Flytec 5020/5030
Bräuniger Compeo/Competino

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Communication Definition

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Flytec 5020/5030
Bräuniger Compeo/Competino

Version Control

Beginn of version control of this document 6.9.2005
New items compared to the previous version are highlighted in grey

Date	Version Nbr (Date in YYMMDD)	Version 5020/Competino	Version 5030/Compeo
06/10/2008	050906	1.14r	2.20(9)

Introduction

This document is valid for the following instruments: Flytec 5020/5030 and Bräuniger Compeo/Competino. The term “Instrument” is used, where the definition is valid for every device mentioned before. In case of differences between devices, every definition is referenced by the device name.

The instrument is equipped with special communication features, in order to communicate with external devices.
It is possible to transfer data in both directions, so efficient handling during competitions is guaranteed.
The high speed interface with 57.600 baud allows quick transfers with only short delays.

Via RS232 it is possible to communicate with the instrument.
Communication includes:

- Get Serialnumber and pilotname
- Get the actual stored waypointlist
- Get the actual stored routeslist
- Get a selected track, tracklist
- Put waypoints into the instrument
- Put routes into the instrument
- Handle Flight restricted areas (CTRs)

Interface Settings

The instrument receives and transmits data with the following format:

- 57.600 baud
- 1 start bit
- 8 data bit
- 1 stop bit
- no parity
- Software handshake XON / XOFF for flow control

Flytec 5020/5030
Bräuniger Compeo/Competino

General dataformat

ASCII data are accepted and transmitted as the only valid data format. All data are packed into different NMEA-sentences with a propriatary identifier. The only exception are the track data, which are sent directly in the IGC-format, which is requested by the FAI.

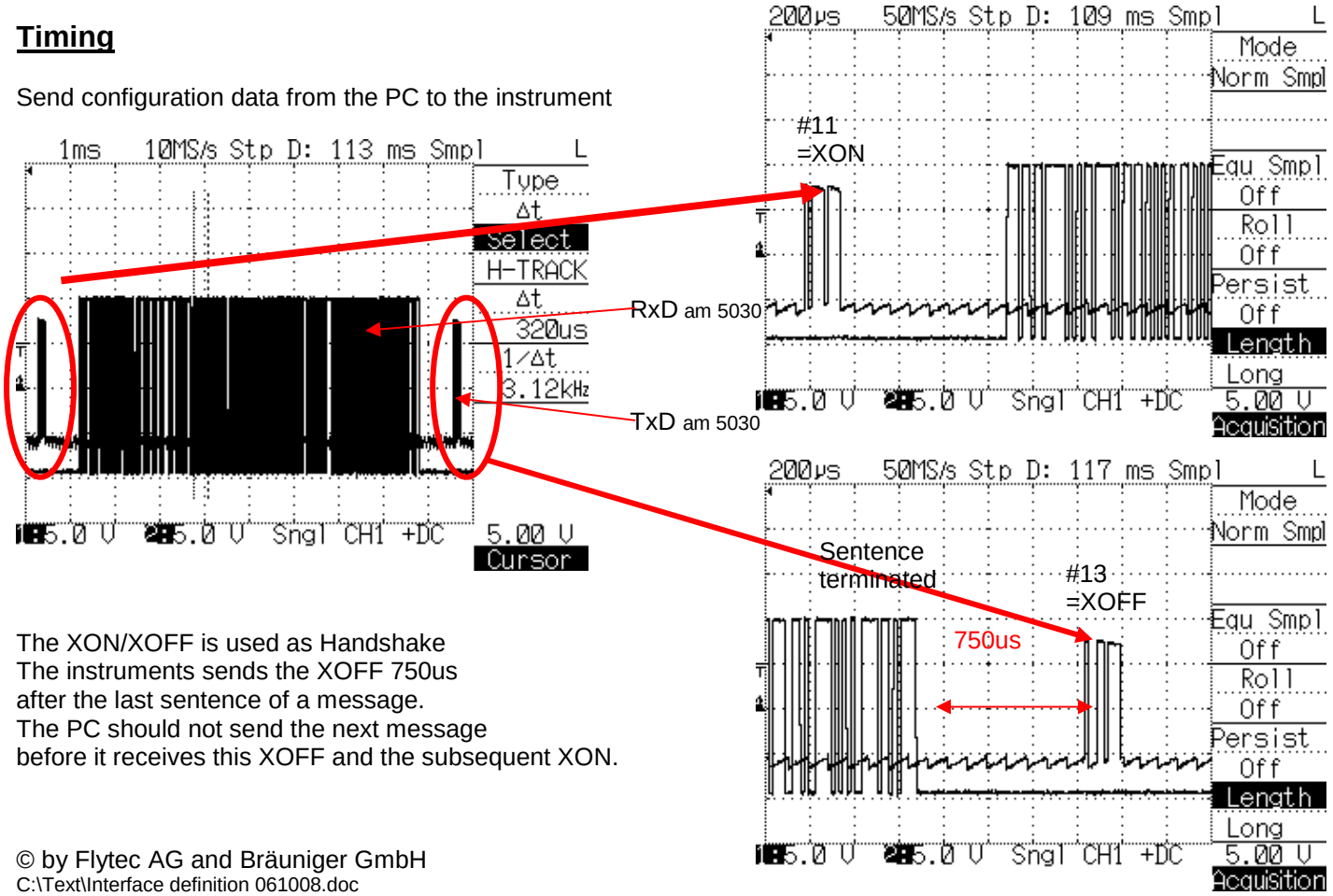
Handshake

XON / XOFF is used to control data flow in both directions.

If the instrument receives a valid command from the PC, it sends an XOFF (13h) character. After the command is completely processed, (e.g. an IGC-file is sent) the instrument sends the XON (11h) character

Timing

Send configuration data from the PC to the instrument



The XON/XOFF is used as Handshake
The instruments sends the XOFF 750us
after the last sentence of a message.
The PC should not send the next message
before it receives this XOFF and the subsequent XON.

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Requesting the Serialnumber and the Pilotname

The instrument has to be set into MENU-mode.

1	2	3	4	5	6	7	8	9	0	1	2	3
$	**P**	**B**	**R**	**S**	**N**	**P**	**,**	*****	**Z**	**Z**	**CR**	**LF**

$PBRSNP Identifier
*ZZ Checksum as defined by NMEA

Reply of the instrument:

1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6
$	**P**	**B**	**R**	**S**	**N**	**P**	**,**	**5**	**0**	**3**	**0**	**,**	**J**	**I**	**M**	**I**		**H**	**E**	**N**	**D**	**R**	**I**	**X**						**,**	**0**	**1**	**0**	**0**	**1**	**,**	**2**	**.**	**0**	**0**	*****	**Z**	**Z**	**CR**	**LF**

$PBRSNP Identifier
5030 / Compeo Instrument Identifier (fix)
JIMI HENDRIX Pilotname (17 char, if shorter, filled with spaces)
01001 Serialnumber (5 char)
2.00 SW-Version (4 char)
*ZZ Checksum as defined by NMEA

Requesting the waypointlist

The instrument has to be set into MENU-mode.

