



Apollo 11 Eagle Grumman LM-5 Construction Log

Description by Heritage

Grumman Apollo 11 Lunar Module Handwritten Construction and Testing Log Book.

A June to December 1968 log with approximately 125 single-sided handwritten 8" x 11" pages in binder, of construction and testing of LM-5 (Eagle), the first ship to land on the moon. The last entry in this volume is dated December 19, 1968, marking the week during which, while final touches were being put on the Lunar Module's golden jacket, Apollo 8 lifted off and went around the moon, seven months ahead of the Apollo 11 landing. Written in the original hand of A. Hecht, S. Sarbello, E. Dowse, and other Apollo engineers, this Log is like peering into a time capsule. This volume is the original, and the only one in existence. It contains the actual handwritten pages in red and black ink - which include (as in the 10/17/68 entry) hand-drawn schematic revisions, and (as on the 9/18/68 entry) ink smudges and the fingerprints of engineer Dowse. The pages include sign-ins at the top by the Apollo engineers who wrote them. A true museum piece. Very fine condition.

This is one of the Logs consulted by Charles Pellegrino during the writing of *Chariots for Apollo*. It is the one from which originates the October 22, 1968 entry (in Chapter 39, "A Tale of Woe and Intrigue"): "10:10A.M. Requested CDR man to state if docking hatch is open during the test. Answer: Yes, open. Question: How is the docking hatch switch held in depressed (open) position? Answer: It is taped in the depressed position. The tape just fell off (loose tape was probably the reason for Failure #62)."

The Log documents a surprisingly high number of electrical problems, including reversed labeling of LM-5's internal jumper cables (11/11/68) and charring of wires (10/17/68) - which is consistent with Ross Fleisig's observation that the Lunar Module was a completely battery-operated machine, built during a time in which battery technology and sensing equipment were "a black art." False alerts from the ship's Master Alarm are noted throughout the Log. This is the

very same Master Alarm that sounded throughout the first lunar landing, almost causing a mission abort.

Events: 6/6/68, floor plates in crew cabin are borrowed from LM-3 (Apollo 9); 6/25, LM-5 is fitted with a spare part assigned to LM-3. 7/16 (a year before the mission of Apollo 11), testing delays result from Long Island Lighting Co. electrical supply irregularities. 7/20 - 26: modifications improving efficiency of battery use will prove critical to the safe voyage of a LM-7, simultaneously under construction (Apollo 13). 8/5, 6/68, A. Hecht makes one of several personal notations of exhaustion arising from lack of days off and even lack of meals, as a docking light hook-up error is discovered. 12/8/68, A. Hecht references replication of electrical tests and procedures modified for LM-5 - on LM-6 (Apollo 12) and LM-7 (Apollo 13).

The very last page is an evidently proudly inserted copy from the cover of Ross Fleisig's LM-5 Phase III Reliability Report, dated Nov. 20, 1968: "Reportable failures have gone down from (205 for) LM-3, to (74 for) LM-4, 57 (for) LM-5... Significantly improved vehicle... Low [says] this is very likely to be the LM to land on the moon - it should be." From the collection of scientist and author Charles Pellegrino.

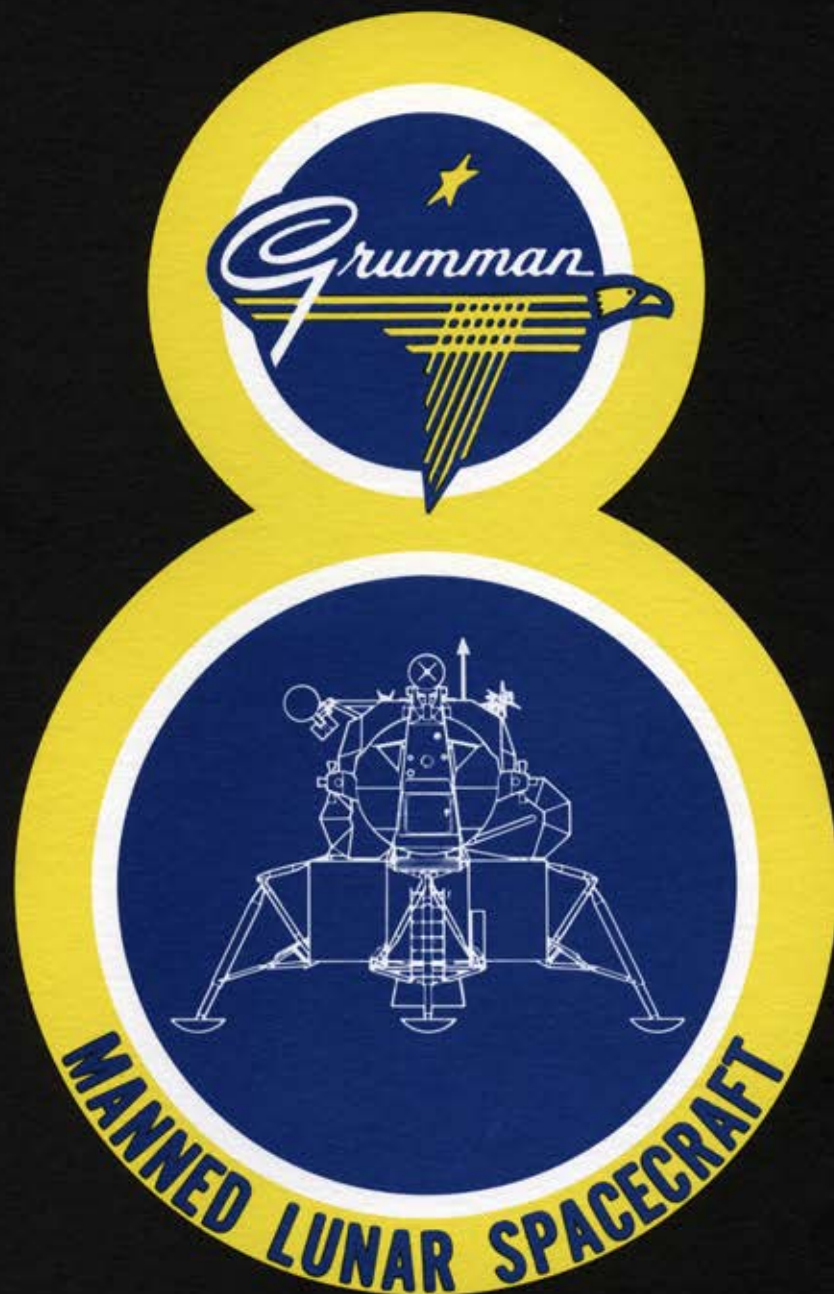
With Day and Night shift reports from

A. Hecht
S. Sarbello
Ed Dowse (son's name is Jimmy)
A. Rabinowitz
S. Fauer
T. Hebel
R. Stonehouse
A. Beuregard
Ross Fleisig

If you have any information or back story on the details in the report or you know how to reach any of the engineers above, please email Steve@DFJ.com

The following pages were scanned from the Jurvetson Space Collection:

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T. Buzz Aldrin
APOLLO XI LMP

LOG

Page No 73052

Engineer A. Hecht Project LM-5 Location Plt 5
 Time 8am/6pm day shift Title _____ Date 6-5-68

- ① Mod 14 to TPS 70010 prep was issued last night, deleting ECS Control Unit & all assoc. cables (because P/S 765 cannot be mated due to absence of ECS Relay Box).
 - ② Generated dev. #8-11 to incorporate Mod 14 change into OCP (temporary).
 - ③ Attended LMS Mtg: Heard following statement:
 DO NOT USE Bag of OLD CB Guards delivered to vehicle yesterday. They may be TIGHT FIT.
 Delivery of NEW CB guards promised for 6/10 (Mon)
 - ④ Waited for QC coverage to transfer stamps fr. 70010 Prep TPS to OCP from 0915 until 1430. No QC coverage available.
 Advised Pad Supervisor, Don Getrost (QC), J. De Martino, R. Valdez (QC), Meeting at Command post (incl. Al Bean regard), and Milt Cohen.
 Result: At 1430 still no QC, no promise except "will try for tonight".
 Pad supvr will call 1611 ~~when~~ QC becomes available. Returned to plt 39.
-
- ⑤ checked 1730 w. pad supervisor for QC assignment. He suggested we call back after 1815 to get QC coverage (ask for Vinnie Mackel, pad supvr).

LOG

Page No 73053

Engineer S. SARBELLO Project LM-5 Location PLT 5
Time 6PM / 4AM NIGHT SHIFT Title _____ Date 6/5-6/6/68

1. STAMPED OFF OPEN ITEMS IN TPS (LDW 410-11373-1 & LSK 560-1024-21). LSK 560-1024-21 IS NOW HOOKED UP & STAMPED OFF IN TPS FIG. 1-3 HOWEVER, LSK 560-1024-19 IS NOT HOOKED UP TO VEHICLE BECAUSE LM-5 REQUIRES A MODIFICATION TO THE CABIN FLOOR PLATE SIMILAR TO LM'S 3 & 4. AN ACCESS HOLE IS REQUIRED TO FEED THE 1024-19 & -23 CABLES THROUGH TO THE LCA AREA (CAN WE USE LM-3'S FLOOR PLATE WHILE THEY MODIFY LM-5'S PLATE ?)

2. TRANSFERED ALL QC STAMPS (PLUS THOSE OPEN ITEMS MENTIONED ABOVE) FROM 70010 PREP TPS TO OCP.

3. SUPPORTED BILL & PAUL IN ADVANCING THEIR OCP 36527 QC BUY OFFS.

4. ONLY OPEN ITEMS LEFT ARE :

(a) LDW 410-11372-9-2 TO BE INCORPORATED.

(b) HOOK-UP OF LSK 560-1024-19 J1 TO VEHICLE.

(c) CIRCUIT BREAKER GUARDS

— A GOOD NIGHT'S WORK.

LOG

Page No 73054

Engineer A. Hecht Project LM-5 Location PH 5
Time Day shift Title _____ Date 6/6/68

- ① Bought off OCP 70010 Figs as req'd to start OCP 36015 only, since figs were not done during last shift.
- ② Remaining Stamps still req'd to perform OCP 36527.
- ③ Wrote deviations up to #15.
 - (a) ACE P.S. #1 deleted
 - (b) ICB addition (~~4CB235~~) (4CB236) Ⓟ
 - (c) ICB deletion (~~4CB236~~) (4CB235) Ⓟ
- ④ Deviation #14 & 15 ~~left w. Nasa Rep. for sig. prior to~~ incorp. into OCP (seq already run).
- ⑤ Cabin floor plate was to be ready this PM. Installation not verified by A.H. When complete, mate P/J1 (LTS) & verify if already configured.
- ⑥ OCP 36015 now in progress. Expect completion in several hours.

A.H.

Major open item is ② above.

LOG

Page No 73055

Engineer S. SARBELLO Project LM-5 Location PLT 5
Time NIGHT SHIFT Title _____ Date 6/6-7/68

1. INSTALLATION OF ^{MODIFIED} CABIN FLOOR PLATE COMPLETED.
HOOKED UP LSK 560-1024-19 J1 TO VEHICLE.
TPS 70010 FIG 1-3 ALSO STAMPED OFF BY GRUMMAN
AND NASA Q.C.
2. H. KATZ HAS BEEN FOLLOWING OCP 36527
STAMP OFFS AND STATED MY EFFORT WOULD ONLY
BE REDUNDANT. (HE STATED LADERMAN WAS HE
DAY COUNTERPART).
3. STAMPED OFF FIG 1-2 OF OCP 70010.
4. OCP 36015 COMPLETED (APPROX. 2AM)



5. IF THEY ARE READY TO EXECUTE
OCP 36527, TPS 35-915 (LIGHTING
SUPPORT TPS) IS WITH ED. DOWSE.
(I HAVE A PRELIMINARY COPY ON MY DESK)



LOG

Page No 73056

Engineer A. Hecht Project LM5 Location PLT 5
Time Day Shift Title _____ Date 6-7-68

- ① Latest status on LBN 410-11372-9-2 cable (interconn ACE Carry on Console w. IV & DC DIST Box) per Mel Schecker, 8³⁰am: Nasa Crab still unresolved. Cable not ready for hook up.
- ② Reinstalled (#4) Ground connection betw. Asc Stage Support strut & Workstand ground pipe.
- ③ 1130: LTG TPS 35-915 starting. Vehicle power up performed per 70010.
- ④ 1200: on LTG TPS, prior to Item III, step 5, Mod is needed to close AC BUS A, INV. 2 & AC BUS B, INV. 2 CB.
Also at end of TPS, open same CB's.
- ⑤ 1430: LTG TPS Completed & fully stamped out, incl. deviations per R. Altieri.
- ⑥ Preping for OCP 36527 in progress.
- ⑦ Deviations are needed to 70010 to accomplish for 36527 what item ④ above did for LTG TPS.

Accordingly I have marked up pages 2-13, 2-20, 2-21 and 2-24 with the req'd changes (located in front of E. Dowse copy).

Please prepare 4 TEMPORARY Deviations (Temp because CB guards not used) for use with 36527 when called out. (Reason: To power up AC BUS B)

Let STE have copies for his book.
Final change will be by PER after completion of 36527.



LOG

Page No 73057

Engineer S. SARBELLO

Project LM-5

Location PLT 5

Time NIGHT SHIFT

Title

Date 6/7-8/68

~~1. ELIMINATED~~

- (1) PROCESSED THE DEVIATIONS (#16 THRU #19) IN OCP 70010 REQUIRED FOR OCP 36527. DEVIATIONS ARE PERMANENT AND WILL BE INCORPORATED IN CHANGE #2 AT WHICH TIME "GUARDS" WILL BE INSERTED INTO THE TEXT OF THE CHANGE.
- (2) 36527 PREP RUNNING INTO NUMEROUS MINOR PROBLEM DELAYING START OF SECTION 2.
- (3) NASA PLACED A CRAB AGAINST LIGHTING TEST SET STATING SEALS WERE BROKEN ON TOP & BACK DOORS. SEALS IN THESE TWO PARTICULAR AREAS WERE NEVER REQUIRED (ON PREVIOUS LTS/VEHICLE SET-UPS) AFTER 3 HOURS OF RESEARCH WITH BOTH STE'S & SETTANNI (AT HOME) WERE INVOLVED, THE CRAB WAS REMOVED & STICKERS ARE NOW AFFIXED (MUCH TO SETTANNI DISAPPROVAL). LM-4'S LTS MAY HAVE TO FOLLOW SUIT.
- (4) 2 AM - STILL HAVEN'T FIRED UP 70010. PREP TPS & SECTION 1 OF 36527 HAVEN'T BEEN SIGNED OFF
- (5) 3 AM - GRUMMAN & NASA QC COMPLETED "WALK AROUND" AND STARTED STAMPING OFF - DEFINATELY ~~WILL~~ WILL NOT FIRE UP GSE THIS MORNING.
- (6) LEAVING LOG BOOK, DOWSE'S 70010 BOOK AND Q.C.'S 70010 IN ACE #3 ROOM FOR YOUR UTILIZATION.

LOG

Page No 73058

Engineer A. Hecht Project LM5 Location PLT5
 Time Day Shift Title _____ Date 6/8/68

- ① OCP 36527 Precheckout Prep C/L started 0920.
- ② Minor conflict in OCP 70010 (to be cleared up with final deviation regarding CB guards on same page 2-13):
 - Ⓐ p 2-12 Seq. 04-004 → 113 to 120 VAC
 - Ⓑ Note on top of p 2-13 → 112 to 120 VAC (S/B 113)
- ③ LTS PNL1, "SPARE" LIGHT does not light. Check bulb after completion of 36527. QC Seals prevent us from checking at this time.
- ④ Verified "DC BUS VOLT" CB ratings on pnl 11 & 16 for LM-6 in 099 Shop:
 - Ⓐ 4CB22 on PNL 11 → 3A
 - Ⓑ 4CB21 on PNL 16 → 2A
 Shop Drawings showing this are for LM 4 & sub.
- ⑤ No other significant events occurred during day shift. *AH*

S. SARBELLO
NIGHT SHIFT

6/8-9/68

1. LOCATED BIDDLE TEST SET - UNIT IS CHARGED OUT SINCE 5/28/68. UNIT IS ALSO NOT THE ACCEPTED MILLIOMMETER. Q.C. STATED THAT THE BIDDLE UNIT IS USED FOR INITIAL TESTING & THAT THE KEITHLEY MODEL 502A UNIT IS USED WHEN RECORDING FINAL DATA.
2. ACE ROOM AIR CONDITIONING WHEN DOWN AT 10PM & REPAIR BY MIDNIGHT. 36527 PROGRESSING NICELY.
3. RECEIVED OPERATION MANUAL ON THE KEITHLEY MILLIOMMETER.



LOG

Page No 73059

Engineer A. Hecht Project LM5 Location PH 5
Time Day shift Title --- Date 6/10/68

- ① OCP 36527 progressing OK, No EPS problems.
Off.

E. HOMBURGER
NIGHT SHIFT

6/10 - 6/11/68

1. INSTR OCP 36527 CONTINUED
COMM WERE PERFORMING CONTINUITY CHECKS.
2. At 2015, the IPT, LDW410-81070^{S/N2}, AUTOMATICALLY KICKED OUT, REMOVING AC POWER FROM VEHICLE. INSTR WAS ON A BREAK AT THE TIME & HAD NOT DONE ANYTHING FOR 5 MINUTES PREVIOUS TO THIS. WE RE-POWERED THE AC TO THE VEHICLE, AND EVERYTHING HELD OK FOR THE REST OF THE NIGHT.
I AM INCLINED TO THINK THAT THERE WAS A MOMENTARY FAULT IN THE 400 N FACILITY INPUT.
3. IT WAS NOTED THAT VEHICLE 'CROSS-TIE' & 'X-LUNAR' CB'S WERE NOT CLOSED, AS SPECIFIED IN OCP 70010 PG 2-8, BOTTOM. THE CROSS TIE'S MAY NOT BE IMPORTANT AT THIS TIME, BUT THE 'X-LUNAR' CB'S SHOULD BE CLOSED TO PROTECT THE 4K3 & 4K4 RELAY CONTACTS,

NOTE: Item #2 above is TDR #7 of 36527

Item #3 above indicates that on powering down & back up the closing of the 4 req'd EPS cb's were omitted.

LOG

Page No 73060

Engineer A. Hecht Project LM5 Location Plt. 5
 Time Day shift 8am - 6pm Title — Date 6-11-68

- ① Generated sample "Power-up" & "Power-down" deviation sheets for use w. 36527, referencing OEP 70010 sequences & additional CB operation req'd.
 a) Gave 9 copies to Inst. TC
 b) Gave 1 copy to W. Durkin, STE.
- ② Investigated 81070 shut-down which occurred at 2020 last night. Could find no evidence of recorded facility power failure.
 Areas checked: (1) GPS log, (2) 063 EPS log,
 (3) LM5 pad super log, (4) LM4 pad super or log,
 (5) Plant facilities lead man.
Suggestion: Re-check techs who worked last night for possible clues (e.i.: accidental tripping of 81070 switch, accidental pulling on facility cable, ~~etc.~~ what switches did he operate for AC to come on again?)
 H/H

E. HOMBURGER
 NIGHT SHIFT

6/11 - 6/12/68

1. INSTR & COMM CONTINUED ON LINE. NO EPS PROBLEMS.
2. NOTES ON PREVIOUS NIGHT'S IPT SHUT-DOWN -
 - (a) FROM WHAT I CAN FIND OUT, THIS 400N FACILITY PWR JUST FEEDS THE TEST FLOOR AND THE MEZZANINE. I COULDN'T FIND ANYTHING ON THE MEZZANINE USING THIS POWER. ALSO, LM4 WAS ALL POWERED DOWN, SO IT APPEARS THAT LM5 WAS THE ONLY LOAD.
 - (b) THE 063 MEN REPORT THAT ON FRIDAY, THIS 400N FACILITY POWER WAS DEAD FOR AN EXTENDED PERIOD OF TIME.
 - (c) THE DETAILS OF THE SHUT-DOWN ARE:
 THE GPS TECH SUDDENLY OBSERVED:
 1. "S/C PWR" AND "IPT PWR" SWITCHES BOTH OFF
 2. GREEN AND WHITE LIGHTS BOTH OUT.
 3. "HI" AND "LO" RED LIGHTS BOTH ON.
 IT WAS VERIFIED THAT BOTH 5-AMP CB'S IN THE J167 POWER BOB WERE STILL IN.

LOG

Page No 73061

Engineer A. Hecht Project LM5 Location PH 5
 Time Day Shift 8am - 6pm Title --- Date 6-12-68

1. OCP 36527 completed, except for some open TDR items.
2. Wrote notes for Inst (36527) personnel, giving 81070 trip-out background information and a trip-out rationale to help to disposition their TDR #7.
3. No significant activity for remainder of day shift.
4. No EPS night coverage req'd.

AH

A. Hecht
 Day Shift 8am - 6pm

LM5

PH 5
 6-13-68

1. Descent stage being hardmated.
2. Started prep. for 62000 EPS & setting up for SMP 3914.
3. Informed by GPS that DVM #1 & #2 may ^{NO} longer be put on top of Interface Unit, because of impeding IU air flow from emerging thru the top surface.

Called GSE (Doug Crooks) to get their mechanical man to furnish a mounting rack or a raised platform type rack for the top of IU (Bob Stringham's area).
 GSE is looking into this.

E. HOMBURGER

NIGHT SHIFT

6/13 - 6/14/68

1. 23:30 - SMP 3914 STARTED. (DARYL KIDD/T.C.)
2. 01:20 - VEHICLE POWERED-UP, VIA J167.
3. 02:55 - SMP 3914 REV-2 COMPLETED.

No TDR's - JUST A COUPLE OF MINOR DEVIATIONS:
 CHANGE IN GSE CABLE NO.

RELOCATE INSTRUCTION IN PROCEDURE

4. 03:00 VEHICLE POWERED DOWN.

LOG

Page No 73062

Engineer A. Hecht Project LM5 Location PH 5
 Time Day shift Title — Date 6-14-68

- ① Preping for OCP 62000 in progress
- ② No problems arose during this shift.
- ③ Writing TPS to improve CWEA/Inv. Sw. interaction. *CH*

E. HOMBURGER
 NIGHT SHIFT

6/14-6/15/68

No EPS PROBLEMS AT VEHICLE.

A. Hecht
 Day shift

LM5
 —

PH 05
 6-15-68

- ① No EPS activity at vehicle.
- ② Wrote TPS to improve CWEA/INV. Switch interaction. TPS is complete, but still needs sig's & number.

GSE for TPS still req's gathering. *CH*

E. HOMBURGER

NIGHT SHIFT

6/15-6/16/68

ED OCP 32020 ON LINE - COMPLETED 19:40
 RAT 407-027 ALSO COMPLETED
 STE SHUT DOWN POWER.

LOG

Page No 73063

Engineer E. HOMBURGER Project LM 5 Location PLT 5
 Time 0748 - 1818 Title — Date 6/17/68

1. VEHICLE POWERED UP AT 1345
2. STANDING BY TO PERFORM TPS 35-923, UPON COMPLETION OF ED TPS 35-1040.
3. VEHICLE POWERED DOWN 1700
4. NO 063 TECHS AVAILABLE TO START GATHERING BOB'S & CABLES TO BE REQUIRED FOR THE TPS.
5. NEED MOD 1 TO TPS TO MATE P/J 953.

A. Hecht Night Shift 6/17 to 6/18 6pm - 4am
 Steve Bauer, QC Steve Cacace, Tech.

- ① 6-8pm - ED TPS 35-1040 RUNNING UNTIL FOUND OUT THE Capacitor Scheme did not work for their application.
- ② 8-10pm Tried to gather equipment & were told we needed work orders for obtaining GSE. Sal Deliberto (GSE) informed us he will get relocation work orders written & sent over to plt. 5.
 (P.S. The Stockman did not know about the work order req't & we got all but 1 item w/o use of work order.)
- ③ 10-11pm Xray
- ④ 11-11⁴⁵pm Could not get Nasa QC.
- ⑤ 1145- ~~1200~~ 1230 Dinner break.
- ⑥ 1am Finally got Nasa QC agreement to run w/o them.
- ⑦ 0115 Trouble mating P/J 953. Vel Cable too taut. Issued Crab # 572 for vehicle fix, if possible. Got 053 to give us some more slack to provide for interim mating. Finished step 2B.
- ⑧ 0200 QC man disappeared. After checking w. leadman, we got replacement.
 New QC: Ted DeMartino.
- ⑨ 0345 Completed to step 15, but stamped only up to 14, since 15 req's recheck next shift.

Actual runtime: 2³/₄ hrs
 incl. crab delay.

Good luck tomorrow.
 20% compl. AH.

LOG

Page No 73064

Engineer E. Homburger Project LM 5 Location PLT 5
 Time 0748-1818 Title - Date 6/18/68

Note to E. Homburger (fr. A. H.):

When you complete TPS 35-923, hold the 3 prong to 2 prong adaptor, which belongs to Bob Martin of 063. I will return it to him tomorrow night (6/18).
 Thanks. A.H.

VEHICLE POWERED-UP, AND BACK ON LINE WITH TPS 35-923.

TPS COMPLETED 1600. CONCLUSIONS -

1. 35 μ f AT P/J 148 PINS C & D SEEMED JUST AT THE VERGE OF PREVENTING THE MASTER ALARM WHEN SWITCHING FROM "OFF" TO "INV 1".
2. WITH 50 μ f, THE MASTER ALARM NEVER CAME ON, IN 10 CYCLES OF SWITCHING FROM "OFF" TO "INV 1" AND TO "OFF" AGAIN.
3. WITH THE 50 μ f, THE MASTER ALARM CAME ON - AS IT SHOULD - WHEN THE AC BUS WAS DE-ENERGIZED.

A. Hecht 6-18-68 Night shift 6pm - 2am

- ① No power on vehicle. No EPS activity at vehicle. J. Goldmacher suggested I leave at 2¹⁵ if no further probs arise.
- ② Material for TTR for TPS 35-923 for night shift is on previous page (73063). Check into status or disposition of crab # 572 (short cable to J953).
- ③ Could not untangle the apparent problem of Real Time Measm't of OEP 62000 seq 10 and therefore could not make improvements.

A.H.

LOG

Page N° 73065

Engineer E. HOMBURGER Project LM 5 Location PLT 5
Time 0748-1818 Title — Date 6/19/68

PERFORMED NO ACTIVITY AT VEHICLE. DAY WAS TAKEN UP WITH MEETING ON THE C&NEA MASTER ALARM SITUATION, AND A PRELIMINARY READINESS REVIEW MEETING FOR OCP 62000 EPS & ED. DID NOT HAVE A CHANCE TO START A TPER FOR THE TPS.

Night shift 6/19/68 A. Hecht

- ① Crab #572 (Ref TPS 35-923) has been sold. They were able to get enough slack for connector from vehicle harness.
- ② Vehicle powered up about midnight.

Master Alarm:
The alarm alarm
has been a
problem since
LM-5 landing

LOG

Page N° 73066

Engineer E. HOMBURGER Project LM 5 Location PLT 5
Time 0748-1818 Title - Date 6/20/68

PERFORMED NO ACTIVITY AT VEHICLE. RECEIVED 200-PG.
CHANGE (PCR 546) FOR OCP 62000-EPS.

Night Shift 6/20/68 A. Hecht.

- ① NO EPS problems encountered.
- ② Check on availability of CB guards.
They were to be manufactured by 6/10 and have not yet showed up at LM 5.
I can think of 3 places to check:
① Mel Schecker ^{X6346} ② Don Snow (who ordered them) X 6405
③ Geo Hanna (663 Stock rm) X 8-6478
- ③ Please note that my pay check was locked up and unavailable to me, forcing me to come in tomorrow during the day in order to get cash at a bank before closing (before returning to work).

It would be well if night shift personnel could have their checks brought to the AEE Station in the future, to avoid similar inconvenience.

