

Approved per signature page

SERVICE MODULE
COMMUNICATION SYSTEM
(PTK)
SM.1

2000

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INTRODUCTION

These PTK crew procedures contain information for the crew about the following: [CTTC], [TBC], command radio system, onboard measurement system operations and [CTTC], [TBC] schematics

These crew procedures are intended for trained crew members who have completed the full training course and simulations

These crew procedures may be updated ISS assembly, pending systems modification and procedure validation at simulators and training facilities

These crew procedures are developed per BBC software release 4.30.14 and RS Laptop software dated 07.03.00

ACRONYMS AND ABBREVIATIONS

АФУ	- antenna feeder unit
АО	- propulsion compartment
б/и	- crew procedure
БРТА	- Orlan telemetry unit
БТ	- push-to-talk unit
ВКЛ	- on, activate
ВКУ	- video control monitor
ВНА	- omni antenna
ВПУ	- intercom
ГНШК	- low-noise headset
ДнаЗ-М	- report to MCC-М
ДпоУЗ-М	- √MCC-М
ЗАП	- record
ЗУ	- memory device
ИСХ	- initial condition
ИнПУ	- integrated control panel
инд	- indicator
КРЛ	- command radio link
кбл	- cable
кн	- pushbutton, pb
М 1,2	- microphone 1,2
МБС	- intermodule communication
МКС	- International Space Station, ISS
НП	- real-time transmission
Н/С	- off-nominal situation
ОВЛ	- open EV hatch
ОРЛАН-М	- Orlan
ОТКЛ	- off, deactivate

ПА	- comm panel
ПНА	- semi-directional antenna
ППС	- system power panel
ПРД	- transmitter
ПРМ	- receiver
ПСС	- caution and warning panel
Пр	- fuse
ПрК	- SM transfer tunnel
ПрО	- SM transfer compartment
поУЗ-М	- on MCC-M GO
п	- procedure
пан	- panel
пл	- plane
РЕЖ	- mode
РЕЗ	- backup
РЕТР	- retransmission, relay
РПУ	- voice converter
РТК	- communication system
рис	- Figure
рзм	- connector
СБ	- solar array
СМ	- Service Module
СТТС	- SM audio subsystem
СвД	- LED, light emitting diode
СУДН	- motion control and navigation system
см	- ref
с/с	- comm pass
ТВ	- television
ТВС	- television subsystem
Т/К	- TV camera
ТЛФ	- phone, telephone
ТНГ	- push-to-talk button
ТМИ	- telemetry data
тмб	- switch, sw
ФГБ	- Functional Cargo Block
ЦВКУ	- color video control monitor
ЦП	- central post
ЦТ	- color (TV image)
ЦУП	- Mission Control Center
ЧБ	- black-and-white (TV image)
ЭВК	- LIV experimental video complex

SYMBOLS

<input type="checkbox"/>	- illuminated
<input checked="" type="checkbox"/>	- not illuminated
	- sw →On (i.e. up relative to label on panel)
	- sw →Off (i.e. down relative to label on panel)
BEHT → OCHOBH	- sw labeled BEHT → OCHOBH (if there are two positions labeled OCHOBH and PE3EPB, respectively)
BEHT → PE3EPB	- sw BEHT → PE3EPB (if there are two positions labeled OCHOBH and PE3EPB, respectively)
	- mouse left click
	- adjust by rotating
	- place physical device in designated position
	- disconnect
	- connect
	- press pushbutton
	- press pushbutton to lock
	- press pushbutton to release
	- check (in case of discrepancy, attempt a corrective action one time only)
	- verify
	- verify aurally
15:46:28	- 15 h 46 min 28 sec

***** - an anticipated off-nominal situation, if the condition left of the asterisks on the same line is not met, perform action(s) enclosed by asterisk lines

	- unit has a reserve
	- notification annunciation (not necessary for monitoring)

CHANNEL 1 CHANNEL 1 - Press pb CHANNEL 1 to stop
 LED on this pb

COMMAND ISSUE VIA RS LAPTOP

RS Laptop CM:COTP:Команды
cmd T_ONPSKV1 (*Вкл пум.СКВ-1*)
Execute

- Open the specified display
- Select the command by its unique ID
- Issue the command with execution confirmation

PROCEDURE RUN VIA RS LAPTOP

RS Laptop CM:COTP:СТР_проц
proc FT_11 (*KOX loop selection*)
param 1 —

param n —
Execute

- Open the specified display
- Select the command by its unique ID
- Type parameter #1 value in the parameter input field
- Type parameter #n value in the parameter input field, 'n' stands for total number of procedure parameters
- Run the procedure with execution confirmation

COMMAND ISSUE VIA INTEGRATED CONTROL PANEL (ИНПУ)

ИНПУ SM COTP CONTROL
 FAN MASTER PWR **OFF** FANS PWR OFF

- Open the specified display
- Place cursor on softkey (FAN MASTER PWR)
- Press key COMMAND / ON (**OFF**)
- Verify indicator (FANS PWR OFF) becomes highlighted (in bright green)

INDICATOR MONITORING VIA ИНПУ

ИНПУ SM COTP CONTROL
 FAN1 ПpK PWR ON

- Open the specified display
- Verify indicator (FAN1 ПpK PWR ON) becomes highlighted (in bright green)

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 to MCC-M** completed operations and any system problems at earliest available comm pass
3. Monitor systems operation per these crew procedures and **MCC-M** instructions
4. When there is a deviation from nominal systems operation, the crew is responsible for the following actions:
 - record time when the deviation (malfunction) was detected
 - record the nature of the deviation (malfunction)
 - **report to MCC-M** at the earliest available comm pass
5. Upon detection of an off-nominal situation, documented in these crew procedures, take actions to eliminate or to localize it per these crew procedures
6. Prior to operations, perform indicator checks on the control panels to be used
7. Output commands via control panels using pushbuttons (no lockout feature) by pressing them to the stop for 1 – 2 sec
8. Record actual time spent performing operations
9. When working with hardware equipped with protective caps and 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 is responsible for the following actions:

1. When working with the system, use only hardware, tools, and protective devices, designated by these crew procedures or **on MCC-M GO**
2. Upon detection of an off-nominal situation, not documented in these crew procedures, the crew is responsible for the following actions:
 - 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** at earliest available comm pass
3. Before replacing fuses, powerdown appropriate systems and/or instruments.
Replace fuse according to voltage given on the fuse.
Repeat fuse replacement **on MCC-M GO**

2. SM AUDIO SUBSYSTEM

2.1. [CTTC] FUNCTIONAL SCHEMATIC

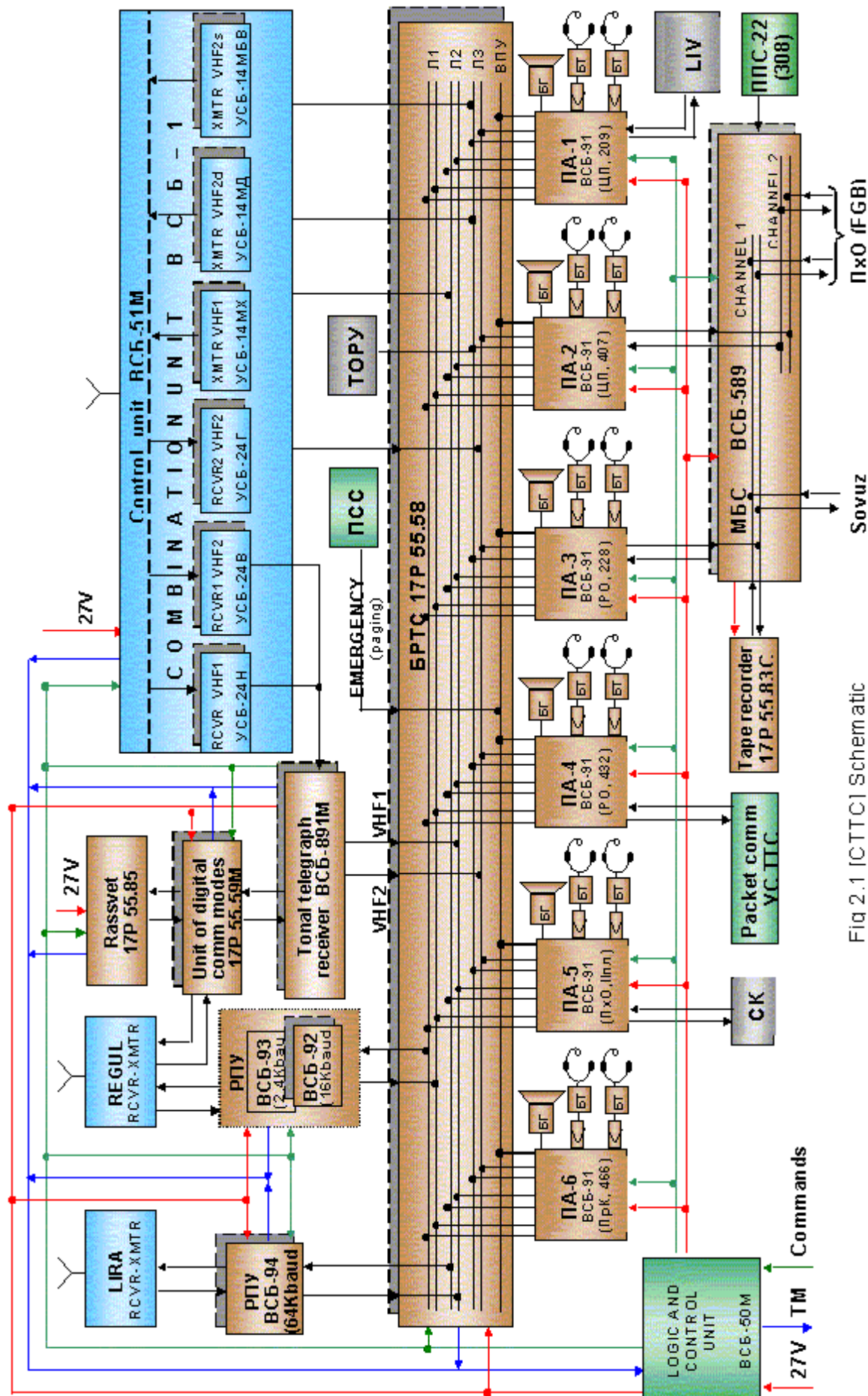


Fig 2.1 [CTTC] Schematic

2.2. [CTTC] OPERATIONAL FEATURES

- [CTTC] setup can be activated only via ИНПУ or via КРЛ
- pb CTTC Reinit on RS Laptop does not deactivate Regul and Lira RCVR-XMTR. **MCC** activates and deactivates Regul and Lira
- ↓ PAGE – speakers on all ПА are activated except the speaker which pb is pressed
- ↓ XMIT on any ПА - LED XMIT on all ПА
- In case of system configuration change (new mode selection)
ПА XMIT (XMIT)

