



PDRS OPS CHECKLIST

STS

8

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RMS POWERUP

RMS POWERUP

(Assumes RMS in TEMP MONTR)

- RMS POWERUP**
- 1 PLB LTS, CCTV ACT
- A7 PL BAY FLOOD - as reqd
- Perform TV ACT, VTR ACT, TV/VTR/DAC
Cue Card
- TV CAMR PWR as reqd - ON
- ✓Physical integrity of arm, EE, blankets
- 2 RMS SEL (IDLE MODE)
- ✓BRAKES - ON (tb-ON)
- ✓RMS SEL - OFF
- ✓PWR - PRI
- CRT SM 94 PORS CONTROL
- ✓I/O ON, ITEM 5 - (*)
- ✓ENA, ITEM 9,11 - (*)
- RMS SEL - PORT (if cradled, MA,
C/W RCH LIM It-on (SP,EP),
SINGULAR It-on (EP))
- ✓SAFING tb - gray

3 DEPLOY/RELEASE ARM

R13L PL BAY MECH PWR SYS (two) - ON
PORT RMS - DPY (tb-DPY) (34 sec max), then
- OFF

PORT RMS RETEN LAT - REL (tb-REL)
(8 sec max), then
- OFF

R13L PL BAY MECH PWR SYS (two) - OFF

4 ARM UNCRADLE

PARAM sel - JOINT ANGLE

BRAKES - OFF (tb-OFF)

Until clear of MPMs:

RATE sw - VERN (RATE MIN tb-on)

MODE - SINGLE, ENTER

SINGLE DR to approx:

	SY	SP	EP	WP	WY	WR
1	0	0	0	+5	0	0
2			+1			
3		+25				
4			-25			

BRAKES - ON (tb-ON)

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RMS
C/O

RMS CHECKOUT

RMS CHECKOUT

(Required only on first RMS deployment)

RMS
C/O

1 PANEL LIGHTING TEST

PARAM sel - TEST (MA) (30 sec max)

✓IND 1,2,3 - +8.8.8.8

✓All pnl AB lts - on

2 TV CAMERA CHECKOUT

TV CAMR PWR A,B,C,D,RMS - ON

✓Each camera for proper operation

TV CAMR PWR as reqd - OFF

3 JOINT DRIVE TEST

PARAM sel - JOINT ANGLE

BRAKES - OFF (tb-OFF)

MODE - SINGLE, ENTER

SINGLE DR to approx:

	SY	SP	EP	WP	WY	WR
1	0	+25	-25	+5	0	0
2				-45		
3					-15	

SY, WR - each joint in turn

SINGLE DR - '+/-'

✓Motion visually for correct phasing

BRAKES - ON (tb-ON)

4 EE CHECKOUT

A7

CCTV - MON 2 - B
Adjust Camera B to view inside of EE

BRAKES - OFF (tb-OFF)
MODE - SINGLE, ENTER
EE MODE - MAN



red ON VTR

EE CAPTURE sw - depress (hold until CLOSE
tb-gray) (3 sec max)



EE MAN CONTR - RIGID (hold until RIGID
tb-gray) (20 sec max)



EE MAN CONTR - DERIGID (hold until DERIGID
:b-gray) (5 sec max)



EE RELEASE sw - depress (hold until OPEN
tb-gray) (3 sec max)



EE MAN CONTR - DERIGID (hold until EXTEND
tb-gray) (20 sec max)



EE MODE - AUTO
EE CAPTURE sw - depress (nom)



EE MODE - OFF
BRAKES - ON (tb-ON)

5 B/U DRIVE AND PAYLOAD RELEASE TEST

✓B/U PL REL - OFF
RMS SEL - OFF

RMS PWR - B/U
SEL - PORT

B/U PL REL - ON

✓Visually snares open and lying in grooves
B/U PL REL - OFF ..

B/U JOINT - each joint in turn
DR - '+/-'

✓Motion visually for correct phasing

6 RECONFIGURE TO PRIMARY POWER

RMS SEL - OFF
PWR - PRI (MA)

CRT

SM 94 PDRS CONTROL
I/O ON - ITEM 5 EXEC

RMS SEL - PORT
SAFING - CANCEL (tb-gray)

7 AUTO RELEASE CHECK



EE MODE - MAN
EE CAPTURE sw - depress (hold until CLOSE
tb-gray) (3 sec max)



EE MAN CONTR - RIGID (hold until RIGID
tb-gray) (20 sec max)



EE MODE - AUTO
EE RELEASE sw - depress (mom)
(after - 20 sec)



EE MODE - OFF ** VTR-STOP

8 HAND CONTROLLER CHECK

BRAKES - OFF (tb-OFF)
MODE - TEST, ENTER

RHC, THC - each axis in turn,
deflect hand controller hard over
✓ There is no arm movement, actual rates are
zero. Commanded rates: THC - $\sqrt{\text{rate meter}}$,
RHC - $\sqrt{\text{SPEC 96}}$ - proportional to deflection

BRAKES - ON (tb-ON)

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RMS
POWERDOWN

RMS POWERDOWN

RMS POWERDOWN

1 ARM CRADLE

PRE-CRADLE Ref: (0, 25, -25, +5, 0, 0)

X	Y	Z	P	Y	R
-1261	-146	-551	5	2	0

NOTE

C/W SINGULAR lt - on (MA) (EP = -7.6)

REACH LIM lt - on (MA) (EP = -2.4)

(SP = +2.6)

When S/W STOP tb - bp (EP = -0.4)

Then MODE - SINGLE, ENTER

BRAKES - OFF (tb-OFF)

When near NPMs:

RATE sw - VERN

MODE - SINGLE, ENTER

SINGLE DR to:

	SY	SP	EP	WP	WY	WR
1	0	+25	-25	+5	0	0
2			+1(MA)			
3		0(MA)				
4			0			
5				0		

✓PORT RMS R-F-L tb (three) - gray

BRAKES - ON (tb-ON)

2 LATCH/STOW ARM

R13L

PL BAY MECH PWR SYS (two) - ON

✓PORT RMS R-F-L tb (three) - gray

PORT RMS RETEN LAT - LAT (tb-LAT)

(8 sec max)

- OFF

PORT RMS - STOW (tb-STO) (34 sec max)
- OFF

R13L PL BAY MECH PWR SYS (two) - OFF

3 CCTV, PLB LTS DEACT

PLB FLOOD (six) - OFF, as reqd
Perform TV DEACT, VTR DEACT, TV/VTR/DAC
Cue Card
CAMERA PWR (five) - OFF, as reqd

4 RMS TEMP MON

✓BRAKES - ON (tb-UN)

RMS SEL - OFF
✓RMS PWR - PRI

CRT

SM 94 PDRS CONTROL
✓I/O ON - ITEM 5(*)

PARAM sel - PORT TEMP
JOINT - CRIT TEMP

NOTE ..
Steps 5,6 performed only ..
if RMS to be completely ..
POWERED DOWN WITHOUT HTRS ..

5 RMS POWERDOWN

RMS PWR - OFF
PORT RMS HTR - OFF

6 ORBITER/PDRS AC POWERDOWN

MA73C:F cb AC1 RMS PRI ϕ A - op
 cb AC2 RMS B/U ϕ A - op

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ACTIVATE TEMP MONITOR

TEMP
MONITOR

ACTIVATE TEMP MONITOR

017 ✓MEC (two) - OFF

CRT

SM GPC MEMORY
✓LAUNCH I, ITEM 16 assigned
to SM GPC

✓RMS SEL - OFF

✓RMS PWR - OFF

RMS PWR - PRI (MA)

CRT

SM 94 PDRS CONTROL (MA, GPC DATA It-on,
If calling SPEC 94 for first time)
I/O ON - ITEM 5 EXEC

SAFING - CANCEL (tb-bp) (✓GPC DATA It-off)

PARAM sel - PORT TEMP

JOINT - CRIT TEMP

Record ary out of limit temps

TEMP
MONITOR

CONTINGENCY OPERATIONS

CONTINGENCY OPERATIONS

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RMS JETTISON (may include PL)NOTE

For RMS JETTISON procedure (5-2 thru 5-11), CDR activities are now on even numbered pages and PLT activities on odd numbered pages

NOTE

Jettison between sunrise and noon if possible

CDRAUTO MNVR TO -XLV

CRT

|GNC UNIV PYG|

✓ START TIME at least 15 min prior to sunrise

✓ TGT ID +2

BODY VECT +2

GM +0

Initiate TRK

A6U

DAP: A/AUTO/VERN

014,

015,

016

A6U

✓ RJD DRIVER (nine) - ON

FLT CNTLR PWR - ON

EVENT TIMER MODE - UP

CNTL - STOP

TIMER - RESET

A7U

✓ Lighting - as reqd

CRT

When in attitude, then

|GNC 33 REL NAV|

AVG 5 ON - ITEM 1 EXEC (*)

When PLT confirms CCTVs configured to monitor jettison, then proceed to 5-8

PLT

POWER UP RMS PYROS

A14 ✓BRAKES - ON (tb-ON)
 ✓PYRO PORT RMS (five) - SAFE
 ✓RMS LAT - SAFE

ML86B cb MNB PYRO JETT SYS A PORT RMS - c1
 cb MNC PYRO JETT SYS B PORT RMS - c1

IF NPM FAIL (Latches go with RMS)

R13L ✓PL BAY MECH PWR SYS (two) - OFF
 ✓PORT RMS RETEN LAT tb - LAT
 A14 RMS LAT - DEADFACE
 ✓PORT RMS RETEN LAT tb - bp
 PYRO PORT RMS ARM - GUILLOTINE
 Wait 1 sec, then
 PYRO PORT RMS LAT (three) - GUILLOTINE
 - SAFE
 ARM - JETT
 Wait 1 sec, then
 PYRO PORT RMS LAT (three) - JETT
 - SAFE
 or ARM - SAFE

PARAM sel - JOINT ANGLE
 BRAKES - OFF (tb-OFF)
 MODE - SINGLE, ENTER

Drive to:

	SY	SP	EP	WP	WY	WR
1	0	+45	0	0	0	0
2	-45		-45			

BRAKES - ON (tb-ON)

Go to POWER DOWN MRL AND RMS, 5-7

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PLT

R13L
AB

R13L

IF MRL FAIL (Latches stay with MPM)
PL BAY MECH PWR SYS (two) - ON
PORT RMS RETEN LAT - REL (tb-REL)
- OFF

PL BAY MECH PWR SYS (two) - OFF
PARAM sel - JOINT ANGLE
BRAKES - OFF (tb-OFF)
MODE - SINGLE, ENTER

Drive to:

SY	SP	EP	WP	WY	WR
-45	+45	-45	0	0	0

BRAKES - ON (tb-ON)

Go to POWER DOWN MRL AND RMS, 5-7

IF EE FAIL TO RELEASE (PL goes with RMS)

PARAM sel - JOINT ANGLE
BRAKES - OFF (tb-OFF)
MODE - SINGLE, ENTER

Drive to:

SY	SP	EP	WP	WY	WR
-45	+45	-45	0	0	0

BRAKES - ON (tb-ON)

Go to POWER DOWN MRL AND RMS, 5-7

IF JOINT DRIVE FAIL (PL goes with RMS if still grappled)

Consult NCC for mode capability
and joint configuration for jettison
PARAM sel - JOINT ANGLE

MODE - _____

Drive to:

SY	SP	EP	WP	WY	WR

✓BRAKES - ON (tb-ON)

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POWER DOWN MRL AND RMS
R13L ✓ PL BAY MECH PWR SYS (two) - OFF
A14 RMS LAT - DEADFACE
AB ✓ PORT RMS RETEN LAT tb - bp
 ✓LAT - OFF
PORT RMS HTR - OFF
RMS SEL - OFF
PWR - OFF

GUILLOTINE WIRES AT SHOULDER
A14 PYRO PORT RMS ARM - GUILLOTINE
Wait 1 sec, then
PYRO PORT RMS SHLDR - GUILLOTINE
 - SAFE
 ARM - SAFE

CONFIGURE CCTVs TO MONITOR JETTISON
A7U CCTV MON 1 - A
 2 - B
POINT B CCTV AT RMS SHOULDER JOINT
Put new tape in VTR

CDR
SUNRISE
A6U

JETTISON

DAMP RATES

DAP ROT: DISC/DISC/DISC

TRANS: PULSE/PULSE/NORM

If VERN jets avail

| DAP: A/MAN/VERN

If VERN jets not avail

DAP: B/MAN/NORM

Wait until rates damped, then

DAP: A/MAN/NORM

✓SENSE - as reqd

NOTE

After JETT, initiate opening rate
ASAP. Minimize other THC/RHC inputs

START TIMER

EVENT TIMER CNTL - START

JETT+

0:01

WHEN JETTISON COMPLETE, TRANSLATE AWAY

THC +Z, 2 sec (1 ft/sec)

(-X sense: THC dn)

(-Z sense: THC out)

2:00

SECOND SEP BURN

SENSE - as reqd

THC +Z, 2 sec (1 ft/sec)

(-X sense: THC dn)

(-Z sense: THC out)

Maintain visual contact with RMS in OVHD
window using RHC

When RMS no longer visible, then

PLT
SUNRISE

JETTISON

When rates damped, then
VTR - PLAY/RCD/RUN

A14

When Timer started, then
PYRO PORT RMS ARM - JETT

JETT

Wait 1 sec, then
PYRO PORT RMS SHLDR - JETT ..

Maintain RMS in B CCTV

CDR

CLEANUP

CRT

GNC 33 REL NAV
AVG G ON - ITEM 1 EXEC (no *)
(Turns AVG G off)

GNC UNIV PYG

✓ START TIME in past

✓ TGT ID +2

BODY VECT +3

✓ DM +0

Initiate TRK

A6U

DAP: A/AUTO/VERN

014,
015,
016

✓ All primary RJD DRIVER (eight) - as reqd

A7U

✓ Lighting - as reqd

PLT

CLEANUP
VTR - STOP

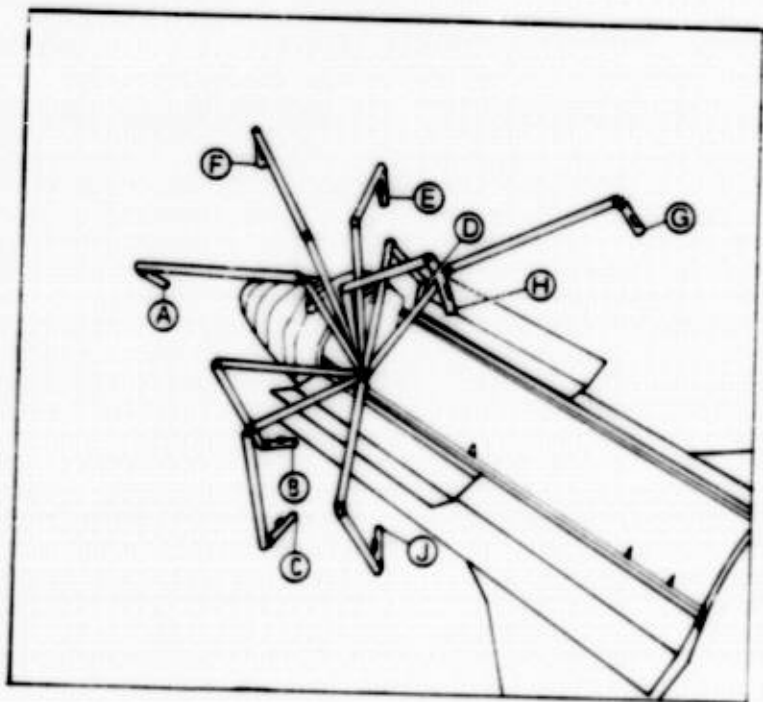
A14 RMS LAT - SAFE
PYRO PORT RMS SHLDR - SAFE
ARM - SAFE
ML86B cb MNB PYRO JETT SYS A PORT RMS - OD
cb MNC PYRO JETT SYS B PORT RMS - OD

EXTERIOR
SURVEYS

.....If no MPM fail.....
. R13L PL BAY MECH PWR SYS (two) - ON .
. AB PORT RMS - STOW (tb-STO) .
. - OFF .
. R13L PL BAY MECH PWR SYS (two) - OFF .
.....

