DAIFUKU

INTERBAY AND INTRABAY TRANSPORT COMMUNICATIONS SPECIFICATIONS

CSOT t4 Module OHT

Version4.2.0

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1 INTRODUCTION

1.1Purpose

The purpose of this document is to define the communication specifications to be used in online communication with the intrabay/interbay transport system.

1.2Referenced Documentation

SEMI Doc E5－	EQUIPMENT COMMUNICATIONS STANDARD 2 MESSAGE CONTENT(SECS-II)
SEMI Doc E30－	GENERIC MODEL FOR COMMUNICATIONS AND CONTROL OF MANUFACTURING EQUIPMENT (GEM)
SEMI Doc E37－	HIGH-SPEED SECS MESSAGE SERVICES (HSMS) GENERIC SERVICES
SEMI Doc E37.1－	HIGH-SPEED SECS MESSAGE SERVICES SINGLE-SESSION MODE (HSMS-SS)
SEMI Doc E82－	Specification for Interbay/Intrabay AMHS SEM (IBSEM)
SEMI Doc E88－	Specification for AMHS Storage SEM (STOCKER SEM)

2 CONFORMANCE TO SEMI STANDARD

2.1SECS Communication

Communication between the Transport System Controller (TSC) and host system must conform to the following SEMI standards.

Table 1 - SECS Communication SEMI Standards

No	SEMI STANDARD	Description
1	SEMI Doc E5	SEMI EQUIPMENT COMMUNICATIONS STANDARD 2 MESSAGE CONTENT(SECS-II)
2	SEMI Doc E37	HIGH-SPEED SECS MESSAGE SERVICES (HSMS) GENERIC SERVICES
3	SEMI Doc E37.1	HIGH-SPEED SECS MESSAGE SERVICES SINGLE-SESSION MODE (HSMS-SS)

2.2Equipment Model

The Transport System Controller (TSC) is equipped with equipment models compliant to the following SEMI standards.

Table 2 - Equipment Model SEMI Standards

No	SEMI STANDARD	Description
1	SEMI Doc E30	The following sections from GENERIC MODEL FOR COMMUNICATIONS AND CONTROL OF MANUFACTURING EQUIPMENT (GEM): Sections 1, 2 and 3: all Section 4: 4.1, 4.21, 4.2.2, 4.2.5, 4.2.6, 4.3, 4.5, 4.7, 4.8, 4.9, 4.10 and 4.12 Section 8: all
2	SEMI Doc E82	SPECIFICATION FOR INTERBAY/INTRABAY AMHS SEM (IBSEM)

NOTE)

Section 14, "GEM Capabilities" of the IBSEM defines the GEM functions as defined by the IBSEM. These functions are as indicated in the chart on the next page. Those functions that are marked with a "•" are those functions that are as indicated in the above chart.

Table 3 - Gem Compliant Items in the IBSEM

No	GEM Basic Condition		No	Additional Capabilities	
1	status model		1	communications establishment	○
2	equipment process status		2	dynamic event report setting modifying	○
3	host initiated S1, F13/F14 scenarios		3	variable data collection	○
4	event notification		4	trace data collection	×
5	online confirmation		5	status data collection	○
6	error messages		6	alarm control	○
7	documentation		7	remote control	×
8	control(operator activated)		8	equipment constants	○
			9	process program control	×
			10	material movement	○
			11	equipment terminal service	○
			12	clock	○
			13	limit monitoring	×
			14	spurring	×

		15	control (host activated)	○

(Notation example)　○：　Necessary　　×：　Not necessary

2.2.1State Model List

The state models to be included in the TSC are described in both SEM and GEM. The following is a list of those state models:

Table 4　　- State Model List

No	Model Name	Reference
1	Communication State Model	GEM 3.2 Communication State Model
2	Controller State Model	GEM3.3　Controller State Model
3	TSC State Model	SEM 8.2　TSC Status Model
4	Transfer Command State Model	SEM 8.3　TRANSFER Command State Model
5	Carrier State Model	SEM 8.4　Stocker Carrier State Model
6	Crane State Model	SEM 8.5　Stocker Crane State Model

The TSC also contains an HSMS-SS state model. (Refer to section 5 of SEMI E37.1 HSMSSS).

2.2.2State Model Entities

The following illustration indicates the entities contained in the state models listed on the previous page. For example, in the TSC State Model, the TSC is the entity in that model. Likewise, the in the case of the Carrier State Model, the carrier is the entity in that model. So, in the TSC State Model, there is only one entity, the TSC. However, in the Carrier State Model, there are as many entities as there are carriers. The following illustration indicates how things look from the host's perspective but the standard does not define whether or not this is the actual condition.

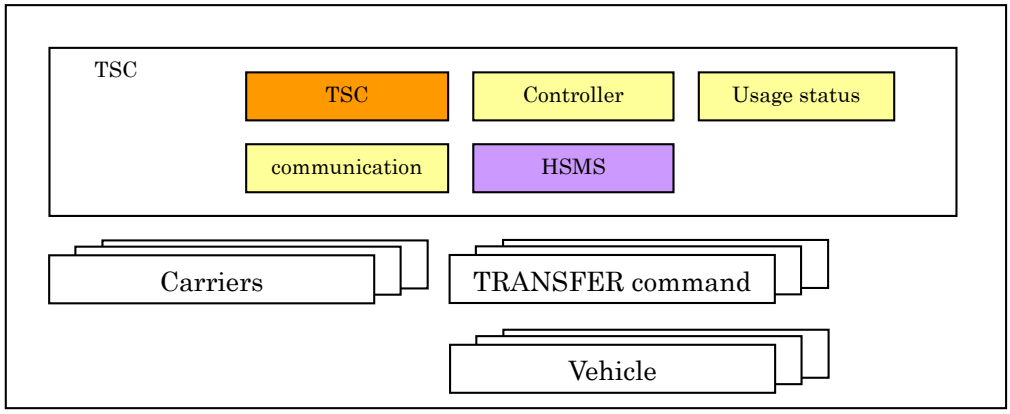


Figure 1 - STATE MODEL ENTITIES

2.2.3DAIFUKU Original State Model

13） UNIT ALARM State Model

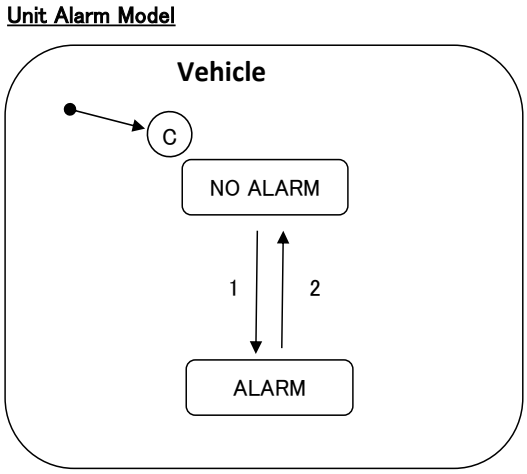


Figure 2 - UNIT ALARM State Model

Transition	Previous State	Trigger	New State	Action	Comments
1	NO ALARM	Vehicle alarm occurs, Communication error	ALARM	S6F11 UnitAlarmSet	
2	ALARM	Vehicle alarm cleared, Communication normally	NO ALARM	S6F11 UnitAlarmCleared	

3 DATA ITEMS

This chapter explains the SECS message data items used by the transport system.

3.1SECS Data Items

The following chart contains the SECS message data items used by the transport system. The features of the chart are as follows:

< Data in the chart >

Name: The name of the data item.

Format: The format of the data item value. However, "Ux" is sent as "U2" from the host.

SIZE: The size of the data item value.

EXPLANATION: An explanation of the data item and/or the range of the data.

Table 5 - SECS Data Items Used by the Transport System

No	NAME	FORMAT	SIZE	EXPLANATION
1	ACKC5	B	1	0 = ACK >0 = error, could not ACK 1-63 = hold
2	ACKC6	B	1	0 = ACK 1-63 = hold

No	NAME	FORMAT	SIZE	EXPLANATION
3	ACKC10	B	1	0 = ACK 1 = message not displayed 2-63 = hold
4	ALCD	B	1	bit8 = 1 generated alarm status bit8 = 0 clear alarm status bit1-7 = 0 not used bit1-7 = 1 personal safety bit1-7 = 2 Equipment safety bit1-7= 3 Parameter control warning bit1-7 = 4 Parameter control error bit1-7 = 5 Irrecoverable error bit1-7 = 6 Equipment status warning bit1-7 = 7 Attention flags bit1-7 = 8 Data integrity bit1-7 = 9 Other categories
5	ALED	B	1	bit8 = 1 alarm enabled bit8 = 0 alarm disabled
6	ALID	U4	4	alarm ID
7	ALTX	A	Max: 40	alarm text
8	CEED	BOOLEAN	1	false = not valid true = valid
9	CEID	U2	2	collection event ID
10	CEPACK	L,U1		0 = no error 1 = CPNAME doesn't exist 2 = the incorrect value is specified in CEPVAL 3 = the incorrect format is specified in CEPVAL 4 = the CPNAME usage isn't valid
11	CEPVAL	A, B, BOOLEAN ,Fx,Ix,J,L, Ux		the command extension parameter value
12	COMMACK	B	1	0 = ACK 1 = denied, retry 2-63 = hold
13	CPACK	B	1	1 = CPNAME doesn't exist

No	NAME	FORMAT	SIZE	EXPLANATION
				2 = the incorrect value is specified in CPVAL 3 = the incorrect format is specified in CPVAL >3 = another equipment error 4-63 = hold
14	CPNAME	A	max: 40	command parameter name
15	CPVAL	A, B, BOOLEAN ,Fx, Ix, J, Ux		command parameter value
16	DATAID	U4	4	data ID always sends DATAID = 0.
17	DRACK	B	1	0 = ACK 1 = denied, insufficient space 2 = denied, incorrect format 3 = denied, at least one RPTID is already defined 4 = denied, at least one VID does not exist >4 = some other error 5-63 = hold
18	EAC	B	1	0 = ACK 1 = denied, there isn't at least one constant 2 = denied, busy 3 = denied, at least constant is beyond the allowed range >3 = some other error 4-63 = hold
19	ECDEF	A, B, BOOLEAN ,Fx, Ix, J, Ux		equipment constant default value
20	ECID	U2		equipment constant ID
21	ECMAX	A, B, BOOLEAN ,Fx, Ix, J, Ux		equipment constant maximum value
22	ECMIN	A, B, BOOLEAN ,Fx, Ix, J, Ux		equipment constant minimum value

No	NAME	FORMAT	SIZE	EXPLANATION
23	ECNAME	A		equipment constant name
24	ECV	A, B, BOOLEAN ,Fx, Ix, J, Ux		equipment constant
25	ERACK	B	1	0 = ACK 1 = denied, there isn't at least one CEID >1 = some other error 2-63 = hold
26	HCACK	B	1	0 = confirmed, the command was executed (The transport system doesn't use this value.Confirmation is made using the number 4 value.) 1 = command doesn't exist 2 = currently not able to execute 3 = at least one parameter isn't valid 4 = confirmed, the command will be executed 5 = rejected, already requested 6 = object doesn't exist 7 = Enabled route doesn't exist 9 = not suitable carrier attribute for the destination. 10-63 = hold
27	LRACK	B	1	0 = ACK 1 = denied, insufficient space 2 = denied, incorrect format 3 = denied, at least one CEID link is already defined 4 = denied, there isn't at least one CEID 5 = denied, there isn't at least one RPTID >5 = some other error 6-63 = hold
28	MDLN	A	Max 6	equipment format
29	MEXP	A		SxxFyy
30	MHEAD	B		message header of the message that is in error
31	OBJSPEC	A		the text string used to indicate the specified object instance The

No	NAME	FORMAT	SIZE	EXPLANATION
				emulator always sends OBJSPEC = NULL.
32	OFLACK	B		0 = offline confirmed 1-63 = hold
33	ONLACK	B		0 = online confirmed 1 = not allowed to go online 2 = already online 3-63 = hold
34	RCMD	A		Remote command or command sequence
35	RPTID	U2	2	report ID
36	SHEAD	B	1	message headers related to the transaction timer
37	SOFTREV	A	Max 6	software revision code
38	SV	A, B, BOOLEAN ,Fx, Ix, J, Ux		status variable data
39	SVID	U2	2	status variable ID
40	SVNAME	A		status variable name
41	TEXT	A	One line of text	41
42	TIACK	B	1	Time confirmation code 0 = OK 1 = error, not okayed 2-63 = hold
43	TID	B	1	0 = single or main terminal >0 = additional terminal of the same equipment
44	TIME	A	16	YYYYMMDDhhmmsscc
45	UNITS	A		those allowed by section 9 of SEMI E5
46	V	A, B, BOOLEAN ,Fx, Ix, J, Ux		variable data
47	VID	U2	2	variable ID

3.2Table of Variables

This section explains the transport system variables and VIDs.

3.2.1VID Numbering

The following chart summarizes how VIDs are assigned to transport system variables.

Table 6 - VID Numbering

No	所属	VARIABLE TYPE	VID
1	Daifuku defined variables VID 1～300	GEM defined variables	1～50
2		SEM defined variables	51～200
3		Daifuku defined variables	201～300
4	Supplier defined VIDs 301～	Supplier defined VIDs	301～

Note)
All variables defined by GEM or SEM that are not included in this specification that are specified by the supplier are assigned a VID of 301 or above.

3.2.2Transport System Variables

The following chart lists the variables used by the transport system. The GEM Variables Used by the Transport Systemfeatures of the chart are as follows:

< Data in the chart >

VID:	The variable's VID.
Variable Name:	The name of the variable.
Class:	The class of the variable's data.
Format:	The format of the variable's data.
Explanation:	An explanation of the variable.

