
Protocol description

STUDER ATR ES Bus Protocol Specifications of RS422 Serial Interface
for analog tape recorders STUDER A812, A816, A820-2CH, A820-MCH, A827-MCH

STUDER Norm-Nr. 10.85.1350

STUDER analog ATR ESbus communication interface

The specifications in this document conform to EBU technical publication
Tech. 3245 (ESbus) except all descriptions which concern the STUDER
analog ATR dialect.

The fundamental levels of the ESbus structure are:

- level 1 electrical and mechanical
- level 2 supervisory
- level 3 system service
- level 4 virtual machine

The ELECTRICAL/MECHANICAL level consists of the electrical and mechanical specifications which define the actual communication channel.

The SUPERVISORY level establishes communication between physical units and provides data synchronization, data transfer and error recovery services.

The SYSTEM SERVICE level provides such services as mapping logical address to physical address and identification of the dialect required for each type of machine used.

The VIRTUAL MACHINE level contains the general control language regardless of the characteristics of the physical machine and a distinct dialect corresponding to virtual machine (equipment) type (ATR, VTR etc)

In order to implement the complete ESbus communication according to the OSI model, the ESbus specification overhead must be respected. Therefore, the STUDER A816 subset of ESbus specification provides:

- level 1,2,3 compatibility
- specific STUDER message format (see section 2.2)
- specific STUDER analog ATR dialect on level 4 which is n o t a subset of recommended ESbus codes, but a completely different dialect created in mid of the 80ies in correspondence to the internal machine standard, when an international norm for ATR's has been absent. Therefore this dialect won't be supported in future, but will be replaced by another one, which will be compatible to the international ATR code language.

1. Electrical and mechanical interface specification

1.1. Communications Channel Definition

- a full-duplex four wire communication
- asynchronous, bit serial transmission via a balanced wire pair
- standard transmission rate 38.4 kbit/s
- the serial data word consists of one start bit (SPACE), eight data bits, a parity bit (EVEN) and one stop bit (MARK). The least significant bit is transmitted first.

1.2. Interface Circuit

The interface circuit is specified to meet the requirements of EIA-422 standard using differential line driver/receiver for digital data transmission over balanced lines.

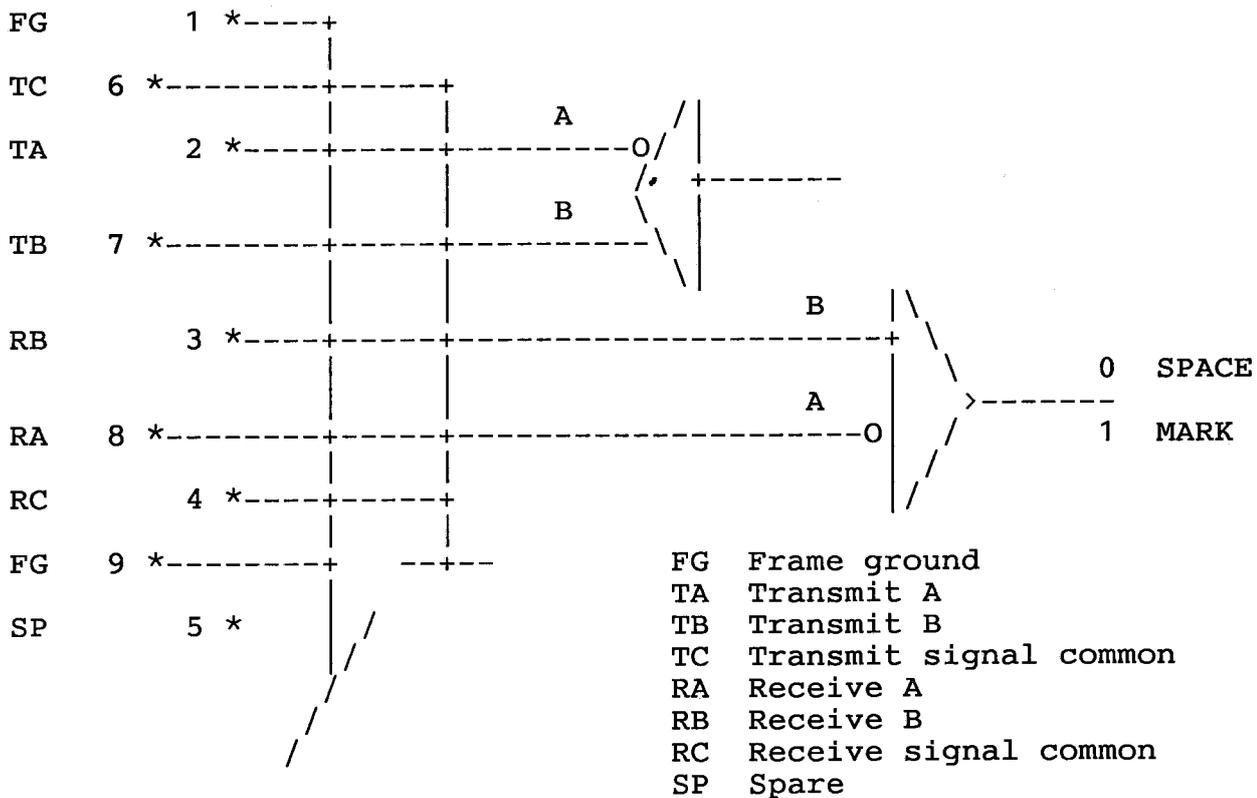
The B terminal of the line driver shall be positive with respect to the A terminal for a binary 1 (MARK) state.

