NEWSLETTER August 2020

Hello everyone, judging by the weather today, summer has come and nearly gone. I think the highlight of Club activity this month was when we had our social meeting at North Grimston (YO17 8AX). I didn't realise how much I had missed actually seeing and talking to people. I have arranged another gathering along the same lines for Wednesday 26th August. We were very well catered for at the Middleton Arms, attendees came from between Pocklington and Whitby and Scarborough so the venue was not too far off the beaten track.

Club Meeting

We will have our first meeting at the Pickering Memorial Hall on Wednesday 7th October, circumstances permitting. This will take the form of a simple "Welcome Back" but if anyone has anything interesting to bring along please do so. Refreshments will not be provided, but please feel free to bring you own. The Main Hall is reserved for 7.00pm. The directions for getting to the Memorial Hall and areas of permissible free parking were given in the March issue of the newsletter.

Milling Cutter Donation And Micrometer For Sale

Richard Llewellin has donated a few baccy tins of milling cutters and a few tools to the workshop for use when the workshop reopens. There is a surplus 0 to 2" micrometer for sale £5 for club funds, again thanks to Richard. I heard a good one the other day. A chap with a well-equipped workshop was often asked to lend tools etc to a "friend". Friend came round to borrow a tap and was given a left hand one. When the friend returned the tap, the chap asked if it worked OK and the friend replied "Oh Yes". He didn't see his friend for a while after that. If anyone is short of a spanner or two, I have a few Whitworth, AF and metric ones to give away.

Stay safe everyone,

Jonathan.

Completed Atkinson Differential Engine Model. Mel Doran

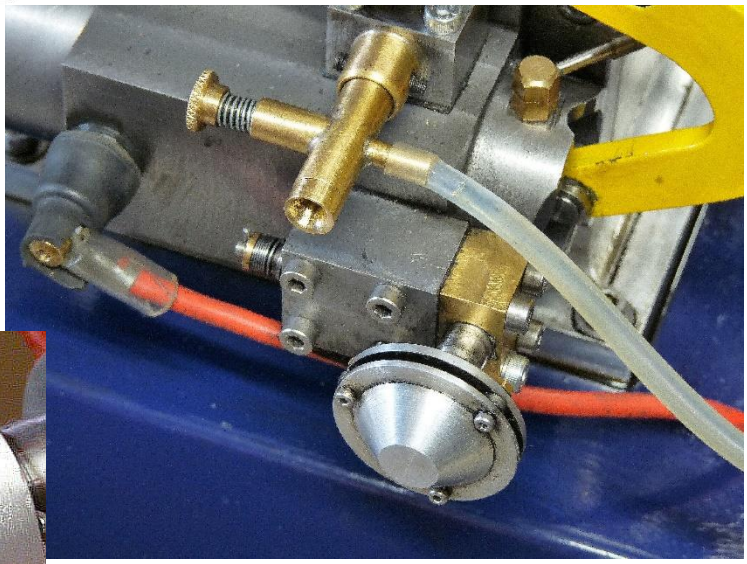
If you recall, at last October's "Bring and Brag", Mel Doran presented his Atkinson Differential Engine Model. The model and its description are presented in the PEEMS October 2019 Newsletter. At the time it was still a 'work in progress', but now it has been completed.

Mel continues:

The engine was scratch built from a primitive sketch plan, with many dimensional errors! I started gathering materials for the engine at the last Model Engineering Show, at Doncaster. At the Show, I had a conversation with a visitor, who was looking at my Atkinson Cycle Engine, who berated the fact that there was no Diff Engine at the show. This sparked my interest, and I recalled that I had some plans of an engine in the workshop. One year later, here it is:

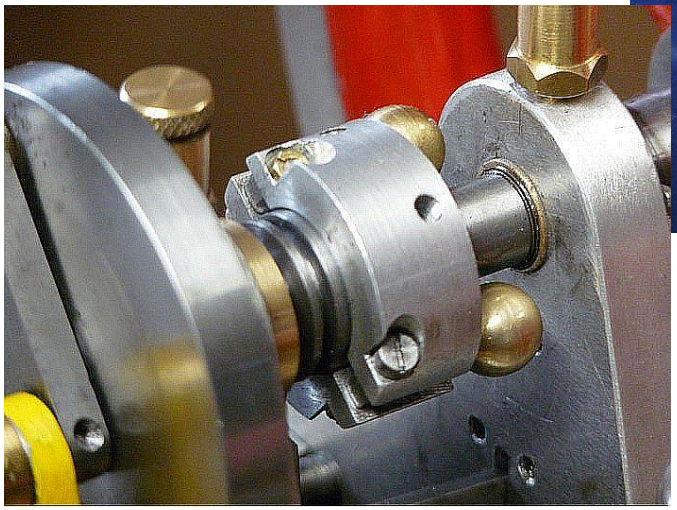
Complete Engine

Fuel Tank



Spark Plug, Carburettor and Exhaust

Fly Ball Regulator



News From Elvington, Melbourne Raceway (York), And From Paul Windross

- **Graham Sykes' *Force Of Nature* Steam Jet Bike Update:**

  Graham had it fired up a few days ago, and will be giving it a blast at Elvington very soon.
  He did extensive modifications to the stainless pressure vessel to accommodate the new valves. The previous valves were not up to the job and leaked. Graham had been sold the wrong type, and the replacements seem to be correct after his test at Elvington (see end of next page).

