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SCOTTISH SCHOOLS SCIENCE  
EQUIPMENT RESEARCH  
CENTRE

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# Introduction

In this issue we give details of a further selection of items of surplus equipment. In the past many non-physicists may have thought this information a waste of time and space since all the items were electronic in nature and therefore of interest only to a small select band of electronics enthusiasts. It is therefore gratifying that on this occasion at least, there will be more for the chemist and biologist, as the list is mainly composed of standard and ordinary glassware, specimen tubes, etc.

Two further points in connection with surplus equipment are worthy of mention here. The first concerns Item 106, polystyrene cups with lids, first listed in Bulletin 47. These have a limited application in secondary schools, e.g. the biologist can use them as miniature plant pots, but experience in one school has shown that in the lower grades of the primary they can be invaluable, having a wide variety of uses. Our outlets to primary schools are limited and we therefore appeal to anyone having connections with primary schools either through administrative channels or by personal contact, to bring this item to the notice of those who might benefit from it. We are quite prepared to sell these cups to primary schools, in fact to any school which can use them.

This brings up the second, and rather delicate point concerning surplus equipment. Any teacher who takes the trouble to check on other sources of surplus material will find that our prices are ridiculously low. Our ability to sell items at such low prices arises from the fact that we do not regard this as a profit making activity, our chief concern being to see that useful apparatus is available to schools at prices they can afford. A teacher who may be limited to buying out of petty cash, or even from his own pocket, may not want to afford very much. Our overheads, which may be a substantial part of the cost of equipment, are not taken into consideration in assessing the selling price. Equipment bought from Dounreay or Harwell has to be fetched, which is a three day journey in our van for one technician, possibly two. Equipment bought at auctions, say at Carlisle, must be inspected on a different day from the auction itself and fetched on a third separate day. Once inside the Centre, all equipment has to be inspected, sorted, perhaps repaired, and stored.

We consider that these services have been paid for in advance by every L.E.A. and fee-paying school which subscribes to SSSERC. It follows from this that we can sell only to schools which have made such pre-payment. We cannot sell to non-L.E.A. schools which are not members of SSSERC and we cannot sell to individuals equipment which is for their own personal use, or for some application which has no educational value. We have assumed that teachers and others seeking surplus equipment were aware of these limitations, but we have had one or two cases, possibly through a genuine misunderstanding of our function, where it became obvious that the individual had some non-scholastic purpose in mind and we have had to refuse to sell the item.

The dividing line between what constitutes proper and improper use /

use of this service is very finely drawn, and can only be drawn by the teacher himself. There are still authorities which do not allow their teachers petty cash, and they have working for them, although they may not deserve them, dedicated and enthusiastic teachers who rather than let such restrictions hamper them, will pay for equipment out of their own pockets. These teachers feel, in our view rightly so, that they have a right to take such equipment with them if they leave the school. While situations like these exist, it is up to the individual to square his own conscience before buying from us. We will continue to assume the bona fides of any such individual until it is proved otherwise; we mention the matter here to reduce the possibility of future misunderstanding.

## Display Laboratory

The following items have been added to the display laboratory since this item was last included in Bulletin 47.

<u>Item</u>	<u>Manufacturer or Agent</u>
Small Mammal Trap	SSSERC
Spark Generator	SSSERC
Refractometer	SSSERC
Worcester Circuit Board	SSSERC
Velocity of sound in rod	SSSERC
Microwa 7720 Balance	Griffin and George
Microwa 7730 Balance	Griffin and George
DO2T Balance	Stanton
Solar Cell	Philip Harris
Moving Coil Meters	Philip Harris
Kinetic Motion Model	Philip Harris
Spectrophotometer	Philip Harris
Absorption Spectrometer	Philip Harris
Colorimeter	Decon
7010 pH Meter	Electronic Instruments
501A pH Meter	Carwyn Instruments
ST9 200 Galvanometer	Jay-Jay
Critical Potentials Tube	Teltron
Compressed Air Pucks	Morris
Laboratory Trolley	Gratnell
Plastics Samples	British Petroleum
Shirlastain E	Shirley
Choice Chamber	Griffin and George
Hori Abbephase Microscope	Pyser-Britex
Meopta AZ2 Microscope	Eastern Scientific
Meopta A22V Microscope	Eastern Scientific
Nikon Model G Microscope	Projectina
Mouse Cage	Bio-Serv
Microslides	Philip Harris
Microslides	Gerrard
Microslides	Northern Biological
Microslides	Bio-Serv
Microslides	G.B.I.
Micrograph Transparencies	Philip Harris
Micrograph Transparencies	Gerrard
Electron Micrograph Prints	Philip Harris