The B terminal of the line driver shall be negative with respect to the A terminal for a binary 0 (SPACE) state.

1.3. Interface connector

The interface connector shall be a 9-pin-D-miniature female. The pin assignment shall be as shown in Fig.1:

FIG.1: connector pin assignment



2.1. Tributary operational states

A tributary shall be in one of five major operational states:

- IDLE** The tributary shall not perform any communications. It shall leave this state only in response to BREAK.
- ACTIVE** Prerequisite for transition to other operational states. The tributary shall enter this state whenever BREAK is received.
A tributary shall leave the ACTIVE state on receipt of an address which directs to the POLL, SELECT or GROUP SELECT states.
- POLL** A tributary shall enter the POLL state on receipt of its poll address.
The tributary shall transmit a single status byte to the bus controller from the following:
- | | | |
|-----|-----|--|
| 04h | ACK | Acknowledge |
| 05h | NAK | Negative acknowledge |
| 06h | BSY | Busy |
| 07h | RST | Reset |
| 08h | SVC | Service request
from controlled equipment |
- SELECT** A single tributary shall enter a communications mode with the bus controller on receipt of its select address.
- Receive message: format see 3.2. The tributary shall indicate error-free reception by responding with ACK and shall then return to the SELECT state, otherwise to the IDLE state.
- Transmit message: A tributary shall notify the bus controller that a message is waiting by transmitting SVC (08h) during POLL. On receipt of TEN (09h) while in SELECT, the tributary shall transmit a standard message block as defined in 3.2.
- GROUP SELECT** All tributaries or a selected group of tributaries shall enter a communications mode with the bus controller on receipt of their group select address.

2.2. Supervisory messages

Tributaries shall be directed to operational states through various communications sequences by supervisory messages as shown in Fig.2. Supervisory messages consist of the following elements:

- BREAK** Shall drive all tributaries to the ACTIVE state.
- (Addr Poll)** A tributary poll address (Addr Poll) shall drive the

addressed tributary to the POLL state.

(Addr Select) A tributary select address (Addr Sel) shall drive the addressed tributary to the SELECT state.

(Group Addr Sel) A group select address shall drive a group of tributaries to the GROUP SELECT state.

2.3. Supervisory characters

01h	GRP	Group assign
02h	STX	Start of message
03h	ESC	Escape
04h	ACK	Acknowledge
05h	NAK	Negative acknowledge
06h	BSY	Busy
07h	RST	Reset
08h	SVC	Service request from controlled equipment
09h	TEN	Transmit enable

3. Control messages

3.1. Message classification

The message specification conforms to the EBU-Technical Publication Tech.3245.

In accordance with the principles of communications layering, control messages are classified as follows:

- System service messages

In order to implement a complete ESbus communications standard, the ESbus-system service message shall be used to command the performance of system functions. These functions include, but are not limited to, the following:

- Segmentation and re-assembly

These processes enable the transfer of messages which exceed the maximum supervisory level message block length

- Blocking and deblocking

These processes enable the concatenation of messages within a single supervisory level message block.