<u>NOTE</u>	
For transmission use push-to-talk button on push-to-talk unit or pb XMIT on ПА (push-to-talk button remains depressed). In this case: on ПА on RS Laptop CM:БРТК:CTTC	
<input type="checkbox"/> LED XMIT 1(2, 3)	УСБ-14МХ (УСБ-14МД , УСБ-14МБВ)

2.3. [CTTC] INITIAL CONFIGURATION

- | | | | |
|-----------------|----|---|--|
| ППС-22
(308) | 1. | <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> МБС | |
| All ПА | 2. | <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> All pb | <input checked="" type="checkbox"/> All LEDs |
| RS
Laptop | 3. | <div style="border: 1px solid black; padding: 2px; display: inline-block;">CM:БРТК:CTTC</div>
<div style="background-color: #e0f0ff; padding: 2px; display: inline-block;">CTTC preparation</div>
<div style="background-color: #cccccc; padding: 2px; display: inline-block;">all units and channels (Regul and Lira units can be blue)</div>
(to deactivate ↓ pb CTTC Reinit) | |
| ИНПУ | 4. | <div style="border: 1px solid black; padding: 2px; display: inline-block;">SM COMM CONTROL</div>
<input checked="" type="checkbox"/> SM COMM READY INIT ON <input type="checkbox"/>
<input checked="" type="checkbox"/> VHF 1 SQUELCH ON <input type="checkbox"/>
<input checked="" type="checkbox"/> VHF 2 SQUELCH ON <input type="checkbox"/>
<input checked="" type="checkbox"/> VHF 1 OFF <input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> VHF 2 SIMPLEX OFF <input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> VHF 2 DUPLEX OFF <input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> EVA COMM OFF <input checked="" type="checkbox"/> | <div style="border: 1px solid black; padding: 2px; display: inline-block;">SM COMM -STATUS</div>
<input checked="" type="checkbox"/> VHF 1 SQUELCH PWR OFF
<input checked="" type="checkbox"/> VHF 2 SQUELCH PWR OFF
<input checked="" type="checkbox"/> RCVR VHF 1
<input checked="" type="checkbox"/> RCVR 1 VHF 2
<input checked="" type="checkbox"/> RCVR 2 VHF 2 |

2.4. INTERNAL COMMUNICATION

- ПА (in use)
1. \downarrow and hold PAGE
Page a crewmember using the low-noise headset
 2. \downarrow ICOM ICOM
Communicate

To complete comm

3. \uparrow ICOM ICOM

2.5. CONTROL VIA Laptop

2.5.1. REGUL COMM

ПА (in use) LED REGUL (when operating via НИП extra VHF)

\downarrow CHANNEL 1 CHANNEL 1
To complete comm

- LED REGUL LED XMIT 1
 $\sqrt{\uparrow}$ XMIT CHANNEL 1
 \uparrow CHANNEL 1 CHANNEL 1

RS Laptop CM:БРТК:СТТС
When operating via relay satellite
REGUL REGUL1(2)
When operating via НИП
VHF REGUL1(2)
REGUL ВСБ-92(93)

REGUL REGUL1(2)
 ВСБ-92(93)

2.5.2. LIRA COMM

ПА (in use) LED LIRA
 \downarrow CHANNEL 2 CHANNEL 2

To complete comm

- LED LIRA LED XMIT 2
 $\sqrt{\uparrow}$ XMIT CHANNEL 2
 \uparrow CHANNEL 2 CHANNEL 2

RS Laptop CM:БРТК:СТТС
LIRA LIRA
 ВСБ-94

LIRA LIRA
 ВСБ-94

2.5.3. VHF COMM

1. COMMUNICATION SETUP

NOTE

Use VHF2s for comm during rendezvous and docking with Soyuz and Orbiter

RS Laptop

CM:БРТК:СТТС

	Mode selection	Mode deactivation
VHF1	cmd: U_ONUK1 (VHF1 ON) Execute	cmd: U_OFUK1 (VHF1 OFF) Execute
VHF2d	cmd: U_ONUK2D (VHF2 duplex ON) Execute	cmd: U_OFUK2D (VHF2 duplex OFF) Execute
VHF2s	cmd: U_ONUK2S (VHF2 simplex ON) Execute	cmd: U_OFUK2S (VHF2 simplex OFF) Execute

2. VHF1 COMM

ПА (in use) CHANNEL 2**To complete comm**
 XMIT
 CHANNEL 2
 CHANNEL 2
 LED XMIT 2
 CHANNEL 2

RS Laptop CM:БРТК:СТТС

УСБ-24Н

 УСБ-14МХ
 УСБ-24Н

3. VHF2 DUPLEX COMM

ПА (in use) CHANNEL 3**To complete comm**
 XMIT
 CHANNEL 3
 CHANNEL 3
 LED XMIT 3
 CHANNEL 3

RS Laptop CM:БРТК:СТТС

УСБ-24В

 УСБ-14МД
 УСБ-24В

4. VHF2 SIMPLEX COMM

NOTE

For reception via VHF2s, release push-to-talk button (■ LED XMIT 3)

ПА (in use) LED XMIT 1, 2, 3 CHANNEL 3**To complete comm**
 XMIT
 CHANNEL 3
(all ПА XMIT) CHANNEL 3
 LED XMIT 3
 CHANNEL 3

RS Laptop CM:БРТК:СТТС

УСБ-24В

 УСБ-14МБВ
 УСБ-24В

2.5.6. VHF1-VHF2 DUPLEX RELAY

ПА LED XMIT 2, 3 (mode selected)

If LED XMIT 2, 3

To select mode

RS Laptop

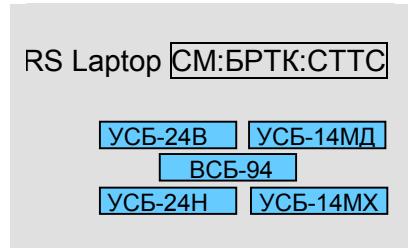
cmd: U_ONRTRLIRUK2 (*Lira-VHF2 relay ON*)

Execute

cmd: U_ONKANUK1 (*VHF1 Ch ON*)

Execute

ПА LED XMIT 2, 3



For comm	
with MCC	with manned vehicle or ORLAN-M
<input checked="" type="checkbox"/> CHANNEL 2 <input type="checkbox"/> CHANNEL 2	<input checked="" type="checkbox"/> CHANNEL 3 <input type="checkbox"/> CHANNEL 3

To complete comm

- CHANNEL 2, 3
- XMIT
- If LED XMIT 2, 3
- CHANNEL 2, 3
- LED XMIT 2, 3

To deactivate mode

RS Laptop

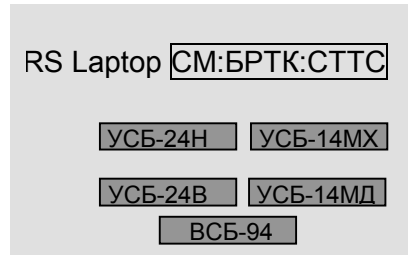
cmd: U_OFKAHUK1 (*VHF1 Ch OFF*)

Execute

cmd: U_OFRTLIRUK2 (*Lira-VHF2 relay OFF*)

Execute

ПА LED XMIT 2, 3



2.5.7. EVA COMM

1. PREPARATION FOR EVA

behind panel 406
bottom right

cnctr X796 ↔ plate cnctr X796 (disconnect ПСС annunciation unit from [CTTC])
cap ↔ cnctr X796-1
cnctr X796 →|← plate cnctr X796-1 (connect ПОВ annunciation unit to [CTTC])

ПА-5(ПхО) Low-noise headset ↔ ПА and transfer into [PO]

2. EVA COMM USING THE ORLAN UMBILICAL

NOTE

The IV crewmember (**on MCC-M GO**), or **MCC** establishes comm via VHF1(2d), Regul, Lira

Prior to Orlan donning

ПА-5(ПхО) ↓ CHANNEL 1, 2, 3 □ CHANNEL 1, 2, 3
 ↓ XMIT □ LED XMIT 1, 2, 3

After Orlan doffing

 ↓ XMIT ■ LED XMIT 1, 2, 3
 ↓ CHANNEL 1, 2, 3 ■ CHANNEL 1, 2, 3

3. EVA COMM USING БРТА

NOTE

1. Comm is performed via ПО-4М panel of the ORLAN-M Korona system
2. IV crewmember (**on MCC-M GO**), or **MCC** establishes Regul-VHF2 duplex relay on board (Lira-VHF2d, VHF1-VHF2d)

Prior to Orlan donning

RS Laptop **CM:БРТК:CTTC**
cmd: U_ONSVEXIT (EVA Comm ON)
Execute

ПА-5(ПхО) ↓ CHANNEL 3 □ CHANNEL 3
 ↓ XMIT □ LED XMIT 3

After Orlan doffing

 ↓ XMIT ■ LED XMIT 3
 ↓ CHANNEL 3 ■ CHANNEL 3

RS Laptop **CTTC**
cmd: U_OFSVEXIT (EVA Comm OFF)
Execute

RS Laptop **CM:БРТК:CTTC**

УСБ-24Г
УСБ-24В
УСБ-14МД

УСБ-14МД
УСБ-24В

УСБ-24Г

4. CLOSEOUT OPERATIONS

ПА-5(ПхО)
behind panel 406
bottom right

Low-noise headset →|← ПА
cnctr X796 ↔ plate cnctr X796-1
cap →|← cnctr X796-1
cnctr X796 →|← plate cnctr 796

