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RC3502 COM Testprogram User's Guide

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Abstract: This manual describes the relaibility testprogram for the COM203/SLA201 (HDLC-controller). It contains two subprograms, 'a' with a normal transmission test with databuffers of variable size and 'b' which is a mirror, sending all data back. 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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RCSL No 42-I 2164

TABLE OF CONTENTS PAGE

1. INTRODUCTION 1.

This manual describes the reliability testprogram for the RC3502 HDLC, RC3541/43 (COM203/SLA201).

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 (COM203/SLA201)-controller in one RC3502 by connecting pairs of channels together with either a testcable (CBL974/975) 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 two different subtests, one "a" transferring buffers of constant size and one "b" transferring buffers of variable size. 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 COM test is a testpackage in the RC3502 test system, TOP35, and must have this as a parent process, see ref. [2].

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

1.1 Configuration Requirements

A minimum configuration for the RC3502 testsystem, a testcable CBL974/975 or modem interconnection, a COM203, an SLA201 or another COM203 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

Param No	Text	Default	Min.	Max.
000	TESTPROGRAM	a	a	b
001	NO OF RUNS	20	1	32767
002	LEVEL NO	24	16	126
003	Channel (0-1)	-2	-2	1
004	Channel (2-3)	-2	-2	3
006	DATACHECK	YES	NO	YES
009	STATUSCHECK	YES	NO	YES
010	MIN. BLOCKSIZE	1	1	P011
011	MAX. BLOCKSIZE	128	2	32000
012	FRAMEGAP (msec)	128	1	32000
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	1	32767
021	RETRY COUNT	5	1	32767
049	MAX. MESSAGE	10	1	32767

Param No 002 is interrupt level.
Params No 010 and 011 are used by test "a".
Param No 003 can have the following values: -2 for both channel 0 and 1, -1 for none of the two, and 0 for channel 0 or 1 for channel 1.
Param No 004 can have the following values: -2 for both channel 2 and 3, -1 for none of the two and 2 for channel 2 or 3 for channel 3.
Param No 004 cannot have the value -1 at the same time as Param No 003.

Note: Channels are numbered 0 through 3.

1.3 Load and Start of the Test

How to load in general, see ref. [1]. TOP35 and the COM-test is loaded and started as described in ref. [2].

To start the test, type <NEW:COM> when TOP35 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 COMPRINT<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

2.1 Dynamic Test Buffers

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 16 buffers of the maximum size, 2 transmitbuffers and 2 receivebuffers for each channel.

If the allocation meets limitations in memory, it is tried to start the test with 1 transmitbuffer and 1 receivebuffer 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 : 128
--- maximum queue depth for xfer: 2

2.2 Test Loop

2.2.1 Line Connection

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

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.

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.

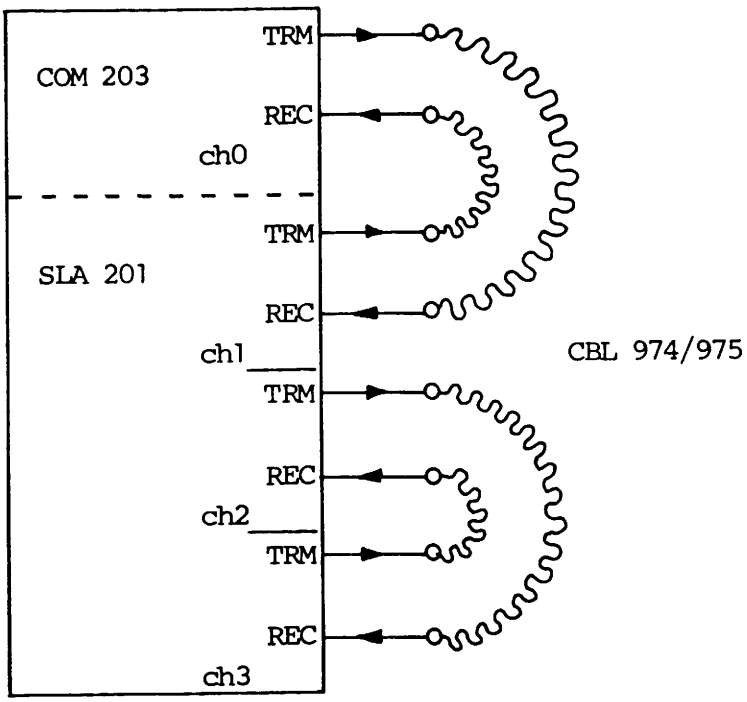

Figure 1: Closed loop configuration.