- **Elvington's July Speed Meetings:**

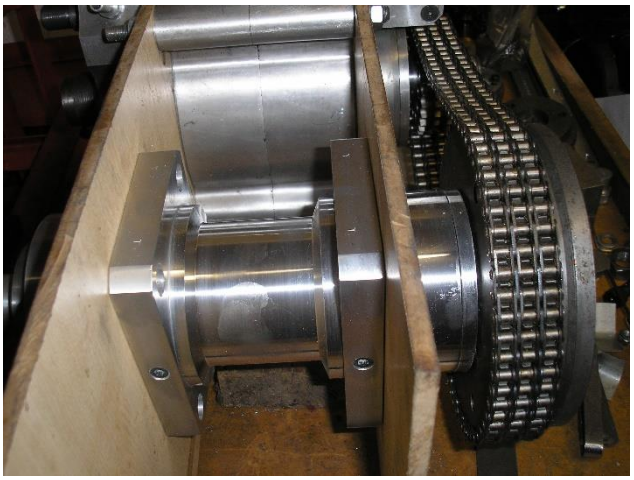
  Guy Martin is a regular competitor and he is aiming for 300mph at the end of the standing start mile. Last year 270mph was achieved on a Hayabusa with a tail fairing. A problem is finding still air conditions. The best time is normally early in the morning or in the evening. Runs at those times are not allowed now due to the rules for using the runway.

- **Myself:**

  I have been isolated at home for months but should be going to Elvington next month providing the virus does not have a second wave. The Elvington July speed meetings have been busy, but I have been taking precautions, so gave them a miss.

  I am plodding away at my steam project and made a countershaft with a much modified *Norton Commando* clutch on it. With simple modifications I can make it a centrifugal assist type if needed. It's a crossover shaft with the clutch at one side and a rear drive sprocket at the opposite side.

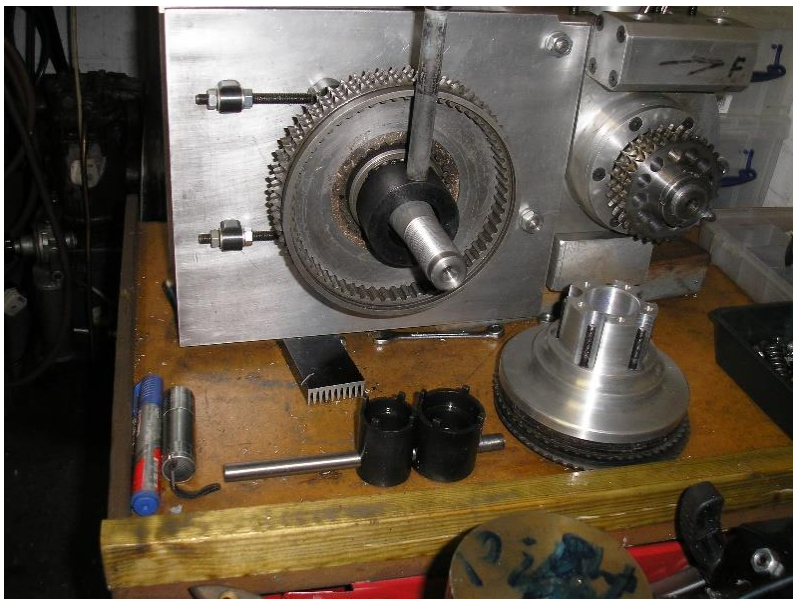
  The countershaft for the steam engine:



Setting Up Countershaft

Polished Countershaft

The main shaft will be shortened and a long hole drilled for the clutch release push rod.



Tools and Clutch

- **Melbourne Raceway (Seaton Ross, York):**

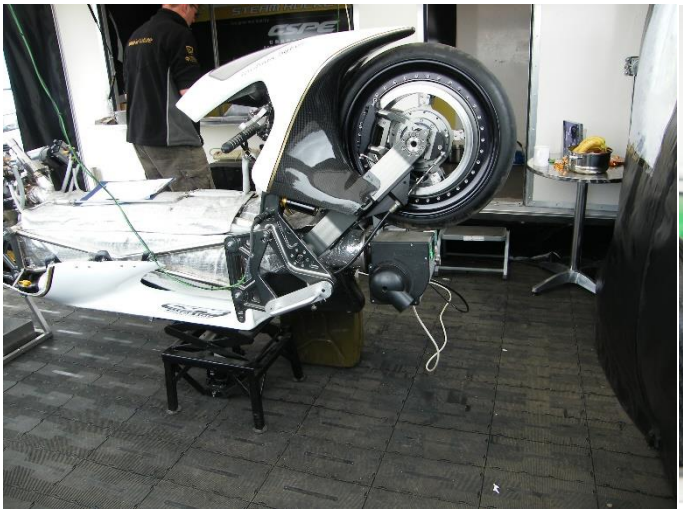
  Melbourne drag racing will be starting soon due to massive donations. A new track has been laid. It will be the only second permanent drag venue in the UK. Trevor Duckworth from *'Straightliners'* explains:

  https://www.youtube.com/watch?v=2mOo1G12wxU

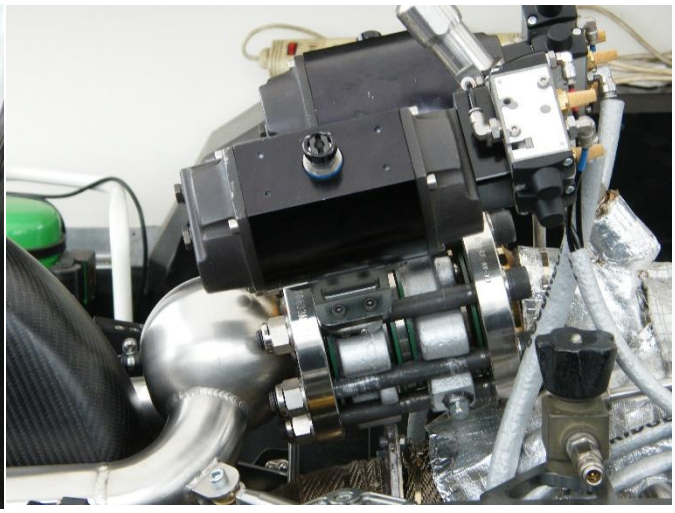
  I have been at Melbourne Raceway for the opening of this refurbished drag racing venue. At the moment, only an eighth mile is available but there will be a full quarter mile eventually.

