INTERNATIONAL SPACE STATION
INTEGRATED MEDICAL GROUP (IMG)
MEDICAL OPERATIONS BOOK
ALL EXPEDITION FLIGHTS

August 24, 2000

APPROVED BY:

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United States
Systems Operations Data File

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#### INTEGRATED MEDICAL GROUP (IMG)
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24 AUG 00
## CONTENTS

ACTIVATION AND CHECKOUT PROCEDURES ................................................. 1
CMS PROCEDURES
MEDICAL EQUIPMENT COMPUTER - ACTIVATION/CHECKOUT ....................... 3

EHS PROCEDURES
COMPOUND SPECIFIC ANALYZER - COMBUSTION PRODUCTS
ACTIVATION AND CHECKOUT .................................................................... 9
SOUND LEVEL METER (SLM) - CHECKOUT .............................................. 13
TOTAL ORGANIC CARBON ANALYZER (TOCA) ACTIVATION AND
CHECKOUT ............................................................................................. 19

HMS PROCEDURES
BLOOD PRESSURE/ELECTROCARDIOGRAPH - ACTIVATION/
CHECKOUT ............................................................................................. 27
SPACE STATION EYEWASH - ACTIVATION AND CHECKOUT .................. 31

NOMINAL PROCEDURES ........................................................................... 33
CMS PROCEDURES
MEDICAL EQUIPMENT COMPUTER - BATTERY INSTALL/CHARGE ............. 35
MEDICAL EQUIPMENT COMPUTER - DATA COPY FILE TRANSFER ............ 37
MEDICAL EQUIPMENT COMPUTER - DEACTIVATION ......................... 41
MEDICAL EQUIPMENT COMPUTER - EXERCISE DATA DOWNLOAD TO
MEC ........................................................................................................... 43
MEDICAL EQUIPMENT COMPUTER - MEC-TO-OCA FILE TRANSFER VIA
RF LAN ....................................................................................................... 47
MEDICAL EQUIPMENT COMPUTER - SETUP ......................................... 51
TREADMILL VIBRATION ISOLATION SYSTEM (TVIS) NOMINAL
OPERATIONS ............................................................................................ 53
TREADMILL WITH VIBRATION ISOLATION AND STABILIZATION -
MONTHLY MAINTENANCE ..................................................................... 59

EHS PROCEDURES
AUDIO DOSIMETER - ACOUSTIC NOISE MEASUREMENT ......................... 61
ACOUSTIC DOSIMETER - ACOUSTIC NOISE MEASUREMENT .................... 65
CARBON DIOXIDE MONITOR - PERSONAL AND AREA ............................ 69
COMPOUND SPECIFIC ANAYLIZER - COMBUSTION PRODUCTS (CSA-CP)
ACTIVATION (DEACTIVATION) AND PASSIVE SAMPLING ....................... 73
COMPOUND SPECIFIC ANALYZER - COMBUSTION PRODUCTS DATA
LOGGER ACTIVATION/DEACTIVATION .................................................... 75
COMPOUND SPECIFIC ANALYZER - COMBUSTION PRODUCTS
ONBOARD EXCHANGE ............................................................................. 77
COMPOUND SPECIFIC ANALYZER - COMBUSTION PRODUCTS (CSA-CP)
ACTIVE SAMPLING WITH PROBE AND DATA LOGGING ...................... 79
COMPOUND SPECIFIC ANALYZER - COMBUSTION PRODUCTS ALARM
DISABLE/ENABLE .................................................................................... 81
COMPOUND SPECIFIC ANALYZER - COMBUSTION PRODUCTS
ALARM/AUTOLOG SETPOINT CHANGE .................................................. 83
COMPOUND SPECIFIC ANALYZER - COMBUSTION PRODUCTS -
RESUPPLY .............................................................................................. 87
<table>
<thead>
<tr>
<th>Topic</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMPOUND SPECIFIC ANALYZER - COMBUSTION PRODUCTS</td>
<td>89</td>
</tr>
<tr>
<td>SAMPLING PUMP BATTERY CHANGEOUT</td>
<td>91</td>
</tr>
<tr>
<td>COMPOUND SPECIFIC ANALYZER - COMBUSTION PRODUCTS</td>
<td>93</td>
</tr>
<tr>
<td>SAMPLING PUMP FILTER CHANGEOUT</td>
<td></td>
</tr>
<tr>
<td>BATTERY CHANGEOUT</td>
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</tr>
<tr>
<td>COMPOUND SPECIFIC ANALYZER - COMBUSTION PRODUCTS DATA DOWNLOAD</td>
<td>95</td>
</tr>
<tr>
<td>COMPOUND SPECIFIC ANALYZER - COMBUSTION PRODUCTS POST FIRE AIR ANALYSIS</td>
<td>97</td>
</tr>
<tr>
<td>COMPOUND SPECIFIC ANALYZER - COMBUSTION PRODUCTS ROUTINE MAINTENANCE</td>
<td>103</td>
</tr>
<tr>
<td>COMPOUND SPECIFIC ANALYZER - COMBUSTION PRODUCTS - ZERO CALIBRATION OF UNITS AND COMPARISON OF VALUES</td>
<td>109</td>
</tr>
<tr>
<td>FORMALDEHYDE MONITORING KIT - OPERATIONS</td>
<td>113</td>
</tr>
<tr>
<td>GRAB SAMPLE CONTAINER (GSC) OPERATIONS</td>
<td>115</td>
</tr>
<tr>
<td>MICROBIAL SAMPLES DATA ENTRY TO MEDICAL EQUIPMENT COMPUTER</td>
<td></td>
</tr>
<tr>
<td>POTABLE WATER COLLECTION FOR CHEMICAL AND MICROBIOLOGY</td>
<td>117</td>
</tr>
<tr>
<td>IN-FLIGHT AND POST-FLIGHT ANALYSIS - WMK/WS&amp;A</td>
<td>119</td>
</tr>
<tr>
<td>POTABLE WATER COLLECTION FOR CHEMICAL (IN-FLIGHT AND POST-FLIGHT) AND MICROBIOLOGY IN-FLIGHT ANALYSIS - WMK/WS&amp;A</td>
<td>131</td>
</tr>
<tr>
<td>POTABLE WATER COLLECTION FOR CHEMICAL/MICROBIOLOGY IN-FLIGHT ANALYSIS - WMK/WS&amp;A</td>
<td>141</td>
</tr>
<tr>
<td>SOLID SORBENT AIR SAMPLER (SSAS) PROCEDURE</td>
<td>149</td>
</tr>
<tr>
<td>SOUND LEVEL METER - OPERATION</td>
<td>151</td>
</tr>
<tr>
<td>SOUND LEVEL METER - TRANSFER</td>
<td>155</td>
</tr>
<tr>
<td>SURFACE SAMPLER KIT - SAMPLE COLLECTION/INCUBATION</td>
<td>157</td>
</tr>
<tr>
<td>SURFACE SAMPLER KIT (SSK)/WATER MICROBIOLOGY KIT (WMK) - VISUAL ANALYSIS AND DATA RECORDING</td>
<td>163</td>
</tr>
<tr>
<td>TISSUE EQUIVALENT PROPORTIONAL COUNTER - RELOCATE</td>
<td>165</td>
</tr>
<tr>
<td>TISSUE EQUIVALENT PROPORTIONAL COUNTER - CALDOW</td>
<td>167</td>
</tr>
<tr>
<td>TISSUE EQUIVALENT PROPORTIONAL COUNTER - DATA TRANSFER OPERATIONS</td>
<td>169</td>
</tr>
<tr>
<td>TISSUE EQUIVALENT PROPORTIONAL COUNTER - ALARM PROCEDURE</td>
<td></td>
</tr>
<tr>
<td>TOTAL ORGANIC CARBON ANALYZER (TOCA) CALIBRATION</td>
<td>175</td>
</tr>
<tr>
<td>TOTAL ORGANIC CARBON ANALYZER (TOCA) - CONDENSATE COLLECTION FROM SRV-K</td>
<td>181</td>
</tr>
<tr>
<td>TOTAL ORGANIC CARBON ANALYZER (TOCA) RAM DATA CARD REPLACEMENT</td>
<td>187</td>
</tr>
<tr>
<td>TOTAL ORGANIC CARBON ANALYZER (TOCA) REAGENT MIXING</td>
<td>191</td>
</tr>
<tr>
<td>TOTAL ORGANIC CARBON ANALYZER (TOCA) WASTE CONTAINER REPLACEMENT</td>
<td>193</td>
</tr>
<tr>
<td>TOTAL ORGANIC CARBON ANALYZER (TOCA) WATER SAMPLE ANALYSIS</td>
<td>199</td>
</tr>
<tr>
<td>WATER MICROBIOLOGY KIT - FILLING MCD WITH GROWTH MEDIA</td>
<td>203</td>
</tr>
<tr>
<td>WATER MICROBIOLOGY KIT (WMK) - IN-FLIGHT WATER PROCESSING</td>
<td>211</td>
</tr>
</tbody>
</table>

24 AUG 00 viii MED OPS
HMS PROCEDURES
BLOOD PRESSURE/ELECTROCARDIOGRAPH - ECG AND BP
SOFTWARE CONFIGURATION ........................................................................ 219
BLOOD PRESSURE/ELECTROCARDIOGRAPH - LEAD BOX
CONNECTIONS ............................................................................................ 223
HEART RATE MONITOR RETURN TO TIME OF DAY DISPLAY ...................... 225
HEART RATE MONITOR - DATA DOWNLOAD TO MEDICAL EQUIPMENT
COMPUTER .................................................................................................. 227
HEART RATE MONITOR - ERASE DATA FILES ........................................... 231
HEART RATE MONITOR - NOMINAL OPERATIONS ..................................... 233
HEART RATE MONITOR - SETTING HEART RATE LIMITS ......................... 237
HEART RATE MONITOR SETTING TIMER .................................................. 239
HEART RATE MONITOR - SOFTWARE PREPARATION .............................. 241
PERIODIC FITNESS EVALUATION - NOMINAL OPS .................................. 243
TONOPEN - CALIBRATION ........................................................................... 257

MALFUNCTION PROCEDURES .................................................................... 259

CMS PROCEDURES
MEDICAL EQUIPMENT COMPUTER - REBOOT USING GHOST IMAGE
CD ROM ........................................................................................................ 261
TREADMILL WITH VIBRATION ISOLATION AND STABILIZATION -
MALFUNCTION - BELT LOCKED ................................................................. 265
TREADMILL WITH VIBRATION ISOLATION AND STABILIZATION -
MALFUNCTION - NO RESPONSE FROM SLDS .......................................... 267
TREADMILL WITH VIBRATION ISOLATION AND STABILIZATION -
MALFUNCTION - BELT SPEED IS SLOWER THAN COMMANDED SPEED .... 269
TREADMILL WITH VIBRATION ISOLATION AND STABILIZATION -
MALFUNCTION - BLUE RUBBER MATERIAL ON SUBJECT POSITIONING
DEVICE DEFORMED OR CRACKING ......................................................... 271
TREADMILL WITH VIBRATION ISOLATION AND STABILIZATION -
MALFUNCTION - BELT SLIPPING ............................................................... 273
TREADMILL WITH VIBRATION ISOLATION AND STABILIZATION -
MALFUNCTION - 'SYS PWR' LED NOT CHANGING COLOR OR CONTROL
PANEL LCDS NOT ILLUMINATING ................................................................. 275
TREADMILL WITH VIBRATION ISOLATION AND STABILIZATION -
MALFUNCTION - GYRO SPEED NOT INCREASING .................................... 277
TREADMILL WITH VIBRATION ISOLATION AND STABILIZATION -
MALFUNCTION - 'GYROSCOPE UNDERSPEED' ........................................... 279
TREADMILL WITH VIBRATION ISOLATION AND STABILIZATION -
MALFUNCTION - PCMCIA CARD LOCKS SYSTEM ...................................... 281
TREADMILL WITH VIBRATION ISOLATION AND STABILIZATION -
MALFUNCTION - S1, S2, S3, S4 NOT DISPLAYED PRIOR TO GYRO
READY ........................................................................................................ 283
TREADMILL WITH VIBRATION ISOLATION AND STABILIZATION -
MALFUNCTION - SLD LOAD UNEVEN: POST LOADING ............................ 285
TREADMILL WITH VIBRATION ISOLATION AND STABILIZATION -
MALFUNCTION - STBL FAULTS S1, S2, S3, S4 ......................................... 287
TREADMILL WITH VIBRATION ISOLATION AND STABILIZATION -
MALFUNCTION - SUBJECT POSTIONING DEVICE BINDING ................... 291
TREADMILL WITH VIBRATION ISOLATION AND STABILIZATION - MALFUNCTION - SYSTEM OSCILLATING AFTER 'GYRO READY' MESSAGE .......................................................... 293
TREADMILL WITH VIBRATION ISOLATION AND STABILIZATION - MALFUNCTION - UNUSUAL BELT NOISES .......................................................... 295

EHS PROCEDURES
CARBON DIOXIDE MONITORING - BATTERY CHANGEOUT .................. 297
CARBON DIOXIDE MONITORING - FILTER ASSEMBLY CHANGEOUT .... 299
TOTAL ORGANIC CARBON ANALYZER (TOCA) ERROR AND DIAGNOSTICS ........................................................................................................ 301
TOTAL ORGANIC CARBON ANALYZER (TOCA) DATA DOWNLOAD .... 307
TOTAL ORGANIC CARBON ANALYZER (TOCA) - FUSE REPLACEMENT - MALFUNCTION ........................................................................................................ 309
WATER MICROBIOLOGY KIT (WMK) OFF-NOMINAL IN-FLIGHT WATER PROCESSING .......................................................... 311
WATER MICROBIOLOGY KIT MALFUNCTION .................................................. 315

HMS PROCEDURES
AUTOMATIC BLOOD PRESSURE CUFF - BATTERY REPLACEMENT ..... 317
BLOOD PRESSURE/ELECTROCARDIOGRAPH - ERROR MESSAGES ...... 319
BLOOD PRESSURE/ELECTROCARDIOGRAPH (BP/ECG) - FUSE CHANGEOUT ........................................................................................................ 323
BLOOD PRESSURE/ELECTROCARDIOGRAPH - MICROPHONE CHANGEOUT ........................................................................................................ 325
BLOOD PRESSURE/ELECTROCARDIOGRAPH - PAPER CHANGEOUT ..... 327
IV PUMP - BATTERY CHANGEOUT .............................................................. 329
LARYNGOSCOPE - BATTERY CHANGEOUT ............................................... 331
OPHTHALMOSCOPE - BULB CHANGEOUT ............................................... 333
OTOSCOPE - BATTERY CHANGEOUT ....................................................... 335
OTOSCOPE - BULB CHANGEOUT ............................................................ 337
PENLIGHT - BATTERY CHANGEOUT ......................................................... 339
PORTABLE CLINICAL BLOOD ANALYZER - BATTERY CHANGEOUT .... 341
PULSE OXIMETER - BATTERY CHANGEOUT ........................................... 343
SPACE STATION EYEWASH - MALFUNCTION ........................................ 345
TONEP - BATTERY CHANGEOUT ............................................................. 347

CORRECTIVE PROCEDURES ....................................................................... 349
EHS PROCEDURES
CARBON DIOXIDE MONITOR - ALARM DISABLE/ENABLE ............... 351
HIGH RATE DOSIMETER - CONTINGENCY .............................................. 353

REFERENCE PROCEDURES ..................................................................... 355
TISSUE EQUIVALENT PROPORTIONAL COUNTER - STARTUP DISPLAY ..... 357
ACTIVATION AND CHECKOUT PROCEDURES
UNSTOW:

FGB1 MEC Kit
_424 MEC

PCS Power Supply
PCS/DC Power 20V Cable Assy
UOP 1553 Data/28VDC Power Cable Assy

Temporarily stow MEC Kit.

1. **REMOVING MEC BATTERY**

   **NOTE**
   When the MEC will be station-powered, the battery should be removed prior to powering on the MEC to avoid draining the battery. Refer to MEDICAL EQUIPMENT COMPUTER - BATTERY INSTALL/CHARGE (SODF: MED OPS: NOMINAL: CMS) to reinstall battery.

   Tilt the MEC screen back as far as possible.
   Lift the MEC keyboard by sliding the side latches forward.
   Slide out the CD ROM module (on far left), pulling the blue tabs upward and temporarily stow to secure (Velcro to MEC Kit).
   Remove the MEC Battery Pack and stow in the MEC Kit and close the lid to the MEC Kit.
   Replace the CD ROM module by sliding back into place and pushing down at arrows.
   Lower MEC keyboard and snap into place.

2. **CONNECTING POWER CABLES**

   √CHeCS POWER/DATA OUTLET power – Off

   Connect PCS Power Supply (J2 output) to the MEC (J1) using the PCS/DC Power 20V Cable Assy.

   Connect PCS Power Supply (J1 28VDC input) to the CHeCS PWR/Data Outlet using the UOP 1553 Data/28VDC Power Cable Assy.

   **NOTE**
   There are no 1553 data capabilities during Expedition 1, so the 1553 cable extensions from the UOP 1553 Data/28VDC Power Cable Assy should remain coiled and secured with the attached Velcro straps.
3. **MEC ACTIVATION**

CHeCS PWR/DATA OUTLET power → On

√PCS PWR SUPPLY sw1 – On (green light on)

**NOTE**
Let MEC cycle through the initialization screens without any keystroke inputs. System boot takes 3 -- 4 minutes.

Activate power switch on MEC.
Record any error messages during initialization.

At the warning message window, ‘Please install battery pack to ensure proper systems operation,’ ignore this message and click ‘OK’.

******************************************************************************
If MEC fails to start up, contact **MCC** at earliest convenience.
******************************************************************************
4. **INSERTING GHOST IMAGE CD ROM FOR MEC REBOOT**

Unstow:
- Ambulatory Medical Pack (AMP)
- MEC CD Pouch from the AMP and restow the AMP.

**NOTE**
This step must be completed before the MEC is deactivated to prepare for the step 4 to follow. No action is required of the CD at this time.

Retrieve the Ghost Image CD ROM from the MEC CD Pouch and insert into the CD ROM drive on the MEC.
Stow the MEC CD Pouch in the MEC Kit.

**NOTE**
When the reboot is complete, it will overwrite any data previously stored on the hard drive.

5. **MEC DEACTIVATION**

At the taskbar on bottom of display, left-click the ‘Start’ button.

Select ‘Shut Down’.

On the ‘Shut Down Windows’ window, click on ‘Shut Down the Computer?’ then click the Yes button.

********************************************************
If during shutdown a ‘DLL error’ occurs, close the error window and repeat step 5.
********************************************************

6. **MEC PREREBOOT**

Unstow the External Floppy Drive from the MEC Kit.
Connect the External Floppy Drive to the MEC floppy disk port labeled ‘FDD’ on the back of the MEC.
Unstow the Bootable Floppy Disk from the MEC Software Kit attached to the top of the MEC.
Insert the Bootable Floppy Disk into the External Floppy Drive.

7. **MEC REBOOT**

Activate the MEC power switch.

At the opening screen, select ‘OK’.

From the ‘Symantec’ menu box, select ‘Local’, then ‘Disk’, then ‘From Image’.

From the window ‘Filename to Load Image From’, click on the option list box and select ‘CD ROM Drive’.

Select the filename with the ‘.GHO’ extension.
From the window ‘Select the local destination drive by clicking on the drive #’, click on the field under ‘Drive’.

At the ‘Question?’ window, ‘Proceed with disk load?’, click ‘Yes’.

**NOTE**
At this point, the Ghost Image will be loading.

****************************************************
If the MEC locks up, repeat step 7.
****************************************************

At the ‘Clone Complete’ window, click ‘Continue’.

At the ‘Symantec’ menu box, click ‘Quit’.

At the ‘Quit Ghost’ window, click ‘Yes’.

8. **MEC POST REBOOT**
Eject the Ghost Image CD ROM and the Bootable Floppy Disk and stow in the MEC Software Kit.

Disconnect the MEC External Floppy Drive and stow in the MEC Kit.

Reboot the MEC by simultaneously pushing the three keys on the MEC keyboard, ‘CTRL - ALT - DEL’ to verify complete loading of the Ghost Image.

9. **SETTING CLOCK TO GMT**
Double left-click on the clock in the right corner of the task bar to open the ‘Date/Time Properties’ window.

If the date and time are correct on the ‘Date & Time’ tab and the GMT time on the ‘Time Zone’ tab is ‘Monrovia, Casablanca’, select the ‘OK’ button to exit ‘Date/Time Properties’ and go to step 11.

If the date, time, or time zone are not correct on the ‘Date & Time’ tab, make corrections using the pulldown boxes or click on correct settings.

On the ‘Time Zone’ tab, click on the pulldown menu box and scroll down the list and select ‘Monrovia, Casablanca’.

Select the ‘Apply’ button, then the ‘OK’ button to exit the ‘Date/Time Properties’ window.
10. **TESTING MEC SOFTWARE CHECKOUT**

Double left-click the CHecS Application icon on the desktop.

Double left-click the ‘CSA-CP’ icon.

**NOTE**
Program should start up with a blank data entry screen.

Note any error messages.

Close the CSA-CP application.

At the prompt, ‘Do you want to quit?’, select ‘QUIT’.

Close the CHecS application window.

**NOTE**
At this point, the Ghost Image Reboot is complete and the MEC is ready for nominal operations. If the MEC is not needed at this time (the Expedition 1 crew is not present yet), the MEC is to be stowed.

11. **MEC DEACTIVATION**

At the taskbar on bottom of display, left-click the ‘Start’ button.

Select ‘Shut Down’

Confirm ‘Shut Down’ and click ‘Yes’.

**************************************************
If during shutdown a ‘DLL error’ occurs, close the error window and repeat step 11.
**************************************************

PCS PWR SUPPLY sw1 → Off

CHecS Power/Data Outlet power → Off

Disconnect and stow the following in the MEC Kit:

- PCS/DC Power 20V Cable Assy
- UOP 1553 Data/28VDC Power Cable Assy
- PCS Power Supply
- MEC

FGB1_424  Stow the MEC Kit.
1. Retrieve CSA-CP Stowage Kit.

2. Transfer CSA-CP Stowage Kit to stowage location.

3. Unstow CSA-CP (one) from CSA-CP Stowage Kit.

4. **ACTIVATING CSA-CP**
   4.1 MODE pb → Press, hold until ‘RELEASE’ displayed
   4.2 √ Display indicates readings for OXYGEN, HCN, HCL, and CO

5. **ACTIVATING CSA-CP DATA LOGGER**
   
   **NOTE**
   After activating/deactivating the logger, the nominal display (gas concentrations) will return in approximately 10 seconds.

   5.1 MODE pb → Press nine times until ‘LOG OFF’ displayed
   5.2 Press “+” button to activate logger.
      √ ‘LOG ON’ displayed
   5.3 Transfer CSA-CP to designated sampling location.

6. **DEACTIVATING DATA LOGGER**
   After ~24 hours
   6.1 MODE pb → Press nine times until ‘LOG ON’ displayed
   6.2 Press “+” button to deactivate logger.
      √ ‘LOG OFF’ displayed

7. **DEACTIVATING CSA-CP**
   7.1 MODE pb → Press, hold until ‘RELEASE’ displayed
   7.2 √ CSA-CP unit – Off
   7.3 Transfer CSA-CP to CSA-CP Stowage Kit location.

8. **DOWNLOADING DATA TO MEC**
   8.1 Unstow CSA-CP Data Cable from CSA-CP Stowage Kit.
   8.2 Take CSA-CP Data Cable to current location of MEC.
   8.3 Remove RS-232 port cap on CSA-CP.
      Temporarily stow on CSA-CP.
8.4 CSA-CP Data Cable 9-pin connector → MEC serial port (9-pin male connector)

8.5 CSA-CP Data Cable 3-pin connector → CSA-CP RS-232 port by aligning the red dots

MEC 8.6 On the MEC screen, double-click the ‘CHeCS Applications’ icon.

8.7 Double-click the ‘CSA-CP’ icon.

8.8 Click or select File in the upper left corner.

8.9 Click or select ‘Connect’.

8.10 Verify CSA-CP – Off

8.11 Click ‘OK’ or press the ENTER key.

CSA-CP 8.12 MODE sw → Press, hold until CSA-CP displays ‘RELEASE’

8.13 √ ‘CONNECT’ displayed on CSA-CP

MEC 8.14 On the MEC, click ‘Download Data’.

**NOTE**
1. MEC will automatically download data and assign a file name associated with the current date.

2. Downloading a file can take several seconds or several minutes (maximum of 30 minutes) depending on how much data are on the Data Logger.

3. When the download is complete, a ‘Comments Entry’ display will appear.

8.15 If desired, enter notes on the ‘Comments Entry’ screen.

   If not desired, click ‘OK’.

8.16 Verify Data Download complete.

   Click ‘OK’.

8.17 Select ‘Clear Data’, click ‘Yes’.

8.18 Select ‘Exit’.

CSA-CP 8.19 MODE → Press until the display reads ‘RELEASE’
MEC 8.20 Exit the CSA-CP software by clicking on ‘File’, ‘Exit’, then ‘Yes’.

CSA-CP 8.21 CSA-CP Data Cable ←|→ CSA-CP, MEC

8.22 Replace RS-232 port cap.


8.24 Stow CSA-CP Stowage Kit.

9. Follow MEC procedure to downlink CSA-CP Data Logger file to ground.
NOTE
1. Due to the nature of this instrument, if there is an operational problem, the best thing to do is to try to start over at the beginning of the section. If that does not work, the SLM should be turned off and back on, to allow it to reset itself.

2. Note the difference between the instrument buttons (found on the green face), and the side buttons (found on the right side of the display screen). Be sure that the correct button is located before proceeding with the step.

SLM POWERUP
1. Unstow:
   SLM from Acoustic Countermeasures Hardware

2. Attach foam wind screen to the microphone end if it is not there already.

3. Press \( \text{I} \), wait for load screen to disappear.

4. If screen indicates a remote connection, use the side arrows to change it to local. This will only happen if the SLM was connected to the MEC the last time it was used.

5. Press \( \text{+} \), to check battery level.

*******************************************************************************
If the 'Battery Level' is less than 1 volt above SLM 'Power-off Level', change the batteries:
   Unstow spare battery located within the Acoustic Countermeasures Hardware.
   Press \( \text{I} \) twice to turn SLM off.
   Remove battery cover.
   Remove and replace battery.
   Replace cover.
   Mark used battery with “X” using pen.
   Stow used battery in Acoustic Countermeasures Hardware.
   Press \( \text{I} \) to turn the power on.
*******************************************************************************

6. Push ‘ok’ if batteries were not changed.

7. Push \( \text{A} \), to calibrate the SLM.

   7.1 Press ‘Calib. Menu’ (side button).

   7.2 Press ‘Charge Inject. Cal.’ (side button).

   7.3 Press ‘CIC-Check’ (side button).
7.4 ‘Deviation from Reference’ number in CIC Check section
If this number is greater than ± 1.0 dB, do not proceed and call ground.
If there is a message about the deviation being fairly large, ignore and proceed.

**SLM SETUP**

8. Set up the SLM by pressing [8].

8.1 Press the ‘Display Menu’ button on the side.

8.2 Press the ‘Spectrum’ button on the side.

8.3 Push ‘▼’ (on instrument panel) three times, then select ‘Meas. Par ▼’.

8.4 Press ‘Meas. Par ▼’ (side button) until ‘L_{eq}’ shows on the screen.

9. Set the Range of the Instrument by pressing [9].

9.1 Press ‘▼’ or ‘▲’ (side buttons) until values of ‘~30 - ~110’ are displayed.

9.2 Press ‘ok’ (side button).

10. Continue with the setup by pressing [10].

11. Press ‘Set-up Menu’ (side button).


13. Use ‘▼’ (on instrument panel) to highlight (three) parameters under ‘Freq. Weight’.

14. If necessary, press ‘▼’ (side button) until the highlighted area displays.

A & L
   L
   L

15. Press ‘Save’ (side button).

16. Press ‘Set-up Menu’ (side button).

17. Press ‘Measurement Control’ (side button).

18. If mode is ‘MANUAL’, press ‘▲’ (side button) to change to ‘AUTOMATIC’.

19. Press ‘▼’ (on instrument panel) to select preset time.
20. If time not set to 15 seconds
   20.1 Use ‘▲’ (side button) to set the time to 15 seconds.
   20.2 Press ‘Save’.

21. Press ‘Set-up Menu’ (side button).

22. Press ‘Measurement Path’ (side button).

23. Press ‘Create Dir.’ (side button).

24. Press ‘▼’ (on instrument panel) until ‘Internal Disk\Data\Meas1’ is displayed.

   **NOTE**
   If file name is entered incorrectly, go back to step 24.

25. Use the instrument panel arrows and the ‘Insert Char.’ (side button) to enter a file name. File name should be as follows: ‘SLM_mmddyy’.

26. Press ‘ok’ (side button).

27. Scroll down by pressing ‘▼’ (on instrument panel) until your directory is found. Press ‘▲’ (on instrument panel) until ‘No Files Found’ is displayed.

28. Press ‘Save’ (side button).

29. Press ‘Set-up Menu’ (side button). Display screen should show ‘Internal Disk\Data\Meas1\SLM_mmddyy’.

30. Press ‘Input’ (side button).

31. √Serial number on the screen is the same as the serial number on microphone at the very tip of the instrument

32. √‘Pol. Voltage’ is ‘0 V’, and the ‘S.I. Corr.’ is ‘Random’

33. If changes need to be made, use the directional arrows on the instrument panel and the side buttons to select the correct parameters.

34. If changes were made, press ‘Save’ (side button).

35. Press ‘Set-up Menu’ (side button).

36. Press ‘Output’ (side button).

37. √Aux. 1, Aux. 2, and digital are ‘off’

38. If changes were made, press ‘Save’ (side button).
39. Press ‘Set-up Menu’ (side button).

40. Press ‘▼’ (on instrument panel) once.

41. Press ‘Print/Output’ (side button). The display should show ‘Type:’ is ‘Spread Sheet’. Use the ‘▼’ or ‘▲’ (side buttons) to change if necessary.

42. If changes were made, press ‘Save’ (side button).

43. Press ‘Set-up Menu’ (side button).

44. Press ‘PC Comm.’ (side button). Display should read ‘19200’ for baud rate. Use the ‘▼’ or ‘▲’ (side buttons) to change.

45. If changes were made, press ‘Save’ (side button).

46. Press ‘Set-up Menu’ (side button).

**TAKING MEASUREMENTS WITH THE SLM**

47. Press , a spectrum graph should be seen.

<table>
<thead>
<tr>
<th>NOTE</th>
</tr>
</thead>
<tbody>
<tr>
<td>When you are in position, make sure everyone in the module is quiet, and proceed.</td>
</tr>
</tbody>
</table>

48. Place the SLM in the desired location.

49. Press .

<table>
<thead>
<tr>
<th>NOTE</th>
</tr>
</thead>
<tbody>
<tr>
<td>If any random noises occurred during the measurement, start the measurement over by pressing 0 again.</td>
</tr>
</tbody>
</table>

50. A ‘▼’ will appear in the upper-left corner of the display screen to indicate measurements are being taken. When the triangle turns into ‘u’ (after 15 seconds), the measurement is done.

51. After measurement is finished, save the data by pressing the button.

\[ \text{Path is ‘SLM_mmddyy’} \]

Save in the first data file displayed.

<table>
<thead>
<tr>
<th>NOTE</th>
</tr>
</thead>
<tbody>
<tr>
<td>If you forget to push ‘ok’, the measurement will not be stored.</td>
</tr>
</tbody>
</table>
52. Press ‘ok’ (side button) to save it.

53. Repeat steps 49 --- 52 until measurements are obtained from all locations.

54. Power down by pressing \( \square \).

55. Proceed to SOUND LEVEL METER - TRANSFER (SODF: MED OPS: NOMINAL: EHS) or stow SLM in Acoustic Countermeasures Hardware.
CAUTION

Hardware should be mounted for deployment (and Power cable routed) that rapid egress from the module is not impeded.

1. Unstow:
   TOC Supply Kit
   TOC Analyzer
   WS&A

2. Remove Log Book and Washcloth from TOC Supply Kit.
   Temporary stow both near TOCA.

3. Unstow:
   Power cable

4. √ Power switch – Off

5. Power cable → | ← TOC Analyzer connection marked “27.5 VDC”
   Power cable → | ← ISS electrical connector

6. Power switch → On

7. √ Display ORIENTATION screen
   Select orientation (picture on the screen normal or upside down)
   (keys “↑” “↓”).
   Press ENTER

8. √ ‘REMOVE SAMPLE SYRINGE’ display appears
   Open door on sample Syringe Pump access area (door fastener ←).
   √ If Syringe in TOCA
     Remove Syringe from TOCA.
     Grasp Syringe Plunger and pivot out 60° (towards user).
     Grasp knurled fitting and slide in bracket toward user to stop position
     Refer to Figure 1.
     Close shutoff vlv on Syringe by turning vlv perpendicular to flow
direction.
     Disconnect Syringe from Syringe Pump by turning knurled fitting ◐ to
     hard stop
     Refer to Figure 1.
Slide knurled fitting back into recessed area.
Close door on Syringe Pump access area to hard stop.

Attach protective cover to female fitting connection of Syringe.
Temporary stow Syringe on locker.
Press ENTER

If no Syringe in TOCA
Press ENTER

9. Select ‘ANALYZE’ from main menu screen (keys “↑” “↓”).
Press ENTER to access Analysis menu.

10. Choose ‘FROM SYRINGE’ or ‘FROM BAG’ from analysis menu.
Press ENTER

11. If ‘FROM BAG’ is selected, go to step 21.

12. Open sample Syringe Pump access area (door fastener).
Secure door to Velcro strip.

Figure 1.- Sample Syringe-Pump Access Area.
   Record location, date, and time of sample collection from Syringe Label 
   in the Log Book.

14. **CONNECTING SYRINGE TO SYRINGE PUMP**
   Grasp knurled fitting and pull outward in bracket to stop position. 
   Refer to Figure 1.

   Pivot towards user.
   Loosen knurled fitting to hard stop. 
   Insert Syringe fitting into knurled fitting. 
   Refer to Figure 1.

   Tighten knurled fitting to hard stop. 
   Open shutoff vlv on Syringe by turning vlv parallel to flow direction. 
   Press Syringe Plunger for 3 seconds to confirm that Syringe connection 
   is tight and no leaks occur.

   √ No leaks at connection

   If Syringe leaks
   Reinstall Syringe
   √ Connection tight

   Grasp knurled fitting and push back fully into recessed area. 
   Pivot Sample Syringe away from user and lock into Syringe Pump. 
   Close door on sample Syringe access area (door fastener to hard stop).

:00:00 15. Press ENTER to initiate analysis. 
   Wait for 1 minute to check for error messages. 
   If error message occurs, follow directions on display.

   Refer to TOTAL ORGANIC CARBON ANALYZER ERROR AND 
   DIAGNOSTICS (SODF: MED OPS: MALFUNCTION).

:36:00 16. √ Analysis is completed 
   √ Data shows on display
17. Note sample number, time, and date of analysis, and results of total organic carbon (TOC), total inorganic carbon (TIC), total carbon (TC), pH, and conductivity (COND) from display. Record this information in the Log Book.

18. **REMOVING SYRINGE FROM TOCA**

   Open door on sample Syringe Pump access area (door fastener \( \leftarrow \)).
   Grasp Syringe Plunger and pivot out 60° (toward user).
   Grasp knurled fitting and slide in bracket toward user to stop position.
   Refer to Figure 1.

   Close shutoff vlv on Syringe by turning vlv perpendicular to flow direction.
   Disconnect Syringe from Syringe Pump by turning knurled fitting \( \rightarrow \) to hard stop
   Refer to Figure 1.

   Slide knurled fitting back into recessed area.
   Attach protective cover to female fitting connection of Syringe.

19. Place Syringe in small Ziploc Storage Bag and place into Subpack in TOC Supply Kit.

20. Go to step 40.

21. √Starting menu appears

   Open sample Syringe Pump access area (door fastener \( \leftarrow \)).
   Secure door to Velcro strip.

22. Unstow:

   **TOC TOC Water Sample Syringe Supply Kit**

   **CAUTION**
   Make sure syringe plunger is depressed completely before installing in Analyzer.

23. **CONNECTING EMPTY SYRINGE TO SYRINGE PUMP**

   Grasp knurled fitting and pull outward in bracket to stop position
   Refer to Figure 1.

   Pivot towards user.
   Loosen knurled fitting \( \rightarrow \) to hard stop.
   Insert Syringe fitting into knurled fitting
   Refer to Figure 1.
Tighten knurled fitting to hard stop.
Open shutoff vlv on Syringe by turning vlv parallel to flow direction.
Grasp knurled fitting and push back fully into recessed area.
Pivot sample Syringe away from user and lock into Syringe Pump.
Close door on sample Syringe access area (door fastener to hard stop).
Press ENTER

Wait approximately 2 --- 3 minutes while pump resets
Menu will display ‘WORKING’ until ready.

\textbf{NOTE}
Pressing CLEAR backs up to the prior menu.

24. When pump is ready new starting menu appears.

✓ New Starting menu

25. Open sample door by turning door fastener.

26. Clamp Syringe Handle by pushing Clamp Handle up to locking position
Refer to Figure 2.

\begin{figure}
\centering
\includegraphics[width=\textwidth]{syringe Clamp Handle in locked position}
\caption{Syringe Clamp Handle in Locked Position.}
\end{figure}

27. Shut sample door by turning door fastener to hard stop.
WS&A 28. Unstow:
   ISS Water Sample Collection in bag

29. Attach Sample Bag to Luer lock connection on front of TOCA by turning bag connection until bag locks (1/4 turn).
    Press ENTER to initiate analysis.
    Wait 2 --- 3 minutes while pump resets.
    When pump is ready 60 minute clock appears.

:00:00 30. \^Display for 60 minute clock to begin countdown

    Wait 1 minute to check for error messages after 60 minute clock begins to count down.
    If error messages, follow directions on display.
    Refer to TOTAL ORGANIC CARBON ANALYZER (TOCA) ERROR AND DIAGNOSTICS (SODF: MED OPS: MALFUNCTION).
    If no errors, return in 30:00 minutes.

\^Errors

\^Note
Pressing CLEAR backs up to the initial menu.

:30:00 31. \^Analysis is continuing without errors

    If error message occurs, follow directions on display.
    Refer to TOTAL ORGANIC CARBON ANALYZER (TOCA) ERROR AND DIAGNOSTICS (SODF: MED OPS: MALFUNCTION).

:60:00 32. \^Analysis is completed
\^Data shows on display

33. Note sample number, time, and date of analysis, and results of total organic carbon (TOC), total inorganic carbon (TIC), total carbon (TC), pH, and conductivity (COND) from display.
    Record this information in the Log Book.

34. Press CLEAR to get Reset menu.
35. Remove Sample Bag by turning bag connection. Replace protective cover on bag. Place bag in small Ziploc Storage Bag (from WS&A). Temporary stow bag in WS&A.

36. Open sample door by turning door fastener.

37. Release Syringe Handle Clamp by pushing Clamp Handle down Refer to Figure 3.

Shut door on sample Syringe Pump access area by turning door fastener to hard stop. Press ENTER

38. Wait for menu instructions to remove Syringe (2 --- 3 minutes while pump resets).

39. REMOVING SYRINGE FROM TOCA
Open door on sample Syringe Pump access area (door fastener ).
Grasp Syringe Plunger and pivot out 60° (towards user).
Grasp knurled fitting and slide in bracket toward user to stop position Refer to Figure 1.

Close shutoff vlv on Syringe by turning vlv perpendicular to flow direction. Disconnect Syringe from Syringe Pump by turning knurled fitting to hard stop. Refer to Figure 1.

Slide knurled fitting back into recessed area.
Close door on sample Syringe Pump access area by turning door fastener to hard stop.
40. Press ENTER to return to main menu.

41. Repeat steps 9 --- 40 for all remaining analyses.
   If no waste water container replacement notification is displayed on
   TOCA screen, perform step 42.
   If waste container notification appears, perform TOTAL ORGANIC
   CARBON ANALYZER (TOCA) WASTE CONTAINER REPLACEMENT,
   all (SODF: MED OPS: NOMINAL), then:

42. After all samples have been analyzed, close door by turning fastener on
    TOC door \( 
    \) to hard stop.

    TOC Front Panel
    Power switch \( \rightarrow \) Off
    Power cable \( \leftarrow \) ISS electrical connector
    Power cable \( \rightarrow \) front Panel

43. Stow:
    Supply Kit
    Power cable
    Syringe Subpack
    Syringe
    TOC Analyzer
    TOC Supply Kit
    WS&A

44. Report to **MCC**
    Date
    Time of sample collection
    Analysis results for each sample analyzed.
1. Unstow: TBD BP/ECG (SED46115812)


3. Lift up Nomex cover to BP/ECG. Unstow BP/ECG Power Cable (KLSD210056), located in rear left corner of kit. Refer to Figure 1 for cable locations.

4. $\sqrt{\text{CHeCS Power/Data Outlet (Panel 431)}} \rightarrow \text{OFF}$

5. $\sqrt{\text{Power switch (rear of ECG device)}} \rightarrow \text{OFF}$

6. BP/ECG Power Cable $\rightarrow | \leftarrow \text{CHeCS Power/Data Outlet (Panel 431)}$

7. CHeCS Power/Data Outlet $\rightarrow \text{ON}$

8. Power switch (rear of ECG device) $\rightarrow \text{ON}$

9. Flip ECG screen up.

10. Depress green ON key (ECG keyboard).

11. $\sqrt{\text{Display is illuminated}}$
If display is not illuminated
   √ Contrast wheel on right side of ECG device

If still no display
   Perform BLOOD PRESSURE/ELECTROCARDIOGRAM -
   DARK DISPLAY (SODF: MED OPS: MAL).

If no joy
   Notify MCC.

*************************************************************************

12. Unstow:
   BP/ECG Patient Cable-5 Lead Assy (KLSD210084)
   Air Hose/Microphone Assy (KLSD210083)

   Refer to Figure 1 for cable locations.

13. Grasp heads of all five electrodes in one hand to create disturbances on
    display.

    **NOTE**
    1. Cuff will inflate until maximum inflation is reached.
    2. Blood pressure measurement takes approximately
       30 --- 50 seconds to be completed.

