LXFAI

data-fil, conv-fil, vali-fil programs for PC's

VERSION 2.4

FILSER ELECTRONIC GmbH
LXFAI, data-fil, conv-fil, vali-fil, programs for PC's, 1997

Table of Contents

Glossary

LX instrument	A wide range of different variometers and navigation systems produced by Filser Electronic
LX20	Instrument produced by Filser Electronic used for flight validation purposes and terminal functions
FAI Logger	Part of LX20 instrument, which is used for flight validation purposes
Terminal	Part of LX20 instrument, which is used for storing LX5000 logged files, airport database
NMEA0183	Special American marine protocol, which is outputted from most GPS receivers. It is in ASCII form.
LX logger	Type of logger, which is produced by LX instrument.
Turning points and task memory	Memory, which is used for storing turning point data (up to 600 points) and tasks data (up to 100) and is same for whole family of LX instruments.
TP & TASK memory	Short name for turning points and task memory.
Turning point list	List of all turning points stored in TP & TASK memory.
LXGPS program	Program for PC computer, which is supplied with LX5000 and is used for writing and reading to LX instrument, database management and analyzing LX logger.
LXFAI program	Program for PC computer, which is included in LX20 package. It is used for downloading, viewing and analyzing flights from LX20.
DATA-FIL program	Program required by FAI used for downloading data from LX20 to PC.
VALI-FIL program	Program required by FAI used for security check of flights from LX20
CONV-FIL program	Program required by FAI used for conversion from internal binary format to IGC file format.
DA4 extension	With this extension, files in which turning point and tasks are marked.
LO4 extension	LX5000 loggers are stored in these files.
FIL extension	FAI Logger, recorded with LX 20 is stored in this files. Data is written in internal binary format.
IGC extension	FAI Logger is stored in this file. Data is written in IGC format in ASCII form.
HDR extension	In this files, information about pilot, glider and task used for flight validation purposes are written. Data is stored in internal binary format.

INSTALLATION

Technical requirements
Setup

Technical requirements

LXFAI software package is supplied on one 3.5 inch DOS formatted diskette.
Minimum configuration for operating is
- MS-DOS 3.3 or later
- 450 KB of memory
- 286 processor
- CGA graphic display
- 3.5" diskette drive
- 3 MB of hard disk space
- Keyboard
- 9-pin or 25-pin serial line port

Recommended configuration of your system
- MS-DOS 3.3 or later
- 550 KB of memory
- 486 processor with mathematics coprocessor
- VGA graphic display
- 3.5" diskette drive
- 3 MB of hard disk space
- Keyboard
- 9-pin serial line port

NOTE: All programs are also running under Windows 3.1, Windows 95 or Windows NT

Setup

Installing from MS-DOS
Type at prompt,

```
C:\> A:
```

to move to your diskette drive and type install at DOS prompt

```
A:\>INSTALL
```

Press <ENTER> and wait until setup screen will appear

Installing from Windows 3.1
Select PROGRAM-MANEGER group. Open FILE menu and choose RUN item. Type at prompt,

```
A:\INSTALL,
```

and press <ENTER> key. Wait until setup screen will appear

Installing from Windows 95
Select START button and RUN item. Type at prompt,

```
A:\INSTALL,
```

and press <ENTER> key. Wait until setup screen will appear

If setup program is invoked correctly, following screen will appear

```
┌─ LXFAI program installation setup ─────┐
│                                        │
│  Program directory:                    │
│  C:\LXFAI                              │
│                                        │
│  ESC Quit installation                 │
│  F10 Start installation                │
│                                        │
└────────────────────────────────────────┘
```
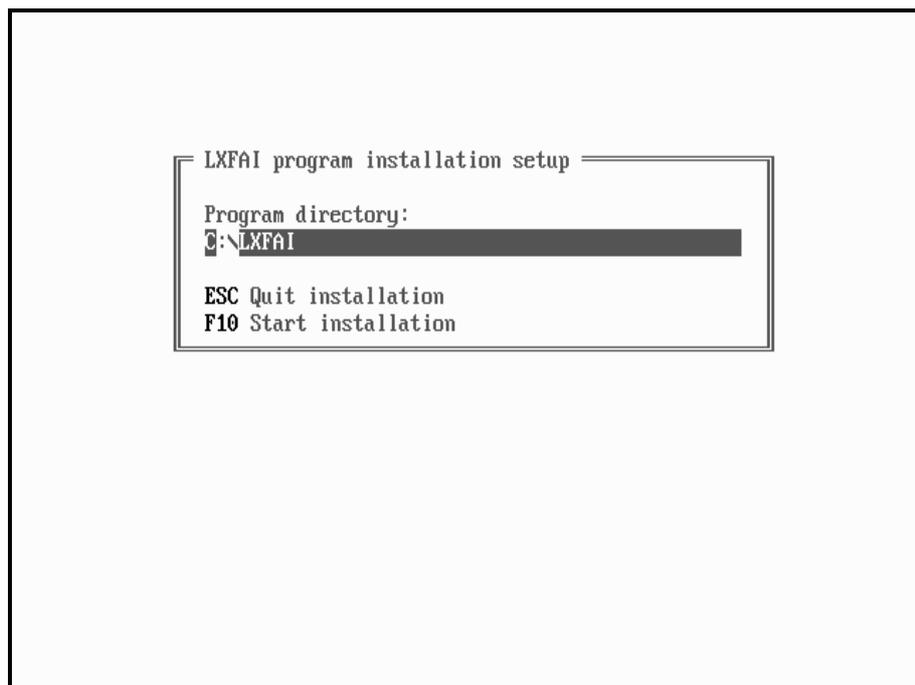
All you have to do is to type the location, to which all files will be extracted. Press <F10> to start installation process. All files are now being copied to the selected location.

```
┌─ LXFAI program installation setup ────────────┐
│                                               │
│ Program directory:                            │
│ ┌─ Color and printer setup ═══════════════╗   │
│ ║                                         ║   │
│ ║   Screen type: (SPACE to change)        ║   │
│ ║   EGA - 16 colors                       ║   │
│ ║                                         ║   │
│ ║   Printer type: (SPACE to change)       ║   │
│ ║   EPSON FX and compatible               ║   │
│ ║                                         ║   │
│ ║                                         ║   │
│ ║   ESC Finish setup                      ║   │
│ ║                                         ║   │
│ ╚═════════════════════════════════════════╝   │
│                                               │
└───────────────────────────────────────────────┘
```
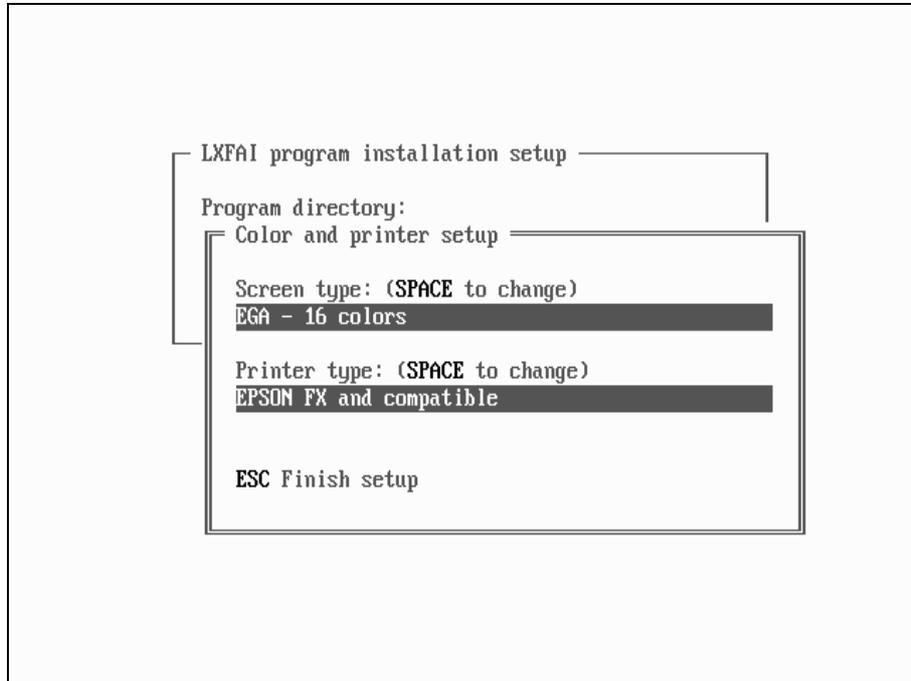
Chose your screen type and printer you are using. This setting can also be changed later, if you run SETUP program. Type at DOS prompt

```
C:\LXFAI\> SETUP
```

and press <ENTER>.
If you are going to run program under Windows, we recommend to make shortcut to program or PIF Icon. (See Windows Manual for more details).