- Virtual machine messages

These messages are used to pass commands and responses between CONTROLLER and DEVICE. They are initiated by CONTROLLER; responses originate in DEVICE. The receipt of a command message shall result in a defined action or response by DEVICE.

Responses are messages from DEVICE to CONTROLLER containing information which are held in an array of information (status) fields within DEVICE and which may be needed by CONTROLLER.

The virtual machine messages may be sub-divided into common messages (3.4), type specific messages (3.5) and user-defined messages (3.6).

3.2. Message formats

Messages between CONTROLLER and DEVICE will be sent in the following format (in an internationally standardized version):

<STX><BC><message><CS>

Supervisory character STX shall be followed by:

Byte 1	byte count (BC) of bytes 2 to n where max. n=256 (0:256).
Bytes 2 to n	message, max. 256 bytes
Byte n+1	checksum (CS), defined as 2's complement of the last significant byte of the sum of bytes 1 to n.

All control messages are formed as groups of bytes. The first byte of each message is the keyword.

A keyword specification defines the format of its argument. Messages are constructed in one of the following formats:

- format 1 <message> = <keyword>
- format 2 <message> = <keyword><parameter list>

where <parameter list> can be <parameter>
or <parameter list> can be <parameter group>

Attention: at STUDER ATR's the complete message length (including BC and
----- CS) is restricted to maximal 128 bytes, but only 1 keyword
in a message block (needs maximal <BC>+<keyword>+<parameter
list>+<CS> = 1+1+7+1 = 10 bytes) is recommended to avoid FIFO
buffer overflow states !

3.3. System service messages

This specification doesn't require implementation of the ESBUS system service message set.

3.4. Common messages

The messages which are common to all types of virtual machine (ATR, VTR, DAT, CD) as EXECUTE PROCEDURE (26h), EXTENSION (3Fh), DEFINE PROCEDURE (0Bh), DELETE PROCEDURE (0Ch) and ERROR (29h) are not implemented in the STUDER A816 subset of ESBUS protocol.

3.5. ATR specific messages

These messages can be found in official ESBUS protocol documents and won't be listed here, because they are not implemented in the implemented STUDER dialect, which is exclusively constructed on a set of user defined messages (see 3.6).

Attention: In the following STUDER ATR message tables the transport motion process tally ("TMPT"=60H) for indication of states as 'loop', 'locate' isn't provided, but is represented by tape motion state tally ("TMST"=61H), where all tape motion states are generated individually. That means either that superstates as 'loop' are composed by substates 'play' and 'locate' or that superstates as 'locate' are directly interpreted as substates, so they cannot be differentiated more. This causes some incompatibility with internationally standardized ATR protocol !

3.6. ESBUS compatible user-defined ATR functions

These messages represent substates of the <UDEF> commands and <UDND> tallies as described in table 4.2.3. Some examples:

Examp 1: activation of start control by command

<message> = <UDEF><udbc><STCN><kyst>

with <message> see context in 3.2.

<UDEF> = 3EH USER DEFINED keyword
<udbc> = 02H user defined byte count
<STCN> = 5DH START CONTROL keyword
<kyst> = 01H key status pressed

Examp 2: request of leader stop mode by command

<message> = <READ><UDND><udbc><LEAT>

with <message> see context in 3.2.

<READ> = 22H READ keyword
<UDND> = 3EH USER DEFINED tally
<udbc> = 01H user defined byte count
<LEAT> = 5EH LEADER STOP MODE tally

as response transmitted from tape recorder to ESBUS controller:

<message> = <IFRE><UDND><udbc><LEAT><lemo>

with <message> see context in 3.2.

<IFRE> = 23H I/F ITEM RESPONSE keyword
<UDND> = 3EH USER DEFINED tally
<udbc> = 02H user defined byte count
<LEAT> = 5EH LEADER STOP MODE tally
<lemo> = 00H leader stop mode off

4. Code tables

4.1. General remarks to the following tables

There are much more codes in the international ESBUS and in the STUDER internal command tables, which are n o t decoded in the STUDER A816 subset of ESBUS tables, mostly synchronizer and time code functions, which don't figure in lower table, that means which cannot be controlled by the STUDER A816 ESBUS interface. Otherwise, on a A820-2CH TC and a A812 TC machine, some TC commands are possible, but strongly restricted by fact, that TC selection is only possible (and then forced) if TC read/write unit is inserted in machine. In this case, TC is read by special output from machine and the timer source is not freely selectable on ESBUS IF communication bus. This comes from the concept of a A820-2CH and A812 simply to record TC on tape and to playback TC from tape, but not to generate TC by an internal TC generator.