14. Depress dark blue ‘NIBP’ and then light blue ‘2’ pb on ECG keyboard to
    initiate BP cuff inflation.
    Verify BP cuff is inflating.

    **************************************************************************
    If cuff is not inflating
       Repeat steps 13 and 14.

    If still not inflating
       Perform BLOOD PRESSURE/ELECTROCARDIOGRAM -
       ECG AND BP SOFTWARE CONFIGURATION (SODF: MED
       OPS: NOMINAL: HMS).
       Repeat steps 13 and 14.

    If no joy
       Notify MCC.
    **************************************************************************

15. Ignore beeping sound annunciated after BP measurement is completed.

16. After inflation, apply pressure to cuff to deflate before stowage.

17. Stow:
   BP/ECG Patient Cable-5 Lead Assy (KLSD210084)
   Air Hose/Microphone Assy (KLSD210083)
18. Depress OFF key (ECG keyboard). 
   Lower ECG screen.

19. Power switch (rear of ECG device) \(\rightarrow\) OFF

20. CHeCS Power/Data Outlet \(\rightarrow\) OFF

21. BP/ECG Power Cable (KLSD210056) \(\leftrightarrow\) CHeCS Power/Data Outlet
   (Panel 431)

22. Stow:
    BP/ECG PWR Cable

23. Close Nomex cover to BP/ECG.

24. Stow:
    BP/ECG
SM

1. Unstow:
   - CCPK (Remove eyewash)
   - Towels

2. Position CCPK near SVO-ZV interface.

3. Verify that silver stopcock handle is in closed position (perpendicular to tubing).

4. Connect large white adapter of eyewash with pressure to SVO-ZV to verify fit.

5. Disconnect eyewash.

6. Replace drinking straw interface if required.

7. Restow eyewash in CCPK.

8. Stow CCPK.

9. Report fit check results to **MCC-H** during next scheduled PMC.
NOMINAL PROCEDURES
1. **MEC DEACTIVATION**

   At the taskbar on bottom of display, click the Start button.

   Click ‘Shut Down’.

   On the ‘Shut Down Windows’ window, click on ‘Shut Down the computer?’ then click the Yes button.

   ******************************************************
   If during shutdown a ‘**DLL error**’ occurs, close the error window and repeat step 1.
   ******************************************************

   PCS POWER SUPPLY sw1 → Off (light off)

   CHeCS POWER/DATA OUTLET power → Off

2. **INSTALLING MEC BATTERY**

   Unstow the MEC Battery Pack from the MEC Kit.

   Tilt the MEC screen back as far as possible.

   Lift the MEC keyboard by sliding the side latches forward.

   Slide out the CD ROM module (on far left), pulling the blue tabs upward and temporarily stow to secure (Velcro to the MEC Kit).

   Install the MEC Battery Pack in the position to the left of the hard drive, press firmly into place.

   Replace CD ROM module by sliding back into place and pushing down at arrows.

   Lower MEC keyboard and snap into place.

3. **CHARGE MEC BATTERY**

<table>
<thead>
<tr>
<th>NOTE</th>
</tr>
</thead>
<tbody>
<tr>
<td>The MEC should not be powered on while the battery is charging. Only the CHeCS POWER/DATA OUTLET and the PCS POWER SUPPLY will be powered on.</td>
</tr>
</tbody>
</table>

   CHeCS POWER/DATA OUTLET power → On

   PCS POWER SUPPLY sw1 → On (green light on)

<table>
<thead>
<tr>
<th>NOTE</th>
</tr>
</thead>
<tbody>
<tr>
<td>The display window is located on the upper left corner of the MEC keyboard.</td>
</tr>
</tbody>
</table>

   Charge MEC Battery, prior to use, for 1 hour or until the display window on the MEC keyboard shows ‘100%’ for the percentage charged.
1. OPENING DATA COPY APPLICATION
   Double left-click on the ‘CHeCS Application’ icon.
   Double left-click on the ‘Data Copy’ icon.

   **WARNING**
   Do not select ‘FILE’ from the DATA COPY menu bar. The crew should not need any functions from this menu unless directed by ground personnel.

2. SELECTING FILES TO BE TRANSFERRED
   
   **NOTE**
   The list of applications with files scheduled to be downlinked during this DATA COPY activity can be found on the OSTP Viewer in the OPS PLAN note, or will be provided by ground personnel.

   In the ‘Select Data Type’ window, left-click the applications containing files to be downlinked.

   **NOTE**
   The DATA COPY program will transfer any new data files from the selected applications to the PC CARD. Then archive these files so they will not be transferred again at the next scheduled DATA COPY activity.

3. TRANSFERRING FILES TO PC CARD
   Unstow PC CARD from the MEC Software Kit located on the top of the MEC (back of display).

   After selecting all data to downlink, insert PC CARD into the PC card port on the right side of the MEC.

   Verify the PC CARD icon 📋 appears on the taskbar at the bottom right corner of the desktop display to confirm the card is recognized.

   Left-click the ‘Copy Data to PC Card’ button.

   While the files are being transferred, a series of message boxes will appear as follows:

   ******************************************
   If a message box ‘No files to Copy’ appears, click ‘OK’.
   ******************************************
At the ‘Begin Data Copy’ box which asks, ‘Verify destination card location is drive E.  Are you ready to copy (program name) data to PC Card?’, click the ‘Copy Data’ button.

At the ‘Complete’ box, click ‘OK’.

**NOTE**
There is no final indication of data transfer completion. Data transfer is complete when the message boxes cease to appear.

Continue to confirm (close) each message box until they cease.

**NOTE**
The MEC can be left as is with the DATA COPY application still running, while the crew completes steps 4 and 5.

Left-click on the PC CARD icon in the taskbar and select ‘Stop (PC CARD name) Card’.

At the Alert box, ‘You may safely remove this device’, click ‘OK’ and eject the PC CARD.

4. **TRANSFERRING FILES TO OCA MACHINE**
Insert PC CARD into the OCA machine.

Verify the PC CARD icon appears on the taskbar.

Double left-click on ‘My Computer’ icon on the OCA machine desktop.

Double left-click on the PC CARD drive to view contents.

Go to the ‘EDIT’ menu of the PC CARD window and click ‘Select All’ from the pull-down menu.

Go back to the ‘EDIT’ menu and click ‘Copy’.

Close the ‘My Computer’ application.

Double left-click the ‘Network Neighborhood’ icon on the OCA machine desktop.

Open each of the following by double left-clicking:
- ‘Entire Network’
- ‘SSC’
- ‘Oca1’
- ‘C:’
- ‘OCA-down’ folder
- ‘CHeCS’ folder
Right-click inside the CHeCS folder window and select ‘Paste’ from the popup menu.

If all files transferred successfully to the CHeCS folder
Close all windows opened for this activity and go to step 5.

If all files did not transfer successfully
Repeat step 4.

************************************************************************
If all files will not transfer to the CHeCS folder after one retry,
contact MCC-H for further instructions.
************************************************************************

5. EJECTING PC CARD FROM OCA MACHINE
Left-click on the PC CARD icon in the taskbar and select ‘Stop (PC CARD name) Card’.

At the Alert box, ‘You may safely remove this device’, click ‘OK’ and eject the PC CARD.

NOTE
At this point, the crewmember is through using the OCA machine, and will continue with the MEC.

Insert the PC CARD into the MEC and verify the PC CARD icon appears in the taskbar.

Before proceeding to step 6, wait for “GO” from ground personnel to confirm successful receipt of the files.

6. MERGING MICROBIOLOGY FILES

NOTE
This next step will help to avoid archiving new data, which the DATA COPY program will try to archive.

Minimize the DATA COPY application and double left-click the ‘Microbiology’ application from the ‘CheCS’ application window to open.

Click on ‘Merge New Data’ button, then click on ‘Yes’ in the ‘Merge New Data’ box, then click ‘OK’ in the ‘Microbiology’ box.

Click on ‘Exit’ to close Microbiology application, then click ‘OK’ to confirm closing the application.
7. **ERASING AND EJECTING PC CARD**

   Restore the DATA COPY application and go to ‘EDIT’ in the menu bar and select ‘ERASE CONTENTS OF PC CARD’ from the pulldown menu.

   At ‘Erase PC CARD’ warning box, click ‘OK’.

   Click on the ‘Exit’ button on the DATA COPY window to close.

   Left-click on the PC CARD icon on the taskbar and select ‘Stop (PC CARD name) Card’.

   At the Alert box, ‘You may safely remove this device’, click ‘OK’ and eject the PC CARD.

   Stow the PC CARD in the MEC Software Kit.
1. **DEACTIVATION**
   At the taskbar on bottom of display, click the ‘Start’ button.

   Click ‘Shut Down’.

   On the ‘Shut Down Windows’ window, click on ‘Shut Down the computer?’ then click the ‘Yes’ button.

   *******************************************************
   If during shutdown a ‘**DLL error**’ occurs, close the error window and repeat step 1.
   *******************************************************

   PCS POWER SUPPLY sw1 → Off (light off)

   ChECS POWER/DATA OUTLET power → Off

   If the MEC is to be stowed, proceed to step 2.

2. **DISCONNECTING CABLES AND STOWING HARDWARE**
   Disconnect and stow the following in the MEC Kit:
   - PCS/DC Power 20V Cable Assy
   - UOP 1553 Data/28VDC Power Cable Assy
   - PCS Power Supply
   - MEC

   FGB1_424 Stow the MEC Kit.
1. Unstow:

- FGB1_226  TVIS PCMCIA card from the TVIS Exercise Operations Kit (three)
- FGB TBD   CEVIS PCMCIA card from the TBD
- NOD1S3   iRED Exercise Log Book from iRED Accessory Kit

**NOTE**
It is most efficient for the crewmember performing this procedure to enter all three exercise sessions for one crewmember before moving to the next crewmember ID.

2. **DOWNLOADING TVIS**

Insert the TVIS PCMCIA card into the PCMCIA card port located on the right side of the MEC.

Double left-click the ‘CHeCS Application’ icon on the desktop.

Double left-click the ‘Exercise’ icon.

Select the appropriate crewmember ID from the pulldown menu in the first field.

**NOTE**

1. The crewmember logging into Exercise application should match the crewmember ID on the PCMCIA card. If not, the crewmember will be denied access into this application.

2. At this point, if the PCMCIA card was not inserted, a prompt will alert the crewmember that the card was not installed and to install it at this time. There is a ‘HELP’ button available with a graphic picture of the location of the PCMCIA card port on the MEC.

Select TVIS pulldown menu from the following selection:

- TVIS
- CEVIS
- iRED
- Exit

From the pulldown menu, select ‘Download data from TVIS card’.
NOTE
This selection will move the data files from the PCMCIA card to the TVIS folder in ‘C:\CHeCS\exer\tvis’ on the MEC.

At prompt window ‘Do you want to delete files from the card?’ click ‘Yes’.

3. EJECTING TVIS PCMCIA CARD AND STOWING
At the taskbar at the bottom of the display, left-click the PC CARD icon 📡.

NOTE
Since there may be two PC CARDS inserted, verify the correct card selected to stop.

Select ‘Stop (PC CARD ID here) card’.

NOTE
This function could take up to 2 minutes before the PCMCIA CARD can be ejected.

At the ‘ALERT’ window saying ‘YOU MAY SAFELY REMOVE THIS DEVICE’, click ‘OK’, then eject the PCMCIA CARD by pushing the eject button next to the PCMCIA CARD Port.

If the user is through with the PCMCIA CARD, stow in the Exercise Kit designated for that card.

4. DOWNLOADING CEVIS
Select CEVIS pulldown menu from the following selection:

TVIS
CEVIS
iRED
Exit

From the pulldown menu, select ‘Download data from CEVIS card’.
This selection will move the data files from the PCMCIA card to the CEVIS folder in ‘C:\CHeCS\exer\cevis’ on the MEC.

At prompt window ‘Do you want to delete files from the card?’ click ‘Yes’.

5. **EJECTING CEVIS PCMCIA CARD AND STOWING**

   At the taskbar at the bottom of the display, left-click the PC CARD icon.

   **NOTE**
   
   Since there may be two PC CARDS inserted, verify the correct card selected to stop.

   Select ‘Stop (PC CARD ID HERE) card’.

   **NOTE**
   
   This function could take up to 2 minutes before the PCMCIA CARD can be ejected.

   At the ‘Alert’ window saying ‘You may safely remove this device’, click ‘OK’, then eject the PCMCIA CARD by pushing the eject button next to the PCMCIA CARD Port.

   If the user is through with the PCMCIA CARD, stow in the Exercise Kit designated for that card.

6. **iRED DATA ENTRY**

   Select iRED from the following selection.

   Click anywhere on the button except directly on the word ‘iRED’.

   - TVIS
   - CEVIS
   - iRED
   - Exit
From ‘Select iRED data file to load’ window, select the current week’s protocol (e.g., R1-1_12.dat would be Shep’s file for week 12 of iRED exercise).

Using the iRED Exercise Log Book data sheets, enter data from ‘actual’ row of each exercise.

**NOTE**
Each day of the week can be accessed by selecting the appropriately labeled tab on the iRED data entry screen.

Click ‘Save’.

Click ‘Close’.

7. Repeat steps 2 --- 6 for the remaining crewmembers.

8. **CLOSING EXERCISE APPLICATION AND STOWING**

   Click ‘Exit’ from the following menu:

   - TVIS
   - CEVIS
   - iRED
   - Exit

   **Stow:**
   - **FGB1_226**
     - TBD: Treadmill Exercise Operations Kits
     - NOD1S3: CEVIS TBD
     - iRED Exercise Log Book in iRED Accessory Kit
1. VERIFYING MEC CONNECTION TO OPS LAN/LOGON

**NOTE**
The RF LAN connection has been made if the ‘RF LAN’ icon, appears on the bottom right corner of the MEC display.

If the MEC is connected to the OPS LAN via the RF LAN card Proceed to step 2.

If no OPS LAN connection is made
Unstow the RF LAN card/cable from the MEC Software Kit which is attached to the top of the MEC (back of display).

Insert the RF LAN card into the MEC PCMCIA card port, located on the right side of the MEC.

*************************************************************************
If no RF LAN connection is made (no ‘RF LAN’ icon appears)
Eject and reinsert the RF LAN card into the MEC PCMCIA card port.

If no RF LAN connection can be made
Contact MCC for instructions.
*************************************************************************

2. SELECTING/COPYING FILES FOR DOWNLINK
Perform steps 1 and 2 of the MEDICAL EQUIPMENT COMPUTER - DATA COPY/PC CARD TRANSFER (SODF: MED OPS: NOMINAL: CMS), then proceed with this procedure.

After selecting all data to downlink, click the ‘Copy Data to MEC Download Directory’ button.

Close the ‘Data Copy’ window.
NOTE
Some applications and the respective data files may not be included in the DATA COPY program, and will not be copied to the CHeCS downlink folder. The following steps will ensure all desired data files are copied to the downlink folder.

If there are files to be copied to the CHeCS data download directory
Double left-click the ‘My Computer’ icon on the desktop and go to the specified drive/folder to select files for downlink.

Click on the file(s) to be copied on the drive/folder window.

If there are more files in the same location (drive/folder)
While holding down the ‘CTRL’ key, click on all files to be copied, then release the ‘CTRL’ key.

Go to the ‘Edit’ menu and select ‘Copy’.

Close the drive/folder window and double left-click the ‘C:’ drive from the ‘My Computer’ application to open.

Double left-click the ‘datadump’ folder to open.

Right-click inside the ‘datadump’ window and click ‘Paste’ from the popup menu. All copied files should then appear along with the files copied from the DATA COPY application.

Close the ‘My Computer’ and ‘C:\datadump’ windows.

NOTE
At this point, if OCA is able to retrieve files from the MEC ‘C:\datadump’ path, crew participation is complete.

If OCA cannot retrieve files from the ‘C:\datadump’ path, proceed to step 3.

3. TRANSFERRING FILES TO CHeCS FOLDER
If not still open, reopen ‘My Computer→ C: → datadump’

Click on the first file in the folder. Go to ‘Edit’ in the menu bar and click on ‘Select All’ to highlight all files for copy. Then from the ‘Edit’ menu, click ‘Copy’.

Close the ‘datadump’ window.

Double left-click the ‘Network Neighborhood’ icon on the desktop to open.
Open each of the following by double left-clicking:
- ‘Entire Network’
- ‘SSC’
- ‘Oca1’
- ‘C:’
- ‘OCA-down’ folder
- ‘CHeCS’ folder

Right-click in the ‘CHeCS’ window (folder) and click ‘Paste’ from the popup menu.

Close all windows to clear the desktop.

**NOTE**
At this point, OCA ground personnel can retrieve files from the CHeCS folder on the OCA machine onboard the ISS and the required crew participation for this activity is complete.
This Page Intentionally Blank
1. Unstow:

FGB1_424 MEC KIT
MEC Power Supply
PCS/DC Power 20V Cable Assy
UOP 1553 Data/28VDC Power Cable Assy

Temporarily stow MEC Kit.

2. REMOVING MEC BATTERY

NOTE
When the MEC will be station-powered, the battery should be removed prior to powering on the MEC to avoid draining the battery. See MEDICAL EQUIPMENT COMPUTER - BATTERY INSTALL/CHARGE (SODF: MED OPS: NOMINAL: CMS) to re-install battery.

Tilt the MEC display back as far as possible.

Lift the MEC keyboard by sliding the side latches forward.

Slide out the CD ROM module (on far left), pulling the blue tabs upward. Temporarily stow to secure (Velcro to MEC Kit).

Remove the MEC Battery Pack.
Stow in the MEC Kit.
Close the lid to the MEC Kit.

Replace the CD ROM module by sliding back into place and pushing down at arrows.

Lower MEC keyboard and snap into place.

3. CONNECTING POWER CABLES

\[ \sqrt{\text{CheCS PWR/DATA OUTLET power → Off}} \]

Connect PCS Power Supply (J2 output) to the MEC (J1) using the PCS/DC Power 20V Cable Assy.

Refer Figure 1.

Connect PCS Power Supply (J1 28VDC input) to the CheCS Power/Data Outlet using the UOP 1553 Data/28VDC Power Cable Assy.

NOTE
There are no 1553 data capabilities during Expedition 1, so the 1553 cable extensions from the UOP 1553 Data/28VDC Power Cable Assy should remain coiled and secured with the attached Velcro straps.
Figure 1.- Top Side View of the MEC Taken from the ISSSH.

4. **MEC ACTIVATION**

   CHeCS Power/Data Outlet power → On

   √ PCS Power Supply sw1 → On (green light on)

   **NOTE**

   Let MEC cycle through the initialization screens without any keystroke inputs. System boot takes 3 --- 4 minutes.

   Activate power switch on MEC.

   Record any error messages during initialization.

   At the warning message window, ‘Please install battery pack to ensure proper systems operation.’

   Ignore this message and click ‘OK’.

   ---------------------------------------------------------------------------

   If MEC fails to start up, contact **MCC** at earliest convenience.

   ---------------------------------------------------------------------------

   If the ‘C:’ directory window is open at startup, close the ‘C:’ directory window.

   **FGB1_424** Stow the MEC Kit.
1. **STRETCHING PROTOCOL**

| NOTE | Stretching protocol is recommended prior to all exercise to reduce soreness or chance of muscle injury. |

TBD Unstow Towel.

Perform muscle stretch
- Stretch to point of mild discomfort, not pain
- Hold stretch for 30 seconds
- Do not bounce.

2. **EXERCISE PREPARATION 1**

TVIS Ex. Unstow:
- OPS Kit Heart Rate Monitor (HRM) Transmitter
- HRM Chest Strap

Adjust HRM Chest Strap with slide buckle to fit below nipple line.
Attach HRM Transmitter to HRM Chest Strap.
Don HRM Transmitter/belt strap just below nipple line.

3. **EXERCISE INITIAL SETUP 1**

| NOTE | Position TVIS Control Panel to desired location and route TVIS Control Panel cable, as required. |

SM √cb Service Module TBD (two) – Cl

TVIS SYS PWR pb → Press

√SYS PWR LED – yellow
√LCDs on TVIS Control Panel – ON
TREADMILL VIBRATION ISOLATION SYSTEM (TVIS) NOMINAL OPERATIONS
(MED OPS/2R - ALL/FIN) Page 2 of 6 pages

If SYS PWR LED not yellow or LCDs not ON
Press SYS PWR pb

√LED – red

TBD cb SM MN Pwr (two) – Op

TM √Electronics Box cbs (five) – Cl
TBD √Control Panel cable connection

Control Panel cb SM MN Pwr (two) – Cl
Press SYS PWR pb

√LED – yellow, LCDs ON

If no joy, √MCC.

√LEDs (four) under top right cover on TVIS Control Panel are in nominal startup configuration
STBL VIS – red
GYRO VIS – red
MOTOR TRD – green
POWER TRD LED – green

If LEDs (four) are not in correct configuration
Press respective pb until correct configuration is obtained.

√LEDs (four) are in correct configuration

√’Insert CCM’ message appears on MAIN MENU/MESSAGE screen

If no screen
SYS PWR pb → Press twice (LED – red/yellow)
√’Insert CCM’ message appears on MAIN MENU/MESSAGE screen

If no joy, notify MCC.

******************************************************

NOTE
1. Press GYRO VIS and STBL VIS pb within 1 second of each other.

2. Gyro will take approximately 5 --- 10 minutes to spinup.
4. **CREDIT CARD MEMORY (CCM) CARD INSTALL**

**TEOK**
Unstow CCM Card.

**Cntl Pnl**
Lift top left cover of TVIS Control Panel.
Insert CCM Card into slot.

√'Reading CCM' and 'Complete' messages appear
√Correct Subject name appears on screen

*******************************************
If Subject name not correct, replace
  CCM Card with correct card.
*******************************************

sel Protocol or Manual mode

<table>
<thead>
<tr>
<th>NOTE</th>
</tr>
</thead>
<tbody>
<tr>
<td>'STABILIZER FAULTS' and 'GYRO MODE = UNDERSPEED' messages appear after gyro speed &gt; 300 rpm.</td>
</tr>
</tbody>
</table>

Verify the following messages appear on screen in VIS STATUS menu.

‘STABILIZER FAULTS = S1S2S3S4’
‘GYRO FAULT = ???????’
‘GYRO MODE = UNDERSPEED’
‘GYRO SPEED =’ (is increasing)

5. **EXERCISE PREPARATION 2**

**TEOK**
Unstow:
  Treadmill Harness with magnet
  Series Bungee System (two)

Don Treadmill Harness.
Connect Fastex buckles per color codes.
Adjust to comfort (approximately 70 % hip load, 30 % shoulder load).

6. **EXERCISE PREPARATION 3**

√Following messages appear on screen in VIS STATUS menu

‘STABILIZER FAULTS = NONE’
‘GYRO FAULTS = NONE’
‘GYRO MODE = READY’
‘GYRO SPEED =’ (greater than 2000 rpm)

**ENT pb → Press**

Stand on Treadmill side running boards.
Do not stand on treadmill belt.
TREADMILL VIBRATION ISOLATION SYSTEM (TVIS) NOMINAL OPERATIONS

NOTE
Use D-ring that is aligned with centerline of leg.

Attach Series Bungee System (two) to Subject Load Device and corresponding D-ring on each side of Treadmill Harness.
Attach Subject Positioning Device (two) to corresponding D-ring on each side of Treadmill Harness.

7. VIS SYSTEM STATUS

NOTE
Gyro will take approximately 5 --- 10 minutes to spinup.

√ Following msgs appear on screen in VIS STATUS menu
   ’STABILIZER FAULTS = NONE’
   ’GYRO FAULTS = NONE’
   ’GYRO MODE = READY’
   ’GYRO SPEED =’ (greater than 2000 rpm)

Control Panel
ENT pb → Press to continue

Attach Harness Emergency Stop Magnet to “EMERGENCY STOP” mark on Control Panel.

NOTE
SYS PWR LED will remain yellow if Emergency Stop Magnet not centered properly on mark.

√ SYS PWR LED – green

*********************************************************************
If at any time during Exercise Session the Emergency Stop Magnet disconnects
   Wait for System Paused menu to appear on screen.
   Reattach Emergency Stop Magnet.
   Select Item 1 - ‘Resume Session’
   Continue.
*********************************************************************

8. HEARTRATE VERIFICATION

Control Panel
√Heart Rate Displayed on LCD
9. **SUBJECT LOADING**

<table>
<thead>
<tr>
<th>NOTE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Recommended Subject Load = ( \frac{2}{3} ) Individual Body Weight.</td>
</tr>
<tr>
<td>2. Use keypad to adjust Subject Load.</td>
</tr>
<tr>
<td>3. Press ENT pb on Control Panel to move forward through the menu.</td>
</tr>
<tr>
<td>4. Press CLR pb on Control Panel to resume the previous menu.</td>
</tr>
</tbody>
</table>

Control Panel

- Stand in center of Treadmill belt.
- Enter desired Subject Load value.
- Adjust Subject Load, as desired.

10. **EXERCISE SESSION**

Follow Menu instructions.

Increase Treadmill Speed by
- Depressing Arrow keys that adjust speed by 0.1 mph, or depressing desired speed value and then depressing ENT.

Stop Treadmill belt by
- Removing Emergency Stop Magnet, or depressing SYSTEM PAUSE pushbutton on Control Panel.

*********************************************************************

If at any time during Exercise Session the Emergency Stop Magnet disconnects
- Wait for System Paused Menu to appear on screen.
- Reattach Emergency Stop Magnet.
- Select Item 1 - ‘Resume Session’
- Continue.

*********************************************************************

<table>
<thead>
<tr>
<th>NOTE</th>
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</thead>
<tbody>
<tr>
<td>Maximum belt speed dependent on Subject Load and running style.</td>
</tr>
</tbody>
</table>

Belt Speed Adjustment (maximum = 10 mph).

<table>
<thead>
<tr>
<th>NOTE</th>
</tr>
</thead>
<tbody>
<tr>
<td>For passive session, adjust resistance of Treadmill belt by adjusting foot knob on flywheel case.</td>
</tr>
</tbody>
</table>

*********************************************************************

If TVIS unstable, SYSTEM PAUSE pb → Press

\[ \sqrt{MCC} \]
11. **EXERCISE SESSION END**
   When exercise complete
   Control Panel
   Press [↓] pb or enter lower belt speed value to reduce belt speed to walking pace (~2.0).

   **SYSTEM PAUSE pb → Press to stop Treadmill Belt**

   Select Item 7 – ‘Quit Session’

   Follow Menu instructions for final Subject Load determination.

   **TEOK Remove, stow CCM card.**
   Remove magnet from Control Panel.

   **SYS PWR pb → Depress**

   √SYS Pwr LED – red

12. **EXERCISE CLEANUP**
   Disconnect Treadmill Harness from Subject Positioning Device (two)
   Disconnect Series Bungee System (two) from Subject Load Devices.
   Step off Treadmill.

   **NOTE**
   Batteries will wear out if Transmitter not disconnected from chest strap

   Doff Treadmill Harness, HRM Transmitter, HRM Chest Strap.

   **TEOK Stow:**
   CCM Card
   HRM Transmitter
   HRM Chest Strap
   Treadmill Harness
   Series Bungee System
   Tethered Magnet

   **TM Fold down Subject Positioning Device (two).**
SERIES BUNGEE SYSTEM INSPECTION

Unstow:

TVIS Exercise Ops Kit (Gidzenko):
Series Bungee System (two)

TVIS Exercise Ops Kit (Krikalev):
Series Bungee System (two)

TVIS Exercise Ops Kit (Shepherd):
Series Bungee System (two)

To remove sock, untie two Nomex cords that attach one end of sock to the SBS.

Pull down sock completely to view cords.

Note any cracking or damaged areas.

Inspect sock for damage.

Notify MCC of condition of Series Bungee System.

Replace sock to original configuration.

Stow:

Series Bungee System (two per crewmember) in respective Crewmember Exercise Ops Kits

**********************************************************************************************

If it is determined that there is significant damage to SBS or sock, use crewmate’s SBS.

**********************************************************************************************
1. Unstow:
   Dosimeters (two) from ISS Audio Dosimeter Biobag and if needed, Dosimeter (one) from Acoustic Countermeasure Hardware

2. Change batteries in all three Dosimeters.
   2.1 Unstow 9V Battery Kit from Audio Dosimeter Biobag.
   2.2 Unstow spare 9VDC battery from 9V Battery Kit.
   2.3 Slide front panel up on dosimeter, if not already up.
   2.4 O/I sw $\rightarrow$ O (off) on dosimeter.
   2.5 Firmly grasp unit in one hand, press in and up on grooved area on bottom of Dosimeter to remove battery cover.
   2.6 Remove and replace battery.
   2.7 Replace cover.
   2.8 Use pen to mark used battery with “X”.
   2.9 Stow used battery in 9V Battery Kit.
   2.10 Stow 9V Battery Kit in Audio Dosimeter Biobag.

   \[\text{NOTE}\]
   New battery will operate unit for ~40 hours.

3. Slide front panel up on all audio dosimeters (S/Ns 1002, 1003, and 5008).

4. O/I sw $\rightarrow$ I (on).

5. $\sqrt{\text{BATT OK}}$ readout appears in top left of display and does not blink after ~10 seconds; if not, refer to steps 4.1 --- 4.8
   $\sqrt{0:00 \text{ time}}$ appears on display

6. Depress and release front panel black pushbutton (three times) until ‘Lavg/Leq’ mode appears on display.

7. If obtaining crew worn measurements, attach Dosimeter to trousers. Run microphone underneath shirt and attach microphone to collar as close to ear as possible.

   If obtaining static measurements, place Dosimeter in specified location and slide front panel down to cover display.
   Attach microphone as close to the centerline as possible.
8. Record mission number, date, recorder’s name, measurement location including crewmember name (for crew worn), and start time in Table 1 in procedures.

9. After specified time has expired (usually 24 hours), retrieve Dosimeters from location or crewmembers.

10. Slide front panel up on both Dosimeters, if not already up.

11. Record measurements in Table 1 in procedures. Include stop time for data acquisition and measurement data.

**NOTE**

An ‘OFL’ (memory overflow) message may appear momentarily on the display if the Dosimeter picks up a sound ≥ 99 dB or if the Dosimeter has been on ≥ 20 hours. Ignore this message and continue to take measurements.

12. Record measurements on MEC as follows.

   12.1 Click on ‘CHeCS Application’ icon.

   12.2 Select ‘Audio Dosimeter’.

   12.3 Select ‘yes’ to open as read-only.

   12.4 Transfer all information from log book to template.

   12.5 Select ‘File-Save As’.

   12.6 On ‘Save in’ menu select ‘C:\CHeCS\Audio’.

   12.7 Type in file name as ‘AcDos__mmddyy’; record file name in log book.

   12.8 Select ‘Save’.


14. Slide front panel down.

15. Stow dosimeters two in ISS Audio Dosimeter Biobag (S/N 1002 and 1003) and Acoustic Countermeasures Hardware (one) (S/N 5008).
Table 1

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24-hour Measurement

| Static Location: | Lavg/Leq: ____________ | Start GMT: ____________ | Stop GMT: ____________ |
| Static Location: | Lavg/Leq: ____________ | Start GMT: ____________ | Stop GMT: ____________ |
| Static Location: | Lavg/Leq: ____________ | Start GMT: ____________ | Stop GMT: ____________ |
| Crewmember Worn: | Lavg/Leq: ____________ | Start GMT: ____________ | Stop GMT: ____________ |
| Crewmember Worn: | Lavg/Leq: ____________ | Start GMT: ____________ | Stop GMT: ____________ |
| Crewmember Worn: | Lavg/Leq: ____________ | Start GMT: ____________ | Stop GMT: ____________ |
ACOUSTIC DOSIMETER - ACOUSTIC NOISE MEASUREMENT

1. Unstow:
   Dosimeters (two) from ISS Audio Dosimeter Biobag
   If needed, Dosimeter (one) from Acoustic Countermeasure Hardware

2. Change batteries in all three dosimeters.
   2.1 Unstow 9V Battery Kit from Audio Dosimeter Biobag.
   2.2 Unstow Spare 9V DC Battery from 9V Battery Kit.
   2.3 Slide front panel up on Dosimeter, if not already up.
   2.4 O/I sw → O (off) on Dosimeter
   2.5 Firmly grasp unit in one hand.
      Press in and up on grooved area on bottom of Dosimeter to remove
      battery cover.
   2.6 Remove and replace battery.
   2.7 Replace cover.
   2.8 Use pen to mark used battery with “X”.
   2.9 Stow used battery in 9V Battery Kit.
   2.10 Stow 9V Battery Kit in Audio Dosimeter Biobag.

   **NOTE**
   New battery will operate unit for ~40 hours.

3. Slide front panel up on all audio Dosimeters (S/Ns 1002, 1003, and 5008).

4. O/I sw → I (on)

5. √‘BATT OK’ readout appears in top left of display, and does not blink after
   ~10 seconds; if not, refer to steps 4.1 --- 4.8
   √‘0:00 time’ appears on display

6. Depress and release front panel black pushbutton (three times) until
   ‘Lavg/Leq’ mode appears on display.

7. If obtaining crew worn measurements, attach Dosimeter to trousers.
   Run microphone underneath shirt and attach microphone to collar as
   close to ear as possible.
   If obtaining static measurements, place Dosimeter in specified location
   and slide front panel down to cover display.
   Attach microphone as close to the centerline as possible.
8. Record mission number, date, recorder’s name, measurement location including crewmember name (for crew worn), and start time in Table 1 in procedures.

9. After specified time has expired (usually 24 hours), retrieve Dosimeters from location or crewmembers.

10. Slide front panel up on both Dosimeters, if not already up.

11. Record measurements in Table 1 in procedures. Include stop time for data acquisition and measurement data.

   **NOTE**
   An ‘**OFL**’ (memory overflow) message may appear momentarily on the display if the Dosimeter picks up a sound ≥ 99 dB or if the Dosimeter has been on ≥ 20 hours. Ignore this message and continue to take measurements.

12. Record measurements on MEC as follows.

   12.1 Click on ‘CHeCS Application’ icon.

   12.2 Select ‘Audio Dosimeter’.

   12.3 Select ‘yes’ to open as read-only.

   12.4 Transfer all information from log book to template.

   12.5 Select ‘File-Save As’.

   12.6 On ‘Save in’ menu select ‘C:\CHeCS\Audio’.

   12.7 Type in file name as ‘AcDos_mmddyy’; record file name in log book.

   12.8 Select ‘Save’.

13. O/I sw → I (off)

14. Slide front panel down.

15. Stow:
   - Dosimeters (two) in ISS Audio Dosimeter Biobag (S/N 1002 and 1003)
   - Acoustic Countermeasures Hardware (one) (S/N 5008)
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**24-hour Measurements**

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</table>
1. **NOTE**

   - The CDM will operate for approximately 18 hours before the battery pack is discharged. The CDM will emit a short beep once every 15 seconds to indicate a low battery condition with approximately 3 hours remaining. Battery should be changed out when low battery indicated.

2. The CDM contains a data logger which is activated upon startup. Logged data are time-stamped via an internal clock set to GMT. When a monitoring session (more than a single data point) is conducted, e.g., during an IFM task behind a panel, it is important to record the GMT (watch or CDM clock) at the beginning and end of the activity. Data from the entire session stored in the data logger can then be correlated with log book data and sampling information.

3. In the nominal operating mode, the CDM clock can be accessed by pressing the MODE pushbutton nine times until ‘RT XX:XX’ on the top line indicates real time.

---

1. **CDM SETUP**

   Unstow CDM Kit.

   Remove from CDM Kit:
   - CDM
   - Clean Filter Assembly (blue ring next to CLEAN label)

   Temporarily stow kit.

   CDM QD $\rightarrow$ Filter $\leftarrow$

   Attach Velcro tether.

2. **CDM ACTIVATION**

   - **NOTE**
     1. Audible beeps occur when the MODE pushbutton is depressed during unit activation.
     2. A single beep occurs when the self-check routine is complete.

   Press and hold MODE pushbutton until ‘RELEASE’ displayed.

   Wait approximately 1 minute while unit runs self-check routine.

   Verify display indicates CO2 concentration.
3. **CDM OPERATIONS**

**NOTE**

1. Both area and personal exposure monitoring for CO$_2$ should be conducted during the mission.

2. Area monitoring is conducted at mid-axis in each module during daily ingress and egress. CO$_2$ concentration and sampling information should be called down to **MCC-H** if A/G is available. Readings taken during LOS periods should be recorded in the log book and called down at crew convenience.

3. Personal monitoring is conducted during IFM tasks requiring work in or around open panels. The CDM must be located very close to the crewmember to assess exposure; however, not in the path of exhaled breath.

4. A Nomex belt is provided to attach the CDM to the torso or, alternatively, adhesive-backed Velcro patches are provided for surface attachment in the work zone. For these monitoring sessions, the CO$_2$ concentration and sampling information must be recorded in the Log Book at the beginning and end of the session.

---

**If initial mission activation of the CDM**

**NOTE**

Initial CDM activation can only be performed if cabin pressure is above 12 psia.

Remove Log Book and marker from CDM Kit.

Temporarily stow kit.

Transfer CDM, Log Book, and marker to orbiter flight deck.

Wait 30 seconds.

If A/G communication is available with **MCC-H**, report CDM CO$_2$ data for comparison and evaluation to orbiter sensor output.

If A/G communication is not available (LOS), record the CDM CO$_2$ concentration (%) and sampling information in Log Book and report to **MCC-H** at AOS.

If module ingress/egress area monitoring (single data point monitoring)

Remove Log Book and marker from CDM Kit.

Temporarily stow kit.

Transfer CDM, Log Book, and marker to designated location.
Per ECLSS callout, place CDM at each designated location.

Take readings away from crewmember’s breathing zone after a 30-second equilibration period.

**NOTE**
Additional CO2 monitoring may be performed at crew discretion. Extended monitoring periods should be coordinated with MCC-H for battery management purposes.

If A/G communication is available with MCC-H, report CDM CO2 data.

If A/G communication is not available (LOS), record the CDM CO2 concentration (%) and sampling information in Log Book and report to MCC-H at AOS.

If conducting a monitoring session during a crew activity

Remove Log Book, marker, Nomex belt, and/or Velcro patch from CDM Kit.

Temporarily stow kit.

Transfer CDM and items above to monitoring location.

Record the CO2 concentration and sampling information in Log Book when the activity begins.

Temporarily stow Log Book and marker.

Place the Nomex belt around the torso.

Insert the CDM in the pouch or, alternatively, use the Velcro patch to attach the CDM to a surface in the work zone.

Following completion of the activity, record the current CO2 concentration, time the activity ended, and other sampling information in the Log Book.

When monitoring is complete and all pertinent data recorded, deactivate CDM.

4. **CDM DEACTIVATION**
   Press and hold MODE pushbutton until 'RELEASE' displayed.

   Verify CDM → OFF

5. **CDM STOWAGE**
   Remove filter assembly and stow on clean side.

   Stow CDM and Filter Assembly in CDM Kit.
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CSA-CP ACTIVATION
1. Unstow CSA-CP from CSA-CP Stowage Kit.

**NOTE**
Audible beeps occur when the MODE pushbutton is pressed during activation.

2. MODE pb → Press, hold until ‘RELEASE’ displayed

**NOTE**
Wait approximately 1 minute while unit runs self-check routine. A single beep occurs when the self-check routine is complete.

3. √Display indicates readings for OXYGEN, HCN, HCL, CO

4. Deploy instrument as required for passive sampling.

CSA-CP DEACTIVATION
5. MODE pb → Press, hold until ‘RELEASE’ displayed

√CSA-CP off
1. If ‘LOG OFF’ or ‘LOG ON’ is not displayed, wait 10 seconds for the Nominal display and then repeat the step.

   MODE pb → Press (nine times from nominal display) until ‘LOFF OFF’ (for activation) or ‘LOG ON’ (for deactivation) displayed.

2. Within 10 seconds, press “±” button to activate or deactivate Data Logger.

   √ ‘LOG ON’ or ‘LOG OFF’ displayed, as desired

3. Wait 15 seconds.

   √ Display indicates readings for OXYGEN, HCN, HCL, CO
NOTE
The prime CSA-CP unit will be replaced with the backup CSA-CP unit approximately every 90 days.

FGB 1-4261

1. Unstow backup CSA-CP from CSA-CP Stowage Kit.

2. On the backup CSA-CP, perform COMPOUND SPECIFIC ANALYZER - COMBUSTION PRODUCTS BATTERY CHANGEOUT, all (SODF: MED OPS: NOMINAL), then:

   NOTE
   Following swap of the CSA-CPs, their designations are exchanged and the backup CSA-CP becomes the prime (deployed) unit.

3. Exchange CSA-CP units.

4. **DEACTIVATING PREVIOUSLY DEPLOYED CSA-CP**
   
   CSA-CP
   
   | MODE pb → Press, hold until ‘RELEASE’ displayed |
   | CSA-CP off |

5. Stow previously deployed CSA-CP in CSA-CP Stowage Kit.

6. **ACTIVATING PREVIOUSLY STOWED CSA-CP**
   
   CSA-CP
   
   | 6.1 MODE pb → Press, hold until ‘RELEASE’ displayed |
   | NOTE |
   | Audible beeps occur when the MODE pushbutton is depressed during unit activation. |

6.2 Wait 1 minute.
   √ Display indicates readings for OXYGEN, HCN, HCL, and CO

7. Deploy previously stowed CSA-CP to designated location.
1. Retrieve backup CSA-CP from CSA-CP Stowage Kit.

2. Remove Sampling Pump from CSA-CP Stowage Kit.

3. Loosen Velcro straps on Sampling Pump.

4. Slide backup CSA-CP into Sampling Pump bracket as far forward (toward inlet) as possible.
   Backup CSA-CP oriented with display visible when facing the front panel of the Sampling Pump.

5. Tighten Velcro straps firmly around back-up CSA-CP.

6. **ACTIVATING BACKUP CSA-CP**
   
   **NOTE**
   Audible beeps occur when the MODE pushbutton is depressed during unit activation.

   **6.1 MODE pb → Press, hold until **RELEAS**E** displayed

   **NOTE**
   Wait approximately one minute while unit runs self-check routine. A single beep occurs when the self-check routine is complete.

