

Orbit Operations Checklist

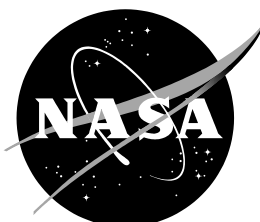
STS-99 Flight Supplement

**Mission Operations Directorate
Operations Division**

**Final, Rev A
August 31, 1999**

National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas



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MISSION OPERATIONS DIRECTORATE

**ORBIT OPERATIONS CHECKLIST
STS-99 FLIGHT SUPPLEMENT**

FINAL, REVISION A
August 31, 1999

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ORBIT OPERATIONS CHECKLIST
 STS-99 FLIGHT SUPPLEMENT

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ORBIT OPS CUE CARDS

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CO2 ABSORBER		
REPLACEMENT		
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(Back)	FS CC 14-4	ORB OPS-14b/ NON-RCRS/99/B
RCS JET ACTIVITY -		
SINGLE (Front)	FS CC 14-5	ORB OPS-31a/99/O/A
MULTI (Back)	FS CC 14-5	ORB OPS-31b/99/O/A
RCS JET ACTIVITY -		
DOUBLET (Front)	FS CC 14-6	ORB OPS-32a/99/O/A
TRIPLET (Back)	FS CC 14-6	ORB OPS-32b/99/O/A
ZDS LATE INITIATION		
(Front)	FS CC 14-7	ORB OPS-33a/99/O/A
TABLE N/TABLE S		
(Back)	FS CC 14-8	ORB OPS-33b/99/O/A

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POC SOFTWARE

<u>PROGRAM TITLE</u>	<u>VERSION</u>	<u>MEDIA</u>
3D Orbiter	generic	H
10.2 Depress	generic	H
Acrobat Reader	generic	H
Cabin Leak	generic	H
COSS	1.0	H
Crew Mail	generic	H
Cyrillic Starter/Keyboard	generic	H
Deorbit Manager	generic	H
EarthKam	5.0a	H
Electronic Still Camera	generic	H
Excel	generic	H
Floppy Update (PADM)	generic	H
Fuel Cell Monitoring System	generic	H
** GrafTrak	generic	H
** GrafTrak Editor	generic	H
HazMat	generic	H
Internet Explorer	generic	H
KODAK TWAIN Drivers	generic	H
Locker Stow	generic	H
MET Server (Time-Vector Server)	generic	H
MET Starter	generic	H
MPV	generic	H
NetCheck	generic	H
Norton AntiVirus	generic	H
Norton Utilities Emergency Disks	generic	F
OCA Audio	generic	H
* OCA Diagnostic	generic	F
OCA KFX	generic	H
OCA MFX	generic	H
OCA Stats	generic	H
OMS-RCS	generic	H
Outlook	generic	H
Packet Display Program	generic	H
Pan/Tilt	generic	H
pcANYWHERE32	generic	H
* PCDecom	generic	H

H – Hard Drive F – Floppy Disk P – PCMCIA Card

* DOS only

** DOS applications available under Windows 95

<u>PROGRAM TITLE</u>	<u>VERSION</u>	<u>MEDIA</u>
PCMMU Server – Serial	generic	H
PCMMU Server Starter	generic	H
PET Timer	generic	H
* PILOT	generic	H
Pingmaster	generic	H
POC Plot	generic	H
Procomm Plus	generic	H
ProShare	generic	H
Spawn Print	generic	H
** Stars	generic	H
* Super Memory Event Monitor	generic	H
Thumbs Plus	generic	H
Time Calculator	generic	H
Video Capture	generic	H
Video Overlay	generic	H
Water Dump	generic	H
Windows '95	generic	H

(Audio Control, Calculator, Character Map, Clipboard Viewer, Control Panel, Explorer, Hyper Thermal, Media Player, Notepad, Paint, Sound Recorder, Word Pad)

WinZip	generic	H
Word	generic	H
World Map	generic	H

<u>SINGLE FILES</u>	<u>VERSION</u>	<u>MEDIA</u>
BIND16.EXE	generic	H
PCMMU16.EXE	generic	H

<u>SPECIAL DRIVERS</u>	<u>VERSION</u>	<u>MEDIA</u>
GPIB PCMCIA Driver	generic	H
PCMMU.DLL	generic	H
METTIMER.DLL	generic	H
SVDISPCL.DLL	generic	H
TIPS Driver	generic	H

<u>PDF DOCUMENT FILES</u>		
System Data (Photos/Section 15)	Generic A,9	P
Malfunction	Generic D,6	P
DPS Dictionary	Generic J,5	P

H – Hard Drive F – Floppy Disk P – PCMCIA Card

* DOS only

** DOS applications available under Windows 95

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COMM/INST

LOAD PCMMU FORMAT FS 1-2
PDI DECOM FORMAT FS 1-4

**COMM/
INST**

FS 1-1

ORB OPS/99/FIN A

COMM/
INST

LOAD PCMMU FORMAT

- C3 1. ✓OI PCMMU FORMAT – GPC
SM 62 PCMMU/PL COMM
- CRT 2. FORMAT:
FXD – ITEM 1 EXEC (*)
SEL ID – ITEM 3 +X X X EXEC
3. ✓SM COMM BUF – RDY
LOAD – ITEM 4 EXEC
✓LOAD, ITEM 4 – RUN,CPLT
- If LOAD – CPLT:
Repeat steps 2 and 3 for second ID
- * If LOAD – FAIL and ERR MSG – 'I/O *
* ERR MMU 1(2)': *
* Go to 5.2a, 'I/O ERR MMU 1(2)' (MAL, *
* DPS) >> *
* *
* If LOAD – FAIL and a first load attempt: *
* Repeat steps 2 and 3 for failed ID *
* *
* If LOAD – FAIL and a subsequent load *
* attempt: *
* ✓MCC *
C3 * OI PCMMU PWR – 2(1) *
* ✓ERR MSG – 'I/O ERR PCM' *
CRT * I/O RESET PCM – ITEM 5 EXEC (*) *
* Repeat steps 2 and 3 *
4. When final LOAD – CPLT:
PGM – ITEM 2 EXEC (*)

DNLIST COMPATIBILITY	PHASE	FORMAT ID 64/128	CONFIG NO.
GNC,BFS	(ASCENT)	102/FXD	-
G2,G8,S2	ORBIT/ORBIT BURN/FCS C/O	103/161	-
G2,S2,OPS 0	OPS 0	- /163	-
G2,S2,P9	MMU C/O	- /163	-
G1,G3,BFS	(ENTRY)	102/164	-
G3,G9,S2	LOSS OF 2 GNC GPCs	- /172	-
G2,G8,S2	SRTM Lo rate SM (PRIME)	103/192	763
G2,G8,S2	SRTM Lo rate SM (BACKUP 1)	103/211	770
G2,G8,S2	SRTM Lo rate SM (BACKUP 2)	103/199	780
G2,G8,S2	SRTM Lo rate SM (BACKUP 3)	103/212	781
G2,G8,S2	SRTM Lo rate OI (PRIME)	103/179	757
G2,G8,S2	SRTM Lo rate OI (BACKUP 1)	103/203	765
G2,G8,S2	SRTM Lo rate OI (BACKUP 2)	103/185	761
G2,G8,S2	SRTM Lo rate OI (BACKUP 3)	103/206	768

NOTE

LDR TFL may affect PCMMU BITE. If PCMMU or SM 2 GPC switched since last TFL, ID 64 and 128 will not reflect current state

LOAD PDI DECOM FORMAT

SM 62 PCMMU/PL COMM

CRT 1. PDI:
 ✓I/O RESET – ITEM 8 (*)
 SEL DECOM – ITEM 9 +X EXEC
 SEL FMT – ITEM 10 +X X X EXEC
 LOAD – ITEM 11 EXEC

If LOAD – CPLT:
 SEL INPUT – ITEM 12 +X EXEC
 LOAD – ITEM 13 EXEC
 Repeat step 1 for additional DECOMs/FPM

* If LOAD – FAIL and ERR MSG – 'I/O *
* ERR MMU 1(2)': *
* Go to 5.2a, 'I/O ERR MMU 1(2)' (MAL, *
* DPS) >> *
* *
* If LOAD – FAIL and a first load attempt: *
* Repeat step 1 *
* *
* If LOAD – FAIL and a subsequent load *
* attempt: *
* *
* NOTE *
* Power cycling PDI will cause PDI *
* to lose DFLs previously loaded *
* *
* ✓MCC *
A1L * S-BD CNTL – PNL *
* PL DATA INTLVR PWR – OFF,ON *
* ✓ERR MSG – 'S62 BCE BYP PL' *
* ✓'S62 BCE BYP PDI' *
* S-BD CNTL – CMD *
* *
* PCM: *
CRT * I/O RESET PCM – ITEM 5 EXEC (*) *
* *
* PDI: *
CRT * I/O RESET – ITEM 8 EXEC (*) *
* Repeat step 1 for all of config (XXX) *

CONFIG	DECOM	FMT	INPUT	USE *
ENTRY TFL 164	1	-	-	
	2	-	-	
	3	-	-	-
	4	-	-	-
	5-FPM	507		H-H-N/A **
763 SRTM (PRIME) TFL 192	1	4	4	SIR-C
	2	5	2	XSAR 1 (Inbd)
	3	6	3	XSAR 2 (Outbd)
	4	7	1	AODA
	5-FPM	501		H-H-L **
770 SRTM (BACKUP 1) TFL 211	1	17	1	AODA
	2	14	4	SIR-C
	3	15	2	XSAR 1 (Inbd)
	4	16	3	XSAR 2 (Outbd)
	5-FPM	502		H-H-L **
780 SRTM (BACKUP 2) TFL 199	1	9	3	XSAR 2 (Outbd)
	2	27	1	AODA
	3	2	4	SIR-C
	4	8	2	XSAR 1 (Inbd)
	5-FPM	503		H-H-L **
781 SRTM (BACKUP 3) TFL 212	1	18	2	XSAR 1 (Inbd)
	2	19	3	XSAR 2 (Outbd)
	3	28	1	AODA
	4	3	4	SIR-C
	5-FPM	504		H-H-L **
757 SRTM LO RATE OI (PRIME) TFL 179	1	4	4	SIR-C
	2	5	2	XSAR 1 (Inbd)
	3	6	3	XSAR 2 (Outbd)
	4	7	1	AODA
	5-FPM	501		L-H-H **
765 SRTM LO RATE OI (BACKUP 1) TFL 203	1	17	1	AODA
	2	14	4	SIR-C
	3	15	2	XSAR 1 (Inbd)
	4	16	3	XSAR 2 (Outbd)
	5-FPM	502		L-H-H **

* ALL Decoms are downlinked in each config

** OI-GNC-SM, Orbiter Downlist Data Rates (High or Low)

CONFIG	DECOM	FMT	INPUT	USE *
761	1	9	3	XSAR 2 (Outbd)
SRTM	2	27	1	AODA
LO RATE OI	3	2	4	SIR-C
	4	8	2	XSAR 1 (Inbd)
(BACKUP 2)	5-FPM	503		
TFL 185				L-H-H **
768	1	18	2	XSAR 1 (Inbd)
SRTM	2	19	3	XSAR 2 (Outbd)
LO RATE OI	3	28	1	AODA
	4	3	4	SIR-C
(BACKUP 3)	5-FPM	504		
TFL 206				L-H-H **

* ALL Decoms are downlinked in each config

** OI-GNC-SM, Orbiter Downlist Data Rates (High or Low)

PTG

STAR PAIRS PAD FS 2-2
PAIRS FS 2-3

PTG

FS 2-1

ORB OPS/99/FIN A

PTG

STAR PAIRS PAD									
		ATT SET 1				ATT SET 2			
PAIR	ANG SEP	DUAL S TRK	SINGLE S TRK		DUAL S TRK	SINGLE S TRK			
			-Z	-Y		-Z	-Y		
A	88.4	-Y:37 R+ 50 -Z:16 P+ 283 Y+ 76	R+ 0 -Z:37 P+ 244 Y+ 67	R+ 233 -Y:16 P+ 186 Y+ 87	-Y:16 R+ 173 -Z:37 P+ 53 Y+ 293	R+ 124 -Z:16 P+ 93 Y+ 288	R+ 223 -Y:37 P+ 13 Y+ 286		
B	81.9	-Y:97 R+ 113 -Z:21 P+ 242 Y+ 346	R+ 28 -Z:97 P+ 239 Y+ 332	R+ 194 -Y:21 P+ 227 Y+ 350	-Y:21 R+ 161 -Z:97 P+ 54 Y+ 30	R+ 73 -Z:21 P+ 63 Y+ 19	R+ 250 -Y:97 P+ 41 Y+ 22		
C	84.3	-Y:102 R+ 67 -Z:101 P+ 177 Y+ 308	R+ 323 -Z:102 P+ 154 Y+ 302	R+ 145 -Y:101 P+ 168 Y+ 321	-Y:101 R+ 228 -Z:102 P+ 327 Y+ 55	R+ 121 -Z:101 P+ 353 Y+ 56	R+ 310 -Y:102P+ 331 Y+ 41		
D	92.1	-Y:53 R+ 295 -Z:22 P+ 225 Y+ 344	R+ 206 -Z:53 P+ 227 Y+ 359	R+ 28 -Y:22 P+ 241 Y+ 342	-Y:22 R+ 335 -Z:53 P+ 51 Y+ 359	R+ 247 -Z:22 P+ 43 Y+ 12	R+ 64 -Y:53 P+ 64 Y+ 6		

PAIR	COAS ALIGN	ANG SEP	COAS ALIGN
	ATTITUDE 1		ATTITUDE 2
C	+X COAS	15 R+ 193 P+ 116 Y+ 346	26 R+ 167 P+ 31 Y+ 346
D			
A	-Z COAS	15 R+ 345 P+ 23 Y+ 348	26 R+ 346 P+ 304 Y+ 13
S			

SINGLE S TRK MIN MNVR OPT
TGT ID = 11-110 NAV STAR #
BODY VECTOR = 5

	-Z S TRK	-Y S TRK
P	87.7	0
Y	358	280.6

NOTE:
Star 101 has been replaced by 447:EPSILON LEO , RA:145.8,DEC: 24.0
Star 102 has been replaced by 788:DELTA DRACO , RA:288.1,DEC: 67.6

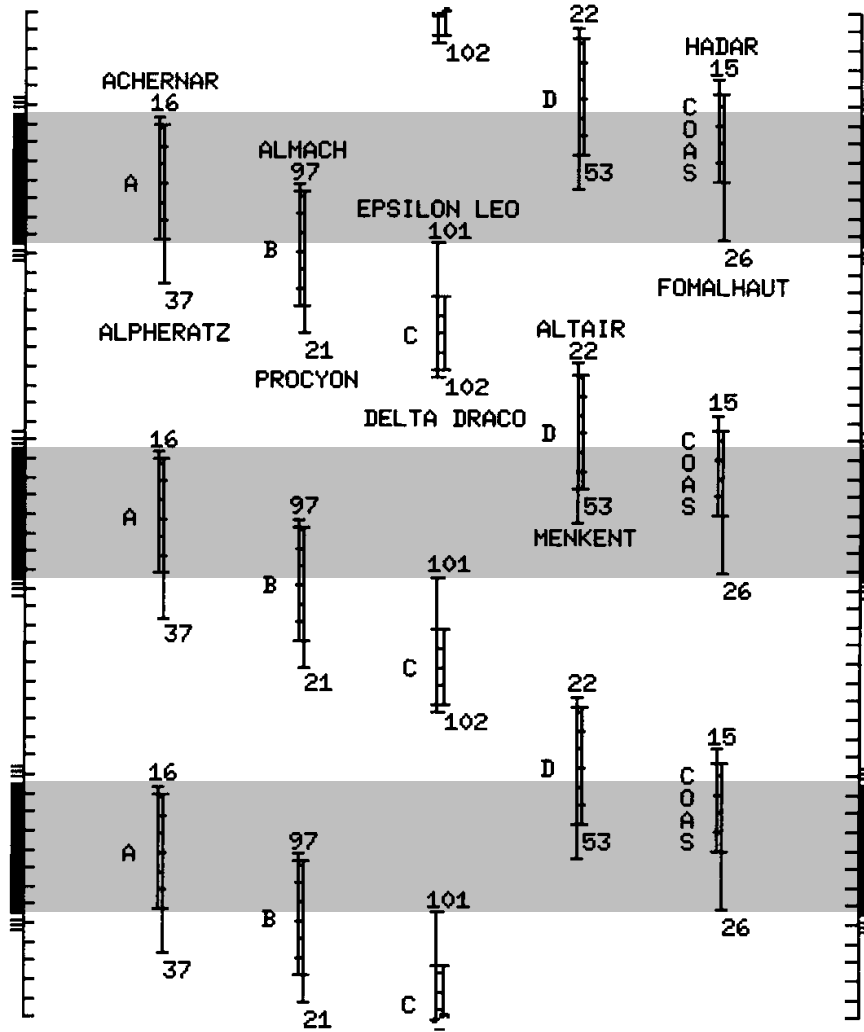
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Date L/O: 09/16/99
GMT L/O: 259/12:47:00

FS 2-2

ORB OPS/99/FIN A

STAR PAIRS PAD

STAR PAIRS



MET Applicable: 0/01:00:00 - EOM
 Date L/O: 09/16/99
 GMT L/O: 259/12:47:00

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CREW SYS

DUAL SHIFT PRE-SLEEP ACTIVITY FS 3-2

**CREW
SYS**

FS 3-1

ORB OPS/99/FIN A

DUAL SHIFT PRE-SLEEP ACTIVITY

1. CRYO HEATER Config per MCC

B 2 3 4 5 6 7 8 9 10 11 12
 13 14 15 16
 R 1 2 3 4 5 6 7 8 9 10 11 12
 13 14 15 16

MO69M 2. If FD1 and PPO2 < 3.20:
 ✓LEH O2 8 vlv – CL
 Insert O2 Bleed Orifice Assy into LEH O2 8 QD
 LEH O2 8 vlv – OP
 C7 ✓LEH O2 SPLY 1,2 vlv – OP