1	2	3	4	5	6	7	8	9	0	1	2	3
$	**P**	**B**	**R**	**W**	**P**	**S**	**,**	*****	**Z**	**Z**	**CR**	**LF**

$PBRWPS Identifier
*ZZ Checksum as defined by NMEA

Reply of 5030 / Compeo:

1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3
$	**P**	**B**	**R**	**W**	**P**	**S**	**,**	**4**	**7**	**5**	**0**	**.**	**7**	**6**	**0**	**,**	**N**	**,**	**0**	**1**	**1**	**0**	**8**	**.**	**5**	**0**	**0**	**,**	**E**	**,**	**B**	**R**	**A**	**0**	**5**	**5**	**,**	**B**	**R**	**A**	**E**	**U**	**N**	**I**	**G**	**E**	**R**							**,**	**0**	**5**	**5**	**0**	*****	**Z**	**Z**	**CR**	**LF**

$PBRWPS Identifier
4750.760,N Latitude (47°50.760min N)
01108.500,E Longitude (011°08.500min E)
BRA055 Name, Altitude in compatible format 550m (6 char)
BRAEUNIGER Waypoint name (17 char, if shorter, filled with spaces)
0550 Waypoint altitude in meter (4 char)
*ZZ Checksum as defined by NMEA

other examples:

```
$PBRWPS,4743.564,N,01121.571,E,URT062,Urthaler Hof     ,0620*03
$PBRWPS,4754.426,N,01110.212,E,PAE058,Paehl            ,0580*35
$PBRWPS,4736.338,N,01104.378,E,OBE083,Oberammergau     ,0830*62
$PBRWPS,4548.429,N,01147.065,E,BAS018,Bassano          ,0180*22
$PBRWPS,4726.020,N,01053.042,E,DAN234,Daniel           ,2340*77
$PBRWPS,4549.637,N,01146.259,E,PUP085,PUPPULO          ,0853*34
$PBRWPS,4548.571,N,01145.714,E,DEL017,DELLA-MENA       ,0176*3F
```

The instrument may transmit up to 200 waypoints in sequence.

Requesting the extended waypointlist

The instrument has to be set into MENU-mode.

1	2	3	4	5	6	7	8	9	0	1	2	3	4
$	**P**	**B**	**R**	**W**	**P**	**S**	**E**	**,**	*****	**Z**	**Z**	**CR**	**LF**

$PBRWPSE Identifier
*ZZ Checksum as defined by NMEA

Reply of 5030 / Compeo:

| 1 | 2 | 3 | 4 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3

Requesting the routeslist

The instrument has to be set into MENU-mode.

1	2	3	4	5	6	7	8	9	0	1	2	3
$	**P**	**B**	**R**	**R**	**T**	**S**	**,**	*****	**Z**	**Z**	**CR**	**LF**

$PBRRTS	Identifier
*ZZ	Checksum as defined by NMEA

Reply of the instrument:
The answer of the instrument consists of several sentences: the first sentence describes the route name, while the others defines the waypoints of the route.

First sentence

1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9
$	**P**	**B**	**R**	**R**	**T**	**S**	**,**	**A**	**A**	**,**	**B**	**B**	**,**	**C**	**C**	**,**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	*****	**Z**	**Z**	**CR**	**LF**	

$PBRRTS	Identifier
AA	internal route number (for information only)
BB	total number of sentences of route
CC	actual sentence of the route: 00 indicates route name
NNNN	route name (17 char, if shorter, filled with spaces)
*ZZ	Checksum as defined by NMEA

following sentences

1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6
$	**P**	**B**	**R**	**R**	**T**	**S**	**,**	**A**	**A**	**,**	**B**	**B**	**,**	**C**	**C**	**,**	**X**	**X**	**X**	**X**	**X**	**X**	**,**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	*****	**Z**	**Z**	**CR**	**LF**	

$PBRRTS	Identifier
AA	internal route number (for information only)
BB	total number of sentences of route
CC	actual sentence of the route 01 – (BB-1) indicates members (waypoints)
XXXXXX	compatible name coded altitude
NNNN	waypoint name (17 char, if shorter, filled with spaces)
*ZZ	Checksum as defined by NMEA

Examples of routes:

```
$PBRRTS,01,05,00,Route 123                *58
$PBRRTS,01,05,01,PUP085,PUPPULO           *2A
$PBRRTS,01,05,02,DEL017,DELLA-MENA        *23
$PBRRTS,01,05,03,BAS018,Bassano           *39
$PBRRTS,01,05,04,DEL017,DELLA-MENA        *25
```

Sending waypoints to the instrument

The instrument has to be set into MENU-mode.

Inside the instrument, all waypoints are referenced by its name, which is always 17char long. If a waypoint is received, its name is compared with the internal waypoints. If a name matches, the original waypoint is overwritten.
If no match is found, the new waypoint is added to the internal list.
If a waypoint is stored, a short acceptance beep is output. The acoustic therefore should not be switched off!
The XON / XOFF protocol allows a transfer of up to 200 waypoints in sequence.
Waypoints may be transmitted in compatible or in native notation.

1. Compatible notation:

1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2
$	**P**	**B**	**R**	**W**	**P**	**R**	**,**	**4**	**7**	**5**	**0**	**.**	**7**	**6**	**0**	**,**	**N**	**,**	**0**	**1**	**1**	**0**	**8**	**.**	**5**	**0**	**0**	**,**	**E**	**,**	**B**	**R**	**A**	**0**	**5**	**5**	*****	**Z**	**Z**	**CR**	**LF**

$PBRWPR	Identifier
4750.760,N	Latitude (47°50.760min N)
01108.500,E	Longitude (011°08.500min E)
BRA055	Name, Altitude in compatible format 550m (6 char)
*ZZ	Checksum as defined by NMEA

2. Native notation with long name:

1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9
$	**P**	**B**	**R**	**W**	**P**	**R**	**,**	**4**	**7**	**5**	**0**	**.**	**7**	**6**	**0**	**,**	**N**	**,**	**0**	**1**	**1**	**0**	**8**	**.**	**5**	**0**	**0**	**,**	**E**	**,**	**,**	**B**	**R**	**A**	**E**	**U**	**N**	**I**	**G**	**E**	**R**								**,**	**0**	**5**	**5**	**0**	*****	**Z**	**Z**	**CR**	**LF**

$PBRWPR	Identifier
4750.760,N	Latitude (47°50.760min N)
01108.500,E	Longitude (011°08.500min E)
BRAEUNIGER	Waypoint name (17 char, if shorter, filled with spaces)
0550	Waypoint altitude in meter (4 char)
*ZZ	Checksum as defined by NMEA

Examples for waypoints in native notation:

```
$PBRWPR,4743.564,N,01121.571,E,,Urthaler Hof     ,0620*ZZ
$PBRWPR,4754.426,N,01110.212,E,,Paehl            ,0580*ZZ
$PBRWPR,4736.338,N,01104.378,E,,Oberammergau     ,0830*ZZ
```

Examples for waypoints in compatible notation:

```
$PBRWPR,4743.564,N,01121.571,E,URT062*ZZ
$PBRWPR,4754.426,N,01110.212,E,PHL058*ZZ
$PBRWPR,4736.338,N,01104.378,E,OGA083*ZZ
```

3. Extended notation with long name and Type:

1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3
$	**P**	**B**	**R**	**W**	**P**	**R**	**E**	**,**	**4**	**7**	**5**	**0**	**.**	**7**	**6**	**0**	**,**	**N**	**,**	**0**	**1**	**1**	**0**	**8**	**.**	**5**	**0**	**0**	**,**	**E**	**,**	**,**	**B**	**R**	**A**	**E**	**U**	**N**	**I**	**G**	**E**	**R**								**,**	**0**	**5**	**5**	**0**	**,**	**T**	**T**	**T**	*****	**Z**	**Z**	**CR**
4							

Deleting all Waypoints:

1	2	3	4	5	6	7	8	9	0	1	2	3	4
$	**P**	**B**	**R**	**W**	**P**	**X**	**,**	**,**	*****	**Z**	**Z**	**CR**	**LF**

$PBRWPX	Identifier
*ZZ	Checksum as defined by NMEA

Reply of the instrument:

1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6
$	**P**	**B**	**R**	**S**	**N**	**P**	**,**	**5**	**0**	**3**	**0**	**,**	**J**	**I**	**M**	**I**		**H**	**E**	**N**	**D**	**R**	**I**	**X**					**,**	**0**	**1**	**0**	**0**	**1**	**,**	**2**	**.**	**0**	**0**	*****	**Z**	**Z**	**CR**	**LF**

$PBRSNP	Identifier
5030 / Compeo	Instrument Identifier (fix)
JIMI HENDRIX	Pilotname (17 char, if shorter, filled with spaces)
01001	Serialnumber (5 char)
2.00	SW-Version (4 char)
*ZZ	Checksum as defined by NMEA

Sending routes to the instrument

The instrument has to be set into MENU-mode.
Before sending any route, be sure that the waypoints are known by the instrument. So transmit the waypoints before they are referenced by any route.
Inside the instrument, all waypoints are referenced by its name, which is always 17char long. If a valid route is received, its name is compared with the internal route names. If a name matches, the original route is overwritten.
If no match is found, the new route is added to the internal list.
If a route is stored, a short acceptance beep is output. The acoustic therefore should not be switched off!
The XON / XOFF protocol allows a transfer of up to 20 routes with up to 30 waypoints in sequence.

