

K.F. H

MEDICAL

APOLLO 15 FRR MEDICAL

- **CHANGES FROM PREVIOUS MISSION**
- **METABOLIC AND RADIATION ASSESSMENTS**
- **MEDICAL STATUS**

APOLLO 15 MEDICAL CHANGE SUMMARY

- ELIMINATION OF QUARANTINE
- HEALTH STABILIZATION PROGRAM REVISED
- BIOINSTRUMENTATION/MEDICAL KIT CHANGES
- EVA FOOD/DRINK PROVISIONS
- DETAIL REVISIONS TO PRE- AND POSTFLIGHT PROTOCOLS
- REVISED LIGHT FLASH PHENOMENA DTO's

APOLLO 15

ELIMINATION OF QUARANTINE

- **DECISION TO ELIMINATE QUARANTINE IMPACTS**
 - **POSTFLIGHT HEALTH PROTECTION OF CREW**
 - **POSTFLIGHT MEDICAL FACILITIES**
 - **DIETARY CONTROLS**
 - **GAMMA SPECTROMETRY**

APOLLO 15

FLIGHT CREW HEALTH STABILIZATION PROGRAM

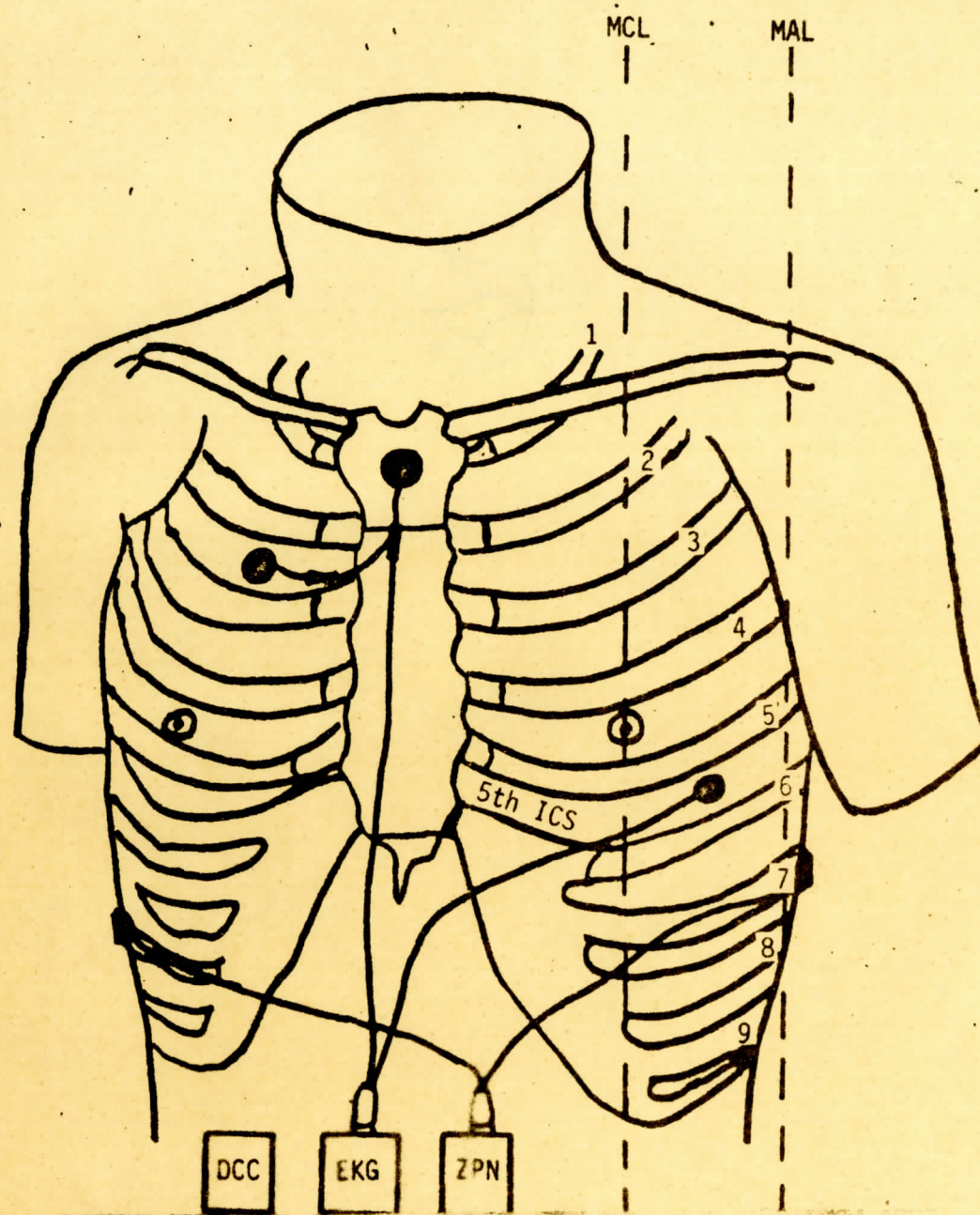
- **SAME AS APOLLO 14 EXCEPT**
 - **CONTROL GROUP ADDED AT KSC**
 - **NO SCHOOL SURVEILLANCE (VACATION PERIOD)**
- **COOPERATION, ASSISTANCE, AND COGNIZANCE OF
ALL MSF PERSONNEL IMPORTANT**