Machine properties

"_" not implemented
"1" implemented at least in one option of the family
"x" optionally implemented in future

Machine names

machine family A812 means A812 mono, A812 2CH or A812 2CH+TC
machine family A820 means A820 mono, A820 2CH or A820 2CH+TC
machine family A816 means A816 2CH or A816 2CH+TC
machine family A820MCH means A820-MCH 1", A820-MCH 2", A820-MCH Umruest
machine family A827MCH means A827-MCH 1", A827-MCH 2", A827-MCH Umruest

4.2. Table of the internationally standardized STUDER codes <CC> of the ESbus protocol (realized subset & user defined functions) with indications to machine models which are concerned

4.2.1. Common Messages

4.2.1.1. Keywords

keyword/command					machine model				
ESbus=STUDER code	ESbus mnemonics	ESbus keyword	STUDER command	ESbus=STUDER parameter	A812 .34 &mor	A816 .22 &mor	A820 .33 &mor	A820 MCH	A827 MCH .27
20	CNOP	no opert	-	-	-	-	-	-	-
21	CRESET	reset	-	-	-	-	-	-	-
22	READ{}	status field request	status request	I/F name	1	1	1	1	1
23	IFRE{}	status field response	any status	byte0:I/F name byte1:I/F value evtl.bytes2..n	1	1	1	1	1
24	TSCE{}	timeline source	-		-	-	-	-	-
26	EXPR{}	execute procedur	-		-	-	-	-	-
27	DEEV{}	define event	-		-	-	-	-	-
28	CLEV{}	clear event	-		-	-	-	-	-
29	CERR{}	error	-		-	-	-	-	-
3E	UDEF{}	user defined	-	byte0: <BC> byte1:<keyword> byte2: <param> (see User Def table below!)	1	1	1	1	1
3F	CEXT{}	extenson	-		-	-	-	-	-

4.2.1.2.Tallies

tally/status request					machine model				
ESbus=STUDER code	ESbus mnemonics	ESbus tally	STUDER status request	ESbus=STUDER parameter	A812 .34 &mor	A816 .22 &mor	A820 .33 &mor	A820 MCH	A827 MCH .27
21	VTYP	virtual machine type	machine type?	3 = ATR	1	1	1	1	1
22	ETYP	equipmnt type	machine name?	<STUDER><CR> <A816><CR> <WW/YY><CR> (ASCII string of 18 resp.21 bytes at MCH) WW: week nr (at inoff.vers. = approx.week) YY: year nr	1	1	1	1	1
23	TIME	time standard	-		-	-	-	-	-
24	TTIM	timeline time	-		-	-	-	-	-
26	EBST	event buffer status	-		-	-	-	-	-
27	VMST	virtual machine status	-		-	-	-	-	-
3E	UDND	user defined	-	byte0: <BC> byte1: <tally> byte2: <param> (see User Def table below!)	1	1	1	1	1
3F	CIEX	extenson	-		-	-	-	-	-

4.2.2. Type Specific Messages

4.2.2.1. Keywords

keyword/command					machine model				
ESbus=STUDER code	ESbus mnemonics	ESbus keyword	STUDER command	ESbus=STUDER parameter	A812 .34 &mor	A816 .22 &mor	A820 .33 &mor	A820 MCH	A827 MCH .27
40	-	not used	-	-	-	-	-	-	-
41	STOP	stop	stop	-	1	1	1	1	1
42	VAPL{}	variable play	(rev) play vari- speed	000000:stop 010000:play FF0000:rev ply 018AD0=maximal play(vari)speed 00A5FE=minimal play(vari)speed FE7530=maximal rv play(v)speed FF5A02=minimal rv play(v)speed	1 1 - 1 1 1 - - - - 1 1	1 1 1 1 1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1 1 1 1 1
43	PLAY	play	play nominal speed	-	1	1	1	1	1