Important: Route No 00 is defined as COMPETITION-ROUTE and is specially treated inside the instrument. Please inform yourself inside the owners manual for further information.

First sentence

1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9
$	**P**	**B**	**R**	**R**	**T**	**R**	**,**	**A**	**A**	**,**	**B**	**B**	**,**	**C**	**C**	**,**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	*****	**Z**	**Z**	**CR**	**LF**

$PBRRTR	Identifier
AA	internal route number (for information only)
BB	total number of sentences of route
CC	actual sentence of the route: 00 indicates route name,
NNNN	route name (17 char, if shorter, filled with spaces),
*ZZ	Checksum as defined by NMEA

If AA is equal 00, NNNN is ignored, because it is fixed to COMPETITION-ROUTE.
If NNNN is omitted, the instrument uses AA to use the name as --------AA-------.

following sentences

1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0
$	**P**	**B**	**R**	**R**	**T**	**R**	**,**	**A**	**A**	**,**	**B**	**B**	**,**	**C**	**C**	**,**	**,**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	*****	**Z**	**Z**	**CR**	**LF**

$PBRRTR	Identifier
AA	internal route number (for information only)
BB	total number of sentences of route
CC	actual sentence of the route: 01 – (BB-1) indicates members (waypoints)
NNNN	waypoint name (17 char, if shorter, filled with spaces)
*ZZ	Checksum as defined by NMEA

Examples of routes, which are accepted by the instrument

```
$PBRRTR,01,05,00,Route 123         *ZZ
$PBRRTR,01,05,01,,PUPPULO           *ZZ
$PBRRTR,01,05,02,,DELLA-MENA        *ZZ
$PBRRTR,01,05,03,,Bassano           *ZZ
$PBRRTR,01,05,04,,DELLA-MENA        *ZZ

$PBRRTR,00,05,00,Route 123         *ZZ          Name is converted internal to FAI-ROUTE
$PBRRTR,00,05,01,,PUPPULO           *ZZ
$PBRRTR,00,05,02,,DELLA-MENA        *ZZ
$PBRRTR,00,05,03,,Bassano           *ZZ
$PBRRTR,00,05,04,,DELLA-MENA        *ZZ

$PBRRTR,02,06,00,*ZZ                          Name is set to  -------02-----
$PBRRTR,02,06,01,,PUPPULO           *ZZ
$PBRRTR,02,06,02,,DELLA-MENA        *ZZ
$PBRRTR,02,06,03,,Bassano           *ZZ
$PBRRTR,02,06,04,,DELLA-MENA        *ZZ
$PBRRTR,02,06,05,,PUPPULO           *ZZ
```

Options for the Competition Route

Route No 00 is the Competition Route, which will have several options:
Radius, Start Time, Gates, time between gates, ENTER/EXIT option.

Setting the Radius of the waypoints of a Competition Route:

1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2
$	**P**	**B**	**R**	**R**	**T**	**R**	**R**	**,**	**A**	**A**	**,**	**B**	**B**	**B**	**B**	**B**	*****	**Z**	**Z**	**CR**	**LF**

$PBRRTRR	Identifier
AA	index of waypoint of the competition route, where 00 is the first waypoint
BBBBB	radius in 10m resolution, 5 char (00002-20000)*10m
*ZZ	Checksum as defined by NMEA

Requesting the Radius of the waypoints of a Competition Route:

1	2	3	4	5	6	7	8	9	0	1	2	3	4
$	**P**	**B**	**R**	**R**	**T**	**L**	**R**	**,**	*****	**Z**	**Z**	**CR**	**LF**

$PBRRTLR Identifier
*ZZ Checksum as defined by NMEA

Reply of the instrument:

1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	2	3	4	5	6
$	**P**	**B**	**R**	**R**	**T**	**L**	**R**	**,**	**A**	**A**	**,**	**B**	**B**	**,**	**C**	**C**	**C**	**C**	**C**	*****	**Z**	**Z**	**CR**	**LF**

$PBRRTLR Identifier
AA index of the wayoint, beginning with 0
BB total waypoints of the competition route
CCCCC radius in 10m resolution (00002-20000)*10m
*ZZ Checksum as defined by NMEA

Up to 30 sentences are transmitted in sequence.

Setting an optional Start-Waypoint

1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9
$	**P**	**B**	**R**	**R**	**T**	**S**	**S**	**,**	**A**	**A**	**,**	**B**	**B**	**B**	**B**	**,**	**D**	**D**	**,**	**E**	**E**	**,**	**T**	*****	**Z**	**Z**	**CR**	**LF**

$PBRRTSS Identifier
AA waypoint index inside the route
BBBB local starttime (0000-2359)
DD number of startgates (01-10)
EE time gap between startgates (05-60)min
T Startmode: E (ENTER) or X (EXIT) or N (no startgate, default)
*ZZ Checksum as defined by NMEA
Note: only one Start-Waypoint is allowed.

Requesting the optional Start-Waypoint of a Competition Route:

1	2	3	4	5	6	7	8	9	0	1	2	3	4
$	**P**	**B**	**R**	**R**	**T**	**S**	**L**	**,**	*****	**Z**	**Z**	**CR**	**LF**

$PBRRTSL Identifier
*ZZ Checksum as defined by NMEA

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Answer from the instrument

1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9
$	**P**	**B**	**R**	**R**	**T**	**S**	**L**	**,**	**A**	**A**	**,**	**B**	**B**	**B**	**B**	**,**	**D**	**D**	**,**	**E**	**E**	**,**	**T**	*****	**Z**	**Z**	**CR**	**LF**

$PBRRTSL	Identifier
AA	waypoint index inside the route, -1 if not set, corresponds with Startmode N
BBBB	local starttime (0000-2359)
DD	number of startgates (01-10)
EE	time gap between startgates (05-60)min
T	Startmode: E (ENTER) or X (EXIT) or N (no startgate, default)
*ZZ	Checksum as defined by NMEA

Deleting Routes

All routes, except the COMPETITION-route, can be deleted

Deleting one single Route:

1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0
$	**P**	**B**	**R**	**R**	**T**	**X**	**,**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	*****	**Z**	**Z**	**CR**	**LF**

$PBRRTX	Identifier
NNNN	Route name (17 char),
*ZZ	Checksum as defined by NMEA

Deleting all Routes:

1	2	3	4	5	6	7	8	9	0	1	2	3	4
$	**P**	**B**	**R**	**R**	**T**	**X**	**,**	**,**	*****	**Z**	**Z**	**CR**	**LF**

$PBRRTX	Identifier
*ZZ	Checksum as defined by NMEA

Reply of the instrument:

1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6
$	**P**	**B**	**R**	**S**	**N**	**P**	**,**	**5**	**0**	**3**	**0**	**,**	**J**	**I**	**M**	**I**		**H**	**E**	**N**	**D**	**R**	**I**	**X**					**,**	**0**	**1**	**0**	**0**	**1**	**,**	**2**	**.**	**0**	**0**	*****	**Z**	**Z**	**CR**	**LF**

$PBRSNP	Identifier
5030 / Compeo	Instrument Identifier (fix)
JIMI HENDRIX	Pilotname (17 char, if shorter, filled with spaces)

01001	Serialnumber (5 char)
2.00	SW-Version (4 char)
*ZZ	Checksum as defined by NMEA

Requesting track data of a selected flight

The instrument has to be set into MENU-mode. Additional, a stored flight has to be selected (FLIGHT-ANALYSIS Page)

1	2	3	4	5	6	7	8	9	0	1	2	3
$	**P**	**B**	**R**	**I**	**G**	**C**	**,**	*****	**Z**	**Z**	**CR**	**LF**

$PBRIGC Identifier
*ZZ Checksum as defined by NMEA

Note: This command is not recommended for actual interfacing systems. Please use the commands for requesting the track list and request a specific track

Requesting the track list

The instrument has to be set into MENU-mode.