EXTERIOR SURVEYS' ARM CONFIGURATIONS

EXTERIOR
SURVEYS



EXTERIOR SURVEY (CONFIGURATION A)

(Port side, Orbiter nose)

SETUP

CRT | GNC UNIV PYG |
TGT ID +2 (earth)
BODY VECT +5
P +0 } -YLV
Y +270 }
OM | | - per MCC

A6 DAP: A1/AUTO/VERN
Initiate TRK

A7 CCTV - MON 1 - B
- MON 2 - RMS/Wrist (ZOOM OUT)
- VTR RCD - RMS/Wrist
ALC, GAMMA - NORM

R11(OV099) VTR - ✓Tape
L12(OV102)

PARAM sel - JOINT ANGLE
BRAKES - OFF (tb-OFF)
MODE - SINGLE, ENTER

SINGLE DR to:

Tol: ± 1 deg

	SY	SP	EP	WP	WY	WR
1	90	45	-10	-100	20	140
2		81				
3			-80			
4	152					

BRAKES - ON (tb-ON)

SURVEY

BRAKES - OFF (tb-OFF)

MODE - SINGLE, ENTER

A7 Adjust ALC, GAMMA, as reqd

R11(OV099) RMS SPOT PORT - ON, as reqd

L12(OV102) VTR pb - PLAY,RCD

SINGLE DR to:

	SY	SP	EP	WP	WY	WR
1	152	81	-80	-110	20	140
2				<u>-100</u>		

BRAKES - ON (tb-ON)

R11(OV099) VTR pb - STOP

L12(OV102)

RECONFIGURE

BRAKES - OFF (tb-OFF)

MODE - SINGLE, ENTER

If continuing exterior survey

SINGLE DR to:

or

	SY	SP	EP	WP	WY	WR
1	<u>90</u>	81	-80	-100	20	140

BRAKES - ON (tb-ON)

Go to next survey configuration

If survey finished

SINGLE DR to:

	SY	SP	EP	WP	WY	WR
1	<u>0</u>	81	-80	-100	20	140
2		<u>45</u>				
3			<u>-30</u>			

BRAKES - ON (tb-ON)

RMS SPOT PORT - OFF

A7

Mnvr back to attitude per CAP

EXTERIOR SURVEYS (CONFIGURATION B,C)

(Orbiter underbody, landing gear)

SETUP

CRT

| SM 94 PDRS CONTROL |
 ✓SOFT STOP, ITEM 7 - ENA
 ✓AUTO BRAKE, ITEM 9 - ENA

| GNC UNIV PTG |
 TGY ID +2 (earth)
 BODY VECT +5
 P +270 } +ZLV
 Y +0 }
 OM | | - per MCC

A6

DAP: A1/AUTO/VERN
 Initiate TRK

A7

CCTV - MON 1 - B
 - MON 2 - RMS/Wrist
 - VTR RCD - RMS/Wrist
 ALC, GAMMA - NORM

R11(OV099)

VTR - ✓Tape

L12(OV102)

RATE sw - VERN
 PARAM sel - JOINT ANGLE
 BRAKES - OFF (tb-OFF)
 MODE - SINGLE, ENTER

SINGLE DR to:

Tot: ±1 deg

	SY	SP	EP	WP	WY	WR
1	0	45	-10	110	90(MA)	0
2	145					
3		30				

BRAKES - ON (tb-ON)

L9,R10,
 05,09,
 A13,M042F

A11 AUD A/A - RCV (IF SINGLE USED) **

SURVEY

CAUTION UHF XMIT MUST BE INHIBITED IF SINGLE MODE
--

A7 Adjust ALC, GAMMA, as reqd
 RMS SPOT PORT - ON, as reqd
 R11(OV099) VTR pb - PLAY,RCD
 L12(OV102)

BRAKES - OFF (tb-OFF)
 MODE - SINGLE, ENTER

SINGLE DR to:

Tot: +1 deg

	SY	SP	EP	WP	WY	WR
1	145	10	-10	110	90	0
2			-100			
3						180
4				-110		
5					30	
6				-105		
7					50	
8					-15	
9				-100		
10					-45	
11			-10			
12		30				
13	90					
14			-105			
15				-105		
16					45	
17					-90(MA)	

BRAKES - ON (tb-ON)
 R11(OV099) VTR pb - STOP
 L12(OV102)

RECONFIGURE

BRAKES - OFF (tb-OFF)

MODE - SINGLE, ENTER

If continuing exterior survey

SINGLE DR to:

	SY	SP	EP	WP	WY	WR
1	90	30	-10	-105	-90	180
2		45				

or

BRAKES - ON (tb-ON)

REENABLE UHF TRANSMITTER

ATT AUD A/A - Y/R ..

L9,R10,
05,09,
A13,M042F

Go to next survey configuration

If survey finished

SINGLE DR to:

	SY	SP	EP	WP	WY	WR
1	90	30	-10	-105	-90	180
2		45				
3	0					

BRAKES - ON (tb-ON)

REENABLE UHF TRANSMITTER

ATT AUD A/A - Y/R ..

L9,R10,
05,09,
A13,M042F

A7

RMS SPOT PORT - OFF

Mnvr back to attitude per CAP

EXTERIOR SURVEY (CONFIGURATION D)

(Stbd side. wing leading edge)

SETUP

CRT

SM 94 PDRS CONTROL
 ✓SOFT STOP, ITEM 7 - ENA
 ✓AUTO BRAKE, ITEM 9 - ENA

TGT ID +2 (earth)
 BODY VECT +5
 P +0 | +Y_{LV}
 Y +90 |
 OM - per MCC

A6

DAP: A1/AUTO/VERN
 Initiate TRK

A7

CCTV - MON 1 - A
 - MON 2 - RMS/Wrist (ZOOM OUT)
 - VTR RCD - RMS/Wrist
 ALC, GAMMA - NORM

R11(OV099)
 L12(OV102)

VTR - ✓Tape

RATE sw - VERN
 PARAM sel - JOINT ANGLE
 BRAKES - OFF (tb-OFF)
 MODE - SINGLE, ENTER

SINGLE DR to:

Tot: +1 deg

	SY	SP	EP	WP	WY	WR
1	<u>-90</u>	<u>30</u>	<u>-30</u>	<u>-110</u>	<u>60</u>	<u>180</u>
2	<u>-120</u>					
3			<u>-78</u>			
4		<u>12</u>				

BRAKES - ON (tb-ON)

SURVEY

BRAKES - OFF (tb-OFF)

MODE - SINGLE, ENTER

A7

Adjust ALC, GAMMA, as reqd

RMS SPOT PORT - ON, as reqd

R11(OV099)

VTR pb - PLAY,RCD

L12(OV102)

SINGLE DR to:

	SY	SP	EP	WP	WY	WR
1	-120	12	-78	-110	-75(MA)	180

BRAKES - ON (tb-ON)

R11(OV099) VTR pb - STOP

L12(OV102)

RECONFIGURE

BRAKES - OFF (tb-OFF)

MODE - SINGLE, ENTER

If continuing exterior survey

SINGLE DR to:

or

	SY	SP	EP	WP	WY	WR
1	-120	<u>30</u>	-78	-110	-75	180
2			<u>-30</u>			
3	<u>-90</u>					

BRAKES - ON (tb-ON)

Go to next survey configuration

If survey finished

SINGLE DR to:

	SY	SP	EP	WP	WY	WR
1	-120	<u>30</u>	-78	-110	-75	180
2			<u>-30</u>			
3	<u>0</u>					

BRAKES - ON (tb-ON)

RMS SPOT PORT - OFF

A7

Mnvr back to attitude per CAP

EXTERIOR SURVEY (CONFIGURATION E)

(Stbd side, nose)

SETUP

CRT

GNC UNIV PTG
TGT ID +2 (earth)
BODY VECT +5
P +0
Y +90
OM <u> </u> - per MCC

A6

DAP: A1/AUTO/VERN
Initiate TRK

A7

CCTV - MON 1 - C
- MON 2 - RMS/Wrist (ZOOM OUT)
- VTR RCD - RMS/Wrist
ALC, GAMMA - NORM

R11(OV199)

VTR - ✓Tape

L12(OV102)

PARAM sel - JOINT ANGLE
BRAKES - OFF (tb-OFF)
MODE - SINGLE, ENTER

SINGLE DR to:

Tol: ±1 deg

	SY	SP	EP	WP	WY	WR
1	-90	45	-30	-110	0	-140
2	-127					
3			-68			
4		43				

BRAKES - ON (tb-ON)

SURVEY

BRAKES - OFF (tb-OFF)
 MODE - SINGLE, ENTER
 Adjust ALC, GAMMA, as reqd
 RMS SPOT PORT - ON, as reqd
 VTR pb - PLAY,RCD

A7

R11(OV099)
 L12(OV102)

SINGLE DR to:

	SY	SP	EP	WP	WY	WR
1	-127	43	-68	-110	-45	-140

BRAKES - ON (tb-ON)

R11(OV099)
 L12(OV102)
 VTR pb - STOP

RECONFIGURE

BRAKES - OFF (tb-OFF)
 MODE - SINGLE, ENTER
 If continuing exterior survey

SINGLE DR to:

or

	SY	SP	EP	WP	WY	WR
1	-127	43	-30	-110	-45	180
2		30				
3	-90					

BRAKES - ON (tb-ON)

Go to next survey configuration

If survey finished

SINGLE DR to:

	SY	SP	EP	WP	WY	WR
1	-127	43	-30	-110	-45	180
2		30				
3	0					

BRAKES - ON (tb-ON)

RMS SPOT PORT - OFF

A7

Mnvr back to attitude per CAP

EXTERIOR SURVEY (CONFIGURATION F)

(Top side, nose - ovhd windows)

SETUP

CRT | GNC UNIV PTG |
TGT ID +2 (earth)
BODY VECT +3 (-Z)
OM | | - per MCC

A6 DAP: A1/AUTO/VERN
Initiate TRK

A7 CCTV - MON 1 - B
- MON 2 - RMS/Wrist (ZOOM OUT)
- VTR RCD - RMS/Wrist

ALC, GAMMA - NORM
R11(OV099) VTR - ✓Tape
L12(OV102)

PARAM sel - JOINT ANGLE
BRAKES - OFF (tb-OFF)
MODE - SINGLE, ENTER

SINGLE DR to:

Tol: ± 1 deg

	SY	SP	EP	WP	WY	WR
1	-90	30	-30	-98	-13	-151
2		<u>94</u>				
3			<u>-100</u>			
4	<u>-134</u>					

BRAKES - ON (tb-ON)

SURVEY

BRAKES - OFF (tb-OFF)
 MODE - ORB UNL, ENTER
 Adjust ALC, GAMMA, as reqd
 RMS SPOT PORT - ON, as reqd
 VTR pb - PLAY, RCD

A7

R11(OV099)

L12(OV102)

Translate +X (THC OUT) to X = -300, then
 return to X = -500

BRAKES - ON (tb-ON)

R11(OV099)

L12(OV102)

VTR pb - STOP

RECONFIGURE

BRAKES - OFF (tb-OFF)
 MODE - SINGLE, ENTER
 If continuing exterior survey

SINGLE DR to:

	SY	SP	EP	WP	WY	WR
or 1	<u>-90</u>	94	-100	-98	-13	151
2			<u>-30</u>			
3		<u>30</u>				

BRAKES - ON (tb-ON)
 Go to next survey configuration

If survey finished

SINGLE DR to:

	SY	SP	EP	WP	WY	WR
1	<u>0</u>	94	-100	-98	-13	151
2			<u>-30</u>			
3		<u>30</u>				

BRAKES - ON (tb-ON)
 RMS SPOT PORT - OFF

A7

Mnvr back to attitude per CAP

**EXTERIOR SURVEYS
CONFIGURATION G (STBD), H (PORT)**

(Top views: Config G-STBD wing; Config H-port wing)

SETUP

CRT |GNC UNIV PYG|
TGT ID +2 (earth)
BODY VECT +3 (-2)
OM | | - per MCC

A6 DAP: A1/AUTO/VERN
Initiate TRK

A7 CCTV - MON 1 - C
- MON 2 - RMS/Wrist (zoom out)
- VTR RCD - RMS/Wrist

ALC, GAMMA - NORM
R11(OV099) VTR - ✓Tape
L12(OV102)

PARAM sel - JOINT ANGLE
BRAKES - OFF (tb-OFF)
MODE - SINGLE, ENTER

If Configuration G
SINGLE DR to:

or	SY (X)	SP (Y)	EP (Z)	WP (P)	WY (Y)	WR (R)
IC	-60	45	-45	-75	35	60
REF	(-950)	(220)	(-700)	(310)	(350)	(0)

If Configuration H
SINGLE DR to:

	SY (X)	SP (Y)	EP (Z)	WP (P)	WY (Y)	WR (R)
IC	0	94	-40	-102	17	10
REF	(-950)	(-250)	(-800)	(300)	(0)	(0)

BRAKES - ON (tb-ON)

SURVEY

A7 Adjust ALC, GAMMA, as reqd
RMS SPOT PORT - ON, as reqd
R11(OV099) VTR pb - PLAY,RCD
L12(OV102)

BRAKES - OFF (tb-OFF)

If evaluating stbd wing (G)
MODE - END EFF, ENTER
Mnvr to scan stbd wing surface

If evaluating port wing (H)
MODE - ORB UNL, ENTER

Mnvr to approx:

X	Y	Z	P	Y	R
-950	-250	-800	300	0	0

then,

MODE - END EFF, ENTER
Mnvr to scan port wing surface

BRAKES - ON (tb-ON)
R11(OV099) VTR pb - STOP
L12(OV102)

RECONFIGURE

If continuing exterior survey
Go to next survey configuration

If survey finished

A7 RMS SPOT PORT - OFF
Mnvr back to attitude per CAP

EXTERIOR SURVEY (CONFIGURATION J)

(Orbiter underbody, vent doors)

SETUP

CRT

SM 94 PDRS CONTROL
✓SOFT STOP, ITEM 7 - ENA
✓AUTO BRAKE, ITEM 9 - ENA

TGT ID +2 (earth)
BODY VECT +5
P +270 } +ZLV
Y +0 }
OM - per MCC

A6

DAP: A1/AUTO/VERN
Initiate TRK

.....IF RADIATORS UNSTOWED.....