   **6.2 √Display indicates readings for OXYGEN, HCN, HCL, CO**

7. **MODE pb → Press (eleven times) until **GO CAL** displayed

   **NOTE**
   Use of probe and probe handle is optional depending on sampling requirements.

8. Remove Sample Probe and Probe Handle with flex tubing from CSA-CP Stowage Kit.

9. **Probe →|←** Probe Handle

10. Free-end of flex tubing →|← Sampling Pump inlet

   **NOTE**
   When activated, there will be an audible beep, fault LED will momentarily illuminate, and power LED will stay illuminated.

11. Sampling Pump sw → On
12. Transfer active sampling assembly to desired location.

**NOTE**
After activating/deactivating the Logger, the nominal display (gas concentrations) will return in approximately 10 seconds.

13. MODE pb → Press (nine times) until ‘LOG OFF’ or ‘LOG ON’ displayed
If required, press “+” button to reset Data Logger to ‘LOG ON’.

√ ‘LOG ON’ displayed

14. Conduct active sampling session.

15. Following session, MODE pb → Press until ‘LOG ON’ displayed
Press “+” button to reset data logger to ‘LOG OFF’.

√ ‘LOG OFF’ displayed

16. Sampling Pump sw → Off

TBD 17. Return sampling assembly to CSA-CP Stowage Kit.

18. Probe ←|→ Probe Handle

19. Free-end of flex tubing ←|→ Sampling Pump inlet

Stow:
Probes
Probe Handle with flex tubing

CSA-CP Stowage Kit

20. Backup CSA-CP ←|→ Sampling Pump

Stow Sampling Pump in CSA-CP Stowage Kit.

21. If data download required, perform COMPOUND SPECIFIC ANALYZER - COMBUSTION PRODUCTS (CSA-CP) DATA DOWNLOAD, all (SODF: MED OPS: NOMINAL), then:

22. Following data download, return backup CSA-CP to CSA-CP Stowage Kit.
NOTE
Disabling the CSA-CP alarm function will remove audio and visual (flashing red lights) annunciation if target gas thresholds are exceeded. However, any target gas concentration(s) above the preset threshold(s) will continue to be indicated by a blinking display.

1. Notify **MCC** prior to disabling the alarm function.

2. If CSA-CP not activated, activate CSA-CP.

   **NOTE**
   Audible beeps occur when the MODE push button is depressed during unit activation.

   2.1 MODE pb → Press, hold until ‘**RELEASE**’ displayed

   **NOTE**
   Unit self-check will take approximately 1 minute. A single beep occurs when the self-check routine is complete.

   2.2 √Display indicates readings for OXYGEN, HCN, HCL, and CO

3. For activated CSA-CP, MODE pb → press 10 times until ‘**MUTE**’ or ‘**UNMUTE**’ is displayed.

   **NOTE**
   The operating mode will revert to the nominal display after 10 seconds.

4. Press ‘+’ button to disable/enable alarms, as desired.

   √Display indicates alarm enabled/disabled
NOTE
Each sensor has three preset instantaneous alarm thresholds (setpoints): autolog, low alarm, and high alarm. For each sensor, these three thresholds are set to the same concentration. If the preset concentration is exceeded for any sensor, an audible and visual alarm and autolog function are activated.

1. Notify MCC prior to changing any alarm/autolog setpoint.

NOTE
The ‘GO CAL’ mode will revert to the nominal display if the ‘E’ button is not pushed within 10 seconds.

2. If CSA-CP not activated

NOTE
Audible beeps occur when the MODE pushbutton is depressed during unit activation.

2.1 MODE pb → Press, hold until ‘RELEASE’ displayed

NOTE
Unit self-check routine will take approximately 1 minute while unit runs self-check routine. A single beep occurs when the self-check routine is complete.

2.2 Display indicates readings for OXYGEN, HCN, HCL, and CO

If CSA-CP activated
MODE pb → Press (11 times) until ‘GO CAL’ displayed

4. Press ‘E’ button.

√‘SET SPAN’ on top line of display

5. Press “+” button three times until ‘Alarms’ is on top line of display.


√‘INSTANT’ on top line of display

7. Press ‘E’ button.

√‘X.X L HCN’ on top line of display (HCN is the first sensor to be displayed.)

NOTE
The low is indicated by an ‘L’ to the right of the setpoint.
8. If the low alarm setpoint for HCN is to be changed, select it by pressing the ‘E’ button; otherwise, press “+” button to step through the low and high alarm setpoints for each of the sensors until the desired sensor setpoint requiring a change is displayed, then press the ‘E’ button.

   √ Blinking display for desired sensor

   When the sensor is blinking on the display, pressing the “+” and “-” buttons will increase or decrease the alarm setpoint.

9. Press the “+” or “-” button to increase or decrease the alarm setpoint to the desired level. When the desired level is reached, press the ‘E’ button to establish the new setpoint.

   √ Sensor stop blinking

10. Press the “+” to view each of the low and high alarm setpoints for each sensor. Press ‘E’ button to select any of the setpoints requiring changes.

   **NOTE**
   If the low-level alarm setpoint is changed for a sensor, the autolog setpoint should be reset to the same value for that sensor.

11. When all instantaneous alarm setpoints have been reset to desired levels, MODE pb → Press (two times).

   √ ‘ALARMS’ display on top line


   √ ‘INSTANT’ on top line of display

13. Press “+” button three times.

   √ ‘AUTOLOG’ on top line of display


   √ ‘X.X HCN’ on top line of display

15. If the autolog setpoint for HCN is to be changed, select it by pressing the ‘E’ button; otherwise, press “+” button to step through the autolog setpoints for each of the sensors (excluding O2) until the desired sensor autolog setpoint requiring a change is displayed, then press the ‘E’ button.

   √ Blinking display for desired sensor
When the sensor is blinking on the display, pressing the “+” and “-” buttons will increase or decrease the autolog setpoint.

16. Press the “+” or “-” button to increase or decrease the autolog setpoint to the desired level. When the desired level is reached, press the ‘E’ button to establish the new setpoint.

Sensor stop blinking

17. Press the “+” to view the autolog the setpoints for each sensor. Press the ‘E’ button to select any setpoint requiring a change.

18. After all autolog setpoints have been set to desired levels, press the MODE pushbutton three times to return to the nominal display (approximately 10 seconds after MODE button is pushed).

Nominal display
The CSA-CP Resupply Kit contains 10 spare Batteries, one of which will need to be used to replace the Battery in the Sampling Pump.

TBD  1. Unstow CSA-CP Resupply Kit.

TBD  2. Unstow from Central Tools:
   - Small Flat Head Screwdriver
   - Marking Pen

FGB1  3. Retrieve CSA-CP from deployed location and CSA-CP Stowage Kit.

   4. DEACTIVATING PRIME CSA-CP
      CSA-CP MODE pb → Press, hold until  ‘RELEASE’  displayed
      √ CSA-CP – Off

   5. Remove, exchange the following items from CSA-CP Resupply Kit with like items from CSA-CP Stowage Kit and previously deployed CSA-CP
      - CSA-CPs (2)
      - Batteries (9)
      - Zero filter (1)
      - Ziploc Bag (1) of Sampling pump filters (2)

      Perform CSA-CP SAMPLING PUMP BATTERY CHANGEOUT, steps 2 --- 8 (SODF: ISS MED OPS: NOMINAL), then:

   7. Stow used Battery Pack from Sampling Pump in CSA-CP Resupply Kit.

   8. ACTIVATING (ONE) RESUPPLIED CSA-CP
      
      NOTE
      Audible beeps occur when the MODE pushbutton is depressed during unit activation.

      8.1 MODE pb → Press, hold until ‘RELEASE’ displayed
      
      NOTE
      Self-check routine will take approximately 1 minute. A single beep occurs when the self-check routine is complete.

      8.2 Wait 1 minute.

      √ Display indicates readings for OXYGEN, HCN, HCL, and CO
9. Deploy CSA-CP.

10. Stow CSA-CP Stowage Kit.

11. Stow:
    Small Flat Head Screwdriver
    Marker

1. Unstow from Central Tools:
   - Small Flat Head Screwdriver
   - Marking Pen

2. Unstow from CSA-CP Stowage Kit:
   - FGB1_426 Spare Battery Pack
   - Sampling Pump

3. Turn screw on back panel (3 --- 4 turns •). Sampling Pump

4. Remove Panel.
   - Temporarily stow.

5. Grasp Battery Pack pull-tab, remove Battery Pack.


7. Install replacement Battery.
   - Press firmly to seat electrodes.

8. Replace cover plate.
   - Turn screw • until tight.

9. Stow in Central Tools:
   - TBD Small Flat Head Screwdriver
   - Marking Pen

10. Stow in CSA-CP Stowage Kit:
    - FGB1_426 Discharged Battery Pack
    - Sampling Pump
1. Unstow from CSA-CP Stowage Kit:
   FGB1_426 Spare Filter (in Ziploc Bag at bottom of circular hole)
   Sampling Pump

2. Remove Filter from inlet of Sampling Pump by turning ↯.

   **CAUTION**
   Damage to O-ring can occur if over-tightened.

3. Install new Filter until snug.

4. Dispose of used Filter in dry trash.

5. Stow:
   FGB1_426 Sampling Pump in CSA-CP Stowage Kit
1. Unstow:
   TBD                      Marking Pen from Central Tools
   FGB1_426                Spare Battery Pack from CSA-CP Stowage Kit

2. **DEACTIVATING CSA-CP (IF ACTIVATED)**
   CSA-CP                   MODE pb → Press, hold until ‘RELEASE’ displayed
                           √CSA-CP off

3. Turn fasteners (two) on back Panel 1/4 turn ▼. Temporarily stow Panel.


   **NOTE**
   Stored data is maintained for a maximum of 30 minutes without battery installed. All data will be lost if battery installation is delayed more than 30 minutes.

5. Mark Battery Pack as “DISCHARGED” with Marking Pen.

6. Install replacement Battery.
   Press firmly to seat electrodes.

7. Replace back panel, press firmly.
   Turn fasteners (two) 1/4 turn ▼ to lock.

8. Stow:
   TBD                      Marking Pen in Central Tools
   FGB1_426                Discharged Battery Pack from CSA-CP Stowage Kit

9. **ACTIVATING CSA-CP (IF DEPLOYING CSA-CP)**
   Perform COMPOUND SPECIFIC ANALYZER - COMBUSTION PRODUCTS - ACTIVATION AND CHECKOUT, all (SODF: MED OPS: ACTIVATION AND CHECKOUT: EHS), then:

   **NOTE**
   Audible beeps occur when the MODE pushbutton is depressed during unit activation.

   CSA-CP                   9.1 MODE pb → Press, hold until ‘RELEASE’ displayed

   **NOTE**
   Unit self-check routine will take approximately 1 minute. A single beep occurs when the self-check routine is complete.

9.2 Wait 1 minute.

   √Display indicates readings for OXYGEN, HCN, HCL, and CO
TBD 9.3 Deploy CSA-CP to designated location.

G= If not deploying CSA-CP, stow in CSA-CP Stowage Kit.

FGB1_426
1. Unstow: FGB1_426 CSA-CP Data Cable from CSA-CP Stowage Kit

2. Take CSA-CP and CSA-CP Data Cable to current location of MEC.

3. **DEACTIVATING CSA-CP (IF ACTIVATED)**
   
   CSA-CP MODE pb → Press, hold until ‘RELEASE’ displayed
   
   √ CSA-CP off

4. Remove RS-232 port cap on CSA-CP. Temporarily stow on CSA-CP.

5. CSA-CP Data Cable 9-pin connector →|← MEC serial port (9-pin male connector)

6. CSA-CP Data Cable 3-pin connector →|← CSA-CP RS-232 port by aligning the red dots

7. On the MEC screen, double-click the ‘CHeCS Applications’ icon.


9. Click or select ‘File’ in the upper left corner.

10. Click or select ‘Connect’.

11. √ CSA-CP is powered OFF

12. Click ‘OK’ or press the ENTER key.

13. MODE pb → Press, hold until CSA-CP ‘RELEASE’ displayed

14. √‘CONNECT’ displayed on CSA-CP

15. On the MEC, click ‘Download Data’.

---

**NOTE**

1. MEC will automatically download data and assign a file name associated with the current date (e.g., MMDDYYx.csa).

2. Downloading a file can take several seconds or several minutes (maximum of 30 minutes) depending on how much data are on the data logger.

3. When the download is complete, a ‘Comments Entry’ display will appear.
16. If desired, enter notes on the ‘Comments Entry’ screen.
   If not desired, click ‘OK’.

17. Data Download is complete
   Click ‘OK’.

18. Select ‘Clear Data’.
   Click ‘Yes’.

19. Select ‘Exit’.

CSA-CP 20. MODE pb → Press until display reads ‘RELEASE’


22. CSA-CP Data cable ←|→ CSA-CP, MEC


25. ACTIVATING CSA-CP (IF REDEPLOYING)

   NOTE
   Audible beeps occur when the MODE pushbutton is depressed during unit activation.

   25.1 MODE pb → Press, hold until ‘RELEASE’ displayed

   NOTE
   Unit self-check routine will take approximately 1 minute. A single beep occurs when the self-check routine is complete.

   25.2 Wait 1 minute.

   √ Display indicates readings for OXYGEN, HCN, HCL, and CO
CAUTION

A failed sensor may read zero. Do not take a safety critical action based on a single CSA-CP sensor reading of (0.0) for HCN, HCL, or (0) for CO without comparison to the second unit.

Table 1. Exposure Guidance Levels

<table>
<thead>
<tr>
<th>Spacecraft Maximum Allowable Concentration (SMAC)</th>
<th>1 Hour ppm</th>
<th>24 Hour ppm</th>
<th>7 Day ppm</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO</td>
<td>55</td>
<td>20</td>
<td>10</td>
</tr>
<tr>
<td>HCN</td>
<td>8</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>HCL</td>
<td>5</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

Emergency Exposure Guidance Levels (EEGLs)

EEGLs are not standards; they are experts’ judgement of exposures at which one can continue to function in an emergency situation and is unlikely to suffer irreversible effects.

<table>
<thead>
<tr>
<th>*Instrument Saturation ppm</th>
<th>10-minute ppm</th>
<th>20-minute ppm</th>
<th>30-minute ppm</th>
<th>60-minute ppm</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO +OR (overrange)</td>
<td>n/a</td>
<td>999</td>
<td>750</td>
<td>400</td>
</tr>
<tr>
<td>HCN &gt;60</td>
<td>n/a</td>
<td>n/a</td>
<td>50</td>
<td>n/a</td>
</tr>
<tr>
<td>HCL &gt;60</td>
<td>50</td>
<td>n/a</td>
<td>n/a</td>
<td>20</td>
</tr>
</tbody>
</table>

*Indicates breathing the contaminated atmosphere could be immediately dangerous to life and health.

Most Common Symptoms of Acute Exposure

| CO    | Headache, nausea (can be delayed in onset), cardiac effects |
| HCN   | Headache, giddiness, palpitations                          |
| HCL   | Eye and upper respiratory tract irritation, cough          |

1. Don PBAs if 24 hours SMAC exceeded.

TBD 2. Retrieve CSA-CP from deployed location.

TBD 3. Remove backup CSA-CP from CSA-CP Stowage Kit.
4. ACTIVATING BACKUP CSA-CP

4.1 MODE pb → Press, hold until 'RELEASE' displayed

**NOTE**
Unit self-check routine will take approximately 1 minute. A single beep occurs when the self-check routine is complete.

4.2 Display indicates readings for OXYGEN, HCN, HCL, and CO

5. Transfer both activated CSA-CPs to sampling location.

**NOTE**
If annoying, the audio alarm on the CSA-CPs can be deactivated by pressing the MODE button (10 times) until ‘MUTE’ is displayed and then pressing “+” button to disable.

6. When COM available, notify MCC with results from following steps as performed.

**NOTE**
Deploy both CSA-CPs side by side for a valid comparison.

7. Compare CSA-CP readings from both units per CSA-CP Comparison Worksheet.

Refer to Table 3.

8. If readings agree, per worksheet, both units are considered accurate. Units may be used independently or together as the situation requires.

If readings do not agree, one unit is suspect. Proceed using unit with highest readings for rest of the procedure.

At first opportunity, perform COMPOUND SPECIFIC ANALYZER - COMBUSTION PRODUCTS - ZERO CALIBRATION OF UNITS AND COMPARISON OF VALUES, steps 2 --- 25 (SODF: MED OPS: NOMINAL), repeat comparison.

**CREW 1**

9. MONITORING AREA WITH CSA-CP

9.1 Measure concentrations vs. time and location (all applicable modules).

9.2 Record values on CSA-CP log.

Refer to Table 2.

**Crew 2**

10. If CO > 50 ppm, retrieve Russian CO Draeger tube. Perform measurement in same location as CSA-CPs.

12. PBAs may be removed in a module if smoke cleared.
   No crew symptoms and CSA-CP readings below 24-hour SMAC.

13. Relocate CSA-CP(s) at crew discretion or MCC direction.

14. When instructed by MCC, perform COMPOUND SPECIFIC ANALYZER
    COMBUSTION PRODUCTS MALFUNCTIONS steps 37 --- 40 (SODF:
    MED OPS: MALFUNCTIONS: EHS), then:

    MODE pb → Press, hold until 'RELEASE' displayed

  √Unit off


16. Download Prime CSA-CP Data Logger to MEC.

    Perform COMPOUND SPECIFIC ANALYZER - COMBUSTION
    PRODUCTS - DATA DOWNLOAD, all (SODF: MED OPS: NOMINAL:
    EHS), then:

17. Redeploy prime CSA-CP at ground direction.
<table>
<thead>
<tr>
<th>Unit S/N or Draeger</th>
<th>Time</th>
<th>Location</th>
<th>ppm CO</th>
<th>ppm HCN</th>
<th>ppm HCL</th>
<th>% O2</th>
</tr>
</thead>
</table>
### Table 3. CSA-CP Comparison Worksheet

**CO (CSA-CP only)**

<table>
<thead>
<tr>
<th>Both units CO $\leq$ 20 ppm ⇒</th>
<th>Units agree if readings $\pm$ 5 ppm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Either unit CO $&gt;$ 20 ppm ⇒</td>
<td>Mean (add both values, divide by 2) = Hi Limit = 1.2 x Mean = Low Limit = 0.8 x Mean = Units agree if both units within Hi, Low limits</td>
</tr>
</tbody>
</table>

**HCN (CSA-CP only)**

<table>
<thead>
<tr>
<th>Both units HCN $\leq$ 5 ppm ⇒</th>
<th>Units agree if readings $\pm$ 0.6 ppm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Either unit HCN $&gt;$ 5 ppm ⇒</td>
<td>Mean (add both values, divide by 2) = Hi Limit = 1.25 x Mean = Low Limit = 0.75 x Mean = Units agree if both units within Hi, Low limits</td>
</tr>
</tbody>
</table>

**HCL (CSA-CP only)**

<table>
<thead>
<tr>
<th>Both units HCL $\leq$ 5 ppm ⇒</th>
<th>Units agree if readings $\pm$ 0.6 ppm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Either unit HCL $&gt;$ 5 ppm ⇒</td>
<td>Mean (add both values, divide by 2) = Hi Limit = 1.25 x Mean = Low Limit = 0.75 x Mean = Units agree if both units within Hi, Low limits</td>
</tr>
</tbody>
</table>

**CO (Draeger comparison)**

| Draeger Comparison (if required) ⇒ | Mean (add all 3 values divide by 3) = Hi Limit = 1.25 x Mean = Low Limit = 0.75 x Mean = Units agree if all units within Hi, Low limits |

---

23 AUG 00 101 6977.doc
1. Unstow:
   - TBD Marking Pen from Central Tools
   - FGB1_426 Spare Battery Pack from CSA-CP Stowage Kit

2. **DEACTIVATING PRIME CSA-CP (IF ACTIVATED)**
   - CSA-CP MODE pb → Press, hold until 'RELEASE' displayed
   - √ Prime CSA-CP – Off

3. Turn fasteners (two) on back panel 1/4 turn counterclockwise.
   Temporarily stow Panel.

   **NOTE**
   Stored data are maintained for a maximum of 30 minutes without battery installed. All data will be lost if battery installation is delayed more than 30 minutes.


5. Mark Battery Pack as “DISCHARGED” with Marking Pen.

6. Install replacement Battery Pack.
   Press firmly to seat electrodes.

   Turn fasteners (two) 1/4 turn clockwise to lock.


   **NOTE**
   1. The function of the zero calibration filter is to remove all of the target gases (if present) in the air stream so that the sensors can be rezeroed. The capacity to remove the target gases is severely reduced if the tethered filter caps are not immediately replaced and tightened after use.

   2. The deployed CSA-CP is designated as the prime unit and the stowed unit as the backup. The order in which the CSA-CPs are rezeroed is not important; however, identification of the units as prime and backup must be maintained since the prime unit is redeployed following the procedure.

10. Unstow from CSA-CP Stowage Kit:
   - FGB1_426 Sampling Pump
   - _426 Zero Filter
11. Loosen Velcro straps on Sampling Pump.

12. Slide the Prime CSA-CP into Sampling Pump bracket as far forward (toward inlet) as possible (CSA-CP oriented with display visible when facing the front panel of the Sampling Pump).

13. Tighten Velcro straps.

14. **ACTIVATING CSA-CP**

   **NOTE**
   Audible beeps occur when the MODE pushbutton is depressed during unit activation.

   **14.1** MODE pb → Press, hold until ‘RELEASE’ displayed

   **NOTE**
   Wait approximately 1 minute while unit runs self-check routine. A single beep occurs when the self-check routine is complete.

   **14.2** Wait approximately 1 minute.

   Display indicates readings for OXYGEN, HCN, HCL, and CO

15. Remove the Sampling Pump Inlet (blue) Filter. Temporarily stow.


   **NOTE**
   The Pump inlet fitting has outside and inside threads.

17. Screw on Zero Filter clockwise into the Sampling Pump inlet fitting until snug. Arrow on Zero Filter should point toward the Sampling Pump.

18. Sampling Pump switch → ON

19. After 2 minutes

   **CSA-CP**

   MODE pb → Press (11 times) until ‘GO CAL’ displayed at top

   *******************************************************

20. If more than 10 seconds elapses, repeat step 19.


   √‘SET SPAN’ is displayed
22. Press “+” button.

√’ZERO’ is displayed

23. Press ‘E’ button.

√’Zeroing’ displayed

Wait 15 seconds.

24. After ‘ZERO’ displayed,

MODE pb → Press (1 time)

After 15 seconds, verify nominal display (gas concentrations).

25. Sampling Pump switch → OFF

26. Prime CSA-CP ←|→ Sampling Pump

Temporarily stow Prime CSA-CP.

27. Unstow backup CSA-CP from CSA-CP Stowage Kit.


Tighten straps, as done with previous unit.

29. **ACTIVATING BACKUP CSA-CP**

<table>
<thead>
<tr>
<th>NOTE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Audible beeps occur when the MODE pushbutton is depressed during unit activation.</td>
</tr>
</tbody>
</table>

**CSA-CP 29.1** MODE pb → Press, hold until ‘RELEASE’ displayed

<table>
<thead>
<tr>
<th>NOTE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wait approximately 1 minute while unit runs self-check routine. A single beep occurs when the self-check routine is complete.</td>
</tr>
</tbody>
</table>

29.2 Wait 1 minute.

√Display indicates readings for OXYGEN, HCN, HCL, and CO

30. Perform steps 18 --- 25, then:

31. Backup CSA-CP ←|→ Sampling Pump

Temporarily stow backup CSA-CP.

32. Remove Zero Filter from Sampling Pump inlet.

Replace tethered end-caps.

Tighten to finger tight.
33. Replace Sampling Pump Inlet (blue) Filter. Tighten until snug.

34. Stow in CSA-CP Stowage Kit:
   - Zero Filter
   - Sampling Pump

35. Retrieve both CSA-CP units.

36. Compare readings from the two units.
   Verify comparable values to the following
   - CO: ± 5 ppm
   - HCN: ± 0.6 ppm
   - HCl: ± 0.6 ppm

   If values do not agree, notify MCC.

37. **DEACTIVATING BACKUP CSA-CP**
   
   **CSA-CP MODE pb** → Press, hold until ‘RELEASE’ displayed

   √CSA-CP off


40. Redeploy Prime CSA-CP.

41. **ACTIVATING PRIME CSA-CP DATA LOGGER**

[NOTE]

   If ‘LOG OFF’ is not displayed, wait 10 seconds for the nominal display and then repeat the step.

   **CSA-CP MODE pb** → Press (nine times from nominal display) until ‘LOG OFF’ displayed

   √‘LOG ON’ displayed

41.2 Within 10 seconds, press “+” button to activate Data Logger.

41.3 Wait 15 seconds.
   √Display indicates readings for OXYGEN, HCN, HCL, and CO
42. Deploy prime CSA-CP.

43. **DEACTIVATING PRIME CSA-CP DATA LOGGER**

   **NOTE**
   If ‘LOG ON’ is not displayed, wait 10 seconds for the nominal display and then repeat the step.

   **CSA-CP**
   43.1 MODE pb → Press (nine times from nominal display) ‘LOG ON’ displayed
   43.2 Press “+” button to deactivate Data Logger.
   √‘LOG OFF’ displayed
   43.3 Wait 15 seconds.
   √Display indicates readings for OXYGEN, HCN, HCL, and CO

44. Redeploy prime CSA-CP to designated location.
NOTE
1. The function of the zero calibration filter is to remove all of the target gases (if present) in the air stream so that the sensors can be rezeroed. The capacity to remove the target gases is severely reduced if the tethered filter caps are not immediately replaced and tightened after use.

2. The deployed CSA-CP is designated as the prime unit and the stowed unit as the backup. The order in which the CSA-CPs are rezeroed is not important; however, identification of the units as prime and backup must be maintained since the prime unit is redeployed following the procedure.

1. Retrieve prime CSA-CP from sampling location.

Kit 2. Unstow (from CSA-CP Stowage Kit)
   Sampling Pump
   Zero Filter

3. Loosen Velcro straps on Sampling Pump.

4. Slide prime CSA-CP into Sampling Pump bracket as far forward (toward inlet) as possible (CSA-CP oriented with display visible when facing the front panel of the Pump).

5. Tighten Velcro straps.

6. Activate prime CSA-CP.

   NOTE
   Audible beeps occur when the MODE pushbutton is depressed during unit activation.

   6.1 MODE pb → Press, hold until ‘RELEASE’ displayed

   NOTE
   Unit self-check routine will take approximately 1 minute. A single beep occurs when the self-check routine is complete.

6.2 √Display indicates readings for OXYGEN, HCN, HCL, and CO

7. Remove the Sampling Pump Inlet Filter.
   Temporarily stow.

8. Unscrew tethered end caps on the Zero Filter.

   NOTE
   The Pump inlet fitting has outside and inside threads.
9. Screw end of the zero filter into the Sampling Pump inlet fitting until snug.
   Arrow on Zero Filter should point toward the Sampling Pump.

10. Sampling Pump switch → ON

11. After 2 minutes, MODE pb → Press (eleven times) until ‘GO CAL’
    displayed at the top.

    √’SET SPAN’ is displayed at the top

13. Press “+” button.
    √’ZERO’ is displayed at the top

    Wait 15 seconds.
    √’ZEROING’ is displayed at top

15. After ‘ZERO’ displayed at top
    MODE pb → Press (once)
    After 15 seconds, verify nominal display (gas concentrations).

16. Sampling Pump switch → OFF

17. Prime CSA-CP ←|→ Sampling Pump
    Temporarily stow prime CSA-CP.

18. Unstow backup CSA-CP from CSA-CP Stowage Kit.

20. **ACTIVATE BACKUP CSA-CP**

   **NOTE**
   Audible beeps occur when the MODE pushbutton is depressed during unit activation.

   20.1 MODE pb → Press, hold until ‘RELEASE’ displayed

   **NOTE**
   Unit self-check routine will take approximately 1 minute. A single beep occurs when the self-check routine is complete.

   20.2 √Display indicates readings for OXYGEN, HCN, HCL, and CO
21. Perform steps 10 --- 16 in this procedure, then:

22. Backup CSA-CP ←→ Sampling Pump
    Temporarily stow backup CSA-CP.

23. Remove Zero Filter from Sampling Pump inlet.
    Replace tethered end-caps and tighten to finger tight.

    **NOTE**
    Damage to O-ring can occur if over-tightened.

24. Replace Sampling Pump Filter and tighten until snug.


26. Retrieve both CSA-CPs.

27. Compare readings from the two units.
    Verify comparable values to the following
    - CO: ± 5 ppm
    - HCN: ± 0.6 ppm
    - HCl: ± 0.6 ppm

    If no comparable values, notify **MCC**.

28. Deactivate backup CSA-CP.
    MODE pb → Press, hold until ‘RELEASE’ displayed

    √CSA-CP OFF

29. Stow backup Stowage Kit.

30. Stow CSA-CP Stowage Kit.

31. Redeploy prime CSA-CP.
NOTE

1. Monitor attachment site must permit air to move freely over monitor surface.

2. Monitors are deployed in duplicate each scheduled day.

3. Execute experiment for 24 hours.

1. Unstow FMK from stowage location.

2. Remove two monitors from kit.

3. Record (on both monitors):
   Placement location (TBD)
   Date and time in “START” space

00:00:00 4. Remove, dispose “REMOVE TO START” labels.

5. Remove, dispose adhesive covers on Velcro (on back of monitor).

6. Secure monitors side by side (distance ≈ 5 --- 10 cm).

24:00:00 7. Detach monitors from area location.

8. Seal monitoring surface with “APPLY TO STOP” label (on back of monitor).

9. Record date and time in “STOP” space.

10. Stow used monitor in “RETURN BAG” in FMK.

11. Stow FMK.
1. Unstow GSC from stowage location.

2. Record sampling data on GSC label. (Day/HH:MM and Location of sample)

3. Remove tethered inlet cap.

   **NOTE**
   When taking sample, hold GSC far away from body.

4. Open valve for 10 seconds.

   **NOTE**
   A click sound occurs when valve has been closed to the proper position.

5. Close valve until it slips and locks.

6. Replace tethered inlet cap.

7. Stow GSC.
1. Retrieve In-Flight Results Data Sheet(s).

2. Power up MEC.

3. Double-click on CHeCS applications icon.

4. Double-click on Microbiology icon.

5. Click on sample type (‘Air’, ‘Surface’, or ‘Water’).

6. Move cursor to navigation buttons at bottom of screen.

7. Click on the button to begin a new page.

8. Click on the pulldown menu in the Collection Site and select appropriate sample location.

9. Click in ‘Sample Collection Date’ box and type in appropriate date (DD/MM/YR).

10. Click in box for ‘Incubation Temperature’ and type in appropriate temperature (if known).

11. Click on ‘2 Day Report’ tab.

12. Click on ‘Bacteria Direct Count’ box and type in direct count (if available) or click on ‘Colony Density Comparison’ (‘Total Count’ for water samples) to activate pulldown menu and select appropriate choice.

13. Click on ‘5 Day Report’ tab.

14. Repeat step 10 for Bacteria and Fungi (‘Total Count’ for water).

15. Click on NEXT to continue data entry or MAIN MENU to enter different sample type.

16. Repeat steps 5 --- 15 for each sample type.

17. After completion of all data entry, click on EXIT to exit the MEC or MAIN MENU to close Microbiology file.

18. Click on EXIT to exit the Microbiology file.

**NOTE**
Previous data may be viewed by clicking on PREVIOUS or by using the navigation buttons at the bottom of each screen.
Water collection will be taken from three locations for Chemical and Microbiology analyses: SRV-K горячая вода (hot water tap), SRV-K холодная вода (cold water tap), and SVO-ZV. The entire collection procedure will be completed for each tap before proceeding to remaining taps.

FGB
1. Unstow from Water Sampler & Archiver (WS&A):
   1_426 ISS Potable Water Collection Subpack (one)
   WS&A Sharpie Pen
   Water Microbiology Kit (WMK)

CAUTION
1. To avoid contamination, use new potable water sampler for each tap.

2. Wipe appropriate tap SRV-K (SVO-ZV) with Disinfectant Wipe. Discard Wipe.

3. Remove one potable water sampler from Water Sampler & Archiver (WS&A) Subpack and remove from protective package. Place potable water sampler package in WS&A.

CAUTION
1. To avoid sample contamination, do not touch SRV-K (SVO-ZV) tap.
2. Hold potable water sampler by middle only.

5. **ATTACHING SMALL WASTE WATER BAG**

Unstow one Small Waste Water Bag from WS&A Subpack.
Remove cap from Small Waste Water Bag connection.
Attach the Small Waste Water Bag to potable water sampler, bag connection.

6. **COLLECTING WATER INTO SMALL WASTE WATER (FLUSH) BAG**

Switch WATER QUANTITY mL
(ПОРЦИЯ ВОДЫ В МЛ) → CONTINUOUS (НЕПРЕР)

Delivery valve (HOT (ГОР) or COLD (ТЕПЛ)) → OPEN (ОТКР)

√DSPR RDY (ПОДАЧА ВОДЫ) LED is lit

Push H2O DSPR Pump (ПОДАЧА ВОДЫ) pb → ON (БКА)

Place 25 mL of water (one cycle of dispenser) into Small Waste Water Bag (1/12 full).

Push H2O DSPR Pump (ПОДАЧА ВОДЫ) pb → OFF when desired amount of H2O has been dispensed

Delivery valve (HOT (ГОР) or COLD (ТЕПЛ)) → CLOSE (ЗАКР)
(after each portion collection)

**NOTE**

1. Do not remove Small Waste Water Bag until ready to connect TOC Water Sample Bag or Syringe.

2. Do not perform collection into TOC Sample Syringe unless instructed to.

7. Unstow TOC Water Sample Bag or TOC Sample Syringe from WS&A Subpack.

8. Record date, time, and sampling location on Bag or Syringe.

Label using Sharpie Pen.
9. REMOVING SMALL WASTE WATER BAG

10. ATTACHING TOC WATER SAMPLE BAG OR SYRINGE TO POTABLE WATER SAMPLER CONNECTION

BAG
Remove cap from TOC Water Sample Bag connection. Attach TOC Water Sample Bag to potable water sampler, bag connection √. √Connection is tight

SYRINGE
Remove cap from TOC Sample Syringe connection. Attach TOC Sample Syringe to potable water sampler, Syringe connection √. √Connection is tight

NOTE
Do not overfill bag. Overfilled bag may cause leakage.

OPENS SYRINGE SHUTOFF VALVE
Turn valve to position that is parallel to flow direction.
11. **COLLECTING WATER INTO TOC WATER SAMPLE BAG OR SYRINGE**

If collection into Bag

<table>
<thead>
<tr>
<th>SRV-K (БРП-М hot or cold)</th>
<th>SVO-ZV</th>
</tr>
</thead>
<tbody>
<tr>
<td>ПУРВ-К</td>
<td>Place 100 mL of water into TOC Water Sample Bag (1/3 full).</td>
</tr>
<tr>
<td>Switch WATER QUANTITY mL</td>
<td></td>
</tr>
<tr>
<td>(ПОРЦИЯ ВОДЫ В МЛ) →</td>
<td></td>
</tr>
<tr>
<td>CONTINUOUS (НЕПРЕР)</td>
<td></td>
</tr>
<tr>
<td>Delivery valve (HOT (ГОР) or COLD (ТЕПЛ)) → OPEN (ОТКР)</td>
<td></td>
</tr>
<tr>
<td>√DSPR RDY (ПОДАЧА ВОДЫ) LED is lit</td>
<td></td>
</tr>
<tr>
<td>Push H2O DSPR Pump (ПОДАЧА ВОДЫ) pb → ON (ВКА)</td>
<td></td>
</tr>
<tr>
<td>Place 100 mL of water (four deliveries) into TOC Water Sample Bag (1/3 full).</td>
<td></td>
</tr>
<tr>
<td>Push H2O DSPR Pump (ПОДАЧА ВОДЫ) pb → OFF when desired amount of H2O has been dispensed</td>
<td></td>
</tr>
<tr>
<td>Delivery valve (HOT (ГОР) or COLD (ТЕПЛ)) → CLOSE (ЗАКР) (after each portion collection)</td>
<td></td>
</tr>
</tbody>
</table>
If collection into Syringe

Switch WATER QUANTITY mL
(ПОРЦИЯ ВОДЫ В МЛ) → CONTINUOUS (НЕПРЕР)

Delivery valve (HOT (ГОР) or COLD (ТЕПЛ)) → OPEN (ОТКР)

NOTE
Plunger is designed so that it cannot be withdrawn beyond 25 mL mark. Do not underfill Syringe.

Place 25 mL of water into TOC Sample Syringe.

NOTE
Plunger is designed so that it cannot be withdrawn beyond 25 mL mark. Do not underfill Syringe.

Place 25 mL of water (one cycle of dispenser) into TOC Water Sample Syringe.

Push H2O DSPR Pump (ПОДАЧА ВОДЫ) pb → ON (ВКА)

Push H2O DSPR Pump (ПОДАЧА ВОДЫ) pb → OFF when desired amount of H2O has been dispensed

Delivery valve (HOT (ГОР) or COLD (ТЕПЛ)) → CLOSE (ЗАКР)
(after each portion collection)

Turn syringe vlv perpendicular to flow direction.

NOTE
Do not remove TOC Water Sample Bag or Syringe until ready to connect Chemical Post-Flight Analysis Bag.


Record date, time, and sampling location on Chemical Sample Post-Flight Analysis Bag Label using Sharpie Pen.
13. **REMOVING TOC WATER SAMPLE BAG OR SYRINGE/ATTACHING CHEMICAL SAMPLE POST-FLIGHT ANALYSIS BAG**

<table>
<thead>
<tr>
<th>BAG</th>
<th>SYRINGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remove TOC Water Sample Bag from potable water sampler, bag connection.</td>
<td>Remove TOC Sample Syringe from potable water sampler, bag connection.</td>
</tr>
<tr>
<td>Replace cap on bag.</td>
<td>Replace cap on syringe connection.</td>
</tr>
<tr>
<td>Remove cap from Chemical Sample Post-Flight Analysis Bag connection.</td>
<td>Attach Chemical Sample Post-Flight Analysis Bag to water potable water sampler, bag connection.</td>
</tr>
<tr>
<td>Attach Chemical Sample Post-Flight Analysis Bag to water potable water sampler, bag connection.</td>
<td>Replace cap on syringe connection.</td>
</tr>
<tr>
<td>Place TOC Water Sample Bag into small Ziploc Storage Bag.</td>
<td>Place Syringe into small Ziploc Storage Bag.</td>
</tr>
<tr>
<td>Temporary stow Sample Bag in WS&amp;A.</td>
<td>Temporary stow in WS&amp;A.</td>
</tr>
</tbody>
</table>
14. **COLLECTING WATER INTO CHEMICAL SAMPLE POST-FLIGHT ANALYSIS BAG**

**ПУРВ-К**

Switch WATER QUANTITY mL (ПОРЦИЯ ВОДЫ В МЛ) → CONTINUOUS (НЕПРЕР)

Delivery valve (HOT (ГОР)) or COLD (ТЕПЛО) → OPEN (ОТКР)

√DSPR RDY (ПОДАЧА ВОДЫ) LED is lit

Push H2O DSPR Pump (ПОДАЧА ВОДЫ) pb → ON (ВКЛ)

Place 750 mL of water (30 deliveries) into Chemical Sample Post-Flight Analysis Bag (3/4 full).

Push H2O DSPR Pump (ПОДАЧА ВОДЫ) pb → OFF when desired amount of H2O has been dispensed

Delivery valve (HOT (ГОР)) or COLD (ТЕПЛО) → CLOSE (ЗАКР) (after each portion collection)

**NOTE**

Do not remove Chemical Sample Post-Flight Analysis Bag until ready to connect Micro-Sample In-Flight Analysis Bag.

15. **Unstow Micro-Sample In-Flight Analysis Bag from WMK Subpack.**

Record date and circle sampling location on Micro-Sample In-Flight Analysis Bag using Sharpie Pen.

**CAUTION**

Do not remove potable water sampler from port until all samples have been collected from that port.

16. **REMOVING CHEMICAL SAMPLE POST-FLIGHT ANALYSIS BAG**

Remove Chemical Sample Post-Flight Analysis Bag from potable water sampler, bag connection (circle).

Replace cap on bag.

Place bag into large Ziploc Storage Bag.

Temporary stow bag in TBD.
17. **ATTACHING MICRO-SAMPLE IN-FLIGHT ANALYSIS BAG**

Remove cap from Micro-Sample In-Flight Analysis Bag. Attach Micro-Sample In-Flight Analysis Bag to potable water sampler, bag connection ↗.

**NOTE**
Do not overfill bag. Overfilled bag may cause leakage.

18. **COLLECTING WATER INTO MICRO-SAMPLE IN-FLIGHT ANALYSIS BAG**

<table>
<thead>
<tr>
<th>SRV-K (БРП-М hot or cold)</th>
<th>SVO-ZV</th>
</tr>
</thead>
<tbody>
<tr>
<td>ПУРВ-К Switch WATER QUANTITY mL (ПОРЦИЯ ВОДЫ В МЛ) → CONTINUOUS (НЕПРЕР)</td>
<td>Place 125 mL of water into Micro-Sample In-Flight Bag (1/2 full).</td>
</tr>
</tbody>
</table>

Delivery valve (HOT (ГОР) or COLD (ТЕПЛ)) → OPEN (ОТКР)

\[\sqrt{\text{DSPR RDY (ПОДАЧА ВОДЫ) LED is lit}}\]

Push H2O DSPR Pump (ПОДАЧА ВОДЫ) pb → ON (ВКА)

Place 125 mL of water (five deliveries) into Micro-Sample In-Flight Bag (3/4 full).

Push H2O DSPR Pump (ПОДАЧА ВОДЫ) pb → OFF when desired amount of H2O has been dispensed

Delivery valve (HOT (ГОР) or COLD (ТЕПЛ)) → CLOSE (ЗАКР) (after each portion collection)

**NOTE**
Do not remove Micro-Sample In-Flight Analysis Bag until ready to connect Micro-Sample Post-Flight Analysis Bag.

19. Unstow Micro-Sample Post-Flight Analysis Bag from WMK Subpack. Record date and circle sampling location on Bag using Sharpie Pen.

