Remap

custom made equipment for
people with disabilities

Gloucestershire

Yearbook Issue 1

Welcome to REMAP Gloucestershire

REMAP is an independent charity and its Engineers design and manufacture one-off equipment (or modify existing equipment) to improve the quality of life of disabled individuals, when there is nothing otherwise commercially available. The service is provided free to the disabled client.

We are an organisation of friendly Engineers and Occupational Therapists (OT). We meet on the second Thursday of every month at 10.30am for a couple of hours, to discuss existing work and assess new cases. We encourage OT to attend our meetings, but you will need to phone our Case Secretary, Joan Erving, at Tewkesbury South Social Services on 01452 410345 to find out where we will be meeting in any particular month, because we like to visit OT (Social Services) in all parts of Gloucestershire. Joan will also supply blank Referral Forms (see back page).

This Yearbook is intended to provide a glimpse of the work that we are actively involved in, with the purpose also of encouraging more work for the disabled. It is not possible to show everything that we do because, for example, we had 89 case referrals in the year 2000.

We look forward to being of service to you.

Charles Dobbin
Vice Chairman

REMAP Gloucestershire

Year 2000 Cases

The following is a summary of all the case referrals we had during the year 2000 :-

No. of Cases	Category Description
15	Personal care : baths, showers, hygiene, etc
12	Manual wheelchairs and accessories
10	Household and environmental fittings and controls
9	Personal toilet : toilets, commodes, bedpans, etc
8	Leisure activities
7	Chairs including footstools, backrests, etc
5	Childrens development and play
4	Transport including accessories : cars, cycles, etc
4	Eating and drinking
4	Standing or walking help
3	Beds including accessories, mattresses, etc
3	Household : cleaning, cooking, laundry, etc
2	Alarms, telephones and intercoms
1	Powered wheelchairs, scooters, buggies
1	Pressure relief
1	Hoists, lifts and lifting equipment
89	total number of case referrals in Year 2000

Note that the category is as defined by the Hamilton Index.

The remaining pages of this Yearbook describe some of the cases in more detail.

REMAP Gloucestershire Case

Hospital bed extension : Engineered by Charles Dobbin

The Problem

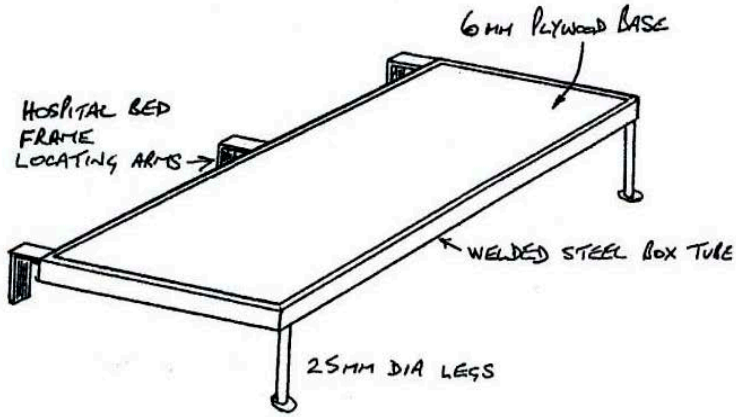
A devoted husband attending to his motor neurone afflicted wife, was slowly but surely deteriorating in health as he tried to sleep in a chair adjacent to his wife. She slept on an electrically elevating hospital bed in a very small room. He very frequently had to tend her during the night and was developing swollen legs as well as becoming exhausted. What was requested by the clients OT was an easily attached/detached extension to the clients bed, to allow the husband to get some rest lying down. As the bedroom was tiny, any extension would have to be able to stand on its end (stored upright) and be light in weight, enabling one man operation.

The Solution

This task was presented to the panel as an emergency, and a "clip-on" extension frame was designed, manufactured and delivered to the client within 48 hours.

The Benefits

The client was much happier.



REMAP Gloucestershire Case

Damped Single Handed Tray : Engineered by Alan Darke

The Problem

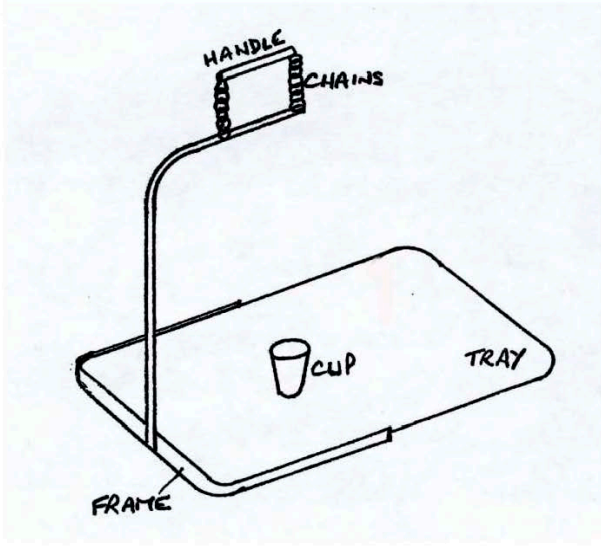
The client was only able to use one hand and suffered from Parkinsons disease. He needed assistance with transporting a full cup of tea from kitchen to sitting room.