1	2	3	4	5	6	7	8	9	0	1	2
$	**P**	**B**	**R**	**T**	**L**	**,**	*****	**Z**	**Z**	**CR**	**LF**

$PBRTL	Identifier (request track list)
*ZZ	Checksum as defined by NMEA

Reply of the instrument:
The answer of the instrument consists of several sentences: every sentence indicates one flight

1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4
$	**P**	**B**	**R**	**T**	**L**	**,**	**A**	**A**	**,**	**B**	**B**	**,**	**D**	**D**	**.**	**M**	**M**	**.**	**Y**	**Y**	**,**	**h**	**h**	**:**	**m**	**m**	**:**	**s**	**s**	**,**	**H**	**H**	**:**	**M**	**M**	**:**	**S**	**S**	*****	**Z**	**Z**	**CR**	**LF**

$PBRTL	Identifier
AA	total number of stored tracks
BB	actual number of track (0 indicates the most actual track)
DD.MM.YY	date of recorded track (UTC)(e.g. 24.03.04)
hh:mm:ss	starttime (UTC)(e.g. 08:23:15)
HH:MM:SS	duration (e.g. 03:23:15)
*ZZ	Checksum as defined by NMEA

Requesting the extended track list

The instrument has to be set into MENU-mode.

1	2	3	4	5	6	7	8	9	0	1	2	3
$	**P**	**B**	**R**	**T**	**L**	**E**	**,**	*****	**Z**	**Z**	**CR**	**LF**

$PBRTLE	Identifier (request track list extended)
*ZZ	Checksum as defined by NMEA

Reply of the instrument:
The answer of the instrument consists of several sentences: every sentence indicates one flight

1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0
$	**P**	**B**	**R**	**T**	**L**	**E**	**,**	**A**	**A**	**,**	**B**	**B**	**,**	**D**	**D**	**.**	**M**	**M**	**.**	**Y**	**Y**	**,**	**h**	**h**	**:**	**m**	**m**	**:**	**s**	**s**	**,**	**H**	**H**	**:**	**M**	**M**	**:**	**S**	**S**

1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1
,	**I**	**I**	**I**	**I**	**I**	**,**	**J**	**J**	**J**	**J**	**J**	**,**	**K**	**K**	**K**	**K**	**K**	**,**	**L**	**L**	**,**	**M**	**M**	**M**	**M**	**,**	**N**	**N**	**N**	**N**	**N**	**,**	**O**	**O**	**O**	*****	**Z**	**Z**	**CR**	**LF**

$PBRTLE	Identifier
AA	total number of stored tracks
BB	actual number of track (0 indicates the most actual track)
DD.MM.YY	date of recorded track (UTC)(e.g. 24.03.04)
hh:mm:ss	starttime (UTC)(e.g. 08:23:15)
HH:MM:SS	duration (e.g. 03:23:15)
IIIII	Max A1 in m
JJJJJ	Max A2 in m
KKKKK	Max A3 in m
LL	Scan Interval in s
MMMM	Max Vario in m/s
NNNNN	Min Vario in m/s
OOO	Max Speed in km/h
*ZZ	Checksum as defined by NMEA

Requesting the specific track number

The instrument has to be set into MENU-mode.
Please request the track list before, in order to get the valid range

1	2	3	4	5	6	7	8		9	0	1	2	3
$	**P**	**B**	**R**	**T**	**R**	**,**	**A**	**A**	*****	**Z**	**Z**	**CR**	**LF**

$PBRTR	Identifier (track request)
AA	specific track number (0 indicates the most actual track)
*ZZ	Checksum as defined by NMEA

Reply of the instrument:
The answer of the instrument consists of data defined in IGC-format. Every line is ended with CrLf sequence.
Be sure to store every received character into a file with the ending .IGC . If data are altered or added, the G-record will indicate manipulation. Exceptions: HP- and HO-records. L-records with as LBRA – origin.
Transmission is framed with a start and stop beep. The acoustic therefore should not be switched off!
Use timeout of e.g. 0.5s for ending reception.

Example:

AFLY00245NO:01
HFDTE230202
HFFXA100
HFPLTPILOT:Herbert L.
HFGTYGLIDERTYPE:ATOS-C
HFGIDGLIDERID:D-NABC
HFDTM100GPSDATUM:WGS84
HFGPSGPS:FURUNO_GN-79L
HFRFWFIRMWAREVERSION:0.01
HFRHWHARDWAREVERSION:1.00
HFFTYFRTYPE:FLYTEC,5030 / Compeo
I013638TAS
B1303104549457N01146295EA0085400879048
B1303154549439N01146336EA0086100877040
B1303204549417N01146372EA0085700877036
B1303254549400N01146418EA0086200876054
B1303304549407N01146468EA0086700877046
B1303354549446N01146468EA0087100879042
B1303404549447N01146412EA0087600881050
B1303454549412N01146415EA0088200882046
B1303504549416N01146463EA0088600883044
B1303554549453N01146472EA0089400886038
B1304004549475N01146423EA0089800890044
B1304054549471N01146367EA0090100895042
B1304104549446N01146336EA0090100902040
B1304154549414N01146355EA0090100911044
B1304204549407N01146412EA0090200918048
B1304254549443N01146427EA0090400922044

B1304304549441N01146380EA0091000923042
B1304354549407N01146381EA0090700923050
B1304404549410N01146430EA0090500924046
B1304454549444N01146408EA0090900924044
B1304504549433N01146361EA0090400924044
B1304554549398N01146349EA0091000923044
….
….
GBB66E7B044E4CD98554FDAA04DA0802D
G263D1F65D25FDDE22B10CC5EE0BA7EA8
G83A27570777B3093006BE2F901A80858
G201D8AC134412BA90078000000009429
The format definition and other useful information can be found in www.fai.org/gliding/gnss

Requesting the CTR-list

The instrument has to be set into MENU-mode.

1	2	3	4	5	6	7	8	9	0	1	2	3
$	**P**	**B**	**R**	**C**	**T**	**R**	**,**	*****	**Z**	**Z**	**CR**	**LF**

$PBRCTR Identifier
*ZZ Checksum as defined by NMEA

Reply of the instrument:
The answer of the instrument consists of several sentences: the first sentence describes the CTR name, while the second defines a remark, while the rest defines the waypoints (points), or circle segments.

