

MANUFACTURED BY DATE QPR # I PGM SUBJECT SIGNATOR LOC



6-A-71 NSC 00 R AFD * Doerre OED-BC

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

(JULY 26 LAUNCH)

* APOLLO 15

LM-10

REVISION A

LM ACTIVATION CHECKLIST

PREPARED BY

GUIDANCE & CONTROL PROCEDURES SECTION

SYSTEMS PROCEDURES BRANCH

CREW PROCEDURES DIVISION



MANNED SPACECRAFT CENTER

HOUSTON, TEXAS

JUNE 14, 1971

APOLLO 15

LM ACTIVATION CHECKLIST

6/14/71

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LM ACTIVATION CHECKLIST

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 Pen & Ink 5/11/71
 Revision A 6/14/71

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*Current Change

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CSM TO LM TRANSFER LIST (TLC)

Scissors (1) - Data File

CWG Elect Adapter (2)

Comm Carriers (2)

UTIL Straps (3) - LHSSC

Inflight Retainer Straps (4) - LHSSC

70mm Magazines (13):

3 in Bag - FWD RHSSC (MM, VV, WW)

4 in Bag - AFT RHSSC (KK, LL, NN, OO)

6 in Bag - Behind Engine Cover (PP-UU)

16mm Magazines (10):

6 in Bag w/Dosimeter - RHSSC (CC-HH)

2 in Bag - Behind Engine Cover (II, JJ)

1 in Bag - ISA Top Pocket (BB)

1 - R.H. Window SEQ Camr (AA)

Ancilliary Stowage Bag - LHSSC

Flight Data In Bag:

LM ACTIVATION CHECKLISTS (2)

DATE ...6/14/71 ...

DATE 4/5/71

1-1

33:00

IVT TO LM

- 1 Activate CABIN DUMP VALVE & Open Hatch
Carry Comm Carrier, CWG Connector &
CSM O2 Hose
- 2 Record Docking Tunnel Index Angle

_____ Rc
- 3 FLOOD LIGHT - All
EXTERIOR LTG - OFF
Window Shades (3) - Open
- 4 DES H2O - OPEN
DES O2 - OPEN
CABIN REPRESS - AUTO
CB(16) CABIN REPRESS - CLOSE
- 5 Check AOT Visibility

33:05

ENTRY STATUS CHECK

- 1 Mount Purse (ISA Bottom Pocket)
Unstow ISA And Install On AFT
Cabin Rest Station Fittings

- 2 Verify CB Status Per INITIAL ACTIVATION
Status Chart

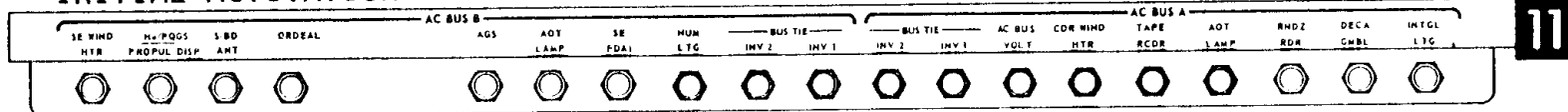
DATE 6/14/71

DATE 4/5/71

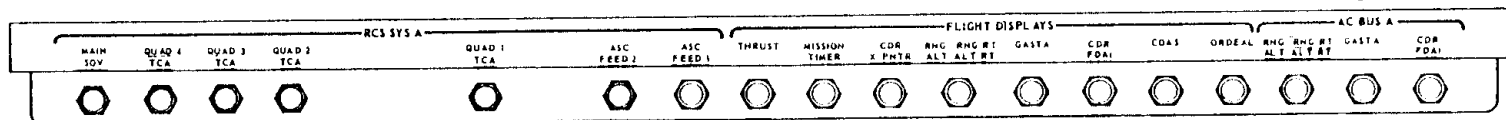
1-3

INITIAL ACTIVATION STATUS

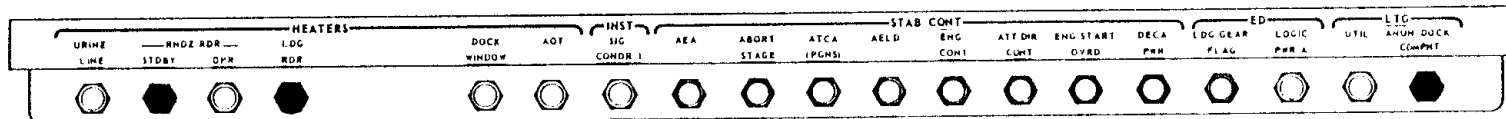
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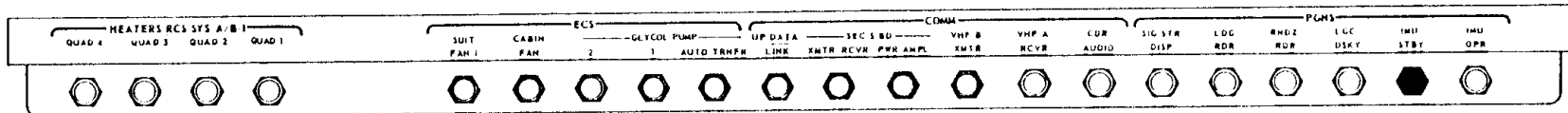
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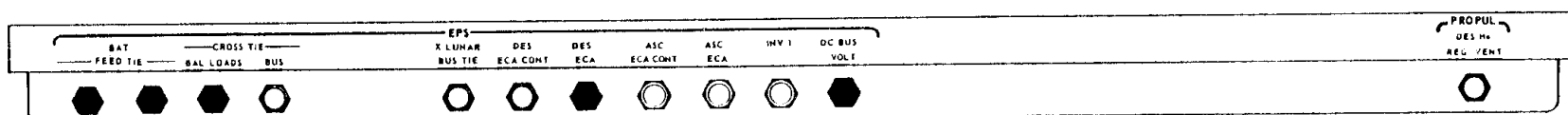
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1 - CLOSED



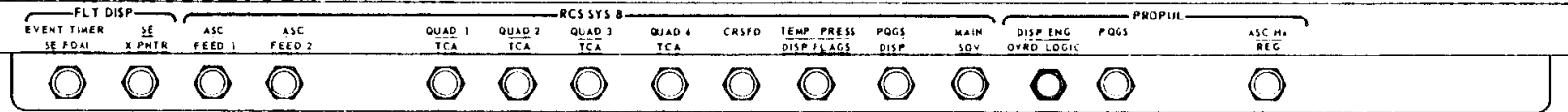
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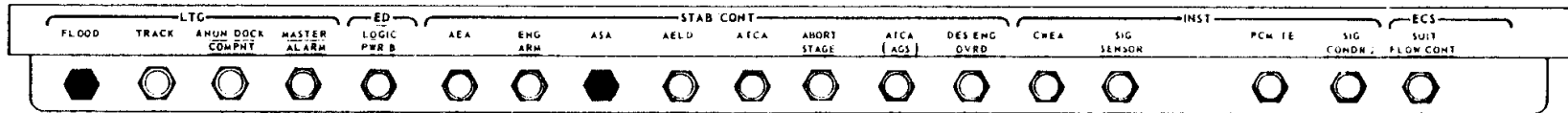
INITIAL ACTIVATION STATUS