2.6. CONTROL VIA ИНПУ

2.6.1. VHF COMM

1. COMMUNICATION

NOTE

Use VHF2s for comm during approach and docking with Soyuz and Orbiter

ИНПУ

SM STATUS SM COMM

	Mode activation		Mode deactivation	
VHF1	VHF 1 ON	<input type="checkbox"/> VHF 1	VHF 1 OFF	<input checked="" type="checkbox"/> VHF 1
VHF2d	VHF 2d ON	<input type="checkbox"/> VHF 2d	VHF 2d OFF	<input checked="" type="checkbox"/> VHF 2d
VHF2s	VHF 2s ON	<input type="checkbox"/> VHF 2s	VHF 2s OFF	<input checked="" type="checkbox"/> VHF 2d

2. VHF1 COMM

ПА (in use) ↓ CHANNEL 2 CHANNEL 2

To complete comm

√ ↓ XMIT LED XMIT 2

 ↓ CHANNEL 2 CHANNEL 2

ИНПУ SM COMM SIG

 RCVR VHF 1 RCVR VHF 1

3. VHF2 DUPLEX COMM

ПА (in use) ↓ CHANNEL 3 CHANNEL 3

To complete comm

√ ↓ XMIT LED XMIT 3

 ↓ CHANNEL 3 CHANNEL 3

ИНПУ SM COMM SIG

 RCVR 1 VHF 2 RCVR 1 VHF 2

4. VHF2 SIMPLEX COMM

NOTE

For reception via VHF2s, release push-to-talk button (LED XMIT 3)

ПА (in use) √ LED XMIT 1,2,3 (all ПА ↓ XMIT)

 ↓ CHANNEL 3 CHANNEL 3

To complete comm

√ ↓ XMIT LED XMIT 3

 ↓ CHANNEL 3 CHANNEL 3

ИНПУ SM COMM SIG

 RCVR 1 VHF 2 RCVR 1 VHF 2

2.6.2. EVA COMM

1. PREPARATION FOR EVA

behind panel 406
bottom right

cnctr X796 ↔ plate cnctr X796 (disconnect ПСС annunciation unit from [CTTC])
cap ↔ cnctr X796-1
cnctr X796 →|← plate cnctr X796-1 (connect ПОВ annunciation unit to [CTTC])

ПА-5(ПХО) Low-noise headset ↔ ПА and transfer into [PO]

2. EVA COMM USING THE ORLAN UMBILICAL

NOTE

Crewmember (**on MCC-M GO**) or **MCC** performs comm via VHF1(2d), Regul, Lira

Prior to Orlan donning

ПА-5(ПХО) ↓ CHANNEL 1, 2, 3 CHANNEL 1, 2, 3
↓ XMIT LED XMIT 1, 2, 3

After Orlan doffing

√ XMIT LED XMIT 1, 2, 3
√ CHANNEL 1, 2, 3 CHANNEL 1, 2, 3

3. EVA COMM USING БРТА

NOTE

- Comm is performed via ПО-4М panel of the ORLAN-M Korona system
- Crewmember (**on MCC-M GO**) or **MCC** performs Regul-VHF2 duplex relay on board (Lira-VHF2d, VHF1-VHF2d)

Prior to Orlan donning

ИНПУ **SM STATUS SM COMM**
EVA COMM **ON**
VHF 2 DUPLEX **ON**
ПА-5(ПХО) ↓ CHANNEL 3 CHANNEL 3
↓ XMIT LED XMIT 3

After Orlan doffing

√ XMIT LED XMIT 3
√ CHANNEL 3 CHANNEL 3

ИНПУ **SM COMM**
EVA COMM **OFF**
VHF 2 DUPLEX **OFF**

ИНПУ **SM COMM SIG**
 RCVR 1 VHF 2, RCVR 2 VHF 2

RCVR 1 VHF 2, RCVR 2 VHF 2

4. CLOSEOUT OPERATIONS

ПА-5(ПХО) Low-noise headset →|← ПА
behind panel 406
bottom right
cnctr X796 ↔ plate cnctr X796-1
cap →|← cnctr X796-1
cnctr X796 →|← plate cnctr 796

2.7. INTERMODULE COMMUNICATION SETUP

Comm from docked vehicles on SM:	
Channel 1(FGB, Soyuz)	Channel 2(FGB)
SM ПА-3 pnl 228	SM ПА-2 pnl 407
Select required comm mode per 2.4-2.6	

2.8. COMM FROM FGB

SM ПА-3(2) 1. Select required comm mode per 2.7

FGB

БК-2 (313) 2. ON LED ([CTC] is powered from FGB СЭП)

To perform comm

BCB-95 3. CHANNEL 1(2) CHANNEL 1(2)

To complete comm

4. CHANNEL 1(2) CHANNEL 1, 2

XMIT LED XMIT 1, 2

БК 2 (313) 5. OFF LED ([CTC] is powered from SM СЭП)

SM ПА-3(2) 6. All pb All LEDs

2.9. COMM FROM DOCKED SOYUZ VIA INTERMODULE COMMUNICATION

SM

ПА-3 (228) 1. Select required comm mode per 2.4 – 2.6
 XMIT LED XMIT 1(2, 3)

SOYUZ 2. Perform Intermodule Communication per RODF: SOYUZ TM "ASCENT AND DESCENT" CHECKLIST, п.1.3 INFLIGHT COMMUNICATION OPERATIONS

SM ПА-3 3. All pb All LEDs

2.10. PACKET COMM

NOTE

1. If there is no RS Laptop, **MCC-M** outputs command `D_ONF3URM` (*YPM Φ3 ON*) via KPL
2. The names of files for transmission should not have more than 8 symbols (English letters and digits) and should not have attributes «Only reading»
3. Do not add files to folder `D:\US_TTS\D_SEND\TTSEND` until transmission is complete

Prior to comm pass

- Wiener Power 1. Prepare and place files into folder `D:\US_TTS\D_SEND\TTSEND`
- RS Laptop 2. `CM:БПТК:CTTC`
cmd: `D_ONF3URM` (*YPM Φ3 ON*) (telephone-telegraph comm YC activation)
Execute

During comm pass

- ПА-4 3. Set up comm for packet transmission (**On MCC-M GO**)
 Regulator ТЛФ 2 maximum, ТЛФ 1 minimum
 ↓ XMIT LED XMIT 1(2, 3)
- Wiener Power 4. Start `WS_TTS3` program from folder `D:\US_TTS\`

If there is no packet transmission via Regul 1(2)

RS Laptop

`CTTC`

√

`BCБ-92`

(**On MCC-M GO** **cmd:** `U_ONTLFREG16` (*Regul 16 Telephone ON*)
Execute)

After file exchange is complete

- | | |
|------------------------------------|--|
| ⏪ window 'Reports about comm pass' | 'Comm pass was performed without mistakes'
(<i>'Comm pass was performed with mistakes'</i>) |
| ⏪ window 'List of delivered files' | Files not transmitted during comm pass |
| ⏪ window 'List of received files' | Files received during comm pass |

After comm pass is complete

5. Exit the program `WS_TTS3.EXE`
- ПА-4 6. XMIT LED XMIT 1, 2, 3

To deactivate mode

- RS Laptop 7. `CTTC`
D_OFF3URM (*YPM Φ3 OFF*) (telephone-telegraph comm YC deactivation)

After comm pass is complete

- Wiener Power 8. Take received files from folder `D:\US_TTS\D_RECV\OTP`

2.11. GNOM-S TAPE RECORDER OPERATION

NOTE

1. When tape recorder is activated, track 1 is preset automatically
2. The initial configuration of the new cassette is in middle position
3. Switchover to the other track is automatic
4. For forced switchover \downarrow direction 1(2)
5. One track operation time is 1 hour 30 min

1. RECORD

- | | | |
|---------------|--|---|
| ПА-3 | \downarrow CHANNEL 1(2, 3) | <input type="checkbox"/> CHANNEL 1(2, 3) |
| or | \downarrow ICOM | <input type="checkbox"/> ICOM |
| Tape recorder | Switch \rightarrow <input type="checkbox"/> | |
| | \downarrow On | <input type="checkbox"/> 1(2) |
| | \downarrow Off (after recording is complete) | |
| ПА-3 | \checkmark CHANNEL 1, 2, 3, ICOM | <input checked="" type="checkbox"/> CHANNEL 1, 2, 3, ICOM |

2. PLAYBACK

- | | | |
|---------------|---|---|
| ПА-3 | \downarrow CHANNEL 1(2, 3) | <input type="checkbox"/> CHANNEL 1(2, 3) |
| or | \downarrow ICOM | <input type="checkbox"/> ICOM |
| | For transmission to MCC | |
| | \downarrow XMIT | <input type="checkbox"/> LED XMIT 1(2, 3) |
| Tape recorder | Switch \rightarrow <input type="checkbox"/> | |
| | \downarrow On | <input type="checkbox"/> 1(2) |
| | \downarrow Off (after playback is complete) | |
| ПА-3 | \checkmark CHANNEL 1, 2, 3, ICOM | <input checked="" type="checkbox"/> CHANNEL 1, 2, 3, ICOM |

3. REWIND

- | | | |
|---------------|---|-------------------------------|
| Tape recorder | Switch \rightarrow <input type="checkbox"/> | |
| | \downarrow On | |
| | \downarrow 1(2) (to choose direction) | <input type="checkbox"/> 1(2) |
| | \downarrow Off (to stop) | |

