IFIXRS= 0      VT    = 0
 ASTRONAUT SET 1 ACTIVITY 3 ACTIVITY GROUP 1
 NASRQD=1 NCAN  =3
 ICAN  =3 2 1 * * *
 TRS    =  0  0  0  DTD    =  0  0 21
 CPD    = 0    CD = 0    SDTCD= 0
 TRAJECTORY SET 1 ACTIVITY 3 ACTIVITY GROUP  1
 BODY  = SUN     BODNAM= SUN     LTF    = 0
 TRS    =  0  0  5      DTD    =  0  0 26
 ATTITUDE SET 1 ACTIVITY 3 ACTIVITY GROUP 1
 MODEC = 1
 TRS    =  0  0  0 DTD    =  0  0 21
 LOCAL RESORC SET 1 ACTIVITY 3   ACTIVITY GROUP1
 RESNO =  1      QUNREQ=       7.000
 TRS    =  0  0  0 DTD    =  0  0 21
ACTIVITY 4 ACTIVITY GROUP 1
DTACT =  0  0 14 DTAMRC=   0  0  0 DTMANA=     0  0
NARCM = 1      NARCD = 1      ICODE = 1
IASETS= 1      ITSETS= 1      IATT  = 1
IRES  = 1      IFIXRS= 0      VT    = 0
 ASTRONAUT SET 1 ACTIVITY 4 ACTIVITY GROUP 1
 NASRQD=1 NCAN  =3
 ICAN  =3 2 1 * * *
 TRS    =  0  0  0  DTD    =  0  0 14
 CPD    = 0    CD = 0    SDTCD= 0
 TRAJECTORY SET 1 ACTIVITY 4 ACTIVITY GROUP  1
 BODY  = SUN     BODNAM= SUN     LTF    = 0
 TRS    =  0  0  5      DTD    =  0  0 19
 ATTITUDE SET 1 ACTIVITY 4 ACTIVITY GROUP 1
 MODEC = 1
```

```
 TRS    =  0  0  0 DTD    =  0  0 14
 LOCAL RESORC SET 1 ACTIVITY 4   ACTIVITY GROUP1
 RESNO =  1      QUNREQ=       7.000
 TRS    =  0  0  0 DTD    =   0  0 14
ACTIVITY 5 ACTIVITY GROUP 1
DTACT =  0  0 11 DTAMRC=   0  0  0 DTMNNA=  0  0  0
NARCM = 2      NARCD = 2      ICODE = 1
IASETS= 1      ITSETS= 1      IATT  = 1
IRES  = 1      IFIXRS= 0      VT    = 0
 ASTRONAUT SET 1 ACTIVITY 5 ACTIVITY GROUP 1
 NASRQD=1 NCAN  =3
 ICAN  =3 2 1 * * *
 TRS    =  0  0  0  DTD    =  0  0 11
 CPD    = 0    CD = 0    SDTCD= 0
 TRAJECTORY SET 1 ACTIVITY 5 ACTIVITY GROUP  1
 BODY  = SUN    BODNAM= SUN    LTF   = 0
 TRS    =  0  0  5     DTD    =  0  0 16
 ATTITUDE SET 1 ACTIVITY 5 ACTIVITY GROUP 1
 MODEC = 1
 TRS    =  0  0  0 DTD    =  0  0 11
 LOCAL RESORC SET 1 ACTIVITY 5   ACTIVITY GROUP1
 RESNO =  1      QUNREQ=       7.000
 TRS    =  0  0  0 DTD    =   0  0 11
ACTIVITY 6 ACTIVITY GROUP 1
DTACT =  0  0 45 DTAMRC=   0  0  0 DTMNNA=  0  0  0
NARCM = 1      NARCD = 1      ICODE = 0
IASETS= 1      ITSETS= 0      IATT  = 0
IRES  = 0      IFIXRS= 0      VT    = 0
 ASTRONAUT SET 1 ACTIVITY 6 ACTIVITY GROUP 1
 NASRQD=1 NCAN  =3
 ICAN  =3 2 1 * * *
 TRS    =  0  0  0  DTD    =  0  0 45
 CPD    = 0    CD = 0    SDTCD= 0
```

PARTICLE COLLECTION (S149)

A. OBJECTIVE

- Determine distribution, composition, and morphologies of micrometeorites in near-earth space.

B. OPERATIONS

- Cassettes are exposed for a period of 72 hours to near-earth space for collection of micrometeorites.

C. PLANNING LIMITATIONS

None

D. PERFORMANCE

Operation	Minimum No. of Performances	Duration of Performance	No. of Crewmen
• Unstow, set up, and extend to operating system	1	43 min	1
• Expose cassettes	1	72 hr	1*
• Retrieve and stow	1	15 min	1

* Crewman necessary for first 5 minutes only to backup with onboard activation if ground control monitoring malfunctions.

E. POINTING REQUIREMENTS

- Experiment hardware will be positioned by deployment of the T027 extension device out of the SAL on the anti-sun side of the OWS.

```
     DETAILED EXOP DEFINITION
S149     MICROMETEORITE
PRIORTY=     95 DES    =     66 PRO    =    100 DIF    =    29
NAGXOP=   1 NXOPCM=   1 NXOPCD=   1 CODE   = 1
IBFOR1=         PRET1 = -0 IBFOR2=         PRET2 = *
TMNTR=  2   0   0   TMXTR= 27   0   0  DTMNRC=   0   0   0

 ACTIVITY GROUP 1   NAG= 2 DTMXAG=   3   3   0
  ACTIVITY 1 ACTIVITY GROUP 1
  DTACT =   3   0 43 DTAMRC=    0   0   0 DTMNNA=   0   0   0
  NARCM = 1       NARCD = 1       ICODE = 0
  IASETS= 1       ITSETS= 0       IATT  = 1
  IRES  = 1       IRIXRS= 0       VT    = 0
   ASTRONAUT SET 1 ACTIVITY 1 ACTIVITY GROUP 1
   NASRQD=1 NCAN  =3
   ICAN  =1 2 3 * * *
   TRS   =  0   0   0  DTD    =  0  H 48
   CPO   = 1    CD = 0    SDTCD= 0
   ATTITUDE SET 1 ACTIVITY 1 ACTIVITY GROUP 1
   MODEC = 1
   TRS   =  0   0   0 DTD    =  3   0 43
   LOCAL RESORC SET 1 ACTIVITY 1   ACTIVITY GROUP1
   RESNO =  1      QUNREQ=      50,000
   TRS   =  0   0   0 DTD    =  3  H 43
  ACTIVITY 2 ACTIVITY GROUP 1
  DTACT =  0   0 15 DTAMRC=    0   0   0 DTMNNA=   0   0   0
  NARCM = 1       NARCD = 1       ICODE = 0
  IASETS= 1       ITSETS= 0       IATT  = 0
  IRES  = 0       IRIXRS= 0       VT    = 0
   ASTRONAUT SET 1 ACTIVITY 2 ACTIVITY GROUP 1
   NASRQD=1 NCAN  =3
   ICAN  =1 2 3 * * *
   TRS   =  0   0   0  DTD    =  0  H 15
   CPO   = 1    CD = 0    SDTCD= 0
```

MULTISPECTRAL PHOTOGRAPHIC FACILITY (S190)

A. OBJECTIVE

- Obtain multispectral photographic data to provide for a wide range of user oriented studies and determine the extent to which precision and repetitive multispectral photographic data from space can be effectively applied to earth resources discipline.

B. OPERATIONS

- Photography in local vertical attitude over prescribed land mass targets.

C. PLANNING LIMITATIONS

- Sun elevation angle greater than 30 and 20 degrees in the summer and winter hemispheres, respectively.
- Exposures limited to daylight passes only.
- Approximately 20 percent of the exposures made with sun less than 60 degrees above horizon.
- Targets are preselected land mass areas; distribution will be 70% to 80% over the United States with the balance over other countries.
- Cloud cover should not exceed TBD% unless under specific instructions from the ground.

D. PERFORMANCE

- The number of performances will depend upon the availability of targets during the mission; mimimum number of performances is 45 for the 3 missions. Each performance has the following operations, requiring one crewman:
  - Preparation (unstow, position camera, install film) - 25 minutes
  - Photography (exposures of prescribed land masses) - 10 minutes
  - Post-operational (remove film, stow camera) - 25 minutes

E. POINTING REQUIREMENTS

- Alignment of the camera array principal axes to be within ±2.5 degrees of the nadir.
- Drift not to exceed 0.1 deg/sec.

```
     DETAILED EXOP DEFINITION
S190    MULTISPECTRAL P
PRIORTY=    51 DES   =    64 PRO   =   100 DIF   =   16
NAGXOP=   4 NXOPCM=   1 NXOPCD=   1 CODE   = 1
IBFOR1=        PRET1 = -0 IBFOR2=        PRET2 = *
TMNTR=  5   0   0  TMXTR= 27   0   0  DTMNRC=   0   0   0

 ACTIVITY GROUP 1  NAG= 1 DTMXAG= 23   0   0
  ACTIVITY 1 ACTIVITY GROUP 1
  DTACT =   0   1   0 DTAMRC=    0   0   0 DTMNNA=   0   0   0
  NARCM = 2      NARCD = 4      ICODE = 0
  IASETS= 1      ITSETS= 1      IATT  = 0
  IRES  = 1      IPIXRS= 0      VT    = 0
   ASTRONAUT SET 1 ACTIVITY 1 ACTIVITY GROUP 1
   NASRQD=1 NCAN  =2
   ICAN  =3 2 * * * *
   TRS   =  0   0   0  DTD   =  0   1   0
   CPO   = 0   CD = 0   SDTCD= 0
   TRAJECTORY SET 1 ACTIVITY 1 ACTIVITY GROUP  1
   BODY  = LANDMK BODNAM= ANOMLY ITF   = 1
   TRS   =  0   0 29      DTD   =  0   0   2
   DTMIN =  0   9   0     DTMAX =  0 16   0
   LOCAL RESORC SET 1 ACTIVITY 1   ACTIVITY GROUP1
   RESNO = 10     GUNREQ=       1,000
   TRS   =  0   0   0 DTD   =   0   1   0

 ACTIVITY GROUP 2  NAG= 1 DTMXAG= 23   0   0
  ACTIVITY 1 ACTIVITY GROUP 2
  DTACT =   0   1   0 DTAMRC=    0   0   0 DTMNNA=   0   0   0
  NARCM = 4      NARCD = 6      ICODE = 0
  IASETS= 1      ITSETS= 1      IATT  = 0
  IRES  = 1      IPIXRS= 0      VT    = 0
   ASTRONAUT SET 1 ACTIVITY 1 ACTIVITY GROUP 2
   NASRQD=1 NCAN  =2
   ICAN  =3 2 * * * *
   TRS   =  0   0   0  DTD   =  0   1   0
   CPO   = 0   CD = 0   SDTCD= 0
   TRAJECTORY SET 1 ACTIVITY 1 ACTIVITY GROUP  2
   BODY  = LANDMK BODNAM= TEXAS  ITF   = 1
   TRS   =  0   0 29      DTD   =  0   0   2
   DTMIN =  0   9   0     DTMAX =  0 16   0
   LOCAL RESORC SET 1 ACTIVITY 1   ACTIVITY GROUP2
   RESNO = 10     GUNREQ=       1,000
   TRS   =  0   0   0 DTD   =   0   1   0

 ACTIVITY GROUP 3  NAG= 1 DTMXAG= 23   0   0
  ACTIVITY 1 ACTIVITY GROUP 3
  DTACT =   0   1   0 DTAMRC=    0   0   0 DTMNNA=   0   0   0
  NARCM = 3      NARCD = 5      ICODE = 0
```

```
 IASETS= 1      ITSETS= 1      IATT  = 0
 IRES  = 1      IFIXRS= 0      VT    = 0
  ASTRONAUT SET 1 ACTIVITY 1 ACTIVITY GROUP 3
  NASRQD=1 NCAN  =2
  ICAN  =3 2 * * * *
  TRS   =  0  0  0  DTD   =  0  1  0
  CPO   = 0   CD = 0   SDTCD= 0
  TRAJECTORY SET 1 ACTIVITY 1 ACTIVITY GROUP  3
  BODY  = LANDMK BODNAM= ONTARIO TF   = 1
  TRS   =  0  0 29     DTD   =  0  0  2
  DTMIN =  0  9  0     DTMAX =  0 16  0
  LOCAL RESORC SET 1 ACTIVITY 1   ACTIVITY GROUP3
  RESNO = 10     QUNREQ=      1,000
  TRS   =  0  0  0 DTD   =  0  1  0

ACTIVITY GROUP 4  NAG= 1 DTMXAG= 23  0  0
  ACTIVITY 1 ACTIVITY GROUP 4
  DTACT =  0  1  0 DTAMRC=   0  0  0 DTMNNA=  0  0  0
  NARCM = 1      NARCD = 2      ICODE = 0
  IASETS= 1      ITSETS= 1      IATT  = 0
  IRES  = 1      IFIXRS= 0      VT    = 0
  ASTRONAUT SET 1 ACTIVITY 1 ACTIVITY GROUP 4
  NASRQD=1 NCAN  =2
  ICAN  =3 2 * * * *
  TRS   =  0  0  0  DTD   =  0  1  0
  CPO   = 0   CD = 0   SDTCD= 0
  TRAJECTORY SET 1 ACTIVITY 1 ACTIVITY GROUP  4
  BODY  = LANDMK BODNAM= GANDER TF   = 1
  TRS   =  0  0 29     DTD   =  0  0  2
  DTMIN =  0  9  0     DTMAX =  0 16  0
  LOCAL RESORC SET 1 ACTIVITY 1   ACTIVITY GROUP4
  RESNO = 10     QUNREQ=      1,000
  TRS   =  0  0  0 DTD   =  0  1  0
```

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IN-FLIGHT AEROSOL ANALYSIS (T003)

A. OBJECTIVE

- Measure the aerosol particle concentration and size distribution inside the spacecraft as a function of time.
- Collect the measured aerosol particles for postflight analysis.

B. OPERATIONS

- As early as possible after OWS activation, the instrument will be removed from its storage location and samples taken; measurements will be continued periodically in the CM, forward dome, and crew quarters until mission completion as per the following schedule:
  - After securing nephelometer to CS-12 immediately following OWS activation, astronaut performs experiment at this station every eight hours (±2 hours) thereafter.
  - On days 4, 14, and 24, immediately following a reading at CS-12 he will move the experiment to CS-10, CS-1, and CS-11 and take one reading with the instrument hand held at each of these stations, respectively; the nephelometer is to be always returned to CS-12 with the experiment performed at the aforementioned frequency.
  - One reading should also be taken on days 4, 14, and 24 whenever crewman enters stations CS-15 (before food preparation and after eating), CS-16 (before and after use of sanitary facilities), and CS-14 (immediately after change and/or suit donning).
  - At astronaut's discretion, 10 readings may be made during the flight at times and positions that may be a source of particulate generation.

C. PLANNING LIMITATIONS

- Experiment is not to be performed if the cabin temperature is above 90°F or 85 percent relative humidity or if visible fogging exists.

D. PERFORMANCE

Operation	Minimum No. of Performances	Duration of Performance	No. of Crewmen
• Reading at CS-12	66	3 min	1
• Readings at CS-10, CS-1, CS-11	3	15 min	1
• Readings at CS-15, CS-16, CS-14	3	24 min	1
• Astronaut selected readings	10	7 min	1

E. POINTING REQUIREMENTS

None

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```
     DETAILED EXOP DEFINITION
T003A    INFLIGHT NEPHE
PRIORTY=    88 DES    =     82 PRO    =    100 DIF    =    21
NAGXOP=   2 NXOPCM=   3 NXOPCD=   3 CODE   = 3
IBFOR1=         PRET1 = -0 IBFOR2=         PRET2 = *
TMNTR  TMXKR
  4   0   0    5   0   0

 ACTIVITY GROUP 1  NAG= 1 DTMXAG=   1   0   0
  ACTIVITY 1 ACTIVITY GROUP 1
  DTACT =   0   0 18 DTAMRC=    0 16   0 DTMNNA=   0   0   0
  NARCM = 2       NARCD = 2       ICODE = 0
  IASETS= 1       ITSETS= 0       IATT  = 0
  IRES  = 0       IFIXRS= 0       VT    = 0
   ASTRONAUT SET 1 ACTIVITY 1 ACTIVITY GROUP 1
   NASRQD=1 NCAN  =3
   ICAN  =1 2 3 * * *
   TRS   =  0   0   0  DTD   =  0   0 18
   CPD   = 1    CD = 2   SDTCD= 1
   DTMNCD=   0   0   0  DTMXCD=   0   0   1

 ACTIVITY GROUP 2  NAG= 1 DTMXAG=   0   1   0
  ACTIVITY 1 ACTIVITY GROUP 2
  DTACT =   0   0 18 DTAMRC=    0   0   0 DTMNNA=   0   0   0
  NARCM = 1       NARCD = 1       ICODE = 0
  IASETS= 1       ITSETS= 0       IATT  = 0
  IRES  = 0       IFIXRS= 0       VT    = 0
   ASTRONAUT SET 1 ACTIVITY 1 ACTIVITY GROUP 2
   NASRQD=1 NCAN  =3
   ICAN  =1 2 3 * * *
   TRS   =  0   0   0  DTD   =  0   0 18
   CPD   = 1    CD = 1   SDTCD= 0
```

```
     DETAILED EXOP DEFINITION
T0038    INFLIGHT NEPHE
PRIORTY=   124 DES   =     82 PRO   =   100 DIF   =    30
NAGXOP=  2 NXOPCM= 22 NXOPCD= 23 CODE  = 1
IBFOR1=        PRET1 = -0 IBFOR2=        PRET2 = *
TMNTR=  2   0   0  TMXTR= 28   0   0  DTMNRC=  0   0   0

 ACTIVITY GROUP 1  NAG= 1 DTMXAG=  1   0   0
  ACTIVITY 1 ACTIVITY GROUP 1
  DTACT =  0   0   3 DTAMRC=    0 17   0 DTMNNA=  0   0   0
  NARCM = 2      NARCD = 2      ICODE = 0
  IASETS= 1      ITSETS= 0      IATT  = 0
  IRES  = 0      IFIXRS= 0      VT    = 0
   ASTRONAUT SET 1 ACTIVITY 1 ACTIVITY GROUP 1
   NASRQD=1 NCAN  =3
   ICAN  =1 2 3 * * *
   TRS   =  0   0   0  DTD   =  0   0   3
   CPO   = 1    CD = 2    SDTCD= 1
   DTMNCD=  0   0   0  DTMXCD=  0   0   1

 ACTIVITY GROUP 2  NAG= 1 DTMXAG=  0   1   0
  ACTIVITY 1 ACTIVITY GROUP 2
  DTACT =  0   0   3 DTAMRC=    0   0   0 DTMNNA=  0   0   0
  NARCM = 1      NARCD = 1      ICODE = 0
  IASETS= 1      ITSETS= 0      IATT  = 0
  IRES  = 0      IFIXRS= 0      VT    = 0
   ASTRONAUT SET 1 ACTIVITY 1 ACTIVITY GROUP 2
   NASRQD=1 NCAN  =3
   ICAN  =1 2 3 * * *
   TRS   =  0   0   0  DTD   =  0   0   3
   CPO   = 1    CD = 1    SDTCD= 0
```

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FOOT CONTROLLED MANEUVERING UNIT (T020)

A. OBJECTIVE

- Determine feasibility of the Foot Controlled Maneuvering Unit (FCMU)
- Obtain operational data for future design and compare with other EVA maneuvering concepts.

B. OPERATIONS

- Perform preselected maneuvers (suited and unsuited) using the FCMU with and without a Propulsion Gas Umbilical (PGU).
- One astronaut operates FCMU while a second astronaut acts as observer and safety man; upon completion of a series of maneuvers by one astronaut, the two men will exchange places and repeat the maneuvers.
- A period at the beginning of each series of maneuvers will be devoted to practicing to develop a feel for the prescribed experiment maneuvers.

C. PLANNING LIMITATIONS

- Experiment will be performed in three runs; each of the three runs should be conducted on separate days, minimizing the dumping of OWS gas overboard.

D. PERFORMANCE

Operation	Minimum No. of Performances	Duration of Performance	No. of Crewmen
• Run 1 (Astronauts 1 & 2 test/shirtsleeve, Astronaut 1 tests/suited)	1	150 min	2
• Run 2 (Astronaut 2 tests/ suited)	1	90 min	2
• Run 3 (Astronaut 3 tests/ shirtsleeve)	1	66 min	2

E. POINTING REQUIREMENTS

None

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```
     DETAILED EXOP DEFINITION
1020      FOOT CONTROLLE
PRIOTY=   126 DES   =     70 PRO   =    100 DIF   =    36
NAGXOP=   1 NXOPCM=   1 NXOPCD=   1 CODE  = 1
IBFOR1=         PRET1 = -0 IBFOR2=         PRET2 = *
TMNTR= 14   0   0  TMXTR= 27   0   0  DTMNRC=   0   0   0

 ACTIVITY GROUP 1  NAG= 3 DTMXAG=   8   0   0
  ACTIVITY 1 ACTIVITY GROUP 1
  DTACT =   0   2 30 DTAMRC=    0   0   0 DTMNNA=  3   0   0
  NARCM = 1       NARCD = 1       ICODE = 0
  IASETS= 2       ITSETS= 0       IATT  = 0
  IRES  = 3       IFIXRS= 2       VT    = 0
   ASTRONAUT SET 1 ACTIVITY 1 ACTIVITY GROUP 1
   NASRQD=1 NCAN  =1
   ICAN  =1 * * * * *
   TRS   =  0   0   0  DTD   =  0   2 30
   CPD   = 0    CD = 0    SDTCD= 0
   ASTRONAUT SET 2 ACTIVITY 1 ACTIVITY GROUP 1
   NASRQD=1 NCAN  =1
   ICAN  =2 * * * * *
   TRS   =  0   0   9  DTD   =  0   1 51
   CPD   = 0    CD = 0    SDTCD= 0
   LOCAL RESORC SET 1 ACTIVITY 1   ACTIVITY GROUP1
   RESNO =  1      QUNREQ=     126,000
   TRS   =  0   0   9 DTD   =   0   1 51
   LOCAL RESORC SET 2 ACTIVITY 1   ACTIVITY GROUP1
   RESNO =  3      QUNREQ=       1,000
   TRS   =  0   0   9 DTD   =   0   1 51
   LOCAL RESORC SET 3 ACTIVITY 1   ACTIVITY GROUP1
   RESNO =  6      QUNREQ=       1,000
   TRS   =  0   0   9 DTD   =   0   1 51
   FIXED RESORC SET 1 ACTIVITY 1   ACTIVITY GROUP 1
   IFIXNO=  2      UNREQ =       1,000
   FIXED RESORC SET 2 ACTIVITY 1   ACTIVITY GROUP 1
   IFIXNO=  3      UNREQ =      14,000
  ACTIVITY 2 ACTIVITY GROUP 1
  DTACT =   0   1 30 DTAMRC=    0   0   0 DTMNNA=  3   0   0
  NARCM = 1       NARCD = 1       ICODE = 0
  IASETS= 2       ITSETS= 0       IATT  = 0
  IRES  = 3       IFIXRS= 2       VT    = 0
   ASTRONAUT SET 1 ACTIVITY 2 ACTIVITY GROUP 1
   NASRQD=1 NCAN  =1
   ICAN  =2 * * * * *
   TRS   =  0   0   0  DTD   =  0   1 30
   CPD   = 0    CD = 0    SDTCD= 0
   ASTRONAUT SET 2 ACTIVITY 2 ACTIVITY GROUP 1
   NASRQD=1 NCAN  =1
   ICAN  =1 * * * * *
   TRS   =  0   0 10  DTD   =  0   0 50
   CPD   = 0    CD = 0    SDTCD= 0
```