# Physics Notes

Following the account in Bulletin 49 of our measurement of the velocity of sound in a rod we have a note from the chairman of our Development Committee, Professor Childs, who has done the experiment many times, but with a series of rods of different lengths. Measured times plotted against rod length then fall very accurately on a straight line, the slope of which can be used to calculate the velocity. The graph gives a substantial intercept on the time axis at zero rod length - from memory, about  $75\mu\text{s}$  - which he attributes to permanent plastic deformation of both the anvil and the end of the rod.

\* \* \* \* \*

The following items of surplus equipment are still available, and from item 118 onwards we give details of new lines not previously advertised. The number in brackets after each item indicates the Bulletin in which the item first appeared, and in which a full description will be found. Fuller details of the service we give in respect of surplus equipment and of methods of payment will be found in Bulletin 43.

- Item 1 (31) Large Scale Ammeters, 50p.
- Item 15 (31) Relays, 5p.
- Item 16 (31) Switches,  $2\frac{1}{2}$ p.
- Item 17 (31) Potentiometers,  $2\frac{1}{2}$ p.
- Item 18 (31) Block Paper Capacitors,  $2\frac{1}{2}$ p.
- Item 23 (32) Fahrenheit Thermometers, type (a) only, 25p.
- Item 24 (32) Transformers and Chokes, 10p.
- Item 25 (32) Electronic valves,  $2\frac{1}{2}$ p.
- Item 49 (36) D.C. Voltmeter Relays, 25p.
- Item 50 (39) Ratemeters, £1.50.
- Item 51 (39) Rotary Transformer, 35p.
- Item 52 (39) Rotary Transformer, 25p.
- Item 56 (39) Height Capsule, 10p.
- Item 62 (39) Silica Gel Desiccant,  $2\frac{1}{2}$ p. per lb.
- Item 63 (41) Nickel Cadmium Cells, 15p.
- Item 68 (41) Pocket Dosimeters, 5p.
- Item 69 (41) Dosimeter Charging Units, 50p.
- Item 87 (43) Printed Circuit Panels, 5p.

- Item 103 (47) Radiation Monitoring Film,  $\frac{1}{2}$ p.
- Item 105 (47) Cable Lengths,  $2\frac{1}{2}$ p.
- Item 106 (47) Polystyrene Cups, 5p. per 50.
- Item 107 (47) Electrolytic Capacitors,  $2\frac{1}{2}$ p.
- Item 118 Large permanent magnet, flux density approximately 0.25 weber tesla, £5.00.
- Item 119 Telephone headset, consisting of a pair of moving diaphragm earphones, and carbon granule microphone on multi-way cable, 25p.
- Item 120 E.H.T. Power Unit, type 875. Fixed output of 5kV at 8mA, £2.00.
- Item 121 Controller type 4278 by Decca Radar. Contains 3in. magstrip and  $360^\circ$  calibrated gear drive, £2.00.
- Item 122 Heavy duty thermocouple. Registers about 40mV at below red heat, 50p.
- Item 123 A.C. Motor, 30W, with reduction gear. Speeds 1425 or 300 rev/min. This motor requires a starting capacitor of 6 -  $8\mu\text{F}$ , £2.00.
- Item 125 Synchronous motor 1500 rev/min. For 100V input but supplied with 110/230V transformer, £2.00.
- Item 126 A.C. Motor, 60W, 3000 rev/min. £1.00.
- Item 127 Steel ball bearings,  $\frac{3}{32}$  in diameter, 100 for 15p.
- Item 128 Fixed resistors, new, carbon film and metal oxide types, all preferred values in the 10% tolerance range between  $10\Omega$  and  $3.3\text{M}\Omega$  except 22, 56, 220, 330, 10K, 1M, 1.5M, 1.8M and  $2.7\text{M}\Omega$  values, All at  $\frac{1}{2}$ p.
- Item 129 Fixed resistors, new, metal oxide type, 1% tolerance in following values - 18, 22, 27, 33, 39, 47, 56, 68, 82, 680, 820, 1.2K, 2.7K, 3.9K, 8.2K, 12K, 15K, 18K, 33K, 120K, 150K, 180K, 270K, 560K, 680K, 820K. All at 2p.
- Item 130 Wirewound fixed resistors in following values - 4.7, 10, 22, 33, 68, 200, 220, 300, 330, 360, 470, 510, 620, 680, 750, 1.2K, 1.5K, 2.4K, 2.7K, 3.3K, 5.1K, 6.2K, 6.8K, 15K, 22K, 27K, 33K, 51K, 75K. All at 1p.
- Item 131 High value resistors,  $3.3$  and  $3.4 \times 10^{10}\Omega$ . 5p.
- Item 132 Gear trains. Four trains each of 5 wheels mounted on a common bracket, 50p.
- Item 133 Nickel crucible,  $270\text{cm}^3$  capacity, 20p.
- Item 134 Filter paper, Whatman's clippings, ashless, 1p per lb.
- Item 135 Conical flask, Pyrex,  $50\text{cm}^3$ , 5p.