4. CASSETTE REPLACEMENT

- | | | |
|---------------|--|----------------------------|
| Tape recorder | \downarrow CASSETTE,
Retrieve cassette
Insert new cassette
Close cover
Switch \rightarrow <input type="checkbox"/> | |
| | \downarrow On | |
| | \downarrow 2 | <input type="checkbox"/> 2 |
| | \leftarrow Counter \rightarrow 2-3 points | |
| | \downarrow Off | |

Notes

2.12.5. VHF RECEIVER FUNCTIONAL CHECK

- ИнПУ 1. **SM STATUS SM COMM**
 VHF 1 **ON** VHF 1
 ПА CHANNEL 2 CHANNEL 2
 ИнПУ **SM COMM**
 VHF 1 SQUELCH **OFF** VHF 1 SQUELCH
 📞 RCVR VHF 1 via the low-noise headset
 VHF 1 SQUELCH **ON** VHF 1 SQUELCH
 ПА CHANNEL 2 CHANNEL 2
 ИнПУ **SM COMM**
 VHF 1 **OFF** VHF 1
 2. VHF 2 DUPLEX **OFF** VHF 2 DUPLEX
 ПА CHANNEL 3 CHANNEL 3
 ИнПУ **SM COMM**
 VHF 2 SQUELCH **OFF** VHF 2 SQUELCH
 📞 RCVR 1 VHF 2 noise via the low-noise headset
 VHF 2 SQUELCH **ON** VHF 2 SQUELCH
 ПА CHANNEL 3 CHANNEL 3
 ИнПУ **SM COMM**
 VHF 2 DUPLEX **OFF** VHF 2 DUPLEX
 3. EVA COMM **ON** EVA COMM
 ПА CHANNEL 3 CHANNEL 3
 ИнПУ **SM COMM**
 VHF 2 SQUELCH **OFF** VHF 2 SQUELCH
 📞 RCVR 2 VHF2 noise via the low-noise headset
 VHF 2 SQUELCH **ON** VHF 2 SQUELCH
 ПА ЛИНИЯ СВЯЗИ 3 ЛИНИЯ СВЯЗИ 3
 ИнПУ **SM COMM**
 EVA COMM **OFF** EVA COMM

- ИнПУ **SM COMM SIG**
 RCVR VHF 1
 VHF 1 SQUELCH PWR OFF
 VHF 1 SQUELCH PWR OFF
 RCVR VHF 1
 RCVR 1 VHF 2
 VHF 2 SQUELCH PWR OFF
 VHF 2 SQUELCH PWR OFF
 RCVR 1 VHF 2
 RCVR 2 VHF 2
 VHF 2 SQUELCH PWR OFF
 VHF 2 SQUELCH PWR OFF
 RCVR 2 VHF 2

Notes

2.13. OFF-NOMINAL SITUATIONS

2.13.1. NO COMM VIA LOW-NOISE HEADSET

ПА	If <input type="checkbox"/> FUSE Replace fuse Report to MCC-M
ПА	If <input checked="" type="checkbox"/> FUSE ☎ comm via second low-noise headset If there is comm Reconnect low-noise headset to be checked to cnctr X1 of second low-noise headset ☎ comm via to be checked low-noise headset If there is comm, first cnctr X1 is bad Work via good cnctr X1 If there is no comm Replace low-noise headset Report to MCC-M

2.13.2. SWITCHOVER TO BACKUP [CTTC] (on MCC-M GO)

NOTE

Select the operating mode for the desired unit on the RS Laptop or ИНПУ before switching to backup RCVR and XMTR VHF2(2d)

Device	Crewmember actions	
Tonal telegraph receiver BCB-891M	behind pnl 331	Reconnect cbl from cnctr 891-Ш6 to cnctr 891-Ш5 Reconnect cap from cnctr 891-Ш5 to cnctr 891-Ш6
МБС BCB-589	pnl 330	☎ CHANNEL 1(2) → BACKUP

1. SWITCHOVER VIA Laptop

Device	Crewmember actions	Note
РПУ BCB-92	RS Laptop <input type="checkbox"/> CM:БРТК:CTTC cmd: U_ONAKK_R (Backup speaker ON) Execute	Switchover to backup subset is performed by all units at the same time
РПУ BCB-94		
БРТК 17P 55.58		
Digital comm unit 17P 55.59M	RS Laptop <input type="checkbox"/> CM:БРТК:CTTC cmd: U_ON17P55_R (17P55.59M backup ON) Execute	
RCVR (XMTR) VHF1 УСБ-24Н(УСБ-14МХ)	RS Laptop <input type="checkbox"/> CM:БРТК:CTTC cmd: U_ONPRM(PRD)UK1_R (VHF1 backup RCVR1(XMTR) ON) Execute	
RCVR1 (2) VHF2 УСБ-24Н(УСБ-24Г)	RS Laptop <input type="checkbox"/> CM:БРТК:CTTC cmd: U_ONPRM1(2)UK2_R (VHF2 backup RCVR1(2) ON) Execute	
XMTR2s (XMTR2d) VHF2 УСБ-24МБВ(УСБ-14МД)	RS Laptop <input type="checkbox"/> CM:БРТК:CTTC cmd: U_ONPRD1(2)UK2_R (VHF2 backup XMTR1(2) ON) Execute	

2. SWITCHOVER VIA ИИПУ

Device	Crewmember actions	Note
РПУ ВСБ-92	ИИПУ <u>SM STATUS SM COMM</u> BU AMPLFR ON <input type="checkbox"/> BU AMPLFR	Switchover to backup subset is performed by all units at the same time
РПУ ВСБ-94		
БРТС 17P 55.58		
RCVR (XMTR) VHF1	ИИПУ <u>SM STATUS SM COMM</u> BU XMTR (RCVR) VHF 1 ON <input type="checkbox"/> BU XMTR (RCVR) VHF 1	
RCVR 1 (XMTR 1) VHF 2	ИИПУ <u>SM STATUS SM COMM</u> BU XMTR 1 (RCVR 1) VHF 2 ON <input type="checkbox"/> BU XMTR 1 (RCVR 1) VHF 2	For VHF2s
RCVR 2 (XMTR 2) VHF 2	ИИПУ <u>SM STATUS SM COMM</u> BU XMTR 2 (RCVR 2) VHF 2 ON <input type="checkbox"/> BU XMTR 1 (RCVR 1) VHF 2	For VHF2d

Notes

3. TELEVISION SUBSYSTEM

3.1. [TBC] FUNCTIONAL SCHEMATIC

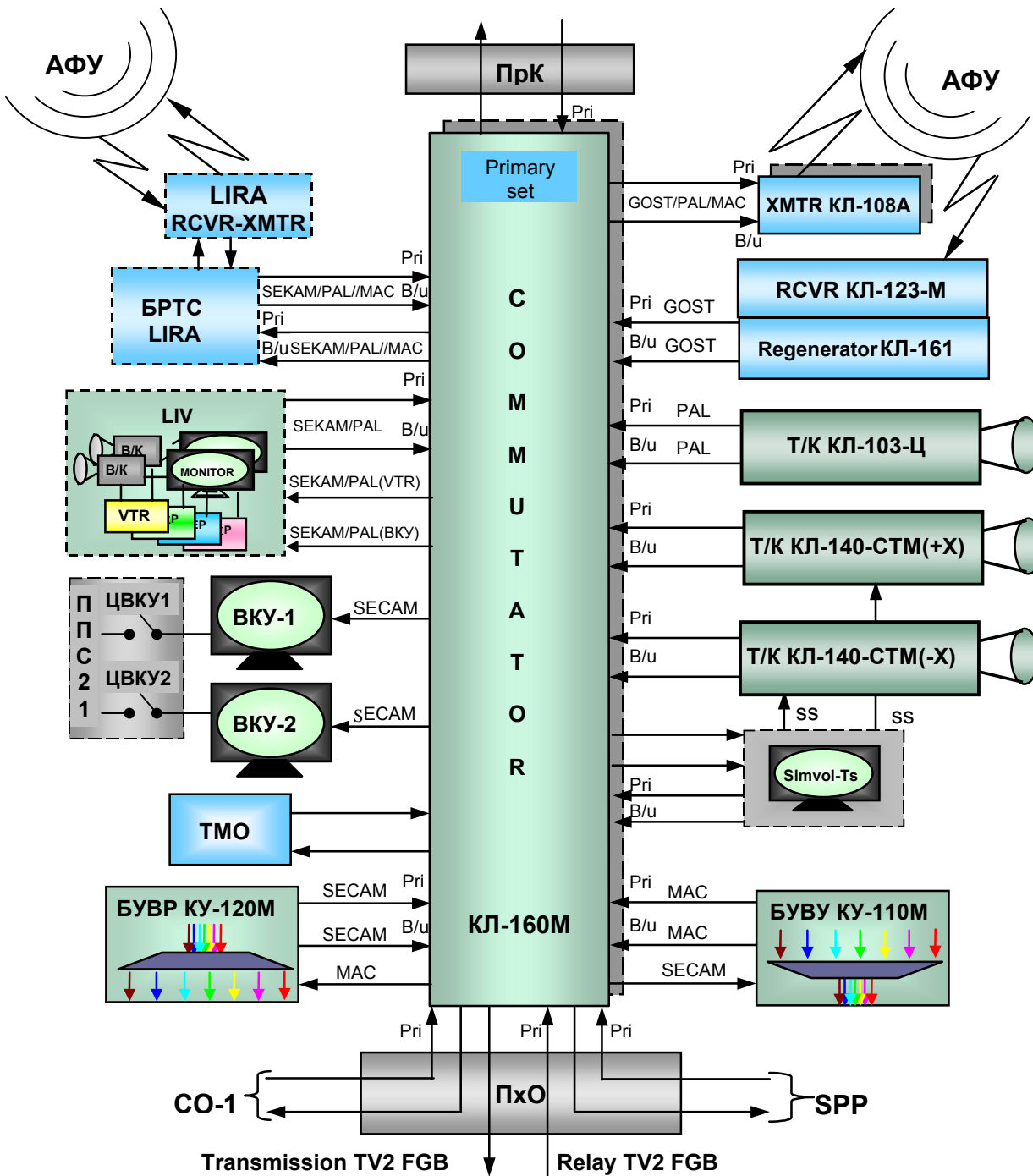


Figure 3.1 [TBC] Functional Schematic

- | | |
|--|------------------|
| БУВУ - Temporary multiplexing onboard device | ss - sync signal |
| БУВР - Temporary demultiplexing onboard device | Pri - primary |
| TMO - Signal converter | B/u - backup |

