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:
http://www.flickr.com/photos/jurvetson/sets/72157623704246792
1. Mod 14 to TPS 70010 prep was issued last night, deleting ECS Control Unit & all assoc. cables (because P/T 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 LM5 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 & OCP from 09:15 until 14:30. No QC coverage available.

Advised Pad Supervisor, Don Getrost (QC), D. De Martino, R. Valdez (QC). Meeting at Command post (incl. Al Beane regard), and Milt Cohen.

Result: At 14:30 still no QC, no promise except "we'll try for tonight". Pad supervisor will call 11:11. QC becomes available. Returned to PLT 39.

5. Checked 17:30 w. pad supervisor for QC assignment. He suggested we call back after 18:15 to get QC coverage (ask for Vinnie Mackel, pad supervisor).
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 REQUIRE A MODIFICATION TO THE CABIN FLOOR PLATE SIMILAR TO LM'S 3-44. AN ACCESS HOLE IS REQUIRED TO FEED THE 1024-19 4-23 CABLES THROUGH TO THE LCA AREA. (CAN WE USE LM-3'S FLOOR PLATE WHILE THEY MODIFY LM-5'S PLATE?)

2. TRANSFERRED 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.
1. Brought 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 36027.

3. Wrote deviations up to #15,
   (a) ACE P.S. #1 deleted
   (b) 1CB addition (4CB235) (4CB236)
   (c) 1CB deletion (4CB236) (4CB235)

4. Deviation #14 & #15 left on Naca Rep for § prior to incorp. into OCP (see already run).

5. Cabin floor plate was to be ready this PM. Installation not verified by AHs when complete, mate P51 (L75) to verify if already configured.

6. OCP 36015 now in progress. Expect completion in several hours.

Major open item is (2) above.
1. INSTALLATION OF 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. 2 AM)

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)
1. Latest status on LDW 410-11372-9-2 Cable (intercom ACE Carry on Console w/ IV & DC DIST Box) per Mel Schecher, 3:30am & NASA Crab still unresolved. Cable not ready for hook-up.

2. Reinstalled (4) Ground connection betw. Asc Stage Support Stunt & Work Stand & Ground pipe.

3. 1130: LTG TPS 35-915 starting. Vehicle power up performed per 70010.

4. 1200: on LTG TPS, prior to Item 3, Step 5, Mod is needed to close AC BOS 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. Preparing 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 reg’l changes (located in front of E. Dowse copies).
   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 PCR after completion of 36527.
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 - DEFINITELY WILL NOT FIRE UP GSE THIS MORNING.

(6) LEAVING LOG BOOK, DOUSSE'S 70010 BOOK AND Q.C.'S 70010 IN ACE # 3 ROOM FOR YOUR UTILIZATION.
1. 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):
   a. P2-12 Seq. 04-004 → 113 to 120 VAC
   b. Note on top of P 2-13 → 112 to 120 VAC (5/8 113)

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 pelps 11 & 16 for LM-6 in 099 shop:
   a. 4CB22 on PNL 11 → 3A
   b. 4CB21 on PNL 16 → 2A
   Shop Dregs showing this are for LM 4 & 3/6.

5. No other significant events occurred during day shift.

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 MILLIONMETER. 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 & REPAIRED BY MIDNIGHT. 36527 PROGRESSING NICELY.

3. REPEATED OPERATION MANUAL ON THE KEITHLEY MILLIONMETER.
1. INSTR OCP 36527 continued COMM were performing continuity checks.

2. At 20:15, the IPT, LDW 410-81070, 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 P2-8, bottom. The Cross Ties 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.
1. Generated sample "Power-up" & "Power-down" deviation sheets for use NW 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 0200 last night. Could find no evidence of recorded facility power failure.
   Areas checked: (1) GPS log, (2) 063 EPS log,
   (3) LM 5 pad support log, (4) LM 4 pad support log,
   (5) Plant facilities lead man,
   Suggestion: Re-check techs who worked last night for possible clues (e.g.: accidental tripping of 81070 switch, accidental pulling on facility cable... what switches did he operate for AC to come on again?)

E. Homburger
Night Shift
6/11 - 6/12/88

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 POWER JUST FEEDS THE TEST FLOOR AND THE MEZANINE. I COULDN'T FIND ANYTHING ON THE MEZANINE USING THIS POWER. ALSO, LM 4 WAS ALL POWERED DOWN, SO IT APPEARS THAT LM 5 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 box were still in.
1. OCP 36527 completed except for some open TDR items.
2. Wrote notes for Inst (36527) personnel, giving 8/670 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.

A. Hecht
Day Shift 8am - 6pm

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1. Descent stage being hardmated.
2. Started prep. for 62860 EPS & setting up for SMP 3914.
3. Informed by GSE that IVU #1 & #2 may no longer be put on top of Interface Unit because of impeding IV airflow from emerging thru the top surface.

Called GSE (Doug Crocke) to get their mechanical man to furnish a mounting rack or a raised platform type rack for the top of IV (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/TC)
2. 01:20 - VEHICLE POWERED-UP , VIA J107.
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.
A. Hecht  
Project LM5  
Time Day Shift  
Location PH 5  
Title  
Date 6-14-68

1. Preparing for OCP 62000 in progress.
2. No problems arose during this shift.
3. Writing TPS to improve CWEA/INV. Switch interaction.  

E. Homburger  
Night Shift  
6/14-6/15/68

No EPS problems at vehicle.

A. Hecht  
LM5  
Day Shift  
PI+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 Jig's & number.

GSE for TPS still req'd gathering.

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.
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.
  - 6-8pm - ED TPS 35-1040 running until found out the capacitor scheme did not work for their application.
  - 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 dept 5.
  - (P.S. The Stockroom did not know about the work order request & we got all but 1 item w/o use of work order.)

- 10-11pm - X-ray
- 11-12am - Could not get NASA QC.
- 12:45 - Dinner Break.
- 1am - Finally got NASA QC agreement to run w/o them.
- 01:15 - Trouble mating P/J 953. VI Cable too tight. Issued Cable # 572 for Vehicle Fix, if possible. Got 053 to give us some more slack to provide for interim mating. Finished step 2B.
- 02:00 - QC man disappeared. After checking with Leadman, we got replacement. New QC: Ted DeMartino.
- 03:45 - Completed to step 15, but stamped only up to 14. Since 15 reg's recheck next shift.

Actual run time: 2 3/4 hrs
Ind. crab delay.

Good luck tomorrow.
80% complete. HIV
Note to E. Homburger (R. A. H.):
When you complete TPS 35-923, hold the 2-prong to 3-prong adapter, which belongs to Bob Martin of 831. I will return it to him tomorrow night (6/18).

Thanks, #7.

Vehicle powered-up, and back on line with TPS 35-923.

TPS completed 1600. Conclusions:
1. 35 µF at P/J 148 PWS C & D seemed just at the verge of preventing the master alarm when switching from "Off" to "Inv 1".
2. With 50 µF, the master alarm never came on, in 10 cycles of switching from "Off" to "Inv 1" and to "Off" again.
3. With the 50 µF, 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.
2. Goldmacher suggested I leave at 215 if no further probe arise.

Material for TFR for TPS 35-923 for night shift is on previous page (73063). Check into status or disposition of cable # 572 (short cable to T953).

3. Could not untangle the apparent problem of Real Time Measmt of CEP 62000 seq 10 and therefore could not make improvements.
Performed no activity at vehicle. Day was taken up with meeting on the C&NWA master alarm situation, and a preliminary readiness review meeting for OCP G2000 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.
PERFORMED NO ACTIVITY AT VEHICLE. RECEIVED 200-PS. CHARGE (PCR 546) FOR OCP 02000-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 1145. I can think of 3 places to check:
   1. Mel Schechter X6346
   2. Don Snow (who ordered them) X 6405
   3. Geo Hanna (663 Stock rm) X 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 ACE Station in the future, to avoid similar inconvenience.
1. Write deviations up to Dev #37, p. 2-156

2. Reg's checking that Sec 34 changes being made will not require additional changes necessitated by matrix continuity.

3. Deviations 1-9 & 11-15 new copies inserted in F.Dowse Copy & ACE-use master copy.
   Remainder - No copies then 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
1. Grumman QC states that NASA QC has notified GAEC 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 120 to start reconfiguring.

4. Reply to questions relative to LTG & AC Power.

   a) Seq. 004 (LTS Setup) prepares for A/DR & dock LTS turn-on. Only 4CB146 or 4CB172 (ARD) CB is req'd to activate C/N LTS & dock LTS. This A/DR 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 IPC "Pre Checkout Prep Check List" par. 114 (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: 0156).

7. CB guards not available for installation. Installation sequences deviation out (temp) by STE.
8. In the setup of ECS valves (IPC p.1-222) it was discovered that ECS OCP 32022 was also on line & a conflict exists (Ref. para 1.54).

9. 0314: GPS obtained permission to shut down PS #1 of ECC (82092). GSE in the act of trouble shooting or switching "D6505" 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 dismissed.

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E. Homberger  DAY SHIFT  6/26/68

Run of OCP 62000 started 178:09:25:00
EPS Seq 004 completed 10:43
RCS Thr 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. Kate)
Inst on line 11:20 - 13:15
ED8 on line 13:15 -

Ed Poole researching the 3 LCR's mentioned in item 1 of Nite Log.
PS #1 was replaced with a LM3 spare.
1) Wrote deviations # 56 to 60
   (RTRS setup for ABORT STAGE & D/S Monitoring
   plus various minor corrections)

2) OCP-INST-62600 obtained TDR # 4: could not
discern C/W LTS ON. After cabin fluorescent
lights were moved to floor level
CIR 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 5/8 02]
    Trouble shooting 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.
    (ED Res check started at 03:25)

5) Reminder to E. Dowse: A. Hecht Night Coverage
    ends tomorrow (Thur) at end of shift (04:10 06).

Day Shift
E. Homburger/I. Neboz/5. Eiker

1) Reconfigured LTS for TDR # 6 of 02, repair
   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 PSTR # F 2193
   (at 15:33) Dev # 64
1. Restart w. Seq. 005-012 5/5 06
   EPO - DEHOTT, EPH - J. Galasso, RC T. Palazzolo
2. Seq. 05 comp el except CB guard to be installed later (time 1915)
3. AT 1920 CDR INFORMS US THAT THE TYPE OF CB GUARDS
   JUST GIVEN HIM DOES NOT FIT ON CB'S DUE TO
   OVERLAY INTERFERENCE. (P156816-7 is P/N of guards)
   They are tubular & should slip over CB stem, but
  _overlay prevents their locking in place.
   EPO Chris Howard, EPH - A Costango
5. Checked Inv. 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 rest
   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
   or executed. Otherwise they would insist
   on TDR.
   Resume 2143 wr Seq 007-008
7. 2200:
   Got TDR # 2. Neither Current Mtn # 5 nor
   Current Monitor # 6 read current on
   Ammeter. (CM's are S/N 5 & S/N 6). Start T/SH @
   0130:
   All functions operate when both curr mtns,
   except ammeters do not read.
   Holding in attempt to get two replacement
   current monitors from LM4,
   cont'd on next page
8) At approx 0215 someone tripped open PS3 Sw. at EPS 40 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 PIRR # F1372 & F1375.

0400 Vehicle now being powered down by STE
   (a) Pull cabinet breakers
   (b) Open CB's on T164 & 167 BOBs

$2090 left in standby (as in TDR#2, step 43).

To power up tomorrow morning for TDR #2, configure to restart sequence 20-000
(Bat 6 NF ON).

Then proceed on TDR #2 to verify ammeter operation ofCurr Mon #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.

Note: We were in Hold from 2105 thru 0400
for several consecutive reasons (see above).
Completed TDR #2 against Seq 008.
TDR's #3, 4, 5, 6 - Feeder resistances, Seq 008 & 009

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 P119 A, P119B, P119C + P119D are connected to E5085 Ground Point.
L.M. Tucker or 053 & Liaison Engineering are working on this connection. (Ref J92 PINS 15, 16, 21 + 22)
In order to reconfigure for the rerun .01 press left DFR set pushbutton on the 81060 and proceed.
(Also check power supply for proper voltage settings as indicated by the CDP.)

5. Holding at Seq # 027-008

6. Insert Dev. #71. Generate deviation for CDP Addition (After Seq # 027-012). - Deviation #77
After getting signatures
7. Insert deviations #71 & up to approx. #76.
1. Completed TDR #12 (but not sold off yet)
   (Re-run OK at seq 027-008)
2. Deviation #77 for seq 027-012-A
3. Deviation #71 thru #76 signed off
4. TDR #13 against seq 9
5. Deviation #78 for seq 028-024
6. TDR #8 sold

7. LSK 580-119-5 incorrect manufactured in error. All new parts are labeled 587-0760 instead of 597-110. GSE is now using a workorder to correct. Box them @ 06 and
   ship it and allow usage as is.