  There was a big entry of cars and motorbikes and it was a very successful event.

  Graham Sykes was testing both days, and a great deal was learnt. The new valves did their job. Here are a few pictures of the machine.



Steam Bike At Sunday Meet



The New Valves

On-going development is in progress and I don't think any more test runs will be forthcoming for a while. The machine was stable and everything worked. The test runs were very spectacular.

Here is a video of Graham on his test run on Elvington runway 26 (2nd 'shakedown' 26th July 2020).

https://www.youtube.com/watch?v=lK2vLLQ7GbI&fbclid=IwAR3RAMZypmCWFeWyga1jNHcLBA9eH4RErfE_q62wrZm2HVHvH0B_ZDJatOE

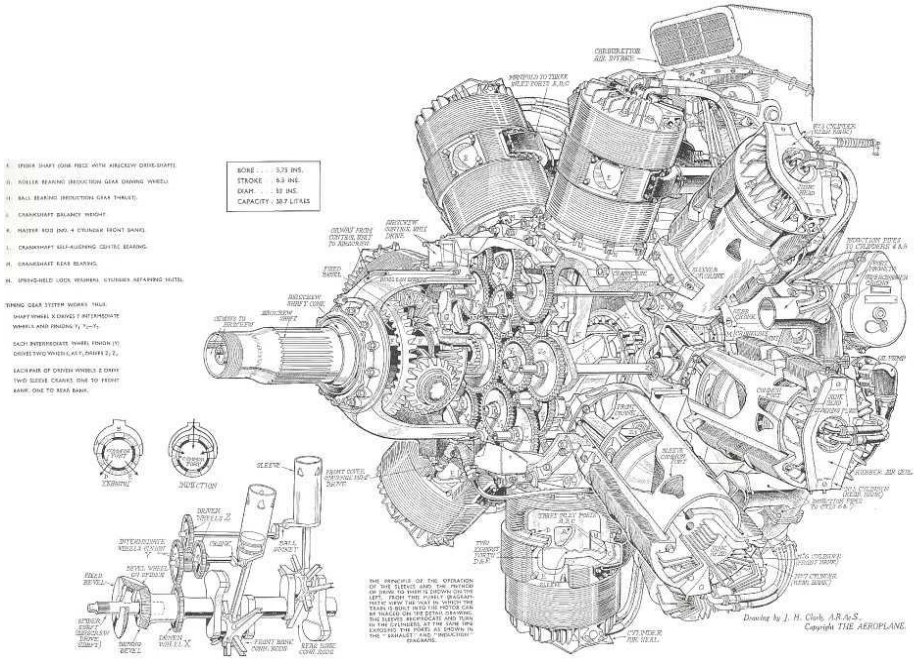
After clicking on link, return to newsletter by clicking on back arrow at the right top of the screen.

The Suez Crisis ~ My Experience. Paul Hayward.

Reading the article by Ted Fletcher in the last PEEMS newsletter, together with the recent article in the Model Engineer, brought back memories of living in Egypt immediately before the nationalisation of the Suez Canal by Colonel Nasser in 1956.

In 1955, my father was seconded from his job with ICI to work for the War Office, undertaking administration duties for the operation of the Suez Canal for the Suez Canal Company. He moved to Egypt sometime around the middle of 1955 and then my mother, sister and I moved to Egypt in December 1955. I was then 7 years old and can remember quite a bit about travelling to Egypt, our life there and our return journey under somewhat worrying circumstances.

At the time we were living in Bridlington, and I recall being bought suitable clothing for Egypt in a shop called Frank Webb's in the town as well as having a series of injections for a whole host of infections we might encounter in the country. We travelled to London by train, (I can still remember the flavour of the tomato soup we were served in the restaurant car!), and then stayed in a hotel close to the British Museum, where we were able to visit the Egyptian Collection. Our journey to Egypt was in two parts, first flying in a Hermes aircraft from Blackbushe airport near Fleet in Hampshire to Malta, were we stayed in the Imperial Hotel in Sliema, before travelling from Malta to Egypt. Having never flown before, I remember being very excited by the whole process. The Hermes aircraft was operated by the Britavia group, which operated Silver City Airways, Air Cruise (Kent) Ltd, and Aquila Airways, and was a four-engined aeroplane with Bristol Hercules engines. These were radial engines with a twin row of seven cylinders, the resultant fourteen cylinders of 5.75" bore and 6.5" stroke giving a capacity of 38.7 litres. These engines were widely used and in some 57,400 were produced and used in a wide variety of aircraft.



Copyright ~ *The Aeroplane*

The second part of the journey was particularly interesting, as we flew from Malta to Egypt in a Short Solent IV flying boat, taking off from the Grand Harbour in Valletta and landing on the Great Bitter Lake, which itself is part of the Suez Canal. The aircraft carried about thirty-five people on two levels and was a civilian version of the Short Sunderland flying boat much used in the Second World War by Coastal Command, particularly on anti-submarine patrols. On the journey, the children were taken onto the flight deck where the Flight Engineer explained the instrumentation, and I remember being impressed by the clicking over of the instrument showing how far we were covering. I also recall flying over miles of sand, the North African Desert.

