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RC3502 HLC Testprogram Package
User's Guide

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Abstract: This manual describes the reliability testprogram for the COM204/ SLA203 (HDLC-controller). It contains three subprograms, 'a' with active transmissions and check of data, 'b' running as a passive mirror, and 'c' running the COM204 testloops. It also has a possibility for the user to get some information on previous events in the driver and hardware and to get statistic information.

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1. INTRODUCTION

This manual describes the reliability testprogram for the RC3502 HDLC, RC3546 (COM204/SLA203).

It is testing the controller through the standard RC3502 HDLC packet switching data transmission driver (X.25 level 2 LapB), where the channels will be connected as either DCE or DTE. (master or terminal). It is therefore simulating normal working conditions on the X.25 level.

The testprogram can exercise an HDLC (COM204/SLA203)-controller in one RC3502 by connecting pairs of channels together with either a testcable (CBL730 + SIM203) or a modem connection.

It can also exercise two HDLC-controllers in two different RC3502s. In the last case there must be an incarnation of the test in both RC3502s. Then the two tests will be each others mirrors (see also subsection 2.2.2 for further information about possible testconfigurations).

Of course the parameters specifying the data buffer must be the same.

The testprogram has three different subtests, one "a" transferring buffers of constant or variable size and one "b" running as a mirror. Test 'c' is used together with the testloops (ref. [8]). It has 4 different selectable datapatterns, all zeros, all ones, a pattern where every second byte is 55 hex and the others AA hex, and a counting pattern.

The test also contains a log-book which makes it possible for the user of the testprogram at any time to get statistic information from the driver or to get the cyclic collected testoutput from the driver telling about every proceeding action performed (see section 4.1 and 4.2 for further information).

The HLC test is a testpackage in the RC3502 test system, TOP80, and must have this as a parent process, see ref. [2].

It is written in Real Time Pascal (RC3502 implementation).

1.1 Configuration Requirements 1.1

A minimum configuration for the RC3502 testsystem, a testcable CBL730, SIM203 or modem interconnection, a COM204, an SLA203 or another COM204 placed e.g. in another RC3502, and a load possibility for the testsystem (e.g. TES modules with the testsystem or an RC8000 connection).

1.2 Parameter Values for Subtest a and b 1.2

Param No	Text	Default	Min.	Max.
000	TESTPROGRAM	b	a	b
001	NO OF RUNS	100	1	32767
002	LEVEL NO	72	16	122
003	MEM NO	144	128	158
004	Channel (0,1,both)	2	0	2
006	DATACHECK	YES	NO	YES
009	STATUSCHECK	YES	NO	YES
010	MIN. BLOCKSIZE	1	1	P011
011	MAX. BLOCKSIZE	128	2	256
012	FRAMEGAP IN (10 µsec)	2	0	8000
013	CHECK MODEM STATE	NO	NO	YES
017	MEASURE LINESPEED	NO	NO	YES
018	DATA KIND	4	0,1,3,4	
020	TIMEOUT (100 msec)	30	2	320
021	RETRY COUNT	5	1	32767
049	MAX. MESSAGE	10	1	32767

Param No 002 is interrupt level.
Param No 003 may be given as a hex number, same number as used in the debugger (144 = h90).
Params No 010 and 011 are blocksize.
Param No 004 can have the following values: 2 for both channel 0 and 1, and 0 for channel 0 or 1 for channel 1.

Note: Channels are numbered 0 through 1.

1.3 Parameter Values for Subtest c 1.3

Param No	Text	Default	Min.	Max.
000	TESTPROGRAM	c	c	c
001	NO OF RUNS	1	1	32767
002	LEVEL NO	72	16	122
003	MEM NO	144	128	158
004	Channel (0,1,both)	2	0	2
006	DATACHECK	YES	NO	YES
009	TEST LOOPING	NO	NO	YES
010	FIRST TEST NO	3	3	16
011	LAST TEST NO	15	2	16
013	MULTI PORT TEST	YES	NO	YES
017	RAM MEMORY TEST	YES	NO	YES
049	MAX. MESSAGE	10	1	32767

