

GRAPHIC T·O·O·L·S

& TECHNIQUES





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JOHN LAING
RHIANNON SAUNDERS-DAVIES

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PREFACE

Among the many innovations of our century the explosion in the use of mass communications is particularly outstanding. This expansion of activity has, increasingly, not been confined to a small and knowledgeable elite. Access to and participation in media activity has become astonishingly open. Any person can now publish or advertise; and the industries surrounding the media are huge and diverse. The jobs market offered by these concerns is rich and varied. Many people are finding the prospect of working as a designer increasingly possible, as well as attractive in terms of lifestyle.

This book attempts to give an introduction to the vast range of materials and equipment that is available. Obviously, not every item on the market has been mentioned but the product lists give a brief description of the most familiar and popular ones to help both the beginner and the confirmed user in making a more informed choice about the right tool for each job. We also offer some basic 'how-to-do-it' sections, outlining some of the simpler procedures that designers perform every day of their working lives. It is only a start and those who are interested can then move on to more advanced study. . .

A note on measurement: draftsmen, architects and designers are at present faced with a confusion of different measuring systems. Type, for instance, is not only specified in pica and inches but now millimetres are also jostling for position as computer typesetting becomes more dominant. The metric system has all but taken over in Britain and Europe and manufacturers of every kind are having to produce goods which conform to international metric specifications. Use of the metric system is also increasing in the USA and the pace of change is likely to speed up over the next few years. Similarly, the 'A' system of sizing papers is the most common in Britain and Europe, and is starting to become more widespread in the United States. In this book we have given imperial measurements wherever possible but metric ones take precedence as these are becoming the internationally recognized standard.

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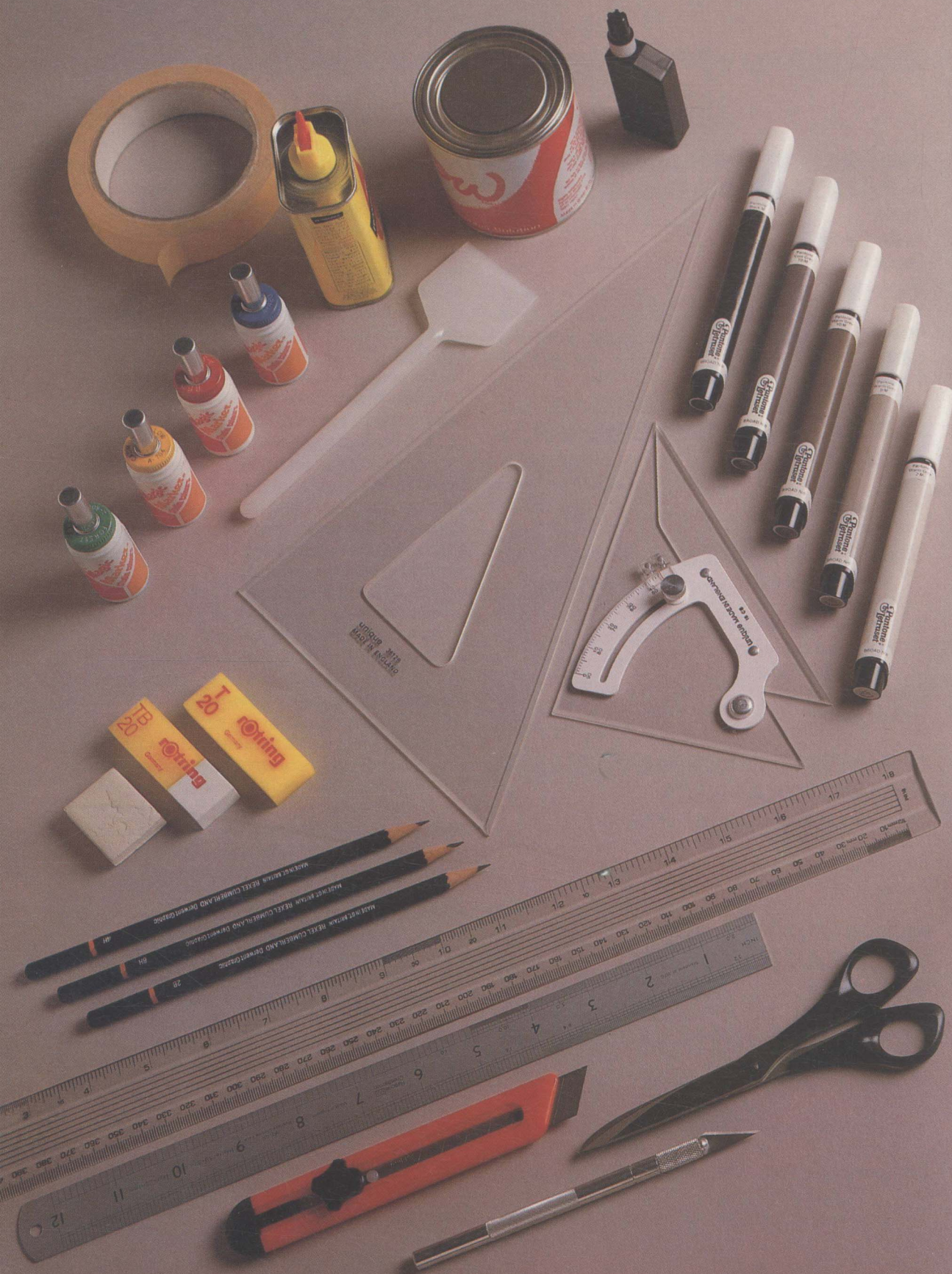
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SETTING UP A STUDIO