Arriving just before Christmas on the 18th of December, our new home was a three-bedroomed bungalow in Kensington Village, part of Fayid, just a short distance from the Great Bitter Lake. Fayid had been a RAF base and Kensington Village was formerly the married quarters for the camp. My sister and I went to the school in the village, starting around 7.30 am and finishing around 1.00 pm. It was only a short distance to the school, but it could be very uncomfortable if it was windy, as the blowing sand acted as sandpaper on exposed skin! The powered milk we were given at the school was also unpleasant to say the least.

There were many families living locally, most associated with the operation of the Canal, but others, such as teachers, providing services for the people working and their families. Life settled down into a routine of school in the morning, home for lunch, a rest in the heat of the day, and then a visit to the Contractors Club in the late afternoon before returning home for the evening meal. We had a cook/housekeeper, a Sudanese man called

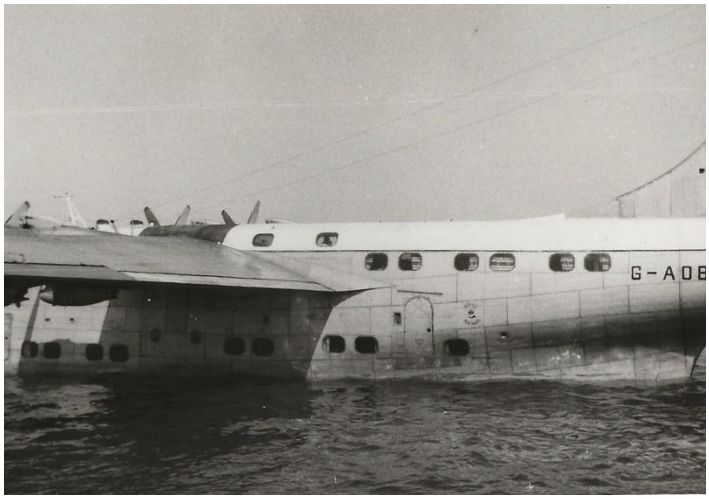
Karrar, who refused to let my mother do anything in terms of cooking, housework or any domestic activities. My sister and I were always wanting water to drink, but as it all had to be boiled first, we were always waiting for it to cool.

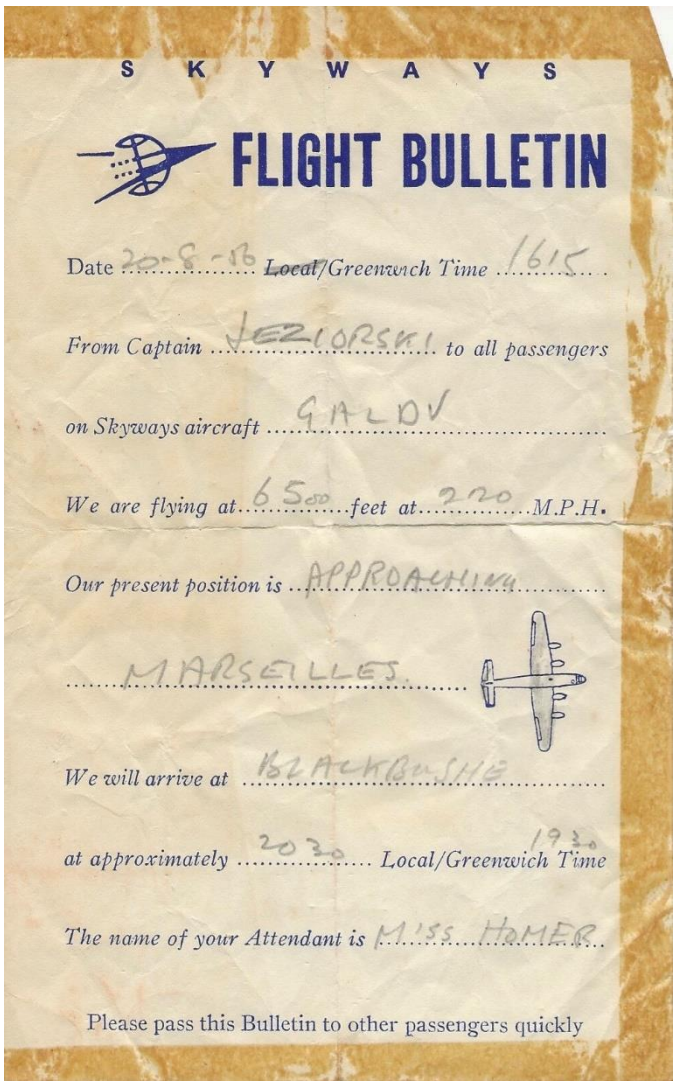
The Contractors Club was on the shore of the Great Bitter Lake and had previously been the Officers' Club for the Army and Airforce (it is now the El-Morgan Hotel after being extended). The Suez Canal is approximately 120 miles long and the lake is about two thirds of the way along it, travelling South from Port Said on the Mediterranean Sea in the North, to Suez itself on the Gulf of Suez in the South. It has high salinity so it was where I learnt to swim. The ships using the Canal were not often visible at this point, but elsewhere it was possible to see the ships from the Canal side. They were very close to the shore and I vividly remember seeing passenger ships being brightly lit at night and hearing music playing, and seeing people dancing on board. It was quite possible to shout to people on board – and hear their reply!

On Saturdays there was a troop-carrying vehicle (TCV) service into nearby Ismailia, a large town (now a city) with a very French colonial town atmosphere, where my mother and father took us to a café called Antoinette, where I remember having Mille Fueilles. Perhaps this is the reason why I am rather partial to custard slices produced by Thomas's !

