

SC 108 PROP 1088

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OCT-9-1968 ① OCP-P-4225-SC108 — MA0710-4225-
 FIRST 308 was briefly reviewed. Several
 NDM undesirable features about the
 way the CM WIRING do is
 written:

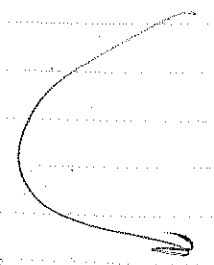
- A. 04-002 & 06-002 ARE INCORRECT — cannot have both PR4 and PR6 adjusted at the same time or there isn't any effective FILEW or OXID identification.
- B. It would be more desirable to perform all the CM RCS Engine wiring in one sequence. — Maybe, done this way to utilize pneumatic hook-up.

Oct. 14-68① SC108-PEP TALK — Vehicle
 FIRST is anticipated being turned over
 NDM to ATO tonight.
 Begin 10030

1107
 8252
 10058 completed.
 TPS will all be in one book
 TAIR. V34-GEN (000002).

ACTION — TPS — RCS BME TEST
 ENGINE WIRING TEST! — OCP?

TER JIM CRAGER — 1103



JOHN HILL WANTS US TO ALLOW THE WRITERS A CHANCE TO GET NEW OCP 4223 OUT FOR USE.

PROBLEM — SHARING CIA-075 in Service Rm 2D, with SC107.

OCT 15, 68 MCR 7838 — Adds ARC SUPPRESSION FIRST to RCS engine fire circuits to WDM minimize EMI. Writer Howard Rode, X-1305 or 3741 — should be coordinated with Ron Stedman X-1055 who is well aware of it and the potential changes to A22A requirements.

3RD SHIFT 10-17-68

JY — S/C STILL IN MANUFACTURING. OCP 10030 IN PROGRESS.

OCT 18, 68 SC108 turned over to ATO FIRST at 1400. WDM

② See soft copy of MA0719-4223-308 which is to be released and work on such commence SOON.

OCT 21, 68 OCT-24-68

FIRST FAIR V37-GEN-FO06 E.O. 685826 WDM SPS HTR INSTH — eliminate loops was signed — McDowell sold. no work required — just sell.

SECOND 10/28/68

① Released TPS-001 for MA0710-4223-308 (copy enclosed). Cannot get released on this shift. NR-OC unit except until they get an ATO-IL and released cert.

3RD SHIFT 10-29-68

1- NOTIFIED CIC TO HOLD UP FINLEY'S TPS UN OCP 4223. EQUIPMENT REQ'D ON S/C 107 ATR & RETEST TPS'S.

OCT 29, 68 OCP-4223 — A work-around for FIRST the CIA-075 requirement was WDM established per speed letter to JIM KRADER. The SIA-082/GIA-845101-21 interface will be Test Kit 24351. (Yes) — Should be see available tomorrow morning. See TVAR 24351. which make the necessary OCP work changes for the work-around. The pretest section I should not be accomplished until TK 24351 is built, and the TVAR 24351 is available for shop to work to.

OCT 30, 68 ① Reference E.O. 720207-1 (MCR 7838) FIRST ELIMINATE EMI EFFECTS OF CM, RCS WDM ENGINE CALL OPERATION. The parts for this E.O. are not available. The PLAN-OF-ACTION:
1. Perform ~~of~~ OCP-4223.
2. Work E.O. 720207
3. Rerun OCP-4223 — recheck

engine wiring and measure
 ac-suppression voltage levels.
 Copy of E.O. put in OCP
 4223, STC COPY in TPS Nov.
 section. Parts available - 11-12-68

② OCP 4128 - Norm Meyer informed
 me that a GSE blow down
 at the end of POCP was being
 added to satisfy MA0206-0312
 (GSE SPEC). Informed Huber -
 we'll see!

SECOND 10/30/68

TRP PUSHING TO GET OCP-4223 - what
 else can be said -

3RD SHIFT 10-31-68

HS 1 - NO ACTIVITY ON OCP-4223 DUE TO OCP 96101

10/31/68 ① OCP-4223 TVAR 24351 signed
 FIRST by Hoffarth (OCP writer), J. Iblets (CEE)
 JDM took TVAR to get it signed -
 haven't seen it since.

② OCP-4223 - Equipment
 SC107 - using 11FC-0034
 SC107 - needed TK-4225-001-714-81
 much time lost getting these from
 SC108 to SC107.
 Cannot get 4223 started until
 equip. available and TVAR 24351 is
 released to shop.

SECOND 10/1/68

2430 BME UNV 46 EQUIPMT WENT TO T/C #1
 NO - WAS DONE ON 3RD SHIFT AT 0200HRS.

3RD SHIFT 11-1-68

HS 1 - B/O BOXES AND ASSOC. CABLES REQ'D FOR
 OCP 4223 - FOLLOWED THE C14-003400
 TO TEST CELL 1, TO SUPPORT S/C 100.

AS 2 - SPACECRAFT POWERED DOWN FOR PANEL 2
 REMOVAL.

11-1-68 ① CEE still has OCP 4223
 FIRST, TVAR 24351.
 JDM

② ATTENDED A MEETING -
 SUBJECT GSE 0312 SPEC
 AFTER TEST CONTAMINATION
 SPEC. OUR STAND - GSE
 TEST SHOULD BE DONE IN
 GBE SP TEST BY GBE PEOPLE
 WAS EMPHASIZED - DURLAND
 (WRITER SUPERVISOR AGREES BUT
 UNDERSTANDS DECISION OF "WHERE
 TEST SHOULD BE DONE" MUST
 BE MADE BY FIALKO &
 SOMMERS OR THEIR BOSS.
 WE'LL SEE!

11-1-68 SECOND.

- ① RCS VLV BME EQUIPMT IN BME AT THIS TIME. ALL CANNES & B16 & BIT BOXES ARE WITH IT ALSO. PLAN TO TRANSFER FROM BME TO STA. 2C ON 3RD SHIFT MONDAY.

11/4/68
THIRD
JMB

- ① ATTEMPTED TO PUT 4223 BACK IN WORK. I & CEE COULD NOT LOCATE TVAR 24351.

- ② AS I DESCRIBED THE TVAR WE HOOVED UP THE -21 PANEL TO THE SIM-022 & THEN USED REGULAR J56 & B53 FOR TR'S. BUT TEP TYPES SAY NO!!! WHAT IS THE STORY?

- ③ STL DOESN'T WANT THE IIC-0034 TO LEAVE BME UNTIL WE ARE ABSOLUTELY READY TO USE IT.... SO DIDN'T FORCE THE J TO PUT IT ON 2C.

11/4/68

- 11/4/68 FIRST JMB
① TVAR 24351 located in NASA (STAN HARVEY'S) OFFICE. Harvey has some reservations about signing TVAR — he'll probably "come around" — The change in hook-up — connect TR 4223-001 TEST KITS DIRECTLY TO -21 pressurization panel — do not connect to fluid distribution system because TER will be using it to fix CIA-025 work order (case 025 in 2B).

- 1430 ② TVAR 24351 SIGNED ABOUT 1300 SOME DIFFICULTY FINDING TR-TVAR 24351-SC108-OCP-4223-001 — GOT IT — HOOKING-UP — SHOOTING TO GET GOING BY 1500 — LUCKY TO BE GOING BY 1630.

- ③ The master of TVAR 24351 was left for Walt Burke #6205 in CIC.

- ④ STATUS — Test kits are installed per Fig 2-1 and TVAR 24351 — all equipment is on the stack. Need to verify 4.2 and accomplish 8.3 portion of TVAR even though gold — probably can be revised. Accomplish 8.2 — Complete ~~sequence~~ section of all CBT it's on TRH. Sold. go into test.

- ⑤ PLAN — PERFORM OCP OUT ON STACK — WE WERE ABLE TO GET OCP GIC TO DO SO — PHIL OTTE (CTC) SAID OK AND IF ANY TROUBLE HE WOULD HELP.

SWING - 11/4/68

21:10 Got into OCP 4223 Finally -

24:50 In hold-shift edge for some people.
Holding on CM-RES-SYS I C19B7 @ Auto-oxid.

3RD SHIFT 11-5-68

1- Completed SEQ 01 & 02
BAD VALVE SIGS ON SYS 1, -R, +Y & -P
C19B3, C19B9, C19B11

2- ENTERED SEQ 03 AT 0320.

3- Completed SEQ 03
BAD VALVE SIG ON SYS 2 - ROLL (FUELDIR).
C19B4

4- OCP 4223 COMPLETE - THANKS TO 3RD
SHIFT QCC & SMT - WHO WORKED
THRU THEIR BREAK TO FINISH OCP.

5- ~~WAS~~ TOLD GENE OKAMPO TO MODIFY
9EH (GSE) PROTECTIVE COVERS ON CM SO
THAT WE CAN HAVE ACCESS ENGINES.

11-5-68 OCP 4223 - Redlines and TVAR's
FIRST delivered to R. Hoffarth (OCP writer).
He will get engines identified in
pretest for the following OCPs - as
was requested.

2- RCS Engineering looked at data for
SYS 1 + P, -P, -R, and SYS 2 - R. ENG.
has a tentative plan to R & R
SYS 1 + Y (SN 950230) and SYS 1 + P
(SN 960124) and accept SYS 1 &
SYS 2 - R's. Stedman requested time

so Eng could resolve exactly
how the spec will be changed.

3- Pictures (raw data) given to
Bill Jung (data reduction) and
a data request was filled
out. They were given data
sheets to fill out - Stedman
requested we hold off on
data sheet TVAR's and DR's
until Engineering has a
unified plan. Incidentally,
there aren't any replacement
engines.

11-6-68 OCP 4223 IMPOUND DATA SHEETS
FIRST WERE FILLED OUT FROM
DATA STORAGE AND RETRIEVAL
DATE 11-6-68
Numbers SC108 0130-01
SC108 0130-02
Location CO308.

Ron Stedman is reviewing data and
will be coming out with an E.O.
FOR 4223 DATA TOLERANCES. He
requested us not to pursue
the comparable TVAR until all
ENGINEERING is in agreement.

11-7-68 OCP-4223 - TVAR 21341 Released
FIRST Q.C. IMPOUND COPY MUST BE
DELIVERED TO IMPOUND OCP.
DR's ON C19B3, C19B9, C19B11 & C19B4
WERE WRITTEN (I WROTE THEM) &
GIVEN TO FOSS TO GET OFFICIALLY
LOGGED & RECORDED BY Q.C.

WE HAVE BEEN REQUESTED TO GET THE NECESSARY ENGINEERING C/A. ASAP.

11/7/68 SECOND SHIFT

1. INFORMED AT 11:55 THAT ~~THE~~ PAPER IS BEING GENERATED TO R & R THE FOLLOWING ENGINES:

- RCS (-) PITCH SYSTEM 1 (C19B11) DR3 & DR4
- RCS (+) YAW SYSTEM 2 (C19B9)

3RD SHIFT. 11-8-68

1. DR A113898 ITEM 120 OF V36 GEN HAS BEEN WRITTEN AGAINST SYS 1 - PITCH & +YAW RCS ENGINES.

2. PURGE PROCEDURE FOR R&R OF ENGINE HAS BEEN WRITTEN ON CONTINUATION SHEETS OF DR # 120. (USING OCP 4223 SET-UP).

3. NOTE TVAR 21341 - WHERE DO THESE NEW LIMITS COME FROM? THIRD SHIFT METS DOESN'T KNOW. An E.O. is in the release system of the 020? will be revised.

IT WAS A SHOCK TO ME WHEN I FOUND THAT STACK WAS DOING THE PRETEST ON OCP 4225. WAS NOT INFORMED THAT A TPS WAS ISSUED.

5. PURGE PROCEDURE ON R/R OF RCS ENGINES WILL HAVE TO BE REWRITTEN, OCP 4223 SET-UP WERE REMOVED FROM STATION.

6. WAS INFORMED THAT THE C14-075 IS AVAILABLE TO SUPPORT OCP 4225.

11-8-68 MAHAN (SNIP SUP) was informed FIRST DR 120 should be a sub DR to OCP 4223 DR's 3 & 4. He said he would get 120 made into the necessary sub-DR. - Accomplished PHAN - NO SC108 work this week-end. - Replacement engines will be available about Wednesday of next week - when DR 120 R&R will commence. - FOUND OUT purge equip specified (TK 4225-001's & TK TVAR 24351) has been checked out of tool crib and never checked back in so it is on the stock somewhere.

MCR 7838 - FAIR tickets for working of were signed but will be held by service engineer until parts are available.

11-11-68 C19B9 & C19B11 purge provided, per DR 120, dynastube fittings disconnected, one purge secured - engines being removed. Note - rest of replaced engines C19B3, C19B4 will be accomplished by rerunning the applicable sequences of OCP 4223 - OCP 4223 equipment req'd.

"THE PLAN" — LEAVE THE PRESSURIZATION SET-UP HOOKED-UP AS IS UNTIL THE ENGINES HAVE BEEN RETESTED. — TER ASSURED US THEY WOULD NOT REMOVE THE EQUIPMENT.

11-12-68 ① DR V36-GEN-143 — DYNATUBE FITTINGS NOT FIRST DOUBLE BAGGED AND SEALED — DISPOSITIONED ~~WDM~~ AND SOLD BY TYLER.

② DR V36-GEN-144 — SAME AS 143 — DISPOSITIONED AND SOLD BY MANWA.

③ C19B9 & C19B11 RETEST — TVAR 21342 written to rerun OCP 4223 for C19B3, C19B4, C19B9, C19B11 — less engine wiring verification for C19B3 & C19B4. TVAR 21343 — requested per ENGINEERING, OBTAINS FIVE PICTURES PER VALVE INSTEAD OF THREE.

3RD SHIFT 11-13-68

11-13-68 — PITCH ENGINE STILL MISSING.

11-13-68 ① See enclosed note about ALL RCS FIRST ISO valve TB indicators being GRAY ~~WDM~~ except one PROP ISO being BP on Quad D. — NAR PILOTS noted. An inspection on the stack revealed

- NO POWER ON S/C.
- All RCS TB's GRAY except four Quad sec. which were BP.
- RCS CB's on Panel 8 required to operate TB's still CLOSED.

CONCLUSION:

A. No power indications are that TYPE 1 ~~OR~~ TB are where they should be and TYPE 2 are where they should be.

B. The strange indication is possible without any wiring problem or failure because

1. The test cells can operate PRIM and SEC valves separately and
2. These valves have not been operated by their commonly controlled switch in the S/C.

★ Therefore there is a 90% chance there is NO problem.

3. True, if this condition occurs after the valves have been operated from the S/C switch there is a strong chance of a problem.

① TVARS 21342 & 21343 signed by Stedman. ~~W.D. Burke & CEE has the TVAR's.~~ TVAR's signed less NASA.

11-14-68 ① Ref. entry ① yesterday — called FIRST Leo Krapp and explained — he agrees ~~WDM~~ and we will keep an eye open for a possible (small) problem in 4225.

② DR120 - Anticipate connecting dynastages on C19B9 & C19B11 tonight - Rewire engine 3rd shift Monday before powering-up and go into retest thereafter.

③ TVAR's 21342 & 21343 signed & distributed - TVAR 21344 written at Harvey's request - Spedman cool to it - I don't know - Ask your M & TS type - he'll know as much about it as anybody.

11-15-68 SPS He Panel Replacement - FIRST McDowell (Service Engineer) presented WDM a FAIR to accomplish - I wouldn't sign because we don't know when or where the panel will be removed and replaced - went to 0900 spc coordination meeting and explained problem of using both FAIR's and TPS's. Assist. Prog. Manager - Ted Claus assured there would be an investigation and action taken to attempt to correct problem.

② OCP 4225 - Refer to G14-845241 FLUID DISTRIBUTION SYSTEM INSTALLATION - INTERCONNECTING MANIFOLDS, WORK STATION 2B & 2C. - See changes to OCP 4225 to use STA 2B G14-075 instead of RD G14-075.

③ C19B9 & C19B11 R & R is almost complete - wiring C19B9 and clamping C19B9 wire bundle.

THIRD 11/18/68 JMS

① ATTEMPTED TO PUT OCP 4223 TEST INTO WORK AFTER POWER UP & PRACTICAL COMPLETION OF QCS W/ WITH LITTLE SUCCESS.

11-18-68 FIRST WDM

① OCP 4223 - much difficulty in trying to get retest, started retest not even scheduled - BME not on stand and not asked for until 1000 - tried to accelerate that. Then G.C.C. insisted Δ TR's would be required and Section one would have to be rerun. While trying to get Δ TRL squared away tech found C19B11 engine wires in TB not properly sleeved - taking DR and backing off on retest. In mean time G.C.C. backed OFF request to rerun section 1. STATUS - all equip. ready to go - G/A on OCP 4223 DR's 2, 3, 4, & 5 - EXPECT to get into test after steering completed, about 1400. New TRL has two cat 1's

DR163

a. DR 1633 - sleeving by removal C254 X-RAY has a burned-out tube - delayed looking for replacement.

② DR120 Steps 120.9 & 120.10 were stamped for + VAW engine only

ARCHER SAYS G.C. THAT WERE ON THE JOB SHOULD VERIFY

G.C. 4291

Got them stamped for - Pitch by getting OK to install stamp of DR 120. Steps 12 thru 16 of DR 120 deleted because they will be accomplished in CCP rerun. Steps 120.9, 120.10, & 120.11 need NASA stamps - should GET ARCHER who went through part of this with us.

③ MCR 7838 - RCS ARC SUPPRESSION - MECHANICAL WORK SHOULD CONTINUE. Electrical work should NOT be done until C19B9 & C19B11 have been retested per 4228. Arc suppression mod is a Cat 2 to 4224 - no constraint to 4225 - it can be worked during 4225.

- ④ CCP 4223
- ① Before starting to RETEST it would be most desirable to sell C19B9.
- 3 FAIR - 032 + YAW R & R SOLD
- 4 - 033 - PITCH R & R C19B11
- 4 DR 120 - R & R + Y & P
- DR 163 - Sleeving (X-Ray)
- 2 Removal - C254 (TBI)

⑤ X-RAY machine malfunctioned a second time - No X-RAY until 2nd shift.

- 5 ΔTRL
- 6 TVR 21342

11/15/68 Second

- ① I GOT WORD THAT ONE TEAM BRAND TBI WAS WIRED INCORRECTLY
- ② ~~FOR~~ FOR (-) PITCH ENGINE
- ② LATER ON AFTER MANY QUESTIONS FOUND OUT STEERING WAS WRONG BUT WIRING GOOD
- ③ MUCH LATER YOU GOT WORD THAT ALL PAPER WAS OK.
- ④ INTO 4223 RETEST AT 10:00 APAX
- ⑤ GOT TO SEQO1-023 DID NOT GET ACTUATION - RAN CONTINUITY ON BOTH BREAK BAKES BECAUSE INSPE FOUND 81% OF THE TP LOOSE - I ALSO HAD OLC, GIVE ME A VERIFICATION THAT TBI WAS GOOD

11/19/68 3RD SHIFT

- Hg 1- RECEIVED WORD THAT ON PANEL 8 - PROP ISO MAIN A BREAKER IS BROKEN: DR #?
- Hg 2- COMPLETED RETEST ON CM RCS EXCEPT FOR C19B9 SYS 1 + YAW, + YAW ENG WAS WIRED FOR ARC SUPPRESSION.
- Hg 3- SYS 1 + YAW IS WIRED NOW TO THE OLD CONFIGURATION. NEED X-RAY. REF SUB DR 167 V36 GEN.