The Solution

A single handed tray was made by securing a tray to a frame with a single tube rising about four hundred millimetre above the centre of gravity of the tray. The filled cup could then be placed in the centre of the tray without toppling. The whole was then supported from a handle attached by the use of two short chains to the frame. These two chains allowed movement of the handle without moving the tray and thus effectively damped the movement tremor of the client, such that a full cup of tea could be transported without spilling.

The Benefits

A successful and simple construction, much to everyone's delight, especially when our Chairman failed to spill the tea!



REMAP Gloucestershire Case

Eddie's Buoyancy Aid : Engineered by Charles Dobbin

The Problem

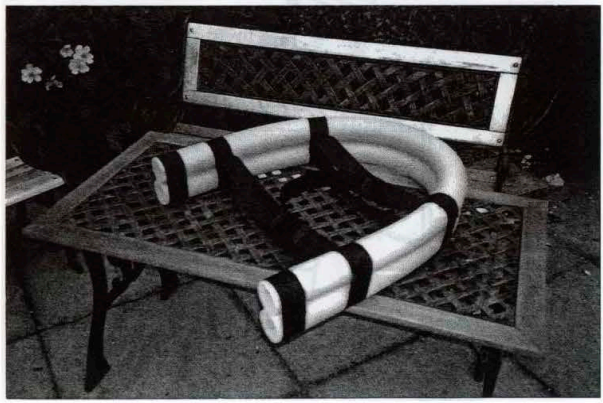
One of the County's schools dedicated to disabled children, requested our help to solve what turned out to be a most interesting and rewarding project. The school is very fortunate in having its own hydrotherapy pool, which is much enjoyed by the pupils. Two of these pupils (one most severely disabled) needed assistance. Both boys thoroughly enjoyed being in the pool, their broad grins and smiling eyes overcoming their inability to communicate verbally, but they needed constant adult help, for whom a support was requested. Eddie could safely be immersed in the water up to his neck.

The Solution

Although unable to move any of his limbs he thoroughly enjoys the rocking motion of the water. In order for him to float on his own, a horseshoe shaped buoyancy aid was developed using two 100mm diameter lengths of closed cell foam, glued together and provided with adjustable straps. The straps locate under Eddie's armpits, across his chest and under his bottom. With his head resting on the crown of the horseshoe shaped bend, his body is slightly submerged without fear of Eddie failing out.

The Benefits

The adults had confidence that Eddie was adequately supported.



REMAP Gloucestershire Case

Paul's Buoyancy Aid : Engineered by Charles Dobbin

The Problem

One of the County's schools dedicated to disabled children, requested our help to solve what turned out to be a most interesting and rewarding project.

The school is very fortunate in having its own hydrotherapy pool, which is much enjoyed by the pupils. Two of these pupils (one most severely disabled) needed assistance. Both boys thoroughly enjoyed being in the pool their broad grins and smiling eyes overcoming their inability to communicate verbally, but they needed constant adult help, for whom a support was requested.

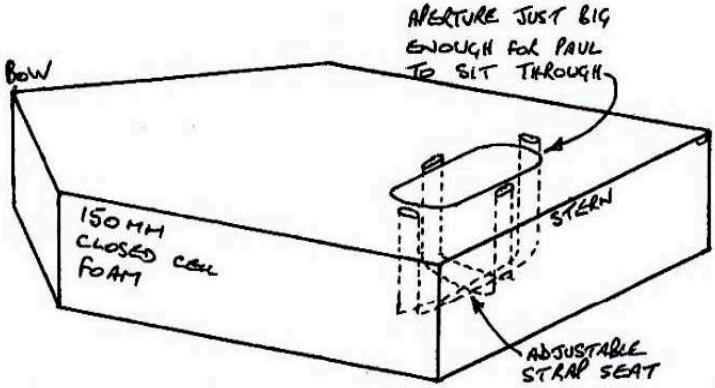
A totally different solution from Eddie's was required for Paul - it required more thought, because while Paul really enjoyed being in the swimming pool, he has to be held upright at all times to avoid water entering his tracheotomy throat valve.

The solution

The solution was to manufacture a closed cell float (boat shaped to add interest) incorporating an adjustable web seat. An aperture just big enough to allow Paul's lower body through was cut in the centre of the float. The "bow" of the float keeps splashes away from Paul's upper body. His attendant has only to steer the buoyancy aid, no longer being required to take any weight or hold upright.