keyword/command					machine model				
ESbus=STUDER code	ESbus mnemonics	ESbus keyword	STUDER command	ESbus=STUDER parameter	A812 .34 &mor	A816 .22 &mor	A820 .33 &mor	A820 MCH	A827 MCH .27
44	STEP	step	-	-	-	-	-	-	-
45	AFST{}	audible fast	wind ctrl.w. demute	see SHUT=46	1	1	1	1	1
46	SHUT{}	shuttle	wind contrld with mute	b7=0/1 of byte0 ->forwrd/revers direction 0000XX=still 0100XX= fixed play speed 14ABXX=maximal speed at 30 ips resp. at 76cm/s 2956XX=maximal speed at 15 ips resp. at 38cm/s 52ACXX=maximal speed at 7.5ips resp. at 19cm/s 7FFFXX=maximal speed at 3.75ips resp. at 9.5cm/s FF00XX= fixed rev play speed EB55XX=max rev speed at 30 ips resp. at 76cm/s D6AAXX=max rev speed at 15 ips resp. at 38cm/s AD54XX=max rev speed at 7.5ips resp. at 19cm/s 8000XX=max rev speed at 3.75ips resp. at 9.5cm/s XX=don't care (any digit)	1	1	1	1	1

keyword/command					machine model				
ESbus=STUDER code	ESbus mnemonics	ESbus keyword	STUDER command	ESbus=STUDER parameter	A812 .34 &mor	A816 .22 &mor	A820 .33 &mor	A820 MCH	A827 MCH .27
47	-	not used	-	-	-	-	-	-	-
48	-	reserved	-	-	-	-	-	-	-
49	CAPS{}	capstan reference select	varispd source (only if mode active)	0: internal crystal 1: external	1	1	1	1	1
4A	REHS{}	rehearse select	rehears mode	0: rec disable = all ch safe & rehears fals 4: rehears true else:rec enable = all ch ready & rehears false	1	1	1	1	1
4B	RSTB	record strobe	punch in	-	1	1	1	1	1
4C	REEX	record exit	punch out	-	1	1	1	1	1
4D	TACS{}	tape code select	timer source	0:internal LTC 2: tape timer *)TC ch assigned -> <ACK>	1 1	- 1	1 1	1 *)	1 *)
4E	TASE{}	target search	locate address	see TATI=46	1	1	1	1	1
4F	LPRS	sync preroll search	-	-	-	-	-	-	-

keyword/command					machine model				
ESbus=STUDER code	ESbus mnemonics	ESbus keyword	STUDER command	ESbus=STUDER parameter	A812 .34 &mor	A816 .22 &mor	A820 .33 &mor	A820 MCH	A827 MCH .27
50	SYNC	sync	-	-	-	-	-	-	-
51	LOCK	lock	-	-	-	-	-	-	-
52	LPRS	lock preroll search	-	-	-	-	-	-	-
53	CHAS	chase	-	-	-	-	-	-	-
54	-	reserved	-	-	-	-	-	-	-
55	-	reserved	-	-	-	-	-	-	-
56	-	reserved	-	-	-	-	-	-	-
57	-	reserved	-	-	-	-	-	-	-
58	TARL	tape release	unload	-	-	-	-	-	-
59	FISS{}	fixed speed select	set nominal speed	20: 3.75 ips resp. 9.5cm/s 30: 7.5 ips resp. 19 cm/s 40: 15 ips resp. 38.1cm/s 50: 30 ips resp. 76.2cm/s	1	1	1	1	1
5A	-	not used	-	-	-	-	-	-	-
5B	-	not used	-	-	-	-	-	-	-
5C	-	not used	-	-	-	-	-	-	-
5D	-	not used	-	-	-	-	-	-	-
5E	-	not used	-	-	-	-	-	-	-
5F	-	not used	-	-	-	-	-	-	-