A. Hecht
(As per memo
filed.)

LOG

Page N° 73068

Engineer A. Hecht / S. Sarbello Project LM5 Location Pit 39
Time Night shift Title — Date 6/24-25/68

- ① Wrote deviations up to Dev #37, p. 2-156
 - ② Reg's checking that Seq 34 chgs being made will not ~~require~~ require add'l changes necessitated by matrix continuity.
 - ③ Deviations 1-9 & 11-15 run copies & inserted in E. Dowse copy & ACE-use Master copy.
Remainder - No copies run yet.
-

E. DOWSE / R. HOMBURGER
DAY SHIFT

6/25/68

1. DEVIATIONS #38 THRU #53 WRITTEN
2. 17:35 IPC SECT 1 TEST PREP COMPLETE
CALL TO STATIONS FOR OCP 62000

LOG

Page No 73069

Engineer HECHT/SARBELLO Project LM-5 Location P/H5, ACE3
 Time NIGHT SHIFT Title _____ Date 6/25-26/68

(BILL SMITH)

1. GRUMMAN QC STATES THAT NASA QC HAS NOTIFIED GAEC ~~THAT~~ THAT LCR'S 1694, 2529 & 2685 CONSTRAINT THE RUNNING SEQUENCE #70. CHECK THE ABOVE MENTIONED LCR'S & CHECK WITH E. BACA OF NASA
2. Wrote Dev. 54 (p 2-3) & 55 (p 2-184).
3. Seq. 041-010 asks verification that RTRS is ready. We should probably add a sequence about 2 hours prior to get IRD to start reconfiguring.
4. Reply to questions relative to LTG & AC Power.
 - a) Seq. 004 (LTS Setup) prepares for A/DK & Dock LTS turn-on. Only 4CB146 or 4CB148 (A/DK) CB is req'd to activate C/N LTS & Dock LTS. This A/DK turn on is done by "Instrumentation" following EPS power up.
 - b) AC GSE power is turned off in the beginning of seq 005 (INV 1). It is turned on again in seq. 040.
 - c) No deviation seems required.
5. day 178 time 0057: Started IBC "Pre Checkout Prep Check List" par. 1.14 (P. 1-198).
6. On EPS C/O Controller, PS #1 did not hold 30 volts, not even with max. voltage setting. STE notified GSE group. (Time: 0150)
7. CB guards not available for installation. Installation sequences deviated out (temp.) by STE

LOG

Page No 73070

Engineer HECHT/SARBELLO Project LM-5 Location PHS, ACE3
 Time Night Shift 6/25-26/68 ~~CONTINUED~~ FROM prev. page.

8. IN THE SET UP OF ECS Valves (IPC p.1-222) it was discovered that ECS OCP 33022 was also on line & a conflict exists (Ref. para 1.54).
9. 0314 : GPS obtained permission to shut down PS #1 of ECC (82090). GSE is ~~in the act of~~ in the act of trouble shooting or switching "D 6505" for a replacement supply.
10. 0345 : Crew dismissed, except GPS.
 GPS station remains in STAND-BY configuration per IPC document.
 No power-down was performed. No Dev. written prior to crew dismissal.

E. HOMBURGER

DAY SHIFT

6/26/68

RUN OF OCP 62000 STARTED 178:09:25:00

EPS SEQ 004 COMPLETED 10:43

RCS HTR CHECK COMPLETED 11:15

DEV #70 TO IPC : CSM BOB: WAS-1119-3, REVISED-1119-5

BOB REMOVED IN AM FOR REWORK PER TPS (H. KATZ)

INST ON LINE 11:20 - 13:15

EDS ON LINE 13:15 -

ED POWSE RESEARCHING THE 3 LCR'S MENTIONED IN ITEM ①
 OF NITE LOG.

PS #1 WAS REPLACED WITH A LM 3 SPARE.

LM-3
 Apollo 9

LOG

Page No 73071

Engineer HECHT/SARBELLO Project LM-5 Location ACE 3
 Time Night shift 6/26-27/68 Title _____ Date _____

- ① Wrote deviations # 56 to 60
 (RTRS Setup for ABORT STAGE & D/S Monitoring
 plus various minor corrections)
- ② OCP-INST-62000 obtained TDR #4: Could not
 discern C/W LTS ON. After cabin fluorescent
 lights were moved to floor level,
 CDR no longer had trouble seeing lights
 lit.
- ③ OCP-INST-62000 obtained TDR #6: When in
 test mode (component), DC BUS FAULT light
 did not light up. [p 2-17, seq. 003-36 s/s 02]
 Troubleshooting of ckt will be necessary.
- ④ ED & Inst Satellites are expected to continue
 into the day shift. NO EPS runs were
 conducted during this shift. ~~off~~
 (ED Res check started at 0305.)
- ⑤ Reminder to E. Dowse: A. Hecht Night Coverage
ends tomorrow (Thur) at end of shift (0414 Fri).

Day Shift

E. Homburger/H. Hebel/S. Failer

6/27/68

- ① Reconfigured LTS for TDR #6 of OI, rean
 sequence successfully and then wrote Dev #61 (p 2-7)
 to correct EPS seq.
- ② Inst TDR 6 signed and sold to NASA & QC
- ③ Deviation #62 (pg 2-48), #63 (pg 2-59)
- ④ Started SEQ 005 at 179:15:19:00
- ⑤ TDR #1 at SEQ 005-015 PIRR # F 2193
 (at 15:33) DEV #64

LOG

Page No 73072

Engineer A. Hecht / S. Sarbello Project LM-5 Location ACE 3
 Time Night shift 6pm - 4am Title Date 6/27/68

- ① Restart w. Seq. 005-012 s/s 26
 EPO - DEMOTT, EPH - J. Galasso, QC J. Palazzo
- ② Seq. 05 compl except CB guard to be installed later (time 1915).
- ③ AT 1926 CDR INFORMS US THAT THE TYPE OF CB GUARDS JUST GIVEN HIM DOES NOT FIT ON CB'S DUE TO OVERLAY INTER FERENCE. (P156816-7 is P/N of guards) They are tubular & should slip over CB stem, but overlay prevents their locking in place.
- ④ Holding for P3/J3B Mating (A32) in seq 006-001A, 2015
 EPO Chris Howard, EPH - Acostango.
- ⑤ Checked Inv. Ser. Nos.: 134 (Inv. 1) & 145 (Inv. 2).
 C. Clark intends to have # 134 replaced by new GPI.
- ⑥ 2105: Holding after step 007-007 to reset Master Alarm & C/W LTS which came on after power transfer to Bat 6.
 See Dev # 66.
 Nasa requires we hold until deviation is written & executed. ~~for~~ otherwise they would insist on TDR.
 Resume 2143 w seq 007-008
- ⑦ 2200:
 Got TDR # 2. Neither Current Mon # 5 nor Current Monitor # 6 read current on Ammeter. (CM's are S/N 5 & S/N 6). Start T/shftg.
 0130:
 All functions operate thru both Curr Mon, except ammeters do not read.
 Holding in attempt to get two replacement current monitors from LMA.

contd on next page

LOG

Page N° 73073

Engineer A. Hecht / S. Sarbello Project LM5 Location _____
 Time Night Shift 6pm - 4am ~~6/27/68~~ 6/28/68 Date _____

⑧ At approx 0215 someone tripped open PS3 SW. at EPS G/O controller and reset it immediately. CDR indicated this by observing a transient of output voltage on 1054 Meter Box. C/W lights came on & had to be reset by Instr-TC on our TDR # 2.

⑨ 0318 - GSE is now installing 2 new Current Monitors & removing old ones with PIR # F1372 & F1375

0400 Vehicle now being powered down by STE

(a) Pull cabin breakers

(b) Open CB's on J166 & 167 BOBs } See Dev. by STE

82090 left in std by (as in TDR #2, step 43).

To power up tomorrow morning for TDR #2, ~~the above steps (a) & (b) will be~~

configure to restart sequence 08-000 (Bat 6 NF ON).

Then proceed on TDR #2 to verify ammeter operation of Curr Man # 6, and then number 5.

PS: Instr. TC used our TDR #2 extensively to reset C/W & to Troubleshoot C/W light extinction. Don't let this confuse you.
 Att.

Note: We were in Hold from 2105 thru 0400 for several consecutive reasons (see above).

LOG

Page No 73074

Engineer E. HOMBURGER / S. FALKER / T. HERR Project LM 5 Location PLT 5
 Time DAY SHIFT Title _____ Date 6/28/68

Completed TDR #2 against SEQ 008.

TDR's #3, 4, 5, 6 - Feeder resistances, SEQ 008 & 009

TDR #7 at SEQ 21-010 Batt 2 Power Supply / Current Monitor #2 problem. Seems to be Current Monitor
 At end of shift - trouble shooting Current Monitor

A. RABINOWITZ / E. DOWSE / S. SARBELLO 6/28-29/68
 NIGHT SHIFT

1. TDR'S # 8 THRU # 12 GENERATED.
2. SOLD OFF TDR # 9 & # 10.
3. SELL OFF TDR # 7 (CURRENT MONITOR #2 WAS BAD - IT HAS A SHORT WHEN MOUNT ONTO VEHICLE BUT NOT WHEN OFF VEHICLE. SHORT BETWEEN DIODE HEAT SINK & PERFORATED COVER AT THE POINT WHERE THE BACK IS NOTCHED TO CLEAR THE HEAT SINK (YOU CAN SEE WHERE IT ARCED OVER). THIS INFO WILL SELL OFF #7.
4. TDR #12 CAN BE CLEARED AS SOON AS P119A, P119B, P119C & P119D ARE CONNECTED TO E 5085 GROUND POINT.
 L.M. TUCKER OF 053 & LIASION ENGINEERING ARE WORKING ON THIS CONNECTION. (REF J92 PINS 15, 16, 21 & 22 IN ORDER TO RECONFIGURE FOR THE RERUN
 .01 PRESS LUT DEF SET PUSHBUTTON ON THE 81060 AND PROCEED.
 (ALSO CHECK POWER SUPPLIES FOR PROPER VOLTAGE SETTINGS AS INDICATED BY THE OCP.)
5. HOLDING AT SEQ # 027-008
6. ~~INSERT DEV # 71~~, GENERATE DEVIATION FOR OCP ADDITION (AFTER SEQ # 027-012). - Deviation #77
 AFTER GETTING SIGNATURES
7. INSERT DEVIATIONS # 71 & UP TO APPROX. #76.

LOG

Page No 73075

Engineer E. HAMBURGER / S. FAUER / T. ABEL Project LM-5 Location P2T-5
 Time DAY SHIFT Title - Date 6-29-68

1. Completed TDR #12 (but not sold off yet.)
(Rerun OK at seq 027-008)
2. Deviation #77 for seq 027-012A
3. Deviations #71 thru #76 signed off
4. TDR #13 against seq
5. Deviation #78 for seq 028-024
6. TDR #8 sold
9. LSK 580-1119-5 is ~~incorrect~~ manufactured in error. All new points are labeled P9 & P10 instead of J9 & J10. GSE is now assigning a workorder to correct Bob. Then QC will check it and allow usage as is.
10. After using BOB BOX it was discovered that box was improperly wired. PIRR will be written after sequence 38
11. Found PVT leads ~~not~~ connected to CSM BOB - another set of PVT were connected
12. Armature on CSM BOB is also sticky. TDR 14 remains open because of this.

Nights

T. Abel / A. Rabinowitz / S. Lucello

1. Approx 1.5 Hr. Hold during Seq 38 for QC and other problems regarding connection
2. Received go ahead from AC (Ken Adema) to demit out connection
3. PICKED UP TDR'S # 15 #16 & #17
4. COMPLETED SEQ'S # 34, 35, 36 & 37
5. TDR #17 IS A CONSTRAINT- REMOVED LM/CSM BOB 1119-5 TO PERFORM C&R EVALUATION ON BOB.
6. HOLDING AT SEQ #38-020 SUB STEP 02.
7. PERFORM C&R EVALUATION ON BOB AND THE FOLLOWING

CHANGES REQUIRED (1) REVERSE THE TWO BINDING POSTS WITH THEIR ATTACHED LEADS ("CSM H1 & CSM L0"). (2) ON FRONT OF BOB, REVERSE LETTERING ("CSM H1 - (14+15)" WITH "CSM L0 - (7+8)". (3) ON BACK, REVERSE

LOG

Page N° 73076

Engineer DOWSE/SARBELLO Project LM-5 Location PLT 5
 Time DAY SHIFT Title Date 7-1-68

1. PROCEEDED TROUBLE SHOOTING TDR #17:

(a) REWORK LM/CBM INTERFACE BOB LSK 560-1119-5 TO A
 " -7 " CONFIGURATION AND FLOPPED THE MECHANICAL
 MOUNTING OF "CB-1" & "CB-2" (ELECTRICAL CIRCUITRY OK BUT
 REVERSE CB MOUNTINGS MADE TROUBLESHOOTING INCONCLUSIVE
 LAST SATURDAY), BOB REINSTALLED AND CONTINUED ON TDR #17.

(b) RAN TDR #17 TO STEP 53 WHICH CONCLUDED THIS TDR.

2. GENERATED DEVIATIONS #95 THRU #108.

3. OCP NOW COMPLETED TO SEQ #38-028 INCLUSIVE (~~---~~ #
~~---~~ (DEV. #108).

NIGHT SHIFT E. HOMBURGER

7/1-7/2/68

1. Resumed run of OCP at SEQ 38-033

2. Deviations #109 thru 115 written

3. TDR's #18 thru 22 received.

4. Completed SEQ 039. Need deviations to
 get back to BAT 5 for 39 cfo. Wrote
 steps to do this but did not get to
 perform

5. The real time recordings of Abort Stage switchover

6. Set-up now: Interface - Output Pwr - Bus
 1093 - Current Monitors 1-4:

25 A HV Input In
 100 A HV Output In
 Sec - 25 Amp
 LV CB's Out

1092 - #5: 25 Amp CB & Switch

LOG

Page No 73077

Engineer DOWSE/SARBELLO Project LM-5 Location PLT 5
 Time DAY SHIFT Title _____ Date 7-2-68

1. GENERATED TDR #23424

2. - - - -

3. TDR #25 CREATED A CONSTRAINT, START HOLDING AT (SEQ #41) 1520.

3A. FOR AC HEADERS CREATE NEW LIMITS OF LLS 0.25 AMP & ALSO REDEF. COR. AC WINDOW HERE. AS IT'S NOW ULS 0.75 AMP & CONNECTED.

4. REQUESTED GSE ON STATION TO EVALUATE LDW 410-82090 OC/RC CONTROL PANEL, (LEFT SIDE TESTED AT 2.3 AMPS, RIGHT SIDE ZERO).

Master Alarm
Unit

2. MASTER ALARM CAME ON AT APPROX. 11:16 WITH EPS, LIGHTING, RCS & WATER MANAGEMENT ON LINE. EPS, LIGHTING & RCS RECYCLED THEIR TESTS AND DID NOT RECREATE AN ALARM CONDITION. STE HELD ALL TESTING UNTIL APPROX 13:30 AT WHICH TIME IT WAS FOUND THAT WATER MANAGEMENT CAUSED THE ALARM CONDITION WHILE TROUBLESHOOTING TDR #3 ON OCP 33022.

5. FOUND LDW 410-82090 EPS C/O CONTROLLER UNIT (S/N 6) WITH "OC/RC CONTROL PANEL" (S/N 5) TO HAVE A BAD RIGHT SIDE UNIT WHICH WAS SLATED TO PROVIDE OC STIMULI FOR DESCENT ECA'S.

6. RECONFIGURE THE OC/RC CONTROL PANEL (LDW 410-82094-1) S/N 5 TO USE THE LEFT SIDE UNIT WHICH WAS USED FOR THE ASCENT OC/RC CHECKS ON ECA #3 & #4. (PIRR # 2966) WAS PLACED AGAINST THE OC/RC PANEL.

7. RETRY AT SEQ #41 START AT 17:48. STIMULI OK. SEQ #41 COMPLETED 17:58.

8. COMPLETED SEQ #42 AT 18:03

9. SELL TDR #25 AS A "BAD STIMULI UNIT".

10. COMPLETED SEQ 50 BY 184:19:04.

PICKED UP TDR #29 WHEN 82090 STIMULI PANEL LEFT SIDE FAILED IN THE BAT 2 POSITION.

REPORT SEQ 51 & SELL TDR #29 WITH A NEW STIMULI UNIT.

LOG

Page No 73078

Engineer E. HOMBURGER / A. RABINOWITZ Project LM5 Location PLT 5
 Time NIGHT Title - Date 7/2-7/3/68

1. The 82090 was powered down and the CPOCRC removed. New panel installed. S/W 6 out 5/13 IN
2. 22:10 - calibration check of new panel indicated faulty RH side. 22:35 - check of LH side completed OK. Portions of RAT were performed, via TDR #29 Continuation sheets.
3. Seq 51 resumed, with the deviation for LH side
4. Completed seq. 58 at 185:02:33.
5. Went into GSE Hold at 02:45 at Seq 59-001, due to missing J176 jumper plug, LSK 417-1370-1. This apparently has been missing and searched-for, for a few days.
6. CDR window heater was wired in Continuation sheets for TDR #24 measured current at 0.47 amps.

DOWSE/SARBELLO
 DAY SHIFT

7/3/68

1. HOLDING AT SEQ 59 (OCP IN GSE HOLD)
2. SOLD OFF TDR'S # 25 & 29
3. ALSO SOLD OFF TDR'S #14, 15, 7, ~~25~~
4. HELD ENTIRE DAY SHIFT AT START OF SEQ #59 DUE TO MISSING SHORTING CONNECTOR (LSK 417-1370-1)
5. NEW SHORTING CONNECTOR TO BE FABRICATED AND MADE AVAILABLE DURING 2ND SHIFT.

E. HOMBURGER / A. RABINOWITZ NIGHT SHIFT 7/3-7/4

1. SUBSTITUTE JUMPER PLUG FOR J176 WAS RECEIVED, AND SEQ 59 RUN, OK.
2. COMPLETED SEQ 60 (WITH DEV #128) @ 185:22:25
3. VEHICLE POWERED DOWN FOR WEEK-END, VIA DEV TO CONTROL DOCUMENT

LOG

Page No 73079

Engineer E. DOWSE / S. SARBELLO

Project LM-5

Location PLT 5

Time 7:48AM - 8:18PM

Title

Date 7/8/68

1. GENERATED STATUS REPORT ON EPS TDR'S AND SUBMITTED TO ROSS FLEISIG.
2. SOLD TDR'S # 16, 18, 22, 23 & 24.
3. TDR'S # 12 & # 13 ARE STILL OPEN & WON'T BE RESOLVED UNTIL THE PROPER CONNECTION OF THE 4 # 119 WIRES ARE CONNECTED AS PER LDW 80-54359 CONTROL # LM 5 -14050. THE PAD SUPERVISOR IS WORKING ON THIS PROBLEM.

E. HOMBURGER

7:48PM - 8:18AM

7/8-9/68 ~~7/8/68~~

2. ~~8~~ COULDN'T OBTAIN KEITHLEY MILLIOHMMETER FROM Q.C.
(NIGHT SUPV. WOULDN'T RELEASE UNIT FOR TEST)
1. ~~8~~ DREW TROUBLESHOOTING CIRCUIT FOR BAT 5 + 6 FEEDER LINE Ω ANALYSIS
3. BIDDLE DUCTER AVAILABLE IN PANEL SHOP BUT NO Q.C. SUPPORT.
4. STARTED TIME/SEQUENCE CHART FOR TPER ON 62000-EPS-LMS.

S. SARBELLO

7:48AM - 8:18PM

7/9/68

1. OBTAINED KEITHLEY MILLIOHMMETER FROM Q.C. MODEL #502A AND TOOK RESISTANCE CHECKS OF ACCESSABLE TEST POINTS ON TDR #3 CONTINUATION SHEET. DATA WAS QUESTIONABLE AND FOUND THE KEITHLEY INACCURATE WITH A KNOWN Ω SAMPLE. THE BIDDLE DUCTER WAS TESTED WITH SAME SAMPLE AND FOUND TO BE MORE ACCURATE. SAMPLE WAS A 18 FT AWG #6 CABLE. KEITHLEY READ .016 Ω , BIDDLE DUCTER READ .0062 Ω . SUGGEST NIGHT SHIFT USE THE BIDDLE DUCTER AND REPEAT THE STEPS #1 THRU #12.
(NOTE AWG #6 APPROX 400 $\mu\Omega$ /FT)

LOG

Page No 73080

Engineer E. HOMBURGER Project LM 5 Location PLT 5
 Time NIGHT SHIFT Title — Date 7/9, 10/68

1. Measured resistances for TDR #3 Continuation Sh 4, with Biddle Ductor. Cannot see anything wrong.
 Also measured Bat 5(-) and Bat 6(-) studs to vehicle frame — each was 1 milliohm.
 Our troubles could very possibly be in the DVM instrumentation.

E. DOWSE/S. SARBELLO
 7:40AM — 8:18PM

PLT 5
 7/10/68

1. SIGNED OFF TDR #3 CONTINUATION SHEETS #3 & #4.
2. REVIEWED RECORDER DATA TAKEN ON JUNE 28, 1968 ON RECORDER ZAIA7 CHANNELS #7 & #8 (GC0071 & GC0155) COVERING OPERATIONAL HISTORY RELATED TO LM-5 INVERTERS #1 & #2.
3. DREW TABULAR LIST/CHART FOR ATTACHMENT PAPER TO PIRR (WHEN INVERTER #1 IS REMOVED FROM VEHICLE) DEPICTING THE FAULT CYCLE (CYCLE #1), CYCLE #2 WITH NO GSE CONNECTED & CYCLE #3, NORMAL TEST CYCLE WITH GSE & 3 AMP LOAD.
4. TDR #28^{WAS} SOLDERED BY JIM WEIR.
5. TDR #5 OF ED WAS SOLD BY FRED PRECHT.

E. HOMBURGER

NIGHT SHIFT

7/10, 11/68

NOT ALLOWED ON WORK STAND DUE TO
 OPTICAL ALIGNMENTS

NOTIFIED STE THAT CRT PG 4 LINE 21, INVERTER
 BUS VOLTAGE, READS 1-5.2

LOG

Page N° 73081

Engineer E. DOWSE / S. SARBELLO Project LM-5 Location PLT 5
 Time 7:48 AM - 8:18 PM Title _____ Date 7/11/68

1. WITNESSED PIT TEST (TOTAL 4.5 HRS) ON GENERAL PURPOSE INVERTER S/N 128. TEST CONDUCTED BY JIM LAMPRECHT. DEPT 063 OPERATOR OF GPI TEST STATION WAS CHARLIE FARMER. COPY OF TEST DATA TO BE FORWARDED TO S. SARBELLO AT LATER DATE.
2. TRANSFERRED INSTRUMENTATION PROBLEM INCURRED IN EPS TDR #2 TO INSTR. TDR ^{#16} AND ATTEMPTING TO SELL OFF TDR #2 TO NASA.
3. SOLD TDR #2.

E. HOMBURGER - NIGHT SHIFT - 7/11, 12/68

1. Performed Continuation sheet #5 for TDR 3 - checked PVM-DVM 2 readings against Fluke meter at Battery studs.
2. Stood by as EPH for FCS OCP
3. Got Controller Control Panel (Power supply for CPOERC) repaired now?

E. DOWSE - DAY SHIFT 7-12-68

1. THE CONTROLLER REPAIR PEOPLE ARE OBTAINING ALL NECESSARY REPAIR PARTS AND WHEN THESE ITEMS ARE GATHERED WE WILL THEN GIVE THEM A WINDOW TO WORK ON THE UNIT. THE CONTROLLER IS NOT TO LEAVE THE WORK STAND.
- 2.

E. HOMBURGER - NIGHT SHIFT - 7/12, 13/68

1. LM6 Panel 5 ready at 0515, but no window now for changing panels because ECS is using C&W lights
2. R/R OCP got TDR for no PFI light at CDR X-ENTER
3. Got Nasa to sign off the Batt Readout Test Set Pin F charge to the ITC.

LOG

Page No 73082

Engineer E. DOWSE Project LM 5 Location PLT 5
 Time 7:48 AM TO 8:18 PM Title EPS 62000 COG. Date 195.7.13-68

1. CHECKED IF THE FOUR #119 WIRES FROM P92 WERE
 INSTALLED AND DISCOVERED THAT
 LHW280-
 54359 EOH4 HAD CONNECTED THESE WIRES.

TDR'S FZ+13 MAY NOW BE CLEARED WHEN A TEST
 WINDOW IS OBTAINED.

2. DISCUSSED THE LDW410-82090 EPS C/O CONTROLLER
 PROBLEM WITH BOB HACKENH(063) AND DISCOVERED
 THAT THIS CUT OUT PROBLEM OF THE POWER SUPPLIES
 THAT FEED THE CPOCRC HAS EXISTED FOR SOME TIME
 AND OCCURS ONLY AFTER THE 82090 HAS BEEN ON
 FOR MANY HOURS (?) DAYS (?). THE SEEMS TO BE
 AN INTERNAL HEAT DISSIPATION PROBLEM AND THE
 THERMAL CUT OUTS TURN OFF THESE POWER SUPPLIES.

3. AS YET NO WINDOW HAS BEEN OBTAINED TO REMOVE
 PANEL 5 (195.14.13:45)

4. POSSIBLE LTG PROBLEM TDR #9 OOP 62000 ECS.
 WHEN PNL 16

ECS SUIT FAN ΔP 4CB120 IS IN

THE FOLLOWING CAUTION LTS

ECS

PRE AMPS

RNDZ RDR

+ WARNING LIGHT

ASC PRESS

BECOME DIM

(NOTE THESE WERE THE ONLY LIGHTS OF
 THIS TYPE ON AT THE TIME.)

DWG. REFERENCE LTS 330-55000 SHEET 5

AT FIRST THOUGHT THIS IS A LTS LOADING PROBLEM.

SAMUEL GREENBERG WAS PILOT AND CAN
 ANSWER QUESTIONS.

CHECK ECS 62000 SHUTDOWN PROCEDURE

SUGGESTION WAS MADE THAT THE LIGHTING TEST SET

SHOULD INCLUDE AN AMMETER IN THIS CIRCUIT WITH
 A CURRENT REFERENCE THAT STATES ANY CURRENT INDICATED

LOG

Page No 73083

Engineer E. DOWSE Project LM-5 Location PLT 5
 Time 195 15:19:58 Title 62000 EPS LM5 Date 7-13-68

THE FOLLOWING
 ABOVE A CERTAIN LEVEL, ~~CERTAIN~~ LIGHTS WILL
 BECOME DIMMER;
 THESE ARE THE ANNUNCIATOR LTS.

ECS
 SPEAKING WITH D. TYLER CONCERNING THIS
 SAME PROBLEM IN ADDITION TO THE ABOVE LIGHTS
 ON PANEL 2 (7DS7)
 THE H2O SEPA LIGHT ~~CAME~~ ^{WAS} ON & REMAINED ON
 THE 7DS1 LIGHT CAME ON WHEN THE PH16
 ECS SUIT FAN ΔP CB (4CB120) IS DEPRESSURED
 AND WENT OFF WHEN THE ΔP (4CB120) IS PULLED.

1530 T. Hebel

1700 Resolved TDR #9 for ECS see continuation
 sheet in ECS TDR Book.

1930 Still no window to pull Panel 5 (RR & LR
 require Ann/Dock/Compt CB for power to
 C&W lights - there might be a window between
 RR & LR)

E. HOMBURGER - NIGHT SHIFT - 7/13, 14/68

Panel 5 removed. Completed our little ^{5 minute} check with the
 Flood CB at 20:40. CB did not pop.

Panel 5 of LM6 installation completed 01:05
 Could not get a preliminary look at the removed
 panel - no one at 0900.

The new Panel 5 did not pop the CB (FLOOD). 03:12
 Gave OK to GSE Support (Frank Otten) to take two of
 our 1213 BOB's. He is taking the boxes via
 TPS G 6807-14-001. No IPC coverage tonight
 I presume we should document this change
 via a temporary deviation to the IPC.

LM6
 is Apollo 12

LOG

Page No 73084

Engineer A RABINOWITZ Project LM-5 Location PLT 5
 Time 7:48 AM - Title _____ Date 7/14/68

LDG RDR received a TDR (TDR #18) due to flickering of a warning light located in ALT/ALT RT meter (9M9) on Panel 1. Occurred during running of OCP-GF-C2000-1-RAD-LM5 Seq 22-035-02. at approx 12:30.

Attempted to trace light with no success. Advise contacting following tomorrow.

Harold Weber - LM6

Pat Wiley - Ldg Rdr Subsystem

Frank Kaplan - LM4

S. SARBELLO - NIGHT SHIFT

7/14-15/68

1. EPS SUPPORT OF LDG RADAR OCP. NO NEW PROBLEMS OCCURED RELATED TO EPS/LIGHTING.

2. RDR'S TDR #18 RESEARCHED FURTHER - LEVEL 3 DWGS AND LM-5 EFD'S SHOW 9M9 AS A "BLACK BOX" (ONLY SHOWS INTEGRAL & NUMERIC INPUT POINTS). THIS WARNING LIGHT IS NOT PART OF THE PFI FAMILY OF LIGHTS - HOWEVER, ITS ^{PURPOSE} FUNCTION IS SIMILAR. THIS METER HAS BUILT IN LOGIC WHICH ^{THE PRESENCE OF} REQUIRES SENSING AC, DC AND RADAR PULSE TRAIN TO KEEP THE WARNING LIGHT OFF. THE OCP ATTEMPTED TO PUT THE LIGHT ON BY REMOVING THE LDG RDR PULSE TRAIN. THE RESULT WAS A FLICKERING ACTION. RABINOWITZ HEARD THIS SAME PROBLEM EXISTED IN LM-3. LIGHTING TEST SET OK - SUSPECT RANDOM PULSES AS A POSSIBLE CAUSE OF FLICKER.