The Benefits

The adults had confidence that Paul was adequately supported.



REMAP Gloucestershire Case

Window Opener : Engineered by Ron Crumpler

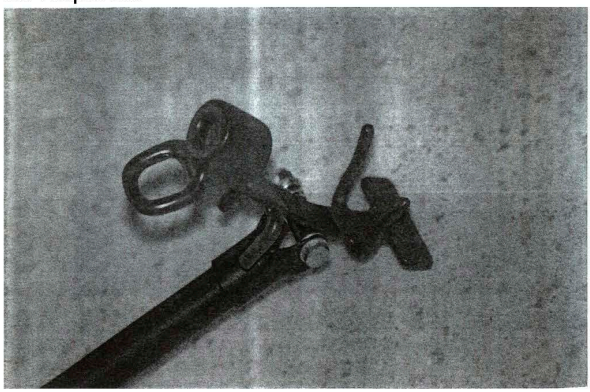
The Problem
Modern reinforced plastic windows differ from the preceding metal and wooden framed windows which can adversely affect the disabled and infirm, viz

- window latches are eliminated by the use of high friction hinges
- multi-point locking is employed with stiff handle operation
- a thumb button must be pressed even when the window is not locked
- no standardisation of handle form, thumb button position or orientation
- left and right hinged, and top hinged needs to be coped with too
- bungalows particularly need windows opened in hot weather

In this case the client was wheelchair bound but had good upper body and arm strength, and lived in a bungalow. He could not reach the kitchen window behind the sink, nor the bathroom window behind the wash basin, nor two windows behind furniture in the lounge.

The solution
The design of the two fingered opener put the head of the opener at one end of a one metre long metal tube via a friction hinge, the friction being just sufficient to hold the head in any position to which it is set by the client. A pistol grip is attached to the other end of the tube to enable push pull and twist of the opener to be achieved. Because of the need to avoid breaking glass when the opener was rotated in use, fine tolerances had to be used in the manufacture of the opener.

The Benefits
The client is now able to open and close his windows and thus control his environment as required.



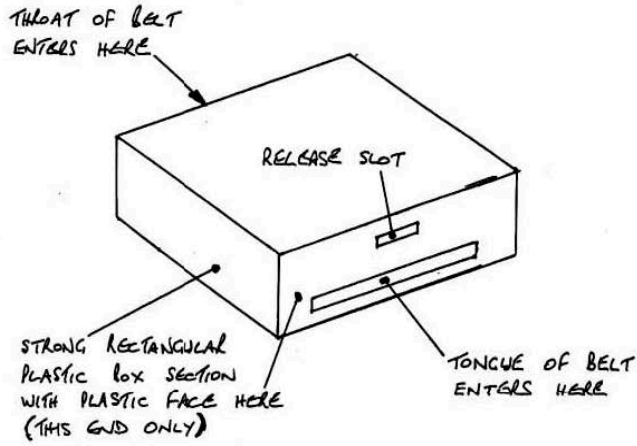
REMAP Gloucestershire Case

Seat Belt Protection : Engineered by Alan Darke

The problem
A device was required to prevent a child self releasing from their seat belt in a moving car.

The Solution
The solution was a small strong plastic shield quickly and easily fitted over the release mechanism that would prevent the occupant from pressing the red release button. It is held in place by the tongue inserted into the throat of the seat belt. Release is effected by the parent, by inserting a key or similar instrument through a small slot at the top of the shield. It can be easily removed when not required. It can be used on almost any make of car. The device is acceptable to the Emergency Services who say they would use a knife to quickly cut the seat belt anyway.

The Benefits
The driver and other occupants of the car can be assured that the child will remain safely 'belted up'.



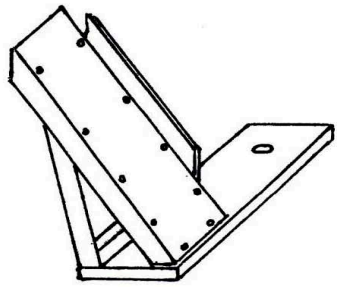
REMAP Gloucestershire Case

Car foot rest : Engineered by Mike Plant

The problem
A client paralysed from the waist down commuted to work by car fitted with manual controls and a pedal guard to keep his feet off the pedals. The guard had to be removed by his wife to enable her to drive the car, and she had some difficulty doing this. An alternative form of pedal guard was needed which could stay in place at all times. The client did not want a guard for his right leg.
There was an obvious safety factor involved, and after discussion with the client some other factors had to be considered.

The solution
Using existing guard floor anchor points, a new base plate was cut and steel angle iron welded to it at left end to form an angled ramp rising between clutch pedal and the central console. The ramp needed to hold the dead weight of the clients leg and foot being dropped onto it, so it was double braced to the base plate and then infilled with aluminium. The right hand edge was upturned to form a clutch pedal guard but still enabled the client to swing his leg over onto the foot rest.