In this section, we start with the most basic, and obvious, requirement of a designer – a room – and look at which rooms are suitable, and why. Once you have your room, there is a wide variety of equipment which you can purchase. We look here at what you will need to start with, and the larger purchases which are useful in the longer term.



Setting up a studio can so often be approached in the way some amateur photographers start out. They buy lots of very expensive equipment which far exceeds their immediate needs and their technical competence. An expensive camera does not necessarily make you a better photographer – a simple camera in the hands of a skilled photographer can produce very high-quality work.

The message we want to convey here must be obvious: it is not necessary to spend vast sums of money on setting yourself up with perfectly decent studio facilities that will enable you to produce excellent work. Very highly sophisticated and specialized techniques are best bought from people who make it their business to produce just that very narrow part of the market's needs. Computer graphics is an obvious example of this. It would not be difficult to spend some hundreds of thousands of dollars buying the equipment required.

So, what are the priorities? The first requirement, and not necessarily the most

obvious one, is a room – preferably a room you use for no other purpose. Choose a room, if you can, that has good natural light. A large window facing north (in the northern hemisphere) is considered to be the best. Why facing north? That way you avoid direct sunlight which changes in intensity and direction throughout the day. It is very difficult for the eyes to adjust to a situation where, one minute, you have piercingly strong and intense sunlight falling on your work and, the next minute, a cloud passes across the sun and you can hardly see what is in front of you. North light offers a filtered, reflected and fairly constant level of illumination. A room at the top of the house can be best of all, especially if it also has a roof light.

Of course, you will need artificial light some of the time. For general studio lighting, strip fluorescent lights give the most even illumination over larger areas. One of the problems with all interior lighting is that the values of colours change from what they are in daylight. Strip lighting can be obtained with light

Your studio need not be a large room, but it should be light, airy, and well-organized, with the items you use most frequently to hand.



values balanced very closely to those of daylight.

You will certainly need a good drawing board. It is worth spending as much as you can afford on this item. To do really accurate mechanicals you have to have the guarantee of absolute squareness at all parts of the working surface. If you cannot afford one with an attached drafting machine system, it should have a well set straight-edge down the left-hand side, offering a good 'run' for a T-square.

Your board can either be a free-standing unit or one placed on a table-top. If it is free-standing, choose one that has a sturdy base. The height and the angle of the board must be adjustable. If you are using a table as a mount for your board make sure that the table too is solid and strong. In either situation you cannot do accurate work on a rickety base.