3. LDG RDR OCP COMPLETED ~~0715~~ 7/15/68.

E. DOWSE 7-15-68

WROTE CONTINUATION SHEETS FOR TDR'S #12 & 13 WHICH ARE TO BE RUN SEQUENTIALLY WHEN A WINDOW IS OBTAINED FROM THE STE. THE CURRENT FOR THIS PERIOD IS NOT TO EXCEED TEN AMPS AND ALL TROUBLE SHOOTING OR SATELLITES SHOULD BE IN STANDBY.

GET 063 TO WRITE A PIRR ON INV 1 USE A TDR #1 CONTINUATION SHEET TO REMOVE THE VHP.
 RECORD PIRR # E 1860

LOG

Page N° 73085

Engineer S. SARBELLO Project LM-5 Location PLT 5
Time NIGHT SHIFT Title _____ Date 7/15-16/68

1. GENERATED PIRR# E1860 TO HAVE INVERTER #1 S/N 134 REMOVED FROM VEHICLE, ALSO ATTACHED TO PIRR "OPERATIONAL HISTORY OF INVERTER #1".
2. REMOVED INV. #1 FROM VEHICLE ON TDR #1 (063-DAVE STEIN)
3. REQUEST FOR ED EVENT ACTIVITY OF NY89084, NY89424 AND NY90364 ^{ON} 7/15/68 BETWEEN 1400 TO 2115 WILL BE AVAILABLE FOR ANALYSIS WHEN RECORDERS 3A4A2 & 3A4A4 ROLLS ARE PULLED OFF MACHINE. (NY89084 "SYS A, QD4 STAGE BLTT" ON 3A4A2, CHAN #10. NY89424 "SYS B - ZLDG GEAR DPLY T" ON 3A4A4, CHAN #28. NY90364 "SYS A DES FL VENT VLV T" ON 3A4A4, CHAN #15).
4. FCS WENT INTO A HOLD AT 0418 TO CONFIGURE AN ED TEST-NO WINDOW GRANTED TO START ON EPS TDR #12 AND #13 FROM STE.

LOG

Page N° 73086

Engineer G. Hecht Project LM 5 Location ACE 3
 Time _____ Title _____ Date 7-16-68

Day shift:

- ① Inv. #1 installed in Vehicle, S/N 128, on TDR #1.
- ② Requested window (2hrs) for completing TDR #1, by Inv. #1 Retest.

S. SARBELLO
NIGHT SHIFT

7/16-17/68

1. DUE TO SHORTAGE OF FCS PERSONNEL, ASSISTANCE WAS REQUESTED TO MAN ISL STATION DURING RUNNING OF FCS OCP.
2. COMPLETED FCS SEQ 26 @ 0730

E. DOWSE / E. HOMBURGER - DAY SHIFT - 7-17-68

1. AT 0905 THE IPT TRIPPED OUT. IT WAS IMMEDIATELY RESET. LILCO WAS HAVING POWER PROBLEMS TODAY.

Interference with test resulting from Long Island power Co. power irregularities 1 X 1000 SEC. LAUNCH

S. SARBELLO - NIGHT SHIFT

7/17-18/68

1. WROTE INSTALLATION INSTRUCTIONS FOR PANEL #5 AGAINST TDR #26 PAGES 6 & 7
2. AFTER FCS SEQ #27, A WINDOW WAS AVAILABLE TO INSTALL PANEL #5. (EST. 1.5 HRS, ACTUAL 4.0 HRS)
3. FCS RESUMED TESTING AT 0500 SEQ #28.

LOG

Page No 73087

Engineer E. DOWSE/E. HOMBURGER Project LM 5 Location PLT 5 WS 11
 Time _____ Title 62000 EPS + SUPPORT Date 7-18-68

DAY SHIFT

DISPOSITIONED ⁶²⁰⁰⁰FCS TDR #12 BY QUOTING
 ECS 62000 TDR #9. THIS IS THE DSKY STATUS
 LIGHTS DIMMING PROBLEM. THIS DUE TO LTS LOADING.

SUCCESSFULLY RERAN INV #1 SN128 THIS CLEARS
 TDR #1. - SOLD

TOOK ADDITIONAL DATA ON THE BAT 5 NORMAL
 FEEDER LINE DROP. THIS DATA CALCULATES
 TO APPROXIMATELY 21 MILLI OHMS.

THIS DATA IS ON TDR #3 CONTINUATION SHEETS.

S. SARBELLO - NIGHT SHIFT

7/18-19/68

1. NO WINDOWS AVAILABLE DURING SHIFT, ECS ORP
 RUNNING. EPS IN SUPPORT MODE.

E. DOWSE/E. HOMBURGER - DAY SHIFT - 7/19/68

No window available for any EPS activity.
 Analyzed measurements taken yesterday.

Noting
 change-out
 of flight-
 assigned spaces

A. Hecht - Night Shift - 7/19-20/68

PCMTE Being Removed fr. LM5 & being replaced by
 an operational Spare to be obtained from stock.
 LM5 PCMTE Assy had a temperature dependent fault requiring
 its replacement.

S. SARBELLO

7/20/68

1. FLUCTUATIONS WAS OBSERVED BY CDR ON CDR BUS
 POSITION ON POWER/TEMP MONITOR. ACE STATION RECORDERS
 SHOWED APPROX .8V VARIATION ALSO VERIFIED BY CRT DISPLAY.
 CURRENT MONITOR #5 SHOWED A LOAD OF 6 AMPS ^{AND STEADY}. BELIEVE THE
 VARIATIONS ARE DUE TO VARIOUS ECS MODES OF OPERATION

LOG

Page N° 73088

Engineer S. SARBELLO

Project LM-5

Location

Time DAY SHIFT

Title

Date 7/20/68

(CONTINUED)

2. WHEN WINDOW IS AVAILABLE, EPS WILL PLACE BAT 6 NORMAL ON LINE WITH BAT 5 NORMAL (THIS SUPPLY CONFIGURATION WILL REMAIN FOR ECS & AGS OCP RUNS.

3. ECS OFF LINE AND WINDOW WAS AVAILABLE TO PUT BAT #6 NORMAL ON LINE.

A. Hecht Night shift 7/20-21/68

EPS Configuration at turn-over:

- ① Bat 5 NF & Bat 6 NF Supplying BUS
- ② Interface Unit:
 - a) Controller output - Section 1 & Section 2 - "A/S"
 - b) Vehicle P.S. Output SW - "OFF"
 - c) Load Bank / BUS Connect SW - "ON"
 - d) PNL 16 - ASC & DES ECA & ECA CONT CB'S PRESSED CLOSE

Observation: With above configuration and a total DC load of about 10 amps, current balance between Bat 5 & Bat 6 is not easily obtained, and if obtained cannot be maintained. The 2 sets of ECC power supplies tend to oscillate at such light loads causing load to shift back & forth between these power supplies and showing up as fluctuations of the "Output Pwr Routing - Ascent stage" lights.

OCP 62000 COMM is operating, drawing from 5 to 8 amperes in addition to normal vehicle current demands. Also ECS & AGS are operating, thus total current drain is in excess of 10 amps continuously.

LOG

Page No 73089

Engineer E. HOMBURGER Project LM5 Location PLT 5
 Time DAY SHIFT Title - Date SUN, 7-21-68

1. FCS OCP running. CDR reported DEPA numeric digits "8" blinking in background when "0" was on. No TDR was generated. Waited for FCS to re-duplicate the situation - was then going to vary the LTS variac and observe any change, but they were busy continuing their OCP. The variac is presently set at 60 (Note - the EPS OCP, Sec 70 Lighting Support configuration, does call for variac to be set at 70).
2. Couldn't do LUT re-verification - the DC load was varying between 11 and 13 amps.
3. 18:25 IPT kicked out. Immediately notified Facilities. The facility 400 cps was dead. 19:25 they restored the power and IPT was powered up again.
 Note - With IPT Voltmeter reading 119.4 v., CRT Inverter Bus is reading 114.7 v.

A. Hecht - Night Shift - 7/21-22/68

FCS, ECS & Com operating. Veh. loading constantly in excess of 10 amps DC. (Com shut down early in shift).

During this shift, the 81070 "IPT" Voltmeter was reading 119.7V (trip limit is 120V). During this interval, CRT read 114.7 to 115.0 Volts.

It is suggested that day shift GSE look at the meter calibration and/or the level of IPT 400 HZ INPUT voltage.

Engineer SARBELLO/HOMBURGER Project LM 5 Location PLT 5
Time DAY SHIFT Title _____ Date 7-22-68

1. The 81070 IPT still reads near high limit
 IPT VM 119.6 v AMM $1\frac{1}{4}$ AMPS
 AC MONITOR 118.2 v at J167 BOB
 CRT 115.2 v.
 On basis of AC Monitor, we did not request facilities to lower the voltage. Our IPT Vm probably is reading higher than it should. GSE Support (M. Crooks) felt we should not attempt anything in the IPT until its next calibration.
2. Gave OK to John Haytaian (X6346) to take the following from LM5 to set up LM4:
 LSK 5600-1106-1 COAS SIMULATOR & CABLE
 " -1128-3-3 SEQ CAM T.S.
 " -1128-5-1 " " " CABLE
 " -1128-7-5 " " " "
 " -1123-1 TRACKING LIGHT SIM & CABLE
3. SOLD TDR #28 (TO DATE 19 TDR'S SOLD AND 10 TDR'S OUTSTANDING). ALL SOLD TDR'S, PAGE #'S 1 & 2 REPRODUCED & INTERLEAVED INTO OUR RUN OCP MASTER BOOK.

A. Hecht Night shift 7/22-23/68

- ① FCS operating, ave DC current is ≈ 20 Amps.
- ② No EPS problems encountered, except for lowering Bat 6 voltage by approx $0.3V$ to prevent hunting of Bat 5 & Bat 6 voltages (by reducing I_6 to zero amps).

SARBELLO / HOMBURGER JAY SAIFT 7/23/68

1. C-Started the Battery Amp-Hrs on CRT Pg 3 (845) just for the exercise
2. Helped out with a Prop - Inst PIRR on wiring.
3. Question has come up - will batteries be used for LM 5-61018?

LOG

Page No 73091

Engineer E. DOWSE

Project LM-5

Location ACE 3
PLT 5

Time

Title 62000 SUPPORT

Date 7-23/24-68

DISCOVERED THAT PANEL 8 EXPLOSIVE DEVICES
STAGE SEQ RELAYS SYS A & SYS B
WERE ON.

ITEM ALSO AT ACE^{ED} 3 THE FOLLOWING LIGHTS WERE ON.

- ① 3A5A1 SYS A ED RLY K1-K6 XFER (GREEN)
- ② 3A5A1 SYS B ED RLY K1-K6 XFER (GREEN)
- ③ 3A5A1 SYS A ED RLY K7-K15 XFER (GREEN)
- ④ 3A5A1 SYS B ED RLY K7-K15 XFER (GREEN)
- ⑤ 3A5A3 SYS B QD4 STAGE NOT T (RED)
- ⑥ 3A5A5 SYS B ASC OX COMP VLV 3T (RED)
- ⑦ 3A5A5 SYS A DES FL VENT VLV T (RED)
- ⑧ 3A5A5 C/O ENCLOS NO. 1 PRESS (WHITE)

WROTE DEVIATION NO 143 & 144 ~~AND~~ WHICH
ADDED STEPS TO ^{FCI 62000} A SEQ 52 WHICH RESET:

- ① THE PANEL 8 ED STAGE SEQ RELAYS SYS A & SYS B
LIGHTS (LIMITED LIFE)
- ② ITEMS ①, ②, ⑤, ⑥ & ⑦

RE WROTE TDR #12 & 13 TDR CONTINUATION SHEETS
IN SUCH A MANNER THAT THESE TDR'S MAY BE SOLD
BY SWITCHING FROM THE EXISTING VEHICLE STATUS,
WHEN A SUITABLE WINDOW IS OBTAINED (LESS THAN
5.0 AMP VEHICLE LOADS)

THE BUS LOADING WAS ABOUT 25 AMPS ALL NIGHT.

A. HECHT / E. HOMBERGER - DAY SHIFT - 7/24/68

1. Obtained copy of NASA MEMO & TWX, AND LCR 2376,
regarding wiring insulation resistance - for TDR #17.
These are in master run book in back of TDR #17.
2. Regarding TDR #12 & 13 - final installation of ground
leads was done per EO H4 to LDW 280-54359.
(Adding Ground Point E5085 for connections to J92)
3. FCS OCP near completion, then just COM will run.
4. Vehicle will be soft-meted tomorrow, for mfg.
purposes..
5. From approx. 1900 on, ACE Recorders & Event Lites went haywire,
CLEAR AT 1935

LOG

Page No 73092

Engineer E. DOWSE Project LM-5 Location ACE #3
 Time Night Shift Title EPS SUPPORT Date 7/29/25/68

RE WROTE TDR'S #12 & 13 TDR CONTINUATION SHEETS
 AND RAN BOTH TDR CONTINUATION SHEET SETS
 SUCCESSFULLY. OBTAIN NASA SIGNATURE DURING
 THE DAY SHIFT. THERE IS NO NASA EPS COVERAGE
 TONIGHT.

ON THE 82090 THE ϕ B LAMP IS OUT (BULB IS GOOD)
 AND THE BLOWERS DO NOT OPERATE.

FRANK OTTEN GSE IS CHECKING INTO THE PROBLEM
 WHILE GSE IS LOOKING INTO THE 82090 PROBLEM
 VEHICLE PWR WAS SWITCHED FROM THE BAT 5 & 6
 INPUT TO BUS INPUT POWER.

AS SOON AS THE 82090 PROBLEM IS CLEARED SWITCH
 POWER TO THE BAT 5 & 6 INTERFACE AND GET
 VOLTAGE DROP INFORMATION.

Note: EPS ϕ CONT Turned off, but Bat 5 & 6 NF
 Contacts are still closed - Before returning to
 A/S Power, check Int. Unit Output power Routing
 Switches & Veh Power Output SW positions & set
 Same as req'd.

A. Hecht / E. Homburger Day Shift 7/25/68

- ① 82090 ϕ 2 problem was poor contact in plug mating
 to J3 of Interlock Box. This was corrected by
 adjusting wire inside plug & restoring plug to J3.
- ② Sold Off TDR's #12 and #13.
- ③ Per Jim Weir & Sal Alaimo: LCA due fr. vendor 7/26 PM,
 but will go to EMI test by agreement w. Ross Fleissig.
 LM5 will get LCA Sun night, near end of Mfg. update.
- ④ Per R. Longinetti & D. King: NO work on Sunday (both shifts).
 D. King wants to talk to E. Dorse at 8am tomorrow.
- ⑤ Configuration of power remains exactly as at end of
 prev. night shift. 6hr powerdown expected 8pm for soft mat.

LOG

Page No 73093

Engineer E. DOWSE Project LM-5 TEST Location PLT 5
 Time NIGHT SHIFT Title 62000 SUPPORT Date 7/25-26/68

20:00 VEHICLE BEING PREPPED FOR SOFTWARE
 GENERATED POWER DOWN PROCEDURE WITH
 STE B. DURKIN.
 POWERED DOWN AT 2400

GENERATED POWER UP PROCEDURE WITH
 STE F. SLOVER.

S. SARBELLO/E. HOMBURGER
 DAY SHIFT

7/26/68

① (09:45-10:30) WITH POWER OFF VEHICLE, ADDITIONAL
 BIDDLE-DUCTER READINGS WAS TAKEN ON TDR #3,
 SHEET #12.

② 10:30 - POWER WAS APPLIED TO VEHICLE.

③ No Battery current readings - P/S 877 is demated at PCM
 Checked Current Monitors #5 & 6 - each showed a few amps.

④ Ed Dowse - Stan Barron wants to talk to you Monday
 about RAT validation of 8510 between 62000 & 64015.

⑤ TPS written to remove Track Light S/N 109 and interim
 installation of S/N 103. DON FOX IS TRYING TO
 LOCATE S/N 103 AND PIT VALIDATION PAPERS

E. DOWSE 7/26-27/68

ON EVENT LT PANEL 3A5A2 THE FOLLOWING
 RED LIGHTS ARE ON; (208.4 22:30)

SYS A QD.4 STAGE BCT T

SYS A CABLE CUTTER T

SYS A QD1 STAGE BCT T

HOWEVER THE CRT IS NOT UPDATING AND
 THE 208.4 KBIT DATA IS NOT BEING UTILIZED
 AT THIS TIME.

AT R-START OBC INSURED 1111 XEQ & VERIFY
 0000 XEQ & VERIFY

THE THREE RED LTS ARE ON.

LOG

Page No 73094

Engineer S. SARBELLO/A. HECHT Project LM5 TEST Location PLT 5
 Time DAYSHIFT Title EPS SUPPORT Date 7/27/68

1. BOB 1126 WAS RECHECKED BY HARRY MARTINUCCI (GSE) PRIOR TO REMOVAL OF DEFECTIVE UNIT (S/N 1). AN OPEN CDR(-) FUSE WAS FOUND. NO REMOVAL WILL BE PERFORMED. WILL CONTINUE TDR#3. QC WANTS SEQ 101 RERUN ENTIRELY.
2. BOB LONGINOTTI INFORMED ME THAT A COPY OF TDR#7, SHEET #5 WAS LOCATED IN ED CARABETTA'S OFFICE & THAT IT HAD QC STAMPS AND NO T. MARTIN SIGNATURE. HE SAID THAT JOE ARTILLO RASPD PLT #25 HAS THE ORIGINAL. LET DAY SHIFT TRACK DOWN THE ORIGINAL FOR QC'S BOOK & GET T. MARTIN TO SIGN IT OFF.
3. 1830; TDR#3 progress thru step #117. Holding until next shift because tests are req'd for LM4 Batt. Installation. *left.*
4. 1830 - DON FOX TO DATE HAS NOT LOCATED S/N 103 TRACKING LIGHT ASSY & ITS RELATED PIT TEST HISTORY. HE WILL LEAVE A TIE-IN WITH HIS (MONDAY) DAY MAN TO GET IN TOUCH WITH THE COG. ENGR.

5. REMOVE LOAD BANK DURING HOLD PERIOD (18:50)

E. DOWSE / A. HECHT 7-27/28/68

PERFORMED TDR#3 CONTINUATION SHEETS

17, 18, 19 & 20. THE DATA OBTAINED ON THESE SHEETS SHOULD BE ENOUGH TO SELL TDR'S #3, 4, 5, 6 & 11 THE CDR BUS INTERFACE WITH J107 GSE CONNECTOR IS TOO HIGH IN RESISTANCE BUT CAN BE DISPOSITIONED AS ADEQUATE BECAUSE THIS INTERFACE IS NOT USED IN FLIGHT.

THE VOLTAGE DROPS ACROSS THE ASCENT ECA'S TURNED OUT TO BE HIGHER THAN EXPECTED.

LOG

Page N^o 73095

Engineer A. Hecht Project LM5 Location ACE 3
 Time Day Shift 8am-8pm Title EPS Support Date 7-29-68

1. COMM is only OCP running
2. Dev. # 51, 44, 45 & 46 prepared to permit RAT testing of 8510 (Inv. Simulator) by TPS 66804-29-001. (These Dev. are to 62000-CON-LM5). These dev's isolate the J167 PWR BOB from vehicle for use with RAT.
3. 13:39 - Performed Dev. ~~51, 44 & half of 45~~ 51, 44 & half of 45 (of 62000-CON) to isolate J167 PWR BOB from BUS. GSE (STAN BARRON) WILL NOTIFY WHEN TPS 66804-29-001 (8510-INV. SIMULATOR RAT test) IS COMPLETE.
4. 17:07 - 8510 RAT TPS is completed and Dev's 51, 44, 45 & 46 have also been completed. COMM advised to resume running. Bat 5 NF is supplying DC power to bus.

S. SARBELLO
NIGHT SHIFT

7/29-30/68

1. COMM OCP RUNNING
2. ACE REQUIRES STATION TIME FOR COUPLE HOURS. COMM OFF LINE.
3. ED WARNING LIGHTS IN ACE ROOM CAME ON DUE TO ACE ACTIVITY. EXTINGUISHED EVENT LIGHTS WITH R-STARTS 080 & 081. (3A5A2-1, 16, 19 & 23 ALSO 3A5A4-15)
4. EXTRACTING TIME HISTORY DATA FROM 62000-EPS OCP FOR EVENTUAL USE IN TPER. (COMPILED HISTORY FROM SEQ 008 THRU SEQ 038)

A. Hecht Day Shift (8am-8pm) 7-30-68

1. Found missing Sht 5 of TDR # 7 in Raapo office (TDR book had unstamped copy instead of stamped copy). Asked QC to close out TDR # 7.
2. TDR # 7 Completely stamped off (Sht 5 & 1)

LOG

Page No 73096

Engineer S. SARBELLO Project LM-5 Location PLT 35
 Time NIGHT SHIFT Title _____ Date 7/30-31/68

1. RESET ED EVENTS LIGHTS 3A5A2-17423 ALSO 3A5A23.
AT 1630.
2. COMPLETED TIME HISTORY DATA ON 62000-EPS UP TO
PRESENT STATUS.

E. DOWS ← DAY SHIFT 8-1-68

3A5A4

SYS B ASC FL

COMP VLV 2 T RED LT ON

DISCOVERED ON AT 213:18:14

INSERTED 1000 IN R-START 080 EXEC &
VERIFIED AND THE LIGHT RESET.

DISCOVERED ON 3A5A2

SYS B QD 1 STAGE HUT T RED LT. ON
AT 213 18 48.

INSERTED 0001 IN R-START 080 EXEC &
VERIFIED AND THE LIGHT RESET.

S. SARBELLO
NIGHT SHIFT

7/31-8/1 ~~8/1-2/68~~

1. EXTENSION CABLE LDW 410-4061-1 FOUND IN PLACE OF LDW 410-8529-1
HOWEVER IT IS VERY SHORT. 063 LOOKING FOR ADDITIONAL
EXTENSION CABLE. (DAVE STEIN & BILL STEVENS)
2. 2320 LOST POWER TO VEHICLE. CAUSE UNKNOWN.
3. CHECK GPS AREA - ALL UNITS (82140, 82090 & 81060) DEAD.
4. RESET ALL GSE & RETURNED POWER TO VEHICLE. ~~RESET~~
4A ^{CHECK} PUM AT BAT 5, SE BUS & CDR BUS OK. RETURNED GSE
IN STANDBY MODE FOR X-RAY PERIOD (MIDNIGHT TO 1AM)
ALL CB'S ON PNL #11 & #16 PULLED
5. 0005 - GPS REPORTS LOSS OF STANDBY POWER. TOLD
GPS TO ATTEMPT RESET 82140 & 82090 POWER SUPPLIES.
GPS TO ATTEMPT RESET 82140 & 82090 POWER SUPPLIES.

LOG

Page No 73097

Engineer S. SARBELLO Project LM-5 Location PLT 5
Time NIGHT SHIFT Title 7/31-8/1 Date 8/1/68

6. IF 82090 FAILS FOR 3RD TIME, ^{DC} POWER TO SUPPORT COMM OCP WILL BE VIA 82140 AND EPS TDR#3 WILL BE SCRUBBED FOR NIGHT SHIFT.
7. WITH MARVIN MITZNER (GSE ENG'RG) OBSERVED POWER UP FROM GPS AREA AT 0145. EVERYTHING LOOKED NORMAL. BOTH POWER FAILURE CAUSES UNKNOWN. SUSPECT MOMENTARY FACILITY POWER OR OPERATOR ERROR INTERRUPTION. POWER STATUS - 82090, BAT 5 NORM FEED.
8. TDR#3 DATA GATHERING FUNCTION DEFINITELY SCRUBBED TONIGHT. EMI GROUP HAS PLACED EXTENDER CABLES ON ALL PANEL #1 CONNECTORS DURING OUR POWER PROBLEM PERIOD. STE STATES EMI GROUP HAS PRIORITY.
9. WROTE TDR#3 SHEETS # 21 & 22 IN PREPARATION FOR NEXT WINDOW. 063 HAS FLUKE, BOB AND NECESSARY EXTENSION CABLES TO GO.

E. DOWSE
DAY SHIFT

8/1/68

REVIEWED FEEDERLINE RESISTANCE DATA WITH STAN FEINBERG X 9833 OR 1551, C. KEENAN V1685, AND BOB BRANDT X1551. THEY ARE SATISFIED WITH THE TEST RESULTS BUT AT PRESEN

LOG

Page No 73098

Engineer S. GARBELLO Project LM-5 Location PLT 5
Time NIGHT SHIFT Title _____ Date 8/1-2/68

1. PUT A 1213 BOB TO J803 OF VEHICLE, READY TO CONTINUE GATHERING TEST DATA ON TDR#3.
2. 11:50 WENT INTO A HOLD AT ~~SECT 95~~ SEQ 120-95. ON PANEL 14 SET BAT 5 B.V. CDR FEED SW TO ON TB STAYED BP (CRT RESPONDED OK). CDR STATED THAT BAT 5 N.F. HAS ALSO BEEN BP THROUGHOUT HIS TOUR OF CABIN DUTY (10PM - MIDNIGHT). CDR STATED ALL FLAGS ON PNL#14 BP. MADE VOLT METER & AMMETER CHECKS TO ASCERTAIN EPS - DISPLAY CB TO BE OK. ALSO HAD EPO CHECK CONNECTOR CARD & VISUAL CHECKS OF P/J74A & B, P/J970, P/J886 & P/J1804. PROBLEM RESOLVED - FOUND P/J1804 DEMATED FOR COMM GROUP NO CONSTRAINT TO COMPLETING TDR#3 TEST.
- 2A. COMPLETED TDR#3 TEST DATA.
3. SOLD TDR#1 ON 62000 - CONTROL DOCUMENT
4. EMI GROUP CAUSED VEHICLE PWR FAILURE DURING TPS - 35-730. THEY TOOK A TDR & EPS POWERED UP VIA THE TDR.
5. SUPPORTED EMI GROUP WITH LIGHTING TEST SET THROUGHOUT SHIFT.
6. RESET ED 3A5A4-24 EVENT LIGHT.
7. TESTED PNL#14 TALK BACK AFTER P/J1804 REMATE - TEST OK.

E. DOWSE DAY SHIFT.
REVIEW

LOG

Page N° 73100

Engineer S. SARBELLO Project LM-5 Location PLT 5
 Time DAY SHIFT Title _____ Date 8/3/68

1. STAN FEINBERG HAS TAKEN DATA FROM PAGE #24 OF TDR #3 & STATED THAT HE HAS ENOUGH LM-5 DATA & WILL GET BACK TO US EARLY TUESDAY TO FIRM UP THE SELLING OF TDR #3. TILL THEN, HE WILL RESEARCH PREVIOUS VEHICLES & IF REQUIRED, TAKE DATA ON ANOTHER PANEL #11 WHICH AT PRESENT, IS NOT WIRED UP COMPLETELY.
 2. REVIEWED RETEST TPS FOR PANEL #1. PANEL INSTALLATION PERIOD NOT FIRM FOR TONIGHT (CHANGED T/W INDICATOR & TALK ABOUT POSSIBLE CHANGE OF ALT/ALT RATE INDICATOR).
 3. I MODIFIED INTEGRAL LIGHTING PORTION OF TPS (SHUT-DOWN PORTION LTS NOT REQUIRED) HOWEVER, RECOMMEND PERFORMING A VISUAL CHECK OF LTS AFTER TPS COMPLETION TO ASCERTAIN LTS IS CONFIGURED PER SEQ 070-000 OF 62000-EPS.
 4. DUANE KING WANTS HECHT (SATURDAY NIGHT) & RABINOWITZ SUNDAY, IF NECESSARY, TO GENERATE TPS FOR CHECKING NEW ECA BY SUNDAY NIGHT.
- STE
5. POWERED DOWN AT 1815. NO POWER REQUIREMENTS UNTIL PANEL #1 IS INSTALLED.

Note: on J167 Power Bob,
 both AC & the DC CB is now open (per Dan Perkins).

