

**Philips Consumer Electronics**

1. INTRODUCTION**1.1 Purpose**

This document describes the RS-232 Interface for the products of the TLR.

1.2 Scope

The target reader of this paper has got good knowledge of Video Cassette Recorders in general and detailed knowledge about Olivia range, at least concerning Time Lapse Recorders and the Functional Requirements Specification for Time Lapse Recorder.

1.3 Definitions and Abbreviations**1.3.1 Abbreviations**

<u>TLR</u>	Time Lapse Recorder
<u>PC</u>	Personal Computer
<u>SP</u>	Standard Play
<u>ASCII</u>	American Standard Code for Information Interchange
<u>Xon</u>	Receiver ON
<u>Xoff</u>	Receiver OFF
<u>CR</u>	Carriage Return (ASCII 0x0D)
<u>CP</u>	This ASCII-String confirms the correct reception of a command. After receiving a command, the TLR checks, executes the command.
<u>AO</u>	This ASCII-String confirms that the execution of a command has been completed. After sending this message the execution of the next command is possible.
<u>TP</u>	Timer Prepare
<u>AL</u>	Alarm
<u>BS</u>	Busy

1.3.2 Definitions

half duplex: communication between two stations on one channel, at a certain time one is the transmitter and the other one the receiver and vice versa

Author: Walter Hermesen	Status : Final	Version: 3,00
Reference: VCM-WH- C:\Documenti\CD ROM Italia\CCTV\Utilità\RS232.DOC	Classification: Restricted	Archive: No
	Date: 00-09-05	Page: 1/17

1.4 References

- [1] *Functional Requirements Specification for Time Lapse Recorders*
12NC 8636 005 10021
J. Romako

2. Protocol

This interface is used for controlling the functions of a TLR via PC.

The RS-232 can be activated and de-activated by the OSD-switch “RS 232” in the Basic Settings Menu.

If RS-232 is switched on and the TLR-Software on the connected PC is started, communication can occur with inspections and commands as it is shown in this manual.

After the TLR has executed a command from the PC, the PC has to control it with a status command.

2.1 RS-232C Interface Specification

2.1.1 Communication system

Half duplex

2.1.2 Communication rate

9600 Baud

2.1.3 Communication format

Start: 1 bit
Data: 8 bits
Parity: None
Stop: 2 bits

2.1.4 Communication Code

ASCII - Code

2.1.5 Handshake

Xon/Xoff Software Handshake Protocol

3. Communication protocol

All commands consist of a header (two ASCII letters) and some commands are complemented with parameters to give detailed information.

All commands have to be separated with a CR.

There maybe any number of colons and commas, as it is shown in the tables, between the parameters. Capital and small letters are also allowed.

Incorrect commands, wrong parameters, values out of range to the TLR, causes an error message.

After the TLR has executed a command from the PC, the PC has to control it.

3.1 Machine status commands

The Syntax of these commands consists of two ASCII letters and a carriage return.

After evaluation, the TLR gives response on the VE-command with the string of the TLR-Type and on the VS-command with the parameters as it is shown below and a carriage return.

Only after the TLR has sent back his status commands to the PC, new commands can be transmitted to the TLR.

Command to TLR	Response from TLR	Function	Remark
VE	str	TYPE OF TLR	str: TLR type (e.g. TL960A)
VS	nr ps	VERSION	Software version nr: number ps: u = PAL (1 Byte) n = NTSC (1 Byte)

3.2 Used counter command

The Syntax of this command consists of two ASCII letters and a carriage return.

After evaluation, the TLR gives response with the parameters as it is shown below and a carriage return.

Only after the value is sent back to the PC, new data can be received by the TLR.

Command to TLR	Response from TLR	Function	Remark
UC	hh:mm	USED COUNTER	Value of the used counter h: hours (2 Byte) mm: minutes (2 Byte)

3.3 Status commands

The Syntax of this command consists of two ASCII letters and a carriage return.

After evaluation, the TLR gives response as it is shown below and a carriage return to the PC. Only after the status is sent back to the PC, new data can be received by the TLR.

If a deck status command is sent to the TLR, the display shows “REMOTE” and the TLR-keys are locked for 4 seconds.