SINGLE RAD OPS
(Requires opening MAY3C: CMD MCA LOGIC
PWR AC cbs)

STOW:	<u>STBD RAD cbs</u>	<u>PORT RAD cbs</u>
	<u>AC 3MID3</u>	<u>AC 3MID1</u>
	<u>AC 3MID2</u>	<u>AC 3MID4</u>
LATCH:	<u>AC 3MID3</u>	<u>AC 3MID1</u>
	<u>AC 3MID2</u>	<u>AC 3MID4</u>
	<u>AC 3MID2</u>	<u>AC 3MID4</u>

R13L

✓RAD LAT CNTL SYS (two) - OFF (tb-REL)
✓CNTL SYS (two) - OFF (tb-DPY)
PL BAY MECH PWR SYS (two) - ON
RAD CNTL SYS (two) - STOW (concurrently)
✓STBD tb - DPY
✓PORT tb - bp -40 sec. STOW
SYS (two) - OFF

RAD LAT CNTL SYS (two) - LAT(concurrently).
 ✓STBD tb - REL
 ✓PORT tb - bp -25 sec, LAT
 SYS (two) - OFF
 PL BAY MECH PWR SYS (two) - OFF

A7 CCTV - MON 1 - B
 - MON 2 - RMS/Wrist (ZOOM OUT)
 - VTR RCD - RMS/Wrist

R11(OV099) ALC, GAMMA - NORM
 L12(OV102) VTR - ✓Tape

PARAM sel - JOINT ANGLE
 BRAKES - OFF (tb-OFF)
 MODE - SINGLE, ENTER

SINGLE DR to:

	SY	SP	EP	WP	WY	WR
1	90	45	-10	-112	0	180
2	<u>55</u>					
3		<u>5</u>				

L9,P10, A11 AUD A/A - RCV (IF SINGLE MODE USED) **
 05,09,
 A12,MO42F

SURVEY

CAUTION UHF XMIT <u>must be</u> INHIBITED

CAUTION PORT RADIATOR <u>must be</u> stowed

A7

BRAKES - OFF (tb-OFF)
 MODE - SINGLE, ENTER
 Adjust ALC, GAMMA, as reqd
 RMS SPOT PORT - ON, as reqd
 VTR pb - PLAY, RCD

R11(OV099)

L12(OV102)

SINGLE DR to:

	SY	SP	EP	WP	WY	WR
1	55	5	-100	-112	0	180
2					-105(MA)	
3				114		
4					-45	
5						30
6					-90(MA)	

R11(OV099)

L12(OV102)

BRAKES - ON (tb-ON)
 VTR pb - STOP

RECONFIGURE

BRAKES - OFF (tb-OFF)
 MODE - SINGLE, ENTER

SINGLE DR to:

	SY	SP	EP	WP	WY	WR
1	55	45	-100	-114	-90	30
2			-30			

L9, R10,
 05, 09,
 A13, M042F

REENABLE UHF TRANSMITTER
 ATT AUD A/A - Y/R ..

.....IF RADIATOR DEPLOY REQD.....

UNLATCH/DEPLOY PORT RAD

SINGLE RAD OPS	
(Requires opening MA73C: C&D MCA LOGIC PWR AC cbs)	
STOW: STBD RAD cbs	PORT RAD cbs
AC1MID3	AC1MID1
AC3MID2	AC3MID4
LATCH: AC1MID3	AC1MID1
AC2MID2	AC2MID4
AC3MID2	AC3MID4

R13L

✓RAD LAT CNTL SYS (two) - OFF
 ✓CNTL SYS (two) - OFF
 PL BAY MECH PWR SYS(two) - ON
 RAD LAT CNTL SYS (two) - REL
 (concurrently)
 ✓STBD tb - REL
 ✓PORT tb - bp -25 sec, REL
 SYS (two) - OFF
 RAD CNTL SYS (two) - DPY (concurrently)
 ✓STBD tb - DPY
 ✓PORT tb - bp -40 sec, DPY
 SYS (two) - OFF
 PL BAY MECH PWR SYS (two) - OFF
 MA73C:C&D cb MCA LOGIC PWR (five) - cl

BRAKES - OFF (tb-OFF)
 MODE - SINGLE, ENTER

If continuing exterior survey
 SINGLE DR to:

	SY	SP	EP	WP	WY	WR	
or	1	55	45	-10	114	-90	30

BRAKES - ON (tb-ON)

- Go to next survey configuration

If survey finished

SINGLE DR to:

	SY	SP	EP	WP	WY	WR
1	55	45	-10	114	-90	30
2	0					

BRAKES - ON (tb-ON)

A7

RMS SPOT PORT - OFF

Mnvr back to attitude per CAP

RMS/
EVA

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RMS/EVA

MPM FAILURE

A7L ✓PORT RMS - OFF
R13L ✓PL BAY MECH PWR SYS (two) - OFF
A7 PLB FLOOD (six) - OFF, as reqd
 CAMERA PWR (five) - OFF, as reqd

✓BRAKES - ON (tb-ON)
RMS sel - OFF
✓RMS PWR - PRI

RMS/
EVA

CRT

| SM 94 PDRS CONTROL |
✓I/O ON, ITEM 5 - (*)

PARAM sel - PORT TEMP
JOINT - CRIT TEMP

JOINT FAILURE

✓BRAKES - ON (tb-ON)

MODE - DIRECT (lt-on)

Configure arm per following options
using DIRECT MODE

IF FAILED JOINT IS FROZEN,
CONFIGURE GOOD JOINTS:

SY	SP	EP	WP	WY	WR
0°	+25°	-25°	0°	0°	0°

NOTE

These are desired joint locations.
If shoulder or elbow joint fails,
arm should be placed in a position
over the port longeron and clear of
the Orbiter if possible

IF FAILED JOINT IS FREE,
If wrist joint free, configure good joints:

SY	SP	EP	WP	WY	WR
0°	+25°	-25°	0°	0°	0°

If EP free:

SY	SP	EP	WP	WY	WR
0°	140°	FREE	0°	0°	0°

If SP free:

SY	SP	EP	WP	WY	WR
-90°	FREE	-10°	0°	0°	0°

If SY free:

SY	SP	EP	WP	WY	WR
FREE	90°	-10°	0°	0°	0°

NOTE

These configurations allow free joint to move its full travel limits without contacting Orbiter structure

A7 PLB FLOOD (six) - OFF, as reqd
CAMERA PWR (five) - OFF, as reqd

✓BRAKES - ON (tb-ON)
RMS sel - OFF
✓RMS PWR - PRI

CRT

SM 94 PDRS CONTROL
✓I/O ON, ITEM 5 - (*)

PARAM sel - PORT TEMP
JOINT - CRIT TEMP

BACKDR
TECH

BACKDRIVE TECHNIQUE - JOINT FREE

SP - FAILED

- 1 PARAM sel - JOINT ANGLE
JOINT - SP
Record SP angle _____
- 2 ✓BRAKES - ON (tb-ON)
MODE - DIRECT (lt-on)
DIRECT DR - EP to safe configuration to
drive arm in SY
DIRECT DR SY - +75°
EP - -(2 x SP) or max of -90°
WP - 0°
WY - 0°
WR - 0°

CRT

- 3 SM 94 PDR'S CONTROL
AUTO BRAKES INH - ITEM 10 EXEC
- 4 JOINT - EP
BRAKES - OFF (tb-OFF)
MODE - SINGLE, ENTER
RATE sw - COARSE (RATE MIN tb-OFF)
SINGLE DR - (+)
After 2 sec,
BRAKES - ON (while still holding SINGLE
DR sw)
SINGLE DR sw - release
JOINT - SP (Compare SP angle to original
value)

NOTE

When EP - -8°, reconfigure EP

- ✓BRAKES - ON (tb-ON)
MODE - DIRECT (lt-on)
DIRECT DR EP - -(2 x SP)

Repeat step 4 until SP = 2-5°

- 5 ✓BRAKES - ON (tb-ON)
MODE - DIRECT (!t-on)

CAUTION

Use CCTV to monitor proximity of arm
and Orbiter

DIRECT DR EP - +1⁰
WP - +10⁰
WY - 0⁰
WR - 0⁰
SY - 0⁰
EP - -2⁰

- 6 JOINT - EP
BRAKES - OFF (tb-OFF)
MODE - SINGLE, ENTER
SINGLE DR - (+)
After 1/2 sec,
BRAKES - ON (while still holding SINGLE
DR sw)
SINGLE DR sw - release
JOINT - SP (Note SP angle)

NOTE

When EP - +1⁰, reconfigure EP

✓BRAKES - ON (tb-ON)
MODE - DIRECT (!t-on)
DIRECT DR EP - (-) as far that is safe

Repeat step 6 until
PORT RMS R-F-L FWD tb - gray

- 7 ✓BRAKES - OFF (tb-OFF)
MODE - SINGLE, ENTER
RATE sw - VERN (RATE MIN tb-ON)
SINGLE DR EP - 0⁰
WP - 0⁰
✓PORT RMS R-F-L tb (three) - gray
BRAKES - ON (tb-ON)

- 8 Go to RMS PWRDN, steps 2,4

EP - FAILED

- 1 PARAM sel - JOINT ANGLE
JOINT - EP
Record EP angle _____
- 2 ✓BRAKES - ON (tb-ON)
MODE - DIRECT (lt-on)
DIRECT DR SP - $-(2 \times EP)$ or max of $+130^{\circ}$
SY - 0°
WP - $+5^{\circ}$
WY - 0°
WR - 0°

CRT

- 3 | SM 94 PDR'S CONTROL |
AUTO BRAKES INH - ITEM 10 EXEC
- 4 JOINT - SP
BRAKES - OFF (tb-OFF)
MODE - SINGLE, ENTER
RATE sw - COARSE (RATE MIN tb-OFF)
SINGLE DR - (-)
After 4 sec,
BRAKES - ON (while still holding SINGLE
DR sw)
SINGLE DR sw - release
JOINT - EP (Note EP angle)

NOTE

When $SP < -(EP)$, reconfigure SP

- ✓BRAKES - ON (tb-ON)
MODE - DIRECT (lt-on)
DIRECT DR SP - $-(2 \times EP)$
Repeat step 4 until EP -1°
- 5 JOINT - SP
BRAKES - OFF (tb-OFF)
MODE - SINGLE, ENTER
SINGLE DR - (-)

After 1/2 sec,
BRAKES - ON (while still holding SINGLE
DR sw)
SINGLE DR sw - release
JOINT - EP (Note EP angle)

Repeat step 5 until EP = $0^{\circ} \pm 0.1^{\circ}$

- 6 ✓BRAKES - OFF (tb-OFF)
MODE - SINGLE, ENTER
RATE sw - VERN (RATE MIN tb-ON)
SINGLE DR SP - 0°
WP - 0°
✓PORT RMS R-F-L tb (three) - gray
BRAKES - ON (tb-ON)
- 7 Go to RMS PWRDN, steps 2,4

WP - FAILED

- 1 PARAM sel - JOINT ANGLE
JOINT - WP
Record WP angle _____
- 2 ✓BRAKES - ON (tb-ON)
MODE - DIRECT (lt-on)
DIRECT DR SP - +90°
EP - -90°
SY - 0°
WY - 0°
WR - +19.5°

CRT

- 3 SM 94 PDRS CONTROL
AUTO BRAKES INH - ITEM 10 EXEC
- 4a if WP < 0:
 - JOINT - WP
 - BRAKES - OFF (tb-OFF)
 - MODE - END EFF, ENTER
 - RATE sw - COARSE (RATE MIN tb-OFF)
 - or THC - UP (1/3 to 1/2 deflection) (hold)
When RATE METER (ACTUAL RATE)
hesitates,
 - THC - down (full deflection) (hold)
When WP (DIGITAL DISPLAY #3) is
constant,
 - Remove THC command slowly
- 4b if WP > 0:
 - JOINT - WP
 - BRAKES - OFF (tb-OFF)
 - MODE - END EFF, ENTER
 - RATE sw - COARSE (RATE MIN tb-OFF)
 - THC - down (1/3 to 1/2 deflection) (hold)
When RATE METER (ACTUAL RATE)
hesitates,
 - THC - up (full deflection) (hold)
When WP (DIGITAL DISPLAY #3) is
constant,
 - Remove THC command slowly

If SP > 120° or $\frac{\text{NOTE}}{60^\circ}$, reconfigure

✓BRAKES - ON (tb-ON)
MODE - DIRECT (lt-on)
DIRECT DR SP - +30°
EP - -90°
SY - 0°
WY - 0°
WR - +19.5°

NOTE
Use vernier rates when WP < 2°

Repeat step 4 until WP = 0° $\pm 0.1^\circ$

5 ✓BRAKES - OFF (tb-OFF)
MODE - SINGLE, ENTER
RATE sw - VERN (RATE MIN tb-ON)
SINGLE DR EP - +1°
SP - +10°
SY - 0°
WY - 0°
WR - 0°
SP - 0°
EP - 0°

✓PORT RMS R-F-L tb (three) - gray

6 Go to RMS PWRDN, steps 2,4

WY - FAILED

- 1 PARAM sel - JOINT ANGLE
JOINT - WY
Record WY angle _____
- 2 ✓BRAKES - ON (tb-ON)
MODE - DIRECT (it-on)
DIRECT DR SP - +90°
EP - -90°
SY - 0°
WP - 0°
WR - +19.5°

CRT

- 3 SM 94 PDR'S CONTROL
AUTO BRAKES INH - ITEM 10 EXEC

4a If WY < 0:

JOINT - WY
BRAKES - OFF (tb-OFF)
MODE - END EFF, ENTER
RATE sw - COARSE (RATE MIN tb-OFF)
or THC - RIGHT (1/3 to 1/2 deflection)(hold)
When RATE METER (ACTUAL RATE)
hesitates,
THC - LEFT (full deflection) (hold)
When WY (DIGITAL DISPLAY #3) is
constant,
Remove THC command slowly

4b If WY > 0:

JOINT - WY
BRAKES - OFF (tb-OFF)
MODE - END EFF, ENTER
RATE sw - COARSE (RATE MIN tb-OFF)
THC - left (1/3 to 1/2 deflection) (hold)
When RATE METER (ACTUAL RATE)
hesitates,
THC - right (full deflection) (hold)
When WY (DIGITAL DISPLAY #3) is
constant,
Remove THC command slowly

If SP > 120° or < ^{NOTE}60°, reconfigure

✓BRAKES - ON (tb-ON)
MODE - DIRECT (lt-on)
DIRECT DR SP - +90°
EP - -90°
SY - 0°
WP - 0°
WR - +19.5°

^{NOTE}
Use vernier rates when WY < 2°

Repeat step 4 until WY = 0° ±0.1°

5 ✓BRAKES - OFF (tb-OFF)
MODE - SINGLE, ENTER
RATE sw - VERN (RATE MIN tb-ON)
SINGLE DR EP - +1°
SP - +10°
SY - 0°
WR - 0°
WP - +5°
SP - 0°
EP - 0°
WP - 0°

✓PORT RMS R-F-L tb (three) - gray

6 Go to RMS PWRDN, steps 2,4

BACKUP
CRADLE

BACKUP CRADLE

1 ARM CRADLE

✓BRAKES - ON (tb-ON)

RMS SEL - OFF

RMS PWR - B/U

RMS SEL - PORT

Drive arm to approx:

SY	SP	EP	WP	WY	WR
0	+25	+1	+5	0	0

(WR = 0 when wrist camera aligned w/Z -axis)

Drive SP to get FWD R-F-L, then

Drive EP to get MID R-F-L, then

Drive WP to get AFT R-F-L

2 RECONFIGURE TO PRIMARY POWER (TEMP MONITOR)

RMS SEL - OFF

RMS PWR - PRI (MA)

SM 94 PDRS CONTROL
170 ON - ITEM 5 EXEC

SAFING - CANCEL (tb-bp)

Go to RMS PWRDN, step 2 LATCH/STOW ARM

BACKUP
CRADLE

CRT

INADVERTENT RELEASE

AD-11

INADVERTENT PL RELEASE

A6U BACKOFF
DAP: A/MAN/NORM
DAP ROT: DISC/DISC/DISC
DAP TRANS: NORM/NORM/NORM
✓SENSE - -X
THC +Z (dn) 2 sec (1 FPS)
Maintain visual contact through ovhd/aft
window with THC $\pm X$, $\pm Y$ as reqd until
out-of-plane burn performed

MANEUVER OUT OF PLANE

GNC UNIV PTG

STOP - ITEM 21 EXEC

GNC, OPS 202 PRO

GNC ORBIT MNVR EXEC

RCS SEL - ITEM 4 EXEC (*)