8. Afterriging BOB Box it was discovered that box was improperly wired. PIPR
   will be written after sequences 38
9. Found PUM leakage most connected
   to CSM Bob - another set of PUM were
   connected
10. Ar’meter on CSM Bob is also sticky.
    TDR 14 remains open because of this.

Wrights
T. Neil/A. Rehmann/S. Schublers

1. Approch 154-H. held during seq 38 for QC
   and other problems regarding connection.
2. Received go-ahead from AC (Jim Adams) to
demote this
3. Picked up TDR’s # 15 #16 #17
4. Completed seq’s # 34, 35, 36, 437
5. TDR #17 is a constraint- removed. LM/CSM Bob 119-5
   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 Hi & CSM Lo"). (2) on front of BOB, reverse
   lettering ("CSM Hi -(14+15)"") with "CSM LO - (7+8)). (3) on back, reverse
   "CSM Hi -(14+15)" with "CSM LO - (7+8))".
1. PROCEEDED TROUBLE SHOOTING TDR#17
   (a) REWORK LM/CSM 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.

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NIGHT SHIFT E. HOMBURGER

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 Seq 040. Wrote notes to do this but did not get to perform.
5. The real time recordings of Abort Stage switchdown
6. Set-up now: Interface - Output Per - Bus 1093 - Current Monitor 1-4:
   25 A HV Input In
   100 A HV Output Out
   Sec - 25 Amp
   LV CB's Out
   1092 - 1095: 25 Amp CB & Switch
1. Generated TDR # 234-24

2. TDR # 25 created a constraint, start holding at (SEQ # 41) 1520.

3. tested for AC heaters create new limits of LL 0.25 AMP, also test for AC window heaters, as it is now connected.

4. Requested SE on station to evaluate LDW 410-82090 OC/RC control panel. (left side tested at 2.3 Amps, right side = zero).

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 410-82094-0) S/N 5 to use the left side unit which was used for the ascent OC/RC checks on ECA #34#4, (PIRR # 2966) was placed against the OC/RC panel.

7. Retrav at SEQ # 41 start at 17:48. Stimuli OK, SEQ # 41 completed 17:55.

8. Completed SEQ # 42 at 18:03

9. Sell TDR # 25 as a "bad stimuli unit".


Picked up TDR # 29 while 82090 stimuli panel left side failed in the BAT 2 Position.

Repeat SEQ 51 + sell TDR # 29 with a new stimuli unit.
LOG

Time
Title
Date 7/2-7/3/68

1. The 82090 was powered down and the OPO CRC removed. New panel installed, S/N 6 out 8/23 in.
2. 22:10 calibration check of new panel indicated faulty RH side. 22:35 check of LH side completed OK. Portions of RAS were performed via TDR #29 Continuation sheet.
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 had been missing and searched-for, for a few days.
6. CDR window heater was wired in Continuation sheet for TDR #24 measured current at 0.47 amps.

DOWSE/SARBELLO
DAY SHIFT

1. HOLDING AT SEQ 59 (OEP IN GSE HOLD)
2. SOLD OFF TDR'S # 25 4 29
3. ALSO SOLD OFF TDR'S # 14 15 7
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.

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
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 and won't be resolved until the proper connection of the 4 #119 wires are connected as per LDU 54359 Control # LM5 -14050. The P&D Supervisor is working on this problem.

E. Homberger
7:48 PM - 8:18 AM
7/8-9/68

2. Couldn't obtain Keithley Milliohmmeter from Q.C. (NIGHT SUPV. WOULDN'T RELEASE UNIT FOR TEST)

3. Drew troubleshooting circuit for BAT 5 & 6 Feeder line - L analysis

4. Biddle ducter available in panel shop but no Q.C. support.

S. Sarbello
7:40 AM - 8:18 PM
7/9/68

1. Obtained Keithley Milliohmmeter from Q.C. Model #502A and took resistance checks of accessible test points on TDR #3 continuation sheet. Data was questionable and found the Keithley inaccurate with a known 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 0.16, Biddle, ducter read 0.062. Suggest night shift use the Biddle ducter and repeat the steps #1 thru #12. (Note AWG#6 approx 400 M. 2/FT)
1. Measured resistances for TDR #3 Continuation Sh. 4, with B2B2B Ax. Cannot see anything wrong. Also measured Bat 5 (-) and Bat 6 (-) studs to vehicle frame - each was 1 milliΩ. Our troubles could very possibly be in the DVM instrumentation.

E. Dowse/S. Sarbello
7:48 AM - 8:18 PM

1. SIGNED OFF TDR #3 CONTINUATION SHEETS #3 & #4.

2. REVIEWED RECORDER DATA TAKEN ON JUNE 27, 1968 ON RECORDER 2A1A7 CHANNELS #7 & #8 (GO471 & GO4155) 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 SOLD 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
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 G.PI TEST
STATION WAS CHARLIE FARMER. COPY OF TEST DATA
TO BE FORWARD TO S. SARBELLO AT LATER DATE.

2. TRANSFERRED INSTRUMENTATION PROBLEM INCURRED
IN EPS TDR #2 TO INSTR. TDR #10 AND ATTEMPTING
TO SELL OFF TDR #2 TO NASA.

3. SOLD TDR #2.

E. Homburger - Night Shift - 7/11/68

1. Performed Continuation Sheet #5 for TDR 3 -
checked PVM-DVM 2 readings against
Fluke meter at Battery stand.
2. Stared up an EPH for FCS OCP
3. Get Controller Control Panel (Power supply for
CP0CRC) 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 - 7/12/68

1. LM-6 Panel 5 ready at 05:15 but no window now
for changing panel because EC's is using C&W lights
2. R/R OCP I got TDR for me PFI light at CDR X-RTR
3. Got NASA to sign off the Batt Readout Test Set Pin F
charge to the ITC.
1. CHECKED IF THE FOUR 117 WIREs FROM P 92 WERE INSTALLED AND DISCOVERED THAT LOW 53-54339 E01H4 HAD CONNECTED THESE WIRES. TDRS FL413 MAY NOW BE CLEARED WHEN A TEST WINDOW IS OBTAINED.

2. DISCUSSED THE LOW 540-52090 EPS C/O CONTROLLER. PROBLEM WITH BOB HARRISON (O65) AND DISCOVERED THAT THIS CUT OUT PROBLEM OF THE POWER SUPPLIES THAT FIELD THE NODE C CRC HAS EXISTED FOR SOME TIME AND OCCURS ONLY AFTER THE 52090 HAS BEEN ON FOR MANY HOURS (?) DAYS (?). THE SEEMS TO BE AN INTERNAL HEAT DISSIPATION PROBLEM AND THE THERMAL CUTOUTS 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 NO OSP 62000 ECS. WHEN PNL 16 ECS SUIT FAN OP 4CB120 IS IN THE FOLLOWING CAUTION LTS ECS PREAMPS RNDZ RDR + WARNING LIGHT ASC PRESS BECOME DIM (NOTE THESE WERE THE ONLY LIGHTS ON 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 ESS 62000 SHUTDOWN PROCEDURE SUGGESTION WAS MADE THAT THE LIGHTING TEST SET SHOULD INCLUDE AN AMMETER IN THIS CIRCUIT WITH A CORRECT INDICATOR THAT STOPS ANY CURRENT INDICATED.
Above a certain level, certain lights will become dim if on. These are the annunciator lights.

Speaking with D. Tyler concerning this same problem in addition to the above lights, on panel 2 (1057), the H20 sep light was on and remained on the 7051 light came on when the PNL 18 ECS suit fan AP CB (9CB120) is depressed and went off when the AP (9CB120) is pulled.

1530 T. Kiedel

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

1930 Still no window to panel 5. (RR & R require Airlift/Dock/C ramp, CB for power to C/W lights — there might be a window between RR & LR)

E. Homburger — Night Shift — 7/13, 4/68

Panel 5 removed. Completed our little check with the flood CB at 20:40. CB did not pop.

Panel 5 of LM6 installation completed 01:00.

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.
LOG

Engineer: A. Rabinowitz  Project: LM-5  Location: PLT 5

Time: 7:48 AM  Title:

Date: 7/14/68

LOG RDR received a TDR (TDR #18) due to flickering of a warning light located in ALT/ALT RT meter (9 MG) on Panel 1. Occurred during running of OCP-GF-2000-1-RAD-LMS. See 22-035-02 at approx 12:30.

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

Harold Weber - LM-6

Pat Wiley - LDR Rdr Subsystem

Frank Kaplan - LM-4

S. Sarbello - Night Shift  7/14-15/68

1. EPS Support of LDG RDR OCP. No new problems occurred related to EPS/Lighting.

2. RDR'S TDR #18 researched further - Level 3 DWG5 AND LM-5 EFD's show 9 MG as a 'Black Box' (only shows integral & numeric input points). This warning light is not part of the PFI family of lights - however, purpose its function is similar. This meter has built in logic which 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 07/15 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 site. 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

Continuation sheet to remove the unit.

Record PIRR: E/1860
1. GENERATED PIRR# E1860 TO HAVE INVERTER #1 5/4/134 REMOVED FROM VEHICLE, ALSO ATTACHED TO PIRR "OPERATIONAL HISTORY OF INVERTER #1."

2. REMOVED INV. #1 FROM VEHICLE ON TDR #1 (OGB - DAVE STEIN)

3. REQUEST FOR ED EVENT ACTIVITY OF NY 89 084, NY 89 424 AND NY 90 364 ON 7/15/68 BETWEEN 1400 TO 2115 WILL BE AVAILABLE FOR ANALYSIS WHEN RECORDERS 3A4A2 AND 3A4A4 ROLLS ARE PULLED OFF MACHINE. (NY 89 084 "SYS A, QD4 STAGE BLT" ON 3A4A2, CHAN # 10. NY 89 424 "SYS B - ZLDG GEAR DPLY T" ON 3A4A4, CHAN # 28. NY 90 364 "SYS A DES FL VENT VLVT" ON 3A4A4, CHAN # 15).

4. FCS WENT INTO A HOLD AT O418 TO CONFIGURE AN ED TEST - NO WINDOW GRANTED TO START ON EPS TDR #12 AND #13 FROM STE.
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. L1CO was having power problems today.

S. Sarbello - Night Shift

7/17-18/68

1. Wrote installation instructions for panel #5 against TDR #26 pages 647

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.
DAY SHIFT

Dispensioned ECS TDR 12 by quoting ECS 62000 TDR 129. This is the DSHY status lights dimming problem. This due to LCS loading.

Successfully reran INV1 8N128. 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.

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

PCMTE being removed fr. LMS 1 being replaced by an operational spare to be obtained from stock. LMS PCMTE Assy had a temperature dependent panel requiring its replacement.

S. Sarbello 7/20/68

1. Fluctuations was observed by CDR on CDR BUS position on power/Temp monitor. AEC Station Recorders showed approx 18V variation also verified by CRT display. Current monitor #5 showed a load off Gamps. Believe the variations are due to various ECS modes of operation.
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) PNL16 - 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 Power Routing - Ascent stage" lights.

OCP & COMM is operating, drawing from 5 to 7 amperes in addition to normal vehicle current demand. Also ECS & AGS are operating, thus total current drain is in excess of 10 amps continuously.
1. FCS OCP running. CDR reported DEPA numeric digits "8" thinking in back ground 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 was 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 400Hz was dead. 19:25 they restored the power and IPT was powered up again. Note: With IPT Voltmeter reading 119.4V, CRT Inverter Bus is reading 114.7V.

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

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

During this shift, the 41070 "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.
1. The 81070 IPT still reads near high limit IPT VM 119.6 V AMM 1/4 AMPS AC Monitor 118.2 V at J167 BOB CRT 118.2 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 (KL, Brothers) 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:
   L5K 5000-1106-1 COAS SIMULATOR & CABLE
   "   -1128-3-3 SEQ CAM TSN
   "   -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 #142 reproduced & interleaved into our run OCP MASTER BOOK.

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

1. FCS operating, ave DC current is x 20 Amps.
2. No EPS problems encountered, except for lowering Bat 6 voltage by approx 0.3V to prevent heating of Bat 5 & Bat 6 voltages (by reducing I6 to zero amps).