The benefits
1 When getting into his car the client knows that his left leg will stay in place on the guard while he is swinging his right leg in.
2 He has confidence that the left leg will not drift onto the clutch pedal whilst driving (pedal moves under hand control)
3 Whilst driving, the left ankle now 'sets' at an angle which matches the angle he needs for his wheel chair footrest.
4 His wife does not have the inconvenience of removing the pedal guard when she wants to drive, nor refitting it afterwards.



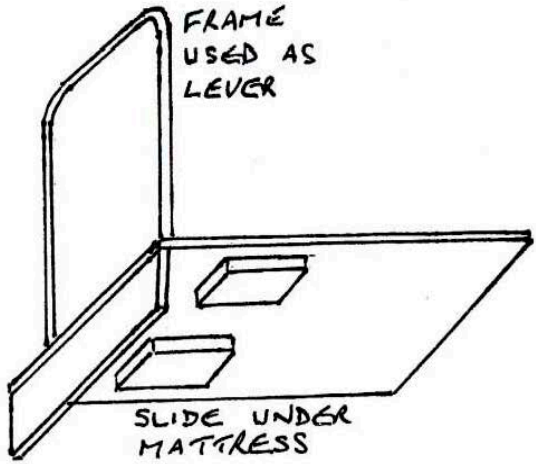
REMAP Gloucestershire Case

Bed lever mount : Engineered by Mike Plant

The problem
Client had MS. She had a bed lever which she used to pull herself out of bed. This was reasonably rigid and usable when the bed was flat but drifted around and was unstable when the bed head was raised up even slightly from the horizontal (electrically driven).
Could this bed lever be attached to the bed frame to stabilise it, yet be easily removable by the client when she went away on visits.

The solution
Hardwood blocks were cut and shaped to slot between the cross members of the moving section of the bed frame. These were glued and screwed to the underside of the bed lever in positions to provide lateral and longitudinal stability. A mild steel frame was secured to the mount for her to grip and lever herself as required.

The benefits
1 Client can still use the bed lever even when the bed frame is in an upright position
2 The bed lever is easily removable by the client and because of the positioning of the new blocks, can be slipped under a conventional mattress for use when the client is visiting family or friends.



REMAP Gloucestershire Case

Smoking Aid : Engineered by Charles Dobbin

The Problem

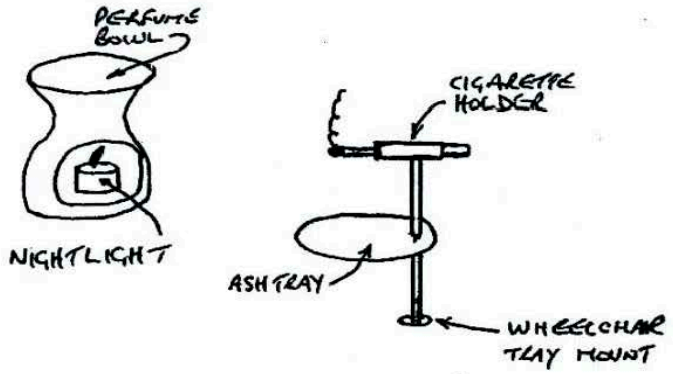
Our client was wheelchair bound with limited arm movement and strength, who wanted a cigarette during the day when she was on her own. She was unable to light up by herself and did not want the cigarette in her mouth all the time.

The Solution

The lighting of the cigarette was overcome by the use of a night light candle burning for several hours. A combined cigarette holder and ash tray was made and mounted on the wheelchair tray, spare cigarettes being held near the holder. The cigarette was smoked by leaning her head forward and inhaling, and at the end it could be ejected from the holder by a small spring activated by pushing the end of the holder with the mouth. The cigarette then dropped Into the ashtray. Loading of the cigarette holder took some time because of her limited hand and arm movement.

The Benefits

The client was much more independent during the day.



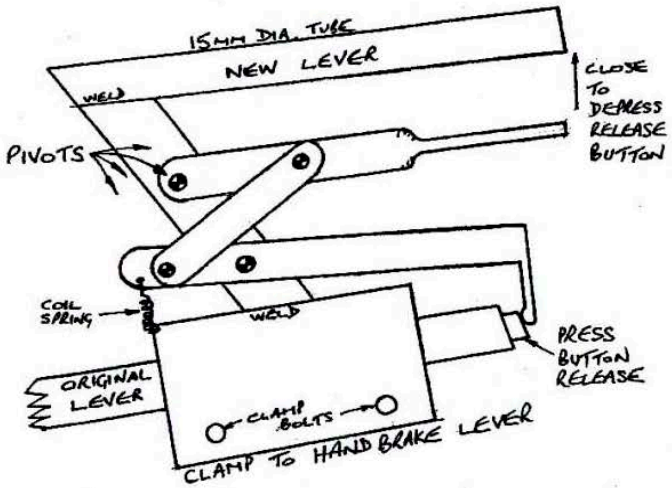
REMAP Gloucestershire Case

Car Lever adaptations : Engineered by Jerry Lawrence

The Problem
The client had bought a small car with auto transmission and power steering but she had a very short arm length and was unable to reach the gear change or the hand brake levers.