Set TIG to current time +2:00

TGT PEG 7 ΔV_x - ITEM 19 +0 EXEC

ΔV_y - ITEM 20 +2 EXEC

ΔV_z - ITEM 21 +0 EXEC

LOAD - ITEM 22 EXEC

TIMER - ITEM 23 EXEC

✓VGO Z ≥ 0 ; if VGO Z < 0, then

- * TGT PEG 7 ΔV_y - ITEM 20 -2 EXEC *
- * LOAD - ITEM 22 EXEC *
- * TIMER - ITEM 23 EXEC *
- * ✓VGO Z ≥ 0 *

DO NOT MNVR to BURN ATT
At TTG deflect THC to null VGOs

INADV
PL REL

PERFORM FINAL SEP MNVR

✓ RCS SEL - ITEM 4 (*)

TV ROLL - ITEM 5 +1 8 0 EXEC

Set TIG to last TIG +20:00

TGT PEG 7 ΔV_x - ITEM 19 +5 EXEC

ΔV_y - ITEM 20 +0 EXEC

ΔV_z - ITEM 21 +0 EXEC

LOAD - ITEM 22 EXEC

TIMER - ITEM 23 EXEC

DAP: A/AUTO/NORM

At TIG -8:00; MNVR - ITEM 27 EXEC (*)

At TIG deflect THC to null VGOs

MNVR TO MINIMUM DRAG ATTITUDE (-ZLV)

DAP: A/AUTO/VERN

GNC, OPS 201 PRO

|GNC UNIV PYG|

✓ TGT ID - 2

BODY VECT - 3

OM - 180

START TRK - ITEM 19 EXEC (CUR *)

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PL
JETT

PL JETTISON (RMS ok - PL cannot be berthed)

NOTE

For PL JETTISON procedure (5-50 thru 5-55), CDR activities are now on even numbered pages and PLT activities on odd numbered pages

NOTE

Jettison between sunrise and noon if possible

CDR AUTO MNVR TO -XLV

CRT |GNC UNTV PTG|
✓START TIME at least 15 min prior to sunrise
✓TGT ID +2
BODY VECT +2
CM +0
Initiate TRK

A6U DAP: A/AUTO/VERN

014, ✓RJD DRIVER (nine) - ON
015,
016

A6U FLT CNTLR PWR - ON
EVENT TIMER MODE - UP
 CNTL - STOP
 TIMER - RESET

A7U ✓Lighting - as reqd

CRT When in attitude, then
 |GNC 33 REL NAV|
 AVG G ON - ITEM 1 EXEC (*)

When PLT confirms CCTVs configured to monitor jettison, then proceed to 5-52

PL
JETT

PLT

MANVR PL FOR JETTISON

Maneuver PL/RMS to optimum deploy attitude |

BRAKES - ON (tb-ON)

CONFIGURE CCTVs TO MONITOR PL JETTISON

A7U

CCTV MON 1 - A

2 - B

Point CCTVs at EE

CDR
SUNRISE
A6U

JETTISON

DAMP RATES

DAP ROT: DISC/DISC/DISC
TRANS: PULSE/PULSE/NORM

If VERN jets avail
| DAP: A/MAN/VERN
If VERN jets not avail
DAP: B/MAN/NORM

WAIT UNTIL RATES DAMPED, THEN FREE DRIFT

DAP ROT: PULSE/PULSE/PULSE

DAP: A/MAN/NORM

✓SENSE - as reqd

NOTE

After JETT, initiate opening rate
ASAP. Minimize other THC/RHC inputs

JETT+
0:01

WHEN RMS PILOT CONFIRMS JETTISON COMPLETE,
TRANSLATE AWAY

EVENT TIMER CNTL - START

THC +Z, 2 sec (1 ft/sec)

(-X sense: THC dn)

(-Z sense: THC out)

DAP ROT: DISC/DISC/DISC

2:00

SECOND SEP BURN

SENSE - as reqd

THC +Z, 2 sec (1 ft/sec)

(-X sense: THC dn)

(-Z sense: THC out)

Maintain visual contact with PL in OVHD
window using RHC

When PL no longer visible, then

PLT
SUNRISE

JETTISON

When Orbiter is in free drift, then
BRAKES - OFF (tb-OFF)
MODE - END EFF, ENTER
During next step, as soon as OPEN tb-gray
Maneuver: -XEE (out), clear fixture
EE MODE - AUTO
EE RELEASE sw - depress (mom)
After -18 sec (max)

JETT



CDR

CLEANUP

CRT

GNC 33 REL NAV

AVG G ON - ITEM 1 EXEC (no *)
(Turns AVG G off)

GNC UNTV PTG

✓START TIME in past

✓TGT ID +2

BODY VECT +3

✓OM +0

Initiate TRK

A6U

DAP: A/AUTO/VERN

014.

✓All primary RJD DRIVER (eight) - as reqd

015.

016

A7U

✓Lighting - as reqd

PLT

CLEANUP

EE MODE - OFF

BRAKES - ON (tb-ON)

WHEN ORBITER PILOT CONFIRMS VERNIERS IN USE,
Stow arm via RMS POWERDOWN, steps 1-5

NOTE

For PL JETTISON procedure (5-56 thru 5-61), CDR activities are now on even numbered pages and PLT activities on odd numbered pages

NOTE

Jettison between sunrise and noon if possible

CDR

AUTO MNVR TO -XLV

- CRT |GNC UNIV PTG|
✓START TIME at least 15 min prior to sunrise
✓TGT ID +2
BODY VECT +2
OM +0
Initiate TRK
- A6U DAP: A/AUTO/VERN
- 014, ✓RJD DRIVER (nine) - ON
015,
016
- A6U FLT CNTLR PWR - ON
EVENT TIMER MODE - UP
CNTL - STOP
TIMER - RESET
- A7U ✓Lighting - as reqd
- When in attitude, then
CRT |GNC 33 REL NAV|
AVG G ON - ITEM 1 EXEC (*)
- When PLT confirms CCTVs configured to monitor jettison, then proceed to 5-58

PLT

MNVR PL FOR JETTISON

Consult MCC for mode capability and joint configuration for PL jettison, also mode and joints to be used to back off grapple fixture after EE release, 5-59

PARAM sel - JOINT ANGLE

MODE - _____

Drive to:

SY	SP	EP	WP	WY	WR

√BRAKES - ON (tb-ON)

CONFIGURE CCTVs TO MONITOR PL JETTISON

A7U
CCTV MON 1 - A
2 - B

Point CCTVs at EE

CDR
SUNRISE
A6U

JETTISON

DAMP RATES

DAP ROT: DISC/DISC/DISC

TRANS: PULSE/PULSE/NORM

If VERN jets avail

| DAP: A/MAN/VERN

If VERN jets not avail

DAP: B/MAN/NORM

WAIT UNTIL RATES DAMPED, THEN FREE DRIFT

DAP ROT: PULSE/PULSE/PULSE

DAP: A/MAN/NORM

✓SENSE - as reqd

NOTE

After JETT, initiate opening rate
ASAP. Minimize other THC/RHC inputs

JETT+
0:01

WHEN RMS PILOT CONFIRMS JETTISON COMPLETE,

TRANSLATE AWAY

EVENT TIMER CNTL - START

THC +Z, 2 sec (1 ft/sec)

(-X sense: THC dn)

(-Z sense: THC out)

DAP ROT: DISC/DISC/DISC

2:00

SECOND SEP BURN

SENSE - as reqd

THC +Z, 2 sec (1 ft/sec)

(-X sense: THC dn)

(-Z sense: THC out)

Maintain visual contact with PL in OVHD
window using RHC

When PL no longer visible, then

PLT
SUNRISE

JETTISON

When Orbiter is in free drift, then
BRAKES - OFF (tb-OFF)
EE MAN CONTR - DERIGID (hold until DERIGID
tb-gray) (5 sec max)



EE RELEASE sw - depress (hold until OPEN
tb-gray) (3 sec max)

JETT



Per MIC

✓MODE -
Joints to be driven to clear grapple
fixture

EE MAN CONTR - DERIGID (hold until EXTEND
tb-gray) (20 sec max)



CDRCLEANUP

CRT |GNC 13 REL NAV|
AVG G ON - ITEM 1 EXEC (no *)
(Turns AVG G off)
|GNC UNTV PTG|
√START TIME in past
√TGT ID +2
BODY VECT +3
√DM +0
Initiate TRK
A6U DAP: A/AUTO/VERN

014, √All primary RJD DRIVER (eight) - as reqd
015,
016

A7U √Lighting - as reqd

PLT

CLEANUP

EE MODE - OFF

BRAKES - ON (tb-ON)

WHEN ORBITER PILOT CONFIRMS VERNIERS IN USE

Stow arm via BACKDRIVE TECHNIQUE - JOINT

FREE,5-35

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REFERENCE DATA

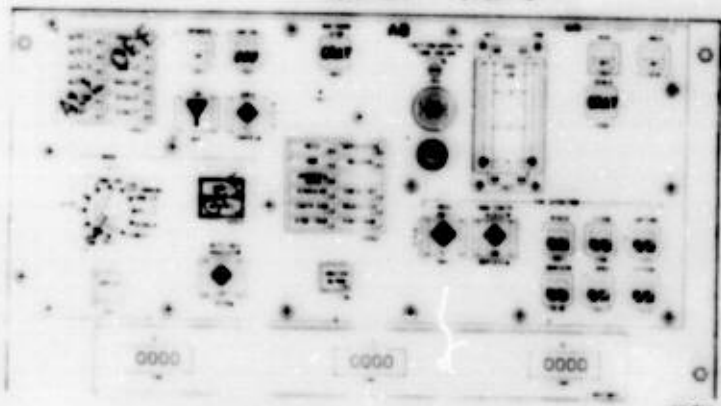
D & C STATUS

1 SUSPEND MODE

RMS PWR - PRI

RMS SEL - OFF

I/O OFF - ITEM 6 *

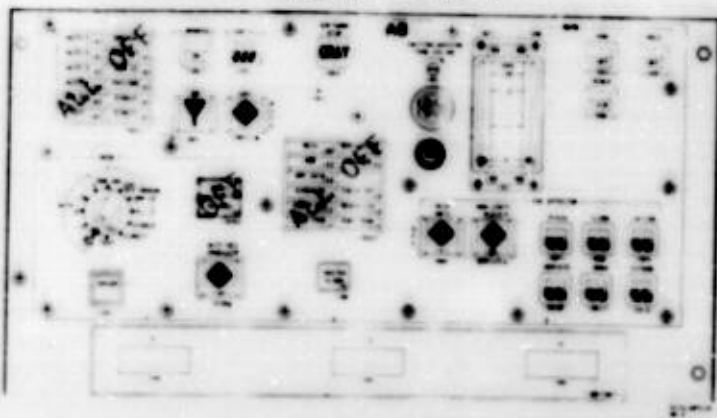


2 TEMP MODE

RMS PWR - PRI

RMS SEL - OFF

I/O ON - ITEM 5 *



TEMPERATURE DATA

NOTE

To read temperatures:

PARAM sel - PORT TEMP

JOINT sel - as desired (see below)

'LED' temps measured at joints

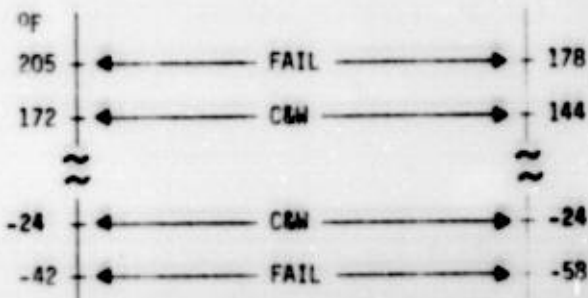
'ABE' temps measured at electronics

JOINT SW SEL	IND #1 TEMP OF	IND #2 TEMP OF	IND #3 JOINT ID
SY	SY LED	SP, SY ABE	101
SP	SP LED	SP, SY ABE	102
EP	EP LED	EP ABE	103
WP	WP LED	WP, WY ABE	104
WY	WY LED	WP, WY ABE	105
WR	WR LED	WR ABE	106
EE	EE LED	EE ABE	107

TEMPERATURE LIMITS

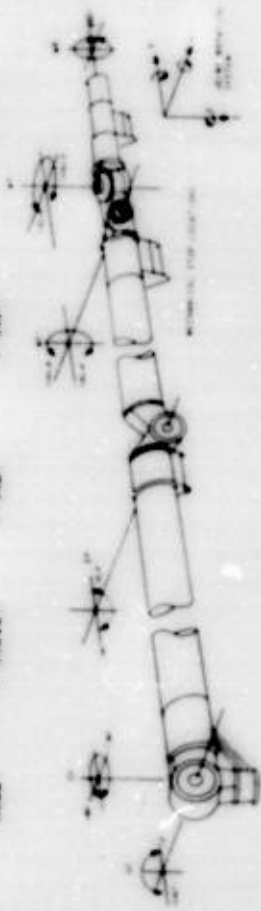
LED Limits

ABE Limits



JOINT TRAVEL LIMIT LOCATIONS

JOINT	REACH LIMIT		SOFT STOP		MECHANICAL STOP LOCATION	SINGULARITY LOCATION
	LOCATION	LOCATION	LOCATION	LOCATION		
SHOULDER YAW	+ 175.40	+ 177.40	+ 177.40	+ 180.00	+ 180.00	
	- 175.40	- 177.40	- 177.40	- 180.00	- 180.00	
SHOULDER PITCH	+ 2.60	+ 0.60	+ 0.60	- 20	- 20	
	+ 160.40	+ 142.40	+ 142.40	+ 145.00	+ 145.00	
ELBOW PITCH	- 2.40	- 0.40	- 0.40	+ 2.40	+ 2.40	- 7.6
	- 155.60	- 157.60	- 157.60	- 161.00	- 161.00	
WRIST PITCH	- 114.40*	- 116.40	- 116.40	- 121.40	- 121.40	
	+ 114.40	+ 116.40	+ 116.40	+ 121.40	+ 121.40	
WRIST YAW	- 114.60	- 116.60	- 116.60	- 121.30	- 121.30	- 75/-105
	+ 114.60	+ 116.60	+ 116.60	+ 121.30	+ 121.30	+ 75/+105
WRIST ROLL	- 440.00	- 442.00	- 442.00	- 447.00	- 447.00	
	+ 440.00	+ 442.00	+ 442.00	+ 447.00	+ 447.00	



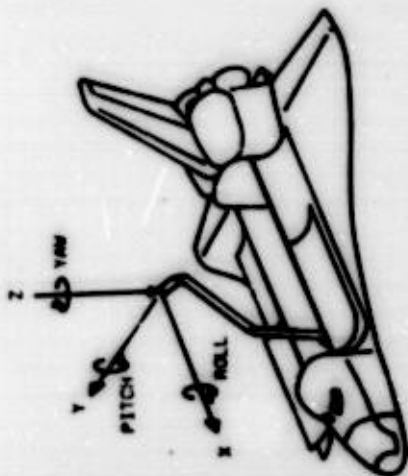
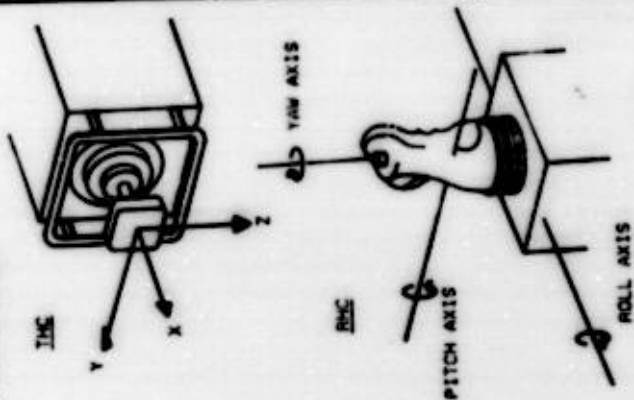
WRIST ROLL RANGE