SARBELLO/HOMBURGER DAY SHIFT 7/23/68

1. C-Started the Battery Amp-Hrs on CRT PG 3 (845) just for the exercise.
2. Helped out with a PIR on wiring.
3. Question has come up—will batteries be used for LM5-61018? 
DISCOVERED THAT PANEL 8 EXPLOSIVE DEVICES
STAGE SEG RELAYS SYS A + SYS B
WERE ON.

ED
ITEM ED
ALSO AT ACE #3 ED THE FOLLOWING LIGHTS WERE ON.
ED
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 GD4 STAGE CNT T (RED)
6. 3A5A5 SYS B ASCO X COMP LVLVT (RED)
7. 3A5A5 SYS A DES FL VENT LVLVT (RED)
8. 3A5A5 C/O ENCLOS NO.1 PRESS (WHITE)

ED
WROTE DEVIATION NO 143 + 144 ED WHICH
ADDED STEPS TO ACE #52 WHICH RESET:

1. THE PANEL 8 ED STAGE SEG RELAYS SYS A + SYS D
LIGHTS (LIMITED LIFE)
2. ITEMS 1, 2, 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. HOMERGER — DAY SHIFT — 7/24/68

1. Obtained copy of NASA Memo & TWX, and LCR 2376,
regarding welding insulation resistance — for TDE #17.
These are in master run book in back of TDE #17.
2. Regarding TDE #12 + 13 — final installation of ground
loads was done per EO H4 to LDW Z80254359.
(Adding Ground Point E5085 for connection to J92)
3. FCS #10P near completion, then just COM will run.
4. Vehicle will be soft-mated tomorrow, for 1935.
   [CLEANED AT 1935]
5. From approx. 1900 on, ACE Record — Event 21. This metal hazy wire,
Rewrote TDR's 12 & 13; TDR continuity sheets and ran both TDR continuity sheet sets successfully. Obtain NASA signature during the day shift. There is no NASA EPS coverage tonight.

On the S2090 the #2 lamp is out (bulb is good) and the blowers do not operate. Frank often GSE is checking into the problem while GSE is looking into the S2090 problem vehicle PWR was switched from the BAT 5 & 6 input to BUS INPUTPOWER. As soon as the S2090 problem is cleared switch power to the BAT 5 & 6 interface and get voltage drop information.

Note: EPS #6 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.

Attn: E. Humburger  Day Shift  7/25/68

1. S2090 #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. Pass Feissig. LM5 will get LCA Sun night, near end of MG, update.

4. Per R. Longinotti & D. King: NO work on Sunday (both shifts). D. King wants to talk to E. Dowse at 8am tomorrow.

5. Configuration of power remains exactly as at end of prev. night shift. 6hr powerdown expected 8pm for soft mat.
20:00 VEHICLE BEING PREPARED FOR SOFTMATE
GENERATED POWER DOWN PROCEDURE WITH
STE B. DURKHIN.
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 READING WAS TAKEN ON TDR #3,
SHEET #12.

2) 10:30- POWER WAS APPLIED TO VEHICLE.

3) NO BATTERY CURRENT READINGS - P/S 877 IS DAMAGED AT PCM
CHECKER CURRENT MONITOR 05-66 - EACH SHOWED A FEW AMPS.

4) ED SOWLE: STEVE BARNES WANTS TO TALK TO YOU MONDAY
ABOUT RAT VALIDATION OF 8510 BETWEEN 62000 & 67015.

5) TPS WRITTEN TO REMOVE TRACK LIGHT S/N 107 AND INTERIN
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 CT PANEL 3A5A2 THE FOLLOWING
RED LIGHTS ARE ON: (08:22-30)
SYS A QO 4 STAGE BOTT
SYS A CABLE COUTER T
SYS A QO 1 STAGE BOTT

HOWEVER THE CAT IS NOT UPDATING AND
THE 208.4 K BIT DATA IS NOT BEING UTILIZED
AT THIS TIME.

AT R-START OBS NOISE ON 1111 X.EQ. & VERIFY
0000 X EQ & VERIFY

THE THREE RED UPS ARE OUR.
1. Bob 1124 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. 18:30; TDR#3 progress thru step #117. Holding until next shift because techs are req'd for LRMTB. Installation left.

4. 18:30 - Don Fox to date has not located S/N 103 tracking light Assy & its related PTH test history. He will leave a tie-in with his (Monday) dayman to get in touch with the Cog. Engr.

5. Remove load bank during hold period (18:50)

E. Dowse /A. Hecht 7-27/68

Performed TDR#3 continuation sheets 17, 18, 19, 20. The data obtained on these sheets should be enough to sell TDR's #3, 9, 5, 6+11 the CDR bus interface with 3167 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 ECC's turned out to be higher than expected.
1. COMM is only OCP running.
2. Devs. 51-44, 45 & 46 prepared to permit RAT testing of 8510 (Inv. Simulator) by TPS 6804-29-001. (These Devs. are to G2000-CNV-LMS). These dev's isolate the T/67 PWR BOB from vehicle for use with RAT.

   GSE (Stan Barron) will notify when TPS 6804-29-001 (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

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1. COMM OCP RUNNING
2. ACE REQUIRE 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 0804-081, 33592-1, 16, 19 & 23 also 33834-15.
4. EXTRACTING TIME HISTORY DATA FROM G2000-EPS OCP FOR EVENTUAL USE IN TRPER, (COMPILED HISTORY FROM SEQ 008 THRU SEQ 030)

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A. Hecht
Day Shift (8am-8pm) 7-30-68
1. Found missing Sht 5 of TDR# 7 in Ramp office (TDR back had unstamped copy instead of stamped copy).
   Asked QC to close out TDR# 7.
2. TDR# 7 Completely stamped off (Sht 541).
1. RESET ED EVENTS LIGHTS 3ASA2 -17423 ALSO3ASA23, AT 1630.

2. COMPLETED TIME HISTORY DATA 62000 - EPS UP TO PRESENT STATUS.

E. DOWSE: DAY SHIFT 8-1-68

3A5A4
SYS B ASC FC
COMP VLV 2 T RED LT ON

DISCOVERED AT 213:18:14
INSERTED 1000 IN R-START 080 EXEQT
VERIFIED AND THE LIGHT RESET

DISCOVERED ON 3ASA2
SYS B QD 1 STAGE HUT T RED LT ON
AT 213 18 48
INSERTED 0001 IN R-START 080 EXEQT
VERIFIED AND THE LIGHT RESET

S. SARBELLO
NIGHT SHIFT 7/31-8/1 8/1-8/68

1. EXTENSION CABLE LDW410-4061-1 FOUND IN PLACE OF LDW410-8529-1
   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.
   CHECK 4A5 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.
   RESET OK IN STANDBY MODE.
6. IF 82090 FAILS FOR 3RD TIME, DC POWER TO SUPPORT COMM
   OCR WILL BE VIA 82140 AND EPS TDR#3 WILL
   BE SCRUBBED FOR NIGHT SHIFT.
7. WITH MARVIN MITZNER (GSE ENGINEER) OBSERVED
   POWER UP FROM GPS AREA AT 0145. EVERYTHING
   LOOKED NORMAL. BOTH POWER FAILURE CAUSES
   UNKNOWN. SUSPECT MOMENTARY FACILITY POWER
   OR OPERATOR ERROR.
   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

REVIEWED FELDER PERFORMANCE DATA
WITH STAN FEINBERG X 9833 OR 1551, C. KEENAN X 1551,
AND BOB BRANDT X 1551. THEY ARE SATISFIED
WITH THE TEST RESULTS BUT AT PRESEN
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 SEQ 120-95 ON PANEL 14 SET BAT 5 B.U. 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/J 74 A#B, P/J 970, P/J 886 & P/J 1804. PROBLEM RESOLVED - FOUND P/J 1804 DEMATED FOR COMM GROUP NO CONSTRAINT TO COMPLETING TDR#3 TEST.

2A. COMPLETED TDR#3 TEST DATA.

3. SOLD TDR#1 ON G2000 - 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 3354-24 EVENT LIGHT.

7. TESTED PNL# 14 TALK BACK AFT AFTER P/J 1804 REMATE - TEST OK.

E. DOWSE DAY SHIFT.
REVIS
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. Review & 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 S0 070-000 of 62000-0PS.

4. Duane King wants Hecht (Saturday night) & Rabinowitz Sunday, if necessary, to generate TPS for checking new ECA by Sunday night.

5. Power down at 1815, no power requirements until panel #1 is installed.

Note: On J167 power Bob both AC & the DC CB's now open (per Dan Perkins).

Hecht Night Shift 8/3-4/68

1. Started to write RETEST for new ASC ECA #3 on TDE #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
1. There was no EPS Day Coverage (8-4-68). A. Rabinovitz was scheduled to be there, but his failure to show still requires to be clarified.

2. Power-up during day shift was done by STE using DEP 70 010 and powering to BUS DIRECTLY.

3. Continuing to write ECA #3 RETEST.

4. 0443: Power down by Dev. #55 (CON)

5. PNL 1$5 RETEST TPS held up by need for changes as reg'd by NASA Test Eng'r.

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 HUV & Dev. Bats SW to "ON" and A/S Bats to OFF:
      1st - Section 1 (Bat 1 & 2) to D/S & Deadface & CONNECT
      2nd - Bat 3 & 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 values on CRT. (partial seq 55-57)
1. HOMBURGER & HECHT INTERFACING FOR ECA #3 RETEST TPS. SARBELLO COVERING PANEL #1 RETEST TPS AND GENERATION OF POWER UP PROCEDURE (DEVIAITON #56 THRU #60)

2. COMPLETED POWER UP PROCEDURE. DEVIATIONS WRITTEN AGAINST CONTROL DOCUMENT. POWER UP MODE TO BE BAT 5 N.F.I. VIA 82090 TO 1167 BOB.

3. 1800 - HARD MATE OF VEHICLE IN PROGRESS. AFTER HARD MATE, POWER TO BE APPLIED TO VEHICLE. 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 PULLED TONIGHT.

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

1. Called E. Hamburger on schedule. He wants to see there tomorrow, 8/6, to attend meeting w. subsystem and NASA in order to try to resolve TDR's #34, 58 & 59. This will cancel this day-off this week. Will try to get replacement for Sat night, if possible. Asked Dr. Goldmacher of these facts & the possible weekend problem.

2. Reviewed Power-up deviations #56 - 60 (cont.) & changed phase rewire dev. # 58 & 59. Added last step to Dev. 60.

3. 0200 - Powered up vehicle.

4. Compiled w. E. Hamburger suggestions to modify a few steps & to rewrite TDR # 5, item 5 to include both RET & leader line drops.

5. Wrote DC BUS ISOL Sequence (TDR item 9) & partial item 10.

6. RETEST (TDR #5) Nearly complete, except for RC application of 4 battery currents (Bat 1-4).
1. In order to remove panel #12 last night, DR 17 disconnected our JIG BOB.

2. LTS configured to support OCP G1015 (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 reveals hook-up error (4 pairs of docking light wires patched correctly to SUDC terminal post. Last pair erroneously hooked in 5VAC terminal posts. No damage to wires detected and problem rectified by tagging 5 pairs of wires to related terminal posts. Also found FWD STBD extension lead open circuited by poor crimp connections.

5. Continued writing TDR#5 Continuation sheets.
cont'd from prev. page

7. Found PS #3 Voltmeter on 82090 to be out of calibration (2 volt too high). Get GSE to recalibrate PS #3 when the pull #2 for calibe tomorrow. Better yet, calibrate all 4 PSs-they are all off.

8. Completed TDE #5 to step 12 incl.


all EPS CB openings now need VEH Duct, as ECA's & ECA controls (MV973).

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, return 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 Panel 11 # 16.

2. Regarding item 10 above - checked configuration. Calling 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 CMM
- HTR5 - S BD ANT

On Panel 11:
- (6) CB's under CMM
- HCBUS A - TAPE RECVR & LTG-INTGL
(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
even does not prove enough to justify the extra
   mating of connectors.

   x (b) Seq 072-006 5/15 02   Delete "and W3"
       Delete "and J1 and"

   x (c) Seq 072-006 5/15 05 Delete Deviation #14. The
       LTS is to be disconnected and given to LM 6
       Delete or modify Seq 073-005. 30-hr timing
       test is going off the Event Timer.

x (d) Delete Seq 073-011 5/15 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 Decade 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
   6/1015. 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

Engineer: A. Hecht        Project: LMS       Location: ACE 3
Time: Night-SWFT  PM-PM  Title:          Date: 3/17-3/18

1. Prepare to run 62000 LTG Sequences.
   Wrote Devs. 134 & 135.

2. Waiting for Tech & QC Coverage.

3. 0400: Ready to start running Seq. 071.
   NASA QC states there are 3 LCR's in existence
   Constraining the LTG Sequences. Details are
   Not known to the writer. He would not
   Let us start.