As 1956 developed, the local situation began to deteriorate, although being a child, I was unaware of this. The only two things that come to mind regarding the potential problems that emerged, was firstly when our cook/housekeeper left to go back to the Sudan, as he was worried about the situation and secondly, when our car was forced off the road by Egyptian Police motor cycle outriders escorting a cavalcade of cars, one of which had Colonel Nasser in it, and a tomato was thrown at us, hitting the windscreen.

When the Canal was nationalised by Nasser in July 1956, we were told we would be evacuated as soon as possible. In a classic case of "women and children first", the families were told to be ready to leave at two hours' notice. We eventually left in mid-August. The journey home was the outward journey in reverse, with a Solent flying boat taking off from the Great Bitter Lake, and landing in the Great Harbour at Valletta in Malta. The pictures of the flying boat in this article are taken at the Lake and show passengers boarding, the plane getting ready to leave and then moving off to the take-off point, with the port inner engine yet to be started. Arriving in Malta, we then had to wait several days in the Imperial Hotel, waiting for the flight home. We were not allowed to leave the hotel whilst waiting, a wait which seemed endless at the time. As an aside, the Solent flying boat also had the Bristol Hercules engine and this particular aircraft G-AOBL, was used on the service form Southampton to Madeira via Lisbon, and when the P&O shipping group took over Britavia, and then ceased the flying boat service, the aircraft was delivered to Lisbon where it continued to provide a service to Funchal in Madeira. It still existed in the 1970s but was later scrapped.





S K Y W A Y S

FLIGHT BULLETIN

Date 20-8-56 ~~Local~~/Greenwich Time 1615

From Captain JEZIORSKI to all passengers

on Skyways aircraft GALDV

We are flying at 6500 feet at 220 M.P.H.

Our present position is APPROACHING

MARSEILLES

We will arrive at BLACKBUSHE

at approximately 2030 Local/Greenwich Time 1930

The name of your Attendant is MISS HOMER

Please pass this Bulletin to other passengers quickly

We returned from Malta with Skyways, again in a Hermes aeroplane as shown on the Flight Bulletin with this information. On a rather sad note, this aeroplane was lost in an accident on 1st April 1958, on a test flight following an engine change. We landed at Blackbushe and were taken to Elvetham Hall, close by the airport and now a hotel, before returning to Bridlington. My father was lucky in that he flew back on the last plane to leave, given only an hours' notice, while his work colleagues and other workers were all interned for several months. They were taken to Cairo by bus where they were surrounded by an angry crowd who tried to overturn the buses in the convoy, hiding under seats while the bus windows were broken. They were kept in a junior school, and after a very worrying time for them, eventually returned to Britain around the turn of the year.

All this seems a long time ago now but my memories are still there and I am still interested in flying boats. I am yet to visit the example preserved at the Solent Air Museum though!

Sound for Cinema - Part 2. A Digital Revolution. Colin Bainbridge

When I left the story of cinema sound in Part 1, we were just on the cusp of the introduction of digital sound to the cinema.

In the early 1990s, cinema entertainment in the average venue was still being delivered using 35mm film projected onto a screen with analogue stereo sound. Digital sound for cinema, or rather sound derived from a digital source, although having been available to the domestic market in the form of Compact Discs from the early 1980s, took all of these intervening years to catch up. Indeed, digital sound in the home predated even this date by probably another ten years, as it had been adopted as a means of sound distribution by broadcasters in the 1970s, only in those days it was called Pulse Code Modulation or PCM for short.

A Bit of Digital History.

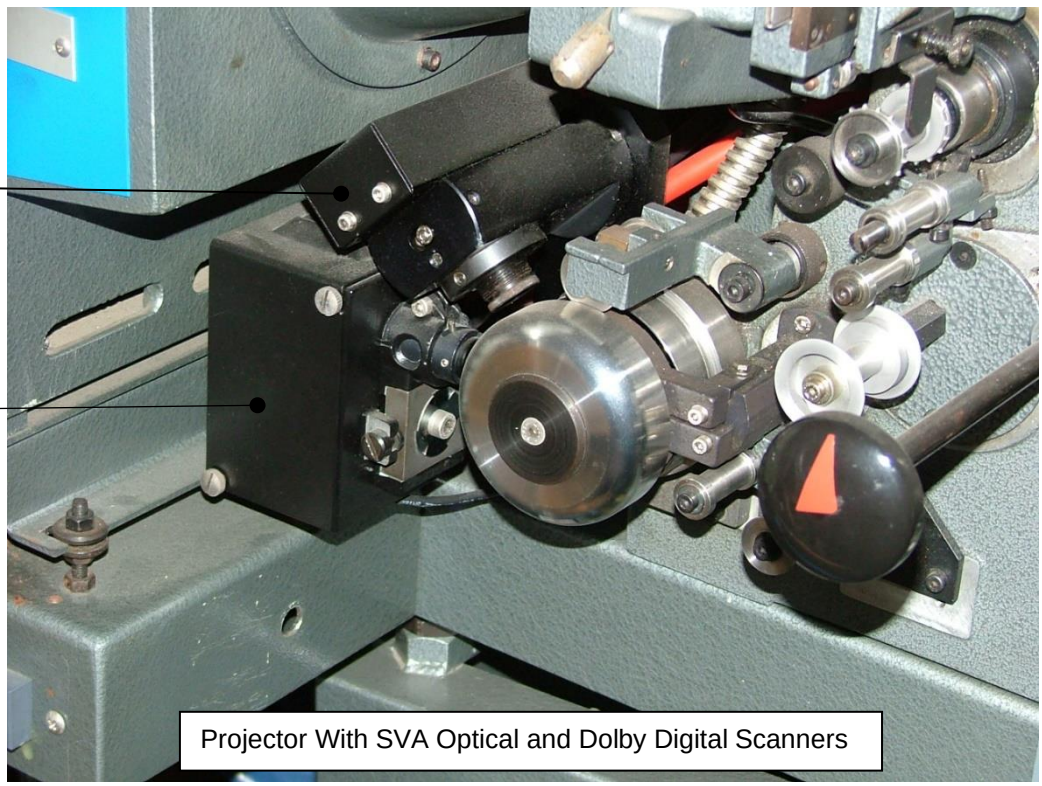
The widespread adoption of digital sound has taken many years to find its way into the numerous areas we find it in today. Its expansion has been driven to a large extent by the development of coding techniques used by computers, and especially by the development of the PC (Personal Computer).