For lighting close to the working surface you can buy good light fittings which clamp on to your board. This is particularly useful on free-standing units. Good fittings are also available mounted on a heavy base, or they can be fixed to a wall just where you want them. Whichever means you prefer, make sure that you have the floating arm type of light so that you can direct the beam to the part of your work that requires it most. Some adjustable lamps come with fluorescent light sources, others with a combination of fluorescent and incandescent. These are better for colour work than the purely incandescent type.

A swivel chair is the most convenient, although not essential. It is helpful if the height of the chair is adjustable so that you can arrange the best position for different kinds of work. Generally speaking, your height should be such that you are looking down on your work rather than along a shallow angle of view. Some designers use stools but this is not always either comfortable or good for your posture. Typists' chairs support the base of the back and enable you to work over long periods in comfort.

A light box or table is very helpful for visualizing purposes. It saves time in tracing down material from illustrations, type or photographs, and it gives you greater control of accuracy over small details. It is also very useful for viewing colour slides and transparencies. Table-top models of various sizes are available.

You will need also space for cutting, trimming and mounting work, so allow room for a cutting mat.

BASIC STUDIO TOOLKIT

Three blacklead pencils: 4H, HB and 2B
Blue pencil for mechanicals (the camera does not pick up blue)
Two drafting pens: 0.25mm and 0.50mm
Ink for the drafting pens
Compass attachment for the drafting pens
Selection of fibre-tipped markers
Selection of felt-tipped markers
Clear plastic 300 or 450mm (12 or 18in.) ruler
Steel straight-edge
Type scale
T-square
60° 300mm (12in.) set square (triangle)
45° adjustable set square (triangle)

Ellipse guide
French curves
Springbow compass
A pair of sharp scissors
A scalpel (X-Acto knife) and a craft (mat) knife
Plastic eraser
Kneadable (kneaded) eraser
Rubber-based adhesive (cement) and spreader (container for brush)
Lighter fuel (fluid) for removing rubber adhesive
Masking tape
A tube of process white
A selection of gouache paints
A broad wash brush and a fine sable brush
Last, but not least, a telephone!

A pinboard on the wall helps you to see what your work looks like when it is vertical and also what it looks like from a greater distance. It is also useful for day to day reminders.

You now have your basic furniture.

Take a similar approach to purchasing tools. The list above gives a good idea of the minimum requirements. When you want to update, then the next items to consider might include a projector/viewer. These are fairly large, usually free-standing, pieces of equipment which illuminate the images you wish to use in your design, but they will also enlarge or reduce them to just the size your design needs. The image is cast on to a sheet of glass enabling you to trace it off. This is an expensive but very useful piece of studio equipment.

A flat file is very useful for storing and preserving work. Without one, you run the risk of pieces becoming dusty, crumpled, spilt on or otherwise damaged. It also adds to the general tidiness of your working room and the flat top of the file provides another useful surface – maybe for a cutting mat.