- Item 136 Filtration flask, Pyrex, 250cm<sup>3</sup>, 10p.
- Item 137 R.B. flask, Pyrex, 2 litre, B29 socket, 10p.
- Item 138 R.B. flask, Pyrex, 5 litre, B50 socket, 25p.
- Item 139 Longneck flask, Pyrex, 500cm<sup>3</sup>, 10p.
- Item 140 Dewar flask, refill for 2 pint vacuum jar, 25p.
- Item 141 Soda glass funnel with stopcock, 500cm<sup>3</sup>, B24 socket, 10p.
- Item 142 Storage jar, wide mouth, 4oz, 2p; 8oz, 2½p.
- Item 143 Filter plates, Pyrex, porosities 0, 2, 3 or 4, 5p.  
Porosity No. 4 is suitable for atmometers.
- Item 144 Tool knife, 3 blades, 5p.
- Item 145 High vacuum stopcocks, 4mm bore, 10p.
- Item 146 Pyrex stoppers, B29 cone size, 2p.
- Item 147 Pipe clay triangles, 2in. side, 2p.
- Item 148 Silica triangles, 2½in. side, 5p.
- Item 149 Specimen tubes, flat bottom, soda glass, 1 x 3/8in. 1p;  
2 x 3/8in. 2p; 3 x ½in. 2½p; 2 x 5/8in. 2½p.
- Item 150 Capillary tubing Pyrex in 5ft lengths, 2mm bore.  
5p per length.
- Item 151 Wash bottles, Pyrex, 500cm<sup>3</sup>, B24 socket, and 125cm<sup>3</sup>,  
B29 socket, 5p.
- Item 152 Heavy duty ultra violet lamp with starter, £2.00.
- Item 153 Edwards vacuum/pump compressor, Type 1V, £5.00.
- Item 154 Starting resistor for lamp, 10p.
- Item 155 Resistor, 71.5Ω, 2.8A, 5p.
- Item 156 Mercury lamps, 250V 125w, 10p.
- Item 157 Ballast 110V for Ultra Violet Lamp, 10p.
- Item 158 Moisture Meter, 1½ and 45V batteries required, £1.50.
- Item 159 Tapped dropping resistor, 30 to 100Ω, 500w, 25p.
- Item 160 Spekker Absorptiometer with accessories, £4.00.
- Item 161 Ilford filters. Set of 8, 25p.
- Item 162 Sets of three filters, 10p.
- Item 163 Marconi pH Meter (L.T. 3 and 22.5V required), £1.00.
- Item 164 L.T. Thermo-regulator, 50p.