Param No 002 is interrupt level (72 = 48 hex).
Param No 003 is COM204 module address, e.g. 144 = 90 hex (strap 12 = 01000).
Param No 006: true sets the testloop to 'stop on error'.
false sets the testloop to 'loop on error'.
Param No 009 = true if you want to have the testloop running in a larger periode.
Param No 010. The test numbers can be seen in ref. [8].
Param No 011 is last test number. If you don't want to run any test then set Param No 011 to 2.
Param No 013 = true means that a memory address test is run in address 3000 hex to 7F3F hex while testloop 15 (F hex) is running, in order to make intensive traffic on the COM204 bus.
Param No 17 = true means that a memory address test is run in address 200 hex to 7F3F hex.

1.4 Load and Start of the Test 1.4

How to load in general, see ref. [1]. TOP80 and the HLC-test is loaded and started as described in ref. [2].

To start the test, type <NEW:HLC> when TOP80 is waiting for input. This causes the test to start and wait for selection of subtest. When the subtest is selected the log book is started with the name HLCPRINT<NO> (where <NO> is the same number as assigned to the test). Now the test is ready to have its parameters changed or to be started.

2. TEST DESCRIPTION 2.

2.1 Dynamic Test Buffers 2.1

With the blocksize parameters, an abitrary databuffer size can be selected. These buffers are not allocated when the test is initiated, but dynamic allocated when the test is started. There is allocated 36 buffers of the maximum size, 9 transmitbuffers and 9 receivebuffers for each channel.

If the allocation meets limitations in memory, it is tried to start the test with fewer buffers per channel.

If this also fails, the test tries to get buffers with half the size and so on.

The buffer-allocation can fail in two ways. It finds no buffers at all, or it finds to few buffers of the size to have at least 1 transmitbuffer and 1 receivebuffer per channel. In the last case it is recommendable to restart the test with smaller buffers.

In both cases the test will be terminated.

If the allocation of buffers succeeds, the test will write as follows:

```
*** maximum test buffer size     : 256
*** maximum queue depth for xfer:   9
```

2.2 Test Cycle

2.2.1 Line Connection

The test will connect the line with the following parameters given to the driver:

auto_return: = true, outputbuffers returns at disconnect.

no_s_commands: = false, supervisory commands are transmitted in case of timeout.

no_poll: = false, poll bit is transmitted in case of timeout.

delay_inf: = false, data frames are transmitted though Receive Not Ready - frame is received.

delay_rr: = false, Receive Ready is transmitted when only one inputbuffer is present.

final_alarm: = true, Command Reject Response is transmitted if an unsolicited response with final bit set to 1 is received.

auto_connect: = false, no autoconnection is performed.

connect_ident, a channel will be connected as either DTE or DCE, which means that one end will act as terminal and the other as master.

frame space param 012 is used.

This information is only informative.

2.2.2 Testing Strategy

The test is designed to be able to run in a closed loop or to run face to face with another controller (maybe placed in another RC3502). Figs. 1 and 2 show possible testconfigurations.

