Hi fans,

Welcome to the second FAN CLUB News of 2000. We would also like to welcome the many fans who have become members since our last issue in the spring.

Have a look at page 2. We have started an ideas competition, where every entry goes into the big prize draw. So send us your suggestions for building kit topics or models. Also, there will be more advantages of using our Internet shop. So turn the page ... - hang on. Not yet.

On page 3, we report, in conjunction with the Kassbohrer Gelandefahrzeug AG on the famous PistenBullys, which will have to pull their weight in the coming winter. You can do everything that they do with the new "Power Bulldozer" kit - from laying tracks for living-room pistes to "snow clearing" for the fischertechnik building blocks lying around your rooms.

Lots of your great models have landed in our post box - but, as you know, we can't show them all. To help us out, next spring we are going to start the "FAN CLUB Gallery" on our homepage, where we hope to show as many models as possible. If you send us enough pictures, we're going to have a "Model of the Month" competition. Of course, you can send us scanned pictures (in JPG or GIF format) by E-Mail. Please make sure that the mail is not bigger than 1.5 MB.

On page 6 we're demonstrating the new "Computing Starter Pack", the ideal complete package for computing beginners. There are also tips and tricks on "saving bricks", i.e. efficient programming in LLWin 3.0.

As club model 17, we are showing an excavator built using the "Power Bulldozer" for the chassis and the "Profi Pneumatic" for the assembly of a functioning arm.

Have fun reading FAN CLUB News 2/00.

Yours,

Eric


**P.2      Kit ideas competition**

This year, we want to know what kits/topics you would like to see from fischertechnik. Be imaginative and send us your rough ideas before January 31, 2001.

Of course you can win something. We are giving away

2 x DM 150.00 vouchers
2 x DM 100.00 vouchers
3 x DM 75.00 vouchers
4 x DM 50.00 vouchers
5 x DM 25.00 vouchers

We hope to include one or two of your ideas in our new 2002 range.

**P.3 PistenBully - the Real "Power Bulldozers". Technology for Environment, Nature and Leisure Time**

You must have already seen them: the Kassbohrer PistenBullys, who, along with their drivers, make sure that you can wedel on perfectly prepared pistes on your winter holiday.

For snowboarders there's a special gadget: the "Pipe Magician", a device which can build and look after the much-loved halfpipes and fun parks (with fischertechnik you can also do this: try some pipes out... you can find out more about the "Pipe Magician" and all the other PistenBully machines on the Internet under www.pistenbully.com)

What not many people know is that PistenBullys can also carry out logging work, work on mudflats, tend oyster beds, help farmers with their harvests, dredge rivers, shift grain mountains in giant storehouses and lots more.

Their uses are nearly limitless. Customs and border patrols use them, as do disaster control agencies. They are also used for care and rescue work when fighting fires. Energy and media technologies use these vehicles for overhead line and pipeline construction as well as for maintenance and inspection work and waste dump management.

Because of their extreme cross-country mobility, they are also used for expeditions e.g. in the Antarctic: in areas, which are usually inaccessible for vehicles, PistenBully special vehicles can show what they are capable of. In summer and in winter, they can traverse usually inaccessible regions, which require special sensitivity either because the surface conditions are rough or because of conservation reasons.

Thanks to its minimal ground bearing load (that is the pressure which the PistenBully exerts on the earth's surface, on snow, forest floors, mud, etc.), the vehicles treat the environment very carefully: on a weight of only about 50 g/cm$^2$ (compare this with a fischertechnik Power Motor, which has a mass of approximately 100 g), even though the machines weigh at least six tonnes. The wide, relatively soft (depending on the use) tracks make this possible.

The PistenBullys can, thanks to their Mercedes Benz turbo-diesel engines and their hydrostatic transmission (see box), climb grades of 45° - that is halfway to "vertical". Take a set square and draw the angle. Really steep, huh?!