If program installation finished OK, following message will appear:

```
┌─ LXFAI program installation setup ─────────┐
│                                            │
│ Program directory:                         │
│ C:\LXFAI                                   │
│                                            │
│ ESC Quit ┌──────────────────────┐          │
│ F10 Start│ Installation finished OK!│       │
│          └──────────────────────┘          │
│                                            │
└────────────────────────────────────────────┘
```
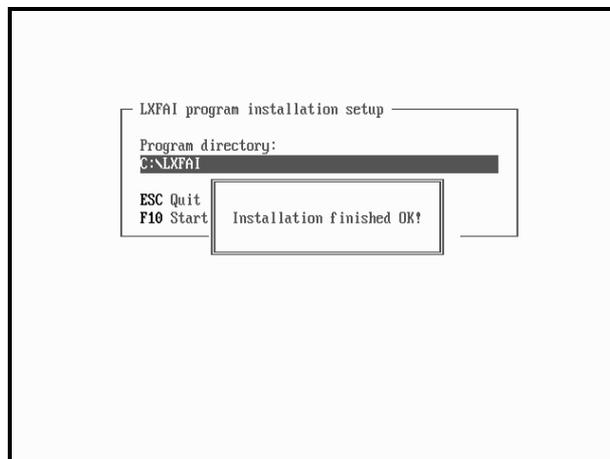
Folder structure:
- `LXFAI`: program files, configuration files, printer and display drivers
- `LXFAI\LOGGER`: default path for downloaded
- `LXFAI\DATA`: default path for turning point databases and flight information files
- `LXFAI\AIRSPACE`: airspace structure files
- `LXFAI\XXXX-FIL`: data-fil, conv-fil, vali-fil programs

To run LXFAI program, move to LXFAI folder and type at DOS prompt:

`C:\LXFAI\> LXFAI`

Press <ENTER> and LXFAI main screen will appear. Choose highlighted letter to invoke proper menu. Press <F1> for online help or press <F10> to exit LXFAI program.

TRANSFERS

Downloading flights from LX20
Turning point database transfers
Flight information updating

Downloading flights from LX20

Connect LX20 to computer serial line port with cable, which is supplied with LX20 package. Run LXFAI program and switch on LX20. Press letter 'T' on your computer to open Transfer menu.
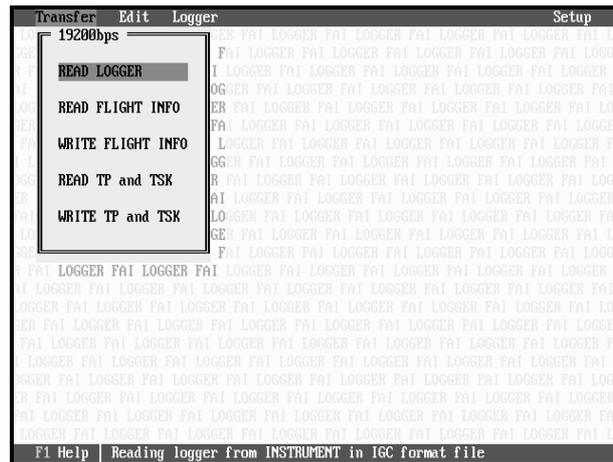

Select FAI LOGER menu item on LX20 and press <WRITE> button, message connect will appear.

When connection is established, press <ENTER> on PC. Information about all flights will be downloaded to the PC.
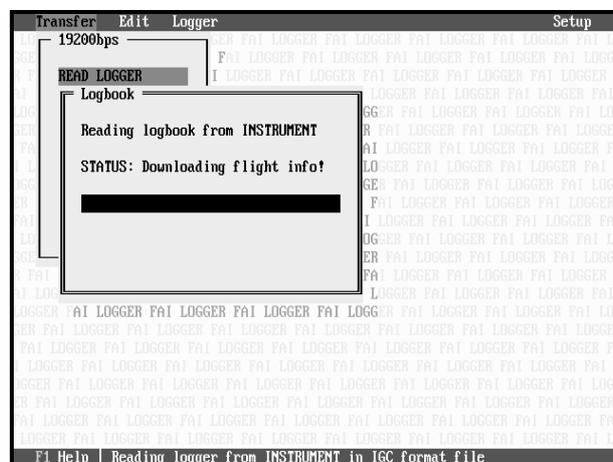
Flights are listed from newest to the oldest. Use <UP> and <DOWN> key to move between flights. Press <F2> to download highlighted flight. If you want to download more flights at once, select them with <INS> key and then press <F2> for downloading.
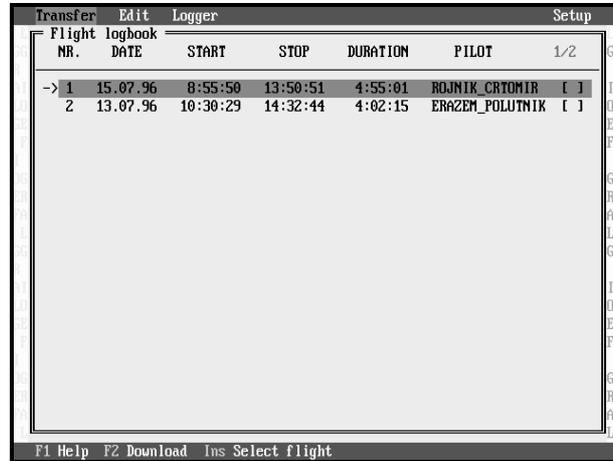

After flight is downloaded, it is automatically converted to the IGC format fil. Both types of file are stored; binary - FIL extension and ASCII - IGC extension. Filename is automatically created and means following:

`ymdFxxxn.FIL`

- y -last digit of year of flight
- m - month of flight (A- October, B - November, …..)
- d - day of flight (A -10, B - 11 ….)
- f - FILSER
- xxx - serial number of LX20
- n - number of flight in this day.
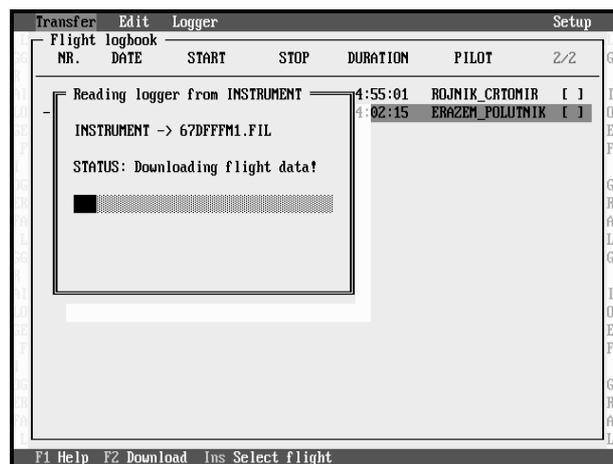
All flights are stored on LOGGER folder. When data transfer is finished, press <ESC> to return to Transfer menu.