3. SM CHECKPOINT INITIATE (ORB OPS, DPS)

R 1 2 3 4 5 6 7 8 9 10 11 12
 13 14 15 16

4. Perform ERR log reset:

GNC 0 GPC MEMORY

ITEM 48 EXEC

SM 0 GPC MEMORY

ITEM 48 EXEC

R 1 2 3 4 5 6 7 8 9 10 11 12
 13 14 15 16

5. WCS CLEANING/URINE SCREEN
 REPLACEMENT (Cue Card, EDO WCS URINE
 COLLECTION)

B 2 3 4 5 6 7 8 9 10 11 12
 13 14 15 16
 R 1 2 3 4 5 6 7 8 9 10 11 12
 13 14 15 16

Cont next page

6. MSG REVIEW/POSTING

B 2 3 4 5 6 7 8 9 10 11 12
13 14 15 16
R 1 2 3 4 5 6 7 8 9 10 11 12
13 14 15 16

7. COMM/INST, KU-BD ANT CABLE POSITIONING
Perform during ZOE or on MCC call

B 2 3 4 5 6 7 8 9 10 11 12
13 14 15 16
R 1 2 3 4 5 6 7 8 9 10 11 12
13 14 15 16

8. CO2 ABSORBER REPLACEMENT (Cue Card)

B 2 3 4 5 6 7 8 9 10 11 12
13
R 1 2 3 4 5 6 7 8 9 10 11

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OCA

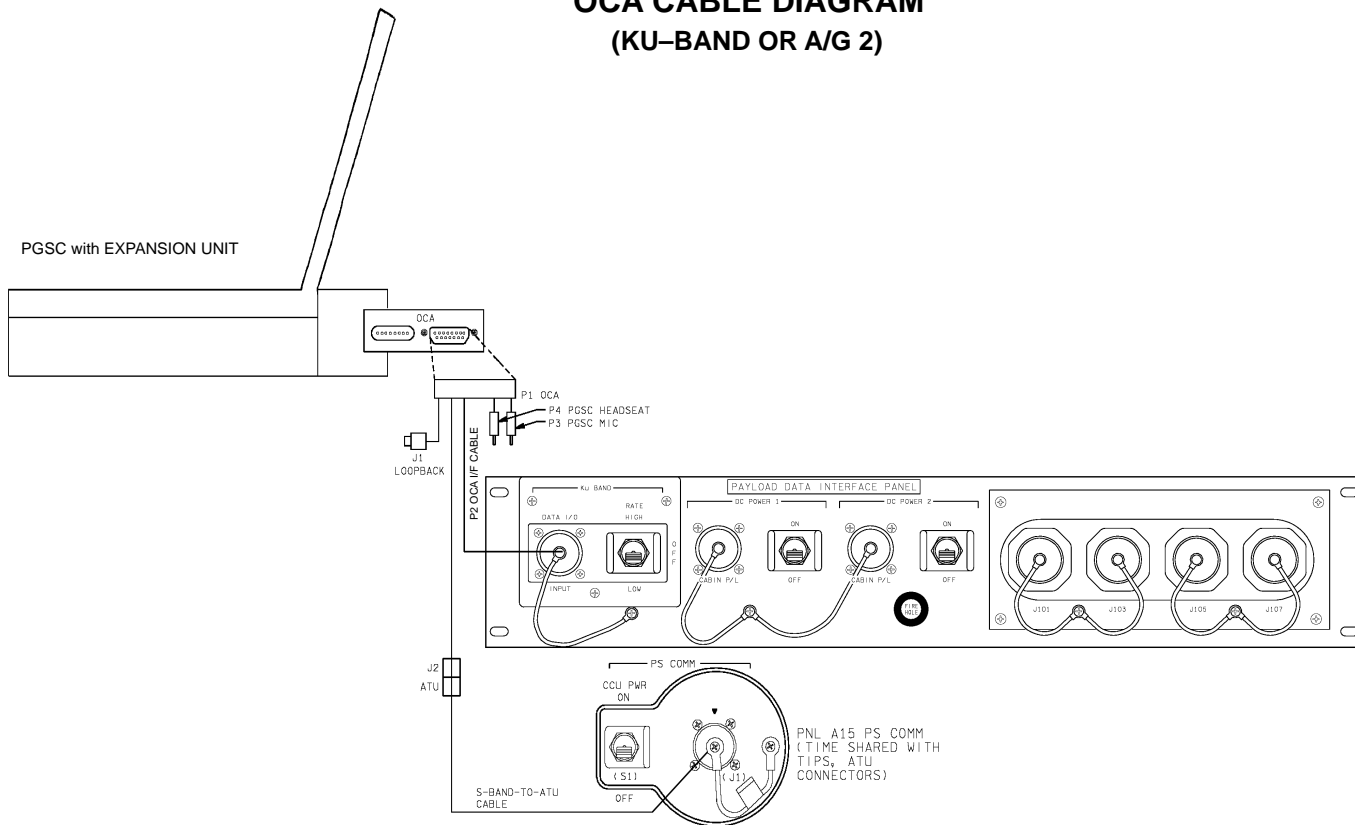
OCA SETUP	FS 4-2
CABLE DIAGRAM	FS 4-3
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OCA

OCA SETUP

1. Unstow:
 - If not pre-routed, OCA I/F cable
 - If not pre-routed, PGSC Modem cable (if reqd)
2. Config cables per OCA CABLE DIAGRAM, FS 4-3
3. Config for KU-Band file xfer:
 - cb PDIP PWR 2/KU-BAND RLY - cl
 - ✓MCC for HDR(LDR)
- A6L PDIP Ku BAND RATE - LO(HI)
4. For PGSCs running OCA Router, ProShare (if reqd), and KFX software:
 - Perform PGSC ACT, steps 1 thru 5 (PGSC), 12-2, then:
5. Config network for PGSCs running OCA Router, ProShare (if reqd), and KFX software:
 - Perform PGSC NETWORK - Setup [for OCA Router: steps 1 thru 5 only] (PGSC), 12-16, then:
- OCA Router PGSC 6. Press [CTRL]/[ALT]/[DEL] to logon to Windows NT
 - Sel 'OK' on 'Logon Information' dialog box
 - Wait approx 10 sec for logon sequence to complete
7. VERIFY DATA RATE
 - Double-click 'OCA Control Panel Applet' icon on desktop
 - ✓'Local OCA Card-1' display on desktop:
 - ✓OCA - FLIGHT SEND - 2(4)M
 - * If Send rate out of config: *
 - * Sel 'Control' on menu bar of 'Local OCA Card-1' display *
 - * Sel 'Transmit Rate' - 2(4) Mbps *
 - * OCA internal clock (✓) *
- 'KFX' PGSC 8. Activate KFX software on PGSC networked to OCA Router:
 - Double-click 'Shuttle Apps' icon on desktop
 - Double-click 'OCA' folder
 - Double-click 'KFX' icon
 - Arrange 'KFX' window as reqd
9. Notify MCC when complete

OCA CABLE DIAGRAM (KU-BAND OR A/G 2)



FS 4-3

ORB OPS/99/FIN A

OCA DOWNLINK VIA GROUND CMD

1. MOVE FILE(S) TO DOWNLINK DIRECTORIES

NOTE

Files will be downlinked via ground cmd, unless MCC instructs otherwise

See OCA DIRECTORY STRUCTURE, FS 4-5
See OCA FILENAMES, FS 4-6, for file naming convention

PGSC

Copy(Move) desired files to
c:\oca-down\mail(payloads)
Notify MCC when complete

2. MONITOR KFX DOWNLINK (if desired)

When link established:

From 'KFX' window:

- ✓REMOTE KFX – green
- ✓Uplink arrow ('↑' next to send rate) – green
- ✓Dnlink arrow ('↓' next to send rate) – green

- ✓KFX application activated
- ✓File Transfer Status dialog (displayed during file xfer)

3. MONITOR MFX DOWNLINK (if desired)

If MFX application not activated:

Perform OCA S-BAND MODEM(MFX)
ACTIVATION, FS 4-8, then:

If minimized:

- ✓Icon Title displaying File Name, Send/Receive Status

NOTE

For detailed file xfer information, following steps must be completed prior to file xfer initiation

Sel 'File' on menu bar of MFX application

- ✓Show Status During File Xfers – (✓)
- ✓Z MODEM(1K-X MODEM) display appears
- ✓Displaying File Name, Send/Receive Status

OCA DIRECTORY STRUCTURE

```
C:\
├── OCA-DOWN
│   ├── MAIL
│   └── PAYLOADS *
├── OCA-UP
│   ├── ARCHIVE
│   ├── MAIL
│   │   ├── CDR
│   │   ├── MS1
│   │   ├── MS2
│   │   ├── MS3
│   │   ├── MS4
│   │   ├── MS5
│   │   ├── PLT
│   │   ├── PS1
│   │   └── PS2
│   ├── NEWS
│   ├── OTHER
│   ├── PAYLOADS
│   ├── SPOC **
│   └── WEB
└── OCA—SW (Ground Use Only)
```

* PAYLOADS Directory: Directory may contain flight specific subdirectory

** SpOC Directory: Directory will contain latest SpOC updates. To create SpOC update disk, copy all files in c:\oca-up\spoc\uplink to a:\uplink

OCA FILENAMES

UPLINKED FILES

LOCATION

SpOC updates:	a:\uplink\ (c:\oca-up\spoc\)
World News:	c:\oca-up\news\
Ops notes:	c:\oca-up\other\opsxxxx.doc
Graphics files:	c:\oca-up\other\othrxxxx.bmp
Uplinked personal mail:	c:\oca-up\mail\
Uplinked Payload files:	c:\oca-up\payloads\

DOWNLINKED FILES

LOCATION

Personal mail, other:	c:\oca-down\mail\
P/L files:	c:\oca-down\payloads\

STD FILENAMES

filename.doc	WORD documents only
filename.txt	ASCII text file (NOTEPAD or WORD)
filename.bmp	Graphics file (Paint)
filename.pcx	Graphics file (Paint)
famcdr01.doc	family mail: CDR → family on FD01
cdrfam02.doc	family mail: family → CDR on FD02
fltcd02.doc	message: CDR → FLT Director on FD02
plx_06.doc	message: to Payload X on FD06

NOTE

Do not downlink medical data. Downlink directories will be cleared of all files at end of each OCA session. To retain archive copy of downlink msgs, save in personal directory

OCA KU-BAND (KFX) MANUAL DOWNLINK

- PGSC
1. CONFIGURE S/W FOR FILE DOWNLINK
If reqd, enlarge 'KFX' window

From 'KFX' window:
 - ✓REMOTE KFX – green
 - ✓Uplink arrow ('↑' next to send rate) – green
 - ✓Dnlink arrow ('↓' next to send rate) – green
 2. SELECT FILE(S) TO DOWNLINK
Use WINDOWS EXPLORER to sel files/directories to transfer
Drag files over KFX window
Rel mouse button
 - ✓'KFX File Transfer Preview' display appears with selected file(s) listed
 3. ADD ADDITIONAL FILE FOR DOWNLINK (if reqd)
 - ✓'KFX File Transfer Preview' display active
 - Sel 'add to list' button (button with documents, '+' symbols)
 - ✓'Select Files for Transfer' display appears
 - Sel desired file from file listbox
 - Sel Select' button
 - Repeat for each additional file as reqd
 - Sel Done' button
 4. REMOVE FILE FROM DOWNLINK (if reqd)
 - ✓'KFX File Transfer Preview' display active
 - Sel desired file(s) in listbox
 - Sel 'delete' button (button with 'X')
 5. START FILE DOWNLINK

NOTE

User may halt transfer while in progress by sel Abort' button

- ✓'KFX File Transfer Preview' display active
- Sel 'downlink' button (button with '↓')
- ✓'File Transfer Status' display appears
- ✓Displaying xfer status

* If error displayed, repeat step 5 *

OCA S-BAND MODEM (MFX) ACTIVATION

1. ESTABLISH LINK

On MCC GO:

A15 PS COMM CCU PWR – OFF

L9 PS AUD PWR – AUD
A/G 1 – OFF
A/G 2 – T/R
A/A – OFF
ICOM (two) – OFF
VOL A/G 2 tw – 0
XMIT/ICOM MODE – PTT/PTT

CAUTION

Loss of A/A (UHF) will occur if OCA PGSC Modem cable connected to COMM OUTLET and A/A in T/R on ATU

O9 R AUD A/G 2 – OFF
O5 L AUD A/G 2 – OFF
R10 MS AUD A/G 2 – OFF
A13(OV102) OS AUD A/G 2 – OFF
MO42F MIDDECK SPKR AUD A/G 2 – OFF

A15 ✓PGSC Modem cable connected to PS COMM outlet

2. ACTIVATE FILE XFER S/W

OCA Router
PGSC

If PGSC not running Windows 95:
Restart (or pwr on) PGSC
At Startup Menu, sel Windows 95 option
Press [ENTER]

Double-click 'Shuttle Apps' icon on desktop
Double-click 'OCA' folder
Double-click 'MFX' icon
✓'MFX' display appears
✓WINDOW – OFFLINE
Arrange 'MFX' window as reqd

VIDEO CONFERENCING

1. Unstow:
 - Headset
 - Mini-cam
 - ProShare Video/Pwr cable
 - VLHS/VTS I/F cable
2. Perform OCA SETUP, steps 1 thru 5, FS 4-2, then:
3. Config cables per P/TV VIDEO CONFERENCING (PHOTO/TV FS, P/TV06 VID CONE)

ProShare
PGSC

4. Double-click 'Shuttle Apps' icon on desktop
Double-click 'OCA' folder
Double-click 'OCA ProShare Video' icon
5. ✓Video active in 'Local' window
6. Adjust Thinkpad display tilt-angle, camera position, iris, focus so oper's face centered in 'Local' video window
7. ✓Picture quality and position
 - * If picture quality poor:
 - * From 'Local' video window: *
 - * Sel 'Adjusts video' button ('slide *
 - * bar' icon) *
 - * Adjust picture quality as reqd *
 - * Sel 'Close' button *
 - * If 'Save camera control settings?' *
 - * appears, sel 'Yes' button *
 - * *
 - * From 'Local' video window: *
 - * ✓'Zooms in' button (mag glass) in *
 - * out position *
8. TO RECEIVE CALL
Notify MCC when ready to receive video conference call, wait for MCC to initiate

Cont next page

9. TO INITIATE CALL

Notify MCC when ready to place video conference call, wait for MCC confirmation
Sel 'Dial List' button
Sel 'MCC, PC'
Sel 'Dial' button

NOTE

Title of remote video window changes to designate caller when video conference established

10. CONDUCT VIDEO CONFERENCE

NOTE

Video conference performance may be affected if other applications are active

- ✓ Remote video window active, audio active
Sel 'Split' button on handset
Move remote video window directly beneath camera
Adjust audio volume using slide bar under remote video window
- ✓ Headset/speaker Toggle button configured for headset audio (button not depressed)

11. TERMINATE VIDEO CONFERENCE

NOTE

When video conference completed, either side can terminate call. If MCC has disconnect, 'Hang Up' button will change to 'Dial'

From ProShare Video handset:
Sel 'Hang Up' button
Sel System Menu (upper left corner)
Sel 'Exit' ([ALT]/[SHIFT]/[F4])

OCA CHALKBOARD

1. Perform VIDEO CONFERENCING, steps 1 thru 8(9), FS 4–9 then:
2. TO RECEIVE CHALKBOARD SESSION
Notify MCC when ready to receive chalkboard session, wait for MCC to initiate

PGSC

From ProShare Video handset, sel 'Split' button
If 'Local' video remains on screen, minimize 'Local' video window

3. TO INITIATE CHALKBOARD SESSION
Notify MCC when ready to initiate chalkboard session, wait for MCC confirmation

From ProShare Video handset, sel 'OCA CHALKBOARD' button

Sel 'Yes' at 'Do You Want to Share Notebook?' dialog

Minimize all unused windows

4. TERMINATING CHALKBOARD SESSION

NOTE

When chalkboard session completed, either side can terminate session

From ProShare Personal Conferencing menu bar:
Sel 'Conference'
Sel 'UnShare Notebook' menu

If MCC has terminated session, sel 'OK' in 'The other participant closed the notebook'

From ProShare Personal Conferencing menu bar:
Sel 'File'
Sel 'Exit'

NOTE

Operator will be prompted to save chalkboard session in 'xxxx.mtg' file

APPLICATION SHARING

- PGSC
1. Launch desired application
 2. Perform OCA CHALKBOARD, steps 1 thru 3, FS 4-11, then:
 3. From ProShare Personal Conferencing menu bar:
Sel 'Application'
Sel 'Share Application View..'
 4. From 'Share Application View' dialog box:
Sel desired application
Sel 'OK'
 5. Perform application edits with MCC when application is shared

NOTE

Mouse operation, shared between MCC and flight operator, must be coordinated using conference audio

6. TERMINATING APPLICATION SHARING
Either side can terminate application sharing by exiting application

REMOTE PAN/TILT/ZOOM CONTROL OF GROUND CAMERA (KCA CAMERA CNTL)

NOTE

PAN/TILT control only available if ground workstation involved in video conference has PAN/TILT, and ground PAN/TILT camera is running

1. Perform VIDEO CONFERENCING, steps 1 thru 8(9), FS 4-9, then:

ProShare

PGSC

2. Double-click 'Shuttle Apps' icon on desktop
Double-click 'OCA' folder
Double-click 'OCA ProShare Pan-Tilt' icon
3. Sel 'Help' in KCA Camera Control menu bar for instructions
4. When camera control ops complete, close KCA camera control application

OCA PROSHARE CONFIG FOR CAMCORDER OPS

NOTE

Only one instance of OCA ProShare application can be open at one time

ProShare

PGSC

1. If open, exit ProShare application
2. Double-click 'Shuttle Apps' icon on desktop
3. Double-click 'OCA' folder
4. Double-click 'OCA ProShare Video with Camcorder' icon

OCA LOOPBACK TEST

NOTE

Perform procedure on OCA Router
PGSC running in Windows NT

- OCA Router
PGSC
1. LOGON TO WINDOWS NT
Press [CTRL]/[ALT]/[DEL] to logon to Windows NT
Sel 'OK' on 'Logon Information' dialog box
Wait approx 10 sec for logon sequence to complete
Double-click 'OCA Control Panel Applet' icon on
desktop
✓'Local OCA Card-1' display on desktop
 2. INITIATE INTERNAL LOOPBACK TEST
From 'Local OCA Card-1' display:
Sel 'OCA Self Tests' on menu bar
Sel 'Internal Loopback'

✓'Local OCA Card-1' display:
Successful Test – Animated Signal moving
inside PC icon
Unsuccessful Test – 'Frowny Face' displayed
inside PC icon
Inform MCC of results
 3. TERMINATE INTERNAL LOOPBACK TEST
From 'Local OCA Card-1' display:
Sel 'OCA Self Tests' on menu bar
Sel 'Stop Loopback Testing'
 4. INITIATE EXTERNAL LOOPBACK TEST
Disconnect OCA I/F cable from PDIP panel
Connect PDIP end of OCA I/F cable to loopback
port on PGSC end of cable
See OCA CABLE DIAGRAM – LOOPBACK,
FS 4-15, for cable config

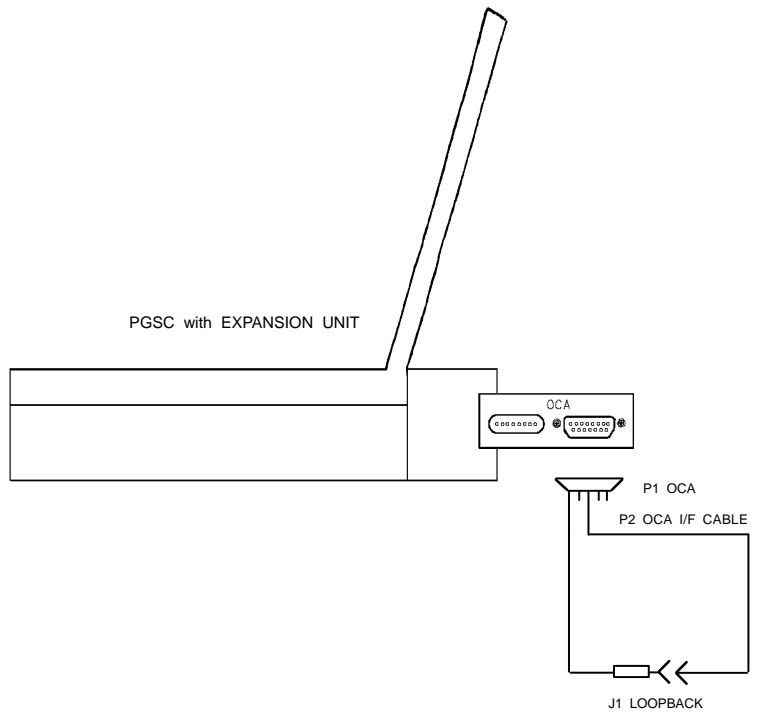
From 'Local OCA Card-1' display:
Sel 'OCA Self Tests' on menu bar
Sel 'External Loopback #1'

Cont next page

- ✓'Local OCA Card-1' display:
 - Successful Test – Animated Signal moving outside PC icon
 - Unsuccessful Test – 'Frowny Face' displayed inside PC icon
- Inform MCC of results

- 5. TERMINATE EXTERNAL LOOPBACK TEST
 - From 'Local OCA Card-1' display:
 - Sel 'OCA Self Tests' on menu bar
 - Sel 'Stop Loopback Testing'