APOLLO 15

BIOINSTRUMENTATION/MEDICAL KIT CHANGES

- REPOSITIONED LOWER STERNAL ELECTRODE (SEE FIGURE)
 - LESS SUSCEPTIBLE TO DETACHMENT
 - GREATER MARGIN FOR PLACEMENT ERROR
- PROVIDED ELECTRODE ATTACHMENT KIT IN LM
 - INCREASED LUNAR STAY TIME AND REMOVAL OF SUITS RESULTS IN HIGHER PROBABILITY OF INADVERTENT DETACHMENT
- ADDED FOUR UCTA ROLL-ON CUFFS TO LM MEDICAL KIT
 - INCREASED LUNAR STAY TIME AND REMOVAL OF SUITS
- PROVIDED FOR DON/DOFF CAPABILITY OF ELECTRODES (SEE SCHEDULE)
 - MINIMIZE POTENTIAL SKIN IRRITATION
 - SKYLAB TYPE CONFIGURATION (SEE FIGURE)
- DRUG CHANGES
 - ADDED SECONAL
 - ADDED TETRACYCLINE

BIOSENSOR PLACEMENT CHART



ELECTRODE DON/DOFF SCHEDULE

MISSION PHASE

REQUIREMENT FOR WEAR

LAUNCH THROUGH TLI

ALL CREWMEMBERS

TLC

AT LEAST ONE CREWMEMBER

CSM LUNAR ORBIT (SOLO)