keyword/command					machine model				
ESbus=STUDER code	ESbus mnemonics	ESbus keyword	STUDER command	ESbus=STUDER parameter	A812 .34 &mor	A816 .22 &mor	A820 .33 &mor	A820 MCH	A827 MCH .27
60	PRST{}	preset	(re)set timer	byte0:I/F name=tapetimer(TATI) byte1:10**1hour b7 of byte1:0/1=pos/neg sign byte2:10**0hour byte3:10**1min byte4:10**0min byte5:10**1sec byte6:10**0sec byte7:10**-1sec	1	1	1	1	1
61	FFOR	fast forward	wind forward	-	1	1	1	1	1
62	FREV	fast reverse	rewind	-	1	1	1	1	1
63	-	not used	-	-	-	-	-	-	-
64	RECS{}	record ready select	channel rea/saf status	bits0/1=ch1/2 0:safe 1:ready)3bytes bitmap b0..b23:ch1..24	1	1	1	1)	1)
65	-	not used	-	-	-	-	-	-	-
66	AUAS{}	auto attenuat select	channel mute (remot)	1:remote mute 0:remot demute	1	1	1	1	1
67	TLDS{}	lifter defeat select	lifter	0:off=tape not on heads; <>0:on=tape on heads	1	1	1	1	1
68	-	not used	-	-	-	-	-	-	-
69	-	not used	-	-	-	-	-	-	-
6A	-	not used	-	-	-	-	-	-	-
6B	-	not used	-	-	-	-	-	-	-
6C	-	not used	-	-	-	-	-	-	-
6D	-	not used	-	-	-	-	-	-	-
6E	-	not used	-	-	-	-	-	-	-
6F	-	not used	-	-	-	-	-	-	-

keyword/command					machine model				
ESbus=STUDER code	ESbus mnemonics	ESbus keyword	STUDER command	ESbus=STUDER parameter	A812 .34 &mor	A816 .22 &mor	A820 .33 &mor	A820 MCH	A827 MCH .27
70	LKMS{}	lock mode select	-		-	-	-	-	-
71	MONS{}	global monitor select	channel output	3:input 2:sync 1:repro	1	1	1	1	1
72	ESYS{}	exclusiv sync select	sync		x	x	x	x	x
73	SYIS{}	sync input select	auto input mode	0: record 1: rec/not play (STUDER mode A) 2: rec or ready (STUDER mode B)	1	1	1	1	1
74	-	not used	-	-	-	-	-	-	-
75	-	not used	-	-	-	-	-	-	-
76	-	not used	-	-	-	-	-	-	-
77	-	not used	-	-	-	-	-	-	-
78	-	not used	-	-	-	-	-	-	-
79	-	not used	-	-	-	-	-	-	-
7A	LLOS{}	local lockout select	-	0: local ctrl enabled 1: local ctrl disabled	1	1	1	1	1
7B	-	not used	-	-	-	-	-	-	-
7C	PLMS{}	play mod select	-		-	-	-	-	-

4.2.2.2.Tallies

tally/status request					machine model				
ESbus=STUDER code	ESbus mnemonics	ESbus tally	STUDER status request	ESbus=STUDER parameter	A812 .34 &mor	A816 .22 &mor	A820 .33 &mor	A820 MCH	A827 MCH .27
21	VTYP	virtual machine type	machine type?	3 = <ATR>	1	1	1	1	1
22	ETYP	equipmnt type	machine name?	<STUDER><CR> <name><CR> <WW/YY><CR> <name>=<A812>, <A816>, <A820> <A820MCH> or <A827MCH>	1	1	1	1	1
40	-	not used	-		-	-	-	-	-
41	INTC	internal LTC	-	0/1 = valid/ non valid LTC)TC ch assigned -> valid	1	-	1	1*)	1*)
42	-	not used	-		-	-	-	-	-
43	SETC	selected tape cod	-		-	-	-	-	-
44	INUB	internal LTCusbit	-		-	-	-	-	-
45	-	not used	-		-	-	-	-	-
46	TATI	tape timer	timer?	byte0:10**1hour b7 of byte0:0/1 =pos/neg sign byte1:10**0hour byte2:10**1min byte3:10**0min byte4:10**1sec byte5:10**0sec byte6:10**-1sec	1	1	1	1	1
47	-	not used	-		-	-	-	-	-
48	-	reserved	-		-	-	-	-	-
49	CRET	capstan reference tally	varispd mode?	0: internal crystal 1: external	1	1	1	1	1