OCA CABLE DIAGRAM – LOOPBACK

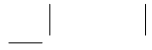


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GPS

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(DTO 700-14)	FS 5-7
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HARD DRIVE SWAP (CONTINGENCY) ...	FS 5-14
RESTART (CONTINGENCY)	FS 5-15

GPS



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GPS



GPS DEVELOPMENT FLIGHT TEST

OPS 2 GPS TEST

- A13 1. GPS POWER UP
✓GPS PWR – ON
- CRT * If receiver not powered, *
* GPS PWR – ON *
* ✓GPS ENCRYPT – NORMAL *
* Wait at least 30 sec *
* GNC I/O RESET *
* * *
* GNC 55 GPS STATUS *
* INIT – ITEM 15 EXEC (*) *
* ✓MODE – INIT *
* NAV – ITEM 18 EXEC (*) *
* ✓MODE – INS *
* On MCC GO, proceed to next step *
- CRT 2. GPS SHORT PWR CYCLE
A13 ✓NAV – ITEM 18 (*)
GPS PWR – OFF (5 sec), ON
(expect 'BCE STRG 2 GPS')
Wait 10 sec
CRT GNC I/O RESET
- ✓MODE – INS
✓SATELLITES – tracking 4 satellites
✓MCC before proceeding
- CRT 3. GPS LONG PWR CYCLE
A13 ✓NAV – ITEM 18 (*)
GPS PWR – OFF (at least 30 sec), ON
(expect 'BCE STRG 2 GPS')
Wait at least 30 sec
CRT GNC I/O RESET

Cont next page

CRT INIT – ITEM 15 EXEC (*)
✓MODE – INIT
NAV – ITEM 18 EXEC (*)

✓MODE – INS
✓SATELLITES – tracking 4 satellites
(may take up to 12 min to acquire 4 or more satellites)
✓MCC before proceeding

4. GPS FILTER RESTART

✓MODE – INS
RESTART – ITEM 21 EXEC (*)
Wait 5 sec
✓RESTART – ITEM 21 (no *)

5. IMU TO GPS REASSIGNMENT

A. REASSIGN GPS 2 TO IMU 3

CRT GNC 55 GPS STATUS
IMU – ITEM 24 +3 EXEC
✓‘33’ next to ITEM 24
Wait 5 min

B. REASSIGN GPS 2 TO INVALID IMU

CRT GNC 55 GPS STATUS
IMU – ITEM 24 +2 EXEC
✓‘21’ next to ITEM 24
Wait 1 min

C. REASSIGN GPS 2 TO AUTO SELECTED IMU

CRT GNC 55 GPS STATUS
IMU – ITEM 24 +0 EXEC
✓‘_1’ next to ITEM 24

On MCC GO, proceed to next step

Cont next page

6. SATELLITE DESELECTS

A. DESELECT SATELLITES TRACKED ON
PRIMARY CHANNELS

NOTE

SAT DES/RES may take up
to 15 sec to be honored

Note satellite #s currently tracked on primary
channels (C1–C4)

C1 ____ C2 ____ C3 ____ C4 ____

GNC 55 GPS STATUS

CRT

DES – ITEM 43 +(C1 SAT#) EXEC
DES – ITEM 44 +(C2 SAT#) EXEC
DES – ITEM 45 +(C3 SAT#) EXEC
DES – ITEM 46 +(C4 SAT#) EXEC

✓GDOP and QA1 (expected to increase)
Wait 2 min before proceeding to next step

B. RESELECT SATELLITES

GNC 55 GPS STATUS

CRT

DES – ITEM 43 –(C1 SAT#) EXEC
DES – ITEM 44 –(C2 SAT#) EXEC
DES – ITEM 45 –(C3 SAT#) EXEC
DES – ITEM 46 –(C4 SAT#) EXEC

✓GDOP and QA1 (expected to decrease)

NAV RECOVERY

C3 1. SYSTEM SAFING
DAP: FREE
S-BD PM ANT – BEST ANT

GNC 55 GPS STATUS
GPS TO NAV INH – ITEM 36 EXEC (*)

Establish COMM with MCC
If COMM established, MCC will uplink Orbiter
State Vector

* If no joy on COMM: *
* Proceed to step 2 *

C3 On MCC GO:
DAP: AUTO
S-BD PM ANT – GPC

2. NAV RECOVERY

NOTE

This step is only applicable in GNC OPS 2,
and only when MCC has previously
uplinked a Target State Vector

GNC 33 REL NAV
RNDZ NAV ENA – ITEM 1 (*)
TGT TO ORB – ITEM 11 (*)

C3 DAP: AUTO
S-BD PM ANT – GPC

Establish COMM with MCC

GNC 33 REL NAV
RNDZ NAV ENA – ITEM 1 (no *)

**SINGLE STRING GLOBAL POSITIONING SYSTEM
(DTO 700-14)**

MAGR UNSTOW

- MF71E 1. Open locker door
2. ✓Temp strip – rightmost three blocks black
- * If Temp strip rightmost three blocks not *
 - * black (temp > 122 degF) *
- MO13Q * DC UTIL PWR – OFF *
- * Wait 10 min *
- MF71E * Expansion Chassis pwr – off *
- * ✓Temp strip rightmost three blocks black *
- MO13Q * DC UTIL PWR – ON *
- MF71E * Expansion Chassis pwr – on *
- * PGSC pwr – on *
 - * ✓MCC *
- MF71E 3. Remove PGSC foam assy
- MAGR 4. Open PGSC monitor
- PGSC ✓Data Display
- * If data not updating, ✓MCC *
5. Press [ESC] twice to exit data collection program
✓‘C:\GPS>’ appears on display
6. Enter ‘cflash’ [RETURN]
Record number of files in directory from upper
flash card. Press [ENTER] and then record
number of files in directory from lower flash
card. Report to MCC and press [ENTER]
7. PGSC pwr – off
Expansion Chassis pwr – off
- MO13Q 8. DC UTIL PWR – OFF

Cont next page

MAGR/ 9. Demate power and GPS RS-422 connections
MF71E

10. Remove cables from locker door openings

MAGR 11. Reconnect power and GPS RS-422 data cables
PGSC

MO13Q 12. DC UTIL PWR – ON

MAGR 13. Expansion Chassis pwr – on
PGSC PGSC pwr – on

MAGR ONORBIT SETUP

MAGR
PGSC

1. At 'C:\GPS>', enter 'GPS'
2. At intro display, select 'orbit'
 - * If error msg appears, ✓MCC *
3. When intro display returns, press [F1]
4. ✓Data Display is updating
5. Wait until at least one satellite SV in STAT 5 appears on the display
6. Enter CTRL-T (sets clock in PGSC)
7. ✓Data is being recorded
 - If recording, the following should appear in
FLAGS blocks:
'Recording'
Filename
'ON'
 - * If not recording, *
 - * enter [F8] to toggle recording *
8. Record approx MET ____:____:____
Record drive letter and filename located in
FLAGS block ____:____.____
Record Disk space remaining in Mbytes located
below FLAGS block _____ Mb
9. Call MCC (report step 8 results)

NOTE

Velocity RSS, FOM, time since 4 SV NAV,
'4 at STAT 5' flags are located in DATA
DISPLAY (F1). FOM and time since 4 SV
NAV are located in WorldMap Display (F2)

10. If FOM = 9, and Time since 4 SV NAV > 1 hr, or if
ENU Velocity RSS > 8000 m/s, report to MCC

MAGR ENTRY SETUP

- MAGR PGSC 1. Press ESC twice to exit data collection program
✓'C:\GPS>' appears on display
2. PGSC pwr – off
Expansion Chassis pwr – off
- MO13Q 3. DC UTIL PWR – OFF
- MAGR PGSC 4. Demate power and GPS RS-422 connectors
- MAGR/MF71E 5. Reroute power and GPS RS-422 cables through locker door
6. Reconnect power and GPS RS-422 connectors
- MO13Q 7. DC UTIL PWR – ON
- MAGR PGSC 8. Expansion Chassis pwr – on
PGSC pwr – on
9. ✓DOS prompt appears on display
✓Expansion Chassis fan running
10. ✓Flash cards (two) installed in PCMCIA slots
- MF71E 11. Unstow foam assy and carefully place PGSC in foam
✓Cables routed through foam and PGSC connections secure
- MAGR PGSC 12. At 'C:\GPS>' prompt, enter 'dflash' to erase data on PCMCIA cards
13. When DOS prompt returns, enter 'GPS'
14. At intro display, select 'entry' [RETURN]

* If error msg appears, ✓MCC *

Cont next page

MAGR
PGSC

15. ✓Data Display is updating
16. Wait until at least one satellite SV in STAT 5 appears on the display
17. Enter CTRL-T (sets clock in PGSC)
✓Data recording OFF (lower right corner of screen)
 - * If recording, press [F8] to toggle *
 - * recording OFF *
18. Record approx MET ____:____:____
19. Call MCC (finished step 18, approx MET)

NOTE

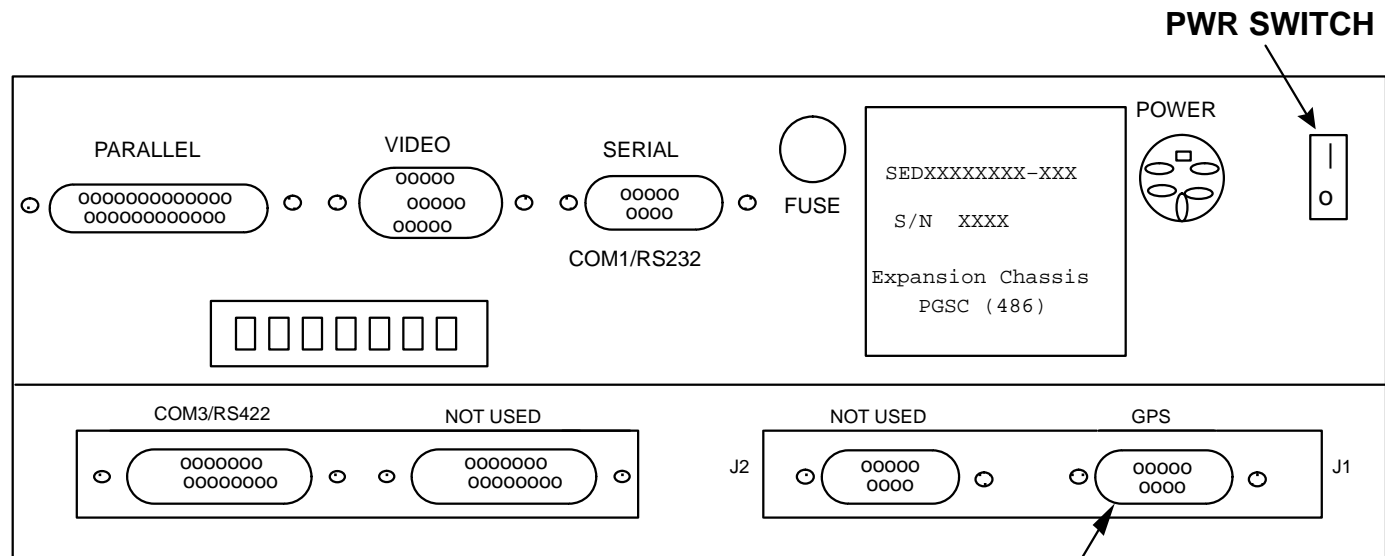
Velocity RSS, FOM, time since 4 SV NAV,
'4 at STAT 5' flags are located in DATA
DISPLAY (F1)

20. If FOM = 9, and Time since 4 SV NAV > 1 hr, or if Velocity RSS > 8000 m/s, report to MCC

MF71E

21. Close monitor
22. Stow foam assy (with PGSC inside) in locker and close locker door
✓PGSC cable connections secure

MAGR PGSC SCHEMATIC



PWR SWITCH

MAGR RCVR (RS-422 CABLE)

FS 5-12

ORB OPS/99/FIN A

MAGR DOWNLINK (CONTINGENCY)

NOTE

GPS Filenames are: GPSXXX.001 –
GPSXXX.999 where XXX is Julian day.

Files are located in C:\GPS subdirectory.

When Recording Bit toggled OFF/ON,
new file is created

- PGSC
1. Exit GPS program (press [ESC] twice)
 2. Insert OCA data disk into floppy drive
 3. From 'C:\GPS>' subdirectory, enter "copy
GPSXXX.XXX a:" to copy GPS data file to
floppy drive where "GPSXXX.XXX" is GPS data
file to be downlinked
 4. Remove disk from floppy drive
 5. Perform MAGR ONORBIT SETUP, steps 1 thru 4
- OCA
6. Insert OCA data disk into OCA PGSC floppy drive
Go to OCA DOWNLINK VIA GROUND CMD
(OCA) to downlink desired file(s)

MAGR HARD DRIVE SWAP (CONTINGENCY)

- | | |
|--------------|---|
| MAGR
PGSC | 1. Enter ESC twice to exit data collection program
✓'C:\GPS>' appears on display |
| | 2. PGSC pwr – off
Expansion Chassis pwr – off |
| MF71E | 3. Obtain spare DTO 700–14 3GB hard drive from
foam assy and remove packaging |
| MAGR
PGSC | 4. Open monitor |
| | 5. Pull keyboard release latches (same latches
used to open monitor) forward until 'snap',
lift keyboard up |
| | 6. Using blue tabs, pull up handle on hard drive
(hard drive is located in front, right–hand side) |
| | 7. Pull up and back on handle to remove hard drive |
| MF71E | 8. Stow removed hard drive in foam assy |
| MAGR
PGSC | 9. Place fresh hard drive in PGSC and snap handle
into place to secure |
| | 10. Pull keyboard release latches forward and close
keyboard |
| | 11. Expansion Chassis pwr – on
PGSC pwr – on
✓DOS prompt appears on display |

MAGR RESTART (CONTINGENCY)

1. ✓'C:\GPS>' appears on display
2. Enter 'dir/od' [RETURN]
3. Record name of last file displayed ('gpsxxx.yyy') and call MCC
4. Enter 'move gpsxxx.yyy d:\', where gpsxxx.yyy is file name recorded above
5. Proceed with MAGR ONORBIT SETUP

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GALLEY IODINE REMOVAL

GALLEY IODINE REMOVAL ASSEMBLY (GIRA)	
INSTALLATION	FS 6-2
GALLEY OVERNIGHT CONFIG	FS 6-4
MORNING CONFIG	FS 6-4
WATER SAMPLE	FS 6-4
GIRA STOWAGE	FS 6-5

GIRA

**GALLEY IODINE REMOVAL ASSEMBLY (GIRA)
INSTALLATION**

(Time: 1 hr)

EQUIPMENT PREPARATION

Unstow the following from _____:

MCV (short metal cartridge)
ACTEX hose (labeled #3,4,5)
ACTEX (large insulated cartridge labeled #2,3)
Hose/Microbe filter (wrapped in washcloth)
assembly (labeled #1,2)

NOTE

Have towel ready for possible release of water
when mating/demating any connections.
Numbered figure labels are indicated in ()

- ML90N
1. Remove tie-wrap (if present) connecting Galley Ambient and Chilled hoses
Detach Galley Ambient and Chilled hoses from QD bracket
 2. Install MCV on Ambient (uninsulated) supply line by connecting MCV to Ambient QD at QD bracket and connecting Galley Ambient supply hose to other end of MCV (See figure 6-1)
 3. Connect Hose/Microbe filter (#1) assembly to Galley Chilled (insulated) hose
 4. Attach ACTEX (#2) to Hose/Microbe filter assembly (#2)
 5. Attach ACTEX hose (#3) to ACTEX assembly (#3)
 6. Connect ACTEX hose (#4) to Chilled QD at QD bracket
 7. Secure ACTEX assembly as reqd (Reference figure 6-1). Ensure access to locker MF140
 8. Circulate water through galley:
OVEN/RHS – OFF,ON
- Galley

GIRA

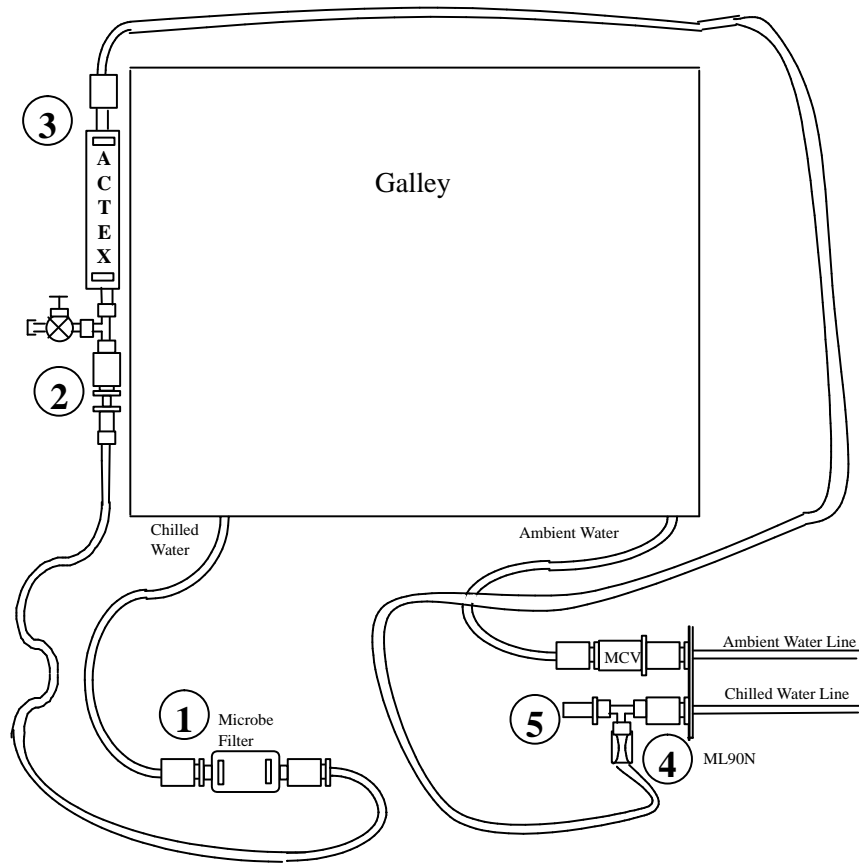


Figure 6-1.- GIRA configuration (connections and routing).

