S T U D E R P R O F . A U D I O A G 30.07.1997

Protocol description

ASCII Protocol Specifications of RS232 Serial Interface for analog tape recorders
REVOX C270, STUDER A807, STUDER A810, STUDER A812, STUDER A816, STUDER A820-2CH

STUDER Norm-Nr. 10.85.1330

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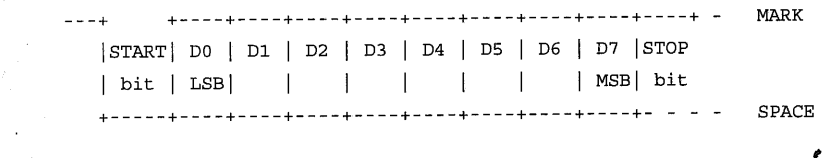
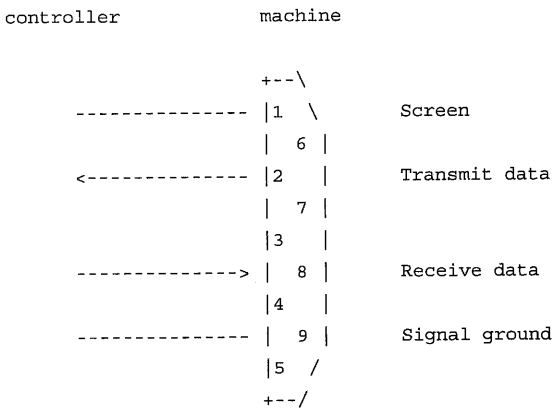
1. COMMUNICATION FORMAT

Asynchronous, bit serial signal
- according to RS 232 C specifications;
- full duplex communication channel;
- data transmission rate: 9600 bauds;
- word composition as follow:
  1 START bit, 8 data bits, no parity, 1 STOP bit;



Connector specifications
- 9 pin connector, D type, (SMPTE/BUS / RS232 connector);
- pin out:



2. MESSAGE FORMAT

The communication between the STUDER machine and the controller is implemented through ASCII coded strings of not fixed length.

A message string is composed by ASCII characters:
capital letters, "?", " ", figures and the following control characters

'CR'	(0Dh)
'LF'	(0Ah)
'CX'	(18h)
'XOFF'	(13h)
'XON'	(11h)

All commands mnemonics have a length of 3 characters and are usually terminated by a 'CR'.
Only commands with parameters vary in length. The additional characters are inserted between the command and 'CR'.

The parameters are separed by blanks or colons. There are some exceptions: commands which do not have termination characters. Please refer to the individual command description for the exact syntax of each command.

The STUDER machine uses the sequence 'CR LF' as acknowledge message or to terminate the answer string.

Ex:

"WNF 0400" 'CR' = controlled wind forward at 4 times nominal speed

WNF = command, controlled wind forward
0400 = parameter, 0400h coded as ASCII string

the controller will send to the machine:

character	ASCII code sent
'W'	57h
'N'	4Eh
'F'	46h
' '	20h
'0'	30h
'4'	34h
'0'	30h
'0'	30h
'CR'	0Dh

The machine should answer:

'CR'	0Dh
'LF'	0Ah

The 'CX' control character is used by the controller to reset asynchronously the STUDER machine's communication port.

'XOFF' and 'XON' are used by the machine as handshake characters.

For terminal operation the machine's communication port can operate in 'echo mode'. In this mode, an echo of each character is sent back to the controller, and a prompt ('>') is sent after the answer string.
The 'echo mode' may be set via the machine menu. It should not be used for computer remote control.

3. COMMUNICATION PROTOCOL

a) general informations

The communication between the controller and the STUDER machine is a master-slave protocol. The controller is the master and it should take initiative in the communication. The communication has to fulfill the following specifications:

- the machine has to acknowledge a command with a 'CR LF' within 100 msec from the moment that the command's last byte is received;

- the machine's communication port is asynchronously resetted (both receiver and transmitter) by a 'CX' sent by the controller, and it has to acknowledge it with a 'CR LF' in the specified time;

- the machine can interrupt the controller in any moment by sending an 'XOFF' and recover the connection sending an 'XON'. They do not have to be acknowledged by controller;

- for the controller, there is no time specification for the interval between two bytes of a command;

- the controller should not output the next command before receiving the machine's answer (exception: 'CX').

b) Error messages

If a message is not understood by the machine, it shall be ackowledged by:

"?" 'CR LF'

If the machine is in 'echo mode', or with old versions of machine software, it is also possible to have:

"INPUT FORMAT ERROR !" 'CR LF'

At A816, only if the machine is in 'echo mode', the messages

"SWITCH EDIT LEVER TO NORMAL POSITION, PLEASE !" 'CR LF'

resp. "OVERRUN FRAMING ERROR !" 'CR LF'

are also possible.

c) Notes:

- After power on, the machine may announce itself with a welcome message of some length;

- After a power on or an error message, it is recommended to initialize the communication by sending 'CX'. The communication is established as soon the machine answers with 'CR LF' within the specified time. Then the communication can be considered restored.

- The machine is capable to handle at least 10 commands per second without XOFF-XON interference.

- After the reception of a command the machine should answer with an updated status. E.g. if the command was a "PLY", the machine must answer with 'play not achieved' or 'play achieved'.

- If a command cannot be executed, the machine may answer with a 'not achieved' status, which will be replaced by the actual machine status. E.g. sending a PLY during tapeout the machine may answer with 'play not achieved' before going back to 'tapeout'.

- A locate command has a particular option. It can be followed by a command 'play' or 'record'. This preselection means that, once the locate is terminated, the machine will go in play or record. Preselection commands (play or record) can be repeated without cancelling the execution of the locate command.

  The status corresponding to a locate command is 'locate wind forward' or 'locate rewind', either 'achieved' or 'not achieved'. In addition, the machine may also answer 'play not achieved' or 'record not achieved', if play or record has been preselected.

  A normal locate command is considered completed when the machine sends a stop status. When the execution of 'locate' with a preselection of play or record is completed, the machine sends back a status of 'play achieved' respectively 'record achieved'.

- There are two exceptions to the upper description in the A810, A807 and C27X machines. The commands "F" and "R" are not followed by the acknowledgement 'CR LF'. That helps to increase the data transfer rate.