```
 LOCAL RESORC SET 1 ACTIVITY 2   ACTIVITY GROUP1
 RESNO =  1     QUNREQ=    126.000
 TRS   =  0  0 10 DTD   =   0  0 50
 LOCAL RESORC SET 2 ACTIVITY 2   ACTIVITY GROUP1
 RESNO =  3     QUNREQ=      1.000
 TRS   =  0  0 10 DTD   =   0  0 50
 LOCAL RESORC SET 3 ACTIVITY 2   ACTIVITY GROUP1
 RESNO =  6     QUNREQ=      1.000
 TRS   =  0  0 10 DTD   =   0  0 50
 FIXED RESORC SET 1 ACTIVITY 2   ACTIVITY GROUP 1
 IFIXNO=  2     UNREQ =      1.000
 FIXED RESORC SET 2 ACTIVITY 2   ACTIVITY GROUP 1
 IFIXNO=  3     UNREQ =     14.000
ACTIVITY 3 ACTIVITY GROUP 1
DTACT =  0  1  5 DTAMRC=   0  0  0 DTMNNA=  0  0  0
NARCM = 1      NARCD = 1      ICODE = 0
IASETS= 2      ITSETS= 0      IATT  = 0
IRES  = 3      IFIXRS= 2      VT    = 0
 ASTRONAUT SET 1 ACTIVITY 3 ACTIVITY GROUP 1
 NASRQD=1 NCAN  =1
 ICAN  =3 * * * * *
 TRS   =  0  0  0  DTD   =  0  1  5
 CPO   = 0   CD = 0   SDTCD= 0
 ASTRONAUT SET 2 ACTIVITY 3 ACTIVITY GROUP 1
 NASRQD=1 NCAN  =1
 ICAN  =2 * * * * *
 TRS   =  0  0 10  DTD   =  0  0 25
 CPO   = 0   CD = 0   SDTCD= 0
 LOCAL RESORC SET 1 ACTIVITY 3   ACTIVITY GROUP1
 RESNO =  1     QUNREQ=    126.000
 TRS   =  0  0 10 DTD   =   0  0 25
 LOCAL RESORC SET 2 ACTIVITY 3   ACTIVITY GROUP1
 RESNO =  3     QUNREQ=      1.000
 TRS   =  0  0 10 DTD   =   0  0 25
 LOCAL RESORC SET 3 ACTIVITY 3   ACTIVITY GROUP1
 RESNO =  6     QUNREQ=      1.000
 TRS   =  0  0 10 DTD   =   0  0 25
 FIXED RESORC SET 1 ACTIVITY 3   ACTIVITY GROUP 1
 IFIXNO=  2     UNREQ =      1.000
 FIXED RESORC SET 2 ACTIVITY 3   ACTIVITY GROUP 1
 IFIXNO=  3     UNREQ =     14.000
```

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ATM CONTAMINATION MEASUREMENT (T027)

A. OBJECTIVE

- Determine change in optical properties of windows, mirrors, gratings, etc., resulting from deposition of contaminants.
- Measure sky brightness background caused by solar illumination of the particle contaminants found about the OA.
- Provide a deployment mechanism for S149.

B. OPERATIONS

- Two systems employed to accomplish above objectives:

  SAMPLE ARRAY SYSTEM - a sample array containing optical surfaces which are exposed to collect contaminants; deployed out of SAL for five days, then returned to earth for analysis.

  PHOTOMETER SYSTEM - consists of a photoelectric and a photographic photometer which provide photometric and photographic data on the background brightness as a function of angular displacement of sun; deployed out of SAL on sunside to scan celestial sphere for total of four orbits.

C. PLANNING LIMITATIONS

- Sample array should be exposed for five days; waste dump should be scheduled during first 24 hours of sample array exposure.
- Photometry system should scan celestial sphere once during day portion of orbit and once during night portion of same orbit for a total of four orbits (preferably consecutive).
- Schedule photometry system operation when $\beta<40$ degrees, where β is the angle between the OA -Z axis and the solar vector (if scheduled to be performed when $\beta>40$ degrees, a pitch maneuver is required).
- Experiment is not to conflict with S019, UV Stellar Astronomy.

D. PERFORMANCE

Operation	Minimum No. of Performances	Duration of Performance	No. of Crewmen
Activate sample array	1	19 min	1
Deactivate sample array	1	33 min	1
Set up and activate Photometer System	1	43 min	1
Calibrate; daylight/night data scans	4	85 min	1
Remove film, photometer, stow	1	29 min	1

E. POINTING REQUIREMENTS

- Required reference orientation is X-POP orientation mode provided Photometer System is scheduled for performance while $\beta<40$ degrees.
- Photometer System is deployed out of SAL on sunside of OA.

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```
     DETAILED EXOP DEFINITION
T027    CONTAMINATION M
PRIOTY=    84 DES   =    68 PRO   =   100 DIF   =   24
NAGXOP=  2 NXOPCM=  1 NXOPCD=  1 CODE  = 1
IBFOR1=       PRET1 = -0 IBFOR2=       PRET2 = *
TMNTR=  3  0  0  TMXTR= 11  0  0  DTMNRC=  0  0  0

 ACTIVITY GROUP 1  NAG= 3 DTMXAG=  8  0  0
  ACTIVITY 1 ACTIVITY GROUP 1
  DTACT =  0  0 43 DTAMRC=   0  0  0 DTMNNA=  0  0  0
  NARCM = 1      NARCD = 1      ICODE = 0
  IASETS= 1      ITSETS= 0      IATT  = 0
  IRES  = 0      IFIXRS= 0      VT    = 0
   ASTRONAUT SET 1 ACTIVITY 1 ACTIVITY GROUP 1
   NASRQD=1 NCAN  =3
   ICAN  =3 2 1 * * *
   TRS   =  0  0  0  DTD   =  0  0 43
   CPO   = 0   CD = 0   SDTCD= 0
  ACTIVITY 2 ACTIVITY GROUP 1
  DTACT =  0  1 33 DTAMRC=   0  0  0 DTMNNA=  0  0  0
  NARCM = 3      NARCD = 4      ICODE = 0
  IASETS= 1      ITSETS= 1      IATT  = 1
  IRES  = 1      IFIXRS= 0      VT    = 0
   ASTRONAUT SET 1 ACTIVITY 2 ACTIVITY GROUP 1
   NASRQD=1 NCAN  =3
   ICAN  =3 2 1 * * *
   TRS   =  0  0  7  DTD   =  0  1 25
   CPO   = 0   CD = 0   SDTCD= 0
   TRAJECTORY SET 1 ACTIVITY 2 ACTIVITY GROUP  1
   BODY  = SUN    BODNAM= SUN    ITF   = 0
   TRS   =  0  0  0     DTD   =  0  0 56
   ATTITUDE SET 1 ACTIVITY 2 ACTIVITY GROUP 1
   MODEC = 2
   TRS   =  0  0  7 DTD   =  0  1 25
   LOCAL RESORC SET 1 ACTIVITY 2   ACTIVITY GROUP1
   RESNO =  1     QUNREQ=     66.000
   TRS   =  0  0  7 DTD   =  0  1 25
  ACTIVITY 3 ACTIVITY GROUP 1
  DTACT =  0  0 29 DTAMRC=   0  0  0 DTMNNA=  0  0  0
  NARCM = 1      NARCD = 1      ICODE = 0
  IASETS= 1      ITSETS= 0      IATT  = 0
  IRES  = 0      IFIXRS= 0      VT    = 0
   ASTRONAUT SET 1 ACTIVITY 3 ACTIVITY GROUP 1
   NASRQD=1 NCAN  =3
   ICAN  =3 2 1 * * *
   TRS   =  0  0  0  DTD   =  0  0 29
   CPO   = 0   CD = 0   SDTCD= 0
```

```
ACTIVITY GROUP 2  NAG= 2 DTMXAG=  6  0  0
 ACTIVITY 1 ACTIVITY GROUP 2
 DTACT =  0  0 19 DTAMRC=   0  0  0 DTMNNA=  5  0  0
 NARCM = 1      NARCD = 1      ICODE = 0
 IASETS= 1      ITSETS= 0      IATT  = 0
 IRES  = 1      IFIXRS= 0      VT    = 0
  ASTRONAUT SET 1 ACTIVITY 1 ACTIVITY GROUP 2
  NASRQD=1 NCAN  =3
  ICAN  =3 2 1 * * *
  TRS   =  0  0  0  DTD   =  0  ñ 19
  CPO   = 0   CD = 0   SDTCD= 0
  LOCAL RESORC SET 1 ACTIVITY 1   ACTIVITY GROUP2
  RESNO =  1     QUNREQ=     13.600
  TRS   =  0  0 19 DTD   =   5  ñ  0
 ACTIVITY 2 ACTIVITY GROUP 2
 DTACT =  0  0 33 DTAMRC=   0  0  0 DTMNNA=  0  0  0
 NARCM = 1      NARCD = 1      ICODE = 0
 IASETS= 1      ITSETS= 0      IATT  = 0
 IRES  = 0      IFIXRS= 0      VT    = 0
  ASTRONAUT SET 1 ACTIVITY 2 ACTIVITY GROUP 2
  NASRQD=1 NCAN  =3
  ICAN  =3 2 1 * * *
  TRS   =  0  0  0  DTD   =  0  ñ 33
  CPO   = 0   CD = 0   SDTCD= 0
```

CLUSTER DEACTIVATION (CDS)

A. OBJECTIVE

- Perform CM/SM systems checkout and return stowage.
- Perform stowage management in OWS and in MDA/AM.
- Deactivate OWS and MDA/AM systems.

B. OPERATIONS AND PERFORMANCE

- The specific functions and the times associated with the above tasks have not yet been identified; mission days 28 and 29 have been reserved for these deactivation activities.

C. PLANNING LIMITATIONS

None

D. POINTING REQUIREMENTS

None

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```
     DETAILED EXOP DEFINITION
CDS      WORKSHOP DEACTI
PRIORTY=   613 DES    =     99 PRO    =    100 DIF    =    23
NAGXDP=   1 NXOPCM=   1 NXOPCD=   1 CODE   = 1
IBFOR1=         PRET1 = -0 IBFOR2=         PRET2 = *
TMNTR= 28   0   0  TMXTR= 29   0   0  DTMNRC=   0   0   0

 ACTIVITY GROUP 1  NAG= 2 DTMXAG=   1   0   0
  ACTIVITY 1 ACTIVITY GROUP 1
  DTACT =   0   5 15 DTAMRC=    0   0   0 DTMNNA=   0   0   0
  NARCM =  1      NARCD =  1      ICODE =  0
  IASETS=  1      ITSETS=  0      IATT  =  0
  IRES  =  0      IFIXRS=  0      VT    =  0
   ASTRONAUT SET 1 ACTIVITY 1 ACTIVITY GROUP 1
   NASRQD=3 NCAN  =3
   ICAN  =1 2 3 * * *
   TRS   =   0   0   0  DTD    =   0   5 15
   CPO   =  0    CD =  0    SDTCD=  0
  ACTIVITY 2 ACTIVITY GROUP 1
  DTACT =   0   4   0 DTAMRC=    0   0   0 DTMNNA=   0   0   0
  NARCM =  1      NARCD =  1      ICODE =  0
  IASETS=  2      ITSETS=  0      IATT  =  0
  IRES  =  0      IFIXRS=  0      VT    =  0
   ASTRONAUT SET 1 ACTIVITY 2 ACTIVITY GROUP 1
   NASRQD=2 NCAN  =2
   ICAN  =2 3 * * * *
   TRS   =   0   0   0  DTD    =   0   4   0
   CPO   =  0    CD =  0    SDTCD=  0
   ASTRONAUT SET 2 ACTIVITY 2 ACTIVITY GROUP 1
   NASRQD=1 NCAN  =1
   ICAN  =1 * * * * *
   TRS   =   0   0 30  DTD    =   0   3 30
   CPO   =  0    CD =  0    SDTCD=  0
```

PERSONAL HOUSEKEEPING (RR/PHK)

A. OBJECTIVE

- To provide free time during each day for the astronaut's personal use.

B. OPERATIONS

None

C. PLANNING LIMITATIONS

None

D. PERFORMANCE

- Up to 1 hour and 30 minutes allocated for each astronaut per day.
- Astronaut time is allocated in 30-minute blocks.

E. POINTING REQUIREMENTS

None

```
     DETAILED EXOP DEFINITION
RR/PHK   PERSONAL HOUSE
PRIORITY=     74 DES   =     40 PRO   =    100 DIF   =    37
NAGXOP=   3 NXOPCM= 25 NXOPCD= 27 CODE  = 1
IBFOR1=        PRET1 = -0 IBFOR2=        PRET2 = *
TMNTR=  2  0  0  TMXTR= 29  0  0  DTMNRC=  0 15  0

 ACTIVITY GROUP 1  NAG= 1 DTMXAG=  0  7  0
  ACTIVITY 1 ACTIVITY GROUP 1
  DTACT =  0  0 30 DTAMRC=   0  0  0 DTMNNA=  0  0  0
  NARCM = 1      NARCD = 3      ICODE = 0
  IASETS= 1      ITSETS= 0      IATT  = 0
  IRES  = 0      IFIXRS= 0      VT    = 0
   ASTRONAUT SET 1 ACTIVITY 1 ACTIVITY GROUP 1
   NASRQD=1 NCAN  =1
   ICAN  =1 * * * * *
   TRS   =  0  0  0  DTD   =  0  0 30
   CPO   = 0   CD = 1   SDTCD= 1
   DTMNCD=  0  7  0  DTMXCD=  0 15  0

 ACTIVITY GROUP 2  NAG= 1 DTMXAG=  0  7  0
  ACTIVITY 1 ACTIVITY GROUP 2
  DTACT =  0  0 30 DTAMRC=   0  0  0 DTMNNA=  0  0  0
  NARCM = 1      NARCD = 3      ICODE = 0
  IASETS= 1      ITSETS= 0      IATT  = 0
  IRES  = 0      IFIXRS= 0      VT    = 0
   ASTRONAUT SET 1 ACTIVITY 1 ACTIVITY GROUP 2
   NASRQD=1 NCAN  =1
   ICAN  =2 * * * * *
   TRS   =  0  0  0  DTD   =  0  0 30
   CPO   = 0   CD = 1   SDTCD= 1
   DTMNCD=  0  7  0  DTMXCD=  0 15  0

 ACTIVITY GROUP 3  NAG= 1 DTMXAG=  0  7  0
  ACTIVITY 1 ACTIVITY GROUP 3
  DTACT =  0  0 30 DTAMRC=   0  0  0 DTMNNA=  0  0  0
  NARCM = 1      NARCD = 3      ICODE = 0
  IASETS= 1      ITSETS= 0      IATT  = 0
  IRES  = 0      IFIXRS= 0      VT    = 0
   ASTRONAUT SET 1 ACTIVITY 1 ACTIVITY GROUP 3
   NASRQD=1 NCAN  =1
   ICAN  =3 * * * * *
   TRS   =  0  0  0  DTD   =  0  0 30
   CPO   = 0   CD = 1   SDTCD= 1
   DTMNCD=  0  7  0  DTMXCD=  0 15  0
```

SYSTEMS HOUSEKEEPING (SHK)

A. OBJECTIVE

- To provide astronaut time each day for systems monitoring and maintenance.

B. OPERATIONS

None

C. PLANNING LIMITATIONS

None

D. PERFORMANCE

- Up to 1 hour and 30 minutes allocated for each astronaut per day.
- Astronaut time is allocated in 30-minute blocks.

E. POINTING REQUIREMENTS

None

```
     DETAILED EXOP DEFINITION
SHK      SYSTEMS HOUSEKE
PRIOTY=     75 DES   =     40 PRO   =    100 DIF   =    37
NAGXOP=   3 NXOPCM= 25 NXOPCD= 27 CODE  = 1
IBFOR1=         PRET1 = -0 IBFOR2=         PRET2 = *
TMNTR=  2  0  0  TMXTR= 29  0  0  DTMNRC=  0 15  0

 ACTIVITY GROUP 1  NAG= 1 DTMXAG=  0  6  0
  ACTIVITY 1 ACTIVITY GROUP 1
  DTACT =  0  0 30 DTAMRC=   0  0  0 DTMNNA=  0  0  0
  NARCM = 1      NARCD = 3      ICODE = 0
  IASETS= 1      ITSETS= 0      IATT  = 0
  IRES  = 0      IFIXRS= 0      VT    = 0
   ASTRONAUT SET 1 ACTIVITY 1 ACTIVITY GROUP 1
   NASRQD=1 NCAN  =1
   ICAN  =1 * * * * *
   TRS   =  0  0  0  DTD   =  0  0 30
   CPO   = 0   CD = 1   SDTCD= 1
   DTMNCD=  0  1  0  DTMXCD=  0  7  0

 ACTIVITY GROUP 2  NAG= 1 DTMXAG=  0  6  0
  ACTIVITY 1 ACTIVITY GROUP 2
  DTACT =  0  0 30 DTAMRC=   0  0  0 DTMNNA=  0  0  0
  NARCM = 1      NARCD = 3      ICODE = 0
  IASETS= 1      ITSETS= 0      IATT  = 0
  IRES  = 0      IFIXRS= 0      VT    = 0
   ASTRONAUT SET 1 ACTIVITY 1 ACTIVITY GROUP 2
   NASRQD=1 NCAN  =1
   ICAN  =2 * * * * *
   TRS   =  0  0  0  DTD   =  0  0 30
   CPO   = 0   CD = 1   SDTCD= 1
   DTMNCD=  0  1  0  DTMXCD=  0  7  0

