

Technical Description

Clock Driver for Windows NT ab 3.5x
Clock Circuit Boards 6036/6038



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1 General Information

This programme synchronizes a Windows NT™ computer with the **hopf** radio controlled clock board 6036/6038. A completely novel synchronization process is used which does no longer set the internal clock roughly onto the new values but adjusts the timer tick of the computer gently (fuzzy control). The synchronization process itself is a realized system service and automatically knows when a control is required and how often a control has to be carried out.

The computer clock is set roughly only after booting, after that the system time is adjusted by means of the **SystemAdjustmentCounter** in steps of 100 nanoseconds. If the computer time is set manually it may take up to several minutes until the synchronization process sets the computer again "roughly".

2 Installation Of the Clock and the Delivered Software

2.1 Hardware Installation

The hardware (board 6036 or 6038) is set into a vacant ISA-slot of the computer and screwed into place. Our company delivers the board with the following settings:

- Address Port Hex 280
- Master (synchr. Via antenna)
- serial parameter of the interface 9600 baud, 8 bit, no parity, 1 stopbit

It usually suffices if you wait about 5 minutes after the installation of the clock board, the connection of the antenna and as well as the according software drivers. The clock is usually synchronized within this time span and further actions are not required.

2.2 Service Programme ANTSERI / GPS 6038

In case of reception problems the programme **ANTSERI.EXE** (not SERVICE.EXE) can be used to find the best antenna position for the clock boards 6036 or **GPS_6038.EXE** for the clock board 6038. This programme is necessary to eliminate reception problems or hardware conflicts.

ANTSERI.EXE / GPS_6038 works with a serial interface of your computer which is needed during the installation period only. The software automatically recognizes the first available COM port of the computer (see dialogue window "Help info"). The delivered modem cable must be connected to this COM-port and to the 9-pole Sub-D connector of the clock board. On completion the programme is ready for operation.



Please note : The programme should be handled by qualified personnel / administrators only.

2.2.1 General Information on the Programmes ANTSERI and GPS 6038

Both clock boards **6036 DCF** and **6038 GPS** need different service software to align the antenna. Detailed descriptions of the service functions of **ANTSERI** and **GPS_6038** are included in the respective delivery.

2.2.2 Changing of the Port Address

Before you change the preset port address (0x280) you must find a free port address in the Windows NT Registry. The clocks support the following port settings:

board 6036	board 6038
0x200-0x23f	0x200-0x23f
0x240-0x27f	0x240-0x27f
0x280-0x2bf (default)	0x280-0x2bf (default)
0x2c0-0x2ff	...
0x300-0x33f	...
0x340-0x37f	...
0x380-0x3bf	in steps of Hex 0x40 to max.
0x3c0-0x3ff	0x1FC0-0x1FFF

Jumper J2 must be removed from the clock board. Afterwards a new address field can be selected by means of the menu item "file: change hardware address". The clock driver "HopfClk" must be changed to the new address by Windows NT Registry.

Steps:

- call up diagnosis in the group "manager" Windows NT, and "TOOLS" under menu, then activate the Registry Editor
- the directory
 - HKEY_LOCAL_MACHINE
 - SYSTEM
 - CurrentControlSet
 - Servicessearch for the entry HopfClk and set the entry IOPortAdress in the sub-directory to the new value.

Alternatively it is possible to edit the file HOPFCLK.INI and set the entry parameters

```
form  IoPortAddress = REG_DWORD 0x00000280
to    IoPortAddress = REG_DWORD 0x00000xxx
```

xxx being the new portaddress.

The driver software must be reinstalled for this process.

2.2.3 Master-/Slave Operation 6036 only

"menu item master/slave operation" see description 6036!

2.2.4 Setting the Time

This function serves to set the time on the clock board.



Please note : It should be used for testing purposes only.

2.2.5 Releasing a Reset

This menu item can be used to reinitialise the clock hardware.

2.2.6 Aligning the Antenna 6036 only

Use the command "file" "start antenna alignment" to start the programme, which shows the incoming DCF-signal as an oscillogram. On every second change the signal should dip by about 20% (wave trough). The best reception position (max. Wave trough) is found by slowly turning the antenna. The reception suffices, if

- The second pulse is shown undisturbed on the monitor.
- the DCF-dip is bigger than 150 (top right in the menu line) .

The representation of the antenna values can be changed optically by means of the command grid positive or negative resp. plus line width +/-.



Please note : Once the clock has been successfully put into operation the modem cabel should be removed to eliminate possible unauthorized manipulation of the clock board.

2.3 Installation of the Driver Software

- All the data on the Windows NT disc must be copied into a new directory.

e.g. "C:\HOPFCLK" on a hard drive

- The file "HOPFCLK.SYS" must also be copied into the Windows NT "driver directory" e.g either

C:\WINNT\SYSTEM32\DRIVERS

or C:\WINDOWS\SYSTEM32\DRIVERS

- The installation must be carried out with an administrator (privilege).

Now "INSTDRV.BAT" can be used to install the driver software, the programme showing some information on the monitor. Afterwards the computer must be booted again.

3 Checking the Installation

Call up the Windows NT diagnose in the group "**ADMINISTRATION**", then "**TOOLS**" and activate the registry editor in the "**REGISTRY EDITOR**"

Check in the directory

```
HKEY_LOCAL_MACHINE
  SYSTEM
    CurrentControlSet
      Services
```

The following entries must be present:

- HopfClk (with the subdirectory "**Parameters**")
(note: change portaddress here)
- HopfServ (with the subdirectory "**Security**")

Activate **control panel** in the main group, select the entry "**Services**", here the listbox of the clock driver must show the entry

"hopf ClockSync.- Service Started Automatic"

The system is now synchronized by the clock board under the conditions that:

the clock must have a valid time (LED time /radio)

4 Working with the Time Zones

The clock driver can be called up by UTC or MEZ from the version 2.01. The synchronization process takes the according time information from the board to synchronize the computer.

The files:

<u>Instdrv.bat</u>	installs the driver with local time as the time basis.
<u>Inst UTC.bat</u>	installs the driver with UTC (universal time coordinated) as time basis
<u>Inst MEZ.bat</u>	installs the driver with MEZ only as time basis

When using the individual synchronization methods you must decide whether the feature (automatic changeover to summertime) offered by the system is activated or not.

5 Files on the Disc

hopfclk.sys hardware driver of the clock board 6036 (Kernel Mode Device)
hopfclk.ini initialization data for the hardware driver
(here you can name a new hardware address before the installation)
regini.exe installation routine for the hardware driver
hopfserv.exe driver for the clock service is configured by means of the command line
[-install][-UTC][-MEZ]
[-remove] and can be - if required - removed manually or installed.

Board 6036

antseri.exe service programme for alignment of the antenna, set hardware address, change master / slave mode etc.

Board 6038

GPS_6038.exe service programme for alignment of the antenna, set hardware address, change position data etc.

hilfe.txt help text for AntSeri
bwcc.dll Custom Controls for AntSeri

readme.txt last information

instdrv.bat installation programme for the clock driver with local time
Inst.UTC.bat installs the driver with UTC as time basis
Inst.MEZ.bat installs the driver with CET as time basis
Inst.rem.bat removes the clock service