A. Hecht Night shift 8/3-4/68

1. Started to write RETEST for new ASC ECA #3 on TDR #5 Continuation sheets.
2. For powering up, use suggested steps on enclosed sheet.
3. Continue item ①. Note completed sheets 3 thru 6 & required contents in black notebook. → on right

LOG

Page No 73101

Engineer A. Hecht Project LM-5 Location ACE 3
 Time Night Shift (Sunday) Title _____ Date 8/4-5/68

1. There was no EPS Day Coverage (8-4-68). A. Rabinowitz was scheduled to be here, but his failure to show still requires to be clarified.
2. Power-up during day shift was done by STE using OCP 70010 and powering to BUS DIRECTLY.
3. Continuing to write ECA #3 RETEST.
4. (443: Power down by Dev. #55 (CON))
5. PNL 1 & 5 RETEST TPS held up by need for changes as req'd by Nasa Test Engr.
6. Open items to be completed on ECA #3 Retest (TDR #5):
 - (a) Bat 1-4 Voltages
 - (b) Bat 1-4 Current indications
 - (c) DC BUS Isolation (seq. 32)
7. Suggested course:
 - a) Set Bat 1-4 HV & Des Bats SW to "ON" and A/S Bats to OFF:
 - 1st - Section 1 (BAT 1 & 2) to D/S & Deadface to "CONNECT"
 - 2nd - Bat 6 BU "OFF"
 - 3rd - Section 2 (Bat 3 & 4) to D/S.
 - (Utilize sequences in seq 31 etc)
 - b) Run Seq. 32 (incl dev.)
 - c) Put Bats 2 & 4 back on
 - d) Check Bat 1-4 voltage read-out
 - e) Apply Bat 1 thru 4 RC to get current rdgs on CRT. (partial seq. 55-58).

LOG

Page No 73102

Engineer SARBELLO/HOMBURGER Project LM-5 Location LM-5
 Time DAY SHIFT Title _____ Date 8/5/68

1. HOMBURGER & HECHT INTERFACING FOR ECA #3 RETEST TPS. SARBELLO COVERING PANEL #1 RETEST TPS AND GENERATION OF POWER UP PROCEDURE (DEVIATION #56 THRU #60)
2. COMPLETED POWER UP PROCEDURE. DEVIATIONS WRITTEN AGAINST CONTROL DOCUMENT. POWER UP MODE TO BE BAT 5 N.F. VIA 02090 TO J167 BOB.
3. 1800 - HARD MATE OF VEHICLE IN PROGRESS. AFTER HARD MATE, POWER TO BE APPLIED TO VEHICLE. ~~THE~~ PANEL #1 RETEST TO FOLLOW THEN RCS RETEST FOLLOWED BY ECA #3 RETEST.
4. 1915 - HARD MATE STILL IN PROGRESS. PANEL #12 PLANNED TO BE ~~B~~ PULLED TONIGHT.

A. HECHT Night shift 8/5-6/68

1. Called E. Hamburger on schedule. He wants to be here tomorrow, 8/6, to attend meeting w. subsystem and Nasa in order to try to resolve TDR's #3, 4, 5 & 6. This will cancel his only day-off this week. Will try to get replacement for Sat night, if possible. Advised J. Goldmacher of these facts & the possible weekend problem.
2. Reviewed Power-up deviations #56-60 (con) & changed please reiterate dev. #58 & 59. Added last step to Dev. 60.
3. 0200 - Powered up vehicle.
4. Complied w. E. Hamburger suggestions to modify a few steps & to rewrite TDR #5, item 8 to include both Batt leader line drops.
5. Wrote IC BUS ISOL Sequence (TDR item 9) & partial of 10.
6. RETEST (TDR #5) Nearly complete, except for RC application to get 4 battery currents (Bat 1-4).

LOG

Page No 73103

Engineer SARBELLO/HOMBURGER Project LM-5 Location PLT 5
 Time DAY SHIFT Title _____ Date 8/6/68

1. IN ORDER TO REMOVE PANEL #12 LAST NIGHT, DR 17 DISCONNECTED OUR JIG BOB.
2. LTS CONFIGURED TO SUPPORT OCP 61015 (EXCEPT S1 THRU S-10 ARE IN "OFF" POSITION ON LTS PANEL #1 - SW'S WILL BE THROWN "ON" AS REQUIRED IN OCP.
3. CONFIGURED REAL TIME RECORDING SYSTEM TO SUPPORT ECA #3 RETEST ON TDR #5. RTRS OPEN ITEM - TC WHEN READY TELL IRO OPERATOR TO HOOK-UP CHANNEL #1 TO BACK OF PVM (LEFT OFF INTENTIONALLY FROM PVM/DVM #2 - POSSIBLE NOISE SOURCE)
4. CDR NOTIFIED STE OF WARM WIRES OUTSIDE CABIN. INVESTIGATION SHOWED FWD PORT DOCKING LIGHT WIRES IN PLASTIC BAG WARM. CHECKING LIGHTING TEST SET REVEAL HOOK-UP ERROR ~~OF~~ (4 PAIRS OF DOCKING LIGHT WIRES PATCHED CORRECTLY TO SVDC TERMINAL POST. LAST PAIR ERRONEOUSLY HOOKED IN SVAC TERMINAL POSTS. NO DAMAGE TO WIRES DETECTED AND PROBLEM RECTIFIED BY TAGGING 5 PAIRS OF WIRES TO RELATED ~~TERMINAL~~ ^{TERMINAL} POSTS. ALSO FOUND FWD STBD EXTENSION LEAD OPEN CIRCUITED BY POOR CRIMP CONNECTIONS.

Docking light
hook-up error
8/7. No breaks or mud

5. Continued writing TDR #5 Continuation sheets

A. Hecht Night shift 8/6-7/68

1. TPS 35-1075 (PNL1 RETEST) CONTINUING TO COMPETE.
2. TECHS & IRO'S NOTIFIED TO STAND BY.
3. NOTIFIED STE OF EPS SCHED CHG FOR WED & THU & Marked on their sched. Wrote AVO to H. Friedman asking him to take care of S. Sarbello's 2 DNP & Sunday time cards.
4. 2200 - ED Warning LTS "Sys A Cable Cutter T" & "Sys B Q1 Stage Nut" were found ON. Reset using R080 per ED Seq: 10 (62000).
5. GSE wants c/o Controller PS#2 for calibration.
6. Start Run of TDR #5 at 0250.

Over Please.

LOG

Page No 73104

Engineer A. Hecht Project LM5 Location ACE 3
 Time Night shift Title _____ Date 8/7/68

Cont'd from prev. page

7. Found PS #3 Voltmeter on #2090 to be out of calibration (2 volt too high).

Get GSE to recalibrate PS #3 when the pull #2 for calib. tomorrow.

Better yet, calibrate all 4 P.S. - They are all off.
 8. Completed TDR #5 to step 12 incl.

Time 0719, Techs & QC had no breaks nor breakfast.

9. Day shift: add to TDR5 shd 14

all EPS CB openings now req'd ^{VEH}
 such as ECA'S & ECA Controls (A/S & D/S).

10. Also, on p.6, item 5, no reverse current malfunction indication was observed and no Bat 6 current was seen.

Please check sequence for possible error and if none, rerun to make certain that there is no fault.

E. HOMBURGER - DAY SHIFT -

8/7/68

- ① Regarding item 9 above - Pulled ASC & DES ECA & ECA CONTROL, and BAT FEED CB's on Pula 11 & 16
- ② Regarding item 10 above - checked configuration. Cabling from ECA 4 to BOB to Controller was still connected OK. Got no further with this problem.
- ③ Informed STE following CB's must be pulled open when installing Panel 12:
 On Panel 16: { (9) CB's under COMM
 { HTRS - S-BD ANT
 On Panel 11: { (6) CB's under COMM.
 { ACBUS A - TAPE RCDR & LTG-INTGL

LOG

Page No 73105

Engineer E. HOMBURGER Project LM 5 Location PLT 5
 Time DAY SHIFT Title — Date 8-7-68

(continued)

- ④ The decision was made to install an LCA type-4.
 A few changes required to OCP —
- x (a) Delete SEQ 071. George Sattani feels this does not prove enough to justify the extra mating of connectors.
 - x (b) Seq 072-006 s/s 02 Delete "and W3"
Delete "~~and~~ J1 and"
 - v (c) Seq 072-006 s/s 05 Delete DEVIATION #14. The LTS is to be disconnected and given to LM 6
 - x (d) Delete or modify Seq 073-005. 30-hr timing test is going on for Event Timer.
 - x (e) Delete Seq. 073-011 s/s 01. Don't pull Event Timer CB
- ⑤ Gave OK to Julie Merritt to pull out two P.S.'s from the Controller
- ⑥ I note that the final X-Lunar check, Seq 077, was not revised to the new procedure using the Fluke meter and Decode resistor as was done in Seq 38. Is it the intent to revise it or leave as is?
- ⊗ Note - LCA installation (w/o mating) completed at 16:00. Event Timer test will be completed at about 22:00. Team decided to do our OCP LCA-checkout after that.
- ⑦ Got involved with looking over the EPS IPC for 6/15. Noted that PVM connections to the Current Monitors (for Battery voltage readings on DVM) were deleted.
- ⑧ On LTS Panel 1, turned on DEPA Numerics switch to support the FCS operations.

LOG

Page N° 73106

Engineer A. Hecht Project LM5 Location ACE 3
 Time Night Shift 8pm - 8am Title — Date 8/7-8/68

1. Prepare to run 62000 LTG Sequences.
 Write Dev. 134 & 135
2. Waiting for Tech & QC coverage.
3. 0100: Ready to start running seq. 071.
 Nasa QC states there are 3 LCR's in existence
 constraining the Ltq sequences. Details are
 not known to the writer. He would not
 let us start.
4. 0415: After some detective work involving
 STE, LM5 program, Liaison, LM4 personnel, etc.,
 located LCR files in plt 39. Obtained keys
 & found LCR's 1694, 2529, & 2685 (filed prior to seq 071).
 These LCR's are related to docking lights only.
 They do not constrain running seq 71 to 75.
5. 0425: Called QC & Tech personnel to start run.
 0435: Started running step 071-000A (Mate LTS cable
 of to J1 of LCA).
6. Identification of LCA in LM5: LSC 390-9-3-4, S/N 117.
 (I understand this is an INTERIM installation & the test
 will be repeated with final LCA - 6. This info is not official.)
7. 0555 Got TDR # 30 (OCP does not account for
 2 NEW LTS lights which are "on".
8. NOTE: Portions of Seq 065 "FLOOD LIGHTS"
 HAVE NOT BEEN COMPLETED.
 Look into this.
9. 0625 Compl seq 071. Tech writer not avail to
 write deviations f. 071 - Will be done later.

over please.

LOG

Page No 73107

Engineer A. Hecht Project LM5 Location ACE 3
 Time Night Shift 8pm - 8pm Title — Date 8/7-8/68

(Contd fr. prev. sheet)

0710: Hold on step 072-006.

Cannot mate P1/J1 because insufficient vehicle cable slack. Issued

Cable No. 801,

053 loosened cable clamps ~~for temporary~~ ~~making~~, prior to getting sufficient slack (see crab)

0741: Floor replaced. Seq. 072 completed,

TDR #30 dispositioned & ready f. sell to Nasa.

S. SARBELLO
DAY SHIFT

8/8/68

1. LTG ON LINE RUNNING SEQ 71, PICKED UP TDR#30 (AGAINST LTS TWO NEW BLUE LIGHTS ADDED IN LSK560-1024-7 & NOT COVERED IN OCP). COMPLETED SEQ 71.
2. COMPLETED^{ED} SEQ'S 072, 073
3. RECEIVED TDR#~~30~~ 31 ON SEQ 074-⁰¹²~~012~~-04

4.
E. HOMBURGER - NIGHT - 8/8/68 - 8/9/68

1. Obtained 3 FLUKE meters and a new J167 -1126 BOB to work on measurements on TDR#3 Continuation sheet #26. The "new" -1126 BOB was rejected because of bad pins on PIRR # FV2801.
2. FLUKE #97894 is marginal on Battery check.

LOG

Page No 73108

Engineer A. HECHTProject LM5Location ACE 3Time Day ShiftTitle —Date 8-9-68 (Fri)

- ① 8³⁰am: A. Schneider wants us to issue PIRR's against 82090 PS #3 & others to have calibration checked. Asked time to get techs (R. Hachman) to generate PIRR's as I am too busy preparing for more TDR#3 exercises.
- ② 9³⁰am: R. Hachman cannot write PIRR without reference to a TDR indicating a defect. Qc will not buy w/o a TDR reference. We would have to run some steps on an open TDR.
- ③ Info. fr. R. Hachman:
 - Ⓐ ECC P.S. Voltmeters read voltage "Sensed", not the "local" voltage.
 - Ⓑ Examination of J167 Bob S/N 4 does not show a "4° bent pin", nor can "burned" pins be seen. There may have been dirt or discoloration which has wiped off the pins.
- ④ Due to absence of sufficient info on test reg'ts for continued run of TDR#3 (as determined at a meeting 8/8 between subsystem, Nasa & an EPS group representative), I met ~~again~~ with S. Feinberg to obtain necessary info.

⑤ CAUTION for entire weekend 8/10 & 11

Do NOT energize these CB's (due to wiring work being done):

PNL 16 RCS Sys B - Quads 1-4 TCA
INST - CWEA
ALL COMMUNICATION CB'S

PNL 11 RCS Sys A - Quads 1-4 TCA
INST - Sig Condr 1
ALL COMMUNICATIONS CB'S

over please

LOG

Page No 73109

Engineer A. HECHT Project LM5 Location ACE 3
 Time Day Shift Title — Date 8-9-68

(Contd. fr. prev. page.)

- (6) Advised P. Holmgren to charge Bat of (disch'd.) Fluke voltmeter
- (7) 4³⁰pm - Checked w. Don Fox to get Fluke meter leads if not already available.
- (8) 19¹⁵ - asked D. Fox to get 1213 BOB, 3287, 3279, 4356 & 4357 cables (for ~~the~~ SE BUS meas)
- (9) Transmittal of test reqmts (TDR 3) attached.

E. HOMBURGER

- NIGHT -

8/9-10/68

1. Prepared outline of steps to make measurements, and started writing continuation sheets under TDR # 3, at sheet # 29.
2. Instrumentation went off the line at 02:40, and EPS got the go-ahead. Started, at vehicle, with QC and techs, at 02:55.
3. Could not mate GSE cables to P and J 74A. GSE cable to J 74A too stiff to bend into position. This would probably be OK when panels are not in, but with panels, a 90° connector would be required. The GSE cable to P 74A would not mate because keyways did not align. Another GSE cable from stock was the same. The GSE support group should be informed of this.
4. Altered the tactics to use P 87 on panel 16 instead of P 74A. Started re-writing the continuation sheets - got half thru Sheet 30.
5. Got as far as mating P 87 (don't need J 87) to 1213 BOB. Intended to use HEATERS RCS SYS A/B-2 QUAD 2, pins P 87 N ⊕ and M ⊖
6. Vehicle powered down at 0735.

LOG

Page No 73110

Engineer S. SARBELLO Project LM-5 Location PLT 5
 Time DAY SHIFT Title _____ Date 8/10/68

1. ASSIGNED STE DUTY FOR ACE 3 STATION FOR TODAY
NO TURNOVER REQUIRED FOR TONIGHT. NO COVERAGE OR
SUPPORT REQUIRED FOR BOTH SHIFTS ON 8/11/68
2. WROTE POST TEST DEVIATIONS #137 THRU #145
(STANDARDIZATION OF SEQ'S #055 THRU #058,
BAT 1 THRU BAT 4 REVERSE CURRENT TESTS).
3. NASA'S JOHN HAWK TOO BUSY TO SIGN DEVIATIONS
SO HAVE TOM MARTIN SIGN THEM MONDAY.
4. TDR #31 CONTINUATION SHEETS HAVE LOCATED
INTEGRAL LIGHTING SHORT IN PANEL #2'S P804,
PINS #1 & #2 (1/2 INCH FROM CONNECTOR - SHORT
LOCATED BY REFLECTOMETER).

Entomberger / Attecht Day Shift 8/12/68

- ① Ran TDR 3 shifts 29 thru 36 (Line drop data)
- ② TDR #3 still requires:
 - Ⓐ P/J 105 Bob removal & Conn remate
 - Ⓐ P/J 87 Bob removal & Conn remate
 - Ⓐ On pul 16, pull "HTRS, RCS Sys A/B, Quad 2"
 - ~~pull "ASC ECA CONT CB"~~
 - Ⓑ On pul 11, pull "DES ECA CB"
- ③ Non word via bat 5 NF.

LOG

Page No 73111

Engineer S. SARBELLO Project LM-5 Location PLT 5
 Time NIGHT SHIFT Title _____ Date 8/12-13/68

1. ~~CON~~ RECONNECTED P/J 105 & P/J 87 ON TDR #3 SHEET 30.
2. RECONFIGURED ALL CB'S TO CLOSE POSITION THAT WERE CLOSED LAST FRIDAY NIGHT (8/9-10/68) IN SUPPORT OF INSTRUMENTATION TESTING (SEE TDR #3 SHEET #38).
3. CRT ~~2~~ CABIN VOLTMETER AND CAUTION/WARNING LIGHT "DC BUS" ~~SHOW~~ SHOW SYSTEM ENGINEERS' BUS OFF. A CHECK AT GPS STATION (S.E. POS) AND AT 1113 BOB SHOW DC ON S.E. BUS. PROBLEM LOOKS LIKE AN OPEN CIRCUIT IN THE INSTRUMENTATION AREA.
4. EPS SUPPORTING COMMUNICATIONS & INSTRUMENTATION TESTING. LIGHTING GROUP TO GO ON LINE AT 0400.
5. LIGHTING GROUP RAN SEQ. 075 AND PICKED UP TDR #32. ~~GRP~~ LTG THEN CHECKED OUT TEMPORARILY INSTALLED DOCKING LIGHTS USING TDR #31 CONTINUATION SHEETS. DOCKING LIGHTS CHECKED OK.

A. Hecht / E. Homburger Day Shift 8/13/68

① *TURNOVER MTG:*

ROSS FLEISSIG REQUESTED TO FIND OUT DETAILS OF WHEN DOCKING LTS CHECK W LCA (DEVIATED OUT OF 62000) WILL BE DONE. APPARENTLY, DOCK'G LTS WILL NOT BE INSTALLED IN OCP 61015.

② *Reply: Docking LTS have been TEMPORARILY installed, and will be checked in 61015 as such.*

③ *Found Bat 5 & 6 Negative Leads loose at Bat 5 & 6 Dummy Bat Studs. Also loose at Current Mon #5 & 6. S/B tightened when veh. is powered down. (61015 prep has crab about this which req's selling).*

over please.

LOG

Page **Nº 73112**

Engineer A.H. & E.H. Project LM5 Location ACE3
 Time Day Shift (contd) Title — Date 8-13-68

④ We reviewed data summary (in note book) & question results: "What is common between Bat 6NF & Bat 6BU which results in 3.75 to 5.4mΩ greater res than res. of Bat 5NF & 5BU lines?"

Can loose Return connections at bat 6 Studs be responsible?

This should be looked into if window is available. Suggest measmts before & after tightening.

S. SARBELLO
NIGHT SHIFT

8/13-14/68

1. WROTE STEPS REQUIRED TO TIGHTEN BATTERY #5 & #6 WITH EPS POWER IN SUPPORTING MODE. WAITING TO GO ON LINE. INSTRUMENTATION REPAIRING OPEN CIRCUIT (CONNECTOR P186B PIN 14)
2. SUPPORTING 063 ON OCP 61015
3. INSTRUMENTATION REPAIRED CONNECTOR - CRT PAGE 4 LINE 10 (GLO302) OK. ^{INSTR.} COMPLETED WORK AT 0430.
4. 053 CAUSED SCRUB OF BATTERY #5 & #6 STUD TIGHTENING ACTIVITY - NO TIE IN ~~AT~~ DURING SHIFT CHANGE OF INFO AND GATHERED EQUIPMENT & HARDWARE.
5. LTG GROUP TROUBLESHOOTING ALL NIGHT ON TOR #32

Example, these pages of Rose Flanagan & J. Kipling: "Batteries were a black art."

LOG

Page N° 73113

Engineer E. Hamburger/A. Hecht Project LM5 Location ACE 3
 Time Day Shift Title _____ Date 8-14-68

- ① Attempted to T/S TDR#3 further. Got shut off because G#N are running. Standing by for G#N completion.
- ② Completed TDR#3 continuation sheets 39 thru 42

S. SARBELLO
NIGHT SHIFT

8/14-15/68

1. COMPLETED RERUN SEQ 065 (FLOOD LTG) VIA DEVIATION #147. TEST CHECKOUT GOOD
2. RAN CONFIDENCE CHECK ON DOCKING (SEQ 076) & NUMERICS (SEQ 073) VIA TDR#32 WITH LCA PI/JI MATED. AC & DC OUTPUTS OK. TDR#32 TO BE SOLD TODAY 8/15/68 BY BILL SEID. ALL TESTS CHECK ~~GOOD~~ GOOD.
3. WROTE & RAN DR#13 SEQ'S #243L THRU #243X CHECKING OUT MASTER ALARM INHIBIT CIRCUIT RESPONSES TO PANEL#14 INVERTER SWITCH FUNCTIONS. ALL TESTS CHECKED GOOD - NO MASTER ALARM ACTUATIONS.
4. ~~POWERED~~ ^{LEFT GSE} AC PWR OFF VEHICLE AND POWERED DOWN D.C. ~~82090~~ ⁸²⁰⁴⁰ POWER SUPPLIES. POWERED UP VIA ~~82040~~ TO CONFIGURE VEHICLE & GSE FOR STARTING SEQ 77 (X-LUNAR BUS ISOLATION CHECK), CONFIGURED VIA DEVIATION #69, 62000-CON-LM5.
5. RECEIVED TDR#33 AT SEQ 077-020-03
6. 0600 - STARTED TROUBLESHOOTING TDR#33.
7. GET DEVIATION #148 SIGNED OFF BY RASPO.

LOG

Page No 73114

Engineer Hombarger/Hecht Project LM5 Location ACE3
 Time Day Shift Title _____ Date 8-15-68

- ① Continued T/S on TDR # 33. Had to power up for other subsystems testing after lunch. TDR # 33 in hold.
- ② Notified by K. Leuchter that PSAPM connector opened by EPS Seq 77 (X-Lunar Bus Isol.) MUST BE CLOSED prior to Monday Morning for their test.
3. Had J722 to PTMU re-mated. Note - OCP Seq. 077 calls for P722 going into the EMI box to be de-mated for the test. Waiting for window to try this.
4. Powered-down via TDR # 33 continuation sheet so that STE could then power-up via 70010 to give power to other systems.
5. Data taken yesterday on Ascent ECA's indicate high resistance inside ECA #4 between terminals 4 and 2. (TDR Sheets 39 thru 42)
6. Try to complete TDR # 33 as follows:
 - (a) Demate proper P 722 conn & do not exceed 1 hr max time.
 - (b) If not successful, try demating vehicle side of Lut Interface Bob (at P92). (we heard rumors of sensing leads in Bob which are not shown on our schematic).
 - (c) If this is successful, complete the seq (077).
7. If time permits (write on TDR # 3) remove all potting on ECA #4 (Bat 6) terminals #1, 2 & 4 in preparation for testing tomorrow.
 Note: latest TDR # 3 & #33 sheets are in our black notebook.
8. Continued on TDR # 33, page 4 at 6²⁰pm after RCS completed. Stopped at 077-012.
9. Established that info on J722 remate (received fr. Lo Cassio) was wrong. Joe Palazzo, QC had verified last night that P722 was

LOG

Page No 73115

Engineer S. SARBELLO Project LM-5 Location ACE 3
 Time NIGHT SHIFT Title _____ Date 8/15-16/68

1. RERUN OF SEQ 077-000 ~~077-000~~ TO SEQ ⁰⁷⁷⁻020-03
 STILL SHOW 1.5 TO 2.0 OHMS BETWEEN X-LUNAR
 & D-BUSSES AFTER LUT/CSM BOB LSK560-1120
 WAS DEMATED FROM VEHICLE J92
2. HECHT'S REQUEST TO DEMATE ALL X-LUNAR RELATED
 CONNECTORS IN PANEL #11 & #16 WAS REJECTED
 BY JERRY GOLDMACHER. LM-5 VEH. MGR TO GIVE
 FURTHER DIRECTION.
3. REMATED PTMU P722 TO J101 EMI BOX AND
 TMA MODE SW "ON". ALSO REMOVED 28VDC PWR
 FROM LM/CSM BOB 1119 AND PULL "CSM/PYRO PWR"
 CB ON 81060.
4. SOLD TDR #32.
5. ECA #4, TERMINALS 1, 2 & 4 HAVE POTTING COMPOUND
 REMOVED (BY DRY PICKING METHOD)
6. STE HAS SHUT DOWN VGPS 82140 VIA OCP 70010.

A. Hecht/E. Hamburger LM5 Dayshift 8/16/68

- ① Ran TDR #33 steps 22 thru 25 which prove that
 lack of isolation stems from 1 of 4 equipments
 presently removed from vehicle: IMV, PTA, RREA & RRAA.
 Reading was 300 Ω / 250 Ω .
 Got PTMU Alarm when completed. Called STO who said
 that alarm was reset & no alarm condition exists.
- ② Informed STE that EPS shall be notified when
 each of above boxes is installed, so that
 further checks can be made then.
- ③ 1820: E. Daws's son Jimmy was notified that Ed
 is not expected to work on Sundays.
- ②A Ran TDR33, steps 26 - 32.

LOG

Page No 73116

Engineer S. SARBELLO Project LM-5 Location ACE-3
 Time NIGHT SHIFT Title _____ Date 8/16-17/68

1. HOMBURGER VERIFIED IMU INSTALLATION NOT THE CAUSE OF ISOLATION PROBLEM.
2. TONIGHT PTA UNIT ^{WAS} ~~IS~~ INSTALLED - ALSO NOT THE CAUSE OF ISOLATION PROBLEM. ISOLATION OK (300- Ω) TO DATE. RREA & RRAA STILL OPEN ITEMS TO BE REINSTALLED & EVALUATED.
3. RAN TDR#33 TO STEP #49. ALSO RECONNECTED P722 & PSAAM.
4. TOOK BIDDLE-DUCTER READINGS AND TORQUE MEASUREMENTS ON TDR#3 (STEPS #227 THRU #232). CONFIRMED HIGH Ω READING BETWEEN ECA 4-4 & 4-2. REMOVED ALL MOUNTING HARDWARE AFTER TORQUE MEASUREMENT SHOWN TO BE WITHIN SPECIFIED TOLERANCES (60"/LBS ± 5). HARDWARE & PHENOLIC COVERS HELD BY FRANK DAMIS, DEPT 053. RECOMMEND CLEAN ALL HARDWARE OF POTTING COMPOUND AND OXIDATION THEN REASSEMBLE AND RECHECKED BY BIDDLE-DUCTER. THE COMPOSITE DATA IS AS FOLLOWS:

FLUKE METHOD

<u>ECA #3</u>	<u>ECA #4</u>
TERM 4-2 = .36 M Ω	5.10 M Ω
TERM 4-1 = .48 M Ω	5.14 M Ω

BIDDLE-DUCTER

<u>ECA #4</u>
6.8 M M Ω
8.5 M Ω

LOG

Page No 73117

Engineer DOWSE/SARBELLO Project LM-5 Location ACE 3
 Time DAY SHIFT Title _____ Date 8/19/68

1. COMPLETED SEQ 077 (X-LUNAR BUS ISOLATION TEST) LESS RREA & RRAS. ISOLATION TEST TO BE ~~REP~~ REPERFORMED AT A LATER DATE WHEN ABOVE MENTIONED UNITS ARE INSTALLED. TDR # 33 TO REMAIN OPEN TILL THEN.
2. PREPARATION WITH DEPT'S 053 & 063 IN WORK IN RELATION TO REASSEMBLING ECA #4 HARDWARE. TDR #3 TO BE USED TO REASSEMBLE, TORQUE AND BIDDLE-DUCTER TESTING.
3. AFTER ACTIVATION OF THE CIRCUIT MONITOR MODULES THE SYS A CABLE CUTTER T (RED) LIGHT CAME ON (3A5A2)
 RESET AT 232 : 19.37.01 BY INSERTING
 IN R-START 080 0001 XEQ & VERIFIED
 0000 XEQ & VERIFIED.
4. RAN SEQUENCES # 233 THRU # 238 ON TDR #3 AFTER ECA 4-4, 4-2 & 4-1 TERMINALS WERE CLEANED OF POTTING MATERIAL & DEGREASED. BIDDLE-DUCTER RETEST WAS VERY FAVORABLE. FINAL RESULTS TO BE EVALUATED DURING RERUN OF SEQUENCES RELATED TO TDR #3, #4, #5 & #6.

A. Hecht Night Shift

8/19/68 to 8/20/68

- ① 2304: Observed SYS A CABLE CUTTER T (RED) ED 2T on 3A5A2 was ON. Reset as above, except 2nd step was 0000 XEQ & verified.
- ② 0145: Same observation & action as item #1.
- ③ GEN running or T/S all night. No EPS activity on vehicle.
- ④ Note to Day crew: Dev. # 137 thru 145, written 8/10, are still in black notebook. They require Sig & incorporation into OEP.