 ACTIVITY GROUP 3  NAG= 1 DTMXAG=  0  6  0
  ACTIVITY 1 ACTIVITY GROUP 3
  DTACT =  0  0 30 DTAMRC=   0  0  0 DTMNNA=  0  0  0
  NARCM = 1      NARCD = 3      ICODE = 0
  IASETS= 1      ITSETS= 0      IATT  = 0
  IRES  = 0      IFIXRS= 0      VT    = 0
   ASTRONAUT SET 1 ACTIVITY 1 ACTIVITY GROUP 3
   NASRQD=1 NCAN  =1
   ICAN  =3 * * * * *
   TRS   =  0  0  0  DTD   =  0  0 30
   CPO   = 0   CD = 1   SDTCD= 1
   DTMNCD=  0  1  0  DTMXCD=  0  7  0
```

A P P E N D I X B

SKYLAB SUMMARY BASELINE PRINT

This appendix presents an ESP summary of the astronaut, local resource, and attitude profiles for the 29-day Skylab 1/2 mission scheduled in this study. The computer print that constitutes this appendix is a sample of the off-line summary print obtained from Route 13 of ESP. Included in the appendix is a status of the non-replenishable resource supply at the end of the mission.

ASTRONAUT TIMELINES

The astronaut planning baselines list chronologically each of the three astronauts' activities for the entire mission. The events are designated by the astronaut utilization code (UC) in the following manner:

UC = 0	Uncommitted time
UC = 1	Astronaut sleeping
UC = 2	Astronaut eating
UC $\geq$ 10	Astronaut time committed to performing an activity of an EXOP.

When an astronaut is committed to work on an EXOP, the acronym for that EXOP, the EXOP Cycle Number (ER), the Activity Group Number (AG), the Activity Number (A), and the Activity Cycle Number (AR) are printed along with the start time of the activity. That activity is assumed to continue until the astronaut utilization code changes. The typical astronaut day was used to initialize the astronaut baselines for the entire mission length although that typical day was not followed for the days of launch and recovery. The time is referenced to the astronaut scheduling day and not ground elapsed time, i.e., 1 DAY 0 HOURS 0 MINUTES SCHEDULING TIME IS LIFTOFF, OR ZERO GROUND ELAPSED TIME. It should be noted that the astronaut timelines presented in this appendix reflect the same crew activities schedule illustrated in Figure 1 of the attached report.

ASTRONAUT PLANNING BASELINES

D	H	M	EXOP	ER	AG	A	AR	1	2	3 4 5 6 7 UTILIZATION CODES
1	18	30	M487	1	1	1	1	10	10	10
1	23	45						0	0	0
2	0	0	M17134	1	1	1	1	12	12	12
2	1	15	RR/PHK	1	1	1	1	10		
2	1	15	RR/PHK	1	2	1	1		10	
2	1	15	T003B	1	1	1	1			10
2	1	18	RR/PHK	1	3	1	1			10
2	1	45	RR/PHK	1	1	1	2	10		
2	1	45	RR/PHK	1	2	1	2		10	
2	1	48	RR/PHK	1	3	1	2			10
2	2	15	RR/PHK	1	1	1	3	10		
2	2	15	RR/PHK	1	2	1	3		10	
2	2	18	RR/PHK	1	3	1	3			10
2	2	45						0	0	
2	2	48	M487	1	1	1	2	10	10	10
2	8	0	M17134	1	1	1	2	12	12	12
2	9	15	T003B	1	2	1	1	1	1	11
2	9	18								1
2	17	15	M17134	1	1	2	1	12	12	12
2	18	12	M172	1	1	1	1	12	2	2
2	18	19	M172	1	1	1	1	2	12	
2	18	24	M172	1	1	1	1		2	12
2	18	30	S009	1	1	1	1	10		
2	18	30	SHK	1	2	1	1		10	
2	18	30	T003B	1	1	1	2			10
2	18	33	SHK	1	3	1	1			10
2	18	53	SHK	1	1	1	1	10		
2	19	0	SHK	1	2	1	2		10	
2	19	3	SHK	1	3	1	2			10
2	19	23	SHK	1	1	1	2	10		
2	19	30	SHK	1	2	1	3		10	
2	19	33	SHK	1	3	1	3			10
2	19	53	SHK	1	1	1	3	10		

ASTRONAUT PLANNING BASELINES

D	H	M	EXOP	ER	AG	A	AR	1	2	3 4 5 6 7 UTILIZATION CODES
2	20	0							0	
2	20	3								0
2	20	23	M487	1	1	2	1	10	10	10
3	0	0	M17134	2	1	1	1	12	12	12
3	1	15	RR/PHK	2	1	1	1	10		
3	1	15	T027	1	2	1	1		10	
3	1	15	T003B	2	1	1	1			10
3	1	18	T027	1	1	1	1			10
3	1	34	RR/PHK	2	2	1	1		10	
3	1	45	RR/PHK	2	1	1	2	10		
3	1	58	RR/PHK	2	3	1	1			10
3	2	4	RR/PHK	2	2	1	2		10	
3	2	15	RR/PHK	2	1	1	3	10		
3	2	28	RR/PHK	2	3	1	2			10
3	2	34	RR/PHK	2	2	1	3		10	
3	2	45	S020	1	1	1	1	10		
3	2	58								0
3	3	4							0	
3	3	20	T027	1	1	2	1	0		10
3	4	15	M092	1	1	1	1	10	10	
3	4	45								0
3	4	53	T027	1	1	2	2			10
3	5	31	M092	1	2	1	1	10	10	
3	6	18								0
3	6	26	T027	1	1	2	3			10
3	6	47						0	0	
3	7	16	M093	1	1	1	1	10	10	
3	7	31							0	
3	7	51								0
3	7	56						0		
3	8	0	M17134	2	1	1	2	12	12	12
3	9	15	T003B	2	2	1	1	1	1	11
3	9	18								1
3	17	15	M17134	2	1	2	1	12	12	12
3	18	12	M172	2	1	1	1	12	2	2
3	18	19	M172	2	1	1	1	2	12	
3	18	24	M172	2	1	1	1		2	12
3	18	30	SHK	2	1	1	1	10		
3	18	30	SHK	2	2	1	1		10	
3	18	30	T003B	2	1	1	2			10
3	18	33								0
3	18	51	T027	1	1	2	4			10
3	19	0	SHK	2	1	1	2	10		
3	19	0	SHK	2	2	1	2		10	

ASTRONAUT PLANNING BASELINES

D	H	M	EXOP	ER	AG	A	AR	1	2	3 4 5 6 7 UTILIZATION CODES
3	19	30	SHK	2	1	1	3	10		
3	19	30	SHK	2	2	1	3		10	
3	20	0	S149	1	1	1	1	10		
3	20	0	ATM	1	6	1	1		10	
3	20	16								0
3	20	17	T027	1	1	3	1			10
3	20	46	SHK	2	3	1	1			10
3	20	48						0		
3	21	16								0
3	21	30	M092	1	3	1	1	10		10
3	21	45							0	
3	21	55	S020	1	1	2	1		10	
3	22	31							0	
3	22	46	SHK	2	3	1	2	0		10
3	23	15	M093	1	2	1	1	10	10	
3	23	16	SHK	2	3	1	3			10
3	23	30						0		
3	23	46								0
3	23	55							0	
4	0	0	M17134	3	1	1	1	12	12	12
4	1	15	S015	1	1	1	1	10	0	
4	1	15	T003A	1	1	1	1			10
4	1	18	RR/PHK	3	2	1	1		10	
4	1	30						0		
4	1	32	D008	1	2	1	1	10		
4	1	33	RR/PHK	3	3	1	1			10
4	1	48	RR/PHK	3	2	1	2		10	
4	2	2						0		
4	2	3								0
4	2	15	M131A	1	1	1	1	10	10	
4	2	15	S015	1	1	2	1			10
4	2	25	RR/PHK	3	3	1	2			10
4	2	45	M131A	1	2	1	1	10	10	
4	2	55								0
4	3	15	M131A	1	3	1	1	10		
4	3	15	S015	1	1	3	1		10	
4	3	15	M131A	1	3	1	1			10
4	3	40	RR/PHK	3	2	1	3		10	
4	3	45	RR/PHK	3	1	1	1	10		
4	3	45	RR/PHK	3	3	1	3			10
4	4	10	S020	1	1	2	2		10	
4	4	15	M171A	1	1	1	1	10		0
4	4	45	M171A	1	1	1	1		10	
4	5	15							0	

ASTRONAUT PLANNING BASELINES

D	H	M	EXOP	ER	AG	A	AR	1	2	3 4 5 6 7 UTILIZATION CODES
4	5	41	S020	1	1	2	3		10	
4	5	45	M093	1	3	1	1	10		10
4	6	0	RR/PHK	3	1	1	2	10		
4	6	17	ATM	1	6	1	2		10	
4	6	25								0
4	6	30						0		
4	6	50	D008	1	1	1	1	10		
4	7	5	RR/PHK	3	1	1	3	10		
4	7	14	S020	1	1	3	1			10
4	7	35	S020	1	1	4	1	0		10
4	7	49	S020	1	1	5	1			10
4	8	0	M17134	3	1	1	2	12	12	12
4	9	15	T003A	1	2	1	1	1	1	11
4	9	33								1
4	17	15	M17134	3	1	2	1	12	12	12
4	18	12	M172	3	1	1	1	12	2	2
4	18	19	M172	3	1	1	1	2	12	
4	18	24	M172	3	1	1	1		2	12
4	18	30	SHK	3	1	1	1	10		
4	18	30	SHK	3	2	1	2		10	
4	18	30	T003A	1	1	1	2			10
4	18	48	S020	3	1	5	1			10
4	18	59	S020	1	1	6	1			10
4	19	0	SHK	3	1	1	2	10		
4	19	0	SHK	3	2	1	2		10	
4	19	30	SHK	3	1	1	3	10		
4	19	30	SHK	3	2	1	3		10	
4	19	44	SHK	3	3	1	1			10
4	20	0	ATM	1	5	1	1	10	10	
4	20	14	SHK	3	3	1	2			10
4	20	44	SHK	3	3	1	3			10
4	21	14								0
4	21	30	M171A	1	2	1	1	0	10	
4	21	34	D008	2	2	1	1			10
4	22	0	M171A	1	2	1	1	10		
4	22	4								0
4	22	30	ATM	1	5	1	2	10		10
4	23	0							0	
5	0	0	M17134	4	1	1	1	12	12	12
5	1	15	RR/PHK	4	1	1	1	10		
5	1	15	RR/PHK	4	2	1	1		10	
5	1	15	T003B	4	1	1	1			10
5	1	18	RR/PHK	4	3	1	1			10
5	1	45	RR/PHK	4	1	1	2	10		

ASTRONAUT PLANNING BASELINES

D	H	M	EXOP	ER	AG	A	AR	1	2	3 4 5 6 7 UTILIZATION CODES
5	1	45	RR/PHK	4	2	1	2		10	
5	1	48								0
5	2	2	S190	1	3	1	1			10
5	2	15	M131B	1	1	1	1	10	10	
5	3	0	M131B	1	2	1	1	10	10	
5	3	2	RR/PHK	4	3	1	2			10
5	3	32	RR/PHK	4	3	1	3			10
5	3	45	RR/PHK	4	1	1	3	10		
5	3	45	RR/PHK	4	2	1	3		10	
5	4	2								0
5	4	15	ATM	1	6	1	3	0	10	
5	4	15	M171A	1	3	1	1			10
5	4	45	M171A	1	3	1	1	10		
5	5	15						0		
5	5	45	M131B	1	3	1	1	10		10
5	6	0							0	
5	6	4	D008	2	1	1	1		10	
5	6	19							0	
5	6	30	ATM	1	5	1	3	0	10	10
5	7	45	D008	3	1	1	1	10		
5	8	0	M17134	4	1	1	2	12	12	12
5	9	15	T003B	4	2	1	1	1	1	11
5	9	18								1
5	17	15	M17134	4	1	2	1	12	12	12
5	18	12	M172	4	1	1	1	12	2	2
5	18	19	M172	4	1	1	1	2	12	
5	18	24	M172	4	1	1	1		2	12
5	18	30	SHK	4	1	1	1	10		
5	18	30	SHK	4	2	1	1		10	
5	18	30	T003B	4	1	1	2			10
5	18	33	SHK	4	3	1	1			10
5	19	0	SHK	4	1	1	2	10		
5	19	0	SHK	4	2	1	2		10	
5	19	3	SHK	4	3	1	2			10
5	19	30	SHK	4	1	1	3	10		
5	19	30	SHK	4	2	1	3		10	
5	19	33	SHK	4	3	1	3			10
5	20	0	ATM	1	6	1	4	0	10	
5	20	3								0
5	20	34	S190	1	4	1	1			10
5	20	50	D008	3	2	1	1	10		
5	21	20						0		
5	21	30	M171B	1	1	1	1	10		
5	21	34								0

ASTRONAUT PLANNING BASELINES

D	H	M	EXOP	ER	AG	A	AR	1	2	3 4 5 6 7 UTILIZATION CODES
5	21	45							0	
5	22	0	M171B	1	1	1	1		10	
5	22	0	S190	1	2	1	1			10
5	22	40							0	
5	22	55						0		
5	23	0								0
6	0	0	M17134	5	1	1	1	12	12	12
6	1	15	RR/PHK	5	1	1	1	10		
6	1	15	RR/PHK	5	2	1	1		10	
6	1	15	T003B	5	1	1	1			10
6	1	18	S190	1	3	1	2			10
6	1	45	RR/PHK	5	1	1	2	10		
6	1	45	RR/PHK	5	2	1	2		10	
6	2	15	M131A	2	1	1	1	10	10	
6	2	15	RR/PHK	5	3	1	1			10
6	2	45	M131A	2	2	1	1	10	10	
6	2	45	RR/PHK	5	3	1	2			10
6	3	15	M131A	2	3	1	1	10		
6	3	15	RR/PHK	5	2	1	3		10	
6	3	15	M131A	2	3	1	1			10
6	3	45	RR/PHK	5	1	1	3	10	0	
6	3	45	RR/PHK	5	3	1	3			10
6	4	15	M092	2	1	1	1	10	10	
6	4	15	ATM	1	3	1	1			10
6	5	31	M092	2	2	1	1	10	10	
6	6	47						0	0	
6	7	16	M093	2	1	1	1	10	10	
6	7	31							0	
6	7	56						0		
6	8	0	M17134	5	1	1	2	12	12	12
6	9	15	T003B	5	2	1	1	1	1	11
6	9	18								1
6	17	15	M17134	5	1	2	1	12	12	12
6	18	12	M172	5	1	1	1	12	2	2
6	18	19	M172	5	1	1	1	2	12	
6	18	24	M172	5	1	1	1		2	12
6	18	30	SHK	5	1	1	1	10		
6	18	30	SHK	5	2	1	1		10	
6	18	30	T003B	5	1	1	2			10
6	18	33	SHK	5	3	1	1			10
6	19	0	SHK	5	1	1	2	10		
6	19	0	SHK	5	2	1	2		10	
6	19	3	SHK	5	3	1	2			10
6	19	30	SHK	5	1	1	3	10		

ASTRONAUT PLANNING BASELINES

D	H	M	EXOP	ER	AG	A	AR	1	2	3	4	5	6	7
										UTILIZATION CODES				
6	19	30	SHK	5	2	1	3		10					
6	19	33								0				
6	19	50	S190	1	4	1	2			10				
6	20	0						0	0					
6	20	43	S149	1	1	2	1	10						
6	20	50	SHK	5	3	1	3			10				
6	20	58						0						
6	21	15	S190	1	2	1	2		10					
6	21	20								0				
6	21	30	M092	2	3	1	1	10		10				
6	22	15							0					
6	22	46						0		0				
6	22	52	S190	1	2	1	3			10				
6	23	15	M093	2	2	1	1	10	10					
6	23	30						0						
6	23	52								0				
6	23	55							0					
7	0	0	M17134	6	1	1	1	12	12	12				
7	1	15	RR/PHK	6	1	1	1	10						
7	1	15	RR/PHK	6	2	1	1		10					
7	1	15	T003B	6	1	1	1			10				
7	1	18	M507	1	1	1	1			10				
7	1	45	RR/PHK	6	1	1	2	10						
7	1	45	RR/PHK	6	2	1	2		10					
7	2	15	RR/PHK	6	1	1	3	10	0					
7	2	18	M507	1	1	2	1		10					
7	2	18	RR/PHK	6	3	1	1			10				
7	2	45	ATM	1	6	1	5	10						
7	2	48	RR/PHK	6	3	1	2			10				
7	3	18								0				
7	3	36	RR/PHK	6	2	1	3		10					
7	3	36	M507	1	1	3	1			10				
7	4	6							0					
7	4	15	M171B	1	2	1	1		10					
7	4	30						0						
7	4	36	RR/PHK	6	3	1	3			10				
7	4	45	M171B	1	2	1	1	10						
7	5	6								0				
7	5	25						0						
7	5	40	ATM	1	6	1	6		10					
7	5	40	M171B	1	3	1	1			10				
7	6	10	M171B	1	3	1	1	10						
7	6	50						0						
7	7	5	M093	2	3	1	1	10		10				

ASTRONAUT PLANNING BASELINES

D	H	M	EXOP	ER	AG	A	AR	1	2	3	4	5	6	7
										UTILIZATION				CODES
7	7	20						0						
7	7	25							0					
7	7	45								0				
7	8	0	M17134	6	1	1	2	12	12	12				
7	9	15	T003B	6	2	1	1	1	1	11				
7	9	18								1				
7	17	15	M17134	6	1	2	1	12	12	12				
7	18	12	M172	6	1	1	1	12	2	2				
7	18	19	M172	6	1	1	1	2	12					
7	18	24	M172	6	1	1	1		2	12				
7	18	30	SHK	6	1	1	1	10						
7	18	30	SHK	6	2	1	1		10					
7	18	30	T003B	6	1	1	2			10				
7	18	33	SHK	6	3	1	1			10				
7	19	0	SHK	6	1	1	2	10						
7	19	0	SHK	6	2	1	2		10					
7	19	3	SHK	6	3	1	2			10				
7	19	30	SHK	6	1	1	3	10						
7	19	30	SHK	6	2	1	3		10					
7	19	33	SHK	6	3	1	3			10				
7	20	0	ATM	1	5	1	4	10	10					
7	20	3								0				
7	20	31	S190	1	2	1	4			10				
7	21	30	M171C	1	1	1	1	10	0					
7	21	31								0				
7	21	45	M171C	1	1	1	1		10					
7	22	7	S190	1	2	1	5			10				
7	23	7								0				
7	23	15							0					
7	23	30						0						
8	0	0	M17134	7	1	1	1	12	12	12				
8	1	15	RR/PHK	7	1	1	1	10	0					
8	1	15	T003B	7	1	1	1			10				
8	1	18								0				
8	1	25	S190	1	3	1	3			10				
8	1	34	T027	1	2	2	1		10					
8	1	45	RR/PHK	7	1	1	2	10						
8	2	7							0					
8	2	15	M131A	3	1	1	1	10	10					
8	2	25	RR/PHK	7	3	1	1			10				
8	2	45	M131A	3	2	1	1	10	10					
8	2	55								0				
8	3	15	M131A	3	3	1	1	10						
8	3	15	RR/PHK	7	2	1	1		10					

ASTRONAUT PLANNING BASELINES

D	H	M	EXOP	ER	AG	A	AR	1	2	3 4 5 6 7 UTILIZATION CODES
8	3	15	M131A	3	3	1	1			10
8	3	45	RR/PHK	7	1	1	3	10		
8	3	45	RR/PHK	7	2	1	2		10	
8	3	45	RR/PHK	7	3	1	2			10
8	4	15	M171C	1	2	1	1	0	10	
8	4	15	RR/PHK	7	3	1	3			10
8	4	30	M171C	1	2	1	1	10		
8	4	45								0
8	6	0	ATM	1	2	1	1	10		10
8	6	15	RR/PHK	7	2	1	3		10	
8	6	45							0	
8	8	0	M17134	7	1	1	2	12	12	12
8	9	15	T003B	7	2	1	1	1	1	11
8	9	18								1
8	17	15	M17134	7	1	2	1	12	12	12
8	18	12	M172	7	1	1	1	12	2	2
8	18	19	M172	7	1	1	1	2	12	
8	18	24	M172	7	1	1	1		2	12
8	18	30	SHK	7	1	1	1	10		
8	18	30	SHK	7	2	1	1		10	
8	18	30	T003B	7	1	1	2			10
8	18	33	SHK	7	3	1	1			10
8	19	0	SHK	7	1	1	2	10		
8	19	0	SHK	7	2	1	2		10	
8	19	3	SHK	7	3	1	2			10
8	19	30	SHK	7	1	1	3	10		
8	19	30	SHK	7	2	1	3		10	
8	19	33								0
8	19	48	S190	1	2	1	6			10
8	20	0	ATM	1	5	1	5	10	10	
8	20	48	SHK	7	3	1	3			10
8	21	18								0
8	21	28	S190	1	3	1	4	0	10	
8	21	30	M171C	1	3	1	1			10
8	21	45	M171C	1	3	1	1	10		
8	22	28							0	
8	23	15						0		
8	23	30								0
9	0	0	M17134	8	1	1	1	12	12	12
9	1	15	RR/PHK	8	1	1	1	10		
9	1	15	RR/PHK	8	2	1	1		10	
9	1	19	T003B	8	1	1	1			10
9	1	18	RR/PHK	8	3	1	1			10
9	1	45	RR/PHK	8	1	1	2	10		

ASTRONAUT PLANNING BASELINES

D	H	M	EXOP	ER	AG	A	AR	1	2	3 4 5 6 7 UTILIZATION CODES
9	1	45	RR/PHK	8	2	1	2		10	
9	1	48	RR/PHK	8	3	1	2			10
9	2	15	RR/PHK	8	1	1	3	10		
9	2	15	RR/PHK	8	2	1	3		10	
9	2	18	RR/PHK	8	3	1	3			10
9	2	45						0	0	
9	2	46	S190	1	1	1	1			10
9	3	46	ATM	1	3	1	2			10
9	4	15	M092	3	1	1	1	10	10	
9	5	31	M092	3	2	1	1	10	10	
9	6	47						0	0	
9	7	16	M093	3	1	1	1	10	10	
9	7	31							0	
9	7	46								0
9	7	56						0		
9	8	0	M17134	8	1	1	2	12	12	12
9	9	15	T003B	8	2	1	1	1	1	11
9	9	18								1
9	17	15	M17134	8	1	2	1	12	12	12
9	18	12	M172	8	1	1	1	12	2	2
9	18	19	M172	8	1	1	1	2	12	
9	18	24	M172	8	1	1	1		2	12
9	18	30	SHK	8	2	1	1	0	10	
9	18	30	T003B	8	1	1	2			10
9	18	33	D021	1	1	1	1	10		10
9	19	0	SHK	8	2	1	2		10	
9	19	20	SHK	8	1	1	1	10		
9	19	20	SHK	8	3	1	1			10
9	19	30	SHK	8	2	1	3		10	
9	19	50	SHK	8	1	1	2	10		
9	19	50	SHK	8	3	1	2			10
9	20	0							0	
9	20	20	SHK	8	1	1	3	10		
9	20	20	SHK	8	3	1	3			10
9	20	45	S190	1	3	1	5		10	
9	20	50						0		0
9	21	30	M092	3	3	1	1	10		10
9	21	45							0	
9	22	46						0		0
9	23	15	M093	3	2	1	1	10	10	
9	23	30						0		
9	23	55							0	
10	0	0	M17134	9	1	1	1	12	12	12
10	1	15	S015	2	1	1	1	10		

ASTRONAUT PLANNING BASELINES

D	H	M	EXOP	ER	A_G	A	AR	1	2	3	4	5	6	7
										UTILIZATION				CODES
10	1	15	M508	1	1	1	1		10					
10	1	15	T003B	9	1	1	1			10				
10	1	18								0				
10	1	30	RR/PHK	9	1	1	1	10						
10	2	0	RR/PHK	9	1	1	2	10						
10	2	15	S015	2	1	2	1			10				
10	2	25	RR/PHK	9	3	1	1			10				
10	2	30	RR/PHK	9	1	1	3	10						
10	2	55								0				
10	3	0						0						
10	3	15	S015	2	1	3	1	10						
10	3	34	RR/PHK	9	3	1	2			10				
10	3	40						0						
10	4	4	RR/PHK	9	3	1	3			10				
10	4	31	ATM	1	2	1	2	10		10				
10	4	45	RR/PHK	9	2	1	1		10					
10	5	15	RR/PHK	9	2	1	2		10					
10	5	45	RR/PHK	9	2	1	3		10					
10	6	15							0					
10	6	31						0		0				
10	6	45	M093	3	3	1	1	10		10				
10	7	0						0						
10	7	25								0				
10	8	0	M17134	9	1	1	2	12	12	12				
10	9	15	T003B	9	2	1	1	1	1	11				
10	9	18								1				
10	17	15	M17134	9	1	2	1	12	12	12				
10	18	12	M172	9	1	1	1	12	2	2				
10	18	19	M172	9	1	1	1	2	12					
10	18	24	M172	9	1	1	1		2	12				
10	18	30	SHK	1	1	1	4	10	0					
10	18	30	T003B	9	1	1	2			10				
10	18	33	M508	1	1	2	1		10	10				
10	19	0	SHK	9	1	1	2	10						
10	19	30	SHK	9	1	1	3	10						
10	20	0	ATM	1	3	1	3	10						
10	22	53	SHK	9	2	1	1		10					
10	22	53	SHK	9	3	1	1			10				
10	23	23	SHK	9	2	1	2		10					
10	23	23	SHK	9	3	1	2			10				
10	23	53							0	0				
11	0	0	M17134	10	1	1	1	12	12	12				
11	1	15	RR/PHK	10	1	1	1	10						
11	1	15	RR/PHK	10	2	1	1		10					

ASTRONAUT PLANNING BASELINES

D	H	M	EXOP	ER	AG	A	AR	1	2	3 4 5 6 7 UTILIZATION CODES
11	1	15	T003B	10	1	1	1			10
11	1	18	S019	1	1	1	1			10
11	1	45	RR/PHK	10	1	1	2	10		
11	1	45	RR/PHK	10	2	1	2		10	
11	1	45	RR/PHK	10	3	1	1			10
11	2	15	RR/PHK	10	1	1	3	10		
11	2	15	RR/PHK	10	2	1	3		10	0
11	2	45	ATM	1	5	1	6	10	10	
11	3	10	S019	1	1	2	1			10
11	3	40								0
11	4	15	M171A	2	1	1	1	10	0	
11	4	40	S019	1	1	2	2			10
11	4	45	M171A	2	1	1	1		10	
11	5	10								0
11	5	15							0	
11	5	45	ATM	1	2	1	3	10	10	
11	6	17	S019	1	1	2	3			10
11	6	47	RR/PHK	10	3	1	2			10
11	7	17	RR/PHK	10	3	1	3			10
11	7	45						0	0	
11	7	47								0
11	8	0	M171A4	10	1	1	2	12	12	12
11	9	15	T003B	10	2	1	1	1	1	11
11	9	18								1
11	17	15	M171A4	10	1	2	1	12	12	12
11	18	12	M172	10	1	1	1	12	2	2
11	18	19	M172	10	1	1	1	2	12	
11	18	24	M172	10	1	1	1		2	12
11	18	30	SHK	10	1	1	1	10		
11	18	30	SHK	10	2	1	1		10	
11	18	30	T003B	10	1	1	2			10
11	18	33								0
11	18	42	S019	1	1	2	4			10