The Solution
The easier adaptation was for an extended steel framed hand grip clamped onto the gearchange lever, but the handbrake was more difficult because of the press button release. A three bar linkage was constructed underneath a raised 15mm diameter tube clamped in parallel with the handbrake lever, which allowed the thumb and fingers to exert pressure by closing them together. The linkage transferred this hand closing force to the handbrake button which then allowed the handbrake to be released. A coil spring holds the linkage away from the handbrake release when the handbrake is on.

The benefits
The client is now able to fully control her car, and has thus regained her mobility.



REMAP Gloucestershire Case

Remote Triple Switch : Engineered by Jim Quinn

The Problem

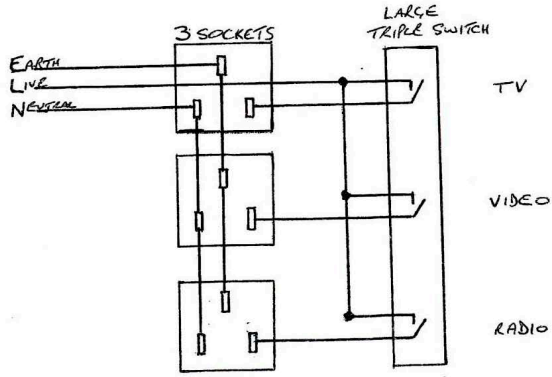
The client was an elderly lady with cognitive difficulties. She had to call for a helper (she lived In a residential home) whenever she wanted to watch TV or listen to the radio. The TV, video, and radio were all plugged into separate switched sockets on the skirting board and were all too low for her to reach. She was also unable to use the TV or video remote because the keys ware too small for her arthritic fingers.

The Solution

Fortunately the client wanted only to watch one TV channel (BBC1) or one radio channel, so switching the power supply was all that was required. A big triple switch was bought and three switchless sockets with three metres of three core wiring, sufficient for the triple switch to sit on her lap, while the sockets were all safely a distance away. The triple switch was labelled "TV", "VIDEA" and "RADIO" and she was thus able to turn each of them on and off as required. The TV would only switch on to "ready" not to a channel, so another TV needed to be found by the OT, which would switch directly onto BBC1. Selecting the video 'ON' needed a helper to change TV channel accordingly, but she was able to switch them off and then revert to BBC1 all on her own.

The Benefits

The client was much more Independent during the day, and was last seen switching them all on and off in a continuous cycle of enjoyment!!



REMAP Gloucestershire Case

Wheelchair Armrest : Engineered by Jim Quinn

The Problem

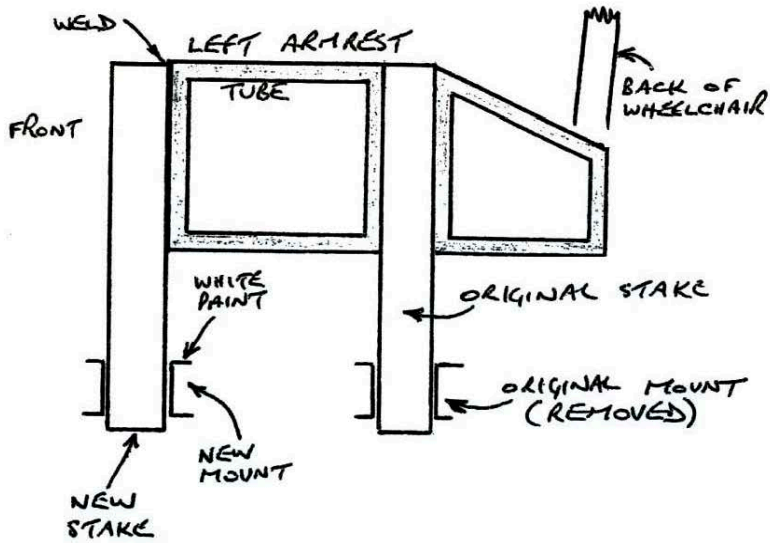
The client was a triple amputee due to diabetes, with only his left hand remaining. He wanted to be able to remove and replace the left armrest for access to other seating.