Explanations to the following tables

Syntax of input/output strings

[-,A,B,C] means '-' or 'A' or 'B' or 'C' is definitively expected
(-,A,B,C) means '-' or 'A' or 'B' or 'C' is possibly expected

Machine properties

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

Machine names

machine family C27x means C270 or C274 or C278
machine family A807 means A807 2CH or A807 4CH
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

TAPE DECK COMMANDS

sign set	machine 27X	807	810	812	820	816	input	output	meaning
STP	1	1	1	1	1	1	STP [,CR]	CR LF	stop
EDI	1	-	-	1	1	1	EDI [,CR]	CR LF	edit
PLY	1	1	1	1	1	1	PLY [,CR]	CR LF	play
RPL	1	-	-	-	1	1	RPL [,CR]	CR LF	reverse play
REC	1	1	1	1	1	1	REC [,CR]	CR LF	record
FWD	1	1	1	1	1	1	FWD [,CR]	CR LF	forward
RWD	1	1	1	1	1	1	RWD [,CR]	CR LF	rewind
WNR	-	1	-	1	1	-	WNR [ ] <xxxx>	CR LF	controlled wind reverse
<SPEED>	-	-	-	-	-	1	WNR [ ] <xxxx> [,CR]		
							(0 <= xxxx <= 5FFFH)		
WNF	-	1	-	1	1	-	WNF [ ] <xxxx>	CR LF	controlled wind forward
<SPEED>	-	-	-	-	-	1	WNF [ ] <xxxx> [,CR]		
							(0 <= xxxx <= 5FFFH)		
TPL	-	-	1	-	-	-	TPL [,CR]	CR LF	tape load
TPN	1	-	-	-	-	-	TPN [,CR]	CR LF	tape dump on
TPF	1	-	-	-	-	-	TPF [,CR]	CR LF	tape dump off
F	1	-	1	-	-	-	F [,CR]		forward used by synchronizer (needs ESY !!)
R	1	-	1	-	-	-	R [,CR]		rewind used by synchronizer (needs ESY !!)

TAPE DECK COMMANDS

sign set	machine 27X	807	810	812	820	816	input	output	meaning
SHS	1	-	1	-	-	-	SHS [,CR]	CR LF	set high speed (2 speeds only)
SLS	1	-	1	-	-	-	SLS [,CR]	CR LF	set low speed (2 speeds only)
SSA	-	1	-	1	1	1	SSA [,CR]	CR LF	set play speed A (3.75 IPS)
SSB	-	1	-	1	1	1	SSB [,CR]	CR LF	set play speed B (7.50 IPS)
SSC	-	1	-	1	1	1	SSC [,CR]	CR LF	set play speed C (15 IPS)
SSD	-	1	-	1	1	1	SSD [,CR]	CR LF	set play speed D (30 IPS)
SVP	-	-	-	1	1	1	SVP [ ] xxxxxx [,CR]	CR LF	set varispeed parameter 0A5FE <=xxxxxx <=018ACE (hex) parameter refers to nominal speed, signless, independent of tape deck status 010000 = nominal (fixed) speed
NS?	1	-	-	-	-	-	NS? [,CR]	xx CR LF xx=03..05 for 3.75..15 ips	nominal speed ?
	-	1	1	-	-	1	NS? [,CR]	xx CR LF xx=00..03 for 3.75..30 ips	
	-	-	-	1	1	-	NS? [,CR]	yy IPS CR LF yy=3.75..7.5..15..30	
VS?	-	-	-	1	1	1	VS? [,CR]	xxxxxx CR LF	varispeed parameter ? 0A5FE<= xxxxxx <=018ACE (hex) parameter refers to nominal speed, signless, independent of tape deck status 010000 = nominal (fixed) speed
SVS	1	-	1	1	1	1	SVS [,CR]	CR LF	varispeed on
CVS	1	-	1	1	1	1	CVS [,CR]	CR LF	varispeed off
VEN	-	1	-	1	1	1	VEN [,CR]	CR LF	external varispeed on
VEF	-	1	-	1	1	1	VEF [,CR]	CR LF	external varispeed off

TAPE DECK COMMANDS

sign set	machine 27X	807	810	812	820	816	input	output	meaning
FEN	1	1	-	1	1	1	FEN [,CR]	CR LF	fader enable on
FEF	1	1	-	1	1	1	FEF [,CR]	CR LF	fader enable off
EDT	-	1	1	1	1	1	EDT [,CR]	CR LF	lifter mode (defeat) on (tape on heads)
LFT	-	1	1	1	1	1	LFT [,CR]	CR LF	lifter mode (defeat) off (tape not on heads)
LOC	-	1	1	-	-	-	LOC [ ]<(-)hh[,:]mm[,:]ss>	CR LF	locate to address < >
<address>	1	-	-	-	-	-	LOC [ ]<(-)hh[,:]mm[,:]ss> [,CR]		
	-	-	-	1	1	-	LOC [ ] <(-)hh[,:]mm[,:] ss[,:] x> x=dsec		
	-	-	-	-	-	1	LOC [ ] <(-)hh[,:]mm[,:] ss[,:] x> [,CR] x=dsec		
LMV	1	1	-	-	-	-	LMV [ ] <xxxxxx> [,CR] 3 Byte (hex)	CR LF	locate move roll < >
<address>	-	-	1	-	-	-	LMV [ ] <xxxxxx> 3 Byte (hex)	CR LF	locate move roll < >
	-	-	-	1	1	-	LMV [ ] <xxxxxxxx> 4 Byte (hex)	CR LF	locate move roll < >
	-	-	-	-	-	1	LMV [ ] <xxxxxxxx> [,CR] 4 Byte (hex)	CR LF	locate move roll < >
ZLO	-	-	-	1	1	1	ZLO [,CR]	CR LF	locate to zero
LZA	1	-	-	-	-	-	LZA [,CR]	CR LF	locate to zero
LAD	1	-	-	-	-	-	LAD [,CR]	CR LF	locate to address 1
LA?	1	-	-	-	-	-	LA? [,CR]	(-)hh:mm:ss CR LF	locate address 1 ?
LOP	1	-	-	-	-	-	LOP [,CR]	CR LF	auto loop <0000,locate 1 addr>