4. 0415: After some detective work involving
   STE, LMS plug-in, Liaison, LMS personnel, etc.,
   located LCR files in Jet 39. Obtained keys
   & found LCR's 1694, 2529, & 2625 (filled 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 (Main LTS Cable
          to J1 of LCA).

   (I understand this is an INTERIM installation & the test
   will be repeated with final LCA - G. This info is not official.)

7. 0555 Got TDR #30 (OCF 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 Completed Seq. 071. Tech writer not able to
    Write deviations of 071. Will be done later.

Over please.
CONT'D FROM PREV. SHEET

0710: Hold on step 072-006, cannot mate P1/J1 because insufficient vehicle cable slack, Issued Code No. 801, 053 loosened cable clamps prior to getting sufficient slack (see crab)

0741: Floor replaced, Seq. 072 completed, TDR #30 dispositioned & ready for sell to NASA.

S. SARPELLO
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 ORP), COMPLETED SEQ 71
2. COMPLETED SEQ'S 072, 073
3. RECEIVED TDR #31 ON SEQ 074-012-04

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" J167-1126 BOB was rejected because of bad pins on PIRR # FJ 2801
2. FLUKE #97894 is marginal on battery check
8:30 am: A. Schneider wants us to issue PIRR's against 82090 PS #3 & others to have calibration checked. Asked him to get techs (R. Hachman) to generate PIRR's as we are too busy preparing for more TDR #3 exercises.

9:30 am: R. Hachman cannot write PIRR without reference to a TDR indicating a defect. We will not buy w/o a TDR reference. We would have to run some steps on an open TDR.

2) Info, Mr. R. Hachman:
   a) ECC P.S. Voltmeters read voltage "sensed", not the "local" voltage.
   b) Examination of J167 BQT 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 regimts for continued run of TDR #3 (as determined at a meeting 8/8 between subsystem NASA & an EPS group representative), I met 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):

P/N 10 RCS Sys B - Quads 1-4 TCA
INST  - CW/EA
All Communication CB's

P/N 11 RCS Sys A - Quads 1-4 TCA
INST  - Sig Cond
All Communications CB's
6. Advised P. Holmgren to charge Bat of (disch'd.) Fluke voltmeter.

7. 4:30 pm - Checked W. Don Fox to get Fluke meter loads if not already available.

8. 19:15 - Asked D. Fox to get 1213 BOB, 3297, 3279, 4356 & 4357 Cables (for SE BUS meas)

9. Transmittal of test reqmts (TDR 3) attached.

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E. KOMBUERGER  - NIGHT -  8/9-10/68

1. Prepared outline of steps to make measurements, and started writing continuation sheets under TDR #3, at Sheet #129.

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 J74A. GSE cable to J74A too stiff to bend into position. This would probably be ok when panels are not in, but with panels in, a 90° connector would be required.

   The GSE cable to P74A 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 P87 on panel 16 instead of P74A. Started re-writing the continuation sheets - got half thru Sheet 30.

5. Got as far as mating P87 (don't need J87) to 1213 BOB 1. Intended to use HEATERS RCS Sys A/B-2 QUAD 2, pins P87 N± and M±

6. Vehicle powered down at 07:35.
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 18041, pins 1 & 2 (1/2 inch from connector - short located by reflectometer).

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Ettmenger/Attlebet Day Shift 8/12/68

1. Ran TDR 3 shots 29 thru 36 (Line drop data)

2. TDR #3 still requires:
   a. P/J185 Bob removal & conn remote
   b. P/J 87 Bob removal & conn remote
   c. On pull 16, pull in HTS, RCS sy's A/B, & quad 2
   d. Pull ASC ECA CB
   e. On pull 11, pull in DES ECA CB

3. Nonpowrd via bat 5 NF.
1. Reconnected P/J 105 & P/J 87 on TDR#3 Sheet 37.

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. [Cabin Voltmeter and Caution/Warning Light DC Bus] 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. LTG then checked out temporarily installed docking lights using TDR #31 continuation sheets. Docking lights checked OK.

A: Heart/E. Hamburg or 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 OCP 62000) will be done. Apparently, Dock & 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 stands. Also loose at current mon # 5 & 6. S/B tightened when veh. is powered down. (61015 prep has crab about this which reg's selling).
4. We reviewed data summary (in notebook) & question results, "What is common between Bat 6NF & Bat 6BU which results in 3.75 to 5.4 m typ greater red than res. of Bat 5NF & 5BU lines?"

Can loosen return connections at bat 6 Stud be responsible?

This should be looked into if window is available. Suggest measurements 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 0186B pin 14)

2. Supporting 053 on OCP 61015

3. Instrumentation repaired connector - CRT page 4 line 10 (G0.0302) OK. Completed work at 0430.

4. 053 caused scrub of battery #5 & #6 stud. Tightening activity - no tie in during shift change of info and gathered equipment.

5. LTG group troubleshooting all night on TDR #32
1. Attempted to T/S TDR# 3 further. Got shut off because G&N are running. Staying by for G&N completion.

2. Completed TDR# 3 continuation sheets 39 thru 42.

§. SARBELLO
NIGHT SHIFT

1. COMPLETED RERUN SEQ 065 (FLOOD LG) VIA DEVIATION #147. TEST CHECKOUT GOOD.
2. RAN CONFIDENCE CHECK ON DOCKING (SEQ 070) & 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 CHECKED GOOD.

3. WROTE & RAN DR# 13 SEQ'S #243 L THRU #243 X CHECKING OUT MASTER ALARM INHIBIT CIRCUIT RESPONSES TO PANEL#14 INVERTER SWITCH FUNCTIONS. ALL TESTS CHECKED GOOD - NO MASTER ALARM ACTUATIONS.

4. POWERED AC PWR OFF VEHICLE AND POWERED DOWN D.C. 82050 POWER SUPPLIES. POWERED UP VIA $24140 TO CONFIGURE VEHICLE & GSE FOR STARTING SEQ 77 (X-LUNAR BUS ISOLATION CHECK), CONFIGURED VIA DEVIATION #49, #2900-CON-LMS.
5. RECEIVED TDR#33 AT SEQ 077-020-03.

6. 0600 - STARTED TROUBLESHOOTING TDR#33.

7. GET DEVIATION #148 SIGNED OFF BY RASPO.
1. Continued T/S an TDR # 33. Had to power up for other subsystem testing after lunch. TDR #33 in hold.

2. Notified by K. Leechter that P5AAM connector opened by EPS seq 77 (X-Linear Bus SOL.) 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 7010 to give power to other systems.

5. Data taken yesterday on ascent ECA #4 indicates 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 P722 conn. & do not exceed 1 hr max time.
   b) If not successful, try demating vehicle side of Lnt 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 C) 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 6:29 pm after RCS completed. Stopped at 077-012.

9. Established that info on J722 remate (revs L. Lo Cassio) was wrong. Joe Palazzo, QC had verified last night that P722 was
1. RERUN OF SEQ 077-000 TO SEQ 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.


4. SOLD TDR #32.

5. ECA #4 TERMINALS 1, 2 & 4 HAVE POTTING COMPOUND REMOVED (BY DRY PICKING METHOD).

6. STE HAS SHUT DOWN VCPS & 2140 VIA OCP 70010.

A. Hecht / E. Hamburger
LM-5 Day Shift 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 & (IMU, PTA, RRAA, RREA). Reading was 360-52/250-52, 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. Ed20: Ed Devois’s son Jimmy was notified that Ed is not expected to work on Sunday.

2A. Ran TDR #33 steps 26 - 32.
1. Homberger verified IMU installation not the cause of isolation problem.

2. Tonight PTA unit was installed - also not the cause of isolation problem. Isolation OK (300-A) to date. AREA & RRAA still open items to be reinstalled & evaluated.

3. Ran TDR #33 to step #49. Also reconnected P722 & PSAAM.

4. Took Biddle-Ductor readings and torque measurements on TDR #3 (Steps #227 thru #232), confirmed high R 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-Ductor. The composite data is as follows:

   **Fluke Method**

<table>
<thead>
<tr>
<th>ECA #3</th>
<th>ECA #4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Term 4-2 = 0.36 MΩ</td>
<td>5.10 MΩ</td>
</tr>
<tr>
<td>Term 4-1 = 0.48 MΩ</td>
<td>5.14 MΩ</td>
</tr>
</tbody>
</table>

   **Biddle-Ductor**

<table>
<thead>
<tr>
<th>ECA #4</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.8 MΩ</td>
</tr>
<tr>
<td>8.5 MΩ</td>
</tr>
</tbody>
</table>
1. COMPLETED SEQ 077 (X-LUNAR BUS ISOLATION TEST) LESS RREA & RRAS. ISOLATION TEST TO BE REPERFORMED AT A LATER DATE WHEN ABOVE MENTIONED UNITS ARE INSTALLED. TDR#33 TO REMAIN OPEN TILL THEN.

2. PREPARATION WITH DEPT'S 053 & 043 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 232:1937.01 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 9/16/68

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. #74 running or 7/8 all night, No EPS activity on vehicle.

4. Note to Day Crew: Dev. #137 Thin 145, written 7/10, are still in black notebook. They require Sig & incorporation into O.C.P.
1. IT WAS DETERMINED THIS MORNING BY DON DIMARTINO THAT THE RETEST OF THE NEW "B-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#0 GP C2000'S ON #8 R43 CONTINUATION SHEET IN ORDER TO SELL TDR'S #3, 4, 5 & 6

THE DESCENT STAGE IS DEMANED
CONNECT (MAY BE ALREADY CONNECTED) TO J174 OF ASCENT STAGE TO MONITOR THE FOLLOWING POINTS IN PARALLEL WITH THE MODIFIED J167 BOB (L5K 560-1126-3-5) & THE MODIFIED J166 BOB (L5K 560-1123-7)
(4) 5 POINTS AND (2) 2 POINTS, INSTEAD OF THE 3 POS + NEG AND THE 3 SE POS + NEG POINTS;

J174 PIN 239 → TO PNL 11 NEG VIA
TREX - 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

PIECE PORTIONS OF THE GP AND INTERLEAVE READINGS OF THESE POINTS BY MEANS OF THE TID CONTINUATION SHEETS.
① Awaiting availability of Techs & QC acceptance of 1102-7 Power Bob.
③ 0400 - Start power-up per TDR's sheet 46, ECS cooling is back on-line, maintaining interface of about 60°F.
④ Asked IRO to take only periodic checks (approx 1 hr apart), he is not req'd to remain on station. His reports were approx 10 to 62°F.
⑤ 0500: Hold - Bat 6 NF does not come on. Found open CB's on curr man #6, continue on TDR #3, sheet 47.
⑥ 0745: Completed up to TDR #3, p. 49, item 254 inclusive. (OCP Seq 80F is complete)
⑦ Continue w/ OCP Seq 809 as above.
⑧ 053 has alerted EPS Group that Docking Heater Wiring was broken and requested the EPS Test Sequence that will recheck the wiring.

Dowse/Sarbello
Day Shift

[Signature] 8/21/68

1. Ran all necessary steps from Seq #603 thru #268, 239 thru #269. Test data was satisfactory to close out TDR #3, 4, 546.

2. Sold off post test deviations #138 thru #145.

3. Docking window htr (PIR # 44940) recheck 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. 5002-05-44940.
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 (GC 0302)) CRT PAGE 4 LINE 10 READ 0.16VDC 5/8 26.5/32.5VDC).

A. Hecht Night Shift 12M to 5am 8/22/68

1. Ran Docking Window Hdr Verification (Ref PIRR 41940) on TDR #33 page 9. Completed 0230.

2. While doing (1), burned hole into J167 Bob case by large wire being shorting "GSEA" to Bob case. See TDR #33 page 9, note 7 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 7 for PIRR & details.

4. 0345: Completed writing of PIRR's for items 2-9(b). Relieving STE during his lunch break.

5. Completed reference hook up sketch, TDR #3, p. 52.

6. Open item on TDR #3: (a) Remove Bobs at J173 & 174 (b) Verify/Perform PUM leads to J166 & 167 Bobs are restored to IPC configuration.

7. (Opposable) replace J167 Bob to have S/N 2 repaired per PIRR's 95024 & 95025 (Items 2 & 3 above)
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. Damage to EPS connectors 173 & 174 being evaluated by Dowse.