**CAUTION**
Do not remove potable water sampler from port until all samples have been collected from that port.
20. **REMOVING MICRO-SAMPLE IN-FLIGHT ANALYSIS BAG**
Remove Micro-Sample In-Flight Analysis Bag from potable water sampler, bag connection \( \sim \).
Replace cap on bag connection.
Temporary stow bag in WMK.

Attach Micro-Sample Post-Flight Analysis Bag to water sampler, bag connection \( \sim \).

22. **COLLECTING WATER INTO MICRO-SAMPLE POST-FLIGHT ANALYSIS BAG**

<table>
<thead>
<tr>
<th>SRV-K (БРП-М hot or cold)</th>
<th>SVO-ZV</th>
</tr>
</thead>
<tbody>
<tr>
<td>ПУРВ-К Switch WATER QUANTITY mL (ПОРЦИЯ ВОДЫ В МЛ)</td>
<td>Place 1000 mL of water into Micro-Sample Post-Flight Bag (full).</td>
</tr>
<tr>
<td>CONTINUOUS (НЕПРЕР)</td>
<td></td>
</tr>
</tbody>
</table>

Delivery valve (HOT (ГОР) or COLD (ТЕПЛ)) \( \rightarrow \) OPEN (ОТКР)

\( \sqrt{DSPR RDY (ПОДАЧА ВОДЫ)} \) LED is lit

Push H2O DSPR Pump (ПОДАЧА ВОДЫ) pb \( \rightarrow \) ON (ВКА)

Place 1000 mL of water (40 deliveries) into Micro-Sample Post-Flight Bag (full).

Push H2O DSPR Pump (ПОДАЧА ВОДЫ) pb \( \rightarrow \) OFF when desired amount of H2O has been dispensed

Delivery valve (HOT (ГОР) or COLD (ТЕПЛ)) \( \rightarrow \) CLOSE (ЗАКР) (after each portion collection)

23. **REMOVING MICRO-SAMPLE POST-FLIGHT ANALYSIS BAG**
Remove Micro-Sample Post-Flight Analysis Bag from potable water sampler, bag connection \( \sim \).
Replace cap on bag.
Place bag into large Ziploc Storage Bag (from WMK Subpack).
Temporary stow bag in WMK.

24. Remove potable water sampler from SRV-K (SVO-ZV) tap.
25. Place potable water sampler into small Ziploc Storage Bag. Place in WS&A Subpack.

26. Repeat steps 2 --- 25 for other ports requiring sampling.

27. Place Subpack into WS&A.

28. Stow WS&A.
Collect 25 mL in Small Waste Water Bag

Collect 100 mL in TOC Water Sample Bag

Collect 750 mL in Chemical Sample Post-Flight Analysis Bag

Collect 125 mL in Micro-Sample In-Flight Analysis Bag

Collect 1000 mL in Micro-Sample Post-Flight Analysis Bag

Figure 1.- Water Collection Order - Chemical and Micro In-Flight and Post-Flight.
NOTE
Water collection will be taken from three locations for Chemical and Microbiology analyses: SRV-K Гор (hot water tap), SRV-K ТЕПЛ (cold water tap), and SVO-ZV. The entire collection procedure will be completed for each tap before proceeding to remaining taps.

FGB
1. Unstow from Water Sampler & Archiver (WS&A):
   1_426 ISS Potable Water Collection Subpack (one)
   WS&A Sharpie Pen
   Water Microbiology Kit (WMK)

NOTE
1. SRV-K water: Turn SRV-K heater on before collecting water samples. Start sampling only after heating cycle is completed. Each heating cycle requires 15 minutes for pasteurization of 525 mL of water. One delivery = 25 mL.

2. SVO-ZV: The hand pump may be used to provide sufficient pressure to permit water sample collection. There is no device for accurate SVO-ZV water amount measurement.

3. Crewmember will be required to perform visual estimation of 25 mL of flush water and 100 mL and 125 mL samples by comparison to SRV-K samples.

CAUTION
To avoid contamination, use new potable water sampler for each tap.

2. Wipe appropriate tap SRV-K (SVO-ZV) with Disinfectant Wipe. Discard wipe.

3. Remove one potable water sampler from WS&A Subpack and remove from protective package. Place potable water sampler package in WS&A.

CAUTION
1. To avoid sample contamination, do not touch SRV-K (SVO-ZV) tap.

2. Hold potable water sampler by middle only.

5. **ATTACHING SMALL WASTE WATER BAG**
   Unstow one Small Waste Water Bag from WS&A Subpack.
   Remove cap from Small Waste Water Bag connection.
   Attach the Small Waste Water Bag to potable water sampler, bag connection.

6. **COLLECTING WATER INTO WASTE WATER (FLUSH) BAG**

   **SRV-K (БРП-М Hot or Cold)**
   Switch WATER QUANTITY mL (ПОРЦИЯ ВОДЫ В МЛ) → CONTINUOUS (НЕПРЕР)

   Delivery valve (HOT (ГОР) or COLD (ТЕПЛ)) → OPEN (ОТКР)

   √DSPR RDY (ПОДАЧА ВОДЫ) LED is lit

   Push H2O DSPR Pump (ПОДАЧА ВОДЫ) pb → ON (ВКА)

   Place 25 mL of water into Small Waste Water Bag (1/12 full).

   Push H2O DSPR Pump (ПОДАЧА ВОДЫ) pb → OFF when desired amount of H2O has been dispensed

   Delivery valve (HOT (ГОР) or COLD (ТЕПЛ)) → CLOSE (ЗАКР)

   (after each portion collection)

   **SVO-ZV**

   Place 25 mL of water into Small Waste Water Bag (1/12 full).

   **NOTE**
   1. Do not remove Small Waste Water Bag until ready to connect TOC Water Sample Bag or Syringe.
   2. Do not perform collection into TOC Sample Syringe unless instructed to.

7. Unstow TOC Water Sample Bag or TOC Sample Syringe from WS&A Subpack.

8. Record date, time, and sampling location on Bag or Syringe.
   Label using Sharpie Pen.
9. **REMOVING SMALL WASTE WATER BAG**

10. **ATTACHING TOC WATER SAMPLE BAG OR SYRINGE TO POTABLE WATER SAMPLER CONNECTION**

**Bag**
Remove cap from TOC Water Sample Bag connection.
Attach TOC Water Sample Bag to potable water sampler, bag connection.

**Syringe**
Remove cap from TOC Sample Syringe connection.
Attach TOC Sample Syringe to potable water sampler, Syringe connection.

√ Connection is tight

**NOTE**
Do not overfill bag. Overfilled bag may cause leakage.

**OPENING SYRINGE SHUTOFF VLV**
Turn vlv to position that is parallel to flow direction.
11. **COLLECTING WATER INTO TOC WATER SAMPLE BAG OR SYRINGE**

If collection into Bag

<table>
<thead>
<tr>
<th>SRV-K (БРП-М Hot or Cold)</th>
<th>SVO-ZV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switch WATER QUANTITY mL</td>
<td>Place 100 mL of water into TOC</td>
</tr>
<tr>
<td>(ПОРЦИЯ ВОДЫ В МЛ) → CONTINUOUS (НЕПРЕП)</td>
<td>Water Sample Bag (1/3 full).</td>
</tr>
<tr>
<td>Delivery valve (HOT (ГОР) or COLD (ТЕПЛ)) → OPEN (ОТКР)</td>
<td></td>
</tr>
<tr>
<td>√DSPR RDY (ПОДАЧА ВОДЫ) LED is lit</td>
<td></td>
</tr>
<tr>
<td>Push H2O DSPR Pump (ПОДАЧА ВОДЫ) pb → ON (ВКА)</td>
<td></td>
</tr>
<tr>
<td>Place 100 mL of water (four deliveries) into TOC Water Sample Bag (1/3 full).</td>
<td></td>
</tr>
<tr>
<td>Push H2O DSPR Pump (ПОДАЧА ВОДЫ) pb → OFF when desired amount of H2O has been dispensed</td>
<td></td>
</tr>
<tr>
<td>Delivery valve (HOT (ГОР) or COLD (ТЕПЛ)) → CLOSE (ЗАКР)</td>
<td></td>
</tr>
<tr>
<td>(after each portion collection)</td>
<td></td>
</tr>
</tbody>
</table>

If collection into Syringe

<table>
<thead>
<tr>
<th>SRV-K (БРП-М Hot or Cold)</th>
<th>SVO-ZV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switch WATER QUANTITY mL</td>
<td>NOTE</td>
</tr>
<tr>
<td>(ПОРЦИЯ ВОДЫ В МЛ) → CONTINUOUS (НЕПРЕП)</td>
<td>Plunger is designed so that it cannot be withdrawn beyond 25 mL mark. Do not underfill Syringe.</td>
</tr>
<tr>
<td>Delivery valve (HOT (ГОР) or COLD (ТЕПЛ)) → OPEN (ОТКР)</td>
<td></td>
</tr>
</tbody>
</table>

**CAUTION**

Do not remove potable water sampler from port until all samples have been collected from that port.
13. **REMOVING TOC WATER SAMPLE BAG OR SYRINGE/ATTACHING CHEMICAL SAMPLE POST-FLIGHT ANALYSIS BAG**

<table>
<thead>
<tr>
<th>Bag</th>
<th>Syringe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remove TOC Water Sample Bag from potable Water Sampler, bag connection.</td>
<td>Remove TOC Sample Syringe from potable water sampler bag connection.</td>
</tr>
<tr>
<td>Replace cap on bag.</td>
<td>Replace cap on syringe connection.</td>
</tr>
<tr>
<td>Remove cap from Chemical Sample Post-Flight Analysis Bag connection.</td>
<td>Attach Chemical Sample Post-Flight Analysis Bag to water potable water sampler, bag connection.</td>
</tr>
<tr>
<td>Attach Chemical Sample Post-Flight Analysis Bag to water potable water sampler, bag connection.</td>
<td>Replace cap on syringe connection.</td>
</tr>
<tr>
<td>Place TOC Water Sample Bag into small Ziploc Storage Bag.</td>
<td>Place Syringe into small Ziploc Storage Bag.</td>
</tr>
<tr>
<td>Temporary stow Sample Bag in WS&amp;A.</td>
<td>Temporary stow in WS&amp;A.</td>
</tr>
</tbody>
</table>

14. **COLLECTING WATER INTO CHEMICAL SAMPLE POST-FLIGHT ANALYSIS BAG**

<table>
<thead>
<tr>
<th>СРВ-К (БРП-М Hot or Cold)</th>
<th>СВО-ЗВ</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ПУРВ-К</strong></td>
<td><strong>ПУРВ-К</strong></td>
</tr>
<tr>
<td>Switch WATER QUANTITY mL (ПОРЦИЯ ВОДЫ В МЛ) → CONTINUOUS (НЕПРЕР)</td>
<td>Place 750 mL of water into Chemical Sample Post-Flight Analysis Bag (3/4 full).</td>
</tr>
<tr>
<td>Delivery valve (HOT (ГОР) or COLD (ТЕПЛ)) → OPEN (ОТКР)</td>
<td></td>
</tr>
<tr>
<td>√DSPR RDY (ПОДАЧА ВОДЫ) LED is lit</td>
<td></td>
</tr>
<tr>
<td>Push H2O DSPR Pump (ПОДАЧА ВОДЫ) pb → ON (ВКА)</td>
<td></td>
</tr>
<tr>
<td>Push H2O DSPR Pump (ПОДАЧА ВОДЫ) pb → OFF when desired amount of H2O has been dispensed</td>
<td></td>
</tr>
<tr>
<td>Place 750 mL of water (30 deliveries) into Chemical Sample Post-Flight Analysis Bag (3/4 full).</td>
<td></td>
</tr>
<tr>
<td>Delivery valve (HOT (ГОР) or COLD (ТЕПЛ)) → CLOSE (ЗАКР) (after each portion collection)</td>
<td></td>
</tr>
</tbody>
</table>
15. Unstow Micro-Sample In-Flight Analysis Bag from WMK Subpack.

Record date and circle sampling location on Micro-Sample In-Flight Analysis Bag using Sharpie Pen.

**CAUTION**

Do not remove potable water sampler from port until all samples have been collected from that port.

16. **REMOVING CHEMICAL SAMPLE POST-FLIGHT ANALYSIS BAG**

Remove Chemical Sample Post-Flight Analysis Bag from potable water sampler, bag connection 🔗. Replace cap on bag. Place bag into large Ziploc Storage Bag. Temporary stow bag in TBD.

17. **ATTACHING MICRO-SAMPLE IN-FLIGHT ANALYSIS BAG**

Remove cap from Micro-Sample In-Flight Analysis Bag. Attach Micro-Sample In-Flight Analysis Bag to potable water sampler, bag connection 🔗.

**NOTE**

Do not overfill bag. Overfilled bag may cause leakage.
18. **COLLECTING WATER INTO MICRO-SAMPLE IN-FLIGHT ANALYSIS BAG**

<table>
<thead>
<tr>
<th>SRV-K (БРП-М Hot or Cold)</th>
<th>SVO-ZV</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ПУРВ-К</strong></td>
<td><strong>ПУРВ-К</strong></td>
</tr>
<tr>
<td>Switch WATER QUANTITY mL</td>
<td>Place 125 mL of water into Micro-Sample In-Flight Bag (1/2 full).</td>
</tr>
<tr>
<td>(ПОРЦИЯ ВОДЫ В МЛ) → CONTINUOUS (НЕПРЕР)</td>
<td></td>
</tr>
<tr>
<td>Delivery valve (HOT (ГОР) or COLD (ТЕПЛ) → OPEN (ОТКР))</td>
<td></td>
</tr>
<tr>
<td>√DSPR RDY (ПОДАЧА ВОДЫ) LED is lit</td>
<td></td>
</tr>
<tr>
<td>Push H2O DSPR Pump (ПОДАЧА ВОДЫ) pb → ON (ВКА)</td>
<td></td>
</tr>
<tr>
<td>Place 125 mL of water (five deliveries) into Micro-Sample In-Flight Bag (3/4 full).</td>
<td></td>
</tr>
<tr>
<td>Push H2O DSPR Pump (ПОДАЧА ВОДЫ) pb → OFF when desired amount of H2O has been dispensed</td>
<td></td>
</tr>
<tr>
<td>Delivery valve (HOT (ГОР) or COLD (ТЕПЛ)) → CLOSE (ЗАКР) (after each portion collection)</td>
<td></td>
</tr>
</tbody>
</table>

19. Remove Micro-Sample In-Flight Analysis Bag connection 🅌. Place cap on bag connection. Temporary stow bag in WMK.

20. Remove potable water sampler from SRV-K (SVO-ZV) tap.


22. Repeat steps 2 --- 21 for other ports requiring sampling.

23. Place Subpack into WS&A.

24. Stow WS&A.
ISS WATER SAMPLING SEQUENCE

Collect 25 mL in Small Waste Water Bag

Collect 100 mL in TOC Water Sample Bag

Collect 750 mL in Chemical Sample Post-Flight Analysis Bag

Collect 125 mL in Micro-Sample In-flight Analysis Bag

Collect 1000 mL in Micro-Sample Post-Flight Analysis Bag

Figure 1.- ISS Water Sampling Sequence.
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Water collection will be taken from three locations for Chemical and Microbiology analyses: SRV-K Гор (hot water tap), SRV-K TEP (cold water tap), and SVO-ZV. The entire collection procedure will be completed for each tap before proceeding to remaining taps.

FGB 1. Unstow from Water Sampler & Archiver (WS&A):
   1_426 ISS Potable Water Collection Subpack (one)
   WS&A Sharpie Pen
   Water Microbiology Kit (WMK)

   1. SRV-K water: Turn SRV-K heater on before collecting water samples. Start sampling only after heating cycle is completed. Each heating cycle requires 15 minutes for pasteurization of 525 mL of water. One delivery = 25 mL.

   2. SVO-ZV: The hand pump may be used to provide sufficient pressure to permit water sample collection. There is no device for accurate SVO-ZV water amount measurement.

   3. Crewmember will be required to perform visual estimation of 25 mL of flush water and 100 mL and 125 mL samples by comparison to SRV-K samples.


5. **ATTACHING SMALL WASTE WATER BAG**

6. **COLLECTING WATER INTO SMALL WASTE WATER (FLUSH) BAG**
   **SRV-K (БРП-М Hot or Cold) SVO-ZV**
   - Switch WATER QUANTITY mL (ПОРЦИЯ ВОДЫ В МЛ) → CONTINUOUS (НЕПРЕР)
   - Delivery valve (HOT (ГОР) or COLD (ТЕПЛ)) → OPEN (ОТКР)
   - DSPR RDY (ПОДАЧА ВОДы) LED is lit
   - Push H2O DSPR Pump (ПОДАЧА ВОДы) pb → ON (ВКА)
   
   Place 25 mL of water (one cycle dispenser) into Small Waste Water Bag (1/12 full).
   
   Delivery valve (HOT (ГОР) or COLD (ТЕПЛ)) → CLOSE (ЗАКР)
   (after each portion collection)

   **NOTE**
   1. Do not remove Small Waste Water Bag until ready to connect TOC Water Sample Bag or Syringe.
   2. Do not perform collection into TOC Sample Syringe unless instructed to.

7. Unstow TOC Water Sample Bag or TOC Sample Syringe from Subpack.

8. Record date, time, and sampling location on Bag or Syringe. Label using Sharpie Pen.
CAUTION
Do not remove potable water sampler from port until all samples have been collected from that port.

9. REMOVING SMALL WASTE WATER BAG
Remove Small Waste Water Bag from potable water sampler, bag connection ▽.
Replace cap onto Small Waste Water Bag connection.
Place the Small Waste Water Bag into a small Ziploc Storage Bag.
Stow in Subpack (WS&A).

10. ATTACHING TOC WATER SAMPLE BAG OR SYRINGE TO POTABLE WATER SAMPLER CONNECTION
Bag
Remove cap from TOC Water Sample Bag connection.
Attach TOC Water Sample Bag to potable water sampler, bag connection ▽.
√ Connection is tight

Syringe
Remove cap from TOC Sample Syringe connection.
Attach TOC Sample Syringe to potable water sampler, syringe connection ▽.
√ Connection is tight
Open Syringe Shutoff Valve
Turn vlv to position that is parallel to flow direction.

NOTE
Do not overfill bag. Overfilled bag may cause leakage.
11. COLLECTING WATER INTO TOC WATER SAMPLE BAG OR SYRINGE

If collection into Bag

SRV-K (БРП-М Hot or Cold)

ПУРВ-К

Switch WATER QUANTITY mL
(ПОРЦИЯ ВОДЫ В МЛ) → CONTINUOUS (НЕПРЕР)

Delivery valve (HOT (ГОР) or COLD (ТЕПЛ)) → OPEN (ОТКР)

√DSPR RDY (ПОДАЧА ВОДЫ) LED is lit

Push H2O DSPR Pump (ПОДАЧА ВОДЫ) pb → ON (ВКА)

Place 100 mL of water (four deliveries) into TOC Water Sample Bag (1/3 full).

Push H2O DSPR Pump (ПОДАЧА ВОДЫ) pb → OFF when desired amount of H2O has been dispensed

Delivery valve (HOT (ГОР) or COLD (ТЕПЛ)) → CLOSE (ЗАКР)
(after each portion collection)

If collection into Syringe

SRV-K (БРП-М Hot or Cold)

ПУРВ-К

Switch WATER QUANTITY mL
(ПОРЦИЯ ВОДЫ В МЛ) → CONTINUOUS (НЕПРЕР)

Delivery valve (HOT (ГОР) or COLD (ТЕПЛ)) → OPEN (ОТКР)

NOTE
Plunger is designed so that it cannot be withdrawn beyond 25 mL mark. Do not underfill Syringe.
√DSPR RDY (ПОДАЧА ВОДЫ) LED is lit

Push H2O DSPR Pump (ПОДАЧА ВОДЫ) pb → ON (ВКА)

NOTE
Plunger is designed so that it cannot be withdrawn beyond 25 mL mark. Do not underfill Syringe.

Place 25 mL of water (one cycle of dispenser) into TOC Water Sample Syringe.

Push H2O DSPR Pump (ПОДАЧА ВОДЫ) pb → OFF when desired amount of H2O has been dispensed

Delivery valve (HOT (ГОР) or COLD (ТЕПЛ)) → CLOSE (ЗАКР)
(after each portion collection)

Turn Syringe vlv perpendicular to flow direction.

12. Remove Micro-Sample In-Flight Analysis Bag from WMK Subpack. Record date and circle sampling location (SRV-K hot, SRV-K cold, SVO-ZV) on bag using Sharpie Pen.

NOTE
Do not remove TOC Water Sample Bag or Syringe until ready to connect Micro-Sample In-Flight Analysis Bag.

CAUTION
Do not remove potable water sampler from port until all samples have been collected from that port.
13. REMOVING TOC WATER SAMPLE BAG OR SYRINGE/ATTACHING MICRO-SAMPLE IN-FLIGHT ANALYSIS BAG

<table>
<thead>
<tr>
<th>Bag</th>
<th>Syringe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remove cap from Micro-Sample In-Flight Analysis Bag connection.</td>
<td>Attach Micro-Sample In-Flight Analysis Bag to water potable water sampler, bag connection (∧).</td>
</tr>
<tr>
<td>Attach Micro-Sample In-Flight Analysis Bag to water potable water sampler, bag connection (∧).</td>
<td>Replace cap on syringe connection.</td>
</tr>
<tr>
<td>Place TOC Water Sample Bag into small Ziploc Storage Bag.</td>
<td>Place Syringe into small Ziploc Storage Bag.</td>
</tr>
<tr>
<td>Temporary stow Sample Bag in WS&amp;A.</td>
<td>Temporary stow in WS&amp;A.</td>
</tr>
</tbody>
</table>

14. COLLECTING WATER INTO MICRO-SAMPLE IN-FLIGHT ANALYSIS BAG

<table>
<thead>
<tr>
<th>SРВ-K (БРП-М Hot or Cold)</th>
<th>SVO-ZV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switch WATER QUANTITY mL</td>
<td>Place 125 mL of water into Water Sample Bag (1/2 full).</td>
</tr>
<tr>
<td>(ПОРЦИЯ ВОДЫ В МЛ)  → CONTINUOUS (НЕПРЕР)</td>
<td></td>
</tr>
<tr>
<td>Delivery valve (HOT (ГОР) or COLD (ТЕПЛ)) → OPEN (ОТКР)</td>
<td></td>
</tr>
<tr>
<td>√DSPR RDY (ПОДАЧА ВОДЫ) LED is lit</td>
<td></td>
</tr>
<tr>
<td>Push H2O DSPR Pump (ПОДАЧА ВОДЫ) pb → ON (ВКА)</td>
<td></td>
</tr>
<tr>
<td>Place 125 mL of water (five deliveries) into Micro-Sample Bag (3/4 full).</td>
<td></td>
</tr>
<tr>
<td>Push H2O DSPR Pump (ПОДАЧА ВОДЫ) pb → OFF when desired amount of H2O has been dispensed</td>
<td></td>
</tr>
<tr>
<td>Delivery valve (HOT (ГОР) or COLD (ТЕПЛ)) → CLOSE (ЗАКР) (after each portion collection)</td>
<td></td>
</tr>
</tbody>
</table>

15. Remove Micro-Sample In-Flight Analysis Bag from potable water sampler, bag connection (∧).

16. Replace cap on Micro-Sample In-Flight Analysis Bag connection.
17. Remove potable water sampler from SRV-K (SVO-ZV) tap.

18. Place potable water sampler into small Ziploc Storage Bag. Place in WS&A Subpack.

19. Repeat steps 2 --- 18 for other ports requiring sampling.

20. Place Subpack into WS&A.

21. Stow WS&A.
Water Collection Order
Chemical & Microbiology In-Flight

Collect 25 mL in Small Waste Water Bag

Collect 100 mL in TOC Water Sample Bag

Collect 125 mL in Micro-Sample In-Flight Analysis Bag

Figure 1.- Water Collection Order.
TBD 1. Unstow SSAS.

2. Deploy SSAS in a TBD location.

**NOTE**
1. Record exact date and time experiment begins and ends.
2. Ensure that inlet filter is not contaminated or obstructed.
3. Do not place SSAS near air supply fans.

3. Execute experiment according to instruction on instrument or per steps 4 --- 11.

4. Unscrew tethered inlet cap and attach to Velcro.

5. Selector valve position → corresponding sample period number (turn to position 1 for first sampling period).

6. Record sample (start) location, date, and time on hardware label.

7. Switch power → 'ON'

8. Switch power → 'OFF'

9. Selector valve position → ‘PARK’

10. Record sample (stop) date and time on hardware label.

11. Replace tethered inlet cap.

12. √Selector valve is set to park position and power switch is in the off position at the end of each sampling session

TBD 13. Stow SSAS.
NOTE
1. Due to the nature of this instrument, if there is an operational problem, the best thing to do is to try to start over at the beginning of the section. If that does not work, the SLM should be turned off and back on, to allow it to reset itself.

2. Note the difference between the instrument buttons (found on the green face), and the side buttons (found on the right side of the display screen). Be sure that the correct button is located before proceeding with the step.

SLM POWERUP
1. Unstow:
   SLM from Acoustic Countermeasures Kit

2. Attach foam wind screen to the microphone end if it is not there already.

3. Press $\text{on}$, wait for load screen to disappear.

4. If screen indicates a remote connection, use the side arrows to change it to local. This will happen only if the SLM was connected to the MEC the last time it was used.

5. Press $\text{on}$, to check battery level.

*********************************************************************************************
If the battery voltage is not at least 1 volt above SLM ‘Power-off Level’, change the batteries:
Unstow spare battery located within the Acoustic Countermeasures Hardware.
Press $\text{on}$ twice to turn SLM off.
Remove battery cover.
Remove and replace battery.
Replace cover.
Mark used battery with “X” using pen.
Stow used battery in Acoustic Countermeasures Kit.
Press $\text{on}$ to turn the power on.
Repeat step 5.
*********************************************************************************************

6. Push ‘ok’ if batteries were not changed.

7. Push $\Delta$, to calibrate the SLM.

   7.1 Press ‘Calibrate Menu’ (side button).

   7.2 Press ‘Charge Inject. Cal.’ (side button).

   7.3 Press ‘CIC-Check’ (side button).
7.4 √‘Deviation from Reference’ number in CIC Check section
   If this number is greater than ± 0.5 dB, make a note on the data
   sheet. If there is a message about the deviation being fairly large,
   ignore and proceed.

**SLM SETUP**

8. Set up the SLM by pressing .

8.1 Press the ‘Display Menu’ button on the side.

8.2 Press the ‘Spectrum’ button on the side.

8.3 Use the ‘▼’ (on instrument panel) to select ‘Meas. Par ↓’.

8.4 Press ‘Meas. Par ↓’ (side button) until ‘L_{Leq}’ shows on the screen.


10. Press ‘Set-up Menu’ (side button).

11. Press ‘Measurement Path’ (side button).

12. Press ‘►’ (on instrument panel) until ‘Internal Disk\Data\Meas\SLM\mmddyy’ is
    displayed.

13. Press ‘Create Dir.’ (side button).

   **NOTE**
   If directory name is entered incorrectly,
   go back to step 11.

14. Use ‘▼’ (on instrument panel) and the ‘Insert Char.’ (side button) to enter
    a directory name as follows: ‘SLM_mmddyy’.

15. Press ‘ok’ (side button).

16. Scroll down by pressing ‘▼’ (on instrument panel) until your directory is
    found.
    Press ‘►’(on instrument panel) until ‘No Files Found’ is displayed.

17. Press ‘Save’ (side button).

18. Press ‘Set-up menu’ (side button). Display screen should show ‘Internal
    Disk\Data\Meas\SLM_mmddyy’.
TAKING MEASUREMENTS WITH THE SLM

19. Press $\Delta$, a spectrum graph should be seen.

NOTE
When you are in position, make sure everyone in the module is quiet before taking measurements.

20. Holding SLM as far away from the body as possible (with arm fully extended), point it at the desired location and tilt up 70°.

21. Press $\square$. 

NOTE
If any random noises occurred during the measurement, start the measurement over by pressing $\square$ again.

22. A ‘►’ will appear in the upper-left corner of the display screen to indicate measurements are being taken. When the triangle turns to ‘■’ (after 15 seconds), the measurement is done.

23. After measurement is finished, save the data by pressing the $\downarrow$ button.

√Path is ‘SLM_mmddyy’

Save in the first data file displayed.

NOTE
If you do not push ‘ok’, the measurement will not be stored.

24. Press ‘ok’ (side button) to save it.

25. Repeat steps 21 --- 24 until measurements are obtained from all locations.

26. Power down by pressing $\Box$.

TBD 27. Proceed to SOUND LEVEL METER - TRANSFER (SODF: MED OPS: NOMINAL: EHS) or stow SLM in Acoustic Countermeasures Hardware.
1. Unstow:
   RS232 cable and Sound Level Meter (SLM) (if not already unstowed) from Acoustic Countermeasures Kit.

2. Connect RS232 cable to MEC Serial Port and SLM Serial Port (9-pin female connection).

3. Power on SLM by pressing 📷.

4. On MEC, click on CHeCS icon.

5. Select ‘Noise Explorer’.
   After NASA Screen displays you will see a gray background.


8. For Auto Start, select ‘Com 1’, ‘19200 Baud Rate’, and ‘Never’.

9. Click on ‘Test’.

10. Click on ‘Test Connection’.

11. √ Testing connection to 2260’ indicated ‘passed’
    √ Testing hardwire handshake’ indicates ‘passed’

12. On SLM, √‘Control Mode: Remote’

13. Close MEC test window.


15. Select ‘Insert – New Measurement via RS232 cable…’.

16. Select ‘Next’.

17. On transfer data menu, select directory in which the measurements were stored.

18. Highlight file to transfer and select ‘finish’.

19. √‘now transferring’ displayed on screen (data will automatically be displayed)

20. Repeat steps 13 --- 19 until all files have been transferred.

21. Select ‘File – Save Project As…’.
22. Choose directory: ‘C:\CHeCS\SLM’.
23. Type project name (‘SLM mmddyy’) and select ‘Save’.
24. Exit program.
25. Press ↓ on side buttons to change control to local.
26. Turn off Power to SLM by pressing twice.
27. Disconnect RS232 cable.
1. Unstow SSK Containing:
   TBD Surface Sampler Packet Assemblies (Foil Wrap) (ten), each includes:
   - Tube with Swab (with white and red dots) (one)
   - Media Slide with white dot (in Protective Cover) (one)
   - Media Slide with red dot (in Protective Cover) (one)
   - Small Storage (one with white dot, one with red dot) (two)
   - Incubation Bag with temperature strip
   - Disinfectant Wipe (one)
   - Colony Density Chart #1 (bacteria) and #2 (fungi)
   - In-flight Surface Results Data Sheets (one)
   - Scissors
   - Marker

2. Transport SSK to sampling location.

3. Remove one Foil Wrap and Scissors from SSK.
   Cut one end of the Foil Wrap 3/4 of the way open.
   Temporarily stow Foil Wrap in SSK.

   Stow Scissors.

   **NOTE**
   Both Media Slides in each Foil Wrap will be used at the same sample location. The labeled end of the Protective Cover on the Media Slide with red dot will already be open when removed from the Foil Wrap.

4. Remove both Media Slides (enclosed in Protective Cover).
   Temporarily stow the Media Slide with the red dot in the outside pocket of the SSK.

   **CAUTION**
   1. Do not touch exposed Media Slide with fingers or any object before sampling. If touched, replace with another slide from a new Foil Wrap.
   2. If Media Slide is contaminated (visible microbial growth on media) when removed from Protective Cover, place in Biohazard Bag. Place Biohazard Bag in foil pouch and stow in kit and replace with another slide from a new Foil Wrap.
   3. A small amount of condensation within the Protective Cover is acceptable.

5. **SURFACE SAMPLING**

   **NOTE**
   A flat surface is defined as one that is large enough so that the entire media surface of a slide comes into contact with the sample location. The Tube with Swab will not be used when sampling a flat surface.
5.1 Flat Surface

Hold Media Slide with white dot.

Figure 1.- Media Slide Inside of Protective Cover.

Move the Cover Seal to the nonlabeled end of the Protective Cover. Refer to Figure 1.

Grasp corner of labeled end of Protective Cover. Peel the cover open by pulling the top back no further than the middle of the Protective Cover. Refer to Figure 2.

Figure 2.- Protective Cover and Cover Seal.

While holding the Protective Cover out of the way, remove the Media Slide by grasping the handle and pulling the slide out with the media surface (flat side) facing away from the body. Refer to Figure 3.

Close Protective Cover by sliding Cover Seal to the labeled end. Refer to Figure 2. Temporarily stow Protective Cover.

Firmly but gently press Media Slide onto surface area so that the entire surface is in contact with the surface site. Hold for 1 or 2 seconds.
Replace Media Slide into Protective Cover with media surface (flat side) toward the labeled side of Protective Cover. Move Cover Seal back to labeled end of Protective Cover to close.

Record the date, time, and sample location on affixed label with marker from SSK.

**NOTE**
If the location sampled was the alternate location (not the prime) record it in the appropriate comments section of the Microbiology software on the MEC during the data entry into the MEC.

Place inoculated Media Slide into Biohazard Bag with white dot (from Foil Wrap). Temporarily stow.

Repeat step 5.1 using the Media Slide with red dot and Small Storage Bag with red dot. Sample an area directly adjacent to the surface where sample with slide with white dot was taken.

5.2 Non-Flat Surface

Remove tube with white and red dots from Foil Wrap. Secure tube in pocket on lid of kit. By holding the lid of the tube, unscrew and remove swab from tube.

Using swab, sample a 25 cm² area (5 cm by 5 cm square) by rolling the swab across surface area. Refer to Figure 4.

![Figure 4.- Non-Flat Surface Sample Area.](image)

Return swab to tube and close lid so that it can easily be removed with one hand.

**NOTE**
It is necessary that the Media Slide with the white dot is inoculated before the Media Slide with the red dot.
Remove Media Slide with white dot from Protective Cover as follows.
Refer to Figure 1.

Move the cover seal to the nonlabeled end of the Protective Cover.

Grasp corner of labeled end of Protective Cover.
Peel the Protective Cover open by pulling the top back no further than the middle of the Protective Cover.

While holding the Protective Cover out of the way, remove the Media Slide by grasping the handle and pulling the slide out with the media surface (flat side) facing away from the body.

Close Protective Cover by sliding Cover Seal to the labeled end. Temporarily stow Protective Cover.

Inoculate the Media Slide with white dot by rolling the swab across media surface until entire slide has been swabbed. Refer to Figure 5. Temporarily stow Swab in tube.

Replace Media Slide in Protective Cover with media surface (flat side) toward the labeled side of Protective Cover. Move Cover Seal back to labeled end of Protective Cover to close.

Record the date, time, and location on affixed label with marker from SSK.

Place inoculated Media Slide into Small Storage Bag with white dot. Temporarily stow.

Remove Media Slide with red dot from Protective Cover.

Using the same swab used for the Media Slide with white dot, inoculate the Media Slide with red dot.

Reinsert used swab into tube.

Replace Media Slide into Protective Cover.
Move Cover Seal back to labeled end of cover to secure.

Record the date, time, and sample location on affixed label with marker from SSK.

Place inoculated Media Slide into Small Storage Bag with red dot. Temporarily stow.

Discard tube into Foil Wrap and stow in SSK.

6. Clean the area sampled with the Disinfectant Wipe from the Foil Wrap.

7. Discard the Disinfectant Wipe in the Foil Wrap.
   Stow in kit.

8. Repeat steps 2 --- 7 for each sampling site of required modules.

9. Place the Small Storage Bags with the inoculated Media Slides in the Incubation Bag. Place Incubation Bag in warm location (25° C --- 37° C), if there are no warm locations available, stow in SSK for incubation.

10. Stow the SSK.

    Perform visual analysis and data recording of SSK Media Slides with white dots after 2 days and again after 5 days of incubation.

    Perform visual analysis and data recording of SSK Media Slides with red dot after 5 days of incubation.

Refer to SURFACE SAMPLER KIT/WATER MICROBIOLOGY KIT VISUAL ANALYSIS AND DATA RECORDING (SODF: MED OPS: NOMINAL: EHS).
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NOTE

1. Perform visual analysis of SSK Media Slides with white dots after 2 days and again after a total of 5 days of incubation. Do not remove Media Slides from the Protective Covers.

2. Perform visual analysis of SSK Media Slides with red dots after 5 days of incubation. Do not remove Media Slides from the Protective Covers.

3. Perform visual analysis of WMK MCDs after 2 days of incubation and again after a total of 5 days of incubation.

1. Unstow (as required):
   SSK
   WMK

2. Remove the SSK Media Slides and WMK Microbial Capture Devices (MCDs) from the SSK and WMK. Remove one Data Sheet from each kit.

3. VISUAL ANALYSIS OF SSK MEDIA SLIDES (SURFACE SAMPLES)
   Use one of the options below to examine the Media Slides for microbial growth. On Data Sheet, circle which method was used. Remove the slide from the Biohazard Bag.

   Option 1 (Preferred)
   Count number of colonies on each Media Slide.
   Record results on the label on the Media Slide and on the Data Sheet. Return Media Slides to the Biohazard Bag and stow in kit.

   Option 2
   Remove Colony Density Chart #1 from the SSK for Media Slides with white dots.
   Remove Colony Density Chart #2 for Media Slides with red dots.

   Observe the growth on each Media Slide and compare the amount of growth on each slide to the pictures on the appropriate density chart.

   Match the growth pattern to one on the density charts and record the corresponding number/letter on the Data Sheet (in SSK).
   Slides with white dot, assign 1 --- 4.
   Slides with red dot and showing small, smooth texture colonies, assign A, B, or C.
   For fuzzy or filamentous growth, assign D or E.

   Return Media Slides to the Biohazard Bag and stow in kit. Repeat for each Media Slide.
4. **VISUAL ANALYSIS OF WMK MCDs (WATER SAMPLES)**

   Use one of the options below to examine the MCD for microbial growth.
   On Data Sheet, circle which method was used.
   Remove one MCD from Small Biohazard Bag; stow Biohazard Bag.

   **Option 1 (Preferred)**
   Count number of colonies on each MCD.
   Record results on the label on the MCD and on the Data Sheet.
   Return MCDs to the Biohazard Bag and stow in kit.

   **Option 2**
   Compare colony growth pattern on MCD with the pictures on the colony density chart (in WMK).
   Record the corresponding number on the label on the MCD and on Data Sheet (in WMK).
   Return MCD to Biohazard Bag and stow in kit.
   Repeat for each MCD.

5. If the data recorded meets the criteria below, call the results down to **MCC** at the first available communication opportunity

   - SSK Media Slide with white dot $\geq 4$ (on Colony Density Chart #1)
   - SSK Media Slide with red dot $\geq C$ or $E$ (Density Chart #2)
   - WMK MCD $\geq 5$ (WMK Colony Density Chart)

6. If only 2-day analyses were performed, proceed to step 8.
   If 5-day analyses were performed, proceed to step 7.

7. At the end of the 5-day analyses, enter all data (2 day and 5 day) from data sheets into the Medical Equipment Computer (MEC).

   Refer to **MICROBIAL SAMPLES DATA ENTRY TO MEDICAL EQUIPMENT COMPUTER (MEC)**, all (SODF: MED OPS: NOMINAL).

8. Stow the Data Sheets in the appropriate kit.

HARDWARE REQUIRED:
SM/Lab
- ISS TEPC Assembly
  - SEG 33110776-XXX Spectrometer
  - SEG 16103090-XXX Power/Data Cable
  - SEG 16103075-XXX Detector and Detector Cable

TBD
1. Record preshutdown values per TEPC calldown procedure on TEPC Display Log Sheet.
2. TEPC Power sw – ‘OFF’
3. Power/Data Outlet sw – ‘OFF’
   Refer to Table 1 for CHeCS outlet details.
4. TEPC Power/Data Cable \(\rightarrow\) Power/Data Outlet
5. Transfer TEPC spectrometer and Detector assembly to new location.
   Refer to execute pack for new location.
  \(\sqrt{\text{New outlet available, Power sw – ‘OFF'}}\)
   Refer to Table 1 for outlet details.

   \[\text{NOTE}\]
   Hand tighten cable connections.

6. TEPC Power/Data Cable \(\rightarrow\) Power/Data Outlet
7. Deploy TEPC and Detector w/Velcro (SM) or Seat Track (Lab).
8. Power/Data Outlet sw – ‘ON’
9. TEPC Power sw – ‘ON’
10. Reroute and tie down cables.
11. \(\sqrt{\text{Audio Alarm sw – ‘ON’}}\)
12. Verify proper Startup and displays.

   \[\text{NOTE}\]
   Approximate 5-minute startup sequence (refer to TEPC Startup Reference Procedure, if desired).

    Observe changing dose-rate.
    Incrementing time.
    Green light flashing.
14. Notify **MCC-H**.
Actual Detector location
Provide TEPC calldown data.

Table 1. CHeCS Power/Data Outlet Information

<table>
<thead>
<tr>
<th>Location</th>
<th>Designation</th>
<th>Location</th>
<th>Location of Power Switch</th>
<th>Power Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>SM</td>
<td>CHeCS - 1 or CHeCS - 1221</td>
<td>Panel 214</td>
<td>Panel 308</td>
<td>Power Panel 22</td>
</tr>
<tr>
<td>SM</td>
<td>CHeCS - 2 or CHeCS - 1222</td>
<td>Panel 215</td>
<td>Panel 308</td>
<td>Power Panel 22</td>
</tr>
<tr>
<td>SM</td>
<td>CHeCS - 3 or CHeCS - 1223</td>
<td>Panel 431</td>
<td>Panel 308</td>
<td>Power Panel 22</td>
</tr>
<tr>
<td>SM</td>
<td>CHeCS - 4 or CHeCS - 1224</td>
<td>Panel 431</td>
<td>Panel 308</td>
<td>Power Panel 22</td>
</tr>
<tr>
<td>SM</td>
<td>CHeCS - 5 or CHeCS - 1225</td>
<td>Panel 450</td>
<td>Panel 308</td>
<td>Power Panel 22</td>
</tr>
<tr>
<td>SM</td>
<td>CHeCS - 6 or CHeCS - 1226</td>
<td>Panel 450</td>
<td>Panel 308</td>
<td>Power Panel 22</td>
</tr>
<tr>
<td>Lab</td>
<td>UOP - A137 Fwd port</td>
<td>LAX-3 Rack 5</td>
<td>UOP: J4/S2</td>
<td></td>
</tr>
<tr>
<td>Lab</td>
<td>UOP - A118 Fwd port</td>
<td>LAX-1 Rack 3</td>
<td>UOP: J3/S1</td>
<td></td>
</tr>
<tr>
<td>Lab</td>
<td>UOP - A118 Aft port</td>
<td>LAX-1 Rack 3</td>
<td>UOP: J4/S2</td>
<td></td>
</tr>
</tbody>
</table>
1. Record all call-down values on attached table.