GALLEY OVERNIGHT CONFIG

(Time: 5 min)

NOTE

Have towel ready for possible release of water when mating/demating any connections

- ML90N
1. Disconnect Galley Chilled hose from Microbe filter (#1)
 2. Connect Galley Chilled hose to free end (#5) of Tee attached to Chilled QD at QD bracket
 3. Circulate water through galley:
OVEN/RHS – OFF,ON
- Galley

GALLEY MORNING CONFIG

(Time: 5 min)

NOTE

Have towel ready for possible release of water when mating/demating any connections

- ML90N
1. Disconnect Galley Chilled hose from Tee (#5) attached to Chilled QD at QD bracket
 2. Connect Galley Chilled hose to Microbe filter (#1)
 3. Circulate water through galley:
OVEN/RHS – OFF,ON
- Galley

GALLEY WATER SAMPLE

(Time: 5 min) |

Retrieve Galley Sample Bags from _____:

1. Wipe RHS needle with Alcohol Wipe
2. Fill one Sample Bag with 8 oz hot water
3. Fill out label (circle hot, record MET)
4. Fill one Sample Bag with 8 oz chilled water
5. Fill out label (circle cold, record MET)
6. Stow all Sample Bags in an empty fresh food locker

GIRA STOWAGE

(Time: 15 min) |

NOTE

Have towel ready for possible release of water when mating/demating any connections

- | | |
|----------------|---|
| MAR/
Galley | 1. Remove all black Velcro/Gray Tape from Chilled line assembly and hoses
Leave insulation covers in place |
| ML90N | 2. Detach Galley Chilled hose (insulated) from Microbe filter (#1)
Disconnect ACTEX hose from QD bracket |
| | 3. Detach Galley Ambient hose (uninsulated) from MCV
Remove MCV from QD bracket
Reconnect Galley Ambient and Chilled hoses to QD bracket |
| | 4. Break down assembly formerly installed on Chilled line into sub-assemblies as follows:
Between ACTEX hose and ACTEX cartridge (#3)
Between ACTEX cartridge and Hose/Microbe filter assembly (#2) |
| | 5. Resecure Galley Ambient and Chilled hoses with tie wrap (if present) |
| | 6. Return hardware to launch stowage location |

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FLY-CAST MANEUVERS

SINGLE-PULSE FLY-CAST MANEUVER:
+X RCS BURN FS 7-2
MULTI-PULSE FLY-CAST MANEUVER:
+X RCS BURN FS 7-9
DOUBLET/TRIPLET FLY-CAST MANEUVER:
+X RCS BURN FS 7-15
SINGLE-PULSE FLY-CAST MANEUVER PAD FS 7-23
MULTI-PULSE FLY-CAST MANEUVER PAD FS 7-29
DOUBLET/TRIPLET FLY-CAST MANEUVER PAD .. FS 7-31

**SINGLE-PULSE FLY-CAST MANEUVER:
+X RCS BURN**

O14:F, ✓Pri RJD LOGIC,DRIVER (sixteen) – ON
O15:F,
O16:F

O14:E, ✓cb DDU (six) – cl
O15:E,
O16:E

O6 ✓ANNUN INTENSITY – BRIGHT
ANNUN LAMP TEST – L (hold up)

F6 ✓RCS CMD lts (six) – illuminated

1. VERIFY PL SAFING

APCc

AODA SYS SUMM

- ✓IRU CH A,B,C RATE MODE (three) – HI/HI
- ✓EDM 1,2,3,4 MODE (four) – SAFE(OFF)
 - ✓Filter Position (four) – <06

2. MNVR TO BURN ATT

C3

✓DAP: A11/AUTO/VERN

NOTE

For attitude maneuvers to/from trim burn attitude use:

A10/VERN for nominal maneuver rate (0.2 deg/sec)

A12/VERN for high maneuver rate (0.3 deg/sec)

GNC UNIV PTG

TGT ID	<u>2</u>	
BV	<u>5</u>	
P	<u>259.2</u>	_____ (per ORB MNVR PAD)
Y	<u>059</u>	_____
OM	<u>000</u>	_____

FLY-CAST
MNVRS

Cont next page

Maneuver @ MET ____/____:____:____

DAP: A10(A12)/AUTO/VERN

GNC UNIV PTG

Initiate TRK – ITEM 19 EXEC

3. CONFIG DAPs

CRT

GNC 20 DAP CONFIG

Configure Fly–Cast DAPs per burn pad

EDIT DAP A – ITEM 3 +1 4 EXEC

PRI ROT PLS – ITEM 53 + _____ EXEC

ALT ON TIME – ITEM 61 +1.6 8 EXEC

ALT DELAY – ITEM 62 +1.6 8 EXEC

LOAD – ITEM 5 EXEC

EDIT DAP B – ITEM 4 +1 4 EXEC

PRI ROT PLS – ITEM 53 + _____ EXEC

ALT ON TIME – ITEM 61 + _____ EXEC

LOAD – ITEM 5 EXEC

XJETS ROT ENA – ITEM 7 EXEC (*)

GNC, OPS 202 PRO

1: GNC ORBIT MNVR EXEC

2: GNC 20 DAP CONFIG

Enter or verify TGT DATA per ORB MNVR
PAD

LOAD – ITEM 22 EXEC

TIMER – ITEM 23 EXEC

✓BURN DATA per PAD

CAUTION

Do not perform Item 27

4. DEADBAND COLLAPSE AND BURN SETUP

C3

When within 10 deg (all axes) of attitude:

DAP: B12/AUTO/VERN

When rates damped:

DAP: B11/AUTO/VERN

Cont next page

TIG-2:00

GNC 25 RM ORBIT

F7(F8)

SW RM INH - ITEM 16 EXEC (*)
FLT CNTLR PWR - ON
SW RM INH - ITEM 16 EXEC (no *)

F6(F8)

ADI ERR/RATE - MED
ATT - LVLH
✓ADI ATT, then:
ATT - REF
REF pb - push

NOTE

ADI Rate and attitude needles are
invalid during burn.

RHC pulse inputs should only be +Pitch
(no Roll or Yaw)

5. BURN EXEC

TIG-1:00

C3

DAP: A/FREE/ALT
✓ROT: PULSE/PULSE/PULSE

GNC 20 DAP CONFIG

Load Fly-Cast Maneuver DAPs
DAP A - ITEM 1 +1 4 EXEC
DAP B - ITEM 2 +1 4 EXEC

- * If RCS CMD Its indicate Roll or *
- * Yaw, abort burn *
- * Do not make RHC inputs *
- * DAP: FREE/VERN *

TIG RHC

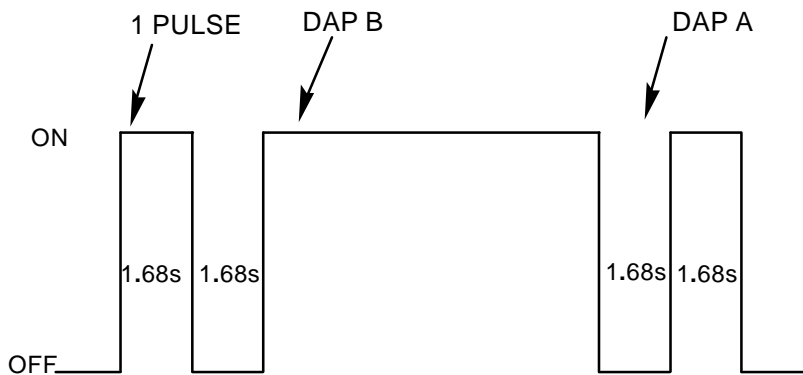
C3

1 PULSE (+PITCH)
Monitor RCS CMD Its or STOPWATCH
While SECOND PULSE FIRING or TIG
+ _____ sec
DAP: B
After SECOND PULSE STOPS FIRING or
TIG + _____ sec
DAP: A

Do Not Trim Residuals

FS 7-5

ORB OPS/99/FIN A



RCS JET ACTIVITY

F7(F8) 6. POST BURN RECONFIG
CRT FLT CNTLR PWR – OFF
GNC, OPS 201 PRO

7. MNVR TO MAPPING ATTITUDE

NOTE

For attitude maneuvers to/from trim burn attitude use:

A10 for nominal maneuver rate
(0.2 deg/sec)

A12 for high maneuver rate
(0.3 deg/sec)

C3 ✓DAP: A/FREE/ALT

GNC UNIV PTG

TGT ID 2

BV 5

P 090 _____

Y 059 _____

OM _____ EXEC

(per ORB MNVR PAD)

Initiate TRK – ITEM 19 EXEC

GNC 20 DAP CONFIG

C3

XJETS ROT ENA – ITEM 7 EXEC (no *)

DAP: A10(A12)/FREE/VERN

DAP: A/AUTO/VERN

Resume mapping @ MET

_____/_____:_____:_____

(per ORB MNVR PAD)

8. RECONFIG FOR GROUP B(C)

If Group B(C) Pwrn:

O14:F, ✓Pri RJD LOGIC,DRIVER (sixteen) – OFF

O15:F, RJDA 1A L2/R2 MANF DRIVER – ON

O16:F

O14:E, ✓cb DDU (six) – as reqd

O15:E,

O16:E

Cont next page

9. DEADBAND COLLAPSE AND EXEC ZDS

✓ In attitude:

- * If ZDS mnvr MET late by >4 min, *
- * perform ZDS LATE INITIATION *
- * (Cue Card) >> *

DAP: B13/AUTO/VERN

When deadband collapse complete

DAP: A11/AUTO/VERN

Future load ZDS maneuver @

MET ____/____:____:____

(per ORB MNVR PAD)

OM – ITEM 17 + _____ EXEC

Initiate TRK – ITEM 19 EXEC

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**MULTI-PULSE FLY-CAST MANEUVER:
+X RCS BURN**

O14:F, ✓Pri RJD LOGIC,DRIVER (sixteen) – ON
O15:F,
O16:F

O14:E, ✓cb DDU (six) – cl
O15:E,
O16:E

O6 ✓ANNUN INTENSITY – BRIGHT
ANNUN LAMP TEST – L (hold up)

F6 ✓RCS CMD lts (six) – illuminated

1. VERIFY PL SAFING

APCc

AODA SYS SUMM

- ✓IRU CH A,B,C RATE MODE (three) – HI/HI
- ✓EDM 1,2,3,4 MODE (four) – SAFE(OFF)
 - ✓Filter Position (four) – <06

2. MNVR TO BURN ATT

C3

✓DAP: A11/AUTO/VERN

NOTE

For attitude maneuvers to/from trim burn attitude use:

A10/VERN for nominal maneuver rate (0.2 deg/sec)

A12/VERN for high maneuver rate (0.3 deg/sec)

GNC UNIV PTG

TGT ID	<u>2</u>	
BV	<u>5</u>	
P	<u>259.2</u>	_____ (per ORB MNVR PAD)
Y	<u>059</u>	_____
OM	<u>000</u>	_____

Cont next page

C3 Maneuver @ MET ____/____:____:____
DAP: A10(A12)/AUTO/VERN
GNC UNIV PTG
Initiate TRK – ITEM 19 EXEC

3. CONFIG DAPs

CRT GNC 20 DAP CONFIG
Configure Fly–Cast DAPs per burn pad
EDIT DAP A – ITEM 3 + 1 5 EXEC
PRI ROT PLS – ITEM 53 + _____ EXEC
LOAD – ITEM 5 EXEC

EDIT DAP B – ITEM 4 + 1 5 EXEC
PRI ROT PLS – ITEM 53 + _____ EXEC
ALT ON TIME – ITEM 61 + _____ EXEC
LOAD – ITEM 5 EXEC

XJETS ROT ENA – ITEM 7 EXEC (*)

GNC, OPS 202 PRO
1: GNC ORBIT MNVR EXEC
2: GNC 20 DAP CONFIG
Enter or verify TGT DATA per ORB MNVR
PAD
LOAD – ITEM 22 EXEC
TIMER – ITEM 23 EXEC
✓BURN DATA per PAD

CAUTION
Do not perform Item 27

4. DEADBAND COLLAPSE AND BURN SETUP

C3 When within 10 deg (all axes) of attitude:
DAP: B12/AUTO/VERN
When rates damped:
DAP: B11/AUTO/VERN

F7(F8) GNC 25 RM ORBIT
SW RM INH – ITEM 16 EXEC (*)
FLT CNTLR PWR – ON
SW RM INH – ITEM 16 EXEC (no *)

Cont next page

F6(F8) ADI ERR/RATE – MED
ATT – LVLH
✓ADI ATT, then:
ATT – REF
REF pb – push

NOTE

ADI Rate and attitude needles are
invalid during burn.

RHC pulse inputs should only be +Pitch
(no Roll or Yaw)

5. BURN EXEC

TIG-1:00
C3

DAP: A/FREE/ALT
✓ROT: PULSE/PULSE/PULSE

GNC 20 DAP CONFIG

Load Fly-Cast Maneuver DAPs
DAP A – ITEM 1 +1 5 EXEC
DAP B – ITEM 2 +1 5 EXEC

- * If RCS CMD Its indicate Roll or *
- * Yaw, abort burn *
- * Do not make RHC inputs *
- * DAP: FREE/VERN *

TIG RHC

2 PULSES (+PITCH)
Monitor RCS CMD Its or STOPWATCH
While SECOND PULSE FIRING or TIG
+ _____ sec

C3
RHC

DAP: B
_____ PULSES (+PITCH) per burn pad
After LONG PULSE STOPS FIRING or
TIG + _____ sec

C3
RHC

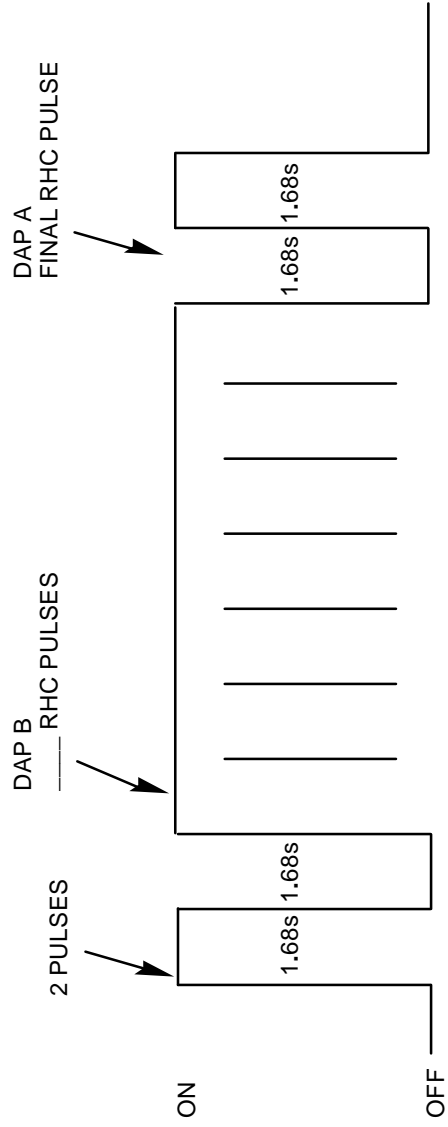
DAP: A
1 PULSE (+PITCH)

Do Not Trim Residuals

Cont next page

FS 7-11

ORB OPS/99/FIN A



RCS JET ACTIVITY

F7(F8) 6. POST BURN RECONFIG
CRT FLT CNTLR PWR – OFF
GNC, OPS 201 PRO

7. MNVR TO MAPPING ATTITUDE

NOTE

For attitude maneuvers to/from trim burn attitude use:

A10 for nominal maneuver rate
(0.2 deg/sec)

A12 for high maneuver rate
(0.3 deg/sec)

C3 ✓DAP: A/FREE/ALT

GNC UNIV PTG

TGT ID 2
BV 5
P 090 _____
Y 059 _____
OM _____ (per ORB MNVR PAD)
Initiate TRK – ITEM 19 EXEC

GNC 20 DAP CONFIG

C3 XJETS ROT ENA – ITEM 7 EXEC (no *)
DAP: A10(A12)/FREE/VERN
DAP: A/AUTO/VERN

Resume mapping @ MET

_____/_____:_____:_____
(per ORB MNVR PAD)

8. RECONFIG FOR GROUP B(C)

If Group B(C) Pwrn:

O14:F, ✓Pri RJD LOGIC,DRIVER (sixteen) – OFF
O15:F, RJDA 1A L2/R2 MANF DRIVER – ON
O16:F

O14:E, ✓cb DDU (six) – as reqd
O15:E,
O16:E

Cont next page

9. DEADBAND COLLAPSE AND EXEC ZDS

✓ In attitude:

- * If ZDS mnvr MET late by >4 min, *
- * perform ZDS LATE INITIATION *
- * (Cue Card) >> *

DAP: B13/AUTO/VERN

When deadband collapse complete

DAP: A11/AUTO/VERN

Future load ZDS maneuver @

MET ____/____:____:____

(per ORB MNVR PAD)

OM – ITEM 17 + _____ EXEC

Initiate TRK – ITEM 19 EXEC

**DOUBLE/TRIPLET FLY-CAST MANEUVER:
+X RCS BURN**

O14:F, ✓Pri RJD LOGIC,DRIVER (sixteen) – ON
O15:F,
O16:F

O14:E, ✓cb DDU (six) – cl
O15:E,
O16:E

O6 ✓ANNUN INTENSITY – BRIGHT
ANNUN LAMP TEST – L (hold up)

F6 ✓RCS CMD lts (six) – illuminated

1. VERIFY PL SAFING

APCc

AODA SYS SUMM

- ✓IRU CH A,B,C RATE MODE (three) – HI/HI
- ✓EDM 1,2,3,4 MODE (four) – SAFE(OFF)
 - ✓Filter Position (four) – <06

2. MNVR TO BURN ATT

C3

✓DAP: A11/AUTO/VERN

NOTE

For attitude maneuvers to/from trim burn
attitude use:

A10/VERN for nominal maneuver
rate (0.2 deg/sec)

A12/VERN for high maneuver
rate (0.3 deg/sec)

GNC UNIV PTG

TGT ID	<u>2</u>	
BV	<u>5</u>	
P	<u>259.2</u>	_____ (per ORB MNVR PAD)
Y	<u>059</u>	_____
OM	<u>000</u>	_____

Cont next page

C3 Maneuver @ MET ____/____:____:____
DAP: A10(A12)/AUTO/VERN
GNC UNIV PTG
Initiate TRK – ITEM 19 EXEC

3. CONFIG DAPs

CRT **GNC 20 DAP CONFIG**
Configure Fly–Cast DAPs per burn pad
EDIT DAP A – ITEM 3 +1 4 EXEC
PRI ROT PLS – ITEM 53 + _____ EXEC
ON TIME – ITEM 61 + _____ EXEC
DELAY – ITEM 62 + _____ EXEC
LOAD – ITEM 5 EXEC

XJETS ROT ENA – ITEM 7 EXEC (*)

GNC, OPS 202 PRO

1: GNC ORBIT MNVR EXEC

2: GNC 20 DAP CONFIG

Enter or verify TGT DATA per ORB MNVR
PAD

LOAD – ITEM 22 EXEC

TIMER – ITEM 23 EXEC

✓BURN DATA per PAD

CAUTION

Do not perform Item 27

4. DEADBAND COLLAPSE AND BURN SETUP

C3 When within 10 deg (all axes) of attitude:
DAP: B12/AUTO/VERN
When rates damped:
DAP: B11/AUTO/VERN

GNC 25 RM ORBIT

F7(F8) SW RM INH – ITEM 16 EXEC (*)

FLT CNTLR PWR – ON

SW RM INH – ITEM 16 EXEC (no *)

Cont next page

F6(F8) ADI ERR/RATE – MED
ATT – LVLH
✓ADI ATT, then:
ATT – REF
REF pb – push

NOTE

ADI Rate needles are invalid during burn.