- Item 165 Column heaters, 250v, 50p.
- Item 166 Filter crucibles and filter sticks, 5p.
- Item 167 Cuvettes for colorimetry. Path length 10 to 50mm, 10p.
- Item 168 Electric steam generator. Uses electrodes, 10p.
- Item 169 Analytical balance. Accuracy 0.01mg per division of graticule. Air damped. Box of weights, £5.00.
- Item 170 250v column heaters including glass column, 25p.
- Item 171 Variety of Burners for town gas. Standard, Meker and 2 blowpipes, 5p.
- Item 172 Quickfit flasks, distilling flasks, soxhlet apparatus, condensers, 1 and 5cm<sup>3</sup> pipettes,  $\frac{1}{2}$  to 50p each.
- Item 173 5l flask, 3 neck, B24; B.34; B.19. 25p.
- Item 174 Test-tubes, rimless, Pyrex 150 x 19, 5p for 10.
- Item 175 Chemicals. Large range. 10% of List Price.
- Item 176 Filter papers; extraction thimbles. 5% of List Price.
- Item 177 Viscometers. Redwood No. 1, 50p. U-tube type, 10p.
- Item 178 Spirit lamps, 5p.
- Item 179 25l Glass aspirator, 50p.
- Item 180 Centrifuge 4 place, variable speed, £2.00.
- Item 181 Spot galvanometer L.227090, 4v. £2.00.
- Item 182 Spot galvanometer L.239981, 230-250v. Needs attention, £1.
- Item 183 Spot galvanometer L.227073 for electric titration, £2.00.
- Item 184 Galvo lamp and scale, 250v. 50cm scale, 50p.
- Item 185 4v Transformer with series resistor, 50p.
- Item 186 Safety glass screen with metal stand, 50p.
- Item 187 Large balance case. Suitable for portable fume cupboard, £1.00.
- Item 188 Large wooden incubator, Capsule thermostat, £2.00
- Item 189 Refrigerator, G.E.C., 120w, 5 c.ft, £8.00.
- Item 190 Tubular heater, 60w, 25p.
- Item 191 Thermostat 0-31°C. Mains up to 0.5A, 25p.
- Item 192 Thermometer Clamps, 5p.



- Item 193 Kemiframe shelves 64 x 27cm, 5p.
- Item 194 Retort stands, Tripods, 5p.
- Item 195 Ring clamps, Clamps, Boss-heads, 2p.
- Item 196 Cossor Oscilloscope Camera, One with magazine but no motor, the other with motor but no magazines. Complete with lenses. £1.00.
- Item 197 Drawing Instruments, B.S. 2460, £2.00.
- Item 198 Creed Perforators, 230v. 15w motor. £3.00. With gears and keyboard.
- Item 199 Nife cells. 45amp. hour. 75p.
- Item 200 Vapour pressure apparatus with two barometer tubes and heating jacket on wooden stand, 20p.
- Item 201 Sonometers, 10p.
- Item 202 Glass prisms, 5p.
- Item 203 Fans, 3 rubber blades, 115v with oscillating gearing. Two in series operate on 240v. 25p each.
- Item 204 Heating mantles, Electrothermal, 2 circuits, 50p.
- Item 205 Red ink. 2 fluid ounce bottles, 2p.
- Item 206 Cork shives, 70 and 75mm, narrow end, 2p.
- Item 207 Weighing bottles, ground glass stoppers, 5p.
- Item 208 Diodes OA81, 5p; Zener diodes. 10w type, CV7286/15V, 7299/51V, CV7308/120V and OZ6275. 15p.  
Transistors GET103; 2S020 (OC81); 2S003 (NPN). 5p.
- Item 209 A.C. Motor, 1/8 HP, 1435 rev/min. £2.00.

## Biology Notes

Stereo-microscopes. In the test procedure in Bulletin 42 we stated under Item 11, Lamp, that "the effectiveness of the illumination is described." From our tests, we feel that the effectiveness of the illumination is largely determined by the intensity and position of the lamp used. Lateral illumination not only enhances stereoscopic images by providing shadows, but also virtually eliminates the annoying reflections caused by overhead lamps when viewing objects under water or glass. Under Item 15, Eyepiece Separation, we were able to give figures for the range of inter-pupillary distance found in adults (55 to 70mm) but not for secondary pupils. We are most grateful to those teachers who have since sent in measurements from their first year pupils. These indicate that the distance ranges from 46-70mm, with /

with a mode of 54mm. From a total number of 471 children tested, however, all but 15 fell within the range 50-64mm.