CMP

LM DESCENT AND LANDING

CDR

LUNAR SURFACE

CDR AND LMP

LM ASCENT AND DOCKING

CDR AND CMP

LUNAR ORBIT OPERATIONS

AT LEAST ONE CREWMEMBER

TEC

AT LEAST ONE CREWMEMBER

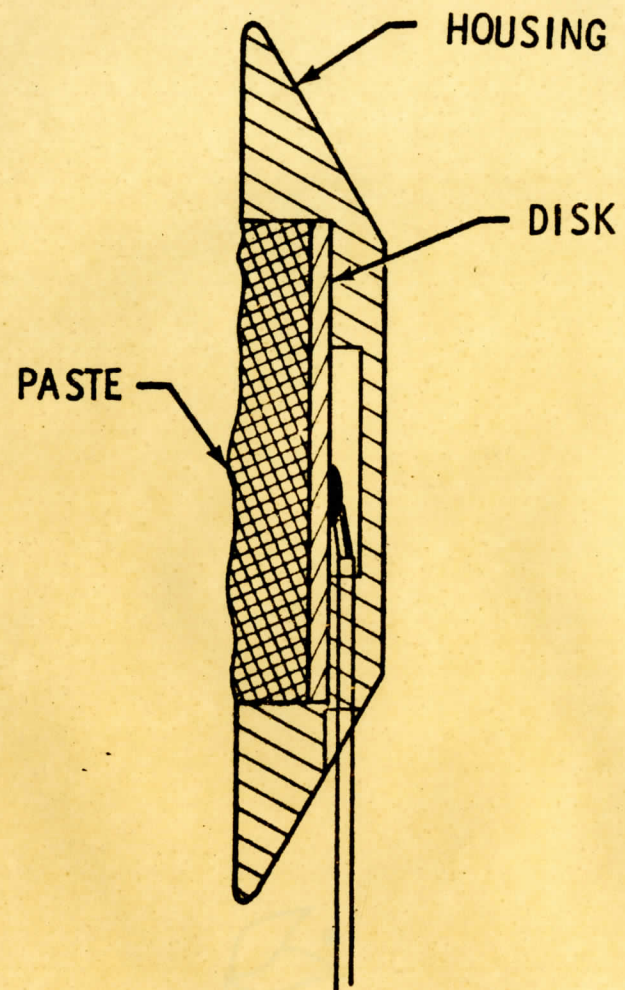
INFLIGHT EVA

ALL CREWMEMBERS

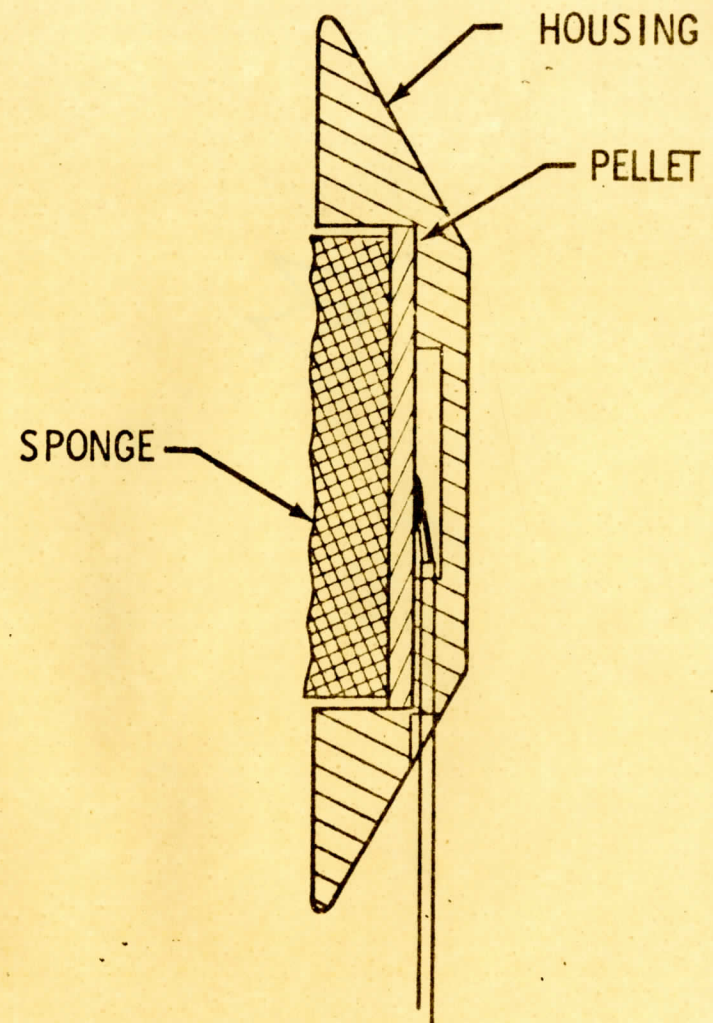
REENTRY AND LANDING

LMP

ELECTRODE/ELECTROLYTE CONFIGURATION



PREVIOUS



PRESENT

APOLLO 15

EVA FOOD/DRINK PROVISIONS

- IN-SUIT FOOD BAR ASSEMBLY
 - FOOD BAR (300 CALORIES)
 - STOWED IN LM (6 UNITS)
 - ACCEPTABLE FOR USE EVA (CREW OPTION)
- IN-SUIT DRINKING DEVICE
 - 32-OUNCE WATER BAG
 - PROBLEMS RELATED TO VALVE POSITION, LENGTH OF HOSE, FLOW RATE WORKED OUT DURING METABOLIC CHAMBER RUNS AND OTHER TRAINING ACTIVITIES
 - INTERFACE PROBLEMS WITH FOOD BAR ASSEMBLY RESOLVED BY VELCRO ATTACHMENT PROVISIONS
- SUMMARY
 - CREW/EQUIPMENT INTERFACE ACCEPTABLE
 - ADEQUATE WATER AND FOOD AVAILABLE FOR ACTIVITY

