APOLLO MEDICAL KIT CONTENTS

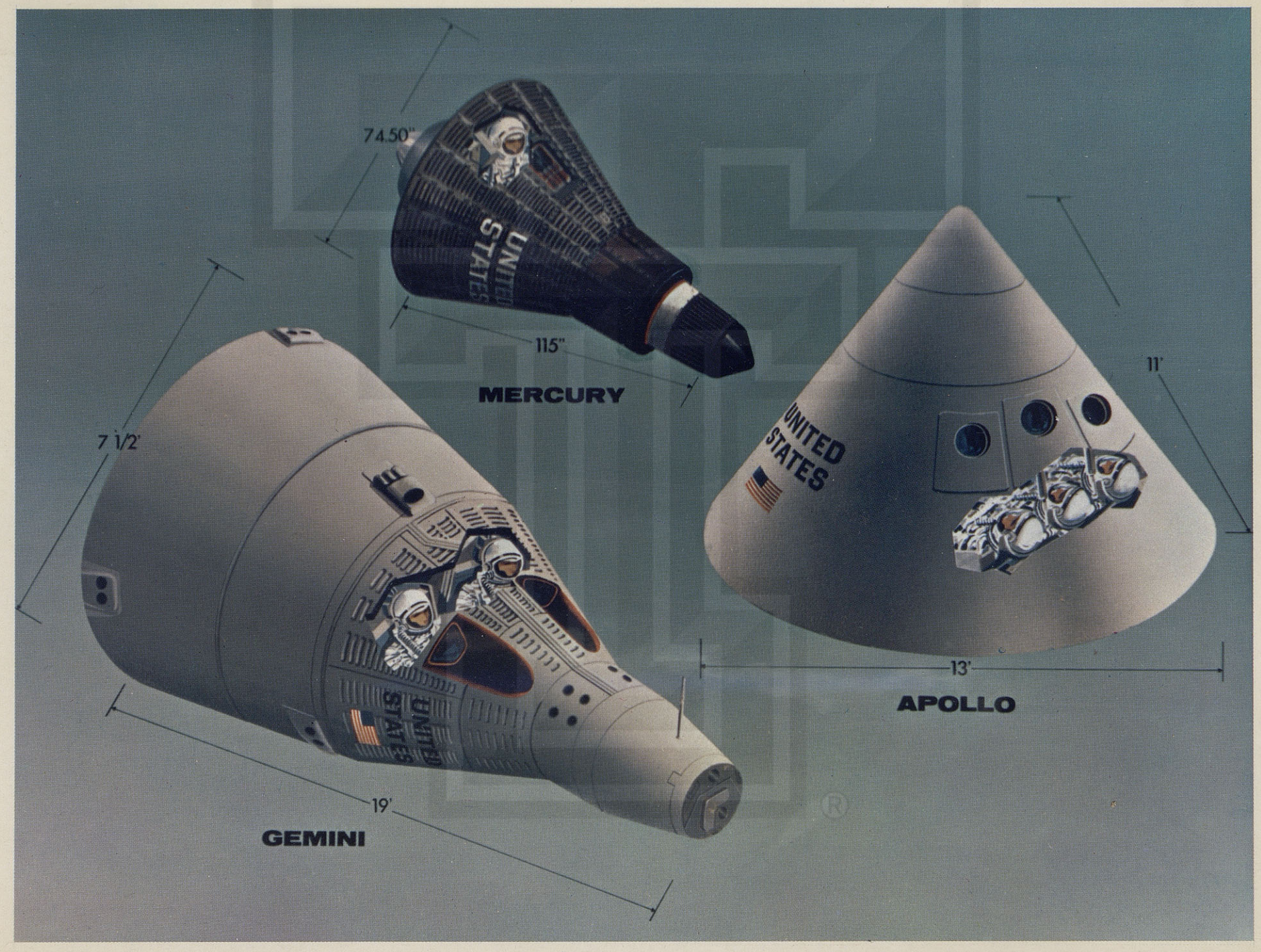
INJECTOR-PAIN, DEMERAL 100 MGM.	3	*TABLETS-ANALGESIC, TYLENOL	14
INJECTOR-MOTION SICKNESS, MAREZINE 45 MGM.	3	LIQUID-NASAL EMOLLIENT , PONARIS	3
CAPSULE-PAIN, DARVON 65 MGM.	12	*SPRAY-NASAL, AFRIN	3
TABLET-STIMULANT, DEXEDRINE 5 MGM.	12	OINTMENT-ANTIBIOTIC, NEOSPORIN	1
TABLET-MOTION SICKNESS, MAREZINE 50 MGM.	12	CREAM-SKIN, J&J FIRST AID CREAM	1
TABLET-DIARRHEA, LOMOTIL 2.5 MGM. WITH .025 ATROPINE	24	BANDAGE COMPRESS	2
		BAND AIDS	12
TABLET-DECONGESTANT, ACTIFED	60	DROPS-EYE, METHYLCELLULOSE	2
TABLET-ANALGESIC, ASPIRIN	72	ORAL THERMOMETER	1
*CAPSULES-ANTIBIOTIC, AMPICILLIN 250 MGM.	60	CUFF'S URINE DEVICE	6
TABLETS-ANTIBIOTIC, ACHROMYCIN 250 MGM.	24	pH PAPER ROLL	1
*CAPSULES-SLEEP, SECONAL 100 MGM.	21	*STERNAL ELECTRODE HARNESS	1
*CAPSULES-SLEEP, SECONAL 50 MGM.	12	*AXILLARY ELECTRODE HARNESS	1
*CAPSULES-ANTIHISTAMINE, BENADRYL 100 MGM.	8	ELECTRODE PASTE	1

*ITEMS ADDED FOR APOLLO VIII

NASA HQ MM69-5208
4-15-69

DATE: 63 ASSIGNMENT: Apollo, Gemini, Mercury photos + charts; undated Box 2 FILE FILE 3

mm 4-816



DATE: ASSIGNMENT: (4) Apollo, Gemini, Mercury photos + charts; undated

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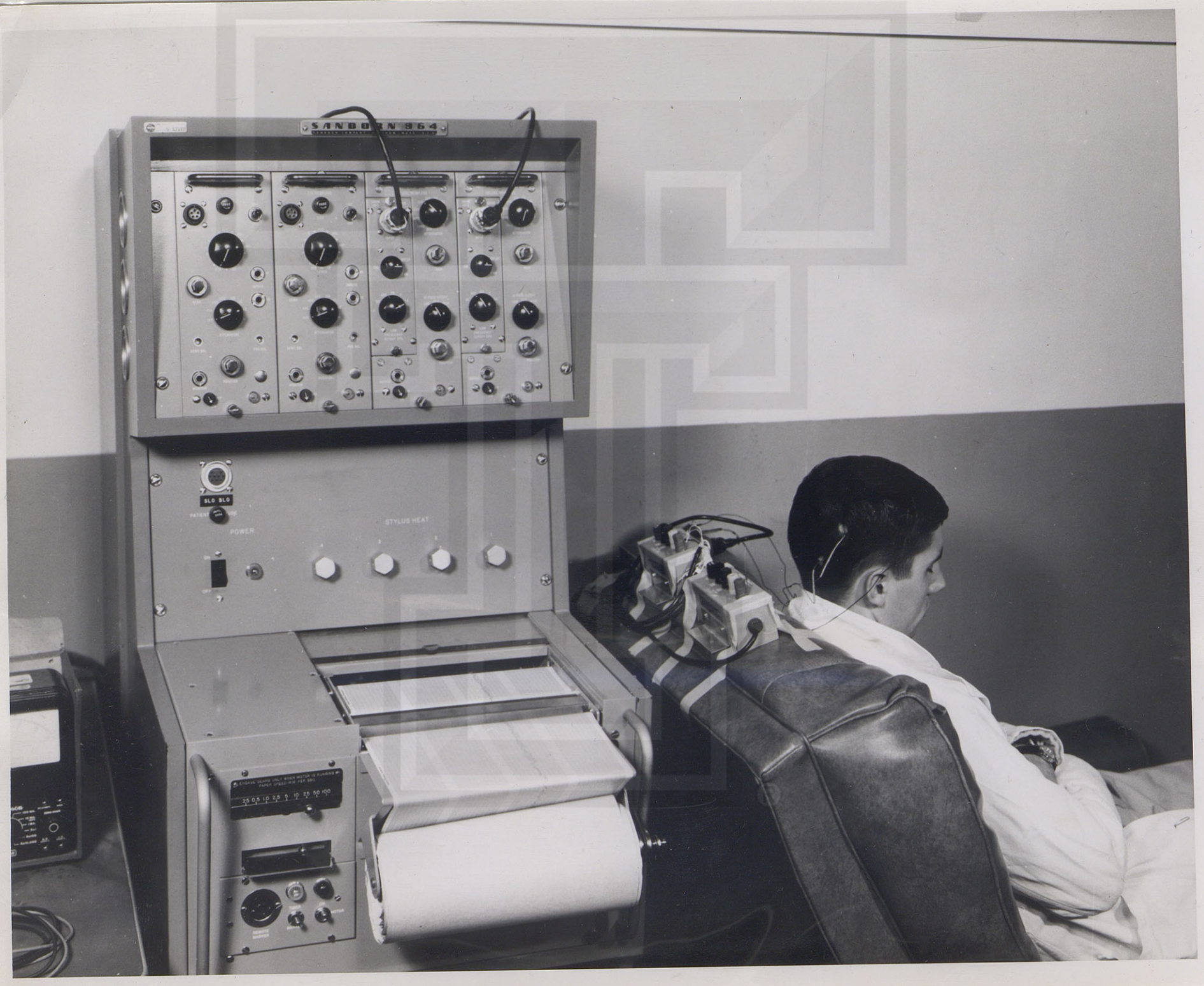
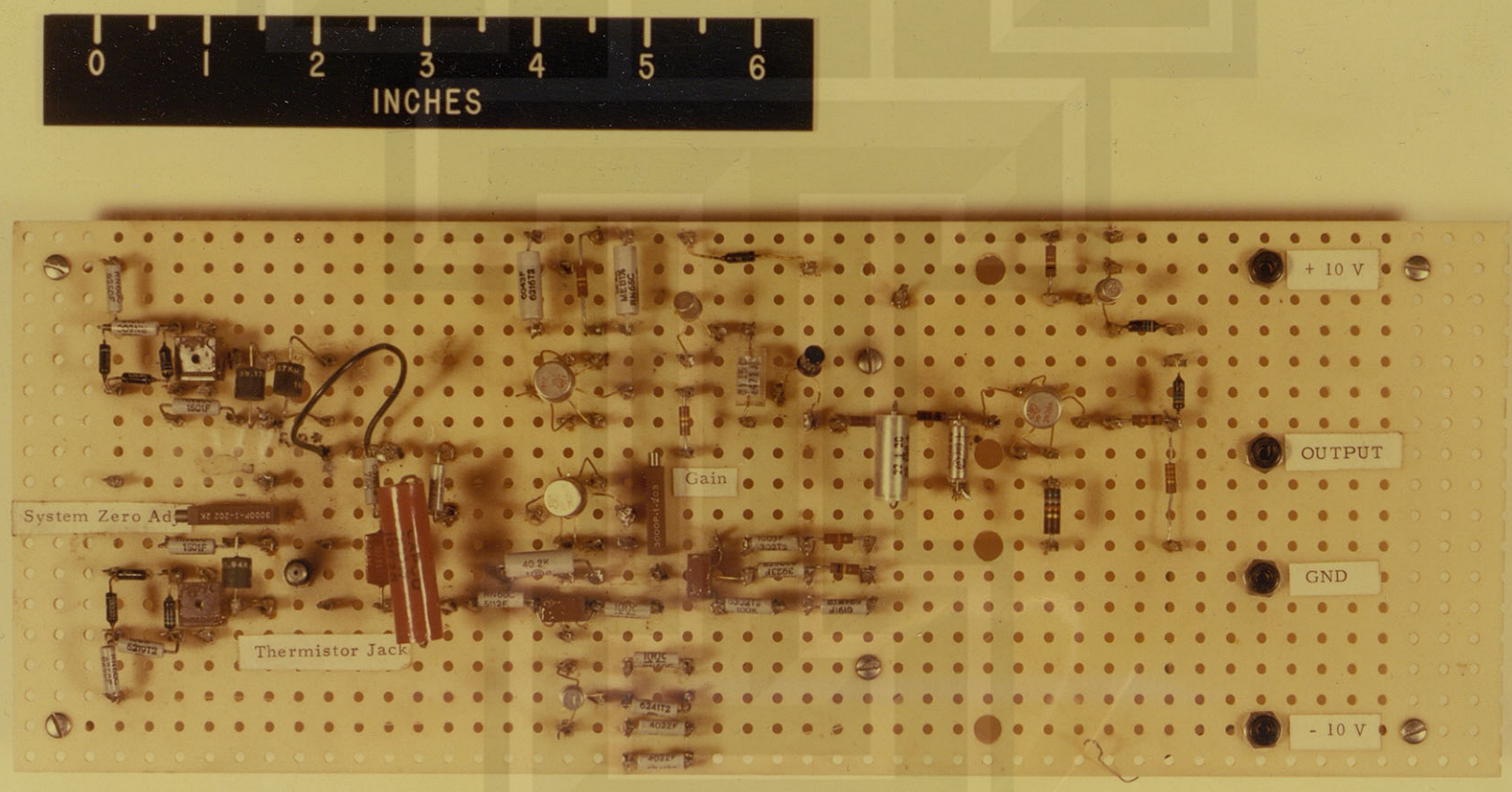