FAQ

Q: I don't get message connect on LX20 screen ?

A: Make sure, that devices are attached correctly, that correct serial port is selected (see also Chapter 3: Program settings).

Q: I get message Data transfer Error ?

A: This could happen, if you are running program from Windows. Set Exclusive mode for LXFAI application (see Windows manual) and try transfer once more. If you still experienced problems, try transfer with lower baudrate.

> IMPORTANT !
>
> On some computers, which are using disk cache programs (eg.: Smartdrv), there is a problem with data transfers. Switch disk cache for writting off (eg.: SmartDrv /x).

Turning point database transfers

Writing turning point database to LX20

You don't need to input all turning points manually to your LX20. Rather do this on PC and then simple transfer points to the LX20. Select Transfer menu from main screen of LXFAI program. Choose Write TP and TASK item and press <ENTER> key. List of all turning point's databases will appear. Select proper database using <UP> and <DOWN> arrow.
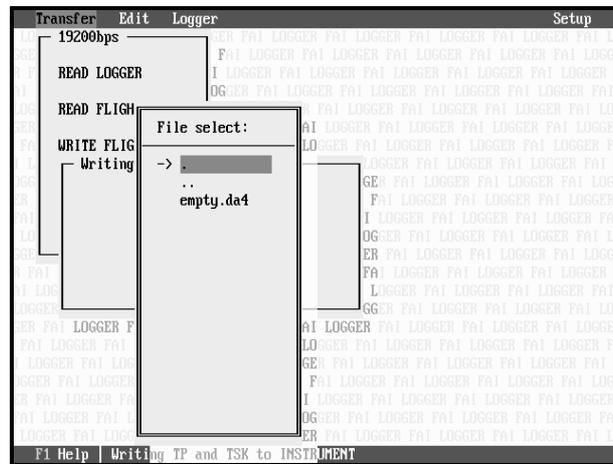
Choose TP&TASK menu on LX20 and press <READ> button. Message connect will appear.
Press <ENTER> on PC to transfer turning point database.

Reading turning point database from LX20

Turning point database could also be read from LX20. Select Transfer menu and then Read TP and TASK option. Press <ENTER> and prompt for database file name will be introduced.
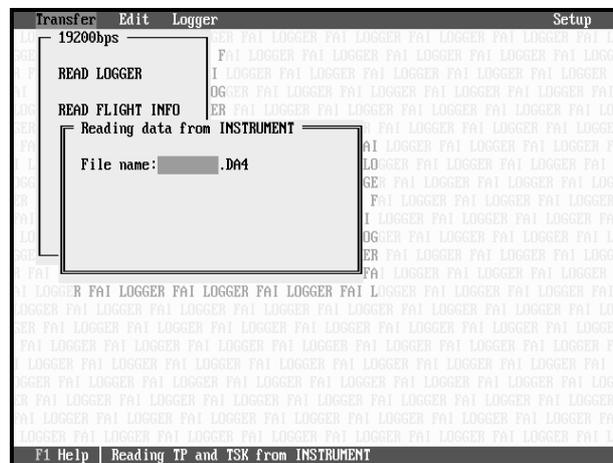
Type name at prompt. Extension is fixed to DA4 extension. Database will be saved in default folder (LXFAI\DATA).
Choose TP & TASK menu on LX20 and press <WRITE> key. Press <ENTER> on PC to start transferring.

NOTE: You can use also other programs to transfer turning points database to the LX20. (E.g.: LXGPS program, CAL, DMSTG …)

Updating flight information

Select Transfer menu from main menu and choose Write flight info or read flight info menu item.
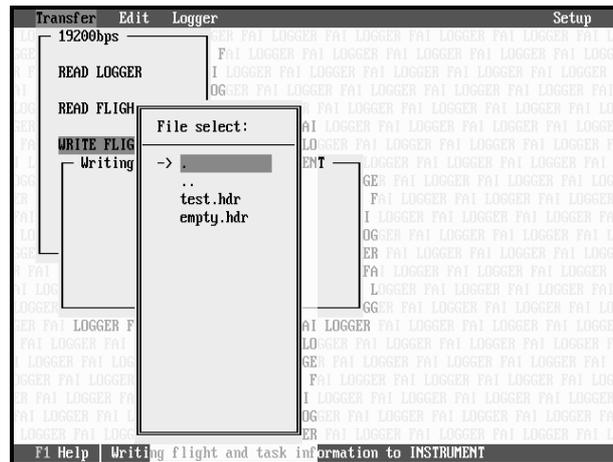
Select FAI LOGER menu item on LX20 and press <READ> button to write flight information from PC to LX20 or press <WRITE> button to write flight information from LX20 to PC. Message connect should appear.

Press <ENTER> on PC for transferring data. If flight information data has been read from LX20, it is stored in default folder (LXFAI\DATA).

VIEWING AND PRINTING

Flight information
Statistics
Route, barogram and photo sectors
Printing
Post flying

Flight information

Once flight is stored on computer, barogram route and other information about flight can be shown. Select Logger menu item from main window of LXFAI program.
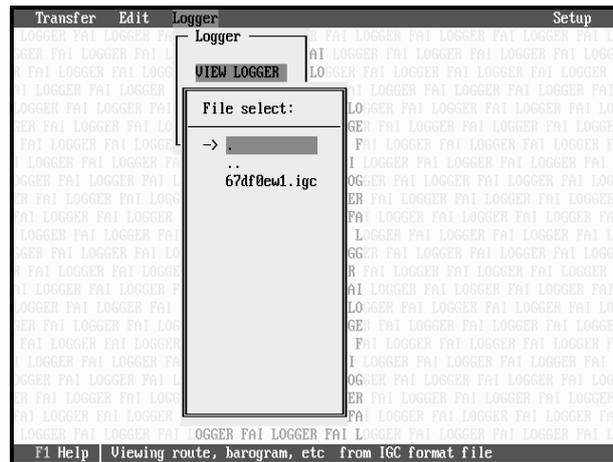
Pull down menu with two items will appear. Select View logger item to see flight stored in IGC formatted file, or select View binary item to see flight stored in Filser binary file (FIL extension). Last choice will provide little faster drawings and calculations, but is limited to be use only with proper files.

Select flight file, which will be examined. Use <UP> and <DOWN> arrow to move between files and press <ENTER> to select. Window with general information about flight will be displayed
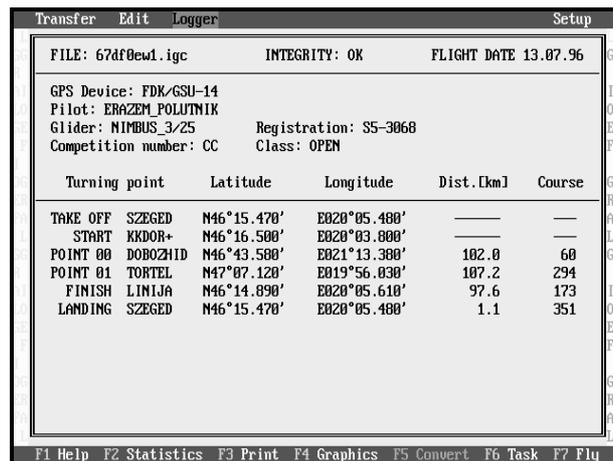
Window is divided into three section. In upper status line file name, flight data and integrity are written. If integrity is BAD, it means that file has been corrupted or flight stored in this file has been modified.