4- STARTED WRITING TVAR 21345 TO RECONFIGURE PNEUMATIC & ELECTRICAL TO RECYCLE TO SEQ 01-001 TO RETEST C19B9 SYS 1 + YAW

Garwood 2370 2722

11-19-68 @ DR 167 was Hexed by NASA and FIRST NASA DR 32 was written saying FA 032 ticket was changed when it should not have been and - What's wrong with the system? Yes, I agree with him and believe somebody should find out what goes with man's planning - why so hard to get J or mps to get a change needed, but when a change not wanted if happens automatically. I think it is a good NASA DR so I didn't try to solve the problem, probably can't anyway, so we'll go around DR 167 and NASA DR 32. - Wasted the whole morning over Q.C. rules.

Finally CTC Phil Otte said to get very Channel 14 with every body get OK to go and go with or without the sliders!

@ 1120, Got OK to GO and annotate TGS tape before going to lunch.

③ Picked-up with Retest per DR6 Calote CTC stopped FVAR - said DR was way to retest. At DR 6.8 step 01-014, (13:30) could not get good trace - no current flop - Made close inspection of C19B9 to TB916 wiring - nothing - check TB916 MD 417-0012 configuration - OK - Continuity checked GSE, patching - OK DR 7 written. ACTION - DR 7.4 Recheck TB916 - for both SC and engine wiring and MD configuration - Extremely frustrating DAY!

④ Huber - Manha ARC-SUPPRESSION understanding as we see it:

SC108 a. Complete 4223
b. work MCR 7838 (arc sup)
c. check engine wiring (applicable portion of 4223)
d. OCP 4224 changed to accommodate arc suppression - check arc suppression levels.

SC109 & SLIBS a. Man's work MCR 7838
b. in 4223 disable arc suppression by removing one wire per engine arc suppressor.
c. Perform 4223.
d. reconnect one arc sup wire per engine
e. OCP 4224 - changed to acc. arc sup. & check arc sup levels.

11-19-68 SECOND

1. DR 74 PUT INTO WORK AT THE START OF SHIFT (WITH VERY HOT WORDS FROM # TO THE STACK SUPERVISOR KOTLICK)

2. We found that C19B9 WAS WIRED INTO THE TB 916 FUEL TO OXID & VISAVERSA SUB DIR. WAS ISSUED TO CORRECT THE PROBLEM DEPT 662 WORKED TILL SHIFT END, AND NOT COMPLETE YET.

3RD SHIFT 11-20-68

#1 - PERFORMED CONT. SHT ON DR#7 TO RETEST C19B9.

#2. SUB DR 174 ON TB 916 SOLD.

#3. COMPLETED RETEST ON C19B9 ENGINE.

4. BILL M - PLEASE GET STACK TO REMOVE BME EQUIPMENT FROM STACK - EQUIP REQ'D BY BME ASAP. Yes

11-20-68 OCP 4223 delivered to Data Reduction NOK Personnel and data reduction FIRST requested per DATA REQUEST #39.

② OCP 4223 DR#7 delivered to Charlie

Brown (controls OCP) - OCP 4223 was not there he assured me DR 7 would put back in book as soon as it came back.

③ TVAR 21342 (C19B3, 4, 9, & 11) data was reduced - all within tolerances as specified per TVAR 21341. DATA STORAGE AND RETRIEVAL Date 11-20-68 11-20-68 Number SC108-0179-01 SC108-0180-01 location F0901 F0901 Recorded data on data sheet couldn't find impound book.

④ OCP 4225 - Appears we are approaching getting into test - See TVARs 24350 & 24389 for section 1 - copies, and OK to proceed to stack - Note that several paper problems in 4223 are listed as CAT 1 to 4225. Maybe these should be down graded because there is no hardware problem.

11/20/68 Second Shift

① TWS 24350 & 24389 Processed to TAKEN TO STACK

② Working on 90030 & 10058

③ Still not out of Sect 1 @ 24330

THIRD SHIFT. 11-20-68

Hs. 1- SECTION 1 NOT COMPLETE
 (a) MISSING DVM & CURRENT METER
 PARA 8.2 OPEN - (10030 & 58)

Hs. 2- DOWNGRADED OCP 4223 OPEN ITEMS TO CAT II.

Hs. 3- DOWNGRADED OCP 10030 TO CAT II
 OPEN ITEMS TO BE COMPLETED IN
 SEQ 9-006 & 007.

Hs. 4- IN OCP 4225 AT 0727 HRE
 DAYS 11/21/68

1 PICKED UP DR#1 A136701 AT
 SEQ 01-028 - 3.175VDC SHOULD BE
 3.22 TO 3.28. REPEATED STEP &
 RECORDED 3.173 STILL OUT OF TOLS.
 CHECKED VOLTAGE ON CRO037 CAL
 CURVE @ 3.175 VOLTS IS 260 PSIA
 EXACTLY NOMINAL PRES. POSSIBLE
 SPEC CHANGE REQD (MA0210-0130)

2 PICKED UP DR#2 @ SEQ 01-103 -
 CRT WAS READING -7 S/A -5 PSIA.
 WROTE TWR 24770 TO CHANGE
 LIMITS -7 TO ZERO (WAS) -5.5 TO ZERO
 REASON - CAL DATA SHOWS 0 VDC
 IS -7 ~~PSIA~~ DEG F.

③ OCP 4223 - C19B3, C19B4, C19B9, &
 C19B11 data put in impound
 copy. DR's 2 through 7 -
 Conclusion was written, and
 STC & ETC signatures obtained.
 CEE signed DR's 2 & 5, but withdrew
 signatures because they feel an
 NRB is require to accept.
 C19B3 & C19B4. Several other
 problems NASA DR 32 is holding
 open DR 16? which is a sub
 to DR 6 of DES.

④ OCP 4225 - OCP 10030 verified -
 A list mostly hook-up of 11FC003
 no problem. Could not prove
 or disprove C28AR102 P1 &
 S28AR14 P2. C28AR102 P1 - P1ch
 sys 1 (C19B11) engine temp
 hooked-up, removal not close
 when engine was replaced.
 S28AR14 P2 signal conditioner
 and transducer missed not installed.
 This is SR 5056 U, which we do
 not test (ducer & sig cond.) in
 4225 - Only put in artificial
 signal. DGS 10030 TWR written
 to correct - Good work Shingiz
 except down grading 10030 sure
 caused a slap - turned ON the world!

11/21/68

① WENT ON STATION AT 16:00
COMPLETED SEQ010-204
COMPLETED SEQ010-205

KYA

THANK YOU

~~DR4~~ ② STARTED SEQ02

DR4 ② SEQ02-006 PICKED UP DR 4
CM PROP ISO A LIGHT ON THE
3A5 6A5 & 16A2 WAS OUT
S/B OIL - FOUND J565/P565
IN LOWER EQUIP BAY NOT
MATED

③ CHECKED WITH 10030 AND THEIR
PAPER SHOWS S/B MATED.

I CHECK'D WIRE LIST & FOUND
NO POWER WOULD BE PRESENT
PROVIDED P565A WERE NOT

MATED. I LOOKED ON 10030
AND FOUND 565A NOT MATED
(MY FIRST MISTAKE)

④ I NOTIFIED CTC OK FROM
PROP TO MATE WITHOUT
GOING THRU EPS WORLD
(MY WORST MISTAKE)

5 CTC GAVE OK TO MATE

DR5 6 GOT MASTER ALARM
MATRIX SHOWED:
AC BUS 1 & 2 OVERLOAD

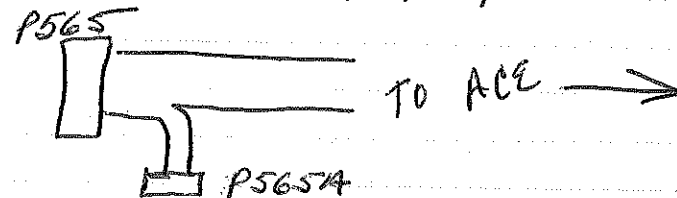
7. J565/P565 ORDERED DEMATED.

8 WENT INTO COMMAND MODULE
TO ASSESS DAMAGE - NO
DAMAGE TO J565 OR P565
PINS OR SOCKETS

9 ALSO FOUND J565A
(REF STEP 3) WAS MATED

10. IT WAS THEORIZED NO
GARTH GOWES OFFICE THAT
DURING OCP 1115 THAT
J565A WAS MATED THEN
SHOULD HAVE BEEN DEMATED
A FEW STEP FURTHER ON
IN THE OCP HOWEVER SINCE
WE FOUND 565 DEMATED &
565A WAS MATED THAT
CMT MUST HAVE DEMATED
WRONG CONNECTOR IN ERROR.

11 FOR FUTURE TESTING PLEASE NOTE:



TO GROUND POWER AC 117 400V

12 EPS DID DETERMINE THAT WITH 565A MATED & AIRBORN INVERTERS 1 2 and/or 3 THAT THE ~~AIRBORN~~ AIRBORN INVERTERS WERE INDEED BUSSED TOGETHER (NEVER SHOULD BE DONE)
3RD SHIFT

1- DOT OCP 4225 IN A HOLD TILL DAYS GOING HOME SICK WITH STOMACH CRAMPS - MR. BERG SAYS IT IS TWO FLU - [GULL STONES]
3RD Shift continued 11/22/68 (DHW)
Completed DR# 5 - returned to OCP 4225 @ 02:25 hrs. at seq 02-007.

Interim Conclusion written for DR#5 - and conclusion written for DR#4 all signatures on DR's -
T= 06:35 completed seq 2 no other problems incurred.

T= 06:45 Started Seq 03 - verifying Pneumatic hook-up per seq 03-002 & fig 2-1.

T= 07:17 Proceeded on to seq 03-006, found that service room 2nd for 075 helium supply G45V51 closed instead of being opened. will use sect I TP 8.5 to open G45V51 for pressure supply to 075.

Also last types write TV 24772 to close Pnl 274 CB's #3 & 4 and then re-open. They wanted to investigate a problem.
(DHW)

DAYS 11/22/68

1- HAD DIFFICULTY PRESSURIZING @ SEQ 03-033 & DISCOVERED ALL FDS B'NUTS @ LEVEL 2 WERE LOOSE. TER GRAMP TO LOOSE FITTINGS & TEST RESUMED

2- HOLDING @ SEQ 03-052 FOR MASS SPEC FAILURE - TIME 11.11 RESUMED TEST @ 15.45

11/27/68 2ND SHIFT AMES

1- WENT ON STATION @ 16:16

@ OCP 4225 SEQ 03-53

2- COMPLETED SEQ 03-

3- TVZ 24773 TOOK THIS PLACE IN 4225 TO POWER DOWN FOR WEEK END. TUR SHUT DOWN THE 075 YOU WILL NEED TUR TO GET CIA 075 BACK IN CONFIGURATION.

4- I WOULD HAVE STARTED ON VAR BUT HAD TO REPORT TO GARTH JONES

3RD SHIFT

1- NEED ^ACOPY OF OCP 4223 TO CLEAR UP DR #7, NEED PAGES TO BUY OFF FOR THE OCP.

2- ON SPS FUEL LINE REWORK - WROTE PURGE PROCEDURE ON CONT. SHIT. ^{DES 4177 GEN} - PRESSURE THRU TP15 AND VENT THRU TP16.

3- While performing sig 04-024, the stake types informed me that some people working ticket to install wiring diodes for the Arc Suppressor - and were working on Terminal leads with live gear. Held OCP, talked to CIC and declared that either 4225 would go into hold on the ticket being worked as a serious safety prob existed. 4225 was and 662 stopped work. It appears CIC knew that the ticket was being worked but nobody else did. I didn't want another electrical mishap to happen -

④ Ran up to sig 04-027.

DAYS 11/25/68

1- HOLDING @ SEQ 05-046 FOR MAIS SPEC CAUS. 03.12. RESUMING TEST @ 10.38

2- STATUS SPS FUEL VENT LINE RISK (DR#1 V37 GEN) - LINE REMOVED & TUBE ENDS HAVE BEEN CLEANED READY FOR NEW LINE INSTL.

SEQ 04-048 & 049 READINGS. ^{BACKGROUND} (OXIDIZER) (2)

Seq	Reading	Component
C19B6	42 ON 10S	NOZZLE
	1.8 x 10 ⁻⁹	DYNATURE
	ZERO	WELDS
	ZERO	FLEX JOINTS
C19B4-	24 ON 10	NOZZLE
	2.0 x 10 ⁻⁷	DYNATURE
	ZERO	WELDS
	FIRST READING 7.0 x 10 ⁻⁵ - ISOLATED 7.4 x 10 ⁻⁷	FLEX JOINTS
	ZERO	
C19B12	24 ON 10	NOZZLE
	1.3 x 10 ⁻⁷	DYNATURE
	ZERO	WELDS
	2.7 x 10 ⁻⁷	FLEX JOINTS
	ZERO	
C19B8		NOZZLE
	2.2 x 10 ⁻⁶	DYNATURE
	ZERO	WELDS
	ZERO	FLEX JOINT
	ZERO	
C19B2	24 ON 10S BACKGROUND	NOZZLE
	2.0 x 10 ⁻⁷	DYNATURE
	1.6 x 10 ⁻⁷	WELDS
	1.5 x 10 ⁻⁷	FLEX JOINT
	1.6 ZERO	
C19B10	20 ON 10S BACKGROUND	NOZZLE
	355 x 10	DYNATURE
	1.5 x 10 ⁻⁷	WELDS
	ZERO	FLEX JOINT
	ZERO	
	ZERO	

FUEL SYS 2

SEQ 04-052 & 053

C19B10 BACKGRD 205 X10
395 X10

1.7 X 10⁻⁷
ZERO
ZERO
ZERO

NOZZLE
DYNAMISES
WELDS
FLEX JOINTS

C19B2 BACKGRD 20 X105
28 X105
26 X105
36 X105

1.2 X 10⁻⁷
1.1 X 10⁻⁷
1.6 X 10⁻⁷
ZERO

NOZZLE
DYNA
WELDS
FLEX JOINTS

C19B4
42 X105
7.8 X10⁻⁷
1.6 X 10⁻⁷
ZERO
ZERO

NOZZLE
DYNA
WELDS
FLEX JOINTS

C19B6
36 X105
7.9 X 10⁻⁶
ZERO
ZERO
ZERO

NOZZLE
DYNA
WELDS
FLEX JOINTS

C19B12 BACKGRD 22 X105
ZERO
ZERO
ZERO
ZERO

NOZZLE
DYNA
WELDS
FLEX JOINTS

C19B8
1.5 X 10⁻⁷
ZERO
ZERO
ZERO

NOZZLE
DYNA
WELD
FLEX JOINT

3 Completed SEQ 04 of Config
for SEQ-05. VCC HAS BEEN
ASKED TO REMOVE QUAD COUPLING
ACCESS PANELS TO EXPEDITE
CONFIG. FOR SUBSEQUENT QUADS.

2ND SHIFT 11/25/68

1. Completed SEQ 05 EXCEPT
LAST 3 STEPS

3RD SHIFT 11-26-68

T=03:58 (1)

(DOWN)

Completed SEQ 05 (LAST THREE STEPS).
WENT INTO SEQ 06 @ 01:58 AND CONFIGURING
PER SEQ 06-002 SINCE 01:58 HRS.
IT APPEARS THAT THE PRESENT MORALE
OF TECHS HAS HIT A NEW LOW POINT AS
THINGS HAVE SLOWED DOWN TO AN ALMOST
STOPPED PACE. THE TIME NOW IS 03:58
AND OCP-4225 CONTINUES AWAITING
COMPLETION OF STEP 06-001 SO THAT
WE CAN CONTINUE THRU STEP 06. I
NEAR WE WILL PWR DOWN AFTER
LUNCH SO THAT THE G/N COMPUTER
PROBLEMS CAN BE INVESTIGATED. NOTE
THE APPROPRIATE SUPERVISION HAS BEEN
NOTIFIED ABOUT THE RE-CONFIGURATION
PROBLEM.

T=04:15 (2)

(DOWN)

SEQ 06-001 HAS BEEN COMPLETED NOW AWAITING
DECISION FROM CTC IF HE WANTS TO PWR
DOWN @ 04:42 OR NOT, HIS DECISION DEPENDS
WOULD DETERMINE IF 4225 WILL CONTINUE
OR NOT.

(OVER)

T=4:28
 (3) AT 04:28 DECISION MADE TO PWR DOWN SIC
 PER OCP-1237- SEQ 6-8-9.
 TEST VARIANCE 24624 WRITTEN AGAINST
 OCP 4225 TO SAFE RCS PNEUMATICALLY (OTS)
 AND ALSO TO PERFORM PWR. DOWN.

T=4:48
 (4) PWR. DOWN SIC COMPLETED @ 04:48 HRS 11-26-68.
 RCS SYSTEM SAFED.
 TV 24624 COMPLETED.

DAYS 11/26/68

NOTE: CHECK STATUS OF ARC SUPPRESSION
 MODIF. & S/M QUAD CONNECTOR
 CONFIG. @ VEHICLE POWER UP
 FOR POSSIBLE CONFLICT. WITH OCP-
 4225 & SYSTEM SAFETY.

(2) Harvey (NASA Eng) has DR's
 3, 4, 6, & 7 for signature. OCP 4223.

(3) OCP 4225 - DR about Cpl curves -
 Harvey wants fixed once and
 for all! - he warned me he
 will make an issue to get
 results.

(4) SPS HE PANEL R & R per
 Z.O. 685756 - purge and blow down
 information is being prepare for
 a PRQ which is to accompany
 ticket FO19-

11/26 2ND SHIFT AMES
 NOTE DAYS NOTE 1 FOR FOLLOWING

(1) A REQUEST WAS MADE TO DEMATE
 PL42/J466 QUAD B - WE ARE GOING
 TO DO QUAD B ON THE NEXT SEQ
 OF 4225. I SAID GO

(2) THE ARC SUPPRESSION MOD HAS JUST
 2 MORE WIRES TO TERMINATE.
 THEN ~~BRAY~~ XRAY & REINSTALLATION
 OF TB'S.

(3) ALL CB ON PANEL ARE - OUT - OFF
 & SCS SWITCHES TO CENTER

11-27-68 (1) OCP 4223 - DR 3, 4, 6, & 7 were signed
 FIRST and put back into book. DATA
 was transferred to new sheets
 and signed.

2 SPS HE PANEL R & R press
 completed and delivered to
 Service Engineers.

3 STATION CALL & PWR UP TEST.
 SCHEDULED FOR 18.00

2ND SHIFT

① NOTE 1 SECOND SHIFT 11/26/68

DR 27 IS SOLD

P642/2166 DEMATED

② QUAD "C" SIMULATORS WERE DEMATED BUT NO RECORD IN 100030 - THEY ARE NOW DEMATED

③ J19/2511 P1 DEMATED

④ ITEM 2 TRL SOLD REF NOTE ① THIS PAGE

⑤ NO POWER UP THIS SHIFT

⑥ WE NEED ONE-TWO-DWELL TVAR TO POWER UP THE -075 TO ENTER 4225 SEQ 06-001

THIRD
12/2/68
JMS

① POWERED UP @ 0615 - 2 TVAR'S & A D1 #6 - CONFIGURATION REQUIREMENTS THUS STEP 9 SEQ 6

12-2-68 OCP 4225-06-020 - SR500Z - FIRST DR #7 difference between 075 NIM gauge and CRT greater than 3% (150) - TVAR 27400 written to correct OCP to 250 psi per INST SPEC MA 0203-0485 which allows 5% tol. - DR 7 sold to company.