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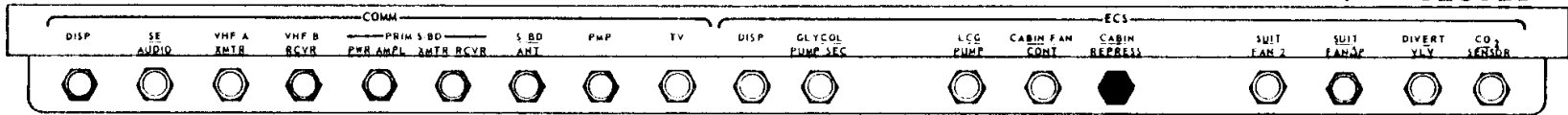
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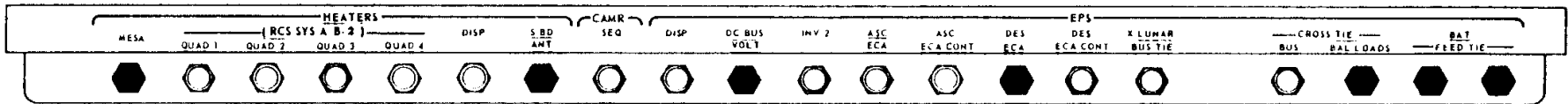
2 - CLOSED



1 - CLOSED



7 - CLOSED



DATE 4/5/71

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1-5

- 3 UTILITY LIGHTS (2) - OFF
RR GYRO SEL - PRIM
- 4 FDAI 1&2 - INRTL
EARTH/LUNAR - PWR OFF
LTG - OFF
MODE - HOLD/FAST
ALT SET - 60
- 5 FUEL & OXID VENT (2) -tb-bp (Vlv Open)
LDG GEAR DEPLOY - tb-bp
MASTER ARM - OFF
ASC HE SEL - BOTH
MESA - LO
URINE LINE - OFF
STAGE - SAFE (Guarded)
- 6 S-BAND T/R - OFF
ICS T/R - OFF
RELAY - OFF
MODE - ICS/PTT
AUDIO CONT - NORM
VHF A&B - OFF
VOX SENS - 9
THUMBWHEEL VOL (5)-6
COAS - OFF

- 8 TIMER CONT - STOP
 LTG OVERRIDE (3) - OFF
 SIDE PANELS - OFF
 FLOOD OVHD/FWD - BRIGHT
 ANUN/NUM - DIM
 INTEGRAL - DIM
- 9 X-POINTER SCALE - HI MULT
 RATE/ERR MON - LDG RDR/CMPTR
 ATTITUDE MON - PGNS
 GUID CONT - PGNS
 MODE SEL - LDG RADAR
 RNG/ALT MON - ALT/ALT RT
 SHFT/TRUN - +50°
 RATE SCALE - 25°/SEC
 ACA PROP - ENABLE
 THR CONT - AUTO
 MAN THROT - CDR
 ENG ARM - OFF (SW Guard - 12 o'clock)
 ATT/TRANSL - 4 JETS
 BAL CPL - ON
 ASC He REG 1&2 - tb - gray (vlv Open)
 DESCENT He REG 1 - tb - gray (vlv Open)
 DESCENT He REG 2 - tb - bp (vlv Closed)
 PRPLNT QTY MON - OFF
 PRPLNT TEMP/PRESS MON - ASC
 HELIUM MON - OFF
 ABORT and ABORT STAGE - Flush/Guarded

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1-7

- 10 SYS A&B ASC FUEL & ASC OXID (4) - tb-bp
 (Feed 2 - Close, Feed 1 - Open)
 SYS A&B QUADS (8) - ENABLE; tb - gray
 CRSFD - tb - bp (vlv closed)
 SYS A&B MAIN SOV - tb - gray (vlv open)
 TEMP/PRESS MON - He
 ACA PROP - ENABLE
 RATE/ERR MON - LDG RDR/CMPT
 ATTITUDE MON - PGNS
 GLYCOL - PUMP 2
 SUIT FAN - 1
 O2/H2O QTY MON - ASC 2
- 11 ENG GMBL - ENABLE
 DES ENG CMD OVRD - OFF
 LDG ANT - AUTO
 RADAR TEST - OFF
 TEST MONITOR - ALT XMTR
 SLEW RATE - HI
 RNDZ RDR - SLEW
 DEAD BAND - MIN
 GYRO TEST - ROLL
 ATTITUDE CONTROL (3) - MODE CONT
 MODE CONT: (Both) - OFF (PGNS SW Guard - 9 O'clock)
 EVENT TIMER: TIMER CONT - STOP
 TEMP MON - LDG

RCS SYS A/B-2 QUADS (4) - OFF
LTG: SIDE PANELS - OFF
FLOOD-A11
OVHD/FWD - BRIGHT
LAMP/TONE TEST - OFF
EXTERIOR LTG - OFF
X-POINTER SCALE - HI MULT

12 ACA/4 JET (2) - ENABLE

TTCA/TRANSL (2) - ENABLE

RNDZ RDR ANT - Stowed
AOT - CL, ANGLE - 0000 (Pushed In)
TTCA (LMP) - JETS
AGS STATUS - OFF

13 PWR TEMP MON-ED/OFF

INV-OFF

DES PWR (6)-tb-bp

ASC PWR (4)-tb-bp

UNLINK SQUELCH-ENABLE

DATE 4/5/71 ..

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1-9

- 14 AUDIO CONT - NORM
S-BAND T/R - OFF
ICS T/R - OFF
RELAY - OFF
MODE - ICS/PTT
UPDATA LINK - OFF
VHF A&B - OFF
VOX SENS - 9
THUMBWHEEL VOL (5)-6
- 15 S-BAND MODULATE - PM
XMTR/RCVR - OFF
PWR AMPL - OFF
VOICE - OFF
PCM - OFF
RANGE - OFF/RESET
VHF A (2) - OFF (SQUELCH-3)
VHF B (2) - OFF (SQUELCH-3)
TELEMETRY - OFF/HI
RECORDER - OFF (tb-bp)
VHF - AFT
TRACK MODE - OFF
PITCH - -75°
YAW - -12°
S-BAND - AFT

- 16 SUIT GAS DIVERTER - PULL/EGRESS
CABIN REPRESS - AUTO
LO PLSS FILL - CLOSE
PRESS REG A&B - CLOSE
DES O2 - OPEN
ASC O2(2) - CLOSE
SUIT ISOL (2) - SUIT DISC
SUIT CIRCUIT RELIEF - AUTO
CABIN GAS RETURN - AUTO
CO2 CANISTER SEL - PRIM
PRIM & SEC CO2 CANISTER - CLOSE
WATER SEP SEL - PULL/SEP 2
ASC H2O - CLOSE
SEC EVAP FLOW - CLOSE
PRIM EVAP FLOW (2) - CLOSE
DES H2O - OPEN
WATER TANK SELECT - DES
SUIT TEMP - COLD
LIQUID COOLING GARMENT - COLD
HI PLSS O2 FILL - CLOSE
- 17 Verify (192 PKG) Lanyard
Not Seated
- 18 FWD CABIN RELIEF AND DUMP - AUTO

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1-11

33:19

HOUSEKEEPING

- 1 Install 16mm Camr Wedge - RHSSC
- 2 Remove Stowage Bags From Drink Bags -
ISA Back Pocket
- 3 Position 4 Inflight Retainer Straps (LHSSC)
Around CDR's Umbilical
- 4 Tape Broomclip On AOT
- 5 Tape Crash Bar
- 6 Position UTILITY LIGHTS On Back AOT Guard

- 7 Configure 1-70mm Camr (Top RHSSC):
 Stow Reseau Cover In Camr Compt
 Install HCEX MAG KK (AFT RHSSC) f11,250,[∞]
 Stow Dark Slide In Camr Compt
 Unstow Trigger and Handle (RHSSC Camr Pkt)
 Unstow RCU/Camr Brkt (RHSSC)
 Install Trigger, RCU/Camr Brkt, Then Handle
 Stow Camr In RHSSC Camr Compt, 2 Snaps