RHC pulse inputs should only be +Pitch (no Roll or Yaw)

5. BURN EXEC

TIG-1:00
C3

DAP: A/FREE/ALT
✓ROT: PULSE/PULSE/PULSE

GNC 20 DAP CONFIG

Load Fly-Cast Maneuver DAPs
DAP A – ITEM 1 +1 4 EXEC

- * If RCS CMD Its indicate Roll or *
- * Yaw, abort burn *
- * Do not make RHC inputs *
- * DAP: FREE/VERN *

TIG RHC

1 PULSE (+PITCH)
Monitor RCS CMD Its
✓Burn complete in _____ sec

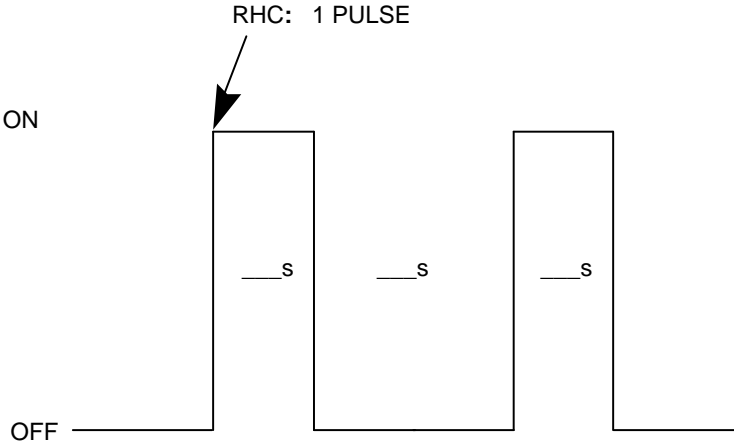
Do Not Trim Residuals

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FS 7-18

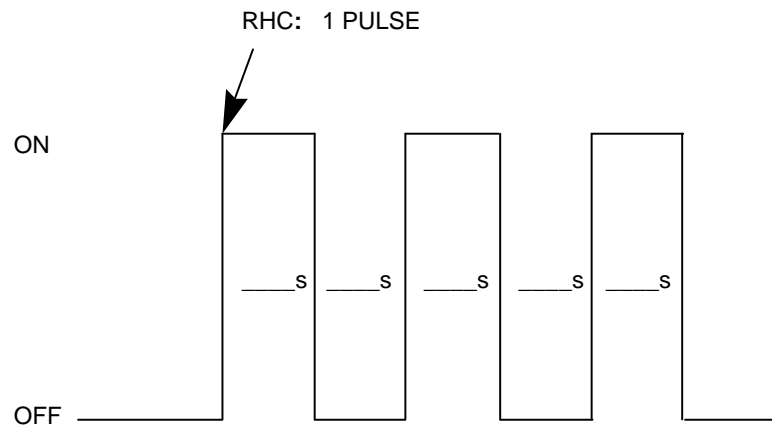
ORB OPS/99/FIN A

DOUBLET



RCS JET ACTIVITY

TRIPLET



RCS JET ACTIVITY

FS 7-19

ORB OPS/99/FIN A

F7(F8) 6. POST BURN RECONFIG
CRT FLT CNTLR PWR – OFF
GNC, OPS 201 PRO

7. MNVR TO MAPPING ATTITUDE

NOTE

For attitude maneuvers to/from trim burn attitude use:

A10 for nominal maneuver rate
(0.2 deg/sec)

A12 for high maneuver rate
(0.3 deg/sec)

C3 ✓DAP: A/FREE/ALT

GNC UNIV PTG

TGT ID 2
BV 5
P 090 _____
Y 059 _____
OM _____ (per ORB MNVR PAD)
Initiate TRK – ITEM 19 EXEC

GNC 20 DAP CONFIG

C3 XJETS ROT ENA – ITEM 7 EXEC (no *)
DAP: A10(A12)/FREE/VERN
DAP: A/AUTO/VERN

Resume mapping @ MET

_____/_____:_____:_____
(per burn pad)

8. RECONFIG FOR GROUP B(C)

If Group B(C) Pwrn:

O14:F, Pri RJD LOGIC,DRIVER (sixteen) – OFF
O15:F, RJDA 1A L2/R2 MANF DRIVER – ON
O16:F

O14:E, ✓cb DDU (six) – as reqd
O15:E,
O16:E

Cont next page

9. DEADBAND COLLAPSE AND EXEC ZDS

✓ In attitude:

- * If ZDS mnvr MET late by >4 min, *
- * perform ZDS LATE INITIATION *
- * (Cue Card) >> *

DAP: B13/AUTO/VERN

When deadband collapse complete

DAP: A11/AUTO/VERN

Future load ZDS maneuver @

MET ____/____:____:____

(per ORB MNVR PAD)

OM – ITEM 17 + _____ EXEC

Initiate TRK – ITEM 19 EXEC

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SINGLE-PULSE FLY-CAST MANEUVER PAD FOR _____

RCS SEL *	4	+X		ΔVTOT *	_____.
WT	9	_____		TGO *	_____:
TIG	10	_____/____:____:____.		VGO X *	() _____.
TGT PEG 7 *				VGO Y *	() _____.
ΔVX *	19	() _____.		VGO Z *	() _____.
ΔVY *	20	() _____.			
ΔVZ *	21	() _____.			

* Read-up not required

PRE-BURN

MNVR TO BURN ATT
DAP A10 _____ A12 _____
P _____
Y _____
OM _____
MANEUVER @ MET ____/____:____:____

CONFIG DAPS
EDIT DAP A PRI ROT PLS - ITEM 53 +____
EDIT DAP B PRI ROT PLS - ITEM 53 +____
 ALT ON TIME - ITEM 61 +____

BURN EXEC
While SECOND PULSE FIRING or TIG +____
After SECOND PULSE STOPS FIRING or TIG +____

POST-BURN

MNVR TO MAPPING ATTITUDE
DAP A10 _____ A12 _____
P _____
Y _____
OM _____
RESUME MAPPING @ MET ____/____:____:____

DEADBAND COLLAPSE AND EXEC ZDS
FUTURE load ZDS maneuver @ MET ____/____:____:____
OM - ITEM 17 +____

NOTES: BURN TYPE: NON-CRITICAL _____ CRITICAL _____
TIG SLIP PRIOR TO DAP: FREE ____:____ (RE-LOAD TGTS)

SINGLE-PULSE FLY-CAST MANEUVER PAD FOR _____

RCS SEL *	4	+X		ΔVTOT *	_____.
WT	9	_____		TGO *	_____:
TIG	10	_____/____:____:____.		VGO X *	() _____.
TGT PEG 7 *				VGO Y *	() _____.
ΔVX *	19	() _____.		VGO Z *	() _____.
ΔVY *	20	() _____.			
ΔVZ *	21	() _____.			

* Read-up not required

PRE-BURN	POST-BURN
MNVR TO BURN ATT	MNVR TO MAPPING ATTITUDE
DAP A10 _____ A12 _____	DAP A10 _____ A12 _____
P _____	P _____
Y _____	Y _____
OM _____	OM _____
MANEUVER @ MET ____/____:____:____	RESUME MAPPING @ MET ____/____:____:____
CONFIG DAPS	DEADBAND COLLAPSE AND EXEC ZDS
EDIT DAP A PRI ROT PLS - ITEM 53 +____	FUTURE load ZDS maneuver @ MET ____/____:____:____
EDIT DAP B PRI ROT PLS - ITEM 53 +____	OM - ITEM 17 +____
ALT ON TIME - ITEM 61 +____	
BURN EXEC	
While SECOND PULSE FIRING or TIG +____	
After SECOND PULSE STOPS FIRING or TIG +____	

NOTES: BURN TYPE: NON-CRITICAL _____ CRITICAL _____
TIG SLIP PRIOR TO DAP: FREE ____:____ (RE-LOAD TGTS)

SINGLE-PULSE FLY-CAST MANEUVER PAD FOR _____

RCS SEL *	4	+X		ΔVTOT *	_____.
WT	9	_____		TGO *	_____:
TIG	10	_____/____:____:____.		VGO X *	() _____.
TGT PEG 7 *				VGO Y *	() _____.
ΔVX *	19	() _____.		VGO Z *	() _____.
ΔVY *	20	() _____.			
ΔVZ *	21	() _____.			

* Read-up not required

PRE-BURN

MNVR TO BURN ATT
DAP A10 _____ A12 _____
P _____
Y _____
OM _____
MANEUVER @ MET ____/____:____:____

CONFIG DAPS
EDIT DAP A PRI ROT PLS - ITEM 53 +____
EDIT DAP B PRI ROT PLS - ITEM 53 +____
 ALT ON TIME - ITEM 61 +____

BURN EXEC
While SECOND PULSE FIRING or TIG +____
After SECOND PULSE STOPS FIRING or TIG +____

POST-BURN

MNVR TO MAPPING ATTITUDE
DAP A10 _____ A12 _____
P _____
Y _____
OM _____
RESUME MAPPING @ MET ____/____:____:____

DEADBAND COLLAPSE AND EXEC ZDS
FUTURE load ZDS maneuver @ MET ____/____:____:____
OM - ITEM 17 +____

NOTES: BURN TYPE: NON-CRITICAL _____ CRITICAL _____
TIG SLIP PRIOR TO DAP: FREE ____:____ (RE-LOAD TGTS)

SINGLE-PULSE FLY-CAST MANEUVER PAD FOR _____

RCS SEL *	4	+X	Δ VTOT *	_____.
WT	9	_____	TGO *	_____:
TIG	10	_____/____:____:____.	VGO X *	() _____.
TGT PEG 7 *			VGO Y *	() _____.
Δ VX *	19	() _____.	VGO Z *	() _____.
Δ VY *	20	() _____.		
Δ VZ *	21	() _____.		

* Read-up not required

PRE-BURN

MNVR TO BURN ATT
 DAP A10 _____ A12 _____
 P _____
 Y _____
 OM _____
 MANEUVER @ MET ____/____:____:____

CONFIG DAPS
 EDIT DAP A PRI ROT PLS - ITEM 53 +____
 EDIT DAP B PRI ROT PLS - ITEM 53 +____
 ALT ON TIME - ITEM 61 +____

BURN EXEC
 While SECOND PULSE FIRING or TIG +____
 After SECOND PULSE STOPS FIRING or TIG +____

POST-BURN

MNVR TO MAPPING ATTITUDE
 DAP A10 _____ A12 _____
 P _____
 Y _____
 OM _____
 RESUME MAPPING @ MET ____/____:____:____

DEADBAND COLLAPSE AND EXEC ZDS
 FUTURE load ZDS maneuver @ MET ____/____:____:____
 OM - ITEM 17 +____

NOTES: BURN TYPE: NON-CRITICAL _____ CRITICAL _____
 TIG SLIP PRIOR TO DAP: FREE ____:____ (RE-LOAD TGTS)

SINGLE-PULSE FLY-CAST MANEUVER PAD FOR _____

RCS SEL *	4	+X		ΔVTOT *	_____.
WT	9	_____		TGO *	_____:
TIG	10	_____/____:____:____.		VGO X *	() _____.
TGT PEG 7 *				VGO Y *	() _____.
ΔVX *	19	() _____.		VGO Z *	() _____.
ΔVY *	20	() _____.			
ΔVZ *	21	() _____.			

* Read-up not required

PRE-BURN

MNVR TO BURN ATT
DAP A10 _____ A12 _____
P _____
Y _____
OM _____
MANEUVER @ MET ____/____:____:____

CONFIG DAPS
EDIT DAP A PRI ROT PLS - ITEM 53 +____
EDIT DAP B PRI ROT PLS - ITEM 53 +____
 ALT ON TIME - ITEM 61 +____

BURN EXEC
While SECOND PULSE FIRING or TIG +____
After SECOND PULSE STOPS FIRING or TIG +____

POST-BURN

MNVR TO MAPPING ATTITUDE
DAP A10 _____ A12 _____
P _____
Y _____
OM _____
RESUME MAPPING @ MET ____/____:____:____

DEADBAND COLLAPSE AND EXEC ZDS
FUTURE load ZDS maneuver @ MET ____/____:____:____
OM - ITEM 17 +____

NOTES: BURN TYPE: NON-CRITICAL _____ CRITICAL _____
TIG SLIP PRIOR TO DAP: FREE ____:____ (RE-LOAD TGTS)

SINGLE-PULSE FLY-CAST MANEUVER PAD FOR _____

RCS SEL *	4	+X		Δ VTOT *	_____.
WT	9	_____		TGO *	_____:
TIG	10	_____/____:____:____.		VGO X *	() _____.
TGT PEG 7 *				VGO Y *	() _____.
Δ VX *	19	() _____.		VGO Z *	() _____.
Δ VY *	20	() _____.			
Δ VZ *	21	() _____.			

* Read-up not required

PRE-BURN

MNVR TO BURN ATT
 DAP A10 _____ A12 _____
 P _____
 Y _____
 OM _____
 MANEUVER @ MET ____/____:____:____

CONFIG DAPS
 EDIT DAP A PRI ROT PLS - ITEM 53 +____
 EDIT DAP B PRI ROT PLS - ITEM 53 +____
 ALT ON TIME - ITEM 61 +____

BURN EXEC
 While SECOND PULSE FIRING or TIG +____
 After SECOND PULSE STOPS FIRING or TIG +____

POST-BURN

MNVR TO MAPPING ATTITUDE
 DAP A10 _____ A12 _____
 P _____
 Y _____
 OM _____
 RESUME MAPPING @ MET ____/____:____:____

DEADBAND COLLAPSE AND EXEC ZDS
 FUTURE load ZDS maneuver @ MET ____/____:____:____
 OM - ITEM 17 +____

NOTES: BURN TYPE: NON-CRITICAL _____ CRITICAL _____
 TIG SLIP PRIOR TO DAP: FREE ____:____ (RE-LOAD TGTS)

MULTI-PULSE FLY-CAST MANEUVER PAD FOR _____

RCS SEL *	4	+X	Δ VTOT *	_____.
WT	9	_____	TGO *	_____:
TIG	10	_____/____:____:____.	VGO X *	() _____.
TGT PEG 7 *			VGO Y *	() _____.
Δ VX *	19	() _____.	VGO Z *	() _____.
Δ VY *	20	() _____.		
Δ VZ *	21	() _____.		

* Read-up not required

PRE-BURN

MNVR TO BURN ATT
 DAP A10 _____ A12 _____
 P _____
 Y _____
 OM _____
 MANEUVER @ MET ____/____:____:____

CONFIG DAPS
 EDIT DAP A PRI ROT PLS - ITEM 53 +____
 EDIT DAP B PRI ROT PLS - ITEM 53 +____
 ALT ON TIME - ITEM 61 +____

BURN EXEC
 While SECOND PULSE FIRING or TIG +____
 _____ PULSES (+PITCH)
 After LONG PULSE STOPS FIRING or TIG +____

POST-BURN

MNVR TO MAPPING ATTITUDE
 DAP A10 _____ A12 _____
 P _____
 Y _____
 OM _____
 RESUME MAPPING @ MET ____/____:____:____

DEADBAND COLLAPSE AND EXEC ZDS
 FUTURE load ZDS maneuver @ MET ____/____:____:____
 OM - ITEM 17 +____

NOTES: BURN TYPE: NON-CRITICAL _____ CRITICAL _____
 TIG SLIP PRIOR TO DAP: FREE ____:____ (RE-LOAD TGTS)

MULTI-PULSE FLY-CAST MANEUVER PAD FOR _____

RCS SEL *	4	+X	Δ VTOT *	_____.
WT	9	_____	TGO *	_____:
TIG	10	_____/____:____:____.	VGO X *	() _____.
TGT PEG 7 *			VGO Y *	() _____.
Δ VX *	19	() _____.	VGO Z *	() _____.
Δ VY *	20	() _____.		
Δ VZ *	21	() _____.		

* Read-up not required

PRE-BURN

MNVR TO BURN ATT
 DAP A10 _____ A12 _____
 P _____
 Y _____
 OM _____
 MANEUVER @ MET ____/____:____:____

CONFIG DAPS
 EDIT DAP A PRI ROT PLS - ITEM 53 +____
 EDIT DAP B PRI ROT PLS - ITEM 53 +____
 ALT ON TIME - ITEM 61 +____

BURN EXEC
 While SECOND PULSE FIRING or TIG +____
 _____ PULSES (+PITCH)
 After LONG PULSE STOPS FIRING or TIG +____

POST-BURN

MNVR TO MAPPING ATTITUDE
 DAP A10 _____ A12 _____
 P _____
 Y _____
 OM _____
 RESUME MAPPING @ MET ____/____:____:____

DEADBAND COLLAPSE AND EXEC ZDS
 FUTURE load ZDS maneuver @ MET ____/____:____:____
 OM - ITEM 17 +____

NOTES: BURN TYPE: NON-CRITICAL _____ CRITICAL _____
 TIG SLIP PRIOR TO DAP: FREE ____:____ (RE-LOAD TGTS)

DOUBLE/TRIPLET FLY-CAST MANEUVER PAD FOR _____

RCS SEL *	4	+X	Δ VTOT *	____.____
WT	9	_____	TGO *	____:____
TIG	10	____/____:____:____	VGO X *	() ____.
TGT PEG 7 *			VGO Y *	() ____.
Δ VX *	19	() ____.	VGO Z *	() ____.
Δ VY *	20	() ____.		
Δ VZ *	21	() ____.		

* Read-up not required

PRE-BURN

MNVR TO BURN ATT
 DAP A10 ____ A12 ____
 P ____
 Y ____
 OM ____
 MANEUVER @ MET ____/____:____:____

CONFIG DAPS
 EDIT DAP A PRI ROT PLS - ITEM 53 +____
 ALT ON TIME - ITEM 61 +____
 ALT DELAY - ITEM 62 +____

BURN EXEC
 ✓ Burn complete in _____

POST-BURN

MNVR TO MAPPING ATTITUDE
 DAP A10 ____ A12 ____
 P ____
 Y ____
 OM ____
 RESUME MAPPING @ MET ____/____:____:____

DEADBAND COLLAPSE AND EXEC ZDS
 FUTURE load ZDS maneuver @ MET ____/____:____:____
 OM - ITEM 17 +____

NOTES: BURN TYPE: NON-CRITICAL ____ CRITICAL ____
 TIG SLIP PRIOR TO DAP: FREE ____:____ (RE-LOAD TGTS)

DOUBLE/TRIPLET FLY-CAST MANEUVER PAD FOR _____

RCS SEL *	4	+X		ΔVTOT *	____.____
WT	9	_____		TGO *	____:____
TIG	10	____/____:____:____		VGO X *	() ____.
TGT PEG 7 *				VGO Y *	() ____.
ΔVX *	19	() ____.		VGO Z *	() ____.
ΔVY *	20	() ____.			
ΔVZ *	21	() ____.			

* Read-up not required

PRE-BURN

MNVR TO BURN ATT
DAP A10 ____ A12 ____
P ____
Y ____
OM ____
MANEUVER @ MET ____/____:____:____

CONFIG DAPS
EDIT DAP A PRI ROT PLS - ITEM 53 +____
 ALT ON TIME - ITEM 61 +____
 ALT DELAY - ITEM 62 +____

BURN EXEC
√ Burn complete in _____

POST-BURN

MNVR TO MAPPING ATTITUDE
DAP A10 ____ A12 ____
P ____
Y ____
OM ____
RESUME MAPPING @ MET ____/____:____:____

DEADBAND COLLAPSE AND EXEC ZDS
FUTURE load ZDS maneuver @ MET ____/____:____:____
OM - ITEM 17 +____

NOTES: BURN TYPE: NON-CRITICAL ____ CRITICAL ____
TIG SLIP PRIOR TO DAP: FREE ____:____ (RE-LOAD TGTS)

DOUBLE/TRIPLET FLY-CAST MANEUVER PAD FOR _____

RCS SEL *	4	+X		ΔVTOT *	_____.
WT	9	_____		TGO *	_____:
TIG	10	_____/____:			_____.
TGT PEG 7 *				VGO X *	() _____.
ΔVX *	19	() _____.		VGO Y *	() _____.
ΔVY *	20	() _____.		VGO Z *	() _____.
ΔVZ *	21	() _____.			

* Read-up not required

PRE-BURN

MNVR TO BURN ATT
DAP A10 _____ A12 _____
P _____
Y _____
OM _____
MANEUVER @ MET ____/____:____:____

CONFIG DAPS
EDIT DAP A PRI ROT PLS - ITEM 53 +____
 ALT ON TIME - ITEM 61 +____
 ALT DELAY - ITEM 62 +____

BURN EXEC
√ Burn complete in _____

POST-BURN

MNVR TO MAPPING ATTITUDE
DAP A10 _____ A12 _____
P _____
Y _____
OM _____
RESUME MAPPING @ MET ____/____:____:____

DEADBAND COLLAPSE AND EXEC ZDS
FUTURE load ZDS maneuver @ MET ____/____:____:____
OM - ITEM 17 +____

NOTES: BURN TYPE: NON-CRITICAL _____ CRITICAL _____
TIG SLIP PRIOR TO DAP: FREE ____:____ (RE-LOAD TGTS)

DOUBLE/TRIplet FLY-CAST MANEUVER PAD FOR _____

RCS SEL *	4	+X		ΔVTOT *	_____.
WT	9	_____		TGO *	_____:
TIG	10	_____/____:			_____.
TGT PEG 7 *				VGO X *	() _____.
ΔVX *	19	() _____.		VGO Y *	() _____.
ΔVY *	20	() _____.		VGO Z *	() _____.
ΔVZ *	21	() _____.			