First sentence

$	**P**	**B**	**R**	**C**	**T**	**R**	**,**	**A**	**A**	**A**	**,**	**0**	**0**	**0**	**,**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**,**	**D**	**D**	**D**	**D**	*****	**Z**	**Z**	**CR**	**LF**

$PBRCTR Identifier
AAA total number of sentences of CTR
NNNN CTR name (17 char, if shorter, filled with spaces)
DDDD warning distance in meter
*ZZ Checksum as defined by NMEA

Second sentence

$	**P**	**B**	**R**	**C**	**T**	**R**	**,**	**A**	**A**	**A**	**,**	**0**	**0**	**1**	**,**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	*****	**Z**	**Z**	**CR**	**LF**

$PBRCTR Identifier
AAA total number of sentences of CTR
NNNN remark (17 char, if shorter, filled with spaces)
*ZZ Checksum as defined by NMEA

following sentences:

Type Point:

$	**P**	**B**	**R**	**C**	**T**	**R**	**,**	**A**	**A**	**A**	**,**	**B**	**B**	**B**	**,**	**P**	**,**	**4**	**7**	**5**	**0**	**.**	**7**	**6**	**0**	**,**	**N**	**,**	**0**	**1**	**1**	**0**	**8**	**.**	**5**	**0**	**0**	**,**	**E**	*****	**Z**	**Z**	**CR**	**LF**

$PBRCTR	Identifier
AAA	total number of sentences of CTR
BBB	actual sentence of the CTR: 002 – (AAA-1) indicates members
P	indicates point (DAFIF)
4750.760,N	Latitude (47°50.760min N) of point
01108.500,E	Longitude (011°08.500min E) of point
*ZZ	Checksum as defined by NMEA

Type Circle :

$	**P**	**B**	**R**	**C**	**T**	**R**	**,**	**A**	**A**	**A**	**,**	**B**	**B**	**B**	**,**	**C**	**,**	**4**	**7**	**5**	**0**	**.**	**7**	**6**	**0**	**,**	**N**	**,**	**0**	**1**	**1**	**0**	**8**	**.**	**5**	**0**	**0**	**,**	**E**	**,**	**D**	**D**	**D**	**D**	**D**	*****	**Z**	**Z**	**CR**	**LF**

$PBRCTR	Identifier
AAA	total number of sentences of CTR
BBB	actual sentence of the CTR: 002 – (AAA-1) indicates members
C	indicates circle
4750.760,N	Latitude (47°50.760min N) of center
01108.500,E	Longitude (011°08.500min E) of center
DDDDD	Radius in meter
*ZZ	Checksum as defined by NMEA

Type Center :

$	**P**	**B**	**R**	**C**	**T**	**R**	**,**	**A**	**A**	**A**	**,**	**B**	**B**	**B**	**,**	**X**	**,**	**4**	**7**	**5**	**0**	**.**	**7**	**6**	**0**	**,**	**N**	**,**	**0**	**1**	**1**	**0**	**8**	**.**	**5**	**0**	**0**	**,**	**E**	*****	**Z**	**Z**	**CR**	**LF**

$PBRCTR	Identifier
AAA	total number of sentences of CTR
BBB	actual sentence of the CTR: 002 – (AAA-1) indicates members
X	indicates center
4750.760,N	Latitude (47°50.760min N) of center
01108.500,E	Longitude (011°08.500min E) of center
*ZZ	Checksum as defined by NMEA

Note: Start- and Stop Segmentcoordinates will follow

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Type Start-Segmentboarders:

| | | |

```
$PBRCTR,003,000,Kreis          ,3440*43
$PBRCTR,003,001,Remark Kreis     *4F
$PBRCTR,003,002,C,4710.001,N,01104.700,E,12345*4D
$PBRCTR,009,000,Engadin        ,1234*46
$PBRCTR,009,001,abcdefghijklmnopq*40
$PBRCTR,009,002,P,4710.001,N,01104.700,E*49
$PBRCTR,009,003,P,4711.002,N,01055.600,E*4E
$PBRCTR,009,004,P,4712.003,N,01100.500,E*49
$PBRCTR,009,005,P,4703.004,N,01110.400,E*4F
$PBRCTR,009,006,P,4714.005,N,01148.300,E*41
$PBRCTR,009,007,P,4725.006,N,01144.200,E*4C
$PBRCTR,009,008,P,4716.007,N,01113.103,E*40
$PBRANS,1*01
```

Sending CTRs to the instrument:

The instrument has to be set into MENU-mode.
Inside the instrument, all CTRs are referenced by its name, which is always 17char long. If a valid CTR is received, its name is compared with the internal CTR names. If a name matches, the original CTR is overwritten.
If no match is found, the new CTR is added to the internal list.
If a CTR is stored, a short acceptance beep is output. The acoustic therefore should not be switched off!
Up to 500 CTRs with up to 100 waypoints in sequence are accepted. (depends on available memory)
Be sure that the points and segments describe a surrounding polygon!

First sentence

$	**P**	**B**	**R**	**C**	**T**	**R**	**W**	**,**	**A**	**A**	**A**	**,**	**0**	**0**	**0**	**,**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**,**	**D**	**D**	**D**	**D**	*****	**Z**	**Z**	**CR**	**LF**

$PBRCTRW	Identifier
AAA	total number of sentences of CTR
NNNN	CTR name (17 char, if shorter, filled with spaces)
DDDD	warning distance in meter
*ZZ	Checksum as defined by NMEA

Second sentence

$	P	B	R	C	T	R	W	,	A	A	A	,	0	0	1	,	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	*	Z	Z	CR	LF
$PBRCTRW								Identifier																													
AAA								total number of sentences of CTR																													
NNNN								remark (17 char, if shorter, filled with spaces)																													
*ZZ								Checksum as defined by NMEA																													

following sentences:

Type Point:

$	P	B	R	C	T	R	W	,	A	A	A	,	B	B	B	,	P	,	4	7	5	0	.	7	6	0	,	N	,	0	1	1	0	8	.	5	0	0	,	E	*	Z	Z	CR	LF
$PBRCTRW								Identifier																																							
AAA								total number of sentences of CTR																																								
BBB								actual sentence of the CTR: 002 – (AAA-1) indicates members																																								
P								indicates point (DAFIF)																																								
4750.760,N								Latitude (47°50.760min N) of point																																								
01108.500,E								Longitude (011°08.500min E) of point																																								
*ZZ								Checksum as defined by NMEA																																									

<u>example: (checksum not valid!)</u>
$PBRCTRW,009,000, Muenchen ,8888*74
$PBRCTRW,009,001,Franz-J. Strauss *74
$PBRCTRW,009,002,P,4710.503,N,01104.700,E*1B
$PBRCTRW,009,003,P,4711.002,N,01055.600,E*1C
$PBRCTRW,009,004,P,4712.003,N,01100.500,E*1A
$PBRCTRW,009,005,P,4703.004,N,01110.400,E*15
$PBRCTRW,009,006,P,4714.005,N,01148.300,E*1F
$PBRCTRW,009,007,P,4725.006,N,01144.200,E*1F
$PBRCTRW,009,008,P,4716.707,N,01113.101,E*15

Type Circle :

$	**P**	**B**	**R**	**C**	**T**	**R**	**W**	**,**	**A**	**A**	**A**	**,**	**B**	**B**	**B**	**,**	**C**	**,**	**4**	**7**	**5**	**0**	**.**	**7**	**6**	**0**	**,**	**N**	**,**	**0**	**1**	**1**	**0**	**8**	**.**	**5**	**0**	**0**	**,**	**E**	**,**	**D**	**D**	**D**	**D**	**D**	*****	**Z**	**Z**	**CR**	**LF**

$PBRCTR	Identifier
AAA	total number of sentences of CTR
BBB	actual sentence of the CTR: 002 – (AAA-1) indicates members
C	indicates circle
4750.760,N	Latitude (47°50.760min N) of center
01108.500,E	Longitude (011°08.500min E) of center
DDDDD	Radius in meter
*ZZ	Checksum as defined by NMEA

example: (checksum not valid!)
$PBRCTRW,003,000,Kreis ,3440*74
$PBRCTRW,003,001,Remark Kreis *74
$PBRCTRW,003,002,C,4710.001,N,01104.700,E,12345*1B

Type Center:

$	**P**	**B**	**R**	**C**	**T**	**R**	**W**	**,**	**A**	**A**	**A**	**,**	**B**	**B**	**B**	**,**	**X**	**,**	**4**	**7**	**5**	**0**	**.**	**7**	**6**	**0**	**,**	**N**	**,**	**0**	**1**	**1**	**0**	**8**	**.**	**5**	**0**	**0**	**,**	**E**	*****	**Z**	**Z**	**CR**	**LF**

$PBRCTRW	Identifier
AAA	total number of sentences of CTR
BBB	actual sentence of the CTR: 002 – (AAA-1) indicates members
X	indicates center
4750.760,N	Latitude (47°50.760min N) of center
01108.500,E	Longitude (011°08.500min E) of center
*ZZ	Checksum as defined by NMEA

Note: Start- and Stop- Segmentcoordinates have to follow

Type Start-Segmentboarders:

$	P	B	R	C	T	R	W	,	A	A	A	,	B	B	B	,	T	,	4	7	5	0	.	7	6	0	,	N	,	0	1	1	0	8	.	5	0	0	,	E	,	X	*	Z	Z	CR	LF

$PBRCTR	Identifier
AAA	total number of sentences of CTR
BBB	actual sentence of the CTR: 002 – (AAA-1) indicates members
T	indicates Start Segmentboarder
4750.760,N	Latitude (47°50.760min N) of segmentbo arder
01108.500,E	Longitude (011°08.500min E) of segment boarder
X	'+':indicates clockwise counting of segment, '-': indicates counterclockwise counting of segment
*ZZ	Checksum as defined by NMEA

Type Stop-Segmentboarders:

$	P	B	R	C	T	R	W	,	A	A	A	,	B	B	B	,	Z	,	4	7	5	0	.	7	6	0	,	N	,	0	1	1	0	8	.	5	0	0	,	E	,	X	*	Z	Z	CR	LF

$PBRCTR	Identifier
AAA	total number of sentences of CTR
BBB	actual sentence of the CTR: 002 – (AAA-1) indicates members
Z	indicates Stop Segmentboarder
4750.760,N	Latitude (47°50.760min N) of segmentbo arder
01108.500,E	Longitude (011°08.500min E) of segment boarder
X	'+':indicates clockwise counting of segment, '-': indicates counterclockwise counting of segment
*ZZ	Checksum as defined by NMEA

example: (checksum not valid!)

$PBRCTRW,008,000,Kreisbogen ,3440*74
$PBRCTRW,008,001,Remark Kreisbogen*74
$PBRCTRW,008,002,P,4710.001,N,01104.700,E*1B
$PBRCTRW,008,003,P,4711.002,N,01055.600,E*1C
$PBRCTRW,008,004,X,4712.003,N,01100.500,E*1A
$PBRCTRW,008,005,T,4703.004,N,01110.400,E,+*15
$PBRCTRW,008,006,Z,4714.005,N,01148.300,E,+*1F
$PBRCTRW,008,007,P,4710.002,N,01104.704,E*1B

Reply of the instrument:

1	2	3	4	5	6	7	8	9	0	1	2	3	4
$	**P**	**B**	**R**	**A**	**N**	**S**	**,**	**C**	*****	**Z**	**Z**	**CR**	**LF**

$PBRANS	Identifier	
C	Status:	
	Acknoledge	1
	Plausibility Error	2
	No further memory	3
	No more writing allowed	4
	NMEA syntax error	5
*ZZ	Checksum as defined by NMEA	

Deleting CTRs

Deleting one single CTR:

1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1
$	**P**	**B**	**R**	**C**	**T**	**R**	**D**	**,**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	*****	**Z**	**Z**	**CR**	**LF**

$PBRCTRD	Identifier	
NNNN	CTR name (17 char),	
*ZZ	Checksum as defined by NMEA	

Reply of the instrument:

1	2	3	4	5	6	7	8	9	0	1	2	3	4
$	**P**	**B**	**R**	**A**	**N**	**S**	**,**	**C**	*****	**Z**	**Z**	**CR**	**LF**

$PBRANS	Identifier	
C	Status:	
	Acknoledge	1
	Plausibility Error	2
	No further memory	3
	No more writing allowed	4
	NMEA syntax error	5
*ZZ	Checksum as defined by NMEA	

Deleting all CTRs:

1	2	3	4	5	6	7	8	9	0	1	2	3	4	5
$	**P**	**B**	**R**	**C**	**T**	**R**	**D**	**,**	**,**	*****	**Z**	**Z**	**CR**	**LF**

$PBRCTRD Identifier
*ZZ Checksum as defined by NMEA

Reply of the instrument:

1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6
$	**P**	**B**	**R**	**S**	**N**	**P**	**,**	**5**	**0**	**3**	**0**	**,**	**J**	**I**	**M**	**I**		**H**	**E**	**N**	**D**	**R**	**I**	**X**					**,**	**0**	**1**	**0**	**0**	**1**	**,**	**2**	**.**	**0**	**0**	*****	**Z**	**Z**	**CR**	**LF**

$PBRSNP Identifier
5030 / Compeo Instrument Identifier (fix)
JIMI HENDRIX Pilotname (17 char, if shorter, filled with spaces)
01001 Serialnumber (5 char)
2.00 SW-Version (4 char)
*ZZ Checksum as defined by NMEA

Requesting CTR Information

1	2	3	4	5	6	7	8	9	0	1	2	3
$	**P**	**B**	**R**	**C**	**T**	**R**	**I**	*****	**Z**	**Z**	**CR**	**LF**

$PBRCTRI Identifier
*ZZ Checksum as defined by NMEA

Reply of the instrument:

1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5
$	**P**	**B**	**R**	**C**	**T**	**R**	**I**	**,**	**N**	**N**	**N**	**,**	**M**	**M**	**M**	**,**	**O**	**O**	**O**	*****	**Z**	**Z**	**CR**	**LF**

$PBRCTRI Identifier
NNN No of actual stored CTRs
MMM No of max. allowed CTRs
OOO No of free elements (Cirle, center, …) The header of every CTR (Name, Remark, etc) consumes appr. 3 elements!
*ZZ Checksum as defined by NMEA

Output of cyclic NMEA-Data

The instrument allows the cyclic (1s update) output of different NMEA sentences for interfacing other devices like cardplotters, autopilots, etc.

Interface settings of receiving device: 9600baud, 8 n 1(internal GH80 receiver only)

Restrictions: The cyclic output is interrupted, if in Menu-mode. If a flight track is redrawn in the realtime track, no data are output during a complete redraw. No output is produced, if the GPS-module is switched off.

$GPRMC
Example:
$GPRMC,175956,A,4754.8316,N,01110.6332,E,031.8,278,030203*38

Definition	Example	Unit
Identification	$GPRMC,	
UTC	175956,	17:59:16
Valid / not valid	A,	A: Valid, V unvalid GPS data
Latitude	4754.8316,N,	47°54,8316 N
Longitude	01110.6332,E,	011°10,6332 E
Speed over ground	031.8,	31.8 kn (kn for compatibility)
Track	278,	278°
Date	030203	03.02.2003
Checksum	*38	As defined by NMEA

$BRSF(you need a release code for this sentence)
Example:
$BRSF,063,-013,-0035,1,193,00351,535,485*38

Definition	Example	Unit
Identification	$BRSF,	
Indicated or true air speed	063,	63 km/h
Integrating vario	-013,	-1.3 m/s (+ xxx if rising)
Altitude A2	-0035,	-35 m (+ xxxx if positiv)
Waypoint activ	1,	1 activ, 0 not activ
Bearing to waypoint	193,	193°

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Distance to waypoint	00351,	35.1 km
McCready speed to fly	535,	53.5 km/h
Speed to fly (best glide)	485	48.5 km/h
Checksum	*38	As defined by NMEA

$VMVABD
Example:
$VMVABD,0000.0,M,0547.0,M,-0.0,,,MS,0.0,KH,22.4,C*65

Definition	**Example**	**Unit**
Identification	$VMVABD,	
GPS Altitude	0000.0,M,	Meter
Baro Altitude (A1)	0547.0,M,	Meter
Integrating vario	-0.0,,,MS	m/s
Indicated or true air speed	0.0,KH,	km/h
Temperature	22.4,C	℃
Checksum	*65	As defined by NMEA

Using VALI-BRA.EXE

The Console application allows official observers to test the integrity and possible manipulation of IGC- files, transferred from the instrument.
VALI-BRA uses all data of the file except the following additional records:

- HO and HP- records, where official observers or pilots can make input in the header section
- L –records, which following 3 characters are not BRA. This allows individual logbook-entries.