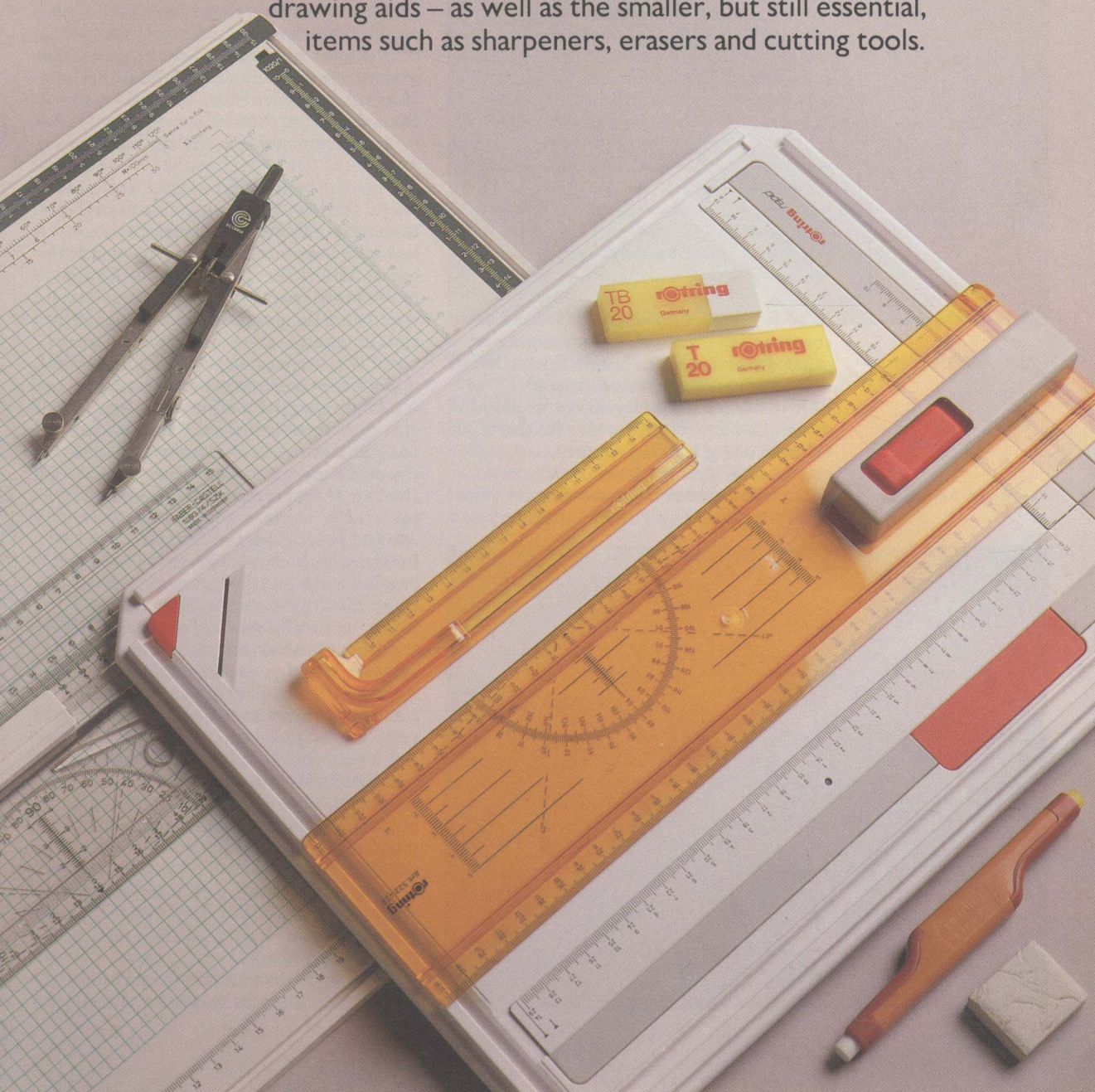
An airbrush and compressor allow you to do more sophisticated artwork but, of course, a lot of practice is necessary if you are to become proficient.

A waxing machine facilitates paste-up work, and a dry-mounting press for fixing photographs and other suitable pieces of artwork on to board can also be useful.



EQUIPMENT AND SURFACES

The last chapter offered an overview of the basic equipment the graphic designer will need for his studio. Here we consider in detail some of the larger, more expensive, pieces – drawing boards and their accessories, light boxes and tables, and precision drawing aids – as well as the smaller, but still essential, items such as sharpeners, erasers and cutting tools.



DRAWING BOARDS AND ACCESSORIES

Drawing boards and their associated equipment and accessories probably offer the most complex range of choices and the widest range of financial outlay. A simple drawing board of squared-up wood will cost very little. Next in price, and slightly more versatile, is a board covered in melamine or some such similar smooth finish which is moisture-proof and solvent-resistant and allows for the easy use of a T-square. Such a board, however, still does not offer the degree of precision required by some work. If great accuracy is required, without going in for a complete assemblage of related hardware, then a board constructed from several separate pieces of wood dovetailed into each other and fixed rigidly to each other by screw-fixed cross-members, will prove more effective. This composite construction eliminates any warping or other distortion of the board. Such a board will also have an inserted strip of hardwood, traditionally ebony, or metal down one edge. This provides for the reliable use of a good T-square, guaranteeing a high level of accuracy.