SPEC 94 WR RANGE X ITEM 26	WR JOINT ANGLE
1	$-450 \leq \phi < -360$
2	$-360 \leq \phi < -180$
3	$-180 \leq \phi < 0$
4	$0 \leq \phi < 180$
5	$180 \leq \phi < 360$
6	$360 \leq \phi < 450$

SINGULARITY ANNUNCIATION

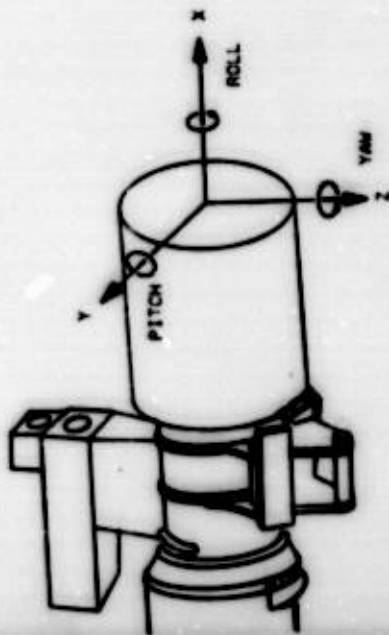
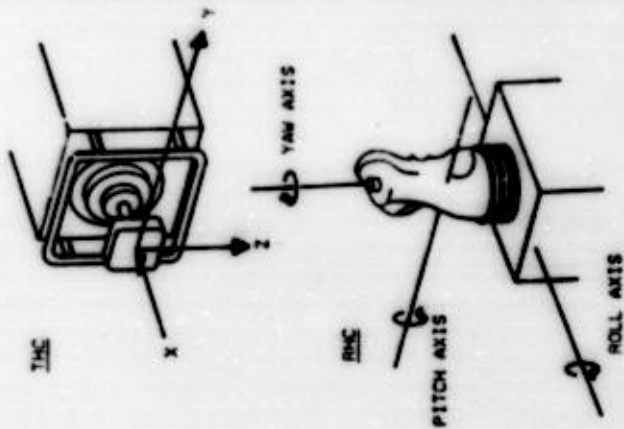
1. When the wrist yaw joint is within 3 feet of a line drawn through the shoulder yaw axis
2. When wrist yaw joint is ± 75 deg to ± 105 deg
3. When elbow joint is less than 7.6 deg

ORBITER UNLOADED MODE PHASING



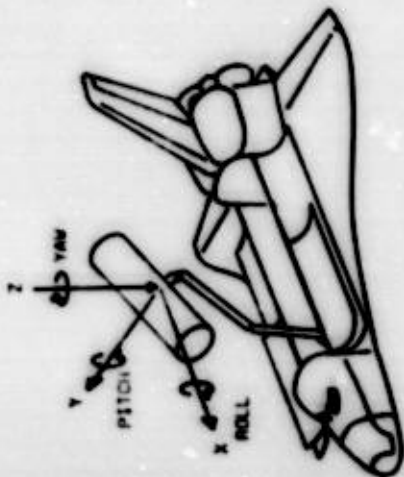
ORBITER UNLOADED MODE

END EFFECTOR MODE PHASING

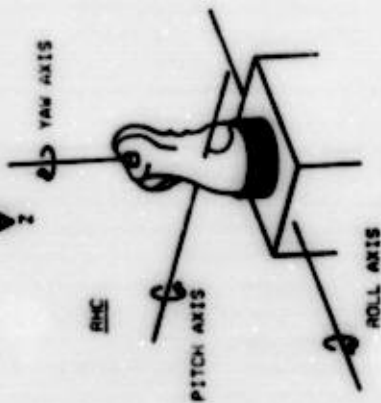


END EFFECTOR MODE

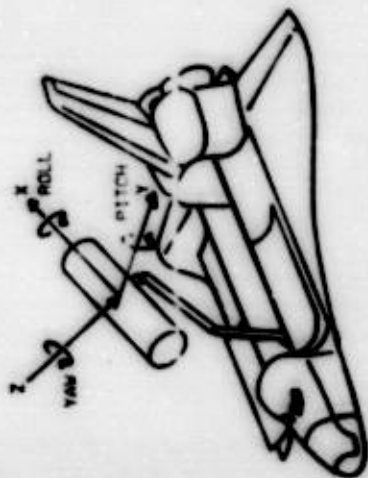
ORBITER LOADED MODE PHASING



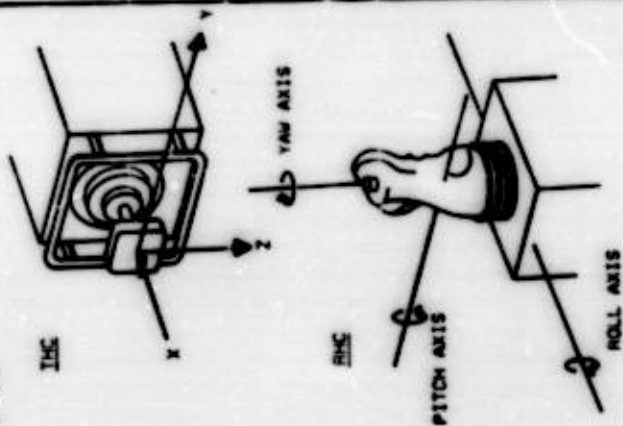
ORBITER LOADED MODE



PAYLOAD MODE PHASING



PAYLOAD MODE



MPM/MRL MOTOR CONTROL

RMS LATCHES	MTR 1			MTR 2		
	AC/MCA	CNTL	MDM	AC/MCA	CNTL	MDM
FWD	2/MID 2	AB1	0A2	3/MID 4	CA1	0A2
MID	1/MID 1	AB1	0F4	2/MID 4	CA1	0A1
AFT	3/MID 2	CA1	0A3	1/MID 3	AB1	0F1

MPM	MTR 1			MTR 2		
	AC/MCA	CNTL	MDM	AC/MCA	CNTL	MDM
SHLD	3/MID 4	CA2	0A2	2/MID 2	BC1	0A2

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SCHEDULING OVERVIEW - NOMINAL

SCHEDULING OVERVIEW - NOMINAL
FLIGHT DAY 3 - GRAPPLE FIXTURE 2

ACTIVITY	DURATION (MIN)	MET (of start of activity)
<u>GF 2</u>		
RMS POWERUP	10	002/00:00
NOMINAL UNBERTH	20	/00:10
RMS/FCS TEST	35	/00:30
RMS/PRCS INTERACTION	55	/01:05
-----	-----	-----
MEAL	60	/02:00
-----	-----	-----
RMS/PRCS INTERACTION (CONT)	20	/03:00
LSS VIBRATION DAMPING	60	/03:20
AUTO MODE EVALUATION	25	/04:20
NOMINAL BERTH	25	/04:45
DIRECT DRIVE UNBERTH	25	/05:10
CONTROL SYSTEM EVAL	65	/05:35
DIRECT DRIVE BERTH	40	/06:40
RMS POWERDOWN	10	/07:20
		/07:30 (END)

SCHEDULE

SCHEDULING OVERVIEW - NOMINAL (CONT)

FLIGHT DAY 4 - GRAPPLE FIXTURE 5

ACTIVITY	DURATION (MIN)	MET (of start of activity)
<u>GF 5</u>		
RMS POWERUP	10	003/02:15
NOMINAL UNBERTH	20	/02:25
RMS/FCS - SIMULATED LDEF DEPLOY	45	/02:45
CONTROL SYSTEM EVAL	65	/03:30
RMS/PRCS INTERACTION	75	/04:35
ORBITER/RMS DYNAMIC INTERACTION	20	/05:50
AUTO MODE EVALUATION	25	/06:10
NOMINAL BERTH	25	/06:35
RMS POWERDOWN	10	/07:00
		/07:10 (END)

SHOPPING LIST

These activities are not scheduled in the CAP. An attempt will be made to schedule these activities in real time if conditions permit.

<u>ACTIVITY</u>	<u>DURATION (MIN)</u>
DIRECT DRIVE UNBERTH - GF 5	25
DIRECT DRIVE BERTH - GF 5	40
AUTO MODE EVALUATION - UNLOADED	20

NOMINAL UNBERTH

NOMINAL UNBERTH

1 GRAPPLE PFTA GF 2 [GF 5]
~~GF 5~~ - Priority ①

A7 CCTV - MDN 2 - RMS/Wrist (zoom out) **
 ✓Target overlay attached
 R11 VTR - ✓Tape, audio

Config DAP: A9/AUTO/VERN

CRT SM 94 PDRS CONTROL
 PL ID - ITEM 3 +2 [9] EXEC

If unberthing to occur in darkness,
 disregard 16mm Camr ops

Take Spotmeter reading of white (sunlit)
 PFTA/RMS

BRAKES - OFF (tb-OFF)
 MODE - ORB UNL, ENTER
 Mnvr to grapple fixture
 X = -1108 GF 2
 X = -919 GF 5

W9 When grapple fixture in view,
 16mm Camr - on (for -1 min)
 EE MODE - AUTO
 MODE - END EFF, ENTER
 Mnvr to grapple envelope
 EE CAPTURE sw - depress (mom)
 ✓ (23 sec max)

EE MODE - OFF **
 BRAKES - ON (tb-ON)
 W9 16mm Camr - off

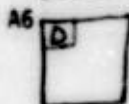
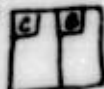
Record POS/ATT and JOINT ANGLES

2 TRUNNION RELEASE/UNBERTH

A7 CCTV - VTR RCD - MIX B&C, Alt with D,
document unbeth

R11 VTR pb - PLAY,RCD

R13 PL BAY MECH PWR SYS (two) - ON
A6 PL RETEN PL SEL - 1
LOGIC PWR SYS (two) - ON



Note any single motor times (> 30 sec)
A6 PL RETEN LAT 1,4 - REL (tb-REL), 60 sec max
- OFF
LAT 2,3 - REL (tb-REL), 60 sec max
- OFF
LAT 5 - REL (tb-REL), 60 sec max
- OFF
PL SEL - MON
LOGIC PWR SYS (two) - OFF

R13 PL BAY MECH PWR SYS (two) - OFF

DAP ROT: PULSE/PULSE/PULSE
DAP: A9/MAN/VERN

✓Exposure w/Spotmeter

RATE sw - VERN (RATE MIN tb-ON), until
clear guides
BRAKES - OFF (tb-OFF)
MODE - ORB LD, ENTER
W9 16mm Camr - on (for -2 min, until bottom of
PFTA visible)
Mnvr PFTA to Z = -600
BRAKES - ON (tb-ON)

R11 VTR pb - STOP

W9 16mm Camr - off

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RMS/FCS TESTS

if poss, let NCC know
RMS/FCS TEST (Grapple Fixture 2) we're starting (ACIP CMD)

1 SET UP IC - Priority ①

√DAP: A9/AUTO/VERN, if desired

CRT

SM 94 PDRS CONTROL

PL ID - ITEM 3 - 3

PL INIT ID - ITEM 24 - 3

DAP ROT: PULSE/PULSE/PULSE

DAP: A9/MAN/VERN

OPR CMD to CONFIG A

-938, -7, -660, 0, 45, 0 GF 2

SY	SP	EP	WP	WY	WR
-35.2	102.5	-93.8	-65.5	5.5	3.1

BRAKES - ON (tb-ON)

A7

√MADS RCDR PWR - PCM/WB ENA
WB/ACIP PCM - ON



2 LOADED ARM MOTION/ACTIVE VRCS ATTITUDE HOLD
TEST - Priority ①

	1	2	3	4
WAKE sw - COARSE				
Config DAP: BXX/LVLH/VERN	B7	B7	B8	B8
DAP ROT: DISC/DISC/DISC				
Pause until within DB				
BRAKES - OFF (tb-OFF) MODE - ORB LD, ENTER				
Input 20 sec	THC UP	THC LT	THC UP	THC LT
Pause 60 sec				
OPR CMD to IC				
Pause 60 sec				
Check complete	---	---	---	---

When test complete,
BRAKES - ON (tb-ON)

3 I-LOAD SENSITIVITY TEST - Priority ②

√DAP: A9/AUTO/VERN, if desired

CRT

|SM 94 PDRS CONTROL|

√PL ID, ITEM 3 - 3

√PL INIT ID, ITEM 24 - 3

DAP ROT: PULSE/PULSE/PULSE

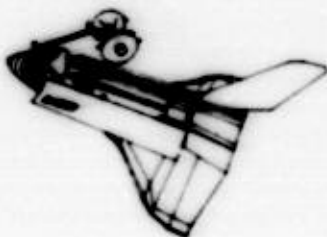
DAP: A9/MAN/VERN

OPR CMD to CONFIG A

-938, -7, -660, 0, 45, 0 GF 2

SY	S ²	EP	WP	WY	WR
-35.2	102.5	-93.8	-65.5	5.5	3.1

BRAKES - ON (tb-ON)



A7 ✓MADS WB/ACIP PCM - ON
 014:E, ✓cb AFT DDU (two) - c1
 016:E

A6 SENSE - -X **
 FLT CNTLR PWR - ON

	1	2	3
(defaults to UNLD POR) ✓BRAKES - OFF (tb-OFF)			
MODE - END EFF, ENTER			
Config DAP: BXX/MAN/VERN	B9	B10	B11
DAP ROT: DISC/DISC/DISC			
Pause until stable			
DAP ROT: PULSE/PULSE/PULSE			
Fire -P (TAIL DN), wait 5 sec then, +Y (TAIL RT), wait 5 sec then, -R (PORT WING UP), wait 5 sec then,			
DAP ROT: DISC/DISC/DISC (simo)			
Pause 2 min			
Check complete	—	—	—

A6 When test complete,
 A7 BRAKES - ON (tb-ON)
 FLT CNTLR PWR - OFF
 MADS WB/ACIP PCM - CMD
 tell MCC test complete

**RMS/FCS TEST
SIMULATED LDEF DEPLOY
(Grapple Fixture 5 only)**

Priority ①

1 SET UP IC

✓DAP: A9/AUTO/VERN, if desired

CRT

| SM 94 PDRS CONTROL |
PL ID - ITEM 3 - 4
PL INIT ID - ITEM 24 - 4

DAP ROT: PULSE/PULSE/PULSE
DAP: A9/MAN/VERN

OPR CMD to CONFIG A

-995, +50, -580, 305, 330, 325 GF 5

SY	SP	EP	WP	WY	WR
-35.2	102.5	-93.8	-65.5	5.5	3.1

BRAKES - ON (tb-ON)