The PistenBullys are driven with a steering wheel in a really comfortable cockpit. Of course, the cockpit must be well heated. You can even make the seat is warm and cozy if you want.

Think about all the great models you can create with the new fischertechnik "Power Bulldozer" kit. Apart from the four standard models described in the instruction booklet (expedition vehicle, bulldozer, snow plow and PistenBully), you are sure to come up with new ideas. Even the PistenBully offers great possibilities. Send us your pictures of your own models.

One more tip: if you want to motorize your "Power Bulldozer", you can use one or two "Power Motor Sets".

If you want to make the model turn on the spot like a bulldozer, and are using the "IR Control Set", our remote control system for limitless fun, you can only use two of the motors.

With a "Mini Motor Set" you can, for example, raise/lower the scoop or other tool, as well as performing other actions.

As a power supply, we recommend the "Accu Set", so that you don't have cables laying around during your works. And for night use, we recommend the "Lights" so that you don't have to drive in the dark.

Also: on the great PistenBully homepage www.pistenbully.com you can find more information, pictures, brochures, data sheets and lots more.

We want to say thanks to Mr. Peter Gring of the Kassbohrer Gelandefahrzeug AG for his friendly support and provision of the pictures.

**Technology: Hydrostatic transmission**
The PistenBully has no shaft for transmission between the engine and the driving gear like on a car. The medium is hydraulic oil.

A power divider is located on the diesel engine. Hydraulic pumps for left and right-hand propulsion are built on to this divider. The pumps put the oil under pressure and the oil flows to the two hydraulic engines (one for each tracks). These engines propel the tracks: the vehicle moves.

For extra machines (e.g. smoothing board, rotary snow plow, etc.) there are extra hydraulics which work on the same principle.

Advantages are
- the constant meshing, similar to an automatic gearbox in a car
- no need to change gear
- a service brake is not necessary: if the flow of oil stops, the vehicle stops, too.


**Facts: Kassbohrer Gelandefahrzeug AG**

1968/69: The Karl Kassbohrer Fahrzeugwerke in Ulm, in those days Germany's biggest coach (Setra) and truck trailer producer, develop an idea of its senior director, who was an enthusiastic skier and hiker, for an innovative track-driven vehicle especially for ski piste care. Its constructive characteristics are: wheel steering, hydrostatic transmission, comfortable driver's cabin and a large load area. Its name: "PistenBully".

The Kassbohrer Gelandefahrzeug AG today, has 360 employees in 65 countries and had a turnover of OM 234.3m in the *1999/2000* financial year. The annual production of this highly profitable enterprise is about 900 vehicles and has 51 % of the world market.

Alongside the PistenBullys, the firm produces the "Beach Tech" beach-cleaning machine and the track-driven all-round vehicle "Flexmobil" which is ideal for expeditions. Production takes places in Ulm or at the company headquarters in Senden.


**Comparison**

| fischertechnik Power Bulldozer | | Kassbohrer PistenBully 300 |
|---|---|---|
| | **Dimensions & Mass (approx.)** | |
| 155 mm | Width across tracks | 4,160 mm |
| 135 mm | Height | 2,880 mm |
| 1.150 kg | Dead weight with tracks | 6,050 kq |
| | **Engine** | |
| 2 x Power Motor, Type 34965 | Type | Mercedes-Benz, Type OM 926 LA |
| 2 x 0.016 kW (0.044 hp) | Power | 240 kW (330 hp) |
| 0.1 Nm at 380 U/min | Max. torque | 1,325 Nm at 1,200-1,500 U/min |
| approx. 1,800 mA current/h | Consumption | approx. 16 I Diesel/h |
| 940 mA | Tank capacity | 190 litre |
| | **Electrics** | |
| 9 Volts | Supply system | 24 Volts |
| 7 x 1.2V/0.94 Ah | Batteries | 2 x 12V/135 Ah |
| 195 $m^2$/h | **Area capacity** (Area which can be worked within one hour) | 90,000 $m^2$/h |
| approx. 30° | **Hill climbing ability** | approx. 45° |
| | **Price** | approx. DM 400,000 |


**P. 4/5 Post Box**

Rudolf Schr6der from Hamburg developed this great three-cylinder air motor from, amongst other things, pneumatic parts. He can power a big wheel for instance.