2. Call down recorded data to MCC-H.

NOTE
TEPC operational sequence consists of continuous cycling through the following six displays.

<table>
<thead>
<tr>
<th>Approximate Elapsed Time</th>
<th>Display Indication</th>
<th>Display Indication Key</th>
</tr>
</thead>
<tbody>
<tr>
<td>00:00:10</td>
<td>Time:_____ Date:______ mrad/min</td>
<td>params: Time: hh:mm:ss, Date: DDMMYY Dose rate: mrad/min</td>
</tr>
<tr>
<td>00:00:20</td>
<td>Time:_____ m</td>
<td>params: Time: hh:mm:ss, Elapsed time: m Total Dose: mrad</td>
</tr>
<tr>
<td>00:00:30</td>
<td>Time:_____ Date:______ MEM _____ - _____ - _____</td>
<td>params: Time: hh:mm:ss, Date: DDMMYY Memory: Start File, End File, Current File</td>
</tr>
<tr>
<td>00:00:40</td>
<td>Time:_____ Date:______ mrem/min</td>
<td>params: Time: hh:mm:ss, Date: DDMMYY Dose Equivalent rate: mrem/min</td>
</tr>
<tr>
<td>00:00:50</td>
<td>Time:_____ m</td>
<td>params: Time: hh:mm:ss, Elapsed time: m Total Dose Equivalent: mrem</td>
</tr>
<tr>
<td>00:01:00</td>
<td>Time:_____ E &gt; __________________</td>
<td>params: Time: hh:mm:ss, Error: _______ Flags (1553. MEM, P,C,M,D)</td>
</tr>
</tbody>
</table>
## TEPC DISPLAY LOG SHEET

<table>
<thead>
<tr>
<th>Date</th>
<th>GMT</th>
<th>Dose Rate (mrad/min)</th>
<th>Total Dose (mrads)</th>
<th>Elapsed Time (M)</th>
<th>Start File (SF)</th>
<th>End File (EF)</th>
<th>Current File (CF)</th>
<th>Dose Equivalent Rate (mrem/min)</th>
<th>Total Dose Equivalent (mrems)</th>
<th>Flags or Errors</th>
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</table>
HARDWARE REQUIRED:

SM

ISS TEPC Assembly:
  SEG 33110776-301  Spectrometer/Assembly
  SEG 16103078-301  Power/Data Cable
  SEG 16103078-301  Detector and Detector Cable

MEC Assembly:
  SED 46115819-301  MEC
  SEG 39129274-301  MEC Data/Power Cable Assy
  SED 39126010-301  MEC Power Supply
  SEG 39129263-301  PCS/DC Power 20V Cable Assy

FGB MEC Kit:
  1-424 SEG 16103078-301  RS-232 Cable

1. CONFIGURING HARDWARE

1.1 Record TEPC calldown procedure data on TEPC Display Log Sheet.

1.2 TEPC Power sw – ‘OFF’

1.3 TEPC Power/Data Outlet sw – ‘OFF’

1.4 Shut down MEC per XXXX.

1.5 MEC Power sw – ‘OFF’

1.6 If TEPC and MEC not in same power/data outlet pair:
   Move MEC
   MEC Power/Data Outlet sw – ‘OFF’
   MEC ←|→ Power/Data Outlet

   \sqrt{Power/Data Outlet adjacent/TEPC – ‘OFF’}

   MEC →|← Power/Data Outlet adjacent/TEPC

   Or
   Move TEPC
   TEPC ←|→ Power/Data Outlet

   \sqrt{Power/Data Outlet adjacent/MEC – ‘OFF’}

   TEPC →|← Power/Data Outlet adjacent/MEC

1.7 Disconnect MEC from RF LAN by removing PC CARD (if installed).

1.8 Temporarily stow PC CARD in MEC Kit (if required).

1.9 Unstow TEPC RS-232 Cable from MEC Kit.

1.10 TEPC RS-232 Data Cable →|← TEPC
1.11 TEPC RS-232 Data Cable → MEC RS-232 serial port

1.12 TEPC Assembly circuit per Figure 1

![Circuit Diagram]

Figure 1.- TEPC and MEC Download Assembly Circuit Configuration.

2. TRANSFERRING DATA

2.1 MEC Power/Data Outlet sw – ‘ON’

2.2 MEC Power – ‘ON’

2.3 TEPC Power/Data Outlet sw – ‘ON’

2.4 TEPC Power sw – ‘OFF’

NOTE
Do not attempt to run other applications on the MEC simultaneously with the TEPC Application Program. It is possible to introduce errors during the download.

MEC 2.5 Double-click CHeCS Applications icon.

2.6 Double-click ‘TEPC’.

2.7 sel ‘TEPC’ or ‘Enter’
TEPC  2.8 TEPC Power – ‘ON’

NOTE
1. Green Power light will stay dark during download operations.
2. TEPC application requires approximately 1 minute to load.

MEC  2.9 If Time/Date/Run page does not appear in 2 minutes
   TEPC Power ‘OFF’ for 30 seconds
   TEPC Power ‘ON’
   √ For Time/Date/Run page

2.10 √TEPC Date and Time

   If date is incorrect
   sel ‘Set TEPC Date’
   Enter day/month/year (DD/MM/YY).
   sel ‘SET’

   If time is incorrect (more than 30 seconds)
   sel ‘Set TEPC Time’
   Enter hours:minutes:seconds (HH:MM:SS).
   sel ‘SET’

2.11 √TEPC Date and Time

2.12 sel ‘Run TEPC’

2.13 Wait approximately 2 minutes until message projecting completion
time appears.

2.14 Note the estimated tasks duration and resume operations at that
time.

NOTE
Download is an unattended activity. After approximately 1 minute,
the MEC will provide a time estimate for download completion.

3. COMPLETING TASK

MEC  3.1 Acknowledge completion message, click ‘OK’.

3.2 sel ‘Exit’

3.3 √MEC directory c:\datadump for *.zip files with today’s date
If not present, call MCC-H for instructions.
4. DECONFIGURING HARDWARE

TEPC
4.1 TEPC Power sw – ‘OFF’

4.2 TEPC Power/Data Outlet sw – ‘OFF’

MEC
4.3 Shut down MEC per MEC Deactivation.

4.4 MEC Power sw – ‘OFF’

4.5 MEC Power/Data Outlet sw – ‘OFF’

4.6 TEPC RS-232 Data Cable ←|→ TEPC

4.7 TEPC RS-232 Data Cable ←|→ MEC

TBD
4.8 Stow TEPC RS-232 Data Cable in MEC Kit.

TBD
4.9 Temporarily stow RF LAN PC CARD from (if required).

TBD
4.10 Connect RF LAN PC CARD to MEC (if required).

4.11 Call **MCC-H** for MEC Relocate/Restart instructions if not provided.

4.12 MEC Startup
   Relocate as directed/start up in place.
   Perform MEC Setup.

4.13 TEPC Startup
   If TEPC to be relocated
   Perform TEPC Relocate.
   Otherwise
   √TEPC Power/Data Outlet sw – ‘ON’
   √TEPC Power sw – ‘ON’
   Reroute and tie down cables if necessary.

4.14 Verify TEPC startup after 10 to 15 minutes.
   Verify increasing total dose.
   Verify increasing time (m) and clock time.
   Verify changing dose rates.

4.15 Provide calldown data from step 1 if not previously provided.
## TEPC DISPLAY LOG SHEET

<table>
<thead>
<tr>
<th>Date</th>
<th>GMT</th>
<th>Dose Rate (mrad/min)</th>
<th>Total Dose (mrads)</th>
<th>Elapsed Time (M)</th>
<th>Start File (SF)</th>
<th>End File (EF)</th>
<th>Current File (CF)</th>
<th>Dose Equivalent Rate (mrem/min)</th>
<th>Total Dose Equivalent (mrems)</th>
<th>Flags or Errors</th>
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</table>
# Tissue Equivalent Proportional Counter - Alarm Procedure

**Ground Communications Available**

<table>
<thead>
<tr>
<th>NOTE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The TEPC alarm is locally silenced using a switch on the Spectrometer. TEPC dose rate information may be read from the TEPC display.</td>
</tr>
<tr>
<td>2. The alarm LED will flash as long as the dose rate exceeds the setpoint. When the dose rate goes below the setpoint, the LED will go dark. There is no audible indication that the alarm condition has cleared.</td>
</tr>
</tbody>
</table>

1. Acknowledge Alarm
   - Verify alarm LED – Flashing Red
     - Audio Alarm sw – ‘OFF’
     - Verify dose rate reading > 5 mrad/min.

2. Notify **MCC-H**
   - Time of alarm.
   - Initial alarm reading.
   - LED status during alarm.

<table>
<thead>
<tr>
<th>NOTE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The radiation ground support team is the primary means of assessing the radiation environment. Nominally, the need to take special actions will be confirmed by <strong>MCC-H</strong>.</td>
</tr>
<tr>
<td>2. Note the time when the alarm clears. Nominally, the alarm condition will clear in less than 15 minutes.</td>
</tr>
</tbody>
</table>

3. Follow ground instructions.

4. When alarm clears
   - Note the time when the alarm clears.
   - Reset alarm.
   - Verify alarm LED – Dark
     - Audio alarm sw – ‘On’

<table>
<thead>
<tr>
<th>NOTE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transit through high radiation zones resulting from solar proton events may occur at ~45-minute intervals. Alarm reinitiation may result from any subsequent pass until the event subsides.</td>
</tr>
</tbody>
</table>

5. Acknowledge and clear alarms as they occur and clear.
   - Note timing and trends as directed in steps 1 and 2.
GROUND COMMUNICATIONS NOT AVAILABLE

1. Acknowledge Alarm
   Verify alarm LED – Flashing Red
   √ Audio alarm sw – ‘OFF’
   Verify dose rate reading > 5 mrad/min.

2. Notify MCC-H
   Time of alarm.
   Initial alarm reading.
   LED status during alarm.

   NOTE
   1. The radiation ground support team is the primary means of assessing the radiation environment. Nominally, the need to take special actions will be confirmed by MCC-H.
   2. When ground communications are present follow ground instructions.

3. Follow the remaining procedure until alarm condition clears for 24 hours or ground communications are established.

   When communications resume, notify MCC-H
   Inform MCC of data values.
   Follow MCC instructions.

   NOTE
   Normally, the alarm will clear in 10 --- 15 minutes.

4. Verify TEPC Alarm Clear
   Verify alarm LED – Dark
   √ Audio Alarm sw – ‘On’
   Note the time when the alarm clears.
NOTE

1. During Solar Proton Events (SPE), the dose rate will periodically rise to higher levels during the higher latitudes of the trajectory. No action will be required if this is first alarm activation.

2. A pattern of peaks approximately 45 or 90 minutes apart accompanied by reactivation of the alarm is indicative of a large SPE.

3. Alarm reinitiation may result from any subsequent pass until the event subsides.

4. Dose rates may decline due to orbital phasing in the Earth’s Magnetic field which provides additional protection. Under these circumstances, local ISS readings will decrease, even though the event is still in progress.

5. Reduction in SPE intensity will also result in lower readings. However, a subsequent shock may initiate levels that will trigger subsequent alarms.

6. Refer to Figure 1 for SPE additional dose zones as measured by TEPC on Mir. This data was during quiet magnetic field conditions. During disturbed conditions, these zones may expand mostly toward the equator, but also small amounts to the east and west. Compare trajectory information vs. the SPE high dose zones.

5. Monitor the TEPC for a reactivation of the alarm (see notes).

NOTE

Absence of an alarm for several hours may indicate that the event has peaked and is in decline. It may also indicate that the orbital phasing has shifted to provide greater protection. Very large events may experience a shock approximately 24 hours later, which potentially may cause an even greater rise in dose rates.

6. If the alarm is not reactivated within 3 hours, the initial alarm is not indicative of a situation that requires immediate protective action. Periodically, check radiation readings and quit procedure.

If the alarm is reactivated

Note:  Alarm time
       Dose rate readings
       Trends
1. If operationally feasible, crew may seek shelter in a more heavily shielded area during time intervals of higher dose rate.

2. Seeking additional shielding is not required during the first occurrence of the alarm. Subsequent alarms should be taken as indicative of a large SPE and temporary refuge during alarm intervals is recommended unless it can be ascertained that radiation levels have not increased on other monitors (i.e., R-16).

7. If dose rate > 5 mrad/min
   Seek shelter recommended until alarm clears.
   The recommended shelter location during the pre-lab configuration is in the aft section of the SM aft of the treadmill.
   Avoid thinly shielded areas.

8. Avoid low shielded areas during periods of alarm activation.
   Refer to Table 1 for list of low shield locations.

| Table 1 Low Shield Locations |
| SM Crew Quarters |
| Transfer Adapter |
| PMAs |

9. Continue to monitor the environment per step 6.
   Take actions per steps 7 --- 10 when the alarm is activated.

10. Continue efforts to contact ground for confirmation.

11. If alarm has not reactivated after 3 hours, conditions are considered temporarily cleared.

12. Conditions are considered fully cleared after 24 hours of no alarm reactivation.
Additional measured dose rate versus time for a Solar Proton Event (SPE) observed on the Mir. Note this is a difference plot and the normal background (SAA and GCR) is subtracted to highlight the effect of the SPE. Zones of elevated dose rate may be larger than depicted during magnetic disturbances. High dose rate zones may extend to lower latitudes than illustrated.
## TEPC DISPLAY LOG SHEET

<table>
<thead>
<tr>
<th>Date</th>
<th>GMT</th>
<th>Alarm (On/Off) (Flashing/Not Flashing)</th>
<th>Dose Rate (mrad/min)</th>
<th>Total Dose (mrad)</th>
<th>Elapsed Time (M)</th>
<th>Dose Equivalent Rate (mrem/min)</th>
<th>Total Dose (mrem)</th>
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CAUTION
Hardware should be mounted for deployment (and power cable routed) such that rapid egress from the module is not impeded.

1. Unstow:
   TOC Supply Kit
   TOC Analyzer
   Calibration Syringe Subpack

2. Remove Washcloth from TOC Supply Kit. Temporary stow Washcloth near TOC.


4. \( \sqrt{\text{Power switch – Off}} \)

5. Unstow Calibration RAM Card from Calibration Syringe Subpack (side pocket).

6. ACCESSING RAM CARD
   Locate cover on top surface of TOCA marked RAM CARD.
   Turn thumb screws (two) on cover \( \wedge \) to unlock.
   Temporary stow cover using Velcro on top of TOCA.

7. REMOVING NOMINAL RAM CARD
   Depress button next to RAM Card to unlock Card.
   Using index finger and thumb, grip RAM Card by top edge.
   Lift RAM Card out of slot and remove from Analyzer.

8. Temporary stow Nominal RAM Card in pocket of Calibration Syringe Subpack.

9. INSTALLING CALIBRATION RAM CARD
   Align RAM Card with card guides in slot by aligning red dots on card and top case of TOCA.
   Slide RAM Card down into slots until it locks and is firmly seated in TOCA.

10. Close RAM Card cover by turning thumb screws (two) \( \wedge \) until hand tight.

11. Power cable \( \rightarrow \| \leftarrow \) TOC Analyzer connection marked “27.5VDC”
    Power cable \( \rightarrow \| \leftarrow \) ISS electrical connector
12. Power switch → On

TOC Front Panel

13. Display ORIENTATION screen

Front Panel

Select ‘ORIENTATION’ (picture on the screen normal or upside down) (keys “↑” “↓”).
Press ENTER.

14. ‘REMOVE SAMPLE SYRINGE’ display appears

If Syringe in TOCA

If Syringe in TOCA
Remove Syringe from TOCA.
Open door on sample Syringe Pump access area (door fastener ).
Grasp Syringe Plunger and pivot out 60° (toward user).
Grasp knurled fitting and slide in bracket toward user to stop position.
Refer to Figure 1.

Close shutoff vlv on Syringe by turning vlv perpendicular to flow direction.
Disconnect Syringe from Syringe Pump by turning knurled fitting to hard stop.
Refer to Figure 1.

Slide knurled fitting back into recessed area.
Close door on Syringe Pump access area to hard stop.

Attach protective cover to female fitting connection of Syringe.
Temporary stow Syringe on locker.
Press ENTER.

If no Syringe in TOCA
Press ENTER.
15. Select ‘CALIBRATE’ from main menu screen (keys “↑” “↓”).
   Press ENTER to access AUTOCALIBRATE menu.

16. When AUTOCALIBRATE USING screen is displayed, press ENTER.

17. Turn fastener on TOC door \(\downarrow\) to open sample Syringe Pump access area.
    Secure door to Velcro strip.

    **NOTE**
    Perform analysis in following order
    Calibration Syringe A
    Calibration Syringe B

Subpack 18. Unstow:
   Calibration Syringe A

19. Remove protective cover and plunger stopper from Syringe.
    Stow stopper in Subpack.

20. \(\sqrt{\text{Shutoff valve on Syringe – Close}}\)

21. **CONNECTING SYRINGE TO SYRINGE PUMP**
   Grasp knurled fitting and pull outward in bracket to stop position.
   Refer to Figure 1.

   Pivot towards user.
   Loosen knurled fitting \(\uparrow\) to hard stop.
Insert Syringe fitting into knurled fitting.
Refer to Figure 1.

Turn knurled fitting to hard stop.
Open shutoff vlv on Syringe by turning vlv parallel to flow direction.

[NOTE]
Press Syringe Plunger to confirm that Syringe connection is tight and no leaks occur.

Press on Syringe Plunger for 3 seconds.
√ No leaks at connection

If syringe leaks
   Reinstall Syringe.
   √ Connection tight

Grasp knurled fitting and push back fully into recessed area.
Pivot Sample Syringe away from user and lock into Syringe Pump.
Close door on sample Syringe Pump access area (door fastener to hard stop).

:00:00 22. Press ENTER to initiate calibration.
   Wait for one minute to check for error messages.
   If error message occurs, follow directions on display, and perform TOTAL ORGANIC CARBON ANALYZER (TOCA) ERROR AND DIAGNOSTICS (SODF: MED OPS: MALFUNCTION), then:

:36:00 23. √ Calibration is completed
   √ Data shows on display

24. Note sample number, time, date of analysis, and results of total organic carbon (TOC), total inorganic carbon (TIC), total carbon (TC), pH, and conductivity (COND) from the display.
   Record this information in the TOC Log Book.

25. REMOVING EMPTY SYRINGE FROM TOCA
   Open door on sample Syringe Pump access area (door fastener to hard stop).
   Grasp Syringe Plunger and pivot out 60° (toward user).
   Grasp knurled fitting and slide in bracket toward user to stop position.
   Refer to Figure 1.

   Close shutoff vlv on Syringe by turning vlv perpendicular to flow direction.
   Disconnect Syringe from Syringe Pump by turning knurled fitting to hard stop.
   Refer to Figure 1.
Slide knurled fitting back into recessed area.
Close door on Syringe Pump access area to hard stop.
Attach protective cover to female fitting connection of Syringe.

26. **STOWING CALIBRATION SYRINGE**
Stow TOC Calibration Syringe in a small Ziploc Storage Bag.
Place Bag in Calibration Subpack.

27. Repeat steps 18 --- 26 for Calibration Syringe B.

28. **Power switch → Off**

29. Unstow Nominal RAM Card from pocket of Calibration Syringe Subpack.
Remove Calibration RAM Card by repeating steps 6 and 7.
Reinstall Nominal RAM Card by repeating steps 9 and 10.

Stow Calibration RAM Card in Calibration Syringe Subpack.
Calibration Syringe Subpack in TOC Supply Kit.

30. **Power cable ←|→ ISS electrical connector**
Power cable ←|→ front panel

Stow:
- Power cable
- TOC Analyzer
- TOC Supply Kit

31. **Report to MCC**
Date
Time of sample collection
Analysis results for each of the two calibration samples.
This Page Intentionally Blank
1. Unstow:
   - Condensate Collection Subpack
   - Temporarily stow:
     - Condensate Sampling Interface Assembly
     - Condensate Sample Bag (Condensate Sample)
     - Small Waste Water Bag

2. √ (Upon removing protective caps) Debris and damage:
   - Interface connectors (Figure 1)
   - SRV-K sampling hydroconnector

3. Condensate Sampling Interface $\rightarrow$ Small Waste Water Bag
   Refer to Figure 2.

4. √ Tight seal

5. **FLUSH**
   - Remove Galley Dining Table.
   - Open SRV-K panel cover.
   - Condensate Sampling Interface/Small Waste Water Bag Assembly $\rightarrow$ SRV-K sampling hydroconnector $\rightarrow$ sampling port 1

   **00:00**
   - √ Flow of condensate into Small Waste Water Bag
   - √ No leakage from fittings

   **NOTE**
   - Flush time (20 minutes) ≈ 20 ml.

   **20:00**
   - Condensate Sampling Interface/Small Waste Water Bag Assembly $\leftarrow$ SRV-K sampling hydroconnector
   - Condensate Sampling Interface $\leftarrow$ Small Waste Water Bag
   - Place Small Waste Water Bag in Ziploc Bag.
   - Seal and stow in subpack.

6. **SAMPLE COLLECTION**
   - Record Start time.
   - Condensate Sampling Interface $\rightarrow$ Sample Bag
   - Refer to Figure 2.

   - √ For tight seal

   - Condensate Sampling Interface/Sample Bag Assembly $\rightarrow$ SRV-K sampling hydroconnector

   - √ Flow of condensate into Sample Bag
   - √ No leakage from fittings
NOTE
Sampling time ≈ 8 hours.

√Bag is nearly full

NOTE
1. If volume is lower than half, continue filling.
2. Report to MCC.

7. Condensate Sampling Interface/Sample Bag Assembly ←|→ SRV-K sampling hydroconnector

8. Condensate Sample Bag ←|→ Condensate Sampling Interface
Replace protective caps on Sample Bag and Condensate Sampling Interface.

9. Report to MCC
Date
Sampling start and stop time
Sampling location

10. Place Condensate Sample Bag in Ziploc Bag.
Seal and stow.

Stow in subpack.

12. Stow:
Condensate Collection Subpack

Figure 1.- Condensate Sampling Interface.
Figure 2.- Condensate Sampling Interface Connection to Waste/Sample Bag.
TOTAL ORGANIC CARBON ANALYZER (TOCA) RAM DATA CARD REPLACEMENT
(MED OPS/2R - ALL/FIN) Page 1 of 2 pages

1. Hardware should be mounted for deployment (and power cable routed) such that rapid egress from the module is not impeded.

2. Do not replace the RAM data card while the analyzer is performing an analysis or current data will be lost. Analysis must be completed prior to replacement of the RAM card to prevent data loss.

1. Unstow:
   TOC Analyzer
   TOC Supply Kit
   Power cable

2. $\sqrt{\text{Power switch } \rightarrow \text{ Off}}$

3. Power cable $\rightarrow \leftarrow$ TOCA “27.5 VDC” connector
   Power cable $\rightarrow \leftarrow$ ISS electrical connector

4. **ACCESSING RAM CARD**
   Locate cover on top surface of TOCA marked RAM CARD.
   Turn thumb screws (two) on cover $\leftarrow$ to unlock.
   Temporary stow cover on top of Analyzer using Velcro.

5. **REMOVING USED RAM CARD**
   Depress button next to RAM Card to unlock Card.
   Using index finger and thumb, grip RAM Card by top edge.
   Lift RAM Card out of slot and remove from Analyzer.

6. Unstow:
   New TOC RAM Data Card Subpack.

7. Remove new TOC RAM Card from Subpack case.
   Place used RAM Card into Subpack case.
   Mark case as “used.”
   Stow subpack case (TOC Supply Kit).

8. **INSTALLING NEW RAM CARD**
   Align RAM Card with card guides in slot by aligning red dots on card and top case of TOCA.
   Slide Ram Card down into slot until it locks and is firmly seated in TOCA.

9. **CLOSING RAM CARD COVER**
   Turn thumb screws (two) on cover $\sim$ until hand-tight.
10. Power switch → On

11. **VERIFYING DISPLAY ON ANALYZER FRONT PANEL**

   **************************************************************************
   If display not illuminated
   √RAM CARD cover fully closed and locked down snugly

   If Display Orientation menu is displayed, proceed to step 13.

   If display shows error message, ‘**RAM card not installed**...’ or ‘**RAM card write-protected**...’, perform TOTAL ORGANIC CARBON ANALYZER (TOCA) ERROR DIAGNOSTICS, all (SODF: MED OPS: MALFUNCTION), then:
   **************************************************************************

12. Power switch → Off

13. Power cable ←|→ ISS electrical connector
    Power cable ←|→ TOCA “27.5VDC” connector cable

14. Stow Power cable

15. Inform **MCC** upon completion.
    Brief any problems.

16. Stow:
    TOC Supply Kit
    TOC Analyzer
TOTAL ORGANIC CARBON ANALYZER (TOCA) REAGENT MIXING

(MED OPS/2R - ALL/FIN) Page 1 of 5 pages

CAUTION
Hardware should be mounted for deployment (and power cable routed) such that rapid egress from the module is not impeded.

1. Unstow:
   TOCA Supply Kit
   TOCA
   Power cable from TOC Supply Kit

TOCA Front Panel

2. √ Power switch – Off

3. Power cable →|← TOCA Connection marked “27.5VDC”
   Power cable →|← ISS electrical connector

4. Look through clear plastic cover marked “REAGENTS” on side of TOCA for any sign of liquid outside of reagents container by shining a portable light source (flashlight) into REAGENTS area.

WARNING

1. If liquid is seen outside reagents container, do not remove clear plastic cover and do not use analyzer further. Notify MCC and await instruction.

2. If liquid is seen inside reagents container (routine condensation), proceed.

5. REMOVING PLASTIC COVER
   Loosen thumb screws (six) ¯\_\_(ツ)_/¯.
   Remove clear plastic cover marked “REAGENTS.”
   Temporary stow plastic cover on Velcro.

6. POSITIONING VALVES
   Locate 1 of 4 mixing valves positioned at ANALYZE.
   Turn valve from ANALYZE position to STORE position.

   Locate next mixing valve positioned at STORE (located to the right of mixing valve positioned at ANALYZE).
   Turn valve from STORE position to MIX position.

CAUTION
During mixing of a new oxidizer solution, plunger of mixing syringe will move very slowly as plunger is manually pressed or pulled back. Constant force should be applied without attempting to force speed of plunger movement.
7. **MIXING SOLUTION**
   Locate plunger corresponding to valve in MIX position.
   Push plunger in completely with constant force.
   Pull plunger out completely with same force to mix solution.
   Wait 2 minutes.
   Push plunger in completely one more time.

   **CAUTION**
   After mixing reagents, make sure that plunger is pushed in completely.

8. Locate mixing valve positioned at MIX position.
   Turn valve from MIX position to ANALYZE position.

9. **REPLACING CLEAR PLASTIC COVER**
   Tighten thumb screws (six).

10. Power switch → On

11. **Display ORIENTATION screen**

   **NOTE**
   If no power to screen, plastic cover is closed.

   Select orientation (picture on the screen normal or upside down) (keys “↑” “↓”).
   Press ENTER.

12. **REMOVE SAMPLE SYRINGE** display appears

   **If Syringe in TOCA**

   Remove Syringe from TOCA.
   Open door on sample Syringe Pump access area (door fastener ↓). Grasp Syringe Plunger and pivot out 60° (toward user).
   Grasp knurled fitting and slide in bracket toward user to stop position.
   Refer to Figure 1.

   Close shutoff valve on Syringe by turning valve perpendicular to flow direction.
   Disconnect Syringe from Syringe Pump by turning knurled fitting ↓ to hard stop.
   Refer to Figure 1.

   Slide knurled fitting back into recessed area.
   Close door on Syringe Pump access area ↓ to hard stop.
Attach protective cover to female fitting connection of Syringe. Temporary stow Syringe on locker. Press ENTER.

If no Syringe in TOCA
Press ENTER.

13. Select SERVICE from MAIN MENU screen (keys “↑” “↓”).
Press ENTER.

14. Select REAGENTS from SERVICE screen (keys “↑” “↓”).

15. Select MIXED from REAGENTS screen (keys “↑” “↓”).
Press ENTER.

Remove protective cap and plunger stopper from Syringe.
Temporary stow.

√Syringe shutoff valve – Close (valve perpendicular to flow direction)

17. **CONNECTING DEIONIZED WATER SYRINGE TO SYRINGE PUMP**
Open door on sample Syringe Pump access area (door fastener →)
Grasp knurled fitting and pull outward in bracket to stop position.
Refer to Figure 1.

Figure 1.- Sample Syringe Pump Access Area.
Pivot toward user.
Loosen knurled fitting to hard stop.
Insert Syringe fitting into knurled fitting.
Refer to Figure 1.

Tighten knurled fitting to hard stop.
Open shutoff valve on Syringe by turning valve parallel to flow direction.
Press Syringe Plunger for 3 seconds to confirm that Syringe connection is tight and no leaks occur.

√ No leaks at connection

If Syringe leaks
Reinstall Syringe.

√ Connection tight

Grasp knurled fitting and push back fully into recessed area.
Pivot sample Syringe away from user and lock into Syringe Pump.
Close door on sample Syringe Pump access area (door fastener to hard stop).

18. Press ENTER on REAGENTS MIXED screen to reset reagent mixing date and begin to purge line.

:00:00 Countdown clock for flushing begins with 22 minutes, 30 seconds.

:25:00 19. √ Mixed date on REAGENTS MIXED screen is current date
√ Reagent batch number
√ Sample number 3 of 27

Press CLEAR.

20. REMOVING EMPTY SYRINGE FROM TOCA
Open door on sample Syringe Pump access area (door fastener ).
Grasp Syringe Plunger and pivot out 60° (toward user).
Grasp knurled fitting and slide in bracket toward user to stop position.
Refer to Figure 1.

Close shutoff valve on Syringe by turning valve perpendicular to flow direction.
Disconnect Syringe from Syringe Pump by turning knurled fitting to hard stop.
Refer to Figure 1.

Slide knurled fitting back into recessed area.
Close door on Syringe Pump access area to hard stop.

Attach protective cover to female fitting connection of Syringe.
Stow Syringe in TOCA Supply Kit.
21. Power switch → Off

**CAUTION**
Wait at least 30 minutes after mixing for oxidizer crystals to dissolve completely before performing an analysis.

22. Power cable ←|→ ISS electrical connector
Remove power cable from the front Panel.

23. Stow:
Supply Kit
- Power cable
- Plunger stopper
- TOCA
- TOCA Supply Kit
CAUTION

Waste container should not be replaced while Analyzer is performing an analysis. Analyzer will lose power automatically when the clear plastic cover over waste container is removed. Loss of analysis data will occur if Analyzer is unpowered during the analysis.

TOCA 1. Unstow:
   Supply Container Subpack (one)
   Waste Washcloth (one)
   Kit Power cable

TOCA 2. √ TOCA Power switch – Off
   Front Panel Power cable → | ← TOCA “27.5 VDC” connection
                        Power cable → | ← ISS electrical connector

WARNING

1. √ Plastic cover for any sign of liquid outside of waste water container
2. If liquid is seen outside waste container, do not remove clear plastic cover and do not use Analyzer further. Notify MCC and await instruction.
3. If liquid is seen inside reagents container (routine condensation), proceed.

Right Top 3. OPENING WASTE STORAGE AREA
   of TOCA Remove clear plastic cover marked “WASTE” by loosening thumb screws (six) ↘.
   Temporary stow plastic cover on top of Analyzer using Velcro.

CAUTION

Be careful! To prevent damage to tube with liquid, do not pull hard on container.

4. REMOVING WASTE CONTAINER FROM TOCA
   Lift waste container out of waste storage area.
   Place a Washcloth under QD fitting.
   Disconnect waste container from TOCA with QD.

5. Place used container into Waste Container Subpack.
   Close subpack with DO NOT USE facing out (red Velcro up).
   Place subpack with used waste container into TOCA Supply Kit.

6. Retrieve new waste container from Waste Container Subpack.
7. **ATTACHING NEW WASTE CONTAINER AND CHECK FOR LEAK**

Connect new waste container connector to QD.
Close QD upstream and downstream shutoff valves to the right and left of the QD.
Refer to Figure 1.

Press both valve buttons down.
Slide Pin located on top of waste container housing right to first stop position. (Pin may not move if good seal established).
Refer to Figure 1.

**VERIFYING QD FOR LEAKS**

If QD leaks
  - Collect liquid with Washcloth.
  - Disconnect QD.
  - Reconnect QD.
  - Rotate Pin towards top of decal to second stop position.
  - Slide Pin right to second stop position. (Pin may not move if good seal is established.)

√QD for leaks

If QD still leaks
  - Waste container is unusable.
  - Retrieve another waste container from Waste Container Subpack and repeat step 7.

Open upstream and downstream shutoff valves (push valve buttons up).
Refer to Figure 1.

![Figure 1.- Waste Container.](image)
8. CLOSING WASTE STORAGE AREA
   Install waste container in waste storage area by placing upstream shutoff valve button into opening of corner of decal.
   Place waste container in waste container storage area (snug fit).
   Liquid line is not kinked

9. Replace clear plastic cover marked “WASTE.”
   Tighten thumb screws (six).
   Return used Washcloth to Ziploc Bag and stow in Kit.

10. TOCA Power switch → On

   NOTE
   If no power to screen, screws are all tightened.

11. Display ORIENTATION screen
   Select orientation (picture on the screen normal or upside down) (keys “↑” “↓”).
   Press ENTER.

12. ‘REMOVE SAMPLE SYRINGE’ display appears
   If Syringe in TOCA
   If Syringe in TOCA.
   Remove Syringe from TOCA.
   Open door on sample Syringe Pump access are (door fastener ).
   Grasp Syringe Plunger and pivot out 60° (towards user).
   Grasp knurled fitting and slide in bracket toward user to stop position.
   Refer to Figure 2.
   Close shutoff valve on Syringe by turning valve perpendicular to flow direction.
   Disconnect Syringe from Syringe Pump by turning knurled fitting to hard stop.
   Refer to Figure 2.
   Slide knurled fitting back into recessed area.
   Close door on Syringe Pump access area to hard stop.
   Attach protective cover to female fitting connection of Syringe.
   Temporary stow Syringe on locker.
   Press ENTER.

   If no Syringe in TOCA.
   Press ENTER.
13. Select SERVICE from MAIN MENU screen (keys “↑” “↓”). Press ENTER.

14. Select WASTE from SERVICE screen (keys “↑” “↓”). Press ENTER.

15. Select REPLACED from WASTE CONTAINER screen (keys “↑” “↓”). Press ENTER.

16. ✓ WASTE REPLACEMENT screen
Press ENTER.

17. ✓ Display shows current date and waste count on display shows 0 --- 500 mLs

TOCA Power switch → Off

19. Power cable ← | → ISS electrical connector
Power cable ← | → Front panel

TOCA Supply Kit

20. Stow:
   Power cable
   TOCA
   TOCA Supply Kit

CAUTION

Hardware should be mounted for deployment (and power cable routed) such that rapid egress from the module is not impeded.

NOTE
If error messages are displayed on TOCA screen, refer to TOTAL ORGANIC CARBON ANALYZER ERROR AND DIAGNOSTICS, all (SODF: MED OPS: MALFUNCTION).

1. Unstow:
   TOCA Supply Kit
   TOCA
   WS&A

2. Remove Log Book and Washcloth from TOCA Supply Kit. Temporary stow both near TOCA.

3. Unstow power cable from TOCA Supply Kit.

4. √ Power switch – Off

5. Power cable →|← TOCA connection marked “27.5VDC”
   Power cable →|← ISS electrical connector

6. Power switch → On

7. √ Display ORIENTATION screen
   Select orientation (picture on the screen normal or upside down) (keys “↑” “↓”).
   Press ENTER.

8. √ REMOVE SAMPLE SYRINGE display appears
   Open door on sample Syringe Pump access area (door fastener ◀). √ If Syringe in TOCA

   If Syringe in TOCA.
   Remove Syringe From TOCA.
   Grasp Syringe Plunger and pivot out 60° (toward user).
   Grasp knurled fitting and slide in bracket toward user to stop position.
   Refer to Figure 1.

   Close shutoff valve on Syringe by turning valve perpendicular to flow direction.
Disconnect Syringe from Syringe Pump by turning knurled fitting $\rightarrow$ to hard stop. Refer to Figure 1.

Slide knurled fitting back into recessed area.
Close door on Syringe Pump access area $\rightarrow$ to hard stop.

Attach protective cover to female fitting connection of Syringe.
Temporary stow Syringe on locker. Press ENTER.

If no Syringe in TOCA. Press ENTER.

9. Select ANALYZE from MAIN MENU screen (keys “↑” “↓”). Press ENTER to access ANALYSIS menu.

**NOTE**
Do not perform analysis with TOCA Syringe unless instructed to.

10. Choose FROM SYRINGE or FROM BAG from ANALYSIS menu. Press ENTER.

11. If FROM BAG is selected, go to step 21.

**NOTE**
Perform sample analysis in the following order, whenever possible:
- SRV-K cold
- SRV-K hot
- SVO-ZV

13. Unstow Deionized Water Sample Syringe from TOCA Supply Kit. Record location, date, and time of sample collection from Syringe Label in Log Book.

14. **CONNECTING SYRINGE TO SYRINGE PUMP**
Grasp knurled fitting and pull outward in bracket to stop position. Refer to Figure 1.

- Pivot toward user.
- Loosen knurled fitting → to hard stop.
- Uncap Syringe.
- Insert Syringe fitting into knurled fitting. Refer to Figure 1.

- Tighten knurled fitting ← to hard stop.
- Open shutoff valve on Syringe by turning valve parallel to flow direction. Press Syringe Plunger for 3 seconds to confirm that Syringe connection is tight and no leaks occur.

- No leaks at connection

If Syringe leaks
- Reinstall Syringe.
- Connection tight

- Grasp knurled fitting and push back fully into recessed area.
- Pivot sample Syringe away from user and lock into Syringe Pump.
- Close door on sample Syringe access area (door fastener ← to hard stop).

:00:00 15. Press ENTER to initiate analysis.
Wait for 1 minute to check for error messages.
If error message occurs, follow directions on display, and perform.

Refer to TOTAL ORGANIC CARBON ANALYZER (TOCA) ERROR AND DIAGNOSTICS (SODF: MED OPS: MALFUNCTION), then:
16. Analysis is completed
   Data shows on display

17. Note sample number, time, and date of analysis, and results of total
    organic carbon (TOC), total inorganic carbon (TIC), total carbon (TC),
    pH, and conductivity (COND) from display.
    Record this information in Log Book.

18. REMOVING SYRINGE FROM TOCA
    Open door on sample Syringe Pump access area (door fastener →).
    Grasp Syringe Plunger and pivot out 60° (toward user).
    Grasp knurled fitting and slide in bracket toward user to stop position.
    Refer to Figure 1.
    Close shutoff valve on Syringe by turning valve perpendicular to flow
    direction.
    Disconnect Syringe from Syringe Pump by turning knurled fitting ← to
    hard stop.
    Refer to Figure 1.
    Slide knurled fitting back into recessed area.
    Attach protective cover to female fitting connection of Syringe.

19. Place Syringe in small Ziploc Storage Bag and place into Subpack in
    TOCA Supply Kit.

20. Go to step 40.

21. STARTING menu appears
    Open sample Syringe Pump access area (door fastener →).
    Secure door to Velcro strip.

22. Unstow empty TOC Water Sample Syringe from TOCA Supply Kit (for
    use with bag sample).

   CAUTION
   Make sure Syringe Plunger is depressed completely before installing in Analyzer.

23. CONNECTING EMPTY SYRINGE TO SYRINGE PUMP
    Grasp knurled fitting and pull outward in bracket to stop position.
    Refer to Figure 1.
    Pivot towards user.
    Loosen knurled fitting ← to hard stop.
    Uncap Syringe.
    Insert Syringe fitting into knurled fitting.
    Refer to Figure 1.
Tighten knurled fitting to hard stop. Open shutoff valve on Syringe by turning valve parallel to flow direction. Grasp knurled fitting and push back fully into recessed area. Pivot sample Syringe away from user and lock into Syringe Pump. Close door on sample Syringe access area (door fastener to hard stop). Press ENTER.

Wait approximately 2 --- 3 minutes while pump resets (menu will display 'WORKING' until ready).

**NOTE**
Pressing CLEAR backs up to the prior menu.

24. When pump is ready, new STARTING menu appears.

New STARTING menu

25. Open sample door by turning door fastener to hard stop.

26. Clamp Syringe handle by pushing clamp handle up to locking position. Refer to Figure 2.

27. Shut sample door by turning door fastener to hard stop.

**NOTE**
Perform Bag sample analysis in following order, whenever possible

- SRV-K cold
- SRV-K hot
- SVO-ZV

Figure 2.- Syringe Clamp Handle in Locked Position.
28. Unstow ISS Water Sample Collection in bag from WS&A.

29. Attach Sample Bag to Luer lock connection on front of TOCA by turning bag connection \( \frac{1}{4} \) until bag locks (1/4 turn). Press ENTER to initiate analysis.
   Wait 2 --- 3 minutes while pump resets.
   When pump is ready, 60-minute clock appears.

30. \( \sqrt{\text{Display for 60-minute clock to begin countdown}} \)

   Wait 1 minute to check for error messages, after 60-minute clock begins to count down.

   If error messages, follow directions on display.
   Refer to TOTAL ORGANIC CARBON ANALYZER (TOCA) ERROR AND DIAGNOSTICS (SODF: MED OPS: MALFUNCTION).

   If no errors, return in 30:00 minutes.

\( \sqrt{\text{Errors}} \)

\( \boxed{\text{NOTE}} \)
Pressing CLEAR backs up to the initial menu.