(56) Apollo, Gemini, Mercury photos + charts; undated Box FILE

NASA
S-63-18717

MM-4-256

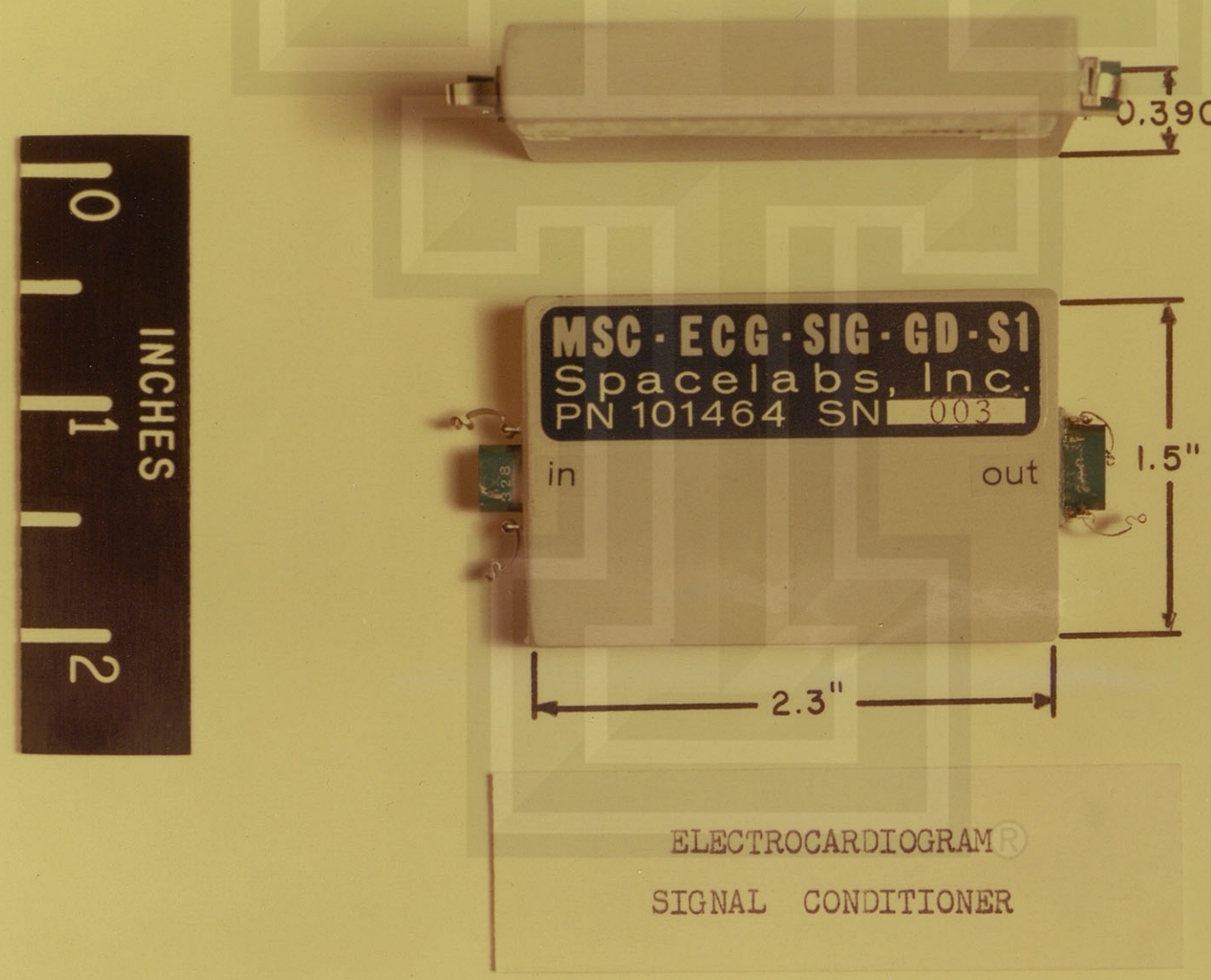


ORAL TEMPERATURE
BREADBOARD

DATE: ASSIGNMENT: (67) Apollo, Gemini, Mercury photos & charts; undated Box FILE FILE NO:

NASA
S-63-18715

MM-4-258

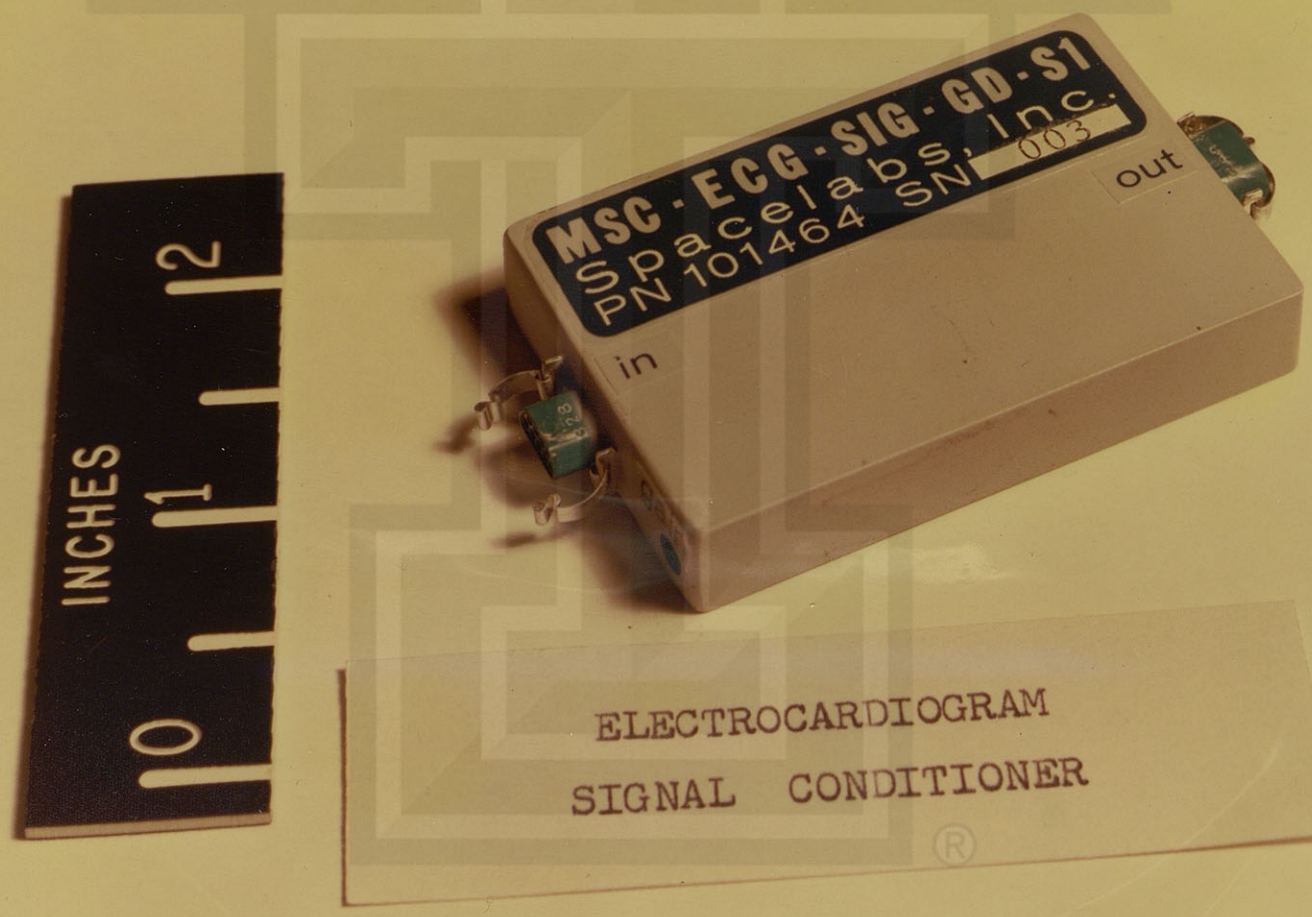


ELECTROCARDIOGRAM®
SIGNAL CONDITIONER

(8) Apollo, Gemini, Mercury photos + charts; undated Box FILE

NASA
S-63-18714

mm-4-962

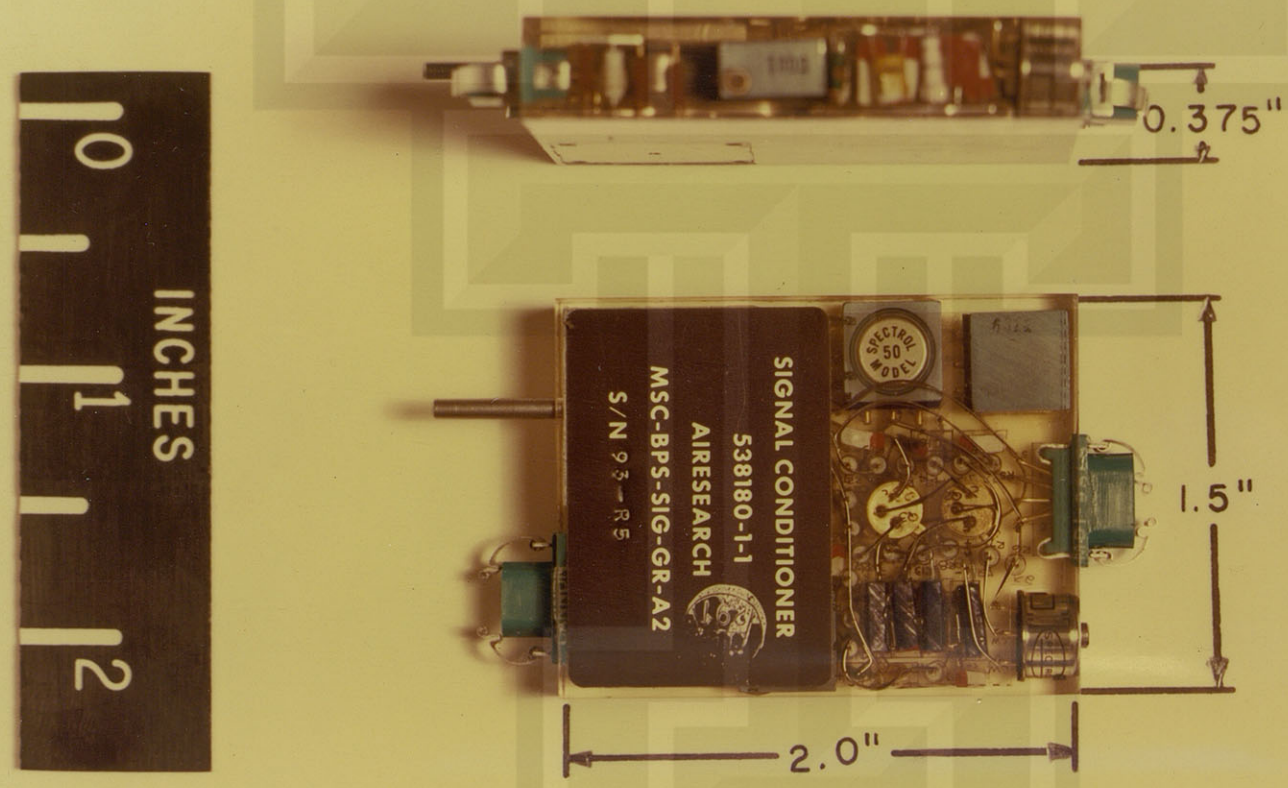


ELECTROCARDIOGRAM
SIGNAL CONDITIONER

(49) Apollo, Gemini, Mercury photos + charts; undated Box FILE

NASA
S-63-18716

MM 4-259



BLOOD PRESSURE
MEASUREMENT SIGNAL
CONDITIONER

(60) Apollo, Gemini, Mercury photos + charts; undated Box FILE

NASA
S-63-18709

MM-4-363

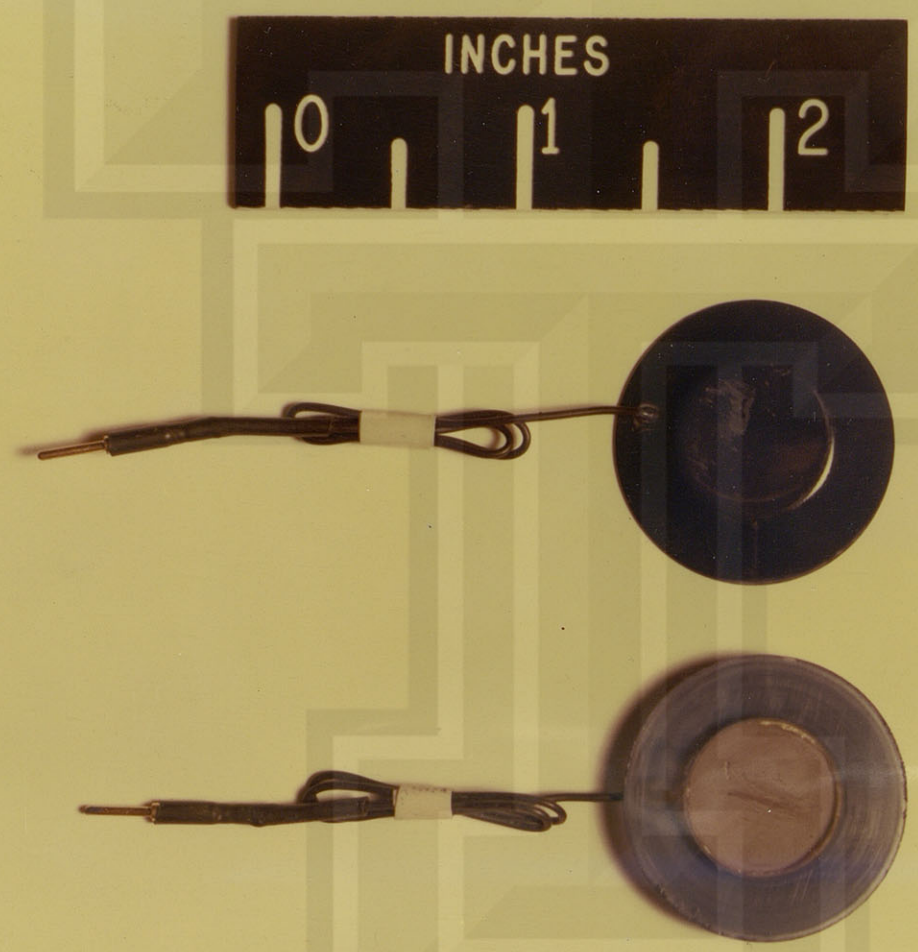
BLOOD PRESSURE
MEASUREMENT SIGNAL
CONDITIONER

(4) Apollo, Gemini, Mercury photos + charts; undated

DATE: ASSIGNMENT: Box FILE FILE NO:

NASA
S-63-18707

mm-4-255

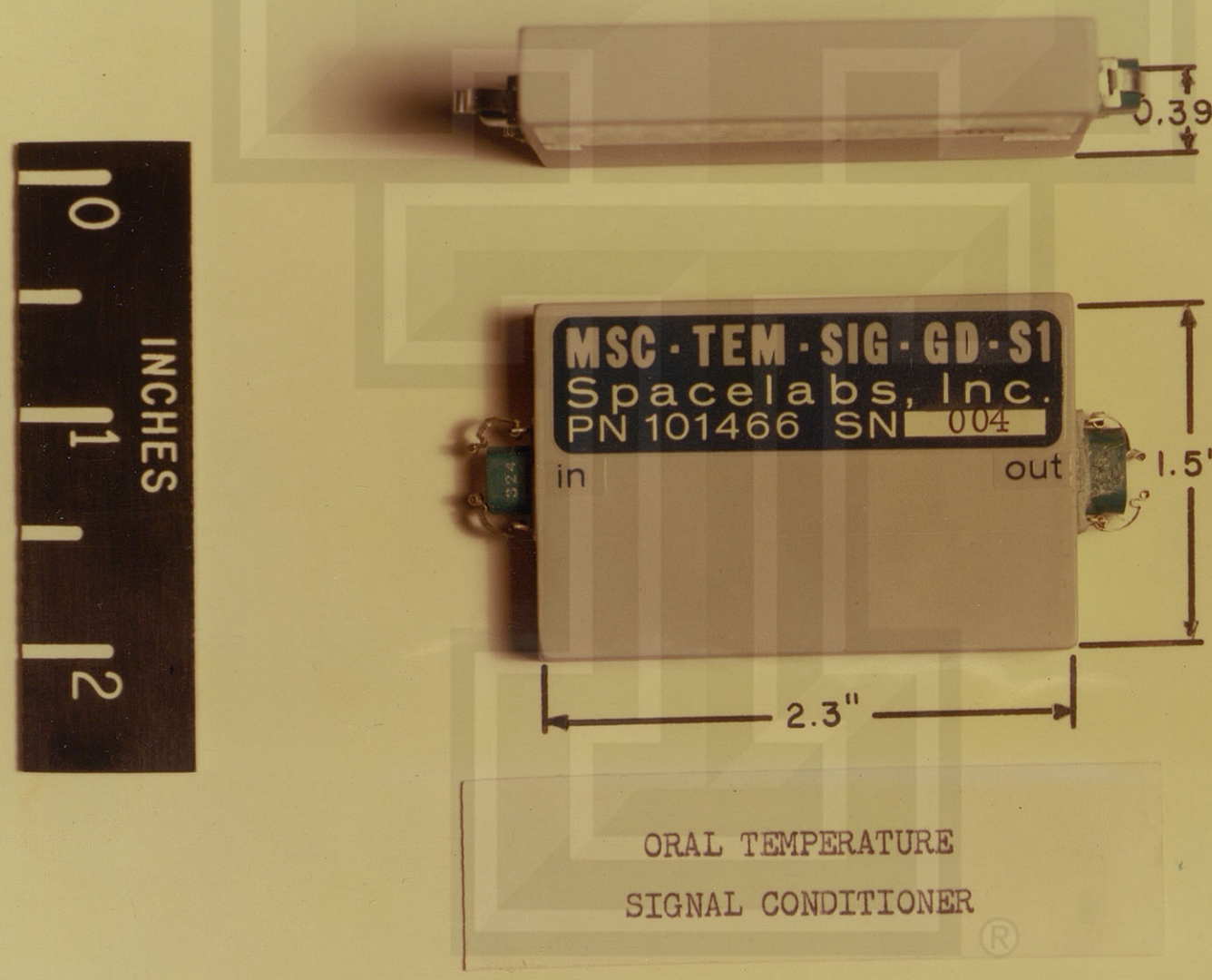


2 cm² ECG AND GSR ELECTRODES

(2) Apollo, Gemini, Mercury photos + charts; undated Box File

NASA
S-63-18713

MM4-258



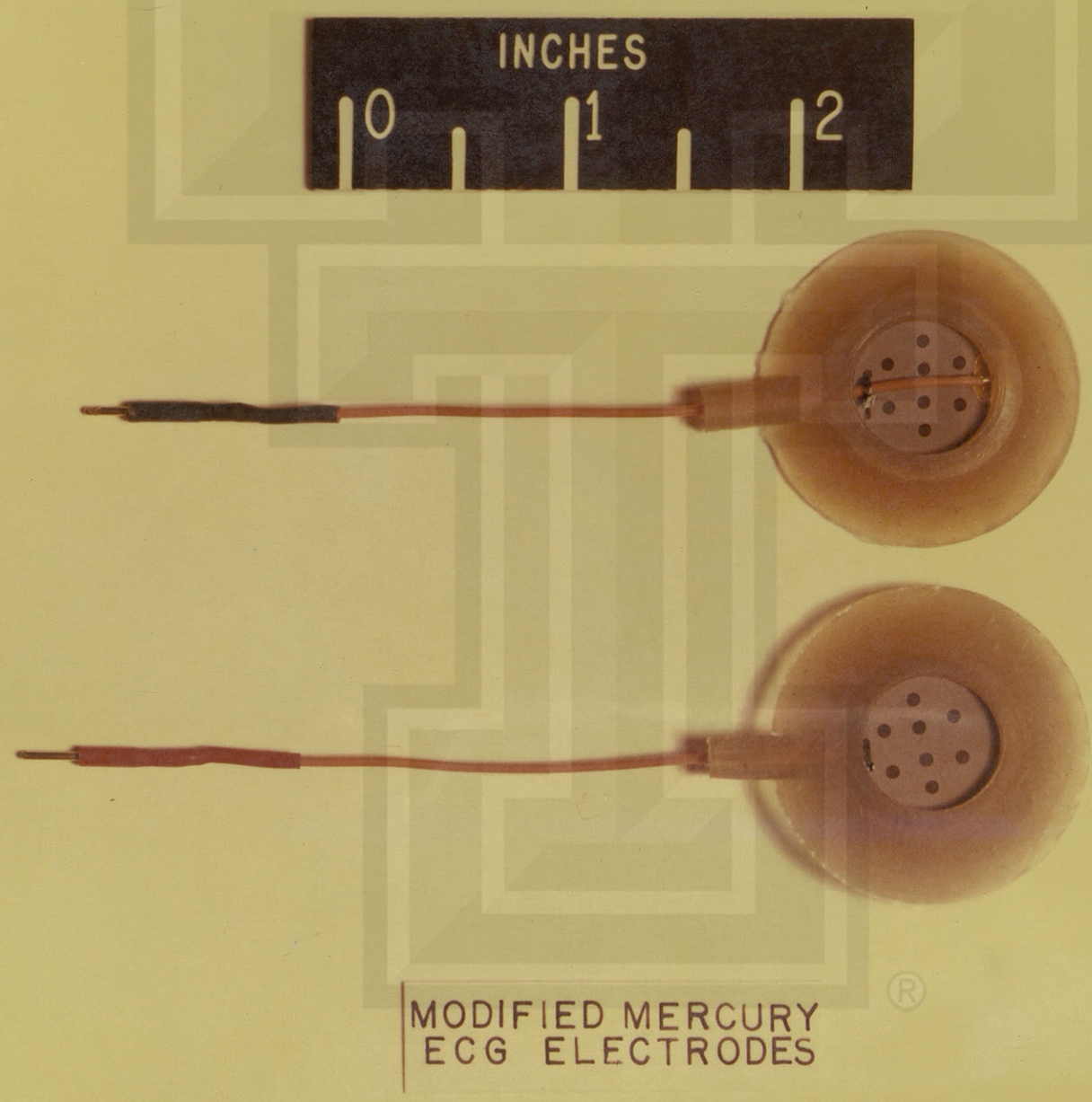
ORAL TEMPERATURE
SIGNAL CONDITIONER

DATE: ASSIGNMENT: (63) Apollo, Gemini, Mercury photos + charts; undated BOX NO: FILE

NASA
S-64-32256

NASA
S-63-18712

MM 4-7074



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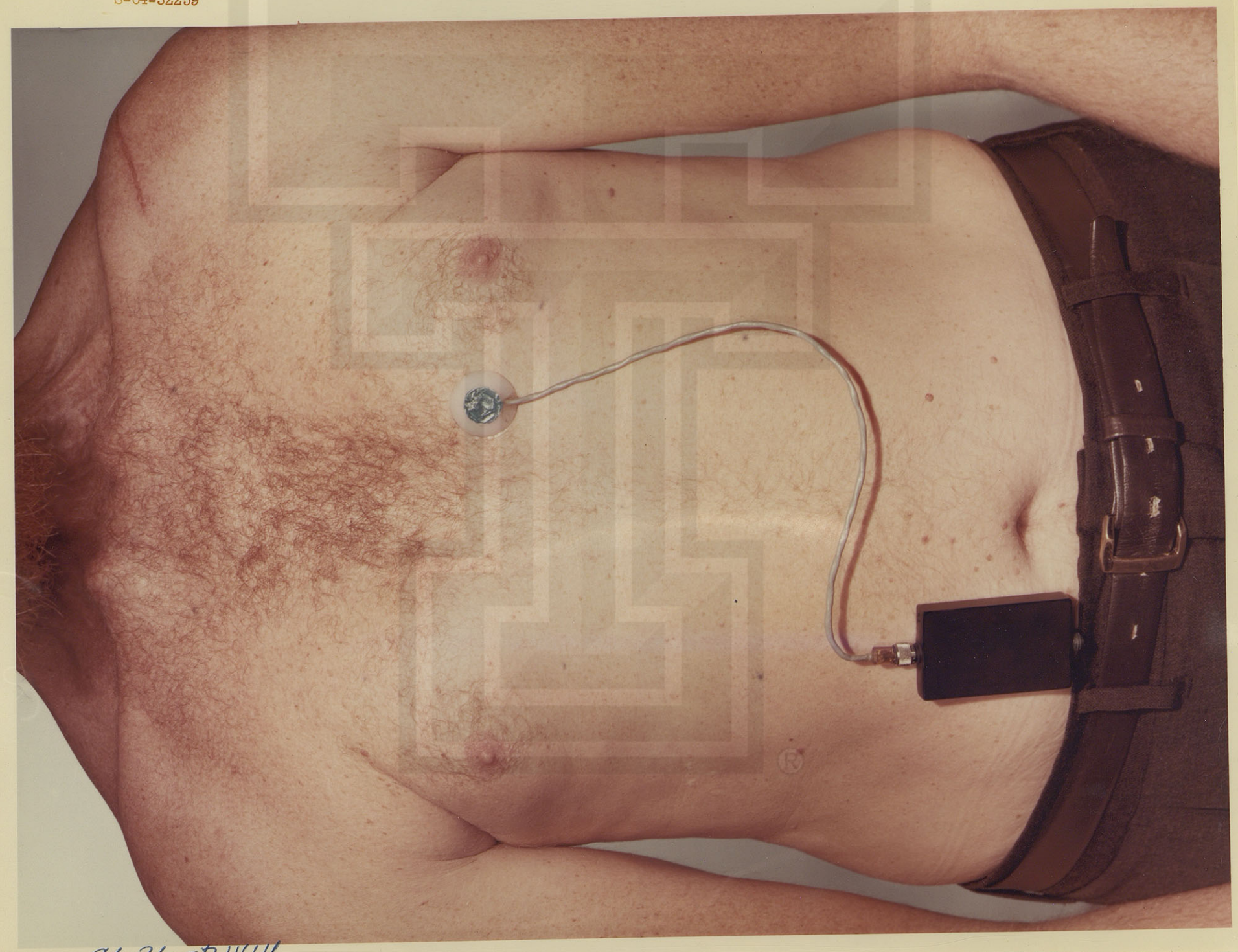
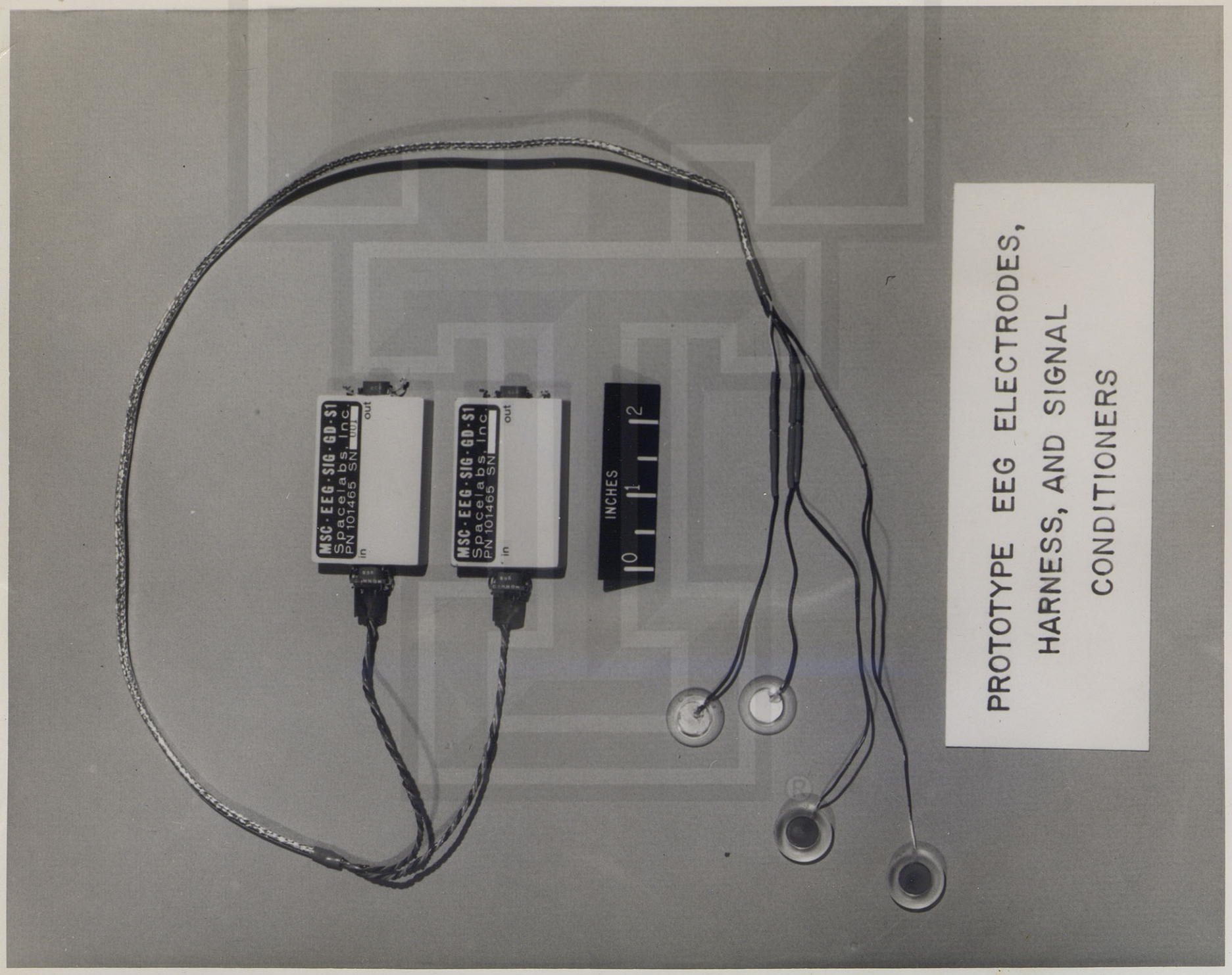
NASA
S-64-32259