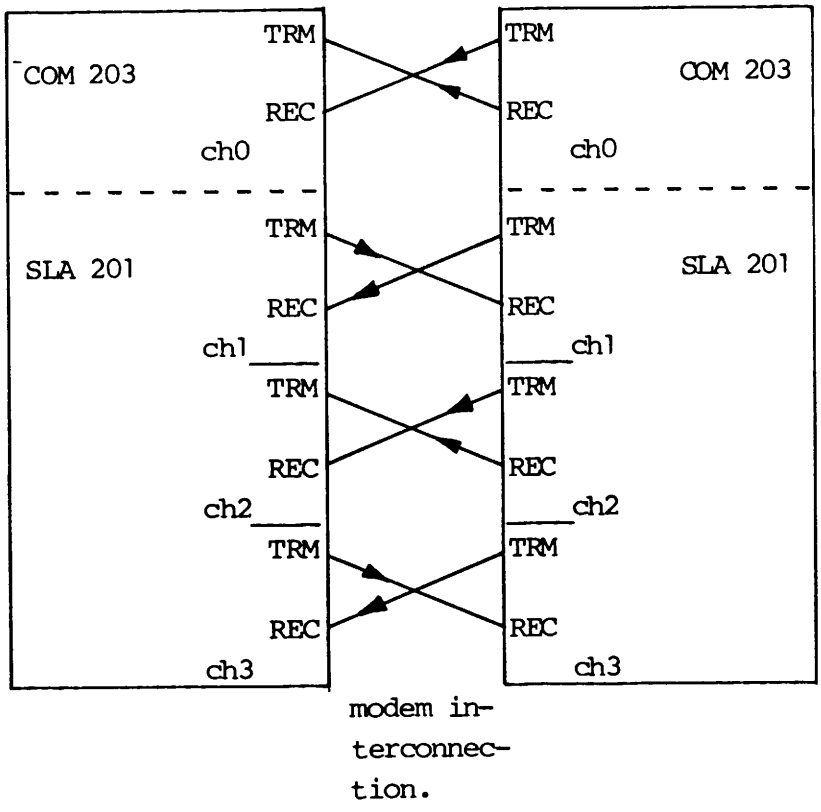

Figure 2: Face to face configuration.

Note: There is an incarnation of the HDLC driver for each channel being tested.

2.2.2.1 Measure Linespeed

2.2.2.1

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 3 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: 2 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 'b', all received data are send back. This test is a passiv test only, it transmits only after receive.

When running test "a", the transferbuffers will 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.

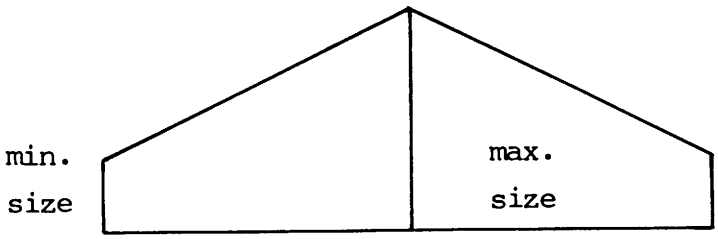

Figure 3: Cycle for a channel.

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

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

action \ next	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

2.3.1 Sense Line Speed

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 : an exception has occurred in the driver.

2.3.5 Return All Buffer and Disconnect

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

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

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.

```
<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]).

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 <LOG<NO>>, where <NO> is the same number identifying the test.

Commands to <LOG<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 only be stopped by killing the test from TOP).

<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, the time in seconds modulus 1000 and the linespeed in bytes/sec. The linespeed will be zero if not measured by the test.

<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:

<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.