3.2. [TBC] OPERATING MODES

Modes selected using procedures via RS Laptop CM:EP TK:TV System from window TVS Modes (F25_TV5_Ne) Modes

Source	Destination	TV XMTR L_ONPRDT	Lira XMTR L_ONEXLT	MON 1(2) L_ONEXVKU1(2)T	MON Simvol-Is L_ONS1T	LIV recorder L_ONEXVMLIVT	LIV MON L_ONEXVKULIVT	TV2 F3B
Cam+X L_ONTKPXT		TVS_0	TVS_1	TVS_27(28)	TVS_2	--	--	Transmission I_TRTV2FGBT
Cam-X L_ONTKOXT		TVS_3	TVS_4	--	TVS_5	--	--	--
Cam +X + TV display		TVS_6	TVS_7	TVS_29(30)	--	TVS_8	--	--
Cam -X + TV display		TVS_9	TVS_10	--	--	TVS_11	--	--
Simvol-Is (Monitor) L_ONSZT		TVS_20	TVS_21	--	--	--	--	--
Cam (portable) L_ONTKRT		TVS_12	TVS_13	TVS_31(32)	--	--	--	--
"LIV" 3BK L_ONENLIVT		TVS_14	TVS_15(16)	--	--	--	--	--
Lira RCVR L_ONENLT		--	--	TVS_35(36)	TVS_23	TVS_25	TVS_24	--
TV RCVR L_ONPRMT		--	TVS_17	TVS_33(34)	TVS_22	--	--	--
TV2 F3B Relay I_RTRTV2FGBT		TVS_40	TVS_39	TVS_37(38)	--	--	--	--
COMMUTATOR KJ-160M L_ONPKL160T								
TV deactivation TVS_26								
EXECUTE FIST BEFORE SELECTING OPERATING MODE USING COMMANDS								
EXECUTE AFTER OPERATION IS COMPLETE (blue highlights disappear)								

3.5. [TBC] OPERATION FEATURES

3.5.1. TV DEACTIVATION PROCEDURE FEATURES

After TV deactivation procedure (F25_TV5_26) is executed to deactivate TV blue highlights of display elements [CM:БРТК:TV System] disappear for all units, except LIRA RCVR and XMTR which are controlled by **MCC-M** and can be left highlighted. In this case:

deactivated:	not deactivated:
T/K КЛ-140СТ-M+X	LIRA RCVR
T/K КЛ-140СТ-M-X	LIRA XMTR
T/K КЛ-103Ц	BKY 1, 2
XMTR КЛ-108А	LIV
БУВР КУ-120М	TV lighting
БУВУ КУ-110М	
RCVR КЛ-123-M	
Regenerator КЛ-161	
Commutator КЛ-160М	

3.5.2. FEATURES OF [TBC] OPERATING MODE SELECTION USING COMMANDS

CAUTION

Simultaneous operation of KLEST transmitter and receiver is not allowed

1. COMMUTATOR КЛ-160М CONNECTION

RS Laptop

[CM:БРТК:TV System]

cmd: I_ONPKL160T (КЛ-160 power ON)

Execute

КЛ-160М Primary set

2. TV SIGNAL SOURCE CONNECTION

RS Laptop

[TV System]

cmd: (source activation command is given in Table 3.2)

Execute

[] selected source

3. TV SIGNAL USER CONNECTION

NOTE

1. Signal degrades if more than three users are simultaneously connected to one source
2. When mode is selected using commands, BKY1(2), BKY Simvol units and lines connecting them on display [TV System] do not appear

RS Laptop

[TV System]

cmd: (user activation command is given in Table 3.2)

Execute

[] selected user

4. OPERATION CLOSEOUT

RS Laptop

[TBC]

proc: F25_TV5_26 (Television OFF)

Execute

Blue highlights disappear

3.6. VIDEO EVENT FROM SM (DOWNLINK)

1. PREPARATION FOR VIDEO EVENT

Remove T/K protective covers

Inspect T/K for damage and ensure optical surfaces are clean

For video event from [PO]	For video event from ПхО
Configure equipment for video event from [PO] per Figure 3.3, p. 3-3	318 cnctr X4Ю29(TV ПхО) →← cnctr X1Ю29
	Configure equipment for video event from ПхО per Figure 3.3, p. 3-3

2. TV SIGNAL MONITORING ON BKY1(2)

1. If necessary install and connect lights per RODF: SM POWER SUPPLY SYSTEM, СПР-1 PORTABLE TV LAMP SETUP AND OPERATION

ППС-21(306) 2. Ⓢ ЦБКУ1(2)

RS Laptop

CM:БРТК:TV System

proc: F25_TVS_31(TVS_32) (Connect TV (portable) to MON1(2))

Execute



Cam (portable) MON1(2)

cmd: I_ONPSVETT (TV Lighting power ON)

Execute

Adjust lighting

3. TV SIGNAL TRANSMISSION TO MCC (on MCC-M GO)

NOTE

KLEST transmitter takes 2 min to start operating mode

RS Laptop

TV System

proc: F25_TVS_12(TVS_13) (Connect color TV(portable) to TV XMTR (XMTR L) ГОСТ)

Execute



Cam (portable)

Perform video event

4. OPERATION CLOSEOUT

RS Laptop

TV System

proc: F25_TVS_26 (Television OFF)

Execute

Blue highlights disappear

cmd: I_OFPSVETT (TV lighting power OFF)

Execute

ППС-21(306)

Ⓢ ЦБКУ1(2)

3.7. EVA VIDEO EVENTS (DOWNLINK)

1. T/K FUNCTIONAL CHECK

1. Remove T/K protective covers
Inspect T/K for damage and ensure optical surfaces are clean

Configure equipment:	
For video event outside [PO]	For video event in ПxO
Preparation for EVA video event outside [PO] Figure 3.3, p. 3-3	318 cnctr X4Ю29(TV ПxO) →← cnctr X1Ю29
	EVA video event from ПxO Figure 3.3, p. 3-3

ППС-21(306) 2. ⚙ ЦБКУ1(2)

RS Laptop

CM:БРТК:TV System

proc: F25_TV_S_31(TVS_32) (Connect TV (portable) to MON1(2))

Execute



Cam (portable) MON1(2)

⚡ T/K operation

RS Laptop

TV System

proc: F25_TV_S_26 (Television OFF)

Execute

Blue highlights disappear

ППС-21(306)

⚙ ЦБКУ1(2)

2. PREPARATION FOR VIDEO EVENT

CAUTION

Do not touch T/K housing with bare hands after cover removal
When operating T/K, hold it only by its handle while wearing gloves

1. Remove T/K cover
Install T/K on boom 17KC.Б9648-0 (to secure camera on handrails)

318 2. cnctr X8Ю29 cbl 17KC.29Ю 8029A-10 ↔ cnctr X1Ю29
cnctr X12Ю29(EVA TV) →← cnctr X1Ю29
cnctr X6Ю29 cbl 17KC.29Ю 8029A-20 ↔ cnctr X6Ю29 cbl 17KC.29Ю 8029A-10

3. VIDEO EVENT FROM [PO] SMALL CONE

Locking plate

5

√ cnctr XФП5-2 ↔ cnctr XФП5-3

cnctr XФП5-2 →← cnctr X6Ю29 cbl 17KC.29Ю 8029A-20 (Figure 3.3, p. 3-3)

4. VIDEO EVENT FROM [PO] LARGE CONE

Locking plate

5

√ cnctr XФП5-2 →← cnctr XФП5-3

Locking plate

6

cnctr XФП6-1 →← cnctr X6Ю29 cbl 17KC.29Ю 8029A-20 (Figure 3.3, p. 3-3)

5. TV SIGNAL MONITORING ONBOARD

ППС-21(306) Ⓢ ЦБКУ1(2)

RS Laptop

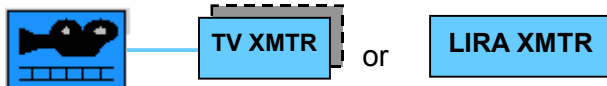
CM:БРТК:TV System

proc: F25_TVVS_31(TVS_32) (Connect TV (portable) to MON1(2))**Execute**

Cam (portable) MON1(2)

6. TV SIGNAL TRANSMISSION TO MCC (on MCC-M GO)NOTE

KLEST transmitter takes 2 min to start operating mode

proc: F25_TVVS_12(TVS_13) (Connect color TV(portable) to TV XMTR ГОСТ)**Execute**

Cam (portable)

7. OPERATION CLOSEOUT

RS Laptop

1. TV System

proc: F25_TVVS_26 (Television OFF)**Execute**

Blue highlights disappear

ППС-21(306)

Ⓢ ЦБКУ1(2)

Locking plate

6

2. √ cnctr XФП6-1 ↔ cnctr X6Ю29 cbl 17KC.29Ю 8029A-20 (Figure 3.3, p. 3-3)

Locking plate

5

√ cnctr XФП5-2 ↔ cnctr X6Ю29 cbl 17KC.29Ю 8029A-20

√ cnctr XФП5-2 →← cnctr XФП5-3

3. Cover T/K

Disassemble equipment

Stow cables and T/K

3.8. TV SIGNAL TRANSMISSION FROM EXTERNAL T/K TO MCC (DOWNLINK)

NOTE

1. On **MCC-M GO** activate in advance external T/K for warming up
2. After docking to FGB, field of view from T/K-X is obstructed
3. To record on LIV VTR prepare per RODF: SM VIDEO & AUDIO, RECORDING FROM EXTERNAL DEVISE