TAPE DECK COMMANDS

sign set	machine 27X	807	810	812	820	816	input	output	meaning
MV?	1	1	1	-	-	-	MV? [,CR]	xxxxxx CR LF	move roll counter ?
	-	-	-	1	1	-	MV? [,CR]	xx[ ]xx[ ]xx[ ]xx CR LF	move roll counter ?
	-	-	-	-	-	1	MV? [,CR]	xxxxxxxx CR LF	move roll counter ?
STM	-	1	1	-	-	-	STM [ ] <(-)hh[,:]mm[,:]ss	CR LF	set timer to address < >
<address>	1	-	-	-	-	-	STM [ ] <(-)hh[,:]mm[,:]ss		set timer to address < >
							[,CR]		
	-	-	-	1	1	-	STM [ ] <(-)hh[,:]mm[,:]		set timer on address < >
							ss[,:]x> x=dsec		-9:59:59:9<ADDR<23:59:59:9
	-	-	-	-	-	1	STM [ ] <(-)hh[,:]mm[,:]		set timer on address < >
							ss[,:]x> [,CR] x=dsec		-9:59:59:9<ADDR<23:59:59:9
RTI	-	-	-	1	1	1	RTI [,CR]	CR LF	reset timer
RTM	1	-	-	-	-	-	RTM [,CR]	CR LF	reset timer
TRA	1	-	-	-	-	-	TRA [,CR]	CR LF	transfer actual timer into locate 1 address
SLA	1	-	-	-	-	-	SLA [ ]<(-)hh[,:]mm[,:]ss>	CR LF	set locate 1 address to < >
							[,CR]		
TM?	1	1	1	-	-	-	TM? [,CR]	(-)hh:mm:ss,xx CR LF	timer ?
								xx=xx/256 sec	
	-	-	-	1	1	1	TM? [,CR]	[-,u,o,h] h:mm:ss:x CR LF	timer? -9:59:59<ADDR<23:59:59
								u=under-, o=overflow, x=dsec	
DST	-	1	1	-	-	-	DST [,CR]	CR LF[_]	display machine status:
									locate_address[__]
								hh:mm:ss,x[__]	actual_timer[__]
								hh:mm:ss,x[__]	achieved_status
								status[____]achieved	(exit by 'CX')
	-	-	-	1	1	1	DST [,CR]	CR LF hh:mm:ss:x..nn..tttttt	display machine status:
									actual_timer..status_code..
								nn defined in field of 'ST?'	..status_text[___]achieved
								except: rec indic B= 0AH/8AH	(exit by 'CX')

TAPE DECK COMMANDS

sign set	machine 27X	807	810	812	820	816	input	output	meaning
ST?	1	1	1	1	1	1	ST? [,CR]	xx CR LF	tape deck status ?
	-	-	1	-	-	-		xx: 00 = tape out	
	1	1	-	1	1	1		01 = tape out	
	1	1	-	1	1	1		81 = tape out achieved	
	-	-	1	-	-	-		02 = tape dump	
	1	1	-	1	1	1		02 = stop	
	-	-	1	-	-	-		82 = tape dump achieved	
	1	1	-	1	1	1		82 = stop achieved	
	1	1	1	1	1	1		03 = rewind	
	1	1	1	1	1	1		83 = rewind achieved	
	-	-	1	-	-	-		04 = stop	
	1	1	-	1	1	1		04 = forward	
	-	-	1	-	-	-		84 = stop achieved	
	1	1	-	1	1	1		84 = forward achieved	
	1	1	1	1	1	1		05 = play	
	1	1	1	1	1	1		85 = play achieved	
	-	-	1	-	-	-		06 = rewind	
	1	1	-	1	1	1		06 = play varispeed	
	-	-	1	-	-	-		86 = rewind achieved	
	1	1	-	1	1	1		86 = play vari achieved	
	-	-	-	x	x	-		07 = play internal ref	
	-	-	-	x	x	-		87 = play int ref ach	
	-	-	1	-	-	-		08 = forward	
	1	1	-	1	1	1		08 = play external ref	
	-	-	1	-	-	-		88 = forward achieved	
	1	1	-	1	1	1		88 = play ext ref ach	
	1	1	-	1	1	1		09 = record	
								or rehearse record	
	1	1	-	1	1	1		89 = record achieved	
								or rehearse rec ach	
	-	-	1	-	-	-		0A = play	
	-	-	1	-	-	-		8A = play achieved	
	1	-	-	1	1	1		0B = edit	
	1	-	-	1	1	1		8B = edit achieved	
	-	-	1	-	-	-		0C = record	
	1	-	-	-	-	-		0C = play fader	
	-	-	1	-	-	-		8C = record achieved	
	1	-	-	-	-	-		8C = play fader achieved	
	-	-	1	-	-	-		10 = locate wind	
	-	-	1	-	-	-		12 = locate play	
	-	1	-	1	1	1		25 = reverse play	
	-	1	-	1	1	1		A5 = reverse play ach.	
	-	-	-	1	1	1		26 = reverse play vari	
	-	-	-	1	1	1		A6 = rev play vari ach.	
	-	-	-	1	1	1		27 = rev play int ref	
	-	-	-	1	1	1		A7 = rev ply int ref ach	
	-	-	-	1	1	1		28 = rev play ext ref	
	-	-	-	1	1	1		A8 = rev ply ext ref ach	
	-	-	-	-	-	-		29 = reverse record	
								or rehearse rev rec	
	-	-	-	-	-	-		A9 = reverse record ach	
								or reh rev rec ach	