Table 7 - GEM Variables Used by the Transport System

VID	Variable Name	Class	Explanation
		Format	
1	AlarmID △4.2	DVVAL	alarm ID For the judgement of Maintenance mode, last 4 digits of AlarmID must be FFFF(HEX) ※ Refer to UnitAlarmStatList (VID=254)
		<U4>	
2	EstablishCommunicationsTimeout	ECV	the S1F13 sending interval for establishing communications
		<U4>	
3	AlarmsEnabled	SV	enabled alarms list
		<L <ALID> ...	
4	AlarmsSet	SV	active alarms list
		<L <ALID> ...	
5	Clock	SV	current time
		<A[16]>	
6	ControlState	SV	1 = offline/equipment offline 2 = offline/going to online 3 = offline/host offline 4 = online/local 5 = online/remote
		B1	
7	EventsEnabled	SV	enabled events list
		<L <CEID> ... >	

Table 8 - IBSEM Variables Used by the Transport System

VID	Variable Name	Class	Explanation
		Format	
51	ActiveCarriers	SV	list of the current status of all carriers in TSC database
		<L[n] <CarrierInfo> ... >	
52	ActiveTransfers	SV	list of the current status of all TRANSFER commands
		<L[n] <TransferCommand> ... >	
53	ActiveVehicles	SV	list of the current status of all vehicles either assigned a TRANSFER command or capable of being assigned a TRANSFER command
		<L[n] <VehicleInfo> ... >	
54	CarrierID	DVVAL	carrier ID of the carrier being transferred
		<A[1..64]>	
-	CarrierID	SV	carrier ID of the carrier being transferred
		<A[1..64]>	
55	CarrierInfo	DVVAL	Information regarding events generated by a specific carrier
		<L[3] <CarrierID> <VehicleID> <CarrierLoc> >	
-	CarrierInfo	SV	Information regarding events generated by a specific carrier
		<L[3] <CarrierID> <VehicleID> <CarrierLoc> >	
56	CarrierLoc	DVVAL	Unique location of the carrier within ITS as reported by the TSC
		<A[1..64]>	
-	CarrierLoc	SV	Unique location of the carrier within ITS as reported by the TSC

VID	Variable Name	Class	Explanation
		Format	
		<A[1..64] >	
57	CommandName	DVVAL	he name of the command sent by the host to the TSC
		<A[1..20]>	
58	CommandID	DVVAL	Remote Command ID issued by Host. Command ID generated by TSC.(MANUIAK****)
		<A[1..64]>	
-	CommandID	SV	Remote Command ID issued by Host. Command ID generated by TSC.(MANUIAK****)
		<A[1..64]>	
59	CommandInfo	DVVAL	Command information regarding a ecific TRANSFER command
		<L[3] <CommandID> <Priority> <Replace> >	
-	CommandInfo	SV	Command information regarding a specific TRANSFER command
		<L[3] <CommandID> <Priority> <Replace> >	
74	CommandType	DVVAL	TRANSFER CANCEL ABORT
		A[1..20]>	
118	CurrentPortStates	DVVAL	
		<L[n] <PortInfo> … >	
60	DestPort	SV	unique ID of the destination port
		<A[1..64]>	
-	DestPort	SV	unique ID of the destination port
		<A[1..64]>	
91	EnhancedCarriers	SV	
		<L[n] <EnhancedCarrierInfo>	

VID	Variable Name	Class	Explanation
		Format	
		... >	
75	EnhancedCarriInfo	DVVAL	
		<L[4] <CarrierID> <VehicleID> <CarrierLoc> <InstallTime> >	
-	EnhancedCarriInfo	SV	
		<L[4] <CarrierID> <VehicleID> <CarrierLoc> <InstallTime> >	
76	EnhancedTransfers	SV	
		<L[n] <EnhancedTransferCommand> ... >	
205	EnhancedTransferCommand	DVVAL	
		<L[3] <CommandInfo> <TransferState> <L[n] <TransferInfo> … > >	
-	EnhancedTransferCommand	SV	
		<L[3] <CommandInfo> <TransferState> <L[n] <TransferInfo> … > >	
61	EqpName	ECV	unique ID of the TSC
		<A[1..80]>	
-	InstallTime	SV	yyyymmddhhmmss
		TIME（A［16］）	
204	InstallTime	DVVAL	yyyymmddhhmmss
		TIME（A［16］）	

VID	Variable Name	Class	Explanation
		Format	
115	PortID	DVVAL	
		<A[1..64]>	
-	PortID	SV	
		<A[1..64]>	
-	PortInfo △2.0	SV	
		<L[2] <PortID> <PortTransferState> >	
-	PortTransferState	SV	1:OutOfService 2:InService
		<U2>	
62	Priority	DVVAL	priority of the remote command(ranging from 1 – 99) 1 = lowest priority 99 = highest priority
		<U2>	
-	Priority	SV	priority of the remote command(ranging from 1 – 99) 1 = lowest priority 99 = highest priority
		<U2>	
63	Replace	DVVAL	replace flag
		<U2>	
-	Replace	SV	replace flag
		<U2>	
64	ResultCode△3.0	DVVAL	execution result of the TRANSFER command 0 = success 1 =unsuccessful 4=Duplicate 5=Mismatch 6=ID Read Failure 8 =TransferCanceled 9 =TransferAborted
		U2>	
65	SourcePort	DVVAL	unique ID of the transfer source port
		<A[1..64]>	
78	SourcePort	SV	unique ID of the transfer source port

VID	Variable Name	Class	Explanation
		Format	
		<A[1..64]>	
114	SpecVersion	SV	Version of SEMI E82 to which the equipment is compliant.
		<A[0..20]>	
66	TransferCommand	DVVAL	Information regarding a specific TRANSFER command
		<L <CommandInfo> <TransferInfo> … >	
-	TransferCommand	SV	Information regarding a specific TRANSFER command
		<L[2] <CommandInfo> <L[n] <TransferInfo> … > >	
67	TransferInfo	DVVAL	carrier information regarding a specific TRANSFER command
		<L[3] <CarrierID> <SourcePort> <DestPort> >	
-	TransferInfo	SV	carrier information regarding a specific TRANSFER command
		<L[3] <CarrierID> <SourcePort> <DestPort> >	
68	TransferPort	DVVAL	unique ID of the transfer port
		<A[1..64]>	
69	TransferPortList	DVVAL	transfer report information regarding the arrival and departure of a specific vehicle
		<L <Transferport> … >	
-	TransferState	SV	1 = queued 2 = transferring 3 = paused

VID	Variable Name	Class	Explanation
		Format	
			4 = canceling 5 = aborting 6 = waiting
		U2	
202	TransferState	DVVAL	1 = queued 2 = transferring 3 = paused 4 = canceling 5 = aborting 6 = waiting
		U2	
73	TSCState	SV	1 = TSC Init 2 = paused 3 = auto 4 = pausing
		U2	
70	VehicleID	DVVAL	the unique ID of the vehicle connected to the event
		<A[1..6] >	
-	VehicleID	SV	the unique ID of the vehicle connected to the event
		<A[1..6] >	
71	VehicleInfo	DVVAL	information related to a specific vehicle
		<L[2] <VehicleID> <VehicleState> >	
-	VehicleInfo	SV	information related to a specific vehicle
		<L[2] <VehicleID><VehicleState>>	
72	VehicleState	DVVAL	the state of the vehicle 1 = removed 2 = not assigned 3 = enroute 4 = parked 5 = acquiring 6 = depositing
		<U2>	
-	VehicleState	SV	the state of the vehicle 1 = removed 2 = not assigned 3 = enroute 4 = parked 5 = acquiring 6 = depositing
		<U2>	

VID	Variable Name	Class	Explanation
		Format	
79	TransferCompleteInfo	DVVAL	Transfer Complete Info
		<L[n] <L[2] <TransferInfo> <CarrierLoc> > >	
117	VehicleLocation	DVVAL	The vehicle's port location. The data is only valid if the vehicle is parked, acquiring, or Depositing.
		<A[0..64]>	
116	CarrierIDList	DVVAL	The Ids of the Carriers being moved. It isn't supported in this SYSTEM. If, when this variable is used, it should do CarrierID.
		<L <CarrierID>…>	
119	EnhancedVehicles	SV	List current status of all vehicles available or being used for TRANSFER commands.
		<L [n] <EnhancedVehicleInfo> … >	
-	EnhancedVehcileInfo △2.0	SV	
		<L[4] <VehicleID> <VehicleState> <VehicleLocation> >	
120	UnitStatusCleable	DVVAL	"Y"
		<A[1]>	
251	VehicleCurrentPosition	DVVAL	Current address （ running address） 0=Unknown Running Address （Such as wireless abnormal ）
		<U4>	
211	UnitID	DVVAL	The unique ID of the vehicle or Equipment.
		A[1..64]	
212	AlarmText	DVVAL	AlarmText
		A[1..40]	
254	UnitAlarmStatList	SV	List of all UnitAlarm status. - The devices that may be occurred

VID	Variable Name	Class	Explanation
		Format	
			alarm or communication error are registered in UnitAlarmStatList. - Besides Vehicle, these devices (MTL･ZCU･HID･AD･FD･FFU) are also registered in UnitAlarmStatList.
		<L[n] <UnitAlarmInfo> … >	
-	UnitAlarmInfo	SV	Information for a specific vehicle (Includes detailed information)
		<L[7] <UnitID> <VehicleCurrentPosition> <VehicleNextPosition> <AlarmID> <AlarmText> <VehicleCommunicationState> <MainteState> >	
-	MainteState △4. 2	SV	MainteStatus In case of alarm concurrently with maintenance, this is added so that Maintenance is individually reported 0: Undefine 1: Maintenance 2: Not Maintenance <<Supplementary matter>> This state report whether UnitState is maintenance mode. When no happen other unit alarm, nothing is registered into AlarmID and AlarmText.
		<U2>	
-	VehicleCurrentPosition	SV	Current address （running address） 0=Unknown Running Address （Such as wireless abnormal ）
		<U4>	
-	VehicleCommunication State	SV	Communication Status 0=Disconnected, 1=Communicating, 2=Not Communicating
		<U2>	

VID	Variable Name	Class	Explanation
		Format	
301	PauseReason	DVVAL	Communication Status 0=MCS Request 1=Work Operation (modification) 2=Periodical Maintenance 3=Error Recovery 9=Other Reason
		<U2>	
262	VehicleNextPosition	DVVAL	Next Position address 0 : Current position is undefined (wireless error, etc.)
		<U4>	
252	MonitoredVehicles	SV	List of all vehicle status
		<L[n] <MonitoredVehicleInfo> … >	
	MonitoredVehicleInfo	SV	Information for a specific vehicle (Includes detailed information)
		<L[10] <VehicleID> <VehicleCurrentPosition> <VehicleDistanceFromCurrentPosition> <VehicleCurrentDomain> <VehicleNextPosition> <VehicleOperationState> <VehicleCommunicationState> <VehicleControlMode> <VehicleJamState> <AlarmID> >	
	VehicleCurrentPosition	SV	Current Position (Move Position) 0 : Current station is undefined (wireless error, etc.)
		<U4>	
	VehicleDistanceFromCurrentPosition	SV	Distance from current position (Move Position) 0 : Current station is undefined (wireless error, etc.)
		<U4>	
253	VehicleCurrentDomain	SV	Domain Name NULL : Current position is undefined (wireless error, etc.)
		<A[0..32]>	
	VehicleNextPosition	SV	Next Position 0 : Current position is undefined (wireless error, etc.)
		<U4>	

VID	Variable Name	Class	Explanation
		Format	
	VehicleOperationState	SV	Operating Status 0=Disconnected, 1=Operating, 2=Stopped, 3=Error, 4=Detached (separated)
		<U2>	
	VehicleCommunication State	SV	Communication Status 0=Disconnected, 1=Communicating, 2=Not Communicating
		<U2>	
	VehicleControlMode	SV	Control Mode 0=Manual, 1=Automatic
		<U2>	
	VehicleJamState	SV	Traffic Jam State 0=No Jam, 1=Jam Exists, 2=Stuck
		<U2>	
360	LaneCutInfoList	SV	List Of Disable Lane info.
		<L[n] >LaneCutInfo> ...>	
330	LaneCutInfo	DVVAL	Only Disabled lane are reported. No reported lane are as enabled.
		<L[2] <LaneInfo> <LaneCutType> >	
	LaneCutInfo	SV	Only Disabled lane are reported. No reported lane are as enabled.
		<L[2] <LaneInfo> <LaneCutType> >	
	LaneInfo	SV DVVAL	Only Disabled lane are reported. No reported lane are as enabled.
		<L[2] <StartPoint> <EndPoint> >	
	StartPoint	DVVAL	Start point of lane cut
		<U4>	
	EndPoint	DVVAL	End point of lane cut
		<U4>	

VID	Variable Name	Class	Explanation
		Format	
	LaneCutType △4.1	DVVAL	Reason of LaneCut 0: Lane cut on HMI 1: Vehicle Alarm
		<U2>	
	ExpectedDuration	DVVAL	EXPECTEDDURATION of Stage
		<U2>	
	NoBlockingTime	DVVAL	NOBLOCKINGTIME of Stage
		<U2>	
	WaitTimeout	DVVAL	WAITTIMEOUT of Stage
		<U2>	
	StageInfo	SV	Information of Stage
		<L[5] <StageID> <Priority> <ExpectedDuration> <NoBlockingTime> <WaitTimeout> >	
	StageCommand		Same Format to S2F49 STAGE. S2F49 STAGEのFormatに合わせてます。
		<L[2] <StageInfo> <TransferInfo> >	
370	ActiveStages	SV	List of current stage commands. 自身のCell内のStage一覧を返す
		<L[n] <StageCommand> … >	
	StageVehicleInfo	SV	Only after the vehicle arrive at the Stage Port, VehicleLocation is specified the PortID VehicleLocation は StagePort に 到 着 後のみPortIDが入る。
		<L[3] <VehicleID> <StageID> <VehicleLocation> >	
371	StageVehicles	SV	List of assigned vehicles by Stage (only self of Cell)

VID	Variable Name	Class	Explanation
		Format	
			Stageに割当っているVehicleの一覧を返す(自身のCellのもののみ)
		<L[n] <StageVehicleInfo> …>	

4 SECS MESSAGES

This chapter explains the stream and function of the SECS messages used by the transport system.

4.1Message List

The following chart lists the minimum SECS messages supported by the transport system. The features of the chart are as follows:

SECS: The message's stream and function.
SEND: "H" indicates the message is sent from the host to the transport system. "E" indicates that the message is sent from the transport system to the host.
FORMAT: The format indicated in SEMI E5's message definition.
DATA EXAMPLE: An example of the message data in SML2 format.