Such boards can be, and are, used quite free from other equipment, either leaned

or propped up on a table. But they can, with advantage, be attached to a stand. This offers either a fixed position or the opportunity of tilting the angle of use to suit the needs of any specific situation. It also increases the range of useful attachments available. Variations between manufacturers are not great; the major ones are Belmont, Bieffe, Blundell Harling, Designer Plus, Plandale and Stacor. The list that follows gives a selection representing the various types available.

Once the board is on a stand, the most useful facility, after being able to control the angle of the working surface, is to have the T-square actually attached to the board. This device, called a parallel motion unit (parallel straight-edge/rule), duplicates the purpose of the detached T-square, namely the ability to draw lines parallel to each other without having to make time-consuming measurements.

Simple parallel motion units (parallel straight-edges/rules) are available in two basic patterns: one is a cross-wire system, the other uses a counterweight system. Of the two, the counterweight system is preferable, as cross-wires can become warped or tangled, resulting in inaccuracy. More sophisticated devices employ tooth and gear mechanisms to carry the drawing edge. Best of all are precision machined steel or aluminium tracking systems in which the reference edge is carried on steel bearings. Various highly accurate drafting devices and lighting fixtures can be attached to this reference edge.

A beginner or student, should choose a board of light- to mediumweight construction with a simple height and angle adjustment system. A good size for a graphic designer is approximately 915 × 660mm (36 × 26 in.). This will provide a large enough working area for most jobs without taking up too much space. Larger boards are used mostly by architects and technical draftsmen.

Note: In the product listings which follow, height always precedes width.

The Bieffe BF8 drawing table.



BIEFFE

BF8

This drawing table has a tubular steel base of great stability. It comes in board sizes from A1 (594 × 841mm/23½ × 33 in.) up to A0 (841 × 1189mm/33 × 47 in.). The height is adjustable from 740mm up to 1100mm (29 in. to 43 in.) and the board tilt range is 30°. Chrome finished adjustment bars raise and lower the assembly very easily through the aid of a simple system of locking knobs.

BF5

Suitable for use at home or in the professional studio. The height can be adjusted for either sitting or standing use and the board will tilt through a full 90°. The sprung counter-balance allows the board to float into any position and be locked by a single lever, and the stand takes boards from A1 (594 × 841mm/23½ × 33 in.) to A0 (841 × 1189mm/33 × 47 in.).

ANGOLO

A four-post drawing base that can also be used as a general work table. It has a spring-balanced, white laminate board 940 × 1500mm (37 × 59 in.) to which a parallel motion unit (parallel straight-edge) can be attached.

ARCHITETTO

Made of square tubular steel with independent front and rear adjustments with a range from 790mm to 1150mm (31 in. to 45 in.), the Architetto's maximum angle of elevation is 25°. The sliding adjustment members are locked within the square, tubular legs by four handwheels.

It takes boards from 800 × 1200mm (31½ × 47 in.) up to 1200 × 2300mm (47 × 90 in.) and is easily foldable for storage or shipment.

GLOBUS

This drawing stand comes in two versions – low, 760mm (30 in.) high, and high, 965mm (38 in.). On the low version, height adjustment is controlled by a hand screw on the central column. On the high version, height is controlled by depressing a lever at the base of the stand. When the lever is released again, the whole mechanism locks. These units will take drawing boards from A1 (594 × 841mm/23½ × 33 in.) up to 920 × 1500mm (36 × 59 in.).

Whichever board is chosen, it can be rotated through 360° to gain the fullest advantage of changing natural light. The tilt of the board is variable through 90° by releasing a lever on the underside of the board. The weight of the board is counter-balanced by a torsion spring so that very little effort is required to change its angle.



The Bieffe Angolo drawing base.