MMU-70-76

(16) Apollo, Gemini, Mercury photos + charts; undated

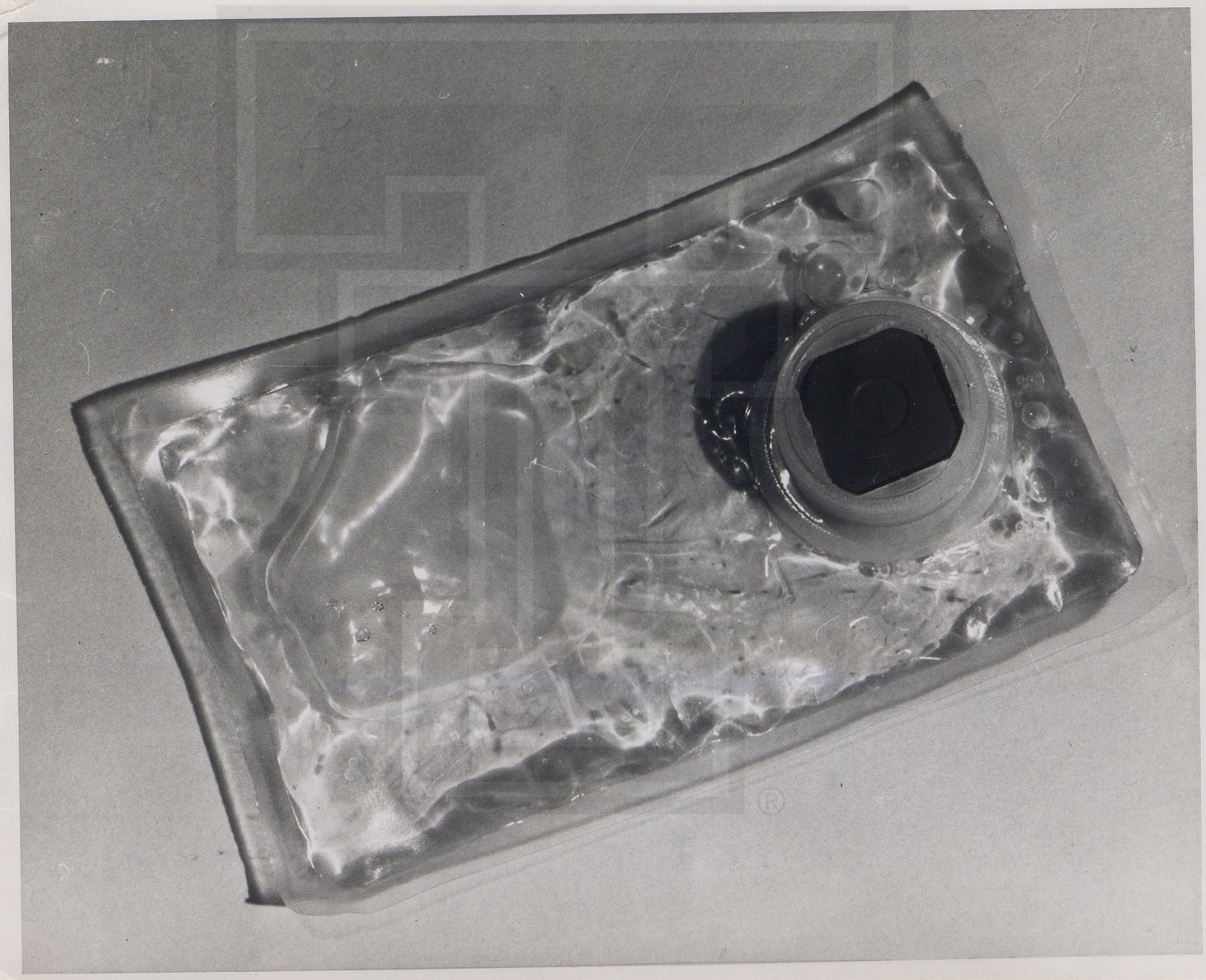
Box



PROTOTYPE EEG ELECTRODES, HARNESS, AND SIGNAL CONDITIONERS

(7) Apollo, Gemini, Mercury photos + charts; undated

DATE: ASSIGNMENT: Box FILE



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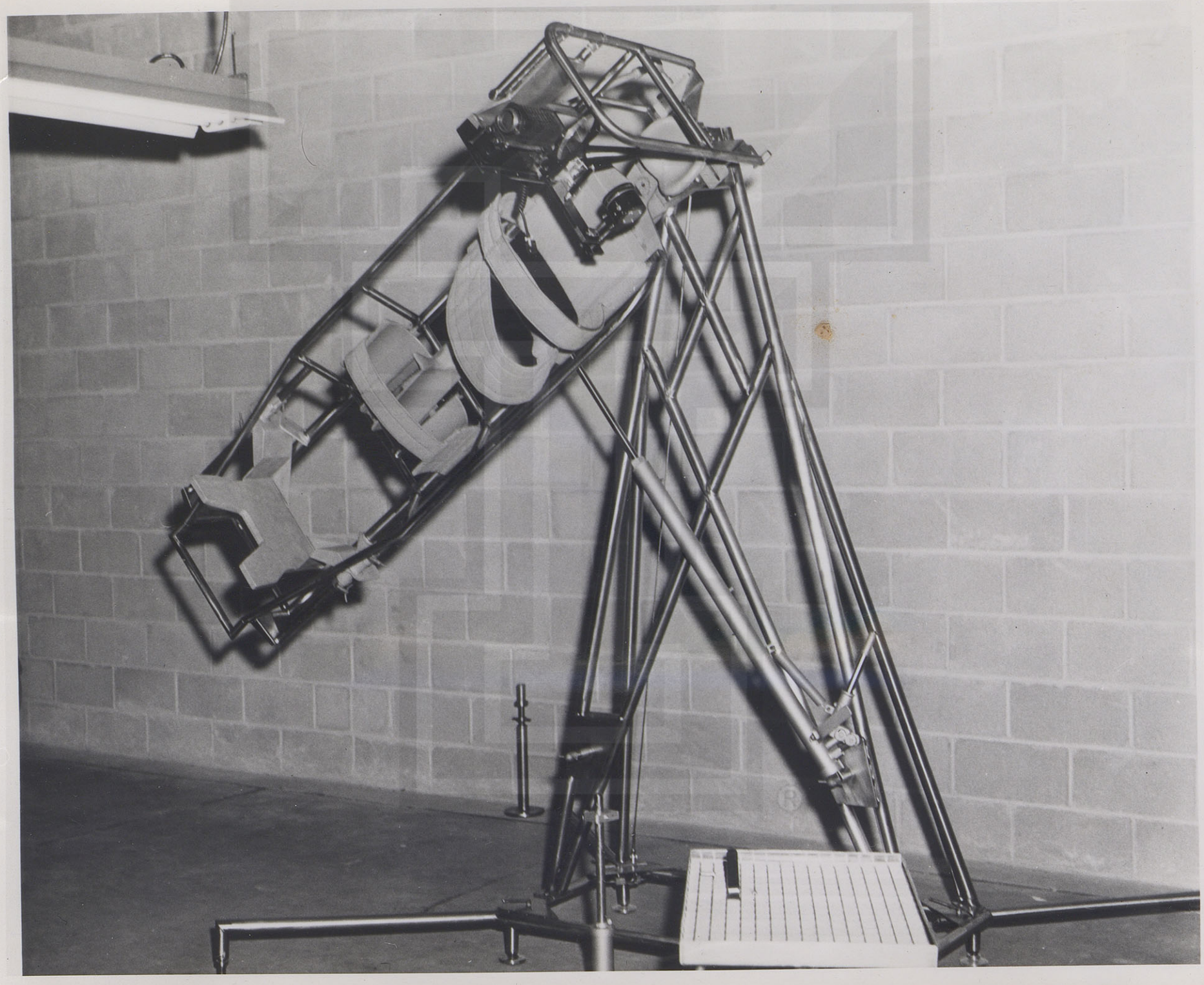
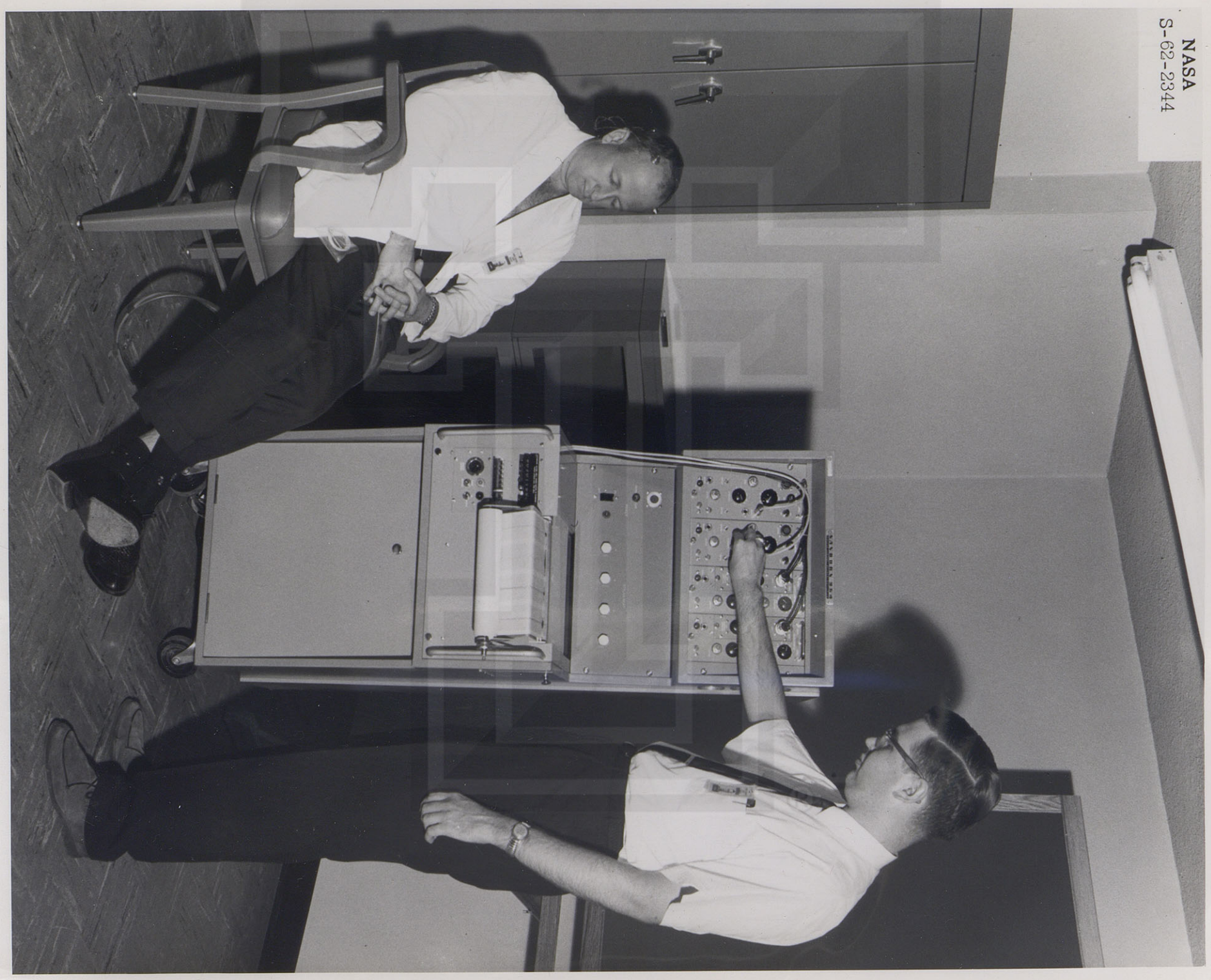


(19) Apollo, Gemini, Mercury photos + charts; undated

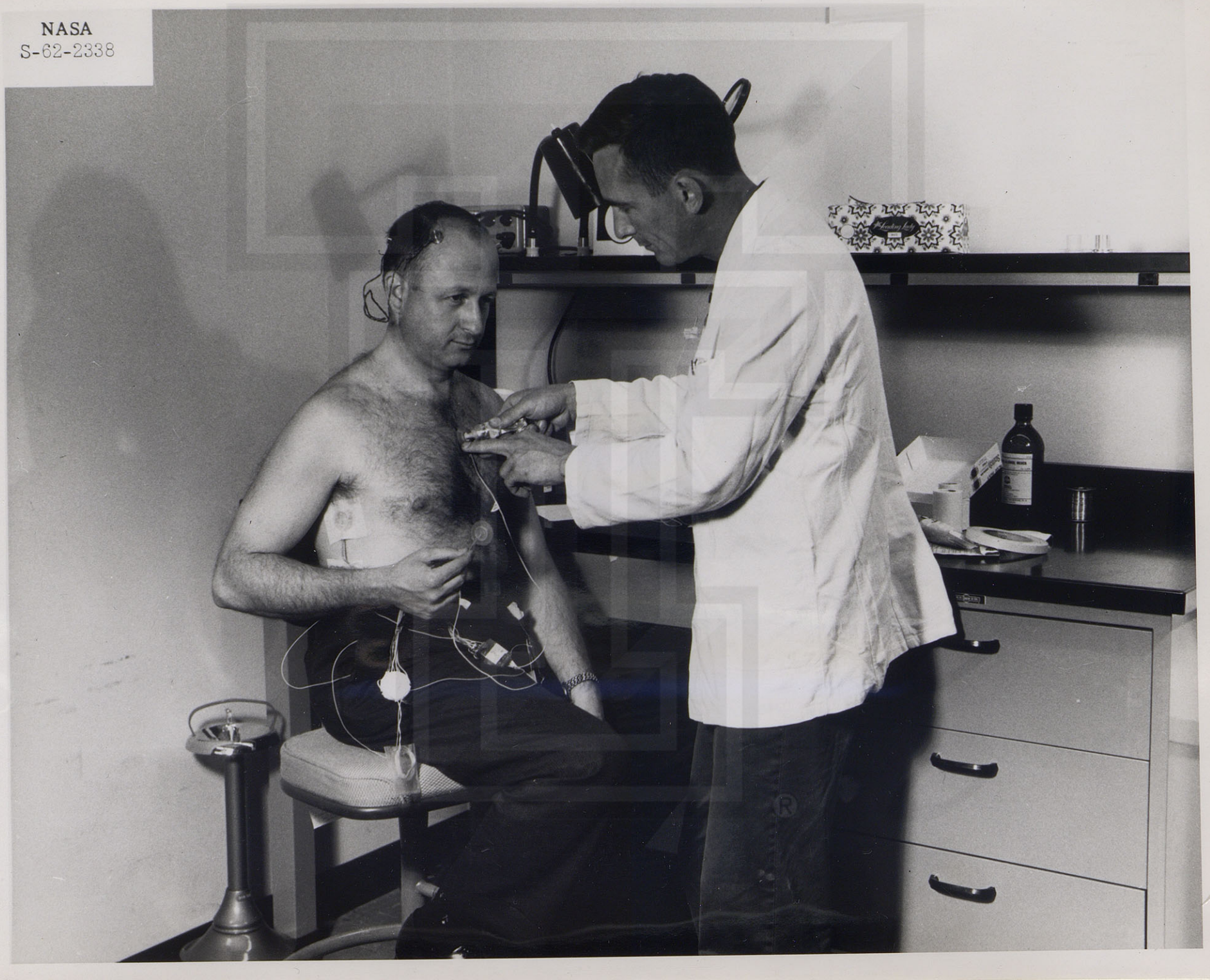
Box FILE



NASA
S-62-2344

DATE: ASSIGNMENT: (6) Apollo, Gemini, Mercury photos + charts; undated BOX FILE NO FILE