31. \( \sqrt{\text{Analysis is continuing without errors}} \)

   If error message occurs, follow directions on display, and perform TOTAL ORGANIC CARBON ANALYZER (TOCA) ERROR AND DIAGNOSTICS (SODF: MED OPS: MALFUNCTION), then:

32. \( \sqrt{\text{Analysis is completed}} \)

   \( \sqrt{\text{Data shows on display}} \)

33. Note sample number, time, and date of analysis, and results of total organic carbon (TOC), total inorganic carbon (TIC), total carbon (TC), pH, and conductivity (COND) from display.
   Record this information in Log Book.

34. Press CLEAR to get RESET menu.

35. Remove Sample Bag by turning bag connection \( \bigcirc \).
   Replace cap on bag.
   Place bag in small Ziploc Storage Bag (from WS&A).
   Temporary stow bag in WS&A.

36. Open sample door by turning door fastener \( \bigcirc \).
37. Release Syringe Clamp Handle by pushing Syringe Clamp Handle down. Refer to Figure 3.

Shut door on sample Syringe Pump access area by turning door fastener to hard stop. Press ENTER.

![Syringe Clamp Handle in unlocked position](image)

Figure 3.- Syringe Clamp Handle in Unlocked Position.

38. Wait for menu instructions to remove Syringe (2 --- 3 minutes while pump resets).

39. **REMOVING SYRINGE FROM TOCA**
   - Open door on sample Syringe Pump access area (door fastener ).
   - Grasp Syringe Plunger and pivot out 60° (toward user).
   - Grasp knurled fitting and slide in bracket toward user to stop position. Refer to Figure 1.
   - Close shutoff valve on Syringe by turning valve perpendicular to flow direction.
   - Disconnect Syringe from Syringe Pump by turning knurled fitting to hard stop. Refer to Figure 1.
   - Slide knurled fitting back into recessed area.
   - Close door on sample Syringe Pump access area by turning door fastener to hard stop.

40. Press ENTER to return to main menu.
41. Repeat steps 9 --- 40 for all remaining analyses.

If no waste water container replacement notification is displayed on TOCA screen, perform step 42.

If waste container notification appears, perform TOTAL ORGANIC CARBON ANALYZER (TOCA) WASTE CONTAINER REPLACEMENT, all (SODF: MED OPS: NOMINAL), then:

42. After all samples have been analyzed
   Close door by turning fastener on TOC door ⌂, to hard stop.
   TOCA
   Front
   Panel
   Power switch → Off
   Power cable ←|→ ISS electrical connector
   Detach Power cable ←|→ Front panel

43. Stow:
   Power cable in TOCA Supply Kit
   Syringe in Syringe Subpack
   Subpack in TOCA Supply Kit
   TOCA
   TOCA Supply Kit
   WS&A

44. Report to **MCC**
   Date
   Time of sample collection
   Analysis results for each sample analyzed.
1. Remove the following items from the Water Microbiology Kit Subpack:
   - Media Syringe Case
   - Biohazard Bags (two)
   Temporarily stow

2. Remove one Media Syringe from Media Syringe Case.

   **NOTE**
   Do not touch any connector ends. Do not use Media Syringe if media is cloudy or purple.

3. Retrieve Microbial Capture Device (MCD).
   Remove red cap.

4. Uncap Media Syringe.
   Temporary stow cap.

5. Connect Media Syringe to the MCD and press tight to ensure good connection for media transfer.
   Refer to Figure 1.

   ![Figure 1.- Media Syringe with MCD.](image)

6. Inject all media from Syringe into MCD.

7. Briefly open and close the blue cap of the MCD to release pressure.

8. Remove empty Media Syringe and recap.
   Replace red cap on MCD.

9. Insert used Media Syringe into Biohazard Bag. One bag can hold multiple Syringes.
   Temporary stow Biohazard Bag.

10. Place inoculated MCD into a Biohazard Bag (up to four MCDs per bag).
    Temporary stow.

11. Repeat steps 2 --- 10 for each MCD.

12. Replace Media Syringe Case in Subpack.
    Place Subpack in WMK.
13. Place Biohazard Bag with MCDs in WMK for incubation.

14. Stow Biohazard Bag with used Media Syringes in WMK.

15. Stow WMK.

16. Perform visual analysis and data recording of MCDs after two days of incubation and again after a total of five days of incubation.

Refer to SURFACE SAMPLER KIT (SSK)/WATER MICROBIOLOGY KIT (WMK) VISUAL ANALYSIS AND DATA RECORDING (SODF: MED OPS: NOMINAL).
1. Remove and temporarily stow the following items on outside of WMK.

<table>
<thead>
<tr>
<th>1_426 Syringe Pump Assembly (on lid of kit)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water Microbiology Kit Subpack:</td>
</tr>
<tr>
<td>- Large Waste Water Bag (one)</td>
</tr>
<tr>
<td>- Microbial Capture Device (MCD) - labeled TOTAL COUNT</td>
</tr>
<tr>
<td>- Air Filter Adapter Assembly with Air Filter Adapters (AFA) in sterile packages</td>
</tr>
<tr>
<td>- Large Storage Bag</td>
</tr>
<tr>
<td>- Small Storage Bag</td>
</tr>
<tr>
<td>From temporary stowage:</td>
</tr>
<tr>
<td>- Micro-Sample, In-Flight Analysis Bag</td>
</tr>
</tbody>
</table>

2. Remove cap from Large Waste Water Bag.

3. By twisting, connect Large Waste Water Bag to Syringe Pump connection (with yellow dot). Temporarily stow assembly on WMK. Refer to Figure 1.

![Figure 1.- Large Waste Water Bag with Syringe Pump.](image)

**NOTE**

To prevent contamination, do not touch any connector ends. If contact is made, clean the connector end using a disinfectant wipe and proceed with sample processing.
1. Unstow a new MCD and AFA for each sample of water.

2. Use the same Large Waste Water bag for up to six samples.

4. Retrieve MCD.
   Refer to Figure 2.

5. Label MCD with the date of sample collection and circle the sampling location (hot, cold, SVO-ZV) using marker.

6. Remove the red cap from the MCD.

   NOTE
   Do not overtighten MCD connector ends.

7. Connect the MCD to the Syringe Pump connection (red to red dot).
   Refer to Figure 3.

8. Remove one Air Filter Adapter (AFA) from the Air Filter Adapter Assembly Package.
9. Check that AFA handle is perpendicular to the long axis of the adapter. Refer to Figure 4.

![Figure 4.- Air Filter Adapter (AFA).]

10. Grasping the sterile AFA, remove AFA from protective covering and discard the covering. Refer to Figure 4.

11. Remove blue cap from MCD. Attach MCD to the AFA (blue to blue dot). Refer to Figure 5.

![Figure 5.- Large Waste Water Bag, Syringe Pump, MCD, and AFA.]

12. Retrieve the Micro-Sample, In-Flight Analysis Bag.
Attach Micro-Sample, In-Flight Analysis Bag to the AFA connector. 
Ensure that all connections are hand tight (by slight twisting). 
Refer to Figure 6.

![Diagram](image)

**Figure 6.** Large Waste Water Bag, Syringe Pump, MCD, AFA, and Micro-Sample, In-Flight Analysis Bag.

**NOTE**  
Syringe Pump is calibrated for a 10 mL volume on each push and release. MCD fills with water during pumping.

14. Turn AFA handle parallel to long axis of AFA. 
Pump 10 times for a total volume of 100 mL. 
Make sure the plunger of the Syringe Pump goes completely forward and back. 
Confirm that MCD is filling with water.

15. Turn handle of the AFA perpendicular to long axis of AFA.

16. Push and release Syringe Pump a few times to completely remove all water from MCD into Large Waste Water Bag. 
Tap MCD several times to facilitate removal of residual water.

17. Disconnect MCD from Syringe Pump by holding the Syringe Pump and twisting the MCD. 
Temporarily stow the Syringe Pump (with Large Waste Water Bag still attached).
18. Recap MCD with red cap.

19. Disconnect MCD from AFA.
   Recap MCD with blue cap.
   Temporarily stow MCD.

20. Disconnect AFA from the Micro-Sample, In-Flight Analysis Bag.
    Recap bag.

21. Stow the used AFA in AFA package for return to ground.
    Place the Micro-Sample, In-Flight Analysis Bag into Small Storage Bag
    and discard in trash.

22. For each Micro-Sample, In-Flight Analysis Bag, repeat steps 4 --- 22,
    using a new MCD and AFA for each sample.
    Use the same Large Waste Water Bag for up to six samples.

23. Push and release the plunger of the Syringe Pump a few times to expel
    all residual water from Syringe Pump.

24. Disconnect the Large Waste Water Bag from the Syringe Pump.
    Recap bag.
    Place the Large Waste Water Bag into a Large Storage Bag (from
    WMK).
    Stow in kit or discard in trash if it is full (600 ml).

25. Stow the Syringe Pump Assembly on lid of kit.
    Place the Air Filter Adapter Assembly Package in Subpack.

26. Go to WATER MICROBIOLOGY KIT (WMK) - FILLING MCD WITH
    GROWTH MEDIA, all (SODF: MED OPS: NOMINAL).
1. Unstow:
   TBD BP/ECG (SED46115812)

2. Lift up Nomex cover to BP/ECG.

3. √CHeCS UOP or Power/Data Outlet → OFF

4. BP/ECG Power Cable (KLSD210056) →|← CHeCS UOP or Power/Data Outlet

5. CHeCS UOP or Power/Data Outlet → ON

6. BP/ECG power switch (rear of ECG keyboard) → ON

7. Flip ECG screen up.

8. Depress green [ON] key on ECG keyboard.

**ECG SOFTWARE CONFIGURATION**

9. Verify proper blood pressure unit is specified on ECG.
   Depress dark blue [NIBP] key.
   Depress [3] key to display NIBP settings.

   √'Bloodpressure unit (one): EBM 502/3'

   If EBM 502/3 is not selected, depress [1] key to toggle through options to select EBM 502/3.
   Depress [FNCT] key on bottom right of keyboard to exit.
10. Verify proper settings for ECG data transmit.

Depress [storage] key on top row of keyboard.


√ 'Channel No. (1): 3'

If Channel 3 is not selected, depress [1] to toggle through options to select 3.

√ 'Baudrate (2): 38400'

If Baudrate is not 38400, depress [2] to toggle through options to select 38400.

√ 'Parity (3): NO'

If NO is not selected for Parity, depress [3] to toggle through options to select NO.

√ 'Stop-Bit (4): 1'

If 1 is not selected, depress [4] to toggle through options to select 1.

Depress [FNCT] key on bottom right of keyboard to exit.

BLOOD PRESSURE SOFTWARE CONFIGURATION

11. Peel back Nomex cover to BP Device on right side of BP/ECG.

12. Verify proper setting of BP Test Parameters.

Depress [1 2 3] key once to display Main Menu.

Depress [1 2 3] key once to highlight Test Parameters.

Depress [1 2 3] key once to display Test Parameters.
BLOOD PRESSURE/ELECTROCARDIOGRAPH - ECG AND BP SOFTWARE CONFIGURATION
(MED OPS/2R - ALL/FIN) Page 3 of 4 pages

√Parameters:
  Technique    : DKA
  Interval      : MAN
  Init Inflate  : 170 mmHg
  Max Inflate   : 220 mmHg
  Deflate Rate  : AUTO

If one of these test parameters is incorrect

Depress ▼ or ▲ to highlight that test parameter that is incorrect.

Depress [ ] to select that parameter.

Depress ▼ or ▲ to toggle through options to select correct parameter value.

Once correct parameter value is selected, depress [ ].

When completed with changes, scroll down to ‘Exit’
using ▼ or ▲ and depress [ ].

If parameters are correct, depress ▼ or ▲ to highlight ‘Exit’ and depress [ ].

13. Verify proper setting of BP to display information on ECG display.

Depress ▲ key until Utilities is highlighted.

Depress [ ] key to display Utility Menu.
Parameters:
Device : BOSCH
ECG Trigger : DIGITAL ↓
Display : ECG

If one of these parameters is incorrect

Depress or to highlight that test parameter that is incorrect.

Depress to select that parameter.

Depress or to toggle through options to select correct parameter value.

Once correct parameter value is selected, depress .

When completed with changes, to Exit, scroll down to ‘Exit’ using or and depress .

If parameters are correct, depress or to highlight ‘Exit’ and depress .

14. Depress to exit Main Menu.

15. Once all parameters have been verified to be correct, continue with PERIODIC FITNESS EVALUATION (SODF: MED OPS: NOMINAL: HMS).
1. √All leads are connected and securely fastened to BP/ECG Lead Box (KLSD210059)
Refer to Figure 1 for Lead Box location.

![BP/ECG Lead Box](image)

Figure 1.- BP/ECG Device.

**NOTE**
V3R snap on BP/ECG Lead Box is not used.

2. If leads are disconnected, reconnect as follows:
Refer to Figure 2 for proper positioning of leads on Lead Box.

- V1 (Red, Brown connector) → V1 snap
- V2 (Yellow, Brown connector) → V2 snap
- V3 (Green, Brown connector) → V3 snap
- V4 (Blue, Brown connector) → V4 snap
- V5 (Orange, Brown connector) → V5 snap
- V6 (Purple, Brown connector) → V6 snap
- RA (White, Beige connector) → RA snap
- LA (Black, Beige connector) → LA snap
- LL (Red, Beige connector) → LL snap
- RL (Green, Beige connector) → RL snap

![Lead Box Connections](image)

Figure 2.- Lead Box Connections.

3. Once leads are securely fastened, continue with PERIODIC FITNESS EVALUATION (SODF: MED OPS: NOMINAL: HMS).
If time of day is not displayed on Heart Rate Watch (HRW)

If ‘SET’ appears at lower left of HRW display and LIM 1, LIM 2, TIME 1, TIME 2 are not alternating
  SET/START/STOP pb → Press until they are alternating
  SELECT pb → Press until time of day is displayed

If ‘MEASURE’ appears at bottom of HRW display and HRW is in stopwatch mode with elapsed time scrolling
  SET/START/STOP pb → Press to stop time from scrolling
  SELECT pb → Press until time of day is displayed

If ‘MEASURE’ appears at bottom of HRW display and watch is not in stopwatch mode or is not alternating between INT, FLE, LFT
  SET/START/STOP pb → Press until INT, FLE, LFT are alternating
  SELECT pb → Press until time of day is displayed

If ‘RECALL’ appears at lower right of HRW display and ‘COM’ appears at top of HRW display
  SET/START/STOP pb → Press once
  SELECT pb → Press until time of day is displayed

If ‘RECALL’ appears at lower right of HRW display and ‘FLE’ appears at top of HRW display
  STORE/RECALL pb → Press once
  SELECT pb → Press until time of day is displayed

Otherwise, SELECT pb → Press until time of day is displayed
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MEC 1. MEC SETUP

**NOTE**

1. The Heart Rate Watch stores only eight exercise sessions.

2. This procedure is to be performed after HRW memory becomes full, or once a week, whichever comes first.

3. Download sequence is in reverse order. The first file that is downloaded will be the last exercise session that was performed. The next file will be from the session previous to that, etc.

---

**FGB1_226** Unstow from Treadmill with Vibration Isolation and Stabilization (TVIS) Exercise Operations Kit:
Heart Rate Watch (HRW)

**FGB1_424** Unstow from HRM Kit:
Downloader Interface Box

Go to MEC location.

Connect downloader interface cable to MEC serial port.

********************************************************************

If DC UTIL PWR − Off, perform MEDICAL EQUIPMENT COMPUTER - SETUP, all (SODF: MED OPS: NOMINAL: CMS), then:

********************************************************************

Double-click on CheCS applications folder icon located on the desktop. Double-click on Polar icon.

---

2. MEC SOFTWARE PREPARATION

Click on File menu.

Select ‘Persons…’ from menu.

Click on ‘Person…’.

Select crewmember whose data is being downloaded.

Click ‘OK’ or press ENTER. Click ‘Close’.
If Connection Failure window appears
Click ‘Cancel’.
Click on Options menu.

Select ‘Serial Port…’ from menu.
Select alternate com port.

Click ‘OK’.

Select ‘HR Monitor…’ from Options menu.
Select correct type of HR monitor (Polar Vantage XL).

Click ‘OK’.

*******************************************************************

Click on Receiver menu.
Select ‘Memory Transfer…’ from menu.

HRW 3. HRM PREPARATION FOR DOWNLOADING

NOTE
HRM downloading should begin with time of day displayed on HRW.

*******************************************************************

If time of day is not displayed, perform HEART RATE MONITOR - RETURN TO TIME OF DAY DISPLAY, all (SODF: MED OPS: NOMINAL: HMS), then:

*******************************************************************

SELECT pb → Press three times. ‘RECALL’ appears at lower right of HRW display. ‘MA’ appears at top of HRW display.

SET/START/STOP pb → Press once. ‘COM’ appears at top of HRW display.

STORE/RECALL pb → Press once. ‘FLE’ appears at top of HRW display. File number is displayed on HRW display.

NOTE
Crewmember can use watch strap to tie watch around downloader interface box and keep watch in place.

Place HRW on MEC downloader interface box (on recessed area) face up.
MEC 4. FILE DOWNLOADING ONTO MEC
Click ‘OK’ or press ENTER on MEC. MEC instructs user to press
STORE/RECALL pb on the watch to start transfer.

HRW STORE/RECALL pb ➔ Press (on HRW). ‘COM’ flashes on HRW screen
and MEC screen reads: ‘Receiving data…please wait!’ Plot of heart
rate data will be displayed on the MEC.

MEC 5. STORAGE OF HRM DATA
Click on File menu.
Select ‘Save’ from menu.
******************************************************************
If it was the second exercise session in one day, use the
letter b instead of the letter a (e.g., SHE0620b).
******************************************************************
Delete date.
Enter exercise name using the first three letters of the crewmember’s last
name, the month and day of the exercise session and the letter a
(e.g., SHE0620a).
Refer to the exercise log for the correct month and day of exercise.
Click on ‘File Info…’ and enter same file name with .hrm extension
(e.g., SHE0620a.hrm).
Click ‘OK’ or press ENTER.
Fill in appropriate date (e.g., 6.20.2000) and time of exercise.
Select appropriate sport, person, and/or team if incorrect.
Click ‘OK’ or press ENTER.

6. DOWNLOADING SUBSEQUENT DATA FILES
Click on Receiver menu.
Select ‘Memory Transfer…’ from menu. ‘COM’ appears on HRW display.

NOTE
Watch will return to time of day display after
approximately 10 minutes of inactivity.

HRW STORE/RECALL pb ➔ Press. ‘FLE’ appears at top of HRW display.
File number is displayed on HRW display (number that appears is the file
that was downloaded last).
SIGNAL pb → Press. File number moves back one number (e.g., from 8 to 7) and watch beeps.

Repeat steps 3, 4, and 5 until all data files have been downloaded.

After ‘FLE 1’ is downloaded and saved, STORE/RECALL pb → Press twice. ‘COM’ flashing at top of HRW display.

Wait until flashing ‘COM’ display stops and watch beeps.

SELECT pb → Press (returns HRW to display time of day).

MEC
Click on File menu.
Select ‘Exit’ to close program.
Disconnect downloader interface cable from MEC serial port.

FGB1_424
Stow downloader interface box, for next use, in HRM Kit.

<table>
<thead>
<tr>
<th>NOTE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heart Rate Watch files must be erased immediately upon completion of data download procedure.</td>
</tr>
</tbody>
</table>

Go to HEART RATE MONITOR - ERASE DATA FILES, all (SODF: MED OPS: NOMINAL: HMS).
NOTE
1. Heart Rate Watch (HRW) programming should begin with the time of day displayed.
2. Heart Rate Watch holds only eight data files.

FGB 1. Unstow from Treadmill with Vibration Isolation and Stabilization (TVIS) Exercise Operations Kit:
Heart Rate Watch (HRW)

********************************************************************
If time of day is not displayed, perform HEART RATE MONITOR - RETURN TO TIME OF DAY DISPLAY, all (SODF: MED OPS: NOMINAL: HMS).
********************************************************************

NOTE
’END’ will appear instead of ‘FLE’ if the memory is full.

2. SELECT pb → Press twice. ‘MEASURE’ is displayed at the bottom of HRW display.
HRW display alternates between the following:
INT – 15 seconds (Heart Rate storage interval)
LFT – XXxx (Memory time left in hr:min)
FLE – 1 --- 8 (File number data will be stored in)

3. SET/START/STOP pb → Press twice. HRW display alternates between ‘LFT’ and ‘FLE’.

NOTE
HRW will beep and time LFT will count up until HRW reaches ‘FLE 1’ and ‘LFT 0820’.

4. SIGNAL pb → Press to erase each file.
Wait until watch beeps and file number changes.
Repeat until all files are erased.

5. STORE/RECALL pb → Press once.
HRW is now in Stopwatch mode.

6. SELECT pb → Press once. ‘RECALL’ is displayed at lower right of HRW display. ‘END’ is displayed at top of HRW display.

7. SELECT pb → Press again. Time of day will be displayed on HRW.

FGB 8. Stow HRW for next use.
1. HRM PREPARATION
   FGB1_226 Unstow from Treadmill with Vibration Isolation and Stabilization (TVIS)
   Exercise Operations Kit:
   Heart Rate Watch (HRW)

   FGB1_424 Unstow from HRM Kit:
   Snap-On Transmitter
   Chest Strap

2. HRM SETUP
   Don HRW.

   Adjust Chest Strap with Slide Buckle.

   Cover electrode surface with moisture (water, saliva, etc.).

   Attach Snap-On Transmitter to Chest Strap.

   Don Snap-On Transmitter/Chest Strap just below pectoral muscle with the red snap on the crewmember’s left.
   Refer to Figure 1.

   ![Figure 1.- Donning Transmitter/Chest Strap.](image)

3. HRW PRE-EXERCISE PROGRAMMING

   NOTE
   HRW programming should begin with the time of day displayed.
If time of day is not displayed, perform HEART RATE MONITOR - RETURN TO TIME OF DAY DISPLAY, all (SODF: MED OPS: NOMINAL: HMS), then:

SELECT pb → Press (twice, button on upper right side of HRW) ‘MEASURE’ appears at bottom center of HRW display.

If memory time is too short to store entire exercise session, or if word ‘END’ appears on HRW display instead of ‘FLE’, perform HEART RATE MONITOR - DATA DOWNLOAD TO MEDICAL EQUIPMENT COMPUTER, all, (SODF: MED OPS: NOMINAL: HMS), then HEART RATE MONITOR - ERASE DATA FILES, all (SODF: MED OPS: NOMINAL: HMS), then:

If INT is not 15
SET/START/STOP pb → Press once (button on the left side of HRW).
SELECT pb → Press to select storage interval of 15.

√HRW display alternates between the following
INT – 15 seconds (Heart rate storage interval)
LFT – XXxx (Memory time left in hr:min)
FLE – 1 --- 8 (File number data will be stored in)

STORE/RECALL pb → Press once (red button on the bottom of HRW).

If the heart rate is not displayed, moisten electrodes and check that the snaps are in the correct position.

√Current heart rate appears after approximately 5 seconds (along with a blinking heart ‘♥’
4. HRW RECORDING

**********************************************************
If beeping is not desired, disable by pressing the SIGNAL pb (button on lower right side of HRW).
**********************************************************

NOTE
HRW will beep if heart rate exceeds or drops below LIMIT 1 or 2 (depending on which LIMIT is currently set).

**********************************************************
If SET/START/STOP pb is inadvertently pressed twice, perform step 5 and then steps 3 and 4.
**********************************************************

SET/START/STOP pb → Press once. Elapsed time will scroll.
Perform prescribed exercise protocol.
SET/START/STOP pb → Press once at completion of exercise protocol Elapsed time will stop.

5. HRM OPERATIONS/POST EXERCISE
SELECT pb → Press twice. Time of day will appear on HRW display.

6. HRM DOFFING AND STOWAGE
SELECT pb → Press once
√Time of day appear on HRW display
Doff HRW.
Doff Snap-On Transmitter/Chest Strap hardware.

NOTE
If the transmitter is left on the belt, the battery will be drained.

Disconnect Snap-On Transmitter from the Chest Strap.
Wipe off excess moisture from transmitter.

NOTE
Allow the chest strap to dry, if damp, before stowing.

FGB1_226 Stow HRW, for next use, in TVIS Exercise Operations Kit.
FGB1_424 Stow Snap-On Transmitter and Chest Strap, for next use, in HRM Kit.
NOTE
HRW programming should begin with the time of day displayed.

FGB 1_226
1. Unstow from Treadmill with Vibration Isolation and Stabilization (TVIS) Exercise Operations Kit:
   Heart Rate Watch (HRW)

*****************************************************************************
If time of day is not displayed, perform HEART RATE MONITOR - RETURN TO TIME OF DAY DISPLAY, all (SODF: MED OPS: NOMINAL: HMS), then:
*****************************************************************************

2. SELECT pb → Press once. ‘SET’ appears at bottom left corner of HRW display. The HRW display alternates between the following preset functions: TIME 1, TIME 2 (if TIME 1 is set), LIM 1, and LIM 2.

3. SET/START/STOP pb → Press until LIM 1 appears. Upper heart-rate limit will be flashing for LIM 1.

4. SELECT pb or SIGNAL pb → Press to move upper limit up or down respectively, in increments of five.

5. STORE/RECALL pb → Press to set desired upper heart rate. Lower heart-rate limit will be flashing.

6. SELECT pb or SIGNAL pb → Press to move lower limit up or down, respectively, in increments of five.

7. SET/START/STOP pb → Press once. Upper heart-rate limit will be flashing for LIM 2.

8. If desired, repeat steps 4 --- 6, to set LIM 2.

9. SET/START/STOP pb → Press once. HRW display alternates between the following preset functions: TIME 1, TIME 2 (if TIME 1 is set), LIM 1, and LIM 2.

10. SELECT pb → Press three times to return to time of day display.

11. Go to HEART RATE MONITOR - SETTING TIMER (SODF: MED OPS: NOMINAL: HMS) if desired, then go to HEART RATE MONITOR - NOMINAL OPERATIONS (SODF: MED OPS: NOMINAL: HMS).
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1. Unstow from Treadmill with Vibration Isolation and Stabilization (TVIS) Exercise Operations Kit: Heart Rate Watch (HRW)

2. SELECT pb → Press once. ‘SET’ appears at bottom left corner of HRW display. The HRW display alternates between the following preset functions: TIME 1, TIME 2 (if TIME 1 is set), LIM 1 and LIM 2.

3. SET/START/STOP pb → Press until TIME 1 appears. First digit will be flashing.

4. SELECT pb or SIGNAL pb → Press to move digit value up or down, respectively.

5. STORE/RECALL pb → Press to set desired value. Second digit will be flashing.

6. Repeat steps 4 --- 5 for each digit, to set TIME 1.

7. SET/START/STOP pb → Press once.

8. If desired, repeat steps 4 --- 7 to set TIME 2.

9. SET/START/STOP pb → Press twice (three times if TIME 2 was not set). HRW display alternates between the following preset functions: TIME 1, TIME 2 (if TIME 1 is set), LIM 1 and LIM 2.

10. SELECT pb → Press three times to return to time of day display.

1. **MEDICAL EQUIPMENT COMPUTER (MEC) SETUP**
   Go to MEC location.

   ********************************************************************************
   If DC UTIL PWR → Off, perform MEDICAL EQUIPMENT COMPUTER (MEC) SETUP, all (SODF: MED OPS: NOMINAL: CMS), then:
   ********************************************************************************

   Double-click on ‘CheCS Applications’ folder icon located on the desktop.
   Double-click on ‘Polar’ icon.
   Click on File menu.
   Select ‘Person…’ from menu.

2. **NEW TEAM DATA ENTRY**
   Click on ‘New Team’.
   Enter expedition number (e.g., EXP 1, EXP 2, etc.) in Create Team box.
   Click ‘OK’ or press ENTER twice.
   Click ‘SAVE’.

3. **TEAM MEMBER DATA ENTRY**
   ********************************************************************************
   If a mistake is made, to delete
   Click ‘Person’.
   Choose person to be deleted.
   Click ‘OK’.
   Click ‘Delete’.
   Select Person Data or Team Data.
   Click ‘Delete’.
   Click ‘Yes’.
   Click ‘No’.
   ********************************************************************************

   Click ‘New’.
   Enter crewmember name (e.g., Bill Shepherd) in Name box.
   Enter crewmember ID (e.g., S1, S2, S3) in ID box.

   Click on Dropdown menu in Team Box.

   Choose appropriate expedition.
   Enter date of birth of crewmember by clicking on the calendar and choosing the correct date or entering it in the format DD-MM-YYYY.
   Enter crewmember’s height in centimeters.
   Select crewmember’s gender.
   Click ‘Save’.
   Click ‘OK’ or press ENTER.
   Repeat step 3 for all expedition crewmembers.

4. **EXITING HEART RATE WATCH PROGRAM**
   Click ‘Close’.
   Click on File menu.
   Select ‘EXIT’ to exit program.
The purpose of the Periodic Fitness Evaluation (PFE) is to monitor crewmembers’ overall fitness levels and determine if cardiovascular and musculoskeletal deconditioning has occurred as a result of exposure to long duration space flight. The PFE consists of performing a graded exercise test on the cycle ergometer.

BLOOD PRESSURE/ELECTROCARDIOGRAPH (BP/ECG) AND MEDICAL EQUIPMENT COMPUTER (MEC) SETUP

NOTE
1. Subject performs steps 1 --- 27 without operator assistance.
2. Subject should have on shorts and shoes for exercise on cycle ergometer.

Figure 1.- BP/ECG and MEC Setup.

1. Unstow:
   TBD    BP/ECG (SED46115812)
   FBG1_424 MEC Thinkpad (SED46115819)
   or deployed PCS Power Supply (28V) (SED39126010)
   location   PCS/DC Power 20V Cable Assy (SEG39129263)
                 UOP 1553 Data/28VDC Power Cable Assy (SEG39129274)
2. Transfer all hardware items to Service Module (SM) near Cycle Ergometer (Panel 121/125).


3. Attach BP/ECG and MEC using Velcro in close proximity to Cycle Ergometer (Panel 121/125) and CHeCS Power/Data Outlet (Panel 431).

5. Perform Russian Cycle Ergometer Setup (Russian MO BOOK 1).

6. √CHeCS Power/Data Outlet (Panel 431) PWR → OFF

**BP/ECG SETUP**
7. Lift up Nomex cover to BP/ECG.

8. BP/ECG Power Cable (KLSD210056) →|← CHeCS Power/Data Outlet (Panel 431).
   Refer to Figure 1 for cable location.

9. BP/ECG RS-232 Cable (KLSD210063) →|← RS-232 Serial Port on rear of MEC.

**MEC SETUP**
10. √PCS Power Supply sw1 → OFF (LED Off)

**NOTE**
When the MEC will be station-powered, the battery should be removed prior to powering on the MEC to avoid draining the battery.

11. √MEC internal battery is removed

Tilt MEC display back as far as possible.

Lift MEC keyboard by sliding the slide latches forward.
If battery is present

Slide out the CD ROM module (on far left), pulling the blue tabs upward, and temporarily stow (Velcro to MEC).

Remove the MEC Battery Pack and stow on the MEC.

Replace the CD ROM module by sliding back into place and pushing down at arrows.

Lower MEC keyboard and snap into place.

If battery is not present,

Lower MEC keyboard and snap into place.

PCS Power Supply (J2 output) →\|← MEC Thinkpad Power Port (J1) using PCS/DC Power 20V Cable Assy.

PCS Power Supply (J1 28VDC input) →\|← CHeCS Power/Data Outlet (Panel 431) using UOP 1553 Data/28VDC Power Cable Assy.

**NOTE**

1553 capability is not present during Expedition 1.

Coil and secure with attached Velcro strap 1553 cable extension of the 1553 Data/28VDC Power Cable Assy.

12. CHeCS Power/Data Outlet Power → ON

13. PCS Power Supply sw1 → ON (green light on)

**NOTE**

PCS boot takes 3 --- 4 minutes. Let MEC cycle through the initialization screens without any keystroke inputs.


15. Record any error messages during initialization.

16. If warning message appears, saying ‘**Please install the Battery Pack to ensure proper system operation**’. Ignore message and click ‘OK’.

    ******************************************
    If MEC fails to startup, notify **MCC**.
    ******************************************

17. If the ‘C:’ directory window is open at startup, close the ‘C:’ directory window.
**BP/ECG ACTIVATION**

18. Power switch (rear of ECG keyboard) → ON

19. Flip ECG screen up.

20. Depress green ON pb (ECG keyboard).

21. √Display is illuminated

   **********************************************************
   If display is not illuminated
   √Contrast wheel on right side of ECG device

   If still no display
   Perform BP/ECG - DARK DISPLAY (SODF: MED OPS: MAL).

   If no joy
   Notify MCC.
   **********************************************************

22. √Date and Time on top right of BP/ECG display are correct

   If date and time are incorrect
   22.1 Depress FNCT pb.

   22.2 Depress 2 pb to select System Settings.
       Depress 2 pb to select Date and Time.

   22.3 Enter time as prompted (hh.mm.ss).
       When time entry completed, depress ENTER pb.

   22.4 Enter date as prompted (mm–dd–yy).
       When date entry is completed, depress ENTER pb.

   22.5 Enter first two letters of weekday as prompted (e.g., Mo, Tu, We, Th, Fr, Sa, Su).
       When weekday entry completed, depress ENTER pb.

       **NOTE**
       Although entry box will move back to the time position,
       entered time and date will remain unless ENTER is
       depressed again.

   22.6 Depress FNCT pb to exit Date and Time window.
SUBJECT PREPARATION


24. HRM Setup

24.1 Don HRW.

24.2 Adjust Chest Strap with Slide Buckle. Cover electrode surface with moisture (water, saliva, etc.).

24.3 Attach Snap-On Transmitter to Chest Strap.

24.4 Don Snap-On Transmitter/Chest Strap just below pectoral muscle with the red snap on the crewmember's left. Refer to Figure 2.

![Figure 2.- Donning Transmitter/Chest Strap.](image)

25. HRW Pre-Exercise Programming

**NOTE**
HRW programming should begin with the time of day displayed.

![Figure 3.- Heart Rate Watch Display - Time.](image)
25.1 SELECT pb → Press twice (button on upper right side of HRW). ‘MEASURE’ appears at bottom center of HRW display.

25.2 HRW display alternates between the following:
- INT – 15 seconds (Heart rate storage interval)
- LFT – XXxx (Memory time left in hr:min)
- FLE – 1 --- 8 (File number data will be stored in)

If memory time is too short to store entire exercise session, or if word ‘END’ appears on HRW display instead of ‘FLE’, perform HEART RATE MONITOR - DATA DOWNLOAD TO MEDICAL EQUIPMENT COMPUTER, all (SODF: MED OPS: NOMINAL: HMS), then HEART RATE MONITOR - ERASE DATA FILES, all (SODF: MED OPS: NOMINAL: HMS), then:

- If INT is not 15
  SET/START/STOP pb → Press once (button on the left side of HRW)
  SELECT pb → Press to select storage interval of 15

25.3 STORE/RECALL pb → Press once (red button on the bottom of HRW).

25.4 Current heart rate appears after approximately 5 seconds (along with a blinking heart ‘♥’)

If the heart rate is not displayed, moisten electrodes and check that the snaps are in the correct position.

**NOTE**

1. HRW will flash ‘1’ in the upper right corner next to the time of day. It will flash a ‘2’ if LIMIT 2 is chosen during recording.

2. HRW will beep if heart rate exceeds or drops below LIMIT 1 or 2 (depending on which LIMIT is currently set).
If beeping is not desired, disable by pressing the SIGNAL pb (button on lower right side of HRW).

If SET/START/STOP pb is inadvertently pressed twice, depress SELECT pb → Press twice and then repeat step 25.

BP/ECG ELECTRODE, CUFF, AND MICROPHONE PLACEMENT
26. Unstow:
   Subpack Consumable Kit (1) from BP/ECG Resupply Kit

27. Prepare Electrode Placement Sites

   NOTE
   All trash produced during subject preparation shall be placed back into Subpack Consumables Ziploc Bag and stowed in BP/ECG Resupply Kit.

   SUBJECT’S RIGHT
   SUBJECT’S LEFT
   WHITE
   BROWN
   BLACK
   RED
   GREEN

   Figure 4.- Placement of Electrodes on Subject.

   27.1 If needed, shave electrode placement sites with razor provided in Subpack Consumables Kit.

   27.2 Thoroughly clean electrode placement sites with alcohol pad provided in subpack kit.
   Rub skin vigorously with pad until red.

   NOTE
   HRM Chest Strap may need to be adjusted to accommodate the placement of the electrodes and electrode leads to torso.

   27.3 Unstow electrode package from subpack kit and remove five electrodes from package.
   Attach electrodes to specified locations on torso.
   Refer to Figure 4 for locations.
27.4 Unstow BP/ECG Patient Cable-5 Lead Assy (KLSD210084).

27.5 Attach color coded BP/ECG Patient Cable-5 Lead Assy to electrodes on torso.
   Refer to Figure 4 for color code.

27.6 √ Electrocardiogram (ECG) waveforms appear on ECG display

   **********************************************************************************
   If no ECG waveforms noticed
   √ All lead connections to subject and BP/ECG

   Perform BLOOD PRESSURE/ELECTROCARDIOGRAM - LEAD BOX CONNECTIONS (SODF: MED OPS: NOMINAL: HMS) if connections are incorrect.

   If no joy
   Notify MCC.
   **********************************************************************************

   **********************************************************************************
   If noisy ECG traces are displayed on ECG screen
   √ Electrode connections to subject

   If still noisy ECG traces
   Reapply electrodes to torso.

   If no joy
   Notify MCC.
   **********************************************************************************

   CAUTION

   Do not bend or squeeze the K-sound Microphone when inserting into the microphone pad or applying the pad and microphone to the arm.


28.1 Unstow BP/ECG Air Hose/Microphone Assy (KLSD210083).

28.2 Remove Microphone Pad from Subpack Consumable Kit.
   Place Microphone from BP/ECG Air Hose/Microphone Assy into Microphone Pad.
   Refer to Figure 5.
28.3 Palpate brachial artery on right arm first by using fingers to ensure proper location.

28.4 Remove paper backing from Microphone Pad to expose adhesive.

28.5 Place the Microphone on arm so that it is parallel to and over the brachial artery.
   Refer to Figure 6.

28.6 Place BP Cuff on right arm with Cuff Hose coming out top with operator’s assistance.
   Refer to Figure 7.
MEC DATA COLLECTION SETUP

29. Double click on CHeCS applications.

30. Double click ‘EGDH.exe’.

NOTE

‘ISSx.x.dat’ is the default name given in the File Name field.

31. Enter crewmember identification in File Name field ‘BPECGX-CM.dat’ (X = Expedition 1,2,… , CM = Crewmember 1,2,3,…).
For example, ‘BPECG1-1.dat’ if Expedition 1, Crewmember 1.

NOTE

Do not click on ‘START EGDH’ until ready to begin test.

EXERCISE TEST

NOTE

1. Operator must be present during exercise session of PFE.

2. Workloads on Cycle Ergometer for each stage of this exercise test will vary for crewmembers. These workloads are determined preflight during crewmembers’ Medical Assessment Test (MAT).

CAUTION

Verify cable routing of MEC and BP/ECG is clear of exercise device.

32. Subject assumes pedaling position on Cycle Ergometer and sets workload for stage 2. Workloads can be found by clicking on the right mouse button on the Periodic Fitness Evaluation activity on OSTPV.

Figure 7.- Placement of BP Cuff on Subject’s Arm.
33. Operator Test BP/ECG BP Cuff

33.1 Depress dark blue NIBP pb on ECG keyboard.

**NOTE**
Subject should keep arm with BP Cuff still during BP measurement.

33.2 Depress light blue 2 pb on ECG keyboard to initiate blood pressure measurement.

********************************************************************************
If cuff is not inflating
   Repeat steps 33.1 and 33.2.

If still not inflating
   Repeat steps 33.1 and 33.2.

If no joy
   Notify MCC.
********************************************************************************

33.3 Once measurement is completed, the blood pressure readings should be displayed on ECG display.

********************************************************************************
If blood pressure readings are not obtained or a beeping sound is heard
   √ BP Cuff is secure around subject's arm
   √ Microphone is over and parallel to brachial artery

   Repeat steps 33.1 and 33.2.

If no joy
   Notify MCC.
********************************************************************************

34. When ready to begin test, operator clicks on ‘Start EGDH’ on MEC and begins timing test, which begins with 2 minutes of seated rest. Refer to Table 1.
35. Blue Status Bar on MEC EGDH display is flashing back and forth

***************************************************************************

If Blue Status Bar is not flashing
Repeat step 34.

If still not flashing
Click on ‘Start’ pb on MEC toolbar (bottom of MEC display).
Select ‘Settings’.
Click on ‘Control Panel’.
Double Click on ‘System’.
Click on ‘Device Manager’.
Double Click on ‘Ports (COM and LPT)’
Verify that ‘Communications Port (COM1)’ is set.
Repeat step 34.

If no joy
Notify MCC.
***************************************************************************

36. HRW Recording
SET/START/STOP pb → Press once. Elapsed time will scroll.

Table 1. Submaximal Exercise Protocol

<table>
<thead>
<tr>
<th>Stage</th>
<th>Experiment Elapsed Time (minutes)</th>
<th>Initiate BP Cuff Inflation at: (minutes)</th>
<th>Exercise Intensity</th>
<th>Workload (watts)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0-2</td>
<td>1</td>
<td>0 % VO2</td>
<td>0 (seated rest)</td>
</tr>
<tr>
<td>2</td>
<td>2-7</td>
<td>6</td>
<td>25 % VO2</td>
<td>–</td>
</tr>
<tr>
<td>3</td>
<td>7-12</td>
<td>11</td>
<td>50 % VO2</td>
<td>–</td>
</tr>
<tr>
<td>4</td>
<td>12-17</td>
<td>16</td>
<td>75 % VO2</td>
<td>–</td>
</tr>
<tr>
<td>5</td>
<td>17-22</td>
<td>21</td>
<td>25 % VO2</td>
<td>–</td>
</tr>
</tbody>
</table>

37. During last minute of each stage, operator initiates blood pressure measurement.

37.1 Depress dark blue NIBP pb.

37.2 Depress 2 to inflate BP Cuff and take one measurement.

NOTE
Subject should keep arm with BP Cuff still during blood pressure measurement.
If blood pressure readings are not obtained or a beeping sound is heard:
Continue with graded exercise test.