When digital sound was introduced to the domestic market in the form of the audio CD, it was in the form of pure audio digitized and not computer coded data. That statement is not strictly true as even PCM audio is a form of coding. However, PCM sound and the development of computer coding and software, are essentially two different things. As software developed PCM, coded information could eventually be processed by computers and returned to the outside world as PCM audio, or in the form of one of the many other audio formats available today. One of the essential uses of processing is usually to compress, and if required, to modify the content of the digitized signal, and ideally to further compress the result into an even smaller data package, as data costs money.

You will see from the foregoing, that it is in fact difficult to differentiate today between what is a straight forward audio device, and a small computer. Probably the only two pure audio devices you will come across in the average home today are the CD player and the home Hi-Fi unit. Any other equipment is most likely to be a variation of a software driven device using compressed data.

So, what is so great about digital sound? By replacing a high-quality analogue sound source with a comparable digital one, many of the limitations of analogue audio are done away with at a stroke. Things like noise (background, hiss etc.) and frequency response, which deteriorate when copying analogue sources, can be ignored. Also, in the replaying of recorded sound, speed stability, wow and flutter are not an issue. Dynamic range is improved by using extra equipment for analogue signals, but can be built into the digital spec. Copying the sound source to many generations is not a problem with digital audio, as long as it is kept within the digital domain.

Many people claim there is a greater clarity with digital sound, and this would certainly appear to be the case, especially where stereo is used. Unfortunately, some of the data compression techniques used in digital can tend to blunt this perceived improvement.



Projector With SVA Optical and Dolby Digital Scanners

Digital Cinema Sound

In the early 1990s, several commercial companies were developing ways of interfacing digital sound with film. Not for the first time in cinema history, the eventual take-up and success of any one of these systems was dependent on which major film company adopted it for their products. Eventually it really came down to three systems being taken up, and for quite a while they co-existed. This situation didn't help all cinemas as whilst the major chains could afford (reluctantly) to have all 3 systems installed in their venues, for the independent operator it meant having to make a difficult choice when deciding where to place their limited financial resources.

The first system was called ''*Digital Theatre System*", known as DTS which used a separate disc (resembling a CD) containing the sound, and which ran remotely from, but in-lock with the film picture.

The second system was developed and marketed by Dolby Labs called ''*Dolby Digital*'' and used an optical track on the film print.

The third system called SDDS, which was short for ''*Sony Dynamic Digital Sound",* also used an optical track on the film.

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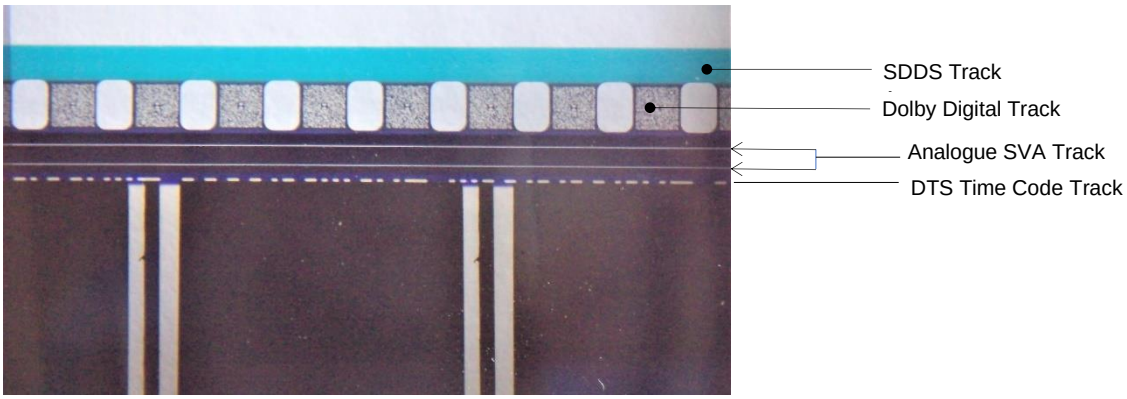


DTS *Dolby Digital* Film Frame

As you see, the location of the digital track was different for each format; this at least meant that where it was used, each system had its own unique position on the film print.

Surprisingly, probably the most successful system during the 1990s was the DTS system using the separate sound disk with *Dolby Digital* next, followed by SDDS. The DTS system differed from the others in not having the actual sound on the film print, but contained on a separate disk. Only a time-code track was recorded on the film, and gave timing and location information to the disc reproducing equipment. This arrangement took the development of cinema sound full circle, for if you recall in Part 1, one of the earliest sound formats for 'Talking Pictures'' was a record mechanically synchronized with the picture. The DTS system was fundamentally the same arrangement but using late 20th century technology, not least in its ability to follow the picture even if frames had been cut out due to damage of the film.

By ElmoBlues - Own work, CC BY-SA 4.0

A DTS Disc And Processor Unit

Both the Dolby system and SDDS being film based, were slightly more vulnerable to the physical wear of the film's surface and could render parts of the print un-readable as far as the sound scanner was concerned. Ingeniously though, all these digital formats were backed-up by the original and existing Dolby SVA analogue optical track, which it automatically defaulted to in the event of a digital sound failure. On a well-maintained system this change-over was seamless.

