

Approved per signature page

SERVICE MODULE  
**POWER SUPPLY SYSTEM**

SM.1

2000

**Revision Log**

1E	01 Aug 00	5—1E	01 Aug 00
2E	01 Aug 00	5—2E	01 Aug 00
3E	01 Aug 00	5—3E	01 Aug 00
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1—1E	01 Aug 00		
2—1E	01 Aug 00		
2—2E	01 Aug 00		
2—3E	01 Aug 00		
2—4E	01 Aug 00		
2—5E	01 Aug 00		
2—6E	01 Aug 00		
3—1E	01 Aug 00		
3—2E	01 Aug 00		
3—3E	01 Aug 00		
3—4E	01 Aug 00		
3—5E	01 Aug 00		
3—6E	01 Aug 00		
3—7E	01 Aug 00		
3—8E	01 Aug 00		
3—9E	01 Aug 00		
3—10E	01 Aug 00		
3—11E	01 Aug 00		
3—12E	01 Aug 00		
3—13E	01 Aug 00		
4—1E	01 Aug 00		
4—2E	01 Aug 00		
4—3E	01 Aug 00		
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4—5E	01 Aug 00		

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## INTRODUCTION

The SM Power Supply System crew procedures contain information for the crew about procedures and commands for СЭП, СОСБ operation, and procedures and rules for Internal Lighting System operations.

These crew procedures are intended for fully-trained crew members who have completed the whole training course and simulations.













These crew procedures may be updated pending ISS assembly, systems modification and procedure validation at simulators and training facilities, and as a result of ground tests.

These crew procedures were developed based on БСC Software release 4.30.14 and RS Laptop Software dated 07.03.00.

## ACRONYMS AND ABBREVIATIONS

АБ	storage battery
АЗС	circuit breaker
б/и	crew procedure
БВ	switch panel
БКВ	command output unit
БВП	switch panel w/ circuit breaker
БПП	fuse box panel
<b>ДнаЗ-М</b>	<b>report to MCC-М</b>
ЗРУ	charge/discharge unit
ИНПУ	integrated control panel
кбл	cable
Л	lamp
н/с	off-nominal situation
СБ	solar array
СОСБ	solar array orientation system
СМ	Service Module
СНТ	voltage and current stabilizer
СЭП	SM power supply system
<b>ПоУЗ-М</b>	<b>on MCC-М GO</b>
ППС	system power panel
ПС	28/120 converter
РБС	power outlet
рзм	connector
РЩП	power distribution panel
ТВ	TV
тмб	switch, sw
ЩО	night lighting panel
ЩСР	crew quarters lighting panel
№__	АБ or ЗРУ indicated by <b>MCC-М</b>

**CONVENTIONAL SYMBOLS**

	illuminated
	not illuminated
	sw → On (i.e. up relative to label on panel)
	sw → Off (i.e. down relative to label on panel)
	mouse left click
	place physical device in designated state
	disconnect
	connect
	press pushbutton
	check (in case of discrepancy, attempt a corrective action one time only)
	verify
	continuously monitor
12:45:30	12 h 45 min 30 sec



advisory information

## 1. GENERAL INSTRUCTIONS

### 1.1. CREW RESPONSIBILITIES

While performing operations, the crew is responsible for the following actions:

1. Perform operations per these crew procedures and **MCC-M** instructions in accordance with the crew functional responsibilities and current status of the onboard systems.
2. **Report** completed operations to **MCC-M**.
3. Monitor systems operations per these crew procedures and **MCC-M** instructions.
4. When a deviation from nominal systems operation is detected, crew must:
  - record malfunction (deviation) detection time;
  - make a description of detected malfunction (deviation) in writing
  - report detected malfunction (deviation) to MCC-M during earliest available comm pass.
5. Upon detection of an off-nominal situation, listed in these crew procedures, perform independent troubleshooting actions recommended in the crew procedures.
6. Check nominal operation of all indicators on the control panels to be used.
7. Output commands from control panels using pushbuttons (w/o lockout feature) by pressing and holding them for 1—2 seconds.
8. Record time used to perform operations.
9. When working with hardware (control panels) equipped with protective caps or covers:
  - remove caps and covers before operations;
  - re-install caps and covers after operations.

### 1.2. SAFETY PRECAUTIONS

To ensure nominal systems operation and crew safety, the crew needs to perform the following actions:

1. When working with the system, use only hardware, tools and protective devices, designated by these crew procedures or by **MCC-M**
2. Upon detection of an off-nominal situation not documented in these crew procedures, the crew must:
  - stop working with the system;
  - record time when the off-nominal situation was detected;
  - record the nature of the off-nominal situation;
  - **report to MCC-M** during earliest available comm pass.
3. Fuse replacement must be conducted after having powered off the appropriate system or device. Ensure fuse amperage matches the label on the hardware.  
Repeated fuse replacement — **on MCC-M GO**.

## 2. POWER SUPPLY SYSTEM (СЭП)

### 2.1. 3PY OPERATING MODES (ON MCC-M GO)

RS Laptop CM:СЭП  
 ↓ АБ Charge Mode

#	Command (Procedure)/Mode Name	Command (Procedure)	RS Laptop <span style="border: 1px solid black; padding: 2px;">CM:СЭП</span> Screen Display Status	Note
1.	<i>АБ Incomplete Charge Mode ON</i>	cmd P_ONRNZAB	Charge mode АБ partial Charge АБ1 – 8 (all)	Full Charge Mode or Incomplete Charge Mode can be activated for all storage batteries, activation of one mode deactivates the other (if currently active)
2.	<i>АБ Full Charge Mode ON</i>	cmd P_ONRPZAB	Charge mode АБ full Charge АБ1 – 8 (all)	
		↓  3PY №		
3.1.	<i>Storage Battery (АБ) #__ Cycling Mode, Start</i>	proc F40_SEP_1 param1 №_	АБ №__	Storage Battery # __ Cycling Mode Activation Requirements: 1. Corresponding 3PY #__ is active 2. Storage Battery # __ is not running 'Discharge Disconnected Storage Battery' procedure
3.2.	<i>АБ #__ Cycling Mode ON</i>	cmd P_ONRCAB №_		
4.1	<i>Storage Battery (АБ) #__ Cycling Mode, Halt</i>	proc F40_SEP_0	АБ №__	This procedure (command) deactivates Cycling Mode on all storage batteries
4.2.	<i>АБ #__ Cycling Mode OFF</i>	cmd P_OFRCAB		
5.1	<i>Discharge Deactivated Storage Battery (АБ)</i>	proc F40_SEP_2 param1 №_	*see 2.1.1.1, p. 2—2	Storage Battery # __ Mode Activation Requirements: 1. Corresponding 3PY #__ is active 2. Storage Battery # __ is not running Cycling Mode Proc <span style="border: 1px solid black; padding: 2px;">CM:СЭП</span> <img alt="Charge mode icon" style="vertical-align: middle;"/> none of АБ 1 – 8 is in Cycling Mode
5.2.	<i>Disconnected АБ #__ Discharge Enable</i>	cmd P_ONROAB	АБ (icon does not change)	'Disconnected АБ #__ Discharge Enable' command is effective for all currently disconnected storage batteries * 2.1.1.2 (command output pattern)
6.	<i>АБ #__ 3PY ON</i>	cmd P_ONZRUAB№_	3PY№_	
7.	<i>АБ #__ 3PY Disconnect</i>	cmd P_OFZRUAB№_	3PY№_	

ЛИСТ

### 2.1.1. DISCONNECTED STORAGE BATTERY DISCHARGE MODE

#### 2.1.1.1. DISCONNECTED STORAGE BATTERY DISCHARGE ACTIVATION USING PROCEDURE (ON MCC-M GO)

NOTE

Requirements to run a procedure:

1. Corresponding 3PY №\_\_ is active
2. Storage battery №\_\_ is not running cycling mode procedure

RS Laptop

CM:СЭП

none of AB 1 – 8 is in Cycling Mode



3PY №\_\_

proc F40\_SEP\_2 (Discharge disconnected storage batteries AB1(2 - 8))

param №\_\_

00:00:00

Execute



AB №\_\_ — cycling in discharge mode

02---03:00:00




3PY №\_\_ — 3PY deactivation



AB №\_\_ — disconnected AB discharge

NOTE

'Disconnected AB discharge Enable' command contained in the procedure is effective for all currently disconnected storage batteries

If  3PY (except those currently in discharge mode)



3PY (except those currently in discharge mode)

cmd P\_ONZRUAB (AB 3PY ON)

Execute




3PY


cmd P\_OFZRUAB (AB 3PY Disconnect)

Execute



3PY (the same 3PY)

96:00:00  ЗПУ №\_\_ — ЗПУ activation (АБ currently in discharge mode)




 АБ №\_\_ — cycling mode activation

**2.1.1.2. DISCONNECTED АБ DISCHARGE MODE ACTIVATION USING COMMAND (ON MCC-M GO)**




RS Laptop

CM:СЭП

◀ none of АБ 1 – 8 is in Cycling Mode


00:00:00 1.  ЗПУ №\_\_  
 ↓  
**cmd P\_ONRCAB №\_\_ (АБ1№\_\_ cycling mode ON)**  
**Execute**  
  
 АБ №\_\_



02--03:00:00 <<< Voltage АБ №\_\_ – 24 V  
 <<< АБ charge indicator ▲ → ▼


2.  ЗПУ №\_\_  
 ↓  
**cmd P\_OFRCAB (АБ cycling mode OFF)**  
**Execute**
3. **cmd P\_OFZRUAAB №\_\_ (АБ1(2 - 8) ЗПУ Disconnect)**  
**Execute**  
 ЗПУ №\_\_
5. **cmd P\_ONROAB (Disconnected АБ discharge Enable)**  
**Execute**  
 (АБ icon does not change)

NOTE

'Disconnected АБ discharge Enable' command contained in the procedure is effective for all currently disconnected АБ

If  3PY (except those currently in discharge mode)

↓  3PY (except those currently in discharge mode)  
**cmd** P\_ONZRUAAB (АБ 3PY ON)  
**Execute**  
 3PY

**cmd** P\_OFZRUAAB (АБ 3PY Disconnect)  
**Execute**  
 3PY (the same 3PY)

≈96:00:00

6. **On MCC-M GO** – override current mode by 3PY activation command
7. **On MCC-M GO** – enable Cycling Mode for АБ

## 2.2. CURRENT AND VOLTAGE STABILIZER [CHT] ACTIVATION/DEACTIVATION

### 2.2.1. [CHT] ACTIVATION (ON MCC-M GO)

Initial configuration:

CHT1,2 – connected to feeder PMA-1C

CHT3,4 – connected to feeder PMA-1D

#### NOTE

When [CHT] is deactivated, parameters are invalid

RS Laptop

CM:СЭП

↙ from USOS (PMA-1C) (from USOS (PMA-1D))

↙ [CHT] connectors are mated

↓ 1 ( 2, 3, 4 ) [CHT]

cmd P\_ONSNT1(2,3,4) (CHT1(2,3,4) ON)

Execute

1 ( 2, 3, 4 )

↓ CHT

CM:СЭП:CHT

↙ Input Voltage 100 --- 170 V

↙ Output Voltage 27 --- 31 V

↙ Output Current 0 --- 60 A

↙ CHT Temperature 30 --- 40 C

### 2.2.2. [CHT] DEACTIVATION (ON MCC-M GO)

RS Laptop

CM:СЭП

↓ 1 ( 2, 3, 4 ) (CHT)

cmd P\_OFSNT1(2,3,4) (CHT1(2,3,4) OFF)



Execute

1 ( 2, 3, 4 )

### 2.3. 28/120 CONVERTER (ПС) ACTIVATION/DEACTIVATION

#### 2.3.1. 28/120 CONVERTER (ПС) ACTIVATION (ON MCC-M GO)

Underneath 134

РЩП-С1    √  E1, E2 (for ПС1)  
              (√  H1, H2 (for ПС2))

NOTE  
When ПС is deactivated, parameters are invalid



RS Laptop

CM:СЭП





CM:СЭП:Continue

< PC connectors are mated

↓  (  )

cmd P\_ONPS1(2) (ПС1(2) ON)

Execute



 (  )

< Input Current	0 --- 90 A	
< Output Current	0 --- 17 A	*****
< Output Voltage	120 ± 2 V	*****
< Temperature	30 --- 40 C	

\*\*\*\*\*

When overcurrent and/or overvoltage protection is triggered,  
28/120 converter (ПС) automatically switches off

Then < Output Current = 0 A  
and < Output Voltage = 95 V

 (  ) – icon does not change.

**On MCC-M GO** — output command for ПС deactivation

\*\*\*\*\*



#### 2.3.2. 28/120 CONVERTER (ПС) DEACTIVATION (ON MCC-M GO)

RS Laptop

CM:СЭП



CM:СЭП:Continue

↓  (  )

cmd P\_OFPS1(2) (ПС1(2) OFF)

Execute

 (  )

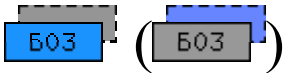
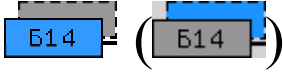
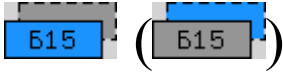

### 3. SOLAR ARRAY ORIENTATION SYSTEM (СОСБ)

#### 3.1. DISPLAY INDICATION SPECIFICS

- When Б14unit is off, **CM:СЭП:СОСБ** display does not show any СБ zones
- If proc «Initial Position 1(2)» is currently running, Mode — **Init. pos. 1(2)** remains on RS Laptop display **CM:СЭП:СОСБ** until any other СОСБ proc is output. In such a case, it is possible to monitor modes using ИНПУ display **SM:STATUS СОЖ, СОСБ, СОТР**
- On ИНПУ screen display **SM: STATUS СОЖ, СОСБ, СОТР**, one of the selected primary operating modes (i.e. СОСБ standalone, СОСБ combined mode, СОСБ СУД-driven) is highlighted

#### 3.2. СОСБ ACTIVATION (ON MCC-M GO)

RS Laptop **CM:СЭП:СОСБ**

- ↓ **Б03**  
**cmd P\_ONPB03\_M (P\_ONPB03\_R) ('Primary (backup) Б03 power ON')**  
**Execute**  

- ↓ **Б14**  
**cmd P\_ONPSOSB\_M (P\_ONPSOSB\_R) (СОСБ primary (backup) Ch power ON)**  
**Execute**  
  
  
 for СБ2 and СБ4 (RS Laptop display pictograms for previously active sets will be highlighted)  


◀ Mode — **Composite** ( **Autonomous** , **from СУД** (previously selected mode indicator is lit)

#### 3.3. СОСБ OPERATING MODE SELECTION

RS Laptop **CM:СЭП:СОСБ**

↓ **Б03**  
**cmd P\_PRAVTSB (СОСБ Autonomous mode)**  
**(P\_PRSOVSB (СОСБ composite mode)**  
**(P\_PRSUDSB (СУД Cntl mode)**  
**Execute**  
 ◀ Mode — **Autonomous**  
 — ( **Composite** )  
 — ( **from СУД** )

### 3.4. COСБ EQUIPMENT SETS SELECTION

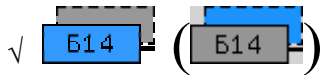
#### 3.4.1. Б15 SETS SELECTION FOR СБ2, СБ4 (ON MCC-M GO)

NOTE

During selection of different Б15 sets, **Б14** unit must be **powered**.