TAPE DECK COMMANDS

sign set	machine 27X	807	810	812	820	816	input	output	meaning
	-	1	-	1	1	1		40 = shuttle backward	
	-	1	-	1	1	1		C0 = shuttle backw ach	
	-	1	-	1	1	1		41 = shuttle forward	
	-	1	-	1	1	1		C1 = shuttle forw ach	
	1	1	1	1	1	1		42 = locate rewind	
	1	1	1	1	1	1		C2 = locate rewind ach	
	1	1	1	1	1	1		43 = locate forward	
	1	1	1	1	1	1		C3 = locate forward ach	
	-	-	-	-	-	-		44 = locate play reverse	
	-	-	-	-	-	-		C4 = loc play revers ach	
	1	-	-	-	-	-		45 = locate play forw	
	1	-	-	-	-	-		C5 = loc play forw ach	
	1	-	-	1	1	1		46 = cueing reverse	
	1	-	-	1	1	1		C6 = cueing reverse ach	
	1	-	-	1	1	1		47 = cueing forward	
	1	-	-	1	1	1		C7 = cueing forward ach	
	1	-	-	-	-	-		48 = position play rev	
	1	-	-	-	-	-		C8 = position ply rv ach	
	-	-	-	-	-	-		49 = position play forw	
	-	-	-	-	-	-		C9 = position ply fw ach	
	-	1	1	1	1	1		4A = rewind controlled	
	-	1	1	1	1	1		CA = rewind contrl ach	
	-	1	1	1	1	1		4B = wind forw contrl	
	-	1	1	1	1	1		CB = wind forw ctrl ach	
	-	-	-	-	-	1		4C = rewind sht dev	
	-	-	-	-	-	1		CC = rewind sht dev ach	
	-	-	-	-	-	1		4D = wind forw sht dev	
	-	-	-	-	-	1		CD = wind fwd sht dev ac	
	1	1	1	1	1	1		59 = tape dump	
	1	1	1	1	1	1		D9 = tape dump achieved	
	-	-	-	1	1	1		5A = cut	
	-	-	-	1	1	1		DA = cut achieved	
	-	-	-	1	1	1		DD = burn in achieved	
LS?	1	-	-	-	-	-	LS? [,CR]	xx CR LF	locator status ?
	1	-	-	-	-	-		xx: 00 = not locate	
	1	-	-	-	-	-		01 = zero locate	
	1	-	-	-	-	-		02 = address locate	
	1	-	-	-	-	-		03 = search	
	1	-	-	-	-	-		04 = auto loop	
	1	-	-	-	-	-		05 = autoreverse	
	1	-	-	-	-	-		10 = autorewind	
	1	-	-	-	-	-		20 = play preselected	
PR?	-	-	1	-	-	-	PR? [,CR]	[Y,N] CR LF	is pressure possible ?
CS?	-	-	1	-	-	-	CS? [,CR]	[Y,N] CR LF	is capstan synchron ?

TAPE DECK COMMANDS

sign set	machine 27X	807	810	812	820	816	input	output	meaning
TP?	-	-	-	1	1	1	TP? [,CR]	aabbccddeeff gghhiijjkkll CR LF tape width 1/4": aa: tape tension play left bb: tape tension play right cc: tape tension wind dd: tape tension edit ee: ttension rev play left ff: ttension rev play right tape width 1/2": gg: tape tension play left hh: tape tension play right ii: tape tension wind jj: tape tension edit kk: ttension rev play left ll: ttension rev play right ttens rev play only at A820	tape tension parameter ?
DCD	-	-	-	1	1	-	DCD [,CR]	CR LF xxxx CAP xxxx	display capstan (deviation) capstan deviation
	-	-	-	-	-	1			8800(H) = nominal 9.525 cm/s
				-	-	1			9000(H) = nominal 19.05 cm/s
				-	-	1			A000(H) = nominal 38.1 cm/s
				-	-	1			C000(H) = nominal 76.2 cm/s
				-	-	1			0800(H) = nominal 3.75 ips
				1	1	-			1000(H) = nominal 7.5 ips
				1	1	-			2000(H) = nominal 15 ips
				1	1	-			4000(H) = nominal 30 ips
				1	1	-			(exit by 'CX')
SP?	-	-	-	-	-	1	SP? [,CR]	xx CR LF	xx = nr of splices resp. takes offset (hex)
DSN	-	-	-	-	-	1	DSN [,CR]	SPLICE xx yy:yy:yy:y CR LF resp. TAKE xx yy:yy:yy:y CR LF	display on splice number resp. takes at leader stop xx = nr of splices since cmd resp.takes since leader stop (updated after each event) threshold: 0.85mm at 9.5cm/s 1.7mm at 19 cm/s 3.4mm at 38 cm/s 6.8mm at 76 cm/s max splice 104.16mm(any speed) =280 movepulses *0.372mm/pulse yy:yy:yy:y = address
DSF	-	-	-	-	-	1	DSF [,CR]	CR LF	display off splice number resp.nr of takes(leader stop)

AUDIO COMMANDS

sign set	machine 27X	807	810	812	820	816	input	output	meaning
SMN	-	-	1	1	1	1	SMN [,CR]	CR LF	set mono (only with mo-st sw.)
SST	-	-	1	1	1	1	SST [,CR]	CR LF	set stereo (mo-st sw.)
ION	-	1	-	-	-	-	ION [,CR]	CR LF	insert on (set mono)
IOF	-	1	-	-	-	-	IOF [,CR]	CR LF	insert off (set stereo)
SNB	-	1	1	1	1	1	SNB [,CR]	CR LF	set NAB equalization
SCR	-	1	1	1	1	1	SCR [,CR]	CR LF	set CCIR equalization
STA	-	1	-	1	1	1	STA [,CR]	CR LF	set tape sort A
STB	-	1	-	1	1	1	STB [,CR]	CR LF	set tape sort B
MSN	-	-	-	1	1	1	MSN [,CR]	CR LF	master safe on
MSF	-	-	-	1	1	1	MSF [,CR]	CR LF	master safe off
SRH	-	1	1	1	1	1	SRH [,CR]	CR LF	rehearsal mode on
		-	-	1	1	1			only with dropin/out delay on
CRH	-	1	1	1	1	1	CRH [,CR]	CR LF	rehearsal mode off
DDN	-	-	-	1	1	1	DDN [,CR]	CR LF	drop in/out delay on
DDF	-	-	-	1	1	1	DDF [,CR]	CR LF	drop in/out delay off
AA?	1	1	1	1	1	1	AA? [,CR]	aabbccdd CR LF	channel 1..8 status ?
	1	1	1	1	1	1		aa: 0 = safe	
	1	1	1	1	1	1		1 = ready/record	
	1	1	1	1	1	1		bb: 0 = tape	MSB(xx) : chnl 8
	1	1	1	1	1	1		1 = input	LSB(xx) : chnl 1
	1	1	1	1	1	1		cc: 0 = rep	
	1	1	1	1	1	1		1 = sync	
	-	1	1	1	1	1		dd: 0 = demute	xx = aa .. dd
	-	1	1	1	1	1		1 = mute	
	1	-	-	-	-	-		dd(H) = xxxxxxxx(B):	
	1	-	-	-	-	-		xxxxxxxy mic/line	y: 0/1 = mic/line
	1	-	-	-	-	-		xxxxxxyx uncal input	y: 0/1 = uncal/cal
	1	-	-	-	-	-		xxxxxyxx uncal output	y: 0/1 = uncal/cal
	1	-	-	-	-	-		xxxxyxxx slow/fast	y: 0/1 = slow/fast
	1	-	-	-	-	-		xxxyxxxx varispeed	y: 0/1 = off/on
	1	-	-	-	-	-		xxyxxxxx c_track	y: 0/1 = off/on
REA <i>	1	1	1	1	1	-	REA [ ] <i> [,CR]	CR LF	set channel i to ready
	-	-	1	-	-	-	i=1,2,3		
	-	-	-	1	1	-	i=1,2,3,F E= tc channel		
	1	-	-	-	-	-	i=1,2,F F=all channels		
	-	1	-	-	-	-	i=1,2,3,4,E,F		
	1	-	-	-	-	-	i=1..8,F		
	-	-	-	-	-	1	i=1,2,E,F		

