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Title:

RC3502 GCI Testprogram Package,

User's Guide

RC International

Keywords:

RC3502, GCI (General Controller Interface), Testprogram.

Abstract:

This manual describes the reliability testprogram for the GCI
(RC35-210), connecting I/O-levels in one or two RC3502 Computers.

(16 printed pages).

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APPENDICES:

1. INTRODUCTION

This manual describes a reliability testprogram for test of a GCI-interface (RC35-210), connecting I/O-hardware in one (or two) RC3502 computers.

In the testprogram is included a GCI-driver process which can handle both writing and reading of data blocks. The data transmission is full duplex, i.e. write- and read-channel are connected to different interruption levels and allocated to different incarnations of the GCI-driver. The read-level is supposed to be one higher than the write-level.

The testprogram has two subtests, "a" and "b". In subtest "a", one pair of I/O-channels is connected to another pair of I/O-channels in the same RC3502 (compare fig. 1). In subtest "b", the second pair of channels is situated in another RC3502 (see fig. 2).
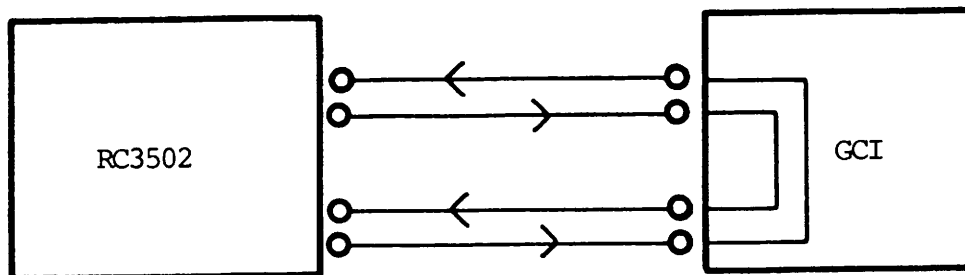

Fig. 1. GCI-test: Subtest "a".
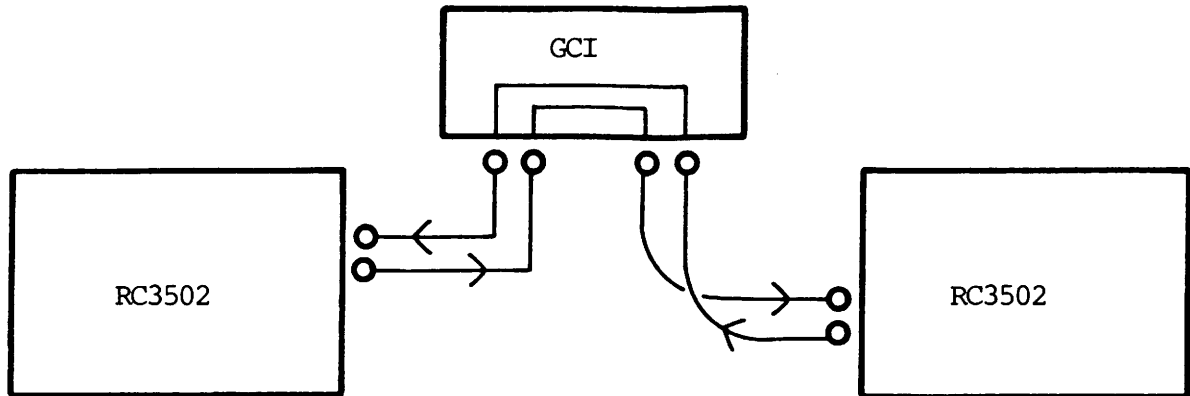
Fig. 2. GCI-test: Subtest "b".

1.1   Configuration Requirements   1.1

A minimum configuration for the RC3502 test system
with a connection to an RC8000 or another load medium
possibility for loading the test system TOP35 and the
test program. Further a GCI-interface (RC35-210) and
cables for connection.

1.2   Parameter Values 1.2

Param.No.	Text	Default	Min.	Max.
000	TESTPROGRAM	A	A	B
001	NO OF RUNS	5	1	integer
002	FIRST WRITE-LEVEL	80	3	122
003	SECOND WRITE-LEVEL	82	3	122
006	DATA CHECK	YES	NO	YES
010	MIN. BLOCKLENGTH	4	3	16384
011	MAX. BLOCKLENGTH	200	3	16384
012	DATA KIND	4	0	4
049	MAX. ERROR MESSAGES	5	1	integer

Remarks:

p002: Interruption level for the first write-chan-
nel. The corresponding read_level is one
higher.

p003: Interruption level for the second write-chan-
nel in case of subtest "a". In case of subtest
"b" this parameter is not used (internally it
is set to -1).

p006: If true, it is checked that the received data
are the same as the ones transmitted. The
first word in the databuffer is equal to the
buffer length (in chars), the next char is the
transmitting levelno.

