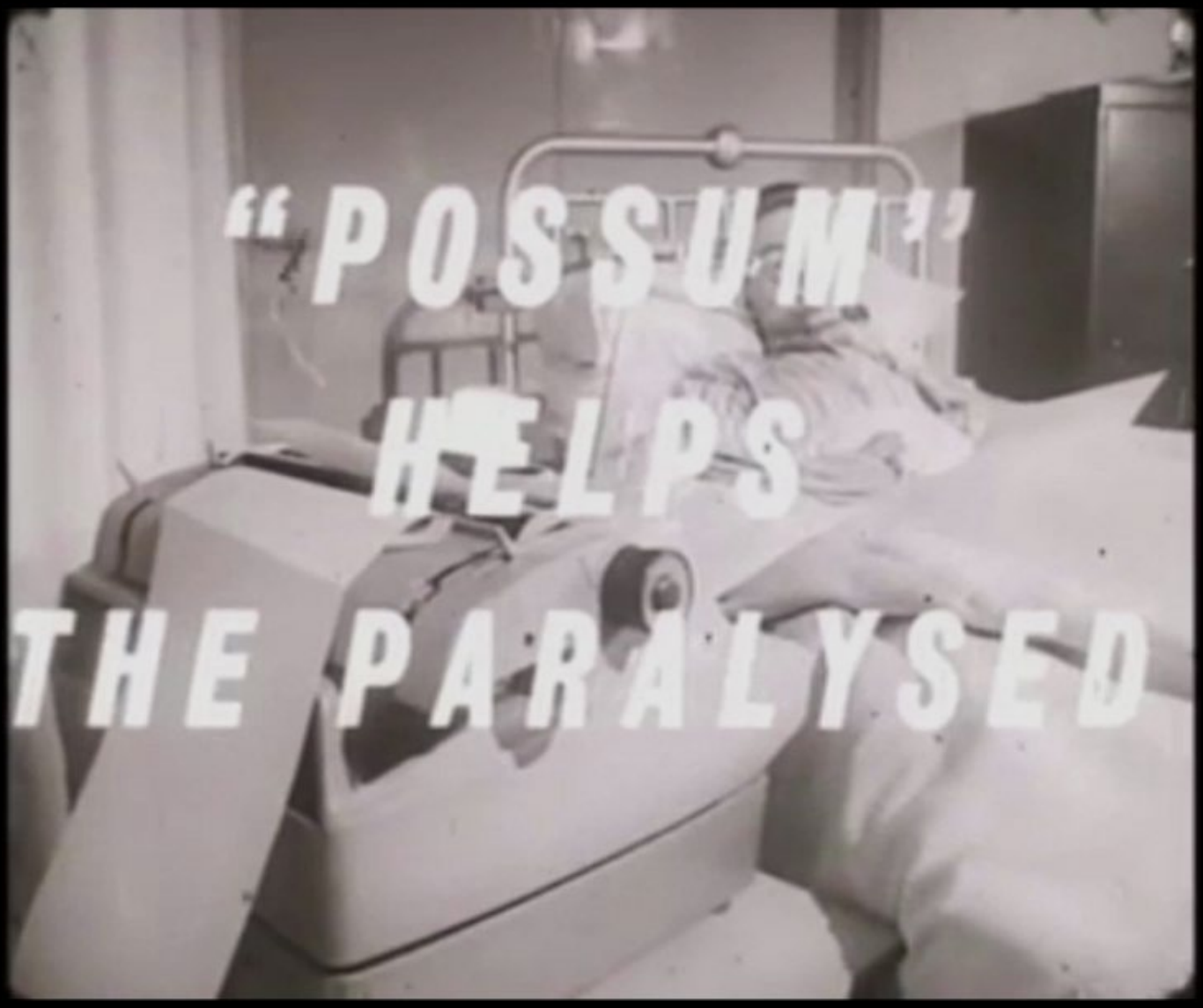


2. POSM (Reg Maling and Derek/Dorothy Clarkson 1960)

Stoke Mandeville Hospital in the UK is famous as the birthplace of the Paralympic movement in 1948. It's less well known as being a massive part of the most influential era in electronic assistive and communication technology.

Riding upon a surge of 20th century medical innovation and refinements, people were increasingly surviving accidents, illnesses and conditions that previously would have killed them.