② SEQ 7-053 CALLS FOR STOPPING RECORDER 20. IT WAS NOT STARTED IN OCP

COMPLETED SEQ 07 AT 19:50 HRS

SEQ 08-001 - PUT IN HOLD AT 22:00 DUE FUEL CELL TPS 023, THEIR VACUUM PUMP WAS ADJACENT TO QUAD DOG & COULD NOT BE MOVED TO ALLOW US TO OPEN QUAD DOOR, ?!?!?

THIRD
12/3/68
JMS

① GOT INTO SEQ 8 @ 0200 AFTER CONTINGUOUS QUAD D

② COMPLETED OCP 4225 @ 0710

③ BILL, THIRD SHIFT TYPES ARE WORRIED CAUSE S/M PROP TANKS ARE NOT PRESSURIZED, DIDN'T KNOW WHETHER YOU WANT TO PRESSURIZE OR NOT.

④ BIG HASSLE GOING ON REGARDING OIL THAT WAS DISCOVERED IN BLDG 288 FACILITY LINES. WORD IS THAT THIS CONDITION MAY HAVE EXISTED SINCE SOMETIME LAST AUG.

FIRST SHIFT.

H.S. 1. ISSUED TPS TO PERFORM SECTION I & II OF OCP 4128 SLC108.

2. TEE FOR 4128 SCHEDULED FOR TOMORROW. NEW CABLE FOR CIA-352 DUE IN THURS. & TVARS DELIVERED TO CEE FOR SIG.

3. Berg, Data Sheet entry step for Q.C.C. — If you ever run across another problem like that TVAR it during test because there is too much red tape to implement a ROC — See typed in signatures required for approval on the ROC.

4. Berg, KPSI-KPSA — Both are (in fact) S/C pressure readings are in absolute on the CRT — per Stevenson (Inst.) I noticed OCP only calls for KPSI for 0-5000 measurements in ACE ROOM READ OUTS. S/C PANELS ARE PSIA and GSE gauges are PSIG. If different where?

5. CIA-075 — GAMV24 which isolates GARV5 (140 ± 5), must be closed to attain 325-350 on GARV5 for dynamic fitting leak checks. Ames & Manha, tried to get a ROC for SLC109 to OPEN & CLOSE GAMV24 in the two places required — Easier to TVAR than ROC.

Refer to seq. 03-051 & 04-046 & Fig 1-4 MA0710-4224-308.

6. 4225 Cal Curve DR's — J. Hill STPE requested get NASA ENG signatures. Harvey (NASA) — wants fix for SLC109 before signing SLC108. Hartsath not doing anything. Stedman not doing anything. Was going to write ROC — ~~RED~~ TAPE!!

SECOND 12/3/68

SFS ENGINE INSTL IN WORK, REDTAG & DR'S INCLUDED. PER J. HILLS INSTR.

Tuller CIC REQUESTED OK TO DEMATE P992 WE TURNED THEM DOWN. IT WOULD AFFECT ABOUT 22 PINS ON CM SYS 1 & 2 PRESSURE & TEMP MEAS. FOR RETEST FROM US.

DAYS 12/4/68

1. TEST READINESS FOR OCP 4128 HELD @ 13.00. NUMEROUS CAT I CONSTRAINTS PARTICULARLY CABLES FOR CIA-352 WHICH SHOULD BE AVAILABLE TOMTE.

2. 4225 — Ref Yesterday entry 6 — A ROC was written — Huber is considering it and looking into alternatives.

③ OCP 4223 — Ray Harr (Being) has our copies of TVARS 21342 & 21343. Bednarski has our copies of initial data. — Trying to get C19B3 & C19B4 accepted but MR's are "stuck" in the "paper machine."

SECURED 12/4/68

SPS ENG INSTL (ele/instr) in work. NOTE: PERSONEL working in Sector A, knocked heads out of the Decade boxes, causing master alarms, Advise etc to check this area, if this occurs again. OCP 4128 is using Cox I think.

Realigning the SPS line heater over the bellows area not complete. They are completing SLE109 engine first, so they can come up with a firm idea for all engine instl's.

SPS VENT/BLEED line in process of welding.

Issued TPS TO REPRESSURIZE OXID/FUEL TANKS (SPS), TPS #30

THIRD 12/5/68

1. New call for C14-352 is now on stack. TER people are running C14-352 % per TPS, they ran into trouble because they wanted to disconnect J17, J19 on S/M, and with power on S/C, no dup. Anyway they still had about 50 steps to perform on TPS.
2. TPS #30 to pressurize SPS Prep tanks is not compatible to OCP 4128 setup, suggest, if we're going to press. tanks, should be done per 4128 hook up.

12-5-680 TPS V34-GEN-030 was Cancelled by TPS V34-GEN-
 FIRST Reason: ① Anticipate getting into OCP 4128 within less than 24 hours when when in step 01-005 the tanks will be depressurized
 ② TK's of 0131 as specified in TPS 030 are not compatible with 4128 TK's installed in pretest of OCP 4128. Big News

NM ② DR 225 (V36) — TB924 misswiring that caused DR 226 blown instr. fuse, must be reworked before pretesting engine wiring verification, which will be the RCS retest on TB924.

③ OCP-4128 PRETEST IN WORK TO USE THE TERM LOOSELY.

④ OCP 4223 DR's 2 & 5 C19B3 & C19B9
 MR's written — A TVAR was
 written to incorporate the new
 acceptance criteria.

SECOND 12/5/68

OCP-4128 PRE-TEST HUNG-UP, No Tech
 support for Pneumatic set-up. Had one
 Tech for ele/instr hookup, but were
 hung up with ATO SUPR on mating
 J18 & J19. Last word from EPS SUPR,
 is, S/C will pur-down for mating of
 J18 & J19. We have X those connector
 we have connected on F16 1-2.

2350 UN-HUNG, PURS-TO-BE decided to connect
 J18 & J19

P.S. D/662 is in ~~process~~ process of connecting
 S15^{ENG} ELE/INSTR to TB-54 & TB58

THIRD 12/6/68

1. BIG PUSH WAS ON TO START OCP-4128, AS USUAL
 SECTION I IS NOT BOUGHT OFF. FOLLOWING
 IS RECAP THAT NEED VERIFICATION.

PARA 8.3 A, B, E & F

PARA 8.4

PARA 8.5

PARA 8.6

PARA 8.7 B, C, D, F

ALSO NONE OF ENG CONNECTORS ARE MATED AND
 WILL REQUIRE TVAR TO OCP 10030 PRIOR
 TO GOING INTO TEST.

DAYS 12/6/68

1 OPEN ITEMS IN 10030 ADDED ON
 Δ TEL. DEGRADE BOXES ARE
 STILL CONNECTED TO TB 54. WE
 WILL HAVE TO MAKE SURE THEY ARE
 REMOVED PRIOR TO SEQ 08 &
 SPOOG1 & SPOOG2 CONNECTED.

2 STARTED OCP-4128 @ 14:12

③ OCP 4223 TEST DEBRIEFING — ONLY
 ITEMS OPEN — SUBDR'S (VAR'S) ON
 C19B3 & C19B4 ARE SIGNED, ONLY NEED
 Q.C. STAMPS AND CLEAN-UP.

④ OCP 4225 TEST DEBRIEFING — MAJOR
 PROBLEM WITH DR? BECAUSE TO
 CHANGE WOULD REQUIRE COMP.
 END ITEM SPEC CHANGE —
 EVERYBODY AGREES S/C OK BUT
 PAPER BIND — WILL NEED SOME
 WAY TO CORRECT VALUES FOR
 DIFFERENCES BETWEEN CAL (ACTUAL
 AND STANDARD) DATA.
 PRI ALSO SOMEWHAT OF A PROBLEM.

⑤ OCP 4128 IS TO CONTINUE TO
 SEQ. 06 WHERE MORE CAT 1's
 MUST BE WORKED AND THEN
 TO SEQ. 07 — MORE (HEATER)
 CAT 01 THEN 08 (INST)
 CAT 1's must be worked.

SECOND 12/5/68

4128 - Picked up DR-1 on SP 0657.
 Ref. DR#1 for T/S done so far, no
 luck in resolving problem. TRIED going
 thru J8, as suggested with no results.
 NOTE: We did notice that the constant
voltage going to PGM CAN only be
 removed by KP TH11 AC/DC PUGS PWR.
 Perhaps it may pay to look at the
 Z1 PT SENSOR - FUEL TK1 CIRCUIT BOARD
 AREA for proper adjustments or reconnect
 W2P2 completely from STM #352 and
 check it out. We can check on OR STOR
 @. AND IT WORKS fine. This led us to
 believe the cable may be OK. Didnt check
 F SOMP TK because of time.
PWR DOWN ON DR#1

PLAN OF ACTION:

- ① WE'RE PULLING W2P2 OFF OF SK107
 IF THIS TAKES CARE OF PROBLEM, THEN
 RUN Seq 02 THRU 04. IF THIS DOESN'T
- ② THEN CHANGE 352 (IF POSSIBLE), TRY
 NEW CABLE AND GO.
- ③ IF CHG'G CABLES does the trick, Get
 TER GRP TO CHECK OUT cable and
 HAVE READY FOR Seq 05 -

THHP
GMS
12/9/68

- ① NO CABLE CHG. - Good luck
 FIDDLE-DIDDLED
 AROUND WITH DR#1 AFTER S/C
 POWER UP

12-9-68

FIRST ① OCP 4128 - DR#1 Troubleshooting
 Dutton revealed wires going to J2/P902-40 &
 NPK 41 broken, or not connected to
 the respective pins of P902. DUBDR
 13:30 V37-GEN - #158 (A13721A) - Safing
 to disconnect J2/P902 to fix wires.

② CONNECTOR REPAIR IN WORK. STEPS
 WRITTEN ON SAT 12 OF DR1 FOR
 RECONFIG & SPOT CHECK & RESUMPTION
 OF OCP @ SEQ 02-009.

③ BE SURE TO RUN STEP 1.55 OF
 DR ON SAT 11 AFTER REPAIR
 PRIOR TO STEPS ON SAT. 12.

④ OCP 4128 - Operation's types want
 to progress to FCSM test
 (06), Heater test (07), or
 instrumentation test (08). See TRH
 recap or TRH and note that
 there are Cat 1 constraints
 against all of them. On the
 other hand, the actuators are
 being nulled so the connectors
 on the SPS engine cannot be
 mated to remove numerous
 Cat 1 constraints. Safest way
 is be sure all Cat 1 constraints
 are worked and be very
 careful before down grading
 Cat 1 constraints.

SECOND 12/9/68

1600 CTC SECURED OCP A128 SO THEY COULD PUT OCP 7070 ON THE LINE. METS PUT REWORK WORDS ON DR-MER FOR P902. NO WORK BEING DONE AT THIS TIME.

2200 GAVE OK TO MATE J2, J3 & J4 FROM SPS ENG. TO SM TO SUPPORT OCP 7070.

NO WORK YET ON P902, SHOP WON'T TOUCH UNTIL EPS TELLS THEM THE CONNECTOR IS SAFE. GAVE EPS OUR STATUS, BUT THEY INSIST THEY C/O PLUG PER TPS TO VERIFY NO VOLTAGE, BEFORE THEY GIVE AN OK.

GIMBLE NULLING PROCEDURE HELD UP DO TO OTHER WORK GOING ON (MYLAR INSTL). TPE SAID SCS HAD A WORK AROUND FOR THE GIMBLE MTR REQMTS.

2300 HAVEN'T BEEN APPROACHED YET, ABOUT CONSTRAINT ITEMS TO A128.

THIRD 12/10/68 JMS

① EPS TPS DIVIDED THESE WERE STILL 3 HOT PINS ON P902

	PIN 30	~ 28 VDC	} FUEL CELL
~ 8 VDC	PIN 82	SC 2085 T	
~ 8 VDC	PIN 83	"	

HAD SOME TROUBLE FIBERING OUT WHAT WOULD POWER DOWN PIN 30 BUT FINALLY ARRIVED AT C&W CSM/CM SW. TO CM & THAT DID THE TRICK. BUT BY THAT TIME DECISION TO POWER DOWN S/C WAS MADE DUE PINS 82 & 83 BEING POWERED BY THE SCE.

THIRD CONT.

② GOT INTO OCP @ ~ 0515 & COMPLETED THRU 02-044

DAYS 12/10/68 JMS

① COMPLETED ^{SEE} 03 AT WHICH TIME WE WERE PLACED IN A HOLD FOR OCP 7070 - A FEW DAYS IS MY GUESS

② WROTE TVAR 27399 - TO SAFE SPS

- a) REMOVED R 201 PWS AC/DC PWR - KP 7411
- b) REMOVED R 205 FUEL HOLD - KP 7396
- c) REMOVED R 205 OXID HOLD - KP 7407
- d) ON PANEL 8
 - SPS GAGING MNA/MNB - OPEN
 - SPS GAGING AC1/AC2 - OPEN
- e) CIA-352
 - 115 VAC FAC PWR (CB1) - OFF
 - 28 VAC FAC PWR (CB2) - OFF

ONE TIME ONLY

SECOND 12/10/68

2300 OCP-7070 IN TROUBLE - BMAG PROBLEMS - STANDING BY FOR TPE DECISION TO PUT A128 BACK IN TEST.

2400 LATEST WORD - IF THEY FIND A BMAG, A128 WILL STILL CONTINUE TO HOLD, IF NOT, WE WILL GO BACK INTO TEST.

WROTE TVAR TO GO BACK INTO TEST, SUGGEST A COMPLETE CB/SW CHECKOUT ALSO.

THIRD
12/11/68
JMS

- ① BACK INTO OCP @ 0232
- ② PICKED UP DQ#2 @ SEQ 04-008 WHEN AFTER CIA-352 15% ADJ. WAS MADE PANEL 3 OX QTY WAS 14.4+9% S/B 14.5 MIN. DIDN'T KNOW WHAT TO DO SO GOT OK TO PROCEED & DID SO.
- ③ DQ#2 AGAIN AT SEQ 04-066 [WHERE CIA-352 ADJ. GAVE 14.4+ ON PANEL 3.] WE TOLD IT OVER TO YOU.

DAYS 12/14/68

STARTED T/S ON DR #2 & DISCOVERED THAT THE REASON FOR VARIATIONS IN OX QTY DISPLAY BETWEEN SEQ 04-008 & 02-071 WAS DUE TO SMT INCORRECTLY INSERTING 0-8-0.8 @ SEQ 02 S/B 0-8-4.2. TRYING TO GET CALIB PEOPLE ON STACK TO MEASURE OUTPUT OF C2 & C4 AS THE LEAD SETTINGS SEEM TO GIVE TO LOW CAP OUTPUT. IF CALIB VALUES ARE WRONG WE WILL HAVE TO RERUN SEQ 02-066 THRU 02-080, 04-007/008, 04-066 OCP-7070 HAVE COMPLETED ALL THE SEQ. THAT INTERFERE WITH PUGS C/O SO WE WILL TRY & RUN IN PARALLEL.

- 2 AFTER CIA-352 CALIB PERFORM FOLLOWING RETEST ON DR#2
- ✓ 1 VER/SET PG MODE SW - P21
- ✓ 2 VER/SET 15% IN CIA-352
- ✓ 3 R202 REMOVE KP7215/KP7221
- ✓ 4 CIA-352 FUEL 1 SIMUL CKT SW - OFF
" 2 " SELECT SW - OFF
" " " " " " OFF
- 5 RERUN SEQ 02-066 THRU 02-080
- 6 RERUN 04-007, 04-008, 04-066 & 04-067
- 7 CONTINUE WITH SEQ 04.
- 8 OCP 4225 - DR #1 signed by Harvey (NASA). TVAR 24386 was written to correct for calib error differences and assist in sale of DR #7.
- 9 OCP 4223 Signed.
- 10 TPS to perform CM ENGINE wiring test, after ore suppression mod. was picked-up by TPE Al Conclini and put into system. NOTE V6 PR 225 is a Cat 1 constraint - IB924 not wired correctly.

11. SPOOB1 & SPOOB2 - transducer, has two blue wires - wirelists calls for a red and blue wire. Bill Griggs (SPS - X-1561,2) said Don Weeks (Inst. Eng. X-1385,6) will write E.O. to correct wirelist.

SECOND

1 COMPLETED DR#2 AND INTO OCP 4128

1400 2 Hung up in Seq 04-008. Finally got hold of Geo Johnson and found out that this step is not written the way they want it ran. George is coming in to straighten this out.

THIRD
12/12/68
JMB

1 COMPLETED SEQ 4 & SEQ 5

2 REMOVED CAT I CONSTRAINT TO SEQ 06 BY MATINE P270/12

UPTO 05-116

3 Wrote TVAR to turn SPS engine on & off with DV THUST SW INSTEAD OF SPS THUST IN SEQ 05-101 & SUBS. WE HAD DONE AS WRITTEN BUT SCS WAS POWERED UP & LOCKED US IN SPS THUST AFTER DIRECT ON: SO RECYCLED WITH TVAR 27267 & 27266 TO 05-101

4 IN HOLD AFTER P270/12 MATINE FOR CUP CLEAN UP.

DAYS 12/12/68

1 Picked up DR#4 @ SEQ 06-010 NO ROUGH ECO. DISCOVERED THOROL CONNECTOR DISCONNECTED @ J1 S31A6. ENGINE INTL HAD BEEN DOWNGRADED FROM CAT I TO CAT III, BUT IT APPEARS THERE IS A DR AGAINST FC5M HARNESS BEING TOO SHORT TO REACH THE S31A6 BOX.

2 CONNECTOR RECONNECTED V37-GEN-168 DR A137632.

3 COMPLETED SEQ 06 WITH ONLY 2 TVARS. STARTING SEQ 07 @ 15.20

2nd & 3rd We're counting on you to finish this OCA.

SECOND

645V35C WAS CLOSED BY 10070 3/B OPEN

2130 OCP 4128 - HOLDING IN SEQ 08-005 FOR SLC PUR-DWR (SCS PROBLEM). WE WILL GO BACK INTO TEST WHEN SCS COMPLETES T/S AND SLC IS PUR-UP, SOMETIME LATE THIRD SHIFT.

THIRD 12/13/68

1. Picked up test at 0100 hrs and performed sequences 08-005 thru 08-037 at which times we went into the GE hold for T/S ACC.

CONT.

2. At 0640 testing was resumed.
TVAR 27269 written to configure
514-04 valving to support test.
3. Completed THRU 08-043 with TVAD
27269 TO PLAY SWITCHY-SWITCHY WITH
OTS & STACK VALVES.