The Solution

Discussion of the problem with the OT led down all sorts of avenues, but the solution was found simply by sitting in the wheelchair oneself. It became immediately obvious that the problem was that the armrest stake, which mounted onto the wheelchair socket, was too far to the back of the wheelchair to be seen by the client during replacement. REMAP moved the socket to the front of the wheelchair, painted it white so that it could be seen easily against the floor background, and welded a new stake onto the front of the armrest.

The Benefits

The client was much more independent during the day.



REMAP Gloucestershire Case

Long Handled Cup Holder: Engineered by John Peabody

The Problem
The client suffered a stroke and was no longer able to lift a cup to his mouth because his elbow would not bend sufficiently, but he was strong enough to hold a cup safely at the end of a long handle. A similar need existed for the use of a spoon.

The Solution
A half metre long cup holder was manufactured from 20mm dia aluminium tube (taken from a scrap zimmer frame!), welded to an aluminium circle large enough to hold a cup. The tube had to be sufficiently large to be gripped easily, thus to control the weight of a full cup of coffee and to allow the cup to be tilted under control into his mouth. The spoon was bolted to a long smaller diameter shaft of aluminium.

The Benefits
The client no longer needed to wait for help, and thus did not have to starve or thirst while waiting!!

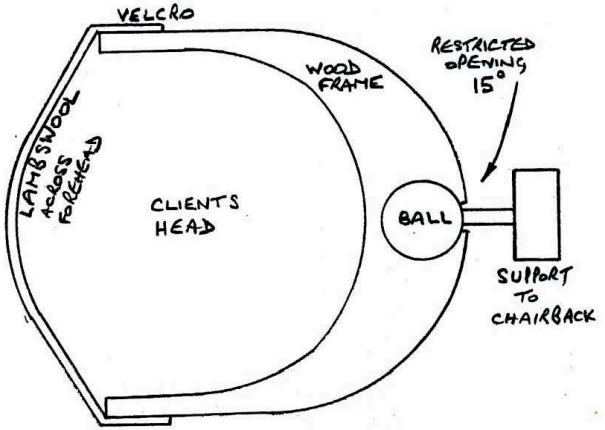
REMAP Gloucestershire Case

Balljoint Head Support : Engineered by John Peabody

The Problem
The client had been discharged from the Spinal Injuries Unit and was not able to hold his head anywhere near a normal upright position. He wanted limited, but free, movement of fifteen degress both sideways and up and down. He wanted to look normal when sitting in his wheelchair.

The Solution
A support was designed which used a ball joint attached to a piece of wood shaped to fit around the back of his head, and tensioned to his head by using a velcro'd strap running across his forehead, which took a deal of persuading for him to accept. The ball joint had to be free to move, but restricted in its movement and it also needed to be as close to his spine vertical axis as possible to make head movement easy. It was therefore buried within the wooden U shape, and with a restricted opening around the ball at the rear wood surface, the requirements were achieved. The forehead strap was covered in lambswool for comfort.

The Benefits
The client was now able to play domino's since he could read them when they were placed in front of him. His disability was such that someone else had to position his domino, but he now had that desired extra degree of play freedom, so very much welcomed.



REMAP Gloucestershire Case

Safe Tipping Kettle : Engineered by Alan Jackson

The Problem

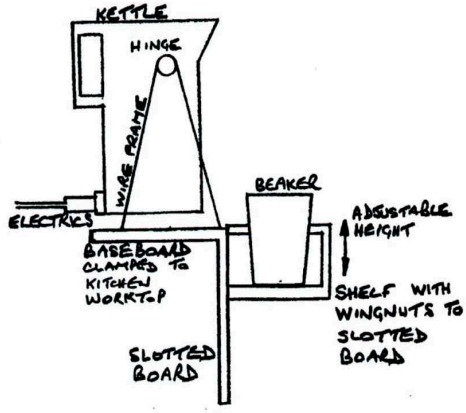
The client had cerebral palsy and suffered an occasional violent hand tremor, and so was scared of scalding himself when making a cuppa. The supplied commercially available kettle tipping frame was designed to work with the balloon shaped stainless kettle, but was unsafe with his cordless jug kettle. He was unable to lift a kettle and pour a cuppa without the use of such a frame to give the needed stability to be able to pour accurately and safely.

The Solution

The commercial steel wire frame was modified to carry his modern jug kettle, and, for security, the cordless base was secured to the kettle with nylon ties. This meant that he did not have to worry either about water getting into the connector, nor about it falling out of engagement.
The frame surrounded the jug kettle and safe tilting was accomplished by positioning two hinges near the top of the kettle frame, which also minimised the movement forward of the kettle spout when it was tilted - thus coping with both the initial gush of fluid as it was tipped, and also the final drip-drip as the cup filling was completed.
The cup or container to be filled by the kettle had to be mounted as high as possible to ensure the minimum fall distance thus to minimise splashing, so a shelf, secured to the bottom board of the wire tilting frame, was made vertically adjustable, with cut-outs to allow for thermos or various jugs or cups.