AUDIO COMMANDS

sign set	machine 27X	807	810	812	820	816	input	output	meaning
SAF <i>	1	1	1	1	1	-	SAF [ ] <i> [,CR]	CR LF	set channel i to safe
	-	-	1	-	-	-	i=1,2,3		
	-	-	-	1	1	-	i=1,2,3,F E= tc channel		
	1	-	-	-	-	-	i=1,2,F F=all channels		
	-	1	-	-	-	-	i=1,2,3,4,E,F		
	1	-	-	-	-	-	i=1..8,F		
	-	-	-	-	-	1	i=1,2,E,F		
INP <i>	1	1	1	1	1	-	INP [ ] <i> [,CR]	CR LF	set channel i to input
	-	-	1	-	-	-	i=1,2,3		
	-	-	-	1	1	1	i=1,2,3,F E= tc channel		
	1	-	-	-	-	-	i=1,2,F F=all channels		
	-	1	-	-	-	-	i=1,2,3,4,E,F		
	-	-	-	-	-	1	i=1,2,E,F		
INP	1	-	-	-	-	-	INP [CR]	CR LF	set all channels to input
SYN <i>	1	1	1	1	1	-	SYN [ ] <i> [,CR]	CR LF	set channel i to synch
	-	-	1	-	-	-	i=1,2,3		
	-	-	-	1	1	-	i=1,2,3,F E= tc channel		
	1	-	-	-	-	-	i=1,2,F F=all channels		
	-	1	-	-	-	-	i=1,2,3,4,E,F		
	-	-	-	-	-	1	i=1,2,E,F		
SYN	1	-	-	-	-	-	SYN [CR]	CR LF	set all channels to synch
REP <i>	1	1	1	1	1	-	REP [ ] <i> [,CR]	CR LF	set channel i to rep
	-	-	1	-	-	-	i=1,2,3		
	-	-	-	1	1	-	i=1,2,3,F E= tc channel		
	1	-	-	-	-	-	i=1,2,F F=all channels		
	-	1	-	-	-	-	i=1,2,3,4,E,F		
	-	-	-	-	-	1	i=1,2,E,F		
REP	1	-	-	-	-	-	REP [CR]	CR LF	set all channels to rep
MTN <i>	-	1	1	1	1	-	MTN [ ] <i> [,CR]	CR LF	mute channel i
	-	-	1	-	-	-	i=1,2 E= tc channel		
	-	1	-	1	1	-	i=1,2,F F=all channels		
	-	1	-	-	-	-	i=1,2,3,4,F		
	-	-	-	-	-	1	i=1,2,E,F		
MAN	-	-	1	-	-	-	MAN [,CR]	CR LF	both channels mute on
MTF <i>	-	1	1	1	1	-	MTF [ ] <i> [,CR]	CR LF	demute channel i
	-	-	1	-	-	-	i=1,2 E= tc channel		
	-	1	-	1	1	-	i=1,2,F F=all channels		
	-	1	-	-	-	-	i=1,2,3,4,F		
	-	-	-	-	-	1	i=1,2,E,F		
MU?	-	-	-	1	1	1	MU? [,CR]	CR LF	channel mute status ?
									b0/b1: 1= mute on
MAF	-	-	1	-	-	-	MAF [,CR]	CR LF	both channels mute off

AUDIO COMMANDS

sign set	machine 27X	807	810	812	820	816	input	output	meaning
SAP <i,j,xx>	-	1	1	1	1	1	SAP [ ]<i,j,xx> [,CR]	CR LF	set audio parameter (write in DAC's and store)
							i= channel (1,2)		
							j= D/A converter		
							xx=hex number 0<=xx<=FF		
	-	1	1	1	1	1	j: 0=level repro/sync		
	-	1	1	1	1	1	1=treble repro/sync		
	-	-	1	1	1	1	2=bass repro/sync		
	-	-	1	1	1	1	3=equalization repro/sync		
	-	1	1	1	1	1	4=level record		
	-	1	1	1	1	1	5=treble record		
	-	1	1	1	1	1	6=bias record		
	-	-	1	1	1	1	7=equalization record		
	-	-	-	1	1	1	8=erase current level		
	-	-	-	1	1	1	9=skimming bias level		
							8 and 9 only in MK II		
PAP <i,j,xx>	-	1	1	1	1	1	PAP [ ]<i,j,xx> [,CR]	CR LF	preset audio parameter
	-	-	-	1	1	1	PAP [ ]<i,j> [,CR] [,CR]	CR LF	cancel preset audio parameter
							i= channel (1,2)		(write in DAC's and store)
							j= D/A converter		
							xx=hex number 0<=xx<=FF		
	-	1	1	1	1	1	j: 0=level repro/sync		
	-	1	1	1	1	1	1=treble repro/sync		
	-	-	1	1	1	1	2=bass repro/sync		
	-	-	1	1	1	1	3=equalization repro/sync		
	-	1	1	1	1	1	4=level record		
	-	1	1	1	1	1	5=treble record		
	-	1	1	1	1	1	6=bias record		
	-	-	1	1	1	1	7=equalization record		
	-	-	-	1	1	1	8=erase current level		
	-	-	-	1	1	1	9=skimming bias level		
							8 and 9 only in MK II		
CAB <speed>	-	-	-	1	1	1	CAB [ ]<speed>[,CR]	CR LF	copy repro/sync parameter tape sort A -> B
							speed = nominal speed 1..3		
							1=7.5ips, 2=15ips, 3=30ips		
VAB <speed>	-	-	-	1	1	1	VAB [ ]<speed>[,CR]	xx CR LF	verify repro/sync parameter tape sort A <-> B
							speed = nominal speed 1..3	xx: 00 = verify failed	
							1=7.5ips, 2=15ips, 3=30ips	01 = verify successful	