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1-13

34:17

COMM ACTIVATION

- 1 Transfer To LM POWER (FLOOD Lts. Blink,
C/W PWR Caution Lt - On)

CB(11) EPS: XLUNAR BUS TIE - Close
CB(16) EPS: XLUNAR BUS TIE - Close
CB(11) LTG: UTIL - Close

- 2 CB(11) COMM: VHF B XMTR - Close
: VHF A RCVR - Close
: CDR AUDIO - Close
INST: SIG CONDR 1 - Close
ECS: GLYCOL PUMP 2- Close

- 3 CB(16) INST: SIG CONDR 2-Close
EPS: DISP - Close
: DES ECA CONT-Close
Verify DES POWER: BAT 1,4 - tb-LO
2,3, LUN - tb-bp
DES BAT - tb-gray

4 Check BAT and BUS Voltages

<p>When BUS VOLT < 27V, Select HI Voltage Taps</p> <p>CB(11) EPS: CROSS TIE BUS - Close</p> <p>CB(16) EPS: CROSS TIE BUS - Close</p> <p>BAT 1 HI-V-OFF/RESET; tb-bp, then ON; tb-gray</p> <p>BAT 4 HI-V-OFF/RESET; tb-bp, then ON; tb-gray</p> <p>CB(16) EPS: CROSS TIE BUS - Open</p> <p> : CROSS TIE BAL LOADS - Open</p> <p>When BAT 1 AMP MTR INDICATES > 30</p> <p>BAT 2 - ON; tb-gray</p> <p>When BAT 4 AMP MTR INDICATES >30</p> <p>BAT 3 - ON; tb-gray</p>
--

- 5 CB(11) COMM: SEC S-BD XMTR/RCVR - Close
- CB(16) COMM: DISP - Close
- : VHF A XMTR - Close
- : VHF B RCVR - Close
- : PRIM S-BD PWR AMPL - Close
- : PMP - Close
- INST: SIG SENSOR - Close
- : PCM/TE - Close
- ECS: DISP - Close
- Check Glycol Pressure _____ Psia

- 6 Connect To LM COMM Umbilical Using
 CWG Connector
- CB(16) SE AUDIO - Close

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1-15

34:29

* S-BAND/VHF SIMPLEX VOICE TEST

- 1 AUDIO (LMP): S-BAND T/R - T/R
: VHF A - T/R
: VHF B - OFF
COMM: S-BAND-PM,SEC,PRIM,DN VOICE BU,
PCM, OFF/RESET,OFF,LO
VHF A XMTR - VOICE
VHF A RCVR - ON
S-BAND ANT - AFT
Perform VHF A Voice Check With CSM

- 2 COMM: VHF A XMTR & RCVR - OFF
: VHF B XMTR - VOICE
: VHF B RCVR - ON
AUDIO (LMP): VHF A-OFF
: VHF B-T/R
Perform VHF B Voice Check With CSM

- 3 Perform S-BD Voice & LBR Check With MSFN
TLM-HI
Perform Voice & HBR Check With MSFN

- 4 BIOMED-RIGHT
Perform Voice & HBR Check With MSFN
- 5 TLM-LO
Perform Voice & LBR Check With MSFN
- 6 S-BAND: VOICE-VOICE
Perform Voice & LBR Check With MSFN
- 7 TLM-HI
Perform Voice & HBR Check With MSFN
- 8 TLM-LO
S-BAND: RANGE-RANGE
Perform Voice & Ranging Check With MSFN
- 9 Record & Report ED BAT Voltage to MSFN
BAT A _____; BAT B _____
- 10 CB(16) CAMR: SEQ - Close
Check SEQ Camera Operation

DATE 4/5/71

DATE 4/5/71

1-17

34:44

OPS CHECKOUT

- 1 Perform OPS Checkout
Read And Record Source Pressures
CDR OPS _____

LMP OPS _____

COMM DEACTIVATION

- 1 AUDIO (LMP): S-BAND T/R - OFF
: VHF B - OFF
- 2 COMM: S-BAND - PM, OFF, OFF, OFF, OFF,
OFF/RESET, OFF, LO
: VHF B XMTR - OFF
: VHF B RCVR - OFF
- 3 Select LO TAPS

CB(16) EPS: CROSS TIE BUS - Close : CROSS TIE BAL LOADS - Close BAT 2 - OFF/RESET; tb-bp BAT 3 - OFF/RESET; tb-bp BAT 4 LO-V-OFF/RESET; tb-bp, then ON; tb-LO BAT 1 LO-V-OFF/RESET; tb-bp, then ON; tb-LO
--
- 4 Configure CB Panels Per INT ACT STATUS
Chart (1-3, 1-4)
Disconnect From LM Comm Umbilical
- 5 Transfer To CSM Power, Observe C/W
PWR Lt - Off

DATE 4/5/71

DATE 4/5/71

1-19

35:00

IVT TO CSM

- 1 DES 02 - CLOSE
DES H20 - CLOSE
CABIN REPRESS - CLOSE
CB(11) EPS: DC BUS VOLT - Open
CB(16) ECS: CABIN REPRESS - Open
Window Shades (3) - Close
- 2 FLOOD LIGHT - OFF
- 3 CABIN RELIEF & DUMP (OVHD) - Open
IVT TO CSM, Close LM Hatch

DATE 6/14/71 _

CSM TO LM TRANSFER LIST (PDI)

Suits And Ancillary Eqpt:

IV Gloves (CDR Transfer)
Helmets (CDR Transfer)
UCTA
FCS
Bio Belt & Instrumentation
Lightweight Headset (2)
Comm Carriers & earpieces
CWG Elect Adapter (2)
Watch & Watchbands (2)
Sunglasses in pouch
Pens & Pencils
Scissors
Penlights (2)
Earplugs (2)
Pocket, Strap On (6)
LCG Plugs (2)
Gas Connector Plugs (4)
PGA Elect Conn Caps (2)
Personal Radiation Dosimeter (2)
Passive Dosimeters (6)
LCG (2) - ISA Big PKT

Flight Data In Bag:

LM TIMELINE BOOK
LM DATA CARD BOOK
LM LUNAR SURFACE CHECKLIST
ORBIT MONITOR CHART
ASCENT MONITOR CHART
LM STAR CHARTS (3)

DATE 4/5/71

2-1

97:50

LMP IVT TO LM

- 1 Activate CABIN DUMP VALVE & Open Hatch
Carry Comm Carrier & CSM 02 Hose
- 2 Verify Docking Tunnel Index
Angle (See 1-1)
Window Shades (3) - Open
Deploy LMP Crash Bar
- 3 Transfer To LM PWR
(FLOOD Lts. Blink, C/W PWR Caution Lt-On)
CB(11) EPS: XLUNAR BUS TIE - Close
CB(16) EPS: XLUNAR BUS TIE - Close
- 4 FLOOD LIGHT - All
CB(11) LTG: UTIL - Close
- 5 DES H20 - OPEN
DES 02 - OPEN
CABIN REPRESS - AUTO
CB(16) ECS: CABIN REPRESS - Close

***** SR 97:54 *****

IVT TO LM
EPS ACT

98:07CDR IVT TO LM

CDR IVT To LM With CDR &
LMP Helmet & Gloves

Connect To LM Comm Umbilical
CB(11) COMM: CDR AUDIO - Close
AUDIO (CDR): S-BAND-T/R
: ICS - T/R