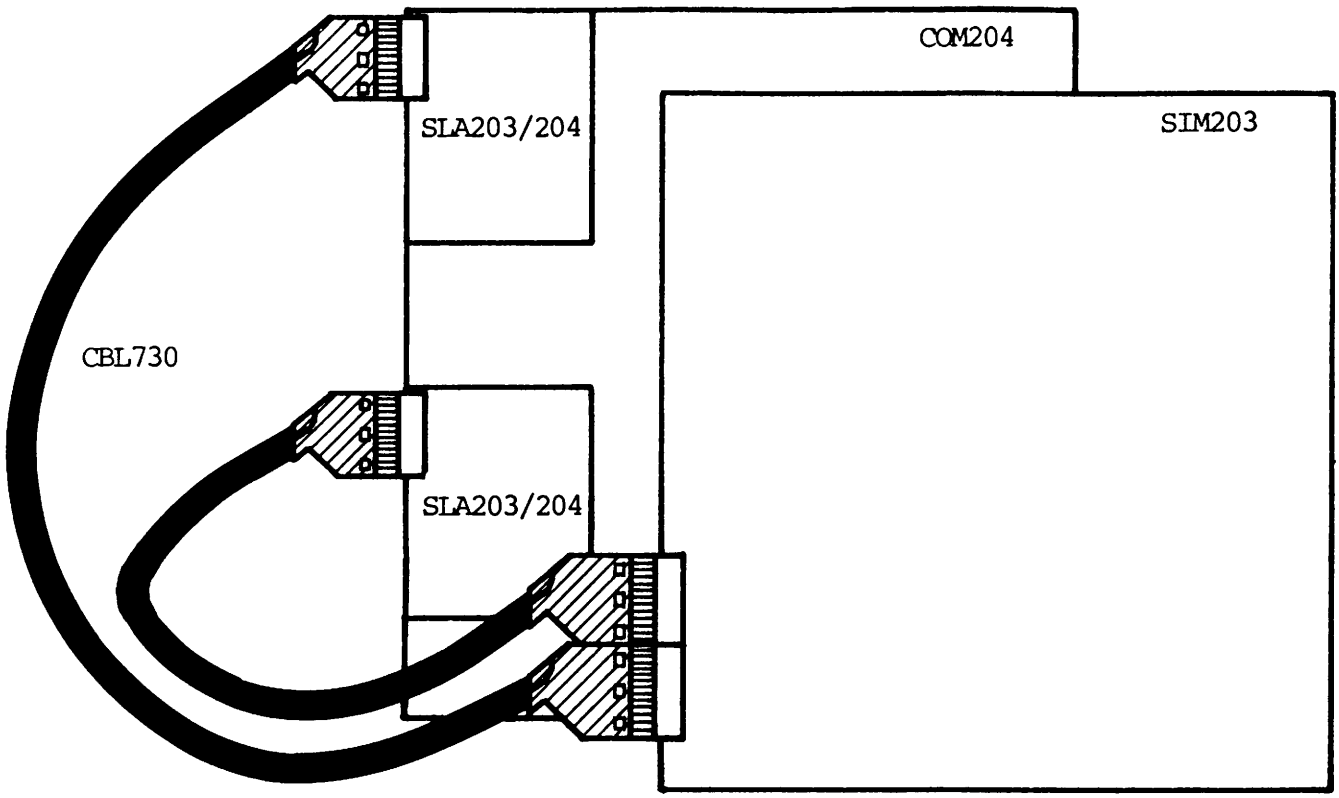

Figure 1: Loop back configuration with modem simulator.