11	19	0	SHK	10	1	1	2	10		
11	19	0	SHK	10	2	1	2		10	
11	19	12	SHK	9	3	1	1			10
11	19	30	SHK	10	1	1	3	10		
11	19	30	SHK	10	2	1	3		10	
11	19	42	SHK	9	3	1	2			10
11	20	0	ATM	1	5	1	7	10	10	
11	20	12	S019	1	1	2	5			10
11	20	42	SHK	9	3	1	3			10
11	21	12								0
11	21	30	M171A	2	2	1	1	0	10	

ASTRONAUT PLANNING BASELINES

D	H	M	EXOP	ER	AG	A	AR	1	2	3 4 5 6 7 UTILIZATION CODES
11	21	48	S019	1	1	2	6			10
11	22	0	M171A	2	2	1	1	10		
11	22	18								0
11	22	30						0		
11	23	0							0	
11	23	18	S019	1	1	2	7			10
11	23	48								0
12	0	0	M17134	11	1	1	1	12	12	12
12	1	15	RR/PHK	11	1	1	1	10		
12	1	15	RR/PHK	11	2	1	1		10	
12	1	15	T003B	11	1	1	1			10
12	1	18	S019	1	1	3	1			10
12	1	45	RR/PHK	11	1	1	2	10	0	
12	2	7	S190	1	1	1	2		10	
12	2	15	RR/PHK	11	1	1	3	10		
12	2	15	RR/PHK	11	3	1	1			10
12	2	45	RR/PHK	11	3	1	2	0		10
12	3	7	RR/PHK	11	2	1	2		10	
12	3	15	RR/PHK	11	3	1	3			10
12	3	37	RR/PHK	11	2	1	3		10	
12	3	45	ATM	1	3	1	4			10
12	4	7							0	
12	4	15	M092	4	1	1	1	10	10	
12	5	31	M092	4	2	1	1	10	10	
12	6	47						0	0	
12	7	16	M093	4	1	1	1	10	10	
12	7	31							0	
12	7	45								0
12	7	56						0		
12	8	0	M17134	11	1	1	2	12	12	12
12	9	15	T003B	11	2	1	1	1	1	11
12	9	18								1
12	17	15	M17134	11	1	2	1	12	12	12
12	18	12	M172	11	1	1	1	12	2	2
12	18	19	M172	11	1	1	1	2	12	
12	18	24	M172	11	1	1	1		2	12
12	18	30	SHK	11	1	1	1	10		
12	18	30	SHK	11	2	1	1		10	
12	18	30	T003B	11	1	1	2			10
12	18	33	SHK	10	3	1	1			10
12	19	0	SHK	11	1	1	2	10		
12	19	0	SHK	11	2	1	2		10	
12	19	3	SHK	10	3	1	2			10
12	19	30	SHK	11	1	1	3	10		

ASTRONAUT PLANNING BASELINES

D	H	M	EXOP	ER	AG	A	AR	1	2	3 4 5 6 7 UTILIZATION CODES
12	19	30	SHK	11	2	1	3		10	
12	19	33	SHK	10	3	1	3			10
12	20	0	ATM	1	4	1	1	0	10	
12	20	3								0
12	21	30	M092	4	3	1	1	10		10
12	22	46						0		0
12	23	0							0	
12	23	15	M093	4	2	1	1	10	10	
12	23	30						0		
12	23	55							0	
13	0	0	M171&4	12	1	1	1	12	12	12
13	1	15	RR/PHK	12	1	1	1	10		
13	1	15	RR/PHK	12	2	1	1		10	
13	1	15	T003B	12	1	1	1			10
13	1	18								0
13	1	23	S190	1	1	1	3			10
13	1	45	RR/PHK	12	1	1	2	10		
13	1	45	RR/PHK	12	2	1	2		10	
13	2	15	RR/PHK	12	1	1	3	10		
13	2	15	RR/PHK	12	2	1	3		10	
13	2	23	RR/PHK	12	3	1	1			10
13	2	45	ATM	1	2	1	4	10	10	
13	2	53								0
13	2	59	S190	1	1	1	4			10
13	3	59								0
13	4	15	M171A	2	3	1	1			10
13	4	45	M171A	2	3	1	1	10		
13	4	45	ATM	1	4	1	2		10	
13	5	15						0		
13	5	45	RR/PHK	12	3	1	2			10
13	6	15								0
13	6	25	M093	4	3	1	1	10		10
13	6	40						0		
13	7	5	RR/PHK	12	3	1	3			10
13	7	35								0
13	7	45							0	
13	8	0	M171&4	12	1	1	2	12	12	12
13	9	15	T003B	12	2	1	1	1	1	11
13	9	18								1
13	17	15	M171&4	12	1	2	1	12	12	12
13	18	12	M172	12	1	1	1	12	2	2
13	18	19	M172	12	1	1	1	2	12	
13	18	24	M172	12	1	1	1		2	12
13	18	30	SHK	12	1	1	1	10		

ASTRONAUT PLANNING BASELINES

D	H	M	EXOP	ER	AG	A	AR	1	2	3 4 5 6 7 UTILIZATION CODES
13	18	30	SHK	12	2	1	1		10	
13	18	30	T003B	12	1	1	2			10
13	18	33	SHK	11	3	1	1			10
13	19	0	SHK	12	1	1	2	10		
13	19	0	SHK	12	2	1	2		10	
13	19	3	SHK	11	3	1	2			10
13	19	30	SHK	12	1	1	3	10		
13	19	30	SHK	12	2	1	3		10	
13	19	33	SHK	11	3	1	3			10
13	20	0						0	0	
13	20	3	ATM	12	2	1	1		10	
13	20	3	ATM	1	2	1	5			10
13	21	30	M171B	2	1	1	1	10		
13	22	0	M171B	2	1	1	1		10	0
13	22	40							0	
13	22	55						0		
14	0	0	M17134	13	1	1	1	12	12	12
14	1	15	T020	1	1	1	1	10	0	
14	1	15	T003A	2	1	1	1			10
14	1	24	T020	1	1	1	1		10	
14	1	33	RR/PHK	13	3	1	1			10
14	2	3	RR/PHK	13	3	1	2			10
14	2	33	RR/PHK	13	3	1	3			10
14	3	3								0
14	3	15	RR/PHK	13	2	1	1		10	
14	3	45	RR/PHK	13	1	1	1	10		
14	3	45	RR/PHK	13	2	1	2		10	
14	4	15	RR/PHK	13	1	1	2	10		
14	4	15	M171B	2	2	1	1		10	
14	4	45	M171B	2	2	1	1	10		
14	5	25	RR/PHK	13	1	1	3	10		
14	5	40	RR/PHK	13	2	1	3		10	
14	5	40	M171B	2	3	1	1			10
14	5	55						0		
14	6	10	M171B	2	3	1	1	10	0	
14	6	50						0		
14	7	5								0
14	8	0	M17134	13	1	1	2	12	12	12
14	9	15	T003A	2	2	1	1	1	1	11
14	9	33								1
14	17	15	M17134	13	1	2	1	12	12	12
14	18	12	M172	13	1	1	1	12	2	2
14	18	19	M172	13	1	1	1	2	12	
14	18	24	M172	13	1	1	1		2	12

ASTRONAUT PLANNING BASELINES

D	H	M	EXOP	ER	AG	A	AR	1	2	3 4 5 6 7 UTILIZATION CODES
14	18	30	SHK	13	1	1	1	10		
14	18	30	SHK	13	2	1	2		10	
14	18	30	T003A	2	1	1	2			10
14	18	48	SHK	12	3	1	1			10
14	19	0	SHK	13	1	1	2	10		
14	19	0	SHK	13	2	1	2		10	
14	19	18	SHK	12	3	1	2			10
14	19	30	SHK	13	1	1	3	10		
14	19	30	SHK	13	2	1	3		10	
14	19	48	SHK	12	3	1	3			10
14	20	0						0	0	
14	20	18	ATM	1	4	1	3			10
14	21	30	M171C	2	1	1	1	10		
14	21	45	M171C	2	1	1	1		10	
14	23	15							0	
14	23	18								0
14	23	30						0		
15	0	0	M17134	14	1	1	1	12	12	12
15	1	15	RR/PHK	14	1	1	1	10		
15	1	15	RR/PHK	14	2	1	1		10	
15	1	15	T003B	14	1	1	1			10
15	1	18	RR/PHK	14	3	1	1			10
15	1	45	RR/PHK	14	1	1	2	10		
15	1	45	RR/PHK	14	2	1	2		10	
15	1	48	RR/PHK	14	3	1	2			10
15	2	15	RR/PHK	14	1	1	3	10		
15	2	15	RR/PHK	14	2	1	3		10	
15	2	18	RR/PHK	14	3	1	3			10
15	2	45						0	0	
15	2	48	ATM	1	3	1	5			10
15	4	15	M092	5	1	1	1	10	10	
15	5	31	M092	5	2	1	1	10	10	
15	6	47						0	0	
15	6	48								0
15	7	16	M093	5	1	1	1	10	10	
15	7	31							0	
15	7	56						0		
15	8	0	M17134	14	1	1	2	12	12	12
15	9	15	T003B	14	2	1	1	1	1	11
15	9	18								1
15	17	15	M17134	14	1	2	1	12	12	12
15	18	12	M172	14	1	1	1	12	2	2
15	18	19	M172	14	1	1	1	2	12	
15	18	24	M172	14	1	1	1		2	12

ASTRONAUT PLANNING BASELINES

D	H	M	EXOP	ER	AG	A	AR	1	2	3 4 5 6 7 UTILIZATION CODES
15	18	30	SHK	14	1	1	1	10		
15	18	30	SHK	14	2	1	1		10	
15	18	30	T003B	14	1	1	2			10
15	18	33	SHK	13	3	1	1			10
15	19	0	SHK	14	1	1	2	10		
15	19	0	SHK	14	2	1	2		10	
15	19	3	SHK	13	3	1	2			10
15	19	30	SHK	14	1	1	3	10		
15	19	30	SHK	14	2	1	3		10	
15	19	33	SHK	13	3	1	3			10
15	20	0	ATM	1	4	1	4	0	10	
15	20	3								0
15	21	30	M092	5	3	1	1	10		10
15	22	46						0		0
15	23	0							0	
15	23	15	M093	5	2	1	1	10	10	
15	23	30						0		
15	23	55							0	
16	0	0	M17134	15	1	1	1	12	12	12
16	1	15	RR/PHK	15	1	1	1	10		
16	1	15	RR/PHK	15	2	1	1		10	
16	1	15	T003B	15	1	1	1			10
16	1	18	RR/PHK	15	3	1	1			10
16	1	45	RR/PHK	15	1	1	2	10		
16	1	45	RR/PHK	15	2	1	2		10	
16	1	48	RR/PHK	15	3	1	2			10
16	2	15	M131B	2	1	1	1	10	10	
16	2	18	RR/PHK	15	3	1	3			10
16	2	48								0
16	3	0	M131B	2	2	1	1	10	10	
16	3	45	M131B	2	3	1	1	10		
16	3	45	RR/PHK	15	2	1	3		10	
16	3	45	M131B	2	3	1	1			10
16	4	15	M171C	2	2	1	1		10	
16	4	30	M171C	2	2	1	1	10		0
16	6	0						0		
16	6	15	M093	5	3	1	1	10	0	10
16	6	30	RR/PHK	15	1	1	3	10		
16	6	55								0
16	7	0						0		
16	8	0	M17134	15	1	1	2	12	12	12
16	9	15	T003B	15	2	1	1	1	1	11
16	9	18								1
16	17	15	M17134	15	1	2	1	12	12	12

ASTRONAUT PLANNING BASELINES

D	H	M	EXOP	ER	AG	A	AR	1	2	3 4 5 6 7 UTILIZATION CODES
16	18	12	M172	15	1	1	1	12	2	2
16	18	19	M172	15	1	1	1	2	12	
16	18	24	M172	15	1	1	1		2	12
16	18	30	SHK	15	1	1	1	10		
16	18	30	SHK	15	2	1	1		10	
16	18	30	T003B	15	1	1	2			10
16	18	33	SHK	14	3	1	1			10
16	19	0	SHK	15	1	1	2	10		
16	19	0	SHK	15	2	1	2		10	
16	19	3	SHK	14	3	1	2			10
16	19	30	SHK	15	1	1	3	10		
16	19	30	SHK	15	2	1	3		10	
16	19	33	SHK	14	3	1	3			10
16	20	0	ATM	1	3	1	6	0	10	
16	20	3								0
16	21	30	M171C	2	3	1	1			10
16	21	45	M171C	2	3	1	1	10		
16	23	15						0		
16	23	30								0
17	0	0	M17134	16	1	1	1	12	12	12
17	1	15	RR/PHK	16	1	1	1	10	0	
17	1	15	T003B	16	1	1	1			10
17	1	18	M508	1	1	2	2		10	10
17	1	45	RR/PHK	16	1	1	2	10		
17	2	15	RR/PHK	16	1	1	3	10		
17	2	45	ATM	1	4	1	5	10		
17	5	38	T020	1	1	2	1		10	
17	5	38	RR/PHK	16	3	1	1			10
17	5	45						0		
17	5	48	T020	1	1	2	1	10		
17	6	8	RR/PHK	16	3	1	2			10
17	6	38	RR/PHK	16	3	1	3	0		10
17	7	8	RR/PHK	16	2	1	1		10	0
17	7	38							0	
17	8	0	M17134	16	1	1	2	12	12	12
17	9	15	T003B	16	2	1	1	1	1	11
17	9	18								1
17	17	15	M17134	16	1	2	1	12	12	12
17	18	12	M172	16	1	1	1	12	2	2
17	18	19	M172	16	1	1	1	2	12	
17	18	24	M172	16	1	1	1		2	12
17	18	30	SHK	16	1	1	1	10		
17	18	30	SHK	16	2	1	1		10	
17	18	30	T003B	16	1	1	2			10

ASTRONAUT PLANNING BASELINES

D	H	M	EXOP	ER	AG	A	AR	1	2	3 4 5 6 7 UTILIZATION CODES
17	18	33	M508	1	2	1	1			10
17	19	0	SHK	16	1	1	2	10		
17	19	0	SHK	16	2	1	2		10	
17	19	30	SHK	16	1	1	3	10		
17	19	30	SHK	16	2	1	3		10	
17	20	0	ATM	1	1	1	1	10	10	
17	22	3	SHK	15	3	1	1			10
17	22	33	SHK	15	3	1	2			10
17	23	3	SHK	15	3	1	3			10
17	23	33								0
18	0	0	M17134	17	1	1	1	12	12	12
18	1	15	RR/PHK	17	1	1	1	10		
18	1	15	RR/PHK	17	2	1	1		10	
18	1	15	T003B	17	1	1	1			10
18	1	18	RR/PHK	17	3	1	1			10
18	1	45	RR/PHK	17	1	1	2	10		
18	1	45	RR/PHK	17	2	1	2		10	
18	1	48	RR/PHK	17	3	1	2			10
18	2	15	RR/PHK	17	1	1	3	10		
18	2	15	RR/PHK	17	2	1	3		10	
18	2	18	RR/PHK	17	3	1	3			10
18	2	45						0	0	
18	2	48	ATM	1	3	1	7			10
18	4	15	M092	6	1	1	1	10	10	
18	5	31	M092	6	2	1	1	10	10	
18	6	47						0	0	
18	6	48								0
18	7	16	M093	6	1	1	1	10	10	
18	7	31							0	
18	7	56						0		
18	8	0	M17134	17	1	1	2	12	12	12
18	9	15	T003B	17	2	1	1	1	1	11
18	9	18								1
18	17	15	M17134	17	1	2	1	12	12	12
18	18	12	M172	17	1	1	1	12	2	2
18	18	19	M172	17	1	1	1	2	12	
18	18	24	M172	17	1	1	1		2	12
18	18	30	SHK	17	1	1	1	10		
18	18	30	SHK	17	2	1	1		10	
18	18	30	T003B	17	1	1	2			10
18	18	33	SHK	16	3	1	1			10
18	19	0	SHK	17	1	1	2	10		
18	19	0	SHK	17	2	1	2		10	
18	19	3	SHK	16	3	1	2			10

ASTRONAUT PLANNING BASELINES

D	H	M	EXOP	ER	AG	A	AR	1	2	3 4 5 6 7 UTILIZATION CODES
18	19	30	SHK	17	1	1	3	10		
18	19	30	SHK	17	2	1	3		10	
18	19	33	SHK	16	3	1	3			10
18	20	0	ATM	1	4	1	6	0	10	
18	20	3								0
18	21	30	M092	6	3	1	1	10		10
18	22	46						0		0
18	23	0							0	
18	23	15	M093	6	2	1	1	10	10	
18	23	30						0		
18	23	55							0	
19	0	0	M17134	18	1	1	1	12	12	12
19	1	15	RR/PHK	18	1	1	1	10		
19	1	15	RR/PHK	18	2	1	1		10	
19	1	15	T003B	18	1	1	1			10
19	1	18	RR/PHK	18	3	1	1			10
19	1	45	RR/PHK	18	1	1	2	10		
19	1	45	RR/PHK	18	2	1	2		10	
19	1	48	RR/PHK	18	3	1	2			10
19	2	15	RR/PHK	18	1	1	3	10		
19	2	15	RR/PHK	18	2	1	3		10	
19	2	18	RR/PHK	18	3	1	3			10
19	2	45						0	0	
19	2	48	ATM	1	2	1	6		10	10
19	4	15	M171A	3	1	1	1	10		
19	4	45	M171A	3	1	1	1		10	0
19	5	15							0	
19	5	45						0		
19	5	55	M093	6	3	1	1	10		10
19	6	10	ATM	1	5	1	8	10	10	
19	6	35								0
19	7	40						0	0	
19	8	0	M17134	18	1	1	2	12	12	12
19	9	15	T003B	18	2	1	1	1	1	11
19	9	18								1
19	17	15	M17134	18	1	2	1	12	12	12
19	18	12	M172	18	1	1	1	12	2	2
19	18	19	M172	18	1	1	1	2	12	
19	18	24	M172	18	1	1	1		2	12
19	18	30	SHK	18	1	1	1	10		
19	18	30	SHK	18	2	1	1		10	
19	18	30	T003B	18	1	1	2			10
19	18	33	SHK	17	3	1	1			10
19	19	0	SHK	18	1	1	2	10		

ASTRONAUT PLANNING BASELINES

D	H	M	EXOP	ER	AG	A	AR	1	2	3 UTILIZATION	4	5	6	7 CODES
19	19	0	SHK	18	2	1	2		10					
19	19	3	SHK	17	3	1	2			10				
19	19	30	SHK	18	1	1	3	10						
19	19	30	SHK	18	2	1	3		10					
19	19	33								0				
19	19	44	S020	2	1	1	1			10				
19	20	0	ATM	1	5	1	9	10	10					
19	20	19	S020	2	1	2	1			10				
19	20	55	SHK	18	3	1	3			10				
19	21	25								0				
19	21	30	M171A	3	2	1	1	0	10					
19	21	31	S020	2	1	2	2			10				
19	22	0	M171A	3	2	1	1	10						
19	22	7								0				
19	22	30						0						
19	23	0							0					
19	23	4	S020	2	1	2	3			10				
19	23	40	S020	2	1	3	1			10				
20	0	0	M17134	19	1	1	1	12	12	12				
20	1	15	RR/PHK	19	1	1	1	10						
20	1	15	RR/PHK	19	2	1	1		10					
20	1	15	T003B	19	1	1	1			10				
20	1	18	RR/PHK	19	3	1	1			10				
20	1	45	RR/PHK	19	1	1	2	10						
20	1	45	RR/PHK	19	2	1	2		10					
20	1	48	RR/PHK	19	3	1	2			10				
20	2	15	RR/PHK	19	1	1	3	10						
20	2	15	RR/PHK	19	2	1	3		10					
20	2	18	RR/PHK	19	3	1	3			10				
20	2	45	ATM	1	6	1	7	10	0					
20	2	48	S020	2	1	4	1			10				
20	3	2								0				
20	3	44	S020	2	1	5	1			10				
20	3	55	S020	2	1	5	2			10				
20	4	6	S020	2	1	6	1		10	0				
20	4	15	M171A	3	3	1	1			10				
20	4	30						0						
20	4	45	M171A	3	3	1	1	10						
20	4	51							0					
20	5	15	ATM	1	2	1	7	10	10					
20	5	45								0				
20	7	15						0	0					
20	8	0	M17134	19	1	1	2	12	12	12				
20	9	15	T003B	19	2	1	1	1	1	11				

ASTRONAUT PLANNING BASELINES

D	H	M	EXOP	ER	AG	A	AR	1	2	3 UTILIZATION	4	5	6	7 CODES
20	9	18								1				
20	17	15	M17134	19	1	2	1	12	12	12				
20	18	12	M172	19	1	1	1	12	2	2				
20	18	19	M172	19	1	1	1	2	12					
20	18	24	M172	19	1	1	1		2	12				
20	18	30	SHK	19	1	1	1	10	0					
20	18	30	T003B	19	1	1	2			10				
20	18	33	T020	1	1	3	1			10				
20	18	43	T020	1	1	3	1		10					
20	19	0	SHK	19	1	1	2	10						
20	19	8	SHK	19	2	1	1		10					
20	19	30	SHK	19	1	1	3	10						
20	19	38	SHK	19	2	1	2		10					
20	19	38	SHK	18	3	1	1			10				
20	20	0						0						
20	20	8	SHK	19	2	1	3		10					
20	20	8	SHK	18	3	1	2			10				
20	20	38	SHK	18	3	1	3		0	10				
20	21	8	ATM	1	4	1	7			10				
20	21	30	M171B	3	1	1	1	10						
20	22	0	M171B	3	1	1	1		10					
20	22	40							0					
20	22	55						0						
21	0	0	M17134	20	1	1	1	12	12	12				
21	1	15	RR/PHK	20	1	1	1	10						
21	1	15	RR/PHK	20	2	1	1		10					
21	1	15	T003B	20	1	1	1			10				
21	1	18	RR/PHK	20	3	1	1			10				
21	1	45	RR/PHK	20	1	1	2	10						
21	1	45	RR/PHK	20	2	1	2		10					
21	1	48	RR/PHK	20	3	1	2			10				
21	2	15	RR/PHK	20	1	1	3	10						
21	2	15	RR/PHK	20	2	1	3		10					
21	2	18	S019	2	1	1	1			10				
21	2	45	ATM	1	5	1	10	10	10					
21	2	48	RR/PHK	20	3	1	3			10				
21	3	18								0				
21	3	57	S019	2	1	2	1			10				
21	4	15	M092	7	1	1	1	10	10					
21	4	27								0				
21	5	27	S019	2	1	2	2			10				
21	5	31	M092	7	2	1	1	10	10					
21	5	57								0				
21	6	47						0	0					

ASTRONAUT PLANNING BASELINES

D	H	M	EXOP	ER	AG	A	AR	1	2	3 4 5 6 7 UTILIZATION CODES
21	7	4	S019	2	1	2	3			10
21	7	16	M093	7	1	1	1	10	10	
21	7	31							0	
21	7	34								0
21	7	56						0		
21	8	0	M17134	20	1	1	2	12	12	12
21	9	15	T003B	20	2	1	1	1	1	11
21	9	18								1
21	17	15	M17134	20	1	2	1	12	12	12
21	18	12	M172	20	1	1	1	12	2	2
21	18	19	M172	20	1	1	1	2	12	
21	18	24	M172	20	1	1	1		2	12
21	18	30	SHK	20	1	1	1	10		
21	18	30	SHK	20	2	1	1		10	
21	18	30	T003B	20	1	1	2			10
21	18	33	SHK	19	3	1	1			10
21	19	0	SHK	20	1	1	2	10		
21	19	0	SHK	20	2	1	2		10	
21	19	3	SHK	19	3	1	2			10
21	19	30	SHK	20	1	1	3	10		
21	19	30	SHK	20	2	1	3		10	
21	19	30	S019	2	1	2	4			10
21	20	0	ATM	1	4	1	8	0	10	
21	20	0	SHK	19	3	1	3			10
21	20	30								0
21	21	0	S019	2	1	2	5			10
21	21	30	M092	7	3	1	1	10		10
21	22	46						0		0
21	23	0							0	
21	23	15	M093	7	2	1	1	10	10	
21	23	30						0		
21	23	55							0	
22	0	0	M17134	21	1	1	1	12	12	12
22	1	15	RR/PHK	21	1	1	1	10		
22	1	15	RR/PHK	21	2	1	1		10	
22	1	15	T003B	21	1	1	1			10
22	1	18								0
22	1	42	S019	2	1	2	6			10
22	1	45	RR/PHK	21	1	1	2	10		
22	1	45	RR/PHK	21	2	1	2		10	
22	2	12	RR/PHK	21	3	1	1			10
22	2	15	M131A	4	1	1	1	10	10	
22	2	42	RR/PHK	21	3	1	2			10
22	2	45	M131A	4	2	1	1	10	10	

C.3

ASTRONAUT PLANNING BASELINES

D	H	M	EXOP	ER	AG	A	AR	1	2	3 4 5 6 7 UTILIZATION CODES
22	3	12								0
22	3	15	M131A	4	3	1	1	10		
22	3	15	S019	2	1	2	7		10	
22	3	15	M131A	4	3	1	1			10
22	3	45	RR/PHK	21	1	1	3	10		
22	3	45	RR/PHK	21	2	1	3		10	
22	3	45	S019	2	1	3	1			10
22	4	15	M171B	3	2	1	1	0	10	
22	4	45	M171B	3	2	1	1	10		
22	4	45	RR/PHK	21	3	1	3			10
22	5	15								0
22	5	25						0		
22	5	40	ATM	1	6	1	8		10	
22	5	40	M171B	3	3	1	1			10
22	6	10	M171B	3	3	1	1	10		
22	6	50						0		
22	7	5	M093	7	3	1	1	10		10
22	7	20						0		
22	7	25							0	
22	7	45								0
22	8	0	M17134	21	1	1	2	12	12	12
22	9	15	T003B	21	2	1	1	1	1	11
22	9	18								1
22	17	15	M17134	21	1	2	1	12	12	12
22	18	12	M172	21	1	1	1	12	2	2
22	18	19	M172	21	1	1	1	2	12	
22	18	24	M172	21	1	1	1		2	12
22	18	30	SHK	21	1	1	1	10		
22	18	30	SHK	21	2	1	1		10	
22	18	30	T003B	21	1	1	2			10
22	18	33	SHK	20	3	1	1			10
22	19	0	SHK	21	1	1	2	10		
22	19	0	SHK	21	2	1	2		10	
22	19	3	SHK	20	3	1	2			10
22	19	30	SHK	21	1	1	3	10		
22	19	30	SHK	21	2	1	3		10	
22	19	33	SHK	20	3	1	3			10
22	20	0						0	0	
22	20	3	ATM	1	3	1	8			10
22	21	30	M171C	3	1	1	1	10		
22	21	45	M171C	3	1	1	1		10	
22	23	15							0	
22	23	30						0		
23	0	0	M17134	22	1	1	1	12	12	12

ASTRONAUT PLANNING BASELINES

D	H	M	EXOP	ER	AG	A	AR	1	2	3 4 5 6 7 UTILIZATION CODES
23	1	15	RR/PHK	22	1	1	1	10		
23	1	15	RR/PHK	22	2	1	1		10	
23	1	15	T003B	22	1	1	1			10
23	1	18	RR/PHK	22	3	1	1			10
23	1	45	RR/PHK	22	1	1	2	10		
23	1	45	RR/PHK	22	2	1	2		10	
23	1	48	RR/PHK	22	3	1	2			10
23	2	15	M131B	3	1	1	1	10	10	
23	2	18	RR/PHK	22	3	1	3			10
23	2	48								0
23	3	0	M131B	3	2	1	1	10	10	
23	3	45	M131B	3	3	1	1	10		
23	3	45	RR/PHK	22	2	1	3		10	
23	3	45	M131B	3	3	1	1			10
23	4	15	M171C	3	2	1	1		10	
23	4	30	M171C	3	2	1	1	10		0
23	6	0	RR/PHK	22	1	1	3	10		
23	6	15	ATM	1	5	1	11		10	10
23	6	30						0		
23	7	45							0	0
23	8	0	M17134	22	1	1	2	12	12	12
23	9	15	T003B	22	2	1	1	1	1	11
23	9	18								1
23	17	15	M17134	22	1	2	1	12	12	12
23	18	12	M172	22	1	1	1	12	2	2