Table 9 - SECS Messages Used by the Stocker

SECS	Massage Name	SEND	Format	Data Example
S1F1	Are You There Request (R)	H,E	S1F1 W . /* header only */	S1F1 W .
S1F2	On Line Data (D)	H	S1F2 <L>.	S1F2 <L>.
		E	S1F2 <L[2] <A MDLN> <A SOFTREV> >.	S1F2 <L [2] <A 'AMHS'> <A 'VER1.0'> >.
S1F3	Selected Equipment Status Request (SSR)	H	S1F3 W <L <Ux SVID> : >.	S1F3 W <L [3] <U2 51> /* ActiveCarrier */ <U2 52> /* ActiveTransfer */ <U2 53> /* ActiveZone */ >.
S1F4	Selected Equipment Status Data (SSD)	E	S1F4 <L <SV> : >.	S1F4 <L [3] /* SV(ActiveCarrier) in the case of 1 carrier */ <L [1] <L [2] /* DVVAL(CarrierInfo) */ <A 'CarrierID1'> <A 'CarrierLoc1'> > > /* SV(ActiveTransfer) in the case of 1 command */ <L [1] /* DVVAL(TransferCommand) in the case of 1 carrier */ <L [2] /* DVVAL(CommandInfo) */ <L [2] <A 'CommandID1'> <A 'Priority1'> > /* DVVAL(TransferInfo) */ <L [3] <A 'CarrierID1'> <A 'CarrierLoc1'> <A 'Dest1'> > > /* SV(ActiveZone) in the case of 1 zone*/ <L [1] <L [2] <A 'ZoneName1'> <A 'ZoneCapacity1'> > > >.
S1F13		H	S1F13 W	S1F13 W <L>.

SECS	Massage Name	SEND	Format	Data Example
	Establish Communication Request (CR)		<L>.	
		E	S1F13 W <L[2] <A MDLN> <A SOFTREV> >.	S1F13 W <L [2] <A 'AMHS'> <A 'VER1.0'> >.
S1F14	Establish Communication Request Acknowledge (CRA)	H	S1F14 <L[2] <B COMMACK> <L> >.	S1F14 <L [2] <B 0x00> <L> >.
		E	S1F14 <L[2] <B COMMACK> <L[2] <A MDLN> <A SOFTREV> > >.	S1F14 <L [2] <B 0x00> <L [2] <A 'AMHS'> <A 'VER1.0'> >.
S1F17	Request ON-LINE (RONL)	H	S1F17 W . /* header only */	S1F17 W .
S1F18	ON-LINE Acknowledge (ONLA)	E	S1F18 <B ONLACK>.	S1F18 <B 0x00>.
S2F15	New Equipment Constant Send (ECS)	H	S2F15 W <L <L[2] <Ux ECID> <Ux ECV> > : >.	S2F15 W <L [1] <L [2] /*ECID(EstablishCommunicationimeout) */ <U2 2> <U2 20> /* ECV */ > >.
S2F16	New Equipment Constant Acknowledge (ECA)	E	S2F16 <B EAC>.	S2F16 <B 0x00>.
S2F17	Date and Time Request (DTR)	H/E	S2F17 W . /* header only */	S2F17 W .
S2F18	Date and Time Data (DTD)	H/E	S2F18 <A TIME>.	S2F18 <A '1999123123595999'>.
S2F31	Date and Time Set Request (DTS)	H	S2F31 W <A TIME>.	S2F31 W <A '1999123123595999'>.

SECS	Massage Name	SEND	Format	Data Example
S2F32	Date and Time Set Acknowledge (DTA)	E	S2F32 <B TIACK>.	S2F32 <B 0x00>.
S2F33	Define Data (DR)	H	S2F33 W <L[2] <Ux DATAID> <L <Ux RPTID> <L <Ux VID> : > > : > >.	S2F33 W <L [2] <U4 0> /* DATAID */ /* in the case of 2 types of report formats */ <L [2] <L [2] <U2 1> /* RPTID */ <L [1] /* VID(EqpName) */ <U2 62> > > <L [2] <U2 2> /* RPTID */ <L [2] /* VID(EqpName) */ <U2 62> /* VID(TransferCommand) */ <U2 74> > > > >.
S2F34	Define Data Acknowledge (DRA)	E	S2F34 <B DRACK>.	S2F34 <B 0x00>.
S2F35	Link Event Report (LER)	H	S2F35 W <L[2] <Ux DATAID> <L <L[2] <Ux CEID> <L <Ux RPTID> : > > : > >.	S2F35 W <L [2] <U2 0> /* DATAID */ /* in the case of 2 types of events */ <L [2] <L [2] /* CEID(control status remote) */ <U2 3> <L [1] <U2 1> /* RPTID */ > > <L [2] /* CEID(TransferInitiated) */ <U2 108> <L [2] <U2 1> /* RPTID */ <U2 2> /* RPTID */ > > > >.

SECS	Massage Name	SEND	Format	Data Example
S2F36	Link Event Report Acknowledge (LERA)	E	S2F36 <B LRACK>.	S2F36 <B 0x00>.
S2F37	Enable/Disable Event Report (EDER)	H	S2F37 W <L[2] <BOOLEAN CEED> <L <Ux CEID> : > >.	S2F37 W <L [2] <BOOLEAN T> /* CEED */ /* in the case of 2 types of events */ <L [2] /* CEID(control status remote) */ <U2 3> /* CEID(TransferInitiated) */ <U2 108> > >.
S2F38	Enable/Disable Event Report Acknowledge (EERA)	E	S2F38 <B ERACK>.	S2F38 <B 0x00>.
S2F41	Host Command Send (HCS)	H	S2F41 W <L[2] <A RCMD> <L <L[2] <A CPNAME> <A CPVAL> > : > >.	S2F41 W <L [2] <A ‘CANCEL’> /* RCMD */ <L [1] <L [2] /* CPNAME */ <A ‘COMMANDID’> /* CPVAL */ <A ‘1999110112000000’> > > >.
S2F42	Host Command Acknowledge (HCA)	E	S2F42 <L[2] <B HCACK> <L <L[2] <A CPNAME> <B CPACK> > : > >.	・in the case of no error S2F42 <L [2] <B 0x00> /* HCACK */ <L [0] > >. ・in the case of a non-valid parameter S2F42 <L [2] <B 0x03> /* HCACK */ <L [1] <L [2] /* CPNAME */ <A ‘CPNAME1’> /* CPACK */ <B 0x01>

SECS	Massage Name	SEND	Format	Data Example
				> > >.
S2F49	Enhanced Remote Command	H	S2F49 W <L[4] <Ux DATAID> <A OBJSPEC> <A RCMD> <L[n] <L[2] <A CPNAME> <x CPVAL> > : > >.	S2F49 W <L [4] <U2 0 > /* DATAID */ <A ‘’> /* OBJSPEC */ <A ‘TRANSFER’> /* RCMD */ <L [2] <L [2] <A ‘COMMANDINFO’> <L [2] <L [2] <A ‘COMMANDID’> <A ‘000001’> > <L [2] <A ‘PRIORITY’> <U2 5> > > > <L [2] <A ‘TRANSFERINFO’> <L [3] <L [2] <A ‘CARRIERID’> <A ‘Carrier1’> > <L [2] <A ‘CARRIERLOC’> <A ‘CarrierLoc1’> > <L [2] <A ‘DEST’> <A ‘CarrierLoc2’> > > > <L [2] <A ‘STAGEIDLIST’> <L [n] <A StageID> …… <A StageID> > > > >.

SECS	Massage Name	SEND	Format	Data Example
S2F50	Enhanced Remote Command Acknowledge	E	S2F50 <L[2] <B HCACK> <L <L[2] <A CPNAME> <A CPACK> > : > >.	・in the case of no error S2F50 <L [2] <B 0x00> /* HCACK */ <L [0] > >. ・in the case of a non-valid parameter S2F50 <L [2] <B 0x03> /* HCACK */ <L [1] <L [2] <A ‘PRIORITY’> <U1 2> /* CEPACK */ > > >.
S5F1	Alarm Report Send (ARS)	E	S5F1 W <L[3] <B ALCD> <Ux ALID> <A ALTX> >.	S5F1 W <L [3] <B 0x80> /* ALCD */ <U4 1> /* ALID */ <A ‘ALARM TEXT’> /* ALTX */ >.
S5F2	Alarm Report Acknowledge (ARA)	H	S5F2 <B ACKC5>.	S5F2 <B 0x00>.
S5F5	List Alram Request (LAR)	H	S5F5 W <Ux [n] ALID ..>.	S5F5 W /* in the case of 2 ALIDs */ <U4 [2] 1 2>.
S5F6	List Alram Data (LAD)	E	S5F6 <L <L[3] <B ALCD> <Ux ALID> <A ALTX> > : >	S5F6 W <L [2] <L [3] <B 0x80> /* ALCD */ <U4 1> /* ALID */ /* ALTX */ <A ‘ALARM TEXT’> > <L [3] <B 0x00> /* ALCD */ <U4 2> /* ALID */ /* ALTX */ <A ‘ALARM TEXT2’> > >.
S6F11	Event Report Send (ERS)	E	S6F11 W <L[3]	S6F11 W <L [3]

SECS	Massage Name	SEND	Format	Data Example
			<Ux DATAID> <Ux CEID> <L <L[2] <Ux RPTID> <L <V> : > > > >.	<U4 0> /* DATAID */ <U2 3> /* CEID(control status remote) */ <L [1] <L [2] <U2 1> /* RPTID */ <L [1] /* V(EqpName) */ <A 'AMHS001'> > > > >.
S6F12	Event Report Acknowledge (ERA)	H	S6F12 <B ACKC6>.	S6F12 <B 0x00>.
S9F1	Unrecognized Device ID (UDN)	E	S9F1 <MHEAD>.	S9F1 <B 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00>.
S9F3	Unrecognized Stream Type (UDS)	E	S9F3 <MHEAD>.	S9F3 <B 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00>.
S9F5	Unrecognized Function name (UFN)	E	S9F5 <MHEAD>.	S9F5 <B 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00>.
S9F7	Illegal Data (IDN)	E	S9F7 <MHEAD>.	S9F7 <B 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00>.
S9F9	Transaction Timer Timeout (TTN)	E	S9F9 <MHEAD>.	S9F9 <B 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00>.
S9F11	Data Too Long (DLN)	E	S9F11 <MHEAD>.	S9F11 <B 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00>.

5 REMOTE COMMANDS

This chapter explains the remote commands supported by the transport system.

5.1REMOTE COMMANDS

5.1.1ABORT

CPNAME	CPVAL	
	FORMAT	NOTES
COMMAND	A[1...64]	The command ID's the TRANSFER remote command

◆Example: ABORT command and reply

Format (S2F41)
S2F41 W <L[2] <A 'ABORT' > <L[1] <L[2]

```
      <A  'COMMANDID' >   /* CPNAME */
      <A  CommandID>      /* CPVAL */
    >
  >
>.
```

Format (S2F42)

```
S2F42
<L[2]
  <B  0x00>   /* HCACK */
  <L[0]
  >
>.
```

StoredAlt carrier should accept ABORT command.

5.1.2CANCEL

CPNAME	CPVAL	
	FORMAT	NOTES
COMMAND	A[1...64]	The command ID's the TRANSFER remote command

◆Example: CANCEL command and reply

Format (S2F41)

```
S2F41 W
<L[2]
  <A 'CANCEL' >
  <L[1]
    <L[2]
      <A 'COMMANDID' >   /* CPNAME */
      <A CommandID>      /* CPVAL */
    >
  >
>.
```

Format (S2F42)

```
S2F42
<L[2]
  <B 0x04>   /* HCACK */
  <L[0]
  >
>.
```

5.1.3PAUSE

CPNAME	CPVAL	
	FORMAT	NOTES

◆Example: PAUSE command and reply

Format (S2F41)

```
S2F41 W
<L[2]
  <A  'PAUSE' >
  <L[0]
  >
>.
```

Format (S2F42)

```
S2F42
<L[2]
  <B  0x04>   /* HCACK */
  <L[0]
  >
>.
```

5.1.4RESUME

CPNAME	CPVAL
FORMAT	NOTES

◆Example: RESUME command and reply

Format (S2F41)

```
S2F41 W
<L[2]
  <A  'RESUME' >
  <L[0]
  >
>.
```

Format (S2F42)

```
S2F42
<L[2]
  <B  0x04>   /* HCACK */
  <L[0]
  >
>.
```

5.1.5TRANSFER △2.0

CPNAME	FORMAT	CPVAL NOTES
COMMANDINFO	L[2]	
COMMANDID	A[1…64]	unique ID for TRANSFER command
PRIORITY	U2	・0 = not valid ・1=lowest ・99=highest
REPLACE	U2	・0=OFF ・0>ON
TRANSFERINFO	L[4]	
CARRIERID	A[1…64]	the carrier ID of the carrier being transfered
SOURCEPORT	A[1…64]	Transfer source port ・all unload ports
DESTPORT	A[1…64]	Transfer destination port ・all load ports

◆Example: TRANSFER command and reply

Format (S2F49)

```
S2F49 W
<L[4]
  <U2  0>
  <A  '' >
  <A  'TRANSFER' >
  <L[2]
    <L[2]
      <A  'COMMANDINFO' >
      <L[3]
        <L[2]
          <A   'COMMANDID' >
          <A   CommandID>
        >
        <L[2]
          <A   'PRIORITY' >
          <U2  Priority>
        >
        <L[2]
          <A  'REPLACE' >
          <U2 Replace>
        >
      >
```

Format (S2F49)

```
    >
    <L[2]
      <A   'TRANSFERINFO' >
      <L[3]
        <L[2]
          <A   'CARRIERID' >
          <A   CarrierID>
        >
        <L[2]
          <A   'SOURCEPORT' >
          <A   SourcePort>
        >
        <L[2]
          <A   'DESTPORT' >
          <A   DestPort>
        >
      >
    >
  >
>.
```

Format (S2F50)

```
S2F50
<L[2]
  <B 0x04>   /* HCACK   */
  <L[0]
  >
>
```

5.1.6STAGE

CPNAME	FORMAT	CPVAL NOTES
STAGEINFO	L[6]	
STAGEID	A[1…64]	unique ID each TRANSFER command
PRIORITY	U2	priority of all STAGE command ・0 = not valid ・1=lowest ・99=highest
REPLACE	U2	can not be used with this system.