RS Laptop

CM:СЭП:СОСБ



↓ (Б14)

**cmd** P\_ONPSOSB\_M (P\_ONPSOSB\_R) (COСБ primary (backup) Ch power ON))

For simultaneous selection of primary sets Б15 for СБ2, СБ4

RS Laptop

CM:СЭП:СОСБ

↓ (Б15 for СБ2(СБ4))

**cmd** P\_SSB2SB4\_M (Primary СБ2,4 Б15 Select)

**Execute**



\*\*\*\*\*

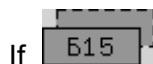
To select primary, backup Б15 sets, output the commands according to the Table below:

RS Laptop

CM:СЭП:СОСБ

#	Sets	Cmd pb	cmd	Name	Monitoring
1	Б15 СБ2 pri		P_SSB2_M	(Primary СБ2 Б15 Select)	for СБ2****
2	Б15 СБ2 bkup	(Б15 for СБ2)	P_SSB2_R	(Backup СБ2 Б15 Select)	for СБ2****
3	Б15 СБ4 pri		P_SSB4_M	(Primary СБ4 Б15 Select)	for СБ4****
4	Б15 СБ4 bkup	(Б15 for СБ4)	P_SSB4_R	(Backup СБ4 Б15 Select)	for СБ4****

\*\*\*\*\*



**cmd** P\_ONPSB2(4) (СБ2(4) Б15 power ON)

**Execute**

\*\*\*\*\*

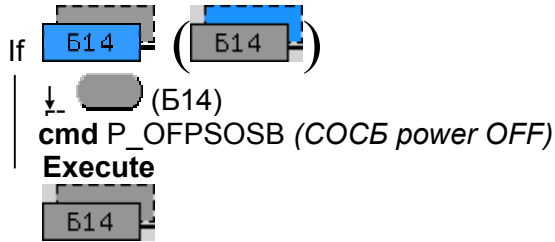
### 3.4.2. Б14М SETS SELECTION (ON MCC-M GO)

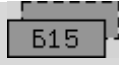
NOTE

During selection of different Б14 sets, the unit must be **unpowered**.

RS Laptop

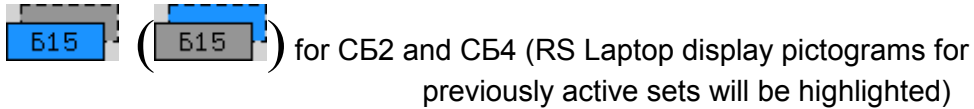
CM:СЭП:СОСБ



 for СБ2 and СБ4

**cmd** P\_ONPSOSB\_R (P\_ONPSOSB\_M) ('COCB backup (primary) Ch power ON')

**Execute**



### 3.4.3. Б03 SETS SELECTION

NOTE

During selection of different Б03 sets, the unit must be **unpowered**.

1. Deactivate system per 3.5, p.3 – 4
2. Activate system with the required sets per 3.2, p.3 – 1.

### 3.5. COCB DEACTIVATION (ON MCC-M GO)

RS Laptop

CM:СЭП:COCB

- 1. ↓\_ (Б14)  
cmd P\_OFPSOSB (COCB Power OFF)  
Execute

Б14

Б15 for СБ2 and СБ4

\*\*\*\*\*

\*\*\*\*\*

If Б15 (Б15) for СБ2 and/or СБ4

- ↓\_ (Б15 for СБ2(СБ4))  
cmd P\_OFPSB2 (P\_OFPSB4) (СБ2 (СБ4) Б15 power OFF)  
Execute

Б15 for СБ2 and СБ4

\*\*\*\*\*

- 2. ↓\_ (Б03)  
cmd P\_OFPB03 (Б03 power OFF)  
Execute

Б03

### 3.6. SOLAR ARRAY CONFIGURATION TO INITIAL POSITION 1(2)

NOTE

Init.pos. 1 – 112.5 degs (docking mode)  
Init.pos. 2 – 0 degs (sun tracking mode)

#### 3.6.1. SOLAR ARRAY CONFIGURATION TO INITIAL POSITION 1(2) USING PROCEDURE (ON MCC-M GO)

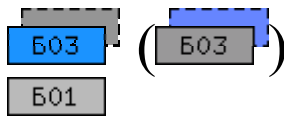
NOTE

1. This mode may be enabled both with activated and deactivated Б14 unit
2. If Б14 was previously powered, re-configuration to select a different set will not occur

If Б14 was deactivated:

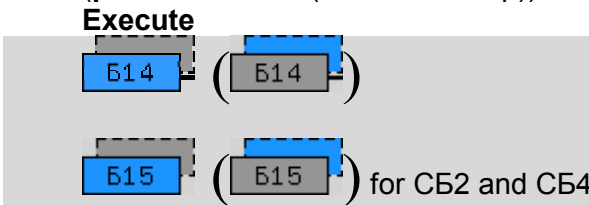
RS Laptop

1. CM:СЭП:СОСБ



2. ↓ (Б03)  
**proc F22\_SOSB\_4 (CB in Initial Position 1, Setup)**  
*(F22\_SOSB\_5 (CB in Initial Position 2, Setup))*  
**param1 0x4002 (for Б14 primary)**  
**(param1 0x4000 (for Б14 backup))**

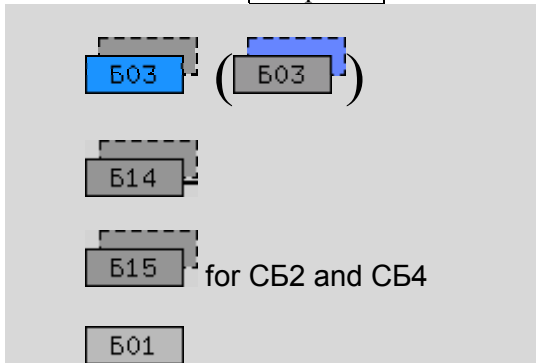
00:00:00



≤ 00:12:00

⏪ Mode — Init.pos. 1

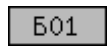
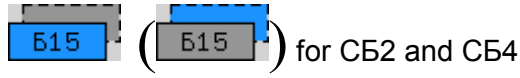
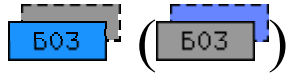
(⏪ Mode — Init.pos. 2)



If Б14 was activated:

RS Laptop

1. CM:СЭП:СОСБ



2. ↓ (Б03)

**proc** F22\_SOSB\_4 (СБ in Initial Position 1, Setup)  
(F22\_SOSB\_5 (СБ in Initial Position 2, Setup))

**param1** 0

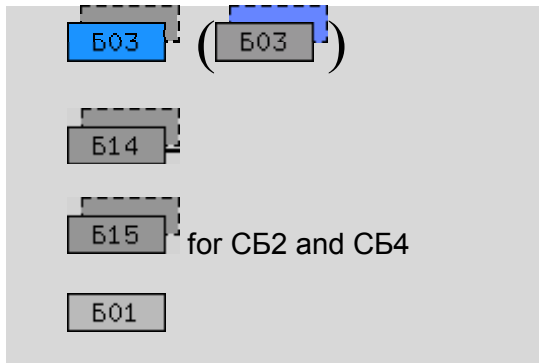
**Execute**

00:00:00

≤ 00:12:00

⏪ Mode — Init.pos. 1

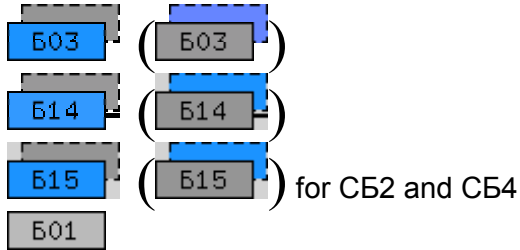
(⏪ Mode — Init.pos. 2)