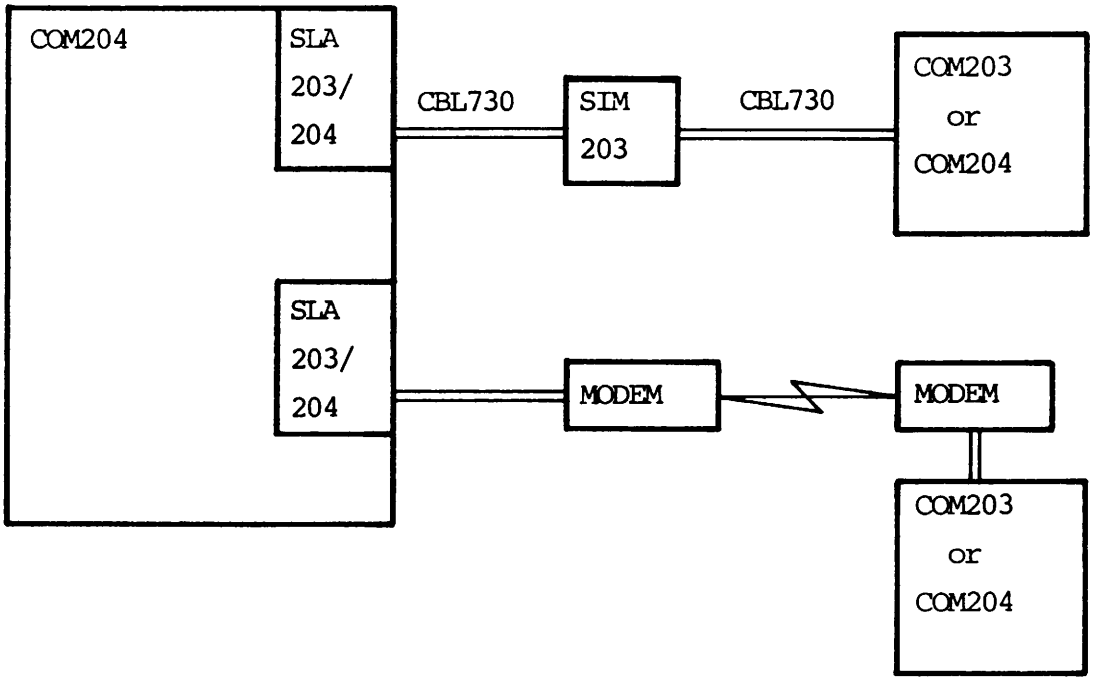

Figure 2: Configurations with more controllers involved.

2.2.2.1 Measure Linespeed

2.2.2

In the beginning of the test, if selected, the test will measure the linespeed of each channel. This will generate an output like the following:

The measured linespeed of channel 0 is: 64 Kbps.

A more exact number could be found in the statistic information.

2.2.2.2 Events

2.2.2.2

From the start, the test will place 3 event messages at each channel related driver. These messages are kept at the driver and used by the driver to inform the test, when an event has occurred. The event could be that a channel was connected, or an error has occurred (see sections 3.1 and 3.2 about errors).

If an event has caused a line to be disconnected, it will automatically be reconnected and the testing will proceed.

When a channel is connected, the following will be written:

channel: 1 connected.

Note: Events numbered 2 to 5 will not cause an errortext to be printed but only a number (see section 3.2).

2.2.2.3 Transferring Data

2.2.2.3

The strategy of the test is to access each channel, with its own driver, independently of the others. Every action taken on a channel will always be a function of the proceeding action. It is the intention to keep two receivebuffers resident at a channel at any time, but the asynchronous way of handling each channel makes it possible that a channel sometimes may not be ready for

receiving. This sideeffect could be verified by inspecting the Statistic Information (see section 4.1), else it has no consequences for the test, but to test the RNR-bits.

When running test "a", the transferbuffers may variate in size. All channels will start with transferring a buffer with minimum size. The buffersize will be increased by one byte for each transfer until the size reaches the maximum size. Then the size will decrease back to minimum (see fig. 3).

The run number will be updated when transferred buffers is equal (maximumsize - minimumsize + 1) * 4, equal to each channel has been through one cycle.

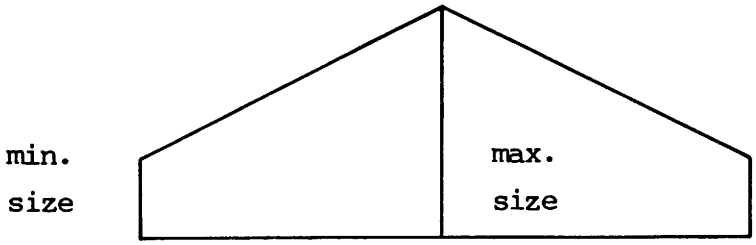

Figure 3: Cycle for a channel.

The data in the databuffers could have 4 different kinds. All zeroes (0), all ones (1), alternating 55 hex and AA hex (3), and counting modulus 256 (4).

The test has independent receive counters and transmit counters. This means that the test could be run with interconnection to another HDLC in another RC3502 without knowing its receive and transmit counters.

It also means that the numbers of transmitted buffers could be ahead or behind the number of received buffer. Do always regard the receiver as a kind of testing mirror for the transmitter at the other end.

2.2.3 Test State Diagram

2.2.3

The following state diagram is intended to give an impression of how the test loop is designed.

next / action	speed	sense	event	con-nect	re-ceive	trans-mit	dis-con-nect	termin-ate
1. start	I*		I*					
2. speed			R					
3. sense				R	R			
4. event		I**	I**					
5. con.					R			
6. rec.					R	I		
7. xmt.					I	R		
8. disc.								R

Notation: I: For immidiate next action

R: For next action as a result of answer from driver.

*: If p017 = yes then a linespeed measurement is performed in the start of the test.