AUDIO COMMANDS

sign set	machine 27X	807	810	812	820	816	input	output	meaning
AP? <i,j>	-	1	1	1	1	1	AP? [ ]<i,j>[,CR] i= channel (1,2) j= D/A converter j: 0=level repro/sync	xx CR LF	audio parameter ?
	-	1	1	1	1	1	1=treble repro/sync		
	-	-	1	1	1	1	2=bass repro/sync		
	-	-	1	1	1	1	3=equalization repro/sync		
	-	1	1	1	1	1	4=level record		
	-	1	1	1	1	1	5=treble record		
	-	1	1	1	1	1	6=bias record		
	-	-	1	1	1	1	7=equalization record		
	-	-	-	1	1	1	8=erase current level		
	-	-	-	1	1	1	9=skimming bias level 8 and 9 only in MK II		
TS?	-	-	-	1	1	1	TS? [,CR]	xx CR LF xx=00 for tape A xx=01 for tape B	tape sort ?
EQ?	-	-	-	1	1	1	EQ? [,CR]	xx CR LF xx=00 for CCIR xx=01 for NAB	equalization norm ?
P <add> to <add>	-	-	1	-	-	-	P <xxxx> [ ] <xxxx> [CR]	.....	punch(save) audio parameters from address 1 to address 2
L	-	-	1	-	-	-	L [CR]	.....	load audio parameters
MIC	1	-	-	-	-	-	MIC [,CR]	CR LF	set mic on
LIN	1	-	-	-	-	-	LIN [,CR]	CR LF	set line on
CON	1	-	-	-	-	-	CON [,CR]	CR LF	calibrate output on
COF	1	-	-	-	-	-	COF [,CR]	CR LF	calibrate output off
CIN	1	-	-	-	-	-	CIN [,CR]	CR LF	calibrate input on
CIF	1	-	-	-	-	-	CIF [,CR]	CR LF	calibrate input off
CC?	-	-	-	1	1	1	CC? [,CR]	aa CR LF aa=total number of channels aa= 01..20H in hex format	channel configuration ?

TIME CODE COMMANDS

sign set	machine 27X	807	810	812	820	816	input	output	meaning
STD <yy>	1	-	-	-	-	-	STD [ ] <yy> [,CR]	CR LF	set time code data
	1	-	-	-	-	-	y: C = real time counter		
	1	-	-	-	-	-	T = clock time		
	1	-	-	-	-	-	D = date		
	1	-	-	-	-	-	K = code		
	1	-	-	-	-	-	- = nothing		
	1	-	-	-	-	-			
	1	-	-	-	-	-	yy = CC		record real time counter
	1	-	-	-	-	-	yy = TT		record clock time
	1	-	-	-	-	-	yy = DD		record date
	1	-	-	-	-	-	yy = KK		record code
	1	-	-	-	-	-	yy = CT		record real time counter and
	1	-	-	-	-	-			clock time
	1	-	-	-	-	-	yy = TC		record real time counter and
	1	-	-	-	-	-			clock time
CD?	1	-	-	-	-	-	CD? [,CR]	y (-)(d)(y (-)d) CR LF	read corrected data from tape
	1	-	-	-	-	-		y: C = real time counter	
	1	-	-	-	-	-		T = clock time	
	1	-	-	-	-	-		D = date	
	1	-	-	-	-	-		K = code	
	1	-	-	-	-	-			
	1	-	-	-	-	-		d: hh:mm:ss counter,time	
	1	-	-	-	-	-		DD:MM:YY date	
	1	-	-	-	-	-		xxxxxx code	
	1	-	-	-	-	-			
	1	-	-	-	-	-		C (-)hh:mm:ss CR LF	real time counter on tape
	1	-	-	-	-	-		D DD.MM.YY T hh:mm:ss CR LF	date and clock time on tape
	1	-	-	-	-	-		K xxxxxx CR LF	code on tape
	1	-	-	-	-	-		- CR LF	no data on tape
UD?	1	-	-	-	-	-	UD? [,CR]	y (-)(d)(y (-)d) CR LF	read uncorrected data
	1	-	-	-	-	-		y: C = real time counter	from tape
	1	-	-	-	-	-		T = clock time	
	1	-	-	-	-	-		D = date	
	1	-	-	-	-	-		K = code	
	1	-	-	-	-	-			
	1	-	-	-	-	-		d: hh:mm:ss counter,time	
	1	-	-	-	-	-		DD:MM:YY date	
	1	-	-	-	-	-		xxxxxx code	
	1	-	-	-	-	-			
	1	-	-	-	-	-		C (-)hh:mm:ss CR LF	real time counter on tape
	1	-	-	-	-	-		D DD.MM.YY T hh:mm:ss CR LF	date and clock time on tape
	1	-	-	-	-	-		K xxxxxx CR LF	code on tape
	1	-	-	-	-	-		- CR LF	no data on tape
ER?	1	-	-	-	-	-	ER? [,CR]	xxxxxxxx yyyy CR LF	recording errors ?
	1	-	-	-	-	-		x: total number of recorded	
	1	-	-	-	-	-		data sets	
	1	-	-	-	-	-		y: total number of errors	

TIME CODE COMMANDS

sign set	machine 27X	807	810	812	820	816	input	output	meaning
TD?	1	-	-	-	-	-	TD? [,CR]	y (-)(d)(y (-)d) CR LF	selected time code data
	1	-	-	-	-	-		y: C = real time counter	
	1	-	-	-	-	-		T = clock time	
	1	-	-	-	-	-		D = date	
	1	-	-	-	-	-		K = code	
	1	-	-	-	-	-			
	1	-	-	-	-	-		d: hh:mm:ss counter,time	
	1	-	-	-	-	-		DD:MM:YY date	
	1	-	-	-	-	-		xxxxxx code	
	1	-	-	-	-	-			
	1	-	-	-	-	-		C (-)hh:mm:ss CR LF	real time counter selected
	1	-	-	-	-	-		D DD.MM.YY T hh:mm:ss CR LF	date and clock time selected
	1	-	-	-	-	-		K xxxxxx CR LF	code selected
	1	-	-	-	-	-		- CR LF	no selected data
SAC	1	-	-	-	-	-	SAC [,CR]	CR LF	set search algorithm for
	1	-	-	-	-	-			continuous recording
SAL	1	-	-	-	-	-	SAL [,CR]	CR LF	set search algorithm for
	1	-	-	-	-	-			logging applications
JCL <time>	1	-	-	-	-	-	JCL [ ] < hh[,:]mm[,:]ss >	CR LF	search of clock time
	1	-	-	-	-	-	[,CR]		
JTM	1	-	-	-	-	-	JTM [ ]<(-)hh[,:]mm[,:]ss>	CR LF	search of real time counter
<address>	1	-	-	-	-	-	[,CR]		
JCD	1	-	-	-	-	-	JCD [ ]<(-)hh[,:]mm[,:]ss>	CR LF	search of clock time and date
<address>	1	-	-	-	-	-	[,CR]		
JTD	1	-	-	-	-	-	JTD [ ]<(-)hh[,:]mm[,:]ss>	CR LF	search of real time counter
<address>	1	-	-	-	-	-	[,CR]		and date
	1	-	-	-	-	-			
TDN	-	-	1	1	1	-	TDN [,CR]	CR LF	time code delay on
									left & right TC heads active
TDF	-	-	1	1	1	-	TDF [,CR]	CR LF	time code delay off
									only right TC head active
TH?	-	-	1	1	1	1	TH? [,CR]	xx CR LF	time code reading head nr ?
TC?	1	1	1	1	1	1	TC? [,CR]	[Y,N] CR LF	time code present on tape ?
TCN	-	1	-	-	-	-	TCN [,CR]	CR LF	set time code delay active
TCF	-	1	-	-	-	-	TCF [,CR]	CR LF	set time code delay bypassed
TV?	1	-	-	-	-	-	TV? [,CR]	[Y,N] CR LF	verify time code
SCO <code>	1	-	-	-	-	-	SCO [ ] <xxxxxx> [,CR]	CR LF	set code at < code >
CO?	1	-	-	-	-	-	CO? [,CR]	xxxxxx CR LF	code ?

