

WEYCO FAC

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F A C SAVES TIME AND MONEY

FAC allows the designer, from the very birth of an idea, to test it out by "thinking directly in terms of mechanism," making it easier to develop the idea into a workable design, readjusting it where necessary as it progresses toward its ultimate form — it is the ideal instrument for all designers to whom space thinking is second nature.

The cost involved in preparing custom-built parts, and the time lost in waiting for them, are eliminated; this is a great asset particularly in those cases where the preliminary tests indicate that changes of the original model are necessary, causing parts to be redesigned or discarded altogether.

Specialized apparatus for use in research, development, and testing laboratories may be designed and built without waiting and at a price which is but a fraction of what a custom-designed equipment would cost.

A FAC working model does away with detailed and long drawn-out explanations, as it gives a direct visual interpretation of the principles involved. By virtue of its power of illustration, it is the ideal basis for discussions within a team working on a new design, and the most convincing means of winning over associates and customers to the idea.

When no longer needed, the model is easily dismantled by unskilled personnel, the parts sorted into the case and available for use in other models.

Maximum construction potential with the minimum number of parts.

Saving of time and money because FAC enables you to make prototypes and models cheaply, without having first to design the article and put it down on a drawing board. Rough sketches are usually sufficient for an intelligent person to construct a model. With FAC, it is possible immediately to make a prototype of some new idea, without having to wait for the fitting shop to make it, and with the wide variety of parts it is seldom necessary to make special parts.

Small special purpose machines are being made using standard FAC parts coupled to a suitable electric motor.

F A C as an educational system

Schools, Technical Colleges and Universities find FAC a very useful medium to demonstrate construction and engineering principles. Working models are of great value to students and apprentices to enable them to grasp essentials immediately.

OTHER WEYCO SPECIALITIES

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Sterilising Ovens
Drying Cabinets

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Specialists

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Scientific Glassware

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Manufacturers of
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Weighing-Testing
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Machines

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WEYCO (SALES) LTD

Libra Works, 18-20 Dames Road, London, E.7

Telephones: MARYland 4334 and 3974

WEYCO FAC

Universal Construction System**WHAT IS FAC ?**

A self-contained set of selected standard elements which are easily assembled into a variety of working models for experimental and demonstration purposes, or for performing specialized functions.

The main principle of FAC is the use of round rods and beams which are assembled into a framework by clamping them together. Clamping is no new idea, but its possibilities as a mounting medium have never been more forcibly used than in the FAC system.

This mounting principle affords several distinct advantages: there are no limitations as to size of the supporting structures; the small components may be mounted at any desired point along the framework members; and by proper design, the framework may be made to carry very heavy loads.

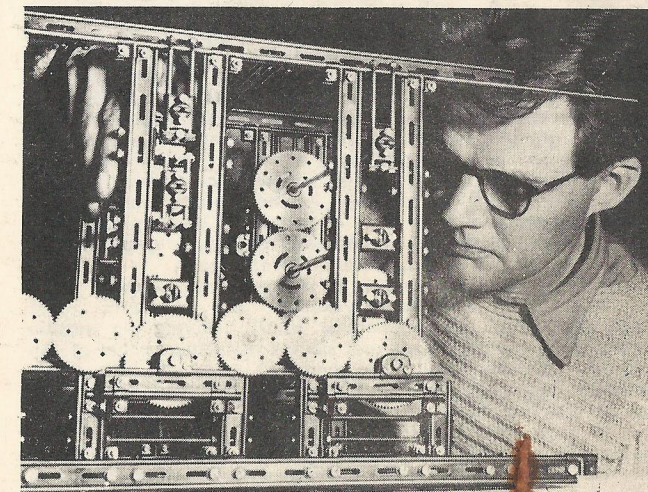
These are very important considerations for a kit to be used in industrial research and experiment work, and have prompted the design of all other parts in the kit along industrial principles.

Maximum flexibility is obtained through the adoption of a 7 mm modulus system for all parts constituting the framework, and all other elements have been strictly standardized to conform with this system. All screws used, and all threaded parts, have the same size of thread, metric M3, all rods are 4mm dia., all shafting either 4 or 6 mm dia.