Two priorities followed survival: Improving independence and improving quality of life. Ideally this led to people freeing bed space, going home, being with loved ones, finding meaningful occupation and making their way in the world again.

POSM, the Patient Operated Selector Mechanism, was a revolutionary invention that made this possible for some of the world's most disabled people. It began in August 1960 at Stoke Mandeville's National Spinal Injuries Centre when two ex-soldiers met. The 33-year old patient, Ian Pritchard and 32-year old hospital volunteer and engineer, Reginald Maling.

Ian arrived at the hospital from Southern Rhodesia paralysed from the neck down after a water-skiing accident. From the confines of his hospital bed, a police whistle

suspended by a piece of string just above his lips was his main method of summoning help. For the first time since being a baby, he could do little himself.

He spoke of his wish to record his experiences during the Mau Mau Uprising in Kenya for a book. Reg wondered if there could be a way for him to operate a dictating machine independently rather than relying upon the sporadic help of visitors and ever busy hospital staff.

Reg's epiphany was in realising that if a patient could control the air in their mouth to blow a whistle, then the same process might be used to operate electrical switches and relays. This could bring control over lights, tape recorders and almost any number of electrical appliances.

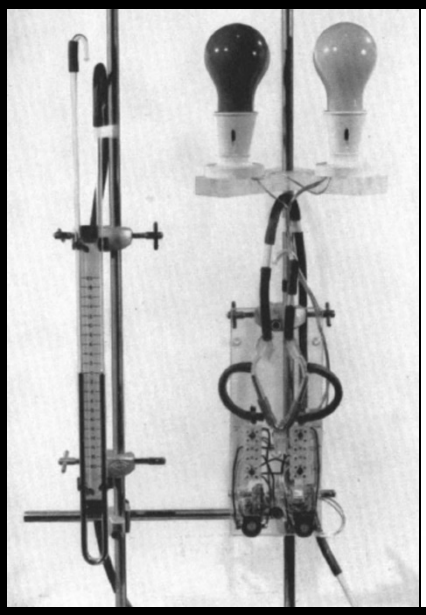
Reg was an industrial chemist by trade but had long been tinkering with electronics. Aged five he was said to have built an electric fence to stop other children from getting at and breaking his toys. He was known for his inventiveness, single-mindedness, good heart, grin and dancing eyebrows when an idea was flourishing. Needing extra help to take his ideas further, he teamed up with fellow hospital volunteer and engineer Derek Clarkson (later Dorothy Clarkson).

Derek's background included servicing Typex cipher machines in World War II (an "unbreakable" British Enigma used to encrypt secret messages). When Derek paired up with Reg in 1960, he was working at General Precision Systems in Aylesbury on computer aided flight simulators.

Working Saturday mornings in the flight simulator lab and spare evenings on Reg's Mother's sitting room floor, the first prototype POSMs took shape.

General Precision Systems (formally Air Trainers Link Ltd) advert, in Flight magazine, 8th July 1960.

The resulting Tape Recorder System was a breath controlled dictating machine using a liquid mercury manometer. This was the first electronic sip-puff assistive technology. With this, Ian swiftly gained independent control to record and organise his thoughts.