### 3.6.2. SOLAR ARRAY CONFIGURATION TO INITIAL POSITION 1(2) USING COMMAND (ON MCC-M GO)

RS Laptop

CM:СЭП:СОСБ



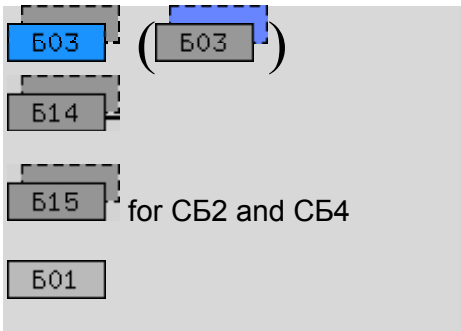
00:00:00

↓ (Б03)  
**cmd P\_ISH1 (Initial Position 1)**      (P\_ISH2 (Initial Position 2))  
**Execute**

If СОСБ main program is on:

≤ 00:12:00

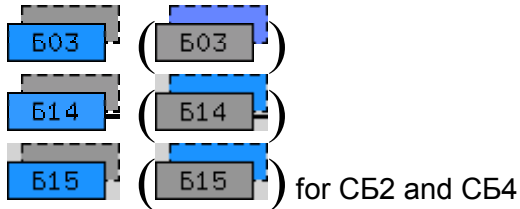
◀ Mode —       (◀ Mode — )



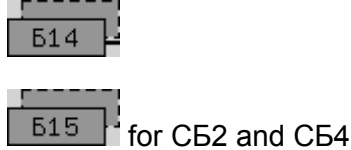
If СОСБ main program is off:

≤ 00:12:00

◀ CБ2 Zone — 6 (IP # 1)      (◀ CБ2 Zone — 1 (IP # 2))  
 ◀ CБ4 Zone — 12 (IP # 1)      (◀ CБ4 Zone — 1 (IP # 2))



↓ (Б14)  
**cmd P\_OFPSOSB (СОСБ power OFF)**  
**Execute**



### 3.7. INITIAL POSITION 1(2) CONFIGURATION MODE CANCEL (ON MCC-M GO)

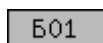
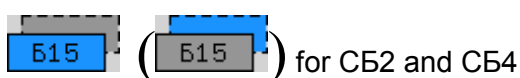
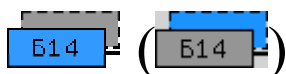
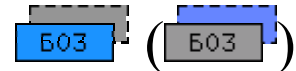
RS Laptop

CM:СЭП:СОСБ

↓ (Б14)

cmd P\_ONPSOSB\_M (P\_ONPSOSB\_R) (СОСБ primary (backup) Ch power ON)

Execute



#### NOTE

This reactivates the mode set prior to configuring solar panels to «Исходное» (Initial) position

Current mode can be monitored on ИнПУ SM: STATUS СОЖ, СОСБ, СОТР

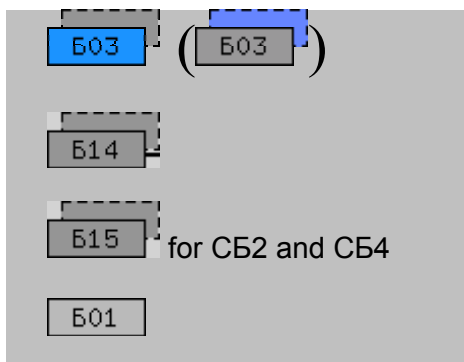
#### 3.7.1. RECOVERY ACTIONS IN CASE OF ERRONEOUS COMMANDING TO INITIAL POSITION

1. Wait until «Исходное» (Initial) position is achieved

RS Laptop

CM:СЭП:СОСБ

◀ Mode — Init.pos. 1 (2)



## 2. To cancel Initial position

RS Laptop

`CM:СЭП:СОСБ`

↓ (Б14)

`cmd P_ONPSOSB_M (P_ONPSOSB_R) (СОСБ primary (backup) Ch power ON)`**Execute**`Б03` ( `Б03` )`Б14` ( `Б14` )`Б15` ( `Б15` ) for СБ2 and СБ4`Б01`

If it is required to set a different Initial position (by running procedure):

RS Laptop

`CM:СЭП:СОСБ`

↓ (Б03)

`proc F22_SOSB_5 ( F22_SOSB_4) (СБ in Initial Position 2(1), Setup)``param1 0x4002 (for Б14 primary)``(param1 0x4000 (for Б14 backup))`**Execute**

### 3.8. SOLAR ARRAY MANUAL CONTROL MODE


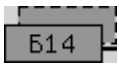
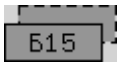


NOTE


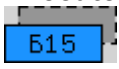
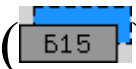

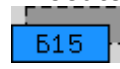
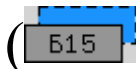
1. Simultaneous control of two drives is impossible.  
Only one drive can be controlled at a time.
2. Each zone is 22.5 degrees wide.
3. Solar array rotation rate ranges 0.5 ---1 degree per second  
(average rate is 0.73).

#### 3.8.1. SOLAR ARRAY INCOMPLETE ROTATION (WITHOUT REACHING STOP) (ON MCC-M GO)

RS Laptop


**CM:СЭП:СОСБ**


1. Determine rotation angle zone ( $\sqrt{\text{MCC-M}}$ )
2. ↓  (Б14)  
**cmd P\_OFPSOSB (COCB power OFF)**  
**Execute**  
 Б14  
  
 Б15 for СБ2 and СБ4
3. ↓  (Б01)  
**cmd P\_ONPRUCSB (Б01 manual control power ON)**  
**Execute**  
◀ Mode — **Manual**  
 Б01

Step	To rotate СБ2	To rotate СБ4
4.	↓  (Б15 for СБ2) <b>cmd P_ONPSB2 (СБ2 Б15 power ON)</b> <b>Execute</b>  Б15 (  Б15 ) for СБ2	↓  (Б15 for СБ4) <b>cmd P_ONPSB4 (СБ4 Б15 power ON)</b> <b>Execute</b>  Б15 (  Б15 ) for СБ4





NOTE

1. P\_POVSBP – rotates solar array counterclockwise
2. P\_POVSBM – rotates solar array clockwise
3. T.K – T.0 = calculated rotation angle/0.73 degrees per second  
(time to pass one zone is approximately 30 seconds)

5. ↓  (Б01)  
**cmd P\_POVSBP(P\_POVSBM) (СБ + Rotation (СБ – Rotation))**  
**Execute**  
T.0\_\_\_\_\_

6.  (Б01)  
**cmd P\_STOPSB (СБ Halt)**  
**Execute**




T.K \_\_\_\_\_


Step	For СБ2	For СБ4
7.	 (Б15 for СБ2) <b>cmd P_OFPSB2 (СБ2 Б15 power OFF)</b> <b>Execute</b>  for СБ2	 (Б15 for СБ4) <b>cmd P_OFPSB4 (СБ4 Б15 power OFF)</b> <b>Execute</b>  for СБ4