REVISIONS TO PRE- AND POSTFLIGHT MEDICAL PROTOCOLS

- EXERCISE RESPONSE TESTING
 - ELIMINATED F-45 DAY TESTING
 - THREE 5-MINUTE EXERCISES VICE 6, 3, AND 3
 - WORKLOAD CONTROL DURING FINAL 2 MINUTES EACH EXERCISE
- MICROBIOLOGY
 - SAMPLING AT F-5 DAYS VICE F-14
 - ELIMINATED R+18 DAYS SAMPLING
 - ADDED TEN SPACECRAFT SAMPLES
- ORTHOSTATIC TOLERANCE
 - LBNP VICE STAND UP

APOLLO 15

APOLLO LIGHT FLASH PHENOMENON

- APPROVED DTO FOR TIMELINING
- EYE SHIELDS WILL BE USED
 - ALL CREWMEN ONE HOUR DURING TEC
 - ONE CREWMAN DURING LUNAR ORBIT (ON A NONINTERFERENCE BASIS) SUBSEQUENT TO LUNAR SURFACE ACTIVITY
- HZE RADIATION DOSIMETER SAME AS APOLLO 14

APOLLO MISSION METABOLIC ASSESSMENT

AVERAGE METABOLIC RATES (BTU/HR)

		APOLLO 11	APOLLO 12	APOLLO 14
EVA I	CDR	900	975	800
	LMP	1200	1000	930
EVA II	CDR	-	875	910
	LMP	-	1000	1000

APOLLO 15 METABOLIC PREDICTIONS

	AVERAGE METABOLIC RATES (BTU/HR)				
	EVA I	EVA II	EVA III	SEVA	INFLIGHT EVA
CDR (LRV)	616	603	605		
(OTHER)	932	962	966		
(OVERALL)	885	851	871	700	
LMP (LRV)	600	603	605		
(OTHER)	920	960	970		
(OVERALL)	864	849	874		
CMP					900

APOLLO MISSIONS: RADIATION DOSE (THERMOLUMINESCENT DOSIMETERS)

AVERAGE DOSE
RAD

APOLLO 7	.16
APOLLO 8	.16
APOLLO 9	.20
APOLLO 10	.48
APOLLO 11	.18
APOLLO 12	.58
APOLLO 13	.24
APOLLO 14	1.14

APOLLO 15

RADIATION EXPOSURE PREDICTION

- NO CAPABILITY TO ESTIMATE QUANTITATIVELY NOMINAL DOSAGE FOR APOLLO 15
- BASED ON TIME THROUGH VAN ALLEN BELT EXPECT DOSAGE LESS THAN APOLLO 14 MEASURED VALUE - 1.14 RAD
- COMPARE WITH MAXIMUM OPERATIONAL DOSE
 - SKIN DOSE 400 RAD
 - DEPTH DOSE 50 RAD

APOLLO 15

MEDICAL STATUS

- DOCUMENTATION

- MEDICAL REQUIREMENTS DOCUMENT, MEDICAL OPERATIONS PLAN, AND FLIGHT CREW HEALTH STABILIZATION PLAN APPROVED AND PUBLISHED

- HARDWARE

- MEDICAL KITS AND BIOINSTRUMENTATION MODIFICATIONS COMPLETED, FOOD PACKAGING AND ASSEMBLY ON SCHEDULE
- NO PROBLEMS ANTICIPATED TO MEET KSC DELIVERY (JULY 10, 1971)

- CREW INTERFACES

- ALL DRUG TESTING COMPLETED
- MEDICAL BRIEFING TO BACKUP CREW COMPLETED JUNE 7, 1971; TO PRIME CREW JUNE 18, 1971
- CREW FLIGHT PHYSICAL EXAMINATIONS SCHEDULED