		・0=OFF ・0>ON
EXPECTEDURATION	U2	0～999 the time to send a TRNASFER command after MCS issues the STAGE command. (Seconds) WAITTIMEOUT monitoring is started at the point that this timer times out.
NOBLOCKINGTIME	U2	0～999 the time to allow no interruption of the path by a vehicle halting at the corresponding port after the STAGE command is received. (Seconds) TSC (MCP) can perform bumping before this time times out. Bump is not performed on a vehicle arriving at the point that this time times out. Therefore, bump is not performed until the pick-up is completed, the STAGE command is deleted or WAITTIMEOUT times out.
WAITTIMEOUT	U2	0～999 time to disable the STAGE command. (Seconds) WAITTIMEOUT monitoring is valid from when a vehicle arrives at the STATION after EXPECTEDDURATION times out. Time-out of WAITTIMEOUT cancels the STAGE command by TSC (MCP).
TRANSFERINFO	L[3]	unique ID for TRANSFER command
CARRIERID	A[64]	can not be used with TSC since CarrierID and DestPort have nothing to do with TRANSFER command. CarrierID is already working, answered 1 in NG (5).
SOURCEPORT	U2	transfer dest port ・ all load ports When a port cannot be recognized, it is answered as parameter NG.
DESTPORT	A[1…64]	transfer dest port ・ all load ports When a port cannot be recognized, it is answered as parameter NG.

◆Example: STAGE command and reply

Format (S2F49)

```
S2F49 W
<L,4
  <A  'STAGE' >
  <L[2]
    <L[2]
      <A  'STAGEINFO' >
```

Format (S2F49)

```
      <L[6]
        <L[2]
          <A 'STAGENAME' >
          <A StageID >
        >
        <L[2]
          <A 'PRIORITY' >
          <U2 Priority>
        >
        <L[2]
          <A 'Replace' >
          <U2 Replace>
        >
        <L[2]
          <A 'EXPECTEDDURATION' >
          <A ExpectedDuration>
        >
        <L[2]
          <A 'NOBLOCKINGTIME' >
          <A NoBlockingTime>
        >
        <L[2]
          <A 'WAITTIMEOUT' >
          <A WaitTimeOut>
        >
      >
    >
  >
  <L [2]
    <A 'TRANSFERINFO' >
    <L [3]
    <L [2]
      <A 'CARRIERID' >
      <A CarrierID>
    >
    <L [2]
      <A 'SOURCEPORT' >
      <A SourcePort>
    >
    <L [2]
      <A 'DESTPORT' >
      <A DestPort>
```

Format (S2F49)

```
    >
  >
>.
```

Format (S2F50)

```
S2F50
<L[2]
  <B 0x00>   /* HCACK  (HCACK ≠ 3) */
  <L[0]
  >
>
```

5.1.7CONFIRMROUTE △2.0

CPNAME	CPVAL	
	FORMAT	NOTES
SOURCEPORT	A[1…64]	Transfer source port ・all unload ports
DESTPORT	A[1…64]	Transfer destination port ・all load ports

◆Example: TRANSFER command and reply

Format (S2F41)

```
S2F41 W
<L[2]
  <A 'CONFIRMROUTE' >
  <L[2]
    <L[2]
      <A 'SOURCEPORT' >
      <A SourcePort>
    >
    <L[2]
      <A 'DESTPORT' >
      <A DestPort>
    >
  >
>.
```

Format (S2F42)

```
S2F42
<L[2]
  <B 0x04>  /* HCACK  */
  <L[0]
  >
>
```

6 EVENTS

The transport system supports the event reports based on the “Dynamic Event Report Setting Modifications” included in GEM. This chapter explains the events used by the transport system.

6.1EVENT and EVENT REPORT

6.1.1CEID Numbering

The following chart summarizes how CEIDs are assigned to transport system events.

Table 10 - CEID Numbering

No	所属	EVENT TYPE	CEID
1	CEIDs defined in Daifuku specifications 1～600	GEM defined events	1～50
2		SEM defined events	51～500
3		Daifuku defined events	501～600
4	supplier defined CEIDs 601～	supplier defined CEIDs	601～

Note:

All events defined by GEM or SEM that are not included in this specification that are specified by the supplier are assigned a CEID of 601 or above.

6.1.2Transport System Events

This section explains the types events used by the transport system.

1） Control Related Events

Table 11 - Control Related Events

CEID	EVENT NAME	OLD STATUS	NEW STATUS	REPORT ID
1	EquipmentOffLine	ONLINE	EquipmentOFFLINE	1
2	ControlStatusLocal	OFFLINE	ONLINE-LOCAL	1
		OFFLINE-REMOTE		
3	ControlStatusRemote	OFFLINE	ONLINE-REMOTE	1
		ONLINE-LOCAL		

2） TSC Transition Events

Table 12 - TSC Transition Events

CEID	EVNET NAME	OLD STATUS	NEW STATUS	REPORT ID
51	AlarmCleared	ALARM	NO ALARMS	1
52	AlarmSet	NO ALARM	ALARMS	1
53	TSCAutoCompleted	PAUSED	AUTO	1
		PAUSING		
54	TSCAutoInitiated	NONE	TSC INIT	1
55	TSCPauseCompleted	PAUSING	PAUSED	1
56	TSCPaused	TSC INIT	PAUSED	1
57	TSCPauseInitiated	AUTO	PAUSING	23

CEID 51 and 52 no need for MCS. But controller is able to send CEID 51 and 52.

3） TRANSFER Command Status Transition Events△2.0

Table 13 - TRANSFER Command Status Transition Events

CEID	EVNET NAME	OLD STATUS	NEW STATUS	REPORT ID
101	TransferAbortCompleted	ABORTING	NONE	3
102	TransferAbortFailed	ABORTING	ACTIVE	3

CEID	EVNET NAME	OLD STATUS	NEW STATUS	REPORT ID
103	TransferAbortInitiated	ACTIVE	ABORTING	3
104	TransferCancelCompleted	CANCELING	NONE	3
105	TransferCancelFailed	CANCELING	QUEUED or WAITING	3
106	TransferCancelInitiated	QUEUED or WAITING	CANCELING	3
107	TransferCompleted	ACTIVE	NONE	2
108	TransferInitiated	QUEUED	WAITING	3
109	TransferPaused	TRANSFERRING	PAUSED	2
110	TransferResumed	PAUSED	TRANSFERRING	3
111	Transfering	WAITING or CANCELING	TRANSFERRING	3

4） Carrier Status Transition Events △2.0

Table 14 - Carrier Status Transition Events

CEID	EVNET NAME	OLD STATUS	NEW STATUS	REPORT ID
151	CarrierInstalled	NONE	INSTALLED	4
152	CarrierRemoved	INSTALLED	NONE	4

5） Vehicle Status Transition Events

Table 15 - VivhiStatus Transition Events

CEID	EVNET NAME	OLD STATUS	NEW STATUS	REPORT ID
201	VehicleArrived	ENROUTE	PARKED	5
202	VehicleAcquireStarted	PARKED	ACQUIRING	6
		DEPOSITING		
203	VehicleAcquireCompleted	ACQUIRING	PARKED	6
204	VehicleAssigned	NOT ASSIGNED	ASSIGNED	7
205	VehicleDeparted	PARKED	ENROUTE	5
206	VehicleDepositStarted	PARKED	DEPOSITING	6
		ACQUIRING		
207	VehicleDepositCompleted	DEPOSITING	PARKED	6
208	VehicleInstalled	REMOVED	INSTALLED	8
209	VehicleRemoved	INSTALLED	REMOVED	8
210	VehicleUnassigned	ASSIGNED	NOT ASSIGNED	7

6） Other Events

Table 16 - Other Events

CEID	EVNET NAME	OLD STATUS	NEW STATUS	REPORT ID
254	OperatorInitiateAction	NONE	NONE	9

7） Operator Definitions △2.0

Table 17 - Operator definitions

CEID	EVNET NAME	OLD STATUS	NEW STATUS	REPORT ID
11	EstablishIntervalTimeChange	none	none	1
	This event is issued when the operator changes the EstablishCommunicationTime from the equipment console.			

8） Port Transfer State

Table 18 - Port Transfer State

CEID	EVNET NAME	OLD STATUS	NEW STATUS	REPORT ID
260	PortOutOfService	None/In Service	Out of Service	10
	Port condition must be UNAVAIL.			
261	PortInService	None/OutOf Service	In Service	10
	Port condition must be AVAIL.			

9） Daifuku Event Definitions

Table 19 - Daifuku Event definitions

CEID	EVNET NAME	OLD STATUS	NEW STATUS	REPORT ID
503	UnitAlarmCleared	ALARM	NO ALARM	11
	For individual equipment, when alarm occurs, report this event. Exception: If the communication abnormality of the equipment is cleared, regardless of the current state of each equipment, report the event. (When the communication failure has been cleared even in abnormal state, this EVENT is reported.)			

CEID	EVNET NAME	OLD STATUS	NEW STATUS	REPORT ID
504	UnitAlarmSet	NO ALARM	ALARM	11
	For individual equipment, when alarm occurs, report this event. Exception: If the communication abnormality of the equipment is occurred, regardless of the current state of each equipment, report the event. （When the communication failure occurred In the abnormal state of equipment, no need to report UnitAlarmCleared event, just only report UnitAlarmSet event.）			

10） Lane Events△4.0

Table 20 - Lane Events

CEID	EVNET NAME	OLD STATUS	NEW STATUS	REPORT ID
570	LaneInService			29
	This event is reported, when LaneCut,LineCut are released. LaneCut,LineCutが解除された時に報告される。全てのCellから報告する。 ラインカットの場合は、レーンカットされたレーンを報告する。			
571	LaneOutOfService			29
	This event is reported, when LaneCut,LineCut are set. LaneCut,LineCutが設定された時に報告される。全てのCellから報告する。 ラインカットの場合は、レーンカットされたレーンを報告する。			

6.1.3Transport System Event Reports

The following chart reveals the report format (default) the host uses in regards to the transport system as an example of a dynamic event report:

Table 21 - Basic Event Report Format

RPTID	VARIABLE (VID)	REPORT FORMAT
1	EqpName	<L[1] <A EqpName> >
2 △3.0	EqpName CommandInfo TransferCompleteInfo ResultCode	<L[4] <A EqpName> <L[3] /* CommandInfo */ <A CommandID> <U2 Priority> <U2 Replace> > <L /* TransferCompleteInfo */ <L[2] <L[3] <A CarrierID> <A SourcePort> <A DestPort> > <A CarrierLoc> > ・・・ > <U2 ResultCode> >
3 △3.0	EqpName CommandInfo TransferCompleteInfo	<L[3] <A EqpName> <L[3] /*CommandInfo*/ <A CommandID> <U2 Priority> <U2 Replace> > <L /* TransferCompleteInfo */ <L[2] <L[3] <A CarrierID> <A SourcePort> <A DestPort> > <A CarrierLoc> >

RPTID	VARIABLE (VID)	REPORT FORMAT
		… > >
4	EqpName CarrierID TransferPort CarrierLoc	<L[4] <A EqpName> <A CarrierID> <A TransferPort> <A CarrierLoc>
5	EqpName VehicleID TransferPortList	<L[3] <A EqpName> <A VehicleID> <L /* TransferPortList */ <A TransferPort> … >
6	EqpName VehicleID CarrierID TransferPort	<L[4] <A EqpName> <A VehicleID> <A CarrierID> <A TransferPort>
7	EqpName VehicleID CommandID	<L[3] <A EqpName> <A VehicleID> <A CommandID>
8 △2.0	EqpName VehicleID	<L[2] <A EqpName> <A VehicleID>
9	CommandID CommandType CarrierID SourcePort DestPort Priority	<L[6] <A CommandID> <A CommandType> <A CarrierID> <A SourcePort> <A DestPort> <U2 priority>
10 △2.0	EqpName PortID	<L[2] <A EqpName> <A PortID>
11	EqpName UnitID AlarmID	< L[6] <A[32] EqpName> <A[32] UnitID> <U4 AlarmID>

RPTID	VARIABLE（VID）	REPORT FORMAT
	AlarmTxt VehicleCurrentPosition UnitStatusCleable	<A[40]AlarmText> <U4 VehicleCurrentPosition> <A[1] UnitStatusCleable> >
20	EqpName VehicleID CarrierID CommandID VehicleCurrentPosition VehicleNextPosition	<L[6] <A EqpName> <A VehicleID> <A CarrierID> <A CommandID> <U4 VehicleCurrentPosition> <U4 VehicleNextPosition> >
23	EqpName PauseReason	<L[2] <A EqpName> <U2 PauseReason> >
29 △4.0	EqpName LaneCutInfo	<A EqpName> <L[2] <L[2] <U4 StartPoint> <U4 EndPoint> > <U2 LaneCutType> >

7 LOCATION INFORMATION

7.1SECS Message Location Information

7.1.1How Location Information Used in Message is Expressed

The following location information names are used to explain location information used in messages.

1） Equipment Location Information

Table 22 - Eqipment location information

EQUIPMENT TYPE	LOCATION INFORMATION NAME

equipment other than AMHS	process equipment ID
transport system	transport system ID

11） Unique Locations(Ports, Positions) within Equipment

Table 23 - Unique locations within equipment

EQUIPMENT TYPE	PORT TYPE	LOCATION INFORMATION NAME
equipment other than AMHS	receive send ports	eq port
transport system	ports on vehicle	vehicle port

7.1.2Location Information △2.0

The following chart lists the location data and carrier location information used in the transport system.