**3.8.2. SOLAR ARRAY COMPLETE ROTATION (WITH REACHING STOP)  
(ON MCC-M GO)**

1. Activate ИНПУ (see RODF:SM Manual Controls)

RS Laptop


2.  (Б14)  
**cmd P\_OFPSOSB (СОСБ power OFF)**  
**Execute**  
 Б14  
 Б15 for СБ2 and СБ4

3.  (Б01)  
**cmd P\_ONPRUCSB (Б01 manual control power ON)**  
**Execute**  
 < Mode —

Step	To rotate СБ2	To rotate СБ4
4.	 (Б15 for СБ2) <b>cmd P_ONPSB2 (СБ2 Б15 power ON)</b> <b>Execute</b> <input type="text" value="Б15"/> ( <input type="text" value="Б15"/> ) for СБ2	 (Б15 for СБ4) <b>cmd P_ONPSB4 (СБ4 Б15 power ON)</b> <b>Execute</b> <input type="text" value="Б15"/> ( <input type="text" value="Б15"/> ) for СБ4

NOTE


1. P\_POVSBP – rotates solar array counterclockwise  
 2. P\_POVSBM – rotates solar array clockwise

5.  (Б01)  
**cmd P\_POVSBP(P\_POVSBM) (СБ + Rotation (СБ – Rotation))**  
**Execute**

00:00:00

ИНПУ  
≤ 00:12:00


ARRAY 2 (ARRAY 4) STOP DISABLE





- RS Laptop CM:СЭП:СОСБ
6.  (Б01)  
**cmd P\_POVSBM(P\_POVSBP)** (СБ – Rotation ((СБ + Rotation))  
**Execute**

NOTE







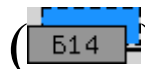
T.K – T.0 = calculated rotation angle from stop/0.73 degrees per second  
 (time to pass one zone is approximately 30 seconds)

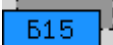
- ИНПУ  
T.0\_\_\_\_\_
7. SM STATUS СОЖ, СОСБ, СОТР  
 ↓ ARRAY RETRACT FROM STOP (press several times)  
 ■ ARRAY 2 (ARRAY 4) STOP DISABLE


- RS Laptop CM:СЭП:СОСБ
8.  (Б01)  
**cmd P\_STOPSB (СБ Halt)**  
**Execute**
- T.K\_\_\_\_\_

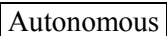
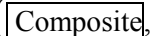
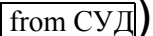
Step	For СБ2	For СБ4
9.	 (Б15 for СБ2) <b>cmd P_OFPSB2 (СБ2 Б15 power OFF)</b> <b>Execute</b>  for СБ2	 (Б15 for СБ4) <b>cmd P_OFPSB4 (СБ4 Б15 power OFF)</b> <b>Execute</b>  for СБ4

### 3.8.3. MANUAL CONTROL MODE DISABLE (ON MCC-M GO)

- RS Laptop CM:СЭП:СОСБ
1.  (Б01)  
**cmd P\_OFPRUCSB (Б01 manual control power OFF)**  
**Execute**  

2.  (Б14)  
**cmd P\_ONPSOSB\_M (P\_ONPSOSB\_R) (СОСБ primary (backup)  
 Ch power ON)**  
**Execute**  
 (Б03)   
 (Б14) 

  for СБ2 and СБ4



◀ Mode —  (, )

NOTE

This reactivates the mode set prior to configuring the system to manual control mode

**4. INTERNAL LIGHTING SYSTEM [CBO]****NOTE**

1. When fuse is blown :
  - lamp (Л) of corresponding light
  - On corresponding lighting panel: □ LED
2. LED number corresponds to fuse number

**4.1. CD1-7 STATIONARY LAMP CONTROL****4.1.1. CD1-7 STATIONARY LAMP CONTROL FROM ЩО-ЛО AND ЩО-ШО****NOTE**

1. sw 5 on ЩО-ЛО is not wired
2. If Л1 has blown out, Л2 will operate when ⚡Л1
3. If Л2 has blown out, then ⚡ Л2 and use Л1
4. If Л1 fuse has blown out, both Л1 and Л2 will not light

**CAUTION**

Do not flip the switch for blown-out lamp — it may cause the power supply unit to burnout

**1. GENERAL MAIN**

ЩО-ЛО (ЩО-ШО)	when ⚡ 1(2,3,4)-Л1	□ 1(2,3,4)-Л1 (lamp of corresponding unit)
	when ⚡ 1(2,3,4)-Л1	■ 1(2,3,4)-Л1
		■ 1(2,3,4)-Л2

**2. AUX**

	when □ 1(2,3,4) - Л1	
ЩО-ЛО (ЩО-ШО)	when ⚡ 1(2,3,4)-Л2	□ 1(2,3,4)-Л2
	when ⚡ 1(2,3,4)-Л2	■ 1(2,3,4)-Л2

**4.1.2. СД1-7 STATIONARY LAMP CONTROL FROM ЩО**NOTE

1. Night lighting can be activated from any of the ЩО panels
2. Night lighting activates automatically after docking with Soyuz or Progress vehicles
3. If lamp Л1(Л2) is blown, ↓ OFF and continue working with Л2(Л1)

ADDITIONAL (only for ПхО and ПрК)

ПхО, ПрК  
ЩО

when ↓ Л1	<input type="checkbox"/> Л1
when ↓ Л2	<input type="checkbox"/> Л2
when ↓ OFF	<input checked="" type="checkbox"/> Л1
	<input checked="" type="checkbox"/> Л2

NIGHT

ЩО

when ↓ Л1	<input type="checkbox"/> Л1 ALL (there are four onboard)
when ↓ Л2	<input type="checkbox"/> Л2 ALL
when ↓ OFF	<input checked="" type="checkbox"/> Л1 ALL
	<input checked="" type="checkbox"/> Л2 ALL

**4.2. СД1-5M STATIONARY LAMP CONTROL**

БВ-1

when ⚡	<input type="checkbox"/> Л
when ⚡	<input checked="" type="checkbox"/> Л

**4.3. СД1-6 PORTABLE LAMP CONTROL**NOTE

1. ЩСР lighting panel is provided with lamp brightness control knob
2. When fuse ПР1-А is blown —  Л

ЩСР

when ⚡ LIGHT ON	<input type="checkbox"/> Л
when ⚡	<input checked="" type="checkbox"/> Л

**4.4. СД1-7, СД1-5М , СД1-6 LAMP UNIT REPLACEMENT****NOTE**

1. Lamps Л1 and Л2 of СД1-7 are combined into one permanently sealed lamp unit (БД)
2. БД lamp unit is replaced if Л1 and Л2 are blown
3. БЦ lamp unit of СД1-5М and СД1-6 is replaced if Л lamp is blown

To replace БД and БЦ lamp units:

1. √ lighting fixture is unpowered
2. Release lamp unit locking latches
3. Remove lamp unit from power supply unit
4. Install new lamp unit onto guide pins
5. Engage lamp unit locking latches

**Report to MCC-M**

**4.5. CP-2 STATIONARY LAMP CONTROL****NOTE**

There are six lamps in one CP-2 lighting fixture

417, 434  
ЩО-ЩО1

- |                  |   |
|------------------|---|
| when ⚡ 1(2) - Л1 | □ 3 Л (three lamps of lighting fixture)       |
| when ⚡ 1(2) - Л2 | □ 3 Л (other three lamps of lighting fixture) |
| when ⚡ 1(2) - Л1 | ■ 3 Л   |
| when ⚡ 1(2) - Л2 | ■ 3 Л   |