98:07EPS ACTIVATION

- 1 LTG: ANUN/NUM - BRIGHT (1 Caution, 9
Power Failure, Glycol COMP Lt-On)
- 2 CB(11) INST: SIG CONDR 1 - Close
EPS: DES ECA CONT -Close
: DC BUS VOLT - Close
CB(16) INST: SIG SENSOR - Close
: PCM/TE - Close
: SIG CONDR 2 - Close
EPS: DISP - Close
: DES ECA CONT - Close
- 3 Connect To LM Comm Umbilical
AUDIO (LMP): S-BAND T/R - T/R
: ICS - T/R
CB(11) COMM: SEC S-BD PWR AMPL - Close ■
CB(16) COMM: DISP - Close
: S.E. AUDIO - Close
: PRIM S-BD XMTR/RCVR - Close ■
: S-BD ANT - Close
: PMP - Close
S-BAND - PM PRIM SEC, VOICE, PCM, RANGE, OFF,LO
S-BAND ANT - AFT

DATE 6/14/71

98:17

ECS ACTIVATION & CHECKOUT

- 1 O2/H2O QTY MON - ASC 2, ASC 1,
DES 1, DES 2

- 2 SUIT ISOL (2) - SUIT FLOW
SUIT ISOL (2) - ACTUATE OVRD (Suit Disc)
SUIT GAS DIVERTER - PUSH/CABIN

- 3 CB(16) ECS: SUIT FAN 2 - Close
: DIVERTER VLV - Close

SUIT FAN - 2 (ECS Caution, H2O SEP Comp
Lts Off In 2 Min)

- 4 PRIM EVAP FLOW NO 1 - Open
GET _____:_____:

DATE 4/5/71

DATE 6/14/71

2-7

98:19

CDR CONNECT TO LM ECS

- 1 Connect To CDR Hoses (R/B & B/R)
PGA DIVERTER VLV - IV (HORIZ)
SUIT ISOL - SUIT FLOW

98:19

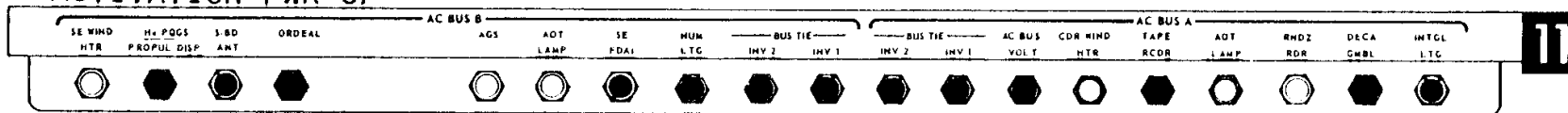
LMP CONNECT TO LM ECS

- 1 Return CSM O2 Hose To CSM
Connect To LMP Hoses (R/B & B/R)
PGA DIVERTER VLV - IV (HORIZ)
SUIT ISOL - SUIT FLOW
PRESS REG A - EGRESS (Suit Gas Diverter
Automatically Extends)
CABIN GAS RETURN - EGRESS

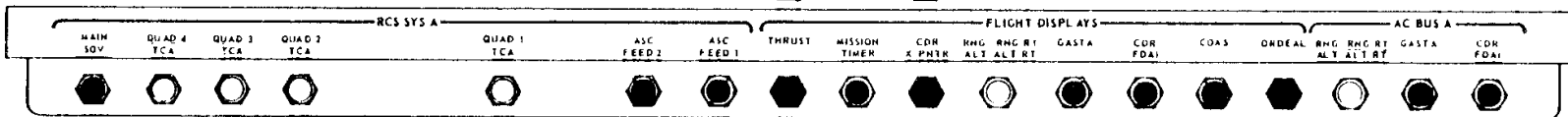
Configure CB's Per ACTIVATION PWR UP Chart

ACTIVATION PWR UP

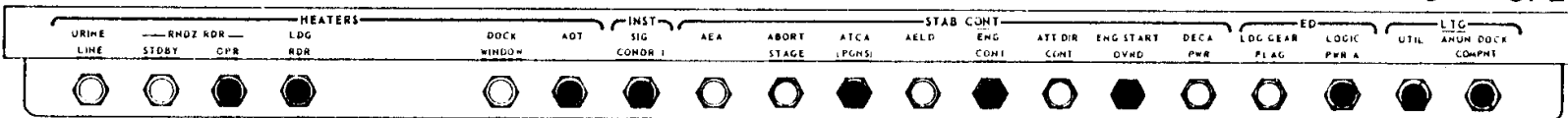
6 - OPEN



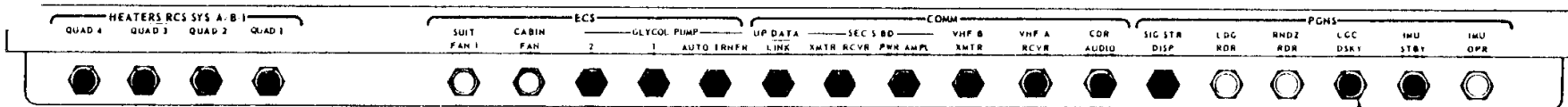
6 - OPEN



9 - OPEN

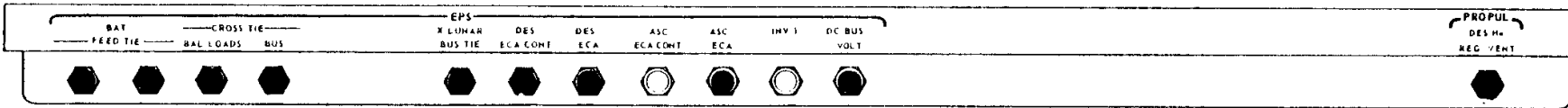


5 - OPEN



M.A., LGC ON THEN OFF,
RESTART, NO DAP

2 - OPEN



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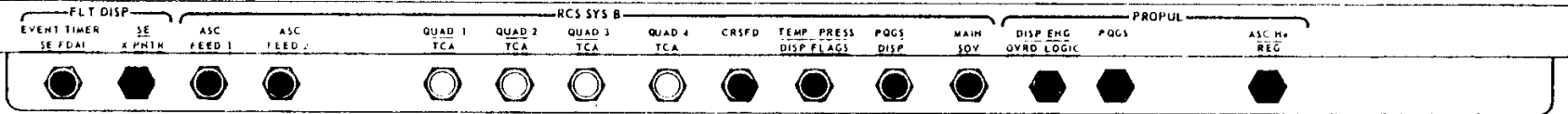
DATE 6/14/71

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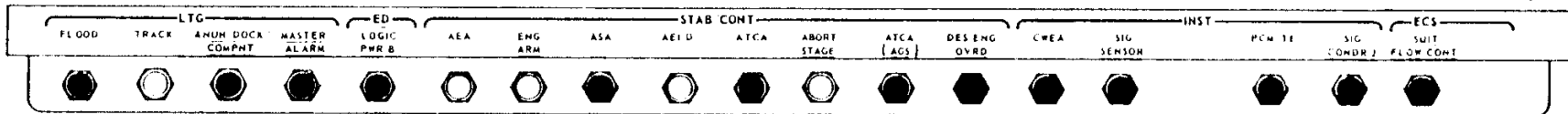
ACTIVATION PWR UP

