

Consultative Committee for Space Data Systems

**RECOMMENDATION FOR SPACE
DATA SYSTEM STANDARDS**

COMMUNICATIONS OPERATION PROCEDURE-1

ECSS MODIFIED VERSION

CCSDS 232.1-B-1

BLUE BOOK

September 2003

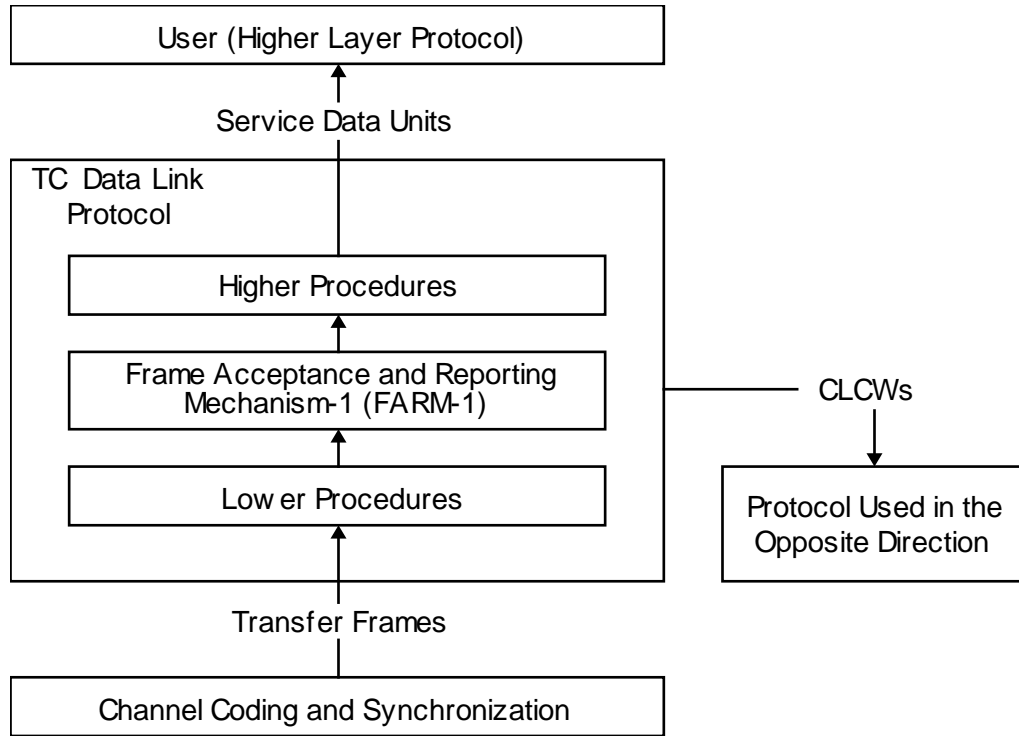


Figure 3-2: Internal Organization of Protocol Entity (Receiving End)

The Lower Procedures shall perform the Frame Validation Check against Transfer Frames received from the underlying entity of Channel Coding and Synchronization, demultiplex Transfer Frames, and deliver the Transfer Frames to the entities of FARM-1 (there is an entity of FARM-1 for each Virtual Channel). FARM-1 shall examine incoming Transfer Frames, perform Frame Acceptance Checks against Type-A Transfer Frames, execute Control Commands, generate some information to be transferred back to FOP-1 in CLCWs, and deliver FDUs extracted from Transfer Frames to the Higher Procedures. The Higher Procedures shall reconstruct service data units from FDUs and deliver the service data units to users of the protocol.

The users of the TC Space Data Link Protocol shall receive service data units from the protocol entity through SAPs using service primitives defined in reference [3].

3.3.2 FARM-1 INTERFACE TO HIGHER PROCEDURES

FARM-1 shall interact with the Higher Procedures using inter-procedure signals. These inter-procedure signals are related to service primitives exchanged between users of the protocol and the protocol entity, and it is assumed in this Recommendation that the Higher Procedures shall perform the necessary conversion between service primitives defined in [3] and inter-procedure signals defined here.

When a Type-AD Transfer Frame is accepted by FARM-1, the FDU contained in the Transfer Frame shall be placed in a buffer for delivery to the Higher Procedures only when

there is a buffer available. If there is no buffer available, the newly arrived Type-AD Transfer Frame shall be discarded.

When a Type-BD Transfer Frame is accepted by FARM-1, the FDU contained in the Transfer Frame shall be placed in a buffer for delivery to the Higher Procedures even if there is no buffer available, in which case the data in the buffer ~~will be~~ erased ~~and an optional 'Aborted Indication' signal may be sent to the Higher Procedures.~~

When a new FDU is accepted, FARM-1 shall send the following signal to the Higher Procedures to indicate the arrival of the new FDU:

FDU Arrived Indication (GVCID, **FDU aborted indication**).

The **FDU aborted indication** shall be used as follows:

- the indication is set when a Type-BD Transfer Frame is accepted by FARM-1 and there is no buffer available;
- the indication is otherwise not set.

The 'FDU Arrived Indication' signal is processed by the Higher Procedures to generate an appropriate service indication primitive to deliver a service data unit to the service user.

NOTES

- 1 The service indication primitive is issued by the Higher Procedures for a service data unit, while the 'FDU Arrived Indication' signal is issued by FARM-1 for an FDU. One 'FDU Arrived Indication' signal may not result in one service indication primitive because segmentation or blocking may have been performed by the Higher Procedures at the sending end (see reference [3]).
- 2 ~~When the FDU aborted indication is set, it informs the Higher Procedures that data in the buffer have been erased in favour of the newly arrived Type-BD Transfer Frame. In addition to the 'FDU Arrived Indication', FARM-1 may optionally send a signal called 'Aborted Indication' to the Higher Procedures when data that were previously contained in a buffer have been erased in favor of the newly received FDU. This Recommendation does not specify how this signal is delivered.~~

Although an implementation may provide a scheme for flow control between FARM-1 and the Higher Procedures, this Recommendation does not define a specific signal for flow control. However, if the flow control scheme ever results in the COP-1 Wait_Flag being set, the scheme must also provide a 'Buffer Release Signal'. In this case, FARM-1 shall be signaled when sufficient buffer space becomes available for at least one more maximum-size Frame.