DAYS 12/13/68

1. PUT IN HOLD IN OCP-4128 @ 08-20
FOR OCP-7070
2. RESUMED TEST @ 13-32.

SECOND 12/13/68

AT STEP 08-137 TEMP STIMULI FOR
SPOO61 AT REF DESI TJ-2 DID NOT PRODUCE
A DECREASE IN TEMP READ OUT. WE SPRAY
SENSOR AT TJ-1 & GOT IMMEDIATE DECREASE,
ALSO DR#5. RESEARCHING TO DETERMINE
IF IT MAKES ANY DIFFERENCE WHICH ONE IS
SPARE.

WENT TO SEQ 09-001. COULD NOT
DO 09-002 - WOULD HAVE SHOT 7070
DOWN IF WE DID. SCS WILL OPEN
THE EPS CB'S WHEN THEY PUR DOWN

THIRD
12/16/68
JMS
MS

① CRAWLED IN ENGINE WELL & TB 54
SEEMS TO BE WIRED PROPERLY BUT
COULDN'T SEE ANY WIRE ID'S
AND 5 XDCERS HAVE WIRES
CONTING FRONT THEM GOING INTO
A COMMON BUNDLE & NO WAY
TO IDENTIFY WHICH WIRE COMES
FRONT WHERE. DIDN'T KNOW
WHAT ELSE TO DO WITHOUT ENGINEERING.

FIRST ① LIMBILICAL CONNECTOR POWER-
12-16-68 DOWN REQM'TS - A copy
of the group will be
kept in the front of
the file drawer labelled
STC RUN COPY OCP's. Note
this list is a revision A-1
and will be updated to correct
mistakes and keep up with
changes. Before using it ISE
should be contacted to determine
if the latest Power-Down Reqm'ts
is being used, or there are any
other questions

② OCP RETEST, GEN-009 CM RCS ENGINE
WIRE RETEST.
Two constraints - ① DR25 not worked
② Haven't accumulated
equipment - Kroger
working on it

NOTE: CIA-075 IN STA 2B
SERVICE ROOM IS BEING
MODIFIED BY TER GRP. DO
NOT OPEN CROSSOVER VALVES
OR TRY TO USE 075 WITHOUT

FIRST CHECKING WITH FER.

4 REF DR#5 OCP#128 - WIRE IDENTIFIERS FOR TS-1 & TS-2 WERE CROSSED. SUB DR HAS BEEN GENERATED IN V37-GEN TO CHANGE WIRE ID'S & TERMINATE PER R/P. AFTER FIX WE SHOULD TAKE CRT READING & SPRAY WITH FREON TO SELL DR#5 & OCP-4128.

5 TOM - WOULD YOU SEE IF YOU CAN PIDDLE DR#3 TO QC. AS DAY SHIFT QC KEEPS NURSING IT.

6 OCP 4225 - TVAR 24771 signed by Harvey but TVAR 27398 signed not acceptable - he wants 3 procedure fix on 109 in all applicable areas.

7 SC108 Δ F MOD ANTICIPATED RETEST. Note in list those lines checked were tested in SC107 retest TPS - The remaining are on panel 3 and panel 8 which were retested some previous SC - Need to find all the retest accumulate - prep for type, edit and get typed. let us hold off until getting typed until more certain about additional items that might pop-up.

3rd 12/17/68
1. No prep activity

12-17-68① Who took the UMBILICAL FIRST CONNECTOR POWER DOWN REQ'NTS out of the log book? "Days" can't keep "nights" informed if they information is lost on nights! If you know where it is - put back in log so "Days" can work on it too.

SECOND 12/17/68

2430 SUPPORTING OCP 0126 - SPS ONLY - Holding AT Seg 012.

DR#5 SUB-DR COMPLETE - NEED TO CHECK OUT SPOOBIT somewhere in OCP 0126 TO CLOSE OUT OCP 4128. Couldn't get to it this shift.

THIRD 12/12/68
JMS
HS

① WORKED DR#5 THRU LUNCH ALL OK BUT SUB NEEDS EO TO SELL & ∴ DR#5 IS NOT COMPLETELY SOLD

②

FIRST ① E.O. 629282 - Provides CM RCS engine individual 12-18-68 valve response verification for increased assurance that go procedures will detect engine malfunctions?

② OCP - 4128 POST TESTED AND SIGNED, CTC, SYS SUP. & NASA HARVEY!

12/18/68 SECOND.

9430 OCP-0126 CHUGGAW MAONE in Seg. 028

12-19-68 V37-SS357254 Sep. 116, 117, 121
 FIRST refer to MA 0310-0048 Service
 Propulsion Engine Gimbal Actuator
 Installation and Function Testing,
 Block II - locking links alignment
 not accomplished per 5.5 & 5.7.
 Of course it cannot be done
 now as specified in 0048, so
 the following should be done:
 1. Inform ATO management that
 such open items should be
 Cat 1's to all SPS engine
 installations in the future.
 2. Suggest performing comparable
 work on SM - SET engine
 using SCAT-01's and OIA-017
 to 0° 0' pitch and yaw
 install locking links and lock
 to this position - Suggest Manly
 do this on there paper
 (They went ATO to Paris & then
 out with a TPS to meet
 the intent of SS 357254.)
 PER ATO SUPERVISION - NO TPS
 unless otherwise directed by ATO
 SUPERVISION.

WJM ② FOUND IN OCP RETEST WHERE WE
 IN PROP HAVE NOT IN THE PAST
 BEEN TESTING P411 & P412 - 42 &
 - 43. - LIST ON TAB RUN - NEED
 to write retest for these.

12-20-68 Ref. entry ② 12-19-68 - P411 & P412
 FIRST pins - 42, & 43 on both are
 WJM tested in OCP 7018 which
 was not been performed yet
 thus pins need not be
 retested, because they will
 be tested in 7018 following
 ΔF MOD. RETEST PIN CONTROL
 TAB RUN was corrected to
 reflect this.

THIRD
 12/26/68
 JMS

① INFORMED OF DI #209 AGAINST
 BELLOWS OF PITCH ACTUATOR
 BEING TWISTED. I DID NOT DISPOSE
 TO DE-NULL BECAUSE I BELIEVE
 THAT DESIGN SHOULD HAVE
 LOOK @ BELLOWS BEFORE UNI-
 TWIST.

12/26/68 DAYS

✓ PANEL RETEST TPS OCP GEN-012
 IS IN TYPE.

THIRD
 12/21/68
 JMS

① P388 - Panel 3 - Pubs connector removed
 & REPLACED - NO DEFINITION OF RE-TEST
 REQUIREMENTS (DONE ON 2nd) & I'M
 AT A LOSS TO US HOW TO RETEST
 EXCEPT DOUBLE POSITIONS of H128
 AGAIN V36 GEN 297 (DI#)

② DI #209 AGAINST BELLOWS DISPOSITIONED
 TO STRAIGHTEN & REALIGN PITCH
 ACTUATOR. I STILL THINK SOMETHING
 DEFINITIVE SHOULD BE SAID ON THE
 INTEGRITY OF THE BELLOWS.

12/27/68 DAYS

1. P388 RETEST ADDED TO TPS 012 WHICH IS STILL IN TYPE

12/27 2nd

(1) DR 274 (P388) - big flap from NASA holding up panel 3 installation because of no retest on this DR. Added note to it to the effect that retest would be done on TPS 012 (retest).

(2) DR 209 (SPS act. bellows) sold to NRQC but NASA put note on requesting NASA engr. (Harvey) concurrence.

D. Rhodewalt

12/28

2nd D. Rhodewalt

(1) DR 274 (P388) - this gets more interesting and embarrassing, lot or 3rd tried to sell DR 274, but found connector misidentified P388 was actually P389. NRQC voided their stamp on 274 and NASA wrote DR #39 requiring continuity on 388 & 389 to see which is which

DAYS 12/30/68

1. TPS 012 NOW COVERS P388 & P389 RETEST REQS.

2. SPEED LETTER DEFINING TPS 012 EQUIP. REQ. DELIVERED TO J. KRAGER.

DAYS 1/2/69

1. TPS 012 COMPLETED & COPIES DELIVERED TO NASA & ENGRG FOR REVIEW.

2. FAIR V37-GEN-031^{E0716706} ISSUED TO CAP WIFE FROM TB70-D2 TO P277 FCSM BOX. WE WILL HAVE TO MODIFY INTEG TEST TO DELETE FCSM SEQ. 24-079 THRU 24-092.

DAYS 1/5/69

1. PARNELL - INTEG. OCP WRITER HAS BEEN INFORMED OF NECESSARY REVISIONS TO OCP TO SATISFY FCSM DELETION, & ADDITION OF GASU60 TO SPS GN² PANEL.

2. TPS-012 ENGRG REVIEW (DUTTONS BASKET) CHANGES HAVE BEEN INCORPORATED & TPS IS ON STEAN HARVEYS DESK FOR SIGNATURE.

3. EQUIP. IS BEING ACCUMULATED FOR O/M PCS ENGINE WIRING RETEST (TPS-OCP RETEST GEN-009)

4. REGARDING DR #209 - SPS GIMBAL ACT BELLOWS REWORK, RETEST TPS IS BEING PREPARED BY SCS GROUP TO REUN PORTION OF SEQ 012 OF OCP-0126.

1-6-68 ① OCP RETEST GEN TPS 009 INTO
 DAYS TEST ABOUT 1300.
 9PM DR _____ STEP 12 C19B77
 DIRECT - NO FLOW } OXID
 C19B9 NORMAL - NO FLOW }
 STEP 15 C19B7 DIRECT NO FLOW } FUEL
 C19B9 NORMAL " " }
 SUSPECT C19B7 DIRECT FUEL &
 OXID WIRES FROM ENG TO TB
 ARE CROSSED - MISIDENTIFIED OR NOT
 WIRED PER PRINT - SAME FOR
 C19B9.

2ND

1/6/68

HAPPY NEW YEAR TO ALL. SO HAPPY
 you guys didn't disappoint me, and had
 some DR's when I came back.

① PICKED UP 2 MORE DR'S ON TPS 009.
 C19B8. TOTAL DR (6). RECHECKED
 SYS WIRE INST. PER EO 270207 AND
 REWIRED TB 917 ACCORDING. RECHECK
 VERIFIED SYSTEM OK. COULDN'T FIND
 ANY PROBLEMS WITH C19B9. CHECKED
 IT OUT REAL GOOD AND THEN CHECKED
 IT OUT OK. COMPLETED TPS 009
 AND ALL DR'S. NEED XRAY ON
 TB 917 AND NASA SYSTEMS FOR
 COMPLETION.

3RD SHIFT

1- RETEST TPS #12 I/W - SOLD STEP 1
 AND CONFIGURE B/O BOXES TO J18 & J19.
 Hg. READY FOR TEST WHEN PERSONNEL IS
 AVAILABLE.

DAYS 1/7/69

① PICKED UP DR #20 @ STEP 18 OF
 TPS #12. UNBALANCE WAS REGGED @
 600 + DUE TO HOLDING TEST SW
 IN POS 1 TOO LONG @ STEP 15.

② Hooking up Quads per Step 27 T. 10. 30

③ Hookup Completed of Holding @ 11:14
 FOR EAS TPS 008 INVERTER e/o

A OCP RETEST, DR'S 13, 15, 17, 18 -
 An attempt was made to sell
 these after all signatures were
 obtained but ran into Q.C.
 problems because of the un-
 orthodox nature of running
 TPS 009 and working the DR's
 such as follows:

1. TPS 009 was performed on
 the stack and bought by stack
 Q.C. - ACE RM will not
 recognize stack Q.C. work
 num? 1 *.
2. The TB's were rewired
 per the OCP retest DR -
 normally the hardware is
 fixed using a SC hardware
 sub DR.

3. The retest was done per the open steps of TPS 009. Normally the retest is detailed on the DR.

WPK

Additional conclusions explaining the way the tests were performed were written and signed by STC, CTC, & CEE. 2nd shift should sell DRs to the Q.C. They were working with.

50CP RETEST DR's 14 and 16 appear to be unexplained in conclusion. (31989 - Normal FUEL & OXID). When we performed the initial test, the B/O box patching power supply output, etc. were very carefully checked for correct hook-up. It is just too much to be a coincidence, they two valves bussed together did not flow gas. It is very easy to theorize an intermittent at TB916-EM was fixed when the wires were checked for correct wiring. Power must be applied to either of these valves and wire in TB916-EM wiggled to prove or disprove TB916-EM intermittency. Additional troubleshooting required on DR's 14 and 16.

WPK

WPK 6. OCP 4224 - Shedman (CRS Engineering) requested that we allow him to make special data reduction reqm'ts

on the DATA REDUCTION REQUEST for valve responses. This is due to recently released engineering information on valve responses with the gro suppression MOD incorporated.

- THIRD 1/8/68 JMB FIRST WDM
- ① Completed TPS 012 EXCEPT for SIMULATOR HOOKUP STEP 55 & 56
- ② TPS 012 complete, less NASA ENG. Sig. on completion. 0830

WPK REMIND ME OF THUNDER PAPER FOR WPK

③ BERG. - SR 5089 - SR 5096 - REFER TO INTEGRATED SCHEM. NOTE THAT THESE MEASUREMENTS COME OFF THE DRIVER SIDE OF THE VALVE SO THEY WILL ONLY BE ON AS LONG AS THE SWITCH IN THE CM IS HELD IN THE -ON OR OFF POSITION (MOMENTARY) - THEY PROBABLY WERE FUNCTIONING CORRECTLY.

④ OCP RETEST - DR 23 was written against SPO006 - reading 78 S/B about 25. Inst. is supposed to take care of this.

⑤ OCP RETEST DR 14, TROUBLESHOOTING Revealed two intermittents TB916-EP & -FP appears both were not properly seated in spite of X-ray Ref. DR's 136-GEN-339 and 340.

1/8/69

SOLD DR's 13, 15, 17, 18 COMPLETELY.
 COULDN'T GET NR-QC TO BUY DR 14 & 16.
 They question the conclusion and
 FIX AND WANT QCE TO EVALUATE.
 BEFORE BUY-OFF. SUB-DR TO DR 14
 & 16 (DR 339/340) ARE SOLD AND COPY
 OF SAME WITH DR 14 & 16.

1-9-69 THIRD SHIFT

HS 1- ISSUED TPS 001 FOR OCP 4224 TO
 PERFORM SECTION I & II.

HS 2- WHAT IS THE PLAN OF ACTION ON THE
 ARC SUPPRESSION NETWORK FOR OCP 4224?
 4224 will be performed as normally
 performed without any configuration
 changes and the data requirements
 will be changed to compensate
 for the arc suppression mod. JPK.

1-9-69 OCP RETEST DR's 14 & 16 SOLD TO
 FIRST NR Q.C. DR's ON STAN HARVEY'S DESK
 JPK FOR NASA ENG SIGNATURE.

OR
 HERB
 BACKMAN
 JPK
 OCP 4224 - PREPARATION IN-WORK - PER
 RON STEDMAN, KEN NICHOLS OF EPS
 ENG ADMITS THERE IS AN ERROR IN
 E.O. 72020? which installed arc suppression
 and must be corrected with E.O.
 before 4224 performed - No further
 information available.

SECOND 1/9/69

① Got copy of EO 722659 1-5 THAT
 CORRECTS THE WIRE REVERSAL ON C19A12.
 COPY ENCLOSED. FAIR TICKET ISSUED AND
 EO COMPLETED 2300. T/B WAS XRAYED
 AND F/T CLOSED OUT. RETEST TO BE PER
 OCP 4224.

② RAN INTO A PROBLEM IN SECTION I,
 OCP 4224, DURING RCS SIM. DISCONNECT
 ON QUAD "D", FOUND SIM. CONNECTOR
 TO J172 INSTALLED IN "GANTED
 POSITION" WITH ONE OF THREE ALIGNMENT
 KEYS COMPLETELY OUT OF CONNECTOR.
 TOOK PICTURES OF INSTA, DISCONNECTED
 AND I/D S/E CONNECTOR, ASIDE
 FROM A SMALL SCARF, NOT DAMAGE
 APPEARED EVIDENT. TRIED QUAD
 CONNECTOR TO J172 AND WENT ON/OFF
 REAL SMOOTH. FURTHER CHECK OF
 PROBLEM, FOUND ENG. HAD INSTALLED
 A CLAMP OVER QUAD WIRE BUNDLE
 TO UNDERSIDE OF BULKHEAD WHERE THE
 S/E CONNECTOR. WITH WIRE BUNDLE CLAMPED
 THIS CLOSE TO S/E CONNECTOR, CONNECTION
 OF THE SIMULATOR (LONG) CONNECTOR IS
 RESTRICTED. THIS CONDITION EXISTS ON
 QUAD "D" & "B" ONLY.

③ REF. PAGE 2-01-006, OCP 4224. A
 TVAR SHOULD BE ISSUED TO DELETE THE
 REDUNDANCY AND REFERENCE TO THE
 CORRECTOR QCE FOR SCALE SW SELECTION.
 STEPS 18 & 19 COULD BE COMPLETELY
 REWRITTEN.

OVER

9-9-69

SECT. I 4224 PRETEST -

FIGURES 1-1, 1-2 & 1-3 WERE COMPLETED.

HAD PROBLEM WITH TR-4224-002-21, THE GHC^s HAD STRAIGHT SPOOLS. WHEN WE ATTEMPTED TO CONNECT TP 70 & TP 20 THE 5TH LEVEL FLOOR INTERFERED. CALLED TER, THEY FURNISHED SOME 90° SPOOLS & ARE INVESTIGATING THE PROBLEM. THEY MAY HAVE TO INITIATE AN E.O. TO CHANGE TO 90°.

THIRD 1-10-69 JMS
① OCP 4224 READY TO GO EXCEPT THAT SKAT 103 IS "IN BASEMENT"

1-10-69 ① 136-DR350 - C1983, wiring not first routed per print - route per JMK print - no pins need be removed - made cat 2 on TRb.

② 0930 - EPS having troubles with power - power-up time? Started into test at 1300.

③ OCP 4224 If there are any problems on 2nd shift Steedman can be reached at HA-51830 (Long Beach).

④ OCP RETEST DR'S 14 & 16 SOLD.

NOTES: 1-10-69

DR ① 1 - DURING CM RCS HTR CHECK, WHEN THE CM RCS HTRS SW IS ACTUATED WE VERIFY ENGINES FIRES BY AUDIBLE VENTING & CURRENT DRAG ON CRT. YET IN TWO TRIES WE COULD NOT GET TRACES ON RECORDING. CHECKED THE CM TRANSFER LITES ON SECS EVENT LITES & NOTED THEY WERE NOT LIT. EXERCISED THE TRANSFER SW. ONCE MORE & THE LITES CAME ON. AND WERE ABLE TO FIRE 12 ENVS WITH THE HTR SW.

LOOKS LIKE ANOTHER CASE OF ACTIVATION OF TRNFR SW. WITH TO LITTLE (VIGOR)??

REF: TVAR 26800 FOR POWER UP. WE PUR DN AT CONCLUSION OF SEQ 1

DR1 SOLD TO COMPANY & NASA

② AFTER REVIEWING TGS RECORDINGS WHICH RESULTED FROM RHC 1 RUN (AUTO COIL VALVE RESPONSE) WE SUSPECT THAT THE TRANSFER SW. WAS IN 3M POSITION (WHICH WAS THE REASON WE PICKED UP DR 1). AT STEP 01-032 (RCS TRANS TO CM) WAS ACCOMPLISHED BY THE CMT BUT I DO NOT REMEMBER SPECIFICALLY LOOKING OVER TO THE SECS PANEL & CHECKING THE CM TRANS LITES. AFTER PUR UP YOU CAN CHECK THIS BY RERUNNING THE FOLLOWING - DISCONNECT C20 3A404J4/P88 & C20 3A404J6/P82. THEN DO 01-027 LINES 03280 & 03290. THEN RUN 01-028 THRU 01-054.