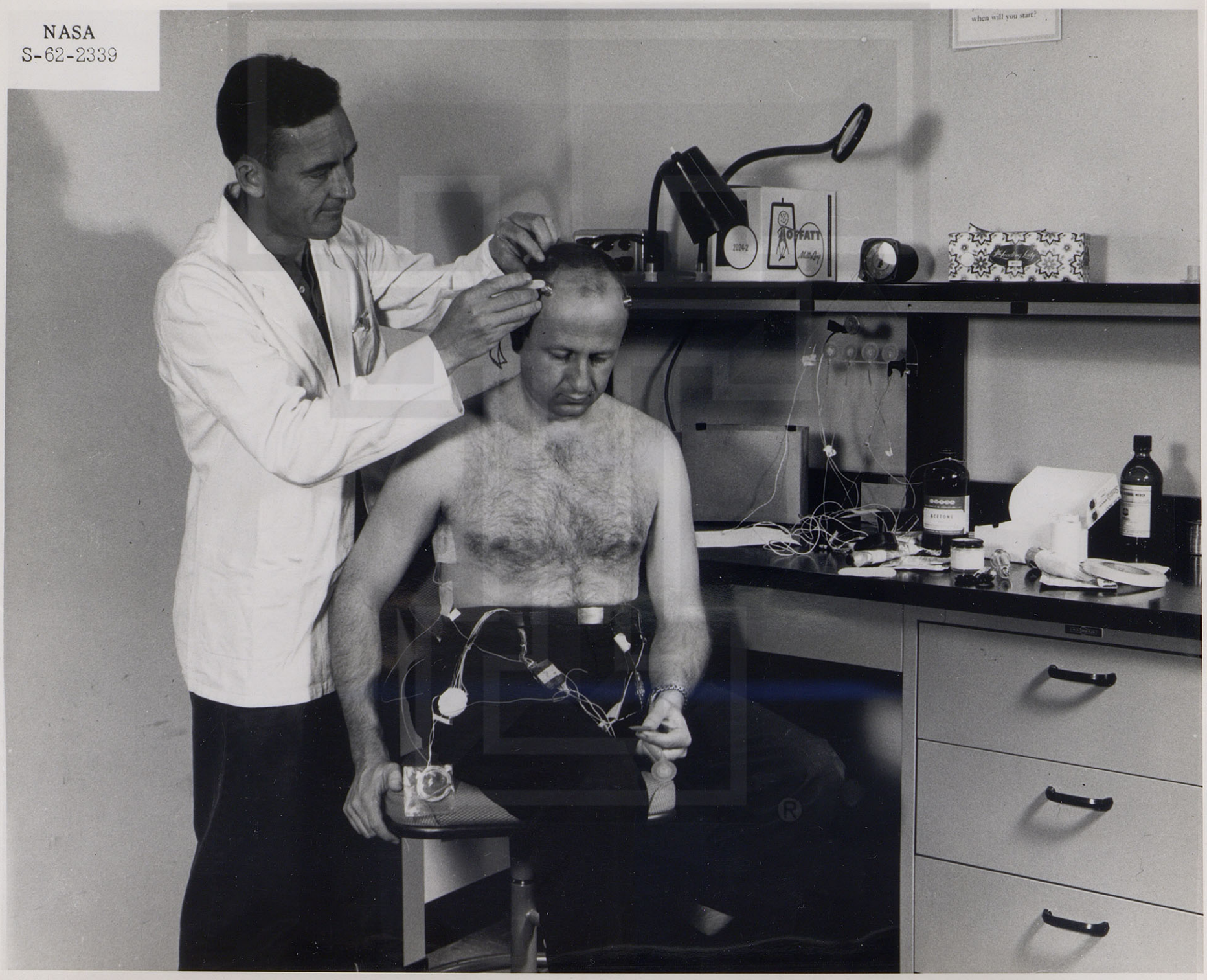
NASA
S-62-2338



(F-) Apollo, Gemini, Mercury photos + charts; undated

DATE: ASSIGNMENT: Box FILE FILE NO.

NASA
S-62-2339

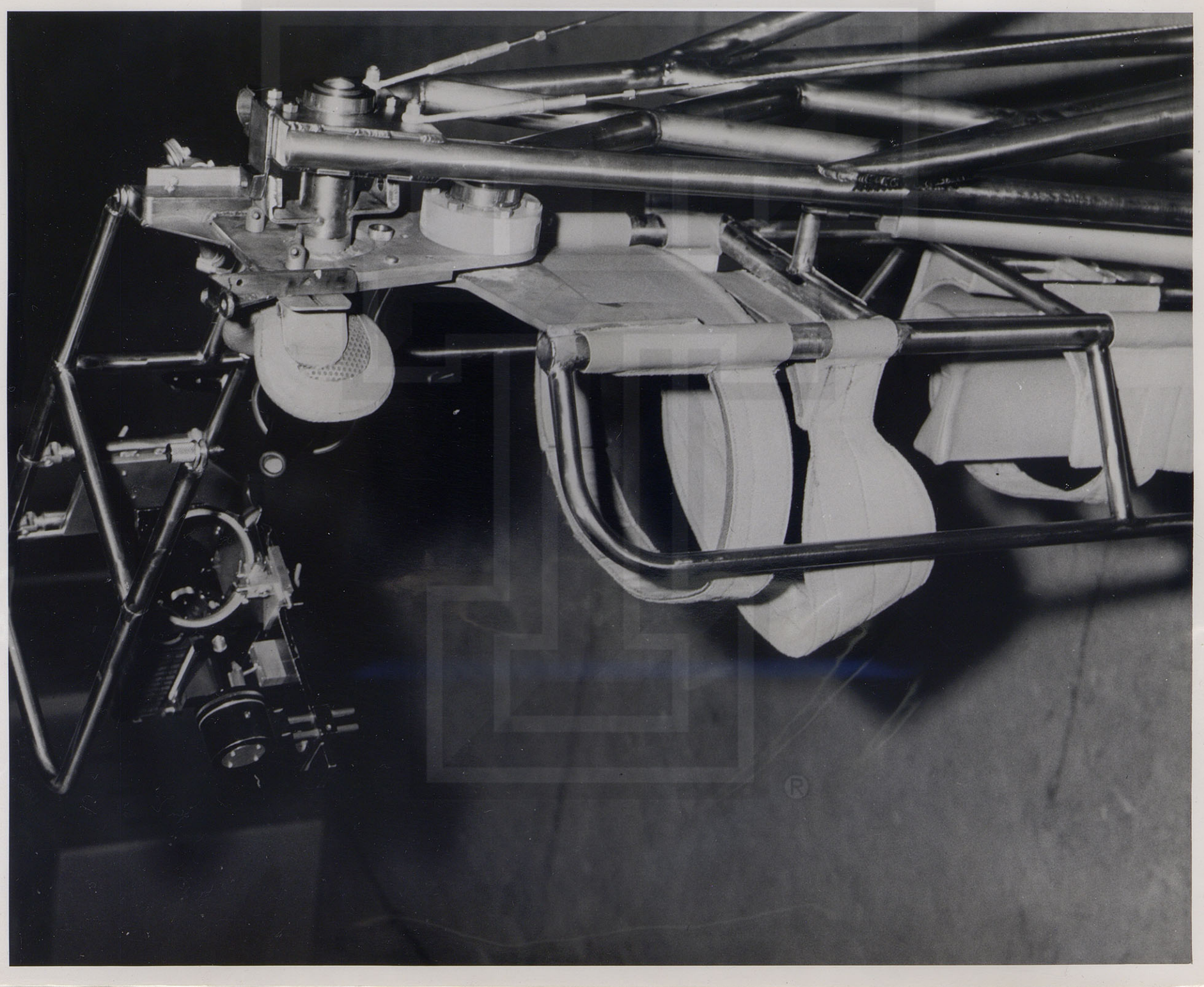


DATE:

ASSIGNMENT: (2) Apollo, Gemini, Mercury photos & charts; undated

Box

FILE NO. FILE



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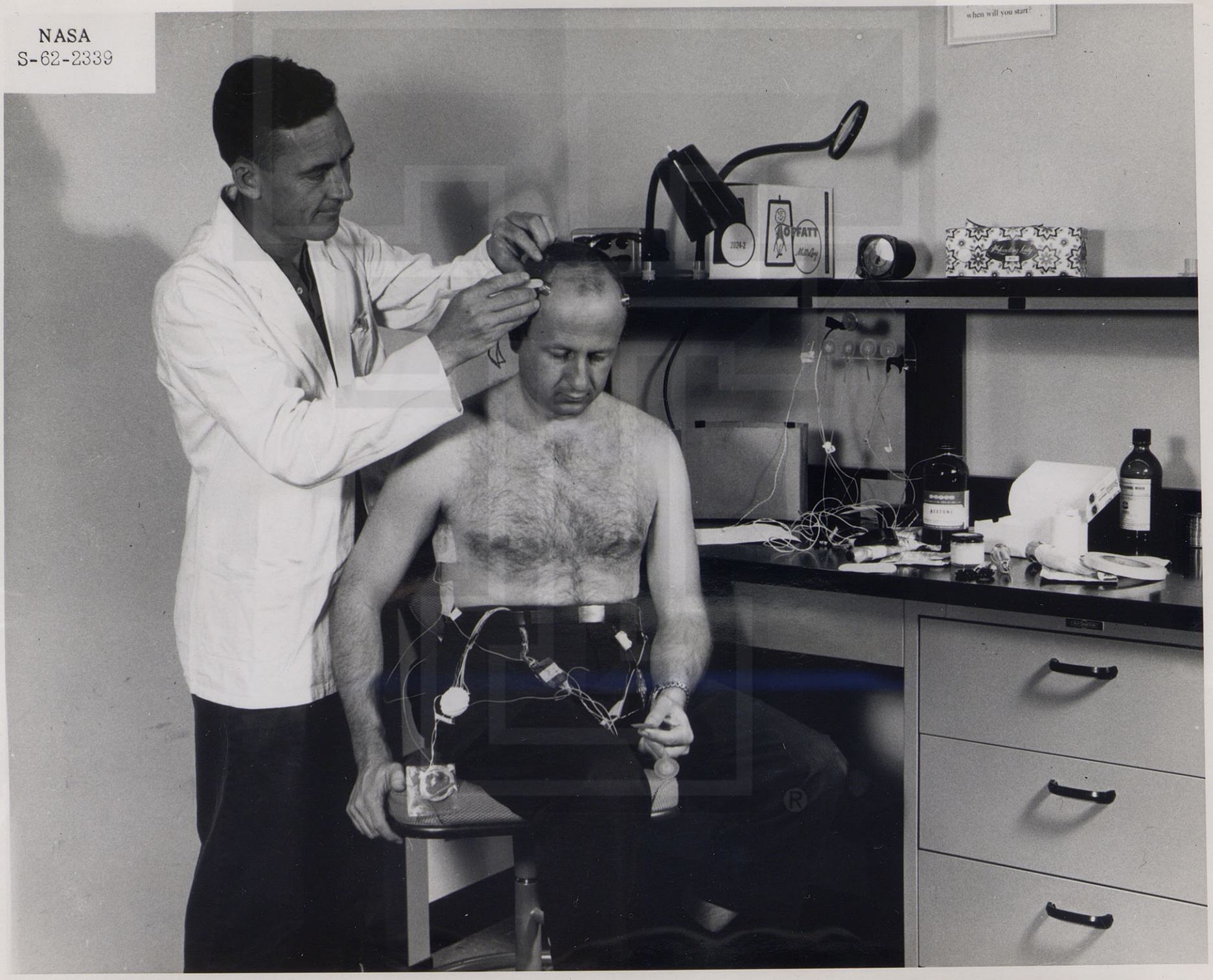
NASA
S-62-2339