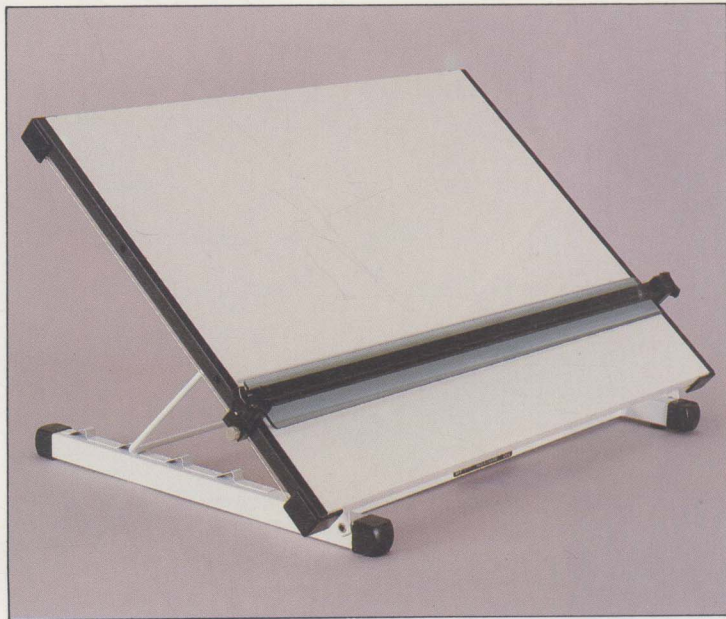
BFIT

A twin 'T'-shaped stand which takes boards from 920 × 1270mm (36 × 50 in.) up to 1200 × 2000mm (47 × 78 in.). This construction gives an exceptionally stable base. The height and angle adjustments are made through a parallelogram system counter-balanced by mechanical springs and a pneumatic piston. A full-length foot pedal releases the system for simultaneous height and angle adjustment. The BF2T stand (for boards up to 1000 × 1700mm/39 × 67 in.) and the BF3T stand (for boards up to 920 × 1500mm/36 × 50 in.) are similar in most respects, but have only the mechanical spring for height and angle adjustment, with no pneumatic aid.

STABILUS

A very robust board combining the advantages of the parallelogram principle for sturdiness and ease of operation with a pedestal construction offering the maximum usefulness in a minimum of space. The minimum horizontal height of the board is 1000mm (39 in.) and this height can be increased a further 300mm (12 in.). A counter-balanced spring system aids easy height adjustment by operating a central foot pedal. The angle of the board can be changed by operating a hand lever underneath the board.

This stand accepts boards of other makes up to 1200 × 2300mm (47 × 90 in.).



The Blundell Harling Sherborne table-top drawing stand.

OPUS

The Opus incorporates an oleo-pneumatic balancing system through the use of a single foot pedal which makes height adjustment particularly easy. The angle of the board is controlled by a hand lever on the underside of the board which is easily released and relocked by very strong clutch-type brakes. The drawing board is counter-balanced by two tension springs which are housed elegantly behind chrome-plated covers.

This stand takes boards from other manufacturers from 1000 x 1500mm (39 x 59 in.) up to 1200 x 2300mm (47 x 90 in.).

BLUNDELL HARLING

Not available in the USA

ACADEMY

Sizes: A1, A2

These are white, extra-thick, melamine-faced drawing boards.

SUPERBOARD

Sizes: A0 ext, A0a, A0, A1 ext. large, A1 ext, A1
This is a high-density particle board free from voids, thereby ensuring stability and freedom from warping or twisting. Both faces are covered with an extra-thick layer of white melamine. All edges are trimmed with the same material, making them suitable for the easy and accurate use of a T-square.

SHERBORNE

A table-top inclined stand with four settings allowing the board, when attached, to be set at

15, 30, 45 or 60°. This stand will accept boards up to size A1.

ADAPTABLE

A floor stand made from 25mm sq. (1 in. sq.) section welded steel tube finished in white epoxy resin. It offers full angle adjustment from vertical to horizontal and also a 130mm (5 in.) height adjustment. It will take drawing boards up to A1 size.

RIDGEWAY

An inexpensive, folding drawing stand ideal for the student and for home use. It is made from 25mm sq. (1 in. sq.) section steel tube and finished to a high standard in white epoxy resin. The open metal parts are stainless steel and nickel-plated throughout. It is fully adjustable for angle and the telescopic legs give a total of 250mm (10 in.) variation – a generous control of height. This stand is suitable for boards up to A0 size.