3.8.1. OPERATION IN BKY MODE

1. TV SIGNAL MONITORING ON BKY

ППС-21(306)
RS Laptop

Ⓢ ЦБКУ1(2)

CM:БРТК:TV System

proc: F25_TV5_27(TVS_28) (Connect TV +x to MON1(2))

Execute



Cam +X

MON1(2)

2. TV SIGNAL TRANSMISSION VIA KLEST TRANSMITTER (on MCC-M GO)

NOTE

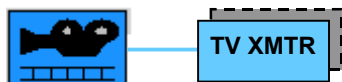
KLEST transmitter takes 2 min to start operating mode

RS Laptop

TV System

proc: F25_TV5_0(TVS_3) (Connect TV (КЛ-140СТ) +x (-x) to TV XMTR)

Execute



Cam +X(-X)

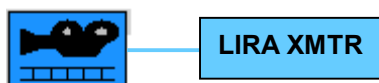
3. TV SIGNAL TRANSMISSION VIA LIRA TRANSMITTER (on MCC-M GO)

RS Laptop

TV System

proc: F25_TV5_1(TVS_4) (Connect TV (КЛ-140СТ) +x (-x) to Lira XMTR)

Execute



Cam +X(-X)

4. OPERATION CLOSEOUT

RS Laptop

TV System

proc: F25_TV5_26 (Television OFF)

Execute

Blue highlights disappear

ППС-21(306)

Ⓢ ЦБКУ1(2)

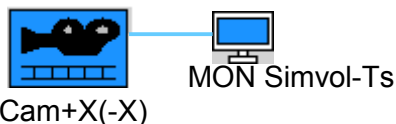
3.8.2. OPERATION IN TV DISPLAY MODE (during dynamic modes)

1. PREPARATION FOR OPERATION

Simvol-Ts Prepare for TV signal reception per RODF: SM MANUAL CONTROLS

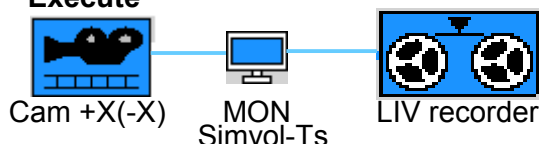
2. TV SIGNAL MONITORING ON SIMVOL-Ts

RS Laptop CM:БРТК:TV System
proc: F25_TV5_2(TVS_5) (Connect TV Camera КЛ-140CT +x (-x) to ЦБKY Simvol-Ts)
Execute



3. TV SIGNAL RECORDING IN DISPLAY MODE ON VTR

RS Laptop TV System
proc: F25_TV5_8(TVS_11) (Connect Display TV with TV (КЛ-140CT) +x (-x) to recorder)
Execute

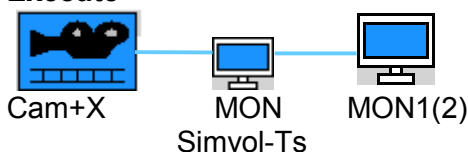


4. TV SIGNAL MONITORING VIA T/K +x IN DISPLAY MODE ON BKY

NOTE

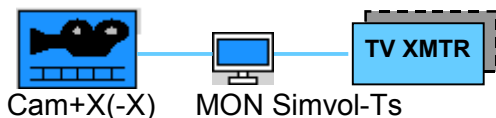
Mode is off-nominal, image on BKY1(2) is flickering with frequency of 16.5 Hz, color may be degraded

RS Laptop TV System
proc: F25_TV5_29(TVS_30) (Connect Display TV +x to MON1(2))
Execute



5. TV SIGNAL TRANSMISSION VIA KLEST TRANSMITTER IN DISPLAY MODE (on MCC-M GO)

RS Laptop TV System
proc: F25_TV5_6(TVS_9) (Connect Display TV with TV (КЛ-140CT) +x (-x) to TV XMTR)
Execute



6. TV SIGNAL TRANSMISSION VIA LIRA TRANSMITTER IN DISPLAY MODE (on MCC-M GO)

RS Laptop TV System
proc: F25_TV5_7(TVS_10) (Connect Display TV with TV (КЛ-140CT) +x (-x) to Lira XMTR)
Execute



7. OPERATION CLOSEOUT

- RS Laptop 1. CM:БРТК:TV System
proc: F25_TV5_26 (Television OFF)
Execute
 Blue highlights disappear
- Simvol-Ts 2. Deactivate per RODF:SM MANUAL CONTROLS

3.8.3. CAMERA CONTROL

NOTE

To change settings T/K should be activated

RS Laptop

CM:БРТК:TV System

↓_ pb between Cam +X and Cam -X

Command	Setting to be changed	Note
cmd: I_ONPRSVT Execute	(Flare reduction ON)	In case of local glares
cmd: I_OFPRSVT Execute	(Flare reduction OFF)	
cmd: I_SFPLT Execute	(Strong Filter)	
cmd: I_SFSLT Execute	(Weak Filter)	
cmd: I_SOOUT Execute	(Narrow-angle lens)	
cmd: I_SOWUT Execute	(Wide-angle lens)	

3.9. TV SIGNAL RECEPTION AND TRANSMISSION FROM SOYUZ (PROGRESS) TO MCC (VIDEO RELAY)

NOTE

If recording on LIV VTR operate per RODF: SM VIDEO & AUDIO, RECORDING FROM EXTERNAL DEVISE

1. TV SIGNAL MONITORING ON BKY

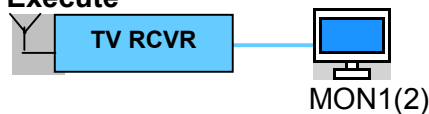
ППС-21(306)
RS Laptop

🔗 ЦБКУ1(2)

CM:БРТК:TV System

proc: F25_TVVS_33(TVVS_34) (Connect TV RCVR to MON1(2))

Execute



2. TV SIGNAL MONITORING ON SIMVOL-Ts (during dynamic modes)

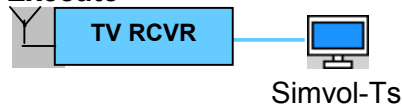
Simvol-Ts
RS Laptop

Prepare for TV signal reception per RODF: SM MANUAL CONTROLS

TV System

proc: F25_TVVS_22 (Connect TV RCVR to ЦБКУ Simvol-Ts)

Execute



3. TV SIGNAL TRANSMISSION TO MCC VIA LIRA (on MCC-M GO)

CAUTION

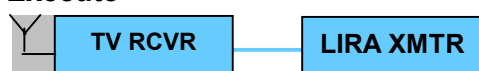
Simultaneous operation of KLEST receiver and transmitter is not allowed

RS Laptop

TV System

proc: F25_TVVS_17 (Connect TV RCVR to Lira XMTR)

Execute



4. OPERATION CLOSEOUT

RS Laptop

TV System

proc: F25_TVVS_26 (Television OFF)

Execute

Blue highlights disappear

ППС-21(306)
Simvol-Ts

🔗 ЦБКУ1(2)

Deactivate per RODF: SM MANUAL CONTROLS

3.10. TV SIGNAL RECEPTION FROM MCC (UPLINK)

NOTE

If recording on LIV VTR operate per RODF: SM VIDEO & AUDIO, RECORDING FROM EXTERNAL DEVISE

1. TV SIGNAL RECEPTION ON BKY

ППС-21(306)

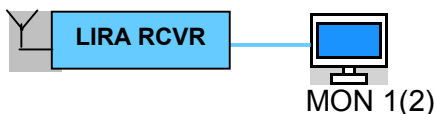
Ⓜ ЦБКУ1(2)

RS Laptop

CM:БРТК:TV System

proc: F25_TV5_35(TVS_36) (Connect Lira RCVR to MON1(2))

Execute



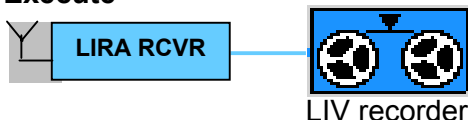
2. MCC TV SIGNAL RECORD ON VTR

RS Laptop

TV System

proc: F25_TV5_25 (Connect Lira RCVR to LIV recorder)

Execute



3. TV SIGNAL RECEPTION ON SIMVOL-Ts

Simvol-Ts

1. Prepare for TV signal reception per RODF: SM MANUAL CONTROLS

RS Laptop

2. TV System

proc: F25_TV5_23 (Connect Lira RCVR to ЦБКУ Simvol-Ts)

Execute



4. OPERATION CLOSEOUT

RS Laptop

1. TV System

proc: F25_TV5_26 (Television OFF)

Execute

Blue highlights disappear

ППС-21(306)

Ⓜ ЦБКУ1(2)

Simvol-Ts

2. Deactivation per RODF: SM MANUAL CONTROLS

3.11. TV COMMUNICATION (TWO-WAY VIDEO)

1. VIDEO EVENT (DOWNLINK)

Prepare and perform video event per 3.6, p.3-6

2. TV SIGNAL RECEPTION FROM MCC (UPLINK)

Receive TV signal from **MCC** per 3.10, p. 3-13

3.12. VIDEO EVENT FROM FGB (DOWNLINK)

1. PREPARATION FOR VIDEO EVENT

1. Remove T/K protective covers
Inspect T/K for damage and ensure optical surfaces are clean
2. Unstow cbl 77KM 2912-140 from bag
Configure equipment for video event from FGB per Figure 3.4, p. 3-4
Ⓢ A3C (circuit breaker)
3. If necessary install and connect lights per RODF: SM POWER SUPPLY SYSTEM,
CNP-1 PORTABLE TV LAMP SETUP AND OPERATION

FGB
427

РБС10/3

2. TV SIGNAL MONITORING ON BKY 1(2) IN SM

ППС-21(306)

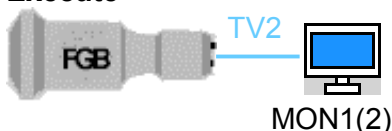
Ⓢ ЦБКУ1(2)