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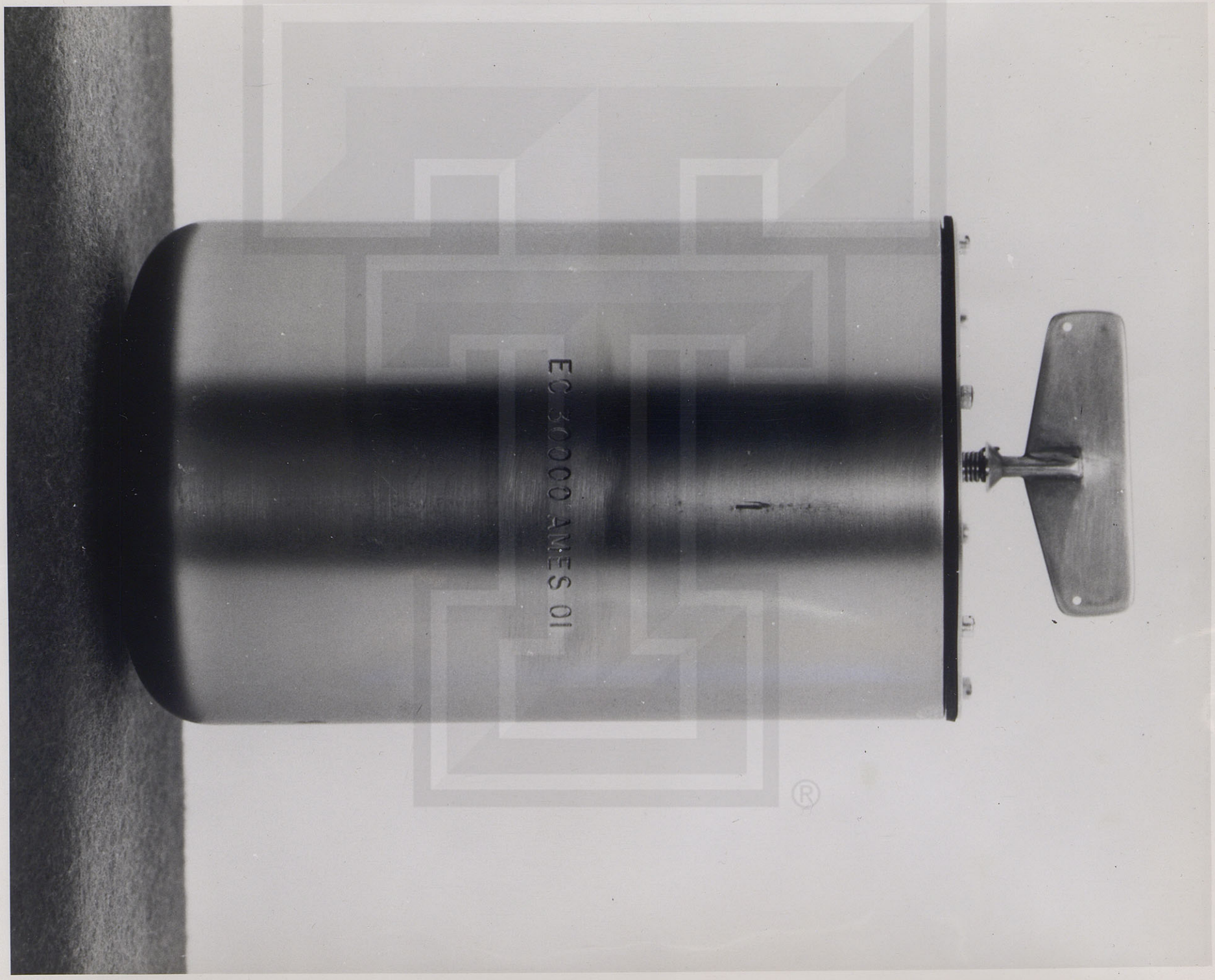

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TETRAPOLAR
EDR ELECTRODES

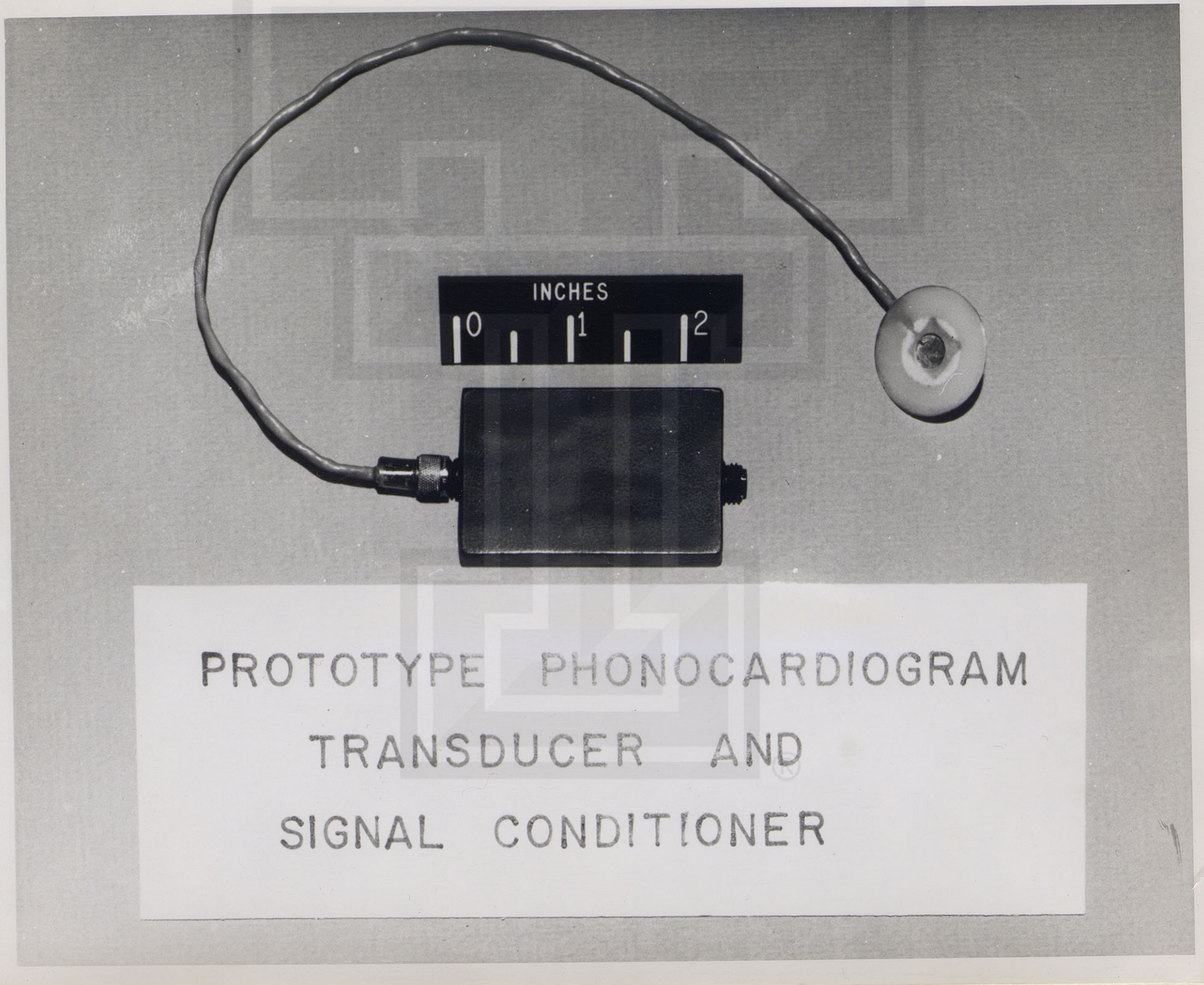
DATE: ASSIGNMENT: (7) Apollo, Gemini, Mercury photos + charts; undated Box FILE NO: FILE

NASA
S-63-17492

MM4-7075

TETRAPOLAR
EDR ELECTRODES

(8) Apollo, Gemini, Mercury
Photos + charts; undated
Box FILE



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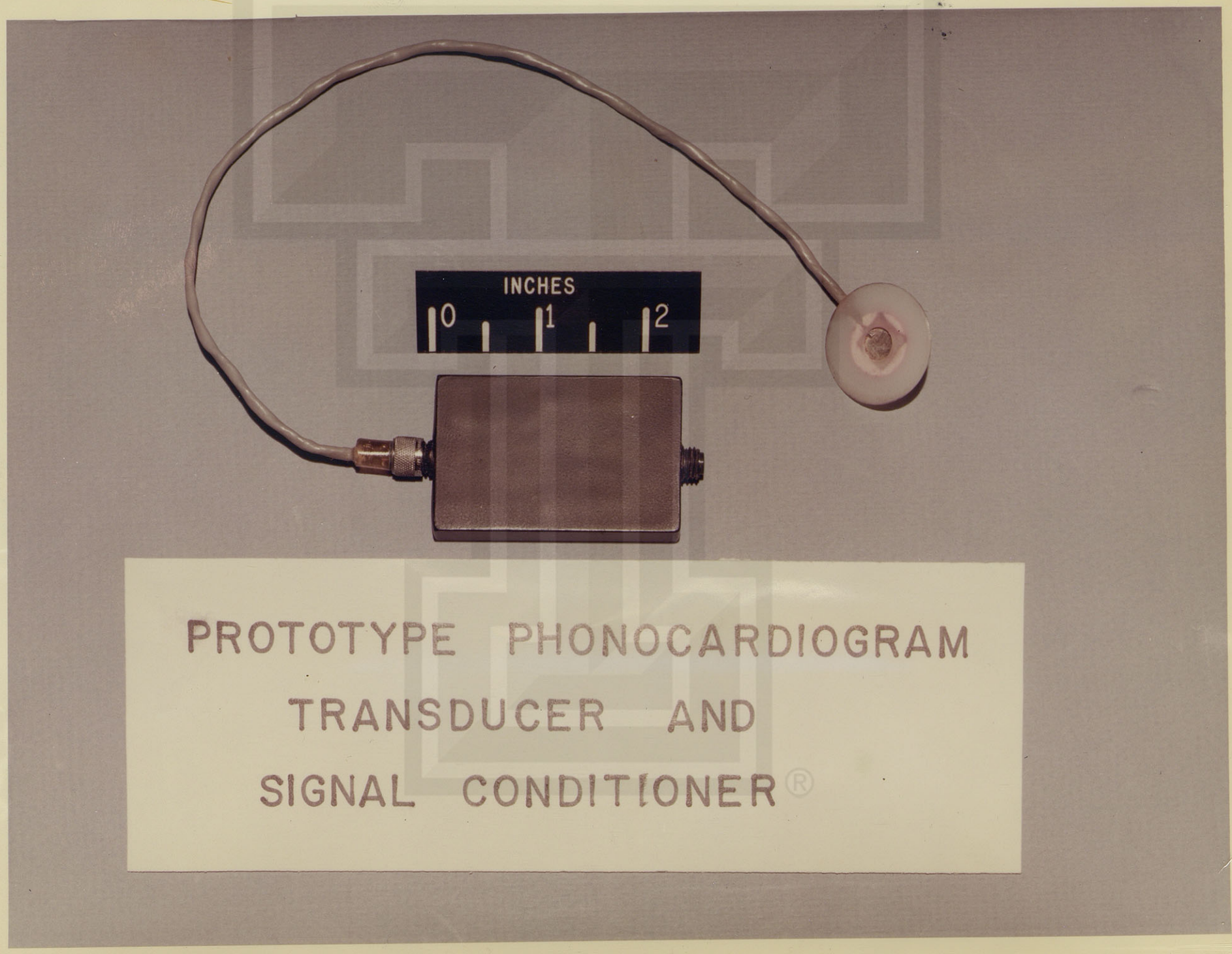
NASA
S-64-32258

MM 4-7077



(10) Apollo, Gemini, Mercury photos + charts; undated

Box FILE FILE

NASA
S-62-8216

(84) Apollo, Gemini, Mercury photos + charts; undated

Box FILE

mm 4-1861

SPAMAG

ORL DIET RECOMMENDED COMPOSITION

HIGH QUALITY PROTEIN	12.5 %
CARBOHYDRATE	62.5 %
FAT	25.0 %

THIS RATIO WILL BE USED TO PROVIDE 2700 TO 3200 CALORIES PER DAY WITH RQ OF 0.8 TO MAINTAIN $CO_2 : O_2$ RATIO OF 1 : 1.

(60) Apollo, Gemini, Mercury photos + charts; undated Box

MM 4-1863

SPAMAG

ORL CALORIC REQUIREMENTS, 150 POUND MAN, SHIRTSLEEVE

ACTIVITY	CAL/HR	BTU/HR
SLEEP	70	280
EATING	1.5×BASAL	420
EXERCISE	2.5×BASAL	700
REST & RELAXATION	1.5×BASAL	420
WORK PROGRAM:		
FLIGHT CONTROL	2×BASAL	560
RECONNAISSANCE	2-2.5×BASAL	560-700
SCIENTIFIC OBSERVATION	1.5-2.5×BASAL	420-700
REPAIR	2-4×BASAL	560-1120

SUITED ENVIRONMENT: ADD INCREASE FACTORS AS FOLLOWS:

SLEEP	+10%
EATING	+50%
EXERCISE	+50%
REST & RELAXATION	+50%
WORK	+50%

FOR EXTRAVEHICULAR WORK A MAXIMUM OF 2000 BTU/HR MAY BE REQUIRED

(3) Apollo, Gemini, Mercury photo + charts; undated Box

mm 4-1276

LIST OF MEMBERS
SPAMAG

MAITLAND BALDWIN, M.D.

JOHN A. BUESSLER, M.D.

LOREN D. CARLSON, PH.D.

ROBERT E. FORSTER, M.D.

EDGAR S. GORDON , M.D.

DOUGLAS GRAHN, PH.D.

ASHTON GRAYBIEL, M.D.

MILFORD D. HARRIS JR. PH.D.

ANDRES I. KARSTENS, M.D.

EDWARD C. KNOBLOCH, PH.D.

JOSEPH F. KUBIS, PH.D.

EDWARD A. LISKE, M.D.

ROSS A. MCFARLAND, PH.D.

SAMUEL NATELSON, PH.D.

HERBERT POLLACK, M.D., PH.D.

RALPH REITAN, PH.D.

SCOTT H. SWISHER, M.D.

JOHN C. TOWNSEND

SHERMAN P. VINOGRAD, M.D.

JAMES V. WARREN, M.D.

G. DONALD WHEDON, M.D.

EARL A. WOOD, M.D.,PH.D.

(24) Apollo, Gemini, Mercury photos + charts; undated

BOX

mm 4-1862

SPAMAG

SUGGESTED ORL ACTIVITY SCHEDULE

SLEEP	8 HRS
EATING	2 HRS
EXERCISE	2 HRS
REST & RELAXATION	4 HRS
WORK PROGRAM	8 HRS

(25) Apollo, Gemini, Mercury photos + charts; undated

Box

mm 4-1860

SPAMAG

ORL DIET, RECOMMENDED MINERAL AND VITAMIN REQUIREMENTS

CALCIUM	0.8 GMS/DAY
PHOSPHATE	1.2-1.5 GMS/DAY
SODIUM (ACCLIMATIZED SUBJECTS)	4-5 GMS/DAY
SODIUM (NON-ACCLIMATIZED SUBJECTS)	ADD 1 GM/DAY PER LITER H_2O OVER 4
VITAMIN D	1000 UNITS/DAY
OTHER VITAMINS	STANDARD MDR POLYVITAMIN SUPPLEMENT
TRACE MINERALS	INCLUDE SUPPLEMENT IF FOOD PROCESSED
WATER	2.5 LITERS/DAY

URINE SHOULD BE MAINTAINED AT NORMAL pH RANGE AND SPECIFIC GRAVITY 1.015 OR LESS.