SECOND 1/10/68

SUGGESTION FOR ITEM 2. THE VALVE SIGNATURE REVIEW INDICATE WE MAY HAVE BEEN IN SM, BY THE LOOKS OF THE VALVE SIGNATURE PROFILES. HOWEVER FURTHER DISCUSSIONS ALSO BROUGHT TO LIGHT THAT THE COILS COULD BE WIRED WRONG OR IMPROPER INSTALLATION OF DIODES. SINCE THESE CONDITIONS MIGHT EXIST, IT IS SUGGESTED THAT THE FIVE CYCLE EVENT FOR CM1 & CM2 BE PERFORMED ONLY, PULL RECORDER DATA, PERMETIZE AND HAVE READY FOR STEADMAN REVIEW MONDAY MORNING.

NOTE: CAUTION CDR TO MOMENTARILY HOLD RES TRANSFER SWITCH IN EITHER POSITION BEFORE RELEASE.

Good Luck.

THIRD 1/13/69 JMB
 (1) AFTER LOOKING AT VALVE SIGS OF F#1 & LISTENING TO VOICE TAPE & CONSIDERING DP#1 & NOTES ABOVE INITIATED DP#2 TO THE EFFECT SM VALVE SIGS WERE RUN INSTEAD OF CM & ∴ WE WOULD RECYCLE & RUN SEQ 01-000 THRU 01-054 AGAIN.

1/13/69 JMB
 DAVIS COMPLETED S/M VALVE SIGS & DISCOVERED C/M DIRECT RESPONSES WERE RUN WITH RECORDER @ 10 INS/SEC (OPERATOR ERROR) WRITING TVAR TO RERUN C/M DIRECTS. (TVAR 27978)

2 COMPLETED RERUN OF C/M DIRECT COILS, RECORDING BEING PERMETIZED & SHOULD BE READY FOR DATA REVIEW @ 16-00.

3. LOOKS AS THOUGH C/M SYS 2 + Y & - P ARE OUT OF TOLS; WILL WAIT UNTIL DIRECT RESPONSES ARE CHECKED & THEN DETERMINE WHAT TO DO.

4. DONT REMOVE TEST KITS AS WE WILL NEED THEM TO PROVIDE PUDGE FOR ENGINE R/R

NITES 1/13/69

TEMPORARILY HOLD FROM 16:00 TO 16:20 TO GET A GCM WHO IS QUALIFIED FOR MASS SPEC.

AT STEP 02-061 ALL ENGINES EXCEPT -Y SYS 2 PASSED NOZZLE LEAK TEST.
 -Y SYS 2 ENG READINGS WERE:
 MASS SPEC - 2.36×10^{-5} (ALLOWABLE - 5.0×10^{-5})
 SCAT 103 - 70.52 CC/HR

22:50 AT STEP 02-064 ALL ENGINES PASSED LEAK CHECK OF NOZZLES

00:27 AT STEP 02-72 ALL ENGINES PASSED LEAK CHECK OF NOZZLES.

SECOND - 1/13/69

REF. DR # 2 STEP 2.5. Reviewed data on UKV SIGN TAKEN HERE. DATA SHOWED THAT WE STILL FIRE TWO (2) engines when we should be firing one (using the C14-650). Further check of data showed that when the C14-650 JET #4 was activated, we got NO RESPONSE. DATA LOOKS AS FOLLOWS.

<u>C14-650</u>			
JET # 3	SIGNAL TO	+P CH3 & -P CH4	
JET # 4	NO SIGNAL.		
JET # 5	SIG. TO	5 & 6	
JET # 6	NO SIG.		
JET # 7	SIG. TO	7 & 8	
JET # 8	NO SIG.		
JET # 9	SIG TO	9 & 10	Profile No good.
JET # 10	NO SIG.		

DIDNT GO ANY FURTHER.

TALKED TO STEADMAN AND HE AGREED SOMETHING WRONG. DON'T KNOW WHAT.

REOPEN DR # 2 AND DISCONNECTED P 954.

CONNECTED OHMMETER THRU C19B8 & C19B12

AND COULDN'T FIND ANYTHING WRONG. ~~WENT~~

WENT TO T4 OF RES CONTROL BX TO T6S

AND IT LOOKS OK. CONNECTED 2 VOLT METERS

TO T4 AND ACTIVATED C14-650 JET #3. HAD

3 VDC ON C14-650. GOT 1.1 VDC ON ON VOLT METER,

LESS THAN 0 VDC ON OTHER VOLT METER. T6S

REPORTED GALVO DEFLECTION ON CH 3 & 24.

SHOULDN'T BE.

SEE 3RD SHIFT NOTES #6.

THIRD
1/14/69
JMB

① SYS I FUEL CM RCS ENGINES PASSED LEAK TEST AT 0125

② NOTE: DJ #3 THE MASS SPEC READING WAS WITHIN TOLERANCE & ∴ THE DJ SHOULD NOT HAVE BEEN INITIATED.

③ AFTER COMPLETION OF 02-07D WENT BACK AND CONFIGURED FOR CM DIRECT COIL SIGS ON DJ #2

HS ④ RAN DIRECT COIL SIGS AS PLANNED. OBTAINED THREE SETS OF VALVE SIGS.

HS ⑤ REQUESTED THAT DR 4 A132200 BE WRITTEN ON SYS 2 + YAW & -PITCH ENGINES AUTO & DIRECT RESPONSES OUT OF TOLER. NEED ACTUAL TIMES OF RESPONSE BEFORE SUB DR'S CAN BE WRITTEN.

HS ⑥ REF DR 2 ~~ERRATA~~ - SOLUTION SOLVED. FIRST SHIFT HAD THE 16 AUTO SELECT SW'S OUT OF CONFIG. WHEN RUNNING DIRECT COIL RESPONSES ALL 16 SWITCHES SHOULD BE IN THE SAME POSITION - MNA OR MNB

NOTE

FINLEY

⑦ MR. FINLEY - INTERIM CONCLUSION ON DR 2. IS IN ERROR. - ON STEP 2.5 - SIGS WERE OBTAINED BUT T6S RECORDER WAS SET AT 10 INCH/SEC 9/B 160 INCH/SEC. THE DATA YOU REVIEWED WAS OBTAINED DURING RUN OF TVAR 27973, I MADE CORRECTIONS TO YOUR INTERIM CONCLUSION, TO REFLECT THIS ERROR.

1/14/69 DAYS

1 Review of DATA printout for CRO248/CRO249 RCS XFER SHOWS WE DID NOT RECEIVE XFER FROM S/M TO C/M @ SEQ 01-032 TIME 17.07. (DATA# S/C 108-0448-01, LOCATION A0703)

2 Sub DR's initiated to R/R 3 ENGINES
ie. V36-GEN-362 (-P SYS 2) #132200 B
V36-GEN-363 (+Y SYS 2) #132200 A
" " -364 (-Y SYS 2) DR#132194

3 S/M RCS RESPONSE NOT RECEIVED ON CHANNELS 3 & 9 (AUTO RESP) & NO ARC SUPPRESSION ON CHANNEL 3 (DIRECT RESP), ENGINES A3 + P & C3 + P. SUSPECT THE CDR DID NOT HIT +P SOFT STOP FOR AUTO TRACES & WE WILL HAVE TO RERUN. THE MISSING ARC SUPPRESSION WILL HAVE TO BE INVESTIGATED & WE SUSPECT P88 PIN C.

4 PRESENT PLAN OF ACTION AS FOLLOWS

a FINISH OCP (FLOW TEST SEQ 03)

b LEAK CHECK C/M ENGINES ON DR #3 USING STAT-103, FOCUSING ENGINES ONLY:
- Y SYS 2 (FUEL & OX)
+ R SYS 2 (OX ONLY)
+ Y SYS 1 (OX ONLY)
- P SYS 1 (FUEL ONLY)
- Y SYS 1 (FUEL ONLY)

THESE ARE SUSPECT DUE TO GREAT DIFFERENCE BETWEEN MASS SPEC READING & STAT-103 READING FOR -Y SYS 2 OX.

c TROUBLESHOOT S/M RCS ENG. C3 (+P) ARE SUPPRESSION (ITEM 3) & RERUN VALVE SIG.

d RERUN S/M RCS +P AUTO VALVE SIG. (ITEM 3)

e CHANGE BAD ENGINES & RETEST ON RESPECTIVE DR'S.

5 TIME IS 16.05 & WE ARE STILL WAITING FOR PNEUM CONFIG PER FIG 1-5 (SEQ 03-008) WHICH WAS STARTED @ 09.24. WDA

6 PLAN OF ACTION 4224

A. Continue and complete sequence 03 of 4224.

B. Rerun leak checks with Volumetrics on engines with 10-6 leak rate with mass spec. DR# 3 was dispositioned to R & R, but now Project says no but to do the following - 1. cycle five times @ 35 ± 5 psig, 2. leak pk w. volumetrics, leak detector, leakage 70 cc/hr or less - engine OK (engineering will cover) more than 70 cc/hr - R & R.

C. There was no arc suppression on S19A3B4 - Troubleshoot this problem - appears to be in wiring.

DON'T BELIEVE IT. MISSION IMPOSSIBLE!

D. Remove and replace +Y & -P
sys 2 engines.

E. Retest — Be sure to pick up
SM, AUTO's channels, 3 & 9
which were missed in self
run.

M.D. Manha

NITES 1-14-69

THE ORIGINAL PLAN TO RUN INJ VLV FLOW
ON SYST 1 OXID. & FUEL VALVES FELL
APART WHEN IT WAS DISCOVERED TP 70
WAS DAMAGED & WOULD NOT ACCEPT THE
GHC. NOW WE CAN ONLY DO FUEL VLV
SYS 1 INJ. FLOW.

ADR HAS BEEN WRITTEN AGAINST TP 70
& IS WAITING MR ACTION.

WHAT CAN HAPPEN NEXT ?? !!
WROTE TVAR 27115 TO RUN SYS 1 INJ. FLOW OX &
FUEL, AFTER DISCOVERING TP 70 WAS DAMAGED
WROTE TVAR 26799 TO CONFIGURE TO RUN FUEL
SYS 1 ONLY

POOPSIE, WOULD YOU BELIEVE WE WERE
FINALLY CONFIGURED AT 23:06

THIRD
1/15/69
JMB

① COMPLETED STEPS 03-119 THRU 03-151
(CMI FUEL BLOWDOWNS) @ 0312

② WENT INTO M7 HOLD @ 0315 AWAITING
M7 DISPOSITION ON TP 70. AT
0345 WAS INFORMED THAT IT HADN'T
BEEN WRITTEN (YET!!!) AT 0445
(AFTER LUNCH) WAS INFORMED THAT
M7 WOULD BE OUT TO THE STACK
WITHIN THE HOUR. SO ::
CONFIGURED FOR CMI OXID B/D'S
WITH THE EXCEPTION OF TP 70.
AT 0610 THE M7 WAS ON THE
STACK & THAT ~~WAS~~ WETHE/BEE DID
IT TO ME AGAIN!

AS. ③ CONFIGURED PNEUMATICS FOR CMI OXID
(LESS TP 70) IN 15 MINUTES. — HOW ABOUT
THAT — POOPSIE — TECH WANTED TO DO SOMETHING.
(STONEKING)

AS. ④ NOTE — WE HAD TO R/R GHC (TP 70)
ME 144-0023-21 (TK-4224-001-61) DUE TO
GULL THREADS.

1-15-69 DR3 troubleshooter 3.13 -YAW
FIRST SYS 2 OXID leak rate 636 cc/hr. 1315
FUEL " " 118 cc/hr

2. PLAN OF ACTION: —

- (a) COMPLETE INT VLV LEAK CHECKS & TP 70
LEAK CHECK (DR#3). ~~WROTE TVAR 27115~~
- (b) COMPLETE SYS 1 EX. INT FLOW
- (c) SUPPLY PURGES FOR C/M ENGINE

Removals (3 Places) also verify
no power on TB's.

d. T/S SM R/S ENG C3 (+P) all purg.
Problem of RERUN VLV SIG.

e. RERUN S/M R/S +P (A3 & C3) AUTO
VLV SIGS. (SEE ITEM 3 1/14/67)

NOTE: IF TP70 GIVES ANY PROBLEMS
COMPLETE INT FLOW & TP70 R/WK
CAN BE PERFORMED @ SAME TIME
AS ENGINE R/R.

3. MR BERG: - HAD TO CORRECT TIME 27200
TO READ "OPEN GAS V50" AS WE
USE GN² FOR GAS FLOW.

4. FAIR V37-GEN-019 SPS HE
PANEL R/R was signed. Press,
purgin etc. incorporated - but no
blanket pressure left on system
1/11.

5. DR 4 & Subs 362 & 363 need failure
Data. Need to fill out 4224 data
sheets. JDM.

NITES 1-15-9

DID NOT GET BEYOND STEP 22 DR 3
AFTER RECEIVING A ZERO LEAK AT
TP 70 & A ZERO LEAK AT +Y/I NOZZLE
SUSPECTED SOMETHING. A CHECK OF
THE SCAT 103 INDICATES IT IS THE
MAGNETIC GAGE WAS STICKING

S/C WAS POWERED DOWN BEFORE
LUNCH. AFTER LUNCH SUPPLIED
5 PSI PURGE ON SYS 2 FOR R/R
ENGINES. USED THE DR 3 FOR PURGE

SCAT 103 WAS TURNED IN AT
TER CRIB & E.E. BANGE NOTIFIED
HE SAID IT WILL BE CHECKED &
CALIBRATED IN THE A.M. YOUR
CONTACT IS SIM CRAGAR.

00:11 HRS. LATEST WORD

IF EPS GETS THE BIRD POWERED
UP DURING THIRD, YOU MAY BE ASK
TO T/S SM - (RERUN SM R/S +P A3 & C3
AUTO VLV SIGS).

THU/D
1/16/69
JMB

① DEF: NOTE 3 OF DAYS: THEN WHY
AT STEP 03-151 DID WE CLOSE
GHSV51? - BUT I BELIEVE YOU.

② AFTER COMPLETION OF PURGE (ENGINES
REMOVED) PLANNED TO RECONFIGURE
FOR TP 70 & +YAW SYS 1 LEAK
CHECK & THEN BACK INTO SYS 1
BLOWDOWNS..... BUT..... FOUND
THAT 1/17 DID ON TP 70 DID NOT
HAVE THE 3 STEPS PRIOR TO
LEAK CHECK SOWD (ACCOMPLISHED
& : TRIED TO GET THIS IN WORK.
(THE PROBE OF THE POPPET
WITH LEVEL 1 PROBE). ALSO
THERE IS A STATEMENT ON THE
1/17 THAT STEPS 366.7 THRU
366.15 MAY BE DELETED
("PROBE & LEAK CHECK")

UNTIL AFTER 4224; BUT STACK QUESTIONED LEGALITY OF STATE! (WETHERBEE FINALLY DETE) - I HINED SAID STATEMENT WAS LEGAL SO YOU CAN (IF YOU WISH BYPASS "PROBE & LEAK CHECK"

③ TWO NEW ENGINES ARE IN INSTRUMENTATION & ONE SUPPOSEDLY ON WAY TO STACK

④ I DON'T KNOW HOW TO T/S LACK OF ARC SUPPRESSION & ALSO TO MY KNOWLEDGE THERE IS NO PAPER DEFLECTING SH QUAD PROBLEMS.

1/16/69 DAYS

1 INITIATED DR#5 ON ARC SUPPRESSION PROBLEM (S/M ENG. C3 + P)

2. Performed direct valve response for Quad C + P, open magazine showed proper arc suppression level. Closed magazine run was then performed. Continuity check of the system proved OK. Perhaps an improper mated connector???

3. On TP-70 MR/OR #366 shop has not completed steps 7, 8 & 9. When ever this is complete we can give them 300 psig for leak check using fig 1-4 setup which is available on stack. If this is

THIPP 1/17/69 JMS

1/17/69

performed make sure stack QC Co & NASA witness leak check and buy their paper.

- 4. Plan is as follows:
 - A. Complete S/M auto coil sig for Quad A & C + P engines / Hold for 2018
 - B. Support shop for leak check of TP 70 leak check. Ref note 3
 - C. Proceed with sig 1 C/M injector flow test per seq 03 of OCP 4224

NOTES 1/16/69 ^{Wether} WAS REASSIGNED TO S/C 107 FOR THIS SHIFT.

① Ref 1/4 HUBER'S INSTRUCTIONS ATTEMPTED TO PUSH MR/OR 366. FINALLY GOT # LEVEL 1 PROBE AT 0500 & SOLD STEPS 7, 8, 9, 10, 11, 12 OF MR/OR VIA DR # 3 FUNCTIONAL STEPS.

② THERE IS NO PROBE ON ENGINES - YAW SYS 2 ENGINE MECHANICALLY INSTALLED.

DAYS ① COMPLETED TP-70 LEAK CHECK & RECONFIGURED FOR PURGE & GAS FLOW FOR CM SYS 1 OP.

② COMPLETED SYS 1 OP GAS FLOW (SEQ 03-088 (REV 03-118)) & WROTE TWR TO SAFE SYS WHILE HOLDING FOR OCP-7018 (TWAR 26796)

(3) AFTER OCP-7018 WE WILL CONTINUE WITH DR#5 +P S/M A3 & C3 AUTO VAL SIGS & C3 DIRECT VAL SIG USING C14-650 & SHARING HARNESS, IN AN ATTEMPT TO REPEAT ARC SUPPRESSION PROBLEM.

(4) PLAN - AFTER 7018

a Run S/M +P A3 & C3 AUTO SIGS PER DR#5 STEPS 5.12 -

b Hook up QUAD C PNEUMATICS & PRESSURIZE (FIG 1-2) TO 15 PSI.

c Run QUAD C +P (C3) DIRECT VALVE RESP. USING SWITCH ON C14-650 TO PROVE ARC SUPPRESSION SHARE HARNESS (SEE STEP 3) & REPEAT VALVE SIG. WE WILL THEN TRY & SELL DR.

(d) DEPRESSURIZE QUAD & DISCONNECT T/K'S. DISCONNECT QUADS A & C ELECTRICALLY.

e AFTER ENGINE R/R - C/M RUN RETEST & FINISH OCP.

(5) ENGINES RETESTS ARE STEPPED OUT ON A DR CONT. SHEETS. NOTE STEPS OF APPLICABLE DOCUMENTS ARE SPELLED OUT. NOTE THAT SC109 4223 WAS USED - REASON - IT HAS NEW ENGINE FAIL CRITERIA AND DETAILS FOR DISABLING AND ENABLING ARC SUPPRESSION. COPIES OF 4223-

ARE IN CABINETS IN CORRIDOR AT CIC #2.

J.D. Mamba

CAUTION - RCS ENGINES CONNECTED - 7018 - SCS POWERED-UP - 4224 SCS POWERED-UP - NO FLOW SENSORS - MAY NOT GET WARNING LIGHT. JDM.