The idea for Albert Kohl's fantastic coal excavator came solely from a picture on the Internet. We couldn't think of any other model which was so huge! The upper section is 220 cm long and 17 cm wide, it is 117 high and weighs 19 kg.

This fully-functional model is driven by 13 (!) motors, controlled by an interface he developed himself: the bucket wheel, turning ring, conveyor belt, boom, clearing belt and the crawler drive and turning ring are fully moveable. A (fischer)technical showpiece!

Michael Werner and his young nephew Simon built this great old-timer, which they christened "FT 1". The model is motorized and possesses spots. It also has a hard top - if it is raining.

12 year-old Andreas Beck designed this industrial crane. The crane has two motors, one for the turning ring and one for the hoisting winch. In the picture, you can see how the King of the Road truck is being loaded.

Klaus Eidinger sent us a picture of his fabulous TV tower. It is 1.40 m high and is fitted with 50 lamps. The antennas give perfect TV reception.

A second helping of snow-clearance vehicles: Harald Steinhaus built this great four-wheel-drive snow cutter out of self-built or modified parts. This off-road supermodel has four drive-axles (8 x 8), a pneumatic-opening driver's cabin, is fully lit and has a payload of 2 kg.

The snow can be removed either by shovel or snow cutter - the truck has both of them on board. So that no-one slips over, a screw mechanism from the salt container throws the grit out the back. Five cm of snow are no problem for this technical masterpiece - in tests, the white powder couldn't go any higher.

Angelo Wyszengrad constructed this great sports car. It is driven by a motor, has double twin tires on the back axle and a rear spoiler, which keeps the vehicle on the road at high speeds.

The bowling alley made by Bjarn Rudolph works like the real thing: as soon as all the pins (fischertechnik figures from the old 3-6 series) have fallen over, one press of a key is all that is required to re-rack them. Also, the ball return system makes sure there are always enough balls available. Control lights display the status of the bowling alley.

**P. 6 Computing Starter Pack**

This complete package is the ideal introduction to the fascinating world of the computer-controlled fischertechnik models. It contains the new version of out "LLWin 3.0" software, the "Intelligent Interface" and over 130 building parts for eight models:

> Traffic lights
> Sliding door
> Parking lot barrier
> Hand drier Heating
> controller Tool
> machine
> Demo model for motor control
> Welding robot

Using the building instructions, the models can be built very quickly and are so clear, that the technology which runs them is clearly visible. The "Computing Starter Pack" is also suited for use in schools.

The detailed programming manual give step-by-step instructions for programming the models with the "LLWin 3.0" graphic software, offers suggestion and shows tips and tricks for extending the scope of the program. Using the manual, the newcomer quickly turns into a programming professional.

The new Version 3.0 of the LLWin software helps them out, because it is more user-friendly than the previous Version 2.1. The models can be controlled using the reliable "Intelligent Interface".

The building kit contains a motor, four lamps and loads of sensor, such as three probes, a photo-transistor for building a light-controlled barrier and an NTC resistor for temperature measurement, as well as the "LLWin 3.0" software and the "Intelligent Interface". The "Computing Starter Pack" is designed for children of 12 years or older.

**Computing Tips & Tricks**

**Saving Function Blocks - More Efficient Programming in LLWin**

If you create very big projects in LLWin, you reach the system limits at some time, especially when you want to run the program in the down load mode of intelligent interface. Either the interface processor is overloaded, so that all counter impulses are no longer counted, for example, or LLWin reports that the program is too big and memory is full. Then the project has too many blocks. Although the storage space that LLWin 3.0 has in online mode is ten times that of Version 2.10, the capacity on the interface is the same. You might be annoyed at first that the software or the interface does not make more capacity available. But you can design even complex programs with a more efficient programming style, so that they even function in the down load mode of the interface.