(56) Apollo, Gemini, Mercury photos + charts; undated

Box FILE

LIFE SUPPORT FACTORS

*1. ATMOSPHERE
2. SUITS
3. FOOD
4. WATER
5. WASTE
6. LIVING CONDITIONS & STANDARDS
7. GROUP INTEGRITY
8. HAZARD PROTECTION
9. SAFETY MONITORING

MM 4-1233

SPAMAG RECOMMENDATIONS

1. LIFE SUPPORT
   (CONTROLLED ENVIRONMENTAL FACTORS)

2. MEDICAL EXPERIMENTS
   (UNCONTROLLED ENVIRONMENTAL FACTORS)

3. ORL DECISIONS
   (SPECIFICATIONS AND OPERATIONS)

MM 4-1273

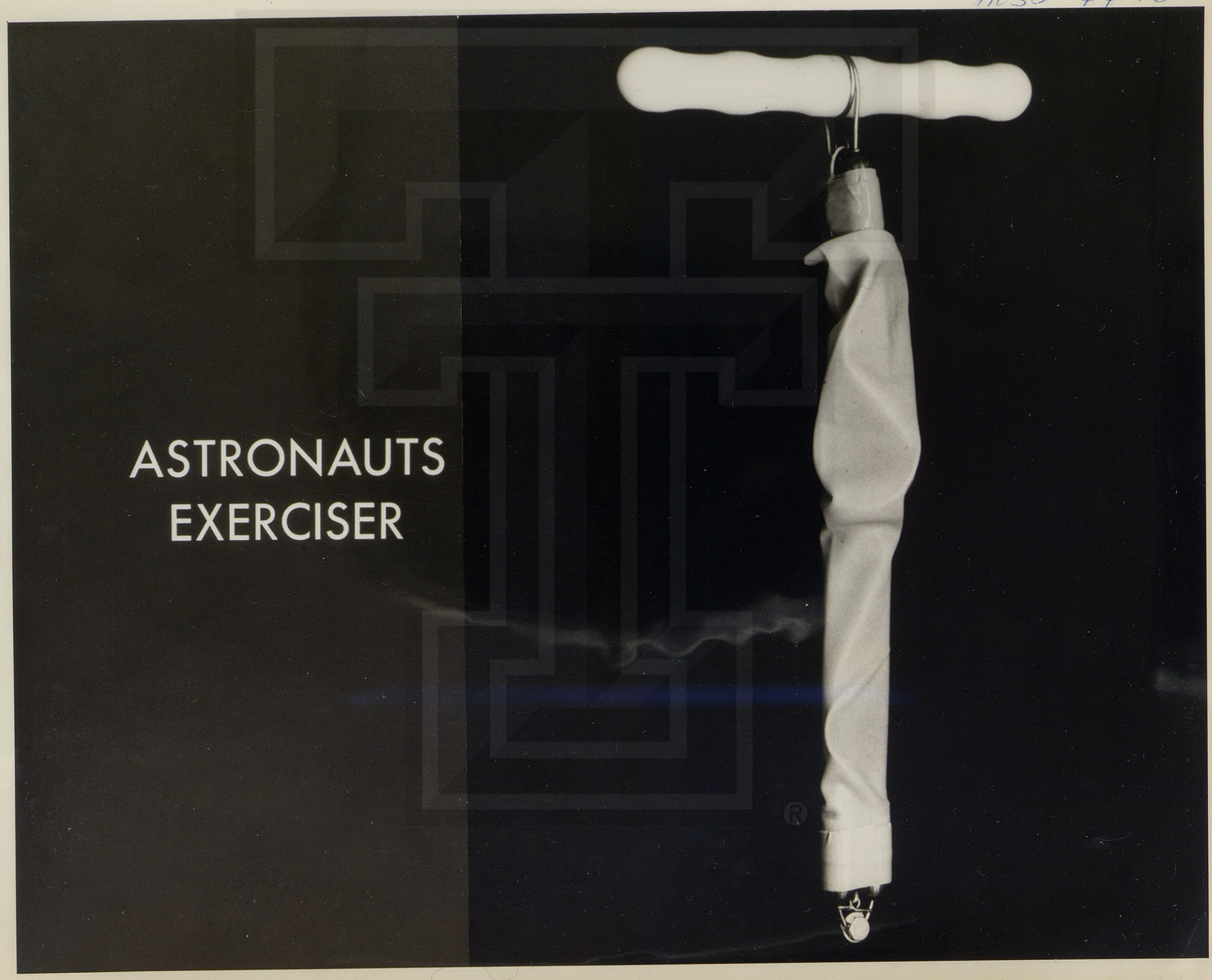
SPAMAG END PRODUCTS

1. GROUP OF ORL MEDICAL EXPERINMENTS IN FORMAT
2. GROUP OF ADDITIONAL ORL MEDICAL MEASUREMENTS IN FORMAT
3. GROUP OF LIFE SUPPORT RECOMMENDATIONS IN FORMAT
4. GROUP OF PREREQUISITE GROUND BASED EXPERIMENTS
5. GROUP OF PREREQUISITE SPACEFLIGHT EXPERIMENTS
6. GROUP OF RECOMMENDATIONS FOR RESEARCH AND DEVELOPMENT
7. GENERAL PHILOSPHY AND RECOMMENDATIONS FOR ORL EXPERIMENTAL APPROACH
8. RECOMMENDATIONS FOR GENERAL ORL DECISIONS
9. TENTATIVE FLIGHT PLAN
10. REVIEWS OF WORK OF FOUR STUDY CONTRACTS AND ORL BEWG
11. SUMMARY OF POSSIBLE USES OF SPACE ENVIRONMENT FOR STUDY AND THERAPY OF PATHOLOGICAL STATES
12. RECOMMENDATIONS FOR FUTURE STUDY EFFORT

MM 4-1235

(19) Apollo, Gemini, Mercury
photos + charts; undated

Box



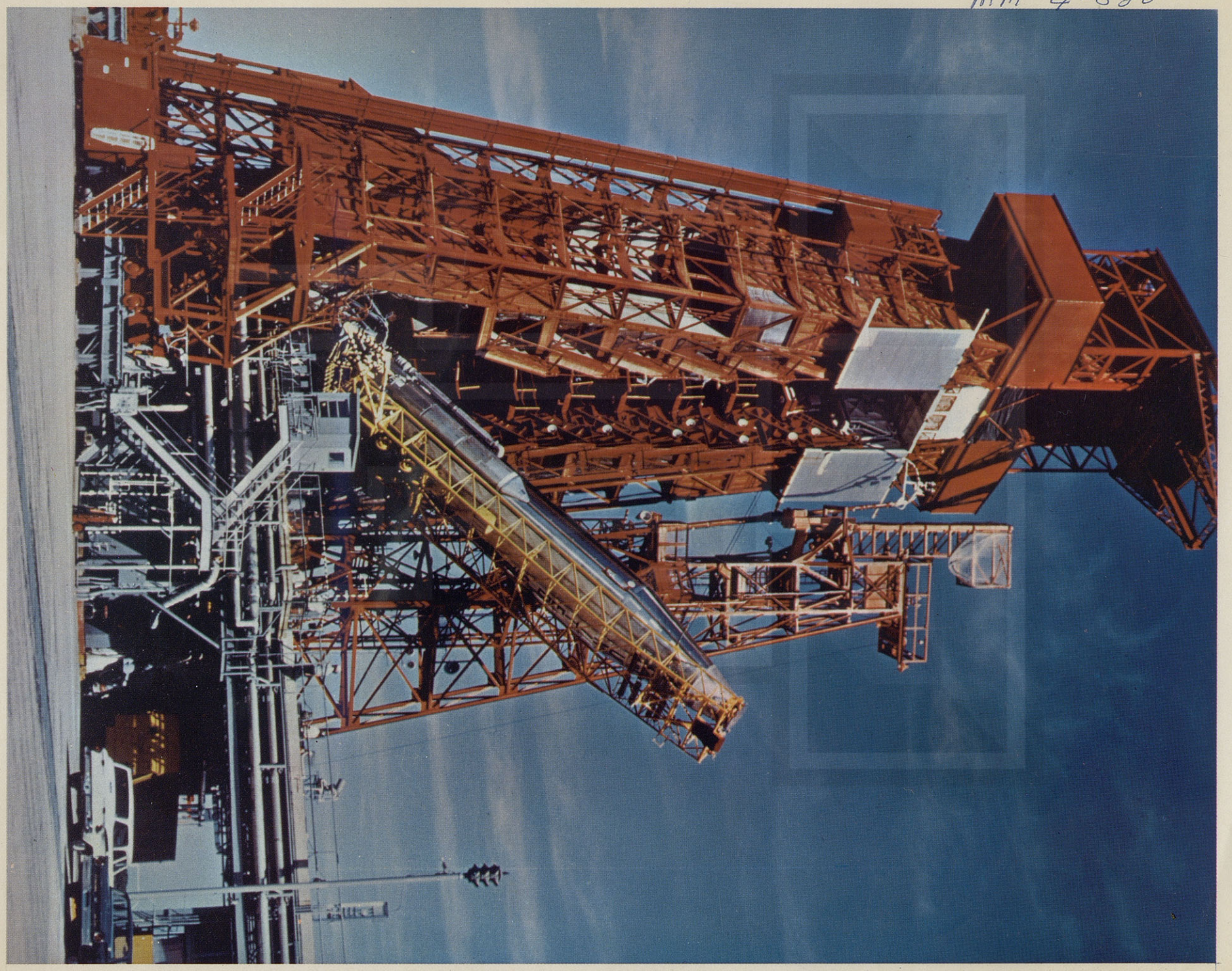
DATE: ASSIGNMENT: (60) Apollo, Gemini, Mercury photos + charts; undated

Box FILE FILE NO.

MM 4-821

DATE: ASSIGNMENT: (9A) Apollo, Gemini, Mercury Photos + charts; undated Box FILE

MM 4-820



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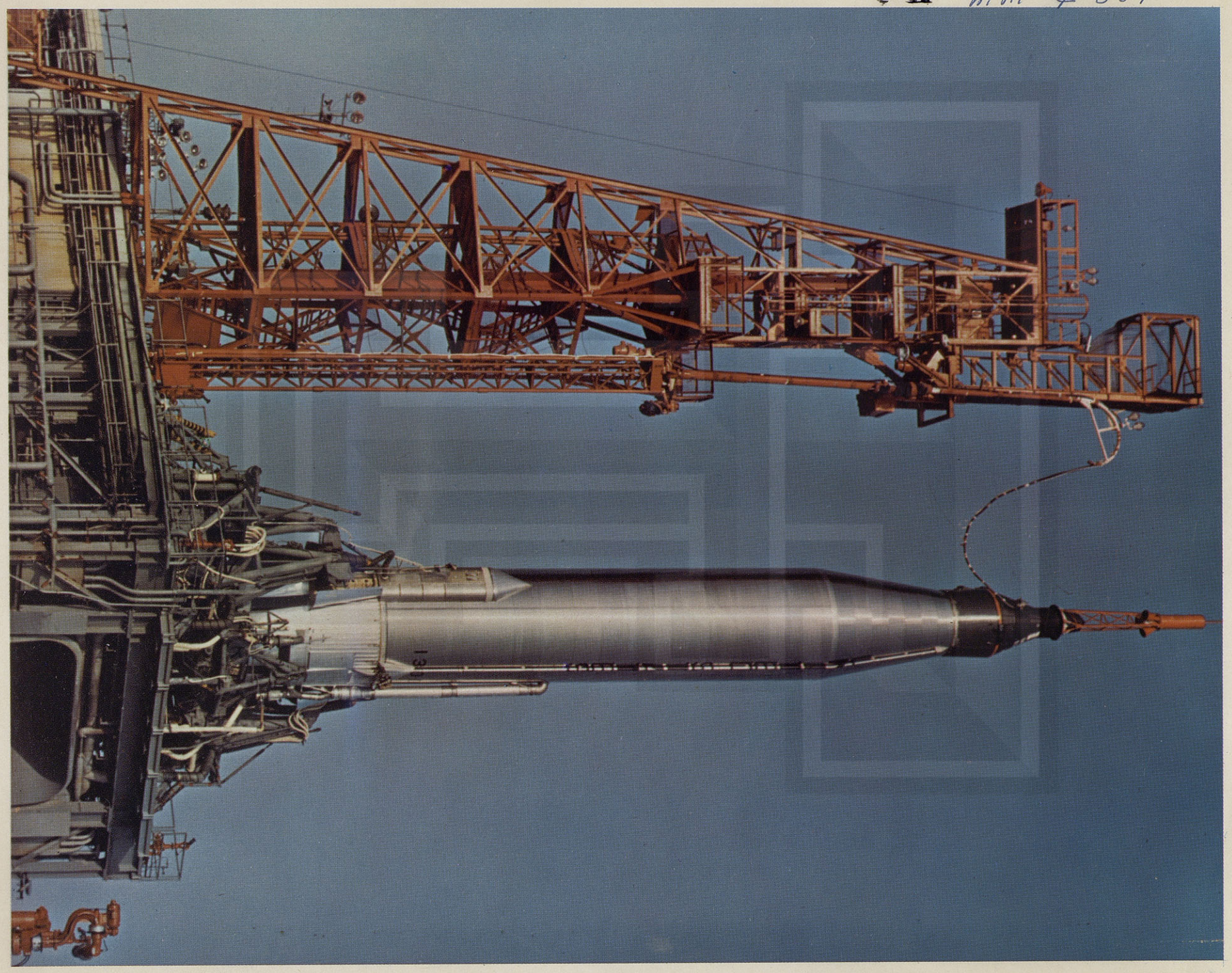


(64) Apollo, Gemini, Mercury photos + charts; undated

Box FILE

MM 4-818

INSERTION OF ASTRONAUT SCHIRRA

(93) Apollo, Gemini, Mercury photos + charts; undated

Box FILE

mm 4-817

MA-8 MERCURY CONTROL CENTER

TABLE V. APOLLO CREW WEIGHT CHANGES

	WEIGHT IN POUNDS		
	PRELAUNCH	RECOVERY	RECOVERY + 1 DAY
APOLLO VII	194.3	188.0	190.5
	157.0	147.0	150.5
	156.0	148.0	153.5
APOLLO VIII	169.25	160.50	163.25
	171.80	164.00	164.75
	142.00	138.00	138.50

NASA HQ MM69-5209
4-15-69

(08) Apollo, Gemini, Mercury photos + charts; undated Box FILE

APOLLO MANNED FLIGHTS

FLIGHT	CREW	LAUNCH	DESCRIPTION	DURATION HRS/MIN/SEC
APOLLO VII	SCHIRRA EISELE CUNNINGHAM	11 OCT 68	EARTH ORBITAL CHECKOUT OF COMMAND MODULE	260:09:45
APOLLO VIII	BORMAN LOVELL ANDERS	21 DEC. 68	1st TRANSLUNAR & LUNAR ORBIT (10) FLIGHT	147:00:11