In middle section information about gps engine, pilot and glider are written. At bottom task specified in file is displayed. If no task was specified, message No task specified is written instead of task.

```
 Transfer   Edit   Logger                                    Setup
 ┌──────────────────────────────────────────────────────────────┐
 │  FILE: 67df0ew1.igc        INTEGRITY: OK      FLIGHT DATE 13.07.96  │G
 │                                                                │F
 │  GPS Device: FDK/GSU-14                                        │I
 │  Pilot: ERAZEM_POLUTNIK                                        │OG
 │  Glider: NIMBUS_3/25        Registration: S5-3068              │ER
 │  Com┌─ Help ──────────────────────────────────────────┐       │FA
 │     │                                                  │       │L
 │   T │ Press:                                      urse │       │GG
 │     │ F2 - view flight and task statistics,            │       │R
 │  TAK│ F3 - print route, barogram, sectors or statistics, ─    │AI
 │     │ F4 - view route, barogram, turning point confirmation, ─ │LO
 │  POI│ F5 - convert to IGC formatted file (only for .FIL files) 60│GD
 │  POI│ F6 - specify new task for current flight only     294   │F
 │    F│ F7 - reflight a flight                            173   │I
 │   LA│                                                  351   │OG
 │     └──────────────────────────────────────────────────┘       │ER
 │                                                                │FA
 │                                                                │L
 │                                                                │GG
 │                                                                │R
 │                                                                │AI
 │                                                                │LO
 ├────────────────────────────────────────────────────────────────┤
 │ F1 Help  F2 Statistics  F3 Print  F4 Graphics  F5 Convert  F6 Task  F7 Fly │
 └────────────────────────────────────────────────────────────────┘
```

Press <F1> key to invoke help window. A list of available action will be shown.

NOTE: <F5> CONVERT option is available only, if binary formatted file is opened. With this option file is again converted to the IGC formatted file.

Creating new task or changing task specified in logger file
Press <F6> key. Window with current task, or empty window will open.

```
 Transfer   Edit   Logger                                    Setup
 ┌─ EDIT TASK ──────────────────────────────────────────┐
 │ FILE: 67d│                                          │TE 13.07.96 │G
 │          │ USER SPECIFED TASK      File: 67df0ew1.TSK│            │F
 │ GPS Devic│                                          │            │I
 │ Pilot: ER│                                          │            │OG
 │ Glider: N│                                          │            │ER
 │ Competiti│ Point   TP name      Distance   Course   │            │FA
 │          │                                          │            │L
 │  Turning │ TKF/LND SZEGED                            │]   Course  │GG
 │          │ 1       KKDOR+         ──────    ────     │            │R
 │ TAKE OFF │ 2       DOBOZHID       102.0km   060°     │      ──    │AI
 │   START  │ 3       TORTEL         107.2km   294°     │      ──    │LO
 │ POINT 00 │ 4       LINIJA          97.6km   172°     │      60    │GD
 │ POINT 01 │ 5       Not Prog                          │     294    │F
 │  FINISH  │ 6       Not Prog                          │     173    │I
 │ LANDING  │ 7       Not Prog                          │     351    │OG
 │          │ 8       Not Prog                          │            │ER
 │          │ 9       Not Prog                          │            │FA
 │          │                                          │            │L
 │          │                       ────────           │            │GG
 │          │                       306.7km            │            │R
 │          │                                          │            │AI
 │          └──────────────────────────────────────────┘            │LO
 ├────────────────────────────────────────────────────────────────┤
 │ F1 Help  F2 Statistics  F3 Print  F4 Graphics  F5 Convert  F6 Task  F7 Fly │
 └────────────────────────────────────────────────────────────────┘
```

Use <UP> and <DOWN> arrow to move between points in task and press <DEL> key to delete a point or <INS> to add a point. When point is added to task, window with all defined points will opened (See also Chapter 4: Editing tasks). Press <ESC> to leave task window and return to information page.

NOTE: Task is actually not added to file, but a file of it own is created at same location at flight file. Because of this, next time you would like to see task, you have to press <F6> key again.

Statistics

Press <F2> key in flight information window to view a statistics page.

```
 Transfer    Edit   Logger                                    Setup

    FILE: 67df0ew1.igc                       FLIGHT DATE 13.07.96

    Pilot: ERAZEM_POLUTNIK     Glider: NIMBUS_3/25   Registration: S5-3068

    Flight statistics                    Task statistics
    _____                  _____

    Start:    10:30:29                   Task finished OK!
    Finish:   14:32:44                   Total task distance:  306.7km
    Duration:  4:02:15                   Task speed:  97.23km/h

    Tr.point        Lat./Lon.          Time    Dist.[km]   v[km/h]   Type

    KKDOR+     N46°16.50' E020°03.80'  11:21:03    ——        ——      FOTO
    DOBOZHID   N46°43.58' E021°13.38'  12:28:28   102.0     90.74    FOTO
    TORTEL     N47°07.12' E019°56.03'  13:41:39   107.2     87.87    FOTO
    LINIJA     N46°14.89' E020°05.61'  14:30:18    97.6    120.31    500m

 F1 Help
```

Screen is divided into three sections. In upper section file name and flight data are displayed. In middle section Information about pilot and glider are shown. Statistic of total flight and complete task is also printed there. If task was finished, message Task finished OK (or Task finished BAD, when task was completed with false turning point confirmation) is written and task speed is calculated. Otherwise, message Task not completed is shown, and total task distance is calculated.

In bottom section leg statistics with turning point is presented. Turning point name, latitude, longitude, time of reaching, leg speed and turning point confirmation mode is displayed. Available confirmation modes are:

- FOTO; photo sector
- 500m; glider has entered into cylinder around turning point with 500m radius
- 90°; glider was parallel to turning point
- 1km; glider has entered into cylinder around turning point with 1000m radius
- 2km; glider has entered into cylinder around turning point with 2000m radius

Preferred confirmation mode can be setup in Setup program menu (See Chapter 3, Program settings)

When task was not finished as last point FOTOLAND or LANDING is written. Press <ESC> to return to flight information page