SECOND 1/17/69

Didnt get into DR#5 OF 4224. CANT FIND SAME. COULDN'T HAVE DONE ANYTHING DUE TO OCP 1718 FINISHING DATE. (1900 HRS -)

THIRD
1/20/69
JMB

(1) PROVIDED PURGE FOR NEW ENGINES VIA DR#3

(2) SPS HELIUM PANEL R & R IN WORK - NEED EQUIP. TO PROVIDE PURGE.

(3) INSTALLATION OF NEW CM ENGINES IN WORK. WIRING ON - YAW ENGINE COMPLETED. WORKING ON - PITCH.

(4) - NO POWER ON S/C TILL WIRING ON CM ENGINES ARE COMPLETED.

1-20-69
FIRST
JDM

(1) TPS 057 TO BE WORKED TO CHECK ALL CM RCS ENGINE TB'S FOR INTERMITTANCY. THE RETEST FOR P953, P954, P955, & P956 WILL BE ON THE FIFTH PAGE OF THE ENGINE RETEST DR - STEP 01049 OF OCP 4224.

WKM ② Started OCP 4224 DR # 4
 C19B2, C19B10, C19B12 RETEST EQUIP
 ACCUM @ 1400. NOTE THE
 RETEST IS WITH THE IMPOUNDED
 DR # 4. - ? TWO, AND ONLY ONES
 TO BE FOUND, OF OCP 4223-109
 ARE IN THE RETEST PACKAGE. -

Pneumatic hook-up on DR # 4.
 WKM ③ OCP RETEST NASA DR # 1 CA
 WAS WRITTEN. - NO FURTHER
 TESTING REQ'D.

WKM ④ PLAN-OF-ACTION

1. Perform Engine/TB intermittency
 TPS, first - unless not available.
 This must be performed before
 DR # 4 Retest by OCP 4224. - 01-049.
2. Perform DR # 4, Retest per (4223 portion)
3. DR # 5 as 3004 as power-up.
 and OK, DR & test in Q.C. impound pack.
4. Complete DR # 4 retest.

WKM ⑤ SPS He Panel R & R in work
 very slow may have to hold
 their hand

SECOND 1/20/69

① 1715 Put TPS 057 in work, along with
 other work on CM-125 548.

1930 FOUND EQUIPMT FOR TPS 057 ON STA 2C,
 got same.

2100 Got TPS 057 in work finally. PICKED
 UP DR # 380 ON CROO02 P PRESS XDCR.
 SOMEONE HAD BROKEN XDCR LEAD IN
 XDCR. RAN RESISTANCE CK, CONFIRMED
 BROKEN LEAD, DISPOSITIONED R/R, RETEST
 REQMTS PER OCP 4171.

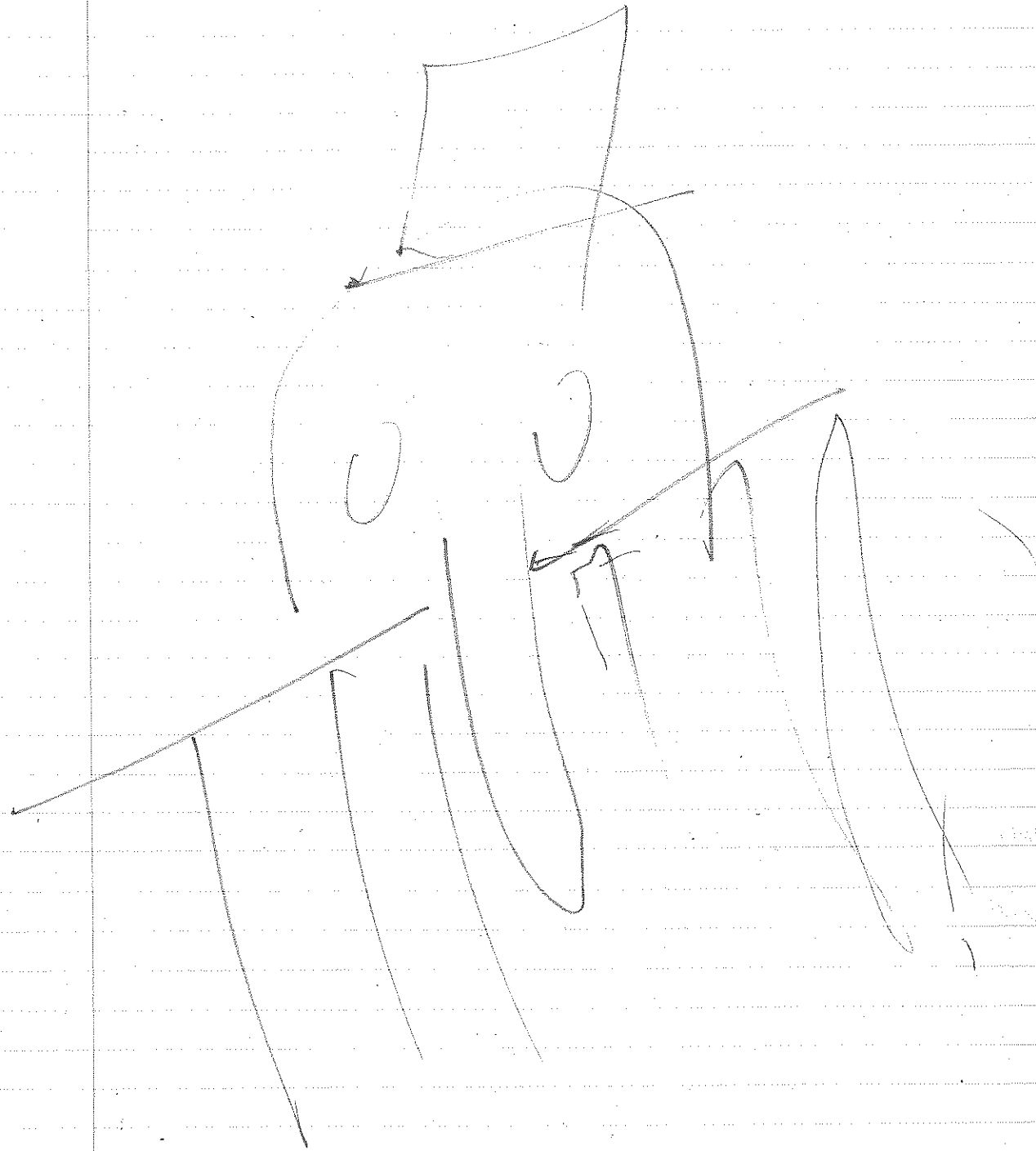
② 2230 Pick up DR 382, LOOSE PIN (A5) IN TB
 923. TECH REPOSITION AND IT WORKED FINE.
 DISPOSITIONED DR AS FOLLOWS: REXRAY
 AND RECHECK PER TPS 057.

③ HAD TO REMOVE WIRES AND REPLACE TB 9AA
 (BROKEN MODULE). SOLD XRAY & INSTALLATION,
 DISPOSITIONED RETEST, PER TPS 057 & DR 4.

④ DR # 379 JUST ABOUT COMPLETE, NEEDS
 SLEEVING INSTL. THIS DR ASSOCIATED WITH
 - P ENGINE. DISPOSITION BOUGHT OFF BY NR &
 NASA.

⑤ s/c NOT PUR UP YET.

⑥ HAD TO RIDE HERD ON SPS PANEL WORK,
 NR-GC A HEADACHE, BE FIRM WITH THEM.



PRR
ALSO

SORRY

ABOUT THIS

SEE NEXT PAGE

3RD SHIFT 1-21-69 SHIMIZU,

1- PICKED UP TPOST FROM T. FINLEY WITH 2 DR'S OPEN.

2- SOLD DR 382 - DR 381 ^{SOLD} NEEDS NASA QC.

3- NOT TO BE OUT DONE BY SECOND SHIFT - PICKED UP 2 MORE DR'S ON C19B9 + YAW PIN D4 AND C19B11 - PITCH PIN FM.

DR# 383
A132613

DISPOSITIONED DR# 383 (C19B9) TB916 R&R. BECAUSE PIN D4 WAS POTTED WITH RTV. THIS WAS THE PIN THAT CAUSED THE INTERMITTANT CONDITION.

DR# 384
A132614

DISPOSITIONED DR# 384 (C19B11) PIN FM - AS RE-INSERT, X-RAY & RETEST PER TPS 057. TB 1.

DR# 386
A132615
LESS XRAY

4- DR# 386 V34 GEN WRITTEN AGAINST C19B4 - ROLL PIN EN ON TB915. INTERMITTANT CONDITION. DISPOSITIONED AS INSPECT, ^{OK} RE-INSERT, ^{OK} X-RAY & RETEST PER TPS 057. - LESS XRAY

SPS Helium
Panel

5- SPS Helium is removed from Smp Lines ARE NOW PREP FOR NEW PANEL.

DR 380.6 -
X-Ducer
CR0003P
R&R

PNEUMATIC SETUP READY FOR PURGE ON X-DUCER R&R. USING -21 AS CALLED OUT ON DR# 380. X-DUCER REPLACEMENT NOT AVAILABLE. REF HELIUM PANEL SYS 2.

8- TOM FINLEY - YOUR QC DID NOT CLEAR STAMPS ON C19B1-YAW & C19B3-ROLL ENGINES, MY QC WOULD NOT X-FER STAMPS FROM SOFT COPY BECAUSE IT LACK NASA QC. ^{9PM} THESE OPEN STEPS WERE RERUN ON FIRST SHIFT and SOLD!

1-21-69 ① TPS: RETEST - GEN 009 & 012 WERE FIRST SIGNED BY NASA - STAN HARVEY. ^{9PM}

② OCP RETEST - GET NASA DR #1 DISPOSITION CHANGED - DISREGARD ALL PROBLEMS ON TB916 PIR TO MODULES BEING REPLACED PER DR 383.

③ OCP 4224 DR #3 PURGE PROVIDED FOR ENGINE R&R WAS SECURED.

④ TB916 RETEST - RERUN OCP 4223 SEQ 02 FOR C19B9 ONLY SHOULD SUFFICE - SPELG OUT ON DR 383. ~~USE~~

1-21-69 SECOND

WROTE MOD A TO TPS 057 TO RECONNECT ELECT CONNECTORS TO C19A1. WHOA! I SHOULDN'T HAVE WRITTEN MOD A. YET. NEED B/O BOXES FOR TB916 RETEST HOWEVER STEP 02-001 OF 4223 WILL HOOK THEM BACK UP.

21:00 MRS PROBLEMS ALREADY - THE -41 TK KIT

enum 14

HAS BEEN RED TAGGED. NO BAGS ON THE GTC. THEY ARE RUNNING A BLOWDOWN & COUNT ON IT. SHOULD BE DONE IN ABOUT 3HRS.

3RD SHIFT - 1-22-69

- 1- COMPLETED WIRING VERIFICATION ON DR 383 C19B9 ENGINE - TB 916. DR 313 SOLD
- 2- DR #4 - OCP 4224 I/W - RUNNING OCP 4223 PORTION.
- 3- COMPLETED C19B2 - YAW ENGINE VALVES SIG'S LOOK O.K.
- 4- HOLD AT SEQ 03-028 FOR C19B10 FY ENGINE.

1-22-69 OCP 4224 DR#6 - NO TRACES FIRST ON C19B10 - TABLE 2-3 ERROR
 900 P954. 00920 & 00930 P956 3/8
 SOLD

② Had a "hell-of-a" flap with QC. using a SC109 document for retest so switched to SC108-1223 at seq. 04 - due to different step numbers took off and put on G-H-C one time unnecessarily.

- 3. OCP-4223 retest complete and continuing on to OCP 4225 retest, waiting for mass spec to comply with seq 04-048, also have seq 04-049

B3

in work, to be accomplished with SKAT-103

- 4. Had QC add to DR 5, the fact that + P traces for C3 & A3 were not present on reduced data... Steps are written on DR 5 to perform same. %

SECOND SHIFT - 1-22-69

Q.C.M. HOLD FROM 17:15HRS TO 18:00HRS NONE AVAILABLE THAT WERE QUALIFIED ON MASS. SPEC.

- 19:15 ENGINES C19B2, C19B10 & C19B12 PASSED LEAK TEST PER 04-048 & 04-049 OXID SIDE.
- 19:32 THEY ALSO PASSED 04-052 & 04-053 LEAK TEST FUEL SIDE.

23:30 - AT STEP 01-023 OF 4224 WE HAD SOME ODD TRACES ON TGS RECORDER. AN INVESTIGATION REVEALED P954 & P956 STILL DEMATED REF: DR 3831. THEY HAVE NOW BEEN MATED WITH 10030 O.K.
 P954 & P956
 REM 15014 - P956
 REM 15008 - P954

P954 & P956 - WERE USED ON DR 4 - 4223 PORTION.

3RD SHIFT 1-23-69

- 1- COMPLETED DR#4 RETEST NOW INTO OCP 4224 AT SEQ 03.
- 2- REVIEWED (QUICK LOOK) ON AUTO VALVE SIG'S. — DON'T LOOK TOO HOT — NEED EXPERT TO EVALUATE SIGNATURES
- 3- COMPLETED SYS 2 FUEL GAS FLOW. CONFIGURING FOR OXID SIDE.
- 4- COMPLETED FUEL GAS FLOW WHILE FIRST SHIFT STC'S LOOKED ON.
NOTE: FIRST SHIFT STC'S WERE MONITORING 3RD SHIFT OPERATION IN AN EFFORT TO DETERMINE NORMAL 3RD SHIFT FAILURE MODE.

1-23-69) Completed 4224

FIRST
JDM

② DCS 4224 — DATA C19B2, C19B10, C19B12 DIRECT TRACES TIMES OUT-OF-TOLERANCE DETERMINED TO BE CAUSED BY THE C14-650 POWER SUPPLY SET TO 25 VDC INSTEAD OF 31.5 VDC. PROBABLY WHAT HAPPENED WAS TBS REDUCED POWER SUPPLY TO 25 FOR CALIBRATION AND NOT RESET. NEED A RERUN — WE'LL USE 0131 TEST KITS FOR PRESSURIZATION AND NEED ~~AM~~ ~~NAN~~ A & MN B POWER SO WE CAN TRANSFER TO CM.

③ DR 5 4224 COMPLETE — CONCLUSION NEED TO SIGN.

SECOND 1-23-69

INITIATED ~~TPS~~ TVAR 24029 TO RERUN C19B2, C19B10 & C19B12 AT CONCLUSION OF SEQ 07. OCP 0131. IT IS NOT SIGNED YET.

TRIED TO SELL DR 5. CEE WILL NOT SIGN UNTIL HE SEES EVIDENCE ON COMPRESSED DATA THAT SUBSTANTIATES PILOT ERROR.

I COULD FIND NOTHING ON DR 5 TO VERIFY ITEM 4 ON 1-22-69 IN LOG.

3RD SHIFT 1-24-69

1- FOUND -YAW & +YAW ^{CM} FLOW SENSORS HOORUP WRONG — ALSO CONNECTORS LOOSE — CORRECTED SAME — ALL CAPS HAVE ORIFICE IN THEM.

2. GOT METS SIGNATURE ON DR'S 380 & 394 AS TO DETEST REQUIREMENT (SUPPOSEDLY A NECESSITY) PUT OCP 4171 AS DETEST FOR DR# 380 BUT FOUND OUT LATER THIS DOESN'T AUTOMATICALLY DO THE JOB. METS ADDING WORDS?

3. WROTE TVAR 27111 TO OCP 10070 FOR C14-352 SETUP. PRETEST 8.18 CALLS 352 TO BE SETUP PER 10070 (SEQ 35) ENCLOSED BUT SIGNED.

REF 2ND }
SHIFT 1/20/92

4. WROTE TVAR 24028 TO REFLECT CHANGES IN THE G14-8V5112 SPS PRESS. PANEL. NEED SIG'S.

1/24/69 DAY

1. E0745204 CHANGES ARE SUPPRESSION LIMITS. TVAR 27975 WRITTEN TO REVISE ODP TO AGREE WITH E0 & MAKE DATA OR AS IS.

② TVAR 24029 was written on a TPS, which is in Stan Harvey's office. Reason TVAR OF 10131 refers to Run sequence of 4224 & NAR/NASA managements agreed to write TPS to perform rerun.

③ NASA (Harvey) is making trouble about NO DATA recorded for C19B2, C19B10, C19B12, 4225 Engine, housing, dynatube fitting, flex hose joint or injection valve leak checks. And shift if you have any information or data produce.

SECOND 1/24/69

1715 RETYPER TPS-002 with added steps to disconnect P88 & P82. Had S. HARVEY STANDBY AND got his signature.

REF: NOTE 3 DAY LOG. HERE IS THE INFO. FROM VOICE TAPE # 10426

C19B2 OXID VALVE SYS 2 MASS SPEC READINGS

26
DYNATUBE - 1.50×10^{-8}
FLEX LINES - 1.50×10^{-8}
WELD - 1.50×10^{-8}
NOZZLE - 3.00×10^{-8}

C19B10 OXID VALVE SYS 2 MASS SPEC READINGS

25
DYNATUBE - 1.20×10^{-8}
FLEX LINES - 1.20×10^{-8}
WELD - 1.20×10^{-8}
NOZZLE - 2.70×10^{-8}

C19B12 OXID VALVE SYS 2 MASS SPEC READINGS.

24
DYNATUBE - 1.80×10^{-8}
FLEX - 1.80×10^{-8}
WELD - 1.80×10^{-8}
NOZZLE - 1.80×10^{-8}

C19B2 FUEL VALVE SYS 2

DYNATUBE - 1.80×10^{-8}
FLEX - 1.80×10^{-8}
WELD - 1.80×10^{-8}
NOZZLE - 2.40×10^{-8}

SECOND 1/24/69

C19B10 FUEL SYS 2

DYNATUBE - 1.50×10^{-8}
 FLEX - 1.50×10^{-8}
 WELD - 1.50×10^{-8}
 NOZZLE - 2.40×10^{-8}

C19B12 FUEL SYS 2

DYNATUBE - 1.50×10^{-8}
 FLEX - 1.50×10^{-8}
 WELD - 1.20×10^{-8}
 NOZZLE - 2.40×10^{-8}

1900 STATION CALL - OCP 0131

2000 HOLD FOR BATTERY CHGE.

2415 HOLD FOR SHIFT CHGE - END SEQ 02 -

PLAN OF ACTION IS STILL TO GO INTO TPS-002 AT END OF PUR-UP OF SEQ 07 -

3RD SHIFT 1-25-69 Stimizy

- 1- RAN RCS ACTIVATION WITH ONE DR# DR #3 - QUAD D HEATER IN PRIM POSITION
- 2- SOLD DR #3 - MAX TEMP REACHED WAS 110°F
- 3- COMPLETED TPS 002 OF OCP 4224 VALVE SIGS LOOK GOOD -
- 4- NOTE - WROTE MOD A AGAINST TPS 002 IN ORDER TO ACCOMPLISH THE TPS.
- 5- W. MANHA ARRIVED AT 0715 HRS BUT NO DUTTON.

6- DUTTON, DUTTON, WHO'S GOT THE DUTTON? To Whom it May Concern
 THROUGH THE TERROR & ANGUISH OF STORM & PESTILENCE, RELIABLE DUTTON ARRIVES PROMPTLY ON SCHEDULE @ 07.30. (MORE LIKE 07.45)

1-25-69
 FIRST 1- Completed seq 08 - 1017
 92M DR 6 - SPO066 - SOLD on grounds same reason as DR 23 of retest.