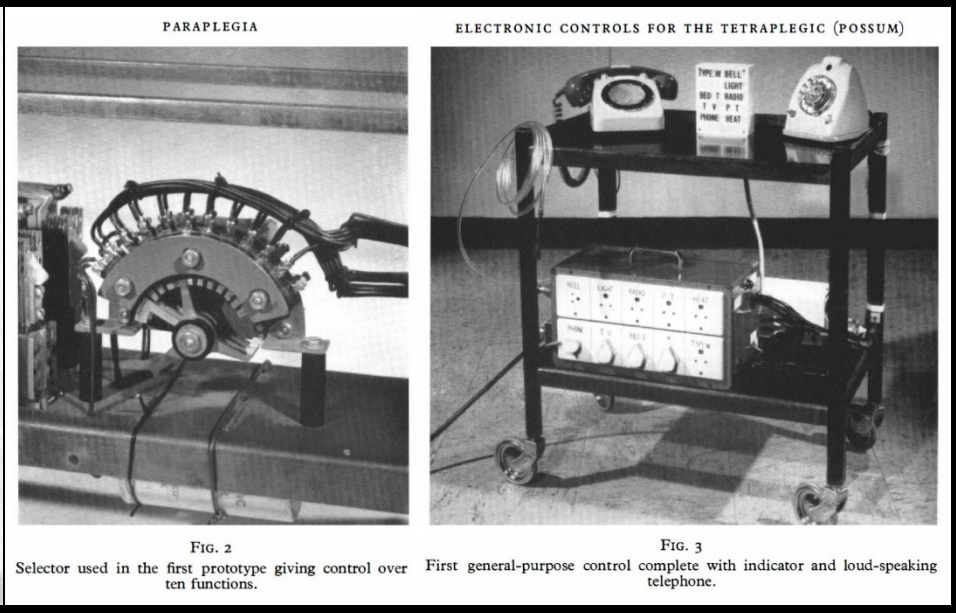


FIG. 2
Selector used in the first prototype giving control over ten functions.

FIG. 3
First general-purpose control complete with indicator and loud-speaking telephone.

The second wave of POSMs were far more powerful. The Environmental Control Unit (ECU), built from parts donated by General Precision Systems, enabled “scan and select” control of ten items. These would go on to include control over alarms, lights, heaters, radios, door mechanisms, page turners, projectors, telephones, televisions and typewriters. The earliest of these ECUs made use of uniselectors, relays, and switch control to cycle through the available choices illuminated by lightbulbs. The similarities between this and a Jamieson’s Electrodart machine make me wonder if Reg or Derek ever played one at a fun-fair and took inspiration.

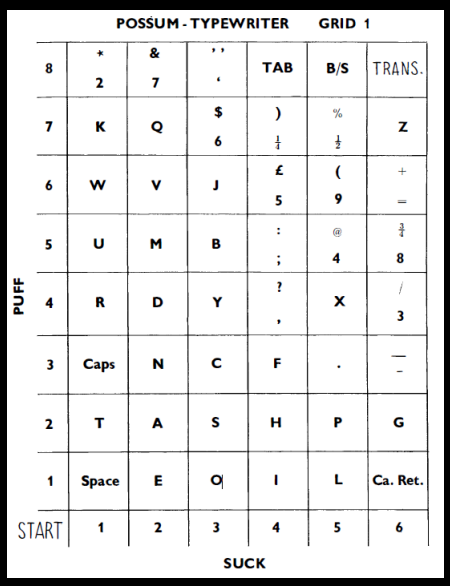
Reg and Derek’s experiments were so successful that upon demonstration to Sir Ludwig Guttmann in the Occupational Therapy Department his vital approval for further development was given. Funding was found from the Polio Research Fund and work continued in earnest. A small team grew to include Joy Wakefield and Roger Jefcoate who would undertake much of the early assessment work.

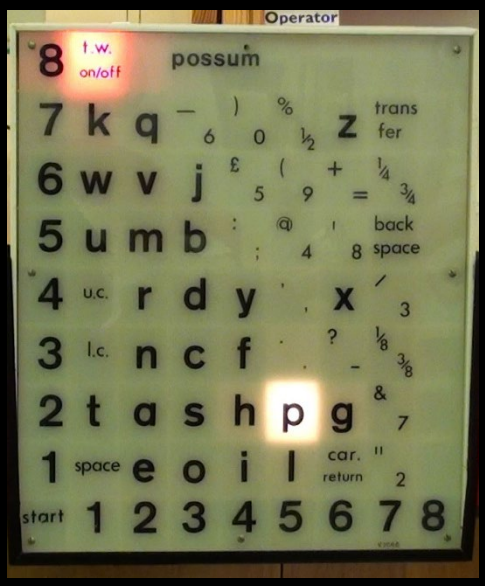
POSM transformed into Possum Controls Limited as a self-contained business moving out from the hospital Electro-Mechanical Laboratory into their own premises, secured at “mates’ rates”.

In 1966 pivotal to their ultimate survival Possum were awarded an NHS contract by the Ministry of Health. This was to supply their systems and support free at the point of need (with some conditions) to patients around the UK.

One of the most powerful Possum accessories was the Type Writer Control System (TWC). One or more switches were enough to scan and select from a grid of letters and symbols to print out via an electric typewriter. Row then column selection was much like picking a square in Chess. Here, a single switch was enough to converse, to convey ideas, wants and needs. And play crosswords.