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:
   a. Should TDR's be accounted for?
   b. Is it worthwhile to list TDR NDRS & the dates on which work was performed on them, without mentioning the hours?
   c. Require direction before proceeding.
On TPS 35-62000-08 (Upper Bus/Feeder Reassembly) operated Mode 1 & 2 powered up vehicle, per TPS and Mods.

A. Hecht 12 Midnight to 9-13-68

1. Comm operating on "Low Bit Rate" - Holding for propel 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 ch at or near P/J 1400 pin 49 (PNL 3). Test by is req'd during day shift to localize fault.

6. Feeder Line check TPS Results:

   Bat 6 NF to CDR BUS : 8.5 Milliamps
   Bat 5 BU to CDR BUS : 9.6 m A
   Bat 5 NF to SE BUS : 9.6 m A
   Bat 6 BU to SE BUS : 9.7 m A

7. Power Status: 1) Bat 6 BU to SE BUS powers buses.
   2) VGPS supplies Bat 6 power with VGPS current Sw in ASCEND
CONTINUED FROM PREVIOUS PAGE.

FIRST CONNECT JUMPER FROM J174-218 TO J174-138
BOTH ARE NOW CONNECTED.
SET ALL LM POWER OFF PTL 70610 VIA 5T.

ALSO CONNECT JUMPER FROM J173 PIN 109 TO J174 PIN 239

PORTABLE PS 30V 10 AMP WITH CURRENT
LIMITING FEATURE IS SET UP FOR 2 AMPS AT
PRESENT SET TO 10 AMPS FOR THIS TEST
IN CABIN CLOSE BOTH X-LUNAR BUS BAR CB'S AND BOTH CROSS TIE
BALANCED LOAD CB'S.

THE CLARIOTAT 296C ('FOUR') ARE ON THE
WORK STAND.

THE LMK 417-1900-5 ('THREE')
AND 417-1900-7 ('FOUR')
ARE ON HAND ASK OGS3

HOOK UP AS PER FIGURE 2-1 OF 62000 EPS
PAGE 2-153 INCLUDING RESISTANCE VALUES.
(POWER SUPPLY AND MEASURING METERS MUST BE FLOATING)

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 (-) AND CLOSE BOTH
10 AMP CB'S

GET VOLTAGE DROP INFORMATION WHILE
MONITORING BOTH X-LUNAR INPUT VOLTAGES AND
BUS VOLTAGES SIMULTANEOUSLY (SET PS AT 25.0 VDC)

CLOSE FOLLOWING SWITCHES:

J9-15
J9-19
J9-11
J9-14
J9-12
J9-19
J9-7

A CHAIN TO DROP
AGAIN DO DROP DUCH SHUT DOWN
(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 DEPLOYES
1: 1300: Started TPS 35-955, Partial PNL 11 Retest.
    1355: Power applied to Busses.
    1455: Holding at item 22 for Com "LOW BIT" operation to conclude.
    1545: Holding into item 37 for INSTRUMENTATION to run and remotely P/F 173 & 174.
    1745: Resume item 37

2000: Held at Step 50, appear to have wrong GSE cable. Checking.

On call for AOT: Stan Benson (or his rep)
    x 86497 (or ACE) x2
    for X-Lunar: William Scardon
    Jim Klemko

Night Shift E. Homburger 10/3-10/4/68

1020 CDR reports that PLT 10 is demated in cabin P/F 9 "mated."

0320 Completed thru item 69, pg 20 of TPS.
    Stalled at item 72, pg 21 - CRT showed 11111111. Reason - no DVA on vehicle.

0330 Item 78 interfered with COMM test, so I dropped the Tape Reader test. I reasoned that this could be done later with the Up Data Link test.
    Could not get AC Electromics coverage for the AOT Test - they were running on CM 14.
    Ran TPS Mod 3 till the mill to get going on the X-Lunar test.
    Stopped at 107.3.02. PTMV below Z pulses.

Summary: Not Done - Items 70 thru 106, and 107.3.02
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1. 3PM - Completed all tests except update 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 3 will give it to Steve 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 drugs 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 2½ minutes.

4. Info on LM 6 X-Lunar -
   (a) Isolation NG with VGPS power - better with portable PS
   (b) Randy Radar lowered isolation resistance.
   (c) Looking into Recent ECA's: 06 on both ECA's with one polarity of meter; 15k on one ECA and 20k on the other ECA with opposite meter polarity.
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 #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 RTEST TO START AFTER PANEL #5 IS REINSTALLED - PANEL #1, #2, #3 RTEST SCRUBBED FOR TODAY.
5. EPS COVERAGE REQUIRED TONIGHT - NO EPS COVERAGE SUNDAY REQUIRED.
6. GENERATED TPS 35-965 PER BOB LONGHOTTI'S REQUEST. MONDAY - GIVE BOB UPDATED 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 - 10am 10/5-6/68

1. Updated my Bob cable list to Rev. B, using copy of rev. B obtained from S. Sarbello (could have saved time if extra copy had been run off).
2. After midnight, the only activity was COMM T/Sht.
3. No problems encountered.
1. Vehicle powered up via 70010 at approximately 0925.
2. Ran Seq. 2 of TPS 35-752 (Run 1, 2, 3 Re-test) in AM.
3. During Seq. 7 (Last Section of TPS) the GSE Power 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 Amandite on TDR#1.
4. Continuation sheet: checked Interlock drop-out voltage. This was 20½ volts - OK. Powered up again, and is holding OK as of several hours later.
5. Trouble is unknown.
6. Ran Mod. 4 to the TPS thru the mill.
7. Power kicked out again at 19:09.
8. TDR#3 was just received - on X-PTR Scale Factor light.

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# 10 of TPS 35-955 is now signed by NASA and stamped OPR by Grumman QC. Only NASA QC stamp OPR is now required.
2. Ran by 3 of TDR#3 on "X"10" light. The question now is whether to de-rate P/3 57 vs P/3 58. According to Fred Pittisch Test Engineering, P/3 58 vs P/3 57 de-rate investigation it is more desirable to de-rate P/3 58 as it is almost entirely REJECTED, retested by M/I of 61015. (However, panel 3 must be physically lifted to get at this component.)
3. GSE Support (Ed Amandite) 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.
1. Re 81001 interlock: Stan Baroza does not have info on replacing LHS box by LHS 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  
ACE 3  
8 AM - 8 PM  
10-9-68

1. TPS 35-965 (Docking Lights, Fwd) Are Removed.  
   Thermal blanket being installed.
2. Sold TDR # 31, 02000 EPS

3. Wrote with D. Stern Ed group the
   request to sell TDR # 1 of TPS 35-753.
4. 02000 EPS TPER & TPS 35-955 TPER in work

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

2. Could not demate P/J 54 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 doc) 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 099 to first check wire to pin 21 of P57 for break before pulling panel 2.

5. Left Boba at P/J 57 & J 56 connected. FCS (Tom Woods) requested we keep them there for FCS use.

6. Special 400 Hz power cable also still on work stand.

7. FCS found CTKS flipped (crossed) between AC BUS A- 
   RANG/RANG RATE & CPE FDAI CB's.
1. Performed sequences 64 thru 77 on TPS 35-752 TDR #4 verifying copper paths of "AC BUS A - FDAI" (4CBZ09) & "AC BUS A - RNG/RNG RT, ALT/ALT RT" (4CBZ04)

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 T001O.


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, Rangelos, etc.) determine what caused the RNG/RNG RT, ALT/ALT RT meter damage & avoid a recurrence.

7. Verification of P/J 60 H, J & T is outstanding & will entail (after powering up) a trans-lunar isolation test.

E. Dowse / H. Hecht / Homburger 10-11-68 Days

1. Performed sequence 2 of TPS 35-752

2. Hecht working on TDR #4 X-Lunar P/J 60 retest which will be performed Monday.

3. Sal tonight Biddle doctor the + Y strut end to a good vehicle ground structure point and write a procedure to redo sec 35 of 62000 also to be performed Sunday.
9. SAL VERIFY 12 S/N 42 12/13-1 BOB (J56)
CABLES WERE RUN OUT
ASK, DAVE STEIN (063)
(XB4650) CHARLEY HEREDIA. (063 GSE) CABLE STOCK AREA.

S. SARBELLO
8PM – 8AM

1. DAVE STEIN CONTINUITY CHECK, ALL ASSOCIATED CABLES
100% THAT WERE WITH BOB 12/13 S/N 42 YESTERDAY
HOWEVER THE BOB WASN'T FULLY CHECKED ON PRR# 1084.
S. SCHAFFLER OF 063 HAS BEEN DIRECTED WITH
QC COVERAGE TO RING S/N 42 100% TONIGHT.

2. ITEM #1 ABOVE COMPLETED – NO ADDITION DISCREPANCIES
FOUND IN BOB 12/13 S/N 42.

3. BIDDLE DUCTER TESTED THE +Y OUTRIGGER STRUT KNUCKLE
(Point A) TO DIS STAGE (Point B) ON BOTH LM5 & LM6.
LM6 HAS AN ADD GROUNDING CABLE (LSK 417-1600-2) FROM
KNUCKLE TO WORKSTAND GROUND. THE TEST DATA SHOWED
(a) LM5 = 360 μΩ
(b) LM6 = 1500 μΩ.
(NO TDR CONTINUATION WAS REQUIRED TO COLLECT ABOVE
TEST DATA).

4. COMPLETED TPER TPS 35-955. REQUIRES
REVIEW AND LIMITED LIFE ENTRIES
(CAN'T LOCATED Q.C.'S TPS 35-955 BOOK FOR ENTRIES)

5. SEQ 35 OF 62000 BEING INVESTIAGTED.
1. Write outlines on TPS Forms but the first priority is P/J 60 retest + x-lunar isolation

2. Review W/S #11 GPS Log for power loss information on 10-7-68. Noted this info to disposition TDR 1 on this date, as the power loss was caused by power leads coming loose at 19:06. What caused the other two.

3. LUT switchover test.

5. Sarbello 8PM-8AM 10/12-13/68

1. Review W/S #11 GPS Log for power loss info as requested - found log book had 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, TED, CDR, FM, TRO, GPS & EPO. Also need leads (3) of stat & SImpson configured per deviation #27 (0CP 6/015) for this test. Leads have been made by 063.

5. (Write LUT switchover test against TDR #33 6/2000-EPS, perform while waiting to get on line for x-lunar isol. test) LUT switchover test after x-lunar test.
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. Dec. 17 to 61015 supposed to be req'd - asked tech to research the contents of this deviation
   3. TC reviewing TDR Sheet for contect & familiarizing himself with what is to be run

2. At 1209 following completion of Carry-on operation at ACE,
   Started TDR #4 at 1231 (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 LMB & 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 Hartin NASA.
   Bill Ryan finally called Ron Baden (MIT) to demate P/T 75 (PSAM), Now waiting for NASA AC 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 connnect Fluke in step 138.52.
   Also have only 1 Simpson meter, trying to get another.

10. 1812: Still searching for 2nd Simpson. Also can't find QC on floor for demate P/T 233 GE had to lend us a Simpson.

11. 1900: Holding after 138.67. AC/MIT is in middle of a sequence on LMB & cannot come to mate P/1
1. COMPLETED TPS 35-752 SE序列 138 S/S. 68 THRU 02

2. ALL GSE CONNECTORS REMATED AND DC POWER RETURNED TO VEHICLE BUSES AT 9 PM. AC TO BUSES APPLIED AT 9:20 PM.

3. HAL KATZ REQUESTS SUPPORT FOR ORP 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

1. Ran TPS 35-969, P/J57 comp 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

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 SER#163 AT 2300 HOURS

4. COMPLETED X-LUNAR ISOL. TEST (SEQ 163.1 THRU 163.25) AT 0310 HOURS. 0310
1. Prepping 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. Longinotti wants to be reminded of this periodically to assure this to be included in schedule.
5. Demated PS(-12V1 cable) from IRT(41076) via TPS 35-971 Held.
   So that PS can be mated to INVISIMULATOR (9570).
   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 hook up at INV/CSM Bob.
7. AC/MIT found in Seq 004-021 & following that 3 breakers remain closed (EPS Disp, ASC ECA CONTBS) which they object to when X-Lunar Bus Ties are opened. Devs #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 390-0001-2 according to LDW 340-53295 as a temporary installation.
3. Tracking Light is electrically installed but not mechanically secured as yet.
4. 8510 Voltage Stops to be set at 119 V.
   61015 TDR #10 was caused by meter stop being set at 117 V.
5. TDR #12 - Docking Lt hook up req'd correction.

2. 0946:28: 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 A.)

3. 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/5 05.)