Table 24 – Location information

COMMAND/EVENT NAME	LOCATION DATA NAME	MESSAGE LOCATION DATA			
		STOCKER INPUT PORT	STOCKER OUTPUT PORT	EQUIPMENT	TRANSPORT VEHICLE
TRANSFER command	SOURCE		loading port	eq port	
	DEST	input port		eq port	
CarrierInstalled	TransferPort	same data as the TRANSFER command’s SourcePort			
CarrierRemoved	TransferPort	same data as the TRANSFER command’s DestPort			
TransferAbortCompleted	TransferInfo	same data as the TRANSFER command			
TransferAbortFailed	TransferInfo	same data as the TRANSFER command			
TransferAbortInitiated	TransferInfo	same data as the TRANSFER command			
TransferCancelCompleted	TransferInfo	same data as the TRANSFER command			
TransferCancelFailed	TransferInfo	same data as the TRANSFER command			
TransferCancelInitiated	TransferInfo	same data as the TRANSFER command			
TransferCompleted	TransferInfo	same data as the TRANSFER command			
TransferInitiated	TransferInfo	same data as the TRANSFER command			
TransferPaused	TransferInfo	same data as the TRANSFER command			
TransferResumed	TransferInfo	same data as the TRANSFER command			
Transferring	TransferInfo	same data as the TRANSFER command			
VehicleAcquireStarte	TransferPor	same data as the TRANSFER command’s			

COMMAND/EVENT NAME	LOCATION DATA NAME	MESSAGE LOCATION DATA			
		STOCKER INPUT PORT	STOCKER OUTPUT PORT	EQUIPMENT	TRANSPORT VEHICLE
d	t	SourcePort			
VehicleAcquireCompleted	TransferPort	same data as the TRANSFER command's SourcePort			
VehicleArrived	TransferPort	same data as the TRANSFER command's SourcePort			
VehicleDeparted	TransferPort	same data as the TRANSFER command's SourcePort			
VehicleDepositStarted	TransferPort	same data as the TRANSFER command's DestPort			
VehicleDepositCompleted	TransferPort	same data as the TRANSFER command's DestPort			

8 INTERPRETING THE SEMI STANDARDS

This chapter describes the items used to clarify the interpretations from the SEMI standards.

8.1VID, SVID and ECID

There are three types of data expressed by variable data (V):

V
- SV (status variable data)
- ECV (equipment variables)
- DVVAL (data value)

The relationship between VID, SVID and ECID is as follows:

- The VID within a VID that indicates a SV is called a SVID.
- The VID within a VID that indicates a ECV is called a ECID.

9 SCENARIOS

Refer to the following sections from the AMHS COMMUNICATION SCENARIO SPECIFICATIONS for information on the communication scenarios of the transport system:

- Section 2, “Common Scenarios”
- Section 4, “Transport System Scenarios”

9.1COMMON SCENARIO

This section describes basic scenarios for stocker.
Each event in the scenarios occurs when a corresponding event occurs. The following scenario is just an example and does not have to be fully complied.

9.1.1 ACTIVATION FROM THE AMHS (EQUIPMENT OFFLINE)

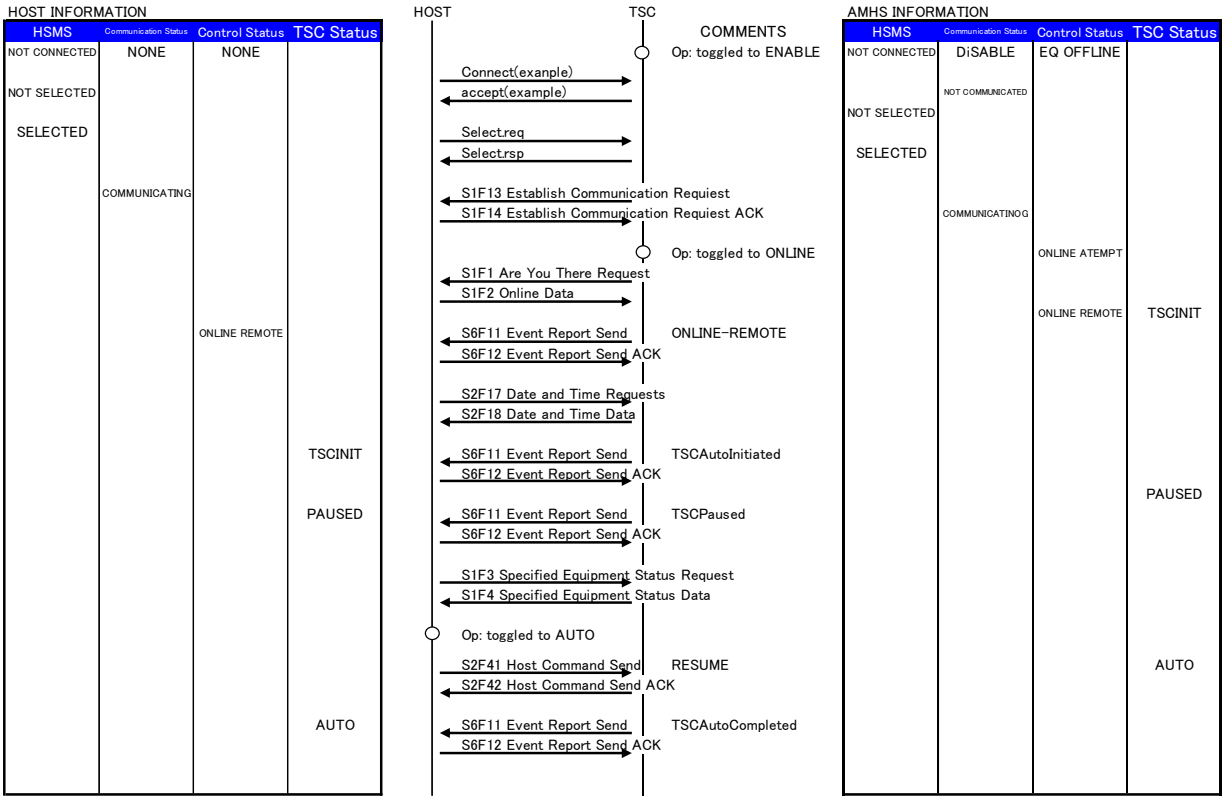


Figure 3 - ACTIVATION FROM THE AMHS (EQUIPMENT OFFLINE)

9.1.2 ACTIVATION FROM THE AMHS (ATTEMPT TO ESTABLISH ONLINE COMMUNICATIONS)

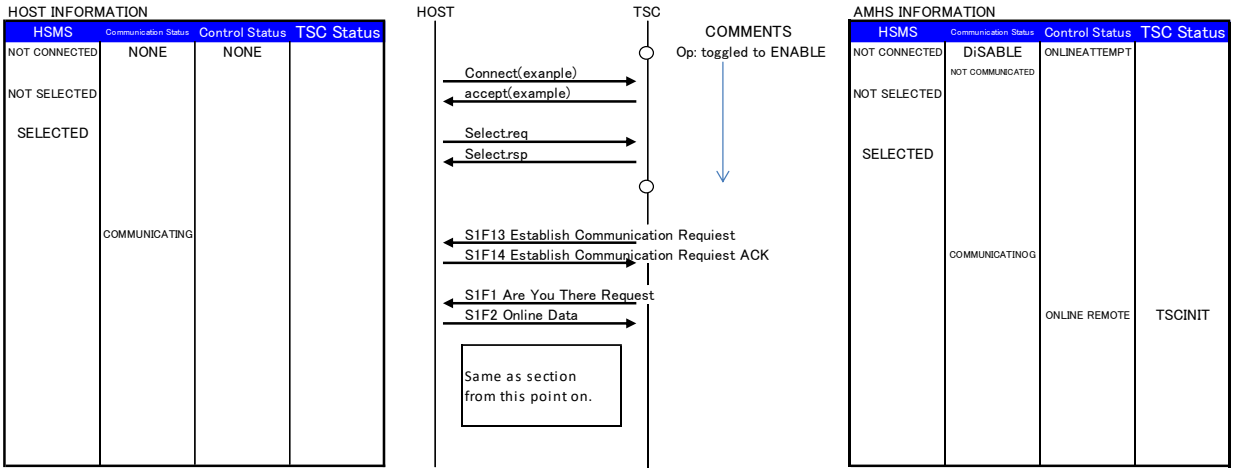


Figure 4 - ACTIVATION FROM THE AMHS (ATTEMPT TO ESTABLISH ONLINE COMMUNICATIONS)

9.1.3 ACTIVATION FROM THE AMHS (HOST OFFLINE)

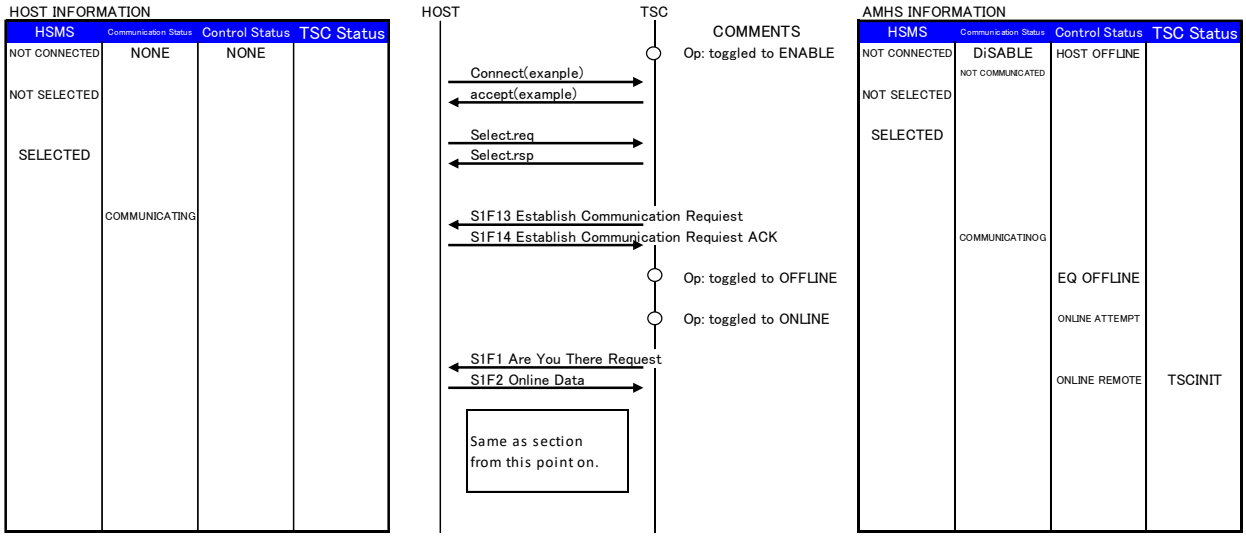


Figure 5 - ACTIVATION FROM THE AMHS (HOST OFFLINE)

9.1.4 ACTIVATION FROM THE AMHS (ONLINE REMOTE)

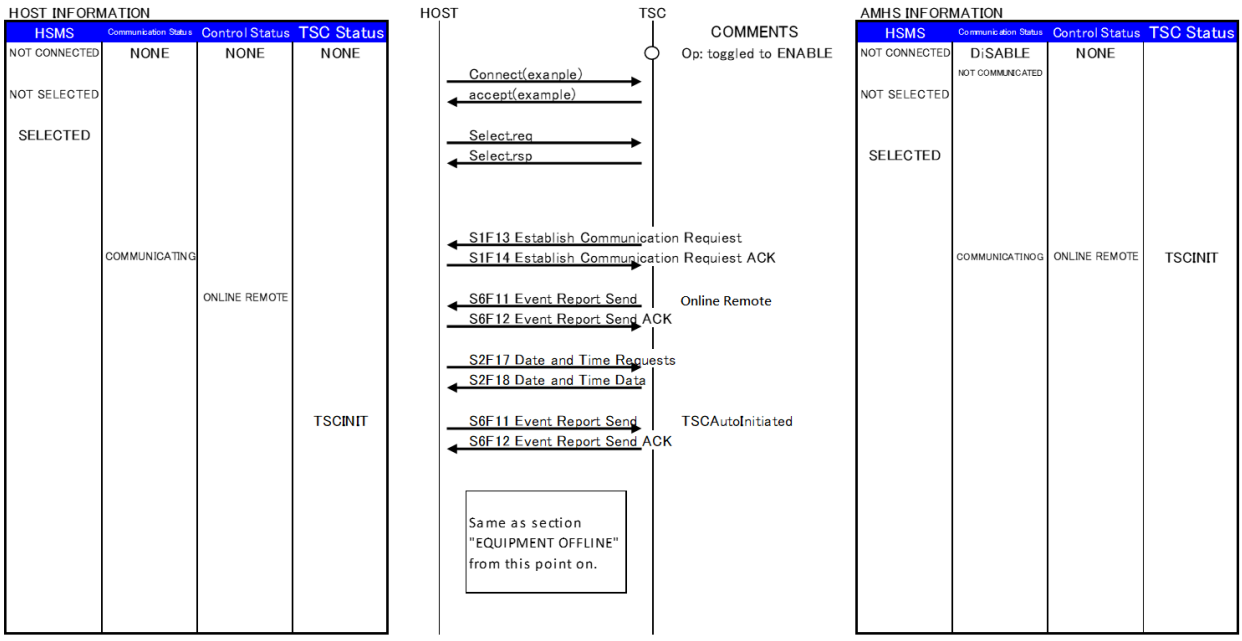


Figure 6 - ACTIVATION FROM THE AMHS (ONLINE REMOTE)

9.1.5 ACTIVATION FROM THE AMHS (S1F14 ERROR REPLY)

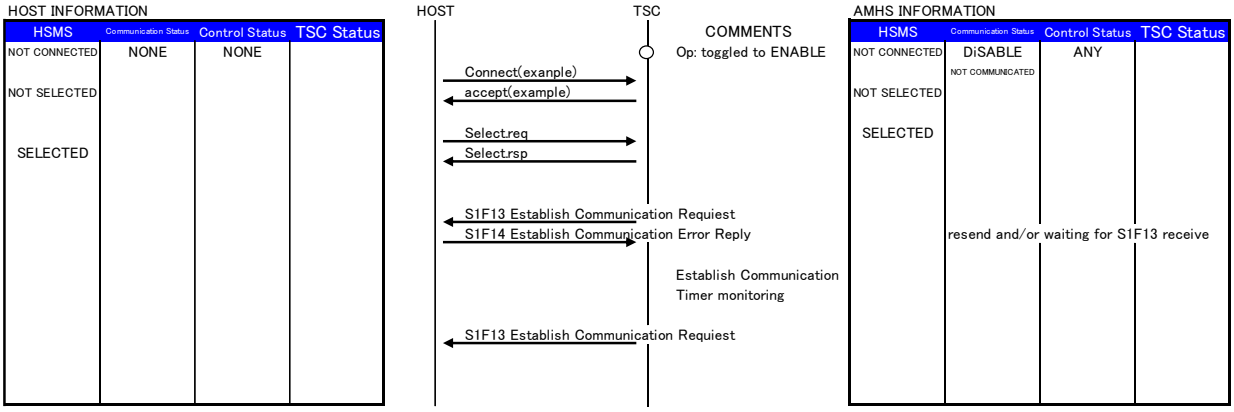


Figure 7 - ACTIVATION FROM THE AMHS (S1F14 ERROR REPLY)