TIME CODE COMMANDS

sign set	machine 27X	807	810	812	820	816	input	output	meaning
CTN	1	-	-	-	-	-	CTN [,CR]	CR LF	c_track on
CTF	1	-	-	-	-	-	CTF [,CR]	CR LF	c_track off
TO?	-	-	-	-	-	1	TO? [,CR]	[Y,N] CR LF	time code option ?
SCK <time>	1	-	1	-	-	-	SCK [ ] < hh[,:]mm[,:]ss >	CR LF	set clock at < time >
CL?	1	-	1	-	-	-	CL? [,CR]	CR LF	clock ?

LEADER MODE COMMANDS

sign set	machine 27X	807	810	812	820	816	input	output	meaning
LOF	-	-	-	-	-	1	LOF [ ] <xx> [,CR] (0 <= xx <= FF)	CR LF	set leader offset
LO?	-	-	-	-	-	1	LO? [,CR]	xx CR LF xx: 00..FF	leader offset ?
CAY	-	-	-	-	-	1	CAY [,CR]	CR LF	calibrate tape colour
YT?	-	-	-	-	-	1	YT? [,CR]	xx CR LF xx: 0/1 = magnetic/yellow	tape colour ?
SCP	-	-	-	-	-	1	SCP [,CR]	CR LF	start control on (play)
SCL	-	-	-	-	-	1	SCL [,CR]	CR LF	start control off (locate)
SC?	-	-	-	-	-	1	SC? [,CR]	xx CR LF xx: 0/1 = inactive/active	start control ?
LEN	-	-	-	-	-	1	LEN [,CR]	CR LF	set leader mode on
LEF	-	-	-	-	-	1	LEF [,CR]	CR LF	set leader mode off
LE?	-	-	-	-	-	1	LE? [,CR]	xx CR LF xx: 0/1 = off/on	leader mode ?
VLN	-	-	-	-	-	1	VLN [,CR]	CR LF	vertical lifter on
VLF	-	-	-	-	-	1	VLF [,CR]	CR LF	vertical lifter off
VL?	-	-	-	-	-	1	VL? [,CR]	xx CR LF xx: 0/1 = inactive/active	vertical lifter ?

MACHINE COMMANDS

sign set	machine 27X	807	810	812	820	816	input	output	meaning
LCD	1	1	1	1	1	1	LCD [,CR]	CR LF	local keyboard disabled
LCE	1	1	1	1	1	1	LCE [,CR]	CR LF	local keyboard enabled
RMD	1	-	-	1	1	1	RMD [,CR]	CR LF	remote keyboard disabled
RME	1	-	-	1	1	1	RME [,CR]	CR LF	remote keyboard enabled
CFA	-	-	-	-	-	1	CFA [,CR]	CR LF	set standard key configuration
CFB	-	-	-	-	-	1	CFB [,CR]	CR LF	set broadcast key configurat.
CF?	-	-	-	-	-	1	CF? [,CR]	aa CR LF aa:0/1=standard/broadcast conf	request key configuration
SPA	-	-	-	1	1	1	SPA [,CR]	CR LF	save au+td parameters
LPA	-	-	-	1	1	1	LPA [,CR]	CR LF	load au+td parameters
SCF	-	-	-	1	1	1	SCF [,CR]	CR LF	save key configuration
LCF	-	-	-	1	1	1	LCF [,CR]	CR LF	load key configuration
SMD	-	-	-	-	-	1	SMD [,CR]	CR LF	save funct modes & addresses
LMD	-	-	-	-	-	1	LMD [,CR]	CR LF	load funct modes & addresses
QSL	-	-	-	1	1	1	QSL [,CR]	CR LF	quit save/load process; if SL? state is 1,2 or 4, the command is not accepted but goes lost
SL?	-	-	-	1	1	1	SL? [,CR]	xx CR LF xx:00H= no plv process 01H= saving in progress 02H= loading in progress 03H=verifying in progress 04H= saving completed 05H= loading completed 06H= verifying completed 07H= saving failed 08H= loading failed 09H= verifying failed 0AH= loading awaited 0BH= verifying awaited 0CH=no lod/ver data found 0DH=wrong data set load 0EH=wrong data set verify	request save & load key configuration process state