The three-way plastic taps mentioned in Bulletins 44 and 48 are now supplied by Henley's Medical Supplies in two different forms, called 'Pharmaseal' and 'Alexa' respectively. Only the 'Pharmaseal' is suitable for biology apparatus since the 'Alexa' is not air-tight. The latter is identifiable by its blue handles.

## Chemistry Notes

Frequently combination pH electrodes are spoiled due to evaporation of the water in which they are stored. From C.L.E.A.P.S.E. there is a simple method of avoiding this. The electrode is stored in water in a 250cm<sup>3</sup> conical flask, being supported in it by a cork stopper suitably bored. Another convenience of this method of storage is that the co-axial cable can be neatly wrapped around the top of the flask.

\* \* \* \* \*

In Bulletin 43 we gave an interim report on tests we had carried out with natural gas. The Conversion Officer of the Scottish Gas Board has been very co-operative in trying to supply satisfactory natural gas equipment to schools changing over to natural gas. We asked him to put us in the picture regarding natural gas burners and other apparatus which were being supplied to schools. Following is a summary of the information we obtained.

Makes of Burners Supplied. All the standard bunsen and semi-micro burners at present being distributed are of Flamefast Engineering, Ltd. manufacture.

Flame Spreaders. These are now being distributed to schools on a one-for-one replacement basis. This spreader has a removable insert and will fit both types of standard Flamefast bunsen burner which have been distributed by the Gas Board. Schools which have already been converted and have not been issued with spreaders are being contacted to make arrangements for them to be supplied.

Ramsay Burners. Very few of these have been encountered in conversions and these can only be replaced by making up special burners. The combustion properties of natural gas make it very difficult to design a suitable Ramsay burner.

Gas Lighters. Ones consisting of an Ever Ready battery and switched tube head with filament for natural gas are supplied on a one-for-one replacement basis.

Semi-micro Burners. These are available on a one-for-one basis for replacement of existing semi-micro burners or standard bunsen burners. We are asked to point out that the Principal Teacher of Science should advise the Surveyor dealing with the conversion that semi-micro burners are /

are desired in place of standard bunsen burners. The Surveyor should then bar-mark the correct number for semi-micro burners on the survey form.

Gas Rings. A new ring is given in place of the old one.

Batswing Burners. These are given on a one-for-one basis. They have been tested by us and found to be satisfactory.

Blow-Pipes. This applies to those using a foot bellows. For these a special conversion has been carried out, a new burner or small air pump being supplied. Each case is treated individually due to the small number involved.

## Trade News

Shirlastain E is a dye, made by Shirley Developments for identifying both natural and man-made fibres, unfortunately only in the undyed state. Along with the dye - 1 oz bottle costs £1.37½ - one can buy a multifabric strip which is dyed along with the sample and identification is then by colour comparison. The multifabric strip contains twelve different fibres, cotton, wool, rayon, nylon, etc., and costs 75p for a 1ft length.

Available free from Educational Services, B.P. is a box containing various materials made from different plastics, with two explanatory booklets.

The Philip Harris absorption spectrometer, cost £35, uses a diffraction grating with a photo-transistor detector mounted on a radial arm and movable along a 30° arc on either side of the optical axis. A 12V, 24W source is required to operate the lamp, and a U2 cell or similar for the photo-cell, the output of which should operate a milliammeter.

A periodic chart designed by CLEAPSE is being marketed by the Education Section, I.C.I. The chart measures 104 x 154½cm. Notable is the clarity and size of the labelling. The commoner elements are given in heavy black type, with their atomic weights; others have atomic numbers only. The lanthanum and actinium series are omitted which seems a pity in the latter case since uranium and plutonium are now household words. The chart costs 50p, or 75p for two, in the same tube. Small charts measuring 21 x 30cm are also available at 50p per pad of 50.

Most, although not all of the pH meters which we have tested are sold with the electrode. For those that are not, or for schools, which prefer to have a variety of electrodes, Activion Glass will sell any of their wide range directly to schools, the only exceptions being those that are manufactured specially for the Philip Harris meter. Russell pH Limited will also sell any of their range of electrodes directly to schools.