**4.6. СГ2-8 PORTABLE LAMP CONTROL**

1. Activation:

СГ2-8	→ ←	connector X2 «3А» of РБС-10/3 power outlet
РБС-10/3	⚡	
СГ2-8	⚡	

2. Deactivation:

СГ2-8	⚡	
РБС-10/3	⚡	
СГ2-8	←+→	РБС-10/3 power outlet

**4.7. СПР-1 PORTABLE TV LAMP SETUP AND OPERATION**

1. Unstow cable 17KC.10Ю 8210A-2150 (-5340) (originally stowed in bag on panel 430)
2. connector 10A of cable 17KC.10Ю 8210A-2150 (-5340) →|← connector OC PC10A (СПР-1)
3. connector X250A(Б) of cable 17KC.10Ю 8210A-2150 (-5340) →|← connector X250-1  
(. . .-14) on panels

**4.7.1. СПР-1 CONNECT TO OUTLETS [ТВ-СВЕТ] ON CONNECTOR #10Ю-X250-11 (. . .-14)**

panel	437	338	228	234
[ТВ-СВЕТ] connector	#10Ю-X250-11	#10Ю-X250-13	#10Ю-X250-12	#10Ю-X250-14
ППС	ППС-23 (panel 338)		ППС-24 (panel 338)	

338

ППС-23 (-24)     PORTABLE LIGHT     СПР-1**NOTE**

Outlets [ТВ-СВЕТ] on connector #10Ю-X250-11 (. . .-14) are protected by ППС-23 (-24) circuit breaker

**4.7.2. СПР-1 DISCONNECT FROM OUTLETS [ТВ-СВЕТ] ON CONNECTOR #10Ю-X250-11 (. . .-14)**

338

ППС-23(-24)     PORTABLE LIGHT     СПР-1

if necessary, disassemble the circuit

**4.7.3. [СПР-1] CONNECT TO OUTLETS [ТВ-СВЕТ]**

panel	206	211	218	324	225
[ТВ-СВЕТ] connector	X250-1	X250-3	X250-5	X250-7	X250-9
БПП	panel 421 БПП-31 (port СПР outlets) Д9 – Д12				

Panel	408	417	419	428	431
[ТВ-СВЕТ] connector	X250-2	X250-4	X250-6	X250-8	X250-10
БПП	panel 421 БПП-32 (starboard СПР outlets) Д9 – Д12				

RS Laptop

CM:БРТК:TV SYSTEMS**cmd** I\_ONPSVETT (*TV Lighting power ON*)**Execute** СПР-1**NOTE**

Outlets X250-1 (. . .-10) are protected by fuses on БПП-31 (-32)

**4.7.4. СПР-1 DISCONNECT FROM OUTLETS [ТВ-СВЕТ]**

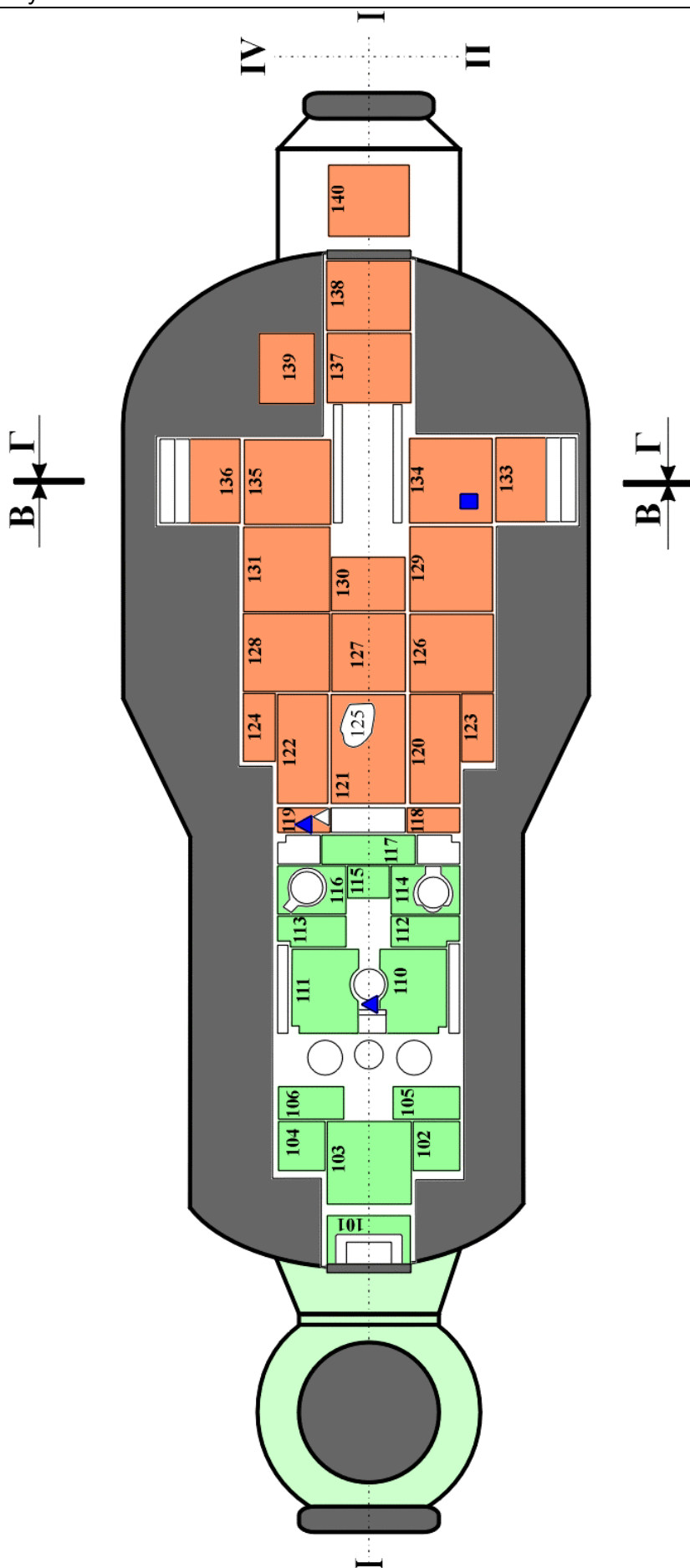
RS Laptop

CM:БРТК:TV SYSTEMS**cmd** I\_OFPSVETT (*TV lighting power OFF*)**Execute** СПР-1

if necessary, disassemble the circuit

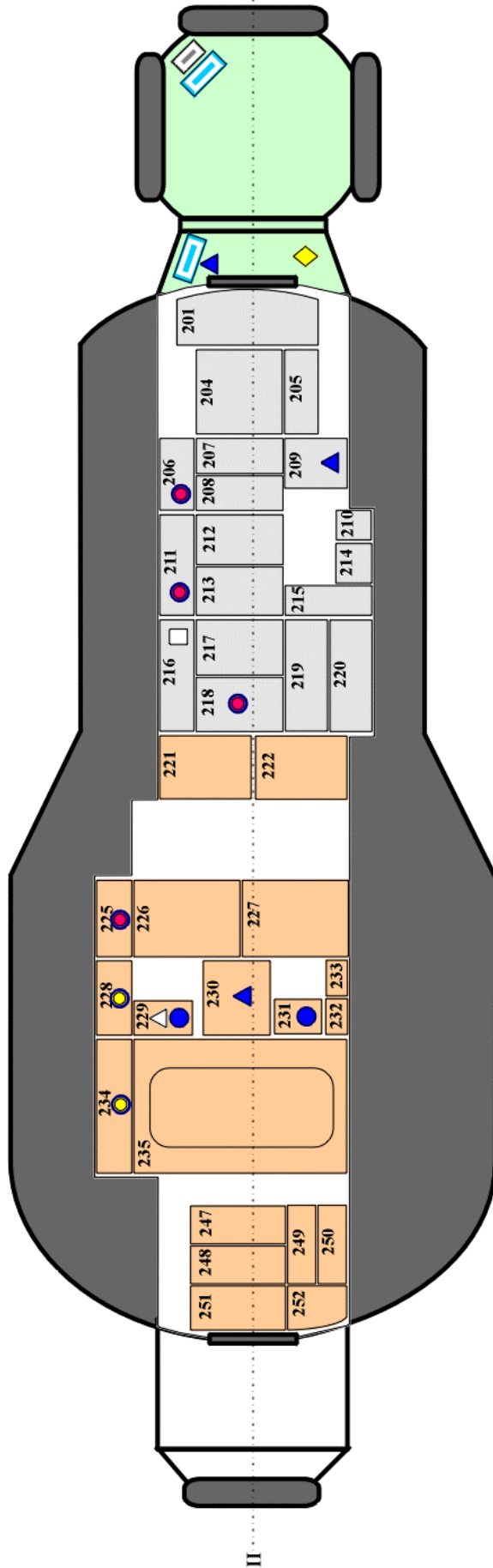
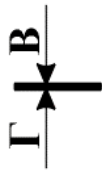