STRATTON

This floor stand is designed to take both A0 and A1 drawing boards. The main uprights give telescopic vertical adjustment and a handwheel operates the angle which is variable from horizontal to almost vertical. The stand is manufactured from welded, heavyweight, round, steel tube with steel cross-braces for extra rigidity. It is finished in white epoxy resin with the bright parts either stainless steel or nickel-plated.

BLANDFORD

A strong and rigid stand at a moderate price. The height adjustment is provided by a spring-loaded parallelogram linkage and the angle of the board is made through a simple fulcrum bar. Both of these variables are controlled by a single lever to the side of the stand.

The stand is constructed from square and rectangular section, steel tube finished in white epoxy resin. Bright parts are stainless steel or nickel-plated. Adjustable feet compensate for uneven floors. This unit will accept boards up to A0 size.

FOSTER

Not available in the UK

BELMONT DRAWING TABLES

A pedestal type of hydraulic stand which can carry three sizes of board – 23 x 31 in., 24 x 36 in. and 31 x 42 in. The central supporting column which carries the hydraulic system enables the board to be turned freely around the vertical axis, adjusted to any height from 27½ in. to 40½ in., or locked into any position with a simple one-handed movement.

PLAN HOLD

DESIGNER PLUS DRAWING TABLES

A well-designed lightweight and manoeuvrable drawing table made from square-section tubular steel with a white laminate board attached. Height can be simply adjusted from 30 in. to 40 in. and the board positioned at any angle between vertical and horizontal. Available in three board sizes – 24 × 36 in., 30 × 42 in. and 36 × 48 in.

STACOR

Not available in the UK

TYROTEC DRAFTING TABLE

A simple but sturdy desk-height drafting table with an adjustable tilt option. A bracket at the rear of the board fits into one of four slots on the sides, offering a choice of angles from 0° to 60°. A full-width shelf underneath gives useful storage space. Available with 30 × 40 in. or 36 × 48 in. board area.

VARITEC DRAFTING TABLE

A slightly more sophisticated drafting table incorporating both height and tilt adjustment options. Height is raised and lowered from 30 in. to 46 in. by large screw knobs and the board can be tilted from 0° to 40°. Available with 30 × 42 in. or 36 × 48 in. board areas.

SUPRETEC DRAFTING TABLE

A high-quality professional drafting table available in larger board sizes – 36 × 60 in. and 36 × 72 in. Tilt can be adjusted from 0° to 35° and height from 30 in. to 44½ in. by means of screw knobs. A full-width shelf underneath the board provides convenient storage space for tools or reference material.

Both this and the VariTec have rubber encased foot-rests for comfortable working posture.

FOLD AWAY DRAWING TABLE

A useful collapsible table for maximum use of studio space. It folds away flat to a width of 4 in. When erected, it offers both stability and versatility, being adjustable in height from 29 in. to 45 in. and tilt from 0° to 40°. The table has a square steel tube base and the board itself is made from easy-to-clean laminate which can be reversed to provide either a white or black working surface. Available with 24 × 36 in. or 30 × 42 in. board areas.

PARALLEL MOTION/STRAIGHT-EDGE AND DRAFTING UNITS

BLUNDELL HARLING

Not available in the USA

TRUELINE PARALLEL MOTION

This portable parallel motion system uses a cross-wire assembly controlled by nylon-covered, stranded steel cable running on acetyl corner pulleys with ball bearings. The corners of the board are protected by moulded blocks which also attach the pulleys to the board. A cam brake is attached to the straight-edge allowing it to be clamped into position when desired. The unit comes with a double-bevelled transparent, tinted straight-edge which can be easily removed and exchanged with either of the optional cutting or centring straight-edges. All of these can be tilted or raised to allow artwork or cutting mats, and so on, to be positioned at will underneath.

STUDLAND PARALLEL MOTION

An extremely accurate, smooth-running unit based on the toothed belt system. The belt is made from non-stretch polyurethane which is reinforced with steel wire. Matched pulleys ensure the accuracy and repeatability of any movement. The unit is mounted on its chosen board by four moulded corner bearings which are smooth running and maintenance free.