4. STRIP OUT OF AC VOLTAGE ON RECORDER 2A1AT SHOWED GSE AC DROP OUT FROM 0946:14 THRU 1:49. A 35SEC LOSS OF POWER. PROBLEM UNDER INVESTIGATION.

RECORDED DATA SHOWS LOSS OF POWER TWICE 1ST @ 9:33:24 RETURNED TO 100VAC @ 9:16:46. 2ND @ 9:46:44, RETURNED @ 9:46:54, TIME SYNC'S WITH "REMOTE SENSING" SW ACTUATIONS ON.

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 & Starbd — x 10/21
b) Forward — x 11/13
c) Expected start of 61018 — 11/21
d) AFT — x 12/6
e) Expected A/S ship date — x 12/13/68

TDR #12 being left open for the time being until Jack Knochel gets a chance to discuss with Tom Martin.

1530: TDR #12 IS NOW SOLD.

6. OCP 62000-EPS — got all stamps & sign for closeout of TDR #31.

7. INTERVIEW BROWN OF 063 DEPT WHO WAS "GPS" DURING INV. SIMULATOR AC PUR DROP OUT AND ED AMERIGE GSE ENGRG. WILL GET BOTH TOGETHER TOMORROW TO RESOLVE TDR #14.
NIGHT SHIFT

1. WROTE DEV NO. 88 TO SWITCH OVER TO ASCENT MONITOR AND TEMPERATURE, THE LCA BECAUSE.
THE SECONDARY COOLANT LOOP WILL BE COOLING THE VEHICLE AND THE PRIMARY LOOP WILL BE SHUT DOWN.
AFTER SECO 13 IS RUN, DEVIATION 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 WITHOUT SECO 13.

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LIMIT 120°F

AT 5:30 A.M.

3. ACE STATION INDICATES GLITCHES. HOWEVER, NO REAL TIME CURRENT VARIATION WAS OBSERVED BY 1RO, FM, 1 OR EPO

CM 42 15 -20 7.5 +10 22 20 0
EPO AND FM ARE MONITORING CURRENT MONITORS 1, 2, 3, 4
AND GPS IS MONITORING THE 82090 AMMETERS FOR GLITCHES

AT 07:16 1RO, GPS, FM & EPO NO CURRENT OR VOLTAGE
TRANSIENTS HAVE BEEN OBSERVED. ONLY SLIGHT
CURRENT VARIATION HAVE BEEN OBSERVED
(EPO, FM & EPO ARE RECORDING CURRENT) AT 15
MINUTE INTERVALS WHILE WATCHING FOR
TRANSIENTS)

DAY SHIFT OBTAIN DATA FROM EPO, FM & GPS
AND HAVE THEM CONTINUE TAKING DATA AND MONITORING
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 L.G. & W.E.

(a) GSE-85/60 functioned OK. Meter relay activated at the 119V limit setting. It is to be expected that the open-loop simulator voltage (VOLT OUTPUT SW still in MIXED 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 variety 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 switch.

(b) CAUTION - Never have REMOTE SENS SW ON when Voltage OUTPUT SW is in VARIABLE.

4. Studied thru M12 in attempt to prevent any recurrences of TDR #14 during AC switchings.

5. Deviations #92, 93, 94, 95 generated.

P1: 119, 348, 711, 679

6. TDR #14 sold.

7. At approximately 17:25, primary cooling loop shut down. Announced this at the Dev. 88 & forenoon shift. Shutdown supposed to be only for 2 hours. Batts 1-4 averaging 4 to 8 amps each; PRIMARY COOLANT

look turned on
291:20:31:40
NOTIFIED GPS DEPO THEY NO LONGER HAD TO
TAKE CURRENT READINGS HOWEVER ANY HIGH CURRNT
EXCURSION SHOULD BE NOTED.

291:22:02
1RO CHART PAPER SHOWS - COR GLITCH
AND A 1 VOLT DROP ON THE COR BUS.
- ECS WAS TROUBLE SHOOTING AT THE TIME. (DBR N6.615)
GLITCH OCCURED JUST WHEN THE SUIT FANS WERE
TURNED ON.

292:03:51:00
RAN TPS 35-974 AND SUCCESSFULLY RETESTED
- THE DOCKING LIGHTS AFTER INSTALLATION OF
DOCKING LIGHTS OVER THEIR ASSOCIATED
THERMAL BLANKETS.

292:05:25:00
CRT PG 05 STANDARD WORDS
DISAPPEARED. C/O RECYCLED THEIR PCM CB
AND THE PROBLEM CLEARED.
VERIFIED WITH THE 1RO THAT NO GLITCHES
WERE OBSERVED ON THE VEHICLE BUS ES DURING THIS
PERIOD.

A. Hecht    Day Shift 8am-8pm  10-18-68
1. OCP 61015 IN HOLD. COMM IS TROUBLE SHOOTING.
2. Sold TDE #1 of TPS 35-752 (Part Interlock shutdown)
3. At 15:30, the wires on pigtails of LREA, P205, were charred & CB tripped.
   I did not get a look at the charred wires since there were too many people around
   LREA and all personnel not immediately involved were ordered to
   leave. Visually, the damage was confined to the LREA side (P205),
   The vehicle side (P205) looks clean. As a test, high pot check is advisable.

[Diagram of circuitry]
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 ZA167 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 (CK105)
   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 RECORING DATA FOR
   ABOVE PERIOD.
   TRY X2275 DON BICKOR.

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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 dots 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" cleat dockng
   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
   in oscilloscope had occurred.
Grumman Aircraft Engineering Corporation

LOG

Engineer: E. H. Douse
Project: LA 5 61015
Location: PLT 5
Time: 7:15 PM TO 8:15 AM
Title: EPS
Date: 10-19-60

1. Wrote DEV. #103, TO COVER THE #4 DOCKING LIGHT NOT BEING INSTALLED. OTHER DEVIATIONS WILL HAVE TO BE WRITTEN AS THE DOCKING LIGHTS ARE EXERCISED UNTIL THE LIGHT IS REINSTALLED.

2. BAT 3 Amps
   21:30:22 9.7
   33:06 5.2
   35:40 5.0
   38:10 5.2
   40:55 5.0
   42:50 3.8
   44:05 4.7
   45:35 5.5
   47:30 5.5
   TOTAL AMPS: 12.3
   BEFORE LR TURN ON

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

4. S. Sarbello
   8AM - 8PM
   10/20/60

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 @ 16:30

4. EPL CAUGHT AROCKPIT SWITCHING ERROR TO LATE (TEST JUST STARTED) CALLED IT TO JOHN MANZIO'S ATTENTION THAT SEQ #36 SHOULD BE BAT 54 BAT 6 IN BACK UP CONFIGURATION.
   PROJECT IN BAT 54 BAT 6 IS NORMAL AS OF 10/19/60.
5. Checking into discrepancy we found that CDR/LMP configured switches via the OCP "Check List" 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 Jairzd to make test #5 BAT 5 B.U. & BAT 6 B.U. but they refused the recommendation. (Ref. OCP page #2-771)

S. 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 2-792). TC executed 41-010 S/S 01 jumped .02 & when S/S .04 was executed, Bats #14 #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 (with seq. data (good stuff) needed.
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 demote of interstage connectors to be performed.
7. 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.

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**F. Homburger**  
**Notes 800-800**  
**Date 10/21-10/22/68**

1. QCP 61015 continued. Seg. 042, Dynamic test in MM 4, was started at 02:30:03 (20 min. run). Afterward, the tape was found to be missing. Tape replay was attempted but was not successful. All EPS personnel were found to be missing. No one was able to be contacted. All the records were locked 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 35-9175 to check the TPS light was run earlier. OK — all 5 TPS lights ON.

3. The decision has been made to re-configure for a re-run of the Dynamic Test.

4. DEB #1104 was generated to raise UT — required because of fluctuations of loads and the poor regulation of the UPS.
1. 10:00: Inv. #2 (was on since 0230) was turned off.

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 S-old.

5. ACE power returned approx. 1500. Call to Sfn 1550, resume at p. 1040.

6. TDR # 62 (Flood lights) - Will be dispositioned by re-run.

7. Acquired TDR # 67 ("Bus" light on IV is dimly lit). (at 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 (ORG 25)
   TDR # 67 S-old.

8. TDR # 68 (COMH) on p. 2-1151 seq 042-328 (x 1925).

E. HOMBURGER - NIGHT 800-800 10/22-10/23/68

1. OCP 6/10/5 continued. MM4 Dynamic Test Re-Ran 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 111 expected.

4. EPS was OK except that Observer said that the Flood lights flickered in unison with the RCS jets firing. NASA (Jack Knodel) was not too concerned.
about this, but wanted it noted for the record. This was added by QC to the Flood TDR #62.
5. The original 'frip' 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/5 by other systems. Wrote a procedure for them to power-up AC with the inverter simulator but we didn't use it yet.

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

1. WROTE TPS-35-976 TO REMOVE -4 (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 IF THERE WAS ANY POSSIBILITY OF SOMEONE VARYING BUS VOLTAGE.

E. HOMBURGER - NIGHT -

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

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E. HOMBURGER - NIGHT - 10/24-25/08

1. AC and DC powered down at 22:30.
2. Interstage connectors mated.
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 06:45.
1. POWERED DC TO BUS (ASCENT STAGE DEMALED) @ 08:13
2. POWERED AC (INV.SIM. #8510) TO BUS @ 08:50
3. WROTE TPS 35-981 TO REMATE BOB'S 1126 41113 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 33-027

VEHICLE NOT POWERED. PREP FOR CCFF. 10/28/68
SOLD: 01015/TDR #62 (FLOOD) DR #28 (LOG GR TB WIRE) 10/29/68

A. Hecht 8AM- DAY SHIFT PD 39 10/29/68

To E. Dowse:
1. Phone call fr. Bill Dunkin (16/15): C2F2 requires J166 & J167 Power 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 Boxes are not shown on figure 1-1. Advised Dunkin to write a TPS to demate, cap & record J166 & J167. He agreed.
2. On above review, found 2 items to be deviated:
   a) DVM #1 (fig 1-1) will not read any voltage, thus s/b deleted.
   b) To permit ascent power to flow fr. 82140, add amp 1-30.
   Verify set "controller output - sect 1 & 2" switches "DESCENT STAGE".
1. OCP 32014 (c^2F^2) 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 (INVISIMULATOR). Did on TDR#1 of TPS-35-617, page 5.

4. Noticed that PVM leads are curved up at D/S level & do not go up to 166 & 167 Power Bobs. Also IBO recorder for Bus Voltages has not been set up.

No action taken, since we are monitoring at ACE & NATA.

TPS activity on 32014 may not be complete. However, cables to J166 & J167 were remated on TPS 35-1121.

5. Vehicle is now powered per OCP 70010; AC & DC.

6. Started to work off TDR #52 of OCP 32014 (Sheet 3).

Docking Hatch switch was not depressed by closing of Hatch, since hatch barely touched SW plunger, instead of depressing it.

Dog LDW-340-53285, sh. 3 requires 0.060 to 0.090 inch plunger depression.

We repositioned arm as far forward as possible & obtained only .016 in switch depression, enough for floodlight to be operated, but not enough to meet .060 Min Spec.

Docking Hatch Cog eng.)

I suggest a mtg w/ SW Cog eng & liaison to resolve a course of action (either change dog reg & add .060 in. Shim on the hatch surface which actuates switch.

![Diagram of Vehicle Structure with SW plunger and Docking Hatch]
1. WHEN POWER IS AGAIN APPLIED TO THE VEHICLE OR YOU
   CAN APPLY IT AS NECESSARY, FOR THE TEST (7 M 4) ECS
   QUANTITY PFI AND (7 A 5) ECS GLYCOL PFI.
   ON PHIL 16 CLOSE ECS DISP CB (4 CD 140) 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 ECO TIPPER.

4. THERE WILL BE TESTING TONIGHT BUT NO
   DEFINITE INFORMATION IS AVAILABLE YET.

5. DICK BARDDOCK WOULD LIKE TO KNOW WHERE THE
   1054 METER BOB IS, Found - was out for cal.

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

1. Had PVM leads connected to pwr leads.
2. Ran verification of ECS Power Failure Indicator
   Lights on DR 30, page 20, steps 96 – 96.
3. Powered down veh at 2200.

5. Tabulated “Run time - hold time” for Work Summary
   sheets; listed TDK’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.
1. WROTE TPS TO SUPPORT AEA TESTING.