tally/status request					machine model				
ESbus= STUDER code	ESbus mnemo nics	ESbus tally	STUDER status request	ESbus= STUDER parameter	A812 .34 &mor	A816 .22 &mor	A820 .33 &mor	A820 MCH	A827 MCH .27
4A	REHT	rehearse tally	rehears mode?	0:rec disabled = all ch safe 4:rehears true 5:rec enabled =channel ready & rehearse off	1	1	1	1	1
4B	CRES	channel record status	ch rec /n.rec status?	bits0/1=ch1/2 1=recording *)3bytes bitmap b0..b23:ch1..24	1	1	1	1 *)	1 *)
4C	-	not used	-		-	-	-	-	-
4D	TACT	tape cod select tally	timer source?	0 = intern LTC 2 = tape timer *)TC ch assign- ned -> valid	1 1	- 1	1 1	1 *)	1 *)
4E	SVTY	sync velocity	-		-	-	-	-	-
4F	PRDU	preroll duration	-		-	-	-	-	-

tally/status request					machine model				
ESbus=STUDER code	ESbus mnemonics	ESbus tally	STUDER status request	ESbus=STUDER parameter	A812 .34 &mor	A816 .22 &mor	A820 .33 &mor	A820 MCH	A827 MCH .27
50	SPNT	sync point	-		-	-	-	-	-
51	LKTT	locktime	-		-	-	-	-	-
52	-	not used	-		-	-	-	-	-
53	-	not used	-		-	-	-	-	-
54	-	reserved	-		-	-	-	-	-
55	-	reserved	-		-	-	-	-	-
56	-	reserved	-		-	-	-	-	-
57	-	reserved	-		-	-	-	-	-
58	-	not used	-		-	-	-	-	-
59	FIST	fixed speed tally	nominal speed?	20: 3.75 ips resp. 9.5cm/s 30: 7.5 ips resp. 19 cm/s 40: 15 ips resp. 38.1cm/s 50: 30 ips resp. 76.2cm/s	1	1	1	1	1
5A	TLTH	tape length	-		-	-	-	-	-
5B	-	not used	-		-	-	-	-	-
5C	SLAC	sync/loc accuracy	-		-	-	-	-	-
5D	LKDE	lock deviaton	-		-	-	-	-	-
5E	-	not used	-		-	-	-	-	-
5F	-	not used	-		-	-	-	-	-

tally/status request					machine model				
ESbus=STUDER code	ESbus mnemonics	ESbus tally	STUDER status request	ESbus=STUDER parameter	A812 .34 &mor	A816 .22 &mor	A820 .33 &mor	A820 MCH	A827 MCH .27
60	TMPT	transport	motion process	tally	-> see chapter 3.5 !!!				
61	TMST	transprt motion state tally	tape deck ach status?	byte0:I/F name=td status byte1: 0=trying 1=successfull 2=failure	1	1	1	1	1
62	VELT	velocity tally	speed value?	010000:play FF0000:rev ply >0: vspd ply <0:rev vspd ply	1	1	1	1	1
63	-	not used	-		-	-	-	-	-
64	RECT	record ready tally	ch safe /no saf status?	bits0/1=ch1/2 1=rec ready true *)3bytes bitmap b0..b23:ch1..24	1	1	1	1*)	1*)
65	-	not used	-		-	-	-	-	-
66	AUAT	auto attenuat tally	channel mute? (remot)	0/1 = remote mute off/on	1	1	1	1	1
67	TLDT	lifter defeat tally	lifter?	0/1=lifter defeat off/on	1	1	1	1	1
68	-	reserved	-		-	-	-	-	-
69	-	reserved	-		-	-	-	-	-
6A	-	reserved	-		-	-	-	-	-
6B	-	reserved	-		-	-	-	-	-
6C	-	reserved	-		-	-	-	-	-
6D	-	reserved	-		-	-	-	-	-
6E	-	reserved	-		-	-	-	-	-
6F	-	reserved	-		-	-	-	-	-