A locking device is built in to the blocks at the end of the straight-edge which can be exchanged for the optional cutting or centring edges. Whichever straight-edge is used, the board can be tilted or raised to allow work to be positioned underneath it.

WEYMOUTH PARALLEL MOTION

This unit comes in kit form in four sizes suited to fit most standard drawing boards. The straight-edge is controlled by a spring-loaded braided cable and counter-balance is provided by weights which maintain constant tension on the wires, enabling the whole action to move smoothly. Ball-bearing races are used on the pulleys and these

require no maintenance. The double-bevelled transparent acrylic straight-edge, which is slotted at the ends to reduce end float, runs on nylon rollers to reduce both friction and static.

SWANAGE PARALLEL MOTION

This unit uses a toothed belt which makes it most suitable for work where accuracy and repeatability are of the greatest importance, for example, with multiple overlays.

The top axle runs in sealed precision ball races housed in square section steel tube. The lower axle also turns in a steel tube but on long-life nylon bearings.

The non-stretch, steel-reinforced, polyurethane belt drives accurately matched pulleys which eliminate backlash. The double-bevelled, transparent acrylic straight-edge is slotted at both ends so that it can be adjusted to reduce end float and runs on nylon rollers to reduce both friction and static.

TRUELINE DRAFTING HEAD

A simple 90° drafting head which runs on the straight-edge of the Trueline or Studland parallel motion units. It can be locked in position and carries a pair of interchangeable scale rules.

CARDINELL

Not available in UK

PROFESSIONAL PARALLEL STRAIGHT-EDGE

A straight-edge which lies flat on the board. The blade of this model is made of maple and mahogany, and the bevelled edge is transparent. The tunnel rides on a keyway to counteract expansion and contraction.

PARA-STEEL PARALLEL STRAIGHT-EDGE

This was designed for those who need the accuracy of a stainless steel blade for precision cutting and technical drawing. Both edges are bevelled, and the model is guaranteed not to warp.

KEUFFEL & ESSER

AUTO FLOW III DRAFTING MACHINE

This unit is counter-balanced to handle any board angle without the need for adjustment. Features include aluminium tracks, adjustable roller bracket, C-clamp mounting, and two-point permanent and portable support.

PORTABLE DRAWING SYSTEMS

A few companies have, enterprisingly enough, sought to extend the availability of drawing office technology to occasional users working at home, in offices otherwise not equipped for studio work and, if required, any other non-permanent working environment.

These products are, understandably, not to be confused with the precision engineered, specialist equipment described earlier in this chapter but they are practical, convenient, useful and reasonably inexpensive and, therefore, also of use to students and others whose budget circumstances restrict the financial outlay available.

FABER-CASTELL

TZ-STANDARD DRAWING BOARD

Sizes: A4 (210 × 297mm/8¼ × 11¾ in.), A3 (297 × 420mm/11¾ × 16½ in.)

This board is made from dimensionally stable, warp-free, high impact plastic. The non-reflecting surface is very durable and is resistant to many instrument marks. It has guide grooves, enabling the attachment of parallel drafting arms on to any of the four sides. The drafting arm glides smoothly along these grooves and features a graduated edge for the use of supplementary triangles and set squares.

Both board sizes have a recessed paper clamp bar which will hold several sheets if required. This clamp has a lock-release key which will stay open to allow for the desired alignment of the paper. The drafting arm is clamped at two points on the left and, in the A3 version, is also clamped at the right.

TZ-PLUS DRAWING BOARD

Sizes: A4 (210 × 297mm/8¼ × 11¾ in.), A3 (297 × 420mm/11¾ × 16½ in.)

In addition to the features offered by the Standard version, the Plus also has magnetic sliding scales with zero-point axis for symmetrical drawing. There are special gradations for circular contours, polygons and angle designs. Both sizes will accept the TZ Swivel action, Special Drawing Head instead of the standard parallel ruler. This allows the user to turn the ruler through a range

of 150°.