9.1.6 ACTIVATION FROM THE AMHS (S1F0 ERROR REPLY)

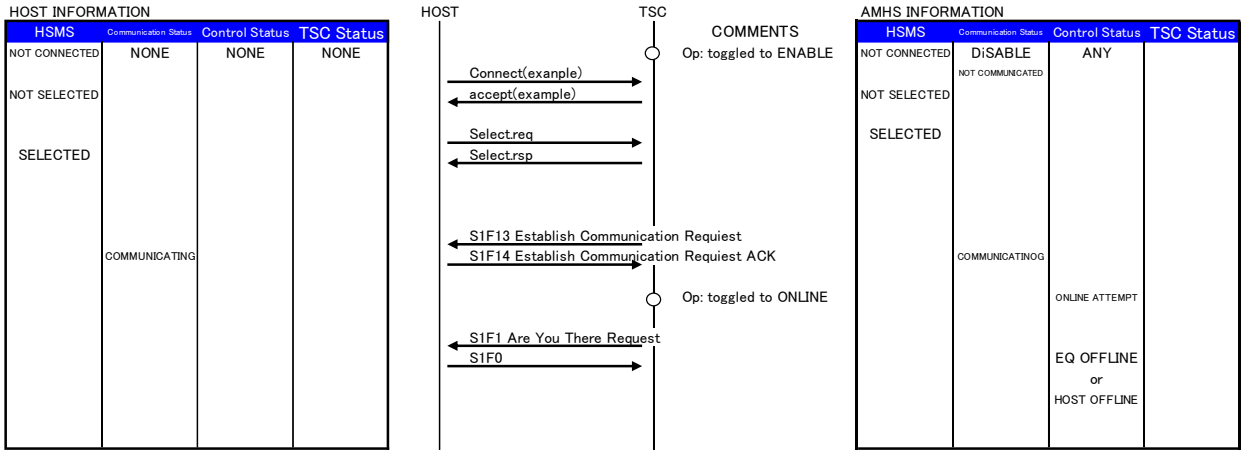


Figure 8 - ACTIVATION FROM THE AMHS (S1F0 ERROR REPLY)

9.1.7 ACTIVATION FROM THE HOST (EQUIPMENT OFFLINE)

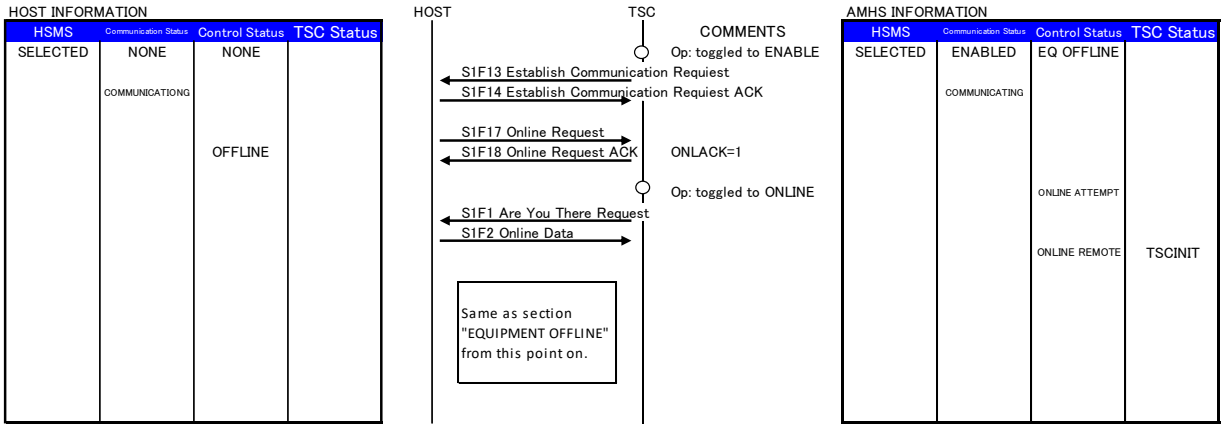


Figure 9 - ACTIVATION FROM THE HOST (EQUIPMENT OFFLINE)

9.1.8 ACTIVATION FROM THE HOST (EQUIPMENT OFFLINE)

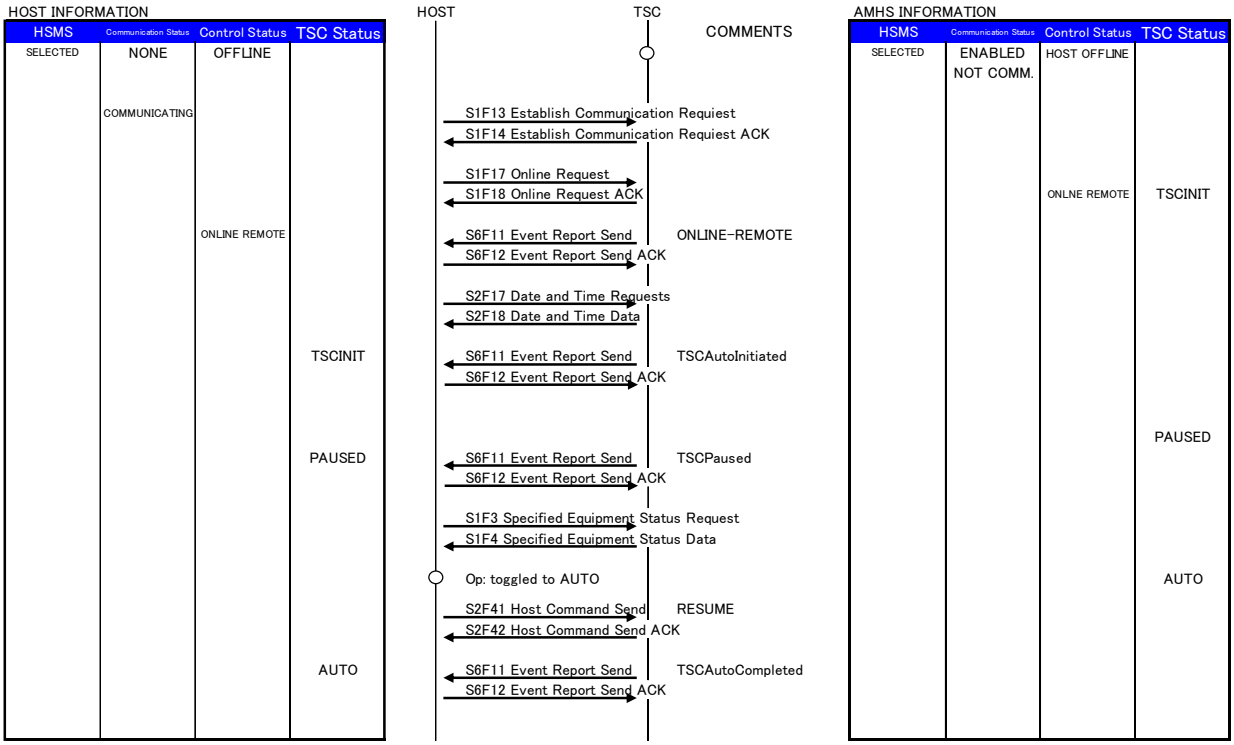


Figure 10 - ACTIVATION FROM THE HOST (EQUIPMENT ONLINE)

9.1.9 ACTIVATION FROM THE HOST (ONLINE REMOTE)

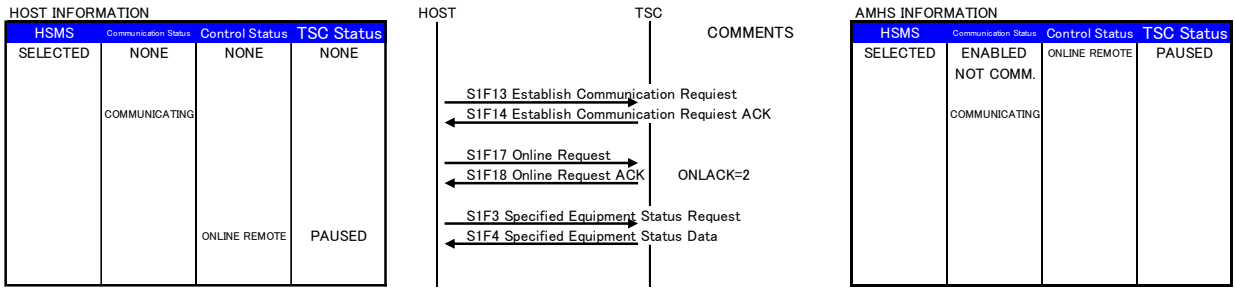


Figure 11 - ACTIVATION FROM THE HOST (ONLINE REMOTE)