Command to TLR	Response from TLR	Function	Remark
SA	ST0	STOP 3H	Stop 3h-Mode (PAL)
		STOP 2H	Stop 2h-Mode (NTSC)
	ST1	STOP 12H	Stop 12h-Mode
	ST2	STOP 24H	Stop 24h-Mode
	ST3	STOP 48H	Stop 48h-Mode
	ST4	STOP 72H	Stop 72h-Mode
	ST5	STOP 168H	Stop 168h-Mode
	ST6	STOP 336H	Stop 336h-Mode
	ST7	STOP 720H	Stop 720h-Mode
	ST8	STOP 960H	Stop 960h-Mode
	PL0	PLAY 3H	Play 3h-Mode (PAL)
		PLAY 2H	Play 2h-Mode (NTSC)
	PL1	PLAY 12H	Play 12h-Mode
	PL2	PLAY 24H	Play 24h-Mode
	PL3	PLAY 48H	Play 48h-Mode
	PL4	PLAY 72H	Play 72h-Mode
	PL5	PLAY 168H	Play 168h-Mode
	PL6	PLAY 336H	Play 336h-Mode
	PL7	PLAY 720H	Play 720h-Mode
	PL8	PLAY 960H	Play 960h-Mode
	PS	STILL	Still
	RC0	RECORD 3H	Record 3h-Mode (PAL)
		RECORD 2H	Record 2h-Mode (NTSC)
	RC1	RECORD 12H	Record 12h-Mode
	RC2	RECORD 24H	Record 24h-Mode
	RC3	RECORD 48H	Record 48h-Mode
	RC4	RECORD 72H	Record 72h-Mode
	RC5	RECORD 168H	Record 168h-Mode
	RC6	RECORD 336H	Record 336h-Mode
	RC7	RECORD 720H	Record 720h-Mode
	RC8	RECORD 960H	Record 960h-Mode
	FF0	WIND	Wind
	FF1	SCAN 7	Search Forward +7x
	FF3	SCAN 2	Search Forward +2x
	FF4	SCAN 11	Search Forward +11 (in PAL only)
	FF7	SLOW FOR 2	Slow Forward ½
	FF5	SLOW FOR 14	Slow Forward 1/14
	FF8	SCAN 5	Search Forward +5x
	RW0	REWIND	Rewind
	RW1	SCAN REV 7	Search Reverse -7x
	RW2	REVERSE	Search Reverse -1x
	RW3	SCAN REV 11	Search Reverse -11x (in PAL only)
	RW4	SCAN REV 2	Search Reverse -2x
	RW7	SLOW REV 2	Slow Reverse ½
	RW5	SLOW REV 14	Slow Reverse 1/14
	RW8	SCAN REV 5	Search Reverse -5x

	FS FR	FRAME FWD FRAME REV	Frame Forward Frame Reverse
	PA	PAUSE	Pause
	PW	STBY	Standby
	EJ	EJECT	Eject
	SE	STBY-EJECT	Standby and no cassette
	TR	TRACKING	Auto Tracking
	AT	ATTS	Automatic Tape Type Selection
	RC	RECORD-CHECK	Record Check
	AL	ALARM	TLR is in ALARM
	TP	TIMER PREPARE	TLR is in timer prepare mode
	TI	TIMER RECORD	TLR is in timer record
	BS	BUSY	TLR is busy (e.g. chart is open)

3.4 Deck commands

The Syntax of the deck commands to the TLR consists of two ASCII letters and parameter following by a CR. After evaluation the TLR answers CP and after the command is done the TLR forwards AO. Only after sending back this message to the PC new data can be received by the TLR.

If a Stop Command with the same speed is sent twice the TLR goes to Standby.

Command to TLR	Response from TLR	Function	Remark
PL0	CP AO	PLAY 3H	<u>only possible in:</u> Standby, Stop, Play, Still, Pause, Reverse Rewind, Wind, Slow Forward 14, Slow Reverse 14, Scan Forward 2, Scan Forward 5, Scan Forward 7, <i>Scan Forward 11(in PAL)</i> , Scan Reverse 2, Scan Reverse 5, Scan Reverse 7, <i>Scan Reverse 11(in PAL)</i>
PL1	CP AO	PLAY 12H	<u>only possible in:</u> Standby, Stop, Play, Still, Pause, Reverse Rewind, Wind, Slow Forward 14, Slow Reverse 14, Scan Forward 2, Scan Forward 5, Scan Forward 7, <i>Scan Forward 11(in PAL)</i> , Scan Reverse 2, Scan Reverse 5, Scan Reverse 7, <i>Scan Reverse 11(in PAL)</i>
PL2	CP AO	PLAY 24H	like PL1
PL3	CP AO	PLAY 48H	like PL1
PL4	CP AO	PLAY 72H	like PL1
PL5	CP AO	PLAY 168H	like PL1
PL6	CP AO	PLAY 336H	like PL1
PL7	CP AO	PLAY 720H	like PL1
PL8	CP AO	PLAY 960H	like PL1
PS	CP AO	STILL	<u>only possible in:</u> Stop, Play, Reverse, Slow Forward 14, Slow Reverse 14,
RC0	CP	RECORD 3H	<u>only possible in:</u>