* Read-up not required

PRE-BURN

MNVR TO BURN ATT
 DAP A10 _____ A12 _____
 P _____
 Y _____
 OM _____
 MANEUVER @ MET ____/____:____:____

CONFIG DAPS
 EDIT DAP A PRI ROT PLS - ITEM 53 +____
 ALT ON TIME - ITEM 61 +____
 ALT DELAY - ITEM 62 +____

BURN EXEC
 ✓ Burn complete in _____

POST-BURN

MNVR TO MAPPING ATTITUDE
 DAP A10 _____ A12 _____
 P _____
 Y _____
 OM _____
 RESUME MAPPING @ MET ____/____:____:____

DEADBAND COLLAPSE AND EXEC ZDS
 FUTURE load ZDS maneuver @ MET ____/____:____:____
 OM - ITEM 17 +____

NOTES: BURN TYPE: NON-CRITICAL _____ CRITICAL _____
 TIG SLIP PRIOR TO DAP: FREE ____:____ (RE-LOAD TGTS)

DOUBLE/TRIplet FLY-CAST MANEUVER PAD FOR _____

RCS SEL *	4	+X		ΔVTOT *	_____.
WT	9	_____		TGO *	_____:
TIG	10	_____/____:			
				VGO X *	() _____.
TGT PEG 7 *				VGO Y *	() _____.
ΔVX *	19	() _____.		VGO Z *	() _____.
ΔVY *	20	() _____.			
ΔVZ *	21	() _____.			

* Read-up not required

PRE-BURN

MNVR TO BURN ATT
DAP A10 _____ A12 _____
P _____
Y _____
OM _____
MANEUVER @ MET ____/____:____:____

CONFIG DAPS
EDIT DAP A PRI ROT PLS - ITEM 53 +____
 ALT ON TIME - ITEM 61 +____
 ALT DELAY - ITEM 62 +____

BURN EXEC
√ Burn complete in _____

POST-BURN

MNVR TO MAPPING ATTITUDE
DAP A10 _____ A12 _____
P _____
Y _____
OM _____
RESUME MAPPING @ MET ____/____:____:____

DEADBAND COLLAPSE AND EXEC ZDS
FUTURE load ZDS maneuver @ MET ____/____:____:____
OM - ITEM 17 +____

NOTES: BURN TYPE: NON-CRITICAL _____ CRITICAL _____
TIG SLIP PRIOR TO DAP: FREE ____:____ (RE-LOAD TGTS)

DOUBLE/TRIPLET FLY-CAST MANEUVER PAD FOR _____

RCS SEL *	4	+X		ΔVTOT *	_____.
WT	9	_____		TGO *	_____:
TIG	10	_____/____:			
				VGO X *	() _____.
TGT PEG 7 *				VGO Y *	() _____.
ΔVX *	19	() _____.		VGO Z *	() _____.
ΔVY *	20	() _____.			
ΔVZ *	21	() _____.			

* Read-up not required

PRE-BURN

MNVR TO BURN ATT
 DAP A10 _____ A12 _____
 P _____
 Y _____
 OM _____
 MANEUVER @ MET ____/____:____:____

CONFIG DAPS
 EDIT DAP A PRI ROT PLS - ITEM 53 +____
 ALT ON TIME - ITEM 61 +____
 ALT DELAY - ITEM 62 +____

BURN EXEC
 ✓ Burn complete in _____

POST-BURN

MNVR TO MAPPING ATTITUDE
 DAP A10 _____ A12 _____
 P _____
 Y _____
 OM _____
 RESUME MAPPING @ MET ____/____:____:____

DEADBAND COLLAPSE AND EXEC ZDS
 FUTURE load ZDS maneuver @ MET ____/____:____:____
 OM - ITEM 17 +____

NOTES: BURN TYPE: NON-CRITICAL _____ CRITICAL _____
 TIG SLIP PRIOR TO DAP: FREE ____:____ (RE-LOAD TGTS)

SRTM
PULSE

VRCS PULSE TEST #1

O14,O15 cb MNA,B DDU L (two) – cl

- APC 1. PULSE TEST PREP
 AODA SYS SUMM
 ✓ATT Control Status – Timer
 ✓Mode – TRK
 ✓tracking three targets

- GNC 20 DAP CONFIG
 ✓DAP: A10/AUTO/VERN
 ✓CNTL ACC – (2)

F7 GNC 25 RM ORBIT
 SW RM INH – ITEM 16 EXEC (*)
 L FLT CNTLR PWR – ON
 SW RM INH – ITEM 16 EXEC (no *)

- TIG-2:00 2. MAST SETTling
 DAP: A/FREE/VERN
 ✓DAP ROT: PULSE/PULSE/PULSE

CAUTION

Do not select DAP: AUTO, INRTL, or LVLH while DAP B3 (CNTL ACC – 0) is loaded. Selection of closed loop attitude control in this config will result in excessive jet firings and eventual loss of vehicle control

NOTE

Vehicle rates displayed on Universal Pointing and on ADIs will be incorrect while DAP B3 (CNTL ACC – 0) is loaded

Cont next page

3. CONFIG DAPs

GNC 20 DAP CONFIG

- ITEM 2 +3 EXEC
- DAP B VERN ROT PULSE – ITEM 46
- +0.0 3 5 EXEC
- ✓DAP B VERN CNTL ACC – (0)

C3

DAP: B3/FREE/VERN

4. PULSE TEST EXEC

On MCC GO:

- TIG L RHC: +ROLL (1 pulse)
Fire F5L,L5L,L5D for 1.52 sec
- TIG+5:00 L RHC: –ROLL (1 pulse)
Fire F5R,R5R,R5D for 1.52 sec

5. MAST SETTling AND RECONFIG

F7
C3 L FLT CNTLR PWR – OFF
DAP: A10/FREE/VERN

GNC 20 DAP CONFIG

- ✓DAP A VERN CNTL ACC – (2)
- ✓NOTCH FLTR ENA – (*)

6. RESUME ATTITUDE CONTROL

TIG+7:00 DAP: A/LVLH/VERN

VRCS PULSE TEST #2

If attitude maintenance reqd, ✓MCC
DAP: A10/AUTO/VERN

1. PULSE TEST PREP
- APC AODA SYS SUMM
✓ATT Control Status – Timer
 ✓Mode – TRK
 ✓tracking three targets
- L12L ✓DAMPER UNCAGED tb (two) – gray
- GNC 20 DAP CONFIG
✓DAP: A10/LVLH/VERN
✓CNTL ACC – (2)
- GNC 25 RM ORBIT
SW RM INH – ITEM 16 EXEC (*)
F7 L FLT CNTLR PWR – ON
 SW RM INH – ITEM 16 EXEC (no *)
2. MAST SETTling
- TIG-2:00 DAP: A/FREE/VERN
 ✓DAP ROT: PULSE/PULSE/PULSE

CAUTION

Do not select DAP: AUTO, INRTL, or LVLH while DAP B3 (CNTL ACC – 0) is loaded. Selection of closed loop attitude control in this config will result in excessive jet firings and eventual loss of vehicle control

NOTE

Vehicle rates displayed on Universal Pointing and on ADIs will be incorrect while DAP B3 (CNTL ACC – 0) is loaded

Cont next page

FS 8-4

ORB OPS/99/FIN A

3. CONFIG DAPs

GNC 20 DAP CONFIG

ITEM 2 +3 EXEC

DAP B VERN ROT PULSE – ITEM 46

+0.0 3 5 EXEC

✓DAP B VERN CNTL ACC – (0)

C3

DAP: B3/FREE/VERN

4. PULSE TEST EXEC

On MCC GO:

TIG

L RHC: +ROLL (1 pulse)

Fire F5L,L5L,L5D for 1.52 sec

GNC 20 DAP CONFIG

DAP B VERN ROT PULSE – ITEM 46

+0.0 2 0 EXEC

TIG+2:00

L RHC: +PITCH (1 pulse)

Fire F5L and F5R for 1.52 sec

GNC 20 DAP CONFIG

DAP B VERN ROT PULSE – ITEM 46

+0.0 2 3 EXEC

TIG+4:00

L RHC: +YAW (1 pulse)

Fire R5R and F5L for 1.52 sec

F7

L FLT CNTLR PWR – OFF

5. RECONFIG MAST DEPLOY DAPs

GNC 20 DAP CONFIG

EDIT DAP A10 – ITEM 3 +1 0 EXEC

CNTL ACC – ITEM 68 +4 EXEC

LOAD – ITEM 5 EXEC

6. RESUME ATTITUDE CONTROL

DAP: A10(A12)/FREE/VERN

GNC 20 DAP CONFIG

✓NOTCH FLTR ENA – (*)

✓DAP A VERN CNTL ACC – (4)

TIG+6:00

DAP: A/AUTO/VERN

Cont next page

7. DEADBAND COLLAPSE

✓In attitude:

DAP: B13/AUTO/VERN

When deadband collapse complete

DAP: A11/AUTO/VERN

O14,O15 cb MNA,B DDU L (two) – as reqd

80% PRCS PULSE TEST

O14,O15 cb MNA,B DDU L (two) – cl

- APCc
1. VERIFY PL SAFING
AODA SYS SUMM
 - ✓ IRU CH A,B,C RATE MODE (three) – HI/HI
 - ✓ EDM 1,2,3,4 MODE (four) – SAFE(OFF)
 - ✓ Filter Position (four) – <06

2. ATTITUDE MNVR

NOTE

For attitude maneuvers use:

A10/VERN for nominal maneuver
rate (0.2 deg/sec)

A12/VERN for high maneuver
rate (0.3 deg/sec)

If attitude maneuver reqd:

GNC UNIV PTG

TGT ID 2

BV 5

P _____ (per Flight Plan)

Y _____

OM _____

Maneuver @ MET ____/____:____:____

DAP: A10(A12)/AUTO/VERN

Initiate TRK – ITEM 19 EXEC

3. CONFIG DAPs

GNC 20 DAP CONFIG

TRANS PLS – ITEM 17 + _____ EXEC
(per MCC)

- C3
- ✓ DAP ROT: PULSE/PULSE/PULSE
 - ✓ DAP TRANS: PULSE/PULSE/PULSE

Cont next page

4. PULSE TEST PREP
 ✓In attitude, rates damped
 TIG-1:00 DAP: A/FREE/VERN

GNC 25 RM ORBIT
 SW RM INH – ITEM 16 EXEC (*)
 F7 L FLT CNTLR PWR – ON
 SW RM INH – ITEM 16 EXEC (no *)

5. PULSE TEST EXEC
 On MCC GO:
 TIG THC: 1 +X PULSE (IN)
 Fire 2 +X PRCS jets for 1.36 sec

F7 L FLT CNTLR PWR – OFF

6. POST PULSE TEST RECONFIG
 TIG+2:00 GNC UNIV PTG
 TGT ID 2
 BV 5
 P 090 _____ (per MCC)
 Y 059 _____
 OM _____
 Initiate TRK – ITEM 19 EXEC

✓DAP: A10(A12)/AUTO/VERN

7. DEADBAND COLLAPSE AND EXEC ZDS
 ✓In attitude:
 DAP: B13/AUTO/VERN
 When deadband collapse complete
 DAP: A11/AUTO/VERN
 Future load ZDS maneuver @
 MET ____/____:____:____
 (per Flight Plan)
 OM – ITEM 17 + _____ EXEC
 Initiate TRK – ITEM 19 EXEC

O14,O15 cb MNA,B DDU L (two) – as reqd

100% PRCs PULSE TEST

O14,O15 cb MNA,B DDU L (two) – cl

- APCc
1. VERIFY PL SAFING
AODA SYS SUMM
 - ✓ IRU CH A,B,C RATE MODE (three) – HI/HI
 - ✓ EDM 1,2,3,4 MODE (four) – SAFE(OFF)
 - ✓ Filter Position (four) – <06

2. ATTITUDE MNVR

NOTE

For attitude maneuvers use:

A10/VERN for nominal maneuver
rate (0.2 deg/sec)

A12/VERN for high maneuver
rate (0.3 deg/sec)

If attitude maneuver reqd:

GNC UNIV PTG

TGT ID 2

BV 5

P _____ (per Flight Plan)

Y _____

OM _____

Maneuver @ MET ____/____:____:____

DAP: A10(A12)/AUTO/VERN

Initiate TRK – ITEM 19 EXEC

3. CONFIG DAPs

GNC 20 DAP CONFIG

TRANS PLS – ITEM 17 + _____ EXEC
(per MCC)

- C3
- ✓ DAP ROT: PULSE/PULSE/PULSE
 - ✓ DAP TRANS: PULSE/PULSE/PULSE

Cont next page

4. PULSE TEST PREP
 ✓ In attitude, rates damped
 TIG-2:00 DAP: A/FREE/VERN

GNC 25 RM ORBIT
 SW RM INH – ITEM 16 EXEC (*)

 F7 L FLT CNTLR PWR – ON
 SW RM INH – ITEM 16 EXEC (no *)

 5. PULSE TEST EXEC
 On MCC GO:
 TIG THC: 1 +X pulse (IN)
 Fire 2 +X PRCS jets for 1.68 sec

 F7 L FLT CNTLR PWR – OFF

 6. POST PULSE TEST RECONFIG
 TIG+2:00 GNC UNIV PTG
 TGT ID 2
 BV 5
 P 090 _____ (per MCC)
 Y 059 _____
 OM _____
 Initiate TRK – ITEM 19 EXEC

 ✓ DAP: A10(A12)/AUTO/VERN

 7. DEADBAND COLLAPSE AND EXEC ZDS
 ✓ In attitude:
 DAP: B13/AUTO/VERN
 When deadband collapse complete
 DAP: A11/AUTO/VERN
 Future load ZDS maneuver @
 MET ____/____:____:____
 (per Flight Plan)
 OM – ITEM 17 + _____ EXEC
 Initiate TRK – ITEM 19 EXEC

 O14,O15 cb MNA,B DDU L (two) – as reqd

PRCS JETS

JET DESELECT FS 9-2
RESELECT FS 9-3

**PRCS
JETS**

JET DESELECT

NOTE

Do not reselect any jets with previous fail off/leak

PRCS
JETS

CRT

GNC 23 RCS

RCS FWD – ITEM 1 EXEC (*)

MANF VLVS STAT OVRD

1 CL – ITEM 40 EXEC

2 CL – ITEM 41 EXEC

3 CL – ITEM 42 EXEC

4 CL – ITEM 43 EXEC

RCS L – ITEM 2 EXEC (*)

MANF VLVS STAT OVRD

2 CL – ITEM 41 EXEC

4 CL – ITEM 43 EXEC

JET DESELECTIONS

JET DES L3L – ITEM 13 EXEC (*)

JET DES L1L – ITEM 15 EXEC (*)

JET DES L1U – ITEM 21 EXEC (*)

JET DES L3D – ITEM 29 EXEC (*)

RCS R – ITEM 3 EXEC (*)

MANF VLVS STAT OVRD

2 CL – ITEM 41 EXEC

4 CL – ITEM 43 EXEC

JET DESELECTIONS

JET DES R3R – ITEM 13 EXEC (*)

JET DES R1R – ITEM 15 EXEC (*)

JET DES R1U – ITEM 21 EXEC (*)

JET DES R3D – ITEM 29 EXEC (*)

JET RESELECT

NOTE

Do not reselect any jets with previous fail off/leak

GNC 23 RCS

CRT

RCS FWD – ITEM 1 EXEC (*)

MANF VLVS STAT OVRD

1 OP – ITEM 40 EXEC

2 OP – ITEM 41 EXEC

3 OP – ITEM 42 EXEC

4 OP – ITEM 43 EXEC

RCS L – ITEM 2 EXEC (*)

MANF VLVS STAT OVRD

2 OP – ITEM 41 EXEC

4 OP – ITEM 43 EXEC

JET RESELECTIONS

JET DES L3L – ITEM 13 EXEC (no *)

JET DES L1L – ITEM 15 EXEC (no *)

JET DES L1U – ITEM 21 EXEC (no *)

JET DES L3D – ITEM 29 EXEC (no *)

RCS R – ITEM 3 EXEC (*)

MANF VLVS STAT OVRD

2 OP – ITEM 41 EXEC

4 OP – ITEM 43 EXEC

JET DESELECTIONS

JET DES R3R – ITEM 13 EXEC (no *)

JET DES R1R – ITEM 15 EXEC (no *)

JET DES R1U – ITEM 21 EXEC (no *)

JET DES R3D – ITEM 29 EXEC (no *)

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HEAT EXCHANGE UNIT EVALUATION (DTO 686)

DTO 686 PREP	FS 10-2
INITIATION	FS 10-3
TERMINATION	FS 10-6
RECONFIG	FS 10-6

**DTO
686**

DTO 686 INITIATION

SM 66 ENVIRONMENT

- R11L 1. SPLY H2O DUMP VLV ENA/NOZ HTR – ON
– OP (tb–OP)
When SUPPLY H2O NOZ T A,B exceed 250 degF
(~10 min):
SPLY H2O DUMP VLV ENA/NOZ HTR – OFF

_____ Unstow from Locker

2. Chill Can Components from storage locker
Chill Can sub-assembly, figure 10-1
Chill Can Koozie, figure 10-2
Jello Bag, figure 10-3
90° Elbow, figure 10-4

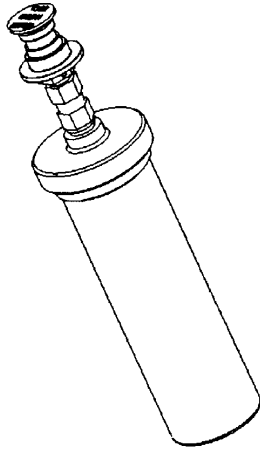


Figure 10-1

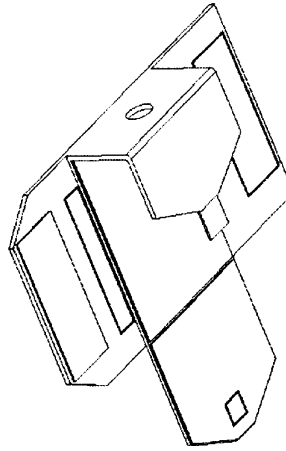


Figure 10-2

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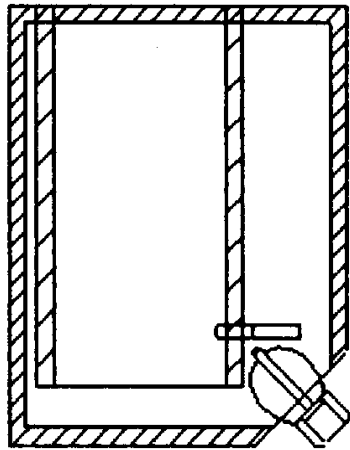


Figure 10-3

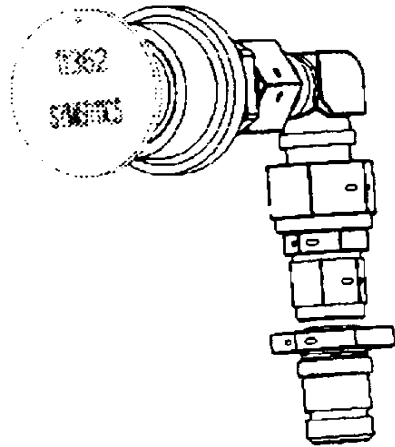


Figure 10-4

3. Hydrate Jello Bag per label instructions, using Galley water
4. Slip Chill Can into Koozie. Chill Can QD should pass thru hole at top of Koozie (figure 10-2), as shown in figure 10-5

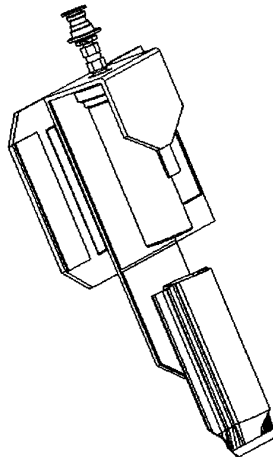


Figure 10-5

5. Place Chill Can into inner pocket of hydrated Jello Bag, as in figure 10-3, then wrap Koozie around Jello Bag and Chill Can
6. Record on provided data sheet which Chill Can number is being tested. Each Chill Can is labeled on the side, 1 thru 3. Connect the 90° Elbow to the QD at the top of the Chill Can
7. Attach completed assembly to the CONT H2O X-TIE POT QD (Port side WCS) via the 90° Elbow