In the rest of the data buffer, 4 different
kinds of data can be transmitted (see p012).

p012: Datakind can have the following values:

0: all chars are 0;
1: all chars are 255;
3: the chars are alternating between
h55 and # haa;
4: the chars have alfanumeric values
(in the range from 33 to 124).

1.3   Load and Start of the Test

How to load in general, see ref. 3.

TOP35 and the GCI-test are loaded and started as described in ref. 4. To start the test, type <NEW:GCI> when TOP35 is waiting for input. This causes the test to start and wait for selection of subtest. When the subtest is selected, the test is ready to have its parameter changed or to be started.

2. TEST DESCRIPTION

2.1 Dynamic Test Buffers

With the blocksize parameters an arbitary databuffer-size can be selected. These buffers are not allocated when the test is initiated, but dynamically allocated when the test is started. Only one receive- and transmit-buffer (of maximum size) is allocated every interruption level. If the allocation meets limitations in memory, 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 too few buffers of the size to have one transmit buffer and one receive buffer per level. In both cases, the test will be terminated.

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

```
--- maximum test buffer size     :   16384
--- maximum queue depth for xfer :       1
```

2.2 GCI-Driver

The GCI-driver process heading is:

PROCESS gci_driver (VAR sem: semaphore, level: integer);

The GCI-driver is waiting on the semaphore: sem, for a message and associated data buffer. The format of the data buffer is as described in ref. 2.

The driver can handle two functions: read and write.

2.2.1 Write Function

First the timer is set to a timeout value.

Then the driver starts by sending a control word: -1, on the transmit level (p002 or p003).

Next a control word containing the value "last" is sent (address of last byte in the data block).

Now the data block is sent (the length given by "first" and "last").

At last a control word = 0 is sent.

Errors may occur if timeout occurs before the transmission is finished.

2.2.2   Read Function

First the timer is set to a timeout value.

Then the driver will read until eoi or timeout.

If the driver is not timed out, the normal sequence will be:

1. read status: the value should first be -1, a control word, sent by the write function (2.2.1).

2. read status once more. The value should be "last" (2.2.1).

3. read the block.

4. read status once more. The value should be 0.

If the driver is timed out, the buffer is returned with result 1 (not processed) and a new receive buffer is sent to the driver. Else errors may occur because of blocklength error (data lost).

2.3   Test Strategy

Parameter p001 tells the test program, how many runs you want the test to perform.

One run consists of transferring buffers, increasing in size from min. blocksize to max. blocksize and then decreasing back to min. blocksize.

For subtest "a" transmission takes place from both level p002 and from level p003.

If subtest "b" is selected, the transmission level value is taken from parameter 002 in both RC3502´s.

When the first buffer is received, the test will write on the console:

 -- level <readlevel> connected to <writelevel>.

When all runs are finished or max_mess of errors has occurred, the program terminates, writing on the console:

 <w_count> transmitted on level <transmitlevel>
 <r_count> received   on level <receivelevel>

3.   ERROR TEXTS

If an error is detected during the operation of the
test, an errormessage is written on the outputmedia
as follows:

```
<error text>
level no      :  <xxx>
channel no    :  <xx>
block length  :  <xxx>
```

If datacheck is selected furthermore two lines with:
"expected" and "received" will be printed if it is a
data error or blocklength error.

The errortexts may be:

```
<timeout, chars lost on output>
Confer section 2.2.1.
```

```
<chars lost on input>
Confer section 2.2.2.
```

```
<blocklength error>
```
The received data block length differs from the one
expected.

```
<data error, hard error>
```
The received data differs from the one transmitted
(occurs mostly in connection to blocklength error).

```
<undefined error>
```
The result value is not known by the testprogram.

A.   REFERENCES   A.

1. RCSL No. 52-AA309
   General Information for RC35-210

2. RCSL No. 31-D617
   PASCAL80 Driver Conventions

3. RCSL No. 52-AA1156
   RC3502 Operating Guide

4. RCSL No. 30-M329
   RC3502, TOP35, Test Operating System,
   User's Guide

B. INDICES

B.1 Survey of Figures

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