**: There is a pool of 3 event messages resident in the driver.

2.3 Result Actions

2.3

2.3.1 Sense Line Speed

2.3.1

When a Sense Line Speed message (driver operation code 36) is sent to the driver the answer is awaited. After the operation is performed, the measured linespeed is printed. It is only an

approximate value. A more exact value could be found in the Statistic Information. The values could be: 110 bps, 300 bps, 600 bps, 1200 bps, 2400 bps, 4800 bps, 9600 bps, 19.2 kbps, 48 kbps, 64 kbps.

The measurement could fail in two ways.
Result 2 from the driver causes the errortext
<speed < minimum (no modem clock ?)> to be printed.
Result 88 from the driver causes the errortext
<line speed not measurable> to be printed. Could be that linespeed was too fast.

2.3.2 Connect

When a Connect message (driver operation code 4) is sent to the driver, the channel state changes to connecting.

If the errortext <line speed measurement is going on> is printed, it means that the line speed measurement is not terminated yet. This should never be the case for this test.

2.3.3 Sense Status

When a Sense Status message (driver operation code 0) is sent to the driver, the test decides whether to go on testing or to connect the line depending on the state being connected or disconnected. If the test was in the testing phase and the channel was disconnected due to an error, it will reconnect the channel and print the errortext <present state is disconnected>.

If param No 18 (check modem state) is <yes>, the modem signals CI, SQD, DCD, DSR (Calling Indicator, Sending Quality Detect, Data Carrier Detect and Data Set Ready), are checked.

If CI is 0, the errortext <CI is or has been on, while int. enable> is printed.

If SQD is 0, the errortext <Sending Quality Detect is/has been off> is printed. (This errortext is always written once at the start of the test due to the signal being off when line was disconnected).

If DCD is 0, the errortext <Data Carrier Detected is or has been off> is printed. (Again this text is always written once at the start of the test due to the signal being off when line was disconnected).

If DSR is 0, the errotext <Data Set Ready is or has been off> is printed.

2.3.4 Event

2.3.4

Normally 3 event messages will be resident at each driver. An event message (driver operation code 40) is returned to the testprogram due to an error, a connection, or some protocol event. Whenever an event is received by the testprogram, a Sense Status is sent to the driver to decide whether the line is connected or disconnected.

Event 0 causes a printout as follows:

```
channel: 1 connected
```

Event 1 disconnected by user is ignored.

Event 2 to 5 causes a printout as follows:

```
event cause: 2 at channel 1
```

These events are protocol events and not related directly to the hardware.

Event

2 : DISC-frame received, to inform secondary that primary is suspending operation. This event will be printed when the test is started the second time. This will be the case until the primary is connected.

3 : SDABM-frame received (set asynchron balanced mode), normally not seen.

4 : UA-frame received (unnumbered acknowledge), normally not seen.

5 : DM-frame received (disconnected mode) could be seen when the channel at the other end fails.

Event 6 - 14 has a related errortext that normally means that the channel is disconnected due to the error and must be reconnected.

Event

6 : CMDR-frame received, has the errortext:
<command reject response frame received>
It could appear as a reaction to the other end having a size error or sequence error.

7 : controlfield unintelligible, has the errortext:
<control field in xmt-format unintelligible>
It is an error in protocol header format, could be an error in the HDLC chip.

8 : unsolicited response with f-bit, has the errortext:
<unsolicited response with f-bit>
It is a poll answer without this end having polled.

9 : size error, has the errortext:
<size error - controller overrun>
It is an overrun in the controller, caused by receiving a databuffer longer than the maximum buffer length.

Event

10 : sequence error, has the errortext:
<sequence no. error>
It is a sequence number error and could appear as a reaction to an error in the header part of the received data. Immediately after a command reject is transmitted.

11 : timeout, driver try to reset, has the errortext:
<timeout, driver try to reset>
It is printed as a reaction to a timeout and is normally followed by the errortext for event 12, when the controller has made the number of retries specified in param No 21. Could appear if the line was cut during transmission.

12 : timeout, driver gives up, has the errortext:
<timeout, driver gives up>
Appear when the controller has retried the number of times specified in param No 21 without success.