tally/status request					machine model				
ESbus= STUDER code	ESbus mnemo nics	ESbus tally	STUDER status request	ESbus= STUDER parameter	A812 .34 &mor	A816 .22 &mor	A820 .33 &mor	A820 MCH	A827 MCH .27
70	LKMT	lock mode tally	-		-	-	-	-	-
71	MONT	global monitor tally	channel output state?	1=playback 2=synch playbck 3=input	1	1	1	1	1
72	ESYT	exclusiv sync tally	sync	bits0/1=ch1/2	x	x	x	x	x
73	SYIT	sync input tally	auto input mode?	0: record 1: rec/not play (STUDER mode A) 2: rec or ready (STUDER mode B)	1	1	1	1	1
74	EXTC	external timecode	-	0: valid tc 1: not valid tc *)TC ch assign- ned & in input	1	-	1	1 *)	1 *)
75	EXUB	external userbits	-		-	-	-	-	-
76	SLRT	slewrates	-		-	-	-	-	-
77	ROFT	requestd offset	-		-	-	-	-	-
78	AOFT	actual offset	-		-	-	-	-	-
79	STLT	stride length	-		-	-	-	-	-
7A	LLOT	local lockout tally	-	0: local ctrl enabled 1: local ctrl disabled	1	1	1	1	1
7B	TCAT	timecode attribut	-	00H = 24 frm/s 01H = 25 frm/s 02H = 30 frm/s 12H = 29.97frm/s	1	-	1	-	-
7C	PLMT	play mod tally	-		-	-	-	-	-

4.2.3. User Defined Messages

4.2.3.1. Keywords

keyword/command					machine model				
User Define code	User Define mnemonics	User Defined byte count	User Defined cmd = keyword	User Defined parameter	A812 .34 &mor	A816 .23 &mor	A820 2CH .33 &mor	A820 MCH	A827 MCH .27
5B	LEOF	02	set leader offset	<offset value> 00..FF	-	1	-	-	-
5C	CALY	01	set tape colour	-	-	1	-	-	-
5D	STCN	02	start control	<key status> 0 = released 1 = pressed	-	1	-	-	-
5E	LEAD	02	leader stop	<mode> 0/1 = off/on	-	1	-	-	-
5F	VLIF	02	vertical lifter	<position> 0 = inactive 1 = active	-	1	-	-	-

4.2.3.2. Tallies

tally/status request					machine model				
User Define code	User Define mnemonics	User Defined byte count	User Defined status= tally	User Defined parameter	A812 .34 &mor	A816 .23 &mor	A820 2CH .33 &mor	A820 MCH	A827 MCH .27
5B	LOFT	02	leader offset?	<offset value> 00..FF	-	1	-	-	-
5C	YELT	02	tape colour?	<tap.transpar.> 0 = yellow 1 = magnetic	-	1	-	-	-
5D	STCT	02	start contrl?	<fct status> 0 = inactive 1 = active	-	1	-	-	-
5E	LEAT	02	leader stop?	<mode> 0/1 = off/on	-	1	-	-	-
5F	VLIT	02	vertical lifter?	<position> 0 = inactive 1 = active	-	1	-	-	-

file es_bus.t

author: oscity

Last update: see next page

Changes

17.-22.01.92 : initializing date
10. 11.92 : 1st revision
04.-05.03.93 : 2nd revision: copy to A816 documentation
08.04.93 : restriction for message length at STUDER ATR's described
29.03.94 : tallies 21h=virtual machine type & 22h=equipment type
introduced with 03h=ATR & 'STUDER A816 WW/YY' as answers
08.07.94 : user defined (3Eh) and virtual machine (device) type
(21h) are now part of STUDER A816 ESbus protocol, so
these exclusions eliminated in general description 3.4.
"Common messages"
11.07.94 : Auto Attenuate Select/Tally beziehen sich nicht auf den
Auto Mute Modus, sondern auf den Remote Mute Modus
14.07.94 : User Defined Command & Tallies UDEF & UDND with
STCN,LED,VLIF,STCT,LEAT,VLIT subcodes introduced
30.08.94 : REHS (4ah) corrected: in "0" state reh mode OFF by
default although ON required, because ON impossible on a
STUDER tape recorder if channels are safe
28.02.95 : A812 & A820-2CH added
28.03.95 : A816 parameter range for AFST(45h) resp.SHUT(46h) adopted
to same as other machines to greater limit (as on RS232)
25.09.96 : A816 User Defined Commands & Tallies LEOF,CALY,LOFT,YELT
24.02.97 : A820MCH & A827MCH added with modification to 24 audio
channels instead of 2 or 2+tc