LOG

Page No 73118

Engineer DOWSE/SARBELLO

Project LM-5

Location ACE3

Time DAY

Title

Date 8/20/68

1. IT WAS DETERMINED THIS MORNING BY DON DIMARTINO THAT THE RETEST OF THE NEW "-7 LCA" WILL BE PERFORMED AFTER PANEL #2 HAS BEEN REPAIRED.
2. SET UP THERMAL COUPLES TO MONITOR ASCENT ECA'S TEMPERATURE. (THE GLYCOL LOOPS ARE DOWN). TEMPERATURE IS NOT TO EXCEED 115 °F.
3. CONFIGURING TO RUN PORTIONS OF OCP 62000ERS ON TDR #3 CONTINUATION SHEET IN ORDER TO SELL TDR'S #3, 4, 5 & 6

⑥ THE DESCENT STAGES DEMAND

- ⑦ CONNECT^{BOB} (MAY BE ALREADY CONNECTED) TO J174 OF ASCENT STAGE TO MONITOR THE FOLLOWING POINTS IN PARALLEL WITH THE MODIFIED J167 BOB (LSK 560-1126-3-5) & THE MODIFIED J166 BOB (LSK 560-1113-7)
- (+) J POINTS AND (-) Z POINTS, INSTEAD OF THE CDR POS + NEG AND THE SE POS + NEG POINTS;

J174 PIN 239 - TO PNL 11 NEG VIA THE X-LUNAR BUS

J174 PIN 240 + TO PNL 11 POS VIA 4CB 10 DES ECA CB

J173 PIN 109 - TO PNL 16 NEG VIA THE X-LUNAR BUS

J173 PIN 108 + TO PNL 16 POS VIA 4CB 11 DES ECA CB

PICK PORTIONS OF THE OCP AND INTER LEAVE READINGS OF THESE POINTS BY MEANS OF THE TDR CONTINUATION SHEETS.

LOG

Page No: 73119

Engineer A. Hecht Project LM5 Location ACE 3
 Time Night shift Title --- Date 8/20-21/68

- ① Awaiting availability of Techs & QC acceptance of -1113-7 POWER BOB.
- ② 0100: Techs & Bobs available. Installing J166 & J167 PWR BOB & J173 & J174 BOBS for Monitoring, (TDR#3, sheets 44 & 45.
- ③ 0400 - Start power-up per TDR3 sheet 46. ECS cooling is back on line, maintaining interface of about 60°F.
- ④ Asked IRO to take only periodic checks (approx 1hr apart). He is not req'd to remain on station. His reports were approx. 60 to 65°F.
- ⑤ 0500: Hold - Bat 6 NF does not come on. Found open CB's on Curr Mon #6. Continue on TDR#3, sheet 47.
- ⑥ 0745: Completed up to TDR#3, p. 49, item 254 inclusive. (OCP Seq 008 is complete)
- ⑦ Continue w. OCP Seq. 009 as above.
- ⑧ 053 HAS ALERTED EPS GROUP THAT DOCKING ~~HEATER~~ WINDOW HEATER WIRING WAS BROKEN AND REQUESTED THE EPS TEST SEQUENCE THAT WILL RECHECK THE WIRING.

DOWSE/SARBELLO
DAY SHIFT

255

8/21/68

OCP-62000-EPS

AND

1. RAN ALL NECESSARY STEPS FROM SEQ 008, 009 VIA TDR#3, SEQ # (239) THRU #269. TEST DATA WAS SATISFACTORY TO CLOSE OUT TDR #3, 4, 5 & 6.

2. SOLD OFF POST TEST DEVIATIONS #138 THRU #145

3. DOCKING WINDOW HTR (PIRR # G4940) ~~RECHECK~~ TEST TO BE PERFORMED ON TDR#33 WHEN POWER (DC) IS ON THE VEHICLE. TDR#33 WILL REQUIRE A SEPARATE HEADING "DOCKING WINDOW HTR RETEST, REF. ..."

LOG

Page No 73120

Engineer DOWSE/SARBELLO Project LM-5 Location ACE 3
 Time DAY SHIFT Title _____ Date 8/21/68

3. (CONT.) SEQ 040-002 (QUIET VEHICLE), 040-003, 005 + 006. USE EXTERNAL 0-5AMPS DC METER ACROSS APPROPRIATE PWR BOB'S + DC CIRCUIT BREAKER FOR CURRENT READINGS BEFORE & AFTER 4CB129 IS ACTIVATED. USE THIS METHOD IN LIEU OF SEQ 040-004.

4. PROCESSED DR-18 ((SYS. ENG. BUS (GC0302) CRT PAGE 4 LINE 10 READ 0.16VDC S/B 26.5/32.5VDC)).

Heating wire for docking window, and a polarity reversal

A. Hecht Night Shift 12M to 8am 8/22/68

1. Ran Docking Window Htr Verification (Ref PIRR §4940) on TDR# 33, page 9. Completed 0230.
2. While doing ①, burned hole into J167 Bob case by large wire lug shorting "GSEA" to Bob case. See TDR #33, page 9, note 1 for PIRR & details. No functional damage was done to BOB.
3. While doing ①, observed that on J167 PWR BOB the polarity of "GSEA" & "VEH A" was reversed. See TDR #33, page 9, note 2 for PIRR & details.
4. 0345: Completed writing of PIRR'S for items ② & ③. Relieving STE during his lunch break.
5. Completed reference hookup sketch, TDR# 3, p. 52.
6. Open item on TDR# 3: ① Remove Bobs at J173 & 174
 ② verify/perform PVM leads to J166 & 167 Bobs are restored to IPC configuration.
7. If possible, replace J167 Bob to have S/N 2 repaired per PIRR'S §5024 & §5025 (Items 2 & 3 above)

LOG

Page No 73121

Engineer DOWSE & SARBELLO Project LM-5 Location ACE-3
 Time DAY SHIFT Title Date 8/2

1. SOLD DR# 18 TO NASA.
2. SOLD TDR # 3, 4, 5 & 6 TO NASA, (ALSO DEV. # 151 THRU 154)
3. REPORTED WATER/GLYCOL LEAK ON VEHICLE. ^{GLYCOL} DAMAGE TO EPS CONNECTORS J173 & 174 BEING EVALUATED BY DOWSE.
- "ROUGH DRAFT"
4. NIGHT SHIFT - START A TPER BOOK - ENCLOSED IN LOG BOOK ARE THE TIME HISTORY EVENTS UP TO 7/4/68. CONTINUE TIME HISTORY USING QC OCP, LOG BOOK, MASTER RUN OCP BOOK AND TDR BOOK.
5. VEHICLE WAS POWERED DOWN APPROXIMATELY NOON TIME. NO POWERING REQUIREMENTS FOR TONIGHT.

A. Hecht Night shift 8pm to 4am 8/22-23/68

- ① No vehicle activity involving power on vehicle.
- ② Did not continue TPER time history data, since after 7/3/68 there was mostly scattered TDR work during selected "windows" for which we have no record of the hours.
 - Ⓐ Should TDR's be accounted for?
 - Ⓑ Is it worthwhile to just list TDR NOS & the dates on which work was performed on them, without mentioning the hours?
 - Ⓒ Require direction before proceeding.

LOG

Page No 73122

Engineer E. Homburger Project LM5 Location PLT 5
 Time 4-12 PM Title _____ Date 9-12-68

On TPS 35-62000-08 (Upper Bus/Feeder Reassembly)
 Generated Mode 1 & 2
 Powered up vehicle, per TPS and Mode.

A. Hecht 12 Midnight to Dawn 9-13-68

- ① Comm operating on "Low Bit Rate" - Holding for proper CRT displays (incl Bat 5 & 6 Status).
- ② Wrote TPS Mod 3 to overcome lack of CRT readouts due to "Low bit rate". Also made TPS corrections on Mod 3 (in some steps changed erroneously made earlier changes back to proper entry (eg: 24 VDC to 30 VDC)).
- ③ Completed actual TPS run at 0400. Wrote mod # 3 & obtained sig's & stamps.
- ④ 0640 - TPS 35-62000-08 completely stamped out.
- ⑤ Info on PNL 1 C/W light problem: Suspect open ckt at or near P/J 1400 pin 49 (PNL 3). T/Shly is req'd during day shift to localize fault.
- ⑥ Feeder Line check TPS Results:

Bat 6 NF	to	CDR BUS:	8.5 Milli Ω
Bat 5 BU	to	CDR BUS:	9.6 " "
Bat 5 NF	to	SE BUS:	9.6 " "
Bat 6 BU	to	SE BUS:	9.7 " "

- ⑦ Power Status: ① Bat 6 BU to SE BUS powers busses
- ② VGPS supplies Bat 6 power with VGPS output Sw in "ASCENDING"

LOG

Page No 58577

Engineer E. DOWSE Project LM-5 Location PLT 5
 Time 1912 Title EPS Date 9-18-68

CONTINUED FROM PREVIOUS PAGE.

FIRST CONNECT JUMPER FROM J174-218 TO J174-138
 BOB ARE NOW CONNECTED.

SET ALL LM POWER OFF PERL 70010 VIA STE.

ALSO CONNECT JUMPER FROM J173 PIN 109 TO J174 PIN 239

- ② PORTABLE PS 30V 10 AMP WITH CURRENT
 LIMITING FEATURE IS SET UP FOR 2 AMPS AT

PRESENT SET TO 10 AMPS FOR THIS TEST

- ②A IN CABIN CLOSE BOTH X-LUNAR BUSTIC CB'S & BOTH CROSS TIE
 BALANCED LOAD CB'S.

- ③ THE CLAROSTAT 240C'S (FOUR) ARE ON THE
 WORK STAND.

- ④ THE LSK 417-1900-5 (THREE)
 & LSK 417-1900-7 (FOUR)

ARE ON HAND ASK OBS

- ⑤ HOOK UP AS PER FIGURE 2-1 OF 62000 EPS
 PAGE 2-153 INCLUDING RESISTANCE VALUES.

(POWER SUPPLY AND MEASURING METERS MUST BE FLOATING)

- ⑥ CLOSE FOLLOWING SWITCHES.

J10 - 11

J10 - 14

J10 - 19

J10 - 15

J10 - 7

J10 - 17

J10 - 18

NOTE CONNECT PS (+) TO GSE (+)

" PS (-) TO GSE (-) & CLOSE BOTH

10 AMP CB'S

- ⑦ GET VOLTAGE DROP INFORMATION WHILE
 MONITORING BOTH W/CSM INPUT VOLTAGES AND
 BUS VOLTAGES SIMULTANEOUSLY (SET PS AT 25.0VDC)

- ⑧ CLOSE FOLLOWING SWITCHES.

J9 - 15

J9 - 19

J9 - 11

J9 - 14

J9 - 8

J9 - 17

J9 - 7

AGAIN DO DROP

- ⑨ OPEN UP STEP ⑥ SWITCHES.

AGAIN DO DROP WHEN SWIT DOWN

LOG

Page No 58578

Engineer S. SARBELLO Project LM-5 Location PLT 5
Time 3 AM Title EPS Date 9-18/19-68

- (1) PERFORMED LM/CSM LOAD TEST (TDR#33, STEPS #139) THRU COMPLETION (STEP#162). TEST MADE POSSIBLE BY TAKING ADVANTAGE OF TIME REQUIRED FOR STE TO MAKE A TPS TO DEMATE ALL GSE EQUIPMENT
- (2) SUPPORTED STE IN RELATION TO EPS GSE DEMATES

LM/
Command-Service
Module load simulation,
10 minutes for
Lunar Mission

LOG

Page No 58579

Engineer DOWSE/SARBELLO/HECHT Project LM-5 Location PLT 5
 Time 7:48 AM Title _____ Date OCT 3 1968

1. 1300: Started TPS 35-955, Partial pul II Retest.
- 1355: Power applied to Busses.
- 1455: Holding at item 22 for com "LOW BIT" operation to conclude.
- 1545: Holding ~~items~~ item 37 for INSTRUMENTATION to run and remate P/J 173 & 174,
- 1745: Resume item 37
- 2000: Hold at Step 50.
 Appear to have wrong GSE cable. Checking

In call for AOT: Stan Benson (or his rep)
 X 86497 (or ACE 1 or 2)
 for X-Lunar: William Scanlon
 Jim Klenko

NIGHT SHIFT E. HOMBERGER

10/3-10/4/68

- 1020 CDR reports that { P/J 10 is demated in cabin
 P/J 9 " mated.
- 0320 Completed thru item 69, pg 20 of TPS.
 Stalled at item 72, pg. 21 -
 CRT showed |||||. Reason - no DUA on vehicle.
- 0330 Item 78 interfered with COMM test, so I dropped the Tape Recorder test. I reasoned that this could be done later with the Up Data Link test.
 Could not get AC Electronics coverage for the AOT test - they were running on LM4.
 Ran TPS Mod 3 thru the mill to get going on the X-LUNAR test.
 Stopped at 107.3.02. PTMU blew 2 fuses.

Summation: Not Done - Items 70 thru 106, and 107.3.02 ^{#up}

LOG

Page N° 58580

Engineer DOWSE/SARBELLO Project LM-5 Location ACE 3
 Time 7:48 AM Title _____ Date OCT. 4, 1968

1. 3PM - COMPLETED ALL TESTS EXCEPT ~~UP~~ DATA LINK CB TEST (ON PAGE # 21) OF TPS 35-955. DUA UNIT PROMISED TONIGHT.
2. RECEIVED TDR #1 AGAINST "TAPE RECORDER CB TEST"
3. WROTE MOD #4 AGAINST TPS 35-955.
4. WROTE TPS FOR PANEL 5 REMOVAL.
 WALTER SCHLATER HAS ORIGINAL & WILL GIVE IT TO STE WHEN IT IS SIGNED. TPS #35-964

E. HOMBURGER NIGHT SHIFT 10/4-10/5/68

1. Ran steps 1 thru 8 on TDR #1, repeating the Tape Recorder sequence.
 NG - The Tape Recorder TB remained BP. LMP reported that it never budged.
2. Looked at Level III dugs and concluded that COMM-DISP CB should be closed, to activate the flag.
3. Ran TDR steps 9 thru 14, and the flag worked OK - it remained gray for $2\frac{1}{4}$ minutes, 04:30
4. Info on LM 6 X-LUNAR -
 - (a) Isolation NG with VGPS power - better with portable PS
 - (b) Rndy Radar lowered isolation resistance.
 - (c) Looking into Percent ECA's : 00 on both ECA's with one polarity of meter; 15K on one ECA and 20K on the other ECA with opposite meter polarity.

LOG

Page N^o 58581

Engineer S. SARBELLO

Project LM - 5

Location ACE 3

Time 7:48 AM

Title

Date 10/5

1. COMPLETED SIGN-OFFS OF DEV'S # 22 THRU # 31 ON OCP 70010 REQUIRED TO PERFORM TPS 35-955
2. COMPLETED SHT #2 TO TDR #1 OF TPS 35-955. CANNOT LOCATE ~~SHT~~ SHT #1 ORIGINAL OR MOD #4. LEFT TIE-IN AND TDR #1 SHTS # 2 + #3 IN TPER BOOK.
3. PANEL #5 REMOVED FROM VEHICLE.
4. PANEL #1, 2 + 3 RETEST TO START AFTER PANEL #5 IS REINSTALLED - PANEL #1, 2 + 3 RETEST SCRUBBED FOR TODAY
5. EPS COVERAGE REQUIRED TONIGHT - NO EPS COVERAGE ^{FOR} SUNDAY REQUIRED.
6. GENERATED TPS 35-965 PER BOB LONGINOTTI'S REQUEST. MONDAY - GIVE BOB + ED DOWSE COPY OF TPS (ENCLOSED).
7. ~~LOCATED~~ REPRODUCED A COPY OF TPS 35-955 MOD # 4 FROM I.C.D. GROUP. ADD IT TO THE RUN COPY IN TPER BOOK ON DOWSE'S DESK.

A. Hecht Night shift 8pm - 8am 10/5-6/68

- ① Updated my Bob cable list to Rev. B, using copy of rev. B obtained fr. S. Sarbello (could have saved time if extra copy had been run off).
- ② After midnite, the only activity was COMM T/Shitg.
- ③ No problems encountered.

Alt.

LOG

Page N^o 58582

Engineer E. DOWSE / E. HOMBURGER Project LM 5 Location PLT 5
 Time DAY SHIFT Title _____ Date 10-7-68

1. Vehicle powered up via 70010 at approximately 0925.
2. Ran Seq. 2 of TPS 35-752 (PUL 1, 2, 3 RETEST) in AM.
3. During Seq. 7 (Lactam Section of TPS) the GND PWR INTERLOCK -81001 kicked out twice: at 12:01, first. Vehicle soon was powered up, then at 12:57 kicked out again. Investigated GSE with Ed Ameridge on TDR #1 continuation sheet: checked Interlock drop-out voltage. This was $20\frac{1}{2}$ volts - OK. Powered up again, and is holding OK as of several hours later. Trouble & unknown.
4. Ran Mod. 4 to the TPS thru the mill.
5. Power kicked out again at 19:09.
6. TDR #3 was just received - on X-PTR Scale Factor light.

Again, Fleisig's rule
 that variations and
 LM electrical work
 "a black art."
 See 10/12/68 - CRF
 10/16/68

A. Hecht Night shift 8pm-8am 10/7-8/68

1. Day Shift: Complete disposition & signatures on TDR #1 to TPS 35-955. This can then be closed out by QC.
2. No power trip-outs occurred during this shift.

E. DOWSE / E. HOMBURGER.

10-8-68

1. TDR #1 of TPS 35-955 IS NOW SIGNED BY NASA AND STAMPED OFF BY GRUMMAN QC. ONLY NASA QC STAMP OFF IS NOW REQUIRED.
2. Ran pg. 3 of TDR #3 on "X10" light. The question now is whether to denate P/J 57 or 58 to trouble-shoot further. ACCORDING TO FRED PATTISCH, TEST ENGINEERING, P/J 58 VS P/J 57 DENATE INVESTIGATION IT IS MORE DESIRABLE TO DENATE P/J 58 AS IT IS ALMOST ENTIRELY ~~RETESTED~~ RETESTED BY MM1 OF 61015. (HOWEVER PANEL 3 MUST BE PHYSICALLY LIFTED TO GET AT THIS ~~CONNECTION~~ ERROR)
3. GSE Support (Ed Ameridge) would like to replace our Interlock -81001 with the one from LM 4 in the EMI Room. Contact Frank Otten, if there should be a window tonight.

LOG

Page No 58583

Engineer A. Hecht Project LM-5 Location ACE 3
 Time 8pm - 8am Title _____ Date 10-9-68

1. Re 81001 interlock: Stan Baron does not have info on replacing LMS box by LM4 box. He would prefer to wait, if no problem, until he can establish the reason for the switch. Also there was no window.

DOWSE/HOMBURGER/SARBELLO
 8AM - 8PM

ACE 3
 10-9-68

1. TPS 35-965 (DOCKING LIGHTS, FWD) ARE REMOVED. THERMAL BLANKET BEING INSTALLED.
2. SOLD TDR #31, 62000 EPS
3. WROTE WITH D. STERN ED GROUP THE RETEST TO SELL TDR #1 OF TPS 35-753.
4. 62000 EPS TPER & TPS 35-955 TPER IN WORK

A. Hecht Night shift 8pm to 8am 10/9-10/68

1. Continued T/S on TDR 3 (TPS 35-752), slits 4, 5 & 6.
2. Could not demate P/J 58 as noted on top of p. 5 of TDR. Demated P/J 57 (PNL 2) instead.
3. Incidental discovery: found ac return path from X-PNTR grounded to X-PNTR case (per test & level 3 dwg) at J1-8.
4. Found open circuit in panel 2 in segment between P57, pin 21 and 9K30B point 6 (Ref: TDR items 42-48). Day crew should get C99 to first check wire to pin 21 of P57 for break before pulling panel 2.
5. Left Bobs at P/J 57 & ~~J~~ J 56 connected. FCS (Tom Woods) requested we keep them there for FCS use.
6. Special 400 HZ power cable also still on workstand.
7. FCS found CKts flipped (crossed) ~~between~~ AC BUS A - RNG/RNG RATE & CDE FDAI CB's.

LOG

Page N° 58585

Engineer S. SARBELLO Project LM-5 Location ACE 3
 Time 8PM-8AM Title _____ Date 10/10-11/68

1. PERFORMED SEQUENCES 66 THRU 77 ON TPS 35-752 TDR#4 VERIFYING COPPER PATHS OF "AC BUS A - FDA1" (4CB209) & "AC BUS A - RNG/RNG RT, ALT/ALT RT" (4CB204)
2. 1AM - WAITING FOR J57 TO BE REPAIRED & POTTED GSE ALL CONFIGURED (LESS MATING OF J57) TO CHECK J57 PIN 21 REPAIR.
3. 4:15AM - COMPLETED VERIFICATION OF J57 PIN 21 REPAIR ON TPS 35-752 TDR #3 SEQUENCES 59 THRU 69. POWERED UP & DOWN PER 70010.
4. VEHICLE CONNECTORS P/J60 & P/J57 REMATED
5. 4:30AM - TDR#4, SEQ 78 WRITTEN TO INSTALL PANEL #1.
6. 7:30AM - PANEL #1 INSTALLATION COMPLETED HOWEVER ROSS FLEISIG DOESN'T WANT ANY POWER ON VEHICLE UNTIL THEY (FLEISIG, CANGELOSI ETC.) DETERMINE WHAT CAUSED THE RNG/RNG RT, ALT/ALT RT METER DAMAGE & AVOID A RE^{OC}CURRENCE.
7. VERIFICATION OF P/J60 H, J, I & T IS OUTSTANDING & WILL ENTAIL (AFTER POWERING UP) A TRANS-LUNAR ISOLATION TEST

E. DOWSE / HECHT / HOMBURGER 10-11-68 DAYS

1. PERFORMED SEQUENCE 2 OF TPS 35-752
2. HECHT WORKING ON TDR #4 X-LUNAR P/J60 RETEST WHICH WILL BE PERFORMED ~~MONDAY~~ SUNDAY
3. SAL TONIGHT BIDDLE DUCTOR THE +Y STRUT END TO A GOOD VEHICLE GROUND STRUCTURE POINT AND WRITE A PROCEDURE TO RE DO SEQ 35 OF 62000 ALSO TO BE PERFORMED SUNDAY

LOG

Page N^o 58586

Engineer E. DOWSE Project LM Location _____
 Time 8 AM TO 8 PM Title _____ Date 10-11-68

4. SAC VERIFY IR SN 42 1213-1 BOB (J56)
 & CABLES WERE RUNG OUT
 ASK. DAVE STEIN (OG3)
 (X84850) CHARLEY HEREDIA. (OG3 GSE) CABLE STOCK AREA.

S. SARBELLO

8PM - 8AM

10/11-12/68

1. DAVE STEIN CONTINUITY CHECK ALL ASSOCIATED CABLES 100% THAT WERE WITH BOB 1213 S/N 42 YESTERDAY HOWEVER THE BOB WASN'T FULLY CHECKED ON PIR# 1084. ~~SHA~~ SCHAEFFLER OF OG3 HAS BEEN DIRECTED WITH QC COVERAGE TO RING S/N 42 100% TONIGHT.
2. ITEM #1 ABOVE COMPLETED - NO ADDITION DISCREPANCIES FOUND IN BOB 1213 S/N 42.
3. BIDDLE DUCTER TESTED THE +Y OUTRIGGER STRUT KNUCKLE (POINT A) TO D/S STAGE (POINT B) ON BOTH LM 5 & LM 6. LM 6 HAS AN ADD GROUNDING CABLE (LSK 417-1600-2) FROM KNUCKLE TO WORKSTAND GROUND. THE TEST DATA SHOWED
 (a) LM 5 = 360 μ Ω .
 (b) LM 6 = 1500 μ Ω .
 (NO TDR CONTINUATION ^{SHEET} WAS REQUIRED TO COLLECT ABOVE TEST DATA).
4. COMPLETED TPER TPS 35-955. REQUIRES REVIEW, ~~RE~~ TYPING ~~AND~~ AND LIMITED LIFE ENTRIES (CAN'T LOCATED Q.C.'S TPS 35-955 BOOK FOR ENTRIES)
5. SEQ 35 OF 62000 BEING INVESTIGATED.

LOG

Page No 58587

Engineer E. DOWSE Project LM-5 Location _____
 Time _____ Title _____ Date 10-12-68

1. SAC WRITE OUTLINES ON TPS FORMS ^{DAYS}
 BUT THE FIRST PRIORITY
 IS P/J 60 PIN RETEST & X-LUNAR ISOLATION

2. REVIEW W.S. #11 GPS ^{LOG} FOR
 POWER LOSS INFORMATION ON 10-7-68
 WHENED THIS INFO TO DISPOSITION TDR #1
 ON THIS DATE ¹⁰⁻⁷⁻⁶⁸ AT ONE POWER LOSS WAS
 CAUSED BY PWR LEADS COMING LOOSE AT 19:06
 WHAT CAUSED THE OTHER TWO.

3. LUT SWITCHOVER TEST

S. SARBELLO
 8PM-8AM

10/12-13/68

1. REVIEW W.S. #11 GPS LOG FOR POWER LOSS INFO AS
 REQUESTED - FOUND LOG BOOK ^{HAD} ~~MADE~~ NO STATEMENTS
 RELATING TO ANY POWER DROP OUTS FOR ENTIRE DAY
 (10-7-68).

2. WROTE "P/J 60 RETEST & X-LUNAR ISOLATION TEST"
 AGAINST TPS 35-752 TDR #4. ARNOLD TO GET
 MAJOR SEQ. STEP NO. (ONLY ONE NUMBER REQUIRED)

3. ARNOLD-RECORD TDR #4 SEQUENCE NO. IN OUR LOG
 BOOK AFTER YOU START TEST

4. BEFORE STARTING TEST, YOU REQUIRE AC ELECTRONIC MAN,
 STE, CDR, FM, IRO, GPS & EPO. ALSO NEED LEADS (3)
 CLAROSTAT & SIMPSON CONFIGURED PER DEVIATION #27
 (OCP 61015) FOR THIS TEST. LEADS HAVE BEEN MADE BY
 063.

5. (WRITE LUT SWITCHOVER TEST AGAINST TDR #33 62000-EPS)
 WHILE WAITING TO GET ON LINE FOR X-LUNAR ISOL. TEST)
 PERFORM
 LUT SWITCHOVER TEST AFTER X-LUNAR TEST.

LOG

Page N^o 58588

Engineer A. Hecht Project LM-5 Location ACE 3
 Time 8am - 8pm Title _____ Date 10-13-68

1. Vehicle is ready for our work on TDR #4 (TPS 35-752) X-LUNAR ISOLATION TEST but we are holding for these reasons:

1. Leads requested from 063 not available yet (0900)
2. Dev. 17 to 61015 supposed to be req'd - asked tech to research the contents of this deviation
3. TC reviewing TDR sheet for content & familiarizing himself with what is to be run.

11. ADMIT WILL COME AFTER 8PM to Mate (George Preo)

2. At 1209, following completion of Carry-on operation at ACE, started TDR #4 at p. 31 (opening veh. CB'S), it. 136 & 137.
3. Hold at 1250 after step 138.20 for IRO. Took Lunch break.
4. IRO avail at 1350. continued at 138.21
5. 1435: Hold at 138.32 because AC/MIT is working at LM6 & expects to be unavailable for demate until about 0300. Also wants to review TDR procedure. Advised A. Schneider & A. Beauregard. They are trying to contact MIT Boss for go ahead.
6. 1610: After calling MIT Boss, then Bill Ryan (MIT), then Tom Martin NASA, Bill Ryan finally called Ron Baden (MIT) to demate P/J (PSAAM). Now waiting for NASA QC coverage.
7. 1645: 1st 3 conn demated. Waiting for QC to continue at ACE to run 138.33. Resumed 1655.
8. 1724: Holding to get jumper req'd for 138-39.
9. 1730: Holding for leads to connect Fluke in step 138.52. Also have only 1 Simpson meter, Trying to get another.
- 1812: Still searching for 2nd Simpson, Also can't find QC on floor for demate P/J 233. GE had to lend us a Simpson.
10. 1900: Holding after 138.67. AC/MIT is in middle of a sequence on LM6 & cannot come to Mate P/J

RE: Clarification -
 Apollo - Al Beauregard

LOG

Page N^o 58589

Engineer S. SARBELLO Project LM-5 Location ACE 3
 Time 8PM-8AM Title _____ Date 10/13-14/68

1. COMPLETED ~~TPS~~ TPS 35-752 SEQ 138 S/S. 68 THRU .82
2. ALL GSE CONNECTORS REMATED AND DC POWER RETURNED TO VEHICLE BUSES AT 9PM. AC TO BUSES APPLIED AT 9:20 PM
3. HAL KATZ REQUESTS SUPPORT FOR OCP 61015
 - EPS OPEN ITEMS SELL-OFF - IN WORK 10:00 PM.
4. WENT INTO CABIN TO LOCATE CDR & SE FWD FLOOD LIGHT ASSEMBLIES FOR SELL OFF EFFORT.
5. STARTED WRITING A TPS FOR LUT/DESCENT SWITCHOVER

Day Shift 10/14/68

~~Atchut~~ /Darse/Homburgs

- ① Ran TPS 35-969, P/J57 crimp check, pins 15 & 52
- ② Generated DR 30, repairing leads to these pins.
- ③ Reviewed yesterday's TDR test results, will run more steps when written.