4 - OPEN

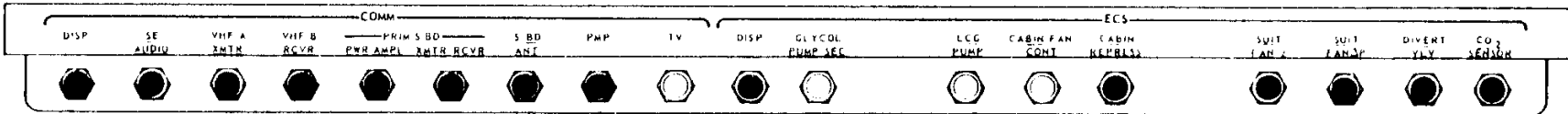
16



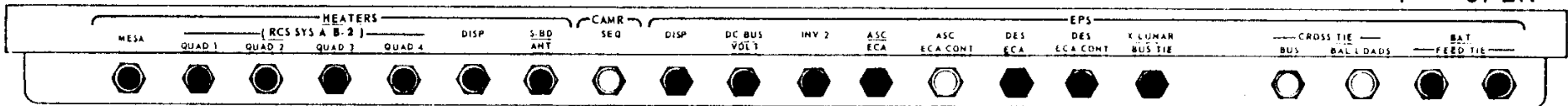
5 - OPEN



4 - OPEN



4 - OPEN



98:22

ACTIVATE RCS HEATERS

1 RCS SYS A/B - 2: QUADS(4)-AUTO

When BUS Volts \leq 27V, Select High Voltage Taps
 CB(11) EPS: CROSS TIE BUS - Close
 CB(16) EPS: CROSS TIE BUS - Close
 : CROSS TIE BAL LOADS - Close
 BAT 1 HI-V-OFF/RESET;tb-b/p, then ON;
 tb-gray
 BAT 4 HI-V-OFF/RESET; tb-b/p, then ON;
 tb-gray
 CR(16) EPS: CROSS TIE BUS - OPEN
 CROSS TIE BAL LOADS - OPEN
 When BAT 1 AMP MTR INDICATES > 30
 BAT 2 - ON; tb gray
 When BAT 4 AMP MTR INDICATES >30
 BAT 3 - ON; tb gray

98:22

TB VERIFICATION

1 CB(16) INST: CWEA - Open Then Close

WARN CAUT COMP

RCS A REG
RCS B REG

2 FUEL & OXID VENT (2) -tb-gray
LDG GEAR DEPLOY - tb-bp

3 ASCENT He REG 1&2 -tb-gray
DESCENT He REG 1-tb-gray
DESCENT He REG 2 -tb-bp

4 SYS A&B ASC FUEL & OXID (4)-tb-bp
SYS A&B QUADS (8)-tb-gray
CRSFD tb-bp
SYS A&B MAIN SOV -tb-gray

***** AOS 98:24 *****

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2-11

98:24

PGNS TURN-ON & SELF TEST

- 1 Check Bus Voltages
RSET (RESTART LT - OFF)
- 2 V96E
V35E
F 88 88
(Master Alarm, LGC & ISS Warning,
And All DSKY Lts - On, 8's In All
Registers; All Lts Except No DAP
Reset In 5 sec, LGC Warning Resets
Within 20 Sec)
- 3 CB(11) PGNS: IMU OPR - Close
NO ATT Lt - On (Off In 90 sec)
- 4 V25 NOTE 1365E
E,E,E,
- 5 V15 NOTE 1365E
R1,R2,R3 All Zero

98:24

VHF B CHECKOUT

- 1 CSM Configure for VHF Simplex B
VHF B XMTR - VOICE
VHF B RCVR - ON
VHF ANT - FWD
AUDIO (Both): VHF B - T/R
TAPE RECORDER - ON
- 2 Both CDR & LMP Perform Voice Check
On VHF Simplex B

98:28

VHF A CHECKOUT

- 1 CSM Configure For VHF Simplex A
VHF A XMTR - VOICE
VHF A RCVR - ON
VHF B XMTR - OFF

AUDIO (Both): VHF B - RCV
: VHF A - T/R
- 2 Both CDR & LMP Perform Voice Check ON

- 6 V21 N27E 10E (Test
Erasable And Fixed Memory)
R1 Number Of Errors
R2 Number Of Tests Started
R3 Number Of Erasable Tests Successful
Test Successful If R2 \geq 3 (Minimum
78 sec)

```

*PROG Lt-On          *
*      V05 N09E 01102 SELF-*
*      TEST ERROR    *
* N08E  Record For MSFN *
*                  *
*      R1  _____ *
*                  *
*      R2  _____ *
*                  *
*      R3  _____ *

```

- 7 V21 N27E 0E TERMINATE SELF TEST

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98:30

2-13

98:30

LGC/CMC CLOCK SYNC/TEPHEM UPDATE

- 1 V25 N36E
- 2 Load Mission Time _____:_____:_____
- 3 V06 N65, On Mark - ENTR
Compare With CSM N65

CSM Time _____:_____:_____

LM Time _____:_____:_____

V55E - Load ΔT
Check Mission Timer

- 4 Record CSM TEPHEM

R1 _____

R2 _____

R3 _____

- 5 V25 N01E, 1706E Load TEPHEM (Octal)

*PRIM S-BD T/R & SEC PWR AMPL CK

- 1 Notify MSFN of PRIM S-BD CK
Perform PRIM S-BD VOICE CK With MSFN
(Up To 60 sec To Lock)

98:35

*SEC S-BD T/R & PRIM PWR AMPL CK

- 1 Notify MSFN of SEC S-BD CK
S-BAND XMTR/RCVR - SEC
S-BAND PWR AMPL - PRIM
(Up To 60 sec To Relock)
- 2 Report PRIM EVAP FLOW TIME (2-6)
- 3 MSFN UPDATE
Copy DAP DATA & AGS Abort Constants

98:38SET DAP

- 1 V48E
F 04 46 Codes (Octal)
R1 _____ (32022)
R2 _____ (00011)
PRO
- 2 F 06 47 LM, CSM Wt. (LBS)
R1 _____ (+36702)
R2 _____ (+38641)
PRO
- 3 F 06 48 GMBL TRIM, PITCH, ROLL (.01°)
R1 _____ (+00629)
R2 _____ (+00648)
(TERM) V34E

*E-MEMORY DUMP

- 1 Verify MSFN Contact
V74E (Erasable Dump) (42 sec)

98:38* S-BAND STEERABLE ANTENNA ACTIVATION

- 1 HTR CONT TEMP MONITOR - S-BAND
(-52° to +135°)
S-BAND -PM,SEC,PRIM,VOICE,PCM,
RANGE,OFF,HI
- 2 HI GAIN: PITCH - -75°
YAW - -12°
TRACK MODE - SLEW (Wait 30 sec)
PITCH (From MSFN) _____ (+134)CCW
YAW (From MSFN) _____ (+6)CCW
ANTENNA S-BAND - SLEW
- 3 Verify Signal Strength > 3.0
TRACK MODE - AUTO
UPLINK SQUELCH - OFF
RANGE - CWEA ENABLE
- 4 S-BAND CHECK WITH MSFN
BIOMED SW - RIGHT

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98:40

*MSFN UPLINK

- 1 UPDATA LINK - DATA
MSFN P-27 Updates LS REFSMMAT, LM
STATE VECTOR AND V66, AND LGC ABORT
CONSTANTS
UPDATA LINK - OFF

98:42

LANDING GEAR DEPLOY

- 1 CB(11) ED: LDG GEAR FLAG - Close
 : LOGIC POWER A - Open
MASTER ARM-ON (SYS B Lt-On)
LDG GEAR DEPLOY-FIRE, tb - gray
CB(11) ED: LOGIC POWER A - Close
 (SYS A Lt - On)
LDG GEAR DEPLOY - FIRE
MASTER ARM - OFF (SYS A&B Lts - OFF)
CB(11) ED: LDG GEAR FLAG - Open

98:42

SUIT FAN/H2O SEP CHECK

- 1 CB(16) ECS: SUIT FAN 2 - Open
 (Master Alarm, SUIT/FAN Warning
 SUIT FAN Comp Lts - On)
- 2 CB(11) ECS: SUIT FAN 1 - Close
H2O SEP SEL - PUSH SEP 1
- 3 SUIT FAN - 1 (SUIT/FAN Warning, SUIT
 FAN Comp Lts - Off
CB(16) ECS: SUIT FAN 2 - Close