MACHINE COMMANDS

sign set	machine 27X	807	810	812	820	816	input	output	meaning
SMA	-	-	1	-	-	-	SMA [ ]<xxxxxx>	CR LF	set machine serial number
MA?	-	-	1	-	-	-	MA? [,CR]	xxxxxx CR LF	machine serial number ?
SBA <address>	-	-	-	1	1	1	SBA [ ]<xxxx>	CR LF	set bus address (8280-FFFF)
BA?	-	-	-	1	1	1	BA? [,CR]	xxxx CR LF	bus address ?
SDN	1	-	-	-	-	-	SDN [ ]<xx>[,CR]	CR LF	set device number
	1	-	-	-	-	-	xx = 00...59		
	1	-	-	-	-	-	xx = 00...99		
DN?	1	-	-	-	-	-	DN? [,CR]	xx CR LF	device number ?
SD?	1	1	1	1	1	1	SD? [,CR]	DD.MM.YY (sw not released)	software date ?
								00.WW.YY (sw released)	DD=day WW=week
									MM=month YY=year
SDA <date>	1	-	-	-	-	-	SDA [ ] < DD[,.]MM[,.]YY >	CR LF	set date at < date >
									DD=day MM=month YY=year
DA?	1	-	-	-	-	-	DA? [,CR]	DD.MM.YY CR LF	date ?
MK?	-	-	-	1	1	1	MK? [,CR]	aa CR LF	mark nr of software version ?
									aa=mark number
									00,01,'?'=mark I, 02=mark II
MT?	-	1	1	1	1	1	MT? [,CR]	aa CR LF	machine type ?
									aa=machine type number
									01=820, 02=812, 03=820MCH,
									04=827MCH, 05=807, 06=816,
									07=810
	1	-	-	-	-	-		aaaa CR LF	aaaa= machine type number
									C270..C274..C278
ESY	1	1	1	-	-	-	ESY [,CR]	CR LF	enable synchronizer
DSY	1	-	-	-	-	-	DSY [,CR]	CR LF	disable synchronizer

file rs232_2CH.t

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Last update: see next page

Changes

02.06.86 : EDT,LFT implemented for A812 and A820
13.06.86 : error message for A812 and A820:
- CR LF "?" CR LF replaced by "?" CR LF
- CR LF "INPUT FORMAT ERROR" CR LF replaced by
"INPUT FORMAT ERROR" CR LF
18.07.86 : in part: "commands for internal use only" got commands
- "B" break \
- "L" load > DISABLED
- "V" verify /
13.08.86 : EDI disabled for A812 and A807 new implemented
02.09.86 : EMC & DMC disabled for A812 and A820
PAP new implemented for A812 and A820
15.01.87 : TC? new implemented for A812 and A820
17.09.87 : AA? new implemented for A812 and A820
21.10.87 : TDF & TDN commentary accomplished
03.11.87 : ION,IOF implemented for A807
04.11.87 : SD? implemented for all machines
09.11.87 : MIC,LIN,CON,COF implemented for C270
09.11.87 : CIF,CIN,SDN,DN? implemented for C270,C274,C278
11.11.87 : LAD,LA?,LOP,TPN,TPF implemented for C270, C274, C278
03.12.87 : RPL,SDA,DA?,SCO,CO?,CTN,CTF,STD,TD?,CD?,UD?,SAC,SAL,JTM,JCL implemented for C274, C278
14.12.87 : ER?,DSY implemented for C274, C278
16.12.87 : ZLO und RTI implemented for A812 and A820
18.12.87 : LZA implemented for C270, C274, C278
09.02.88 : RTM,TRA,MT? implemented for C274, C278
10.02.88 : RTM,TRA,MT? implemented for C270
16.02.88 : locator status 'autoreverse' implemented for C274, C278
16.02.88 : status 'locator play reverse' implemented for C274, C278
16.02.88 : status 'locator play reverse achieved' implemented for C274, C278
14.03.88 : LS?: additional preselected play implemented for C270,C274,C278
23.03.88 : JCD,JTD implemented for C274L,278L
13.01.89 : TP? new implemented for A812 and A820
17.01.89 : MK? new implemented for A812 and A820
17.01.89 : SAP,PAP,AP? completed with selector values 8 and 9 for erase
current level and skimming current level (only MK II)
18.01.89 : MT? new implemented for A812 and A820
06.06.89 : TCN,TCF implemented for A807
21.06.89 : status RPL (reverse play) redefined from 0AH/8AH to 25H/0A5H; stati RPV (rev play vspd), RPI (rev play vspd int ref) and RPE (rev play vspd ext ref) new implemented for A812 and A820
09.08.89 : A807 audio commands completed for tc channel, command RPL implemented for A820 and A812
03.11.89 : command TP? doesn't print now tape tension reverse play left/right at A812
06.12.89 : SVS, CVS, VS? and SVP new implemented for A820/A812 Mk II
11.12.89 : LOC and STM corrected for A807: no CR LF at end
14.02.90 : A816 defined: CR consequently for all commands introduced, CC? and TO? new implemented for A816
16.02.90 : general remarks to control x, xon, xoff protocol
24.09.90 : MT? new implemented for A810
04.04.91 : PAP without parameter means "cancel preset audio parameter"
27.07.92 : STM description for A820,A812,A816 corrected in this protocol (dms: from 'xxx' to 'x')
27.08.92 : LOC description for A820,A812,A816 corrected in this protocol (dms: from 'xxx' to 'x')
19.10.92 : CFA, CFB and CF? for A816 for setting and requesting broadcast mode introduced
20.10.92 : SPA,LPA,SCF,LCF,SL?,QSL for A816 for saving au+td parameters, loading au+td parameters,

	saving keys, loading keys, requesting process state and quitting process introduced
02.11.92	TDF & TDN disabled for A816 (no TC version !)
03.11.92	SMD,LMD for A816 for saving & loading function modes and addresses introduced
23.12.92	ST? completed for A816 with states 4C/4D = wind with shuttle deviation
03.03.93	For A816 error messages "SWITCH EDIT LEVER TO NORMAL POSITION, PLEASE !" and "OVERRUN FRAMING ERROR !" at echo mode introduced
10.03.94	SL? has more states to be displayed: also 0DH and 0EH possible
24.03.94	MU? to display channel mute state implemented for A816
27.01.95	CC?, MU? to display ch conf & ch mute states implemented for A812/A820
14.02.95	SPA,LPA,SL?,QSL introduced for A812MkII and A820MkII
21.03.95	CAB,VAB introduced for A812MkII, A820MkII and A816
25.09.96	LOF,LO?,CAY,YT?,SCP,SCL,SC?,LEN,LEF,LE?,VLN,VLF,VL? for A816
10.10.96	LCF and SCF for A820 2CH and A812
28.02.97	TS? (tape sort A/B) & EQ? (ccir/nab) for A816,A812,A820
04.04.97	DCD (display capstan deviation) for A816,A812,A820
04.04.97	DSN/DSF (display splice nr/takes on/off) for A816
01.05.97	DSN for A816 corrected: shows address also
22.05.97	DSN at A816: max.splice length = 104.16mm (filter); SP? for A816
30.07.97	DCD response with 'CAP ' string only for A816