Route, barogram and photo sectors

Press <F4> key in information window and route will be drawn on the screen.
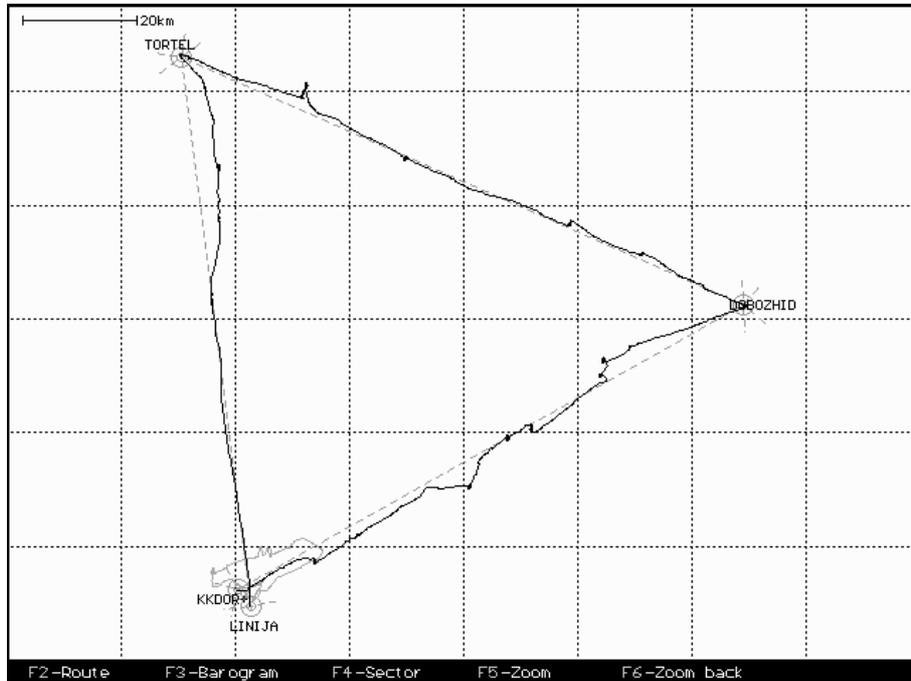
In upper left distance of one grid square is written. Flown route with defined task is displayed and airspace structure is plotted, if this option is enabled in setup menu (See also Chapter 3: Program settings). At bottom of display available actions are printed. Press <F5> key to enlarge a part of window. Cross will display in bottom left corner. Move cross with arrow keys to one corner o section, which will be enlarged. Press <ENTER> and second cross will appear. Choose window and press <ENTER>. Enlarged section is now displayed. For zooming back to whole route press <F6> key.
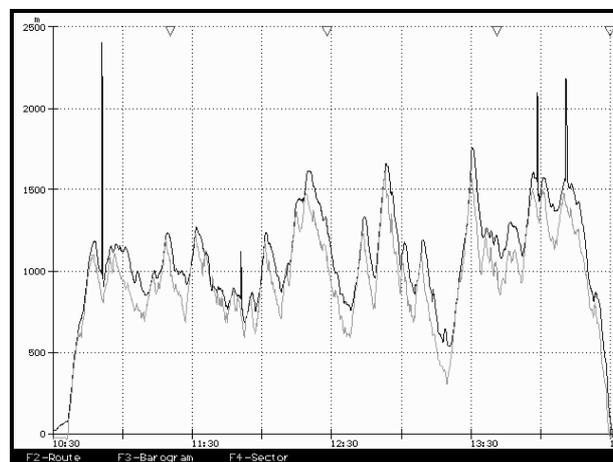
Select <F3> key to view barogram. On barogram both altitudes are drawn; GNSS altitude and pressure altitude. You can change this setting in Setup menu. Pressure altitude is plotted in green color and GNSS altitude is plotted in yellow color. Time, when GPS was not able to calculate position (GPS was bad), is marked with red color. At the top of the screen small green triangles are drawn, which denotes turning points. With short blue lines at the top, events are marked. If engine noise level was recorded, at bottom of barogram engine noise level diagram is shown.

Press <F4> key to see turning point confirmation zones
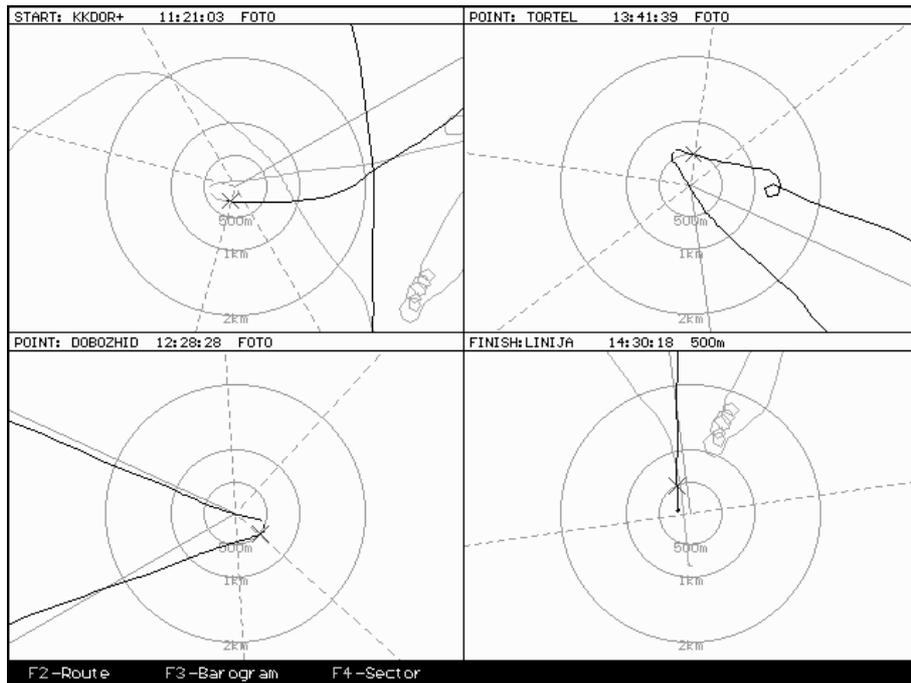
Screen is divided into windows for each turning point. In window title, type of turning point, name of point, time of reaching and confirmation mode is presented. All possible confirmation modes are displayed. Green cross presents position fix, which is used for turning point confirmation.

Press <F2> or <F3> or <F4> key to toggle between route, barogram and photo sectors viewer. Press <ESC> for returning to flight information page.

Printing

Select <F3> key in flight information screen. Printing menu will appear.

Use <UP> and <DOWN> arrow to move within menu. Press <ENTER> to select option and <ESC> to leave printing menu. Printed sheets are same to those you have seen on the screen. In appendix, you have an example of printed flight.

NOTE: If not complete picture is printed, change page length in printer setup.

Post flying

Post-flying option is used for detailed analyze of selected flight. Press <F7> key in flight information page to enter post-fly screen.
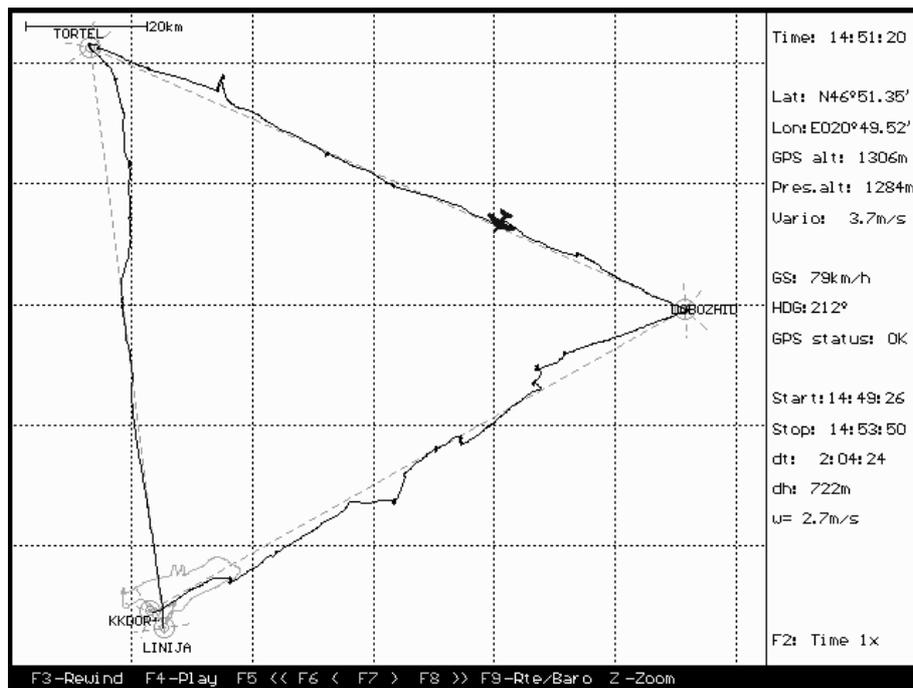
A screen with flown route, task and plane will appear. At bottom line available actions are shown. Right side of screen presents flight parameters.

To move over flown route use keys <F4> to <F8> or arrow keys. Press:

- <F7> or <RIGHT> arrow to move to the next fix position in your flight file,
- <F8> or <PgUp> key to move three minutes forward in your flight,
- <F6> or <LEFT> arrow to move to the previous fix position in your flight file,
- <F5> or <PgDn> key to move three minutes backward in your flight.

Pressing these keys, your plane will move on the route. It is also possible that your plane moves automatically. Press <F4> to start moving. Use <F2> to adjust speed of moving. Press <F4> key again to stop and <F3> key to rewind to the file beginning.

NOTE: If the file is too big to fit into memory, possibilities to move backward will not be available. Use <F3> options to rewind a flight.