The Benefits

The client was confident of not scalding himself, and no longer concerned about electrical safety, and was thus safely independent.



REMAP Gloucestershire Case

Chair Castor Frame : Engineered by Alan Jackson

The Problem

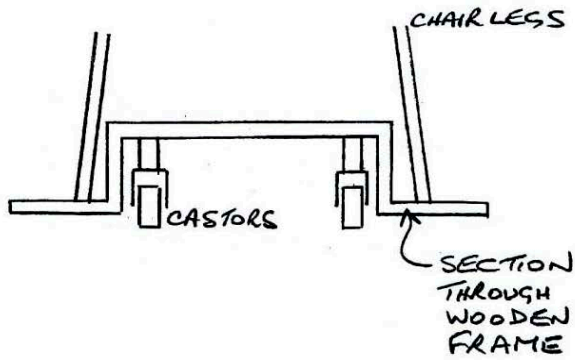
The client suffered from Parkinsons disease, and used to get his legs tangled in the table legs when being pushed on his chair into the table. It was very difficult for his wife to push him into the table.

The Solution

The chair legs were quite thin, so castors had to be fitted to a constructed box frame on which the chair sat. It was requested that the chair legs should not be cut, so the frame had to be quite shallow where the chair legs sat, but could be higher where the castors fitted. All four castors swivelled, but only the two rear ones had foot operated brakes.

The Benefits

The client's wife no longer had such a struggle.



REMAP Gloucestershire Case

Colostomy care table : Engineered by Mike Plant

The Problem

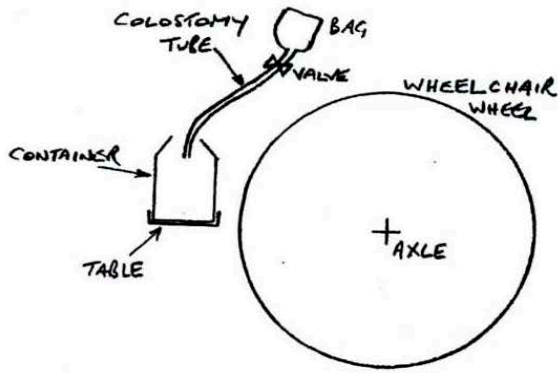
The client had good upper body mobility, but was very unhappy with his hygiene - he was exhausting his bag down the colostomy tube into a half litre medical container, and the whole was insecure when sitting on the bathroom table, bearing in mind he had to release the tube valve at the same time.

The Solution

During discussion with the client it was decided that the best option would be to mount a small table low down on the wheelchair frame, which would support the half litre medical container (which was about 100 mm tall) into which he could dispose of his bag contents. This was designed such that the chair could otherwise be used normally. An aluminium table was produced shaped to hold the container bottom with small (6 - 7 mm) upturned lips all round, and it was fixed to the wheelchair with the existing clamps. The table was fitted forward of the right wheel at near axle height, so that the container was close to the clients reach. It was mounted so that it did not interfere with the wheelchair braking system, nor would it be an obstruction when transferring in and out of the chair.

The Benefits

Client feedback is very positive - the design works.



REMAP Gloucestershire Case

Flexible Cup Holder: Engineered by Charles Dobbin

The Problem

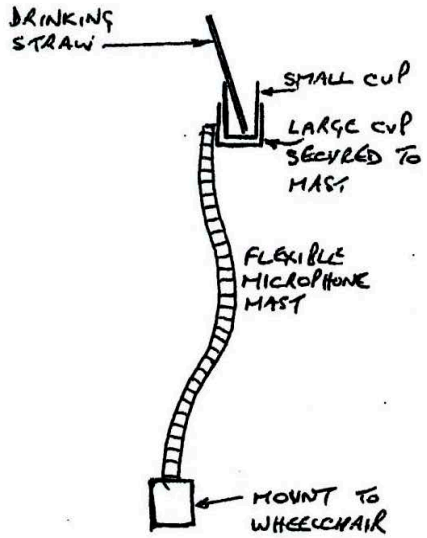
Our client was wheelchair bound with limited arm movement and strength, who wanted liquid refreshment during the day when she was on her own. What was needed was a drinks holder attached to the wheelchair which could be moved towards the mouth and away again.

The Solution

A large plastic mug was used as the cup holder. It was attached to a long flexible pole (a microphone mast) mounted to the wheelchair. The drink was put into a plastic cup inside the large cup and a drinking straw was used lo avoid the need to tilt the cup. The movement of the clients arm was sufficient to flex the pole in and out of the way.

The Benefits

The client was much more independent during the day.