	AO		Standby, Stop
RC1	CP AO	RECORD 12H	<u>only possible in:</u> Standby, Stop
RC2	CP AO	RECORD A24H	<u>only possible in:</u> Standby, Stop
RC3	CP AO	RECORD 48H	<u>only possible in:</u> Standby, Stop
RC4	CP AO	RECORD 72H	<u>only possible in:</u> Standby, Stop
RC5	CP AO	RECORD 168H	<u>only possible in:</u> Standby, Stop
RC6	CP AO	RECORD 336H	<u>only possible in:</u> Standby, Stop
RC7	CP AO	RECORD 720H	<u>only possible in:</u> Standby, Stop
RC8	CP AO	RECORD 920H	<u>only possible in:</u> Standby, Stop
ST0	CP AO	STOP 3H STANDBY	<u>only possible in:</u> Standby, Stop, Play, Still, Pause, Reverse Rewind, Wind, Slow Forward 14, Slow Reverse 14, Scan Forward 2, Scan Forward 5, Scan Forward 7, <i>Scan Forward 11(in PAL)</i> , Scan Reverse 2, Scan Reverse 5, Scan Reverse 7, <i>Scan Reverse 11(in PAL)</i>
ST1	CP AO	STOP 12H STANDBY	like ST0
ST2	CP AO	STOP 24H STANDBY	like ST0
ST3	CP AO	STOP 48H STANDBY	like ST0
ST4	CP AO	STOP 72H STANDBY	like ST0
ST5	CP AO	STOP 168H STANDBY	like ST0

ST6	CP AO	STOP 336H STANDBY	like ST0
ST7	CP AO	STOP 720H STANDBY	like ST0
ST8	CP AO	STOP 960H STANDBY	like ST0
RW0	CP AO	REWIND	<u>only possible in:</u> Standby, Stop
RW5	CP AO	SLOW REVERSE	Play, Still, Slow
RW2	CP AO	REVERSE	<u>only possible in:</u> Stop, Play
RW4	CP AO	SCAN REV 2	Play, Reverse
RW8	CP AO	SCAN REV 5	<u>only possible in:</u> Scan Reverse 2, Scan Reverse 7
RW1	CP AO	SCAN REV 7	<u>only possible in:</u> Scan Reverse 5, Scan Reverse 11 (in PAL)
RW3	CP AO	SCAN REV 11	Search Reverse -11x (only in PAL) <u>only possible in:</u> Scan Reverse 7
FF0	CP AO	WIND	<u>only possible in:</u> Standby, Stop, Rewind
FF5	CP AO	SLOW	<u>only possible in:</u> Play, Still, Slow Reverse 14
FF3	CP AO	SCAN 2	<u>only possible in:</u> Play, Scan Forward 5
FF8	CP AO	SCAN 5	<u>only possible in:</u> Scan Forward 2, Scan Forward 7
FF1	CP AO	SCAN 7	<u>only possible in:</u> Scan Forward 5, Scan Forward 11 (only in PAL)
FF4	CP AO	SCAN 11	(only in PAL) <u>only possible in:</u> Scan Forward 7,
FR	CP AO	FRAME REVERSE	<u>only possible in:</u> Still

FS	CP AO	FRAME FORWARD	<u>only possible in:</u> Still
EJ	CP AO	EJECT	<u>only possible in:</u> Standby, Stop
RC	CP AO	RECORD CHECK	<u>only possible in:</u> Record

3.5 Chart Commands

The Syntax of the **chart write commands** to the TLR consist of two ASCII letters and parameters followed by a CR. After evaluation the TLR answers CP and after the command is done the TLR forwards AO. Only after sending back this message to the PC new data can be received by the TLR. After a chart read command is requested from the PC the TLR-keys are locked and the TLR answers with the chart parameter and the CR.

Command to TLR	Response from TLR	Function	Remark
CR	hh:hh dd mm yyyy set	CLOCK CHART READ	only in Stop mode or Standby CD: clock data hh:hh hours (4 Byte) dd: day (2 Byte) mm: month (2 Byte) yyyy: year (4 Byte) set: clock isn't set (1 Byte) 1 = clock set 0 = clock not set
CW hh:hh,dd,mm,yyyy	CP AO	WRITE CLOCK CHART	only in Stop mode or Standby hh:hh hours (4 Byte) dd: day (2 Byte) mm: month (2 Byte) yyyy: year (4 Byte)

BR

rs
sr
os
vs
be
pl
sec

READ
BASIC SETTINGS
CHART

only in Stop mode or Standby

rs: rec source (1 Byte)

0 = SCART

1 = BNC (default)

sr:..RS232 ON/OFF(1 Byte)

0 = OFF

1 = ON (default)

os: osd (1 Byte)

0 = LEFT BOTTON

1 = RIGHT BOTTON
(default)

2 = RIGHT UPPER

3 = LEFT UPPER

4 = OFF

vs: v sync (1 Byte)

0 = EXT

1 = INT (default)

be: beep (1 Byte)

0 = NO (default)

1 = YES

pl: 24h play (1 Byte)