```
>comprint01
stat clear
channel :2
                        **** STATISTIC INFORMATION ****
level    : 28   time in sec: 241.6   linespeed (bytes/sec): 7980
receiver blockcount                          :00163
transmitter blockcount                       :00088
error received packages                      :00002
retransmitted                                :00000
received Receiver Not Ready                  :00035
transmitted Receiver Not Ready               :00093
received REJects                             :00000
transmitted REJects                          :00001
timeout retransmissions                      :00000
Data Set Ready off                           :00000
Data Carrier Detected off                    :00000
Signal Quality Detected off                  :00000
Calling Indicator on                         :00000
transmitter underrun                         :00000
receiver overrun                             :00000
receiver aborts                              :00001
                              LAST FRAME REJECT RESPONSE
controlfield                                 :00 00
next sequense no to be received (VR)   :    0
no poll / final bit
next sequense no to be transmitted (VS):    0
select information :
```

Figure 4: Example of Statistic Information.

4.2 Testoutput 4.2

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.

The different coloumns of the testoutput have a headline which is explained below.

<time> : gives the relative time in sec. modulus 1000.

<status> : is the latest read status from the controller.

The meaning of <aux>, <adr>, <cmdr> depends of kind as follows:

<kind>	<adr>	<cmdr>	<aux>
0 <rec.> receiver answer	adr	cmd*	alternate
			1 2
1 <trm.> transmitter answer	adr	cmd*	0
2 <mess2> message from test	U1	PR(0)	U3
3 <send> send to transmitter	adr	cmd*	0
4 <mes4> message not from test (U2 <> 7)	U2	RR(0)	0
5 <cmd5> CMDR	cause	I(VS,VR)	0
6 <cmd6> CMDR	cause	cmd	0
7 <fifo> read fifo	flags	0	0
8 <exce> exception	excause	DISC	0

*) In kind 0, 1, 3 the cmdr is printed in the colon <nr p ns i> where <nr> is next to receive sequence no,<p> is poll/final bit, <ns> is next to send sequence no, and <i> is 0 if this is a frame with data.

In kind 0, 1, 3 adr is address part of frame head.

In kind 2, U1 is the driver operation code, ref. [4]. U3 is normally 0 for this test, except for sense-linespeed, where it is the tolerance.

Kind 4 is for illegal messages.

In kind 5 and 6 (command reject), <cause> is the cause of reject either for a data frame or supervisory frame.

Kind 7 is reading the hardware fifo, <flags> is the flags in the hardware fifo registers.

Kind 8 should not occur, it is an exception in the driver.

On the right side of the <!> the extended testoutput is printed.

<b>: bstate, input buffer state. 0 means no buffers, 1 one buffer, 3 two buffers and 4 many buffers (never in this test).

<r>: rstate, receiver state. 0..2 means connected, 3, 4, 6 means connecting, 7, 8 means alternating connect (between DTE and DCE, as in this test), 5, 9, 10 means disconnected.

<x>: xstate, transmite state. reflects next frame to be send.

<y>: ystate, your state, ystate > 0 means RNR has been received.

<m>: mstate, my state, 1 if rejecting, 2 if RNR.

<j>: number of blocks in latest reveived or transmitted frame.

<vi>: number of data frames (i-frames) transmitted but not acknowledged yet.

<tn>: number of timeouts.

<t>: timer in units of 0.2 sec.

<S>: transmitter busy.

<I>: transmitter is sending data frame.

<A>: current frame is aborted.

<rpnt>: receiver fifo pointer, ref. [5].

<tpnt>: transmitter fifo pointer, ref. [5].

```
>comprint01
info imid
channel :3
                    **** testoutput of collected events ****
level    : 30