NOTE

Jello will take up to 3.5 hr to chill

DTO
686

DTO 686 TERMINATION

1. After 3.5 hr, open Jello Bag and observe consistency and taste of the Jello. Record this information and the can number on the provided data sheet
 2. Disconnect the Chill Can assembly from the cross-tie QD; remove the 90° Elbow from the top of the Chill Can
 3. Inspect components for problems; restow when not in use
- R11L 4. SPLY H2O DUMP VLV ENA/NOZ HTR – ON
– CL (tb-CL)
ENA/NOZ HTR – OFF

DTO 686 RECONFIG

1. After final DTO 686 TERMINATION,
R11L SPLY H2O DUMP ISOL VLV – OP (tb-OP)

EPSON 800 COLOR PRINTER CHECKOUT

UNSTOW AND ASSEMBLE PRINTER	FS 11-2
WARM-UP AND SELF-TEST	FS 11-5
STOW PRINTER	FS 11-6
CHECK PRINTER SETTINGS	FS 11-7
PRINTER PAPER JAM	FS 11-7
BLACK INK CARTRIDGE CHANGEOUT	FS 11-8
COLOR INK CARTRIDGE CHANGEOUT	FS 11-10
CLEANING PRINTER HEADS	FS 11-12
EXECUTE PACKAGE PRINTING	FS 11-13

**COLOR
PRINTER**

UNSTOW AND ASSEMBLE PRINTER

(10 min) |

NOTE

Power PRINTER off when not in use

COLOR
PRINTER

- MF43G
1. UNSTOW
PRINTER
AC W PWR cable (if reqd)
PRINTER DATA CABLE (one of the following):
 - 6 ft parallel data cable
 - 25 ft parallel data cable
 - 25 ft network data cablePRINTER PAPER
- MF14G
2. ASSEMBLE PRINTER
PRINTER
Align arrows on PAPER FEEDER TRAY and back of PRINTER
Insert white tabs on PAPER FEEDER TRAY (near arrows) into black outlined slots on PRINTER (See figure 11-1)
Slide tray downward
Attach PAPER FEEDER TRAY to PRINTER (Secure via thumbscrews)
Attach PAPER OUTPUT TRAY to PRINTER (Secure via thumbscrews)
- MO52J
- ✓ AC UTIL PWR – OFF
Connect AC W PWR CABLE to PRINTER power port (See figure 11-2)
 - ✓ AC PWR CABLE connected to AC UTIL PWR panel
Connect PRINTER DATA CABLE to PRINTER
- Connect PRINTER DATA CABLE to PROSHARE PGSC (parallel port or network port)
- Insert 8.5" x 11" paper into PAPER FEEDER TRAY (~50 sheets)

Cont next page

Attach PRINTER to wall of desired area (example:
AFD or AIRLOCK ditch) using Velcro

If OCA Router not configured, reference OCA
SETUP, FS 4-2

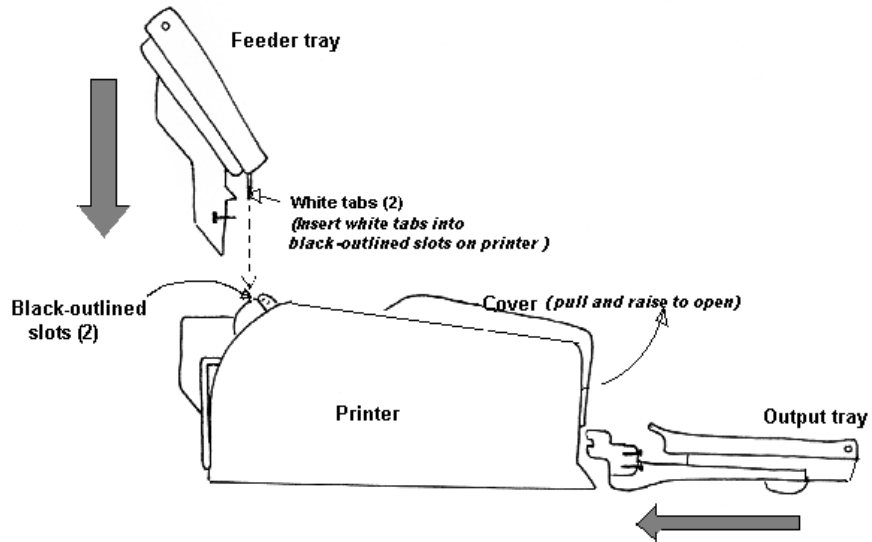
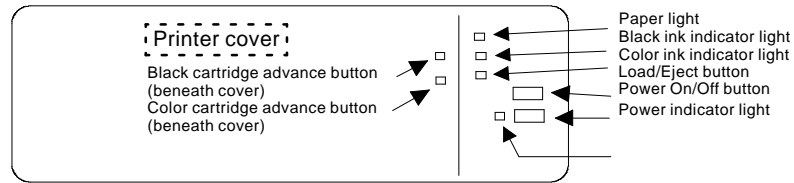
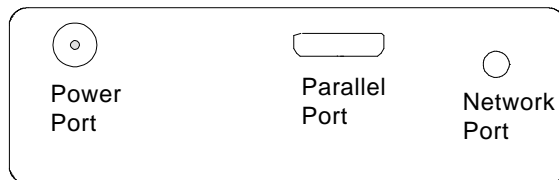


Figure 11-1.- Side view of printer and trays, ready for assembly.

PRINTER Top View (Inside Cover)



PRINTER Back View



760XD PGSC with SelectaDock Expansion Unit

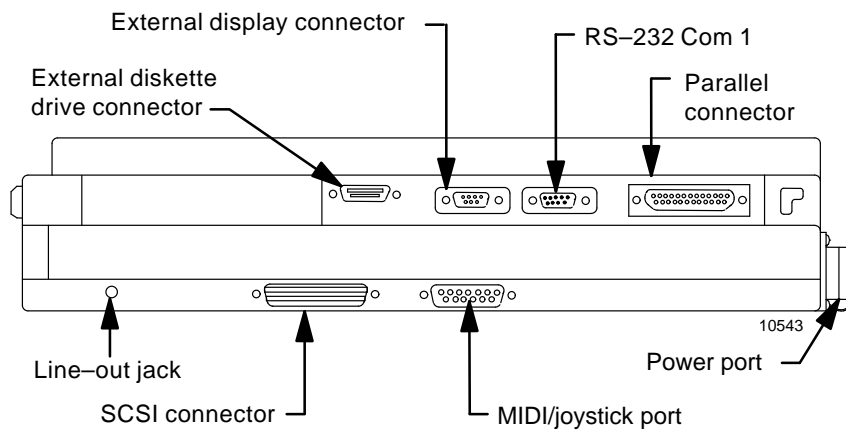


Figure 11-2.- Printer – Top view/back view.

WARM-UP AND SELF-TEST

WARM-UP

- MO52J 1. AC UTIL PWR – ON
- PGSC 2. ✓OCA PGSC – ON
3. PRINTER PWR – on (See figure 11-1)
✓Flashing green pwr light (~5 min)
4. ✓PRINTER ready
(Ready when pwr light is steady green)

NOTE

After successful test print, terminate Self-Test by powering printer OFF

SELF-TEST

1. PRINTER PWR – OFF
2. Press and hold LOAD/EJECT button, then press POWER button
(Hold LOAD/EJECT button for 3 sec after depressing POWER button, then release)
3. Observe printing of one black text page and one color text page
4. ✓Print quality
(Look for missing sections in Nozzle Check section)
5. If print quality not acceptable, go to CLEANING PRINTER HEADS
6. If paper jam, go to PRINTER PAPER JAM
7. If printer quality acceptable, PRINTER PWR – OFF
(to terminate Self-Test)
8. Notify MCC: Status of Self-Test results

STOW PRINTER

PRINTER PRINTER PWR – off (press power button once)
✓PRINTER LIGHT – OFF
(Wait for unit to stop moving. Printer head should be at right side and locked into place)

MO52J 1. AC UTIL PWR – OFF
(Remove paper from PAPER FEEDER TRAY and stow it)

PRINTER 2. Remove PAPER FEEDER TRAY from PRINTER (disconnect via thumbscrews)
3. Remove PAPER OUTPUT TRAY from PRINTER (disconnect via thumbscrews)
4. Disconnect AC W PWR cable from PRINTER
5. Disconnect AC W PWR cable from AC UTIL OUTPUT panel, if reqd
6. Disconnect PRINTER DATA cable from PRINTER
7. Disconnect PRINTER DATA cable from PROSHARE PGSC (parallel port or network port)

MF43G STOW
PRINTER
AC W PWR cable (if reqd)
PRINTER DATA CABLE (one of the following):
6 ft parallel data cable
25 ft parallel data cable
25 ft network data cable

MF14G PRINTER PAPER
PRINTER PAPER FEEDER TRAY
PAPER OUTPUT TRAY

CHECK PRINTER SETTINGS

1. Sel 'Start' from Windows taskbar
2. Sel 'Settings'
3. Sel 'Printers'
4. Right-click on appropriate printer icon:
Parallel: Epson Printer (Local)
Network: Epson Printer (Network)
5. Verify 'Set as default' selected (✓)
6. Sel 'Properties'
7. Sel 'Main' tab
8. Check 'Automatic' selected (●)
9. Click 'OK' to exit

PRINTER PAPER JAM

1. PRINTER PWR – off (press power button once)
2. ✓PRINTER LIGHT – OFF
3. ✓PAPER FEEDER TRAY clear of obstruction
✓PAPER OUTPUT TRAY clear of obstruction
4. Raise PRINTER cover (See figure 11-1)
✓Inside of printer clear from obstruction
5. If paper jam cleared,
proceed to WARM-UP AND SELF-TEST
6. If paper jam continues, **NOTIFY MCC**
7. If reqd, stow PRINTER (Reference STOW
PRINTER)

BLACK INK CARTRIDGE CHANGEOUT

NOTE

Perform if black ink cartridge light is illuminated. Changeout of black and color cartridges takes approx 5 min.

If black ink cartridge light is flashing, black ink is low.

If black ink cartridge light is solid, black ink is out

1. ✓PRINTER – Ready
(notice steady green pwr light)
2. Raise PRINTER cover (See figure 11-1)

NOTE

Printer will reset if step 4 not performed within 1 min after step 3. If reset experienced, repeat step 3

3. Press and hold “black ink cartridge advance button” (~3 sec) and release. Black ink cartridge (leftmost) will move and become accessible

CAUTION

Do **NOT** squeeze INK CARTRIDGE

4. Lift tab on purple cover
Remove black ink cartridge
5. Cover opening on used cartridge with Gray Tape
Stow old cartridge in Ziploc bag
Place Ziploc in printer locker
6. Unstow new cartridge from sealed pack
Remove small yellow plastic tab on top (Do not remove white tab; reference instructions on cartridge)

Cont next page

7. Insert new cartridge (arrow should be pointing toward back of printer)
8. Lower and latch tab on purple cover
(Do not reopen)
If also changing color cartridge, go to step 3 in
COLOR INK CARTRIDGE CHANGEOUT
Otherwise, continue
9. Lower and close PRINTER cover
10. Press the LOAD/EJECT button; printer will perform a cleaning that will last approx 3 min
11. Perform Self-Test to ensure proper operations

COLOR INK CARTRIDGE CHANGEOUT

NOTE

Perform if color ink cartridge light is illuminated. Changeout of black and color cartridges takes approx 5 min.

If color ink cartridge light is flashing, color ink is low.

If color ink cartridge light is solid, color ink is out

1. ✓PRINTER – Ready
(notice steady green pwr light)
2. Raise PRINTER cover (See figure 11-1)

NOTE

Printer will reset if step 4 not performed within 1 min after step 3. If reset experienced, repeat step 3

3. Press and hold “color ink cartridge advance button” (~3 sec) and release. Color ink cartridge (leftmost) will move and become accessible

CAUTION

Do **NOT** squeeze INK CARTRIDGE

4. Lift tab on purple cover
Remove color ink cartridge
5. Cover opening on used cartridge with Gray Tape
Stow old cartridge in Ziploc bag
Place Ziploc in printer locker
6. Unstow new cartridge from sealed pack
Remove small yellow plastic tab on top (Do not remove white tab; reference instructions on cartridge)

Cont next page

7. Insert new cartridge (arrow should be pointing toward back of printer)
8. Lower and latch tab on purple cover
(Do not reopen)
If also changing black cartridge, go to step 3 in
BLACK INK CARTRIDGE CHANGEOUT
Otherwise, continue
9. Lower and close PRINTER cover
10. Press the LOAD/EJECT button; printer will perform a cleaning that will last approx 3 min
11. Perform Self-Test to ensure proper operations

CLEANING PRINTER HEADS (Black and/or Color)

NOTE

Printer must be ON, not printing and appropriate ink cartridge light must not illuminate red

1. ✓PRINTER PWR – on
2. ✓Ink cartridge Lt – OFF
If ink cartridge Lt flashing, go to BLACK/
COLOR INK CARTRIDGE CHANGEOUT
3. Sel 'Start' from Windows taskbar
4. Sel 'Settings'
5. Sel 'Printers'
6. Right-click on appropriate printer icon:
Parallel: Epson Printer (Local)
Network: Epson Printer (Network)
7. Verify 'Set as default' selected (✓)
8. Sel 'Properties'
9. Sel 'Utility' tab
10. Sel 'Head Cleaning'
Sel 'Next'
11. Sel 'Black', 'Color', or 'Both'
Sel 'Next'
12. When cleaning is complet(~5 min), sel 'Nozzle
Check' (If test still missing sections, redo steps
10 and 11)
13. If nozzle test is nominal, click 'OK' to exit

EXECUTE PACKAGE PRINTING

NOTE

Perform following procedure(s) if instructed by MCC

DOCUMENTS

1. Sel 'Shuttle Apps' from Desktop
2. Sel 'Epson' group folder
3. Double-click 'Docs Printing' Icon

PICTURES

1. Sel 'Shuttle Apps' from Desktop
2. Sel 'Epson' group folder
3. Double-click 'PICS Printing' Icon

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CYCLE ERGOMETER OPS

ERGOMETER SETUP	FS 12-2
RECONFIG/STOW	FS 12-6
CYCLE ERGOMETER MANUAL OPS	FS 12-9
ALTERNATE ERGOMETER EXERCISE	FS 12-10

**ERGO
OPS**

ERGOMETER SETUP

1. Remove Ergometer Assy from middeck floor, transport Ergometer to desired exercise location
2. Unstow:
Ergo Assy Ergometer Accessories Bag (Shoe Bag)
Shoe Bag Bio Bag
Bio Bag Sound Mounts (4)
 Adjustable Quick Disconnects (AQDs)
 Spacers (4)

NOTE

102 only – spacers are not used on flight deck

3. Attach AQDs (four) to seat floor studs. Install sound mounts and spacers on ADQs

Disassemble Ergo Assy:

4. Remove seat stem pip pin, seat stem foot, restraining belt; temp stow
5. Remove seat assy, temp stow
6. Remove Ergometer pip pins (four), ergometer assy straps (four); release Ergometer from frame; temp stow
7. Mount both frame sections loosely to AQDs on seat floor studs (fig 12–1) using Knurled Kbs (four)
8. Install seat assy on seat stem; insert seat stem foot into stem
Move seat assy pip pin (one) from green to yellow position, secure w/seat stem pip pin, slide blocks together, tighten Knurled Kbs, and secure w/Velcro
9. ✓Ergometer ON/OFF – OFF

ERGO
OPS

Cont next page

FS 12–2

ORB OPS/99/FIN A

NOTE

Following steps will interrupt power to other loads on that utility outlet

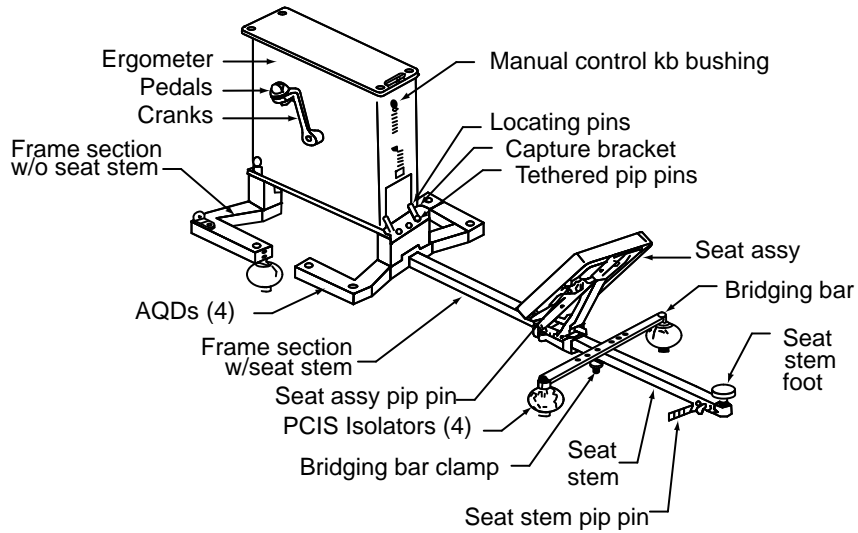
MO52J 10. ✓DC UTIL PWR – OFF

11. Connect prerouted Ergometer Pwr cable to Ergometer Pwr Jack

12. ✓DC UTIL PWR – ON

Shoe Bag 13. Unstow Ergometer Display Panel

14. Connect Ergometer Display Panel cable to Ergometer Display Jack; temp stow



jsc_48036-099.ai

Figure 12-1.- Ergometer w/PCIS.