2 SETUP FOR 3-AXIS MNVR TEST

Change DAP B to B14

CRT

|GNC UNIV PTG|

TGT ID - 2

BODY VECT - 5

P - 35

Y - 10

OM - 170

DAP: B14/AUTO/VERN

Initiate TRK

When mnvr complete,

3 MNVR ORBITER TO 45° NOSE DOWN (YPOP)

|GNC UNIV PTG|

✓ TGT ID - 2

BODY VECT - 5

P - 45

Y - 0

OM - 180

DAP: B14/AUTO/VERN

Initiate TRK

When in attitude,

DAP ROT: DISC/DISC/DISC

DAP: B14/LVLH/VERN

4 MNVR RMS TO LDEF CONFIG

✓DAP ROT: DISC/DISC/DISC **
Config DAP: B15/LVLH/VERN

CRT

SM 94 PDORS CONTROL

PL ID - ITEM 3 - 4

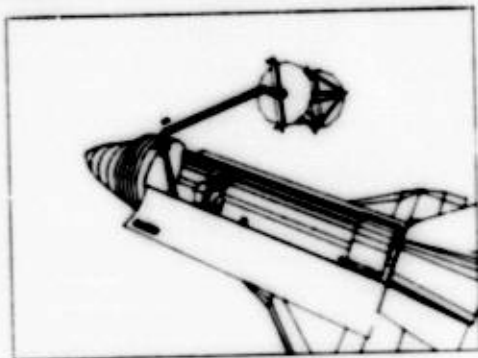
PL INIT ID - ITEM 24 - 4

OPR CMD to 'LDEF' position

-968, +203, -687, 296, 300, 176 GF 5

-41.8 83.8 -71.6 -61.9 -20.6 -131.4

✓BRAKES - OFF (tb-OFF) - position hold



When arm mnvr complete,
✓DAP ROT: DISC/DISC/DISC
Config DAP: B16/LVLH/VERN

5 ROT PULSE INPUTS

014:E, √cb AFT DDU (two) - c1
 016:E
 A6 SENSE - -X ..
 FLT CNTLR PWR - ON

(defaults to
 UNLD POR)

	1	2	3
BRAKES - OFF			
MODE - END EFF, ENTER			
Config DAP: BXX/LVLH/VERN	B17	B18	B19
DAP ROT: DISC/DISC/DISC			
Pause 2 min			
DAP ROT: PULSE/PULSE/PULSE			
Fire -P (TAIL DN), wait 10 sec then, +Y (TAIL RT), wait 10 sec then, -R (PORT WING UP), wait 10 sec then,			
DAP ROT: DISC/DISC/DISC (simo)			
Pause 2 min			
Check complete	—	—	—

A6 After last step,
 BRAKES - ON, (tb-ON)
 FLT CNTLR PWR - OFF

CONTINUED NEXT PAGE

6 RE-ESTABLISH NOMINAL ATTITUDE

✓DAP A set to A9

GNC UNIV PTG
✓START TIME - (in past)
✓TGT ID - 2
BODY VECT - 3
OM - 180
DAP: A9/AUTO/VERN
Initiate TRK

CONTROL SYSTEM EVALUATION

CONTROL SYSTEM EVALUATION

1 MANUAL AUGMENTED (CONFIG A)

SETUP

✓DAP: A9/AUTO/VERN, if desired

CRT

SM 94 PDRS CONTROL

PL ID - ITEM 3 +3 [4] EXEC

PL INIT ID - ITEM 24 +3 [4] EXEC

DAP ROT: PULSE/PULSE/PULSE

DAP: A9/MAN/VERN

OPR CMD to IC

-938, -7, -660, 0, 45, 0 GF 2

-995, +50, -580, 305, 330, 325 GF 5

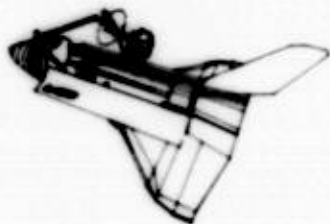
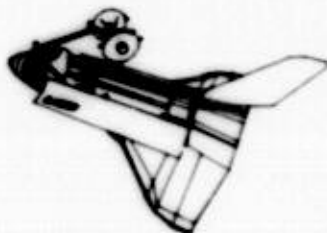
SY	SP	EP	WP	WY	WR
-35.2	102.5	-93.8	-65.5	5.5	3.1

BRAKES - ON (tb-ON)

A7
R11

CCTV - VTR RCD - D, zoom in on EE

VTR - ✓Tape



GF 2 - Priority ②
 GF 5 - Priority ①

TEST



	1	2	3	4
VTR pb - PLAY,RCD				
RATE sw - COARSE				
BRAKES - OFF (tb-OFF)				
MODE - ORB LD, ENTER				
INPUT 15 sec, then STOP arm while cmd in	THC DN, BRAKES	THC LT, RELEASE INPUT	THC IN, SAFING	RHC +YAW BRAKES
PAUSE 60 sec, then VTR pb - STOP				
Reconfigure:				
OPR CMD to IC (steps 1,2,3 only)	BRAKES - OFF		SAFING - CANCEL	NOT REQD X
BRAKES - ON(tb-ON)				
Check complete	—	—	—	—

2 SINGLE JOINT (CONFIG A)

SETUP

√DAP: A9/AUTO/VERN, if desired

CRT

|SM 94 PDRS CONTROL|
√PL ID, ITEM 3 - 3 [4]
√PL INIT ID, ITEM 24 - 3 [4]

DAP ROT: PULSE/PULSE/PULSE
DAP: A9/MAN/VERN

OPR CMD to IC

-938, -7, -660, 0, 45, 0 GF 2

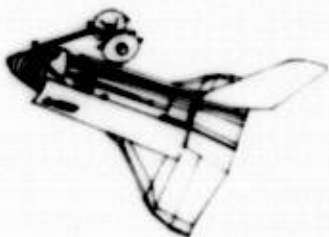
-995, +50 -580, 305, 330, 325 GF 5

SY	SP	EP	WP	WY	WR
-35.2	102.5	-93.8	-65.5	5.5	3.1

BRAKES - ON (tb-ON)

A7
R11

CCTV - VTR RCD - D, zoom in on EE
VTR - √Tape



GF 2 - Priority ②
 GF 5 - Priority ①

TEST

R11

✓RATE sw - COARSE
 VTR pb - PLAY,RCD



BRAKES -
 MODE -

JOINT sel

DRIVE '+' 15 sec, then

R11

PAUSE 60 sec, then
 VTR pb - STOP

Reconfigure:

BRAKES - OFF (tb-OFF)

RETURN to IC (OPR CMD or SINGLE)
 (steps 1,2,3 only)

BRAKES - ON (tb-ON)

Check complete

	1	2	3	4
OFF	OFF	OFF	OFF	ON
SING	SING	SING	SING	DIR
SP	WY	WR	SP	
←--	BRAKES ON		--→	REL CMD
				NOT REQD
	—	—	—	—

When test complete,
 ✓BRAKES - ON (tb-ON)
 MODE - MAN AUG or SINGLE
 - (take out of DIRECT)

3 MANUAL AUGMENTED (CONFIG D)

SETUP

✓DAP: A9/AUTO/VERN, if desired

CRT

|SM 94 PORS CONTROL|

✓PL ID, ITEM 3 - 3 [4]

✓PL INIT ID, ITEM 2⁴ - 3 [4]

DAP ROT: PULSE/PULSE/PULSE

DAP: A9/MAN/VERN

OPR CMD to IC

-1183, +226, -681 8, 53, 47 GF 2

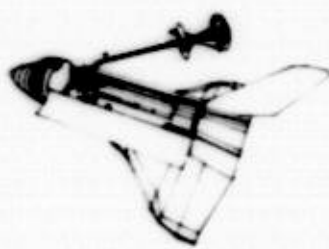
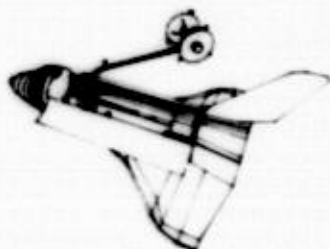
-1272, +294, -697, 10, 323, 1 GF 5

SY	SP	EP	WP	WY	WR
-38	34	-38	0	0	0

BRAKES - ON (tb-ON)

A7
R11

CCTV - VTR RCD - B, zoom in on EE
VTR - ✓Tape



GF 2 - Priority ②
GF 5 - Priority ②

TEST

VTR pb - PLAY, RCD

RATE sw - COARSE

BRAKES - OFF (tb-OFF)

MODE - ORB LD, ENTER

INPUT THC UP 15 sec,
then
STOP arm while cmd in

PAUSE 60 sec, then
VTR pb - STOP

Reconfigure:

Check complete



	1	2
	SAFING - SAFE (tb-bp)	BRAKES - ON (tb-ON)
	SAFING - CANCEL (tb-gray)	
	OPR CMD to IC	
	BRAKES - ON (tb-ON)	
	_____	_____

4 SINGLE JOINT (CONFIG C)

SETUP

✓DAP: A9/AUTO/VERN, if desired

CRT

SM 94 PDRS CONTROL
 ✓PL ID, ITEM 3 - 3 [4]
 ✓PL INIT ID, ITEM 24 - 3 [4]

DAP ROT: PULSE/PULSE/PULSE
 DAP: A9/MAN/VERN

ORB LD or SINGLE to IC (monitor clearances) |

 -1322, -181, -650, 1, 275, 212 GF 2

 -1431, -190, -677, 14, 5, 359 GF 5

SY	SP	EP	WP	WY	GF 2	GF 5
0	25	-10	0	0	WR 180	WR 0

BRAKES - ON (tb-ON)

A7
 R11

CCTV - VTR RCD - C, zoom in on EE
 VTR - ✓Tape



TEST { SINGLE - Priority ①
 { DIRECT - Priority ①

RATE sw - COARSE
JOINT - SP

R11 VTR pb - PLAY,RCD



BRAKES - OFF (tb-OFF)
MODE - SINGLE, ENTER

SINGLE DR '+' 15 sec, then
While cmd in: SAFING - SAFE (tb-bp)

Pause 60 sec

R11 VTR pb - STOP
RATE sw - VERN (RATE min tb-ON) ..
SAFING - CANCEL (tb-gray)
SINGLE DR to IC:

SY	SP	EP	WP	WY	GF 2	GF 5
0	25	-10	0	0	WR 180	WR 0

BRAKES - ON (tb-ON)
MODE - DIRECT (lt-on)
JOINT - SP

R11 VTR pb - PLAY,RCD



DIRECT DR '+' 30 sec, then
RELEASE input

*leave CMD in,
expect slow
response*

R11 Pause 60 sec
VTR pb - STOP

✓BRAKES - ON (tb-ON)
MODE - MAN AUG or SINGLE
- (take out of DIRECT)

RATE sw - COARSE (as reqd)

CONTINUED NEXT PAGE

Reconfigure - GF 2 ONLY:

BRAKES - OFF (tb-OFF)

MODE - ORB LD, ENTER

Drive to X = -1120, then

Y = 0

MODE - SINGLE, ENTER

Drive WR = +60

BRAKES - ON (tb-ON)

RMS/PRCS INTERACTION

RMS/PRCS INTERACTION

1 SETUP (CONFIG E) - Priority ①

√DAP: A9/AUTO/VERN, if desired

CRT

|SM 94 PDRS CONTROL|
PL ID - ITEM 3 +3 [4]
PL INIT ID - ITEM 24 +3 [4]

DAP TRANS: PULSE/PULSE/PULSE
DAP ROT: PULSE/PULSE/PULSE
DAP: A9/MAN/VERN

Before OPR CMD,
MODE - SINGLE, ENTER
Drive SY = 0

OPR CMD to IC

-754, -333, -1080, 217, 65, 264 GF 2

-774, -370, -1185, 79, 19, 344 GF 5

SY	SP	EP	WP	WY	WR
0	90	-10	0	0	0

BRAKES - ON (tb-ON)

A7 CCTV - VTR RCD - B, zoom in on EE
R11 VTR - √Tape

014:E, √cb AFT DDU (two) - c1
016:E

016 ASA 4 - ON
A6 SENSE - -X ..
FLT CNTLR PWR - ON

Change DAP B to B12

RMS/PRCS



Priority

①

①

TEST (CONFIG E)

1

2

✓BRAKES - ON (tb-ON)

DAP ROT: PULSE/PULSE/PULSE

DAP: B12/MAN/NORM

R11

VTR pb - PLAY, RCD



Fire 1st pulse

+P
TAIL
UP

-R
PORT
WING
UP

Pause 2 min, then

Fire 2nd pulse

-P
TAIL
DN

+R
PORT
WING
DN

Pause 2 min, then

R11

VTR pb - STOP

✓RMS IC (0,90,-10,0,0,0)

NOT
REQD

DAP: B12/MAN/VERN

DAP ROT: DISC/DISC/DISC (damp rates)

Check complete

2 SETUP (CONFIG B) (Priority - See FS 4-6)

CRT

SM 94 PDRS CONTROL
 ✓PL ID, ITEM 3 - 3 [4]
 ✓PL INIT ID, ITEM 24 - 3 [4]

DAP ROT: PULSE/PULSE/PULSE
 ✓DAP: B12/MAN/VERN

If coming from config E
 MODE - SINGLE, ENTER
 DRIVE SY = -90

OPR CMD to IC

 -680, -263, -1105, 357, 20, 145 GF 2

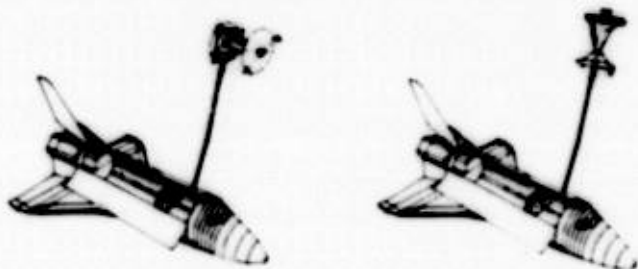
 -680, -281, -1217, 90, 9, 70 GF 5

SY	SP	EP	WP	WY	WR
-90	90	-10	0	0	0

BRAKES - ON (tb-ON)

A7
 R11

CCTV - VTR RCD - B, zoom in on EE
 VTR - ✓Tape



014:E, ✓cb AFT DDU (two) - c1
 016:E
 016 ✓ASA 4 - ON
 A6 ✓SENSE - -X **
 ✓FLT CNTLR PWR - ON

TEST (CONFIG B)



	1		2		3		4		5		6	
BRAKES SAFING MODE	ON CANCEL --				OFF SAFE --				OFF CANCEL SINGLE			
DAP ROT: PULSE/PULSE/PULSE DAP: B12/MAN/NORM												
VTR pb - PLAY,RCD												
Fire 1st pulse	+P TAIL UP	+R PORT WING DN	+P TAIL UP	+R PORT WING DN	+P TAIL UP	+R PORT WING DN	+P TAIL UP	+R PORT WING DN	+P TAIL UP	-R PORT WING UP		
Pause 2 min												
Fire 2nd pulse	-P TAIL DN	-R PORT WING UP	-P TAIL DN	-R PORT WING UP	-P TAIL DN	-R PORT WING UP	-P TAIL DN	-R PORT WING UP	-P TAIL DN	+R PORT WING DN		
Pause 2 min												
VTR pb - STOP												
✓RMS IC (-90,90,-10,0,0,0)											NOT REQD	
DAP: B12/MAN/VERN DAP ROT: DISC/DISC/DISC (damp rates)												
Check complete	—		—		—		—		—		—	

CONTINUED NEXT PAGE

A6
016

After last step,
BRAKES - ON (tb-ON)
FLT CNTLR PWR - OFF
ASA 4 - OFF

NOTE

GF 2

Test	1	2	3	4	5	6
Priority	2	2	3	2	3	2

GF 5

Test	1	2	3	4	5	6
Priority	1	1	3	2	3	2

LSS VIBRATION DAMPING TEST

LSS TEST

LSS VIBRATION DAMPING TEST
(Grapple Fixture 2 only)

1 SETUP (CONFIG B)

✓DAP: A9/AUTO/VERN, if desired

CRT

SM 94 PDRS CONTROL

PL ID - ITEM 3 +3 EXEC

PL INIT ID - ITEM 24 +3 EXEC

DAP TRANS: PULSE/PULSE/PULSE

DAP ROT: PULSE/PULSE/PULSE

DAP: A9/MAN/VERN

OPR CMD to IC

-680, -263, -1105, 357, 20, 145 GF 2

SY	SP	EP	WP	WY	WR
-90	90	-10	0	0	0

BRAKES - ON (tb-ON)