NOTE: If task is specified for this flight, plane will be placed on task start at the beginning nat on actual takeoff position. Use <F5> and <F6> key to go backward. Flying before task start is plotted with dark gray color, whereas other part of flight is plotted with white color.

You can also enlarge an interesting part of flight. Use <Z> letter to invoke zoom options. Cross will appear. Move cross with arrow buttons and press <ENTER> to select other window corner.

HINT: If you want to zoom to full route, overlap first cross with the second one.

During analyzing flight, you can toggle between route viewer and barogram viewer. Use <F9> key to toggle.
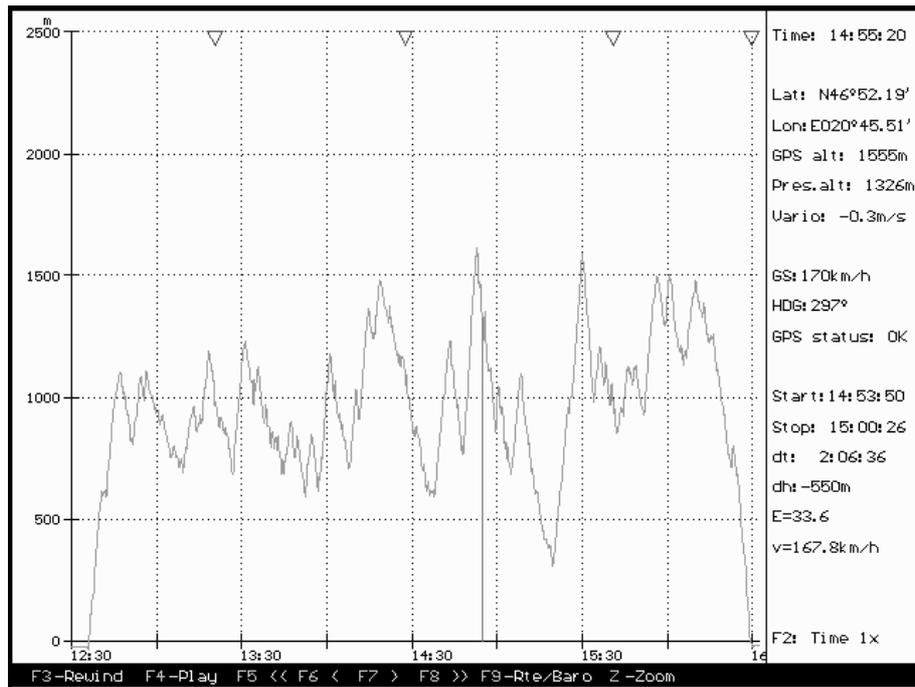
Current position is shown with red line connecting ground and pressure altitude. Press <F9> key to get back to route viewer.

Data on the right screen is divided into two sections. In upper section information about current fix point are shown.
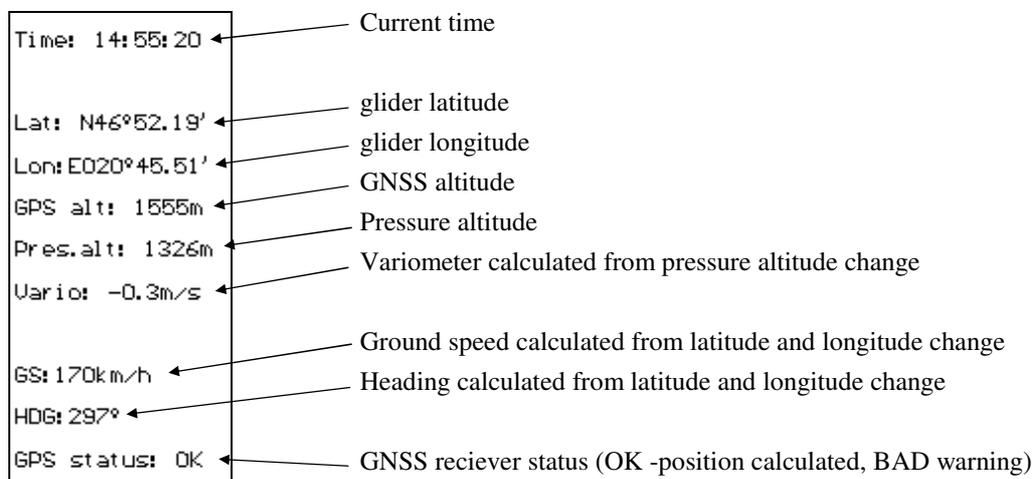
In bottom section information about current etap is shown. Complete flight is divided into circling in thermals and flying straight. Two types of etap are therefore possible, etap for circling in thermals

```
Start:14:49:26  ◄──────── Beginning of current etap
Stop:  14:53:50  ◄──────── Etap end time
dt:   2:04:24  ◄
                            Total time spend circling in thermal
dh: 722m  ◄
                            Gained altitude
w= 2.7m/s  ◄
                            Averege vario (gained altitude/total time



F2: Time 1x
```

and etap for straight flight

```
Start:14:53:50  ◄──────── Beginning of current etap
Stop:  15:00:26  ◄──────── Etap end time
dt:   2:06:36  ◄
                            Total time spend flying straight
dh:-550m  ◄
                            Altitude change
E=33.6  ◄
                            Gliding ratio (distance flown/altitude change)
v=167.8km/h  ◄
                            Average speed (distance flown/total time)



F2: Time 1x
```

WARNING: Etap functions will work correctly only with flights produced by LX20 logger.

Press <ESC> to return to flight information page.

SETTINGS
Program setting
Printer settings
Turning point database

Program settings

Press <S> letter in main lxfai window and setup menu will appear. Choose Program item and press <ENTER>. Window with program settings is opened.
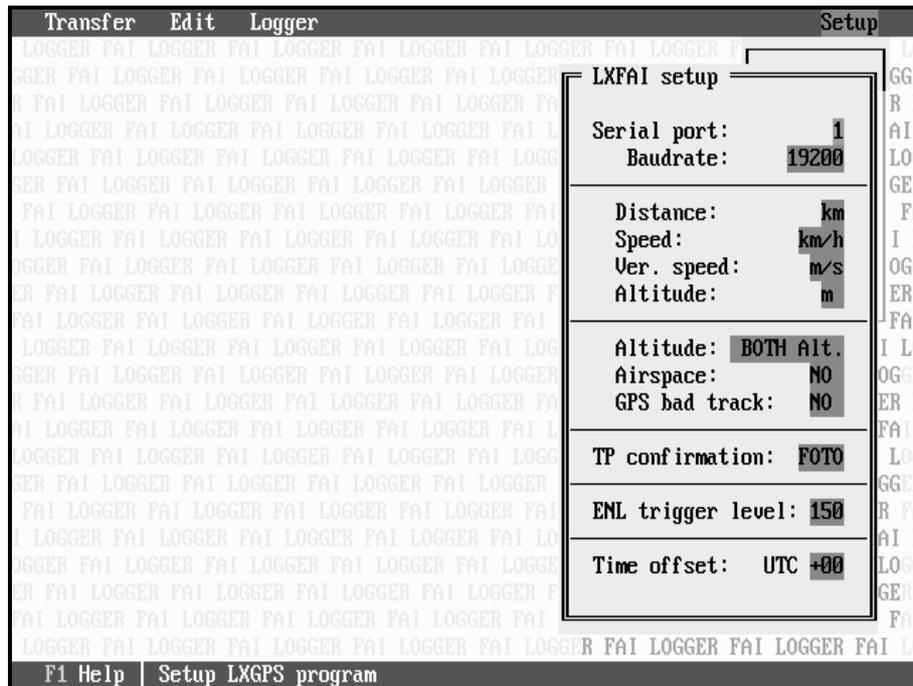
Use <UP> and <DOWN> arrow to move between fields. Press <SPACE> bar to change value in field or type desire value. Settings are divided into 6 groups.