Proops Brothers have a new address for the mail order section of their business, which will be found in our address list. It is worth pointing /

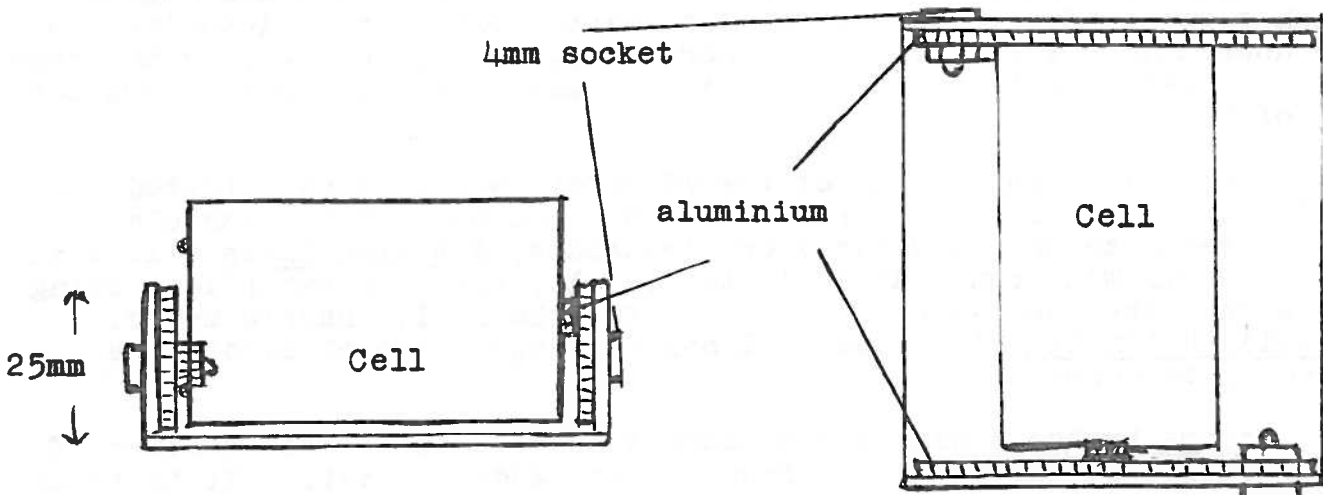
pointing out that they are still the only source we know of for diffraction grating replica, which forms the basis of our direct vision spectroscopy of Bulletin 8, and of the photo-generative cells which we have used as the basis of the solar motor (Bulletins 8 and 24) and for other energy conversion devices.

Non-stackable 4mm plugs, type 2855, are available from Wood and Cairns at £2.50 per 100. A 4mm socket, type DN4, costs £2.00 per 100. The same firm offer a range of die-cast alloy boxes, suitable for mounting small circuits. The sizes, converted from rather unwieldy imperial dimensions to mm, and prices are:

120 x 95 x 29mm	-	£0.50
120 x 95 x 55mm	-	0.65
120 x 95 x 80mm	-	0.90
171 x 120 x 55mm	-	0,85
171 x 120 x 106mm	-	1.47½
222 x 146 x 55mm	-	1.13

## In The Workshop

There have been several U2 cell mounts; we published a design for one, using a wooden circuit box, in Bulletin 27. Since then, in Bulletin 42, we mentioned the discovery of plastic, rectangular-section drainpipe made by Marley Tile, which when cut in half to form a U shape could be adapted to mount many small components and cost less than circuit boxes. It was not immediately apparent that the U2 cell could be fitted into this plastic mount; the solution, sent us by Linlathen Secondary School, Dundee, has proved even simpler than we thought. The overall length of the U2 type cell is 60mm; the inside width of the plastic drainpipe is 62mm. The gap is conveniently taken up, and an electrical contact provided by two plates of 16 S.W.G. aluminium sheet, 60 x 20mm, one on each side. A non-insulated 4mm socket, type F640D, which is available at £3.12 per 100 from Wood and Cairns is bolted through the plastic and the aluminium plate, and the cell mount is complete.



