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MALTRON SINGLE HANDED ERGONOMIC KEYBOARD



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DESIGN FEATURES: The Maltron Single Handed Keyboard has been developed as a logical step forward from the standard Maltron Unit, to meet the needs of people who for physical or occupational reasons have to perform keyboard operations with one hand. The sculptured shape and carefully designed letter layout of Maltron Keyboards, means that they can be learnt in about a quarter of the time required by the present keyboard design, which is now over a hundred years old. This factor greatly enhances the trainee's sense of achievement, with consequent reinforcement of motivation. Reduced fatigue and improved accuracy also contribute to greater job satisfaction and the maintenance of the incentive to learn.

The electronic output of the keyboard enables it to be connected to a printer to create a Single Handed "typewriter". Since the connection is easily changed, the same printer can have both Left and Right hand keyboards available for use as required. A Switch Box can be supplied to meet situations where this change occurs frequently, to give immediate access to either keyboard.

The letter layout of the keyboard is shown in the attached diagram and is similar in concept to the Special keyboard developed for Robert Champion (see illustration and story on back of diagram), in which a separate Numbers key allocates numbers and associated symbols to the letter keys. These are additionally engraved on the keys. When necessary the moulding can be widened and extra keys fitted to control machine functions. This versatility means that the keyboard can be used for computer or data input and key designations are then engraved to suit the application.

OPERATION: The mode of operation of the keyboard is indicated by 3 Function Lights. Green shows normal lower case letter output, Yellow, upper case letters and Red, numbers and symbols. A fourth, Numbers Shift condition is also available and this is arranged to generate machine instruction ASCII Codes and some seldom used symbol codes.

The encoding electronics have an "n" key roll over characteristic, i.e. successive keys may be pressed and each will generate an output, although the previous key or keys have not yet been released. This ensures the easiest keying and fastest output, since there is no need to think about quick finger removal as part of the learning process, or in subsequent operation.

For those suffering physical disability, the sculptured shape which reduces hand movement almost to zero, enables an arm or wrist rest in front of the keyboard to give relaxed operation, or to control unwanted tremor where this occurs. Guide strips between the fingers can also be fitted if necessary.

OUTPUT: The standard output is 7 (or 8 if required) bit Parallel ASCII Code Active Hi, TTL compatible. (Other codes to order). The Strobe or Data available pulse, also Active Hi, has a 10 micro second delay after data is true and is maintained for 10 milliseconds. (Longer or Shorter periods can be provided).

K7A OLYMPIA SCRIPTA PRINTER INTERFACE UNIT: The Olympia Scripta can be driven directly from the keyboard through this unit to create a Single Handed Typewriter. It interprets machine instructions from the keyboard and generates sequential codes for setting up margins, tabulation points, line spacings, etc.

RS232 INTERFACE UNIT: This unit accepts the parallel output from the Keyboard and converts it to the asynchronous serial form (used for computer communication) at 2400 Baud. The unit requires an AC Power Supply of 110 or 220V to energise itself and the Keyboard.

MEASUREMENTS:

KEYBOARD:	11 x 9 x 3.5 ins.,	28 x 23 x 9 cms.	4lbs.	1.8 kgs.	
K7A INTERFACE:	7 x 3.5 x 2.5 ins.,	17 x 9 x 6 cms.	7ozs.	0.25 kg.	
RS232	:"	7 x 4.75 x 2.5 ins.,	180 x 120 x 65 cms.	2lbs.	0.9 kg.

THE NEW MALTRON KEYBOARD

It is not yet fully appreciated that the typewriter keyboard designed over 100 years ago, has a letter layout carefully arranged to slow down operators to minimise type bar clashes. Although the need for this has long since passed, the overall investment in training and equipment has so far been sufficient to prevent the wide adoption of any alternative.

The arrival of electronics now provides a fresh opportunity to start again, not only to revise the letter layout, but also to develop a new shape so that the stresses imposed on the operator by the present design are eliminated. The surprising extent of this stress is detailed in the paper by D. Fergusson and Joan Duncan published in Ergonomics Nov. 1974. The clinical effects described show that the real costs of continuing to use the typewriter keyboard can no longer be assessed only in cash, but must include a measure of physical suffering and occupational hazard.

The new MALTRON keyboard developed by Lillian Malt and Stephen Hobday has resulted from a careful study of the way that hands work, the positions in which they are comfortable (free of stress) and the sequences of finger movement that can be made quickly. Based on the results of a massive computer analysis of the use of over a million words of text, a new letter layout now has 90% of the letters of the 100 most used words (47% of typing) on the home row against 52% for Qwerty.

The new shape divides the keys into two scooped out groups for the fingers and two separate groups of up to 9 keys for each thumb. The two finger groups are 5ins. apart and this ensures that the wrists are straight. The central area is easily reached by the index fingers, so that word processing or computer function keys are much more easily and quickly used than on present designs. Tests by Mrs.W.M.Heath with secretarial students at Basingstoke Technical College have shown the learning time for the MALTRON to be about a quarter of the usual period and the typing position "very comfortable". Recent results also show that the error rate can be as low as one tenth of that usually experienced and this must give greater job satisfaction to the operator.

Those who are already skilled on the Qwerty keyboard may not have time, or see any point in learning again, and indeed may find the initial frustration of reduced output unacceptable. To meet their needs Maltron keyboards are now being supplied with larger memories and a Maltron / Qwerty changeover key. Although the final performance may not be as high as possible, this new feature means that only a few hours of adaption practice are needed to regain former speed and enjoy the ease and comfort of the new Maltron keyboard.