Communication settings
These two items set your communication port, which is used for data transfers from LX20.
- Serial port: Select port number, which will be used for communication. Usually this value is set to 2, because first serial port is mouse port.
- Baudrate: Set the speed of transfer. Default value is 19200bps, which is used for all LX instruments. If you experienced trouble with data transfers, lower this value. It is also possible to set speed 38400bps, but it is not working on all computers.

WARNING: When you change communication speed on your computer, you have to change it also on your LX20.

System of units
Various data, which are displayed or printed through whole LXFAI program, can be presented in different system of measure. Units for distance (km, ml, nm), speed (kph,

mph, knots), vertical speed (m/s, knots) and altitudes (meters, feet's) are setup in this menu.

Graphical setup
Altitude: Select which altitude, do you want to be drawn or plotted on barogram.

Airspace: Define, if you would like to see airspace structure. This option is not recommended to be run on slow computers, because it takes time to draw it (386 processor or better is enough fast). Answer with 'Yes', to see airspace structure.
NOTE: Airspace structure will not be seen on printed sheets, regardless to settings.

GPS bad track: If this value is set to 'No', points in route and barogram viewer will not be connected together, when GPS was bad (GNSS was not able to calculate position). Otherwise, points will be connected with red color.

TP confirmation
This setting is used to define preferred turning point confirmation mode. You have two choices for confirmation mode:
- FOTO; preferred mode will be photo sector and
- 500m; preferred mode will be cylinder around turning point with radius 500m.

ENL trigger level
ENL stands for Engine Noise Level. This method is used to detect operation of motor in motorgliders.
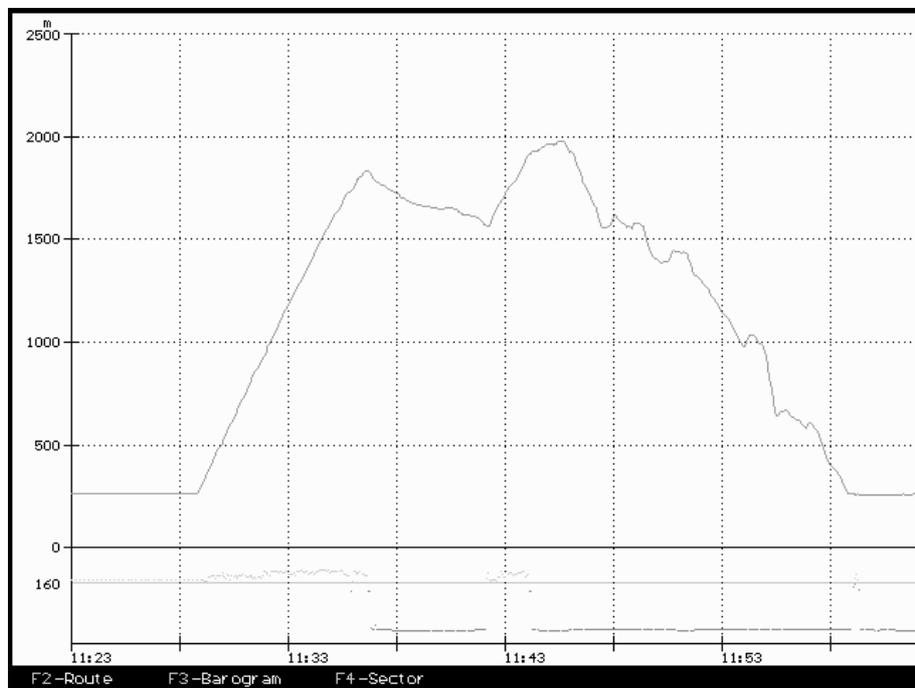
Example of engine noise level presentation

If engine noise level is high it means that motor is operating. If it is low, it means that motor is not operating. With trigger level, you simple define above which value motor is operating. Range of trigger level is 0 to 999.

Time offset
Time recorded in all flights is UTC time. Use this setting to define your local time.

Printer settings

Select Printer menu item from Setup menu and press <ENTER>. Menu with printer settings will appear.
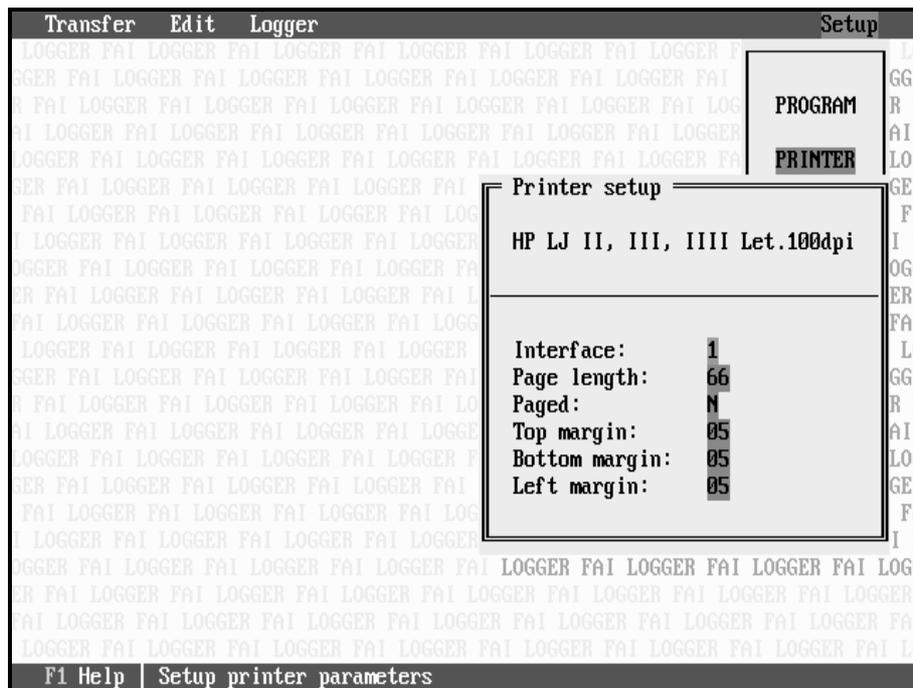
In upper line compatible printers with selected driver are written. If you want to select different printer, you have to leave LXFAI program and run SETUP program.

Interface; define to which parallel port is attached your printer.
Page length; determinate page length in lines.
Paged; define, if your printer is paged or not.
Top margin; select, how many lines from top margin, printer will start printing.
Bottom margin; define bottom margin of page in lines.
Left margin; define left margin in lines.

Turning point database

LXFAI program is capable of dealing with one turning point database at time. When LXFAI program is invoked, it automatically loads turning point database. Use this setting to define, which turning point database will be opened at loading.

Select TP file item and press <ENTER>. Choose turning point database with <UP> and <DOWN> arrow and press <ENTER> to confirm selection. Default turning point database is EMPTY.DA4.

NOTE: All turning point databases have extension DA4 and are also used in LX5000 and LX4000 instruments and in LXGPS program.

EDIT

Editing flight information
Turning point database
Task database

Editing flight information

If you found that entering pilot name, glider name and other flight information directly in LX20 is too much complicated, use PC instead of it. Select Edit menu from main window and choose Edit flight info menu item. Pick one file from list of all available files. To edit new header file, choose EMPTY.HDR file. Press <ENTER> to get into editing screen.

Use <UP> and <DOWN> arrow to move between fields and type new field value. Press <F3> key to toggle between pilot information and task.

In task mode press <CTRL+INS> keys to add a new point to the task, <CTRL+DEL> keys to delete a turning point from a task and <INS> key to add a point from selected turning point database.