Some users memorised the grid, often out of necessity if unable to reliably look at the card. Others would use an animated box of lights, transferring between the smaller ECU box and the TWC as needed. Bespoke methods of control were developed to match each user's needs, including a four-switch sip-puff device and "Word Store" system enabling much faster typing speeds for some.





Throughout, Reg and his team travelled the world to promote the benefits of the Possum systems. Often Reg would fly small borrowed planes, not always getting full air clearance en route. He was said to have caused a diplomatic incident in Israel on one support flight, being buzzed and escorted by their military jets. Alternatively, he'd squeeze Possum gear into his MG sports car to take where needed. Safer that way.

In 1968 the Possum User Association (now The Sequal Trust) was formed by Elizabeth Beeston, the head OT at Southport Spinal Injuries hospital and Roger Jefcoate. The PUA was a support group and magazine set-up to support and empower Possum users. Most importantly it was run by Possum users themselves. Rebranded "Possibility" in 1969 it had subscribers across Europe, Scandinavia, Israel, North America, Canada, Singapore, Australia and New Zealand.

Possum users blazed a trail with their enabling technology. Dick Boydell programmed computers at Ford in the early '70s. Hilary Pole MBE, described in newspapers as the most disabled person in the world, had poems published. Joy Wakefield's "Sequal 25 Years" booklet details many more life affirming stories.

Reg was ousted from Possum in 1973, after disagreements with the trustees, and Sir Ludwig Guttman. In solidarity and protest key members of the team left too. Despite this, by 1974 the National Health Service had supported over 500 POSM installations around the UK enabling many people to live more independent and enriched lives. An entire industry formed, inspired by the original POSM devices as can be seen in “Aids for the Severely Handicapped” by Keith Copeland. This 1974 book features a dozen or so different environmental control and AAC (Augmentative and Alternative Communication) systems.

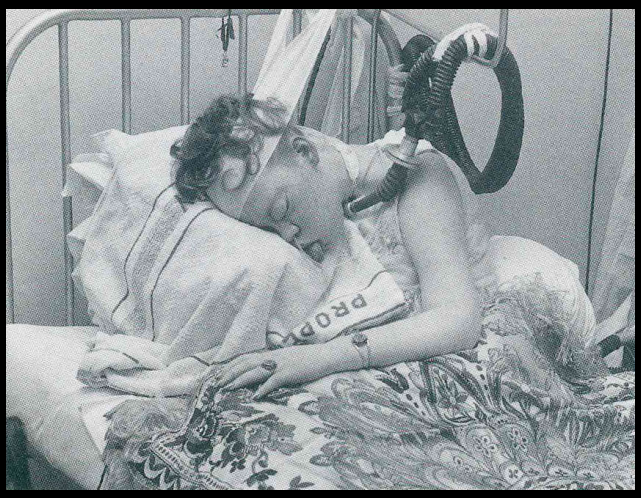
Rival companies brought innovations of their own to the field as with Essex based Zambette Electronics’s System 7 and 8. Options from Zambette included a proximity switch enabling non-touch control with minimal strength, toy control and reportedly a wall projected typewriter. Zambette would later be absorbed by Possum. From Reg and Derek’s early work, a cross pollination of ideas and practices were bursting into vivid life.

Reg went on to form Maling Rehabilitation Systems and later Telemachus which ran the UK’s first on-line disability information resource in 1979 using Prestel. He also gave advice on the cutting-edge MAVIS (Microprocessor Audio Visual Information System) project. Without an NHS contract, it was difficult for Reg to make as much of an impact, leaving him somewhat cast adrift.

Roger Jefcoate left Possum with Reg, going his separate way to form the Aidis Trust in 1975. This was perhaps the first charity to support people needing a wide range of electronic assistive technology. Roger also co-founded AbilityNet in 1997, to provide advice on making computer technology more accessible to all. AbilityNet, The Aidis Trust (now Everyone Can), Sequal and Possum all continue to make the world a better and fairer place for disabled people to this day.