23	18	19	M172	22	1	1	1	2	12	
23	18	24	M172	22	1	1	1		2	12
23	18	30	SHK	22	1	1	1	10		
23	18	30	SHK	22	2	1	1		10	
23	18	30	T003B	22	1	1	2			10
23	18	33	SHK	21	3	1	1			10
23	19	0	SHK	22	1	1	2	10		
23	19	0	SHK	22	2	1	2		10	
23	19	3	SHK	21	3	1	2			10
23	19	30	SHK	22	1	1	3	10		
23	19	30	SHK	22	2	1	3		10	
23	19	33	SHK	21	3	1	3			10
23	20	0	ATM	1	3	1	9	0	10	
23	20	3								0
23	21	30	M171C	3	3	1	1			10
23	21	45	M171C	3	3	1	1	10		
23	23	15						0		
23	23	30								0
24	0	0	M17134	23	1	1	1	12	12	12

ASTRONAUT PLANNING BASELINES

D	H	M	EXOP	ER	AG	A	AR	1	2	3	4	5	6	7
										UTILIZATION			CODES	
24	1	15	RR/PHK	23	1	1	1	10	0					
24	1	15	T003A	3	1	1	1			10				
24	1	33	M508	1	2	2	1		10	10				
24	1	45	RR/PHK	23	1	1	2	10						
24	2	15	RR/PHK	23	1	1	3	10						
24	2	45	ATM	1	6	1	9	10						
24	4	30						0						
24	5	53	M131A	5	1	1	1	10	10					
24	5	53	RR/PHK	23	3	1	1			10				
24	6	23	M131A	5	2	1	1	10	10					
24	6	23	RR/PHK	23	3	1	2			10				
24	6	53	M131A	5	3	1	1	10						
24	6	53	RR/PHK	23	2	1	1		10					
24	6	53	M131A	5	3	1	1			10				
24	7	23	RR/PHK	23	2	1	2	0	10					
24	7	23	RR/PHK	23	3	1	3			10				
24	7	53							0	0				
24	8	0	M17134	23	1	1	2	12	12	12				
24	9	15	T003A	3	2	1	1	1	1	1				
24	9	33								1				
24	17	15	M17134	23	1	2	1	12	12	12				
24	18	12	M172	23	1	1	1	12	2	2				
24	18	19	M172	23	1	1	1	2	12					
24	18	24	M172	23	1	1	1		2	12				
24	18	30	SHK	23	1	1	1	10	0					
24	18	30	T003A	3	1	1	2			10				
24	18	48	M508	1	2	2	2		10	10				
24	19	0	SHK	23	1	1	2	10						
24	19	30	SHK	23	1	1	3	10						
24	20	0	ATM	1	3	1	10	10						
24	23	8	SHK	23	2	1	1		10					
24	23	8	SHK	22	3	1	1			10				
24	23	38							0	0				
25	0	0	M17134	24	1	1	1	12	12	12				
25	1	15	D021	1	1	2	1	10	10	10				
25	6	45	RR/PHK	24	1	1	1	10						
25	6	45	RR/PHK	24	2	1	1		10					
25	6	45	RR/PHK	24	3	1	1			10				
25	7	15	RR/PHK	24	1	1	2	10						
25	7	15	RR/PHK	24	2	1	2		10					
25	7	15	RR/PHK	24	3	1	2			10				
25	7	45						0	0	0				
25	8	0	M17134	24	1	1	2	12	12	12				
25	9	15						1	1	1				

ASTRONAUT PLANNING BASELINES

D	H	M	EXOP	ER	AG	A	AR	1	2	3	4	5	6	7
										UTILIZATION CODES				
25	17	15	M17134	24	1	2	1	12	12	12				
25	18	12	M172	24	1	1	1	12	2	2				
25	18	19	M172	24	1	1	1	2	12					
25	18	24	M172	24	1	1	1		2	12				
25	18	30	SHK	23	1	1	1	10						
25	18	30	SHK	23	2	1	1		10					
25	18	30	SHK	23	3	1	1			10				
25	19	0	SHK	23	1	1	2	10						
25	19	0	SHK	23	2	1	2		10					
25	19	0	SHK	23	3	1	2			10				
25	19	30	SHK	23	1	1	3	10						
25	19	30	SHK	23	2	1	3		10					
25	19	30	SHK	23	3	1	3			10				
25	20	0	ATM	1	1	1	2	10	10	0				
26	0	0	M17134	25	1	1	1	12	12	12				
26	1	15	RR/PHK	25	1	1	1	10						
26	1	15	M509	1	1	1	1		10	10				
26	1	18	M509	1	1	1	1		10	0				
26	1	33	M509	1	1	2	1		10	10				
26	1	45	RR/PHK	25	1	1	2	10						
26	2	15	RR/PHK	25	1	1	3	10						
26	2	45						0						
26	5	58	M131A	6	1	1	1	10	10					
26	5	58	RR/PHK	25	3	1	1			10				
26	6	28	M131A	6	2	1	1	10	10					
26	6	28	RR/PHK	25	3	1	2			10				
26	6	58	M131A	6	3	1	1	10						
26	6	58	RR/PHK	25	2	1	1		10					
26	6	58	M131A	6	3	1	1			10				
26	7	28	RR/PHK	25	2	1	2	0	10					
26	7	28	RR/PHK	25	3	1	3			10				
26	7	58							0	0				
26	8	0	M17134	25	1	1	2	12	12	12				
26	9	15						1	1	1				
26	17	15	M17134	25	1	2	1	12	12	12				
26	18	12	M172	25	1	1	1	12	2	2				
26	18	19	M172	25	1	1	1	2	12					
26	18	24	M172	25	1	1	1		2	12				
26	18	30	M509	1	2	1	1	10						
26	18	30	SHK	24	2	1	1		10					
26	18	30	M509	1	2	1	1			10				
26	18	33	M509	1	2	1	1	10		0				
26	18	48	M509	1	2	2	1	10		10				
26	19	0	SHK	24	2	1	2		10					

ASTRONAUT PLANNING BASELINES

D	H	M	EXOP	ER	AG	A	AR	1	2	3	4	5	6	7
										UTILIZATION				CODES
26	19	30	SHK	24	2	1	3		10					
26	20	0	ATM	1	3	1	11		10					
26	23	13	SHK	24	1	1	1	10						
26	23	13	SHK	24	3	1	1			10				
26	23	43						0		0				
27	0	0	M17134	26	1	1	1	12	12	12				
27	1	15	RR/PHK	26	1	1	1	10						
27	1	15	M509	1	3	1	1		10	10				
27	1	18	M509	1	3	1	1		10	0				
27	1	33	M509	1	3	2	1		10	10				
27	1	45	RR/PHK	26	1	1	2	10						
27	2	15	RR/PHK	26	1	1	3	10						
27	2	45	ATM	1	3	1	12	10						
27	6	8	RR/PHK	26	2	1	1		10					
27	6	8	RR/PHK	26	3	1	1			10				
27	6	38	RR/PHK	26	2	1	2		10					
27	6	38	RR/PHK	26	3	1	2			10				
27	6	45						0						
27	7	8	RR/PHK	26	2	1	3		10					
27	7	8	RR/PHK	26	3	1	3			10				
27	7	38							0	0				
27	8	0	M17134	26	1	1	2	12	12	12				
27	9	15						1	1	1				
27	17	15	M17134	26	1	2	1	12	12	12				
27	18	12	M172	26	1	1	1	12	2	2				
27	18	19	M172	26	1	1	1	2	12					
27	18	24	M172	26	1	1	1		2	12				
27	18	30	M509	1	4	1	1	10	10					
27	18	30	SHK	25	3	1	1			10				
27	18	33	M509	1	4	1	1	10	0					
27	18	48	M509	1	4	2	1	10	10					
27	19	0	SHK	25	3	1	2			10				
27	19	30	SHK	25	3	1	3			10				
27	20	0								0				
27	22	3	SHK	25	1	1	1	10						
27	22	3	SHK	25	2	1	1		10					
27	22	33	SHK	25	1	1	2	10						
27	22	33	SHK	25	2	1	2		10					
27	23	3	SHK	25	1	1	3	10						
27	23	3	SHK	25	2	1	3		10					
27	23	33						0	0					
28	0	0						2	2	2				
28	1	15	RR/PHK	27	1	1	1	10						
28	1	15	RR/PHK	27	2	1	1		10					

ASTRONAUT PLANNING BASELINES

D	H	M	EXOP	ER	AG	A	AR	1	2	3	4	5	6	7
								UTILIZATION CODES						
28	1	15	RR/PHK	27	3	1	1			10				
28	1	45	RR/PHK	27	1	1	2	10						
28	1	45	RR/PHK	27	2	1	2		10					
28	1	45	RR/PHK	27	3	1	2			10				
28	2	15	RR/PHK	27	1	1	3	10						
28	2	15	RR/PHK	27	2	1	3		10					
28	2	15	RR/PHK	27	3	1	3			10				
28	2	45	CDS	1	1	1	1	10	10	10				
28	8	0						2	2	2				
28	9	15						1	1	1				
28	17	15						2	2	2				
28	18	30	SHK	26	1	1	1	10						
28	18	30	SHK	26	2	1	1		10					
28	18	30	SHK	26	3	1	1			10				
28	19	0	SHK	26	2	1	2	0	10					
28	19	0	SHK	26	3	1	2			10				
28	19	18	S009	1	1	1	1	10						
28	19	30	SHK	26	1	1	2	10						
28	19	30	SHK	26	2	1	3		10					
28	19	30	SHK	26	3	1	3			10				
28	20	0	SHK	26	1	1	3	10						
28	20	0	CDS	1	1	2	1		10	10				

LOCAL RESOURCE TIMELINES

Ten items were identified as Skylab replenishable resources and equipment which presented potential scheduling conflicts if required by more than one EXOP simultaneously. Each local resource was characterized as a queue of available units. When an activity required a certain amount of the resource, that amount was taken from the queue over the interval of the activity. At the end of the activity the amount was returned to the queue for reuse. Many activities could be scheduled over an interval as long as there were enough units remaining in the queue to satisfy the activity's request. The ten resources identified, and the initial number of units in the queue, are as follows:

Resource Number	Type	Initial Amount
1.	Constant electric power available from all sources	1000 watts
2.	Ergometer	1
3.	Hasselblad camera	2
4.	ATM equipment	1
5.	VKG vest and Vectorcardiogram equipment	1
6.	Movie camera	2
7.	Analog telemetry channels	50
8.	Digital telemetry channels	50
9.	Razor	1
10.	Multispectral camera	1

The initial number of units available may not be the number of units currently assigned for Skylab. However, the resulting profiles provide an indicator of the usage of each resource.

LOCAL RESOURCE BASELINE

REBOURCE 1				RESOURCE 2				RESOURCE 3				RESOURCE 4			
D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILABLE
0	0	0	1000,000	0	0	0	1,000	0	0	0	2,000	0	0	0	1.000
2	0	0	996,000	3	7	16	.000	14	1	24	1,000	3	20	0	.000
2	1	15	1000,000	3	9	56	1.000	14	3	15	2,000	3	21	45	1.000
2	8	0	996,000	3	23	15	.000	17	5	48	1,000	4	6	17	.000
2	9	15	1000,000	4	1	55	1.000	17	6	38	2,000	4	8	2	1.000
2	17	15	996,000	4	4	15	.000	20	15	43	1,000	4	20	0	.000
2	18	12	1000,000	4	5	45	.000	20	19	8	2,000	4	21	30	1.000
2	10	14	996,000	4	8	25	1.000	25	1	33	1,000	4	22	30	.000
2	10	29	1000,000	4	21	30	.000	26	5	58	2,000	5	0	0	1.000
3	0	0	996,000	4	23	0	1.000	26	18	48	1,000	5	4	15	.000
3	1	15	1000,000	5	4	15	.000	26	23	13	2,000	5	6	0	1.000
3	1	34	986,400	5	5	45	1.000	27	0	0	2,000	5	6	30	.000
3	3	20	920,400	6	7	16	.000	27	1	33	1,000	5	8	0	1.000
3	4	15	915,400	6	9	56	1.000	27	6	8	2,000	5	20	0	.000
3	4	45	981,400	6	23	15	.000	27	18	48	1,000	5	21	45	1.000
3	4	53	849,400	7	1	55	1.000	27	22	3	2,000	6	4	15	.000
3	5	31	910,400	7	7	5	.000					6	8	15	1.000
3	5	35	915,400	7	9	45	1.000					7	2	45	.000
3	6	18	981,400	9	7	16	.000					7	4	30	1.000
3	6	26	849,400	9	9	56	1.000					7	5	40	.000
3	6	51	920,400	9	23	15	.000					7	7	25	1.000
3	7	16	870,400	10	1	55	1.000					7	20	0	.000
3	7	51	936,400	10	6	45	.000					7	21	30	1.000
3	7	56	986,400	10	9	25	1.000					8	6	0	.000
3	8	0	982,400	11	4	15	.000					8	8	0	1.000
3	9	15	986,400	11	5	45	1.000					8	20	0	.000
3	17	15	982,400	11	21	30	.000					8	21	30	1.000
3	18	12	986,400	11	23	0	1.000					9	3	46	.000

LOCAL RESOURCE BASELINE

RESOURCE 1				RESOURCE 2				RESOURCE 3				RESOURCE 4			
D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILABLE
3	18	14	982,400	12	7	16	.000					9	7	46	1.000
3	18	29	986,400	12	9	56	1.000					10	4	31	.000
3	18	51	920,400	12	23	15	.000					10	6	31	1.000
3	20	0	870,400	13	1	55	1.000					10	20	0	.000
3	20	16	936,400	13	4	15	.000					11	0	0	1.000
3	21	30	931,400	13	5	45	1.000					11	2	45	.000
3	21	55	924,400	13	6	25	.000					11	4	15	1.000
3	22	31	931,400	13	9	5	1.000					11	5	45	.000
3	22	50	936,400	15	7	16	.000					11	7	45	1.000
3	23	15	886,400	15	9	56	1.000					11	20	0	.000
3	23	55	936,400	15	23	15	.000					11	21	30	1.000
4	0	0	932,400	16	1	55	1.000					12	3	45	.000
4	1	15	936,400	16	6	15	.000					12	7	45	1.000
4	1	32	935,400	16	8	55	1.000					12	20	0	.000
4	2	2	936,400	18	7	16	.000					12	23	0	1.000
4	2	15	756,400	18	9	56	1.000					13	2	45	.000
4	2	45	756,400	18	23	15	.000					13	4	45	.000
4	3	15	756,400	19	1	55	1.000					13	7	45	1.000
4	3	45	936,400	19	4	15	.000					13	20	3	.000
4	4	10	929,400	19	5	45	1.000					13	22	3	1.000
4	4	46	936,400	19	5	55	.000					14	20	18	.000
4	5	41	929,400	19	8	35	1.000					14	23	18	1.000
4	5	45	879,400	19	21	30	.000					15	2	48	.000
4	6	17	886,400	19	23	0	1.000					15	6	48	1.000
4	6	25	936,400	20	4	15	.000					15	20	0	.000
4	6	50	935,400	20	5	45	1.000					15	23	0	1.000
4	7	5	936,400	21	7	16	.000					16	20	0	.000
4	7	14	929,400	21	9	56	1.000					17	0	0	1.000

LOCAL RESOURCE BASELINE

RESOURCE 1				RESOURCE 2				RESOURCE 3				RESOURCE 4			
D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILABLE
4	7	35	929,400	21	23	15	.000					17	2	45	.000
4	7	49	929,400	22	1	55	1.000					17	5	45	1.000
4	8	0	932,400	22	7	5	.000					17	20	0	.000
4	9	15	936,400	22	9	45	1.000					18	0	0	1.000
4	17	15	932,400	27	0	0	1.000					18	2	48	.000
4	18	12	936,400									18	6	48	1.000
4	18	14	932,400									18	20	0	.000
4	18	29	936,400									18	23	0	1.000
4	18	48	929,400									19	2	48	.000
4	18	59	936,400									19	4	48	1.000
4	21	34	935,400									19	6	10	.000
4	22	4	936,400									19	7	40	1.000
5	0	0	932,400									19	20	0	.000
5	1	15	936,400									19	21	30	1.000
5	6	4	935,400									20	2	45	.000
5	6	19	936,400									20	4	30	1.000
5	7	49	935,400									20	5	15	.000
5	8	0	932,400									20	7	15	1.000
5	9	15	936,400									20	21	8	.000
5	17	15	932,400									21	0	8	1.000
5	18	12	936,400									21	2	45	.000
5	18	14	932,400									21	4	15	1.000
5	18	29	936,400									21	20	0	.000
5	20	50	935,400									21	23	0	1.000
5	21	20	936,400									22	5	40	.000
5	21	30	899,400									22	7	25	1.000
5	22	55	936,400									22	20	3	.000
6	0	0	932,400									23	0	3	1.000

LOCAL RESOURCE BASELINE

RESOURCE 1				RESOURCE 2				RESOURCE 3				RESOURCE 4			
D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILABLE
6	1	15	936,400									23	6	15	.000
6	2	15	756,400									23	7	45	1.000
6	2	45	756,400									23	20	0	.000
6	3	15	756,400									24	0	0	1.000
6	3	45	936,400									24	2	45	.000
6	4	15	931,400									24	4	30	1.000
6	5	31	926,400									24	20	0	.000
6	5	35	931,400									25	0	0	1.000
6	6	51	936,400									25	20	0	.000
6	7	16	886,400									26	0	0	1.000
6	7	56	936,400									26	20	0	.000
6	8	0	932,400									27	0	0	1.000
6	9	15	936,400									27	2	45	.000
6	17	15	932,400									27	6	45	1.000
6	18	12	936,400												
6	18	14	932,400												
6	18	29	936,400												
6	20	43	986,400												
6	21	30	981,400												
6	22	50	986,400												
6	23	15	936,400												
6	23	55	986,400												
7	0	0	982,400												
7	1	15	986,400												
7	1	18	874,400												
7	2	18	874,400												
7	3	36	949,400												
7	4	15	912,400												

LOCAL RESOURCE BASELINE

RESOURCE 1				RESOURCE 2				RESOURCE 3				RESOURCE 4			
D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILABLE
7	4	36	949,400												
7	5	40	949,400												
7	7	5	936,400												
7	7	45	986,400												
7	9	0	982,400												
7	9	15	986,400												
7	17	15	982,400												
7	18	12	986,400												
7	18	14	982,400												
7	18	29	986,400												
7	21	30	949,400												
7	23	30	986,400												
8	0	0	982,400												
8	1	15	986,400												
8	1	34	1000,000												
8	2	15	820,000												
8	2	45	820,000												
8	3	15	820,000												
8	3	45	1000,000												
8	4	15	963,000												
8	6	15	1000,000												
8	8	0	996,000												
8	9	15	1000,000												
8	17	15	996,000												
8	18	12	1000,000												
8	18	14	996,000												
8	18	29	1000,000												
8	21	30	963,000												

LOCAL RESOURCE BASELINE

RESOURCE 1				RESOURCE 2				RESOURCE 3				RESOURCE 4			
D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILABLE
8	23	30	1000,000												
9	0	0	996,000												
9	1	15	1000,000												
9	4	15	995,000												
9	5	31	990,000												
9	5	35	995,000												
9	6	51	1000,000												
9	7	16	950,000												
9	7	56	1000,000												
9	8	0	996,000												
9	9	15	1000,000												
9	17	15	996,000												
9	18	12	1000,000												
9	18	14	996,000												
9	18	29	1000,000												
9	18	33	974,000												
9	19	23	1000,000												
9	21	30	995,000												
9	22	50	1000,000												
9	23	15	950,000												
9	23	55	1000,000												
10	0	0	996,000												
10	1	15	500,000												
10	4	45	1000,000												
10	6	4	993,000												
10	6	45	950,000												
10	7	25	1000,000												
10	8	0	996,000												

LOCAL RESOURCE BASELINE

RESOURCE 1				RESOURCE 2				RESOURCE 3				RESOURCE 4			
D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILABLE
10	9	15	1000,000												
10	17	15	996,000												
10	18	12	1000,000												
10	18	14	996,000												
10	18	29	1000,000												
10	18	33	580,000												
10	22	53	1000,000												
11	0	0	996,000												
11	1	15	1000,000												
11	8	0	996,000												
11	9	15	1000,000												
11	17	15	996,000												
11	18	12	1000,000												
11	18	14	996,000												
11	18	29	1000,000												
12	0	0	996,000												
12	1	15	1000,000												
12	4	15	995,000												
12	5	31	990,000												
12	5	35	995,000												
12	6	31	1000,000												
12	7	16	950,000												
12	7	56	1000,000												
12	8	0	996,000												
12	9	15	1000,000												
12	17	15	996,000												
12	18	12	1000,000												
12	18	14	996,000												

LOCAL RESOURCE BASELINE

RESOURCE 1				RESOURCE 2				RESOURCE 3				RESOURCE 4			
D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILABLE
12	18	29	1000,000												
12	21	30	995,000												
12	22	50	1000,000												
12	23	15	950,000												
12	23	55	1000,000												
13	0	0	996,000												
13	1	15	1000,000												
13	6	25	950,000												
13	7	5	1000,000												
13	8	0	996,000												
13	9	15	1000,000												
13	17	15	996,000												
13	18	12	1000,000												
13	18	14	996,000												
13	18	29	1000,000												
13	21	30	963,000												
13	22	55	1000,000												
14	0	0	996,000												
14	1	15	1000,000												
14	1	24	874,000												
14	3	15	1000,000												
14	4	15	963,000												
14	5	40	963,000												
14	7	5	1000,000												
14	8	0	996,000												
14	9	15	1000,000												
14	17	15	996,000												
14	18	12	1000,000												

LOCAL RESOURCE BASELINE

RESOURCE 1				RESOURCE 2				RESOURCE 3				RESOURCE 4			
D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILABLE
14	18	14	996,000												
14	18	29	1000,000												