98:47GLYCOL PUMP CHECK

- 1 CB(11) ECS : GLYCOL PUMP 1 - Open
 (Master Alarm, ECS Caution & Glycol
 Comp Lts - On Momentarily)
 CB(11) ECS: GLYCOL PUMP 1 - Close
 (GLYCOL Comp Lt-On)

- 2 GLYCOL - INST (SEC) (8 psia)
 CB(16) ECS: GLYCOL PUMP SEC - Close
 (10-20 psi Rise)
 : GLYCOL PUMP SEC - Open
 (Press Decrease)

- 3 GLYCOL - PUMP 2 (21-37 psi)
 (GLYCOL Comp Lt - On Then Off)
 CB(11) ECS: GLYCOL PUMP AUTO
 TRNFR-Open
 GLYCOL - PUMP 1 (21-37 psi)

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98:50

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98:50

DOCKED IMU COARSE ALIGN

ASCENT/LUNAR BAT CHECKOUT

- 1 Verify CSM In Min DEADBAND ATT HOLD
- 2 Calculate LM Gimbal Angles

- 1 CB (16) EPS: ASC ECA CONT - CLOSE
- 2 POWER/TEMP MON SEL-LUN
LMP LUNAR BAT OFF/RESET; tb - b/p,
then ON; tb - LMP
(VERIFY LUNAR BAT CURRENT)
LMP LUNAR BAT - OFF/RESET; tb - b/p
POWER TEMP MON SEL-BAT 5
BAT 5 NORMAL LMP FEED - ON; tb - gray
(VERIFY BAT 5 CURRENT)
LMP BAT 1 HI V - OFF/RESET; tb - b/p
- 3 CDR LUNAR BAT OFF/RESET; tb - b/p,
then ON; tb - CDR
(VERIFY LUNAR BAT CURRENT)
CDR LUNAR BAT - OFF/RESET; tb - b/p
POWER TEMP MON SEL - BAT 6
BAT 6 NORMAL CDR FEED - ON; tb - gray
(VERIFY BAT 6 CURRENT)
CDR BAT 4 HI V - OFF/RESET; tb - b/p
POWER/TEMP MON SEL - CDR BUS, LMP BUS

<u>OG</u>	<u>IG</u>	<u>MG</u>
300.00	180.00	360.00

Rc (1-1) + _____

CM	-	+	-
	<u>(000.00)</u>	<u>(105.50)</u>	<u>(359.90)</u>

LM			
	<u>(300.00)</u>	<u>(285.50)</u>	<u>(000.10)</u>

- 3 V41 N20E COARSE ALIGN IMU
F 21 22 LOAD ICDU ANGLE OG,IG,MG (.01°)
(NO ATT LT - ON, FDAI Torques)
FDAI ANGLES 000,286,060
- 4 V40 N20E ZERO CDU (NO ATT ?? ???)

BAT C/O

2-18

- 5 V25 N07E
F 21 07 SET REFSMFLG
77E,10000E,1E, VOI NO1E,77E Confirm
Bit 13 Is Set (Set If 1st Digit Is
1,3,5, or 7)
- 6 V37E 51E
PRO
V37E 00E

- 4 BAT 5 BACKUP CDR FEED - ON; tb - gray
BAT 6 BACKUP LMP FEED - ON; tb - gray
BAT 5 NORMAL LMP FEED-OFF/RESET; tb-b/p
BAT 6 NORMAL CDR FEED-OFF/RESET; tb-b/p
POWER/TEMP MON SEL - LMP BUS, CDR BUS
- 5 LMP BAT 1 HI V - ON; tb - gray
(VERIFY BAT 1 CURRENT)
LMP BAT 2 - ON; tb - gray
(VERIFY BAT 2 CURRENT)
CDR BAT 3 - ON; tb - gray
(VERIFY BAT 3 CURRENT)
CDR BAT 4 HI V - ON; tb - gray
(VERIFY BAT 4 CURRENT)
BAT 5 BACKUP CDR FEED-OFF/RESET; tb-b/p
BAT 6 BACKUP LMP FEED-OFF/RESET; tb-b/p
- 6 CB (16) EPS: ASC ECA CONT - OPEN
- 7 RECORD & REPORT ED BAT VOLTAGE TO MSFN
BAT A _____
BAT B _____

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***** SS - 98:59 *****

98:59

P52 ALIGN

- 1 CB(11) AC BUS B: AOT LAMP - Close
V37E 52E
F 04 06 R2 00003
PRO
- 2 F 50 25 R1 00015
V32E
- 3 F 01 70 R1 00XXX (Load Star Code 343)
PRO (137)
- 4 F 06 79 CUR/Spir (.01°), PRO
- 5 F 01 71 R1 00XXX (Verify Detent)
PRO
- 6 F52/3 71 MARK, Load Cur/Spir, PRO
PRO, To 3 For 2nd Star (RECORD GET)
- 7 F 06 05 STAR Angle Difference (.01°)
PRO

2-20

- 8 F 06 93 XYZ Torquing Angles (.001°)
PRO (Gyro Torquing)
- 9 F 50 25 R1 00014
ENTR
OOE
AOT-CL, ANGLE - 0000 (PUSHED IN)
- 10 CB(11) AC BUS B: AOT Lamp - Open
Notify CSM Min Deadband No Longer Required

99:09

RCS PRESSURIZATION

- 1 RECYCLE: SYS A&B ASC FEED 2(2) - CLOSE
SYS A&B ASC FEED 1(2) - OPEN
SYS A&B ASC FUEL & ASC OXID - tb (4) Remain - bp
- RECYCLE: CRSFD-CLOSE
: MAIN SOV SYS A&B - OPEN
HTR CONT TEMP MON - Check RCS QUADS (>120°)
- 2 TEMP/PRESS MON - He (2820-3280 psia)
PRPLNT (40°-100°/10-50 psi)
FUEL MANF (25-90 psi)
OXID MANF (25-90 psi)
RCS QUANTITY A&B - 100%

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- 3 CB(16) LOGIC PWR B - Open
 MASTER ARM - ON (SYS A Lt - ON)
 HE PRESS RCS - FIRE
 (RCS A&B REG Warning Lts - Off)
 MASTER ARM-OFF (SYS A Lt - OFF)

- 4 RECYCLE: SYS A&B ASC FEED 2(2) - CLOSE
 : SYS A&B ASC FEED 1(2) - OPEN
 : CRSFD - CLOSE
 : SYS A&B MAIN SOV-OPEN
 CB(16) LOGIC PWR B - CLOSE

- 5 TEMP/PRESS MON - OXID MANF (175-188 psi)
 - FUEL MANF (175-188 psi)
 - PRPLNT (40°-100°/178-188 psi)
 - He (2750-3200 psi)

***** UD - 1:00 (99:14) *****

2-22

99:14

*RCS CHECKOUT

- 1 GUID CONT - PGNS
ATT/TRANSL - 4 JET
ATT CONT (3) - PULSE
MODE CONT (Both) - ATT HOLD (PGNS SW Guard - 6 O'Clock)
(NO DAP Lt - OFF)
ACA/4 JET (CDR) - DISABLE
TTCA (BOTH) - JETS
Verify HBR With MSFN & CSM In
Wide Deadband & Attitude Hold
QUAD Flags - Red & RCS TCA Lt - on will
occur during cold fire checks

- 2 TTCA (Cold Fire) Check
V76E (NO DAP Lt - ON)
V11N10E, 5E
CDR TTCA
UP (+X) - R1 00252 (4 Flags)
DN (-X) - 00125 (4 Flags)
Repeat For LMP
E, 6E
RIGHT (+Y) - R1 00220
LEFT (-Y) - 00140
FWD (+Z) - 00011
AFT (-Z) - 00006