Bio Bag 15. Unstow Threaded Fasteners (four), and Wrench

Cont next page

NOTE

Ergometer ON/OFF, MANUAL/REMOTE switches should face subject

16. Mount Ergometer to frame assy w/Threaded Fasteners (four)
Tighten w/Wrench
17. Unstow:
Ergometer Pedals
Crank
Ergo Acc Bag
18. Install pedals on cranks using Wrench from Ergo Acc Bag, attach cranks w/pedals to Ergometer, tighten w/Wrench (fig 12-1)

NOTE

Install RED on RIGHT; BLUE on LEFT

19. Unstow:
PCIS Kit:
PCIS Isolators – yellow (4)
PCIS Bridging Bar (1)
Bridging Bar Clamp Assy (1)
MF14G
20. Install PCIS Isolators (four) on deck studs (fig 12-1)
21. Install one end of Bridging Bar on PCIS Isolator at seat end of Ergo Assy. Install RED on right
22. Remove Knurled Kbs (four) from AQDs
23. Raise entire cycle/frame assy from deck
Ergo
24. Connect Ergo Assy AQDs (two) in frame section w/o seat stem to PCIS Isolators (two) w/o Bridging Bar Assy
25. Rotate seat stem foot and reinsert with pad on top

Cont next page

26. Install other end of Bridging Bar PCIS Isolator w/bar on top of seat stem
27. Stow in Bio Bag:
 - Sound Mounts (4)
 - AQDs (4)
 - Spacers (4)

NOTE

Rubber pads on Bridging Bar must contact seat stem

28. Hand tighten Bridging Bar Clamp under seat stem
 - As reqd, if exercise session follows immediately, perform muscle stretch:
 29. Hold each stretch 1 min
 30. While stretching, relax involved muscle
31. Adjust seat assy for subject comfort
32. Mount Ergometer
 - Secure shoes into pedals
 - Secure body w/restraining belt
33. Ergometer ON/OFF – ON
34. Perform exercise
35. Ergometer ON/OFF – OFF

RECONFIG/STOW

NOTE

Following steps will interrupt power to other loads on that utility outlet

- MO52J 1. ✓DC UTIL PWR – OFF
2. Disconnect prerouted Ergometer Pwr cable, secure
3. If other loads on utility outlet (verify per Plug-In Plan)
- DC UTIL PWR – ON
- MF14G 4. Unstow PCIS Kit
- Ergo Acc Bag 5. Detach Ergometer Display Panel cable, Ergometer pedals, cranks; stow
- Bio Bag 6. Remove Threaded Fasteners, stow
7. Remove Ergometer from frame, temp stow
8. Remove seat stem pip pin, seat stem foot; temp stow
9. Remove seat assy, reconfigure for launch/landing (pip pin moves from yellow to green hole)
10. Remove Bridging Bar Clamp from under seat stem and stow
Temp stow frame section with seat stem; stow Bridging Bar Clamp in PCIS Kit
11. Release other frame section from PCIS Isolators and temp stow
12. Remove Bridging Bar from PCIS Isolators and stow in PCIS Kit

Cont next page

13. Remove PCIS Isolators from deck studs and stow in PCIS Kit
14. Stow PCIS Kit in MF14G
15. Slide frame half, w/o seat stem, onto stem in launch/landing config (fig 12-2)
- Ergo
Acc Bag 16. Unstow Ergo Assy Straps (two pair), slide onto frame
17. Unstow Pip Pins
18. Attach Ergometer horizontally to frame w/pip pins (fig 12-2)
✓ Arrow on decal, seat stem face same direction
19. Slide seat assy onto seat stem, reinstall seat stem foot, secure w/seat stem pip pin
20. Tighten Knurled Kbs (two) on seat assy
21. Secure restraining belt around seat assy, seat stem
22. Mount frame to launch/landing position in middeck using frame/AQDs (four), w/seat stem facing forward (fig 12-2)
23. Using Ergo Assy Straps attach Ergo Acc Bag to Ergometer (fig 12-2)
24. Pull straps tight; secure loose ends

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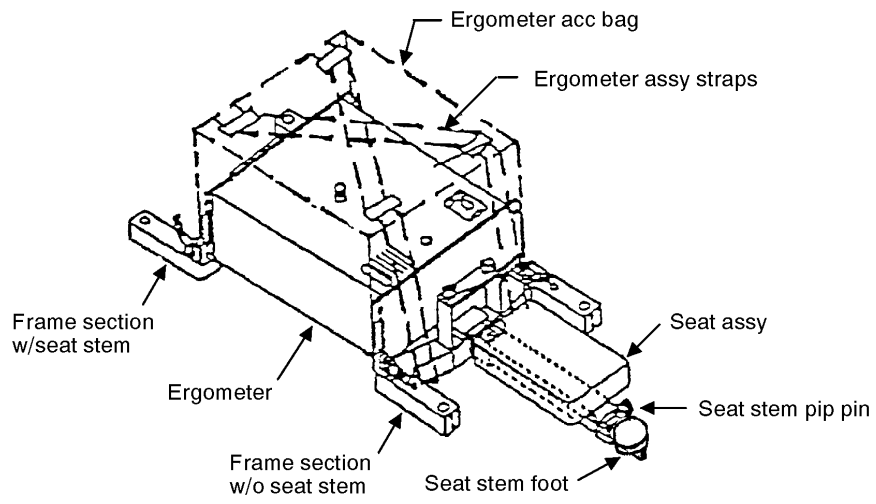


Figure 12-2.- Ergometer middeck launch/landing configuration (ergo assy).

CYCLE ERGOMETER MANUAL OPS

Ergo Acc Bag 1. Unstow Manual Control Kb

2. Screw Manual Control Kb into bushing on Ergometer (fig 12-1)

NOTE

To increase workload, turn Manual Control Kb cw. To decrease workload, turn Manual Control Kb ccw

If workload/pedal speed desired, pwr available:

3. ✓ Ergometer ON/OFF – ON
Set desired pedal speed, workload on display panel
Perform exercise
Adjust Manual Control Kb until ONLY center LED on workload illuminated; repeat for any change in workload

If workload/pedal speed feedback not desired or pwr not available:

4. Perform exercise, adjusting Manual Control Kb cw or ccw as desired

ALTERNATE ERGOMETER EXERCISE

- Ergo Acc Bag
1. Unstow Bungee Cords (Bio Bag)
 2. Connect two sets of four Bungee Cords in series
 3. Stand topside of Ergometer w/feet approx shoulder width apart
 4. Attach Bungees to opposite corners of Ergometer frame crossing Bungees over shoulders (figs 12-3, 12-4)
 5. Adjust bungee length for comfort

NOTE

Use towels, socks for shoulder padding if desired

6. Perform exercise
7. Stow Bungee Cords (Bio Bag)

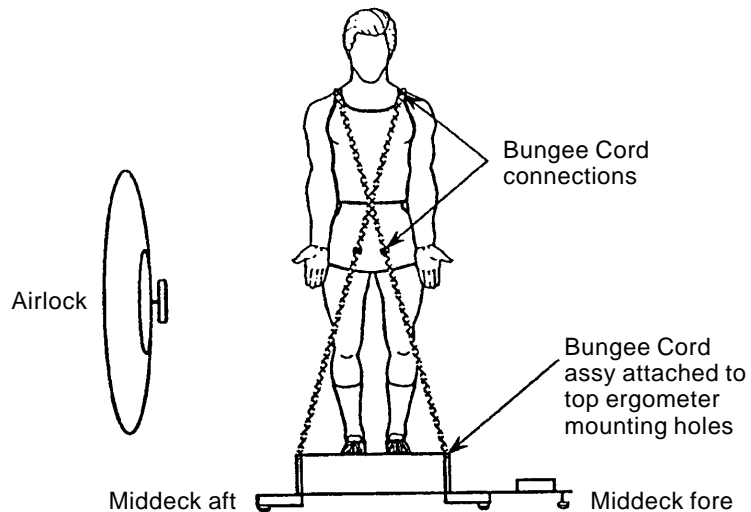


Figure 12-3.- Alternate exercise bungee attachments – front view (facing stbd).

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FS 12-10

ORB OPS/99/FIN A

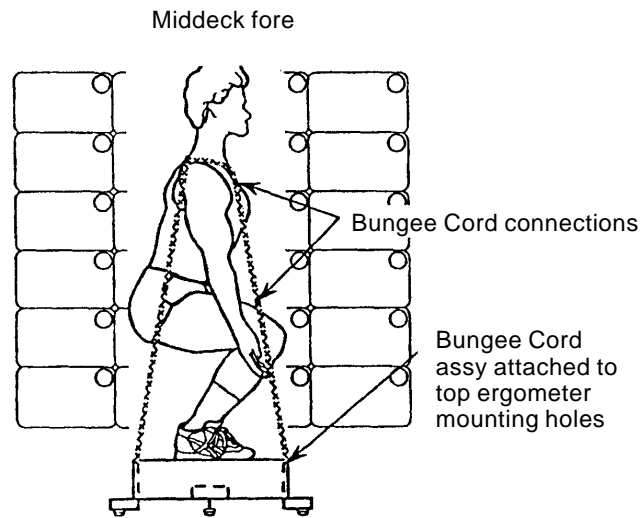


Figure 12-4.- Alternate exercise bungee attachments – side view (facing stbd).

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SHUTTLE COMPOUND SPECIFIC ANALYZER –
COMBUSTION PRODUCTS (CSA-CP)

ACTIVATION	FS 13-2
DATA LOGGER ACTIVATION	FS 13-2
CSA-CP DEACTIVATION	FS 13-2
BATT CHANGEOUT	FS 13-3

CSA-CP

ACTIVATION

- MA73J 1. Unstow:
CSA-CP

NOTE

Audible beep occurs when MODE pb depressed during unit activation

2. MODE pb – press, hold until 'RELEASE' displayed

NOTE

Wait ~1 min while unit runs self-check routine. A single beep occurs when self-check routine complete

3. ✓ Display indicates readings for O2, HCN, HCL, CO

DATA LOGGER ACTIVATION

- CSA-CP 1. Press MODE pb 9 times until 'LOG OFF' displayed

NOTE

The operation mode will revert to nominal display after 10 sec

2. '+' pb – press to activate CSA-CP internal data logger
✓ 'LOG ON' displayed

3. Deploy CSA-CP in mid-deck location w/ good air flow
Record location: _____

CSA-CP

CSA-CP DEACTIVATION

1. MODE pb – press, hold until 'RELEASE' displayed
✓ Unit off

- MA73J 2. Stow CSA-CP

BATT CHANGEOUT

- MA73J
1. Unstow:
Batt Pack
 2. Deactivate CSA-CP, if activated
MODE pb – press, hold until 'RELEASE'
displayed
 3. Turn fasteners (two) on back panel ccw 1/4 turn
Temp stow panel

NOTE

Stowed data maintained for maximum of 30 min w/o batt installed. All data will be lost if batt installation delayed >30 min

4. Grasp Batt Pack pull tab, remove pack and mark as "Discharged"
 5. Install replacement Batt Pack, press firmly to seat electrodes
 6. Replace panel, press firmly, turn fasteners (two) cw 1/4 turn to lock
- MA73J
7. Stow used Batt Pack
 8. If redeploying CSA-CP, repeat ACTIVATION, DATA LOGGER ACTIVATION, and CSA-CP DEACTIVATION
If not deploying CSA-CP, stow

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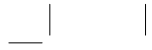
CUE CARD CONFIGURATION

**CUE
CARD**

NOT FLOWN

FS 14-1

ORB OPS/99/FIN A



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**CUE
CARD**



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FS 14-2

ORB OPS/99/FIN A



TOP

HOOK
VELCRO

**DUAL SHIFT ORBITER
CO2 ABSORBER REPLACEMENT**
(6 Crewmembers/BLUE sleeps 1st/FD 1-8)

FLIGHT DAY	POS A	POS B	CK CMLPT
LAUNCH	1*	2	
PRE RED FD1	3	"	
PRE BLUE FD2	4	5*	
PRE RED FD2	"	6	
PRE BLUE FD3	7*	8	
PRE RED FD3	9	"	
PRE BLUE FD4	"	10	
PRE RED FD4	11	12	
PRE BLUE FD5	13	"	
PRE RED FD5	14	15*	
PRE BLUE FD6	"	16	
PRE RED FD6	17*	18	
PRE BLUE FD7	19	"	
PRE RED FD7	"	20	
PRE BLUE FD8	21	22	
PRE RED FD8	23	"	

*Reseal LiOH cans w/Gray Tape and stow
(Location of canisters on back)
ORB OPS-14a/NON-RCRS/99/B

NOTE

This card is specifically used for STS-99 mission with orbiter conducting dual shift ops with crew size of 6

(reduced copy)

FAB USE ONLY

FS CC 14-3

ORB OPS/99/FIN A

TOP
 BACK OF 'DUAL SHIFT ORBITER
 CO2 ABSORBER REPLACEMENT'

HOOK
 VELCRO

**DUAL SHIFT ORBITER
 CO2 ABSORBER REPLACEMENT**
 (6 Crewmembers/BLUE sleeps 1st/FD 9-14)

FLIGHT DAY	POS A	POS B	CK CMLPT
PRE BLUE FD9	24	25*	
PRE RED FD9	"	26	
PRE BLUE FD10	27	"	
PRE RED FD10	28	29	
PRE BLUE FD11	"	30	
PRE RED FD11	31	"	
POST RED FD12	32	33	EOM
PRE BLUE FD12	"	34*	
POST RED FD13	35	36	EOM + 1
PRE BLUE FD13	37	"	
POST RED FD14	"	38	EOM + 2

*Reseal LiOH cans w/Gray Tape and stow

**LiOH CANISTER STOWAGE
 LOCATIONS**

LiOH Locations

MD52M (LiOH): Cans 3-31
 Middeck Stbd
 Ceiling Bag (Bottom): Cans 32-38

ORB OPS-14b/NON-RCRS/99/B

(reduced copy)

FAB USE ONLY

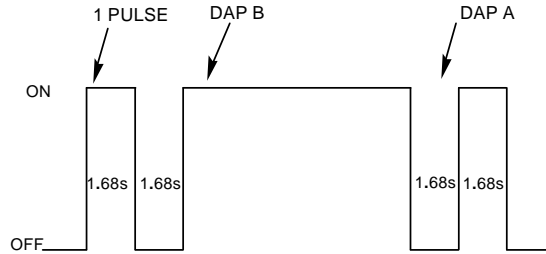
FS CC 14-4

ORB OPS/99/FIN A

TOP

HOOK
VELCRO

RCS JET ACTIVITY – SINGLE-PULSE FLY-CAST MANEUVERS



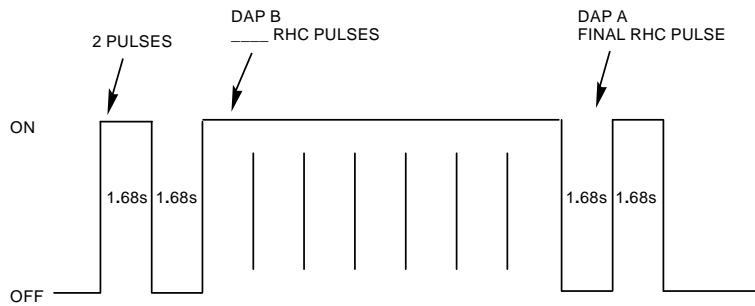
ORB OPS-31a/99/O/A

TOP

BACK OF 'RCS JET ACTIVITY – SINGLE'

HOOK
VELCRO

RCS JET ACTIVITY – MULTI-PULSE FLY-CAST MANEUVERS



ORB OPS-31b/99/O/A

(reduced copy)

FAB USE ONLY

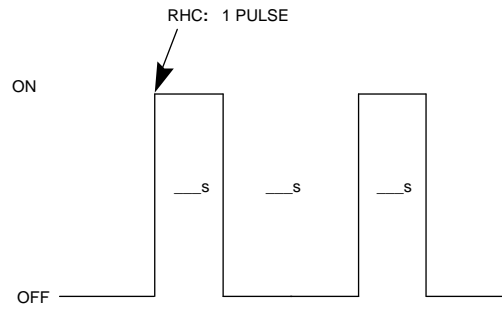
FS CC 14-5

ORB OPS/99/FIN A

TOP

HOOK
VELCRO

RCS JET ACTIVITY – DOUBLET FLY-CAST MANEUVERS



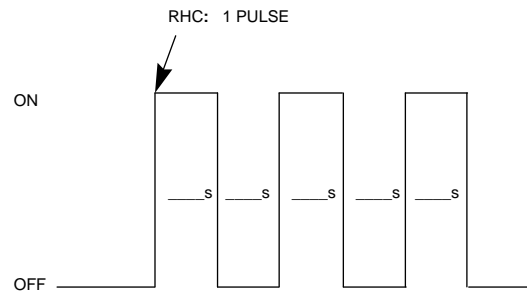
ORB OPS-32a/99/O/A

TOP

BACK OF 'RCS JET ACTIVITY – DOUBLET'

HOOK
VELCRO

RCS JET ACTIVITY – TRIPLET FLY-CAST MANEUVERS



ORB OPS-32b/99/O/A

(reduced copy)

FAB USE ONLY

FS CC 14-6

ORB OPS/99/FIN A

TOP

HOOK
VELCRO

ZDS LATE INITIATION

1. DETERMINE LATE STATUS
 Record Current OM (per UNIV PTG) _____
 Record Minutes Late _____
 (Rounded up to nearest even minute)
 Check (PGSC WorldMap or GNC 55 GPS STATUS)
 orbiter NORTH _____ or SOUTH _____

2. DETERMINE OMICRON FOR LATE ZDS
 Record Omicron (per TABLE N or S) _____

3. INPUT NEW OMICRON
 DAP: B13/AUTO/VERN

GNC UNIV PTG
 OM ITEM 17 + _ _ EXEC (per step 2)
 ITEM 19 EXEC
 When in att DAP: A11/AUTO/VERN

4. FUTURE LOAD ZDS
GNC UNIV PTG
 OM ITEM 17 + _ _ EXEC (2.8 NORTH or 357.2 SOUTH)

If OM not bold (per step 3):
 Future Load:
 (Old ZDS MET + Minutes Late + 3 min) = _____ / _____ : _____ : _____
 ITEM 19 EXEC >>
 If OM bold:
 ITEM 19 EXEC >>

ORB OPS-33a/99/O/A

(reduced copy)

FAB USE ONLY

FS CC 14-7

ORB OPS/99/FIN A

TOP
BACK OF 'ZDS LATE INITIATION'

HOOK
VELCRO

TABLE N – Late ZDS North

		Current Omicron															
		357.2	357.4	357.6	357.8	358.0	358.2	358.4	358.6	358.8	359.0	359.2	359.4	359.6	359.8	0.0	0.0
Minutes Late	6	358.8	359.0	359.2	359.4	359.6	359.8	0.0	0.2	0.4	0.6	0.8	1.0	1.2	1.4	1.6	1.8
	8	359.2	359.4	359.6	359.8	0.0	0.2	0.4	0.6	0.8	1.0	1.2	1.4	1.6	1.8	2.0	2.8
	10	359.5	359.7	359.9	0.1	0.3	0.5	0.7	0.9	1.1	1.3	1.5	1.7	1.9	2.8	2.8	2.8
	12	359.9	0.1	0.3	0.5	0.7	0.9	1.1	1.3	1.5	1.7	1.9	2.8	2.8	2.8	2.8	2.8
	14	0.3	0.5	0.7	0.9	1.1	1.3	1.5	1.7	1.9	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	16	0.6	0.8	1.0	1.2	1.4	1.6	1.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	18	1.0	1.2	1.4	1.6	1.8	2.0	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	20	1.3	1.5	1.7	1.9	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
22	1.7	1.9	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	

NOTE: For OM > 0.2 use late OM of 2.8

TABLE S – Late ZDS South

		Current Omicron															
		2.8	2.6	2.4	2.2	2.0	1.8	1.6	1.4	1.2	1.0	0.8	0.6	0.4	0.2	0.0	359.8
Minutes Late	6	1.2	1.0	0.8	0.6	0.4	0.2	0.0	359.8	359.6	359.4	359.2	359.0	358.8	358.6	358.4	358.2
	8	0.8	0.6	0.4	0.2	0.0	359.8	359.6	359.4	359.2	359.0	358.8	358.6	358.4	358.2	358.0	357.2
	10	0.5	0.3	0.1	359.9	359.7	359.5	359.3	359.1	358.9	358.7	358.5	358.3	358.1	357.2	357.2	357.2
	12	0.1	359.9	359.7	359.5	359.3	359.1	358.9	358.7	358.5	358.3	358.1	357.2	357.2	357.2	357.2	357.2
	14	359.7	359.5	359.3	359.1	358.9	358.7	358.5	358.3	358.1	357.2	357.2	357.2	357.2	357.2	357.2	357.2
	16	359.4	359.2	359.0	358.8	358.6	358.4	358.2	357.2	357.2	357.2	357.2	357.2	357.2	357.2	357.2	357.2
	18	359.0	358.8	358.6	358.4	358.2	358.0	357.2	357.2	357.2	357.2	357.2	357.2	357.2	357.2	357.2	357.2
	20	358.7	358.5	358.3	358.1	357.2	357.2	357.2	357.2	357.2	357.2	357.2	357.2	357.2	357.2	357.2	357.2
22	358.3	358.1	357.2	357.2	357.2	357.2	357.2	357.2	357.2	357.2	357.2	357.2	357.2	357.2	357.2	357.2	

NOTE: For OM < 359.8 use late OM of 357.2

ORB OPS-33b/99/O/A

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ORB OPS/99/FIN A

Space Shuttle Program
FLIGHT DATA FILE

JSC-48036-99
FINAL, REV A



ORBIT OPS CHECKLIST

STS
99

Flight Cover (trim bottom to expose tabs)