The kit contains a wide assortment of the most current machine units, including power transmitting parts, such as gears, shaftings and bearings, and they are of such quality to guarantee long term operation.

There are a number of cases where the use of the relatively large clamps would be detrimental to the general appearance of the model, and where a smaller type of connecting element is required. This applies particularly for crank mechanisms, crossheads, various types of linkages, etc. To provide for this exigency, a

complete line of small threaded parts, male and female, has been incorporated with the FAC system; these include a variety of bushes, sleeves, rings, eye-bolts, studs, collars, rods with threaded ends etc., made possible by the difference in diameter between rods and screws. Through this joint use of bolting and clamping, it is possible to build very compact and gracefully fashioned models with FAC, which look realistic and not like something made out of a toy kit.



Assembling a model of a printing press from standard parts of the FAC system.

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Working Machines • Prototypes • Experimental and Demonstration Models

UNLIMITED SCOPE WITH FEW CONSTRUCTIONAL PARTS

Models of machinery and other engineering equipment have many uses. They may be made for instructional purposes, for experimental work, as a record of something which has been or is about to be destroyed, or by the skilled amateur simply for the pleasure of achievement. The two latter types of model are usually made to scale, and may occupy a skilled modelmaker, professional or amateur, for a considerable time. The professional engineer, however, is more likely to be concerned with one or both of the first two reasons mentioned, instruction or experiment. The value of models in certain cases is too obvious to need comment, but there are many instances where an engineer has to do without a model, because the cost of producing it by orthodox means would be too high, or because the time required to make it would be too long. Sometimes, especially when it is needed for experimental work, a model has to be made regardless of the cost or time involved, and it may well be that the equipment has ultimately to be scrapped, the value recoverable from the parts being negligible.

It is particularly in cases like these, where the model is wanted quickly and as cheaply as possible, but still has to be robust and accurate, that the FAC constructional system has special advantages. It is, however, in no way limited to such applications; stated simply, the function of the FAC system is to enable accurate, robust models to be built quickly of any kind of engineering equipment. It can incorporate all types of mechanical motion, and is equally suitable for models which are designed for permanent or long-term use, or those which are only intended to have a short existence. In the case of the latter, there is full recovery of the parts for re-use when the model is dismantled. The only tools needed are a spanner and a screwdriver, which are supplied with the kits, and a small vice and hacksaw for cutting rods to length if necessary. Constructional kits are, of course, not new, but the FAC system breaks new ground in its logical design and versatility, which are based on normal engineering practice.