14	21	30	963,000												
14	23	30	1000,000												
15	0	0	996,000												
15	1	15	1000,000												
15	4	15	995,000												
15	5	31	990,000												
15	5	35	995,000												
15	6	31	1000,000												
15	7	16	950,000												
15	7	56	1000,000												
15	8	0	996,000												
15	9	15	1000,000												
15	17	15	996,000												
15	18	12	1000,000												
15	18	14	996,000												
15	18	29	1000,000												
15	21	30	995,000												
15	22	50	1000,000												
15	23	15	950,000												
15	23	55	1000,000												
16	0	0	996,000												
16	1	15	1000,000												
16	4	15	963,000												
16	6	15	950,000												
16	6	55	1000,000												
16	8	0	996,000												

LOCAL RESOURCE BASELINE

RESOURCE 1				RESOURCE 2				RESOURCE 3				RESOURCE 4			
D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILABLE
16	9	15	1000,000												
16	17	15	996,000												
16	18	12	1000,000												
16	18	14	996,000												
16	18	29	1000,000												
16	21	30	963,000												
16	23	30	1000,000												
17	0	0	996,000												
17	1	15	1000,000												
17	1	18	580,000												
17	5	38	1000,000												
17	5	48	874,000												
17	6	38	1000,000												
17	8	0	996,000												
17	9	15	1000,000												
17	17	15	996,000												
17	18	12	1000,000												
17	18	14	996,000												
17	18	29	1000,000												
17	18	33	580,000												
17	22	3	1000,000												
18	0	0	996,000												
18	1	15	1000,000												
18	4	15	995,000												
18	5	31	990,000												
18	5	35	995,000												
18	6	51	1000,000												
18	7	16	950,000												

LOCAL RESOURCE BASELINE

REBOURCE 1				RESOURCE 2				RESOURCE 3				RESOURCE 4			
D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILABLE
18	7	56	1000,000												
18	8	0	996,000												
18	9	15	1000,000												
18	17	15	996,000												
18	18	12	1000,000												
18	18	14	996,000												
18	18	29	1000,000												
18	21	30	995,000												
18	22	50	1000,000												
18	23	15	950,000												
18	23	55	1000,000												
19	0	0	996,000												
19	1	15	1000,000												
19	5	55	950,000												
19	6	35	1000,000												
19	8	0	996,000												
19	9	15	1000,000												
19	17	15	996,000												
19	18	12	1000,000												
19	18	14	996,000												
19	18	29	1000,000												
19	20	19	993,000												
19	20	55	1000,000												
19	21	31	993,000												
19	22	7	1000,000												
19	23	4	993,000												
19	23	40	993,000												
20	0	0	989,000												

LOCAL RESOURCE BASELINE

RESOURCE 1				RESOURCE 2				RESOURCE 3				RESOURCE 4			
D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILABLE
20	0	1	996,000												
20	1	15	1000,000												
20	2	48	993,000												
20	3	2	1000,000												
20	3	44	993,000												
20	3	55	993,000												
20	4	6	1000,000												
20	8	0	996,000												
20	9	15	1000,000												
20	17	15	996,000												
20	18	12	1000,000												
20	18	14	996,000												
20	18	29	1000,000												
20	18	43	874,000												
20	19	8	1000,000												
20	21	30	963,000												
20	22	55	1000,000												
21	0	0	996,000												
21	1	15	1000,000												
21	4	15	995,000												
21	5	31	990,000												
21	5	35	995,000												
21	6	51	1000,000												
21	7	16	950,000												
21	7	56	1000,000												
21	8	0	996,000												
21	9	15	1000,000												
21	17	15	996,000												

LOCAL RESOURCE BASELINE

RESOURCE 1				RESOURCE 2				RESOURCE 3				RESOURCE 4			
D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILABLE
21	18	12	1000,000												
21	18	14	996,000												
21	18	29	1000,000												
21	21	30	995,000												
21	22	50	1000,000												
21	23	15	950,000												
21	23	55	1000,000												
22	0	0	996,000												
22	1	15	1000,000												
22	2	15	820,000												
22	2	45	820,000												
22	3	15	820,000												
22	3	45	1000,000												
22	4	15	963,000												
22	5	40	963,000												
22	7	5	950,000												
22	7	45	1000,000												
22	8	0	996,000												
22	9	15	1000,000												
22	17	15	996,000												
22	18	12	1000,000												
22	18	14	996,000												
22	18	29	1000,000												
22	21	30	963,000												
22	23	30	1000,000												
23	0	0	996,000												
23	1	15	1000,000												
23	4	15	963,000												

LOCAL RESOURCE BASELINE

RESOURCE 1				RESOURCE 2				RESOURCE 3				RESOURCE 4			
D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILABLE
23	6	15	1000,000												
23	8	0	996,000												
23	9	15	1000,000												
23	17	15	996,000												
23	18	12	1000,000												
23	18	14	996,000												
23	18	29	1000,000												
23	21	30	963,000												
23	23	30	1000,000												
24	0	0	996,000												
24	1	15	1000,000												
24	1	33	580,000												
24	5	53	820,000												
24	6	23	820,000												
24	6	53	820,000												
24	7	23	1000,000												
24	8	0	996,000												
24	9	15	1000,000												
24	17	15	996,000												
24	18	12	1000,000												
24	18	14	996,000												
24	18	29	1000,000												
24	18	48	580,000												
24	23	8	1000,000												
25	0	0	996,000												
25	1	15	1000,000												
25	3	15	925,000												
25	6	15	1000,000												

LOCAL RESOURCE BASELINE

RESOURCE 1				RESOURCE 2				RESOURCE 3				RESOURCE 4			
D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILABLE
25	8	0	996,000												
25	9	15	1000,000												
25	17	15	996,000												
25	18	12	1000,000												
25	18	14	996,000												
25	18	29	1000,000												
26	0	0	996,000												
26	1	15	1000,000												
26	1	33	794,000												
26	5	58	820,000												
26	6	28	820,000												
26	6	58	820,000												
26	7	28	1000,000												
26	8	0	996,000												
26	9	15	1000,000												
26	17	15	996,000												
26	18	12	1000,000												
26	18	14	996,000												
26	18	29	1000,000												
26	19	48	794,000												
26	23	13	1000,000												
27	0	0	996,000												
27	1	15	1000,000												
27	1	33	794,000												
27	6	8	1000,000												
27	8	0	996,000												
27	9	15	1000,000												
27	17	15	996,000												

LOCAL RESOURCE BASELINE

RESOURCE 1				RESOURCE 2				RESOURCE 3				RESOURCE 4			
D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILABLE
27	18	12	1000,000												
27	18	14	996,000												
27	18	29	1000,000												
27	18	48	794,000												
27	22	3	1000,000												

LOCAL RESOURCE BASELINE

RESOURCE 5				RESOURCE 6				RESOURCE 7				RESOURCE 8			
D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILABLE
0	0	0	1,000	0	0	0	2.000	4	0	0	50,000	0	0	0	50.000
3	4	15	,000	2	0	0	1,000	4	1	32	48,000	3	4	15	42.000
3	5	35	,000	2	0	57	2.000	4	2	2	50,000	3	5	31	34.000
3	7	16	,000	2	8	0	1.000	4	2	15	41,000	3	5	35	42.000
3	7	56	1,000	2	8	57	2.000	4	2	45	41,000	3	6	51	50.000
3	21	30	,000	2	17	15	1.000	4	3	15	41,000	3	21	30	42.000
3	23	15	,000	2	18	12	2.000	4	3	45	50,000	3	22	50	50.000
3	23	55	1,000	3	0	0	1.000	4	6	50	48,000	4	2	15	43.000
4	4	15	,000	3	0	57	2.000	4	7	5	50,000	4	2	45	43.000
4	5	45	,000	3	4	15	1,000	4	21	34	48,000	4	3	15	43.000
4	6	25	1,000	3	5	31	.000	4	22	4	50,000	4	3	45	50.000
4	21	30	,000	3	5	35	1.000	5	6	4	48,000	6	2	15	43.000
4	23	0	1,000	3	6	51	2.000	5	6	19	50,000	6	2	45	43.000
5	4	15	,000	3	7	16	1,000	5	7	45	48,000	6	3	15	43.000
5	5	45	1,000	3	7	31	2.000	5	8	0	50,000	6	3	45	50.000
5	21	30	,000	3	8	0	1.000	5	20	50	48,000	6	4	15	42.000
5	22	55	1,000	3	8	57	2,000	5	21	20	50,000	6	5	31	34.000
6	4	15	,000	3	17	15	1,000	6	2	15	41,000	6	5	35	42.000
6	5	35	,000	3	18	12	2.000	6	2	45	41,000	6	6	51	50.000
6	7	16	,000	3	21	30	1.000	6	3	15	41,000	6	21	30	42.000
6	7	56	1,000	3	22	50	2.000	6	3	45	50,000	6	22	50	50.000
6	21	30	,000	3	23	15	1.000	8	2	15	41,000	8	2	15	43.000
6	23	15	,000	3	23	30	2.000	8	2	45	41,000	8	2	45	43.000
6	23	55	1,000	4	0	0	1,000	8	3	15	41,000	8	3	15	43.000
7	4	15	,000	4	0	57	2.000	8	3	45	50,000	8	3	45	50.000
7	5	40	,000	4	4	45	1.000	10	1	15	37,000	9	4	15	42.000
7	7	5	,000	4	5	15	2.000	10	4	45	50,000	9	5	31	34.000
7	7	45	1,000	4	5	45	1,000	10	18	33	37,000	9	5	35	42.000

LOCAL RESOURCE BASELINE

RESOURCE 5				RESOURCE 6				RESOURCE 7				RESOURCE 8			
D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILABLE
7	21	30	,000	4	6	0	2.000	10	22	53	50,000	9	6	51	50.000
7	23	30	1,000	4	8	0	1.000	17	1	18	37,000	9	18	33	49.000
8	4	15	,000	4	8	57	2.000	17	5	38	50,000	9	21	30	41.000
8	5	15	1,000	4	17	15	1.000	17	18	33	37,000	9	22	50	49.000
8	21	30	,000	4	18	12	2.000	17	22	3	50,000	10	1	15	31.000
8	23	30	1,000	4	22	0	1.000	22	2	15	41,000	10	4	45	49.000
9	4	15	,000	4	22	30	2.000	22	2	45	41,000	10	18	33	31.000
9	5	35	,000	5	0	0	1.000	22	3	15	41,000	10	22	53	49.000
9	7	16	,000	5	0	57	2.000	22	3	45	50,000	12	4	15	41.000
9	7	56	1,000	5	4	45	1.000	23	1	33	37,000	12	5	31	33.000
9	21	30	,000	5	5	15	2.000	23	5	53	41,000	12	5	35	41.000
9	23	15	,000	5	8	0	1.000	23	6	23	41,000	12	6	51	49.000
9	23	55	1,000	5	8	57	2.000	23	6	53	41,000	12	21	30	41.000
10	1	15	,000	5	17	15	1.000	24	7	23	50,000	12	22	50	49.000
10	4	45	1,000	5	18	12	2.000	24	18	48	37,000	15	4	15	41.000
10	6	45	,000	5	22	0	1.000	24	23	8	50,000	15	5	31	33.000
10	7	25	1,000	5	22	40	2.000	25	5	58	41,000	15	5	35	41.000
10	18	33	,000	6	0	0	1.000	25	6	28	41,000	15	6	51	49.000
10	22	53	1,000	6	0	57	2.000	26	6	58	41,000	15	21	30	41.000
11	4	15	,000	6	4	15	1.000	26	7	28	50,000	15	22	50	49.000
11	5	45	1,000	6	5	31	.000	27	0	0	50,000	17	1	18	31.000
11	21	30	,000	6	5	35	1.000					17	5	38	49.000
11	23	0	1,000	6	6	51	2.000					17	18	33	31.000
12	4	15	,000	6	7	16	1.000					17	22	3	49.000
12	5	35	,000	6	7	31	2.000					18	4	15	41.000
12	7	16	,000	6	8	0	1.000					18	5	31	33.000
12	7	56	1,000	6	8	57	2.000					18	5	35	41.000
12	21	30	,000	6	17	15	1.000					18	6	51	49.000

LOCAL RESOURCE BASELINE

RESOURCE 5				RESOURCE 6				RESOURCE 7				RESOURCE 8			
D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILABLE
12	23	15	,000	6	18	12	2.000					18	21	30	41.000
12	23	55	1,000	6	21	30	1.000					18	22	50	49.000
13	4	15	,000	6	22	50	2.000					21	4	15	41.000
13	5	45	1,000	6	23	15	1.000					21	5	31	33.000
13	6	25	,000	6	23	30	2.000					21	5	35	41.000
13	7	5	1,000	7	0	0	1.000					21	6	51	49.000
13	21	30	,000	7	0	57	2.000					21	21	30	41.000
13	22	55	1,000	7	1	18	1.000					21	22	50	49.000
14	4	15	,000	7	2	18	1.000					22	[illegible]	15	42.000
14	5	40	,000	7	3	36	1.000					22	2	45	42.000
14	7	5	1,000	7	4	36	2.000					22	3	15	42.000
14	21	30	,000	7	4	45	1.000					22	3	45	49.000
14	23	30	1,000	7	5	25	2.000					24	1	33	31.000
15	4	15	,000	7	6	10	1.000					24	5	53	42.000
15	5	35	,000	7	6	50	2.000					24	6	23	42.000
15	7	16	,000	7	7	5	1.000					24	6	53	42.000
15	7	56	1,000	7	7	20	2.000					24	7	23	49.000
15	21	30	,000	7	8	0	1.000					24	18	48	31.000
15	23	15	,000	7	8	57	2.000					24	23	8	49.000
15	23	55	1,000	7	17	15	1.000					26	5	58	42.000
16	4	15	,000	7	18	12	2.000					26	6	28	42.000
16	4	15	,000	7	21	45	1.000					26	6	58	42.000
16	4	55	1,000	7	23	15	2.000					26	7	28	49.000
16	21	30	,000	8	0	0	1.000					27	0	0	49.000
16	23	30	1,000	8	0	57	2.000					28	18	33	50.000
17	1	18	,000	8	4	30	1.000								
17	5	38	1,000	8	6	0	2.000								
17	18	33	,000	8	8	0	1.000								

LOCAL RESOURCE BASELINE

RESOURCE 5				RESOURCE 6				RESOURCE 7				RESOURCE 8			
D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILABLE
17	22	3	1,000	8	8	57	2.000								
18	4	15	,000	8	17	15	1.000								
18	5	35	,000	8	18	12	2.000								
18	7	16	,000	8	21	45	1.000								
18	7	56	1,000	8	23	15	2.000								
18	21	30	,000	9	0	0	1.000								
18	23	15	,000	9	0	57	2.000								
18	23	55	1,000	9	4	15	1.000								
19	4	15	,000	9	5	31	.000								
19	5	45	1,000	9	5	35	1.000								
19	5	55	,000	9	6	51	2.000								
19	6	35	1,000	9	7	16	1.000								
19	21	30	,000	9	7	31	2.000								
19	23	0	1,000	9	8	0	1.000								
20	4	15	,000	9	8	57	2.000								
20	5	45	1,000	9	17	15	1.000								
20	21	30	,000	9	18	12	2.000								
20	22	55	1,000	9	21	30	1.000								
21	4	15	,000	9	22	50	2.000								
21	5	35	,000	9	23	15	1.000								
21	7	16	,000	9	23	30	2.000								
21	7	56	1,000	10	0	0	1.000								
21	21	30	,000	10	0	57	2.000								
21	23	15	,000	10	1	15	1.000								
21	23	55	1,000	10	4	45	2.000								
22	4	15	,000	10	6	45	1.000								
22	5	40	,000	10	7	0	2.000								
22	7	5	,000	10	8	0	1.000								

LOCAL RESOURCE BASELINE

RESOURCE 5				RESOURCE 6				RESOURCE 7				RESOURCE 8			
D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILABLE
22	7	45	1,000	10	8	57	2,000								
22	21	30	,000	10	17	15	1,000								
22	23	30	1,000	10	18	12	2,000								
23	4	15	,000	10	18	33	1,000								
23	6	15	1,000	10	22	53	2,000								
23	21	30	,000	11	0	0	1,000								
23	23	30	1,000	11	0	57	2,000								
24	1	33	,000	11	4	45	1,000								
24	9	53	1,000	11	5	15	2,000								
24	10	48	,000	11	8	0	1,000								
24	23	8	1,000	11	8	57	2,000								
27	0	0	1,000	11	17	15	1,000								
				11	18	12	2,000								
				11	22	0	1,000								
				11	22	30	2,000								
				12	0	0	1,000								
				12	0	57	2,000								
				12	4	15	1,000								
				12	5	31	,000								
				12	5	35	1,000								
				12	6	51	2,000								
				12	7	16	1,000								
				12	7	31	2,000								
				12	8	0	1,000								
				12	8	57	2,000								
				12	17	15	1,000								
				12	18	12	2,000								
				12	21	30	1,000								

LOCAL RESOURCE BASELINE

RESOURCE 5 D H M	QUANTITY AVAILABLE	RESOURCE 6 D H M	QUANTITY AVAILABLE	RESOURCE 7 D H M	QUANTITY AVAILABLE	RESOURCE 8 D H M	QUANTITY AVAILABLE
		12 22 50	2.000				
		12 23 15	1.000				
		12 23 30	2.000				
		13 0 0	1.000				
		13 0 57	2.000				
		13 4 45	1.000				
		13 5 15	2.000				
		13 6 25	1.000				
		13 6 40	2.000				
		13 8 0	1.000				
		13 8 57	2.000				
		13 17 15	1.000				
		13 18 12	2.000				
		13 22 0	1.000				
		13 22 40	2.000				
		14 0 0	1.000				
		14 0 57	2.000				
		14 1 24	1.000				
		14 3 15	2.000				
		14 4 45	1.000				
		14 5 25	2.000				
		14 6 10	1.000				
		14 6 50	2.000				
		14 8 0	1.000				
		14 8 57	2.000				
		14 17 15	1.000				
		14 18 12	2.000				
		14 21 45	1.000				

LOCAL RESOURCE BASELINE

RESOURCE 5				RESOURCE 6				RESOURCE 7				RESOURCE 8			
D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILABLE
				14	23	15	2.000								
				15	0	0	1.000								
				15	0	57	2.000								
				15	4	15	1.000								
				15	5	31	.000								
				15	5	35	1.000								
				15	6	51	2.000								
				15	7	16	1.000								
				15	7	31	2.000								
				15	8	0	1.000								
				15	8	57	2.000								
				15	17	15	1.000								
				15	18	12	2.000								
				15	21	30	1.000								
				15	22	50	2.000								
				15	23	15	1.000								
				15	23	30	2.000								
				16	0	0	1.000								
				16	0	57	2.000								
				16	4	30	1.000								
				16	6	0	2.000								
				16	6	15	1.000								
				16	6	30	2.000								
				16	8	0	1.000								
				16	8	57	2.000								
				16	17	15	1.000								
				16	18	12	2.000								
				16	21	45	1.000								

LOCAL RESOURCE BASELINE

RESOURCE 5				RESOURCE 6				RESOURCE 7				RESOURCE 8			
D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILABLE
				16	23	15	2.000								
				17	0	0	1.000								
				17	0	57	2.000								
				17	1	18	1.000								
				17	5	38	2.000								
				17	5	48	1.000								
				17	6	38	2.000								
				17	8	0	1.000								
				17	8	57	2.000								
				17	17	15	1.000								
				17	18	12	2.000								
				17	18	33	1.000								
				17	22	3	2.000								
				18	0	0	1.000								
				18	0	57	2.000								
				18	4	15	1.000								
				18	5	31	.000								
				18	5	35	1.000								
				18	6	51	2.000								
				18	7	16	1.000								
				18	7	31	2.000								
				18	8	0	1.000								
				18	8	57	2.000								
				18	17	15	1.000								
				18	18	12	2.000								
				18	21	30	1.000								
				18	22	50	2.000								
				18	23	15	1.000								

LOCAL RESOURCE BASELINE