√ BP Cuff is secure around subject’s arm
√ Microphone is over and parallel to brachial artery

*********************************************************************
NOTE
If blood pressure is missed during a stage, continue with exercise test.
*********************************************************************

38. As soon as BP Cuff deflates:
   If stage 2, subject begins pedaling.
   If not stage 2, adjust workload on Ergometer for next test stage according to individualized workload.

39. Repeat steps 36 and 37 according to the times in Table 1 until exercise session is completed.

   NOTE
   1. If test interrupted > 5 minutes or test terminated, perform step 40 to stop data collection.
   2. After a 10-minute rest period, restart test beginning at step 34.

TEST TERMINATION
40. Click on Stop EGDH on the MEC.

41. SET/START/STOP pb → Press once at completion of exercise protocol on HRW. Elapsed time will stop.

42. SELECT pb → Press twice on HRW. Time of day will appear on HRW display.

43. If no additional subjects to be tested, click on Close on MEC EGDH display.

44. Close CHeCS Application window.

45. On toolbar (bottom of MEC display), select START/SHUT DOWN.

46. Select YES when Shut Down Windows appears on display.

47. PCS Power Supply sw1 → OFF (LED Off)
CAUTION

Do not pull on the microphone wire and electrode cables to remove the microphone pad and electrodes when doffing.

48. Doff BP/ECG BP Cuff, leads, and electrodes. Place trash (5 electrodes and microphone pad) into used Subpack Consumables Ziploc Bag.

49. Depress orange OFF pb (ECG keyboard).

50. Power switch (rear of ECG keyboard) → OFF

51. CHeCS Power/Data Outlet Power → OFF

52. BP/ECG Power Cable (KLSD210056-301) ←|→ CHeCS Power/Data Outlet

53. BP/ECG RS-232 Cable (KLSD210063-301) ←|→ RS-232 Serial Port on rear of MEC

54. MEC UOP 1553 Data/28VDC Power Cable Assy ←|→ CheCS Power/Data Outlet

55. HRM Doffing

55.1 Doff HRW, Snap-on Transmitter/Chest Strap.

NOTE

If the transmitter is left on the belt, the battery will be drained.

55.2 Disconnect Snap-on Transmitter from Chest Strap.

55.3 Wipe off excess moisture from transmitter.

56. Return Cycle Ergometer to stowage configuration underneath Panel 121/125.

57. Temporarily stow MEC and cables for later use with CHeCS activities.

58. Stow:

TBD BP/ECG
FBG1_424 HRW, Snap-On Transmitter/Chest Strap into HRM Kit
Resupply Trash (Five electrodes, alcohol pad, razor, adhesive tape remover, two gauze, and microphone pad)

59. Once completed, perform daily exercise protocol or personal hygiene cleanup.
1. Unstow:
   Non-Sterile Gloves (P3-B2)

2. Inflate Non-Sterile Glove like a balloon by blowing into Glove and tying off the wrist opening.

3. While holding the inflated Glove in one hand and the Tonopen in the other, depress the Tonopen black button for approximately 1 second and release.

4. Depress the Tonopen black button twice in rapid succession.

5. When ‘CAL’ appears on LCD display, hold the Tonopen steady until the display reads ‘UP’.

6. Quickly push and hold the Tonopen Tip approximately 1 inch into the inflated Non-Sterile Glove (until beep is heard).

7. The LCD display should now read ‘Good’. If LCD display reads ‘Bad’, repeat steps 4 --- 6.

8. Tonopen is now ready for use.

9. Restow Tonopen after use (Physical Exam-8).
MALFUNCTION PROCEDURES
1. **INSERTING GHOST IMAGE CD ROM FOR MEC REBOOT**
   
   **FGB1_426** Unstow:
   
   Ambulatory Medical Pack (AMP)  
   MEC CD Pouch from the AMP and restow the AMP

   **NOTE**
   
   This step must be completed before the MEC is deactivated to prepare for the Ghost Image Reboot procedure to follow. No action is required of the CD at this time.

   Retrieve the Ghost Image CD ROM from the MEC CD Pouch and insert into the CD ROM drive on the MEC.

   Stow the MEC CD Pouch in the MEC Kit.

   **NOTE**
   
   When the reboot is complete, it will overwrite any data previously stored on the hard drive.

   Request confirmation from **MCC** that all steps have been taken to back up any data currently salvageable on the MEC and to proceed with reboot.

2. **MEC DEACTIVATION**
   
   At the taskbar on bottom of display, click the ‘Start’ button.

   Click ‘Shut Down’.

   On the ‘Shut Down Windows’ window, click on ‘Shut Down the computer?’ then click the ‘Yes’ button.

   ****************************************************
   If during shutdown a ‘**DLL error**’ occurs, close the error window and repeat step 2.
   ****************************************************

3. **MEC PREREBOOT**
   
   Unstow the External Floppy Drive from the MEC Kit.

   Connect the External Floppy Drive to the MEC floppy disk port labeled ‘FDD’ on the back of the MEC.

   Unstow the Bootable Floppy Disk from the MEC Software Kit attached to the top of the MEC.

   Insert the Bootable Floppy Disk into the External Floppy Drive.

4. **MEC REBOOT**
   
   Activate the MEC power switch.

   At the opening screen, click ‘OK’.
From the ‘Symantec’ menu box, click ‘Local’, then ‘Disk’, then ‘From Image’.

From the window ‘Filename to Load Image From’, click on the option list box ▼ and select ‘CD ROM Drive’.

Select the filename with the ‘.GHO’ extension.

From the window ‘Select the local destination drive by clicking on the drive #’, click on the field under ‘Drive’.

At the ‘Question?’ window, ‘Proceed with disk load?’, select ‘Yes’.

NOTE

At this point, the Ghost Image will be loading.

********************************************************************************************

If the MEC locks up, repeat step 4.
********************************************************************************************

At the ‘Clone Complete’ window, select ‘Continue’.

At the ‘Symantec’ menu box, select ‘Quit’.

At the ‘Quit Ghost’ window, select ‘Yes’.

5. **MEC POST-REBOOT**

Eject the Ghost Image CD ROM and the Bootable Floppy Disk and stow in the MEC Software Kit.

Disconnect the MEC External Floppy Drive and stow in the MEC Kit.

Reboot the MEC by simultaneously pushing the three keys on the MEC keyboard, ‘CTRL - ALT - DEL’ to verify complete loading of the Ghost Image.

After the reboot, at the ‘Daylight Savings Time Reminder’ window, click ‘OK’ and proceed to next step.

6. **SETTING CLOCK TO GMT**

********************************************************************************************

If at reboot the ‘Date/Time Properties’ window does not come up, double left-click on the clock in the right corner of the task bar to open the ‘Date/Time Properties’.

********************************************************************************************
If the date and time are correct on the ‘Date & Time’ tab, and the GMT time on the ‘Time Zone’ tab is ‘Monrovia, Casablanca’
   Select the ‘OK’ button to exit ‘Date/Time Properties’ and go to step 7.

If the date, time or time zone are not correct,
   On the ‘Date & Time’ tab, make corrections using the pulldown boxes or click on correct settings.

On the ‘Time Zone’ tab, click on the pulldown menu box, and scroll down the list to select ‘Monrovia, Casablanca’.

Click the ‘Apply’ button, then the ‘OK’ button to exit the ‘Date/Time Properties’ window.

7. TESTING MEC SOFTWARE CHECKOUT

Double left-click the CHeCS Application icon on the desktop.

Double left-click the CSA-CP icon.

NOTE
Program should start up with a blank data entry screen.

Note any error messages.

Close the CSA-CP application.

At the prompt, ‘Do you want to quit?’, select ‘Quit’.

Close the CHeCS application window.

NOTE
At this point, the MEC reboot is complete and the MEC is ready for nominal operations.
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Belt Locked

1. Flywheel footknob – 0?
   Yes
   2. Flywheel footknob – 0
      Yes
      3. Proceed with nominal operations.
      No
      4. Powerdown
         Control Panel:
         • SYSTEM PAUSE pb
         • pb 7. ENT to Quit Session
         • STBL VIS pb → press (red)
         • GYRO VIS pb → press (red)
         • ‘SYS PWR’ pb → press (red)
         SM panel 435:
         • cb 374 – open
         • cb 375 – open
         • Wait 1 hour.
      5. Check with MCC before proceeding to 6.
      No
      6. Remove TVIS
         • Perform: [TREADMILL WITH VIBRATION ISOLATION AND STABILIZATION - YEARLY MAINTENANCE], steps 1 --- 1.8 (SODF: MED OPS), then:
         7. • Inspect underside of belt for debris.
            Debris found?
            Yes
            8. Remove debris.
            No
            9. Reinstall TVIS
               • Perform: [TREADMILL WITH VIBRATION ISOLATION AND STABILIZATION - YEARLY MAINTENANCE], steps 10 --- 12.5 (SODF: MED OPS), then:
               11. • Continue nominal operations.
      10. • Using 3/16" T-handle Hex Wrench, perform [TREADMILL WITH VIBRATION ISOLATION AND STABILIZATION - YEARLY MAINTENANCE], steps 1.9 --- 1.12 and 1.19 --- 1.23 (SODF: MED OPS: CMS: NOMINAL), then:
          • Using tool, remove transfer case.
      12. • Check transfer case by rotating splines.
         Splines rotate freely?
         Yes
         13. Transfer Case has failed.
         No
         14. 22
Using tool, disengage bolts on flywheel holding motor box, remove motor box.

Rotate TM Belt.
Rotate freely?

Motor Box has failed.

Notify MCC of status.
Reinstall Transfer case back on chassis (minus the motor box).
Perform (TREADMILL WITH VIBRATION ISOLATION AND STABILIZATION - YEARLY MAINTENANCE), steps 5.1 --- 5.4, 7.4, 7.5, 9 --- 12.5 (SODF: MED OPS: CMS: NOMINAL), then:

Use TVIS in passive mode.

Using tool, remove Flywheel case.

Flywheel has failed.

Notify MCC of status.
Perform (TREADMILL WITH VIBRATION ISOLATION AND STABILIZATION - YEARLY MAINTENANCE), steps 4 --- 5.4, 7, 9 --- 10.10, 12.1 --- 12.5 (SODF: MED OPS: CMS: NOMINAL), then:

Do not use TVIS.
TREADMILL WITH VIBRATION ISOLATION AND STABILIZATION - MALFUNCTION - NO RESPONSE FROM SLDS

(MED OPS/2R - ALL/FIN) Page 1 of 2 pages

FAULT: 'NO RESPONSE FROM SLDS'

1. 'CLR' pb on keypad to return to previous menu.

2. Reenter desired subject load. Listen for SLDs turning.
   Menu Response 'OK'?
   Yes
   No

3. Repeat blocks 1,2 three more times.

4. Continue nominal operations.

5. Remove subject from Series Bungee System and SLDs.

6. FBG1_226:
   Unstow: From 'TVIS Assy Kit' 3/16" T-handle Hex Wrench
   TVIS:
   Remove both rear closeout panels, temporarily stow.

7. Look down into space between right and left SLDs and their corresponding Aft Stabilizers.
   SLD cables connected?
   Yes
   No

8. Power Cycle
   TVIS Control Panel:
   STBL VIS pb → press (red)
   GYRO VIS pb → press (red)
   Perform SYSTEM PAUSED Menu.
   pb 7, ENT to quit session.
   SYS PWR pb → press (red)
   Reinstall closeout panels, wait approximately 20 minutes.

9. Yes

23 AUG 00

267
TREADMILL WITH VIBRATION ISOLATION AND STABILIZATION - MALFUNCTION - NO RESPONSE FROM SLDS
(MED OPS/2R - ALL/FIN)  Page 2 of 2 pages

8
9
• Restart nominal procedures from the beginning.

11
• Reenter desired subject load and listen for SLDs.

12
• Unstow Manual Override Tool from ‘TVIS Malfunction Kit’ in TBD location.
• Unstow Makita Drill and 3/16” bit from ‘ISS IVA Tool Kit’.

13
• Stow 3/16” T-handle in ‘TVIS Assy Kit’ and in FGB1_226.

14
• Reconnect SLD cables to SLDs taking caution not to bend the pins of the cables.

15
• Continue with nominal operations.

16
• Remove left and right fwd closeout panels.

17
• Reinstall closeout panels, stow 3/16” T-handle in ‘TVIS Assy Kit’.

18
• Perform (TVIS MAL: MANUAL OVERRIDE TOOL FOR SLDs), all (SODF: MED OPS: CMS: CORRECTIVE).

19
• Remove Manual override tool.
• Replace closeout panels using 3/16” T-handle.
• Stow tools in original locations.

20
• Notify MCC at first opportunity.
• Continue with nominal operations.
Actual Belt Speed is Slower than Commanded Belt Speed

1. Flywheel footknob – 0
   - Set to 0?

2. Flywheel footknob – 0
   - Set to ‘0’.

3. Continue nominal operations.

4. Control Panel/Main Message Screen
   - SYSTEM PAUSE pb
     - SYSTEM PAUSED
   - sel 3 and ENT for Diagnostic menu
   - sel 7 and ENT
   - VIS VOLTS
   - VIS VOLTS ≥ 25 V?

5. SM Panel 435:
   - *cb 375, 374
   - Either cb open?

6. Powerdown
   - Control Panel:
     - SYSTEM PAUSE pb
     - pb 7, ENT to Quit Session
     - STBL VIS pb → press (red)
     - GYRO VIS pb → press (red)
     - ‘SYS PWR’ pb → press (red)
     - SM panel 435:
       - cb 374 – open
       - cb 375 – open
       - Notify MCC.
       - Wait 1 hour.
       - Remove TVIS skirt.
       - Unstow 3/16” Hex T-handle from TVIS Malfunction Kit.
       - Remove Fwd Left Closeout Panel.
       - Raise TVIS.

7. Call MCC.

8. Call MCC.

9. TVIS fwd end:
   - *cb Motor Box ‘5Amp’
     - Open?

10. Motor Box problem.
     - Lower TVIS, reinstall Closeout Panel, reinstall skirt.
     - Place TVIS in Passive Mode and continue exercise.

11. Call MCC.

12. Notify MCC.

13. Notify MCC.
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User Notification

Upon Inspection, Blue Rubber Material on SPD(s) Found to be Deformed or Cracking

1. If subject begins wandering off center of the belt, TVIS will strike the bumpers causing potential disruption of any microgravity experiments.

2. Continue with nominal operations. System beginning to pitch excessively?
   - Yes
     - Continue with nominal operations.
   - No
     - Unstow gray duct tape. Wrap blue material with duct tape (once around).

3. Continue with nominal operations. TVIS oscillating during exercise?
   - Yes
     - Continue nominal operations.
   - No
     - Stop running on TVIS. Call MCC.

4. Remove SPD top assemblies, stow.

5. Notify MCC. Use TVIS cautiously (stay centered on belt to prevent oscillation).

6. Continue nominal operations.

7. Stop running on TVIS. Call MCC.
TM Belt is Slipping during Operations

1. Complete session.
   - Notify MCC to plan for Treadmill Belt Tensioning.

2. When timelined, perform (TREADMILL WITH VIBRATION ISOLATION AND STABILIZATION - CORRECTIVE - BELT TENSIONING), all (SODF: MED OPS: CMS: CORRECTIVE).

3. Continue with nominal operations when TVIS is back in place.
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TREADMILL WITH VIBRATION ISOLATION AND STABILIZATION - MALFUNCTION - ‘SYS PWR’ LED NOT CHANGING COLOR OR CONTROL PANEL LCDS NOT ILLUMINATING

(MED OPS/2R - ALL/FIN) Page 1 of 1 page

User Notification

SYS PWR' LED Not Changing Color When Depressed

Control Panel LCDs Not Illuminating

---

1

SM:
• cb 374 – Open
• cb 375 – Open

2

• Disconnect Control panel PWR/Data cable from control panel.

3

• Cable connector for debris
Debris found?

Yes

4

• Remove debris.

No

6

• Pins for damage
Pin(s) damaged?

Yes

8

• Perform (TVIS MALFUNCTION: CONTROL PANEL PIN DAMAGE), all (SODF: MED OPS: CMS: MALFUNCTION).

5

• Reconnect cable to control panel.

7

SM: panel 435
• cb 374 – Closed
• cb 375 – Closed

9

• Remove skirt.
• EB cbs on aft end of TVIS
Any cbs open?

Yes

10

• Continue nominal operations.

No

12

• Reinstall skirt to TVIS.

13

Control Panel:
• Reconnect cable.
SM panel 435:
• cb 374 – close
• cb 375 – close
Control Panel:
• Depress SYS PWR pb.

LCDs illuminated?

Yes

15

LED failure.

No

14

Control Panel failure.

16

• Notify MCC.

17

• Continue nominal operations.
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TREADMILL WITH VIBRATION ISOLATION AND STABILIZATION - MALFUNCTION -GYRO SPEED NOT INCREASING

(MED OPS/2R - ALL/FIN)  

1. Control Panel Main Message Display: 
   • VIS Status menu
   • Gyro Mode…UNDERSPEED
   GYRO RPMs fluctuating?  
   Yes  No  

2. Power Cycle VIS  
   Control panel top right:  
   • STBL VIS – red  
   • GYRO VIS – red  
   • Wait 15 minutes.  
   • GYRO VIS – green  
   • STBL VIS – green  

3. VIS Status menu  
   GYRO RPMs ??  
   Yes  No  
   1. Servo Amp/Processor not initialized or EB relay not closed.  
   Yes  No  

4. Let Gyro spin up for about 5 minutes. Does Gyro resist roll motion?  
   Yes  No  

5. Control Panel Main Display:  
   • SYSTEM PAUSE pb  
   • sel 2 and ENT for VIS Status/Control  
   ---VIS STATUS/CONTROL---  
   • sel 1 and ENT  
   ---VIS CONTROL---  
   • sel 4 and ENT to send STAB ON command.  
   • pb 7, ENT  

6. Fault Toggled?  
   Yes  No  

7. Control Panel Main Display:  
   ---VIS STATUS---  
   • Wait 10 minutes.  
   Gyro Mode…READY?  
   Yes  No  

8. Speed processing capability lost.  
   Yes  No  

9. Control Panel Main Display:  
   ---VIS STATUS/CONTROL---  
   • sel 1 and ENT  
   ---VIS CONTROL---  
   • sel 4 and ENT to send STAB ON command  

10. Continue nominal operations.  

11. System PAUSE pb  
    • sel 2 and ENT for VIS Status/Control  
    ---VIS STATUS/CONTROL---  
    • sel 1 and ENT  
    ---VIS CONTROL---  
    • sel 4 and ENT to send STAB ON command  

12. Continue nominal operations.  

13. Verify STBL FAULTS toggled from ‘S1,S2,S3, S4’ → ‘NONE’  

14. Control Panel (top right):  
   • STBL VIS – red  
   • GYRO VIS – red  
   • Notify MCC.
Control Panel Main Display:
SYSTEM PAUSED
• sel 3 and ENT for Diagnostic Menu
• Record all voltages and currents.

GYRO failure.

Control Panel Main Display:
---VIS CONTROL---
• sel 7 and ENT to return to VIS STATUS/CONTROL

---VIS STATUS/CONTROL---
STBL FAULTS...NONE?

Yes
• Continue nominal operations.

No
19
• Go to (SODF: MED OPS: TVIS MALFUNCTION: STBL FAULTS S1,S2,S3,S4) start from block 4.

Go to (SODF: MED OPS: TVIS MALFUNCTION: STBL FAULTS S1,S2,S3,S4) start from block 4.

Call MCC and report values of voltages and currents.

Call MCC and report values of voltages and currents.
Fault Message During Nominal Ops: 'GYROSCOPE UNDERSPEED'

1. Control Panel Main Message screen:
   - SYSTEM PAUSE pb
   - sel 2 and ENT for VIS Status/Control
   - GYRO SPEED

   Speed decreasing or steady?
   Speed slowly increasing?

2. Wait 5 minutes.
   Gyroscope increasing?

3. Monitor speed until RPMs stabilize.
   Speed ≥ 2000?

4. Continue nominal operations.

5. Power Cycle
   Control Panel top right:
   - STBL VIS pb → press (red)
   - GYRO VIS pb → press (red)
   Control Panel face:
   - SYS PWR pb → press (red)
   - Wait approximately 20 minutes.
   - SYS PWR pb → press (green)
   Control Panel top right:
   - GYRO VIS pb → press (green)
   - STBL VIS pb → press (green)

6. Control Panel Main Display:
   - SYSTEM PAUSE pb
   - sel 3 and ENT for Diagnostic Menu
   - Record all currents and voltages.
   - Call MCC and report recordings.

7. Wait approximately 10 minutes.
   - VIS STATUS
   Gyro speed ≥ 2000 rpms?

8. Continue nominal operations.

9. Remove skirt from aft end of TVIS.
   - Electronics Box cbs Open?

10. Call MCC.
PCMCIA Card Locks Up the System

1. Eject PCMCIA card from TVIS control panel.

2. Power Cycle System
   - ‘SYS PWR’ pb → press (red)
   - Wait 3 seconds.
   - ‘SYS PWR’ pb → press (green)

3. Re-insert card
   - Locked up again?
     - Yes
     - Continue nominal operations.
     - No

4. Repeat steps 1 --- 3 once, move on to step 6 after second try.

5. Power Cycle System
   - ‘SYS PWR’ pb → press (red)
   - Wait 3 seconds.
   - ‘SYS PWR’ pb → press (green)

6. Unstow: Spare PCMCIA card from ‘TVIS Malfunction Kit’ in FGB1_226.

7. Use spare PCMCIA card in control panel.
   - System locked up again?
     - Yes
     - Original card has a failure.
     - No

8. Possible CCM Board Failure.


10. Continue nominal operations with ‘spare’ PCMCIA card.
13 Power Cycle System
- Remove PCMCIA card.
- ‘SYS PWR’ pb → press (red)
- ‘SYS PWR’ pb → press (green)

14 Notify MCC.

15 Automatic session and data recording ability is lost.
1. **Power Cycle**
   - Control Panel top right:
     - **STBL VIS pb → press (red)**
     - **GYRO VIS → press (red)**
   - Control Panel face:
     - **SYS PWR pb → press (red)**
     - Wait approximately 20 minutes.
     - **SYS PWR pb → press (green)**
   - Control Panel top right:
     - **GYRO VIS pb → press (green)**
     - **STBL VIS pb → press (green)**

2. **Control Panel Main Display:**
   - Restart session following nominal ops.
   - Go to VIS Status menu.
   - **VIS STATUS MENU**
   - **STBL FAULTS**

3. **STBL FAULTS S1,S2,S3,S4 displayed?**
   - Yes
   - Wait 10 minutes.
   - Verify STBL FAULTS...
   - Verify GYRO READY.

4. **STBL FAULTS...NONE and GYRO READY appear on VIS STATUS MENU?**
   - Yes
   - Continue nominal operations.
   - No
   - Go to **TVIS MALFUNCTION: STBL FAULTS S1,S2,S3,S4** from block 2 (SODF: MED OPS: CMS: MALFUNCTION).

5. **Transient failure.**

6. **No**
   - **VIS STATUS**
   - S1,S2,S3,S4 not Displayed prior to GYRO READY
SLD Load is Uneven after Loading During Operations

1. Control Panel:
   - SYSTEM PAUSE pb then pb 7 for ‘Quit Session’.
   - Follow prompts to ‘Insert CCM’ menu.

2. Follow prompts to reenter subject load.
   - Loads still uneven?
     - Yes
     - No

3. Continue exercise.

4. Control Panel:
   - SYSTEM PAUSE pb then pb 7 for ‘Quit Session’.
   - Follow prompts to ‘Insert CCM’ menu.

5. On Harness and Bungees:
   - Check to see if there are equal number of extension hooks on left and right.
   - Equal number of hooks?
     - Yes
     - No

6. Make equal; continue with nominal exercise.

7. Inspect Series Bungee System (SBS) for broken cords.

8. Perform (TREADMILL WITH VIBRATION ISOLATION AND STABILIZATION - MONTHLY MAINTENANCE), all (SODF: MED OPS: CMS: NOMINAL)
   - Any Bungees broken?
     - Yes
     - No

9. Borrow crewmate’s SBS.
   - Continue with exercise.
Follow prompts on display to Load SLDs.

Both SLDs running?

Yes

SLD Load Cell failure.

No

Non-running SLD has failed.

Perform (TREADMILL WITH VIBRATION ISOLATION AND STABILIZATION - MALFUNCTION - NO RESPONSE FROM SLDs), block 13-18 (SODF: MED OPS: CMS: MALFUNCTION) (only apply to affected SLD).

Notify MCC of problem.
TREADMILL WITH VIBRATION ISOLATION AND STABILIZATION - MALFUNCTION - STBL FAULTS S1, S2, S3, S4
(MED OPS/2R - ALL/FIN) Page 1 of 3 pages

1. TVIS Control Panel Main Display
   - All faults (S1, S2, S3, S4) displayed?
     - Yes
       - S1, S2, S3, S4 NOT DISPLAYED PRIOR TO GYRO READY) block 7, (SODF: MED OPS: TVIS MALFUNCTION)
     - No
       - Continue nominal operations.

2. Continue nominal operations.

3. Notify MCC.

4. TVIS Control Panel Main Display:
   - SYSTEM PAUSE pb
     - SYSTEM PAUSED
   - sel 2, ENT for VIS Status/Control
     - ---VIS STATUS/CONTROL---
   - sel 1, ENT for STB/GYRO/VIS RESET MENU
     - ---VIS CONTROL---
   - sel 4, ENT to send STBL ON command

5. TVIS Control Panel Main Display:
   - pb 7, ENT to return to VIS Status/Control menu
     - STBL FAULTS

6. Treadmill did not capture feedback.

7. Continue nominal operations.

8. AFT end of TVIS:
   - Remove skirt from aft end.
   - 10 amp cb of Electronic Box closed
   - cb closed?
     - Yes
     - MCC
     - No

9. STBL VIS pb → press (green)

10. Control Panel (top right):
    - STBL VIS LED
    - LED green?
      - Yes
      - No

11. Control Panel (top right):
    - STBL VIS pb → press (green)
    - STBL VIS LED turn green?
      - Yes
      - No
12 Power Cycle

Control panel (top right):
- STBL VIS pb → press (red)
- GYRO VIS pb → press (red)
- Wait 20 minutes.
- GYRO VIS pb → press (green)
- STBL VIS pb → press (green)

14 Control Panel Main Display:
- VIS STATUS MENU
- STBL FAULTS

Faults clear after 10 minutes?

17 Continue with nominal operations with passive stabilizers.

19 Call MCC.

16 Transient failure.

18 Continue nominal operations.

15 TVIS Control Panel Main Display:
- pb 7, ENT to return to VIS Status/Control
- STBL FAULTS

Did faults clear?

20 Switchpad in wrong configuration.

21 Continue nominal operations.

23 AUG 00
TREADMILL WITH VIBRATION ISOLATION AND STABILIZATION - MALFUNCTION - STBL FAULTS S1, S2, S3, S4

(MED OPS/2R - ALL/FIN) Page 3 of 3 pages

11

22 TVIS Control Panel Main Display:
- SYSTEM PAUSE pb [SYSTEM PAUSED]
- sel 2, ENT for VIS Status/Control
- sel 1, ENT for STB/GYRO/VIS RESET MENU
- sel 4, ENT to send STBL ON command

23 TVIS Control Panel Main Display:
- pb 7, ENT to return to VIS Status/Control menu
- STBL FAULTS

24 Possible relay failure.

25 Continue nominal operations.

26 LED failure.

27 Continue nominal operations.
If subject begins wandering off center of the belt, TVIS will strike the bumpers causing potential disruption of any microgravity experiments.

**User Notification**

**SPDs are Binding during Nominal Operations**

1. Disengage SPDs from harness.

2. Unscrew yoke bolt from both SPDs and remove from Bottom Assemblies.

3. Notify MCC. Use TVIS cautiously (stay centered on belt to prevent oscillation).

4. TVIS oscillating during exercise?
   - Yes: Continue nominal operations.
   - No: Stop running on TVIS. Call MCC.
TREADMILL WITH VIBRATION ISOLATION AND STABILIZATION - MALFUNCTION - SYSTEM OSCILLATING AFTER 'GYRO READY' MESSAGE

(MED OPS/2R - ALL/FIN)    Page 1 of 1 page

1. Notify MCC. VIS Controller IFM will be required to gain microprocessor control.

--- TVIS Control Panel Main Display: ---

**SYSTEM PAUSED**

- sel 2, ENT for VIS Status/Control
- sel 1, ENT for STB/GYRO/VIS RESET MENU
- sel 5, ENT to send STBL OFF command

2. Oscillation will stop

--- TVIS Control Panel Main Display: ---

**SYSTEM PAUSED**

- sel 4, ENT for Belt Speed Controls/Reset
- sel 3, ENT for Passive Session
- Follow prompts for remainder of passive session setup.

3. Proceed with passive exercise.
   - Notify MCC.

4. STBL Gain setting is too high.
This Page Intentionally Blank
1. Inspect belt for cracks, breaks, or debris. Remove any debris found.

Belt slat broken?

Yes \[\rightarrow 3\]

No \[\rightarrow 2\]

2. Monitor noise. If noise becomes worse, notify MCC.


5. Continue with nominal operations.
1. **NOTE**
   1. With approximately 3 hours of run time remaining, the CDM will emit a short beep once every 15 seconds to indicate a low battery condition.
   2. When the battery has insufficient charge to operate the CDM, **'BATTERY FAIL'** is displayed and a short beep is emitted every second. The battery should be replaced immediately.
   3. When in the normal operation (CO2 concentration displayed), the battery status OK or LOW can be accessed by pressing the MODE pushbutton once. After 15 seconds, the display will revert back to the normal viewing mode.

1. **CDM SETUP**
   Unstow marker and spare Battery Pack from CDM Kit. Temporarily stow kit.
   
   If CDM activated, then deactivate.

2. **CDM DEACTIVATION**
   Press, hold MODE pushbutton until **'RELEASE'** displayed.
   
   Verify CDM → Off

3. **BATTERY CHANGEOUT**
   Turn fasteners (two) on back panel 1/4 turn ⩾.
   
   Temporarily stow panel.
   
   Grasp Battery Pack pull tab, remove pack.
   
   **NOTE**
   Stored data are maintained for a maximum of 30 minutes without battery installed. All data will be lost if battery installation is delayed more than 30 minutes.
   
   Mark Battery Pack as DISCHARGED.
   
   Install replacement Battery Pack.
   Press firmly to seat electrodes.
   
   Replace panel, press firmly, turn fasteners (two) 1/4 turn ⩾ to lock.
   
   Stow marker and used Battery Pack in CDM Kit.
   
   If required, activate CDM.
4. **CDM ACTIVATION**

   **NOTE**
   1. Audible beeps occur when the **MODE** pushbutton is depressed during unit activation.
   2. A single beep occurs when the self-check routine is complete.

Press, hold MODE pushbutton until ‘**RELEASE**’ displayed.

Wait approximately 1 minute while unit runs self-check routine.

Verify display indicates CO2 concentration.

As required, deploy CDM.

Notify **MCC** when the battery changeout is completed.
NOTE
The CDM requires the use of the Filter Assembly for proper operation. The assembly prevents particulate matter from interfering with the infrared sensor and damaging the sampling pump. If the filter becomes clogged, a low flow indication ‘PUMP FLO ALM’ will be displayed and the assembly must be replaced.

If CDM activated, then deactivate.

1. **CDM DEACTIVATION**
   Press, hold MODE pushbutton until ‘RELEASE’ displayed.

   √CDM → Off

   **NOTE**
   When demating the Filter Assembly from the Quick Disconnect (QD), grasp the assembly with one hand and the QD with the other.

2. **FILTER ASSEMBLY CHANGEOUT**
   CDM QD ←|→ Filter Assembly

   **NOTE**
   Clean filter assemblies will have the blue ring next to the CLEAN label in kit pouch lid.

   Return used Filter Assembly to pouch lid with blue ring on the side with the DIRTY label.

   Remove clean Filter Assembly from the CDM Kit.

   CDM QD →|← Clean Filter Assembly

   Activate CDM.

3. **CDM ACTIVATION**

   **NOTE**
   1. Audible beeps occur when the MODE pushbutton is depressed during unit activation.

   2. A single beep occurs when the self-check routine is complete.

   Press, hold MODE pushbutton until ‘RELEASE’ displayed.

   Wait approximately 1 minute while unit runs self-check routine.

   √Display indicates CO2 concentration
NOTE
1. Warning and Error messages are shown on the display.
2. The messages can be called up through the Error Menu. Warning and Error message numbers also are stored to the RAM card and can be downloaded through the RS-232 port to a computer.

Table 1. ISS Total Organic Carbon Analyzer Warning and Error Messages

<table>
<thead>
<tr>
<th>Message Number</th>
<th>Type</th>
<th>Message</th>
<th>Actions to be Taken</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>E</td>
<td>IC CO2 Sensor exceeding 50°C</td>
<td>Switch TOCA power off. Wait until ambient temperature is cooler if it is warm. Otherwise, wait at least 30 seconds and switch TOCA power on.</td>
</tr>
<tr>
<td>2</td>
<td>E</td>
<td>TOC CO2 Sensor exceeding 50°C</td>
<td>Switch TOCA power off. Wait until ambient temperature is cooler if it is warm. Otherwise, wait at least 30 seconds and switch TOCA power on.</td>
</tr>
<tr>
<td>3</td>
<td>E</td>
<td>IC CO2 Sensor less than 5°C</td>
<td>Switch TOCA power off. Wait until Analyzer is warmer if it is cold. Otherwise, wait at least 30 seconds and switch TOCA power on.</td>
</tr>
<tr>
<td>4</td>
<td>E</td>
<td>TOC CO2 Sensor less than 5°C</td>
<td>Switch TOCA power off. Wait until Analyzer is warmer if it is cold. Otherwise, wait at least 30 seconds and switch TOCA power on.</td>
</tr>
<tr>
<td>5</td>
<td>W</td>
<td>Invalid temperature reading in IC CO2 Temperature Sensor</td>
<td>Press any key to continue. TIC and TOC values may be in error.</td>
</tr>
<tr>
<td>6</td>
<td>W</td>
<td>Invalid temperature reading in TOC CO2 Temperature Sensor</td>
<td>Press any key to continue. TOC and TC values may be in error.</td>
</tr>
<tr>
<td>7</td>
<td>W</td>
<td>Conductivity range error in IC CO2 Sensor</td>
<td>Press any key to continue. TIC and TOC values may be in error.</td>
</tr>
<tr>
<td>8</td>
<td>W</td>
<td>Conductivity range error in TOC CO2 Sensor</td>
<td>Press any key to continue. TOC and TC values may be in error.</td>
</tr>
<tr>
<td>9</td>
<td>W</td>
<td>Invalid conductivity reading in IC CO2 Sensor</td>
<td>Press any key to continue. TIC and TOC values may be in error.</td>
</tr>
<tr>
<td>10</td>
<td>W</td>
<td>Invalid conductivity reading in TOC CO2 Sensor</td>
<td>Press any key to continue. TOC and TC values may be in error.</td>
</tr>
<tr>
<td>11</td>
<td></td>
<td>Not used</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>E</td>
<td>Amount of available acid is less than one analysis</td>
<td>Advise MCC and discontinue use of TOCA.</td>
</tr>
<tr>
<td>13</td>
<td>E</td>
<td>Amount of available oxidizer is less than one analysis</td>
<td>Mix new batch of reagent. Refer to section 4.3 TBD.</td>
</tr>
<tr>
<td>Message Number</td>
<td>Type</td>
<td>Message</td>
<td>Actions to be Taken</td>
</tr>
<tr>
<td>---------------</td>
<td>------</td>
<td>---------</td>
<td>---------------------</td>
</tr>
<tr>
<td>14</td>
<td>W</td>
<td>Age of oxidizer solution now being used exceeds 90 days</td>
<td>Mix new batch of reagent. Refer to section 4.3 TBD. Otherwise, press any key if analysis is desired. TOC and TC values may be in error.</td>
</tr>
<tr>
<td>15</td>
<td>W</td>
<td>Limited life item exceeds 80 % of planned life</td>
<td>Press any key to clear display. Access main menu. Select service menu for information on limited life items.</td>
</tr>
<tr>
<td>16</td>
<td>W</td>
<td>Reagent System must be replaced</td>
<td>Press any key if analysis is desired. TIC, TOC, and TC values may be in error.</td>
</tr>
<tr>
<td>17 --- 25</td>
<td></td>
<td>Not used</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>E</td>
<td>RAM card write protected, unable to write</td>
<td>Switch TOCA power off, remove RAM card and move write-protect switch to other position. Analyzer will function in this condition, but no sample data will be saved.</td>
</tr>
<tr>
<td>27 --- 28</td>
<td></td>
<td>Not used</td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>E</td>
<td>Computer error has occurred</td>
<td>Switch TOCA power off. Wait 30 seconds and restart. If error occurs again, do not use TOCA further.</td>
</tr>
<tr>
<td>30</td>
<td>Not used</td>
<td></td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>W</td>
<td>RAM card not installed and data will not be stored. Install RAM card if possible.</td>
<td>Install RAM card if possible. Otherwise, press any key to continue.</td>
</tr>
<tr>
<td>32</td>
<td>E</td>
<td>Servo will not move to “Fill” position</td>
<td>Switch TOCA power off. Wait 30 seconds and restart. If error occurs again, advise MCC and do not use TOCA further.</td>
</tr>
<tr>
<td>33</td>
<td>E</td>
<td>Servo will not move to “Empty” position</td>
<td>Switch TOCA power off. Wait 30 seconds and restart. If error occurs again, advise MCC and do not use TOCA further.</td>
</tr>
<tr>
<td>34</td>
<td>E</td>
<td>Servo error in flag positions sensing</td>
<td>Switch TOCA power off. Wait 30 seconds and restart. If error occurs again, advise MCC and do not use TOCA further.</td>
</tr>
<tr>
<td>35</td>
<td>Not used</td>
<td></td>
<td></td>
</tr>
<tr>
<td>36</td>
<td>E</td>
<td>Motor refill is taking longer than expected</td>
<td>Switch TOCA power off, replace RAM card if possible. Wait 30 seconds and restart. If error occurs again, advise MCC and do not use TOCA further.</td>
</tr>
</tbody>
</table>
Continuation of Table 1

<table>
<thead>
<tr>
<th>Message Number</th>
<th>Type</th>
<th>Message</th>
<th>Actions to be Taken</th>
</tr>
</thead>
<tbody>
<tr>
<td>37 --- 40</td>
<td></td>
<td>Not used</td>
<td></td>
</tr>
<tr>
<td>41</td>
<td>W</td>
<td>RAM card DOS format appears to have been corrupted or changed. Data will not be stored. Replace if possible.</td>
<td>Switch TOCA power off and replace RAM card if possible. Otherwise, remove RAM card.</td>
</tr>
<tr>
<td>42</td>
<td>E</td>
<td>Analysis sequence time greater than 2,400 seconds</td>
<td>Switch TOCA power off. Wait 30 seconds and restart. If error occurs again, advise MCC and do not use TOCA further.</td>
</tr>
<tr>
<td>43</td>
<td></td>
<td>Not used</td>
<td></td>
</tr>
<tr>
<td>44</td>
<td>E</td>
<td>Power loss detected</td>
<td>Press CLEAR key to continue.</td>
</tr>
<tr>
<td>45</td>
<td>E</td>
<td>High pressure detected in sample line</td>
<td>Switch TOCA power off. Wait 30 seconds and restart. If error occurs again, advise MCC and do not use TOCA further until instructed.</td>
</tr>
<tr>
<td>46</td>
<td>E</td>
<td>Low pressure detected in sample line. Check syringe on/off valve and connection, and sample bag connection (if bag sampling used).</td>
<td>Switch TOCA power off and check shutoff valve on sample syringe. Open valve if it is closed. Check Luer lock connection(s) to ensure tight seal. Wait 30 seconds and restart. If error occurs again, advise MCC and do not use TOCA further until instructed.</td>
</tr>
<tr>
<td>47</td>
<td>E</td>
<td>High pressure detected in DI Water Loop</td>
<td>Switch TOCA power off. Wait 30 seconds and restart. If error occurs again, advise MCC and do not use TOCA further.</td>
</tr>
<tr>
<td>48</td>
<td>E</td>
<td>Low pressure detected in DI Water Loop</td>
<td>Switch TOCA power off. Wait 30 seconds and restart. If error occurs again, advise MCC and do not use TOCA further.</td>
</tr>
<tr>
<td>49</td>
<td>E</td>
<td>Sample Syringe Pump will not open</td>
<td>Switch TOCA power off. Open sample door and inspect syringe pump. Remove obstructions, if any. Wait 30 seconds and restart. If error occurs again, advise MCC and do not use TOCA further.</td>
</tr>
<tr>
<td>50</td>
<td>E</td>
<td>Sample Syringe Pump will not close</td>
<td>Switch TOCA power off. Open sample door and inspect syringe pump. Remove obstructions, if any. Wait 30 seconds and restart. If error occurs again, advise MCC and do not use TOCA further.</td>
</tr>
</tbody>
</table>
Continuation of Table 1

<table>
<thead>
<tr>
<th>Message Number</th>
<th>Type</th>
<th>Message</th>
<th>Actions to be Taken</th>
</tr>
</thead>
<tbody>
<tr>
<td>51</td>
<td>W</td>
<td>Sample Syringe may contain too little water</td>
<td>After syringe pump has opened, switch TOCA power off. Remove sample syringe and add more sample to it. Reinsert syringe and switch TOCA power on. From main menu, select analysis menu and repeat.</td>
</tr>
<tr>
<td>52</td>
<td>W</td>
<td>Reagent System life exceeds 360 days</td>
<td>Press any key to continue. TIC, TOC, and TC values may be in error.</td>
</tr>
<tr>
<td>53</td>
<td></td>
<td>Not used</td>
<td></td>
</tr>
<tr>
<td>54</td>
<td>W</td>
<td>Waste Collection System holds waste from 10 analyses. Replace it.</td>
<td>Switch TOCA power off, replace Waste Collection System, switch TOCA power on, and go to main menu. Select service menu. Refer to section 4.2 TBD.</td>
</tr>
<tr>
<td>55</td>
<td>E</td>
<td>Temperature of Conductivity Sensor exceeds 50° C</td>
<td>Switch TOCA power off. Wait until ambient temperature is cooler if it is warm. Otherwise, wait at least 30 seconds and switch TOCA power on.</td>
</tr>
<tr>
<td>56</td>
<td>E</td>
<td>Temperature of pH Sensor exceeds 50° C</td>
<td>Switch TOCA power off. Wait until ambient temperature is cooler if it is warm. Otherwise, wait at least 30 seconds and switch TOCA power on.</td>
</tr>
<tr>
<td>57</td>
<td>E</td>
<td>Temperature of Conductivity Sensor is less than 5° C</td>
<td>Switch TOCA power off. Wait until Analyzer is warmer if it is cold. Otherwise, wait at least 30 seconds and switch TOCA power on.</td>
</tr>
<tr>
<td>58</td>
<td>E</td>
<td>Temperature of pH Sensor is less than 5° C</td>
<td>Switch TOCA power off. Wait until Analyzer is warmer if it is cold. Otherwise, wait at least 30 seconds and switch TOCA power on.</td>
</tr>
<tr>
<td>59</td>
<td>W</td>
<td>Invalid temperature in Conductivity Sensor</td>
<td>Press any key to continue. Conductivity value may be in error.</td>
</tr>
<tr>
<td>60</td>
<td>W</td>
<td>Invalid temperature in pH Sensor</td>
<td>Press any key to continue. pH value may be in error.</td>
</tr>
<tr>
<td>61</td>
<td></td>
<td>Not used</td>
<td></td>
</tr>
<tr>
<td>62</td>
<td>W</td>
<td>Invalid reading in pH Sensor</td>
<td>Press any key to continue. pH value may be in error.</td>
</tr>
<tr>
<td>Message Number</td>
<td>Type</td>
<td>Message</td>
<td>Actions to be Taken</td>
</tr>
<tr>
<td>----------------</td>
<td>------</td>
<td>----------------------------------------------</td>
<td>--------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>63</td>
<td>W</td>
<td>Leak detected in IC Removal Module</td>
<td>Press any key to clear warning, and complete analysis or calibration. Then switch TOCA power off. Wait 30 seconds and restart. TOCS can still be used. Also, ICR can be reset manually. Refer to section 4.4 TBD.</td>
</tr>
<tr>
<td>64</td>
<td>E</td>
<td>Restriction in Deionized Water Supply detected</td>
<td>Switch TOCA power off, wait 30 seconds and restart. If error occurs again, advise MCC and do not use TOCA further.</td>
</tr>
<tr>
<td>65</td>
<td>W</td>
<td>Calibration unsuccessful</td>
<td>TOCA can be operated, but was not calibrated. Repeat of autocalibration is recommended.</td>
</tr>
<tr>
<td>66</td>
<td>W</td>
<td>ICR failed, and has been manually reset</td>
<td>Press Enter, continue using TOCA.</td>
</tr>
<tr>
<td>67-68</td>
<td></td>
<td>Not used</td>
<td></td>
</tr>
<tr>
<td>69</td>
<td>W</td>
<td>Not enough acid to perform analysis</td>
<td>Abort analysis. At the start of the next analysis the acid syringe will be refilled.</td>
</tr>
<tr>
<td>70</td>
<td>E</td>
<td>Battery-backed RAM data have been corrupted</td>
<td>Switch TOCA power off, advise MCC and do not use TOCA further.</td>
</tr>
<tr>
<td>71</td>
<td>W</td>
<td>RAM card operating software checksum failure</td>
<td>Replace RAM card if possible. If not possible, operating software in TOCA will be used.</td>
</tr>
<tr>
<td>72</td>
<td>E</td>
<td>Boot ROM checksum failure</td>
<td>Switch TOCA power off, advise MCC and do not use TOCA further.</td>
</tr>
<tr>
<td>73</td>
<td>E</td>
<td>ROM operating software checksum failure</td>
<td>Switch TOCA power off, insert a RAM card with operating software.</td>
</tr>
</tbody>
</table>
1. Unstow:
   - TOC TOCA Power cable
   - Supply TOCA Data cable

2. √TOCA power – Off

3. Relocate Medical Equipment Computer (MEC) adjacent to TOCA.

4. Connect TOCA Data cable 9-pin connector to MEC serial port.
   Tighten thumb screws.

5. Connect TOCA Data cable 9-pin connector to TOCA RS-232 Port on
   TOCA front panel.
   Tighten thumb screws.

6. MEC power – On

7. Double-click the CHeCS applications icon.


9. Select ‘Transfer’ from the main menu bar.

10. Select ‘Capture Text’ from the Transfer pulldown menu.

11. Name the file “CHeCS/toca/TOCA mm-dd-yy.txt” for download.

12. Click START.

13. **ACTIVATING TOCA FOR DOWNLOADING**

    TOCA Power cable $\rightarrow$ TOC Analyzer Connection marked “2.75VDC”.
    TOCA Power cable $\rightarrow$ Russian Segment 28VDC Power Outlet

    √TOCA power switch – On

    √Display Orientation screen

    Press ENTER.