13 : receiver malfunction, has the errortext:
<receiver malfunction (overrun or CRC)>
An overrun has appeared the number of times specified in param No 21 or there were a CRC error.

14 : transmitter malfunction, has the errortext:
<transmitter malfunction (status error)>
A status error is still present after the number of retries specified in param No 21. This error could appear if there is no modem clock on the line, when an attempt to connect is made.

15 : parity error in controller RAM.

2.3.5 Return All Buffer and Disconnect 2.3.5

As a result to the message Return All Buffer (driver operation code 12) the state is disconnected and all buffers resident in the driver are returned (unused). This message is sent to the driver when the test terminates.

2.3.6 Receive 2.3.6

When a buffer is received (driver operation code 1), the buffer is checked if datacheck (param No 6) is <yes>. The length is checked, as a function of the last received. If the length differs from the expected, the errortext <blocklength error> is printed with an expected size and a received size.

If the received datapattern of a byte differs from the expected, the errortext <data error, hard error> is printed.

2.3.7 Transmit 2.3.7

The transmit message has the driver operation code 2.

3. ERROR TEXTS 3.

Errors occurred during test will be printed with a format like the following example.

```
size error - controller overrun
module No  : 24
channel No :  3
blocklength:  8
```

Blocklength will be the size next to be transmitted. Furthermore two lines with expected and received will be printed if it is a data error or blocklength error.

To get more information, which errortexts that could be printed see section 2.3.

If one of the following errortexts is printed, it will normally not have any meaning to continue, so kill the test from TOP and try again.

```
<fatal error in creation of com_print>
<fatal error in creation of tps>
<fatal error in creation of driver>
```

(tps is the testprogram server (ref. [2]).

```
<connect pool empty>
```

4. LOG BOOK 4.

The test contains a log book, that can be used to get information based on the X.25 protocol, about how the controller and line have been working. The information is supplied by the standard X.25 lapB driver (ref. [4]) and printed by the test related process identified by the name <HLCPRINT<NO>>, where <NO> is the same number identifying the test.

Commands to <HLCPRINT<NO>> are:

<STAT> : Prints the statistic information.

<STAT CLEAR>: Prints the statistic information and resets the counters to zero.

<INFO> : Each time the cyclic testoutput buffer in the driver is filled, it is printed. (Can be stopped by giving some input to HLCPRINT).

<INFO IMID> : The cyclic testoutput buffer in the driver is printed immediately.

4.1 Statistic Information 4.1

The first line of the Statistic Information contains the level of the channel in question.

<receiver blockcount> : Number of buffers received.

<transmitter blockcount> : Number of buffers transmitted.

<error received packages> : Number of buffers received with some error.

<retransmitted> : Number of buffers transmitted more than once, due to some intermidiate error (e.g. timeout).

<received Receiver Not Ready> : Number of times RNR has been received. (There is some intended lack of buffers in the test).

<transmitted Receiver Not Ready> : Number of times this channel has had lack of buffers.

<received REJects> : Number of rejected buffers at the other end due to some error. (e.g. sequence no. error).

<transmitted REJects> : Number of rejected buffers, due to some error.

<timeout retransmissions> : Number of times buffers has been retransmitted, due to timeout (e.g. line busy).

<Data Set Ready off> : Number of DSR offs.

<Data Carrier Detected off> : Number of DCD offs.

<Signal Quality Detected off> : Number of SQD offs.

<transmitter underrun> : Number of transmitter underrun (e.g. bus timeout).

<receiver overrun> : Number of receiver overrun (e.g. bus timeout).

<receiver aborts> : Blocks aborted (e.g. frame error).

The lower part of the Statistic Information contains the Last Frame Reject Response if any:

<controlfield>
the controlfield part of the header, ref. [3].

<next sequence no. to be received (VR)>
the next to be received sequence no. also called N(R).

<no> $\begin{matrix}0\\1\end{matrix}$ <poll/final bit>

<no> is printed if there was no poll or final bit.

<next sequence no. to be transmitted (VS)>
the next to be transmitted sequence no. also called N(S).

<controlfield invalid (W)> $\begin{matrix}0\\1\end{matrix}$

if printed indicates the controlfield received and returned in bits 1 through 8 was invalid or not implemented.