S. SARBELLO
 8PM-8AM

10/14-15/68

1. 9:15PM - HOLDING X-LUNAR ISOL. TEST - WAITING ON LONGINOTTI - MARTIN (NASA) TO EXECUTE OR SCRUB TEST TONIGHT.
2. RECEIVED WORD TO GO AS FAR AS POSSIBLE AFTER X-RAY GOES OFF LINE. WILL USE TDR#33 62000-EPS FOR THIS 2ND X-LUNAR TEST
3. STARTED TDR#33 AT SEQ#163 AT 2300 HOURS
4. COMPLETED X-LUNAR ISOL. TEST (SEQ 163.1 THRU 163.25) AT 03:00 HOURS

LOG

Page No 58590

Engineer A. Hecht / E. Homburger Project LM-5 Location ACE 3
 Time 8am - 8pm Title — Date 10-15-68 Tue.

1. Preping for 61015 nearing completion.
 2. Tracking Lt to be rec'd & installed (req'd per seq. 10)
 3. Decided to run further TDR #33 testing (62000) after 61015, both before final RR installation and after.
 R. Longinatti wants to be reminded of this periodically to assure this to be included in schedule.
 4. Removed EPS Load Bank via TPS 35-970.
 5. Demated P5(-12151 cable) from IPT(81070) via TPS 35-971 Mod 1
 - So that P5 can be mated to INV. SIMULATOR (8510).
 This was mated on 61015 prep.
 6. Wrote & executed 61015 Dev 37 (to replace Dev 17).
 Fluke VM was hooked across Decade Box.
 Simpson was removed from hookup at LM/CSM Bob.
 7. AC/MIT found in Seq 004-021 & following that 3 breakers remain closed (EPS DISP, ASC ECA CONTCS) which they object to when X-Lunar Bus Ties are opened. Dev. # 35 & 36 were written to open & close these CB's in the Floodlight activation Sequence.
 8. Gathered 61015 OCP copies for EPS.
 9. Gave copies to GPS for his review -
- NIGHT SHIFT —
1. E. DOWSE 10-15 TO 10-16-68 NIGHTS
 2. AT 21:30 WROTE TPS 35-972 TO INSTALL TRACKING LT. (SN 109) LSC 340-00011-2 ACCORDING TO LDW 340-53295 AS A TEMPORARY INSTALLATION.
 3. TRACKING LIGHT IS ELECTRICALLY INSTALLED BUT NOT MECHANICALLY SECURED AS YET
 4. 8510 VOLTAGE ^{METER} STOP TO BE SET AT 119 V.
 61015 TDR #10 WAS CAUSED BY METER STOP BEING SET AT 117 V.
 5. TDR #12 - Docking Lt hookup req'd correction

LOG

Page **Nº 58591**

Engineer Sarbello/Homburger/Hecht Project LM5, 61015 Location ACE3
 Time 8am - 8pm Title --- Date 10-16-68

1. Completed work on TDR #12. Not yet signed off.
2. 0946²⁸: TDR #14, Seq. 012-022: Inv. Simulator was switched to "REMOTE SENSING" & voltage was reported to have momentarily dropped & Master alarm came on. (see item 4.)
3. ~~RE~~ SOLD TDR #13 AT 10:45AM. (OCP OMISSION CORRECTED BY DEV #70 RESOLVED THE PROBLEM - REF PG 2-118 SEQ 012-017A FOR DEV #70. TDR #13 WAS AT SEQ 012-018 S/S OS.)
4. STRIP OUT OF AC VOLTAGE ON RECORDER 2A1A7 SHOWED GSE AC DROP OUT FROM 0946:14 THRU :49. A 35SEC LOSS OF POWER. PROBLEM UNDER INVESTIGATION. RECORDED DATA SHOWS LOSS OF POWER TWICE 1ST @ 9:33:24 RETURNED TO 100VAC @ 9:36:46. 2ND @ 9:46:14, RETURNED @ 9:46:54. TIME SYNC'S WITH "REMOTE SENSING" SW ACTUATIONS ON⁸⁵¹⁰.
5. QC will not buy TDR #12 (docking lights) because docking lights are "temporarily" connected & they claim such temporary installations should be flagged by a TDR. Investigated presently effective schedule of "final" dock light installation (after skins):
 - a) Port & Starboard - \approx 10/21
 - b) Forward - \approx 11/13
 - c) expected start of 61018 - 11/21
 - d) Aft - \approx 12/6
 - e) expected A/S ship date \approx 12/13/68
 TDR #12 being left open for the time being until Jack Knochel gets a chance to discuss w. Tom Martin. 1530; TDR #12 IS NOW SOLD.
6. OCP 62000-EPS - Got all stamps & sigs for closeout of TDR #31.
7. INTERVIEW BROWN OF 063 DEPT WHO WAS "GPS" DURING INV. SIMULATOR AC PWR DROP OUT AND ED AMERIGE GSE ENGR'G. WILL GET BOTH TOGETHER TOMORROW TO RESOLVE TDR #14.

LOG

Page N^o 58592

Engineer E. DOWSE Project LM-5 Location PLT 5
 Time 10-16 TO 17-68 Title G1015 MM) Date _____

NIGHT SHIFT

1. WROTE DEV NO. 88 TO SWITCH OVER TO ASCENT POWER AND TEMPERATURE ^{MONITOR} THE LCA BECAUSE. THE SECONDARY COOLANT LOOP WILL BE COOLING THE VEHICLE AND THE PRIMARY LOOP WILL BE SHUT DOWN. AFTER SEQ 13 IS RUN ~~THE~~ DEVIATION ^{#88} RECONFIGURES THE VEHICLE TO PRE DEVIATION 88 CONDITIONS (EPS THAT IS)
2. ASKED FOR TEMP DATA FOR LCA (DEV 87 & 88) DURING SECONDARY COOLANT LOOP CHECKOUT SEQ 13.

LIMIT 120°F

TIME.	TC1	TC2	TC3	TC4
0200	70°	70°	70°	70°
0215	72°	72°	72°	78°
0230	78°	78°	78°	78°
0245	84°	88°	86°	88°
0300	90°	90°	90°	90°
0315	94°	94°	94°	94°
0330	94°	94°	94°	94°
0345	96°	96°	96°	96°
0400	70°	70°	70°	70°

° F

GAEC
 VERIFIED BY QC.
 1244

- AT 5:30 A.M.
3. ACE STATION INDICATES GLITCHES HOWEVER NO REAL TIME CURRENT OR VOLTAGE GLITCHES WERE OBSERVED BY IRO, FM OR EPO

CM #1 15-20 7.5-10 82090 16
 #2 0 0
 #3 20-30 10-15 10
 #4 0 0

EPO & FM ARE MONITORING CURRENT MONITORS 1, 2, 3 & 4 AND GPS IS MONITORING THE 82090 AMMETERS FOR GLITCHES

AT 07:10 IRO, GPS, FM & EPO NO CURRENT OR VOLTAGE SURGES
 07:15

TRANSIENT HAVE BEEN OBSERVED. ONLY SLIGHT CURRENT VARIATIONS HAVE BEEN OBSERVED

(EPO, FM & EPO ARE RECORDING CURRENTS AT 15 MINUTE INTERVALS WHILE WATCHING FOR TRANSIENTS)

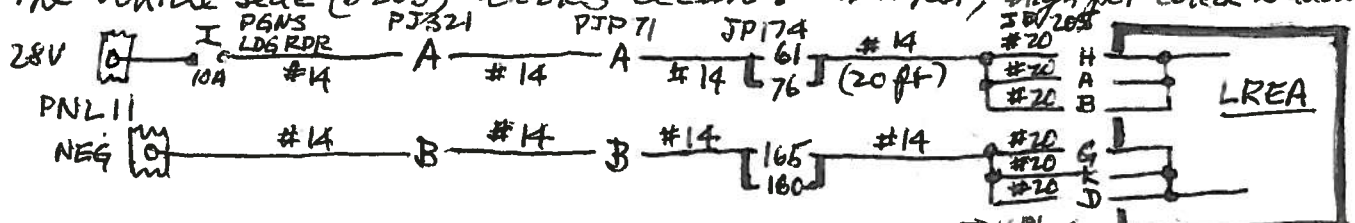
DAY SHIFT OBTAIN DATA FROM EPO, FM & GPS AND HAVE THEM CONTINUE TAKING DATA AND MONITORING

LOG

Page No 58593

Engineer S. Sarullo / E. Homburger Project LM 5 Location Plt 5
 Time DAY SHIFT 800-800 Title _____ Date 10/17/68

1. Day shift EPO continued observations of Current Monitors.
2. OCP 61015 in Hold at end of Seg. 029.
3. S.S. & C.H. discussed Inverter Simulator (Ref. TDR #14) with D. Crooks & E. Amesidge. Conclusions -
 - (a). GSE-8510 functioned OK. Meter Relay activated at the 119 v. Limit setting. It is to be expected that the open-loop inverter voltage (VOLT OUTPUT sw. still in FIXED and REMOTE SENS sw OFF) will rise to maybe 121.5 v. The meter relay magnetically latches at the limit, holding open the AC output to the vehicle even tho the OUTPUT sw is set to VARIABLE and the Variac is lowered. To unlatch the meter and restore the AC Output, the METER RELAY RESET button should be pressed. The GPS man, when the TDR was received, had accomplished this same result by banging the panel, assuming it was a sticky needle.
 - (b) CAUTION - Never have REMOTE SENS sw ON when VOLTAGE OUTPUT sw is in VARIABLE.
4. Studied thru MM 2 in attempt to prevent any recurrences of TDR #14 during AC switchings.
5. Deviations # 92, 93, 94, 95 generated.
Pg: 119, 348, 771, 679
6. TDR #14 SOLD.
7. At approximately 17:25, primary cooling loop shut down. Alerted STE to the Dev. 88 of previous shift. Shut-down supposed to be only for $\frac{1}{2}$ hour. Batts 1-4 averaging 4 to 8 amps each. PRIMARY COOLANT LOOP TURNED ON



LOG

Page No 58595

Engineer E. DOWSE Project LM-5 61015 Location PLT5
 Time 7:48 P.M. TO 8:12 AM Title _____ Date 10-18/19-68

1. INVESTIGATED VEHICLE WIRING ASSOCIATED WITH THE LANDING RADAR J205 CONNECTOR AND ALL SEEMS NORMAL.

THE ORIGINAL MEGGER WAS FOUND TO BE UNRELIABLE AND AFTER OBTAINING ANOTHER, GOOD AND PROPER RESULTS WERE OBTAINED.

2. REDUCED DATA FROM RECORDER 2A1A7 DURING THE PERIOD 10-18-68 13:48 TO 15:21:10 WHICH SHOWS THE CURRENT SURGES ASSOCIATED WITH THE PANEL 11 PGMS LOG RDR (CB105) CB POPPING.

3. OBTAIN CB TRIP CURVES AND I²T CURVES ASSOCIATED WITH THE VEHICLE WIRING IN QUESTION (14 GAUGE ETC).

4. TRY TO OBTAIN REAL TIME RECORDING DATA FOR ABOVE PERIOD.

TRY X2275 DON BICKOR.

A. Hecht Day 8am - 8pm 10-19-68

1. 61015 still in hold. LREA investigation in process. Waited till 3pm to get a look at inside of LREA. Seems that trouble is inside a "Power Supply" module into which P205 pigtail leads. There was evidence of a pitch like substance having leaked out of this module. Other dets look clean.

2. RTDE has voltage traces (fr. light beam oscillograph), labelled: 61015 LM-5 10-18-68 11:19 to 17:00
 location: C5

3. Obtained copy of CB trip curve. At 450% of normal current, the CB should trip in 1.8 to 6.2 seconds. Thus the tripping times observed are OK & the CB functions OK.

4. Wrote TPS 35-975 to remove & reinstall +Y decking lite for skin installation. Retest included in TPS.

5. Had glitch reported on Light beam oscillograph - both buses. On further investigation, the glitches did not occur on the buses at all but fed across from the CAL circuit of the RCS oscillographs. No variation of

LOG

Page No 58596

Engineer E.H. DOWSE Project LM 5 61015 Location PLT 5
 Time 7⁴⁸ PM TO 8¹⁸ AM Title EPS Date 10-19/20/68

- PG 2-933 MM-2
 1. WROTE DEV. #103 A TO COVER THE +V DOCKING LIGHT NOT BEING INSTALLED. OTHER DEVIATIONS WILL HAVE TO BE WRITTEN AS THE DOCKING LIGHTS ARE EXERCISED UNTIL THE LIGHT IS REINSTALLED.

	BAT 3 AMPS	BAT 4 AMPS	TOTAL AMPS	
21:30:22	4.7	7.6	12.3	BEFORE LR TURN ON
33:06	5.2	8.8	14.0	"
35:40	5.0	8.8	13.8	"
38:10	5.2	9.0	14.2	"
40:58	5.0	8.8	13.8	"
42:50	3.8	7.1	10.9	"
44:05	4.7	8.7	8 12.8	"
45:35	5.5	10.4	15.9	LOG. RDR IN.
47:30	5.5	10.2	15.7	"

3. GSE LEAD FROM CURRENT MONITOR #3 LV INPUT TO THE DUMMY BATTERY SWD SHOULD BE REPAIRED WHEN A WINDOW IS OBTAINED.

S. SARBELLO
 8AM - 8PM

10/20/68

1. COMPLETED SEQ'S #034-099 PAGE 2-487 THRU SEQ # 034-225 (09:27 THRU 12 NOON), EPS DATA LOOKED GOOD.

2. STARTED SEQ #35 @ 12:25 (MM2 TEST #3)
 COMPLETED @ 14:40

3. STARTED SEQ #36 @ 15:30 (MM2 TEST #4)
~~COMPLETED @~~ TEST HELD DUE TO WATER/GLYCOL OUTLET TEMP NOT SATISFACTORY FOR IMU TO START
 SEQ #36. COMPLETED @ 18:30

4. EPL CAUGHT A COCKPIT SWITCHING ERROR TO LATE (TEST JUST STARTED) CALLED IT TO JOHN MAZZIO'S ATTENTION THAT SEQ #36 SHOULD BE BAT 5 + BAT 6 IN BACK UP CONFIGURATION.
 ONLY ONE BAT 5 + BAT 6 IN NORMAL THRU 1117

LOG

Page No 58597

Engineer S. SARBELLO

Project

Location

Time 8AM - 8PM

Title

Date

5. CHECKING INTO DISCREPANCY WE FOUND THAT CDR/LMP CONFIGURED SWITCHES VIA THE OCP "CHECKLIST" PAGE 3-63 WHICH WAS IN ERROR (BAT 5 NORM & BAT 6 NORM). OCP WAS CORRECT (BAT 5 B.U. & BAT 6 B.U.). TC TAKING A DEVIATION TO TAKE THE RUN AS IS WHICH WILL BE THE SAME CONFIGURATION FOR MMZ TEST #5 COMING UP (BAT 5 & 6 NORM). I TOLD DAN PERKINS & JOHN IARZZO TO MAKE TEST #5 BAT 5 BU & BAT 6 BU BUT THEY REFUSED THE RECOMMENDATION. (REF. ~~PAGE~~ OCP PAGE #2-771)

E. HOMBURGER NIGHT 8⁰⁰-8⁰⁰ 10/20 - 10/21/68

1. TDR #50 received in Seq 037 at 20:58. Inverter simulator frequency wouldn't vary. The lead to the HP generator wasn't connected.
2. Hold in Seq. 039.

S. SARBELLO/A. HECHT
8AM - 8PM

10/21/68

1. STARTED AT SEQ #39 S/S 134 @ 08:52
COMPLETED SEQ #39
2. COMPLETED SEQ #40
3. STARTED SEQ #41 (@ S/S 41-010.04 LOST PWR TO BUS AT APPROX 10:47. CAUSE UNKNOWN AT THIS TIME.
— FROM REDUCED DATA, PROBLEM WAS CAUSED BY OPERATOR ERROR IN READING OCP (REF PAGE 2-992).
TC EXECUTED 41-010 S/S .01 JUMPED .02 & WHEN S/S .04 WAS EXECUTED, BATS #1 & #2 WERE OFF LINE CAUSING SE BUS TO GO TO ZERO. CDR BUS STAYED UP & INTERLOCK NEVER OPENED HOWEVER TC POWERED DOWN ALL GSE & RECEIVED TDR #54.
4. STARTED SEQ 41 RERUN AT 13:16. COMPLETED RUN OK
(DUE TO LOSS DATA (CARGO STAGE) CANCELED)

LOG

Page No 58598

Engineer Sarbello/Hecht Project LM-5 Location ACE 3
 Time 8am - 8pm (contd) Title 61015 RUN Date 10-21-68

5. SOLD TDR #50 & #47
6. Art Rubens, NASA, left word thru Joe Bonagura that he personally wants to be called & be present whenever a TRANSLUNAR ISOLATION TEST is performed by EPS. (All EPS personnel: please note)
7. 1800: Holding at 042-032 for demate of interstage connectors to be performed. RCS Test firings!
 1925: Resumed running.
8. Was requested at this morning's turn-over meeting to gather info. to establish that "Ryan's" claim of "Bus transients responsible for LREA Failure is not valid. Sketched events from 10-18, 13:48 thru 15:21. Must still coordinate w. Radar people to get original turn-on time & date plus subsequent events.

E. HOMBURGER Nite 800-800 10/21 - 10/22/68

1. QCP 61015 continued. Seq. 042, Dynamic test in MM 4, was started at 02:30:03 (20 min. run). Afterward, the time hacks on all ACE recorders were found to be missing. Tape replay was attempted but was NG and couldn't be run.
 All EPS functioned OK. All the recordings were looked over and were as would be expected, except that on the Real Time Recorder the Bus voltages look real "hashy" due to the RCS jet firings.
2. The TPS 35-975 to check the Dock lights was run earlier. OK - all 5 Dock lights ON.
3. The decision has been made to re-configure for a re-run of the Dynamic Test.
4. DEV. #166 was generated to raise UL - required because of fluctuations of loads and the poor regulation of the VEPS.

LOG

Page No 58599

Engineer E. Dowse / A. Hecht Project LM-5 Location ACE 3
 Time 8am - 8pm Title _____ Date 10-22-68 (Tue)

1. 10:00 : Inv. #2 (was on since 0230) was turned off. Fascinating
↓
2. ACE Station power was lost at 0947, CRT's, etc, went blank.
3. 10:10 Requested CDR to state if docking hatch is open during the test? A: Yes, open.
 How is docking hatch switch held in depressed (open) position? A: It is taped in the depressed position. The tape just fell off. (Loose tape was probably the reason for TDR 62.)
4. Dispositioned TDR # 63 (NUM DISP extinguish during inverter switch over). Generated Dev. # 170 modifying note to be advisory (not for verification). TDR # 63 SOLD.
5. ACE power returned approx. 1500. Call to Stn 1550. Resume at p. 1080.
6. TDR # 62 (Flood lights) - will be dispositioned by re-run.
7. Acquired TDR # 67 ("BUS" Lt on IV is dimly lit). (~1600). Worked off, but disposition still req'd.
 Seq 042 - 044 - 02.
 CAUSE: IRO Lt Beam Recorder channel bias lit "BUS" light & read as 3.7 Volts on DVM (CDR 25) TDR # 67 Sold.
8. TDR # 68 (COMM) on p. 2-1151 seq 042-328 (~1925).

E. HOMBURGER - NIGHT 800-800

10/22 - 10/23/68

1. OCP 61015 continued. MM4 Dynamic Test Re-Run started at 23:06:01.
2. Vehicle powered down per OCP, with Deviations 173 and 175 for EPS, at 23:45.
3. Examined and signed off all the EPS recorded data. This was all as expected.
4. EPS was OK except that Observer said that the Flood lights flickered in unison with the RCS jets firing. NASA (Jack Knackel) was not too concerned.

LOG

Page N^o 58600

Engineer E. HOMBURGER Project LM 5 Location PLT 5
 Time NIGHT (Continued) Title _____ Date 10/22-23/68

about this, but wanted it noted for the records. This was added by QC, to the Flood TDR #62.

5. The original 'gripe' of TDR #62 did not happen again, during the re-run.
6. Vehicle powered-up (DC only) per 70010 at about 02:15 for T/S by other systems. Wrote a procedure for them to power-up AC with the Inverter Simulator but we didn't use it yet.
7. Vehicle powered-down about 06:20.

E. DOWSE / S. SARBELLO
 8AM - 8PM

10/23/68

1. WROTE TPS-35-976 TO REMOVE -Y (PORT) DOCKING LIGHT & TO REINSTALL PERMANENTLY AFTER PORT SIDE VEHICLE SKINS ARE INSTALLED RETEST OF 35-976 TO BE DONE WITH TPS 35-975 (STBD PERMANENT INSTALLATION) TO DATE, PORT & STBD DOCKING LIGHTS ARE THE ONLY PERMANENT HOOK-UPS.
2. 4:45PM TURNED ON INVERTER SIMULATOR 8510 TO SUPPORT LANDING RADAR TEST
3. DOWSE TO HOMBURGER: INVESTIGATE TDR #62 (GET APPROX. TIME HACK OF SEQUENCE & CHECK ^{ON RECORDER} IF THERE WAS ANY POSSIBILITY OF SOMEONE VARYING BUS VOLTAGE.

E. HOMBURGER - NIGHT -

10/23-24/68

1. Re: item 3 above - No significant drop of bus voltages shown on the IRO recording.
2. Vehicle on Controller/Bat 2 & 4 power all night.

LOG

Page No 58601

Engineer DOWSE/HECHT/SARBELLO Project LM-5 Location ACE 3
 Time 8AM-8PM Title _____ Date 10/24/68

1. EPS - SUPPORTING LANDING RADAR TEST (TDR#2, 61015)
2. POWER AC & DC DOWN AT 14:40 (APPROX.) AGAINST TDR #2 (61015) SEQ'S # 273 THRU #287.
3. WROTE SEQUENCES TO RECHECK DUHD/FWD FLOOD LIGHTS (TDR #62), 61015.
4. POWERED DC UP TO ASCENT STAGE VIA BOB 1126 & 1113, @ 19:10
5. POWERED AC UP TO ASCENT VIA INV. SIMULATOR (8510) @ 19:20
6. EPS SUPPORTING TDR #65 (61015) @ 19:30
7. WROTE DOCKING HATCH SW/FLOOD LIGHT TEST FOR TDR #62. TEST TO BE PERFORMED TONIGHT.

E. HOMBURGER — NIGHT — 10/24-25/68

1. AC and DC powered down at 22:30.
2. Interstage connectors mated
3. Wrote pages 4 & 5 to TDR #62. Repowered DC & AC after lunch.
4. Ran the TDR #62 Steps 4 thru 24. Everything worked OK with all combinations of Flood switch, pots, and Docking Hatch switch. 03:45-04:10
5. Vehicle powered down about 0645

LOG

Page N^o 58602

Engineer DOWSE/SARBELLO Project LM-5 Location ACE
 Time 8AM-8PM Title _____ Date 10/25/68

1. POWERED DC TO BUS (ASCENT STAGE DEMATED) @ 08:32

2. POWERED AC (INV. SIM. #8510) TO BUS @ 08:50

3. WROTE TPS 35-981 TO REMATE BOB'S 1126 & 1113
 AFTER D/S IS PULLED OUT FROM WS#11.

4. WROTE DEVIATION NO'S 32 THRU 39 COVERING
 POWERING UP & DOWN VIA OCP-GF-70010
 UTILIZING THE INVERTER SIMULATOR LDW410-8510.

5. POWERED DOWN THE 8510 USING TDR#1 OF ^{TPS} FN 33-022 ^{R-02} PG 11

VEHICLE NOT POWERED. PREP FOR CCFF. 10/28/68

SOLD: 61015/TDR#62 (FLOOD) 10/29/68
 DR #28 (LOG GR TB WIRE)

A. Hecht 8AM-day shift PH 39 10/29/68

TO E. DOWSE:

1. Phone call fr. Bill Durkin (16:15): C²F² requires J166 & J167 power ^{Bob} cables to be removed from entrance hatch. What shall be done?

Checked copy of OCP 32014 & found that interlock is not used for trip-out (Veh light not verified on) & that J166 & J167 Power Bobs are not shown on figure 1-1.

Advised Durkin to write a TPS to demate, eap & record J166 & J167; he agreed.

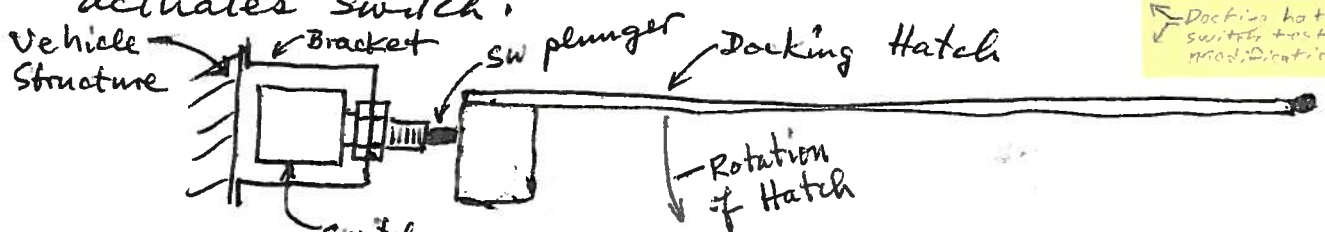
2. In above review, found 2 items to be deviated:
 - a) DVM#1 (fig 1-1) will not read any voltage, thus s/p deleted.
 - b) to permit ascent power to flow fr. 82140, add on p 1-30: Verify Set "Controller Output - Sect 1 & 2" Switches "DESCENT STAGE".

LOG

Page No 58603

Engineer A. Hecht Project LM 5 Location ACE 3
 Time 7pm - 8am, Night shift Title _____ Date 10/31-11/1/68

1. OEP 32014 (C²F²) was completed at 0100. There are 54 TDR'S.
2. Was informed by C. Clark that TPS 35-412 (Subjective Lighting test) will not be run this shift.
3. Ran steps to reconnect P5 of -12151 cable to J5 of -81070 (IPT), instead of cable leading to -8510 (INV. SIMULATOR). Did on TDR #1 of TPS-35-617, page 5.
4. Noticed that PVM leads are curled up at D/S level & do not go up to 166 & 167 Power Bobs. Also IRO recorder for Bus voltages has not been set up.
 No action taken, since we are monitoring at ACE & ~~no action taken~~ TDR activity on 32014 may not be complete. However, cables to J166 & J167 were remated on TPS 35-1121.
5. Vehicle is now powered per OEP 70010; AC & DC.
6. Started to work off TDR #52 of OEP 32014 (Sheets 3 & 4) Docking Hatch Switch was not depressed by closing of Hatch, since hatch barely touched SW plunger, ~~rather than~~ instead of depressing it.
 Dwg LDW 340-53285, Sht 3 requires .060 to .090 inch plunger depression.
 We repositioned sw as far forward as possible & obtained only .016 in switch depression, enough for floodlights to be operated, but not enough to meet ^{the} .060 Min spec.
 I suggest a mtg w/ ^{docking hatch cog engr,} SW cog engr & liaison to resolve a course of action. (Either change dwg req't or add .060 in. shim on the hatch surface which actuates switch.)



LOG

Page N^o 58604

Engineer E. HOMBURGER/E. DOWSE Project LM-5 Location _____
 Time 11-1-68 DAY SHIFT Title _____ Date _____

A. HECHT.

1. WHEN POWER IS AGAIN APPLIED TO THE VEHICLE OR YOU CAN APPLY IT AS NECESSARY FOR YOUR TEST, USE DR 30 TO VALIDATE ~~DR 30~~ (7M4) ECS QUANTITY PFI AND (7M5) ECS GLYCOL PFI. ON PNL IS CLOSE ECS-DISP CB (4CD140) VERIFY BOTH PFI'S OFF THEN OPEN ECS DISP CB AND VERIFY BOTH PFI'S ON.
2. THE PVM LEADS TO THE 1113 AND 1126 BOB SHOULD BE CONNECTED SHORTLY PLEASE VERIFY THIS ALSO THE 1054 METER BOX TO THE 1126 POWER BOB.
3. PLEASE COMPILE TIME HISTORY SUMMARY DATA OF THE 62000 EPS TIPPER.
4. THERE WILL BE TESTING TONIGHT BUT NO DEFINATE INFORMATION IS AVAILABLE YET.
5. ⁽⁰⁶³⁾ DICK BARDDOCK WOULD LIKE TO KNOW WHERE THE 1054 METER BOB IS. *Found - was out for cal.*

A. HECHT Night Shift 11/1-2/68

1. Had PVM leads connected to pvt bobs.
2. Ran verification of ECS Power failure Indicator lights on DR#30, page 20, steps 86-96.
3. Powered down veh at 2200.
4. Left QC books of DR 30 & 32014 at ACE Stn.
5. Tabulated "Run time - hold time" for Work Summary sheets: listed TDR's still need to be classified as to "type" of hold. Sheets are attached to TPER package. Require Work Summary form to complete.
6. Left at 0400 - No power on vehicle.