RESOURCE 5				RESOURCE 6				RESOURCE 7				RESOURCE 8			
D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILABLE
				18	23	30	2.000								
				19	0	0	1.000								
				19	0	57	2.000								
				19	4	45	1.000								
				19	5	15	2.000								
				19	5	55	1.000								
				19	6	10	2.000								
				19	8	0	1.000								
				19	8	57	2.000								
				19	17	15	1.000								
				19	18	12	2.000								
				19	22	0	1.000								
				19	22	30	2.000								
				20	0	0	1.000								
				20	0	57	2.000								
				20	4	45	1.000								
				20	5	15	2.000								
				20	8	0	1.000								
				20	8	57	2.000								
				20	17	15	1.000								
				20	18	12	2.000								
				20	18	43	1.000								
				20	19	8	2.000								
				20	22	0	1.000								
				20	22	40	2.000								
				21	0	0	1.000								
				21	0	57	2.000								
				21	4	15	1.000								

LOCAL RESOURCE BASELINE

RESOURCE 5				RESOURCE 6				RESOURCE 7				RESOURCE 8			
D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILABLE
				21	5	31	.000								
				21	5	35	1.000								
				21	6	51	2.000								
				21	7	16	1.000								
				21	7	31	2.000								
				21	8	0	1.000								
				21	8	57	2.000								
				21	17	15	1.000								
				21	18	12	2.000								
				21	21	30	1.000								
				21	22	50	2.000								
				21	23	15	1.000								
				21	23	30	2.000								
				22	0	0	1.000								
				22	0	57	2.000								
				22	4	45	1.000								
				22	5	25	2.000								
				22	6	10	1.000								
				22	6	50	2.000								
				22	7	5	1.000								
				22	7	20	2.000								
				22	8	0	1.000								
				22	8	57	2.000								
				22	17	15	1.000								
				22	18	12	2.000								
				22	21	45	1.000								
				22	23	15	2.000								
				23	0	0	1.000								

LOCAL RESOURCE BASELINE

RESOURCE 5				RESOURCE 6				RESOURCE 7				RESOURCE 8			
D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILABLE
				23	0	57	2.000								
				23	4	30	1.000								
				23	6	0	2.000								
				23	8	0	1.000								
				23	8	57	2.000								
				23	17	15	1.000								
				23	18	12	2.000								
				23	21	45	1.000								
				23	23	15	2.000								
				24	0	0	1.000								
				24	0	57	2.000								
				24	1	33	1.000								
				24	5	53	2.000								
				24	8	0	1.000								
				24	8	57	2.000								
				24	17	15	1.000								
				24	18	12	2.000								
				24	18	48	1.000								
				24	23	8	2.000								
				25	0	0	1.000								
				25	0	57	2.000								
				25	3	15	1.000								
				25	6	15	2.000								
				25	8	0	1.000								
				25	8	57	2.000								
				25	17	15	1.000								
				25	18	12	2.000								
				26	0	0	1.000								

LOCAL RESOURCE BASELINE

RESOURCE 5				RESOURCE 6				RESOURCE 7			RESOURCE 8			
D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILABLE	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILABLE
				26	0	57	2.000							
				26	1	33	1.000							
				26	5	58	2.000							
				26	8	0	1.000							
				26	8	57	2.000							
				26	17	15	1.000							
				26	18	12	2.000							
				26	18	48	1.000							
				26	23	13	2.000							
				27	0	0	1.000							
				27	0	57	2.000							
				27	1	33	1.000							
				27	6	8	2.000							
				27	8	0	.000							
				27	8	57	1.000							
				27	17	15	.000							
				27	18	12	1.000							
				27	18	48	.000							
				27	22	3	1.000							

LOCAL RESOURCE BASELINE

RESOURCE 9				RESOURCE 10			
D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILA
0	0	0	1.000	0	0	0	1.000
4	4	15	.000	5	2	2	.000
4	7	45	1.000	5	3	2	1.000
4	21	30	.000	5	20	34	.000
5	1	0	1.000	5	21	34	1.000
5	4	15	.000	5	22	0	.000
5	7	45	1.000	5	23	0	1.000
5	21	30	.000	6	1	18	.000
5	22	55	1.000	6	2	18	1.000
7	4	15	.000	6	19	50	.000
7	5	40	.000	6	20	50	1.000
7	7	5	1.000	6	21	15	.000
7	21	30	.000	6	22	15	1.000
7	23	30	1.000	6	22	52	.000
8	4	15	.000	6	23	52	1.000
8	6	15	1.000	7	20	31	.000
8	21	30	.000	7	21	31	1.000
8	23	30	1.000	7	22	7	.000
11	4	15	.000	7	23	7	1.000
11	7	45	1.000	8	1	25	.000
11	21	30	.000	8	2	25	1.000
12	1	0	1.000	8	19	48	.000
13	4	15	.000	8	20	48	1.000
13	7	45	1.000	8	21	28	.000
13	21	30	.000	8	22	28	1.000
13	22	55	1.000	9	2	46	.000
14	4	15	.000	9	3	46	1.000
14	5	40	.000	9	20	45	.000

LOCAL RESOURCE BASELINE

RESOURCE 9				RESOURCE 10			
D	H	M	QUANTITY AVAILABLE	D	H	M	QUANTITY AVAILA
14	7	5	1,000	9	21	45	1.000
14	21	30	,000	12	2	7	.000
14	23	30	1,000	12	3	7	1.000
16	4	15	,000	13	1	23	.000
16	6	15	1,000	13	2	23	1.000
16	21	30	,000	13	2	59	.000
16	23	30	1,000	13	3	59	1.000
19	4	15	,000	27	0	0	1.000
19	7	45	1,000				
19	21	30	,000				
20	1	0	1,000				
20	4	15	,000				
20	7	45	1,000				
20	21	30	,000				
20	22	55	1,000				
22	4	15	,000				
22	5	40	,000				
22	7	5	1,000				
22	21	30	,000				
22	23	30	1,000				
23	4	15	,000				
23	6	15	1,000				
23	21	30	,000				
23	23	30	1,000				
27	0	0	1,000				

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ATTITUDE TIMELINE

The spacecraft attitude mode is designated by the MODE CODE as follows:

0 - solar inertial which can be changed to the X-POP/Z-LV attitude if an EXOP requires the latter attitude.

1 - solar inertial attitude required by an EXOP which cannot be changed to another attitude.

2 - X-POP/Z-LV attitude.

It should be noted that the X-POP/Z-LV attitude was put on the timelines only over the interval of the activity requiring that attitude. No attempt was made to allow for maneuvering times when scheduling this attitude.

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ATTITUDE BASELINE

D	H	M	MODE CODE	NUMBER OF ACTIVITIES USING THIS ATTITUDE
0	0	0	0	0
3	3	20	2	1
3	4	45	0	0
3	4	53	2	1
3	6	18	0	0
3	6	26	2	1
3	7	51	0	0
3	18	51	2	1
3	20	16	1	1
3	21	55	1	2
3	22	31	1	1
4	4	10	1	2
4	4	46	1	1
4	5	41	1	2
4	6	17	1	1
4	7	14	1	2
4	7	35	1	2
4	7	49	1	2
4	8	0	1	1
4	18	48	1	2
4	18	59	1	1
6	20	43	0	0
11	3	10	1	1
11	3	40	0	0
11	4	40	1	1
11	5	10	0	0
11	6	17	1	1
11	6	47	0	0
11	18	42	1	1
11	19	12	0	0
11	20	12	1	1
11	20	42	0	0
11	21	48	1	1
11	22	18	0	0
11	23	18	1	1
11	23	48	0	0
19	20	19	1	1
19	20	55	0	0
19	21	31	1	1
19	22	7	0	0
19	23	4	1	1

ATTITUDE BASELINE

D	H	M	MODE CODE	NUMBER OF ACTIVITIES USING THIS ATTITUDE
19	23	40	1	1
20	0	1	0	0
20	2	48	1	1
20	3	2	0	0
20	3	44	1	1
20	3	55	1	1
20	4	6	0	0
21	3	57	1	1
21	4	27	0	0
21	5	27	1	1
21	5	57	0	0
21	7	4	1	1
21	7	34	0	0
21	19	30	1	1
21	20	0	0	0
21	21	0	1	1
21	21	30	0	0
22	1	42	1	1
22	2	12	0	0
22	3	15	1	1
22	3	45	0	0
28	0	0	0	0
29	0	0	2	1

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FIXED RESOURCE

Two resources were identified from the Skylab non-replenishable supplies as Fixed Resources. A fixed resource is one that is not resupplied during a particular mission. The resources identified and the initial number of units of each are as follows:

Resource Number	Type	Initial Amount
1.	Not used	
2.	Film Packs	300
3.	Oxygen	2400 lbs.

The initial number of units available for the ESP scheduler may not reflect the current allotment for Skylab. However, the amounts after scheduling shown below should provide information regarding the quantities used by Skylab EXOP's.

FIXED RESOURCES

RESOURCE NUMBER	AMOUNT REMAINING
2	94.000
3	1459.000

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A P P E N D I X C

SKYLAB ACTIVITY SCHEDULING HISTORIES

This appendix contains an activity scheduling history for each EXOP in the Skylab crew activities schedule developed in the attached report. The activity scheduling history includes the EXOP Cycle Number (ER), the Activity Group Number (AG), the Activity Number (A), and the Activity Cycle Number (AR) as well as the activity start and end times. The EXOP's are presented in the order they were selected for scheduling. This summary was obtained by executing the proper option in Route 13 of ESP.

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EXOP SCHEDULING HISTORY

M092

ER	AG	A	AR	START			END		
				D	H	M	D	H	M
1	1	1	1	3	4	15	3	5	31
1	2	1	1	3	5	31	3	6	47
1	3	1	1	3	21	30	3	22	46
2	1	1	1	6	4	15	6	5	31
2	2	1	1	6	5	31	6	6	47
2	3	1	1	6	21	30	6	22	46
3	1	1	1	9	4	15	9	5	31
3	2	1	1	9	5	31	9	6	47
3	3	1	1	9	21	30	9	22	46
4	1	1	1	12	4	15	12	5	31
4	2	1	1	12	5	31	12	6	47
4	3	1	1	12	21	30	12	22	46
5	1	1	1	15	4	15	15	5	31
5	2	1	1	15	5	31	15	6	47
5	3	1	1	15	21	30	15	22	46
6	1	1	1	18	4	15	18	5	31
6	2	1	1	18	5	31	18	6	47
6	3	1	1	18	21	30	18	22	46
7	1	1	1	21	4	15	21	5	31
7	2	1	1	21	5	31	21	6	47
7	3	1	1	21	21	30	21	22	46

M171A

ER	AG	A	AR	START			END		
				D	H	M	D	H	M
1	1	1	1	4	4	15	4	5	45
1	2	1	1	4	21	30	4	23	0
1	3	1	1	5	4	15	5	5	45
2	1	1	1	11	4	15	11	5	45
2	2	1	1	11	21	30	11	23	0
2	3	1	1	13	4	15	13	5	45
3	1	1	1	19	4	15	19	5	45
3	2	1	1	19	21	30	19	23	0
3	3	1	1	20	4	15	20	5	45

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M171B

ER	AG	A	AR	START D	START H	START M	END D	END H	END M
1	1	1	1	5	21	30	5	22	55
1	2	1	1	7	4	15	7	5	40
1	3	1	1	7	5	40	7	7	5
2	1	1	1	13	21	30	13	22	55
2	2	1	1	14	4	15	14	5	40
2	3	1	1	14	5	40	14	7	5
3	1	1	1	20	21	30	20	22	55
3	2	1	1	22	4	15	22	5	40
3	3	1	1	22	5	40	22	7	5

M171C

ER	AG	A	AR	START D	START H	START M	END D	END H	END M
1	1	1	1	7	21	30	7	23	30
1	2	1	1	8	4	15	8	6	15
1	3	1	1	8	21	30	8	23	30
2	1	1	1	14	21	30	14	23	30
2	2	1	1	16	4	15	16	6	15
2	3	1	1	16	21	30	16	23	30
3	1	1	1	22	21	30	22	23	30
3	2	1	1	23	4	15	23	6	15
3	3	1	1	23	21	30	23	23	30

M093

ER	AG	A	AR	START D	START H	START M	END D	END H	END M
1	1	1	1	3	7	16	3	7	56
1	2	1	1	3	23	15	3	23	55
1	3	1	1	4	6	45	4	6	25
2	1	1	1	6	7	16	6	7	56
2	2	1	1	6	23	15	6	23	55
2	3	1	1	7	7	5	7	7	45
3	1	1	1	9	7	16	9	7	56
3	2	1	1	9	23	15	9	23	55
3	3	1	1	10	6	45	10	7	25
4	1	1	1	12	7	16	12	7	56
4	2	1	1	12	23	15	12	23	55
4	3	1	1	13	6	25	13	7	9

M093

ER	AG	A	AR	START			END		
				D	H	M	D	H	M
5	1	1	1	15	7	16	15	7	56
5	2	1	1	15	23	15	15	23	55
5	3	1	1	16	6	15	16	6	55
6	1	1	1	18	7	16	18	7	56
6	2	1	1	18	23	15	18	23	55
6	3	1	1	19	5	55	19	6	35
7	1	1	1	21	7	16	21	7	56
7	2	1	1	21	23	15	21	23	55
7	3	1	1	22	7	5	22	7	45

M17134

ER	AG	A	AR	START			END		
				D	H	M	D	H	M
1	1	1	1	2	0	0	2	1	15
1	1	1	2	2	8	0	2	9	15
1	1	2	1	2	17	15	2	18	12
2	1	1	1	3	0	0	3	1	15
2	1	1	2	3	8	0	3	9	15
2	1	2	1	3	17	15	3	18	12
3	1	1	1	4	0	0	4	1	15
3	1	1	2	4	8	0	4	9	15
3	1	2	1	4	17	15	4	18	12
4	1	1	1	5	0	0	5	1	15
4	1	1	2	5	8	0	5	9	15
4	1	2	1	5	17	15	5	18	12
5	1	1	1	6	0	0	6	1	15
5	1	1	2	6	8	0	6	9	15
5	1	2	1	6	17	15	6	18	12
6	1	1	1	7	0	0	7	1	15
6	1	1	2	7	8	0	7	9	15
6	1	2	1	7	17	15	7	18	12
7	1	1	1	8	0	0	8	1	15
7	1	1	2	8	8	0	8	9	15
7	1	2	1	8	17	15	8	18	12
8	1	1	1	9	0	0	9	1	15
8	1	1	2	9	8	0	9	9	15
8	1	2	1	9	17	15	9	18	12
9	1	1	1	10	0	0	10	1	15
9	1	1	2	10	8	0	10	9	15
9	1	2	1	10	17	15	10	18	12
10	1	1	1	11	0	0	11	1	15

M17134

ER	AC	A	AR	START D	START H	START M	END D	END H	END M
10	1	1	1	11	0	0	11	1	15
10	1	1	2	11	8	0	11	9	15
10	1	2	1	11	17	15	11	18	12
11	1	1	1	12	0	0	12	1	15
11	1	1	2	12	8	0	12	9	15
11	1	2	1	12	17	15	12	18	12
12	1	1	1	13	0	0	13	1	15
12	1	1	2	13	8	0	13	9	15
12	1	2	1	13	17	15	13	18	12
13	1	1	1	14	0	0	14	1	15
13	1	1	2	14	8	0	14	9	15
13	1	2	1	14	17	15	14	18	12
14	1	1	1	15	0	0	15	1	15
14	1	1	2	15	8	0	15	9	15
14	1	2	1	15	17	15	15	18	12
15	1	1	1	16	0	0	16	1	15
15	1	1	2	16	8	0	16	9	15
15	1	2	1	16	17	15	16	18	12
16	1	1	1	17	0	0	17	1	15
16	1	1	2	17	8	0	17	9	15
16	1	2	1	17	17	15	17	18	12
17	1	1	1	18	0	0	18	1	15
17	1	1	2	18	8	0	18	9	15
17	1	2	1	18	17	15	18	18	12
18	1	1	1	19	0	0	19	1	15
18	1	1	2	19	8	0	19	9	15
18	1	2	1	19	17	15	19	18	12
19	1	1	1	20	0	0	20	1	15
19	1	1	1	20	0	0	20	1	15
19	1	1	2	20	8	0	20	9	15
19	1	2	1	20	17	15	20	18	12
20	1	1	1	21	0	0	21	1	15
20	1	1	2	21	8	0	21	9	15
20	1	2	1	21	17	15	21	18	12
21	1	1	1	22	0	0	22	1	15
21	1	1	2	22	8	0	22	9	15
21	1	2	1	22	17	15	22	18	12
22	1	1	1	23	0	0	23	1	15
22	1	1	2	23	8	0	23	9	15
22	1	2	1	23	17	15	23	18	12
23	1	1	1	24	0	0	24	1	15
23	1	1	2	24	8	0	24	9	15
23	1	2	1	24	17	15	24	18	12

M17134

ER	AG	A	AR	START			END		
				D	H	M	D	H	M
24	1	1	1	25	0	0	25	1	15
24	1	1	2	25	8	0	25	9	15
24	1	2	1	25	17	15	25	18	12
25	1	1	1	26	0	0	26	1	15
25	1	1	2	26	8	0	26	9	15
25	1	2	1	26	17	15	26	18	12
26	1	1	1	27	0	0	27	1	15
26	1	1	2	27	8	0	27	9	15
26	1	2	1	27	17	15	27	18	12

M172

ER	AG	A	AR	START			END		
				D	H	M	D	H	M
1	1	1	1	2	17	15	2	18	30
2	1	1	1	3	17	15	3	18	30
3	1	1	1	4	17	15	4	18	30
4	1	1	1	5	17	15	5	18	30
5	1	1	1	6	17	15	6	18	30
6	1	1	1	7	17	15	7	18	30
7	1	1	1	8	17	15	8	18	30
8	1	1	1	9	17	15	9	18	30
9	1	1	1	10	17	15	10	18	30
10	1	1	1	11	17	15	11	18	30
11	1	1	1	12	17	15	12	18	30
12	1	1	1	13	17	15	13	18	30
13	1	1	1	14	17	15	14	18	30
14	1	1	1	15	17	15	15	18	30
15	1	1	1	16	17	15	16	18	30
16	1	1	1	17	17	15	17	18	30
17	1	1	1	18	17	15	18	18	30
18	1	1	1	19	17	15	19	18	30
19	1	1	1	20	17	15	20	18	30
20	1	1	1	21	17	15	21	18	30
21	1	1	1	22	17	15	22	18	30
22	1	1	1	23	17	15	23	18	30
23	1	1	1	24	17	15	24	18	30
24	1	1	1	25	17	15	25	18	30
25	1	1	1	26	17	15	26	18	30
26	1	1	1	27	17	15	27	18	30

T003A

ER	AG	A	AR	START D	START H	START M	END D	END H	END M
1	1	1	1	4	1	15	4	1	33
1	2	1	1	4	9	15	4	9	33
1	1	1	2	4	18	30	4	18	48
2	1	1	1	14	1	15	14	1	33
2	2	1	1	14	9	15	14	9	33
2	1	1	2	14	18	30	14	18	48
3	1	1	1	24	1	15	24	1	33
3	2	1	1	24	9	15	24	9	33
3	1	1	2	24	18	30	24	18	48

T003B

ER	AG	A	AR	START D	START H	START M	END D	END H	END M
1	1	1	1	2	1	15	2	1	18
1	2	1	1	2	9	15	2	9	18
1	1	1	2	2	18	30	2	18	33
2	1	1	1	3	1	15	3	1	18
2	2	1	1	3	9	15	3	9	18
2	1	1	2	3	18	30	3	18	33
3	1	1	1	4	1	15	4	1	18
3	2	1	1	4	9	15	4	9	18
3	1	1	2	4	18	30	4	18	33
4	1	1	1	5	1	15	5	1	18
4	2	1	1	5	9	15	5	9	18
4	1	1	2	5	18	30	5	18	33
5	1	1	1	6	1	15	6	1	18
5	2	1	1	6	9	15	6	9	18
5	1	1	2	6	18	30	6	18	33
6	1	1	1	7	1	15	7	1	18
6	2	1	1	7	9	15	7	9	18
6	1	1	2	7	18	30	7	18	33
7	1	1	1	8	1	15	8	1	18
7	2	1	1	8	9	15	8	9	18
7	1	1	2	8	18	30	8	18	33
8	1	1	1	9	1	15	9	1	18
8	2	1	1	9	9	15	9	9	18
8	1	1	2	9	18	30	9	18	33
9	1	1	1	10	1	15	10	1	18
9	2	1	1	10	9	15	10	9	18
9	1	1	2	10	18	30	10	18	33

T003A

ER	AG	A	AR	START D	START H	START M	END D	END H	END M
10	1	1	1	11	1	15	11	1	18
10	2	1	1	11	9	15	11	9	18
10	1	1	2	11	18	30	11	18	33
11	1	1	1	12	1	15	12	1	18
11	2	1	1	12	9	15	12	9	18
11	1	1	2	12	18	30	12	18	33
12	1	1	1	13	1	15	13	1	18
12	2	1	1	13	9	15	13	9	18
12	1	1	2	13	18	30	13	18	33
13	1	1	1	14	1	15	14	1	18
13	2	1	1	14	9	15	14	9	18
13	1	1	2	14	18	30	14	18	33
14	1	1	1	15	1	15	15	1	18
14	2	1	1	15	9	15	15	9	18
14	1	1	2	15	18	30	15	18	33
15	1	1	1	16	1	15	16	1	18
15	2	1	1	16	9	15	16	9	18
15	1	1	2	16	18	30	16	18	33
16	1	1	1	17	1	15	17	1	18
16	2	1	1	17	9	15	17	9	18
16	1	1	2	17	18	30	17	18	33
17	1	1	1	18	1	15	18	1	18
17	2	1	1	18	9	15	18	9	18
17	1	1	2	18	18	30	18	18	33
18	1	1	1	19	1	15	19	1	18
18	2	1	1	19	9	15	19	9	18
18	1	1	2	19	18	30	19	18	33
19	1	1	1	20	1	15	20	1	18

T003A

ER	AG	A	AR	START D	START H	START M	END D	END H	END M
19	1	1	1	20	1	15	20	1	18
19	2	1	1	20	9	15	20	9	18
19	1	1	2	20	18	30	20	18	33
20	1	1	1	21	1	15	21	1	18
20	2	1	1	21	9	15	21	9	18
20	1	1	2	21	18	30	21	18	33
21	1	1	1	22	1	15	22	1	18
21	2	1	1	22	9	15	22	9	18
21	1	1	2	22	18	30	22	18	33
22	1	1	1	23	1	15	23	1	18
22	2	1	1	23	9	15	23	9	18
22	1	1	2	23	18	30	23	18	33
23	1	1	1	24	1	15	24	1	18
23	2	1	1	24	9	15	24	9	18
23	1	1	2	24	18	30	24	18	33

M508

ER	AG	A	AR	START D	START H	START M	END D	END H	END M
1	1	1	1	10	1	15	10	4	45
1	1	2	1	10	18	33	10	22	53
1	1	2	2	17	1	18	17	5	38
1	2	1	1	17	18	33	17	22	3
1	2	2	1	24	1	33	24	5	53
1	2	2	2	24	18	48	24	23	8

M509

ER	AG	A	AR	START D	START H	START M	END D	END H	END M
1	1	1	1	26	1	15	26	1	33
1	1	2	1	26	1	33	26	5	58
1	2	1	1	26	18	30	26	18	48
1	2	2	1	26	18	48	26	23	13
1	3	1	1	27	1	15	27	1	33
1	3	2	1	27	1	33	27	6	8
1	4	1	1	27	18	30	27	18	48
1	4	2	1	27	18	48	27	22	3

M131A

ER	AG	A	AR	START D	START H	START M	END D	END H	END M
1	1	1	1	4	2	15	4	2	45
1	2	1	1	4	2	45	4	3	15
1	3	1	1	4	3	15	4	3	45
2	1	1	1	6	2	15	6	2	45
2	2	1	1	6	2	45	6	3	15
2	3	1	1	6	3	15	6	3	45
3	1	1	1	8	2	15	8	2	45
3	2	1	1	8	2	45	8	3	15
3	3	1	1	8	3	15	8	3	45
4	1	1	1	22	2	15	22	2	45
4	2	1	1	22	2	45	22	3	15
4	3	1	1	22	3	15	22	3	45
5	1	1	1	24	5	53	24	6	23
5	2	1	1	24	6	23	24	6	53
5	3	1	1	24	6	53	24	7	23
6	1	1	1	26	5	58	26	6	28
6	2	1	1	26	6	28	26	6	58
6	3	1	1	26	6	58	26	7	28

M131A

ER	AG	A	AR	START D	START H	START M	END D	END H	END M
1	1	1	1	5	2	15	5	3	0
1	2	1	1	5	3	0	5	3	45
1	3	1	1	5	5	45	5	6	30
2	1	1	1	16	2	15	16	3	0
2	2	1	1	16	3	0	16	3	45
2	3	1	1	16	3	45	16	4	30
3	1	1	1	23	2	15	23	3	0
3	2	1	1	23	3	0	23	3	45
3	3	1	1	23	3	45	23	4	30

D021

ER	AG	A	AR	START D	START H	START M	END D	END H	END M
1	1	1	1	9	18	33	9	19	23
1	1	2	1	25	1	15	25	6	45

M507

ER	AG	A	AR	START D	START H	START M	END D	END H	END M
1	1	1	1	7	1	18	7	2	18