    If No Screen
    √Waste Container, Reagents, RAM Card Covers closed

    √‘Remove Sample Syringe If Installed’ screen displayed

    Press ENTER.

    √Main Menu screen

    Select DOWNLOAD (keys “↑” “↓”).
    Press ENTER.

    √Download Data screen
14. Press ENTER when ready to begin download.

15. Wait 1 --- 2 minutes for data download to be completed.

16. √‘Downloading Succeeded’ displayed

17. Press CLEAR.

18. √TOCA power switch – Off

19. sel ‘Transfer’ from menu bar.
   sel ‘CAPTURE TEXT’ then ‘STOP’.
   sel ‘FILE’ then ‘EXIT’.

   √Hyperterminal Prompt “Are You Sure…?”

   Choose YES.

20. Go to ‘START’ menu.
    Select ‘Shut Down’.
    Click ENTER.
    MEC power – Off

21. TOCA Data cable ←|→ TOCA and from the MEC.
    TOCA Power cable ←|→ TOCA and 28VDC Power outlet

22. Stow:
    TOC
    TOC Power cable
    Supply
    TOC Data cable
    Kit

308
FGB1
_426
1. Unstow:
   TOCA Supply Kit
   TOCA
   Fuse (one)

2. √TOCA Power switch – ‘Off’
   Front
   Panel

   3. Locate fuse location on TOCA front panel.
      Turn black knob ⇧ to unscrew.

   4. Change out fuse.
      Install new fuse.
      Put used fuse in trash.

   5. Turn black knob ⇧ to hard stop to screw back in.

3. Verify fuse location on TOCA front panel.
   Turn black knob ⇧ to unscrew.

6. TOCA Power switch → ‘On’
   Front
   Panel


8. If no power reinstall fuse (repeat steps 2 --- 6).
   Verify power to display.

   If no power replace fuse (TOCA Supply Kit)
   Repeat steps 2 --- 6.
   Verify power to display.

   If no power
   TOCA power → ‘OFF’
   Call MCC for further instructions.

Continue nominal operations.
NOTE
Perform within 6 hours after collection.

1. Remove, temporary stow on outside of kit:
   WMK:
   - Backup Plastic Syringe (60 cc, on kit lid)
   - WMK Subpack (one)
   WMK Subpack:
   - Microbial Capture Device (MCD) - labeled “TOTAL COUNT”
   - Air Filter Adapter Assembly with Air Filter Adapters (AFA) in sterile packages
   - Large Waste Water Bag
   - Large Storage Bag
   - Small Storage Bag
   Temporary Stowage:
   - Micro-Sample, In-Flight Analysis Bag

   NOTE
   To prevent contamination, do not touch any connector ends.
   If contact is made, clean the connector end using a Disinfectant Wipe.

2. Retrieve MCD.

3. Label MCD with the date of sample collection.
   Using Marker, circle the sampling location (hot, cold, SVO-ZV).

4. Remove the red cap from the MCD.

5. Retrieve the backup Syringe.
   Push the plunger completely into the backup Syringe.

6. Connect the red end of MCD to Luer end of backup Syringe.
   Refer to Figure 1.

7. Remove one Air Filter Adapter (AFA) from the Air Filter Adapter Assembly Package.

8. Check AFA Handle.
   Ensure AFA Handle perpendicular to the long axis of the adapter.

9. Remove sterile AFA from protective covering and discard the covering.

10. Remove blue cap from MCD.
    Attach MCD to the Luer end of AFA (blue to blue dot).
Figure 1.- Backup Syringe and Micro-Sample, In-Flight Analysis Bag.

Attach In-Flight Analysis Bag to the AFA connector ensuring that all
connections are hand tight (by slight twisting).

13. Turn AFA handle parallel to long axis of AFA.

14. Pull Syringe Plunger to 50 cc mark.
MCD will fill with water.

15. Turn handle of the AFA perpendicular to long axis of AFA.

16. Pull Syringe Plunger to 60 cc mark (this should remove excess water
from MCD).

17. Disconnect Syringe from MCD.

18. Uncap the Large Waste Water Bag.
Connect the Large Waste Water Bag to the Syringe.
Push in plunger of Syringe to expel contents into Large Waste Water
Bag.
19. Disconnect the Waste Water Bag from the Syringe. 
   Cap the Large Waste Water Bag. 
   Temporary stow.

20. Repeat steps 6, 13 --- 19 for a total of 100cc.

21. Confirm that all water is completely removed from MCD. 
   Continue pulling air through MCD (with AFA handle perpendicular to long 
   axis of AFA). 
   Use sharp movements of MCD to facilitate removal of residual water.

22. Disconnect MCD from AFA. 
   Recap the MCD with blue cap. 
   Recap the MCD with red cap. 
   Temporary stow MCD.

   Recap Micro-Sample, In-Flight Analysis Bag.

24. Stow the used AFA in AFA package for return to ground. 
   Stow the Micro-Sample, In-Flight Analysis Bag in Small Storage Bag and 
   stow in WMK.

25. Repeat steps 1 --- 24 with each source of water.

26. Place the Large Waste Water Bag into a large Storage Bag and stow in 
    kit.

27. Stow the backup Syringe.

28. Go to WATER MICROBIOLOGY KIT (WMK): FILLING MCD WITH 
    GROWTH MEDIA (SODF: MED OPS: NOMINAL).

**NOTE**
Unstow a new MCD and AFA for each sample of water. Use 
the same Large Waste Water Bag for up to six samples.
<table>
<thead>
<tr>
<th>Malfunction</th>
<th>Correction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Syringe Pump Assembly plunger cannot be engaged.</td>
<td>Change out 3-way valve. Grasp the 3-way valve in one hand and the Syringe barrel in the other hand. With a twisting motion, separate valve from Syringe barrel.</td>
</tr>
<tr>
<td></td>
<td><img src="image" alt="Syringe Pump Assembly" /></td>
</tr>
<tr>
<td></td>
<td>If necessary, a crescent wrench (8 --- 10&quot;) may be used to facilitate removal of the valve.</td>
</tr>
<tr>
<td></td>
<td>Replace valve with spare from lid of WMK. Caution should be taken not to overtighten the valve onto the Syringe. Mark the old valve as USED and stow in lid of WMK. Report to MCC. Refer also to Computer Based Training (CBT).</td>
</tr>
<tr>
<td>Operator touches sterile connector end of AFA.</td>
<td>Wipe affected area with Disinfectant Wipe.</td>
</tr>
<tr>
<td>Water leaks from Syringe Pump Assembly.</td>
<td>Check all connections. If leak is coming from 3-way valve, change out 3-way valve. Refer to the following malfunction procedure for 3-way valve changeout: Syringe Pump Assembly plunger cannot be engaged.</td>
</tr>
<tr>
<td></td>
<td>If leak continues, complete procedure using backup Syringe. Refer to WATER MICROBIOLOGY KIT OFF-NOMINAL IN-FLIGHT WATER PROCESSING (SODF: MED OPS: MALFUNCTION: EHS).</td>
</tr>
<tr>
<td>Water leaks from the Microbial Capture Device (MCD).</td>
<td>Check MCD connections to AFA and Syringe Pump. If leak continues, start procedure over with another MCD.</td>
</tr>
<tr>
<td>MCD filter membrane ruptures.</td>
<td>Discard MCD. Start procedure with another MCD.</td>
</tr>
<tr>
<td>Water does not evacuate from MCD.</td>
<td>Continue pumping air through MCD. Use sharp movements of MCD to facilitate removal of residual water.</td>
</tr>
<tr>
<td>Cap is off Media Syringe. Media is cloudy or purple.</td>
<td>Discard Media Syringe. Use another Media Syringe with cap and clear media.</td>
</tr>
<tr>
<td>Blue cap on MCD is not removed to relieve pressure after removal or Media Syringe causing media spillover.</td>
<td>Wipe excess media on outside of MCD with Dry Wipe or Towel.</td>
</tr>
<tr>
<td>Media has been injected into the wrong side (blue capped) of MCD.</td>
<td>Discard MCD. Report to MCC and wait for further instructions.</td>
</tr>
</tbody>
</table>
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1. Unstow:
   - ALSP ABPC (ALSP-4) (red)
   - CSP Four AA Batteries (Battery Subpack)

2. Place ABPC unit face down.

3. Remove battery cover.

4. Remove and replace four AA batteries.
   Stow used batteries in Battery Subpack and mark paper strip with “X” to indicate used.

5. Replace battery cover.

6. Press POWER pb.
   √LCD display to verify power

   *****************************************************
   If power is confirmed, continue to step 7.

   If no power or battery low, √battery configuration and retry power.

   If still no power, replace with new batteries and place defective batteries in Battery Subpack and mark paper strip with “X” to indicate used.

   If still no power, inform Surgeon and use Manual Blood Pressure Cuff.

   *****************************************************

   NOTE
   Manual Blood Pressure Cuffs are located in AMP-1 and ALSP-1.

7. Restow ABPC (ALSP-4).

8. Restow Battery Subpack in CSP.
NOTE

Error messages will occur as a result of inaccurate blood pressure measurement and will be displayed on bottom left of BP Device display. They will be announced by a beeping sound.

If beeping sound is heard or no blood pressure is reported at the end of a blood pressure measurement, peel back Nomex cover to BP Device on right side of BP/ECG to view display for error message.

Take the appropriate action to correct the problem.

If problem is corrected anytime during corrective actions, depress ‘NIBP’ and then ‘2’ pb on ECG keyboard to initiate another blood pressure measurement.

<table>
<thead>
<tr>
<th>Message</th>
<th>Error Description</th>
<th>Corrective Actions</th>
</tr>
</thead>
</table>
| CHECK ECG     | ECG signal is weak, erratic, or missing for more than 2 seconds. No blood pressure will be reported. | 1. √Electrodes are firmly attached to patient  
2. √Skin for inadequate prep or dry electrode  
3. √Electrodes are placed on the proper location on torso (refer to Figure 4 in PFE (SODF: MED OPS))  
4. √BP/ECG PATIENT CABLE - 5 LEAD ASSY (KLSD210084) is properly snapped onto electrodes  
5. 5 Leads →|← BP/ECG PATIENT CABLE - 5 LEAD ASSY port  
6. √BP/ECG PATIENT CABLE - 5 LEAD ASSY (KLSD210084) →|← J12 on BP/ECG Lead Box (KLSD210059)  
7. √BP/ECG Lead Box →|← J3 on rear of ECG  
8. √BP/ECG CABLE ASSY ECG TRIGGER (KLSD210073) →|← J1 on ECG and J8 on BP  
9. Depress ‘NIBP’ and then ‘2’ pb on ECG keyboard to initiate blood pressure measurement again.  
10. If no joy, notify MCC. |
<table>
<thead>
<tr>
<th>Message</th>
<th>Error Description</th>
<th>Corrective Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHECK MIC</td>
<td>Weak, missing sounds, or no K-sounds detected.</td>
<td>1. √Microphone is positioned correctly over brachial artery (refer to Figure 6 in PFE (SODF: MED OPS))</td>
</tr>
<tr>
<td></td>
<td>No blood pressure will be reported.</td>
<td>2. √K-sound microphone →</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. √AIR HOSE/MICROPHONE ASSY (KLSD210083) →</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. Depress ‘NIBP’ and then ‘2’ pb on ECG keyboard to initiate blood pressure measurement again.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5. If previous steps do not work, try using reverse side of microphone.</td>
</tr>
<tr>
<td>ARM MOVEMENT</td>
<td>Excessive arm movement or K-sound noise.</td>
<td>√That patient is holding arm still and not bending elbow during blood pressure reading</td>
</tr>
<tr>
<td></td>
<td>May result in no blood pressure reading being reported.</td>
<td>Depress ‘NIBP’ and then ‘2’ pb on ECG keyboard to initiate blood pressure measurement again.</td>
</tr>
<tr>
<td>INFLATION TOO LOW</td>
<td>K-sounds were detected within 10 mmHg of the target cuff inflation pressure.</td>
<td>Depress ‘NIBP’ and then ‘2’ pb on ECG keyboard to initiate additional blood pressure measurement.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The monitor inflates to 50 mmHg above the previous Systolic reading. On the next reading, the cuff will inflate to the maximum set pressure to ensure a correct blood pressure reading.</td>
</tr>
<tr>
<td>Message</td>
<td>Error Description</td>
<td>Corrective Actions</td>
</tr>
<tr>
<td>------------------</td>
<td>-----------------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| AIR LEAK         | The monitor has 60 seconds to reach the target inflation pressure. If this is not reached the reading is terminated. | 1. √Cuff is snug around subject’s arm  
                    2. Listen for vacating air from blood pressure cuff bladder or hose.  
                    3. √Cuff is properly →|← to AIR HOSE/MICROPHONE ASSY (KLSD10083)  
                    4. √AIR HOSE/MICROPHONE ASSY is →|← to J11 on BP  
                    5. Depress ‘NIBP’ and then ‘2’ pb on ECG keyboard to initiate blood pressure measurement again.  
                    6. If air leak is present, Cuff ←|→ AIR HOSE/MICROPHONE ASSY and stow in BP/ECG Resupply Kit.  
                    7. Notify MCC.                                                            |
| CUFF OVERPRESSURE | Blood Pressure Cuff has been overpressurized and the over-pressure circuit has been triggered. Blood pressure reading is automatically terminated. | √That patient is not bending arm excessively during blood pressure reading  
                                                                                   Depress ‘NIBP’ and then ‘2’ pb on ECG keyboard to initiate blood pressure measurement again. |
| SERVICE REQUIRED | Denotes that the monitor has a system failure or the pressure transducer is no longer within calibration. | Unit can no longer be used and will need to be repaired.  
                                                                                   Notify MCC. |


1. Unstow:
   BP/ECG Resupply Kit Assy (SEG46115989)
   3-Amp Fuse Assy Ziploc, for 28VDC (SEG46115989-602)
   -OR-
   1-Amp Fuse Assy Ziploc, for 120VDC (SEG46115989-603)

2. √ Main power switch (rear of ECG keyboard) → OFF

3. √ CHeCS UOP or Power/Data Outlet → OFF

4. BP/ECG Power Cable (KLSD210056) ←|→ CHeCS UOP or Power/Data Outlet.

5. Turn fuse cap $\nearrow$ to remove cap (rear of ECG keyboard).
   For 28VDC fuse, remove F1 cap.
   For 120VDC fuse, remove F2 cap.
   Refer to Figure 1 for F1 and F2 location.

6. Remove blown fuse.
   Place blown fuse into used Subpack Consumables Kit from BP/ECG Resupply Kit.

7. Remove spare fuse (one) from Amp Fuse Assy Ziploc Bag
   For 28VDC, use 3 amp fuse.
   For 120VDC, use 1 amp fuse.
   Install into fuse slot.

8. Replace fuse cap.
   Turn cap $\nearrow$ until snug.
9. Stow:
   Amp Fuse Assy Ziploc in Resupply Kit Assy
   BP/ECG Resupply Kit Assy

10. BP/ECG Power Cable (KLSD210056) →|← CHeCS UOP or Power/Data Outlet.

11. CHeCS UOP or Power/Data Outlet → ON

12. Main power switch (rear of ECG keyboard) → ON

13. Once fuse has been replaced, continue with nominal PERIODIC FITNESS EVALUATION (SODF: MED OPS: NOMINAL: HMS).
1. Unstow:
   BP/ECG Air Hose/Microphone Assy (KLSD210083)
   Microphone Assy Ziploc Bag (SEG46115989-604)
   from Resupply Kit Assy (SEG46115989)

2. Microphone Cable ←→ from Air Hose/Microphone Assy
   Refer to Figures 1 and 2 for disconnection.

3. Tie knot in broken microphone cable.
   Place broken microphone cable into Microphone Assy Ziploc Bag.

   **NOTE**
   Broken microphone cables are identified with knots. Please do not reuse.

4. Remove a new 14" K-sound microphone from Microphone Assy Ziploc Bag and attach to Air Hose/Microphone Assy.

5. Stow:
   BP/ECG Microphone Assy Ziploc Bag (SEG46115989-604)
   in Resupply Kit Assy (SEG46115989)

6. Once microphone changeout has been completed, continue with
PERIODIC FITNESS EVALUATION (SODF: MED OPS: NOMINAL: HMS).
NOTE
A red strip on the bottom edge of the recording paper indicates that the paper is limited. When this strip appears, there are about eight pages left (i.e., approximately 120 cm). Should the paper run out completely, an audible alarm is initiated and the message ‘REFILL PAPER’ appears on the display.

1. Unstow: BP/ECG Printer Paper from Resupply Kit Assy (SEG46115989)

2. Press the light blue [Replace Paper] key on the upper right corner of the ECG keyboard to automatically slide out paper tray.

3. Remove any remaining paper from the paper compartment and place into BP/ECG Resupply Kit Assy.

4. Place new printer paper into paper compartment with the grid side up and the black paper mark at the top left.

5. Pull the first sheet out of the paper tray so that it is over the roller.

6. Press the [Replace Paper] button again to automatically slide tray in.

7. Press the orange [STOP] key to advance paper to the beginning of a new page.

8. Tear off excess sheet and dispose of in BP/ECG Resupply Kit Assy.
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1. Unstow:
   ALSP IV Infusion Device-Powered (ALSP-2) (red)
   CSP IV Pump Battery Pack (Battery Subpack)

2. Lift the battery compartment hatch to open and expose the IV Pump Battery Pack.

3. Pull tape to remove IV Pump Battery Pack (cable remains attached).

4. Use a paperclip or other pointed instrument to press down on the recessed battery (left of ON/STOP/OFF pb) while gently pulling to remove IV Pump Battery Pack (refer to Figure 1).

5. Stow used IV Pump Battery Pack in Battery Subpack and mark paper strip with “X” to indicate used.

6. Using new IV Pump Battery Pack, place the battery cable connector back into socket of IV Pump (ensure battery release button facing up).

7. Carefully place IV Pump Battery Pack in battery compartment and close the hatch.
   Instrument is now ready for use.

Figure 1.- IV Infusion Device.
8. Press and hold the ON/STOP/OFF pb for approximately 3 seconds. 
√LCD display to verify power

*************************************************************************
If power is confirmed, press and hold ON/STOP/OFF pb for approximately 5 seconds to turn off unit, continue to step 9.

If no power, √IV Pump Battery Pack connection.
Press and hold ON/STOP/OFF pb for approximately 3 seconds and √LCD display to verify power.

If still no power, replace with new IV Pump Battery Pack and place defective pack in Battery Subpack.
Mark paper strip with “X” to indicate used.
Press and hold ON/STOP/OFF pb for approximately 3 seconds and √LCD display to verify power.

If still no power, contact Surgeon and use IV Pressure Infusor.
*************************************************************************

NOTE
IV Pressure Infusor is located in IV Administration Subpack-8 in ALSP.

CSP 9. Restow Battery Subpack in CSP.

ALSP 10. Restow IV Infusion Device-Powered (ALSP-2).
1. Unstow:
   ALSP  Laryngoscope (Airway-16,17) (red)
   CSP   Two AA Batteries (Battery Subpack)

2. Unscrew end of Laryngoscope handle.

3. Remove and replace two AA batteries with “+” end of both batteries toward Laryngoscope blade attachment.

4. Replace end of Laryngoscope handle.

5. Stow used batteries in Battery Subpack and mark paper strip with “X” to indicate used.

6. Replace end of Laryngoscope handle.

7. Verify illumination by lifting Laryngoscope blade.

   ************************************************************
   If illumination confirmed, continue to step 8.
   If no illumination, √ battery configuration and retry illumination.
   If still no illumination, replace with new batteries and place defective batteries in Battery Subpack and mark paper strip with “X” to indicate used.
   If still no illumination, inform Surgeon.
   ************************************************************

   CSP  8. Restow Battery Subpack in CSP.
   ALSP (red)  9. Restow Laryngoscope (Airway-16,17).
   10. Restow Airway Subpack in ALSP.
1. Unstow:
   AMP (blue)
   Ophthalmoscope Head (Physical Exam-10)
   Ophthalmoscope Spare Bulb (Physical Exam-2)

2. Grasp end of Ophthalmoscope bulb and pull out of Ophthalmoscope Head.

3. Stow used Ophthalmoscope bulb in replacement bulb case.

4. Insert new Ophthalmoscope Spare Bulb by carefully aligning pin on lamp shaft with slot in Ophthalmoscope Head.

5. Push lamp in until firmly seated.

AMP (blue)

6. Unstow Otoscope (Physical Exam-9).

7. Unscrew and remove Otoscope Head.

8. Unscrew and remove bulb holder.

9. Screw Ophthalmoscope Head onto Otoscope Handle.

10. Verify Ophthalmoscope bulb illumination by rotating on/off collar at base of Ophthalmoscope Head.

    ******************************************************************************
    If illumination is confirmed, continue to step 11.
    If no illumination, repeat steps 2 --- 10.
    If still no illumination, refer to OTOSCOPE - BATTERY CHANGEOUT (SODF: MED OPS: MALFUNCTION: HMS).
    ******************************************************************************

11. Unscrew and remove Ophthalmoscope Head from Handle.

12. Screw Otoscope bulb holder into Handle.

13. Screw Otoscope Head onto Handle.

AMP (blue)

14. Mark bulb case with an “X” to indicate used and restow used bulb case (Physical Exam-2).

15. Restow Ophthalmoscope Head in AMP (Physical Exam-10).


17. Restow Physical Exam Subpack in AMP.
1. Unstow:
   AMP  Otoscope (Physical Exam-9)
   (blue)

   CSP  Two AA Batteries (Battery Subpack)

2. Unscrew Otoscope Handle to reveal batteries.
3. Remove AA batteries by tapping Otoscope Handle into palm of hand until battery slide out.
4. Insert two AA batteries.
   Insert both batteries so “+” end is toward Otoscope Head.
5. Reassemble Otoscope.
6. Stow used batteries in Battery Subpack and mark paper strip with “X” to indicate used.
7. Verify illumination by rotating ON/OFF collar switch at base of Otoscope Head.

    ***********************************************
    If illumination confirmed, continue to step 8.

    If no illumination, √ battery configuration and verify illumination by rotating ON/OFF collar.

    If still no illumination, replace with new batteries and place defective batteries in Battery Subpack.
    Mark paper strip with “X” to indicate used.

    If still no illumination, refer to OTOSCOPE - BULB CHANGEOUT (SODF: MED OPS: MALFUNCTION: HMS).

    If still no illumination, report to Surgeon.

    ***********************************************

   CSP  8. Stow Battery Subpack in CSP.

   AMP  8. Restow Otoscope (Physical Exam-9).
   (blue)

   9. Restow Physical Exam Subpack.
1. Unstow:
   AMP Otoscope (Physical Exam-9)
   (blue) Otoscope Spare Bulb (Physical Exam-11)

2. Unscrew and remove Otoscope Head.

3. Unscrew bulb holder and remove from handle.

4. Grasp end of bulb and pull out of holder.

5. Stow used bulb in replacement bulb case.

6. Insert new Otoscope Spare Bulb by pushing into bulb holder.

7. Screw bulb holder into handle.

8. Verify Otoscope Bulb illumination by rotating on/off collar at base of bulb holder.

   ****************************************
   If illumination confirmed, continue to step 9.
   If no illumination, reattempt steps 2 --- 8.
   If still no illumination, refer to OTOSCOPE - BATTERY CHANGEOUT (SODF: MED OPS: MALFUNCTION: HMS).
   ****************************************

9. Reattach Otoscope Head to handle.

10. Restow used bulb case (Physical Exam-11).

11. Mark bulb case with an “X” to indicate used and restow used bulb case (Physical Exam-9).

12. Restow Physical Exam Subpack in AMP.
1. Unstow:
   AMP (blue) Penlight (Physical Exam-5)
   -OR-
   ALSP (red) Penlight (Assessment-2)
   CSP Two AAA Batteries (Battery Subpack)

2. Unscrew bulb end of Penlight.

3. Remove and replace two AAA batteries with the “+” end of both batteries toward the bulb.

4. Replace bulb end.

5. Stow used batteries in Battery Subpack and mark paper strip with “X” to indicate used.


   *********************************************************************
   If illumination is confirmed, continue to step 7.
   If no illumination, √ battery configuration and verify illumination by pressing clip.
   If still no illumination, replace with new batteries and place defective batteries in Battery Subpack.
   Mark paper strip with “X” to indicate used.
   *********************************************************************

CSP 7. Restow Battery Subpack in CSP.

8. Restow Penlight in AMP or ALSP with clip on outside of pocket.
1. Unstow:
   AMP PCBA (PCBA -1) (blue)
   CSP 9V Alkaline Batteries (two) (Battery Subpack)

2. Place PCBA unit face down.

3. Lift hinged battery compartment door to expose battery pack.

4. Remove battery pack by squeezing side tabs and firmly pulling upward.

5. Remove and replace 9V batteries.

6. Ensure positive battery terminal aligns with “+” symbol on lower right edge of battery pack.

7. Stow used batteries in Battery Subpack and mark paper strip with “X” to indicate used.

8. Replace battery pack into PCBA, making certain metal contacts are engaged.

9. Close battery compartment door until it snaps into place.

10. Press the DISPLAY pb.
    √LCD display to verify power

    ***************************************************************************
    If power confirmed, continue to step 11.

    If no power or batteries low, √battery configuration and retry power.

    If still no power, replace with new batteries and place defective batteries in Battery Subpack and mark paper strip with “X” to indicate used.

    If still no power, contact Surgeon.
    ***************************************************************************

11. Restow Battery Subpack in CSP.

12. Restow PCBA (PCBA -1).

13. Restow PCBA Subpack in AMP.
1. Unstow:
   ALSP Pulse Oximeter (Assessment-1) (red)
   CSP 9V Battery (Battery Subpack)

2. Grasp Pulse Oximeter firmly by its edges.

3. Pull battery cover, located at base of unit, away from unit.

4. Remove and replace 9V battery.

5. Ensure positive battery terminal aligns with “+” symbol on lower right edge of battery compartment.

6. Stow used battery in Battery Subpack and mark paper strip with “X” to indicate used.

7. Press the Power button.
   √ LCD display to verify power

   ********************************************
   If power is confirmed, press Power button to turn off unit and continue to step 8.
   
   If no power or battery low, √ battery configuration.
   Press Power button and √ LCD display to verify power.

   If still no power replace with new battery and place defective battery in Battery Subpack.
   Mark paper strip with “X” to indicate used.
   Press Power button and √ LCD display to verify power.

   If still no power, contact Surgeon.
   ********************************************

8. Slide battery cover back on.

CSP 9. Restow Battery Subpack in CSP.

ALSP (red) 10. Restow Pulse Oximeter (Assessment-1).

11. Restow Assessment Subpack in ALSP.
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WASTEWATER BAG CHANGEOUT
1. Stop water flow by releasing red valve on SSE dispensing unit.

2. Move silver stopcock handle to closed position (perpendicular to tubing).

3. Unhook used water bag.


5. Move silver stopcock handle to open position (in line with tubing).

6. Press SVO-ZV red release valve to start water flow into goggles.

LOW WATER PRESSURE
7. Repressurize SVO-SV by manually pumping red lever handle until resistance is felt.

   NOTE
   It will take approximately 3 --- 5 strokes to fully pressurize SVO-ZV. It is not possible to over-pressurize, due to a safety release valve.

8. Verify silver stopcock handle is in open position (in line with tubing).


   ******************************************************************************
   If Eyewash water flow resumes
   Return to BURNS (SODF: ISS MED: A THROUGH B).
   
   If water flow does not resume
   ❑For clog
   ******************************************************************************

CLOG SUSPECTED IN SVO-ZV
10. Disconnect supply end of SSE from SVO-ZV port.

11. Visually inspect internal connection of SVO-ZV port.

12. Attempt to remove any visible clogs with hemostats or other small object.

13. With towels handy, repressurize SVO-ZV by manually pumping red lever handle until resistance is felt.

14. Push red release valve to dislodge trapped clogs or confirm water flow.
SPACE STATION EYEWASH - MALFUNCTION
(MED OPS/2R - ALL/FIN) Page 2 of 2 pages

*********************************************************************
If water flow resumes
   Flush line for 1 minute before placing goggles on eyes.
If water flow does not resume
   Contact TsUP for further instructions.
*********************************************************************

CLOG SUSPECTED IN SSE

15. Disconnect supply end of SSE from SVO-ZV port.

16. Visually inspect supply end of SSE.

17. Attempt to remove any visible clogs with hemostats or other small object.

18. If no clog in SSE supply end, disconnect tubing from each side of silver stopcock. (May require some force.)

19. Inspect silver stopcock for clogs.

20. Attempt to remove any visible clogs with hemostats or other small object.

21. Reconnect tubing and reconnect SSE to SVO-ZV.

22. Repressurize SVO-ZV by manually pumping red lever handle until resistance is felt.

23. Press red release valve to dislodge trapped clogs or confirm water flow.

*********************************************************************
If water flow resumes
   Flush line for 1 min before placing goggles on eyes.
If no clog visible and flow does not resume
   Stow SSE.
   Contact MCC-H for further instructions.
*********************************************************************
1. Unstow: AMP Tonopen (Physical Exam-8) (blue)
CSP 1.5 V Lithium Button Cell Batteries (four) (Battery Subpack)

2. Insert paperclip or other pointed instrument into end slot of battery compartment and gently loosen battery cover.

3. Remove battery cover and temporarily stow.

4. Remove and replace 1.5 V batteries.

5. Ensure positive battery terminal aligns with “+” symbol.

6. Stow used batteries in Battery Subpack and mark paper strip with “X” to indicate used.

7. Replace battery compartment by pushing down on cover until it snaps into place.

8. Press black power button. √LCD display to verify power

   **NOTE**
   LCD will display ‘CAL’ (beep will sound).

   ************************************************************
   If power confirmed, continue to step 9.

   If no power or batteries low, √battery configuration and retry power.

   If still no power, replace with new batteries and place defective batteries in Battery Subpack and mark paper strip with “X” to indicate used.

   If still no power, contact Surgeon.

   ************************************************************

CSP 9. Restow Battery Subpack in CSP.

10. Calibrate Tonopen before using.
    Refer to TONOPEN - CALIBRATION (SODF: MED OPS).
CORRECTIVE PROCEDURES
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Disabling the CDM alarm function will remove audio and visual (flashing red lights) annunciation if the preset CO2 threshold concentration is exceeded.

1. Notify **MCC** prior to disabling the alarm function.

2. For activated CDM, press MODE pushbutton (six times) until ‘**ALM ON**’ is displayed.

   **NOTE**
   1. In the alarm on/off mode, pressing the ‘E’ button will toggle the switch between alarm off and alarm on.

   2. The operating mode will revert to the nominal display after 15 seconds.

3. Press ‘E’ button to switch the alarm off.

4. Verify display indicates alarm off.
HARDWARE REQUIRED:
High Rate Dosimeter (HRD) Pouch  WLSF 310018-301
High Rate Dosimeter (HRD)  SED 33101167-307

TBD  1. Unstow HRD Pouch.

   NOTE
   Reading scale is 0 --- 600 rads.

2. Read each HRD by holding the unit to the eye, as though looking through a telescope, and pointing it toward a strong light source.

3. Record readings.

4. Stow HRD Pouch.

5. Voice readings to MCC-H.

<table>
<thead>
<tr>
<th>Date</th>
<th>GMT</th>
<th>HRD1</th>
<th>HRD2</th>
<th>HRD3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tr>
</tbody>
</table>
REFERENCE PROCEDURES
1. Monitor spectrometer display. If deviations occur, notify MCC-H.

### NOTE
1. Startup elapsed times are approximate.
2. Display sequence is automatically executed.
3. Green light will go solid during card check.
4. Recording values only on MCC-H direction.

<table>
<thead>
<tr>
<th>Startup Elapsed Time</th>
<th>Display Indication</th>
<th>Display Indication Key</th>
</tr>
</thead>
<tbody>
<tr>
<td>00:00:00</td>
<td>ISS –TEPC__________</td>
<td>params: Serial Number</td>
</tr>
<tr>
<td></td>
<td>RT ______ ACQ MODE</td>
<td>Remote Terminal 26</td>
</tr>
<tr>
<td>00:00:30</td>
<td>CARD CHECKS DONE</td>
<td>params: All acceptable ('1's)</td>
</tr>
<tr>
<td></td>
<td>D_C_P_M_F_F_F_</td>
<td></td>
</tr>
<tr>
<td>00:00:50</td>
<td>EXTERNAL POWER</td>
<td>params: 25V --- 32V,</td>
</tr>
<tr>
<td></td>
<td>___V___mA___W</td>
<td>200 mA --- 350 mA,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6.0 W --- 10.0 W</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OR</td>
</tr>
<tr>
<td></td>
<td></td>
<td>110 V --- 130 V</td>
</tr>
<tr>
<td></td>
<td></td>
<td>50 mA --- 100 mA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6.0 W --- 10.0 W</td>
</tr>
<tr>
<td>00:01:05</td>
<td>TEPC Voltages</td>
<td>params: -4.0 to -5.5</td>
</tr>
<tr>
<td></td>
<td>______ ______ ______</td>
<td>4.0 --- 5.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.0 --- 5.5</td>
</tr>
<tr>
<td>00:01:10</td>
<td>TEPC Status</td>
<td>params: BAT 3.0 --- 4.0</td>
</tr>
<tr>
<td></td>
<td>BAT_____ TEMP_____ °C</td>
<td>TEMP - EQUAL AMBIENT °C</td>
</tr>
<tr>
<td>00:01:20</td>
<td>TEPC High Voltage</td>
<td>params: -950V to -400 V</td>
</tr>
<tr>
<td></td>
<td>___V___µA___mA</td>
<td>0.01µA --- 8µA,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 mA --- 24 mA</td>
</tr>
<tr>
<td>00:01:30</td>
<td>TEPC Pulser</td>
<td>params: Test Pulser 2.0</td>
</tr>
<tr>
<td></td>
<td>PK_H CNT___</td>
<td>PK: 0H --- 90H,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CNT: 0 --- 300</td>
</tr>
<tr>
<td>Time</td>
<td>Event</td>
<td>Parameters</td>
</tr>
<tr>
<td>---------</td>
<td>--------------------------------------------</td>
<td>----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>00:01:40</td>
<td>xx xx xx xx</td>
<td>params:</td>
</tr>
<tr>
<td>00:01:50</td>
<td>Alpha Check SI</td>
<td>Counts down to 60 to 0</td>
</tr>
<tr>
<td>00:02:50</td>
<td>Alpha Check SI</td>
<td>PK: 0L --- 500L, CNT: 0 --- 1000</td>
</tr>
<tr>
<td>00:03:05</td>
<td>xx xx xx xx</td>
<td>params:</td>
</tr>
<tr>
<td>00:03:15</td>
<td>Background</td>
<td>CNT: 60 --- 0</td>
</tr>
<tr>
<td>00:04:15</td>
<td>Background</td>
<td>CNT: 0L --- 200 L, 0H --- 1000H</td>
</tr>
<tr>
<td>00:04:25</td>
<td>xx xx xx xx</td>
<td>params:</td>
</tr>
<tr>
<td>00:04:35</td>
<td>END TEPC STARTUP</td>
<td>End of Startup</td>
</tr>
</tbody>
</table>

**Parameters:**
- DD: day
- MMM: month
- YY: year
- hh: hours
- mm: minutes
- ss: seconds
2. Observe Normal Operations.
   Green light flashing.
   Dose rate should change with each update.
   Total Dose and Total Dose Equivalent should slowly increase.
   Elapsed time and clock time should increment each minute.

   **NOTE**
   TEPC operational sequence consists of continuous cycling through the following six displays.

<table>
<thead>
<tr>
<th>Approximate Elapsed Time</th>
<th>Display Indication</th>
<th>Display Indication Key</th>
</tr>
</thead>
<tbody>
<tr>
<td>00:00:10</td>
<td>Time:_____ Date:____   _________ mrad/min</td>
<td>params: Time: hh:mm:ss, Date: DDMMYY Dose rate: mrad/min</td>
</tr>
<tr>
<td>00:00:20</td>
<td>Time:________ _______ m   _______ mrad</td>
<td>params: Time: hh:mm:ss, Elapsed time: m Total Dose: mrads</td>
</tr>
<tr>
<td>00:00:30</td>
<td>Time:_______ Date:____   MEM ____ -____ - ____</td>
<td>params: Time: hh:mm:ss, Date: DDMMYY Memory: Start File, End File, Current File</td>
</tr>
<tr>
<td>00:00:40</td>
<td>Time:_______ Date:____   ___________ mrem/min</td>
<td>params: Time: hh:mm:ss, Date: DDMMYY Dose Equivalent rate: mrem/min</td>
</tr>
<tr>
<td>00:00:50</td>
<td>Time:_______ _______ m   ___________ mrem</td>
<td>params: Time: hh:mm:ss, Elapsed time: m Total Dose Equivalent: mrem</td>
</tr>
<tr>
<td>00:01:00</td>
<td>Time:_______ _______ E   &gt;____________________</td>
<td>params: Time: hh:mm:ss, Error: _______ Flags (1553. MEM, P,C,M,D)</td>
</tr>
</tbody>
</table>
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