<incorrect Information field or Supervisory/Unnumbered incorrect length (x)> $\begin{matrix}0\\1\end{matrix}$

If printed indicates the controlfield received and returned in bits 1 through 8 was consisdered invalid because the frame contained an information field which is not permitted with this command. The above must have been printed in conjuction with this bit.

<to long Information field (Y)> $\begin{matrix}0\\1\end{matrix}$

if printed indicates the information field received exceeded the maximum information field length which can be accommodated by the secondary. This bit is mutually exclusive with bit (W) above.

<invalid receive sequence number (Z)> $\begin{matrix}0\\1\end{matrix}$

if printed indicates the controlfield received and returned in bit 1 through 8 contained an invalid N(R) count. This bit is mutually exclusive of the command.

```
>HLCPRINT01
STAT
channel :   0
                        ---- STATISTIC INFORMATION ----
line id :    72
receiver blockcount              :              129904
transmitter blockcount :                         86097
error received packages:                             0
retransmitted  :                                     0
received Receiver Not Ready     :                    0
transmitted Receiver Not Ready :                     0
received REJects        :                            0
transmitted REJects     :                            0
timeout retransmissions          :                   0
Clear To Send (CTS) off          :                   0
Data Set Ready (DSR) off         :                   0
Data Carrier Detected (DCD) off :                    0
Calling Indicator on    :                            1
Signal Quality Detected (SQD) off  :                 0
receiver overrun        :                            0
transmitter underrun    :                            0
receiver aborts:                                     0
received with CRC16 error    :                       0
                              LAST FRAME REJECT RESPONSE
controlfield    :                                  00
next sequense no to be received (VR)    :    0
no poll / final bit
next sequense no to be transmitted (VS):     0
```

Figure 4: Example of Statistic Information.

4.2 Testoutput

The driver holds a cyclic buffer which can be printed. The buffer may have been filled more than once and this is shown as follows:

>>> 5 mod 31 testoutputlines lost.

Each buffer has a headline:

<line ident> t k ovr = <part> rec trm

<line ident> : a number identifying the channel

<part> : controller part with overrun

t: transmit frames.

R: receive frames.

c: control frames.

Each testoutput element is printed in one line with 7 coloums:

1: sequence number

2: kind, see the table below

3: P1, see the table below

4: P2, see the table below

5: P3, see the table below

6: an interpretation of P1, P2, P3 showing received frames.

7: as coloum 6, showing transmitted frames.

kind	value	type	p1	p2	p3
00		rec size error	mod.st.	c-byte	8%you
02		rec ok	- " -	- " -	- " -
04		rec abort (+size err)	- " -	- " -	- " -
06		rec abort	- " -	- " -	- " -
08		rec size err + ovrun	- " -	2.byte	- " -
0a		rec ovrun	- " -	- " -	- " -
0c		rec RSOM = 1	- " -	?	- " -
x0	0<x<8	rec size err + byte	- " -	2.byte	- " -
80		rec size err + crc	- " -	- " -	- " -
x0	8<x	rec sizeerr+crc+byte	- " -	- " -	- " -
x2	0<x<8	rec byte	- " -	- " -	- " -
82		rec crc	- " -	- " -	- " -
x2	8<x	rec crc + byte	- " -	- " -	- " -
01		trm ok	- " -	c-byte	a-byte
03		trm underrun	- " -	- " -	- " -
05		trm aborted	- " -	- " -	- " -
07		cmdr received	cause	cntrs	c-byte rej
09		event	0	evp	e-cause
0b		interrupt 0..4	0	0	0
0d		rec interrupt	ystate	dstate	mst
0f		u-frame	vrmsk	UC: c-byte	UA: 8%you
11		s- or i-frame	mstate	S: last c-byte	VA: last c-byte
13		timeout dstate=0	tn	vi	mstate
15		timeout dstate=6	tn	0	0
17		rec count	0	dnr	i

Figure 5: Testoutput table.