Calling convention:
VALI-BRA “igc-file”

The text out informs about validity or manipulation or corrupt files.

In order to execute VALI-BRA in batch- mode, the return value can be evaluated:
0: data are valid
1: data are not valid, corruption or manipulation
2: bad or missing file when VALI-BRA is called

Reading and writing EEPROM-memory

The instrument has to be set into Menumode.

Requesting memory dump:

PC sends request:

1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8
$	**P**	**B**	**R**	**M**	**E**	**M**	**R**	**,**	**A**	**A**	**A**	**A**	*****	**Z**	**Z**	**CR**	**LF**

$PBRMEMR	Identifier
AAAA	EEPROM-startaddress in hex notation
*ZZ	Checksum as defined by NMEA

Answer from the instrument:

1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2
$	**P**	**B**	**R**	**M**	**E**	**M**	**R**	**,**	**A**	**A**	**A**	**A**	**,**	**X**	**X**	**,**	**X**	**X**	**,**	**X**	**X**	**,**	**X**	**X**	**,**	**X**	**X**	**,**	**X**	**X**	**,**	**X**	**X**	**,**	**X**	**X**	*****	**Z**	**Z**	**CR**	**LF**

$PBRMEMR	Identifier
AAAA	EEPROM-startaddress in hex notation
XX	8 byte of memory beginning with startaddress, hex notation
*ZZ	Checksum as defined by NMEA

Writing memory:

Caution: Writing to memory allows the modification of any configuration data. Writing to unknown addresses may cause damage to the instrument!

PC sends request:

1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4
$	**P**	**B**	**R**	**M**	**E**	**M**	**W**	**,**	**A**	**A**	**A**	**A**	**,**	**Y**	**,**	**X**	**X**	**,**	**X**	**X**	**,**	**X**	**X**	**,**	**X**	**X**	**,**	**X**	**X**	**,**	**X**	**X**	**,**	**X**	**X**	**,**	**X**	**X**	*****	**Z**	**Z**	**CR**	**LF**

$PBRMEMW	Identifier
AAAA	EEPROM-startaddress in hex notation
Y	number of bytes to be written, valid inputs:1 - 8
XX	up to 8 bytes of memory beginning with startaddress will be written, hex notation
*ZZ	Checksum as defined by NMEA

Answer from the instrument:

1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2
$	**P**	**B**	**R**	**M**	**E**	**M**	**R**	**,**	**A**	**A**	**A**	**A**	**,**	**X**	**X**	**,**	**X**	**X**	**,**	**X**	**X**	**,**	**X**	**X**	**,**	**X**	**X**	**,**	**X**	**X**	**,**	**X**	**X**	**,**	**X**	**X**	*****	**Z**	**Z**	**CR**	**LF**

$PBRMEMR	Identifier
AAAA	EEPROM-startaddress in hex notation
XX	8 byte of memory beginning with startaddress, hex notation
*ZZ	Checksum as defined by NMEA

Example of writing 4 bytes (0xA1, 0xBF, 0x12,0x4F) beginning with address 0x04FC
$PBRMEMW,04FC,4,A1,BF,12,4F,,,,*ZZ CR LF
The instrument answers:
$PBRMEMR,04FC,A1,BF,12,4F,00,00,00,00*ZZ CR LF

Addresses of Configuration Data:
Char- types are one byte-types.
Int-Types are two byte types (little endian).

Addresses of 5030/Compeo:

Address (dez)	Type	Definition	Valid range	Remarks
0	Unsigned char (16)	Pilotname	0- terminated string	
32	Unsigned Int	Contrast of LCD	0 – 1000	0.1 % resolution
54	Int	QNH-Correction of A1	-2000m - +1000m	
72	Unsigned char	Speedgain pressure	90 – 100%	
73	Unsigned char	Vario/Speed resp.delay	6 – 40	0.2 s increment
74	Unsigned char	Base volume of beeper	0, 25, 50, 75, 100%	
75	Unsigned char	TEC	0 – 99%	
76	Unsigned char	Variooffset (acoustic threshold)	0 – 20 cm/s	
77	Char	Sink acoustic	-1 - -99cm/s	
78	Char	Temperature Correction	-10 - +10℃	
85	Unsigned char	Polare Sink[0] of set 1	1 – 200cm/s	Means –1 - -200cm/s
86	Unsigned char	Polare Sink[1] of set 1	1 – 200cm/s	Means –1 - -200cm/s
87	Unsigned char	Polare Speed[0] of set 1	20 – 120km/h	
88	Unsigned char	Polare Speed[1] of set 1	20 – 120km/h	
91	Unsigned char	Polare Altitude of set 1	0 – 3000m	100m increments
122	Unsigned char	Polare Sink[0] of set 2	1 – 200cm/s	Means –1 - -200cm/s
123	Unsigned char	Polare Sink[1] of set 2	1 – 200cm/s	Means –1 - -200cm/s
124	Unsigned char	Polare Speed[0] of set 2	20 – 120km/h	
125	Unsigned char	Polare Speed[1] of set 2	20 – 120km/h	
126	Unsigned char	Polare Altitude of set 2	0 – 3000m	100m increments
127	Unsigned char	Polare usage	0: Set 1	

			1: Set 2	
89	Unsigned char	Recording Stop mode	1: autom. Recording stop 0: manual recording stop	
90	Unsigned char	Speed-Displaymode	1: True 0: indicated	
92	Char	UTC-Offset	-13 - +13h	
94	Unsigned char	Stallspeed	0 – 99km/h	
95	Unsigned int	Stallaltitude	0 – 8000m	
97	Unsigned char	Recording interval	1 – 60s	
100	Unsigned char	Acoustic Intergration	1 – 35	Increments of 40ms
102	Unsigned int	UpBaseFrequency	700 – 1400Hz	
104	Unsigned int	DownBaseFrequency	300 – UpBaseFrequency	
110	Unsigned char	Frequency Modulation	2 – 9	
119	Unsigned char	Sink acoustic on/off	0: off 1: on	
120	Unsigned char	Variomode	0: integrating 1: netto 2: integrating/netto	
121	Unsigned char	Vario integration time	1 – 30s	
128	Unsigned char	Speedgain windwheel	70 – 150%	
141	Unsigned char	Units	bit 0: 0: m 1: ft bit 1: 0: m/s 1: fpm bit 2,3: 00: km/h 01: mph 10: kn bit 4: 0: GradC 1: GradF	
142	Unsigned char	Waypoint format	0: dd'mm.mm 1: dd.ddddd 2: dd'mm"ss 3: UTM 4: Swiss Grid	
145	Unsigned int	FAI Starttime	0 – 1439min	00:00 – 23:59
147	Int	QNH-Correction of A2	-8000 - +8000m	
149	Unsigned char	Pressure Speed usage	1: Yes 2: No	