A7

CCTV - VTR RCD - B, zoom in on EE

R11

VTR - ✓Tape

LSS TEST



014:E, ✓cb AFT DDU (two) - c1
 016:E
 016 ASA 4 - ON
 A6 SENSE - -X **
 FLT CNTLR PWR - ON

Change DAP B to B13

Priority

① ① ② ③

TEST (CONFIG B)



	1	2	3	4
BRAKES SAFING MODE	OFF CANCEL SINGLE	OFF CANCEL SINGLE	OFF SAFE --	ON CANCEL --
DAP ROT: PULSE/PULSE/PULSE DAP: B13/MAN/NORM				
R11 VTR pb - PLAY,RCD				
Fire pulse	-R PORT WING UP	+R PORT WING DN	+R PORT WING DN	-R PORT WING UP
Pause 2 min, then				
R11 VTR pb - STOP				
✓RMS IC (-90,90,-10,0,0,0)				NOT RECD
DAMP RATES AFTER TESTS 2,4 ONLY DAP: B13/MAN/VERN DAP ROT: DISC/DISC/DISC	N/A		N/A	
Check complete				

After last step.
 FLT CNTLR PWR - OFF

A6

2 SETUP (CONFIG J)

CRT

SM 94 PDRS CONTROL
 ✓PL ID, ITEM 3 - 3
 ✓PL INIT ID, ITEM 24 - 3

DAP ROT: PULSE/PULSE/PULSE
 ✓DAP: B13/MAN/VERN

Before OPR CMD,
 MODE - SINGLE, ENTER
 Drive EP = -50
 WR = +25

OPR CMD to IC

 -713, +153, -863, 180, 0, 45 GF 2

SY	SP	EP	WP	WY	WR
-82.6	94.0	-72.7	-41.0	-7.0	197.5

BRAKES - ON (tb-ON)

A7
R11

CCTV - VTR RCD - B, zoom in on EE
 VTR - ✓Tape



014:E. ✓cb AFT DDU (two) - c1
 016:E
 016 ✓ASA 4 - ON
 A6 ✓SENSE - -X ..
 FLT CNTLR PWR - ON

Priority

① ① ② ③

TEST (CONFIG J)



	1	2	3	4
BRAKES SAFING MODE	OFF CANCEL SINGLE	OFF CANCEL SINGLE	OFF SAFE --	ON CANCEL --
DAP ROT: PULSE/PULSE/PULSE DAP: B13/MAN/NORM				
R11 VTR pb - PLAY,RCD				
Fire pulse	-R PORT WING UP	+R PORT WING DN	+R PORT WING DN	-R PORT WING UP
Pause 2 min, then R11 VTR pb - STOP				
✓RMS IC (-82.6,94.0,-72.7,-41.0,-7.0,197.5)				NOT REQD
DAMP RATES AFTER TESTS 2,4 ONLY DAP: B13/MAN/VERN DAP ROT: DISC/DISC/DISC	N/A	_____	N/A	_____
Check complete	_____	_____	_____	_____

A6 After last step.
 016 FLT CNTLR PWR - OFF
 ASA 4 - OFF

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ORBITER/RMS DYNAMIC INTERACTION

ORB/RMS
OWN INT

ORBITER/RMS DYNAMIC INTERACTION
(Grapple Fixture 5 only)

Priority ②

*if poss., let MCC
know when
starting*

✓DAP: A9/AUTO/VERN, if desired

CRT

SM 94 PDRS CONTROL
PL ID - ITEM 3 +4 EXEC
PL INIT ID - ITEM 24 +4 EXEC

DAP ROT: PULSE/PULSE/PULSE

DAP: A9/MAN/VERN

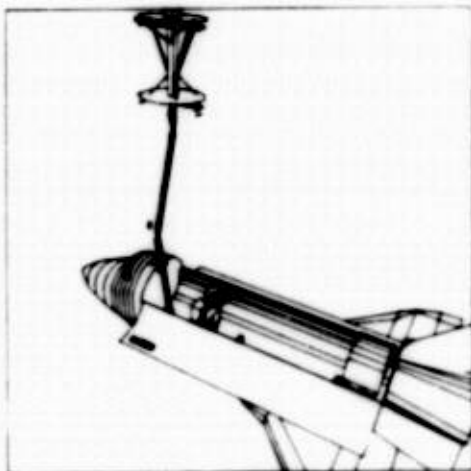
OPR CMD to IC

-608, +38, -1187, 91, 357, 90 GF 5

BRAKES - ON (tb-ON)

SY	SP	EP	WF	WY	WR
-103.2	75.3	-40.0	32.7	4.4	7.5

ORBITER/RMS
DYN INT



A7

✓MADS RCDR PWR - PCM/WB ENA
WB/ACIP PCM - ON

BRAKES - OFF (tb-OFF)
MODE - ORB LD, ENTER
RATE sw - COARSE

THC IN for 15 sec, release input
Pause 30 sec

THC LEFT for 15 sec, release input
Pause 30 sec

BRAKES - ON (tb-ON)

A7

MADS WB/ACIP PCM - CMD

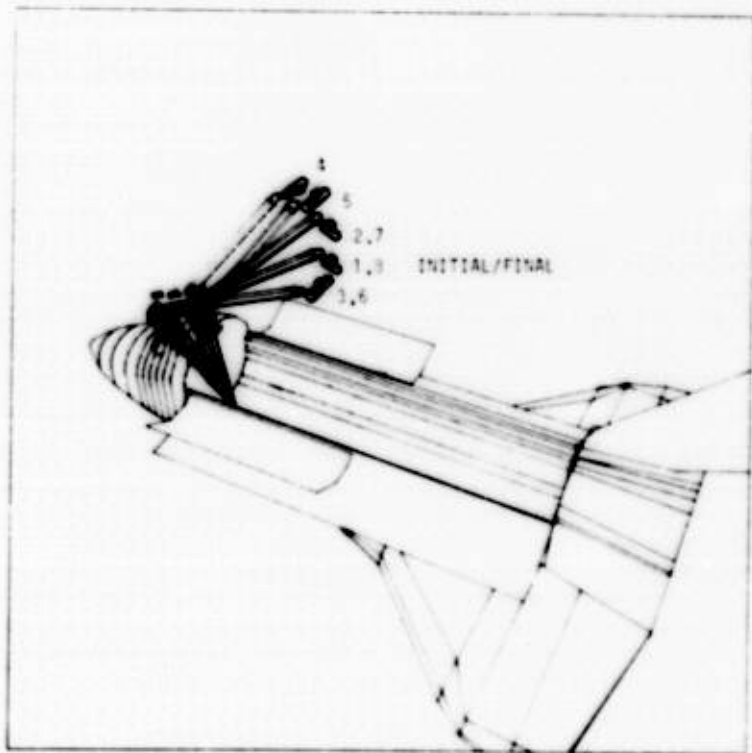
tell MCC when through.

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AUTO MODE EVALUATION (UNLOADED & LOADED)

AUTO

AUTO SEQUENCE - LOADED & UNLOADED



AUTO
PAGE

LOADED & UNLOADED AUTO SEQUENCE

GF 2, GF 5 - Priority ①

UNLD - Priority ③

NOTE

Characters in boxes refer
to unloaded auto sequence.
For unloaded auto sequence,
disregard 16mm Camera ops

A7 CCTV - document auto sequence
R11 VTR - ✓Tape

✓DAP: A9/AUTO/VERN, if desired

CRT

SM 94 PDRS CONTROL

PL ID - ITEM 3 +2 [5] | 0 | EXEC

PL INIT ID - ITEM 24 +2 [5] | 0 | EXEC

DAP ROT: PULSE/PULSE/PULSE

DAP: A9/MAN/VERN

*GF2 - If coming from CONFIG J
Drive SY = -60 and WR = +130
before OPR CMD

Monitor direction of WR during OPR CMD.
(✓WR = -37.8 at INITIAL PT)

OPR CMD to pt 1, PL ID 2 [5] | 0 |

-802, -9, -699, 0, 0, 0 GF 2-----
-892, +7, -683, 270, 315, 270 GF 5-----
-892, -64, -754, 270, 315, 271 UNLD

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SY	SP	EP	WP	WY	WR
-29.6	+96.2	-77.7	-95.3	-22.0	-37.8

BRAKES - ON (tb-ON)

CRT

SM 94 PDRS CONTROL
 PL ID - ITEM 3 +1 EXEC
 PL INIT ID - ITEM 24 +1 EXEC
 AUTO MODE - ITEM 13 +1 EXEC



R11

VTR pb - PLAY, RCD
 BRAKES - OFF (tb-OFF)
 MODE - AUTO 1, ENTER (✓READY lt-on)

pt 1 -892, 0, -690, 0, 0, 0 (INITIAL)

AUTO SEQ - PRO (✓IN PROG lt-on) 1:50
 ✓Moves: UP

pt 2 -892, 0, -750, 0, 0, 0 (PAUSE)

AUTO SEQ - PRO (✓IN PROG lt-on) 1:50
 ✓Rotation only

pt 3 -892, 0, -750, 0, 0, 45 (PAUSE)

AUTO SEQ - PRO (✓IN PROG lt-on) 4:40
 ✓Moves: FWD, STBD, UP

pt 4 -792, +100, -850, 270, 0, 45 (PAUSE)

W9 ✓Exposure w/Spotmeter 4:00
 16mm Camr - on (for -2 min) during
 RMS motion (next step)

AUTO SEQ - PRO (✓IN PROG 1t-on)
✓Moves: AFT, PORT, UP thru FLYBY

pt 5 -892, 0, -900, 0, 0, 45 (FLYBY)

then,
✓Moves: DOWN thru FLYBY

pt 6 -892, 0, -750, 0, 0, 45 } 3.00 (FLYBY)

then,
✓Rotation only

pt 7 -892, 0, -750, 0, 0, 0 (FLYBY)

then,
✓Moves: DOWN 2 00

pt 8 -892, 0, -690, 0, 0, 0 (FINAL)

✓AUTO SEQ 1ts - off
Pause 30 sec, then

- R11 VTR pb - STOP
- BRAKES - ON (tb-ON)
- W9 16mm Camr - off

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NOMINAL BERTH

NOMINAL BERTH
GF 5 - Priority ①

1 SETUP

A7 CCTV - VTR RCD - MUX B&C, Alt with D
document berth

R11 VTR - ✓Tape, audio
✓DAP: A9/AUTO/VERN, if desired

CRT SM 94 PDRS CONTROL
✓PL ID, ITEM 3 - 2 [5]
✓PL INIT ID, ITEM 24 - 2 [5]

DAP ROT: PULSE/PULSE/PULSE
DAP: A9/MAN/VERN

Mnvr to above berthed position

-1018, 0, -600, 0, 0, 0

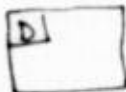
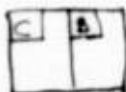
BRAKES - ON (tb-ON)

2 BERTH/LATCH PFTA

R11 VTR pb - PLAY, RCD
RATE sw - VERN (RATE MIN tb-ON), near guides
BRAKES - OFF (tb-OFF)
MODE - ORB LD, ENTER

A6 PL RETEN PL SEL - 1

✓Exposure w/Spotmeter
W9 16mm Camr - on (till end of film)
Berth PFTA
✓PL RETEN RDY 1,2,3,4 tb - gray



.....IF NEXT ACTIVITY IS DIRECT DRIVE UNBERTH.....

·
· BRAKES - ON (tb-ON)
· Go to DIR DR UNBERTH, Step 3, UNBERTH PFTA
·

.....

NOMINAL
BERTH

R13 PL BAY MECH PWR SYS (two) - ON
 A6 PL RETEN LOGIC PWR SYS (two) - ON
 Note any single motor times (> 30 sec)
 PL RETEN LAT 5 - LAT (tb-LAT), 60 sec max
 - OFF
 ✓RDY 1,2,3,4,5 (five) tb - gray
 LAT 1,4 - LAT (tb-LAT), 60 sec max
 - OFF
 LAT 2,3 - LAT (tb-LAT), 60 sec max
 - OFF
 PL SEL - MON
 LOGIC PWR SYS (two) - OFF


R13 PL BAY MECH PWR SYS (two) - OFF
 R11 VTR pb - STOP
 W9 16mm Camr - off

3 RELEASE PFTA
 A7 CCTV - MON 2 - RMS/Wrist (zoom out)

EE MODE - AUTO
 RATE sw - VERN (RATE min tb-ON)

BRAKES - OFF (tb-OFF)
 MODE - END EFF, ENTER

When OPEN tb - gray, mnvr arm away from
 grapple fixture
 EE RELEASE sw - depress (mom)

✓  (23 sec max)

Mnvr arm clear of Orbiter, payload

BRAKES - ON (tb-ON)
 EE MODE - OFF

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DIRECT DRIVE UNBERTH

DIRECT DRIVE UNBERTH

GF 2 - Priority ①

GF 5 - Priority ②

1 GRAPPLE PFTA GF 2 [5]

A7 CCTV - MON 2 - RMS/Wrist (zoom out) **

✓Target overlay attached to MON 2

R11 VTR - ✓Tape, audio

✓DAP: A9/AUTO/VERN

CRT

SM 94 PDRS CONTROL
PL ID - ITEM 3 +2 [5] EXEC

BRAKES - OFF (tb-OFF)
MODE - ORB UNL, ENTER
Mnvr to grapple fixture
X = -1108 GF 2
X = -919 GF 5

When grapple fixture in view,
EE MODE - AUTO
MODE - END EFF, ENTER
Mnvr to grapple envelope
EE CAPTURE sw - depress (mom)

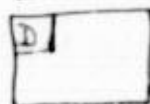
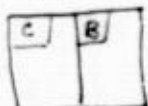
✓ (23 sec max)

EE MODE - OFF **
BRAKES - ON (tb-ON)

Record POS/ATT and JOINT ANGLES

2 TRUNNION RELEASE

- A7 CCTV - VTR RCD - MUX B&C, Alt with D
document unberth
- R11 VTR pb - PLAY,RCD
- R13 PL BAY MECH PWR SYS (two) - ON
A6 PL RETEN PL SEL - 1
LOGIC PWR SYS (two) - ON



Note any single motor times (> 30 sec)

- PL RETEN LAT 1,4 - REL (tb-REL), 60 sec max
- OFF
- LAT 2,3 - REL (tb-REL), 60 sec max
- OFF
- LAT 5 - REL (tb-REL), 60 sec max
- OFF
- PL SEL - MON
- LOGIC PWR SYS (two) - OFF
- R13 PL BAY MECH PWR SYS (two) - OFF

3 UNBERTH PFTA

DAP ROT: PULSE/PULSE/PULSE
 DAP: A9/MAN/VERN

✓BRAKES - ON (tb-ON)
 MODE - DIRECT (lt-on)

Mnvr PFTA to -5 ft above guides,
 using the control scheme below

Desired PL Motion	GF 2 Input	GF 5 Input
+XORB	-WP	-EP
+YORB	-SY	-SY
-ZORB	+SP, +EP	+SP
-PORB	-WP	-WP
+YORB	+WR	+WY
+RORB	-WY	+WR

When PFTA is 5 ft above guides,

..... IF NEXT ACTIVITY IS DIRECT DRIVE BERTH.....