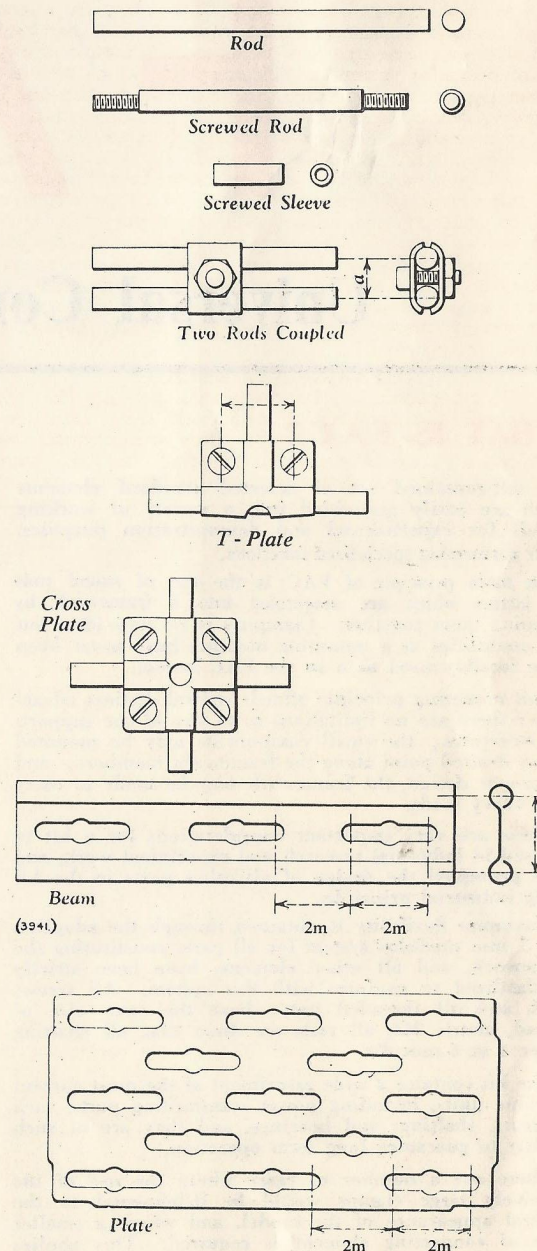
SIMPLE FUNDAMENTAL ITEMS

The basis of the FAC system is a round steel rod, 4mm. ($\frac{3}{16}$ in.) in diameter, which is supplied in various lengths in the FAC kits. It can easily be cut to length or bent to shape as the particular model requires. Simple pressed steel clips or couplings are used with screws and nuts to couple two of these rods together in parallel, as shown in the accompanying drawing, the distance m between the centres of the parallel rods being 7 mm. ($\frac{3}{16}$ in.), which is the module on which the whole FAC system is based, all the components being standardised on this dimensional basis. Cross and T-plates can be used to couple three or four rods in the same plane, and combinations of these plates enable many more arrangements of rods to be connected. The coupling plates are pulled down elastically on the rods, causing a spring-washer effect, so that screws and nuts cannot work loose.

Another standard component is the rod with screwed ends, which mates with an internally-screwed rod or sleeve. The threads are 3 mm. ($\frac{1}{8}$ in.) diameter Metric, leaving the outside diameter of the screwed rods and sleeves the same as that of the solid rods; the components are therefore constructionally interchangeable. By using these screwed rods, or by means of different types of coupling plates, it is possible to couple rods at right angles to each other as well as in the same plane.

Based on the parallel rod construction is the double plate or beam, which is formed of strip material with the edges turned to tubular form at 2m centres (2×7 mm. = 14 mm. or $\frac{1}{4}$ in.). The web of the beam is perforated with slots each 2m in length and 2m apart; standard screws can be passed through the slots for connecting other components. The thickness of the beam web is less than the permissible play between couplings, so the spring clamping effect is assured. A notch in the centre of each slot in the beam permits the passage of a rod or axle.

A further component, the plate, is evolved from the beam; it is, in effect, the web of the beam only. It is supplied in various sizes, square, rectangular or gusset-shaped, and is pierced with staggered slots at 2m spacing and of 2m length, as in the beam web.



The fundamental components of the FAC constructional kit system

ACCESSORIES INCREASE VERSATILITY

With the small number of simple fundamental parts described, rods, beams, couplings, plates, screws and nuts, it is obviously possible to start building up the framework of a machine or model. Suitable design makes it possible for such frames to carry loads which are very heavy in proportion to the supporting structure. With the addition of a few more standard items the range of the FAC system becomes apparent. There are, for example, a series of tie-rods, consisting of 2.5 mm. ($\frac{1}{8}$ in.) diameter wire formed with an eye at each end to take the standard screw, joint plates for beams at various angles, couplings which enable plates and other parts to be connected in one or two planes, and others for carrying bushes to form bearings for rotating shafts. Brass bushes, spacers and collars are included in the standard equipment, as are pulleys, both single and stepped. Circular pressings are employed, which can be bolted together to form V-belt pulleys. One of these pressings bolted to a second of different form makes a flanged wheel of the railway vehicle type, while a further combination of one inner pressing and two of outer flanged type makes a wheel with a well-base rim on which a rubber tyre can be mounted. There are also several other components, among which may be mentioned a chain wheel and sprocket, together with suitable chain, ratchet wheel, pawl and spring, hooks, helical spring and spring cups.

GEARED ASSEMBLIES

With the components so far mentioned it is possible to build virtually unlimited numbers of models of static form, or with wheels, rotary or semi-rotary, reciprocating or intermittent motion, but without a range of gears the scope of the FAC would be limited. A set of spur gears is therefore provided as standard equipment, together with bevel gears and a worm and wheel, and internal spur gears of 64 teeth and interlocking racks of 35 teeth, together with ball bearing housings and ball races. Ratios of 1 to 1 and 3 to 1 are standard with the bevel gears, while the worm and wheel has a ratio of 1 to 2. Spur gears are available in seven sizes from 16 teeth to 96 teeth, and they can be used in a variety of ways besides the obvious layout of the necessary number of gears in the same plane to give simple power transmission of the ratio required. It is possible, for example, to build, quite simply, a gear box with two or three forward gears and one reverse, on the principle of the automobile gearbox, or to build differential gears of more than one type, all with the standard components.