2. S.S. CONTINUED WRITING INV 142 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 / C. Nomburger 11/4/68

1. SOLO TPS 35-981
2. OPTICAL OSCILLOGRAPHS SHALL MONITOR THE VEHICLE BUSSES DURING ALL TESTING. CALL X8 4558 FOR RAY WATERS DAYS OR RAY WILLIAMS NIGHTS.
3. TYPE FOR 62000 LPS-ALG. IS NOW READY FOR TYPING.
4. THE SUBJECTIVE LIGHTING TPS IS NOW IN PROGRESS.
5. SAL ADD MOD TO TPS 35-981 FOR RETEST OF THE LSC 360-618-3 DOCKING LT SWITCH. AS IT IS CALLED ON THE TPS HOWEVER THE SWITCH NAME IS ACTUALLY THE LM/SLA DOCKING LIGHT PRESSURE SWITCH. MAYBE GEORGE SETTRANNI 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. #142. GET TPS NUMBER, SIGNATURES AND REPRODUCE COPIES AS REQUIRED.

3. SUBJECTIVE LIGHTING COMPLETED. R. RADAR NOW TESTING.
1. Note & processed Mod 1 to TPS 35-985, documenting that retest for newly installed LSC360-616-3-1
(LM/SLA Dock & 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. Homburger/A. Hecht Day Shift 11-6-68

1. Used TDR #1 of TPS 35-412 (Subjective Ltq.) to show independence of ammeter reading from "Integral Ltq." dimmer control of EL ltq. operation. Powered up per OCP 70010 & had no bus loading except PCMT E & SCFA'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 load bank and also do not expect to get OK for powerdown req'd for load bank installation & change of power configuration until Friday at the earliest.

1. LIGHT BEAM RECORDER MONITORING SE & CDR BUSSES.
2. EPS SUPPORTING G&H TESTING (EST COMPLETION @ 01/00.)
3. 0315 - G&H TESTING COMPLETED.
4. FCS 30,031 (OFF LINE DUE TO G&H PRIORITY & QUIET SHIP REQUIREMENT) BACK ON LINE.
5. COMM & R. RADAR ATTEMPTING TO TEST BUT ARE RUNNING INTO VARIOUS OCP & MANPOWER PROBLEMS.

A. Hecht Day Shift 11-7-68

1. Requested G. Setlani to sell TDR 1 & 2 of TPS 412 (Subjective Lg test). Both are Delivered. TDR 3 remains open, since dim DSKY Lts are probably a DSKY problem & require action w. AE/MIT.

2. Requested CDR to generate a vehicle crab on scratches in Port & Starboard OUTH Flood light shades covers which permit some light to come through. This was found & reported by CDR during TPS 412. Fix involves paint touch up.

Latest info (1730): LM Pilot will generate crab.

3. STE in conjunction w. Bill Backer (Inst.) is writing deviations to OCP 70 010-LMS adding seq 06A (STWEA turn-on) and seq. 09 A (C&WEA turn-off).


5. Items not yet accomplished:
   Proof reading of 62000-EPS TRER

C. Homburger Night Shift 11/7-8/68

Vehicle powered all night via 366,167 for other S/T tests.
1. TDR's 1 & 2 of TPS 35-412 (Subjective 2%) are now Sold.

2. Wrote Power Switchport portions for TPS 35-781
   (Rudz Radar Pilot Signal Test - Monitoring for Spurious Signals)
   Pages 3, 4, 5, 44, 45 & 46.

3. 1900: Starting Run of TPS 35-781.

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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 O32 Lab installed, for CDR Bus.

2. 02:06 - PGNS-IMU OPR CB closed. Shortly there-
   after, IRO reported glitches on CDR Bus.

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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 ±0.5V fast spikes superimposed on
   CDR Bus volts every time the (IMU ?) Heaters cycled "OFF"
   Concluded unstable condition exists between PS 3 & PS 4 (of C/O 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 this problem (Gus Petrocelli).
   Transient was ±0.25V Negative from ±29.4V level ± 20.77 VDC
   Pulse duration was < 1/100 Sec, chart speed = 4"/Sec.

\[
\frac{\text{4"}}{60 \text{ Min}} = \frac{67 \text{ milli-}}{\text{Sec}} \quad \frac{1\text{ Sec}}{0.07 \text{ in}} = \frac{X}{0.010 \text{ in/sec}}, \quad X = \frac{1}{7} \text{ Sec.}
\]

Pulse duration was less than 140 milli-sec.
This condition returned on LGC Restart 12:30 PM.
See TDR #1 (TPS 35-781) 12:40 PM.
18:15  STE informs me that Gardner Lorimer left a TDR # 05 or 06015 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.

19:45  Leaving for dinner.

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E. Homburger — Night — 11/9-10/68

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

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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 HARDWARE 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 A
   2B A
   Power Supply — AT THIRD MEGAUNION (C/O)
   GAEC 71968 — Power Designs Inc.
   Model 5015T (0-50V, 1/2A)
Vehicle D/S & A/S mated, 6.7 front half of work stand
left open for S-5D area test.

Power cable mated and solder 0100.

Power up per 10010 at 0335
Power down 0440, TPS 35-354 completed.

P/J 173 & 174 were not movable, it could not
do the Mission Critical switch test yet.

Was given notice for 11:45 for TDR #1 of OCP
30031 to run. Could not locate the cables
called for, and also, they wanted to get restarted
on putting the front half of the work stand
in place.

S. Sarbello
8AM - 8PM

11/11/68

1. Supported FCS group on TDR #1 30031, ascertained
the presence of (4) 50K resistors per FCS system (A & B)
via J167 R3D3P and J166 R3, J1, D3P, no power on
vehicle during this test.

2. Powered up vehicle via 70010 at 14:30 with P/J 173
& 174 left demated due to recessed 4 bent pins
found in P/J 173.

3. Powered down at 15:00 due to ace room problem.


5. Waiting (16:00) for glitch detector to be hooked up
to Support AEA RETEST (TPS 35-780).

5A P/J 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/J 173, power up
& EPS to support AEA RETEST TONIGHT.
LOG

Engineer: A. Hecht
Project: LM-5
Location: ACE 3

Time: 8am - 8am
Title:
Date: 11/12/68

1. AEA Retest, TPS 35-780, ready to go on line, but they have no procedure to operate with separate isolated buses.

2. Wrote Mod 2 to TPS 35-780 to change from 70010 configuration to separate buses via bate 5 & 6 prior to start of test. Also included in return to 70010 configuration at completion of test.

Note: Could not do Mission Critical Switch Test with separate buses.

3. While bus was down, prior to TPS 35-780, DVM -1054 Meter both read 6 Volts, switching off the Bus Monitor System removed the 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.

S. Sarbello / Donse / Homeburger

1. Got Mike Mattoni (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 VDT Group. He with post me on progress.


3. Battery Charging for 61018

4. Serial numbers of assigned batteries to be charged are: A15, S/N 104 & 105. 0/35, S/N 111-114.

5. In preping for DCP 61018, Identification Sleeves on Q6T4-HV & Q6T3-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.
6. PREP FOR MISSION CRITICAL SWITCH TEST IN WORK (TPS-35-992), SYS "A" & SYS "B" POWER SUPPLIES ON WORKSTAND. WAITING FOR BOTH P/T 481 MATES BY 053 DEPT TO BE PERFORMED (18:15)

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

Night shift 11-12 & 13-6P

1. Performed power switch over per TPS 35-780, Mod 2 to OEP 70 010 configuration.

2. RR & LE test activities in progress.

3. 0200: Received info that new inverters will be available 11-13-6P 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 Fam 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.

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 LSC 390-8-9-7 INVERTERS.

A. H. PLEASE KEEP TRACK OF CORP BATTERIES & 130 V CHARGED FOR 1M-5 PUMP.

STICKER OF EXHAUSTION
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. 41/16
   C/W reset on p.4 (STE has detailed procedure)
   Added IPT Interface check on p.12, wrote sequence to avoid shutting off buses by resetting Bats 5/6
   (on p.16).

6. 04:20 - Provided power via isolated buses to get Polarity test, OCP 36032, on line. Used Mod 2 of TPS 35-730, Item 1 for power switchover
   Item 3 of Mod 2 should restore OCP 70010 config at end of OCP 36032.

7. Battery charge status at 05:00 -
   ASC/Bat S/N 167 & S/N 105 charged fully.
   DES/Bat S/N 112 & S/N 114 charged fully.
   DES/Bat S/N 111 being charged

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 290 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...
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 mounted 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 2 page mod to Inverter Functional Test, TPS 35-995. Attached same to basic TPS, but not processed yet.

5. Message from Ed Donee:
   ① Ed H. — Clean up **62000** TPER
   ② Follow up item 2 above. (SS # Ed H.)
   ③ SS & Ed H. — Prior to INV Removal & INV Installation, (make sure that: ① PnL 14 INV SW is OFF
   ② PCHTE 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)
1. In morning, was asked to support AGS on their TDR's regarding AEA3 restarts. First they wanted to look for power (bus) glitches with GPS in local sensing then I Remote sensing. I discussed the ORANGE sensory 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 1166/164 Porter Bobs. Then it was decided by R. Angeli to wait until after the Inverter test. The Scope was at the stand, by the cord and leads were returned to Bob Hochman.

Also in the meantime, someone requested Stan Barrow to generate a TPS to test the GPS to REMOTE sensing (TPS2/11-15-002)

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 PC/TE CB was pulled. At the same time the PANEL IT INVERTER CAUTION LIGHT came on. There was no TDR issued for this occurrence because pulling the PC/TE CB it's affect on C&W is not defined. The same operation was repeated and the master alarm did not re occur. Future Ops should flag this item.

Also any time the inverter frequency drifts +/2 Hz we may get a master alarm & an inverter caution.
1. Dispositioned & obtained AC/MIT & Nasa Sig for TDR#4 of TPS 35-791 (Rudy Radar Pilot Signal Test) related to burn 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 Eideowen's desk.

3. Wrote Mod 3 to TPS 35-993 (Battery Charge).

4. Wrote TPS 35-968-01 For Installation of Thermo Couples on LCA Flanges. Scheduled for 6 pm per STE. Hard copy left at D1C S/6 at data bank.

5. ECS observed -8V & +6V spikes at 1427 & 1436 and at 1613 we repeated with only PS#1 & #3 on-line instead of all 4 PS's of P 2090. Suspect faulty (unstable) PS. Should investigate ECS actions vs IRO recorder. With PS#3 only, transients were reported at 1 volt high.

(Ref: TDR#2 of TPS 35-397)

6. Note from STE (Dunkin) to E. Dower: Please power down yourself at 4 am. Do not leave this to Val Sanford (who is not as familiar with 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).

NIGHT & MORNING SHIFT.

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

2. POWERED DOWN PER 70010
   THE VEHICLE STATUS
   PNL 1 & 16
   ALL CB'S OPEN EXCEPT X-LUNAR CB'S

3. WHEN YOU POWER UP USE 70010
   SUPPORT THE BUSSES 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
   Radar Radar testing.
2. Set #506 & 60 off - All ECA's now off.

E. DOUSE - DAY 11-18-68
1. Vehicle powered via 70010
   82190 is in local sense mode
2. In support of TDR #63 62000 ECS
   Waiting to switch the 82190 to remote
   sense via TPS 6 68 11-15-002 Now in remote

E. HOMBURGER - NIGHT - 11/18-19/68
1. No change in power configuration all night.
2. After 3:00 AM, turnover, found out that Bob Fisher
   has a TPS (no number yet) to remove current
   Monitors and Battery Studs to prepare for GORP
   connections. We should keep track of this.

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.

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.

E. Homburger - Night - 11/20-21/68

1. Power changed over to Controller to Bats 5/6 w/split busses, via Mod 20: TPS 35/78.

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
3. TDR #4 of 31001 was run, until 0100.

4. Batts 5 & 6 on tie 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.

5. Sarullo Night / E. Dowse & E. Homburger
   Days.
   Set up for and ran TDR #33 of 62000 cps
   Using new current measuring method.
   Performed complete ex-lunar test with 2 basic
   Exceptions no LM-loads were exercised nor was
   THE AG5 heater operable because P/J 721
   WAS DERated AND BEING pOTTed.

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

1. TDR #33 (62000 CPS) NOT stamped off. NASA & C 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.
   Adding J. Gaiazzo in proving that 27g seg's are retested by 61018 & do not need special retest.