The main purpose of testoutput is to trace events in the firmware in COM204 and the protocol events. It is not intended to be a hardware diagnostic output.

```
>HLCPRINT01
INFO INIB
channel :   0

72  t     k    ovr=      rec     trm
 2943    02 00 82 00   MI1 4
 2943    0D 00 00 00
 2943    11 01 FF 82
 2943    17 00 40 01
 2944    01 00 41 01           1RR 2
 2945    01 00 48 03           3I4 2
 2946    02 00 A1 08   YRR 5
 2946    0D 00 00 00
 2946    11 21 A1 A1
 2947    02 00 A4 00   MI2 5
 2947    0D 00 00 00
 2947    11 01 FF A4
 2947    17 00 60 01
 2948    01 00 61 01           1RR 3
 2949    02 00 A6 00   MI3 5
 2949    0D 00 00 00
 2949    11 21 FF A6
 2949    17 00 80 01
 2950    01 00 81 01           1RR 4
 2951    01 00 8A 03           3I5 4
 2952    02 00 C1 08   YRR 6
 2952    0D 00 00 00
 2952    11 21 C1 C1
 2953    02 00 C8 00   MI4 6
 2953    0D 00 00 00
 2953    11 01 FF C8
 2953    17 00 A0 01
 2954    01 00 A1 01           1RR 5
select information :
```

Figure 6: Example of testoutput.

5. TURN AROUND TIME 5.

The turn around time for one run of the test is much dependend on the maximum and minimum buffer size and on the line speed. The time for one run with a close loop configuration as fig. 1., speed 64 Kbps, minimum blocksize = 1, maximum blocksize = 256 bytes, and testing both channels is ca. 2 min.

A. REFERENCES A.

[1] RCSL No 52-AA988:
PASCAL80 on the RC3502 Computer, How to Use the RC3502

[2] RCSL No 30M-329:
RC3500, TOP80, Test Operating System, User's Guide

[3] Draft International Standard ISO/DIS 4335

[4] RCSL No 52-AA1159
RC3502, COM204, HDLC-driver, Reference Manual

[5] RCSL No 52-AA1138:
GENERAL INFORMATION FOR COM204

[6] RCSL No 52-AA1139:
GENERAL INFORMATION FOR SLA203/204

[7] RCSL No 52-AA1140:
TECHNICAL DESCRIPTION FOR COM204

[8] RCSL No 52-AA1141:
TESTLOOPS TO COM204, SLA203, SLA204

[9] RCSL No 52-AA1143:
TECHNICAL DESCRIPTION FOR SLA203/204

[10] RCSL No 52-AA1144:
TECHNICAL DESCRIPTION FOR P6X202

B. EXAMPLE OF OUTPUT FROM TEST B.

```
>hlc01
Select function:
P1=4  P17=YES  START
Select function:
--- maximum test buffer size    :          256
--- maximum queue depth for xfer:            9
run no.      1          1983.05.19  12.54.50
the measurred linespeed of channel        1  is  :     64kbps
the measurred linespeed of channel        0  is  :     64kbps
channel  :    1  connected

channel  :    0  connected

LIST
-- com 204 test ---- ver 83.05.10 -- LIST OF PARAMETERS :
p  0  testprogram          :      a
p  1  no of runs           :      4
p  2  level no             :     72
p  3  mem no               :      8
p  4  channel ( 0,1,both):       2
p  6  datacheck            :    yes
p  9  statuscheck          :    yes
p 10  min blocksize        :      1
p 11  max blocksize        :    256
p 12  framegap (10 u_sec):       0
p 13  check modem state    :     no
p 17  measure linespeed    :    yes
p 18  data kind            :      4
p 20  timeout (100 msec)   :     30
p 21  retry count          :      5
p 49  max message          :     10
Select function:
run no.      2
run no.      3
run no.      4
event cause:  4 at channel: 1

--  Test terminated.
-- com 204 test ---- ver 83.05.10 -- LIST OF ERRORS :
---------------- run no.     4  : ----------------
  4096 of type :blocks transferred
  4096 of type :blocks received
No errors detected by testprogram.
----------------------- 1983.05.19  13.02.49 ----
Select function:
```

RETURN LETTER

Title: RC3502 HLC Testprogram Package, User's Guide RCSL No.: 30-M335

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