The FAC system is available in two standard sets.

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FAC XI — MINOR INDUSTRIAL SYSTEM

In composing the kit, emphasis was placed on designs with numerous moving parts and, therefore, the top section of the case contains a rich assortment of gears and other special machine elements. As a foundation for future enlargement, this set satisfies high demands on completeness and variety. The FAC instruction manual goes with the case.

Size of case: $27\frac{1}{2} \times 15 \times 2\frac{1}{4}$ in.

Weight of set: 24.7 lbs.

FAC X2 — MAJOR INDUSTRIAL SYSTEM

This very complete set was specially composed to meet industrial requirements. It contains some 4,670 parts chosen according to frequency calculations, i.e. the numbers of individual parts are in the proportions characteristic of the majority of FAC designs. The wooden case contains three tiers, the middle one being a separate case holding coupling elements, screws, nuts and other small items. This subdivision of the case makes for greater ease in finding the desired part when assembling a piece of machinery. The FAC instruction manual goes with the case.

Size of case: $27\frac{1}{2} \times 15 \times 4\frac{1}{4}$ in.

Weight of set: 41.5 lbs.

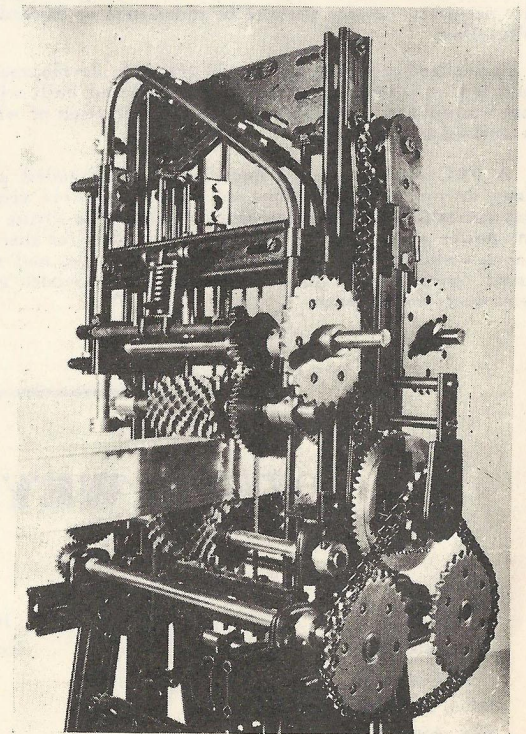
FAC MANUAL

has been compiled as an instruction book for the FAC system. It describes typical constructions and shows how to build with FAC, but it does not contain detailed descriptions of actual

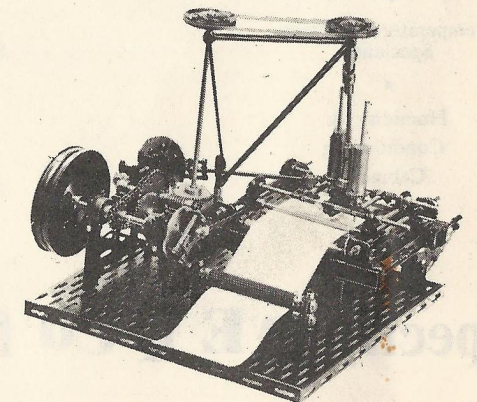
models. Certain typical constructions, such as gearboxes and differentials, are, however, treated in somewhat greater detail. Using the manual for guidance, to understand the FAC principles of construction, the FAC system can be quickly adapted to individual requirements. An illustrated section gives full details of all supplementary parts including price.

FAC SUPPLEMENTARY PARTS

All FAC parts are available separately.



Model reciprocating frame saw, showing a typical application



Ball Pen Testing Machine

quickly and cheaply made by using standard FAC parts

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