3. Apparent errors found in OCP 61018, P, 2-4, 2-45 & 2-5/51 (see markings). Whiz write deviations if these are
   not being picked up on revision sheets.
E. DOWSE / S. SARBELLO  8 AM - 4 PM  11/27/68

1. MIKE MILIORE X 1685 TO HAND CARRY LM-5 BATTERY CABLES FROM FABRICATION SHOP, PLT 33 TO PLT 5 TO VANGROSKI (DEPT. 053)

2. (11 AM) IT HAS BEEN DECIDED THAT 10 AM MEETING, THAT THE NEW CABLES ARE TO BE INSTALLED AFTER FEAT 61018 (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 MIDNIGHT  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.
1. Vehicle powered up AC & DC for 7000A 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 CORDPATHS STILL OPEN ITEM).
2. Powered up DC via 82140 to A/S BATS 5-4-6
   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, including:
   (1) COAS alignment problem, eliminated about 2pm.,
   and (2) Communications problem, flight headset 47 TC,
   either "chopped" or limited to one-way operation only.
3. Wrote Mod 4 to TPS 35-300-10 which reconfigured
   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 33 5:22:19.
3. The eight batteries for 61015 were
   removed from cold storage at 23:00 11-30-68.
   (5 DESCENT BATS & 3 ASCENT BATS).
AT 2:15 TURNED ON 900KHZ PER 70010
TO SUPPORT S-BAND ANTENNA RETEST.

AT 0900 POWERED DOWN PER 70010
AFTER S-BAND ANTENNA
RETEST WAS SUCCESSFULLY COMPLETED.
35-867.

PRIOR TO RETEST
VERIFY THE FOLLOWING ARE
SCHEDULED BY 05300003
TPS 900-02 REMOVAL OF ASCENT STAGE
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 midnight
1. 063 & 032 standing by to configure.
2. H. Katzy & J. Castellano conducting prep operations.
1. OCP 61018 Started approx noon.
2. TDR#2 against seg 007-004. Got "LOS" became premature opening of GSE VMBIL PWR CB opened ground return & dropped out 4KG relay, losing PCUTE & 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 work stand 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.
   I1 = 1.7A  I3 = 1.7A  I5 = 0.03 on CRT
   I2 = 1.2A  I4 = 1.4A  I6 = 0.03

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

1707 Requested TC to switch to GSE power. Ans: "Not yet."
1709 Start switch over to GSE (P-1-43)
   Cross tie BUS CB's were closed.

Bus volts are 30.51 (CDR) & 30.36 (SE) VDC.
I1 = 1.5A  I2 = 0.5A  I4 = 0.5A  I6 = 0.03 on CRT
I3 = 1.5A  I4 = 0.5A  I4 = 0.5A  (No D/S battery current should exist)
   A-H readings as at 1650

1738 Restored Battery Power
   Isolation obtained (275 K-ohms)
1745 Resumed testing at seg. 10

5. 1835: Performed LV/HV Switch over (seg 071)
   Bat 1-4 32.41 VDC
   BUSSES 31.62 VDC (CDR) & 32.25 (SE)
   Was 26.6 to 27.04 before switchover, varying with loading.

6. 1840: Called John Gansel, Software to look into low Amp-hr accumulation on CRT
7. 19:00 Running ECS Seq at 012-028

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<th>Amps</th>
<th>A-H</th>
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Note: OCP has been operating on batteries approx. 4½ 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 it 6A-H for unspecified purposes.

E.H. / S.S. 12/2-3/68

NIGHT SHIFT

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 04:15 (before start of SEQ # 019-000).

3. CRT Amp-Hrs inaccurate. Manually integrated Batt currents for Amp-Hrs.

4. Seq 025-014 @ 08:00
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 switch over 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 switch over to Des Batteries at Seq. 39-000.

5. Powered via GSE from 16:44 to 17:11 (Seq. 095-000)

6. 17:56 Switched to GSE, closed CROSS-TIE BUS CBS.

7. 19:24

8. 21:58 Switched 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 & closed Bal loads CBS as Status Board indicated was on before, shut down to GSE. Restarted A-Hrs program.
1. BSE POWER (82140) TO VEHICLE AT 22:1000
2. CONFIGURED WGM & INSTRUMENTATION PER A0010 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 5AM TELEPHIC FROM NASA QC (BOB WANGAMAKER) TO AL JOWID AT HOME, 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 470X)

2. TPS 35-62000-11 (X-LUNAR ISOLATION) WITTEN & IN DATA BANK.

To Run require following people present:
1. Tom Martin
2. AC/MI T
3. Ed. Dowse
1. Set light beam recorder to monitor under voltage
   instead of over-voltage
With 400 V Facility power thru a variac, set up
the ac glitch detector to trigger at
114.1 V. (165-160 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 41
to 153.28, which should now trigger the
recorder at 114 VAC or below.
2. Continued inverter #1 monitoring in TDR #33

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A. H. & E. D. Day Shift 12-6-68

1. 11:15 Lost power during switch over after
   TC (Di Perkins) had performed Seg. 068-014
   only up to 5/5 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 Seg. 068 at 69-015.

2. TC decided to keep ASE Bats 5/6 ON throughout
   the run to keep batteries from discharging completely.
   Asked TC to remain on GSE power 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

3. Completed another "Simple" on TDR 32
   Then at 12/14 determined that additional test
   have to be prepared for Monday.

4. Bats to be removed from vel & recharged.
   TPS reqd.

5. Before powering up on Mon - power up by 10:00
   and set Bat 5/6 NF OFF/RESET.
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 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 had the total ten nuts (each) removed before work was stopped.

E. Dowse 12-7-68

An the TDR #32-33 outline is on your desk.

1. Setup GSE equipment refer to 70010 & C2132
2. Start writing turn on of GSE and powering the dr & ac busses for the outline.
3. For the 8510 refer to 61015
1. Assisted Stan Barron in writing TPS to hook up Inverter Simulator. Must be returned to LM6 by Wednesday 12-11. TPS#G-6812-08-661. Copy can be obtained from GSP Command Post.

2. Wrote Mod1 to TPS 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 5N 12& 185.

3. Called 032 at 1135, Bill Thorne X#4439, to see what could be done. Bob Shama called back to say we should contact Bob Trybus 52-265-0935. We asked for speed of x 4 inch/sec, 350/min p-p amp. and Trybus can get a larger recorder for LM-7. Get IRC (Bob Shama) to call Trybus ASAP for direction. (an 8mm dynamic run would use 160 ft of paper)

4. Check on 510 hookup w. 863.

5. Get Instructions on 5DR for hooking up Current Month 5&6. Dummy Bat Study 576 & 92090 cables to connect A/S power input.

6. E. Homburger: Call Ed Dawre before you start

E. HOM 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.
1. NO TESTING TODAY WATER GLYCEROL STILL BEING CLEANED UP.

2. DON BICKOR (X 2275) IS SETTING UP THE ADDITIONAL RECORDING CAPABILITY TO SUPPORT 6101B TDR 33 +32. THESE MODS TO THE VOLTAGE MONITOR RECORDING SYSTEM LFB -68-525-$50 WILL BE RCV B AND WILL IMPROVE THE AC VOLTAGE MONITORING.

A. Hecht  Night Shift  5:48 PM to 2:10 AM  12/9/68

11. R. Cangelosi directed me to extract items from Connector Reports relative to harnesses subjected to glycerol spillage. Spent most of evening on this.
2. Reviewed TPS 35-02000-11 for purpose of generating TPER info. Could not find time data, did not get to TPER outline.

E. Dowse  7:01 AM to 8:12 PM  12/10/68
1. NO TESTING TODAY WATER GLYCEROL STILL BEING CLEANED UP.

A. Hecht  Night Shift  7:10 - 4:10  12/10 to 11/4/68

1. Initiated IRO activity to monitor Bat 5 & Bat 6 Currents at Current Monitors on O-graph & Tape via Don Bickor. If validation cannot be accomplished in time, hook up should state “for engineering observation only, no calibration & validation req’d”. Hook up 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 of TDR 33 with details req’d & verified hook up complete, QC Stamps complete.
4. 0345: IRO still has hook up calibration work open.
1. STARTED TROUBLE SHOOTING ON TOE 1330F G1018 LN 5.


3. THE UNIT WAS RECYCLED AND AGAIN THE CB STOPPED. FOR THIS RECYCLING, THE REMOTE SENSE SW WAS OFF AND THE FIXED/ VARIABLE SW WAS VARIABLE.


5. PRR 166 L28B GENERATED AGAINST LDW 910 - 8510-1-1 INVERTER SIMULATOR.

6. PREPRODUCTION INVERTERS LSC 390-6-9-2 S/N 121, 120, 119, 4, 118 ARE IN WAREHOUSE #6 (ALSO LSC 390-6-7 S/N 109 IS AVAILABLE).

7. GENERATED TPS 35-900-08 MOD # "DI BATTERY FEEDER LINE TEST" FEEDER LINES INVALIDATED BY WORK ORDER #495904 "TPS 35-900-08 BASIC.

8. RECORDER CHANNELS:

   - Note: No AC Glitch DETECTOR ON THE SMALL LIGHT BEAM RECORDER NOW.
   - On FR 1300 MAG TAPE = BAT 5 CURRENT BAT 6 CURRENT TIME CODE

Full 100 VOLTS
Or 1 IN = 10V
100 VOLTS
Or 1 IN = 2 V
Glitch (Volt Drop) Wave Top
Of 1 IN = 2V
Or 2 V
Volts/In
BATS BATTERY CURRENT
40 AMPS/IN
Or 1 IN = 4 AMPS
1. Hooked up Variac at T167 PWR BOB pts Veh V/W & GSE V/W, as detailed on TDR 33 (5118) s/h 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, s/h 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 engineer ordered bat removal even before EPS Engr came on scene & work was already in progress on removal. Wrote mod 2 to TPS, removing D/S Bat SN 101 & installing S/N 111. Work complete at 0650.
5. Seq. 068 calls for D/S bats hi-voltage to be applied to busses. Since these bats are fully charged, suggest change to Lo-voltage taps or a 20A-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 & LV Set up per OCP Vol 1, p. 1-187 thru 1-191
   b) -81060 Veh PWR Sup. Output # S/W # B65 (Seq 02)
   c) Close EPS CB's incl D/S & A/S ECA & ECA CONT CB's
   d) Inst Tumor for ACE read outs (OCP 70010)
   e) Turn on Bat 1-4 LV taps (instead of HV taps)
   f) Switch for 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 390-6.5 unit contained in simulator.
1. Vehicle powered up via 7000 @ 09:18. D/S Bats On 09:38

Night Shift 8PM - 8AM G. Hecht

1. Ran TDR 331, Seq 08.
   - Reviewed AC & DC light beam recorder data.
   - No discrepancy occurred. An in-spec AC transient occurred at 13 min 33 sec5 into the run (ABORT STAGE).

2. 02:30: NASA Engr Approval obtained
    03:15: TPS Stamped off by IDC
    04:00: Start configuring to run TPS
    05:00: QC write crabs because we hooked up ECA leads to Dummy Bat Studs prior to complete cure of 3rd potting coat,

    06:20: Started TPS test run.
    08:00: 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 (Doe Bat Feeders Racks)
   - No TDR's - all data in limits

2. Performed TDR #33/0108, pg 72 (Wiggler of J67 Bob AC lines)

G. Hecht

Early shift 12-13-68

Note: Mod 6 to TPS 35-1171 to remove D/S Current Monitors and Dummy Bat Studs from Vehicle.
LOG

Engineer: Storehouse  
Project: LM-5  
Location: PL-5

Time: 8-4 DUSY  
Title:  
Date: 12-19-68

VERIFIED TO R-37 AGAINST DEP 61018 (EO simulation on P-435, not firing) has been sold and the PRR G-6291 is with Andy Christianson for disposition.

K. Douse, 12-20-68 DAV

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.

3. A.H. CHECK WITH GS#A# FOR POWER TO WS #5.
   D.C. PERKINS P.S.
   A.C. 51970 & ASSOCIATED CABLES
   LSC 560-1126 DON
   AC/DC BUS MONITORING 032 (X-4558)
   LCA & INV TEMP MONITORING 032 (MUST LIST CABIN FLOR, J02 INSTALL TEMPERATURE)

4. ONCE HOOK UP INFO IS OBTAINED WRITE PROCEDURE FOR POWERING UP INTO 35-412 FOR #1 AS ADDED SHEETS WITHOUT NUMBERS.

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

USE CLARIStat 240C TO LOAD P229 WITH A 2 AMP LOAD, IF A POWER CAN BE APPLIED TO THE VEHICLE & THE LCA TEMP MONITORED.

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

6. IF PAPER IS NECESSARY IN ORDER TO MONITOR THE LCA WITHOUT COOLING REFER TO DEVIATION # #7 OR #1015 LM-5 (SEE DAY 10-16-68 OR THIS BOOK).
LM - 5 PHASE III
CARR
NOV. 20, 1968