NOTE: On some computers' combination <CTRL+INS> and <CTRL+DEL> does not work. Use <CTRL+E> to delete a point or <CTRL+N> to add a point instead.

Press <F2> key to save a file with current file name or <CTRL+F2> to save file with new name.

WARNING: File can not be saved with, EMPTY file name.

Turning point database

Select Turning point item from Edit menu and press <ENTER>. Window with list of turning points will open. Turning point database is selected in setup menu at 'TP FILE' item.

```
 Transfer    Edit   Logger                                    Setup
┌─ EDIT TP ─────────────────────────────────────────────────────┐
│        TP Name  Latitude    Longitude   Elev.  Frequency  RWY TC │
│                                                                  │
│    1 -> AREH     N46°30.35' E015°33.36' 1140m 000.000MHz 00 G 0001m I │
│    2   BELEVUE  N46°30.89' E015°34.74' 1247m 000.000MHz 00 G 0001m I │
│    3   BOVEC    N46°19.78' E013°32.99' 0440m 000.000MHz 00 G 0001m I │
│    4   CATEZ    N45°53.42' E015°37.71' 0162m 000.000MHz 00 G 0001m I │
│    5   CELJE AD N46°14.59' E015°13.34' 0244m 000.000MHz 00 G 0001m I │
│    6   CERNIVEC N46°15.53' E014°42.12' 0902m 000.000MHz 00 G 0001m I │
│    7   CRNOMELJ N45°35.45' E015°09.86' 0163m 000.000MHz 00 G 0001m I │
│    8   HODOS    N46°49.33' E016°19.64' 0237m 000.000MHz 00 G 0001m I │
│    9   HRUSICA  N46°26.85' E014°00.06' 0584m 000.000MHz 00 G 0001m I │
│   10   I.GORICA N45°56.06' E014°48.33' 0292m 000.000MHz 00 G 0001m I │
│   11   KR.GORA  N46°29.16' E013°47.61' 0805m 000.000MHz 00 G 0001m I │
│   12   KRVAVEC  N46°17.00' E014°29.92' 0660m 000.000MHz 00 G 0001m I │
│   13   KUNIGUND N46°17.90' E015°13.03' 0567m 000.000MHz 00 G 0001m I │
│   14   LAJSE    N46°23.81' E015°02.76' 0380m 000.000MHz 00 G 0001m I │
│   15   LENART   N46°34.50' E015°49.97' 0263m 000.000MHz 00 G 0001m I │
│   16   LENDAVA  N46°33.64' E016°27.05' 0170m 000.000MHz 00 G 0001m I │
│   17   LESCE    N46°21.50' E014°10.50' 0504m 000.000MHz 00 G 0001m I │
│    1/36                                                          │
└──────────────────────────────────────────────────────────────┘
 F1 Help │ Edit TP
```

Use <UP> and <DOWN> arrow to move between turning points. Press <PgUp> or <PgDn> key for quick moving through turning points list. Selected turning point is highlighted and has arrow after number. Turning points are sorted in alphabetical order. Press <F9> to get into edit mode. Message EDIT will appear in bottom left corner and selected point will change color. Type new values over old one.

WARNING: When name of turning point has been changed, point will be automatically sorted, if <ENTER>, <UP> or <DOWN> keys are pressed. Focus is no longer on previous editing point, but point with same number as was previous.

Use <CTRL+INS> or <CTRL+N> combination of keys to add a point to turning point database and <CTRL+DEL> or<CTRL+E> to delete a point from turning point database. Press <F9> button to finish editing season.

NOTE: Turning point database is saved automatically, when you leave turning point list window.

Task database

Select Task menu item from Edit menu and press <ENTER>. A list with tasks stored in turning point database is shown. If task is already defined, turning points used in task are show, otherwise Not prog message is written

Use <UP> and <DOWN> arrow to move between tasks. Selected task is marked with arrow after number. Press <F9> key to get into edit mode for current task. New window will open.

Window is divided in three sections. In upper section, task reference number is displayed. In middle section, turning points used in task are shown. In bottom section, control point status is written.

Use <UP> and <DOWN> arrow to move over fields. Press <INS> key to add a point to the task. Window with available points from turning point list will open.

```
 Transfer  Edit  Logger                                    Setup
          EDIT TSK
                                             SELECT TP
          TSK 05:                                   TP Name

                                              1
                                              2  ->  AREH
                                              3    BELEVUE
          Point   TP name        Distance  Co  4    BOVEC
                                              5    CATEZ
          0    CELJE AD      --------   --  6    CELJE AD
          1    CATEZ          50.2km    14  7    CERNIVEC
          2    LESCE         123.5km    29  8    CRNOMELJ
          3    CELJE AD       81.5km    09  9    HODOS
          4    Not Prog                    10    HRUSICA
          5    Not Prog                    11    I.GORICA
          6    Not Prog                    12    KR.GORA
          7    Not Prog                    13    KRVAVEC
          8    Not Prog                    14    KUNIGUND
          9    Not Prog                    15    LAJSE
                             ----------------  16    LENART
          Control point: N      255.2km    17    LENDAVA
          EDIT                              2/37

 F1 Help │ Edit TSK
```

Use <UP> and <DOWN> arrow to select a point and press <Enter> for updating. Turning point will be added to the task. Press <DEL> key to delete a task point. Use <F9> key to switch back to task list window.

NOTE: Task database is automatically stored, when you leave task window.

Appendix

DATA-FIL program
CONV-FIL program
VALI-FIL program
Example of printed flight

DATA-FIL program

DATA-FIL is short DOS program used for downloading flights from LX20. Only flights from the most recent day are downloaded. For other transfers, you should use LXFAI program.

Connect LX20 to your PC and type at DOS prompt:

```
C:\>DATA-FIL
```

and following screen will appear

```
DATA-FIL Version 2.4 (20.91) by Filser Electronic 1997
Registered use by pilots, FAI Official Observers and NAC/FAI
Officials.

Settings: COM1, 19200,n,8,1
Converting to IGC format: FALSE


Reading logger from LX20: Waiting for connection!
```

Now select FAI LOGGER item on your LX20 and press <WRITE> button. Data transfer will start. After data transfer, flight are automatically converted to IGC file format.

When you do not want to convert file automatically run DATA-FIL program with following parameter:

```
C:\>DATA-FIL /NOCONVERT
```

If setting shown on display, doesn't match your communication setting, run DATA-FIL with following parameter;

```
C:\>DATA-FIL 2
```

if you have communication via second serial port, or

```
C:\>DATA-FIL 9600
```

if you have communication via first serial port and with speed 9600bps.

CONV-FIL program

After flight data is downloaded from LX20, it is stored in Filser binary formatted file. Use CONV-FIL program to convert data from Filser binary formatted file to IGC form. Type at DOS prompt.

```
C:\>conv-fil 67df0ew1.fil
```

You will get following response

```
CONV-FIL Version 2.4 (20.91) by Filser Electronic 1997
Registered use by pilots, FAI Official Observers and NAC/FAI
Officials.

Converting to IGC format 67df0ew1.fil:

Input file: 67DF0EW1.FIL
generating .... 67DF0EW1.IGC
Conversion finish OK!
```

Flight has been converted to the IGC formatted file and is now stored in file with extension IGC.

VALI-FIL program

Program VALI-FIL is used for validating files, where flights produced by LX20 are stored. You can use them on files with IGC extension and on files with FIL extension. Type at DOS prompt:

```
C:\>vali-fil 67df0ew1.fil
```

You will get following response.

```
VALI-FIL Version 2.4 (20.91) by Filser Electronic 1996
Registered for use only by Official of NACs and FAI.

Verifying file 67DF0EW1.FIL: Integrity is OK
```

If file was not corrupted or altered, Message Integrity is OK is written. Otherwise, message Integrity is BAD! is displayed.

Example of printed flight