1	1	2	1	7	2	18	7	3	36
1	1	3	1	7	3	36	7	4	36

T020

ER	AG	A	AR	START D	START H	START M	END D	END H	END M
1	1	1	1	14	1	15	14	3	45
1	1	2	1	17	5	38	17	7	8
1	1	3	1	20	18	33	20	19	38

S019

ER	AG	A	AR	START D	START H	START M	END D	END H	END M
1	1	1	1	11	1	18	11	1	48
1	1	2	1	11	2	10	11	3	40
1	1	2	2	11	3	40	11	5	10
1	1	2	3	11	5	17	11	6	47
1	1	2	4	11	17	42	11	19	12

S019

ER	AG	A	AR	START D	START H	START M	END D	END H	END M
1	1	2	5	11	19	12	11	20	42
1	1	2	6	11	20	48	11	22	18
1	1	2	7	11	22	18	11	23	48
1	1	3	1	12	1	18	12	2	18
2	1	1	1	21	2	18	21	2	48
2	1	2	1	21	2	57	21	4	27
2	1	2	2	21	4	27	21	5	57
2	1	2	3	21	6	4	21	7	34
2	1	2	4	21	18	30	21	20	0
2	1	2	5	21	20	0	21	21	30
2	1	2	6	22	0	42	22	2	12
2	1	2	7	22	2	15	22	3	45
2	1	3	1	22	3	45	22	4	45

S020

ER	AG	A	AR	START D	START H	START M	END D	END H	END M
1	1	1	1	3	2	45	3	3	20
1	1	2	1	3	21	55	3	22	31
1	1	2	2	4	4	10	4	4	46
1	1	2	3	4	5	41	4	6	17
1	1	3	1	4	7	14	4	7	35
1	1	4	1	4	7	35	4	7	49
1	1	5	1	4	7	49	4	8	0
1	1	5	2	4	18	48	4	18	59
1	1	6	1	4	18	59	4	19	44
2	1	1	1	19	19	44	19	20	19
2	1	2	1	19	20	19	19	20	55
2	1	2	2	19	21	31	19	22	7
2	1	2	3	19	23	4	19	23	40
2	1	3	1	19	23	40	20	0	1
2	1	4	1	20	2	48	20	3	2
2	1	5	1	20	3	44	20	3	55
2	1	5	2	20	3	55	20	4	6
2	1	6	1	20	4	6	20	4	51

S015

ER	AG	A	AR	START D	START H	START M	END D	END H	END M
1	1	1	1	4	1	15	4	1	30
1	1	2	1	4	2	15	4	2	25
1	1	3	1	4	3	15	4	3	40
2	1	1	1	10	1	15	10	1	30
2	1	2	1	10	2	15	10	2	25
2	1	3	1	10	3	15	10	3	40

S009

ER	AG	A	AR	START D	START H	START M	END D	END H	END M
1	1	1	1	2	18	30	28	19	30

D008

ER	AG	A	AR	START D	START H	START M	END D	END H	END M
1	2	1	1	4	1	32	4	2	2
1	1	1	1	4	6	50	4	7	5
2	2	1	1	4	21	34	4	22	4
2	1	1	1	5	6	4	5	6	19
3	1	1	1	5	7	45	5	8	0
3	2	1	1	5	20	50	5	21	20

S190

ER	AG	A	AR	START D	START H	START M	END D	END H	END M
1	3	1	1	5	2	2	5	3	2
1	4	1	1	5	20	34	5	21	34
1	2	1	1	5	22	0	5	23	0
1	3	1	2	6	1	18	6	2	18
1	4	1	2	6	19	50	6	20	50
1	2	1	2	6	21	15	6	22	15
1	2	1	3	6	22	52	6	23	52
1	2	1	4	7	20	31	7	21	31
1	2	1	5	7	22	7	7	23	7
1	3	1	3	8	1	25	8	2	25
1	2	1	6	8	19	48	8	20	48
1	3	1	4	8	21	28	8	22	28
1	1	1	1	9	2	46	9	3	46
1	3	1	5	9	20	45	9	21	45
1	1	1	2	12	2	7	12	3	7
1	1	1	3	13	1	23	13	2	23
1	1	1	4	13	2	59	13	3	59

T027

ER	AG	A	AR	START D	START H	START M	END D	END H	END M
1	2	1	1	3	1	15	3	1	34
1	2	1	1	3	1	18	3	2	1
1	2	2	1	3	3	13	3	4	46
1	2	2	2	3	4	46	3	6	19
1	2	2	3	3	6	19	3	7	52
1	2	2	4	3	18	44	3	20	17
1	2	3	1	3	20	17	3	20	46
1	2	2	1	8	1	34	8	2	7

RR/PWK

ER	AG	A	AR	START D	START H	START M	END D	END H	END M
1	2	1	1	2	1	15	2	1	45
1	1	1	1	2	1	15	2	1	45
1	1	1	1	2	1	18	2	1	48
1	2	1	2	2	1	45	2	2	15
1	2	1	2	2	1	45	2	2	15
1	2	1	2	2	1	48	2	2	18
1	2	1	3	2	2	15	2	2	45
1	2	1	3	2	2	15	2	2	45
1	2	1	3	2	2	18	2	2	48
2	2	1	1	3	1	15	3	1	45
2	2	1	1	3	1	34	3	2	4
2	2	1	2	3	1	45	3	2	15
2	2	1	1	3	1	58	3	2	28
2	2	1	2	3	2	4	3	2	34
2	2	1	3	3	2	15	3	2	45
2	2	1	2	3	2	28	3	2	58
2	2	1	3	3	2	34	3	3	4
3	2	1	1	4	1	18	4	1	40
3	2	1	1	4	1	33	4	2	3
3	2	1	2	4	1	48	4	2	18
3	2	1	2	4	2	25	4	2	55
3	2	1	3	4	3	40	4	4	10
3	2	1	3	4	3	45	4	4	15
3	2	1	1	4	3	45	4	4	15
3	2	1	2	4	6	0	4	6	30
3	2	1	3	4	7	5	4	7	35
4	2	1	1	5	1	15	5	1	45
4	1	1	1	5	1	15	5	1	45

RR/PWK

ER	AG	A	AR	START			END		
				D	H	M	D	H	M
4	1	1	1	5	1	15	5	1	45
4	3	1	1	5	1	18	5	1	48
4	2	1	2	5	1	45	5	2	15
4	1	1	2	5	1	45	5	2	15
4	3	1	2	5	3	2	5	3	32
4	3	1	3	5	3	32	5	4	2
4	2	1	3	5	3	45	5	4	15
4	1	1	3	5	3	45	5	4	15
5	2	1	1	6	1	15	6	1	45
5	1	1	1	6	1	15	6	1	45
5	2	1	2	6	1	45	6	2	15
5	1	1	2	6	1	45	6	2	15
5	3	1	1	6	2	15	6	2	45
5	3	1	2	6	2	45	6	3	15
5	2	1	3	6	3	15	6	3	45
5	3	1	3	6	3	45	6	4	15
5	1	1	3	6	3	45	6	4	15
6	2	1	1	7	1	15	7	1	45
6	1	1	1	7	1	15	7	1	45
6	2	1	2	7	1	45	7	2	15
6	1	1	2	7	1	45	7	2	15
6	1	1	3	7	2	15	7	2	45
6	3	1	1	7	2	18	7	2	48
6	3	1	2	7	2	48	7	3	18
6	2	1	3	7	3	36	7	4	6
6	3	1	3	7	4	36	7	5	6
7	1	1	1	8	1	15	8	1	45
7	1	1	2	8	1	45	8	2	15
7	1	1	2	8	1	45	8	2	15
7	3	1	1	8	2	25	8	2	55
7	2	1	1	8	3	15	8	3	45
7	3	1	2	8	3	45	8	4	15
7	2	1	2	8	3	45	8	4	15
7	1	1	3	8	3	45	8	4	15
7	3	1	3	8	4	15	8	4	45
7	2	1	3	8	6	15	8	6	45
8	2	1	1	9	1	15	9	1	45
8	1	1	1	9	1	15	9	1	45
8	3	1	1	9	1	18	9	1	48
8	2	1	2	9	1	45	9	2	15
8	1	1	2	9	1	45	9	2	15
8	3	1	2	9	1	48	9	2	18
8	2	1	3	9	2	15	9	2	45
8	1	1	3	9	2	15	9	2	45
8	3	1	3	9	2	18	9	2	48
9	1	1	1	10	1	30	10	2	0
9	1	1	2	10	2	0	10	2	30
9	3	1	1	10	2	25	10	2	55
9	1	1	3	10	2	30	10	3	0
9	3	1	2	10	3	34	10	4	4

RR/PUK

ER	AG	A	AR	START D	START H	START M	END D	END H	END M
9	3	1	3	10	4	4	10	4	34
9	2	1	1	10	4	45	10	5	15
9	2	1	2	10	5	15	10	5	45
9	2	1	3	10	5	45	10	6	15
10	2	1	1	11	1	15	11	1	45
10	1	1	1	11	1	15	11	1	45
10	1	1	1	11	1	15	11	1	45
10	3	1	1	11	1	45	11	2	15
10	2	1	2	11	1	45	11	2	15
10	2	1	2	11	1	45	11	2	15
10	2	1	3	11	2	15	11	2	45
10	1	1	3	11	2	15	11	2	45
10	3	1	2	11	6	47	11	7	17
10	3	1	3	11	7	17	11	7	47
11	2	1	1	12	1	15	12	1	45
11	1	1	1	12	1	15	12	1	45
11	1	1	2	12	1	45	12	2	15
11	3	1	1	12	2	15	12	2	45
11	1	1	3	12	2	15	12	2	45
11	3	1	2	12	2	45	12	3	15
11	2	1	2	12	3	7	12	3	37
11	2	1	3	12	3	15	12	3	45
11	2	1	3	12	3	37	12	4	7
11	3	1	1	13	1	15	13	1	45
11	1	1	1	13	1	15	13	1	45
11	2	1	2	13	1	45	13	2	15
11	2	1	2	13	1	45	13	2	15
11	2	1	3	13	2	15	13	2	45
11	3	1	3	13	2	15	13	2	45
11	1	1	1	13	2	23	13	2	53
11	2	1	2	13	5	45	13	6	15
11	3	1	3	13	7	5	13	7	35
12	3	1	1	14	1	33	14	2	3
12	1	1	2	14	2	3	14	2	33
12	1	1	2	14	2	3	14	2	33
12	1	1	3	14	2	33	14	3	3
12	2	1	1	14	3	15	14	3	45
12	2	1	2	14	3	45	14	4	15
12	1	1	1	14	3	45	14	4	15
12	1	1	2	14	4	15	14	4	45
12	1	1	3	14	5	25	14	5	55
12	2	1	3	14	5	40	14	6	10
13	2	1	1	15	1	15	15	1	45
13	1	1	1	15	1	15	15	1	45
13	3	1	1	15	1	18	15	1	48
13	2	1	2	15	1	45	15	2	15

RR/PWK

ER	AG	A	AR	START D	START H	START M	END D	END H	END M
14	1	1	2	15	1	45	15	2	15
14	3	1	2	15	1	48	15	2	18
14	2	1	3	15	2	15	15	2	45
14	1	1	3	15	2	15	15	2	45
14	3	1	3	15	2	18	15	2	48
15	2	1	1	16	1	15	16	1	45
15	1	1	1	16	1	15	16	1	45
15	3	1	1	16	1	18	16	1	48
15	2	1	2	16	1	45	16	2	15
15	1	1	2	16	1	45	16	2	15
15	3	1	2	16	1	48	16	2	18
15	3	1	3	16	2	18	16	2	48
15	2	1	3	16	3	45	16	4	15
15	1	1	3	16	6	30	16	7	0
16	1	1	1	17	1	15	17	1	45
16	1	1	2	17	1	45	17	2	15
16	1	1	2	17	1	45	17	2	15
16	1	1	3	17	2	15	17	2	45
16	3	1	1	17	5	38	17	6	8
16	3	1	2	17	6	8	17	6	38
16	3	1	3	17	6	38	17	7	8
16	2	1	1	17	7	8	17	7	38
17	2	1	1	18	1	15	18	1	45
17	1	1	1	18	1	15	18	1	45
17	3	1	1	18	1	18	18	1	48
17	2	1	2	18	1	45	18	2	15
17	1	1	2	18	1	45	18	2	15
17	3	1	2	18	1	48	18	2	18
17	2	1	3	18	2	15	18	2	45
17	1	1	3	18	2	15	18	2	45
17	3	1	3	18	2	18	18	2	48
18	2	1	1	19	1	15	19	1	45
18	1	1	1	19	1	15	19	1	45
18	3	1	1	19	1	18	19	1	48
18	2	1	2	19	1	45	19	2	15
18	1	1	2	19	1	45	19	2	15
18	3	1	2	19	1	48	19	2	18
18	2	1	3	19	2	15	19	2	45
18	1	1	3	19	2	15	19	2	45
18	3	1	3	19	2	18	19	2	48
19	2	1	1	20	1	15	20	1	45
19	1	1	1	20	1	15	20	1	45
19	3	1	1	20	1	18	20	1	48
19	2	1	2	20	1	45	20	2	15
19	2	1	2	20	1	45	20	2	15
19	1	1	2	20	1	45	20	2	15

RR/PUK

ER	AG	A	AR	START D	START H	START M	END D	END H	END M
19	3	1	2	20	1	48	20	2	18
19	2	1	3	20	2	15	20	2	45
19	1	1	3	20	2	15	20	2	45
19	3	1	3	20	2	18	20	2	48
20	2	1	1	21	1	15	21	1	45
20	1	1	1	21	1	15	21	1	45
20	3	1	1	21	1	18	21	1	48
20	2	1	2	21	1	45	21	2	15
20	1	1	2	21	1	45	21	2	15
20	3	1	2	21	1	48	21	2	18
20	2	1	3	21	2	15	21	2	45
20	1	1	3	21	2	15	21	2	45
20	3	1	3	21	2	48	21	3	18
21	2	1	1	22	1	15	22	1	45
21	1	1	1	22	1	15	22	1	45
21	2	1	2	22	1	45	22	2	15
21	1	1	2	22	1	45	22	2	15
21	3	1	1	22	2	12	22	2	42
21	3	1	2	22	2	42	22	3	12
21	2	1	3	22	3	45	22	4	15
21	1	1	3	22	3	45	22	4	15
21	3	1	3	22	4	45	22	5	15
22	2	1	1	23	1	15	23	1	45
22	1	1	1	23	1	15	23	1	45
22	3	1	1	23	1	18	23	1	48
22	2	1	2	23	1	45	23	2	15
22	1	1	2	23	1	45	23	2	15
22	1	1	2	23	1	45	23	2	15
22	3	1	2	23	1	48	23	2	18
22	3	1	3	23	2	18	23	2	48
22	2	1	3	23	3	45	23	4	15
22	1	1	3	23	6	0	23	6	30
23	1	1	1	24	1	15	24	1	45
23	1	1	2	24	1	45	24	2	15
23	1	1	3	24	2	15	24	2	45
23	3	1	1	24	5	53	24	6	23
23	3	1	2	24	6	23	24	6	53
23	2	1	1	24	6	53	24	7	23
23	3	1	3	24	7	23	24	7	53
23	2	1	2	24	7	23	24	7	53
24	3	1	1	25	6	45	25	7	15
24	2	1	1	25	6	45	25	7	15
24	1	1	1	25	6	45	25	7	15
24	3	1	2	25	7	15	25	7	45
24	2	1	2	25	7	15	25	7	45
24	1	1	2	25	7	15	25	7	45
25	1	1	1	26	1	15	26	1	45
25	1	1	2	26	1	45	26	2	15

RR/PHK

ER	AG	A	AR	START D	START H	START M	END D	END H	END M
25	1	1	3	26	2	15	26	2	45
25	3	1	1	26	5	58	26	6	28
25	3	1	2	26	6	28	26	6	58
25	2	1	1	26	6	58	26	7	28
25	3	1	3	26	7	28	26	7	58
25	2	1	2	26	7	28	26	7	58
25	2	1	2	26	7	28	26	7	58
26	1	1	1	27	1	15	27	1	45
26	1	1	2	27	1	45	27	2	15
26	1	1	3	27	2	15	27	2	45
26	3	1	1	27	6	8	27	6	38
26	2	1	1	27	6	8	27	6	38
26	3	1	2	27	6	38	27	7	8
26	2	1	2	27	6	38	27	7	8
26	3	1	3	27	7	8	27	7	38
26	2	1	3	27	7	8	27	7	38
27	3	1	1	28	1	15	28	1	45
27	2	1	1	28	1	15	28	1	45
27	1	1	1	28	1	15	28	1	45
27	3	1	2	28	1	45	28	2	15
27	2	1	2	28	1	45	28	2	15
27	1	1	2	28	1	45	28	2	15
27	3	1	3	28	2	15	28	2	45
27	2	1	3	28	2	15	28	2	45
27	1	1	3	28	2	15	28	2	45

SHK

ER	AG	A	AR	START D	START H	START M	END D	END H	END M
1	2	1	1	2	18	30	2	19	0
1	3	1	1	2	18	33	2	19	3
1	1	1	1	2	18	53	2	19	23
1	2	1	2	2	19	0	2	19	30
1	3	1	2	2	19	3	2	19	33
1	1	1	2	2	19	23	2	19	53
1	2	1	3	2	19	30	2	20	0
1	3	1	3	2	19	33	2	20	3
1	1	1	3	2	19	53	2	20	23
2	2	1	1	3	18	30	3	19	0
2	1	1	1	3	18	30	3	19	0
2	2	1	2	3	19	0	3	19	30
2	1	1	2	3	19	0	3	19	30
2	2	1	3	3	19	30	3	20	0
2	1	1	3	3	19	30	3	20	0
2	3	1	1	3	20	46	3	21	16
2	3	1	2	3	22	46	3	23	16
2	3	1	3	3	23	16	3	23	46

C 4

SHK

ER	AC	A	AR	START D	START H	START M	END D	END H	END M
3	2	1	1	4	18	30	4	19	0
3	1	1	1	4	18	30	4	19	0
3	2	1	2	4	19	0	4	19	30
3	1	1	2	4	19	0	4	19	30
3	2	1	3	4	19	30	4	20	0
3	1	1	3	4	19	30	4	20	0
3	3	1	1	4	19	44	4	20	14
3	3	1	2	4	20	14	4	20	44
3	3	1	3	4	20	44	4	21	14
4	2	1	1	5	18	30	5	19	0
4	2	1	1	5	18	30	5	19	0
4	1	1	1	5	18	30	5	19	0
4	3	1	1	5	18	33	5	19	3
4	2	1	2	5	19	0	5	19	30
4	1	1	2	5	19	0	5	19	30
4	3	1	2	5	19	3	5	19	33
4	2	1	3	5	19	30	5	20	0
4	1	1	3	5	19	30	5	20	0
4	3	1	3	5	19	33	5	20	3
5	2	1	1	6	18	30	6	19	0
5	1	1	1	6	18	30	6	19	0
5	3	1	1	6	18	33	6	19	3
5	2	1	2	6	19	0	6	19	30
5	1	1	2	6	19	0	6	19	30
5	3	1	2	6	19	3	6	19	33
5	2	1	3	6	19	30	6	20	0
5	1	1	3	6	19	30	6	20	0
5	3	1	3	6	20	80	6	21	20
6	2	1	1	7	18	30	7	19	0
6	1	1	1	7	18	30	7	19	0
6	3	1	1	7	18	33	7	19	3
6	2	1	2	7	19	0	7	19	30
6	1	1	2	7	19	0	7	19	30
6	3	1	2	7	19	3	7	19	33
6	2	1	3	7	19	30	7	20	0
6	1	1	3	7	19	30	7	20	0
6	3	1	3	7	19	33	7	20	3
7	2	1	1	8	18	30	8	19	0

SHK

ER	AG	A	AR	START D	START H	START M	END D	END H	END M
7	1	1	1	8	18	30	8	19	0
7	3	1	1	8	18	33	8	19	3
7	2	1	2	8	19	0	8	19	30
7	1	1	2	8	19	0	8	19	30
7	3	1	2	8	19	3	8	19	33
7	2	1	3	8	19	30	8	20	0
7	1	1	3	8	19	30	8	20	0
7	3	1	3	8	20	48	8	21	18
8	2	1	1	9	18	30	9	19	0
8	2	1	2	9	19	0	9	19	30
8	3	1	1	9	19	20	9	19	50
8	1	1	1	9	19	20	9	19	50
8	2	1	3	9	19	30	9	20	0
8	3	1	2	9	19	50	9	20	20
8	1	1	2	9	19	50	9	20	20
8	3	1	3	9	20	20	9	20	50
8	1	1	3	9	20	20	9	20	50
9	1	1	1	10	18	30	10	19	0
9	1	1	2	10	19	0	10	19	30
9	1	1	3	10	19	30	10	20	0
9	3	1	1	10	22	53	10	23	23
9	2	1	1	10	22	53	10	23	23
9	3	1	2	10	23	23	10	23	53
9	2	1	2	10	23	23	10	23	53
10	2	1	1	11	18	30	11	19	0
10	1	1	1	11	18	30	11	19	0
10	2	1	2	11	19	0	11	19	30
10	2	1	2	11	19	0	11	19	30
10	1	1	2	11	19	0	11	19	30
10	3	1	1	11	19	12	11	19	42
10	2	1	3	11	19	30	11	20	0
10	1	1	3	11	19	30	11	20	0
10	3	1	2	11	19	42	11	20	12
10	3	1	3	11	20	42	11	21	12
11	2	1	1	12	18	30	12	19	0
11	1	1	1	12	18	30	12	19	0
11	3	1	1	12	18	33	12	19	3
11	2	1	2	12	19	0	12	19	30
11	1	1	2	12	19	0	12	19	30
11	3	1	2	12	19	3	12	19	33
11	2	1	3	12	19	30	12	20	0
11	1	1	3	12	19	30	12	20	0
11	3	1	3	12	19	33	12	20	3
12	2	1	1	13	18	30	13	19	0
12	1	1	1	13	18	30	13	19	0

SHK

ER	AG	A	AR	START			END		
				D	H	M	D	H	M
12	3	1	1	13	18	33	13	19	3
12	2	1	2	13	19	0	13	19	30
12	1	1	2	13	19	0	13	19	30
12	3	1	2	13	19	3	13	19	33
12	2	1	3	13	19	30	13	20	0
12	1	1	3	13	19	30	13	20	0
12	3	1	3	13	19	33	13	20	3
13	2	1	1	14	18	30	14	19	0
13	1	1	1	14	18	30	14	19	0
13	3	1	1	14	18	48	14	19	18
13	2	1	2	14	19	0	14	19	30
13	1	1	2	14	19	0	14	19	30
13	3	1	2	14	19	18	14	19	48
13	2	1	3	14	19	30	14	20	0
13	1	1	3	14	19	30	14	20	0
13	3	1	3	14	19	48	14	20	18
14	2	1	1	15	18	30	15	19	0
14	1	1	1	15	18	30	15	19	0
14	3	1	1	15	18	33	15	19	3
14	2	1	2	15	19	0	15	19	30
14	1	1	2	15	19	0	15	19	30
14	3	1	2	15	19	3	15	19	33
14	2	1	3	15	19	30	15	20	0
14	1	1	3	15	19	30	15	20	0
14	3	1	3	15	19	33	15	20	3
15	2	1	1	16	18	30	16	19	0
15	1	1	1	16	18	30	16	19	0
15	3	1	1	16	18	33	16	19	3
15	2	1	2	16	19	0	16	19	30
15	1	1	2	16	19	0	16	19	30
15	3	1	2	16	19	3	16	19	33
15	2	1	3	16	19	30	16	20	0
15	1	1	3	16	19	30	16	20	0
15	3	1	3	16	19	33	16	20	3
16	2	1	1	17	18	30	17	19	0
16	1	1	1	17	18	30	17	19	0
16	2	1	2	17	19	0	17	19	30
16	1	1	2	17	19	0	17	19	30
16	2	1	3	17	19	30	17	20	0
16	1	1	3	17	19	30	17	20	0
16	3	1	1	17	22	3	17	22	33
16	3	1	2	17	22	33	17	23	3
16	3	1	3	17	23	3	17	23	33
17	2	1	1	18	18	30	18	19	0

SHK

ER	AG	A	AR	START			END		
				D	H	M	D	H	M
17	1	1	1	18	18	30	18	19	0
17	3	1	1	18	18	33	18	19	3
17	2	1	2	18	19	0	18	19	30
17	1	1	2	18	19	0	18	19	30
17	3	1	2	18	19	3	18	19	33
17	2	1	3	18	19	30	18	20	0
17	1	1	3	18	19	30	18	20	0
17	3	1	3	18	19	33	18	20	3
18	2	1	1	19	18	30	19	19	0
18	1	1	1	19	18	30	19	19	0
18	3	1	1	19	18	33	19	19	3
18	2	1	2	19	19	0	19	19	30
18	1	1	2	19	19	0	19	19	30
18	3	1	2	19	19	3	19	19	33
18	2	1	3	19	19	30	19	20	0
18	1	1	3	19	19	30	19	20	0
18	3	1	3	19	20	55	19	21	25
19	1	1	1	20	18	30	20	19	0
19	1	1	2	20	19	0	20	19	30
19	2	1	1	20	19	8	20	19	38
19	1	1	3	20	19	30	20	20	0
19	3	1	1	20	19	38	20	20	8
19	2	1	2	20	19	38	20	20	8
19	3	1	2	20	20	8	20	20	38
19	2	1	3	20	20	8	20	20	38
19	3	1	3	20	20	38	20	21	8
20	2	1	1	21	18	30	21	19	0
20	1	1	1	21	18	30	21	19	0
20	3	1	1	21	18	33	21	19	3
20	2	1	2	21	19	0	21	19	30
20	1	1	2	21	19	0	21	19	30
20	3	1	2	21	19	3	21	19	33
20	2	1	3	21	19	30	21	20	0
20	1	1	3	21	19	30	21	20	0
20	3	1	3	21	20	0	21	20	30
21	2	1	1	22	18	30	22	19	0
21	1	1	1	22	18	30	22	19	0
21	3	1	1	22	18	33	22	19	3
21	2	1	2	22	19	0	22	19	30
21	1	1	2	22	19	0	22	19	30
21	3	1	2	22	19	3	22	19	33
21	2	1	3	22	19	30	22	20	0
21	1	1	3	22	19	30	22	20	0
21	3	1	3	22	19	33	22	20	3
22	2	1	1	23	18	30	23	19	0
22	1	1	1	23	18	30	23	19	0
22	3	1	1	23	18	33	23	19	3

SHK

ER	AG	A	AR	START D	START H	START M	END D	END H	END M
22	2	1	2	23	19	0	23	19	30
22	1	1	2	23	19	0	23	19	30
22	3	1	2	23	19	3	23	19	33
22	2	1	3	23	19	30	23	20	0
22	1	1	3	23	19	30	23	20	0
22	3	1	3	23	19	33	23	20	3
23	1	1	1	24	18	30	24	19	0
23	1	1	2	24	19	0	24	19	30
23	1	1	3	24	19	30	24	20	0
23	3	1	1	24	23	8	24	23	38
23	2	1	1	24	23	8	24	23	38
24	3	1	1	25	18	30	25	19	0
24	2	1	1	25	18	30	25	19	0
24	1	1	1	25	18	30	25	19	0
24	3	1	2	25	19	0	25	19	30
24	2	1	2	25	19	0	25	19	30
24	1	1	2	25	19	0	25	19	30
24	3	1	3	25	19	30	25	20	0
24	2	1	3	25	19	30	25	20	0
24	1	1	3	25	19	30	25	20	0
25	2	1	1	26	18	30	26	19	0
25	2	1	2	26	19	0	26	19	30
25	2	1	3	26	19	30	26	20	0
25	3	1	1	26	23	13	26	23	43
25	1	1	1	26	23	13	26	23	43
26	3	1	1	27	18	30	27	19	0
26	3	1	2	27	19	0	27	19	30
26	3	1	3	27	19	30	27	20	0
26	2	1	1	27	22	3	27	22	33
26	1	1	1	27	22	3	27	22	33
26	2	1	2	27	22	33	27	23	3
26	1	1	2	27	22	33	27	23	3
26	2	1	3	27	23	3	27	23	33
26	1	1	3	27	23	3	27	23	33
27	3	1	1	28	18	30	28	19	0
27	2	1	1	28	18	30	28	19	0
27	1	1	1	28	18	30	28	19	0
27	3	1	2	28	19	0	28	19	30
27	2	1	2	28	19	0	28	19	30
27	3	1	3	28	19	30	28	20	0
27	2	1	3	28	19	30	28	20	0
27	1	1	2	28	19	30	28	20	0
27	1	1	3	28	20	0	28	20	30

ATM

ER	AG	A	AR	START D	START H	START M	END D	END H	END M
1	6	1	1	3	20	0	3	21	45
1	6	1	2	4	6	17	4	8	2
1	5	1	1	4	20	0	4	21	30
1	5	1	2	4	22	30	5	0	0
1	6	1	3	5	4	15	5	6	0
1	5	1	3	5	6	30	5	8	0
1	6	1	4	5	20	0	5	21	45
1	3	1	1	6	4	15	6	8	15
1	6	1	5	7	2	45	7	4	30
1	6	1	6	7	5	40	7	7	25
1	5	1	4	7	20	0	7	21	30
1	2	1	1	8	6	0	8	8	0
1	5	1	5	8	20	0	8	21	30
1	3	1	2	9	3	46	9	7	46
1	2	1	2	10	4	31	10	6	31
1	3	1	3	10	20	0	11	0	0
1	5	1	6	11	2	45	11	4	15
1	2	1	3	11	5	45	11	7	45
1	5	1	7	11	20	0	12	21	30
1	3	1	4	12	3	45	12	7	45
1	4	1	1	12	20	0	13	23	0
1	2	1	4	13	2	45	13	4	45
1	4	1	2	13	4	45	13	7	45
1	2	1	5	13	20	3	14	22	3
1	4	1	3	14	20	18	15	23	18
1	3	1	5	15	2	48	15	6	48
1	4	1	4	15	20	0	16	23	0
1	3	1	6	16	20	0	17	0	0
1	4	1	5	17	2	45	17	5	45
1	1	1	1	17	20	0	18	0	0
1	3	1	7	18	2	48	18	6	48
1	4	1	6	18	20	0	19	23	0
1	2	1	6	19	2	48	19	4	48
1	5	1	8	19	6	10	19	7	40
1	5	1	9	19	20	0	20	21	30
1	6	1	7	20	2	45	20	4	30
1	2	1	7	20	5	15	20	7	15
1	4	1	7	20	21	8	21	0	8
1	5	1	10	21	2	45	21	4	15
1	4	1	8	21	20	0	22	23	0
1	6	1	8	22	5	40	22	7	25
1	3	1	8	22	20	3	23	0	3
1	5	1	11	23	6	15	23	7	45
1	3	1	9	23	20	0	24	0	0
1	6	1	9	24	2	45	24	4	30
1	3	1	10	24	20	0	25	0	0
1	1	1	2	25	20	0	26	0	0
1	3	1	11	26	20	0	27	0	0
1	3	1	12	27	2	45	27	6	45

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