SWALLOW SYSTEMS PRESENT

PIP

A robust, cost effective, programmable robot for ages 4 to 12

PIP is an independent programmable robot designed to be used in nursery and primary schools for:

- **PRE-LOGO** learning for children.
- **MATHS** estimation, number, shape.
- **SCIENCE** forces, speed, load carrying.
- **CONTROL** robot programming.
- **CRAFT** junk modelling.
- **CROSS CURRICULUM PROJECTS**

'The most valuable child-directed hardware yet'
Times Educational Supplement

'Smarter than the average turtle'
Educational Computing

'PIP itself is as hardy as indicated in the literature'
PrintRun

PIP IN THE CLASSROOM

- **PIP** can be used with children as young as four years old to explore simple mathematical concepts. Older children up to the age of 12 can explore aspects of geometry and science topics in some depth.
- **PIP** is very robust and has been designed to withstand normal classroom (ab)use. Even clumsy, careless or uncoordinated children can be trusted with PIP.
- **PIP** uses a built-in rechargeable battery. No more problems with flat batteries or expensive replacements.
- **PIP** has a shape which can be easily 'dressed up' so that it links to a classroom topic.
- **PIP** can easily become a snail, a dragon, a train, a fire engine, an ambulance or whatever the children choose. These changes provide endless opportunities for language work and art work.
- **PIP** comes with special adhesive strips so that existing school materials can be stuck to the casing as a more permanent fixture.
- **PIP** has a shape which can carry, pull or push loads as part of a science topic.
- **PIP** is very easy to use. Within minutes of meeting PIP for the first time children will be achieving results.
- **PIP** can be rented for short periods to try out in the classroom. Complete the Order Form below.
- **PIP** comes with a 12 month guarantee and is supplied with internal rechargeable batteries, a battery charger unit, song book, manual, application notes, modifier plug and pencil-lead holder. There are no hidden extras.
- **PIP** is designed and manufactured by:
  Swallow Systems
  32 High Street, High Wycombe,
  Buckinghamshire HP11 2AQ.
  Telephone 0494 813471
  Any faults or technical problems should be referred direct to the manufacturers.

PIP SPECIFICATIONS

PIP's commands are:

FORWARDS	up to 999 centimetres
BACKWARDS	up to 999 centimetres
LEFT	up to 999 degrees
RIGHT	up to 999 degrees
FLASH (green light)	up to 999 times
PAUSE	up to 99.9 seconds
REPEAT	up to 99 times
MUSICAL NOTE	C, D, E, F, F#, G, A, B, C, D
END REPEAT	
CLEAR ENTRY	
CLEAR MEMORY	
RESTORE MEMORY	
GO	Start program
TEST	Execute a test routine

- In addition to the command keys **PIP** has 10 digit keys. The digit keys are also labelled with musical notes. There are 24 keys altogether.
- Any keypress will give an immediate audible response, a beep for acceptable entries, a grumble for bad entries and a song for correct program execution.
- Programs are limited to 39 steps. REPEATs can be nested three levels deep.
- **PIP** has an internal rechargeable battery with a charging light. This goes out when the battery is fully charged.
- **PIP** is approximately 90x150x220mm in size with a load platform of 90x140mm. PIP weighs about 1.6kg.
- **PIP** moves in centimetre units and turns in degrees. A free modifier plug enables PIP to move in 10 centimetre steps and turn in 10 degree steps.
- A free pencil-lead holder is included to allow PIP to leave a trail.

PRICES AND ORDERING INFORMATION

Please complete this Order Form or use your LEA requisition form.

PIP PRICE ..... £195.00 + VAT =
CASH/CHEQUE WITH ORDER PRICE (15% DISCOUNT) ..... £165.75 + VAT =
POSTAGE AND PACKING ..... £ 5.00 + VAT =

After 1.4.91 VAT change
£229.13
£194.76
£ 5.87
PIP rental £9.40 per week

PIP can be rented for £8.00 + VAT = £9.20 plus carriage per week.

Please supply ..... PIPs at £..... + VAT each.
Please add Postage and Packing of £5.00 + VAT

I enclose our official order number .....

I enclose a cheque for the Discount Price of £ .....

Tick here ☐ for details of the PIP RENTAL scheme.

Tick here ☐ to be put on our mailing list.

Name ..... Position .....