REMAP Gloucestershire Case

Special book rest holder : Engineered by Mike Plant

The Problem

The client had no arm or hand strength and loved reading. When eventually he became bed bound, he could not sit up and all proprietary book rests were useless. When they had the time, carers used to hold the book or other reading material for him, but this meant sitting with him all the time that he was reading.

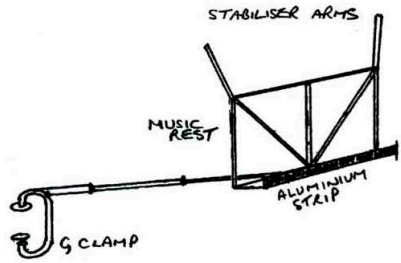
The Solution

A conventional metal music stand was obtained and the legs were removed, and a four inch G clamp was then welded to the bottom of the centre tube at about 25 degrees to the horizontal. To prevent the pages flicking over on their own, a length of aluminium strip was welded to the bottom of the music rest to act like a raised lip. All edges were rounded and the whole sprayed in the clients favoured colour.

In use, the head of the stand was adjusted by the carer to the correct angle and locked with the integral music rest clamp. The G was clamped to the bedside table, and the telescoping centre tube adjusted in length, so that the rest was sufficiently close to the client. The music rest top stabiliser arms were adjusted upwards to cope with a magazine for example and if necessary. The book or magazine was then secured by the carer to the music rest using haberdashers elastic made into loops.

The Benefits

The client was now able to read the two opened pages of anything from a small paperback to a weekend newspaper magazine, before having to call for the carer to turn the page for him.



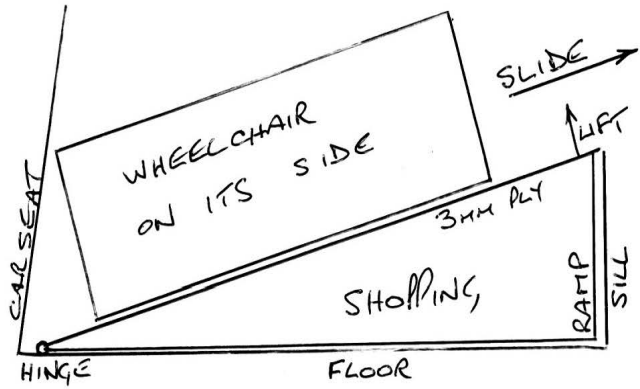
REMAP Gloucestershire Case

Car Boot Ramp : Engineered by Jim Quinn

The Problem
The husband has previously lifted his wife's wheelchair out of the car boot over the rim, but he is no longer able to do this.

The Solution
A ramp was fitted inside the car boot which allowed the wheel chair to be slid out rather than lifted out. The ramp was made from exterior grade 3mm plywood and rested on two wooden rails supporting the ramp all along their increasing axial height. This full width square ramp was hinged at its forward end (near the boot floor), such that shopping could be stored easily underneath it. The hinges were necessary because the ramps made the whole structure too heavy to easily lift while loading the shopping.

The Benefits
The wheelchair is now easily removed from the car boot by pulling it up the ramp, and shopping is easily stored underneath.



REMAP Award Winner - REMAP Peterborough, not Glos

Here because it is so interesting.

Foot Sensor : Engineered by Jim Fell, Peterborough

The Problem

The client had had several back operations which had resulted in the severing of nerves to the right leg. The effect he likened to the pins and needles you get when sitting on your leg for a long time, such that you cannot feel where your foot is, or even if it is on the ground. The result was that he could walk only by almost obsessively concentrating on and watching his foot as he walked. His muscles worked fine, but sensing was lacking.

The Solution

The sensing possibilities were a visual aid, or a feeling aid. The feeling needed to be communicated to the brain, and either a vibrator mounted on the leg, or an audible sound was envisaged - and thus the earpiece was conceived.

A pressure sensor was built using a resistor which changed resistance when force was applied to it, a bit like a strain gauge. The sensor was about 30mm diameter and was less than 0.5mm thick. The sensor was fitted under his sock heel inside the shoe with a fine flexible wire running up the inside of his trouser leg. The wire was plugged into a small, matchbox size, box amplifier on his waist belt. An earpiece was plugged into the box which also had an ON/OFF switch, threshold adjust knob and a volume control.

The client adjusted the controls until he consistently heard a CLICK in the earpiece whenever his shoe heel touched the floor. Once he was walking normally using the click and without looking at his foot, he found he need not concentrate on the click and could hold normal conversation whilst walking - this took only three days to achieve.

The Benefits

He no longer walked headlong into people, and he was once again able to talk to his wife as he walked. He later found that he was able to walk without the click for a time, because he had gained confidence in walking without looking down.

Both he and his wife, and his physiotherapist were delighted with the outcome, and a kind letter and a donation were received from the physio.