Dolby CP500 Digital Cinema Processor

All these systems were multi-channel, producing 6 or 8 channels of sound, and used various data compression techniques, each system being unique. The DTS system was different in that the compression used was much less, and the discs were of the CD-ROM computer format. The audio processor required for each system was of course software driven, meaning they were really computers producing sound from complex data streams.
Excepting the requirement to purchase a processor and some rewiring, plus the purchase of a further couple of amplifiers and speakers, meant the change-over was not too financially traumatic for the independent operator, especially as many were now already equipped for running the analogue 4 channel Dolby – SR SVA format. It also meant that 'budget' versions could be configured to allow further investment by the cinema to follow (hopefully) increased business. The dilemma for independent cinema operators was which system to go for, as each required its own scanner and processor unit. I think in hindsight, the independents did have a bit of breathing space, as the major chains invested in equipment, leaving the independents to watch from the sidelines (as all films had the Dolby SVA track anyway). The independents could then see how many 'Big' films were successful using each format. That said, it didn't take very long before agreement was reached between the various competing systems to release films with two or all three formats supported on each film. This was by no means a universal approach and well into the early 2000's some 'blockbusters' were still only available using one digital sound format.

Dolby Digital Processor DA20

As time progressed, *Dolby Digital* took the lion's share of the releases, and as more film companies came on board, Dolby pretty much became the outright winner. Further support by the all-important advertising industry (cinemas derive income from the adverts they show with films), and with trailers for new films also using the format, meant it became possible to have an 'all digital' sound presentation. From then on, the industry didn't look back.

Postscript:

Why digital is such a revolution is because sound, and latterly pictures in the analogue domain, require lots of electronics and machines to achieve the same but with a less versatile result. After the initial R&D investment for the digitizing and coding software has been paid back, the saving in labour, materials and time across the world is of staggering proportions. Regrettably this also results in a loss of work for many people. This is however, just a continuation of the Industrial Revolution, and Revolution it is!

Foot note:

Digital Sound - Someone once gave me this analogy:

Analogue Sound - Think of an analogue signal as being like a glass of liquid. When transferring the signal down a wire (telephone wire etc.), think of the wire as being like a pipe. If the liquid is poured down the pipe, what is received at the far end will be slightly less in quantity owing to some of it having stuck to the sides. To make up for this loss, a little water is added, but whilst this increases the volume of the liquid back as it was before, it is at the expense of the quality, its purity suffers – for lack of purity think of noise being introduced and maybe a loss of definition, H.Frequencies.

Digital Sound - The digital signal - a numerical representation of the original analogue signal - can be thought of as a bag of marbles. Tipping the marbles down a pipe is now as simple as marbles in one end, marbles out the other, no losses.

My final article (if you can bear anymore!) will be to describe some of the film projectors themselves and the modern wonder of the all-digital cinema, pictures as well as sound.

Free To A Good Home:

I have 10 years' worth of *Model Engineer* magazines to part with mostly in Binders.

These Cover years from 1990 to 2000 + 2001 and 2 not in binders

Would prefer not to split.

Colin

Ivan Shaw and G-SEKR

Ivan has been spending the last month getting G-SEKR ready for first flight, with adjustments to brakes and landing gear suspension. Parallel to that the LAA (Light Aircraft Association) have been requesting various 'checks and balances' backed up by quite a bit of paperwork. Just as he was 'ready to roll' there was a problem with the engine, which was sorted by a dedicated team from *Rotax* visiting the aircraft in Ivan's workshop, along with some sophisticated computer diagnostics.

Ivan is willing to speak to PEEMS next year to give some details of the 'trials and tribulations in getting the aircraft ready for first flight.

A photo of final gear retraction tests at Leeds East prior to first flight:.

Photo reproduced with kind permission of Ivan Shaw

BOC Mig Master 130 Turbo Conversion To Give A Switch From GAS to NO GAS , Making A Budget Mig Welder More Versatile For The Welder By Ted Fletcher.

This is what I did:

I had a piece of scrap brass about 75 x 110mm and used it to make the shaped piece and for the two links. The studs/nuts are 10mm. All the brass work is mounted on some ¼" insulation material, and it is fixed inside a medium size plastic box (see the diagram at the bottom of the page).

You will need a double pole change-over switch. I had used a DPDT square shape slide switch. I cut a square shaped hole in the front panel and mounted the switch in the hole. As this is only 24 Volts with low current, almost any DPDT switch will do. Left for ***NO GAS***, and right for ***GAS.***

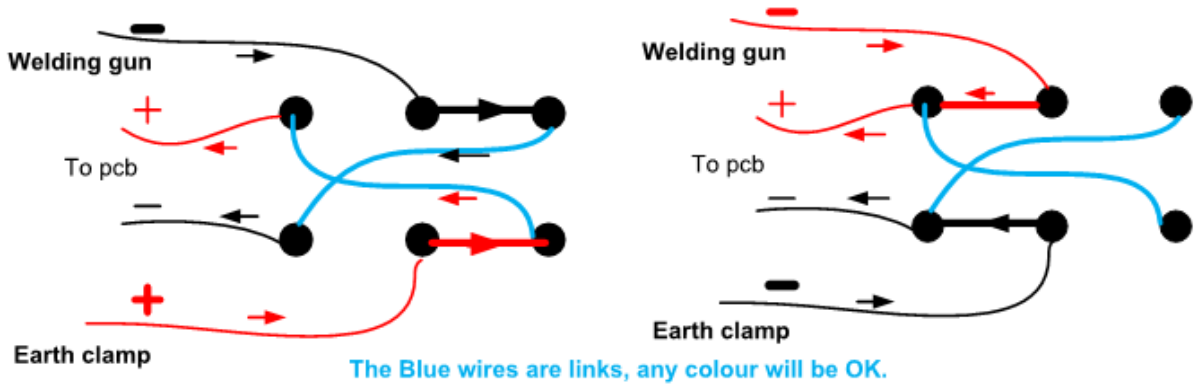
Now working on the *non-wire* side of the welder, I cut a 30mm hole in the central vertical panel and lined it with a piece of flexible cable outer. Then I moved the thick positive wire from the rectifier to the newly made brass plate, and fitted a new thick wire back to the rectifier. I did the same with the thick negative earth wire.