Institution .....

Address .....

..... Postcode .....

Tel. No. ..... Signature .....

Prices and specifications are subject to alteration without notice.

SEND TO: **Swallow Systems**
32, High Street, High Wycombe, Bucks, HP11 2AQ
Tel. No. 0494 813471

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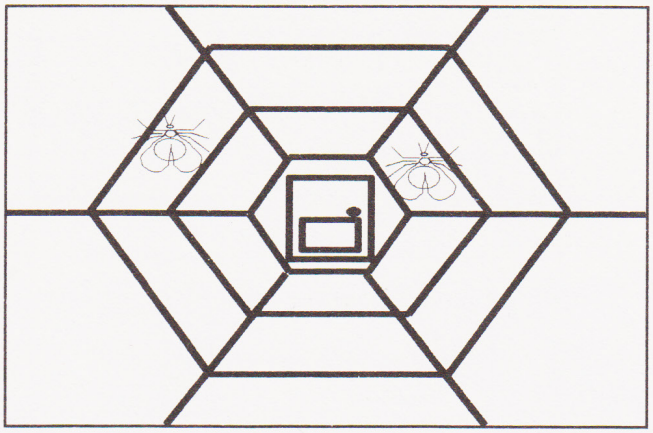
Spider!, a cross-curriculum topic for PIP

This is a typical primary school use of **PIP**. Draw the web on pieces of cardboard taped together that can be stored folded up. For a more durable web use a labelling pen on white hardboard. The web is about 1 metre square.

The spider's meal of flies and insects is drawn on pieces of card and arranged for suitable complexity. The children can make **PIP** into a spider using a suitable shoe box with legs added.



The underlying mathematical idea is the use of polar coordinates for location. When fetching several insects it is easier for **PIP** to return to the centre of the web after each. This lets you work in fixed known increments (60 degrees in the diagram) and only two or three lengths. If **PIP** goes directly between insects you will find it very difficult.

Modifier plugs for PIP.

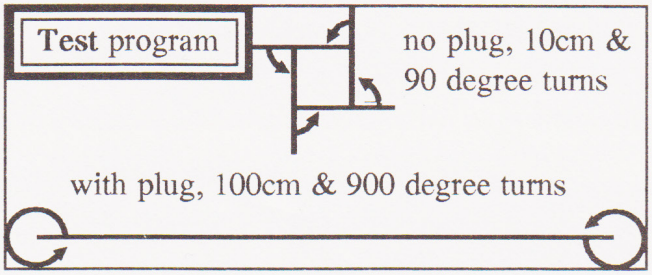
PIP is available with a variety of ''personalities''. All look and behave the same except when a black modifier plug is fitted.

With no plug fitted **PIP** moves in one cm. and one degree units. A grey plug gives ten cm. and ten degree units. A standard **PIP** with a black plug moves in 22.5 cm. (**PIP**'s length) and 22.5 degree (quarter right angle) units.

Some Authorities use special **PIP**s. These have the name of the Authority that first suggested them and come with a black plug instead of grey . A **Lothian PIP** with a black plug moves in 22.5 cm. and right angle units. A **Dudley PIP** with a black plug moves in 22.5 cm. and single degree units.

If you want a special **PIP** please indicate which on your order. Grey and black plugs are available separately if you need both.

The grey plug changes both the distances and the angles that **PIP** moves. You can run programs with and without the plug to see the effect.



The angle change normally changes the shape of the path that **PIP** follows and the distance change alters the size. Is there a program that gives the same shape path with and without the plug?

The solutions may take some finding. You can use trial and error or analysis. The secret is *large* angles; both 361 and 1 degree turns have the same final effect. The smallest magic angle for a grey X10 plug is 40 degrees. **PIP** turns either 40 or 400 (360 + 40) degrees.

Colour factory

The colour factory is an example of **PIP** as an ''industrial'' robot. It moves materials around the factory floor.

The factory is a line of pots of paint powder spaced at, say, 30 cm. The last place has a jug of water. **PIP**'s start and end positions are marked and it has a suitable container fixed on top.

A child manages each pot with instructions to add one spoonful of paint powder to **PIP**'s container if **PIP** stops next to them. The last child adds water rather than paint. At the end, the container is taken from **PIP**, stirred, and quality control tests are carried out on the final product.