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156	Unsigned char	User Set Page	0 – 2	
157	Unsigned char	Daytypical rising average	1 – 20	Increments of 30s
158	Unsigned char	Acoustic Pitch	1 – 7	
159	Unsigned char	SW-Version	214 = V2.14	Read only
182	Unsigned char	McCreadyDelay	0 – 30s	
183	Unsigned char	McCready Gap	0 – 50 cm/s	
186	Unsigned char	Company	0x24: Flytec 0:Bräuniger	
187	Unsigned char	Vario Display	1: Circle Style 0: Bar Style	
188	Unsigned char	Speed Scaling	1: 30 – 80km/h 0: 20 – 70km/h	
189	Unsigned char (3)	Userfield[0] Userfield[1] Userfield[2]	1: small char 0: large char	
192	Unsigned char (16)	Glidertype	0- terminated string	
224	Unsigned char (16)	Glider-ID	0- terminated string	
256	Unsigned int (30)	FAI-Radius	20 – 50000m	Index of Wayoint in FAI-Route
316	Unsigned char	Geodetic ID	1 – 192	1:WGS84, see user manual
320	Unsigned char (7)	Index of Dataitem in Userfield 0	0 – 24	Definition of Dataitem: "WindSpeed ", /* 00 */ " Time ", /* 01 */ "Flighttime", /* 02 */ "Gnd speed ", /* 03 */ " Spd-Diff ", /* 04 */ " Alt a.WP ", /* 05 */ "Dist to WP", /* 06 */ " Bearing ", /* 07 */ " Track ", /* 08 */ " Temp ", /* 09 */ " Alt 2 ", /* 10 */ " Alt 3 ", /* 11 */ "QNH (hPa) ", /* 12 */ " L/D gnd ", /* 13 */ " L/D air ", /* 14 */ " L/D req. ", /* 15 */ " Dist to ^", /* 16 */

				" ", /* 17 */ " Alt a.BG ", /* 18 */ " FL (ft) ", // 19 "Dist t Ctr", // 20 "Alt a.Goal", // 21 "Dis t Goal", // 22 "CalcAirspd", // 23 "Dist Start", // 24
330	Unsigned char (7)	Index of Dataitem in Userfield 1	0 – 24	
340	Unsigned char (7)	Index of Dataitem in Userfield 2	0 – 24	
380	Unsigned char	No of Startgates in C-Route	0 – 9	
381	Unsigned char	Startgate time in minutes	5 – 60	
382	Unsigned char	Vario Freq.-change during beep	0 – 1	

Addresses of 5020/Competino:

Address (dez)	Type	Definition	Valid range	Remarks
0	Unsigned char (16)	Pilotname	0- terminated string	
32	Unsigned Int	Contrast of LCD	0 – 1000	0.1 % resolution
54	Int	QNH-Correction of A1	-2000m - +1000m	
73	Unsigned char	Vario/Speed resp.delay	6 – 40	0.2 s increment
74	Unsigned char	Base volume of beeper	0, 25, 50, 75, 100%	
76	Unsigned char	Variooffset (acoustic threshold)	0 – 20 cm/s	
77	Char	Sink acoustic	-1 - -99cm/s	
78	Char	Temperature Correction	-10 - +10℃	
89	Unsigned char	Recording Stop mode	1: autom. Recording stop 0: manual recording stop	
90	Unsigned char	Speed-Displaymode	1: True 0: indicated	
92	Char	UTC-Offset	-13 - +13h	
94	Unsigned char	Stallspeed	0 – 99km/h	
95	Unsigned int	Stallaltitude	0 – 8000m	
97	Unsigned char	Recording interval	1 – 60s	
100	Unsigned char	Acoustic Intergration	1 – 35	Increments of 40ms
102	Unsigned int	UpBaseFrequency	700 – 1400Hz	
104	Unsigned int	DownBaseFrequency	300 – UpBaseFrequency	
110	Unsigned char	Frequency Modulation	2 – 9	
119	Unsigned char	Sink acoustic on/off	0: off 1: on	
120	Unsigned char	Variomode	0: integrating 1: netto 2: integrating/netto	
121	Unsigned char	Vario integration time	1 – 30s	
128	Unsigned char	Speedgain windwheel	70 – 150%	
141	Unsigned char	Units	bit 0: 0: m 1: ft bit 1: 0: m/s 1: fpm bit 2,3: 00: km/h 01: mph 10: kn	

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			bit 4: 0: GradC 1: GradF	
142	Unsigned char	Waypoint format	0: dd'mm.mm 1: dd.ddddd 2: dd'mm"ss 3: UTM 4: Swiss Grid	
145	Unsigned int	FAI Starttime	0 – 1439min	00:00 – 23:59
147	Int	QNH-Correction of A2	-8000 - +8000m	
156	Unsigned char	User Set Page	0 – 2	
157	Unsigned char	Daytypical rising average	1 – 20	Increments of 30s
158	Unsigned char	Acoustic Pitch	1 – 7	
159	Unsigned char	SW-Version	214 = V2.14	Read only
185	Unsigned char	Last thermal threshold	10=1m/s	
186	Unsigned char	Company	0x24: Flytec 0: Brauniger	
192	Unsigned char (16)	Glidertype	0- terminated string	
224	Unsigned char (16)	Glider-ID	0- terminated string	
256	Unsigned int (30)	FAI-Radius	20 – 50000m	Index of Wayoint in FAI-Route
316	Unsigned char	Geodetic ID	1 – 192	1:WGS84, see user manual
320	Unsigned char (3)	Index of Dataitem in Userfield 0	0 – 22	Definition of Dataitem: "WindSpd ", /* 00 */ " Time ", /* 01 */ "Fl.Time ", /* 02 */ "Gnd spd ", /* 03 */ "Spd-Diff", /* 04 */ "Dist WP ", /* 05 */ "Bearing ", /* 06 */ " Track ", /* 07 */ " Temp ", /* 08 */ " Alt 2 ", /* 09 */ " Alt 3 ", /* 10 */ "QNH hPa ", /* 11 */ " L/D gnd", /* 12 */ " L/D air", /* 13 */ " L/D req", /* 14 */ "Dist to^", /* 15 */

				" ", /* 16 */ "Alt a.BG", /* 17 */ " FL (ft)", // 18 "Dist CTR", // 19 "Airspeed", // 20 "Alt a.Gl", // 21 "Dist Gl ", // 22
330	Unsigned char (3)	Index of Dataitem in Userfield 1	0 – 22	See above
340	Unsigned char (3)	Index of Dataitem in Userfield 2	0 – 22	See above
350	Unsigned char	Best L/D	20-150 =(2.0-15.0)	
351	Unsigned char	Speed at best L/D	20-80	Resolution:1 km/h
352	Unsigned char	Batterytype	0: Alcaline 1: NiMH	
353	Unsigned char (25)	SMS-Receiver number		In ASCII
378	Unsigned char	SMS Competition mode	0 : no competition mode 1 : competition mode	
379	Unsigned char	SMS Cyclic Rate	0 – 60 0: no SMS cyclic transmission	Resolution 1 min
380	Unsigned char	SMS Emergency	0: no emergency SMS 1: emergency SMS activ	

Update Configuration:

When the instrument receives the request, all configuration data are updated from EEPROM

PC sends request:

1	2	3	4	5	6	7	8	9	0	1	2	3	4
$	**P**	**B**	**R**	**C**	**O**	**N**	**F**	**,**	*****	**Z**	**Z**	**CR**	**LF**

$PBRCONF Identifier

*ZZ Checksum as defined by NMEA

Reply of the instrument:

1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6
$	**P**	**B**	**R**	**S**	**N**	**P**	**,**	**5**	**0**	**3**	**0**	**,**	**J**	**I**	**M**	**I**		**H**	**E**	**N**	**D**	**R**	**I**	**X**					**,**	**0**	**1**	**0**	**0**	**1**	**,**	**2**	**.**	**0**	**0**	*****	**Z**	**Z**	**CR**	**LF**

$PBRSNP Identifier

5030 / Compeo Instrument Identifier (fix)

JIMI HENDRIX Pilotname (17 char, if shorter, filled with spaces)

01001 Serialnumber (5 char)

2.00 SW-Version (4 char)

*ZZ Checksum as defined by NMEA