## Bulletin Supplement

Below is a summary of test reports on a selection of pH meters; others will be given in a future Bulletin. Individual reports on these meters can be borrowed by writing to the Director. The classifications used are A - most suitable for school use; B - satisfactory for school use; C - unsatisfactory.

Model	S34-200	7010	501A
Manufacturer	Griffin and George	Electronic Instruments	Carwyn Instruments
Price *	£34.00	£50.00	£26.00
Electrode type cost	B17DA £7.80	- £8.00	- £7.00
Battery type cost	PP6 21p.	mains operated	2 x PP6 42p.
Range	0 - 14pH 0 - 1400mV	0 - 14pH -400-0-400mV	0 - 8; 6 - 14pH -200-+1400mV
Sensitivity; 1 div=	0.2pH 10mV	0.2pH 20mV	0.2pH 50mV
Readability; division separation, mm	1.3	1.6(pH) 2.9(mV)	1.4(pH) 2.2(mV)
Accuracy wide range Max. error	0.2 at pH10	0.1pH	0.1pH
Short range Max. error	0.2 at pH10	0.1pH	0.1pH
Temperature range	None given	0 - 100°C	0 - 100°C
Temperature compensation; Max. error	-	None	0.1pH
Amplifier	2.6% error	satisfactory	satisfactory
Drift	satisfactory	satisfactory	satisfactory
Classification	B	B	A

Note \*Prices include the electrode. Battery cost is not included for Model 501A.

S.S.S.E.R.C., 103 Broughton Street, Edinburgh, EH1 3RZ.  
Tel. 031-556 2184

Activion Glass Ltd., Mitchell Hall, Kinglassie, Fife.  
Bioserv Ltd., 38-42 Station Road, Worthing, Sussex.  
British Petroleum International Ltd., West Halkin House,  
West Halkin Street, London, S.W.1.  
Carwyn Instruments, Carwyn, Pentraeth Road, Menai Bridge, Anglesey.  
C.L.E.A.P.S.E. Development Group, Brunel University,  
Kingston Lane, Uxbridge, Middlesex.  
Decon Laboratories Ltd., Ellen Street, Portslade, Brighton, BN4 1EQ.  
Eastern Scientific Instruments Ltd., Carrow Hill, Norwich, NOR61B  
Education Section I.C.I., Darby House, Bletchingley Road,  
Nerstam, Redhill, Surrey.  
Electronic Instruments Ltd., Richmond, Surrey.  
G.B.I. (Labs.) Ltd., Heaton Street, Denton, Manchester, M34 3RG.  
Gerrard and Haig Ltd., Gerrard House, Worthing Road,  
East Preston, Sussex.  
Gratnell's Ltd., 31 Queen Anne's Gate, London, S.W.1.  
Griffin and George Ltd., Braeview Place, Nerston, East Kilbride.  
Henley's Medical Supplies Ltd., Alexandra Works, Clarendon Road,  
Hornsey, London, N.8.  
Jay-Jay Lloyd Instruments Ltd., Brook Avenue, Warsash, Southampton,  
The Marley-Tile Co. Ltd., London Road, Riverhead, SO36 HP  
Sevenoaks, Kent.  
Morris Laboratory Instruments Ltd., 96-98 High Street,  
Putney, London, S.W.15.  
Northern Biological Supplies, Cheltenham Avenue, Ipswich.  
Philip Harris Ltd., St. Colme Drive, Dalgety Bay, Fife.  
Projectina Company Ltd., 8 Montgomerie Terrace, Skelmorlie,  
Ayrshire.  
Proops Brothers Ltd., The Hyde Industrial Estate,  
Edgware Road, Hendon, London, NW96 JS.  
Pyser-Britex Ltd., Fircroft Way, Edenbridge, Kent.  
Russell pH Ltd., High Street, Auchtermuchty, Fife.  
Shirley Developments Ltd., P.O. Box 6, 856 Wilmslow Road,  
Didsbury, Manchester 20.  
Stanton Instruments Ltd., Copper Mill Lane, London, S.W.17.  
Teltron Ltd., 32/36 Telford Way, London, W.3.  
Wood and Cairns Ltd., 11 Queen Street, Edinburgh, 2.