LOG

Page No 58605

Engineer E. DOWSE / S. SARBELLO Project LM-5 Location _____
 Time 11-2-68 DAY SHIFT Title _____ Date _____

1. WROTE TPS TO SUPPORT AEA TESTING.
2. S.S. CONTINUED WRITING INV 1 & 2 RETEST PACKAGE.

A. Hecht Night shift 11/2-3/68

1. Covering FCS, Propul & Com tests (planned sequentially).
2. NO AEA test planned for tonight.

E. DOWSE / E. HOMBURGER

11/4/68

1. SOLD TPS 35-981
2. OPTICAL OSCILLOGRAPH SHALL MONITOR THE VEHICLE BUSES DURING ALL TESTING.
 CALL X84558 RAY WATERS DAYS
 OR RAY WILLIAMS NIGHTS.
3. TYPEN FOR 62000 EPS & LTC IS NOW READY FOR TYPING.
4. THE SUBJECTIVE LIGHTING TPS IS NOW IN PROGRESS.
5. SAL ADD MOD TO TPS 35-985 FOR RETEST OF THE LSC 360-618-3-1 DOCKING LT SWITCH AS IT IS CALLED ON THE TPS HOWEVER THE SWITCH NAME IS ACTUALLY THE LM/SLA ~~DOCK~~ DOCKING LIGHT PRESSURE SWITCH. MAYBE GEORGE SETTMAN CAN INCLUDE THIS IN HIS TPS.

S. SARBELLO NIGHT SHIFT 11/4-5/68

1. LM/SLA SWITCH CHECKED TONIGHT ON TDR #2 OF TPS 35-412 (SUBJECTIVE LIGHTING).
2. COMPLETED RETEST PACKAGE FOR INV. #1 & #2. GET TPS NUMBER, SIGNATURES AND REPRODUCE COPIES AS REQUIRED.
3. SUBJECTIVE LIGHTING COMPLETED. R. RADAR NOW TESTING.

LOG

Page No 58606

Engineer A. Hecht Project LM-5 Location Pit 39
 Time Day shift 8am - 6pm Title _____ Date 11-5-68

1. Wrote & processed Mod 1 to TPS 35-985, documenting that retest for newly installed LSC360-616-3-1 (LM/SLA DOCK'G LT PRESSURE SW) has been performed on TDR #2, TPS 35-412.
2. Note for night shift: Left at 6pm - Vehicle powered via 70010, No EPS testing scheduled for tonight.

S. SARBELLO
NIGHT SHIFT

11/5-6/68

1. EPS SUPPORTING COMM & FCS POWER REQUIREMENTS THROUGHOUT SHIFT.
2. R. RADAR WILL NOT TEST TONIGHT DUE TO REPAIR WORK ON J238 BEING EXTENSIVE.
3. ESTIMATE 5:30 AM START OF OCP 30,031 (FCS)

E. Hamburger/A. Hecht Day shift 11-6-68

1. Used TDR #1 of TPS 35-412 (Subjective Ltg) to show independence of ammeter reading from "Integral Ltg" dimmer control of EL Ltg operation. Powered up per OCP 70010 & had no bus loading except PCMTE & SCEA'S (Items 1-13, p3 & 4). Could not apply significant loading since we have no load bank.
2. Advised Carl Rosenberg, EPS, that we won't be able to get loadbank and also do not expect to get OK for powerdown req'd for loadbank installation & change of power configuration until Friday at the earliest.
3. Worked on the TPS for Mission-Critical Switch test.

LOG

Page No 58607

Engineer S. SARBELLO Project LM-5 Location PLT 5
 Time NIGHT SHIFT Title _____ Date 11/6-7/68

1. LIGHT BEAM RECORDER MONITORING SE & CDR BUSES.
2. EPS SUPPORTING G&N TESTING (EST COMPLETION @ 0100.)
3. 0315 - G&N TESTING COMPLETED.
4. FCS 30,031 (OFF LINE DUE TO G&N PRIORITY & QUIET SHIP REQUIREMENT) BACK ON LINE.
5. COMM & R. RADAR ATTEMPTING TO TEST BUT ARE RUNNING INTO VARIOUS OCP & MANPOWER PROBLEMS.

Nearing final radar and communications tests before ship leaving LM-5 to Cape

A. Hecht

Day Shift

11-7-68

1. Requested G. Settani to sell TDR 1 & 2 of TPS-412 (Subjective Ltg Test). Both are sellable. TDR #3 remains open, since dim DSKY Lts are probably a DSKY problem & require action w. AC/MIT.
2. Requested CDR to generate a vehicle crab on scratches in Port & Starboard OUTD Flood light Shade covers which permit some light to come thru. This was found & reported by CDR during TPS 412. Fix involves paint touch up. Latest info (1930): LM Pilot will generate crab.
3. STE in conjunction w. Bill Baehr (Inst.) is writing deviations to OCP 70 010-LM5 adding seq 06A (~~C&WEA~~ turn-on) and seq. 09A (~~C&WEA~~ turn-off).
4. Reviewed & added to "Mission critical Switch test. Not quite complete on headings & release.
5. Items not yet accomplished:
 Proof reading of 62000-EPS TPER

E. Homburger

Night Shift

11/7-8/68

Vehicle powered all night via J166, 167 for other s/s tests.

LOG

Page No 58608

Engineer A. Hecht Project LM5 Location PH 39, AEE3
 Time 8am - 8pm Title _____ Date 11-8-68 (Fri)

1. TDR's 1 & 2 of TPS 35-412 (Subjective 2ty) are now Sold.
2. Wrote Power Switchover portions for TPS 35-781
 (Rndz Radar Pilot Signal Test - Monitoring for Spurious Signals)
 Pages 3, 4, 5, 44, 45 & 46.
3. 1900: Starting Run of TPS 35-781.

More electrical
anomalies
↓

E. HOMBURGER - NIGHT - 11/8-9/68

1. Found that a Glitch Detector was on SE Bus, but none on CDR Bus. Wrote MOD.3 to TPS and got unit from 032 Sub installed, for CDR Bus.
2. 02:06 - PGNS-IMU OPR CB closed. Shortly thereafter, IRO reported glitches on CDR Bus.

A. HECHT - DAY - 11-9-68

1. Step 123 of TPS 35-781 has been completed.
2. 0800 - In hold for reconfiguring for step 124. Discovered a problem.
3. 1300 - IRO reported variations on CDR Bus. Checked recording & found a long train of $\approx 0.5V$ fast spikes superimposed on CDR Bus volts every time the (IMU?) Heaters cycled "OFF". Concluded unstable condition exists betw. PS 3 & PS 4 (of 40 controller) which is triggered off by a 5A current drop. Turned off PS #4. Spike train disappeared. Turned PS 4 on again. (13:34:07) Advised Radar TC of the presence of these spikes, in case there is a relation to his problems (Gus Petrocelli). Transient was 8.625V Negative from $\approx 29.4V$ level $\rightarrow 20.77VDC$. Pulse duration was $< 1/100$ inch. chart speed = 4"/minute

$$\frac{4''}{60 \text{ min}} = \frac{67 \text{ milli inches}}{\text{Sec}}; \frac{1 \text{ sec}}{.07 \text{ in}} = \frac{x}{.01 \text{ inch}}; x = \frac{1}{7} \text{ sec.}$$

\therefore Pulse duration was less than 140 milli sec.
 This condition ~~caused~~ ^{required} an LGC Restart ^{started} at 3pm.
 See TDR # 1 (TDR 35-781) - (11/8-9/68)

LOG

Page No 58609

Engineer A. Hecht Project LM-5 Location ACE 3
 Time Day Shift 8am-8pm Title _____ Date 11-9-68

cont'd from prev. sheet

18:15 STE informs me that Gardner Lorimer left a TDR # 65 of OCP 61 015 for EPS to run. He had not discussed this with me when he left early in afternoon. Not quite clear what he wants to determine. Ran accordingly at 18:35 to 18:40 hope his recorder will give him the results.
 18:45 Leaving for dinner.

E. HOMBUEGER - NIGHT - 11/9-10/68

Vehicle restored to 70010 power configuration via the final sequences of TPS 35-781. (23:30)
 Comm then went on line, for remainder of shift.

E. DOWSE 11-10-68 DAY

1. COMM TESTING ON LOW BIT RATE
2. POWERED DOWN AT 12:39
(315:12:39)
3. VEHICLE WILL BE AGAIN POWERED AT 20:00 TONIGHT.
4. AFTER HARD MATE RUN TPS
 MISSION CRITICAL SWITCH TEST. FOR THIS TEST,
 USE CABLES AND PORTABLE POWER SUPPLY
 INSTEAD OF ED BATTERIES -
 CABLES (2) LDW 390-28065-21
 P481 $\begin{array}{c} \text{A} \\ \text{B} \end{array} \begin{array}{c} \oplus \\ \ominus \end{array}$
 POWER SUPPLY - AT THIED MEZZANINE (C/O).
 GAEC 71968 - POWER DESIGNS INC
 MODEL 5015T (0-50V, 1/2A)

LOG

Page No 58610

Engineer E. HOMBURGER Project LM 5 Location PLT 5
 Time - NIGHT - Title _____ Date 11/10-11/68

Vehicle D/S & A/S mated, h.t. front half of work stand
 left open, for S-DD A/S Test.
 Power bbs mated and sold, 0100.
 Power up per 70010 at 0335
 Power down 0440, TFS 35-854 completed
 P/S 173 & 174 were not mated, so couldn't
 do the Mission Critical switch test yet.
 Was given sheets 11 thru 14 of TDR #1 of OCP
 30031 to run. Could not locate the cables
 called for, and also, they wanted to get started
 on putting the front half of the work stand
 in place.

S. SARBELLO

PLT 5

BAM - BPM

11/11/68

- OCP
1. SUPPORTED FCS GROUP ON TDR#1, 30031, ASCERTAINED THE PRESENCE OF (4) 50K RESISTORS PER RCS SYSTEM (A+B) VIA J167 R, J, D & P AND J166 R, J, D & P. NO POWER ON VEHICLE DURING THIS TEST.
 2. POWERED UP VEHICLE VIA 70010 AT 14:30 WITH P/S 173 & 174 LEFT DEMATED DUE TO RECESSED & BENT PINS FOUND IN P/S 173.
 3. POWERED DOWN AT 15:00 DUE TO ACE ROOM PROBLEM.
 4. ACR NOTIFIED STE AT 15:48 PROBLEM RESOLVED.
 5. WAITING (16:00) FOR GLITCH DETECTOR TO BE HOOKED UP TO SUPPORT AEA RETEST (TPS 35-780).
 - 5A P/S 174 MATED
 6. POWER TO VEHICLE VIA 70010 TO SUPPORT (TPS 35-781 TDR#5) AT 18:30. R.R. ON LINE
 7. STE TO POWER DOWN, REMATE REPAIRED P/S 173, POWER UP & EPS TO SUPPORT AEA RETEST TONIGHT.

LOG

Page No 58611

Engineer A. Hecht Project LM-5 Location ACE 3
 Time 8pm - 8am Title _____ Date 11-11 to 12-68

1. AEA Retest, TPS 35-780, ready to go on line, but they have no procedure to operate with separate & isolated busses.
 2. Wrote Mod 2 to TPS 35-780 to change from 70010 configuration to separate busses via bats 5 & 6 prior to start of test. Also included is return to 70010 configuration at completion of test.
- Note: Could not do Mission Critical Sw Test with separate busses.
3. While bus was down, prior to TPS 35-780, DVM & -1054 Meter Bob both read 6 Volts. Switching off the Bus Monitor system removed this extraneous voltage from bus.
 4. 0740: TPS 35-780 nearly finished except for power down. Remind them if they forget that Mod 2 restores 70010 power.

Labeling error
on LM-5's
jumper cables

S. SARBELLO/DOWSE/HOMBURGER
8AM-8PM

ACE 3
11/12/68

1. GOT MIKE MATONTI (X1618-CREW PROV) TIED IN ON DOCKING LIGHT SW MOUNTING PROBLEM (REF. DWG #340-53285 NOTE #4 DICTATES .060 TO .090 PLUNGER TRAVEL WITH HATCH CLOSED) HE WILL REVIEW PROBLEM WITH JOE GORDON (X86651) & THEN WITH VDI GROUP. HE WITH POST ME ON PROGRESS
2. Mission Critical Switch Test assigned no. TPS 35-992
3. Battery Charging for 61018 " " " 35-993
4. SERIAL NUMBERS OF ASSIGNED BATTERIES TO BE CHARGED ARE: AIS, S/N 104 & 105. D/S, S/N 111-114.
5. IN PREPING FOR OCP 61018, IDENTIFICATION SLEEVES ON 4BT4-HV & 4BT3-HV WERE FOUND REVERSED. THESE TWO AWG#6 SMALL JUMPERS (W142 & W143) WERE ORIGINALLY TRANSPOSED & ERROR NEVER DETECTED TILL NOW. NO PROBLEM EXISTS ELECTRICALLY. CRAB PLACED AGAINST BOTH JUMPERS. PROBLEM TO BE RESOLVED BY CUTTING ALL IDENTIFICATIONS OFF BOTH JUMPERS AND SHRINK SLEEVE NEW IDENTIFICATIONS ON AFFECTED JUMPER CABLES.

LOG

Page N° 58612

Engineer SARBELLO Project _____ Location _____
 Time 8 AM / 8 PM Title _____ Date _____

6. PREP FOR MISSION CRITICAL SWITCH TEST IN WORK (TPS-35-992), SYS "A" & SYS "B" POWER SUPPLIES ON WORKSTAND. WAITING FOR BOTH P/J 481 MATES BY 053 DEPT TO BE PERFORMED (18:15)

7. COMPLETED RUN ON TPS 35-992. TEST PERFORMED SATISFACTORY.

~~A. Hecht Night shift 11-12 & 13-6P~~

1. Performed power switchover per TPS 35-780, Mod 2 to OEP 70 010 configuration.
2. RR & LR test activities in progress.
3. 0200: Received info that New Inverters will be available 11-13-68 in afternoon (fr. Don Fox).
4. Comm was to follow radar. At 0610 Comm was notified it is too late to start. Vehicle must be powered down before 8am for mechanical work to be done.
5. 0630. No power on vehicle. Stopped ACE recorders. Leaving for breakfast.

Note to E. Dowse; Request schedule adjustment to put in a Maximum of 8 hours each on Fri & Sat.

Please leave message on this tonight. Please remember that I had previously requested "Sat OFF" & previous schedule had considered this.

↳ Hints of exhaustion

SARBELLO / E. DOWSE.

NO POWER ON VEHICLE WHILE PREPPING FOR THE POLARITY OEP IS BEING DONE.

TPS 35-994 GENERATED TO START P/T TESTING SN 141 & SN 153 LSC390-6-9-7 INVERTERS.

A. H. PLEASE KEEP TRACK OF GORP BATTERIES
 & CHARGED FOR LM-5 FEED

LOG

Page No 58613

Engineer A. Hecht Project LM-5 Location ACE 3
 Time 8pm - 8am Title _____ Date 11-13-68

1. Checked Open TDR's Book of OCP 61015 : No EPS items are open.
2. Checked open items in OCP 62000-EPS : TDR # 33 only.
3. 2230: 2 Des Bat & 1 Asc Bat being charged in Battery room.
4. Inverter PIT Test problem: Test station has intermittent light believed to emanate from intermittent relay. 063 preparing to trouble shoot.
5. Checking & modifying TPS on Inverter test. Added Master Alarm & ANUN/DOCK/COMPNT CB's on p. 4 & 16, C/W reset on p. 4 (STE has detailed procedure), added IPT Interface check on p. 12, wrote sequence to avoid shutting off busses by resetting Bats 5 & 6 (on p. 16).
6. 04:20 - Provided power via isolated busses to get Polarity test, OCP 30032, on line. Used Mod 2 of TPS 35-~~780~~, item 1 for power switchover from OCP 70010 configuration.
 Item 3 of Mod 2 should restore OCP 70010 config at end of OCP 30032.
7. Battery charge status at 05:00 -
 ASC/Bat S/N 104 & S/N 105 charged fully.
 DES/Bat S/N 112 & S/N 114 charged fully.
 DES/Bat S/N 111 being charged

More on battery power as a young scientist

2 apparent problems: ① These batteries charged too quickly (10A f. 1hr & 3A for 1hr). What is wrong?
 ② What about a 4th Des/Bat?

This should be questioned w. The subsystem boys this AM.

8. 05:30 Nasa QC will not sign INV RETEST TPS w/o Raspo concurrence. The only available Raspo rep is not an EPS man & will not infringe on EPS territory. He asked me to wait 3 hrs for EPS Raspo to come in.
9. 06:15 Inv test bench trouble traced to defective K1 relay. Parts might be available from day people?

LOG

Page No 58614

Engineer A. Hecht Project LM-5 Location Alt. 5439
 Time 8pm-8am Shift Title _____ Date 11-14/15-68

1. Performed RETEST of Port Docking Light on TPS 35-976.
TPS now completed.
 2. Could not close out TPS 35-983, since 2 FWD Docking Lts are not installed. Constrained by lack of shielding disks (EO pending on them) which are ^{to be} mounted ~~below~~ under the fwd docking Lts. We should track EO status tomorrow AM.
 3. Prior to doing item 1 above, had to open bags at FWD docking lights & insulate each lead. Could have had short if undetected before retest on TPS 35-976.
 4. Wrote 2page mod to Inverter Functional Test, TPS 35-995, Attached same to basic TPS, but not processed yet.
- ↑ wiring detail,
docking lights
5. Message from Ed Dowse:
 - ① Ed H. - Clean up ~~62000~~ 62000 TPER
 - ② Follow up item 2 above, (SS & Ed. H.)
 - ③ SS & Ed H. - Prior to INV Removal & INV Installation, (mate/demate), make sure that:
 - ① Pnl 14 INV SW is OFF
 - ② PCMTE is turned off
 - ③ INV 1 & 2 DC Breakers are Open.
 Also verify GSE is being gathered for TPS.
 When running TPS try to get consent to run with an open mod (Note that it may not be necessary to power down, etc.).
 - ④ SS - Keep track of Battery Charging & follow up with paper.
 6. 0600 Performed steps 1, 2 & 3 of TPS 35-998, Inverter Removal & Reinstallation. Removal now in progress.
 Photometric Lighting test, TPS 35-418 Starting.
 (G. Setlanni & R. Schwartz)

LOG

Page N° 58615

Engineer E. HOMBURGER Project LM 5 Location PLT 5
 Time DAY 800-800 Title _____ Date 11-15-68

1. In morning, was asked to support AGS on their TDR's regarding AEA restarts. First they wanted to look for power (bus) glitches with GPS in LOCAL sensing, then Remote sensing. I discussed the REMOTE sensing situation with the GSE Support.
2. After lunch, stood by to help AGS monitor the Busses. At 3:30 they were busy on another TDR. I got a Memo Scope up on the work stand at the 5166/167 Power Bobs. Then it was decided by R. Angelosi to wait until after the Inverter test. The Scope is at the stand, but the cord and leads were returned to Bob Hochman.

Also in the meantime, someone requested Stan Barron to generate a TPS to test the GPS to REMOTE sensing. (TPS G6811-15-002)

E. DOWSE NIGHT/MORNING 11-15/16-68

- ① COMPLETED MOD 1 TO TPS 35-995
- ② RAN TPS 35-995 INCL MOD-1 THERE WERE NO ANOMALIES EXCEPT A MASTER ALARM CAME ON WHEN THE PCM/TE CB WAS PULLED. AT THE SAME TIME THE PANEL II INVERTER CAUTION LIGHT CAME ON. THERE WAS NO TDR ISSUED FOR THIS OCCURRENCE BECAUSE PULLING THE PCM/TE CB & ITS EFFECT ON C&W IS NOT DEFINED. THE SAME OPERATION WAS REPEATED AND THE MASTER ALARM DID NOT RE OCCUR. FUTURE ORP'S SHOULD FLAG THIS ITEM. (ALSO ANY TIME THE INVERTER FREQUENCY DIPS ± 2 HZ WE MAY GET A MASTER ALARM & AN INVERTER CAUTION)

LM-515
 quicky Master
 Alarm - and
 Armstrong would
 to be rid of it -

LOG

Page No 58616

Engineer A. Hecht Project LM-5 Location ACE 3
 Time Dayshift 8am-4pm Title _____ Date 11-16-68

1. Dispositioned & obtained AC/MIT & Nasa sig for TDR #4 of TPS 35-781 (Rndy Radar Pilot Signal Test) related to bus noise spikes, glitch and LGC restart. TDR Sold.
2. On TDR #33 of 62000 EPS, Ed Baca said he will sign as soon as LDR has been signed & numbered. He hopes this will be Monday morning. TDR left on E. Dowse's desk.
3. Wrote Mod 3 to TPS 35-993 (Battery Charge).
4. Wrote TPS 35-900-01 FOR INSTALLATION OF THERMOCOUPLES ON LCA FLANGES. Scheduled for 6pm per STE. Hard copy left at IDC, S/b at data bank.
5. ECS observed -8V & +6V spikes at 14:27 & 14:36 and at 16:13 we repeated with only PS #1 & #3 on line; instead of all 4 PS's of P2090. Suspect faulty (unstable) PS. Should investigate ECS actions vs IRO recorder. With PS1 & 3 only, transients were reported at 1 Volt high.
 (Ref: TDR #2 of TPS 35-397)
6. Note From STE (Dunkin) to E. Dowse: Please power down yourself at 4am. Do not leave this to Val Sanford (who is not as familiar w. the routine).

S. SARBELO
 4PM-8PM

11/16/68

1. NO EPS COVERAGE REQUIRED FOR SUNDAY (8AM - 8PM) HOWEVER COVERAGE IS REQUIRED SUNDAY NIGHT (8PM - 8AM) TO SUPPORT R. RADAR. (PER LONGINOTTI'S TELECON AT 17:25).
2. GSE BATTERIES (D/S S/N 101, 105, 112 & 114 AND A/S S/N 104 & 105) CHARGED & READY TO SUPPORT 61018. D/S S/N 113 FOUND DEFECTIVE & SCRAPPED. D/S S/N 111 TO SERVE AS BACK-UP. NO BACK-UPS EXISTS FOR ASCENT.

Rendezvous
 Radar

LOG

Page No 58617

Engineer E. DOWSE Project LM-5 Location PLT 5
 Time _____ Title EPS. Date 11-16/17/68

NIGHT & MORNING SHIFT

① TPS 35-900-01 IS HOOKED UP
 (LCA THERMOCOUPLES.)

② POWERED DOWN PER 70010

THE VEHICLE STATUS

PNL 11 & 16

ALL CB'S OPEN EXCEPT X-LUNAR CB'S

③ WHEN YOU POWER UP USE 70010

& SUPPORT THE BUSES AS PER 70010

THEN PERFORM CONFIGURING

PORTIONS OF TPS 35-999 (ALL ECA'S OFF)

④ CHECK WITH N. KATZ AS TO THE STATUS
 OF 61018 EPS PREPARATION

E. HOMBURGER — NIGHT — 11/17-18/68

1. Vehicle powered up per 70010 at 20:35, for
 Rndg Radar testing.

2. Set #5 & #6 OFF — All ECA's now OFF.

E. DOWSE — DAY 11-18-68

1. VEHICLE POWERED VIA 70010

82140 IS IN LOCAL SENSE MODE

2. IN SUPPORT OF TDR# 63 62000 ECS

WAITING TO SWITCH THE 82140 TO REMOTE

SENSE VIA TPS 68 11-15-002 NOW IN REMOTE

E. HOMBURGER — NIGHT — 11/18-19/68

1. No change in Power configuration all night.
2. At 8:00 AM turnover, found out that Bob Ladman has a TPS (no number yet) to remove Current Monitors and Battery Studs, to prepare for GORP connections. We should keep track of this.

LOG

Page No 58618

Engineer S. SARBELLO Project LM-5 Location PLT 5
 Time 8AM - 8PM Title _____ Date 11/19/68

1. NO CHANGE IN POWER CONFIGURATION - SUPPORTING FCS, ECS, R. RADAR & LDG RADAR TESTING
2. WROTE & PROCESSED TPS 35-900-03 "DOCKING LIGHTS" (VALIDATION OF PERMANENT INSTALLATION)
3. 16:30 - TESTED DOCKING LIGHTS STATUS IS "GO".
4. 19:00 - ALL SATELLITES OFF LINE EXCEPT R. RADAR.
5. 19:50 - NO CHANGE IN POWER CONFIGURATION - SUPPORTING R. RADAR

LDG Radars
Landing
Radar

E. HOMBURGER
8PM - 8AM

11/19-20/68

1. POWERED DOWN AT 05:15.

S. SARBELLO
8AM - 8PM

11/20/68

1. POWERED UP VIA 70010 AT 10:40 AM - SUPPORTING RENDEZVOUS RADAR.

8 months before
LM-5 landing

E. HOMBURGER - NIGHT - 11/20-21/68

1. POWER CHANGED OVER TO CONTROLLER TO BATS 5 & 6 w/ SPLIT BUSES, VIA MOD 2 OF TPS 35-780
2. IN SWITCHING, WITH "CONTROLLER OUTPUT SECT 1 & 2" STILL IN "D/S", WHEN "VEH P.S. OUTPUT" SW WAS SET FROM "A/S" TO "OFF", THE 82140 KICKED OUT DUE TO OVERVOLTAGE. LOOKS LIKE A

LOG

Page N° 58619

Engineer E. HOMBURGER Project LM 5 Location PLT 5
 Time NIGHT Title _____ Date _____

Continued from

3. TDR #4 OF 31001 WAS RUN, UNTIL 01:00.

4. { BATT'S 5 & 6 ON via CONTROLLER
CROSS TIE CB's NOW CLOSED

E. Dowse / E. Homburger / A. Hecht Day Shift 11-23-68

1. Supported TPS 35-789, Mod 3, PNL 1 / AEA INTERFACE.
 - During Bus Adjustments we could not track bus voltage on DVM #2. Later we found 'Sensitivity' knob on DVM turned all the way to zero, which prevented meter from responding to any change in input. Increasing sensitivity setting restored meter to proper functioning.

ST. SARBELLO NIGHT / E. DOWSE & E. HOMBURGER DAYS.

SET UP FOR AND RAN TDR #33 OF 62000 EPS
USING NEW ^{SKIN} CURRENT MEASURING METHOD.PERFORMED COMPLETE EX-LUNAR TEST WITH 2 BASIC
EXCEPTIONS NO LM-LOADS WERE EXERCISED NOR WAS
THE AGS HEATER OPERATABLE BECAUSE P/J 721
WAS DEFATED AND BEING POTTED.

E. Homburger / A. Hecht Nightshift 11-25/26/68

1. TDR #33 (62000 EPS) NOT Stamped off. NASA QC requires clear deviation of OCP to show the new test techniques performed.
2. Battery installation being held up. Pnl 3 #1 being pulled. Retests to be performed. Now being written. Aiding J. Gaizzo in proving that 2tg Seq's are retested by 61018 & do not need special retest.
3. Apparent errors found in OCP 61018, p. 2-4, 2-45 & 2-50/51 (see markings). ~~Will~~ write deviations if these are not being picked up on revision sheets.

LOG

Page No 58620

Engineer _____ Project _____ Location PLD 5 +39
 Time 7⁴² AM TO 8¹⁸ PM Title LM 5 EPS Date 11-26-68

E. DOWSE / S. SARBELLO DAY SHIFT

TDR #33 SOLD OF OCP 62000 EPS

E. Homburger / A. Hecht 8pm to 4am 11-26/27-68

1. checked over DR #44 (PNL3). Seems OK & complete.
 Marked applicable portions of Level 3 & Conn list.
 - (Some functional lines not related to Lamp/Tone SW have not been included.)
2. Did not investigate open areas for DR 43 (PNL 1), but
 PFI ind. lts on pnl 1 & numerics should be looked into.

E. DOWSE / S. SARBELLO 8AM - 4PM 11/27/68

1. (9AM) MIKE MILIORE X1685 TO HAND CARRY LM-5 BATTERY CABLES FROM FABRICATION SHOP, PLT 33 TO PLT 5 TO VANGROSKI (DEPT. 053)
2. (11AM) IT HAS BEEN DECIDED THAT 10AM MEETING THAT THE NEW CABLES ARE TO BE INSTALLED AFTER FEAT 6101B (APPROX. DEC. 4 - PER MIKE MILIORE)
3. BATTERY STATUS - ALL BATS IN COLD STORAGE. BATS TO COME OUT OF STORAGE SAT NIGHT OR SUN MORNING FOR 24 HR AMBIENT RISE. D/B'S #101, 105, 112 & 114 TO GO ON LINE WITH D/B #111 AS BACK-UP. A/B'S #104 & 105 ON LINE WITH A/B #107 AS BACK-UP.