RS Laptop

CM:БРТК: TV System

proc: F25_TV5_37(TVS_38) (Connect FGB TV2 relay to MON1(2))

Execute



cmd: I_ONPSVETT (TV Lighting power ON)

Execute

Adjust lighting

3. TV SIGNAL TRANSMISSION TO MCC (on MCC-M GO)

NOTE

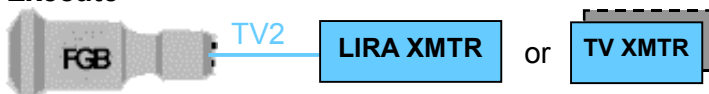
KLEST transmitter takes 2 min to start operating mode

RS Laptop

TV System

proc: F25_TV5_39(TVS_40) (Connect FGB TV2 relay to Lira XMTR)

Execute



Perform video event

4. OPERATION CLOSEOUT

RS Laptop

1. TV System

proc: F25_TV5_26 (Television OFF)

Execute

Blue highlights disappear

cmd: I_OFPSVETT (TV lighting power OFF)

Execute

ППС-21(306)

Ⓢ ЦБКУ1(2)

FGB

РБС10/3

2. √ Ⓢ A3C

Disassemble equipment

427

Stow cbl 77KM 2912-140 into bag

3.13. TV IMAGE VIEWING IN FGB

1. PREPARATION FOR OPERATION

FGB

227

Unstow cbl 77KM 2912-80 and cbl 77KM 2912-150 from bag
Configure equipment for TV image viewing in FGB per Figure 3.4, p. 3-4

PBC10/3

Ⓜ A3C

2. TV SIGNAL DISPLAY ON FGB BKV

RS Laptop

1. Activate commutator KЛ-160M




CM:БРТК:TV System

cmd: I_ONPKL160T (KЛ-160 power ON)

Execute

KЛ-160M Primary set

2. Select TV signal source

TV signal source	Command	Display on RS Laptop
Cam for video event in SM	cmd: I_ONTKRT (Camera ЛТ ON) Execute	 Cam (portable)
Cam KЛ-140 CTM +X	cmd: I_ONTKPXT (Camera +X ON) Execute	 Cam KЛ-140 CTM +X
Cam KЛ-140 CTM -X	cmd: I_ONTKOXT (Camera -X ON) Execute	 Cam KЛ-140 CTM -X
KLEST RCVR	cmd: I_ONPRMT (CM TV system RCVR ON) Execute	<input checked="" type="checkbox"/> TV RCVR
Lira RCVR	cmd: I_ONENLT (TV input from Lira) Execute	
Cam for video event in FGB	cmd: I_RTRTV2FGBT (Relay TV2 FGB -X) Execute	

3. Connect TV signal user

RS Laptop

TV System

cmd: I_TRTV2FGBT (TV2 FGB -X Relay)

Execute

3. OPERATION CLOSEOUT

RS Laptop

1. **TV System**

proc: F25_TV5_26 (Television OFF)

Execute

Blue highlights disappear

FGB

PBC10/3

2. √ Ⓜ A3C

Disassemble equipment

227

Stow cbl 77KM 2912-80 and cbl 77KM 2912-150 into bag

3.14. [TBC] AΦY SWITCHOVER

NOTE

Command I_OFPRDT (TV XMTR OFF) enables AΦY switchover.
It powers down the equipment, but it does not shutdown automatics

1. [AO] AΦY CONFIGURATION CHANGE

RS Laptop

CM:БРТК:TV System

√ TV XMTR (run any procedure activating TV XMTR)

cmd: I_OFPRDT (TV XMTR OFF)

Execute

TV XMTR

↓ pb AΦY TBC

CM:БРТК:TBC:AΦY_TBC

cmd: I_ONVNAT (Switch to BHA mode)

Execute

cmd: I_ONPNAA1T(A2T) (Connect to ПНА А1(А2))

Execute

↵ AΦY configuration change

proc: F25_TV_S_26 (Television OFF)

Execute

Blue highlights disappear

2. TV XMTR SWITCHOVER TO [AO] (CB)

RS Laptop

CM:БРТК:TV System

√ TV XMTR (run any procedure activating TV XMTR)

cmd: I_OFPRDT (TV XMTR OFF)

Execute

TV XMTR

↓ pb AΦY TBC

CM:БРТК:TBC:AΦY_TBC

cmd: I_ONANTAO(SB)T (AO(SB)-XMTR Link)

Execute

↵ connection configuration change

proc: F25_TV_S_26 (Television OFF)

Execute

Blue highlights disappear

(TV RCVR connection
changes at the same time)

Notes

3.15. OFF-NOMINAL SITUATIONS

3.15.1. TV XMTR SWITCHOVER TO BACKUP

RS Laptop

CM:БРТК:TV System

√  (run any procedure activating TV XMTR)

cmd: I_OFPRDT (TV XMTR OFF) (enable switchover of sets)

Execute



cmd: I_SRPRDT (TV XMTR Select)

Execute



cmd: I_ONPRDT (TV XMTR ON)

Execute







proc: F25_TVS_26 (Television OFF)

Execute

Blue highlights disappear

3.15.2. NO IMAGE ON BKU1(2)

front panel

√  pb  (ЦБКУ operates in mode ПТС – complete TV signal)
(mode  pb  - is not used)

3.15.3. SWITCHOVER TO КЛ-160M BACKUP SET

- RS Laptop
1. **CM:БРТК:TV System**
√ КЛ-160 **Primary set** (run any procedure)
cmd: I_SRKL160T (*КЛ-160 Select*)
Execute
КЛ-160 **Backup set**
proc: F25_TVS_26 (*Television OFF*)
Execute
Blue highlights disappear
- КЛ-160M
(327)
2. cbl 17KC.29Ю 8229-690 ↔ cnctr 2910-X17A (primary input to КЛ-160 from FGB)
cbl 17KC.29Ю 8229-690 →← cnctr 2910-X69A (backup input to КЛ-160 from FGB)
 3. Select required operating mode

4. REGUL

REGUL is nominally controlled via КРЛ

In case of operation via the third set there is no telephone comm

Relay satellite is operating via the first set. If it should operate via the second set - connect its direction finder to АФУ (see RODF: SM IFM IVA)

On display, operating set transmitter is highlighted in blue

CAUTION

1. Deactivation and activation of standby mode during equipment maintenance **on MCC GO**
2. When standby mode is deactivated, commands do not pass via КРЛ, АФУ switching is not possible, the third set transmitter is activated and deactivated **only by the crew via Laptop**

4.1. STANDBY MODE DEACTIVATION (on MCC-M GO)

RS Laptop 1. CM:БРТК:Regul_S:Control
 Scripts ↓ Сеансный режим 3 к. РЕГУЛ ОС через ВНА АО(СБ)
 (Comm pass mode of РЕГУЛ ОС third set via [АО] (СБ) omni antenna)
Execute script
 Procedures ↓ Сеансный режим 3 к.РЕГУЛ ОС через ВНА АО(СБ)
 (Comm pass mode of РЕГУЛ ОС third set via ВНА [АО] (СБ) antenna)
proc: F23_REG_11 (End Comm Pass, through PCYC set 3)
Execute

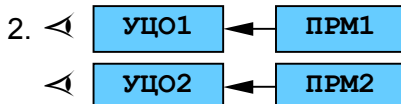


ИнПУ 3. :SM СУБА, REGUL, СУД CONTROL
◀ REGUL STBY COMMAND INHIBITED

00:00:00	COMMAND INHIBITED	ON	<input checked="" type="checkbox"/> COMMAND INHIBITED
<00:00:10	REGUL STBY	OFF	<input checked="" type="checkbox"/> REGUL STBY <input type="checkbox"/> COMMAND INHIBITED

4.2. REGUL STANDBY MODE ACTIVATION (on MCC-M GO)

RS Laptop 1. CM:БРТК:Regul_S:Control
 Procedures ↓ Дежурный режим 3 к.РЕГУЛ ОС
 (РЕГУЛ ОС third set standby mode)
proc: F23_REG_0 (PCYC duty power, Activation)
Execute



4.3. THE THIRD TRANSMITTER ACTIVATION (on MCC-M GO)

- RS Laptop
1. **CM:БРТК:Regul_S**
 < There are no operating sets
 < Connected АФУ ([АО] or СБ)
 2. **CM:БРТК:Регул_S:Control**
 Scripts ↓ ● *Сеансный режим 3 к. РЕГУЛ ОС через ВНА АО(СБ)*
 (Comm pass mode of РЕГУЛ ОС third set via [АО] (СБ) omni antenna)
Execute script
 3. **CM:БРТК:Regul_S**
 < **ПРДЗ**

4.4. THE THIRD SET TRANSMITTER DEACTIVATION (on MCC-M GO)

- RS Laptop
1. **CM:БРТК:Regul_S**
 < **ПРДЗ**
 2. **CM:БРТК:Regul_S:Control**
 Procedures ↓ ● *Сеансный режим 3 к.РЕГУЛ ОС через ВНА АО (СБ)*
 (Comm pass mode of РЕГУЛ ОС third set via [АО] (СБ) omni antenna)
proc: F23_REG_11 (End Comm Pass, through РСУС set 3)
Execute
 3. **CM:БРТК:Regul_S**
 < **ПРДЗ**

4.5. THE THIRD SET DEACTIVATION (on MCC-M GO)

- RS Laptop
- CM:БРТК:Regul_S:Control**
 Scripts ↓ ● *Отключение 3 к.РЕГУЛ ОС*
 (РЕГУЛ ОС third set deactivation)
Execute script