2- SM Quad B He TANK TEMP CRT - 0.16 & Panel 2 reading Zero - Others read positive and about 200 on CRT - NASA TP Questioned this - Condition was same in 4225 - OK.

3- Need '352 "ON" in Seq 16 - said OFF - should have been ON per 10070 - REFER to TVAR 27190.

4 Completed sequence 13.

SECOND 1/25/69

SEQ 16-062 PICKED UP DR#12 - No light FOR -R-Y-JET (DIRECT MODE). T/S of DR HAS ISOLATED PROBLEM BETWEEN J10 & J11 of THE 397.

2334 NTD/ETC DECISION is to complete seq 016 before PUR-DWN.

2430 STILL WAITING FOR G/N TO GET RECONFIGURED.
NOTE: SCS is T/S DR12 - WE ASSIST.

THIRD 1/26/69 JMB
① DECISION TO RECONFIGURE TO START OF SEQ 016 & THEN POWER DOWN S/C PER OCP 1239

② NOTE: WE DID NOT PERFORM SEQ 05 RCS & SPS DEACTIVATION ∴ IF YOU COME UP PER SEQ 07 & 08 OF 0131 YOU WILL HAVE TO T/AN AROUND C14-075 & SPS PRESS PANEL ACTIVATION

③ NOTED THAT SP0003 NOW IS GLITCHED UP CYCLE BETWEEN 4D & 62

④ RE C14-075 & SPS PRESS PANEL S/C 0131 SAID WE WILL NOTE ON DR#12 WHAT PARTS OF SEQ 07 & 08 WE WILL NOT

PERFORM. FOR ACTIVATION! SO NO T/AN EVIDENTLY WILL BE REQUIRED.

③ WHOOPS I GOT CALLED @ 0110 TO CONTINUE T/S OF DR#12 TO PROVE IS WAS GSE - - - SO I DID WZ50 T, TO J11 POOR STATE PINS 24

1-26-69 ① Completed RCS & SPS ACTIVATION, FIRST LESS 075 FUNCTIONS, PER 90K DR 12 step 12.59 at 1100.

② Verified, over telephone, 352 powered up, 1253.

1400 ③ Starting rerun of Seq. 16.

SECOND 1-26-69

SEQ 16 COMPLETED
SEQ 17 STARTED AT 21:04
TIMED SEQ. STARTING AT STEP 17-065 WAS RUN - NOT SATISFACTORY - WILL BE RERUN. NO PROBLEM ON PROPULSION

1-27-69 ① DR 17 (A132350) picked-up on FIRST 20-053 - out of tolerance Quad B 90K Helium manifold pressure - T/AR 26750 corrects Quads A, C, & D pressures.

THIRD SHIFT 1-27-69

- 1- COMPLETED RERUN OF SEQ 17.
COMPLETED SEQ 18 AT 0400 HRS.
- 2- STARTED SEQ 19 AT 0500 HRS
COMPLETED SEQ 19 AT 0615 HRS.
- 3- START SEQ 20 AT 0630 HRS
HOLDING AT SEQ 20-035. — 0715 HRS FOR
SHIFT CHANGE.
- 4 RELIEVED BY B. MANHA AT 07:29:54
BUT NO MR. RELIABLE.

SECOND 1/27/69

UP TO SEQ 22-166 - RECYCLING BACK AGAIN
BECAUSE ERS TYPE ADJUSTED VOLTAGE DURING
ONE OF THE RCS RUNS: EVERYONE F

THIRD SHIFT - 1-28-69

- 1- WHAT HAPPENED TO FIRST SHIFT'S
NOTES? DID THEY ACCOMPLISH ANYTHING
YESTERDAY? (PLAYING THE STOCK MARKET - AGAIN)
- 2- COMPLETED RERUN OF SEQ 22 - O.K.
- 3- COMPLETED SEQ 23 - AT 0330 HRS. OK
- 4- COMPLETED SEQ 24 - AT 0616 HRS OK.
- 5- START SEQ 25 AT 0640 HRS -
- 6- AT SEQ 25-035 AT SHIFT TURNOVER

KP7221 on R202 - ON

1-28-69 1235 — ALL POWER OFF
FIRST SHORTLY FOLLOWED BY LOUD
THUNDER — GEN & SCS
SECURED — RCS ENGINES REPORTED
FIRING — RCS CMD — OFF —
AUTO RCS SELECT SWITCHES
TO OFF NO ACE AT
ALL — TIMING OR ANYTHING
SO NO RECORD OF NUMBER
OF ENGINE CYCLES.

DR#
23

WHEN POWER BACK ON
CHOCKS READ 001:37:48:??
(FACILITY POWER OFF ABOUT 10 MINUTES)
(AT STEP 25-15? — TRANSFER
SWITCH IN SM.)

② E.O. 712314 & 712312 — FO38
ticket to replace SPS pneumatic
packs was signed — expect to
perform Thursday Jan 30 — Aerojet,
Eng., Maint. function.

③ Ref. item 1 — SMT — later came
up to control room and told
CTC & NTD SM engines
sounded like rivet guns chattering.

④ PROPOSED PLANS (WILL THIS BE AFTER 0131??)

- A. Stedman — disconnect guids — hookup
simulators and reproduce engine
cycling — determine number of
cycles then make a decision.
- B. Manha — Perform direct valve response
and valve leak check — If OK accept.

C. Project OFFICE - If necessary
R & R all SM RCS engines.

KNIGHTS 1-28-69

DR 22 SPACE CRAFT PUR UP STILL
IN WORK - NEEDS PAPERWORK CLEAN
UP. SHOULD GET BACK INTO OCP
ON 3RD.

3RD SHIFT 1-29-69

1- THE FIRST TEAM ON STATION

2- COMPLETED SEQ 25 AT 01:10 HRS.

3- IN SEQ 27-005 - PILOT ERROR -
HE PUSH CM/SM SEP. INSTEAD
OF CSM/LM SWITCH.

DR
2/0

HAD -X TRANSLATION - JET WARNING
LITE WORKING. - (SET AT APPROX. 2 MIN.)

4- IN A HOLE FROM 03:30 HRS -
NEED TO RESET SWJC & 42 SEC T.D.

5- PRESENT CONFIGURATION - CM & LM
ORBITING THE MOON. - SM SEPERATED
FROM CM.

1-29-69 ODR #23 C/A applied liberally to
FIRST perform a simulated run to determine
approximately how many cycles and
at what which engines may have
been picked-up. If they exceed
more than 600 RCS wants some

additional checks, which they have
not yet described. Note that the
SCS configuration has not been
filled in. The SCS configuration
at the time of the power loss
is recorded in the SCS LOG
BOOK - Each switch should be
verified and repositioned if
necessary.

KNIGHTS - 1-29-69

COMPLETED UP TO 27-132 WHICH
IS NOW IN WORK (21:45 HRS).

DR 25 SOLVED FOUND P109 / J4
DISCONNECTED.

3RD SHIFT 1-30-69

1- HOLDING MOST OF THE MORNING FOR
VOLTAGE & RESISTANCE CHECKS ON CM/SM
UMBILICAL.

2- STATION CALL AT 0530 HRS.
START SEQ ~~27-135~~ 27-135 AT 05:45 HRS

3- COMPLETED SEQ 27 AT 07:15 HRS

4 NOTE: JET WARNING LITE ON IN
SEQ 27-213. DID NOT REQUEST
DR BECAUSE LIMITATION IS
10 MIN/HR ON TIME. ON CM
ENGINES - ON TIME APPROX
2 MIN 00 SEC.

1-30-69 0131 Sep. 29 at
 FIRST 1000 — Requested 30-023 be
 9DK bypassed until results of DR23
 are determined. DR 23 simulation
 is to be performed following
 power-up on Monday Feb. 3, 1969.
 1030 — 0131 Debriefing held —
 discussed plans of action for
 each open DR and several
 closed DR's discussed.

Note - to put pressure back ON
 Quads, if required — 075

Adjust PR8 to 100 ± 50
 PR4 & PR6 to 10 ± 2 on PG5 & PG7
 OPEN GAMV10 & GAMV14

* If Adjust PR4 & PR6 to 35 ± 5 on PG5 & PG7
~~Quads pneumatic must still be
 removed on DR23~~

3RD SHIFT 1-31-69

1- WHAT'S THE STORY ON DR#23 —
 ACCORDING TO SUP'S LOG — WE
 ARE NOT TO INSTALL SIMULATORS
 FOR QUADS. — THAT'S ALL IT SAID.
 "THE CAPT. HILL HAS SPOKEN!"

2- SPS PNEUMATIC PACKAGE R & R IN
 WORK. EST. COMPLETION IS P.M 1-31-69

1-31-69 0131 DR23 transfered to OCP
 FIRST RETEST BOOK — DR 27.
 9DK

② STORY ON DR #23 — Evidently
 yesterday or last night, unknown
 to me, somebody decided to run
 the BMAG run down — engine cycling
 simulation in the G & C Lab.
 The lab personnel are confident
 a S/C simulation is not required
 and they sound not more than
 150 cycles on any one engine
 for a BMAG run down — Paul
 Garcia or Pete Al — 2 of
 G & C are to put the words
 on DR 23 (27).

③ DCS 4224 DR #4 — Additional
 information, about 25 VDC instead
 of 31.5 VDC driver run, was
 put on DR #4 as requested
 per Harvey.

④ Harvey requested to look at
 all response data. The following
 were pulled:

DATE	DESCRIPTION	DATA NO & LOC.
1-10-69	Initial Run	SC1080438-01 & -02 C0310
1-14-69	DR #2	SC1080452-01 thru -08 C0310
1-16-69	DR #5	SC1080537-01 & -02 - A0802
1-22-69	DR #4	SC1080499-01 A0802
1-25-69	TPS #002	SC1080502-01 A0403

Harvey not too happy because
 this was raw data. He's looking
 at incomplete data sheets.

DR #27 number of cycles recorded

+ P	110	cycles
- P	110	cycles
+ Y	65	"
- Y	58	"
+ R	64	"
- R	44	"

CONCLUSION put on DR 27 - Record cycles & OK.

⑤ Need 4224 & 4128 copies of DR's to start TPE reports.

THIRD 2/3/69 ① Do you want locking links INSTALLED? REQUESTED TPE TO REQUEST FAIR TICKET BUT SERVICE SAYS TPE'S.

2-3-69 ① STC COPIES OF DCS: 4223, 4225, FIRST and 4128 - SC108 are in the second from the left file cabinet, bottom drawer, all the way to the back. THANKS -

② DCS 4224 - Sell in work FOUND TVAR 27975 on Harvey's desk. - Need SRS now.

③ locking links to be installed by shipping FAIR ticket.

④ Thank you - whoever you are that got the copies of 4224 DR's.

⑤ Work can continue on 4224 & 4128 TPE Reports.

SECOND 2/3/69.

① ADDED STEP TO FAIR TICKET TO VERIFY SPS LOCKING LINKS INSTA'D.

② STC PUR-UP put OFF TILL 3rd shift.

NOTE: WHEN PUR-UP COMPLETE, LOOK AT SPO001 AND VERIFY DATA WITHIN TOLERANCE CALLED OUT IN SEG 08-210 OF OCP 0131. NEW CAL-DATA BEING USED IN ACE. IF OK, PUT WORDS ON DR-38

3RD SHIFT

1. STILL NO POWER ON THE SPACECRAFT.

2/4/69 FIRST

1. TRS 070 written to perform depressurization and pressurization of SPS fuel tanks in conjunction with fair fix V37 GEN-40

2. OCP-0131 Prop power-down and power-up information was supplied to L. Hill - looks like commencing on SC109 - No 0131 week end testing.

3. OCP 4224 SOLD in post
test.

4. NASA (Harvey) still looking
into DR 27 engines cycling.

SECOND 2/4/69

Not much activity - ISE ARE WORKING
some DR on SPS MEAS.

THIRD SHIFT 2-5-69

1- STARTED WRITING OCP 4128 TPE REPORT.

MANHA - NEED COPIES OF DR'S OF 4128.
COPIES SHOULD BE AVAILABLE AT
QI/TI IN BLDG #1. NO THIRD SHIFT
AT QI/TI.

2-5-69 OCP⁰¹³¹ DR 23 (Retest DR 29) signed by
FIRST STAN HARVEY.

2-5-69 OCP 4224 TPE REPORT
turned in to typing.

DAYS 2/7/69

1 SPECIAL CABLES of TPS ARRIVED
FROM KSC. CABLES ARE IN W.
HUBERS OFFICE & TPS FOR DOWNNEY
c/o IS IN TYPE. (PUGS TEST)

2 PRESENT PLAN FOR PUGS PROBE TEST:-

(a) PRIOR TO PROBE REMOVAL (TEST SCHED 1/30/69)
PERFORM BME c/o TO PROBE EQUIPMENT
(CIA-163 & CABLES) ARE COMPATIBLE.

(b) CHANGE PROCES & REPEAT BME c/o
PRIOR TO S/M DELIVERY TO B260.

2-10-69 OCP 4224 TPE REPORT WAS SIGNED.

FIRST
JHM.

2 AFTER MUCH HAGGLING S. HARVEY
SIGNED PUGS RETEST TPS (V37-GEN
074) TIME 15.30, & STACK LEAD
HAS BEEN REQUESTED TO PROVIDE
CIA-163 FROM BME USING THIS
TPS AS AUTHORITY. THIS IS ENGRG
EVACUATION TEST TO VERIFY BME
IS READY TO SUPPORT PUGS RETEST.

WE WERE PLANNING TO RUN
THIS ON DAY SHIFT ONLY, BUT
TPE'S ARE PUSHING FOR DESTACK
& WEIGHT & BALANCE TOMORROW.
IF YOU RUN INTO ANY PROBLEMS
CALL E. KASPAR 714-827-3299.

SECOND 2/10/69

- ① Completed TPS 074 - issued MOD "B" to SATISFY NIT-PICKIN NRQC DR. (SHELTON) ^{QC} DISPOSITIONED DR, AFTER WE COMPLETED c/o.
- ② WHOA - MOD "B" TPS DIDN'T COME THRU ON HARD COPY CLEAR ENOUGH, GOT IT KICKED BACK. WILL BE REPROCESSED BY THIRD. IF ANY PROBLEMS, LEAVE FOR FINLEY WHO WILL GET 2ND SHIFT INSPECTION SIGN OFF. DIDN'T SIGN IT ^{QMS}.
- ③ CONTACTED KASPER ABOUT TEST RESULTS, HE IS SATISFIED WITH RESULTS, SO ALL EQUIPMENT IS DISCONNECTED AND PUR-DWN.

2-11-69 Ref TPS V34-GEN-076 — step 2
FIRST SHOP QUERIED ABOUT CONNECTING
JOK J101, J102, J103, J104, J106 TO THE
PLUGS CONTROLLER — PER DUTTON —
NO — NEED OFF FOR PROBE
RETEST.

2-12-69 ① TPS V34-GEN-077 Copy of V34-
FIRST GEN-074 was generated to retest
JOK R & R'd FUEL PROBES ON SPS.
TO BE DONE SOME TIME IN THE
NEAR FUTURE (Before 4074) — Harvey
requested tolerances. — The tolerances
Kasper provided — note one of
the old tolerances would have been
out-of-tolerance — Kasper indifferent
716* — CALL him at home
if necessary.

SECOND 2/12/69

S/M will go back to STACK 2C for QUAD
REMOVAL / SM AFT HEAT SHIELD AND THEN
SPS PROBE REMOVAL.

Someone removed THE CIA-763 PROBE c/o unit
from stack. CAN third shift get unit
back to 4TH level west side. KSC
CABLES for this unit ARE IN BOX IN Huber's
office.

2-13-69 ① DCS 4223 - CAN'T FIND — IF
FIRST YOU KNOW WHERE IT IS — RETURN
JOK. TO FILE. IN FILE — WHERE I SUPPOSE
TO BE — NEED NEW GLASSES,

② Harvey has requested approval
sign-off lines on TPS V34-GEN-077.
McDowell of service engineering
said he would get "retest"
approval sign-off lines added
without a mod sheet.

SECOND 2/13/69

0015 FIRST NEW PROBE JUST GOING IN TANK.

C14-163 IS ON MAIN FLOOR, WILL BE PUT ON 4TH LEVEL WHEN CRANE IS FREE.

TPS 70 & 77 WERE FOUND AND ARE OUT ON STACK NOW. D662 DEADMAN HAS SAME.

THIRD
2/14/69
JMS

① TPS 077 COMPLETED @ 0600 LESS NASA SYSTEMS & NY ENGINEERING

② TPS 070 COMPLETED @ 0645!

FIRST ① TPS V34-GEN-078 WAS WRITTEN FOR 2-14-69 CONNECT, AND GLOBE REMOVALS, PUGS CONNECTORS.

② CM RCS ~~TPS~~ TP 23 - R & R

3/14/69 SECOND

No prep. activity

2-19-69 ① REF TPS V34-GEN-078 - Hookup FIRST PUGS CONNECTORS. REMOVALS ARE STILL OPEN - HAVE DR - COULDN'T FIND IMPOUND COPY OF TPS TO VERIFY IF IT HAS BEEN WORKED.

2/24/69

2400 CM BACK IN B/290 (AFT H/S STAND).

2-25-69 ① DR 542, C19B, 11 dielectric test FIRST WAS PERFORMED.

JDM TB1 / C19B11 must be rewired TB1 X-ray and remount. TB1 retest written on pages 4-8 of 542 - Need equipment being used on SC110 DR 56 which is in work.

Speed, letter requesting equipment written to Krager.

2 TPS FOR OX SUMP TK. Probe RETEST. IN TYPE.

NOTES 2-25-9

TOP DECK BUILD UP PRIORITIES DID NOT ALLOW US TO START ON TB1 REWIRE. THEY WERE WORKING A E.O. WHICH PUTS A HEAT LAMP ON AREA OF TB1.

CHANGED LINE 542.1.4.19 TO READ 50-55 PSIG - THIS IS SHIPPING PRESSURE PER 4171 - 106 & SUBS AS CALLED IN E.O. 629267 ALSO SHIPPING SPEC MAO 310-0031.

THE WAY THE CM WAS SITTING WITH ISOLATION VALVES CLOSED THERE WAS 50-55 PSIG ON TANK SIDE. WE NEED TO MATCH IT ON MANIFOLD SIDE.

SECOND 2/25/69

TER GRP really outdid themselves, they couldn't support us with any valid source of helium pressure for OK VLV removal. YEH. Engineering said, no more use of GN_2 for debrazing / brazing operations, & ITS either Argon or Helium.

Got speed letter over to TER, requesting blow down, millipore-dew point on ports "U" & "V" from CIA-075. Will then connect TEST KITS TO CIA-014 and level facility ports. TER MAKING UP SPECIAL TEST KIT FOR TP6 & TP7 & 8. SHOULD BE READY BY THIRD SHIFT.

NOTE: M&TS TOOK THE BALL (PER CLASS DIRECTION) AND HAVE TYPED STEP BY STEP PROCEDURE ON DR. THEY ARE TO BRING DR TO US FOR OUR INPUT.