9.1.10 SETTING EVENT REPORTS

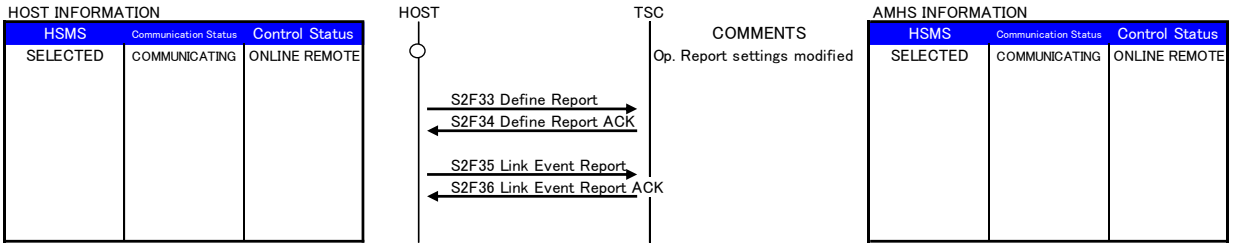


Figure 12 - SETTING EVENT REPORTS

9.1.11 ENABLING/DISABLING EVENTS

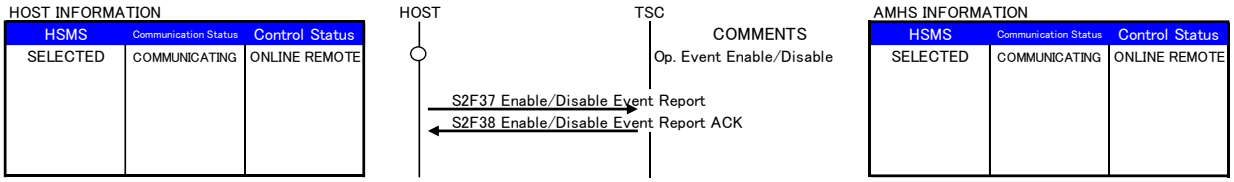


Figure 13 - ENABLING/DISABLING EVENTS

9.1.12 PAUSE／RESUME

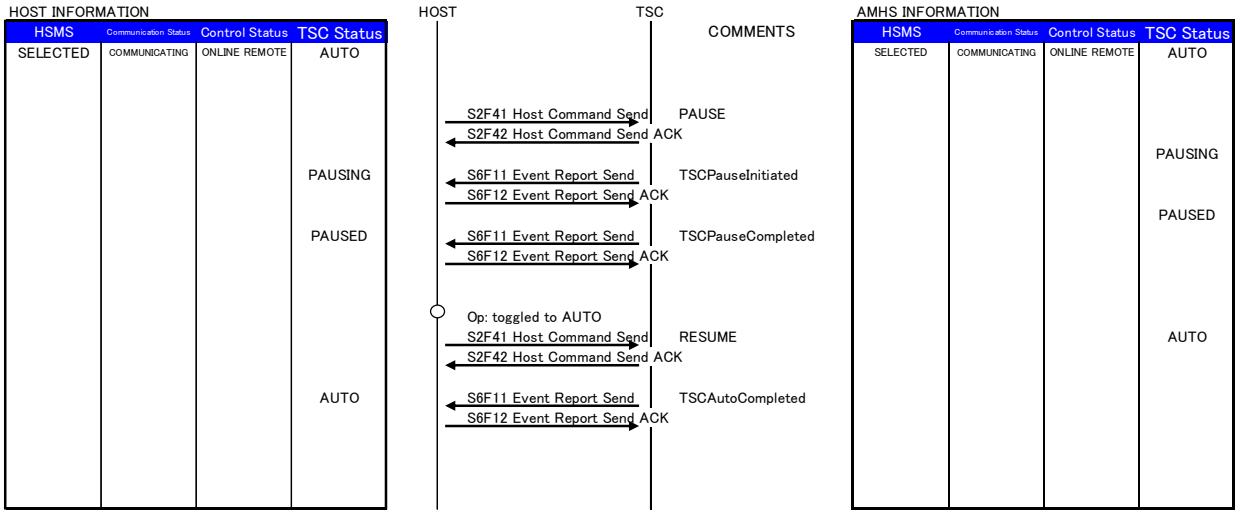


Figure 14 - PAUSE／RESUME

9.1.13 RECONNECTING AFTER A COMMUNICATION FAILURE

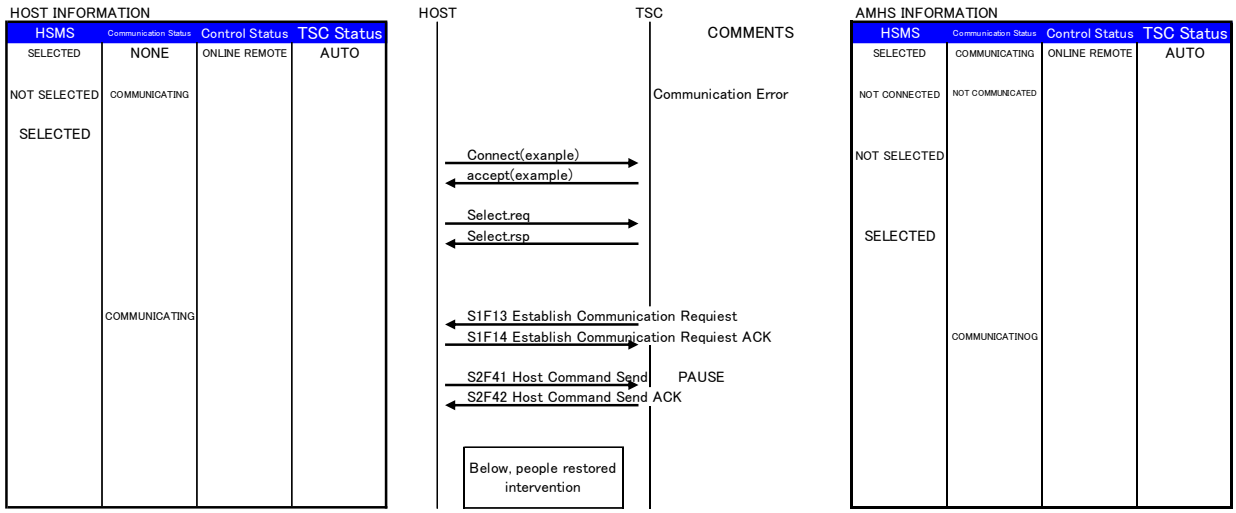


Figure 15 - RECONNECTING AFTER A COMMUNICATION FAILURE

9.1.14 PLANNED STOP

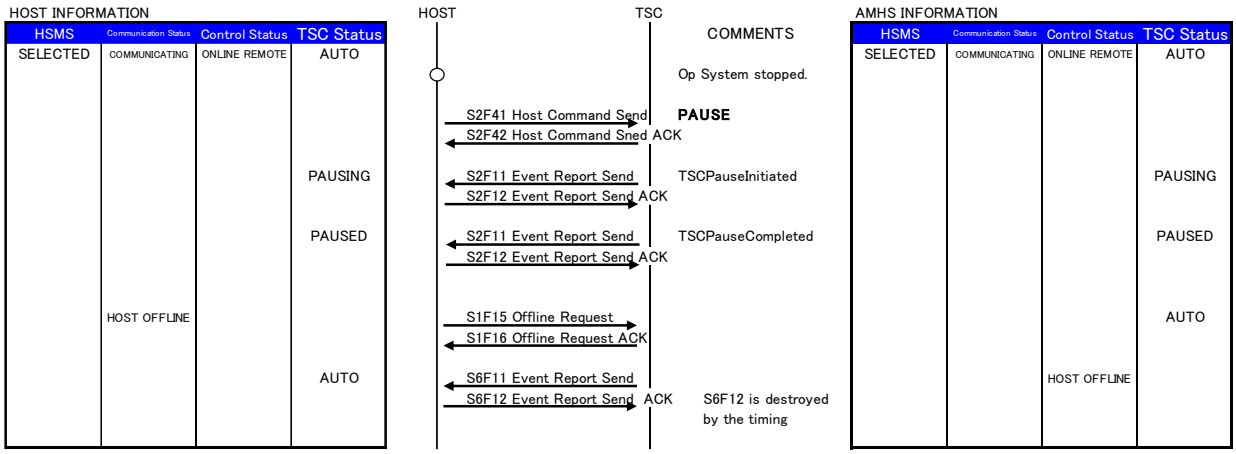


Figure 16 - PLANNED STOP

9.2TRANSPORT SYSTEM SCENARIO

This section describes basic scenarios for transport system.
Each event in the scenarios occurs when a corresponding event occurs.