You need to know the following for this:
If you use subprograms, then the blocks contained in it are also inserted into the LLWin program every time the subprogram block is inserted into the main program. Consequently, frequent insertion of larger subprograms results in a real explosion of the block number in a project. For this reason, the project should be designed in such a way that every subprogram is only retrieved once if possible.

We use state-oriented programming to do this. Specific operations are carried out dependent on the state of different variables.
How this looks is explained in the next example.
This is a program for the "Rob4" model from the "Industry Robots" kit. This program is supplied on the LLWin 3.0 CD. It is in the directory ... ¥Industry Robots¥ and is called rob4.mdl. Because the project is very big, it was not printed completely in the manual. Only the most important sections are shown here.

Program description
The bending-arm robot Rob4 moves first to its initial position. Then it takes the yellow can from position 1 and places it on position 2. Then it takes the second can from position 3 and places it on the first can (position 4). Then it takes the cans back to the positions 1 and 3. Then it starts from the beginning again.

The program is designed, so that the subprogram "Position" moves the three axles of the robot (motors M1-M3) simultaneously into the respectively desired position. The target positions for the motors M1-M3 are set by the variables Var11-Var13.

These variables are then processed in the "Position" subprogram, which is only inserted once into the main program.
Excerpt from the Position subprogram, sequence for motor 1:

The motor M1 moves either ccw or cw depending on whether the current position of the motor (stored in the counter Z2) is larger or smaller than the new target position Var11. When the new result is Var11 in the position block, the motor stops.

The position to which the robot should move depends on the state of the variable Var1 in the main program. Var1 is increased by one after each positioning has been completed.

Query the state of the variable Var1

If Var1 =0, the robot moves to its initial position; if Var1 =1, the robot moves to position 1, etc.
Consequently, only the variable Var1 is queried, the variable Var11-Var13 is defined for each position, and then the position subprogram is carried out.

In this way, this very complicated project can be processed even in the download mode of the intelligent interface. If instead the Positioner subprogram were inserted in a flowchart for each new position of the robot, the storage limit would probably be reached very quickly.

This kind of programming might not be so easy to understand at the beginning. You simply have to try it out. After all, this chapter addresses the pros among the LLWin programmers.

**What Becomes of Old LLWin Projects?**

Old projects, which were created using Version 2.1, can be loaded and started using Version 3.0.
*Note:* But if you save them under LLWin 3.0, they can no longer be opened in LLWin 2.1.

Projects from Version 2.1 can be edited in LLWin 3.0. The blocks can be moved, copied, cut and inserted. New LLWin 3.0 blocks can be added from the block dialog box. Additional old blocks cannot be added. This would be unnecessary, because all functions of the old blocks are also in the new blocks.

Old blocks cannot be copied into other projects either, which were created using LLWin 3.0.

**P. 7/8 FAN CLUB Model No. 17: "Pneumatic Excavator"**

The bases for this FAN CLUB model are the "Power Bulldozer" and "Profi Pneumatic" building kits. We're talking about an excavator with a pneumatic arm and caterpillar tracks. With it you can, for example, load the trucks from the "Cars & Trucks" set.

The steps for building the chassis can be taken from the "Power Bulldozer" manual. All the parts for the pictured model without the driving mechanism are contained in the "Profi Pneumatic" and "Power Bulldozer" kits - no other parts are needed.

Of course, this model can be made even better if motors and remote control are added (e.g. two "Power Motor Sets" for the driving mechanism and the "IR Control Set" for remote control). As a power supply, we recommend the "Accu Set" (see also the "Power Bulldozer" construction manual).

Have fun with the "Pneumatic Excavator"!