THIRD SHIFT 2-26-69

- 1- GAVE MANUFACTURING COPY OF CONT. SHES ON HOW TO DEBRAZE & PURGE. SHOULD BE WITH FIRST PAGE DR.
- 2- TER STILL VERIFYING CLEANNESS OF STA 2C. NO WORD ON SPECIAL T.K KIT AS REQUESTED BY FINLEY.
- 3- REWORK ON OXID TANK DOOR I/W.
- 4- RETEST OF -P ENGINE SCHEDULED FOR FIRST SHIFT.

2-26-69① DR 542 - JBI rewired, and X-rayed. FIRST Equipment accumulated less ~~W/M~~ CIA-845101-21, which Krager was pursuing. He says after the pneumatic test setup is assembled & blow down, millipore, dewpoint, and hydrocarbon is required to verify clean per 0.5% spec. This should be further investigated before being bypassed. The work on DR 542, should continue on all shifts, in spite of what you may have heard.

2 PUGS PROBE RETEST ON SUMP.
 CABLES W36, W37 & W38 ARE BEING SHIPPED FROM KSC.
 CIA-163 CONSOLE IN BME & @ KSC ARE IN MOD, TRYING TO ACQUIRE CONSOLE FROM WHITE SANDS.

SECOND 2/26/69

1730 TEST EQUIPMENT REQUESTED SECOND SHIFT
2/25/69 STILL NOT ON STACK.

1800 GOT TER GRP TO MOVE ON GETTING
EQUIPMENT REQUESTED TO STACK.
WELDERS & QC STANDING BY.

CHECK CM FOR EQUIPMENT REQUESTED
OF KRAGER BY DAVIS, YESTERDAY,
NONE ON STATION. TER GRP ESTIMATES
3 HRS TO COMPLETE BLOW DOWN & SAMPLING.

1830 TALKED TO STA-BME TYPES ABOUT CIA-163,
THEY ESTIMATE COMPLETION ON A.M. 1ST
SHIFT 2/27/69.

1900 FOUND CM TEST EQUIPMENT - NOW BACK ON AFT #16
STAND.

Got PURGE HOOKED UP FOR CK VLV REMOVAL
AND FLOWING.

2415 CHECK VALVE REMOVED - IN PROCESS OF
DRESSING UP LINES.

CM - NO ACTIVITY WITH DR 542. WAITING
FOR TER - GRP TO FINISH BLOW
DOWN & SAMPLING.

THIRD
2/27/69
JMB

① TER TYPES FINISHED B/D ON
-21 PANEL & DEFLATED SAME
FROM WHATEVER FACILITY SUPPLY
THEY USED? TK TVAZ 24351-001
HAD NO INSPECTION STAMPS ON
BAGGED ENDS & IT APPEARED
I WOULD PICK UP A CONTAMINATION
SQUAWK IF I USED IT THAT
WAY..... SO REQUESTED IT
ALSO TO BE BLOWN DOWN.
THANKS! ARE YOU SURE THIS
(DR 542) IS A 3 SHIFT
EFFORT ????

2. REWORK ON TANK DOOR & CHECK VALVES
IN HOLD TILL BRAZING TOOLS CAN
BE REPAIRED.

JMB 3 EQUIPMENT GATHERING & CLEANLINESS
STEP & PNEUMATIC HOOKUP STEP
SOLD ON DR#542. 10030 QC
WOULDN'T GIVE ME AN OK TO
DEBATE P953 & P955.

2-27-69 ① DR 542 COMPLETED AND SOLD -
FIRST NO S/C PROBLEMS, TOOK UNTIL 1100
9PM

② TPS V1A-GEN-086 ISSUED FOR OX PROBE
RETEST & SPS LINE HTR RETEST. CIA-163
IS ENROUTE FROM WHITE SANDS &
CABLES ENROUTE FROM KSC, SHOULD
BE HERE IN THE A.M.

③ SPS TK DOOR & CHECK VALVE RWR.

Progressing @ usual Pace - Slow.

3-3-9 DAYS -

15:15 HRS

THE C14-163 CONSOLE FOR THE PROBE
RETEST IS IN S.T.L. BEING CALIBRATED.
THE CABLE SET SHOULD BE IN SOUTH
AIRLOCK BY NOW. THE CABLES WERE IN
BLD 3 RECEIVING THIS AM.

SECOND 3-3-9

17:15 FOUND C14-163 CABLE SET IN DRAW
OF CONSOLE. EVERYTHING IN STL-BME,
WAITING CAL-CREW.

2400

C14-163 STILL IN BME - CAL-CREW
PLAYING GAMES WITH GERTCH PANEL, WHICH
WE DON'T NEED. TOLD THEM THIS, BUT
NO ONE WANTS TO PUSH CAL-CREW. BSIE
SHOULD BE READY FOR DELIVERY TO
STACK SOMETIME THUR.

OXID-DUCT BRAZING SHOW, AT THIS
TIME THEY STILL HAVE FOUR BRAZES
TO GO. CAN'T HOOKUP TO OXID PROBE
UNTIL THEIR CHECK OF ELECT. CONNECTORS.

THIRD
3/3/69
JMS

① CONSOLE ON 4TH LEVEL. WELD/BRAZE
STILL IN PROGRESS AND PLEASE NOT
ELEC. HATED.

FIRST - 3-4-69

THE C14-163 IS CONNECTED TO
PUGS CONTROL BOX. WE HAVE
BEEN WAITING FOR MFG. TO COMPLETE
THE WELDING & HOOK UP THE PROBE.
ALL YOURS PEOPLES

SECOND 3-4-69

2300

FINNALLY GOT MANUF. TO PUT TECH ON
ROUTING WIRES AND HOOKING UP PROBE.

HAST WELD ON 3" LINE NO GOOD, CAN'T
REHEAT, SO MANUF. HAS TO REMOVE
WHOLE LINE FROM HEATER EXCHANGER TO
TANK ELBOW. THIS WILL REMOVE MORE
OF THE LINE HEATER AND ALSO A
TEMP. SENSOR.

TECHNICIAN PICKED UP A DR FOR US ON
STEP 5 OF TPS 086. STACK READ
ENG. TOLD HIM TO WORK TPS, SO HE
DID, NOT KNOWING ~~TPS~~ TANK SENSORS
WEREN'T HOOK UP. TOLD THEM NOT
TO WORK TPS UNLESS ATO 849 TYPE
WAS PRESENT.

2415

STILL WAITING FOR GC TO CLEAR
10030 FOR HOOKUP.

THIRD
3/5/69
JMS

① I AM INTO TROUBLE WITH TPS
086. AT STEP 7 THE
1ST READING WAS 325.3
PICO FARADS S/B 320±2.
DR# 345 INITIATED. WENT ON
& AT STEP 15 RESISTANCE
OF PIZ6 E TO PIZ6 A WAS ∞.
SO DIDN'T PERFORM THE STEP
& LEFT IT FOR DAYS!

FIRST 3-5-9

TPS 086 COMPLETED UP TO THE
HEATER CHECK. THE TPS HAD MUCH
MISINFORMATION - PIZ6 A S/B PIZ6 G
(PIZ4 P PIZ4 V) S/B (PIZ5 P & PIZ5 V)
THE PARAMETER ON STEP SEVEN
WAS WRONG S/B 322 ± 4.6 PF
HARVEY SIGNED CONCLUSION ON DR 345
TO CHANGE TO TOLERANCE ABOVE.

THIRD SHIFT 3/6/69 → 1 sec H was allowed!
WHY DIDN'T SOMEBODY PUT TOLERANCES
ON DR?

1. Completed confidence leak check on
check valves per DR 281 outline, no
problem encountered & guess Eng. puts the
good words on conclusion, all data recorded
on pk.

FIRST SHIFT 3-6-69

- 1- WROTE TPS # _____ V34 GEN TO SOAP CHECK
OXID PLUMBING AT 50 PSIG. NEED
NASA SIGNATURE. (REF DR 280 V34 GEN)
NASA WON'T SIGN BECAUSE THEY CLAIM MRDR
HAS SAME TPS LEFT IN CIC. 7:00 PM.
- 2- DUE TO TEMPERATURE FACTORS ON LEAK
CHECK OF CHECK VALVE, IT HAS BEEN
DECIDED ~~TO~~ NOT TO DO ANY FURTHER
TESTING IN B/290; (UPSTREAM POPPETS LEAKAGE
WAS OUT - S/B LESS THAN 1.08 CC/HR.)
- 3- WROTE SOME WORDS ON DR 281 - STATING
THAT THE TEST RUN ON THE CHECK VALVE
WAS TO VERIFY NO GROSS/EXCESSIVE
LEAKAGE & ACCEPTANCE TEST WILL BE
DONE IN B/260 PER OCP 4074.
- 4- REQUESTED - 11 GN₂ PRESS PANEL
TO SUPPORT SOAP CHECK OF OXID
PLUMBING. SINCE C14-075-301 WILL BE
USED TO SUPPORT S/C 109.

TPS 086 - THE LAST 2 STEPS TO PERFORM
THE HEATER CHECK ARE OPEN. THEY ARE
THREATENING TO BOND THE HEATER STRIP
ON TONITE DURING OXID PLUMBING
LEAK TEST. SO BE READY.

SECOND 3/6/69

2400 COMPLETE TPS 096 HEAT SPS WELDS.
BROUGHT OXID TANK PRESS TO 10.5 PSIG.

DID NOT GET TO COMPLETE TPS 086.
HTR OK. MANUF. HAD PUT SHIPPING
COVER OVER SM. GUESS WE'LL HAVE
TO GET THIS DONE IN 8/260

3-7-69 PER WE. BAKER (CEE) X-32156 RETEST
FIRST WILL BE REQUIRED FOR DR676-
900 A139246-1 ~~SM~~ CM RCS SYS 1 C19LV3
WILL HAVE TO BE CYCLED TO "ON"
THEN TO "OFF" - VERIFY RESPECTIVE
TALK BACK; DR 288 - A122715-1 SPS
HTR BANK B UMB/SM WIRE
SUBSTITUTED - WILL REQUIRE SPS
HTR'S A/B ON - VERIFY J19-D
TO VGP READS

3/10/69 SECOND SHIFT

1. Wrote Speed Letter to TER for
VALVE SIG EQPT FOR -Y SYS 1
ENG DIRECT RESP TEST (DR 855)
EQPT BEING ACCUMULATED & SHOULD
BE AVAILABLE BY MIDDLE 3RD SHIFT.

2. REVIEWED & MADE MINOR CHANGES
TO SHIMS ROUGH DRAFT OF VALVE
RESPONSE TEST. WROTE IT ON
TPS FORMS READY FOR SIGS.

QUESTION: How MUCH
BLANKET PRESS DOES OCP-4171 PUT
IN FOR SHIP. 50 PSIG ±

FIRST SHIFT 3-12-69

1. TPS #101 V34 GEN SIGNED & ISSUED.
TPS WILL CHECK SYS I PROP. ISO VLV,
C19A10 ARC SUPPRESSION AND SPS
LINE HEATER
1. TPS #101 CAN BE PERFORMED ANYTIME
THE REQ'D EQUIP. IS AVAILABLE.
NO S/C POWER IS REQ'D FOR ARC
SUPPRESSION CHECK. — CHARGE —

3/12/69 2ND SHIFT

1. NO ACTION ON EQPT ACCUMULATION.

2. 

FIRST SHIFT 3-13-69

1. PER TER - ALL REQ'D EQUIP. ARE
AVAILABLE FOR TPS #101 RETEST.
2. TPS 101 IN HOLD FOR DOCKING PROBE
RETEST. S²FS² (SAVE SOME FOR SECOND SHIFT)
3. CANNOT PERFORM SPS HEATER RETEST
PORTION OF TPS 101 CAUSE - J18/19
GSE ACCESS ARE CLOSED OUT.
4. DISREGARD NOTE #3. HEATER RETEST
PORTION COMPLETED.

SC108-0679-01

SPACE DIVISION
NORTH AMERICAN ROCKWELL CORPORATION

DATA REQUEST FORM

244

1. APPROVAL [Signature]
Stand Mgr/CTC

2. REQUESTOR W. HARRISON 3. DEPT 692 4. PHONE 5055 5. VEHICLE 108

6. REQUEST DATE 3-13-69 7. DATE REQD 3-14-69 8. TEST LOG _____

9. TEST DATE Nov 22, 1968 10. ACE TAPE NO. _____ 11. OCP/TPS 4225

12. SEQ NO(S) (1) 02, (2) _____, (3) _____, (4) _____, (5) _____

13. DATA TIME INTERVAL(S)

- () FROM: DAY _____ HOUR 05 MIN 30 SEC _____ TO: DAY _____ HOUR 06 MIN 00 SEC _____
- () FROM: DAY _____ HOUR _____ MIN _____ SEC _____ TO: DAY _____ HOUR _____ MIN _____ SEC _____
- () FROM: DAY _____ HOUR _____ MIN _____ SEC _____ TO: DAY _____ HOUR _____ MIN _____ SEC _____
- () FROM: DAY _____ HOUR _____ MIN _____ SEC _____ TO: DAY _____ HOUR _____ MIN _____ SEC _____
- () FROM: DAY _____ HOUR _____ MIN _____ SEC _____ TO: DAY _____ HOUR _____ MIN _____ SEC _____

14. REQUEST JUSTIFICATION Quad "D" Program in TC 289

15. ACCEPTED BY [Signature] DATE 3/13/69 TIME 1535
(Test Data Engineer)

16. TYPE OF INPUT DATA

- Moving Chart Records Type _____
- Magnetic Tape Type _____
- Other Type _____

17. TYPE OF OUTPUT DATA REQUIRED

- IBM Tab Listing(s)
- Hand Tab Listing(s) Samples Per Second (SPS) _____
- Oscillogram(s) Speed _____
- Hogan Plot(s) Speed _____ Scaled _____ Unscaled _____
- CRT Plot(s) Point Plot _____ Line Plot _____ Meas Per Pg _____ SPS _____
- Tape Copy (Copies)
- Other

18. SPECIAL INSTRUCTIONS SR 5104, SR 5095 & SR 5096
SR 5108, SR 5049, SR 5053, SR 5100,
SR 5120

DATA REQUEST FORM (Cont)

GENERAL INSTRUCTIONS

1. Write legibly.
2. Do not use ditto marks.
3. Make sure that all copies are legible.
1. The signature of the Stand Manager or CTC (or their representative) must be on each request before it will be accepted for processing.
2. S/E
3. S/E
4. S/E
5. S/E
6. S/E
7. S/E
8. Place where data were recorded, e.g., Computer Room 2, TGS, etc.
9. Date when data were recorded to the nearest hour in GMT.
10. S/E
11. S/E
12. Sequence Number(s) from which data are being requested.
13. Test time intervals during which data are being requested. Fill in applicable entry number of sequence in Item 12.
14. Indicate precise need and any information which will aid in establishing priorities, e.g., "Data is required to sell Squawk No. 84."
15. To be completed by the appropriate data engineer.
16. S/E
17. Indicate precise output format required, if known. If turnaround time is critical, see data engineer before determining format.
18. Include measurement number(s) required, measurement loading number(s) and grouping desired.

3/13/69 SECOND.

HAD ONE H— of time get ANY THING DONE ON TPS 101. WHEN WE FINALLY got to VALVE TRACES, WE, COULDN'T get any good ARC SUPPRESSION IN DIRECTS. SUBMITTED MOD-SHT TO RUN IN AUTO (Fuel/OXID) AND hope.

PRESSURE FROM MP6 TO DEMATE. HANG-ON until you get good info.

3/14/69 3rd SHIFT.

1. COMPLETED TPS 101, RAN MOD "C" WHICH FIRES COIL IN AUTO MODE TO CHECK ARC SUPP. PICTURE LOOKS GOOD. DATA ENCLOSED ~~FOR~~ IN LOG BOOK FOR YOUR REVIEW. I HOPE ITS ALL GOOD, SINCE IT WAS PERFORMED HURRIEDLY, CAUSE OPS TYPES WERE PUSHING FOR US TO DISCONNECT FROM C/M OR BE SHUT DOWN. TPS STILL NEEDS SIGNATURES.

3-18-69① TPS 134-GEN-101 PICTURES LOGGED FIRST INTO DATA LIBRARY.
JDM

3-24-69① CIC REQUESTED ASSISTANCE TO FIRST PRESSURIZE SPS FOR SHIPMENT. JDM ALMOST DEMANDED A TPS. THE FOLLOWING EXPLANATION GIVE A SHIPPING FAIR

1. MA 0208-0085 (Shipping spec.) # 4.3.1 - # 4.3.1.7 detail the hook-up of the S14-099 and ref
2. MA 0210-0113 # 6.3.3 - # 6.3.3.3 PRESSURIZE SPS FOR SHIPPING.

A visual inspection revealed the SPS had been pressurized for shipping — FUEL GAUGE READ 52 PSIG. OXIDIZER GAUGE — 32 PSIG. APPEARS SHIPPING PRESSURE HAS LEAKED OFF OXIDIZER SIDE. REQUEST CIC GET A TK 119001 OR TK-4128-001-11 TO CONNECT TO USE ~~IT~~ ~~AND~~ ALSO VERIFY ACCEPTABILITY OF USING S14-099 & SPS PRESSURIZATION PANEL. REF FIGURE 1-6 OF 4128. I REQUESTED CHUCK CALIGHRAN LEAK CHECK THE OXID PRESS. GAUGE ASSEMBLY — HE REFUSED. DR 502 FINALLY WRITTEN — GSE had FIVE leaks — OXID pressurized to 53.5 but not bought by NASA — Gages out of calibration & pressure will be verified on S14-099.

3-25-69① DCS 4225 - 02-099 & 02-101 133
 FIRST NOV 22, 1968 (05 30 - 0540 PST) GMT
 90K APPEARS TO BE AN ANOMOLY.
 AUDIO TAPE 9637, CH 12 RUN
 FROM 1053 - 1719 GMT, SHOULD
 BE PULLED TO SEE IF THERE
 IS SOME ADDITIONAL INFORMATION
 TAPE, DATA STORAGE & RETRIEVAL
 logged 11-22-68
 Item SC108-0196-06
 loc H0204

3-26-69① AUDIO TAPE 9637 side 1
 FIRST TIME 13 39 42 CONFIRMED
 90K SM RCS D HE 2 TB
 WENT BP WHEN SM RCS
 D HE 1 VALVE WAS OPENNED
 three step before
 DATA PER REQUEST 244
 LOGGED INTO DATA LIBRARY
 STORAGE. LOGGED 3-14-69
 Item SC108-0679-01

EAGLE-LEM
 COLUMBIA-CSM

JULY 20 1969
 NEIL ARMSTRONG
 AND BLIZZ ALDRIN
 LANDED AND
 WALKED ON MOON
 WHILE MIKE COLLINS
 CIRCLED ABOVE IN
 CSM - APOLLO 11
 SC 107
 J.D. Manha

NOVEMBER 18, 1969
 CONRAD AND BEAN LANDED AND
 WALKED ON MOON - LANDING VERY
 CLOSELY TO SURVEYOR 3 IN AN
 EXCELLENT PRECISION LANDING - WHILE
 GORDON CIRCLED ABOVE IN CSM -
 APOLLO 12, SC108 - INTREPID-
 LEM, YANKEE CLIPPER - CSM.
 J.D. Manha