9.2.1INTERBAY / INTRABAY TRANSPORT

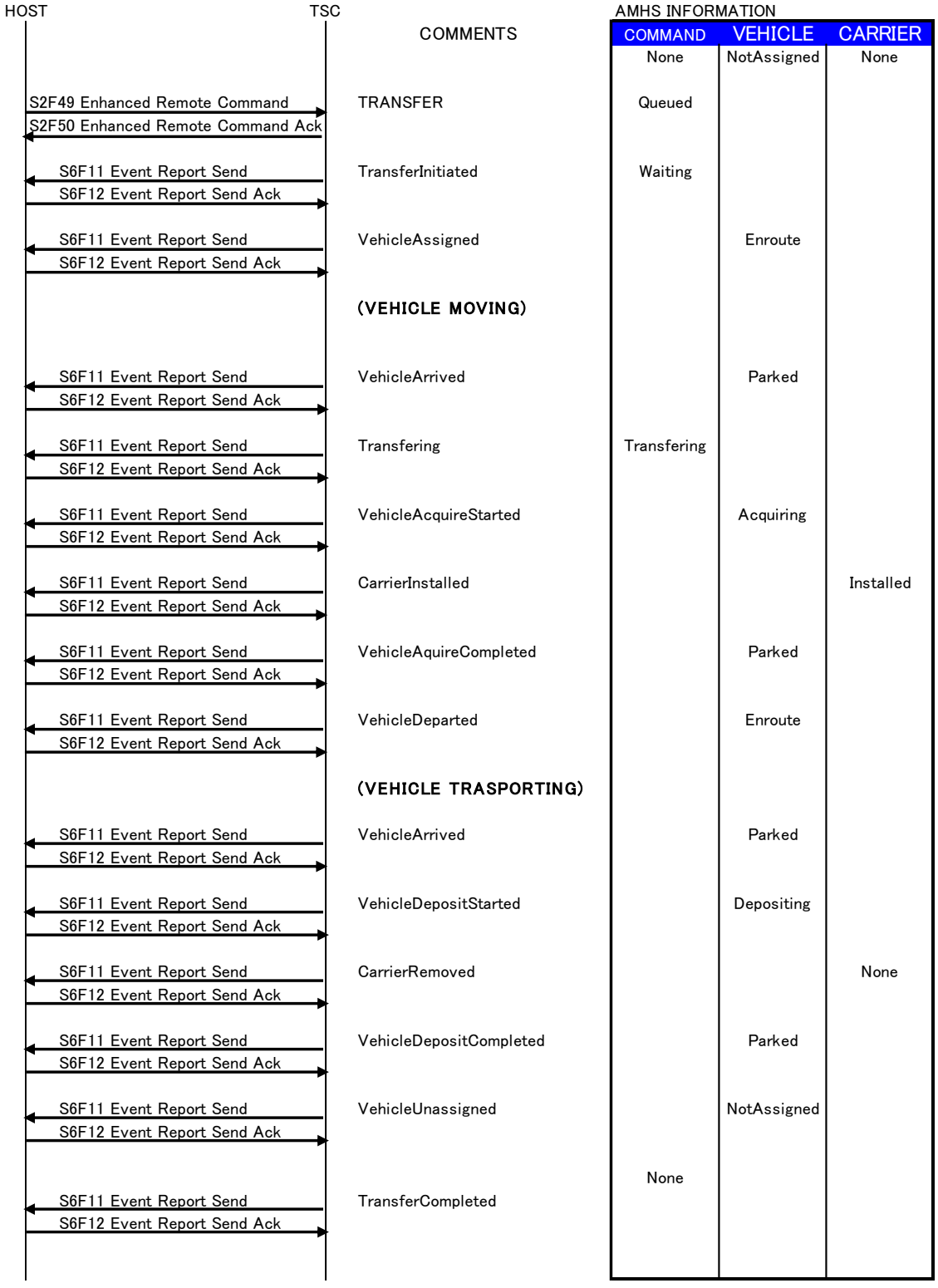


Figure 17 - INTERBAY/INTRABAY TRANSPORT

9.2.2 CANCEL

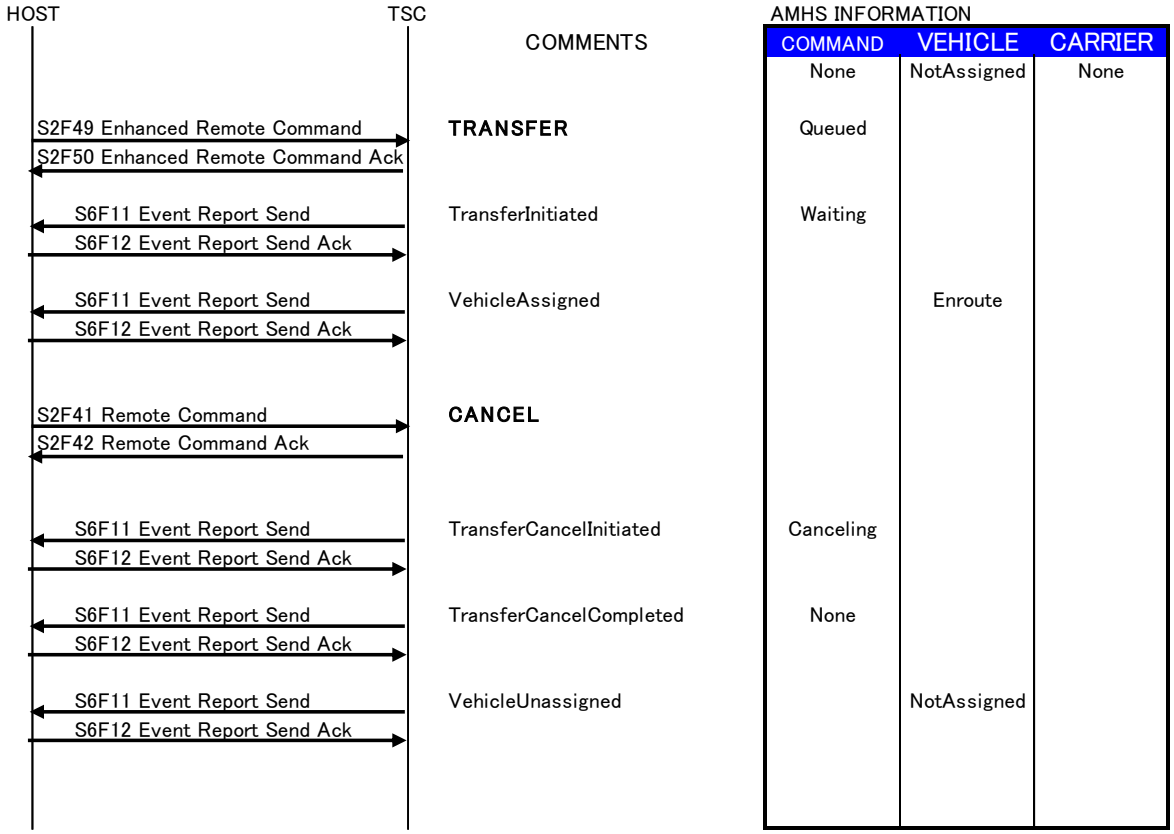


Figure 18 - CANCEL

9.2.3 ABORT(Override)

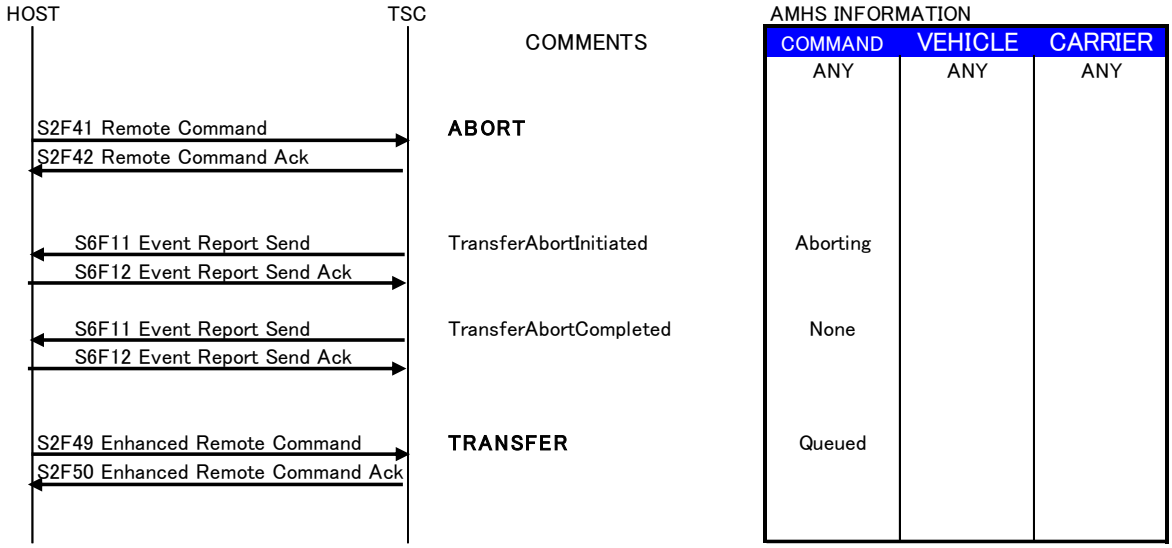


Figure 19 - ABORT

9.2.4 Unsuccessful Completion of a TRANSFER Command

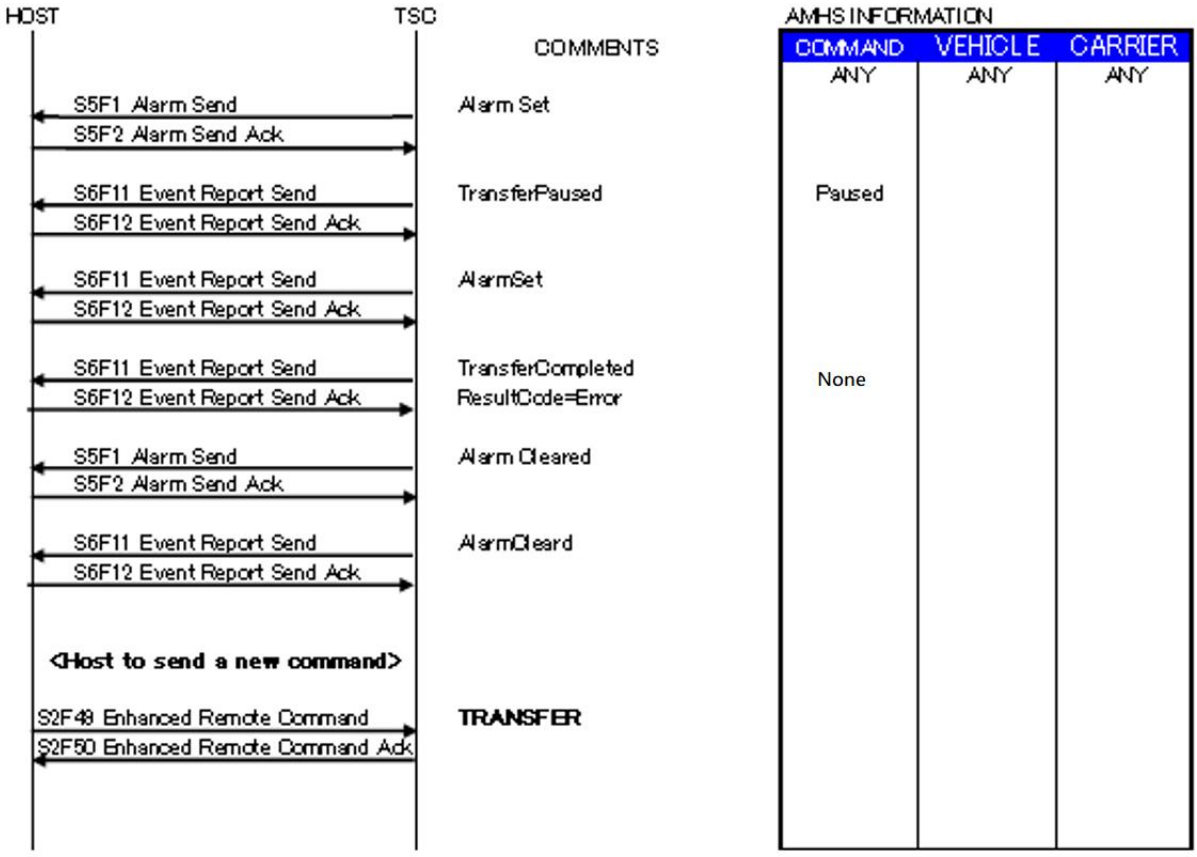
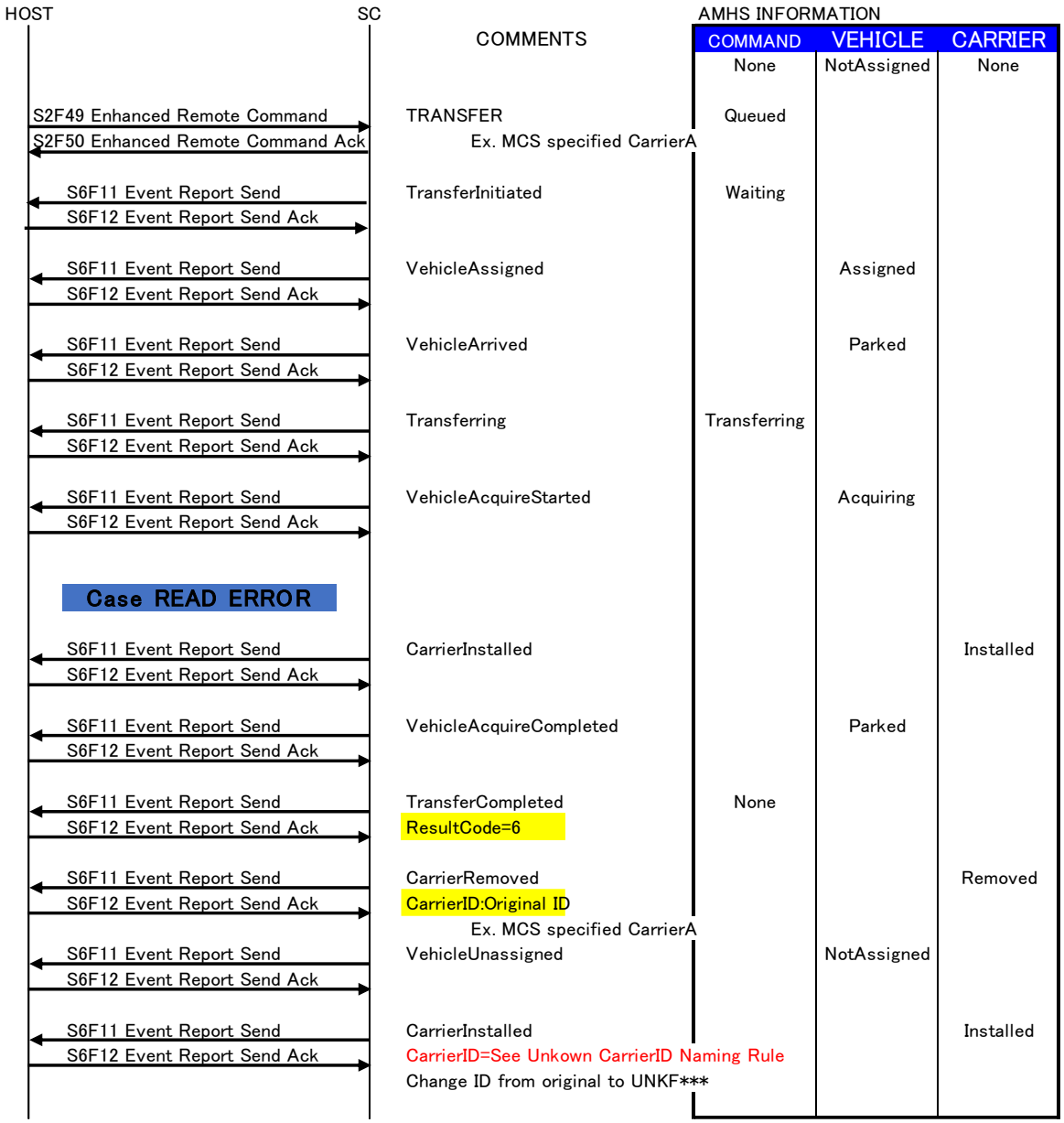
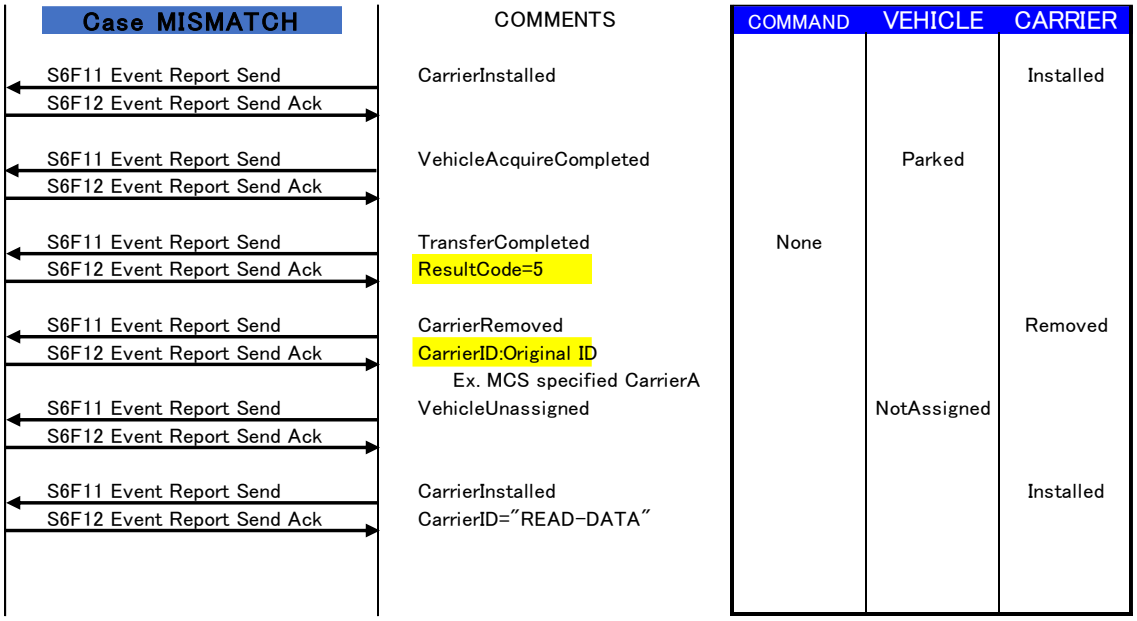
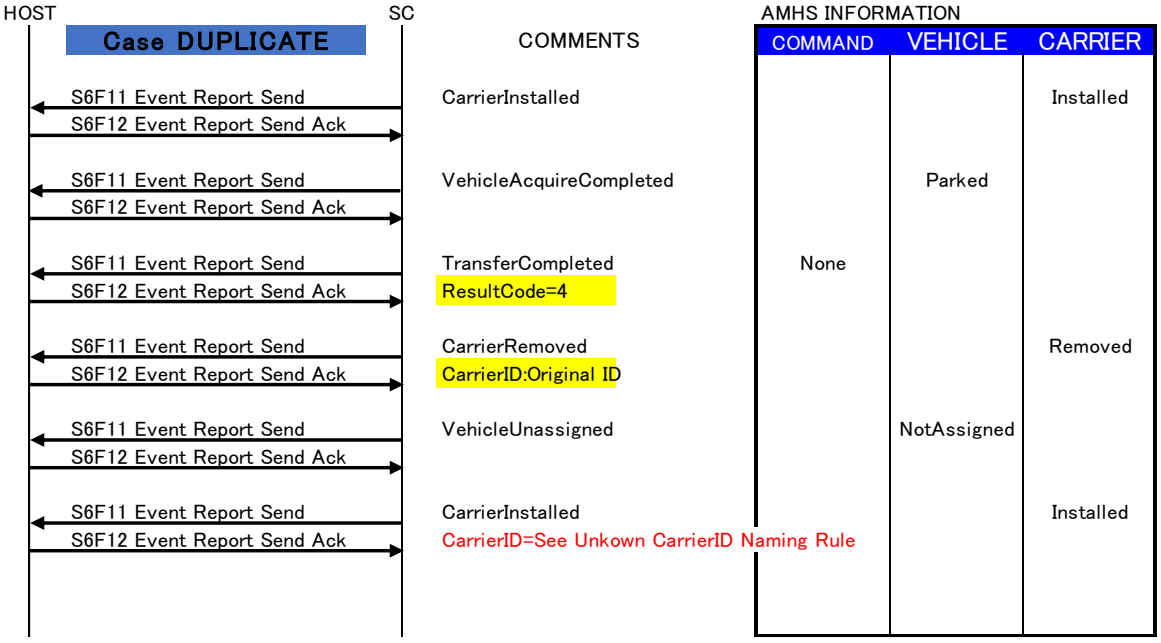


Figure 20 - ABORT

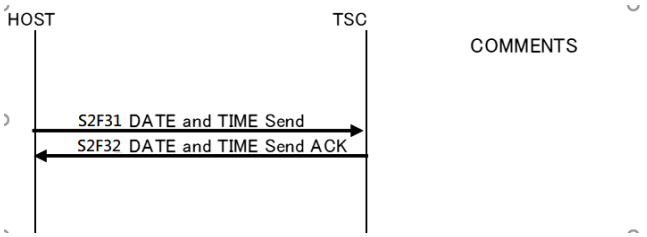
9.2.5 ID READ NG on OHT△2.0




Case MISMATCH
COMMENTS
COMMAND
VEHICLE
CARRIER
S6F11 Event Report Send
S6F12 Event Report Send Ack
CarrierInstalled
Installed
VehicleAcquireCompleted
Parked
TransferCompleted
ResultCode=5
None
CarrierRemoved
CarrierID:Original ID
Ex. MCS specified CarrierA
Removed
VehicleUnassigned
NotAssigned
CarrierInstalled
CarrierID=″READ-DATA″
Installed


HOST
SC
AMHS INFORMATION
Case DUPLICATE
COMMENTS
COMMAND
VEHICLE
CARRIER
S6F11 Event Report Send
S6F12 Event Report Send Ack
CarrierInstalled
Installed
VehicleAcquireCompleted
Parked
TransferCompleted
ResultCode=4
None
CarrierRemoved
CarrierID:Original ID
Removed
VehicleUnassigned
NotAssigned
CarrierInstalled
CarrierID=See Unkown CarrierID Naming Rule
Installed

9.2.6 DATE AND TIME SEND △2.0

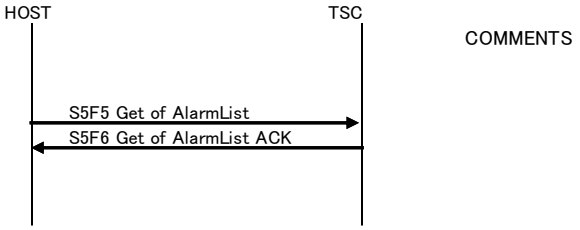


AMHS INFORMATION

HSMS	Communication Status	Control Status	TSC Status
SELECTED	COMMUNICATING	ONLINE	AUTO /PAUSE /PAUSING

Figure 21 - DATE AND TIME SEND

9.2.7 ALARM LIST



AMHS INFORMATION

HSMS	Communication Status	Control Status	TSC Status
SELECTED	COMMUNICATING	ONLINE	AUTO /PAUSE /PAUSING

Figure 22 - ALARM LIST

10 Appendix

10.1 Using VID when synchronize

10.1.1 Transport System△2. 1

VID	Variable Name
118	CurrentPortStates
6	ControlState
119	EnhancedVehicles
73	TSCState
254	UnitAlarmStatList
76	EnhancedTransfers
91	EnhancedCarriers
360	LaneCutInfoList

10.2 Unknown Carrier Naming Rules△2.0

The following spec is temporally spec.
After the discussion with MES and MCS, this spec will be fixed.

1） IDR failure:

UNKNOWN-Old Carrier ID-ControllerID+IDR Position-YYMMDDhhmmssss(Sequence)
Example OHT: UNKNOWN-TRAY1234567890123-MFOHT100V101-190228075834888

2） Duplicate ID:

UNKNOWNDUP-Duplicated CassetteID-YYMMDDhhmmssss(Sequence)
Example: UNKNOWNDUP-TRAY1234567890123-190228075834888

Revision History

Date	Full Version	Description	Prepared by	Approved by
2018/05/31	1.0.0	First edition	H.Nakagawa	
2019/02/26	2.0.0	See △2.0	Y.LIN	

2019/05/10	2.1.0	Sync. Add LaneCutInfoList(360)	Y.LIN	
2019/06/18	3.0.0	Add ResultCode explanation Modify RPTID:2, 3	Y.LIN	
2019/06/25	4.0.0	See △4.0 Add Lane Event CEID 570, 571, RPTID:29 Delete ENABLING/DISABLING ALARMS	Y.LIN	
2019/07/01	4.1.0	Delete STATUS VARIABLE LIST Request Delete STAGEDELETE Delete PLANNED STOP Add LaneCutType	Y.LIN	
2019/10/04	4.2.0	See △4.2 AlarmID MainteState	Y.LIN	

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INTERBAY AND INTERABAY TRANSPORT COMMUNICATION SPECIFICATION

Full Version 1.9

Issued on 2019年10月8日

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