5. БИТС2-12

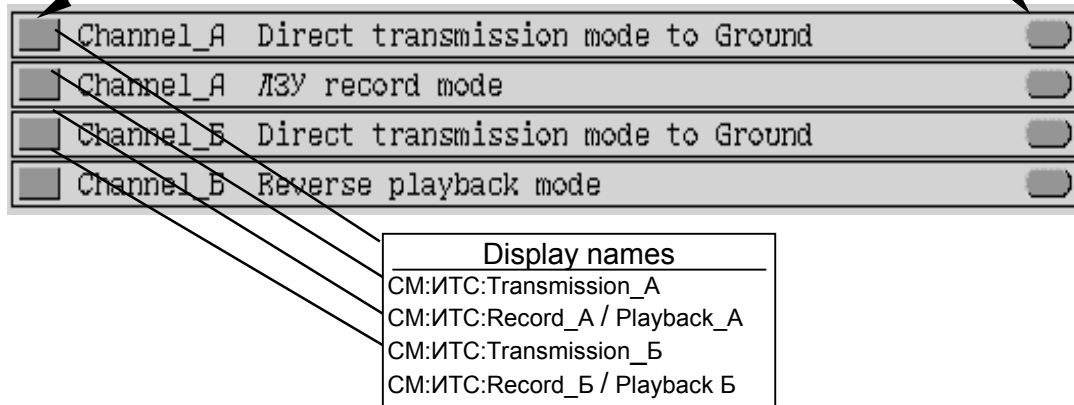
5.1. RS LAPTOP CONTROL DISPLAY FEATURES



- icon to call display `CM:ИТС`

Pushbuttons to call mode parameter monitoring displays

Proc call pushbuttons



Mode is active - text color is black

Mode is not active - text color is gray

5.2. REAL-TIME TRANSMISSION (ИП) MODE

5.2.1. REAL-TIME TRANSMISSION (ИП-А (ИП-Б)) PARAMETERS SETUP (on MCC-M GO)

- RS Laptop 1. `CM:ИТС`
proc: FB_19 (FB_20) (Ch A (Б) transmission mode parameters, Setup)
param1: 0(8, 32, 128, 250) (Transmission rate)
param2: 0(1, 2, 3, 4, 5, 6, 7, 8) (Polling program)

NOTE

1. **Param1** = 0 does not change selected transmission rate
2. **Param2** = 0 does not change selected polling program

Execute

2. `CM:ИТС:Transmission_A` (`CM:ИТС:Transmission_B`)
 < Data rate
 < Down list

5.2.2. REAL-TIME TRANSMISSION (НП-А (НП-Б)) ACTIVATION (on MCC-M GO)

- RS Laptop 1. CM:ИТС
 < Playbck mode of channel A(Б) is **not** active
 If active √ **MCC-M**

2. ACTIVATE БИТС (LIRA, REGUL) XMTR:

XMTR	RS Laptop procedures	Display
БИТС XMTR (НП mode)	proc: FB_1 (FB_2) (НП-А(Б) mode in БИТС2-12, Setup) Execute	
LIRA XMTR (ССД2 mode)	proc: FB_9 (FB_10) (Lira-A(Б) mode in БИТС2-12, Setup) Execute	
REGUL XMTR (СДД mode)	When operating via REGUL set 1 or 3 proc: F17_1 (БИТС2-12 system configuration, Setup) param1: 1 (Group number) param2: 1 (Instrument number) param3: 0 (Primary set) Execute proc: F17_1 (БИТС2-12 system configuration, Setup) param1: 1 (Group number) param2: 33(35) (Instrument number) param3: 0 (Primary set) Execute When operating via REGUL set 2 proc: F17_1 (БИТС2-12 system configuration, Setup) param1: 1 (Group number) param2: 1 (Instrument number) param3: 1 (Backup set) Execute proc: F17_1 (БИТС2-12 system configuration, Setup) param1: 1 (Group number) param2: 33(35) (Instrument number) param3: 1 (Backup set) Execute proc: FB_7 (FB_8) (Регул-А(Б) mode in БИТС2-12, Setup) Execute	

3. Channel_A Direct transmission mode to Ground
 (Channel_Б Direct transmission mode to Ground)

5.2.3. REAL-TIME (НП) MODE DEACTIVATION (on MCC-M GO)

NOTE

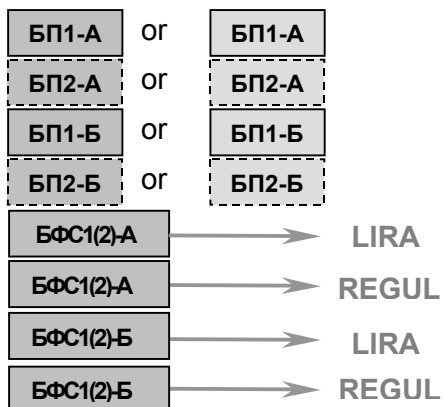
Simultaneous deactivation of telemetry transmission to **MCC**
via all channels – НП, Regul and Lira

RS Laptop

CM:ИТС

proc: FB_6 (All transmission modes, Deactivation)

Execute




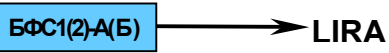
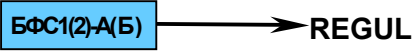
5.3. CHANNEL A(Б) PLAYBACK MODE ACTIVATION (on MCC-M GO)

NOTE

1. In playback mode, command ОТКЛ НП (Realtime Off) is saved and executed after mode is complete
2. Activation of playback mode deactivates НП and ЗАП modes
3. For forced termination of playback mode activate СТОП ЗУ mode per 5.4.2

- RS Laptop
1. **CM:ИТС**
 - ◀ Channel A(Б) record mode **is not** active
If **active** ✓ **MCC-M**
 - ◀ Channel A(Б) НП mode **is not** active
If **active** ✓ **MCC-M**

2. ACTIVATE БИТС(LIRA, REGUL) XMTR:

XMTR	RS Laptop procedures	Display
БИТС XMTR (НП mode)	proc: FB_1 (FB_2) (НП-А(Б) mode in БИТС2-12, Setup) Execute	
LIRA XMTR (ССД2 mode)	proc: FB_9 (FB_10) (Lira-A(Б) mode in БИТС2-12, Setup) Execute	
REGUL XMTR (СДД mode)	When operating via REGUL set 1 or 3 proc: F17_1 (БИТС2-12 system configuration, Setup) param1: <u>1</u> (Group number) param2: <u>1</u> (Instrument number) param3: <u>0</u> (Primary set) Execute proc: F17_1 (БИТС2-12 system configuration, Setup) param1: <u>1</u> (Group number) param2: <u>33(35)</u> (Instrument number) param3: <u>0</u> (Primary set) Execute When operating via REGUL set 2 proc: F17_1 (БИТС2-12 system configuration, Setup) param1: <u>1</u> (Group number) param2: <u>1</u> (Instrument number) param3: <u>1</u> (Backup set) Execute proc: F17_1 (БИТС2-12 system configuration, Setup) param1: <u>1</u> (Group number) param2: <u>33(35)</u> (Instrument number) param3: <u>1</u> (Backup set) Execute proc: FB_7 (FB_8) (Регул-А(Б) mode in БИТС2-12, Setup) Execute	

3. Select playback direction

CM:ИТС

Playback direction	RS Laptop procedures
Direct (Впр)	If tape storage device is in initial configuration (<KB) proc: FB_11 (FB_12) (ВОСПР-А(Б) mode in БИТС2-12, Setup) Execute
	If tape storage device is not in initial configuration (<KB) proc: FB_15 (FB_16) (ИХЗУ-А(Б) mode in БИТС2-12, Setup) Execute proc: FB_11 (FB_12) (ВОСПР-А(Б) mode in БИТС2-12, Setup) Execute
Reverse (Вобр)	proc: FB_13 (FB_14) (ВОСПР-А(Б)(proc) mode in БИТС2-12, Setup) Execute

4. Channel_A Direct (reverse) playback mode
- (Channel_Б Direct (reverse) playback mode)

5.4. 3У MODE

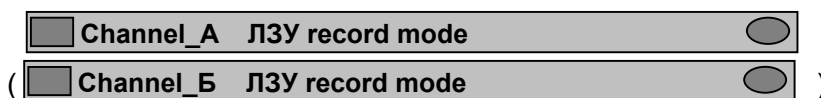
5.4.1. CHANNEL A(Б) RECORD MODE (ЗАП) ACTIVATION (on MCC-M GO)

- RS Laptop
1.
 < Channel A(Б) playback mode **is not active**
 If active ✓ **MCC-M**
 2. **proc:** FB_3 (FB_4) (ЗАП-A(Б) mode in БИТС2-12, Setup)
param1: 1(2, 8, 32) (Record information density)
param2: 0(1, 2, 3, 4, 5, 6, 7, 8) (Record program)

NOTE

1. **param2** = 0 does not change selected recording program
2. Monitor parameters on display

Execute

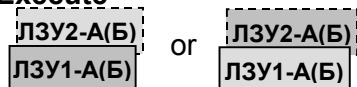


3. ()
 < Selected record information density is set
 < Selected record program is set
4. If record mode is not set ✓ **MCC-M**

5.4.2. RECORD MODE (ЗАП) DEACTIVATION (СТОП 3У MODE)

- RS Laptop
- proc:** FB_17 (FB_18) (СТОП 3У-A(Б) mode in БИТС2-12, Setup)

Execute



5.4.3. 3У INITIAL CONFIGURATION SETUP FOR RECORDING (ИCX 3У-A(Б) MODE)

- RS Laptop
1.
 < Channel A(Б) record mode **is not active**
 If active ✓ **MCC-M**
 < Channel A(Б) playback mode **is not active**
 If active ✓ **MCC-M**
 2.
proc: FB_15 (FB_16) (ИCX3У-A(Б) mode in БИТС2-12, Setup)
Execute

6. TRANZIT SYSTEM

6.1. TRANZIT-Б POWER UP (on MCC-M GO)

RS Laptop CM
cmd: H_ONPTRANZIT1 (Tranzit set 1 power ON)
Execute
cmd: H_ONPTRANZIT2 (Tranzit set 2 power ON)
Execute

6.2. TRANZIT-Б POWER DOWN (on MCC-M GO)

RS Laptop CM
cmd: H_OFPTTRANZIT1 (Tranzit set 1 power OFF)
Execute
cmd: H_OFPTTRANZIT2 (Tranzit set 2 power OFF)
Execute