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- 3 PGNS RATE CMD (Cold Fire), AGS PULSE (Cold Fire) Check
CB(11) ATT DIR CONT - CLOSE
V77E (NO DAP Lt - OFF)
V15 NOTE, 42E

CDR ACA (To Soft Stop, Pause 2 sec At Null)
ROLL RIGHT R3 00045-00057
ROLL LEFT 77720-77732
PITCH UP R1 00045-00057
PITCH DN 77720-77732
YAW RIGHT R2 77720-77732
YAW LEFT 00045-00057

- 4 AGS RATE CMD (Cold Fire), 4 JET SEC
COIL (Hot Fire) Check

Verify CMC MODE - FREE
GUID CONT - AGS
ATT CONT (3) - MODE CONT
ACA/4 JET (CDR) - ENABLE
CDR ACA (Deflect Slowly To Hardover, Pause 2 sec At Null)
ROLL - RIGHT
ROLL - LEFT
PITCH - UP
PITCH - DN
YAW - RIGHT
YAW - LEFT

5 PGNS MIN IMP (Hot Fire) Check

GUID CONT - PGNS

V76E (NO DAP Lt-ON)

CB(11) RCS SYS A: QUAD TCA (4) - Close

CB(16) RCS SYS B: QUAD TCA (4) - Close

CB(16) INST: CWEA - Open Then Close

(RCS TCA Lt - OFF
QUAD FLAGS (8) - Gray)

V11N10E, 31E R1 67777

CDR ACA (Out Of Detent (2 1/2°), Pause 2 sec At Null)

ROLL RIGHT - R1 27757

ROLL LEFT - R1 27737

YAW RIGHT (Twice) - R1 27767

YAW LEFT (Twice) - R1 27773

V48E, V21E, 31022E, PRO, V34E

V11N10E, 31E

CDR ACA (Out of Detent (2 1/2°), Pause 2 sec At Null)

PITCH UP - R1 27776

PITCH DN - R1 27775

Notify CSM Hot Fire Checks Complete

CSM - WIDE Deadband ATT/Hold

6 V37E OOE

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99:23

RNDZ RDR SELF TEST

- 1 CB(11) RR(2) - Close (NO TRACK Lt-On)
Verify: CSM RCS Thruster B3 - Off
 : Radar Xponder - Off
RNDZ RDR ANT - Pull Pin & Release
X-POINTERS (Both) - HI MULT
RATE/ERR MON (Both) - RNDZ RADAR
ATTITUDE MON (Both) - PGNS
MODE SEL - LDG RDR
- 2 RNG/ALT MON - RNG/RNG RATE
SHIFT/TRUN - +50°
RR MODE - SLEW
TEMP MONITOR - RNDZ (+10° To +50°)
RR GYRO SEL-SEC
CB(11) AC BUS A: RNG/RNG RT/ALT/ALT
 RT - Close
FLIGHT DISPLAYS: RNG/RNG RT/ALT/ALT RT-
 Close

99:23

DROGUE AND PROBE INSTALLATION

- 1 Verify:
 Both Electrical Umbilicals Removed
 Drogue Lock Lever Engaged & Flush
 Three Capture Latches Engaged & Locked
 LM Hatch Exterior Insulation O.K.
 Flaps Secured Around Handles
- 2 Close & Secure Hatch
 CABIN DUMP (OVHD) - AUTO & LOCKED
 PRESS REG A&B - CABIN
 Secure LEVA Bags On Engine Cover

- 3 SLEW RATE-HI
 Slew Left To Mode I Region (+Z) (18 sec)
 Slew Right, Down, Left, Up
 (FDAI Needles Right, Down, Left, Up)
 SLEW RATE - LO
 SHFT/TRUN - +5°
 Slew Right, Down, Left, Up
 (FDAI Needles Right, Down, Left, Up,
 1°/sec: X-Pointer-3 mr/sec)
- 4 RR MODE - AUTO TRACK
 RADAR TEST - RNDZ (Rng Rt Tape Drives
 To -478 to -518 fps, X-Pointers Oscillate
 and FDAI Needles Vary Between +5°.
 After 12 sec Rng Tape Drives to
 194 to 197NM, NO TRACK & PWR FAIL Lts-Off)
- TEST MONITOR - AGC (1.4 To 1.9)
 - XMTR (3.3 To 3.8)
 - SHAFT ERR (2.2 To 2.6
 @1/2cps)
 - TRUN ERR (2.2 To 2.6
 @1/2 cps)
 - AGC

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2-27

- 6 Set NORRMON Flag
V25 N07E
101E, 10E, 1E
RR MODE - LGC (NO TRACK Lt - On)

Wait 10 sec
- 7 V63E Start RR Self Test
F 04 12
R1 00004 Specify Radar
R2 00001 Rndz Radar
PRO

TRACKER & NO TRACK Lt-On (Off After 12 sec)
- 8 F 16 72 TRUN, SHAFT (.01°)
R1 Varying At 1/2 cps
R2 Varying At 1/2 cps
PRO
- 9 F 16 78 RANGE, RANGE RATE, TFI (.01nm,
.1fps, min-sec)
R1 +195.29 To +195.69 (TM Within +1.2
of R1)
R2 -0480.0 To -0520.0 (TM=R2-2)
- 10 V34E (PWR FAIL & NO TRACK Lt-On,
X-PNTR-Center)

- 11 RADAR TEST -OFF
- 12 V40 N72E RR CDU ZERO (10 sec)
SHFT/TRUN - +50°
- 13 V41 N72E (+04000, +04000)
F 04 12
PRO
V16N72E
- 14 SHFT/TRUN - +5°
RR GYRO SEL - PRIM
V41 N72E (+35600, +35600)
F 04 12
PRO
V16N72E
- V41 N72E (+00000, +28300)
F 04 12
PRO
V16N72E
CB(11) RR(2) - Open
(NO TRACK Lt-Off)
V44E
RR MODE - SLEW
Notify CSM That Thruster B3-Off, And
Radar Xponder-Off Are No Longer Required

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***** GO/NO GO FOR UNDOCKING *****

99:27

- 1 Match Indicated Angles
- TRACK MODE - SLEW
- S-BD ANT-AFT
- Set P _____ (+41)
- Y _____ (-55)

VHF B XMTR - DATA
 BIOMED-OFF, PCM-LO
 UPLINK SQUELCH - ENABLE
 RANGE - RANGE

***** LOS (99:29) *****

99:33

Reconfigure O2 Hoses (R/R & B/B)
 Verify Cap Off PGA Relief VLV
 Don Helmet & Gloves

99:33

Reconfigure O2 Hoses (R/R & B/B)
 Verify Cap Off PGA Relief VLV
 Don Helmet & Gloves

***** UD -:30 (99:44) *****

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- 7 SUIT CIRCUIT RELIEF - AUTO
CABIN GAS RETURN - AUTO
PRESS REG A - CABIN
SUIT GAS DIVERTER -PUSH/CABIN
(CABIN PRESS WILL RISE TO 4.6-5.0 psia IN
APPROXIMATELY 5 MIN.)
CB(16) ECS: CABIN REPRESS - CLOSE

99:55

RATE GYRO CHECK

- 1 Verify CSM Holding Attitude
GYRO TEST - POS RT (RPY RATE +5°/sec)
GYRO TEST - NEG RT (YPR RATE -5°/sec)
- 2 RATE SCALE-5°/SEC
REPEAT Tests
- 3 Notify CSM ATT/Hold No Longer Required