0 = WITH AUDIO 24hA
(default)

1 = WITHOUT AUDIO
24h

sec: sec code (1 Byte)

0 = OFF (default)

1 = ON

BW rs,os,vs,be,pl

CP
AO

BASIC SETTINGS
CHART
WRITE

only in Stop mode and
Standby

rs: rec source (1 Byte)
0 = SCART
1 = BNC

os: osd (1 Byte)
0 = LEFT BOTTON
1 = RIGHT BOTTON
2 = RIGHT UPPER
3 = LEFT UPPER
4 = OFF

vs: v sync (1 Byte)
0 = OFF
1 = ON

be: beep (1 Byte)
0 = NO
1 = YES

pl: 24h play (1 Byte)
0 = WITH AUDIO 24hA
1 = WITHOUT AUDIO
24h

RS232 ON/OFF
and
SEC CODE ON/OFF
cannot be set via RS-232

AR	as rt rr	ALARM CHART READ	only in Stop mode and Standby
			as: alarm settings (1 Byte) 0 = NO (default) 1 = 3h ALARM MODE 2 = 12h ALARM MODE 3 = 24h ALARM MODE rt: reset time (1 Byte) 0 = 1 min. 1 = 2 min 2 = 5 min (default) 3 = 10 min 4 = 15 min rr: repeat record (1 Byte) 0 = NO (default) 1 = YES 2 = NOT IF ALARM
AW as,rt,rr	CP AO	WRITE ALARM CHART	only in Stop mode and Standby
			as: alarm settings (1 Byte) 0 = NO 1 = 3h ALARM MODE 2 = 12h ALARM MODE 3 = 24h ALARM MODE rt: reset time (1 Byte) 0 = 1 min. 1 = 2 min 2 = 5 min 3 = 10 min 4 = 15 min rr: repeat record (1 Byte) 0 = NO 1 = YES 2 = NOT IF ALARM

AM nr	dd	READ	only in Stop mode and Standby nr: alarm number (1 Byte) dd: date (2 Byte) mm: month (2 Byte) yy: year (2 Byte) hhhh: hours (4 Byte)
	mm	ALARM MEMORY	
	yy		
	hhhh		
PA nr	CP	PLAY	only in Stop mode nr: alarm number (1 Byte)
	AO	ALARM	
CA	CP	CLEAR	
	AO	ALARM MEMORY	

3.6 Timer Commands

The Syntax to the TLR of the **timer write commands** consist of two ASCII letters and parameters followed by a CR.

After evaluation the TLR answers CP and after the command is done the TLR forwards AO. Only after sending back this message to the PC, new data can be received by the TLR.

After a **timer read command** with the timer number (given as parameter after the header) is requested from the PC the TLR answers with the timer parameter and the CR.

The **timer clear command** CT (clear timer) clears the timer with the corresponding timer number (sent as parameter after the command header).

Command to TLR	Response from TLR	Function	Remark
RTnr	nr date dw start stop mode tim	READ TIMER	only in Stop mode and Standby nr: number (1 Byte) date: date (2 Byte) dw: daily/weekly (1 Byte) 0 = ONCE 1 = DAILY 2 = WEEKLY start: start time (4 Byte) stop: stop time (4 Byte) mode: rec speed (1 Byte) 0 = 3h/2h 1 = 12h 2 = 24h 3 = 48h 4 = 72h 5 = 168h 6 = 336h 7 = 720h 8 = 960h tim: switch on or off (1 Byte) 0 = ON 1 = OFF

WTdate,dw,start, stop,mode,tim	CP	WRITE TIMER	only in Stop mode
	AO		date: date (2 Byte)
			dw: daily/weekly (1 Byte) 0 = ONCE 1 = DAILY 2 = WEEKLY start: start time (4 Byte) stop: stop time (4 Byte) mode: rec speed (1 Byte) 0 = 3h/2h 1 = 12h 2 = 24h 3 = 48h 4 = 72h 5 = 168h 6 = 336h 7 = 720h 8 = 960h tim: switch on or off (1 Byte) 0 = ON 1 = OFF
CTnr	CP	CLEAR TIMER	clear timer
	AO		nr: number (1 Byte)
TP	CP	TIMER PREPARE	this is a toggle function
	AO		

3.7 Error Messages

To avoid ERRORS it is recommended to do an status check “SA” before sending a command.

TLR to PC

ER00	command isn't allowed during the current mode (e.g. Set Clock in Play)
ER01	FR or FF command has not been sent during PLAY / STILL
ER02	command isn't allowed during the current deck status
ER03	No Alarm Entry
ER06	Unknown command or wrong parameter added.
ER12	Overflow of the Input-Buffer
ER14	No Cassette is inserted or Cassette is protected
ER15	Checksum Error
ER16	Deck-Error
ER17	No CR (Time out)