The production controller programs **PIP** to collect paint from different pots to make the desired shade. If all goes according to plan the final product should be within specification!

GREY

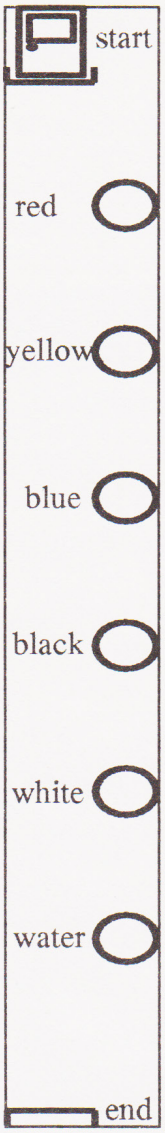
- ↑ 12
- 🕒 50
- ↑ 3
- 🕒 50
- ↑ 3
- 🕒 100
- ↑ 3

With the grey X10 plug fitted and the pots at 30 cm. intervals, the pot positions are all on the 3 times table. Different spacing could be used for different tables.

It can all be set-up very quickly on a suitable smooth (and cleanable!) floor by marking all the positions with masking tape.

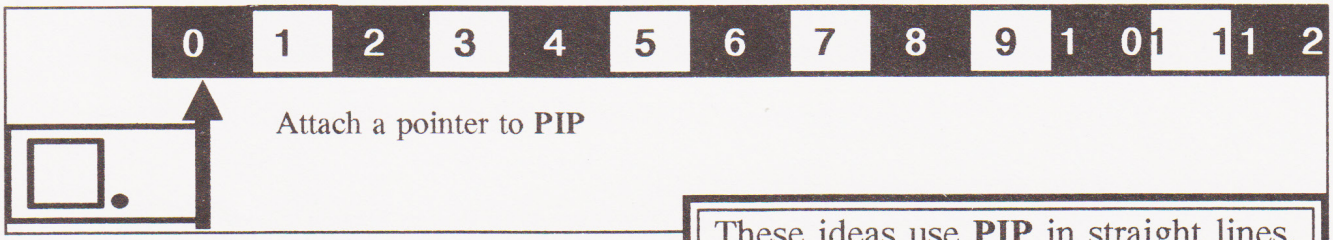
For a bigger range of colours use **PIP**'s flashing light to show how many spoonsful of paint are to be added.

''Recipe cards'', with a sample of the colour, should be made by the children. The children can investigate the variability of their process by comparing repeated runs for the same colour.



Number Line work with PIP

A common use of **PIP** with younger children is a number line. Use the modifier plug and make the number spacing a unit movement.



On the number line you can do simple arithmetic. ↑1 then ↑ 1 is the same as ↑ 2. ↑ 6 then ↓2 is the same as ↑4. How many ways can PIP get to 10?

Use RPT to do multiplication. RPT 3, ↑ 4, END is the same as ↑ 12.

Can you use the number line for division? What are the implications of ↱ 180, ↑ 1?

These ideas use **PIP** in straight lines. They could use angles instead of distances if the set-up is changed from a line to a circle. You might use a line the first time you try them and a circle next time to add variety.

PIP IN THE CLASSROOM

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- **PIP** is very robust and has been designed to withstand normal classroom (ab)use. Even clumsy or careless children can be trusted with **PIP.**
- **PIP** has a built-in rechargeable battery. No "use once" purchasing or disposal problems.
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- **PIP**'s shape makes it easy to carry, pull or push loads as part of a science topic.
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PAUSE	up to 99.9 seconds
REPEAT	up to 99 times
MUSICAL NOTE	C,D,E,F,F#,G,A,B,C,D
END	repeat sequence
CLEAR ENTRY	
CLEAR MEMORY	
RESTORE MEMORY	
GO	Start program
TEST	Execute a test routine

- As well as the command keys **PIP** has 10 digit keys. These are also labelled with musical notes. There are 24 keys altogether.
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- Programs can have up to 39 steps. **REPEATS** can be nested three levels deep.
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POSTAGE AND PACKING.....£ 5.00 + VAT = £ 5.87

PIP can be rented for £8.00 + VAT = £9.40 per week plus carriage.