>>>  0 mod 31 testoutputlines lost

 time status kind adr cmdr*nr p ns i*aux!b  r  x y m j vi tn  t SIA  rpnt  tpnt
 405.4 a3 02 trm.   1     * 2 0  0 1*  0!1  0  0 0 0 0  0  0  5 I.. 66 01  00 00
 405.6 a3 02 mes2   2    1*          *  0!1  0  0 0 0 0  0  0  6 ... 66 01  00 00
 405.6 a3 02 send   1     * 2 0  7 0*  0!1  0  0 0 0 0  1  0  1 II. 66 01  00 00
 405.6 00 00 fifo  32    0*          *  0!1  0  0 0 0 0  1  0  1 II. 66 01  02 22
 405.6 a3 02 fifo 196    0*          *  0!1  0  0 0 0 1  1  0  1 II. 66 01  12 22
 405.6 a3 02 trm.   1     * 2 0  7 0*  0!1  0  0 0 0 1  1  0  1 II. 66 01  22 22
 405.6 00 00 fifo   0    0*          *  0!1  0  0 0 0 0  1  0  1 ... 60 01  22 22
 405.6 83 02 fifo  68    0*          *  0!1  0  0 0 0 1  1  0  1 ... 70 01  22 22
 405.6 83 02 rec.   3     * 0 0  0 1*  1!1  0  0 0 0 1  1  0  1 ... 00 23  22 22
 405.8 00 00 fifo   0    0*          *  0!1  0  0 0 0 0  0  0  2 ... 02 23  22 22
 405.8 83 02 fifo  68    0*          *  0!1  0  0 0 0 1  0  0  2 ... 12 23  22 22
 405.8 83 02 rec.   3     * 0 0  2 0*  2!0  0  0 0 0 1  0  0  2 ... 22 23  22 22
 405.8 83 02 send   1     * 3 0  2 1*  0!0  0  0 0 2 1  0  0  2 I.. 22 23  22 22
 405.8 a3 02 fifo 224    0*          *  0!0  0  0 0 2 0  0  0  2 I.. 22 23  23 33
 405.8 a3 02 trm.   1     * 3 0  2 1*  0!0  0  0 0 2 0  0  0  2 I.. 22 23  33 33
 406.0 a3 02 mes2   2    1*          *  0!0  0  0 0 2 0  0  0  3 ... 22 23  33 33
 406.0 a3 02 send   1     * 3 0  0 0*  0!0  0  0 0 2 0  1  0  1 II. 22 23  33 33
 406.0 00 00 fifo  32    0*          *  0!0  0  0 0 2 0  1  0  1 II. 22 23  35 55
 406.0 a3 02 fifo 196    0*          *  0!0  0  0 0 2 1  1  0  1 II. 22 23  45 55
 406.0 a3 02 trm.   1     * 3 0  0 0*  0!0  0  0 0 2 1  1  0  1 II. 22 23  55 55
 406.0 83 02 fifo  64    0*          *  0!0  0  0 0 2 0  1  0  1 ... 24 45  55 55
 406.0 83 02 fifo  68    0*          *  0!0  0  0 0 2 0  1  0  1 ... 34 45  55 55
 406.0 83 02 rec.   3     * 1 0  2 1*  1!0  0  0 0 2 0  1  0  1 ... 44 45  55 55
 406.2 83 02 fifo  64    0*          *  0!0  0  0 1 2 0  0  0  2 ... 46 67  55 55
 406.2 83 02 fifo  68    0*          *  0!0  0  0 1 2 0  0  0  2 ... 56 67  55 55
 406.2 83 02 rec.   3     * 1 0  0 1*  2!0  0  0 1 2 0  0  0  2 ... 66 67  55 55
 406.2 83 02 mes2   1    1*          *  0!0  0  0 0 2 0  0  0  2 ... 66 67  55 55
 406.2 83 02 send   1     * 3 0  0 1*  0!1  0  0 0 0 0  0  0  2 I.. 66 01  55 55
 406.2 a3 02 fifo 224    0*          *  0!1  0  0 0 0 0  0  0  2 I.. 66 01  56 66
 406.2 a3 02 trm.   1     * 3 0  0 1*  0!1  0  0 0 0 0  0  0  2 I.. 66 01  66 66
 406.2 a3 02 mes2  44    1*          *189!1  0  0 0 0 0  0  0  2 ... 66 01  66 66
select information :
```

Figure 5: 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 = 128 bytes, and testing all 4 channels is 1 min, 55 sec.

A. REFERENCES A.

[1] RCSL No 52-AA1156:
RC3502 Operating Guide

[2] RCSL No 30-M329:
RC3502, TOP35, Test Operating System, User's Guide

[3] Draft International Standard ISO/DIS 4335

[4] RCSL No 43-AA699:
RC3502, COM201, HDLC-driver, Reference Manual

[5] RCSL No 30-M283:
RC3541/43 Reference Manual

[6] RCSL No 30-M285:
RC3541/43 High Level Communication Controller General Information

[7] RCSL No 30-M284:
RC3541/43 High Level Communication Controller, Technical Manual

B. EXAMPLE OF OUTPUT FROM TEST B.

```
list start
** com 203 test **** ver 81.10.08 ** LIST OF PARAMETERS :
p000  testprogram          :      b
p001  no of runs           :     20
p002  module no            :     24
p003  channel ( 0 - 1 )    :     -2
p004  channel ( 2 - 3 )    :     -2
p006  datacheck            :    yes
p009  statuscheck          :    yes
p010  min blocksize        :      1
p011  max blocksize        :    128
p013  check modem state    :     no
p017  measure linespeed    :    yes
p018  data kind            :      4
p020  timeout (100 msec)   :     30
p021  retry count          :      5
p049  max message          :     10
Select function:
Select function:
*** maximum test buffer size    :   128
*** maximum queue depth for xfer:     2
run no.     1
the measurred linespeed of channel  1  is  :64kbps
the measurred linespeed of channel  2  is  :64kbps
the measurred linespeed of channel  3  is  :64kbps
the measurred linespeed of channel  0  is  :64kbps
event cause:  2 at channel: 1
event cause:  2 at channel: 2
channel  :  2  connected

channel  :  3  connected

channel  :  1  connected

channel  :  0  connected

run no.     2
break
***BREAK

*** Test terminated.
** com 203 test **** ver 81.10.08 ** LIST OF ERRORS :
************************** run no.     2  : **************************
No errors detected by testprogram.
********************************************************************************
Select function:
```

C. SPECIALITIES

C.

Note that in version 81.10.08. the test should have been started at least once before the parameter No 017 (linespeed measurement) is set to <yes>. Else the driver could take some erroneous reactions.

Up to 4 drivers are started when the test is started, depending on P003 and P004. A driver occupies two interrupt levels. The drivers are not removed before the test is killed by TOP. Therefore do not change P002 (module no), without killing the test first.

RETURN LETTER

Title: RC3502 COM Testprogram User's Guide RCSI. No.: 30-M334

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Do you find errors in this manual? If so, specify by page.

How can this manual be improved?

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