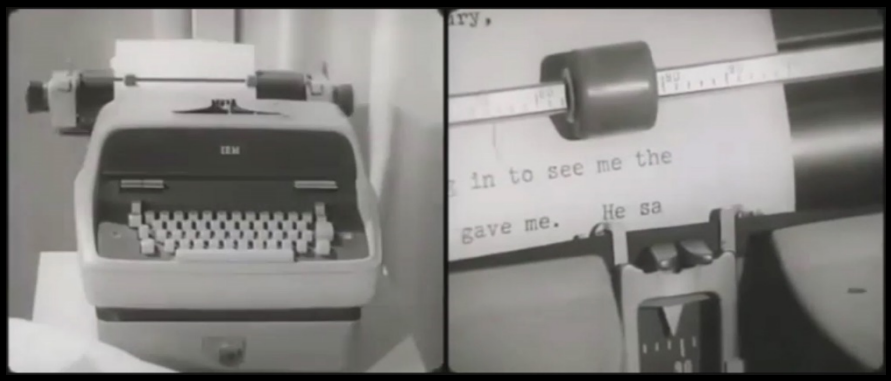
“Our work has received tremendous assistance from a wide range of individuals, firms and corporate bodies. But it is to the severely disabled themselves that the major thanks must go; it was their courage in adversity which provided the determination to start and continue the project... I remember one lady who had literally only a flicker of movement in one toe. She went on to write a beautiful book of poems – it was quite extraordinary... We made a difference."

Reg Maling

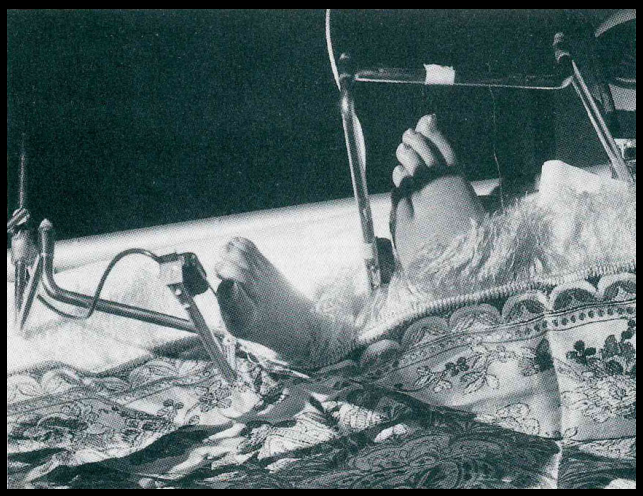


My World

I have a world that's mine alone,
A world where no-one else can roam,
Of books I've read and plays I've seen,
An opera, a ballet theme;
Of roads I've walked and hills I've climbed,
Woods and fields stored in mind.
So if at night I cannot sleep,
I do not end up counting sheep,
Instead I think of days gone by,
Of picnics 'neath a clear blue sky,



The thrill of watching unawares
A pair of boxing, mad March hares.
I wander down Lapal Lane again,
I find a nest, I see a wren,
The fields are full of ripening wheat,
The banks are white with meadowsweet.
And searching closer to the ground,
Bashful violets I have found.
I squelch along the bridle path
(thus awakening Mother's wrath),
I tear my coat, I cut my knee,
But there's a squirrel's drey to see.
The landscape blurs, light fades fast,
I smile, and fall asleep at last.



Hilary Pole

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Possum Helps the Paralysed film stills via: https://youtu.be/m57ECJVSCAI and http://www.possum.co.uk/

General Precision Systems advert via Flight magazine (8th July 1960).

Electronic Controls for the Tetraplegic via Aids for the severely Handicapped book, Keith Copland (1974)

Illuminated "P" image from 2016 trip to Possum HQ in Aylesbury.

The Brave World of Hilary Pole" written by Dorothy Clarke Wilson

Text formed from various sources including my interviews with Dorothy Clarkson, Liz Cartwright (nee Beeston), Roger Jefcoate, David Crockford, Richard Adby, Julia Schofield, once neighbour "Mr. Appleton" and Andy Shelton (ex. Telemachus). Also from Geoff Webb Memories of Polio self-recorded (c.1975) British Library ref. C1383. A transcript from Mandeville Legacy with Dr. John Silver http://www.mandevillelegacy.org.uk/documents/silver.pdf and the Hilary Pole poem from her biography "The Brave World of Hilary Pole" written by Dorothy Clarke Wilson.

SEE: OneSwitch.org.uk/page/100 for the full story