Please supply.....**PIP**s at £..... + VAT each.
DON'T FORGET Postage and Packing of £5.00 + VAT = £5.87
I enclose our official order number...../ a cheque for the discount price of £.....
Tick here ☐ for details of the **PIP** rental scheme. Tick here ☐ to be put on our mailing list.
Name..... Title.....
Institution.....
Address .....
..... Postcode.....
Tel. No.....Signature.....Date.....

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SEND TO: **SWALLOW SYSTEMS,**
32, High Street, High Wycombe, Bucks, HP11 2AQ
Tel. No. 0494 813471

SWALLOW SYSTEMS PRESENT

PIXIE

A small, simple, programmable robot

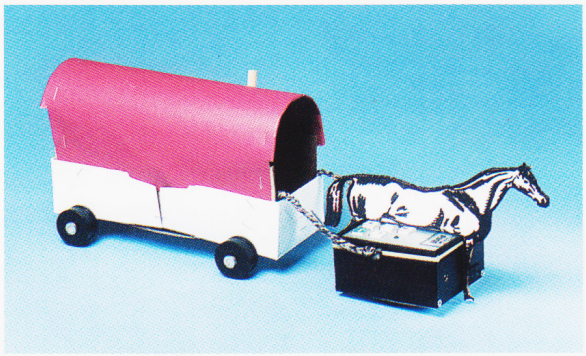
PIXIE is an independent programmable vehicle used in nursery and primary schools for:-

- **PRE-LOGO learning**
- **CONTROL programming**
- **CRAFT junk modelling**
- **MATHS estimation, shape**
- **CROSS CURRICULUM PROJECTS**

Compact design

PIXIE is very small. It is the first educational "floor" robot small enough for table-top use.

This small size makes **PIXIE** very easy to dress up. One new possibility is making silhouettes in cardboard with a **PIXIE**-sized cut-out. The cardboard silhouette is then simply pushed over **PIXIE**.



- Rechargeable batteries
- Non-volatile memory
- Metal construction
- Only 7 buttons
- Rectangular shape

Simple dressing up

Movement and turn units are pre-set to **PIXIE**'s length and 90°. Units can be adjusted to meet particular needs. Changes can only be made while **PIXIE** is being charged and they persist when **PIXIE** is turned on and off.

PIXIE can also be recalibrated to suit a particular surface by the user if necessary. This can also only be done while it is being charged.

PIXIE is Swallow Systems' first robot to break the **£100** price barrier. Don't forget this includes **rechargeable** batteries and charger so this is the total starting cost.

Applications included

Specifications:

PIXIE has 7 buttons. 5 are for programming, **CM** to clear the program and **Go** to run the program. The programming keys are:-

These keys program **PIXIE** to carry out that operation for the unit size. The pause unit size is 1 second. The normal unit size for forwards and backwards is **PIXIE**'s length, 110mm. The normal unit size for turns is 90°.

The normal sizes for movement and turn can be altered while **PIXIE** is being charged. The maximum units are 720° and 1000mm. The minimum units are 5° and 10 mm.

Go switches **PIXIE** from being programmed to running the program. When a program is being run, **PIXIE** can be stopped immediately by pressing ***any*** of the buttons.

CM is used to rub out a program. Programs are non-volatile; i.e. they are preserved when **PIXIE** is turned off.

Key presses give both a sound cue and a flash of the indicator light.

£99.95
plus P&P and VAT

PIXIE can be recalibrated should wear, or a difficult operating surface, require it.

PIXIE has integral rechargeable batteries. Children cannot get at the batteries without using tools to dismantle **PIXIE**. The charger is supplied with **PIXIE**.

PIXIE is approximately 110 mm by 94 mm by 65mm high.

PIXIE is supplied with charger, instruction manual and application notes.

Special introductory offer.
P & P free if ordered before 31/12/94

Send your order to:

Swallow Systems
134, Cock Lane
High Wycombe
Buckinghamshire
HP13 7EA
Tel: 01494 813471
Fax: 01494 813552

Prices and specifications may be changed without notice.

Use this order form for introductory offer.

Please supply . . . . . (number) **PIXIES** at £99.95 each plus VAT. Postage and packing free if ordered before 31/12/94

Order Number . . . . . Date . . . . . .

Signature . . . . . .

Name. Mr./Mrs./Miss/Ms . . . . . .

Organisation . . . . . .

Address . . . . . .

. . . . . .

. . . . . Post Code . . . . . .

Tel. No. . . . . .