***** UD - :15 (99:59) *****

100:00

PREP FOR UNDOCKING

- 1 S-BD-PM, SEC, PRIM, VOICE,
PCM, RANGE
VHF-VOICE, ON, DATA, ON, OFF, LO
AUDIO (Both): VHF A-T/R
: VHF B-RCV

- 2 MISSION TIMER-SET
EVENT TIMER-SET, Count DN to 100:13:56 (Undocking)
OVHD HATCH-LOCKED
OVHD CABIN RELIEF & DUMP - AUTO
PRESS REG A&B - CABIN

- 3 RATE ERR MON (CDR) - LDG RDR/CMPTR
ATTITUDE MON (CDR) - PGNS
GUID CONT - PGNS
MODE SEL - LDG RADAR
RNG/ALT MON - RNG/RNG RT
RATE SCALE - 5°/SEC
ATT/TRANSL - 4 JET
BAL CPL - ON
RATE ERR MON (LMP) - LDG RDR/CMPTR

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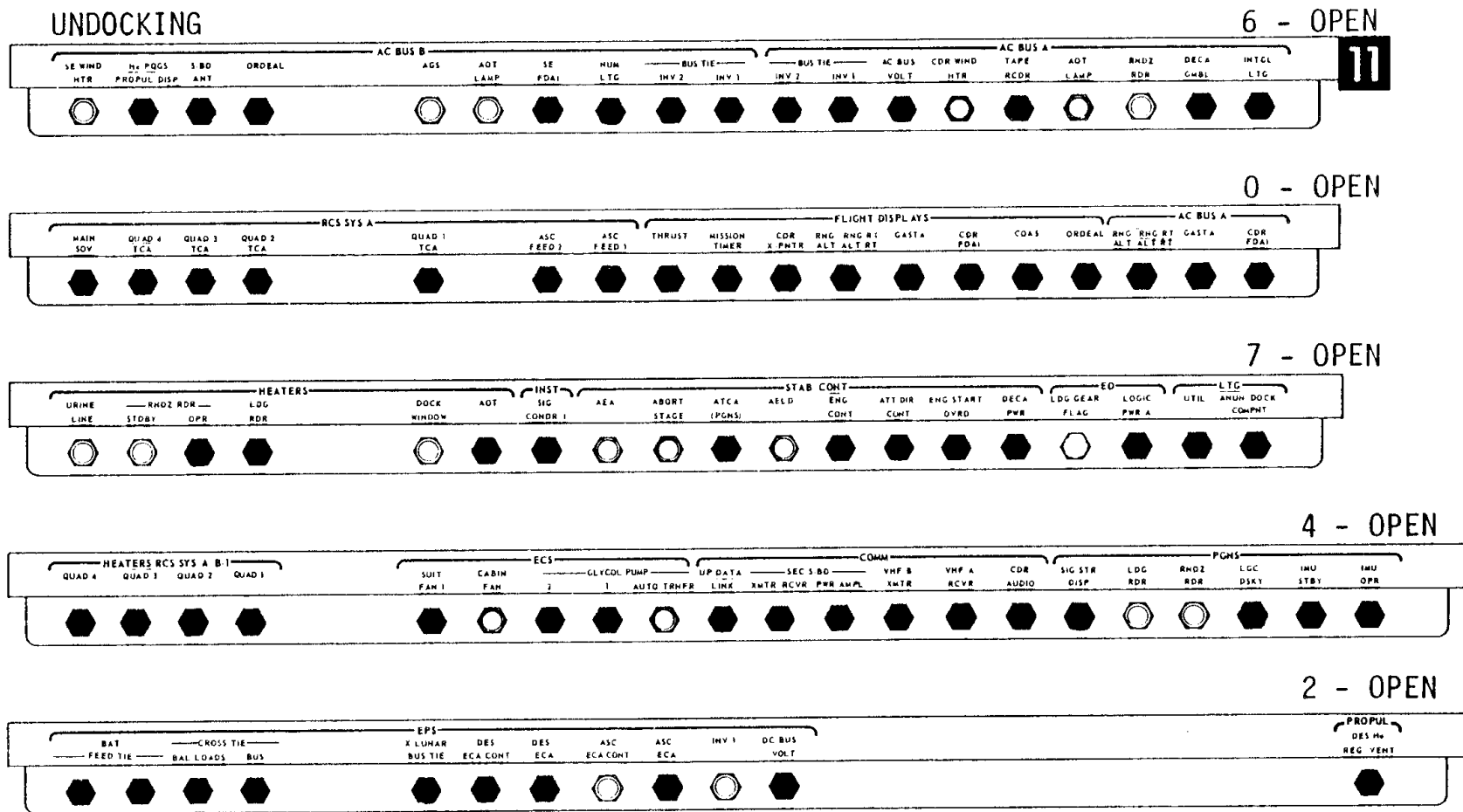
DATE 6/14/71

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ATTITUDE MON (LMP) - PGNS
RR MODE - SLEW
DEADBAND - MIN
ATTITUDE CONTROL (3) MODE CONT
MODE CONT (Both) - ATT HOLD
TTCA (Both) - JET

- 4 Mount Camera On Window Bar
LM 3 /DAC/10/CEX (AA) - ULC
(T8,250, ∞) 6 fps, .06 Mag (1 min)
LM /DC/60/HCEX (KK)
(f11,250,focus) 10 Pictures
Mount TIMELINE Book
- 5 Configure CB Panels Per UNDOCKING Chart
And Then Go To LM TIMELINE BOOK

UNDOCKING



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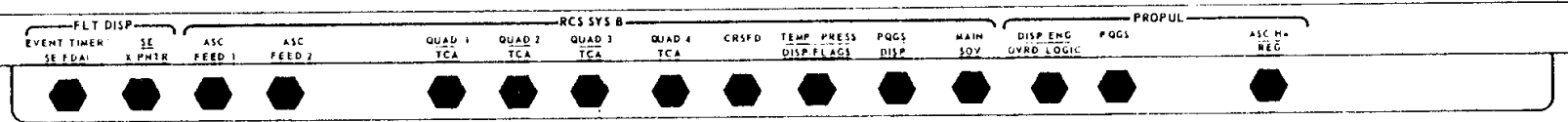
DATE 6/14/71

2-37

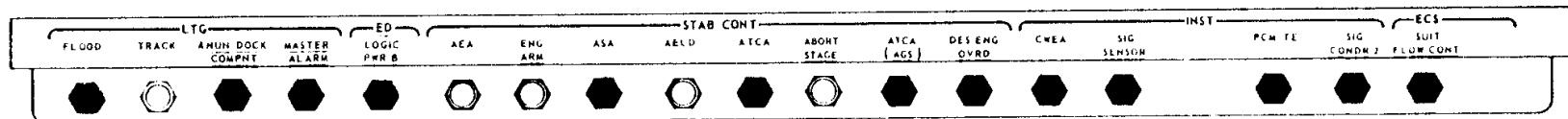
UNDOCKING

16

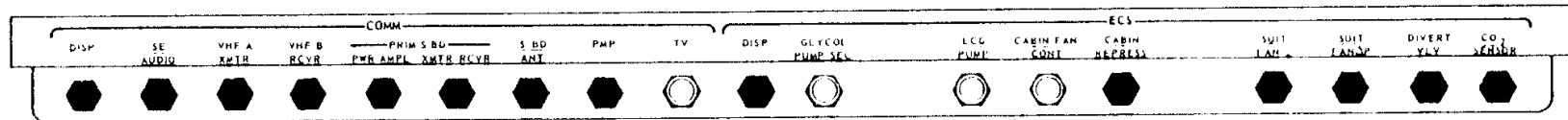
0 - OPEN



5 - OPEN



4 - OPEN



3 - OPEN