# Plane I (Deck)



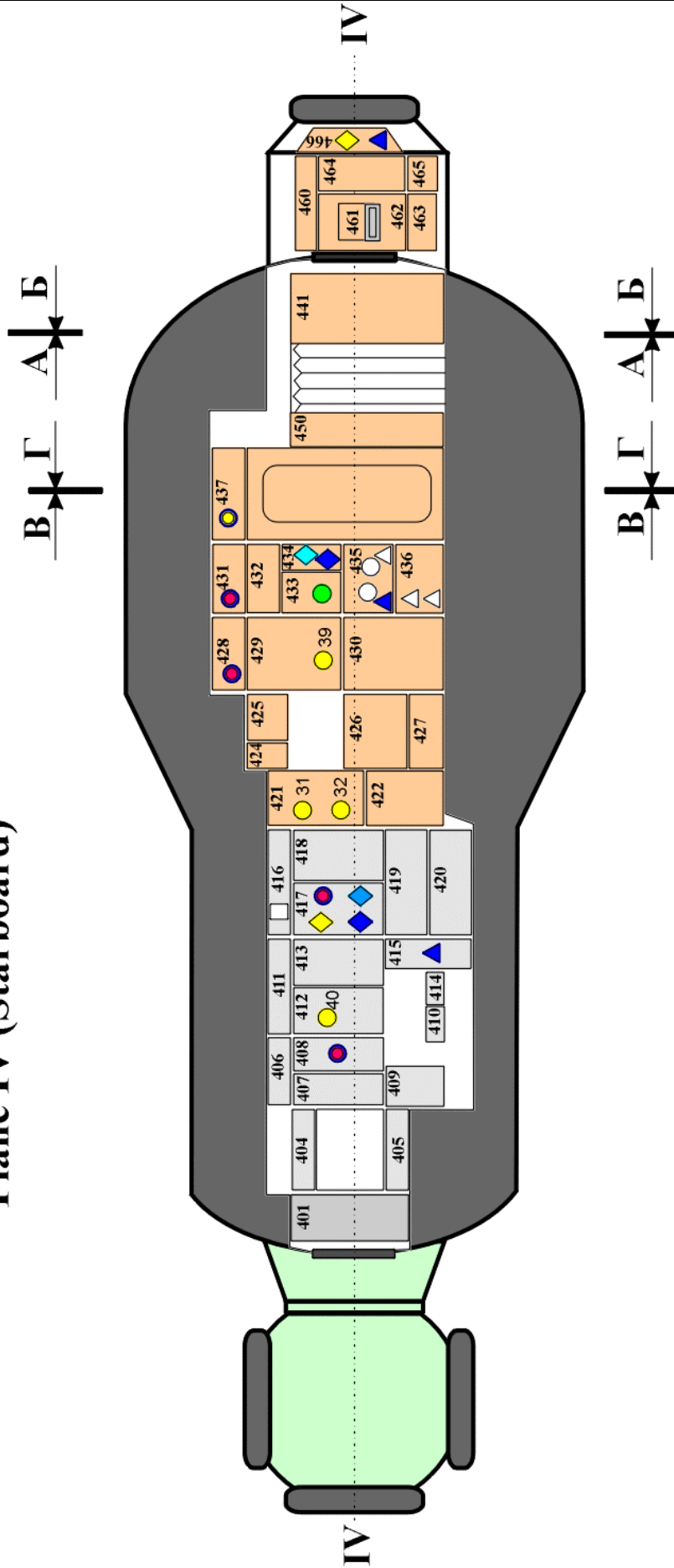
- ▲ Power Outlet PBC10/3
- △ Power Outlet PBC 20
- PЩП-С1 (underneath panel)

Plane II (Port)