NASA HQ MM69-5204
4-15-69

TABLE II. MAN-HOURS OF SPACE FLIGHT

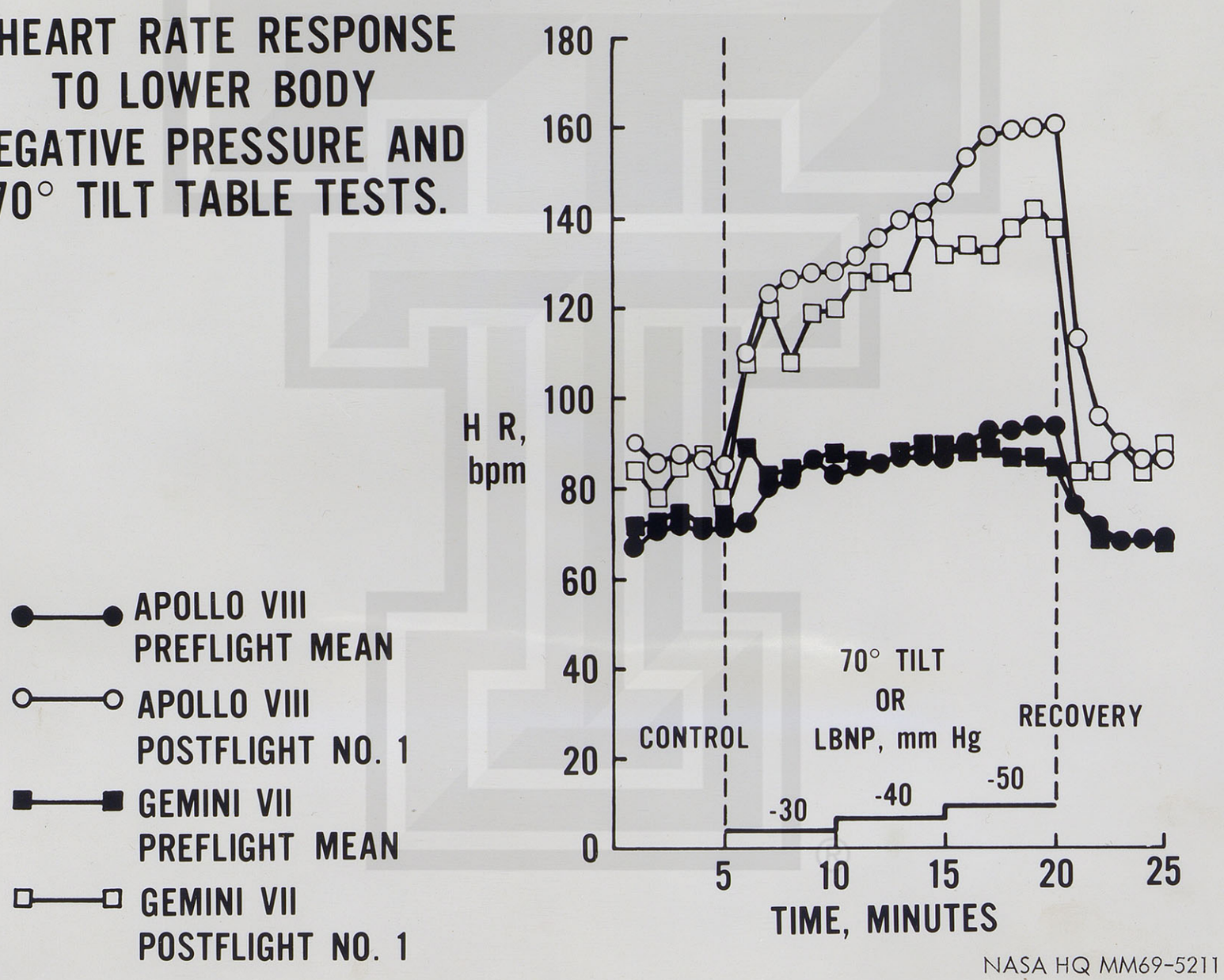
FLIGHT PROGRAM	HRS/MIN
MERCURY	53:56
GEMINI	1939:12
APOLLO	1261:30
TOTAL	3254:38

NASA HQ MM69-5205
4-15-69

(100) Apollo, Gemini, Mercury photos + charts; undated

Box File

HEART RATE RESPONSE TO LOWER BODY NEGATIVE PRESSURE AND 70° TILT TABLE TESTS.

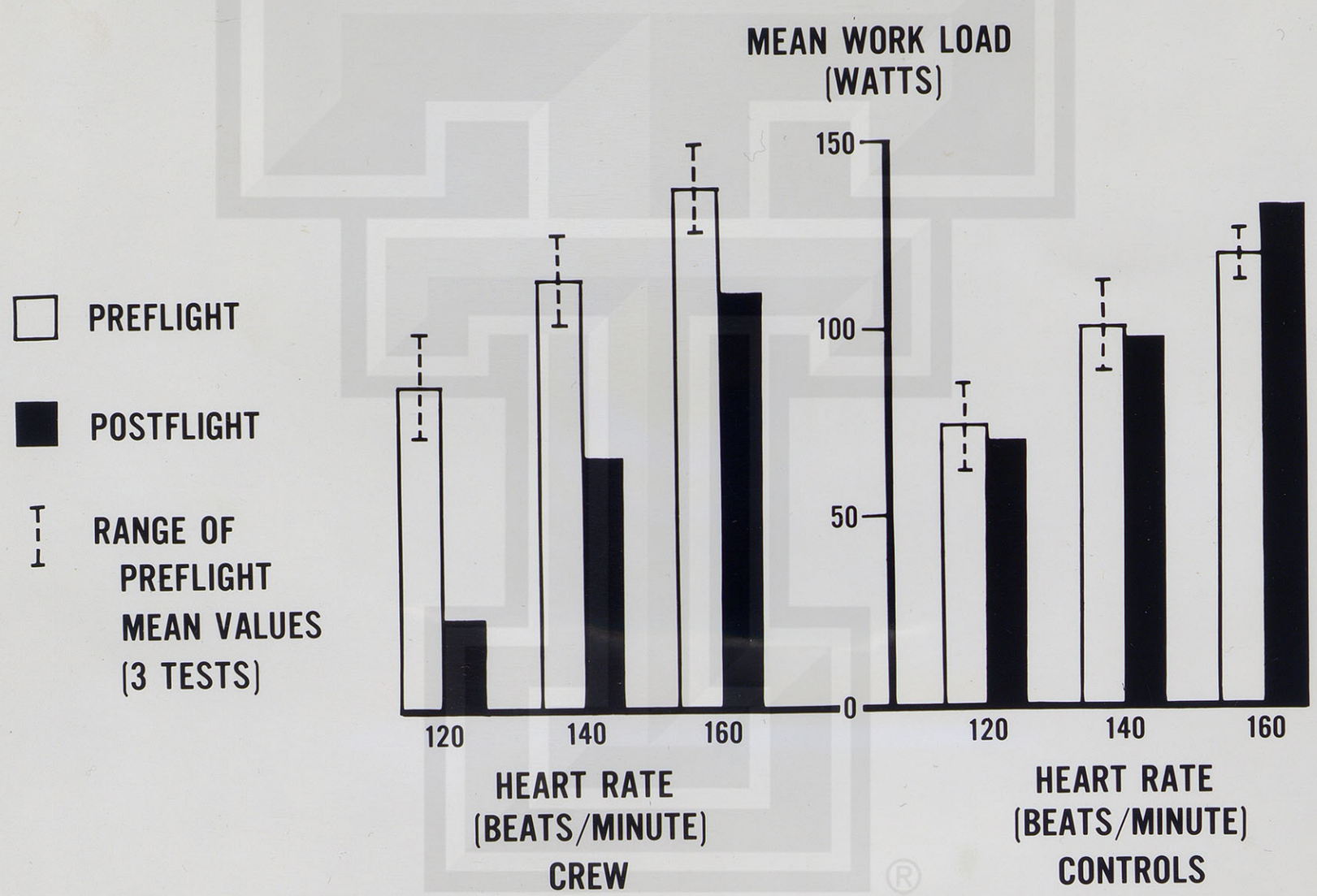


NASA HQ MM69-5211
4-15-69

(Lot) Apollo, Gemini, Mercury photos + charts; undated

Box FILE

SUMMARY OF WORK LOAD CHANGE – APOLLO VII.



NASA HQ MM69-5212
4-15-69

TABLE VI. RED CELL MASS

	PERCENTAGE CHANGE IN RED CELL MASS IN EACH CREWMAN		
APOLLO VII	−0.5	−9.4	−0.3
APOLLO VIII	+2.3	−2.3	−4.0

NASA HQ MM69-5210
4-15-69

(103) Apollo, Gemini, Mercury photos + charts; undated

Box

APOLLO LAUNCH AND ENTRY G LOADS

	APOLLO VII	APOLLO VIII
MAX Gx AT LAUNCH	3.3	3.86
MAX Gx AT ENTRY	3.3	6.8

NASA HQ MM69-5207
4-15-69

(104) Apollo, Gemini, Mercury photos + charts; undated

Box FILE

MEDICAL EXPERIMENTS PROGRAM

OBJECTIVES

A. TO EXTEND MAN'S CAPABILITIES IN MANNED SPACE FLIGHT BY DETERMINING:

1. THE EFFECTS OF SPACE FLIGHT ON MAN, AND THE TIME COURSE OF THESE EFFECTS.
2. THE SPECIFIC ETIOLOGIES AND MECHANISMS BY WHICH THESE EFFECTS ARE MEDIATED.
3. MEANS OF PREDICTING THE ONSET AND SEVERITY OF UNDESIRABLE EFFECTS.
4. THE MOST EFFECTIVE MEANS OF PREVENTION OR CORRECTION OF UNDESIRABLE EFFECTS.

B. TO OBTAIN SCIENTIFIC INFORMATION OF VALUE TO CONVENTIONAL MEDICAL RESEARCH AND PRACTICE.

NASA HQ MM69-5214
4-15-69

(OS) Apollo, Gemini, Mercury photos + charts; undated

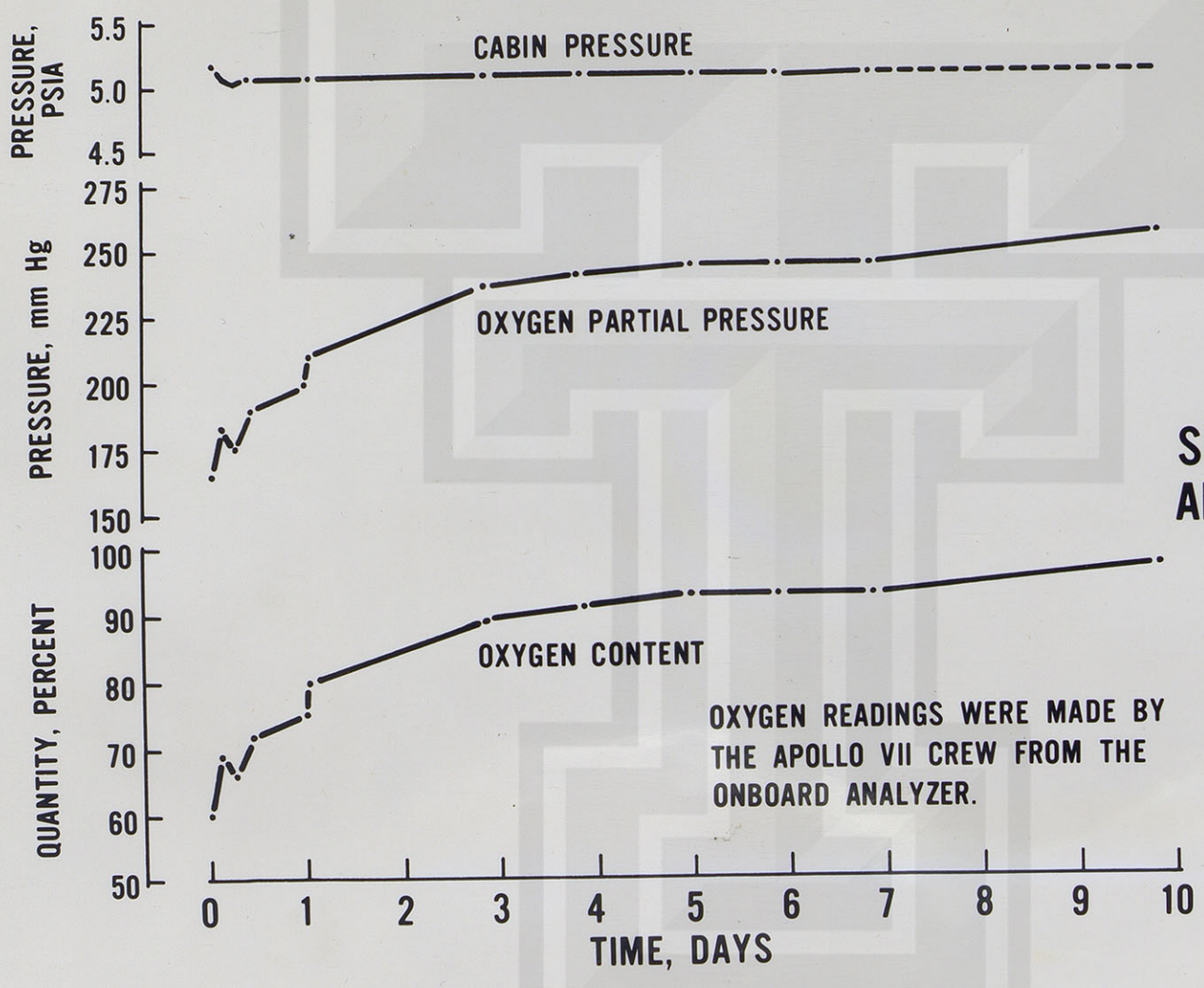
Box

TABLE VII BONE DENSITY CHANGES IN APOLLO

SKELETAL SITES	INDIVIDUAL CREWMEN PERCENTAGE CHANGE DURING FLIGHT					
	APOLLO VII			APOLLO VIII		
OS CALCIS	−5.35	+0.74	+2.27	−2.13	−6.95	−2.93
HAND PHALANX 4-2	−9.30	+2.04	−6.50	−2.19	−2.41	+4.81
HAND PHALANX 5-2	–	–	–	−2.07	−3.09	−1.00
CAPITATE	−4.07	+3.31	−3.44	−9.60	−12.11	−6.65
DISTAL RADIUS	−3.25	+3.34	−3.64	−8.76	−11.06	−11.39
DISTAL ULNA	−3.02	+2.12	−3.41	−6.42	−12.41	−16.17

NASA HQ MM69-5213
4-15-69

(06) Apollo, Gemini, Mercury photos + charts; undated Box



CABIN OXYGEN ENRICHMENT SEQUENCE DURI APOLLO VII 10-D FLIGHT.

NASA HQ MM69-520
4-15-69