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Called the Maltron ergonomic keyboard, it was invented four years ago by Lillian Malt who has spent twenty years training secretaries, and developing typing training methods which are now taught, under franchise, by colleges in the USA, South Africa and the UK. In 1977, in collaboration with Stephen Hobday of PCD, the Maltron was conceived to provide a keyboard to fit the shape of a human hand with an improved letter layout to give between 20 and 40% speed increase without any ill effects on accuracy.

At first sight the keyboard resembles a miniature fun-fair switchback but, after their initial mirth, our own secretaries found it exceptionally comfortable. A long intensive analysis has resulted in a letter sequence design based on finger loads, and a shape of keyboard to relax the wrists, minimise finger movement and thus reduce typing fatigue, and increase speed. Key heights have been calculated to fit the unequal lengths of fingers so that unnatural stretches are no longer needed and keys for the long middle fingers are set deeper into the keyboard than the keys for the shorter fingers. Thumbs, which have apparently been underutilised, are now allocated eight keys each, all within easy reach, and it is claimed, the unique moulded shape makes it almost impossible for the fingers to hit the wrong keys.

When the Maltron was originally invented, no one was prepared to invest in it, buy it or teach it because of the major re-educational job required, and the amount of investment needed in new equipment. However, after a great deal of perseverance, Lillian Malt and Stephen Hobday obtained support from the Department of Industry and Trade to undertake a year's trials based on speed and accuracy. Ten companies were selected and initial training took place in March at PCD's offices in Farnborough, Hants.

As we mentioned in our last issue we felt the best way to find out whether the claims of increased speed and accuracy were justified or not, was to talk to some of the operators.

Our first visit was to Rushmoor Borough Council, covering Farnborough and Aldershot. The operator selected for training was Mrs. Lynda Thompson, trained as a farm secretary and now a secretary/typist in the Borough Secretary's department, working for two Committee Clerks concerned with Housing and Planning.

Lynda spent a full month at the training session (the others spent two weeks) and her initial reaction was that she could never work on the Maltron because she had been using the QWERTY keyboard for six years. With keyboard instruction in the morning, and the afternoon spent with the BDP 90, she found to her delight that she quickly mastered the board, and left the course with a speed of 40 words per minute. And although her work load on the Maltron is uneven her speed is now up to 50 words per minute. Lynda is fully confident this will improve. 'It took me six years to reach 85' she said 'so at this rate I should do better than that in just a few months'. She agrees that her typing is far more accurate because her fingers hardly move at all, she finds the ergonomic layout very comfortable, but confesses to still finding it difficult to use the 'n' and the 's'.

The work produced on the Maltron/BDP Unit is the monthly Committee Minutes previously typed by four girls. It is also used to produce standard personalised letters and working party notes. Otherwise Lynda uses-

Lynda has also been training another secretary/typist in the department, Mrs. Catharine Murphy, who has been typing for 25 years and frankly admits she does not see any reason for the change, although once she had overcome her initial fear, she found the Maltron easy and quick to use.

Douglas Dyter, the Assistant Secretary (Administration) who has been with the Council for 15 years, has very mixed feelings about the Maltron. He thinks it is a revolutionary idea and he is open minded enough to be pleased to take part in the trials. He is also pleased with Lynda's progress and the fact that the monthly minutes can be produced and out within a couple of days on the BDP/Maltron combination. He appreciates the necessity for proper training courses, and if at the end of the 12 months they decide to keep the Maltron then all secretaries in the legal and administrative department will have regular training sessions.

When Power Engineering Associates of London SW1 agreed to take part in the trials they had in mind using the BDP 90 keyboard for a specific contract, but by the time they were installed the project had been abandoned. However, Louise De Maria who was selected for the training course, has found it invaluable for the constant personnel correspondence and the producing and updating of manuals, and is very sorry that her training is wasted as she has, by the time you read this, left the company and country to return to her native Malta.

Originally Louise too was reluctant to learn the Maltron because she had been typing for eleven years and was not interested in changing. Although she found the first day the most difficult she soon began to enjoy herself and thought the keyboard 'great fun'; so much so that she is a total convert and finds it less tiring to use than a standard board. 'It is very important' she said 'to sit properly'. Her normal typing speed is 80 words per minute, and even when she has not used the Maltron for a week or so her speed on it is 50 plus which she believes would increase considerably if she could continue using it. Before she left she began training another secretary whose progress, when we last checked, was 'quite satisfactory'.

Although Sue Walker is an O & M Analyst, she attended the course on behalf of the medical insurance company BUPA, and although not a typist, thought the split keyboard quite fantastic. It was originally intended to recruit and train an operator who had no previous secretarial experience so they would not be confused between the Qwerty and the Maltron keyboard but this has not been successful, so far.

WTR Services, London WC1 are primarily an office training school although they also supply word processing staff. Managing Director is Mrs. Rosemary Pratt, and her son Stephen and one of her staff, Amanda Ellis, went on the training course. One Maltron is already in use, and they hope to qualify for a second one.

Mrs. Pratt has also learnt how to use the keyboard and she estimates that productivity can be increased by nearly 50%.

All the people we talked to admitted a reluctance to change, but when they did they were all delighted with the comfort, ease and speed of the Maltron, and none of them found any problem switching between two