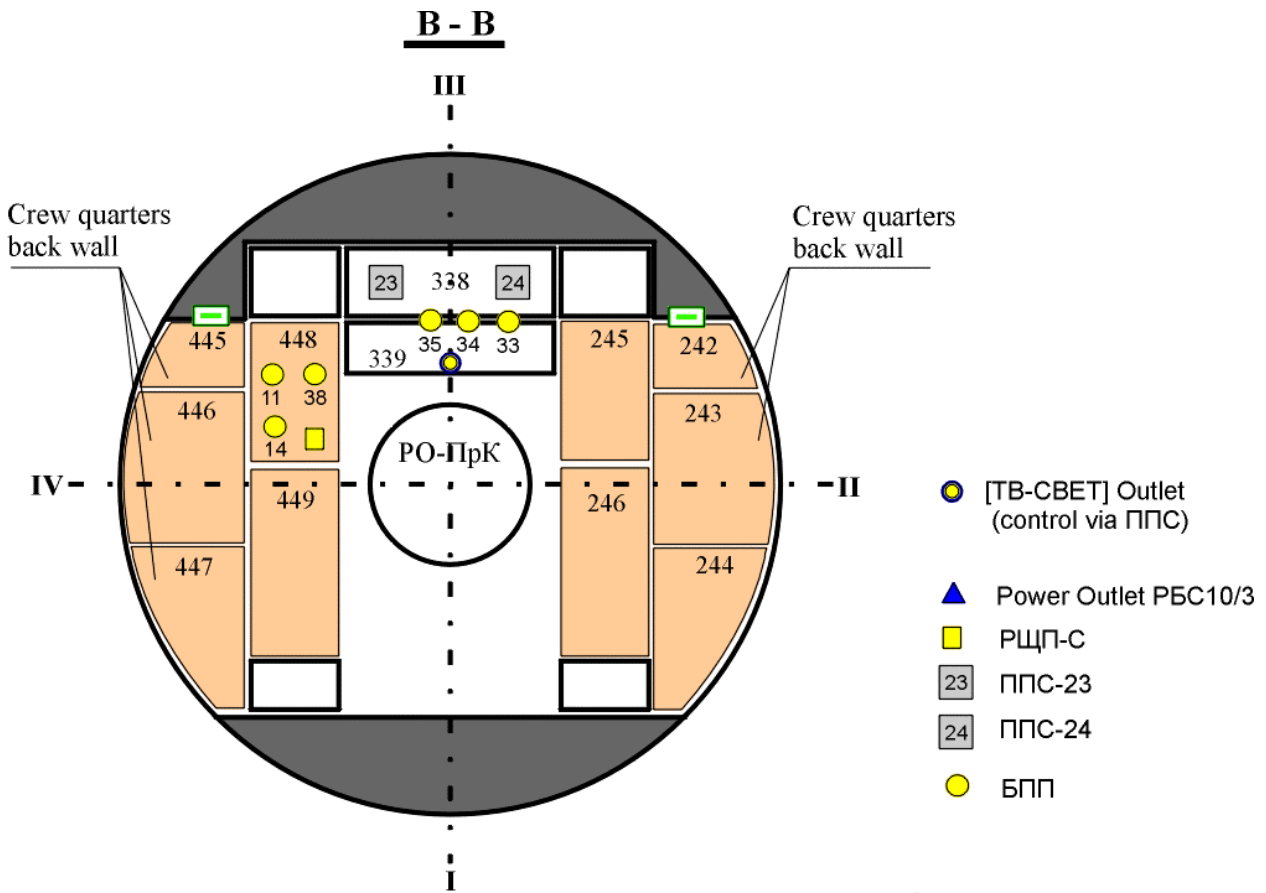


- Power Outlet РБС10/3
- Power Outlet РБС 20
- [ТВ-СВЕТ] Outlet (control via ППС)
- [ТВ-СВЕТ] Outlet (control via RS Laptop)
- Stationary Lamp СД 1-7
- Portable Lamp СГ2 - 8
- ЩО
- БВП-10
- РЦП-А1

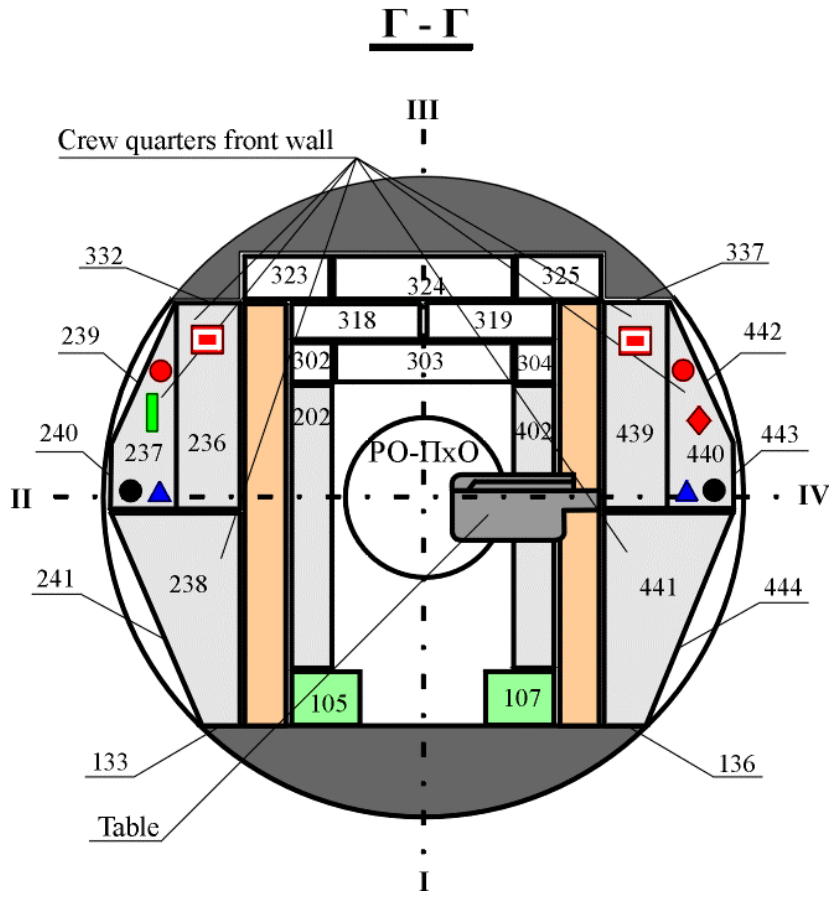
# Plane IV (Starboard)

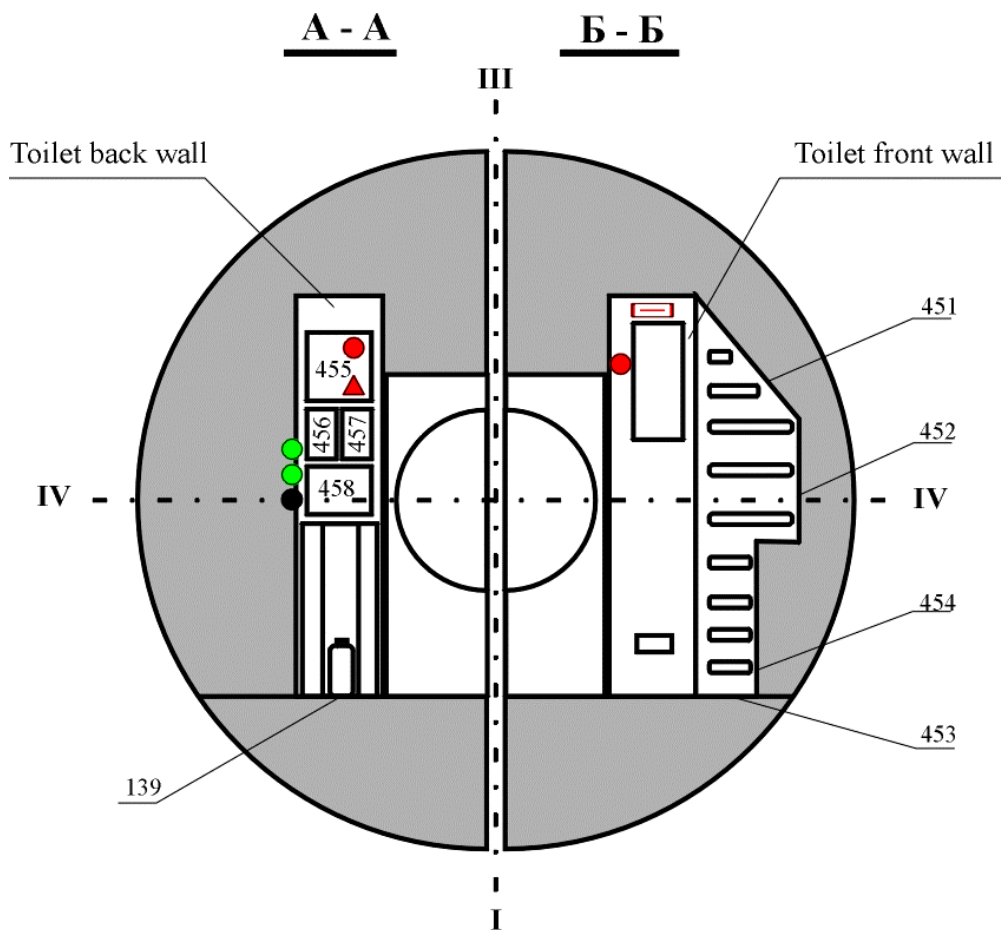


- [ТВ-СВЕТ] Outlet (control via ППС)
- [ТВ-СВЕТ] Outlet (control via RS Laptop)
- ▲ [ТВ-СВЕТ] Outlet (control via ППС)
- △ Power Outlet РСБС10/3
- Power Outlet РСБС 20
- РЦП-А1
- БВ-3
- БВП-20
- БПП
- ▭ Portable Lamp СГ2 - 8
- ◆ ЩО
- ◆ ЩО-ШО
- ◆ ЩО-ШО1
- ◆ ЩО-ЛО



- БВК-2
- Stationary Lamp СД 1-6
- БВ-1
- Portable Lamp СД 1-5
- ЩСР





- ▲ Power Outlet РБС 50
- БВ-1
- БВ-3
- БВК-2
- ▭ Stationary Lamp СД 1-5М