·
 · BRAKES - OFF (tb-OFF) ·
 · MODE - ORB LD, ENTER ·
 · Input position/attitude deltas ·
 · BRAKES - ON (tb-ON) ·
 · Go to DIR DR BERTH, Step 2 BERTH/LATCH PFTA ·
 ······

BRAKES - OFF (tb-OFF)
 MODE - ORB LD, ENTER
 Mnvr to Z = -600
 BRAKES - ON (tb-ON)

R11 VTR pb - STOP

DIR DR
BERTH

DIRECT DRIVE BERTH

DIRECT DRIVE BERTH

GF 2 - Priority ①

GF 5 - Priority ②

1 SETUP

DIR DK BERTH
A7 CCTV - VTR RCD - MUX B&C, Alt with D, ELBOW |
document berth
R11 VTR - ✓Tape, audio

✓DAP: A9/AUTO/VERN

CRT

|SM 94 PDRS CONTROL|
✓PL ID, ITEM 3 - 2 [5]
✓PL INIT ID, ITEM 24 - 2 [5]

DAP ROT: PULSE/PULSE/PULSE

DAP: A9/MAN/VERN

OPR CMD to above berthed position

-1018, 0, -600, 0, 0, 0,

Mnvr to approx 5 ft above guides (Z = -485)

BRAKES - OFF (tb-OFF)

MODE - ORB LD, ENTER

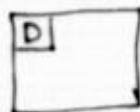
Input position/attitude deltas

BRAKES - ON (tb-ON)

2 BERTH/LATCH PFTA

A6

VTR pb - PLAY,RCD
PL RETEN PL SEL - 1
MODE - DIRECT (lt-on)



Berth PFTA using the control scheme below

Desired PL Motion	GF 2 Input	GF 5 Input
-XORB	+WP	+EP
-YORB	+SY	+SY
+ZORB	-SP, -EP	-SP
+PORB	+WP	+WP
-YORB	-WR	-WY
+RORB	-WY	+WR

A6 ✓ PL RETEN RDY 1,2,3,4 (^{four}~~five~~) tb - gray
 BRAKES - OFF (tb-OFF)
 MODE - TEST, ENTER

R13 PL BAY MECH PWR SYS (two) - ON
 A6 PL RETEN LOGIC PWR SYS (two) - ON

Note any single motor times (> 30 sec)
 PL RETEN LAT 5 - LAT (tb-LAT), 60 sec max
 - OFF
 ✓ RDY 1,2,3,4,5 tb - gray
 LAT 1,4 - LAT (tb-LAT), 60 sec max
 - OFF
 LAT 2,3 - LAT (tb-LAT), 60 sec max
 - OFF
 PL SEL - MDN
 LOGIC PWR SYS (two) - OFF

R13 PL BAY MECH PWR SYS (two) - OFF
 BRAKES - ON (tb-ON)

R11 VTR pb - STOP

3 RELEASE PFTA

CCTV - MON 2 - RMS/Wrist (zoom out)

EE MODE - AUTO


RATE sw - VERN (RATE min tb-ON)

BRAKES - OFF (tb-OFF)

MODE - END EFF, ENTER

When OPEN tb - gray, mnvr away from
grapple fixture

EE RELEASE sw - depress (mom)

✓  (23 sec max)



Mnvr arm clear of Orbiter, payload

BRAKES - ON (tb-ON)

EE MODE - OFF

OFF-

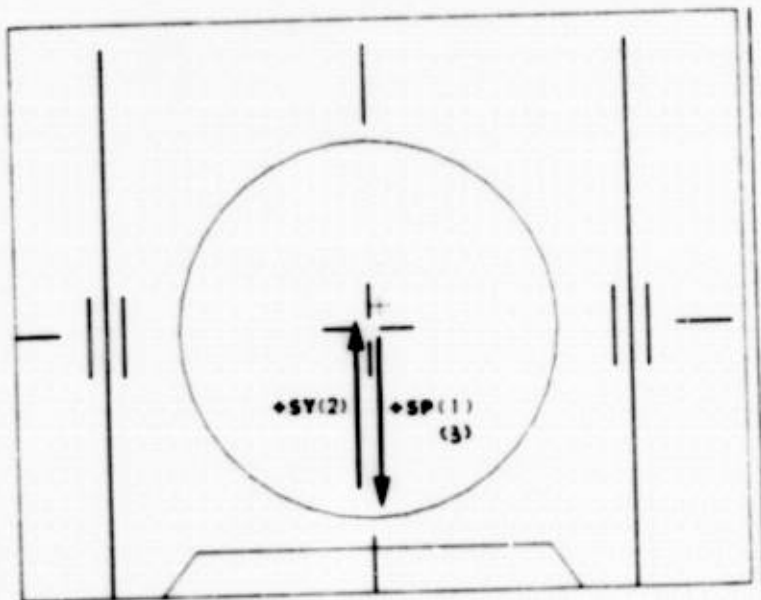
OFF-NOMINAL OPERATIONS

PFTA GRAPPLE FIXTURE 2 BACKOFF - SINGLE JOINT
(Motion of target on CCTV monitor)

✓OPEN tb - gray

A7 CCTV - MON 2 - RMS/Wrist (ZOOM OUT) **

Drive joints in order indicated until end effector is clear of grapple fixture



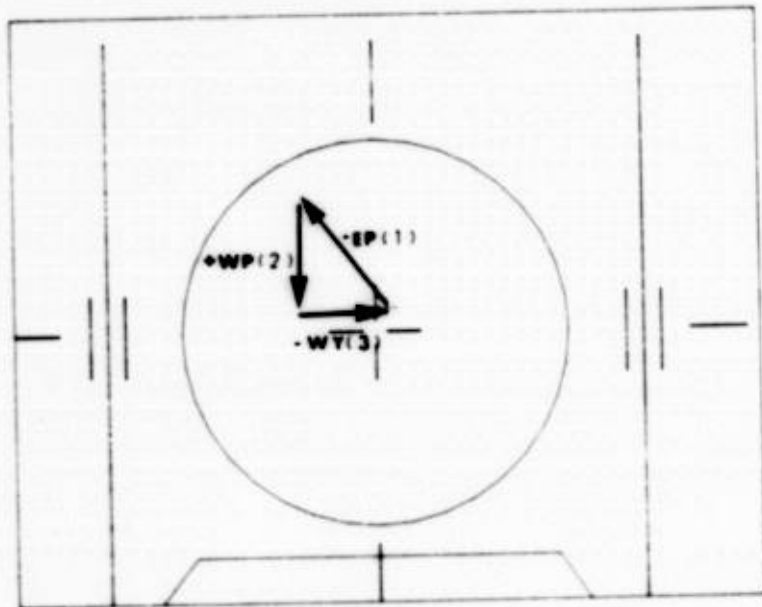
PFTA GRAPPLE FIXTURE 5 BACKOFF - SINGLE JOINT

(Motion of target on CCTV monitor)

√OPEN tb - gray

A7 CCTV - MON 2 - RMS/Wrist (ZOOM OUT) **

Drive joints in order indicated until end effector is clear of grapple fixture



POSITIONS/ATTITUDES FOR BACKED OFF* END EFFECTOR

GF 2 PL 10 0

X = -1108 Y = -66 Z = -465 P = 270 Y = 315 R = 271

SY = -3.0 SP = 47.9 EP = -72.0 WP = -64.4 WY = -25.5 WR = -66.6

GF 5 PL 10 0

X = -902 Y = 0 Z = -400 P = 0 Y = 0 R = 1

SY = -27.5 SP = 53.9 EP = -141.6 WP = 87.7 WY = 27.5 WR = .5

* End effector is backed off 16 in. from rigidized position

HIGH PRIORITY MENU

The order of tests listed below represents the relative priority.
OPR CMD to IC is not verified for this sequence.

GF 5

- 1 NOMINAL UNBERTH, FS 1-1 (20 min)
- 2 RMS/PRCS INTERACTION (40 min)
Step 1, SETUP (CONFIG E), FS 4-2 thru FS 4-3
TEST (CONFIG E), FS 4-3
Step 2, SETUP (CONFIG B), FS 4-4 thru FS 4-5
TEST (CONFIG B), TEST # 1,2 ONLY, FS 4-5
- 3 CONTROL SYSTEM EVALUATION (35 min)
Step 4, SINGLE JOINT (CONFIG C), FS 3-8 thru
FS 3-9
Step 2, SINGLE JOINT (CONFIG A), FS 3-4
TEST # 1,2,4 ONLY, FS 3-5
- 4 RMS/FCS TESTS (25 min)
Step 4, MNVR RMS TO LDEF CONFIG, FS 2-8
Step 5, ROT PULSE INPUTS, FS 2-9
- 5 NOMINAL BERTH, FS 8-1 (25 min)

GF 2

- 6 DIRECT DRIVE UNBERTH, FS 9-1 (25 min)
-

If time permits, proceed with the following tests.
Else at RMS POWERDOWN minus 40 min,
Go to DIRECT DRIVE BERTH

- 7 RMS/PRCS INTERACTION (20 min)
Step 1, SETUP (CONFIG E), FS 4-2 thru FS 4-3
TEST (CONFIG E), FS 4-3

CONTINUED NEXT PAGE

- 8 CONTROL SYSTEM EVALUATION (20 min)
Step 4, SINGLE JOINT (CONFIG C), FS 3-8 thru
FS 3-10
- 9 RMS/FCS TESTS (30 min)
Step 1, SETUP IC, FS 2-2
Step 2, LOADED ARM MOTION, TEST # 2,4 ONLY, FS 2-3
Step 3, I-LOAD SENSITIVITY TEST FS 2-4 thru FS 2-5
- 10 DIRECT DRIVE BERTH, FS 10-2 (40 min)

34D DEPLOY MENU (FD 3 ONLY)

GF 2

- 1 NOMINAL UNBERTH, FS 1-1
- 2 RMS/FCS TESTS, FS 2-1
- 3 RMS/PRCS INTERACTION *
Step 1, SETUP (CONFIG E), FS 4-2 thru FS 4-3
TEST (CONFIG E), FS 4-3
Step 2, SETUP (CONFIG B), FS 4-4 thru FS 4-5
TEST (CONFIG B),
TEST # 1,2,4,6 ONLY, FS 4-5
- 4 LSS VIBRATION DAMPING TEST *
Step 1, SETUP (CONFIG B), FS 5-2 thru FS 5-3
TEST (CONFIG B), TEST # 1,2 ONLY, FS 5-3
Step 2, SETUP (CONFIG J), FS 5-4 thru FS 5-5
TEST (CONFIG J), TEST # 1,2 ONLY, FS 5-5
- 5 AUTO MODE EVALUATION - LOADED, FS 7-1

6 NOMINAL BERTH, FS 8-1

7 DIRECT DRIVE UNBERTH, FS 9-1

8 DIRECT DRIVE BERTH, FS 10-1

CONTROL SYS EVAL.
STEP 4, Single joint
(Config C)
FS 3-8 thru 3-10

Delete CONTROL SYSTEM EVALUATION
Delete AUTO MODE EVALUATION - UNLOADED

*35D DEPLOY MENU (FD 3 ONLY)

GF 2

Perform above menu, except

3 RMS/PRCS INTERACTION
Step 2, TEST (CONFIG B)

TEST 1,2 ONLY, FS 4-5
4 LSS VIBRATION DAMPING TEST - DELETE

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RMS/PFTA BERTHED CONFIGURATION DATA

PAYLOAD ID	POSITION			ATTITUDE			JOINT ANGLES					
	X	Y	Z	P	Y	R	SY	SP	EP	MP	MY	MR
2	-1018	0	-400	0	0	0	-4.0	46.4	-72.8	-61.7	-25.5	-65.6
3	-1108	0	-400	0	0	0	-4.0	46.4	-72.8	-61.7	-25.5	-65.6
4	-1108	0	-400	0	0	0	-25.4	53.5	-138.4	85.0	25.4	0.5
5	-1018	0	-400	0	0	0	-25.4	53.5	-138.4	85.0	25.4	0.5
0 (GF 2)	-1108	-54	-454	270	315	271	-4.0	46.4	-72.8	-61.7	-25.5	-65.6
0 (GF 5)	-919	0	-400	0	0	1	-25.4	53.5	-138.4	85.0	25.4	0.5

PFTA POR/RMS JOINT ANGLES FOR COMMON VALIDATION RUNS

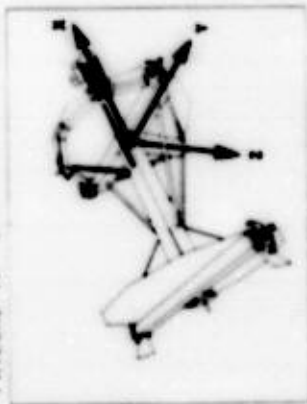
CONFIGURATION	PAYLOAD ID	POSITION			ATTITUDE			JOINT ANGLES					
		X	Y	Z	P	Y	R	SY	SP	EP	WP	WY	WR
A	2	-874	57	-660	0	45	0	-35.2	102.5	-93.8	-65.5	5.5	3.1
	3	-938	-7	-660	0	45	0						
	4	-995	50	-590	305	330	325						
	5	-949	4	-644	305	330	325						
B	2	-594	-232	-1110	357	20	145	-90.0	90.0	-10.0	0.0	0.0	0.0
	3	-680	-263	-1105	357	20	145						
	4	-680	-281	-1217	90	9	70						
	5	-680	-266	-1127	90	9	70						
C	2	-1314	-271	-650	1	275	212	0.0	25.0	-10.0	0.0	0.0	180.0
	3	-1322	-181	-650	1	275	212						
	4	-1431	-190	-677	14	5	179						
	5	-1344	-182	-655	14	5	179						

PFTA POR/RMS JOINT ANGLES FOR COMMON VALIDATIONS RUNS (CONT)

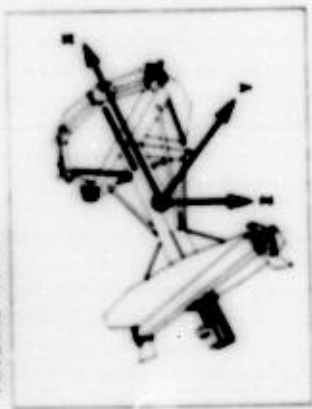
CONFIGURATION	PAYLOAD ID	POSITION			ATTITUDE			JOINT ANGLES					
		X	Y	Z	P	Y	R	SY	SP	EP	WP	WY	WR
D	2	-1129	298	-674	8	53	47	-38.0	34.0	-38.0	0.0	0.0	0.0
	3	-1183	226	-681	8	53	47						
	4	-1272	294	-697	10	323	1						
	5	-1201	240	-684	10	323	1						
E	2	-785	-251	-1104	217	65	264	0.0	90.0	-10.0	0.0	0.0	0.0
	3	-754	-333	-1080	217	65	264						
	4	-774	-370	-1185	79	19	344						
	5	-758	-340	-1101	79	19	344						
J	2	-804	153	-863	180	0	45	-82.6	94.0	-72.7	-41.0	-7.0	197.5
	3	-713	153	-863	180	0	45						
	4	-713	266	-862	0	270	180						
	5	-713	175	-863	0	270	180						

PFTA COORDINATE SYSTEMS

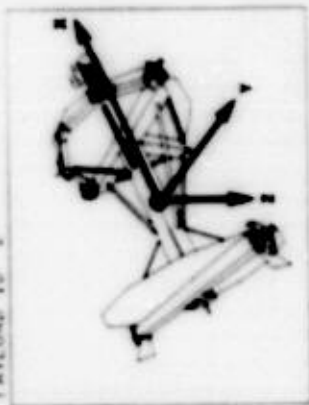
PAYLOAD ID 5



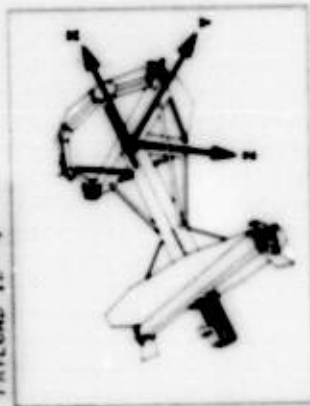
PAYLOAD ID 5



PAYLOAD ID 2



PAYLOAD ID 4



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