A. HECHT / E. HOMBURGER 4 TO MIDNITE 11/27/68

1. A.H. & R.S. ran DR 44 SECT 2.0 (LTG - PANEL 3 RETEST).
2. IRO reported noise on the EPS Bus recording. This lasted from 19:06 to 19:50. AGS test was on line all this time, but had no problems. Glitch detectors did not trip. Final IRO opinion was that vehicle was OK, and that there was some local interference problem.
3. Vehicle powered down at 23:30 for Holiday.

LOG

Page No 58621

Engineer S. SARBELLO / E. HOMSURGER Project LM-5 Location FLT 5
 Time DAY - 800 - 800 Title _____ Date 11-29-68

1. Vehicle powered up AC & DC per 70010 at 08:30.
 Switch-over to Ascent split-bus input via procedure of TPS 35-780 Mod 2.
2. Retest, of DR #43, on line.

E. DOWSE 8PM - 8AM

11/29-30/68

1. POWERED DOWN AT COMPLETION OF DR 43 (COMM - S-BAND ANT COPPERPATHS STILL OPEN ITEM)
2. POWERED UP DC VIA 82140 TO A/S BATS #5 & 6 WITH BUS CROSS TIES CLOSED TO SUPPORT COAS TEST (TPS 35-300-10).
3. ED BATTERIES CHECKED ON VEHICLE - BOTH AT 37.5VDC.

A. HECHT / S. SARBELLO

11/30/68

1. SUPPORTING TPS-35-300-10 COAS TEST.
2. At 1530, work on TPS 35-300-10 had not commenced yet because of several problems, incl'dg ① COAS alignment problem, eliminated about 2pm, and ② Communications problem, flight headset to TC, either "chopped" or limited to one-way operation only.
3. Wrote Mod 4 to TPS 35-300-10 which reconfigures power back to OCP 70010 configuration at end of TPS testing.
4. at 1845, TPS 35-300-10 went on the line.
 Estim. 4 hrs to complete, Then Steerable Antenna test, estim. 3-4 hrs to complete.

E. DOWSE. 11-30-68 12-1-68 NIGHT

1. COAS TEST COMPLETED SUCCESSFULLY.
2. TPS 35-300-10 MOD 4 PERFORMED AT 335122:40 -
3. THE EIGHT BATTERIES FOR 61018 WERE REMOVED FROM COLD STORAGE AT 23:00 11-30-68. (5 DESCENT BATS & 3 ASCENT BATS).

LOG

Page N° 58622

Engineer	E. DOWSE	Project	LM-5	Location	PLT5
Time	336 : 02 : 16 : 00	Title	EPS	Date	12-1-68.

AT 2:15 TURNED ON 400HZ PER 70010
TO SUPPORT S-BAND ANTENNA RETEST.

AT 04:00 POWERED DOWN PER 70010
AFTER S-BAND ANTENNA
RETEST WAS SUCCESSFULLY COMPLETED.
35-867.

PRIOR TO REAT

VERIFY THE FOLLOWING ARE
SCHEDULED BY 053 & 063

TPS 900-02 REMOVAL OF ASCENT STACK
MOD2 CURRENT MONITORS.

TPS 999 INST'L OF INTERIM VEH BATT'S

TPS 999 MOD 1 INST'L OF INTERIM VEH BATT'S.

TPS 1165 VALIDATE BATT. TEMP RECORDING
SYSTEM. (032)

A. Hecht 12-1-68 8pm to 12 midnite

1. 063 & 032 standing by to configure.
2. H. Katz & J. Castellano conducting prep operations.

LOG

Page No 58623

Engineer E. Dorse / A. Hecht Project LM-5 Location ACE 3
 Time Day shift Title OCP 61018 Date 12-2-68

1. OCP 61018 Started approx noon.
2. TDR#2 against seq. 007-004. Got "LOS" because premature opening of "GSE VMBIL PWR" CB opened ground return & dropped out 4K6 relay, losing PCMTE & SCEAS.
3. TDR#4 against 009-026. Low resistance exists between Vehicle & work stand.
 A.H. asked Dan Perkins if vehicle is not mounted on workstand as usual & reply was "Don't worry about it" !!!
 Holding for Perkins to look at fluid lines & at "IRO" lines from PWR BOBS (Bus monitoring).
4. 1615 is start of TDR #4 hold time.

$$\begin{array}{lll} I_1 = 1.7 A & I_3 = 1.7 A & I_5 = 0.0 \\ I_2 = 1.2 A & I_4 = 1.4 A & I_6 = 0.0 \end{array} \left. \vphantom{\begin{array}{lll} I_1 = 1.7 A & I_3 = 1.7 A & I_5 = 0.0 \\ I_2 = 1.2 A & I_4 = 1.4 A & I_6 = 0.0 \end{array}} \right\} \text{on CRT}$$

1650:
 Bat 1 = 0.3 A-H Bat 3 = 0.3 AH
 2 = 0.0 A-H. Bat 4 = 0.0 AH

1707 Requested Tc to switch to GSE power, Answer: "Not yet"

1709 Start switch over to GSE (p1-43)
 CROSS TIE BUS CB'S were Closed.

BUS Volts are 30.51 (CDR) & 30.36 (SE) VDC.

$$\begin{array}{ll} I_1 = .5 A & I_3 = 0.5 A \\ I_2 = .5 A & I_4 = 0.5 A \end{array} \left. \vphantom{\begin{array}{ll} I_1 = .5 A & I_3 = 0.5 A \\ I_2 = .5 A & I_4 = 0.5 A \end{array}} \right\} \text{on CRT}$$
 (No D/S battery current should exist)
 A-H readings as at 16:50

1738 Restored Battery Power
 Isolation obtained (275K Ω)

1745 Resumed testing at seq. 10

- 5. 1835: Performed LV/HV Switch-over (Seq 071)
 Bat 1-4 32.41 VDC
 Busses 31.62 VDC (CDR) & 32.25 (SE)
 was 26.4 to 27.04 before switchover,
 varying w. loading.
- 6. 1840: Called John Gansel, Software to look into low Amp-hour accumulation on CRT

LOG

Page No 58624

Engineer E.D./A.H. Project LM5 Location ACE-3
 Time Day shift Title OCP-61018 Date 12-2-68

7. 19:00 Running ECS Seq at 012-028

	<u>Volts</u>	<u>Amps</u>	<u>A-H</u>
Bat 1	32.09	2.1	6.0
2	32.09	2.1	6.0
3	32.09	1.7	6.0
4	32.09	1.7	6.0
5	37.15	1.0	1.0
6	37.15	1.0	1.0
- CDR BUS	32.09		
SE BUS	31.94		

Note: OCP has been operating on batteries approx.
 4 1/2 hrs (1430 to 1900) at average current
 of 2A per Battery: 9.0 Amp-Hrs estimated.

Was advised by Nick King that someone is now
 troubleshooting the computer subprogram for
 ampere-hours & he cranked in 6 A-H for unspecified
 purposes.

E.H./S.S.
 NIGHT SHIFT

12/2-3/68

1. WENT TO GSE PWR AS REQUESTED BY TC AT 04:10
 (SEQ 016-022) DURING "ACTIVATE VHF VOICE COMMUNICATION."
2. RETURNED TO BATTERY POWER AT 04:54 (BEFORE
 START OF SEQ #019-000).
3. CRT AMP HRS INACCURATE. MANUALLY INTEGR-
 ATED BATT CURRENTS FOR AMP-HRS.
4. SEQ 025-014 @ 08:00

LOG

Page No 58625

Engineer E. Dowse / A. Hecht Project LM-5 Location ACE
 Time Day shift Title 6101P Date 12-3-68

1. 0855 Called Joe Lutz, Software, X-9595 to get resolution of Amp-hr problem. They are working on problem, but need an ACE Station to resolve same. They will advise ASAP.
2. 0947 Completed Switchover to GSE Power at seq. 30-007 (TDR#12, ED T/S).
3. 10:42 TC Direction to stay on GSE power from Seq. 31-000 thru Seq 39.
4. 15:20 Completed Switchover to Des Batteries at Seq. 39-000.
5. Powered via GSE from 16:44 to 17:11 (Seq. 045-000)
6. 17:56 Switched to GSE. Closed CROSETIE-BUS C.B.S.
7. 19:24 " " " " " " " "
- ~~8. 21:46~~
8. 21:50 SWITCHED TO A/S & D/S BATTERIES (START SEQ 50)
9. 22:46 SWITCHED TO GSE PWR FOR HOLD AT 051-004.
10. 23:00 " " D/S BATTERIES FOR RERUN OF SEQ 51.

(E. HOMBURGER / S. SARBELLO
8PM-8AM

12/3-4/68

11. 03:15 SWITCHED TO GSE PWR (COMM PROBLEM AT SEQ 053-024.
12. 03:45 SWITCHED TO D/S BATS #1-#4
13. 05:11 SWITCHED TO GSE PWR (ACE PROBLEM) AT END OF SEQ 053.
14. 06:03 SWITCHED TO D/S BATS
15. 07:14 SWITCHED TO GSE PWR FOR CHANGE OF SHIFT.
SWITCH TO A/S BATTERIES BEFORE STARTING SEQ. 62

07:58 Started seq 062
 Switched to ~~BATS~~ BATS & closed Bal Loads C.B.'s as status board indicated was on before shut down to GSE. Restarted A-Hrs program

LOG

Page No 58626

Engineer HOMBURGER/SARBELLO Project _____ Location _____
 Time 8PM - 8AM Title _____ Date 12/4-5/68

1. GSE POWER (82140) TO VEHICLE AT 22:00
2. CONFIGURED WGM & INSTRUMENTATION PER 70010 TO PREP FOR WORK ON TDR#2 (OCP 61018).
3. TWO ATTEMPTS TO RESET LDR AFTER ~~BATS~~ #1 THRU 4 WERE ON LV RESULTED IN AN LOS CONDITION (TDR#2 SEQUENCES 13 THRU 45)

BY S. SARBELLO

4. AN EFFORT WAS MADE TO PROCESS TPS "X-LUNAR ISOLATION TEST WITH CABIN CLOSE-OUT CONFIGURATION" RASPO & NASA QC WERE RELUCTANT TO SIGN TPS DOCUMENT. NASA QC SAID THEY WOULD SIGN IF THEY GOT AN OK FROM AL JOWID. A SAM TELECON FROM NASA QC (BOB WANAMAKER) TO AL JOWID AT HOME ^{WAS MADE} AL DIRECTED ME NOT TO PERFORM ABOVE MENTIONED TEST AND FOR DOWSE & MARTIN TO TIE IN WITH HIM EARLY (12/5) IN THE MORNING. AL JOWID WANTS TO QUASH ANY FURTHER X-LUNAR ISOLATION TESTING. (ALL X-LUNAR GSE PREPING WAS COMPLETED PRIOR TO THE TPS SIGNATURE SNAG.

5. SUPPORTING TDR ACTIVITY R. RADAR AND AGS SUBSYSTEMS.

A.H. & E.D. Day Shift

12-5-68

1. Started TDR #33 of OCP 61018 (INV VOLT glitch)
2. TPS 35-62000-11 (X-Lunar Isolation) written & in Data Bank.
 To Run require following people present:
 - ① Tom Martin
 - ② AC/MIT
 - ③ Ed. Dowse

LOG

Page No 58627

Engineer S. D'ARIELLO / E. HOMBURGER Project LM 5 Location PLT 5
 Time NIGHT 8⁰⁰ - 8⁰⁰ Title _____ Date 12/5-6/68

1. Set Light Beam recorder to monitor under voltage instead of over-voltages
 With 400V Facility power thru a variac, set up the AC glitch detector to trigger at 114.1 V. (165.60 V. recorder setting)
 Then connected Inverter to recorder, but their counter never started.
 Then varied the recorder voltage - at 157.40 the counter triggered. Then set the voltage down 4V to 153.28, which should now trigger the recorder at 114 VAC or below.
2. Continued Inverter #1 monitoring in TDR #33

A. H. & E. D.

Day Shift

12-6-68

1. 11:15 Lost power during Switchover after TC (D. Perkins) had performed Seq 068-014 only up to S/S 05 & then asked EPS to Switch to Batteries. EPS thought he had Des Bat's flag Gray & ASE Bats on line. Reconfigured & started run of Seq. 68 at GP-015.
~~but not previously asked~~
2. TC decided to keep ASE Bats 5 & 6 ON thruout the run to keep batteries¹⁻⁴ from discharging completely.
3. Asked TC to remain on GSE pwr to start of dynamic run. Request not granted. Des Bats are at following discharge status (11:57):

1- 123.1 AH	3- 121.3 AH	5- 79.2 AH
2- 127.1 AH	4- 119.1 AH	6- 88.0 AH
4. completed another ~~seq~~ "Simplite" on TDR 32
 Then at mtg determined that add'l test have to be prepared for Monday.
5. Bats to be removed fr veh & recharged.
 TPS req'd.
6. Before powering up on Mon - power up by 70010 and set Bat 5 & 6 NF OFF/RESET

LOG

Page No 58628

Engineer S. SARBELLO / E. HOMBURGER Project LM 5 Location PLT 5
 Time NIGHT - 8⁰⁰ TO 8⁰⁰ Title _____ Date 12/6-7/68

1. TPS 35-900-07 WAS GENERATED, TO REMOVE ALL BATTERIES FROM VEHICLE AND TO THE BATTERY ROOM FOR RECHARGING.
2. PERFORMED TPS 35-62000-11 (X-LUNAR ISOLATION).
 RECEIVED TDR #1, ON PTMU SETUP
 GENERATED MOD 1, MAINLY ON SAME SUBJECT.
3. BATTERIES WERE REMOVED BY 063, TO BATTERY ROOM FOR CHARGE.
4. WORK ORDER TO REMOVE BATTERY JUMPER CABLES TO ECA #1 & #2 & REPLACE WITH NEW JUMPER CABLES PUT INTO WORK AFTER BATTERY REMOVAL (TPS 35-900-07) WAS COMPLETED.
5. WORK ORDER TO PERFORMED ITEM #4 ABOVE WAS STOPPED BY S. SARBELLO WHEN IT WAS FOUND WORK ~~ORDER~~ ORDER WAS ALSO PLANNING TO PULL OUT FEEDER CABLES FROM ECA'S TO PANELS #11 & #16.
6. THE EXTENT OF ECA STRIP DOWN INVESTIGATION WAS BOTH ECA'S #1 & #2 ~~THE~~ HAD THE TOTAL TEN NUTS (EACH) REMOVED BEFORE WORK WAS STOPPED.

E. DOWSE. 12-7-68

A. N. THE TDR #32 & 33 OUTLINE IS ON YOUR DESK.

1. SET UP GSE EQUIPMENT REFER 70010 & C2F2
2. START WRITING TURN ON OF GSE AND POWERING THE DC & AC BUSES ^{TO SUPPORT} THE OUTLINE.
3. FOR THE 8510 REFERTO 81015

LOG

Page No 58629

Engineer A. HECHT Project LM-5 Location PH 39
 Time 8am - 12 noon Title _____ Date 12-8-68

1. Assisted Stan Barron in writing TPS to hook up Inverter Simulator. Must be returned to LMG by Wednesday 12-11. TPS#G-6812-08-001. Copy can be obtained from GPS Command Post.
2. Wrote Mod 1 to TFS 35-900-07 (Battery removal & recharge) to delete a part of LTP which cannot be done on GORP batteries. Also added 20A-Hr discharge cycle for A/S batteries S/N 104 & 105.
3. Called O32 at 11³⁵, Bill Thorne X-~~84439~~⁶⁴³⁷, to see what could be done; Bob Slama called back to say we should contact Bob Trybus, 52-265-0935. We asked for speed of ≈ 4 inch/sec, 350kmax p-p ampl., and Trybus can get a larger recorder fr. LM-7. Get IRO (Bob Slama) to call Trybus ASAP for direction. (an 8-min dynamic run would use 160 ft of paper).

LM-7, [^] referenced here, is Apollo 13
4. Check on #510 hookup w. O63,
5. Get Instructions on TDR for hooking up Current Mon # 5 & 6 & Dummy Bat Studs 596 & #2090 cables to connect A/S power input.
6. ED Hornburger: call Ed Dowse before you start

E. HORN BURGER 1:30 PM TO 6:00 PM

NO POWER CAN BE APPLIED TO THE VEHICLE
 BECAUSE OF WATER GLYCOL SPILLAGE ON TWO CABLES IN THE
 APT EQUIPMENT BAY AREA.

LOG

Page No 58630

Engineer E. DOWSE Project LM-5 Location PLT 3945
 Time 7⁴⁸ AM TO 6¹⁸ PM Title EPS GROUP Date 12-9-68

1. NO TESTING TODAY WATER GLYCOL STILL BEING CLEANED UP.
2. DON BICKOR (X 2275) IS SETTING UP THE ADDITIONAL RECORDING CAPABILITY TO SUPPORT 61018 TDR # 33 & 32. THESE MODS TO THE VOLTAGE MONITOR RECORDING SYSTEM LFB - 68-828-560 WILL BE RCV B AND WILL IMPROVE THE AC VOLTAGE MONITORING.

A. Hecht Nightshift 5⁴⁸ PM to 2¹⁸ AM 12/9/68

1. R. Cangelosi directed me to extract items from Connector Reports relative to harnesses subjected to glycol spillage.
Spent most of evening on this.
2. Reviewed TPS 35-62000-11 for purpose of generating TPER info. Could not find time data. Did not get to TPER outline.

E. DOWSE 7⁴⁸ AM TO 8⁴⁸ PM 12-10-68

1. NO TESTING TODAY WATER GLYCOL STILL BEING CLEANED UP.

A. Hecht Nightshift 7⁴⁸ - 4¹⁸ 12/10 to 11/68

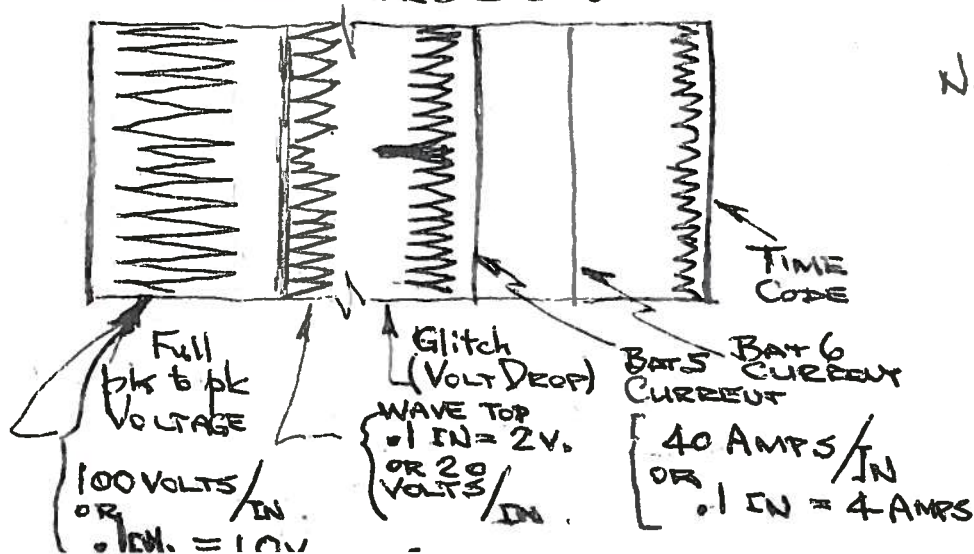
- ① Initiated IRO activity to monitor Bat 5 & Bat 6 Currents at Current Monitors on O-graph & Mag tape via Don Bickor. If validation cannot be accomplished in time, hookup should state "for engineering observation only, no calibration & validation req'd". Hookup details not known at this time & no diagram added on TDR 33.
- ② Told IRO that BUS glitch detectors must be hooked up, since AGS is part of TDR 33 (as verified w. R. Cangelosi & in TDR QC Book). Will be done by Day crew.
- ③ Marked up fig 7-1, p. 11 B of TDR 33 with details requ'd & verified hookup complete. QC stamps complete.
- ④ 0345: IRO still has ^{alternate} hookup & calibration work open.

LOG

Page No 58631

Engineer E. DOWSE Project LM-5 Location WS 11 PLT 5
 Time 7⁴⁸ AM TO 8¹⁸ PM. Title EPS TEST & SUPPORT Date 12-11-68

1. STARTED TROUBLE SHOOTING ON TDR #33 OF 61018 LM 5.
2. DURING THE CONFIGURING OF THE INVERTER SIMULATOR LDW 410-8510-1-1 UNIT NUMBER 179 THE REMOTE SENSE SWITCH WAS SWITCHED TO OFF AND THE GPI 50V 40AMP DC CB OPENED AS WELL AS THE GPI ENABLE SWITCH.
3. THE UNIT WAS RECYCLED AND AGAIN THE CB ^{SV} POPPED. (FOR THIS RECYCLING THE REMOTE SENSE SW WAS OFF + THE FIXED/VARIABLE SW WAS VARIABLE.)
4. THE UNIT WAS AGAIN RECYCLED AFTER A PERIOD OF WAITING ABOUT 30 MIN BUT WHEN THE GPI 50V 40AMP DC CB WAS CLOSED THE DCPS OF THE 8510 INDICATED GREATER THAN 60 AMPS AND AN OUTPUT OF 20VDC. THE GPI 50V 40 AMP DC BREAKER WAS MANUALLY TRIPPED.
5. PIRR # G 6288 GENERATED AGAINST LDW 410-8510-1-1 INVERTER SIMULATOR.
6. PRE PRODUCTION INVERTERS LSC 390-6-9-2 S/N 121, 120, 119 & 118 ARE IN WAREHOUSE #6 (ALSO LSC 390-6-7 S/N 109 IS AVAILABLE).
7. GENERATED TPS 35-900-08 MOD # "D/S BATTERY FEEDER LINE TEST" FEEDER LINES INVALIDATED BY WORK ORDER #495904 & TPS 35-900-08 BASIC.
8. RECORDER CHANNELS :



Note : ① No AC GLITCH DETECTOR ON THE SMALL LIGHT BEAM RECORDER NOW.
 ② ON FR 1300 MAG TAPE : BAT 5 CURRENT
 BAT 6 CURRENT
 TIME CODE

LOG

Page No 58632

Engineer A. HECHT Project LM-5 Location ACE 3
 Time 8pm to 8am Title _____ Date 12-11 to 12-68

1. Hooked up Variac at J167 PWR BOB, pts Vch V&W & GSE V&W, as detailed on TDR 33 (61018) sht 27, step 67E.
2. 2345! Started Run 9 of TDR #33. No glitches observed. Recorder charts should go to RTDE for recheck.
3. Following Run #9, powered down & removed variac per TDR 33, sht 69.
4. Batteries being installed per TPS 35-900-10.
 - At 0450, while connecting Bat #4, 053 drew an arc from HV term to case cover. Safety engineers ordered bat removal even before EPS Engr came on the scene & work was already in progress on removal. Wrote mod 2 to TPS, removing D/S Bat S/N 101 & installing S/N 111. Work complete at 0650.
5. Seq. 068 calls for D/S bats hi-voltage to be applied to buses. Since these bats are fully charged, suggest change to Lo-voltage taps or a 20 A-Hr discharge of batteries prior to start.
6. TDR #32 run of Seq. 068 does not contain details of powering up. Suggest following method be used:
 - a) VGPS & I/V Set up per OCP Vol 1, p. 1-187 thru 1-191
 - b) -81060^W Veh Pwr Sup. Output "Sw" "BUS" (Seq 02)
 - c) Close EPS CB's incl D/S & A/S ECA & ECA CONT CB's
 - d) Inst Turn-on for ACE readouts (OCP 70010)
 - e) Turn on Bat 1-4 LV taps (instead of HV taps)
 - f) Switch fr. GSE to Bats via Spec. instr 4.5.
7. Inv. Simulator was not usable w. available production inverter, since connectors are not the same as that of LSC 390-6-5 unit contained in simulator.

LOG

Page No 58633

Engineer LOWSE / SABELLO / HOMBURGER Project LM5 Location Per 5
 Time DAY 800 TO 800 Title _____ Date 12-12-68

1. VEHICLE POWERED UP VIA 70010 @ 09:18. D/S BATS ON 0938

Night shift 8PM - 8AM G Hecht.

1. Ran TDR 33, Seq 68.

Reviewed AC & DC light beam recorder data.
 No discrepancy occurred. An in-spec AC transient
 occurred at 13 min 33 secs into the run
 (ABORT STAGE).

2. 0015 started review of TPS 35-900-08 Mod 2 to
 prepare to run.

0230: Nasa Engr Approval obtained

0315: TPS Stamped off by IDC

0400: Start configuring to run TPS

0500: QC wrote crab because we hooked up
 ECA leads to Dummy Bat Studs prior
 to complete cure of 3rd potting coat,

0620: Started TPS test run.

0800: Stopped at step 21 for shift change.
 Spent better part of 1 hour to get Fluke
 VM readings for steps 21 & 22, but
 DVM constantly drifted, making values
 useless.

DAY

12-13-68

1. Completed TPS 35-900-08 Mod 2 (Des Bats Feeder Resist.)

No TDR's - all data in limits
 2. Performed TDR #33/61018, pg 72 (Wegger of J167 Bob AC lines)

G. Hecht Eve shift 12-13-68

Wrote Mod 6 to TPS 35-1171 to remove D/S Current Monitors
 and Dummy Bat Studs from vehicle.

LOG

Page No 58634

Engineer Stonehouse Project LM-5 Location PL-5
 Time 8-4 DAYS Title _____ Date 12-19-68

VERIFIED TOR-37 AGAINST OCP 61018 (ED SIMULTAN
 ON P-435, NOT FIRING) HAS BEEN SOLD AND
 THE PIRR G6291 IS WITH ANDY CHRISTIANSON FOR
 DISPOSITION.

Stonehouse

K. DOWSE. 12-20-68 DAY.

1. CHECKED LM-5 DESCENT STAGE AND
 FOUND NEW DESCENT ECA / BATTERY JUMPERS
 ARE INSTALLED BUT THE POTTING CYCLE IS NOT
 YET COMPLETE.

2. STARTED TO SET UP FOR LM 5 IN THE ASCENT
 STAGE WORK STAND # 5 JULIAN MERRIT (X6346 OR X84129)

3. A.H. CHECK WITH GSEA FOR POWER TO
 WS #5

D.C. PERKINS P.S.

AC. 81070 & ASSOCIATED CABLES

LSH 560-1126 BOX

AC & DC BUS MONITORING. 032 (X84658)
 RAY WATERS

LCA & INV TEMP MONITORING. 032 (MUST LIFT CABIN FLOOR
 TO INSTALL THERMOCOUPLES)

4. ONCE HOOK UP INFO IS OBTAINED WRITE
 PROCEDURE FOR POWERING UP INTO 35-412 TOR #3
 AS ADDED SHEETS WITHOUT NUMBERS.

5. AS EARLY AS POSSIBLE SET UP FOR RESISTANCE
 OR VOLTAGE DROP TESTS WHICHEVER IS MORE
 PRACTICAL.

USE CLAROSTAT 240C TO LOAD P229
 WITH A 2 AMP LOAD, IF ^{DC} POWER CAN BE APPLIED
 TO THE VEHICLE & THE LCA TEMP MONITORED.

IF RESISTANCE METHOD IS USED, USE THE HEITNLY
 OR ALINCO.

G. IF PAPER IS NECESSARY IN ORDER TO ^{OPERATE} MONITOR THE
 LCA WITHOUT COOLING REFER TO DEVIATION # 87
 OF 61015 LM-5 (SEE DAY 16-16-68 OF THIS BOOK).

This is the week
 Apollo 8 CSM
 goes out to the
 moon. 7 months
 ahead of Apollo 11

COPY FROM CARR

Ross Fleisig

Sum-ups

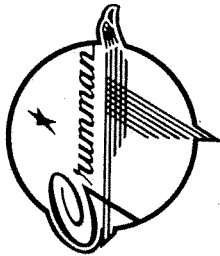
Reportable failures have gone
down from LM-3 ²⁰⁵ to LM-5 ⁵⁷

Same with Test DR's (1733 to 688)

Significantly improved vehicle

Low-Sub-Board ^{to} meet prior to demate
and prior to ship

Low - This is very likely to be the
LM to land on the moon - it
should be



LM-5 PHASE III

CARR

NOV. 20, 1968

Ailbruth - Impressed ^{ed.} with presentation -
Excellent. Getting to crux of
the matter. Impressed with some
tough technical problems left but
thinks they will be solved

Phillips - He agrees with Low & Ailbruth
Keep sharp to react quickly to
new problems. We've built 1st class
S/C. Been good review