If you have a multi-meter, use it as a continuity tester, or you can use a battery and bulb to locate the switch terminals.

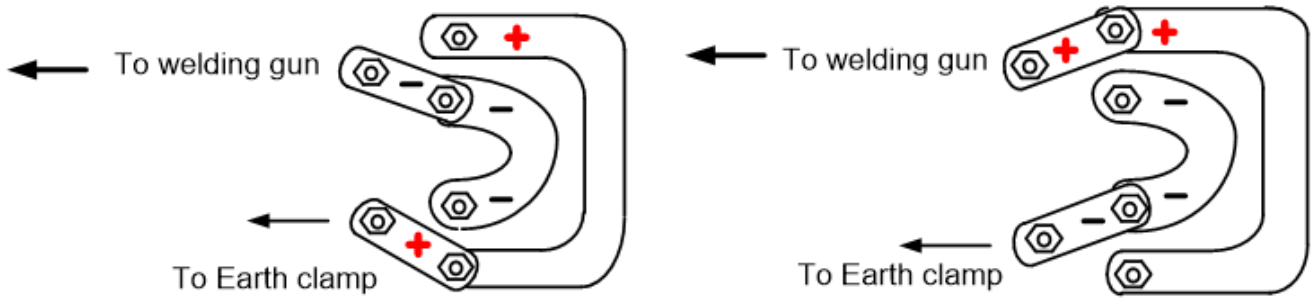
Using four different coloured wires, wire up the switch as shown in one of the two diagrams shown below. Either will be O.K., and actually both are one and the same. Note the cross connections/links, and also note the switch position which is the ***GAS*** one.

You need a centre wire, and one other, such that the meter will show a complete circuit, that is, zero ohms. Next, cut the wire which goes through the vertical panel to the wire rollers, and connect the centre wire of your switch to it. The second wire replaces the other end of the cut wire. Connect it to the PCB (Printed Circuit Board). I located the negative wire to the PCB, cut it, inserted the other centre wires to it, and finally connected the partner to the other end.

At the bottom of the PCB, there is a small connector, which connects the 24 Volts supply to the contactor. You can hear the contactor clanking in and out when the torch switch is operated.



The diagram above shows how the double-pole / double-throw switch maintains the correct polarity to the PCB.



No GAS ***GAS***

The diagram above is just to show how the output polarity of the welder changes, simply by moving the two brass links together with moving the front panel switch from left to right.

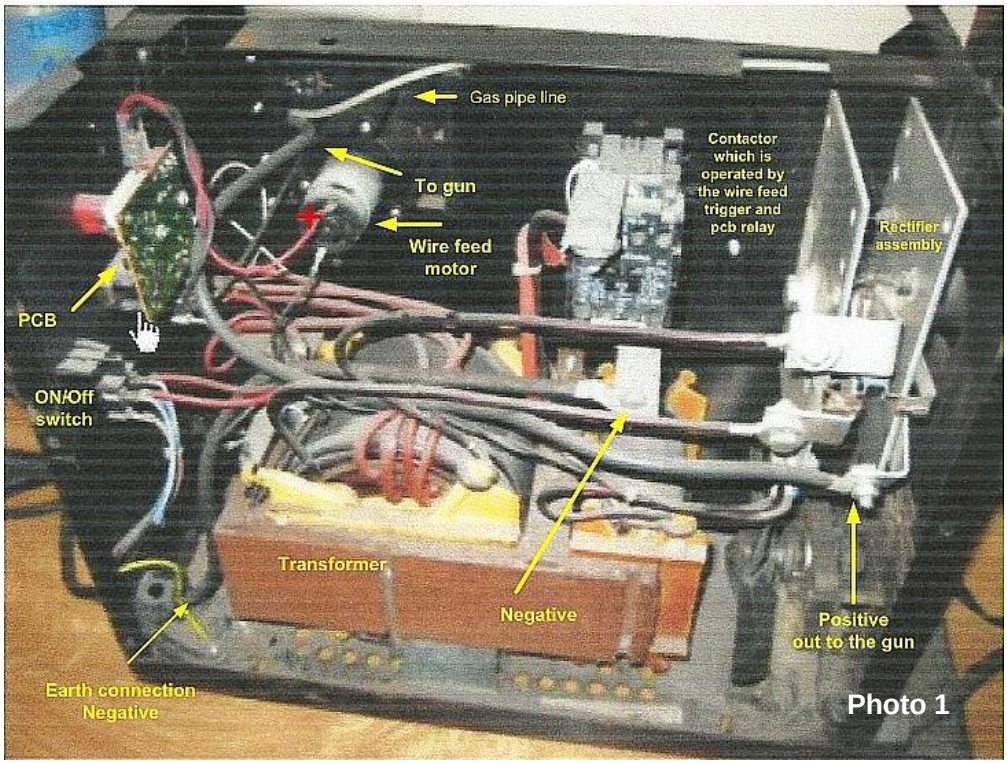
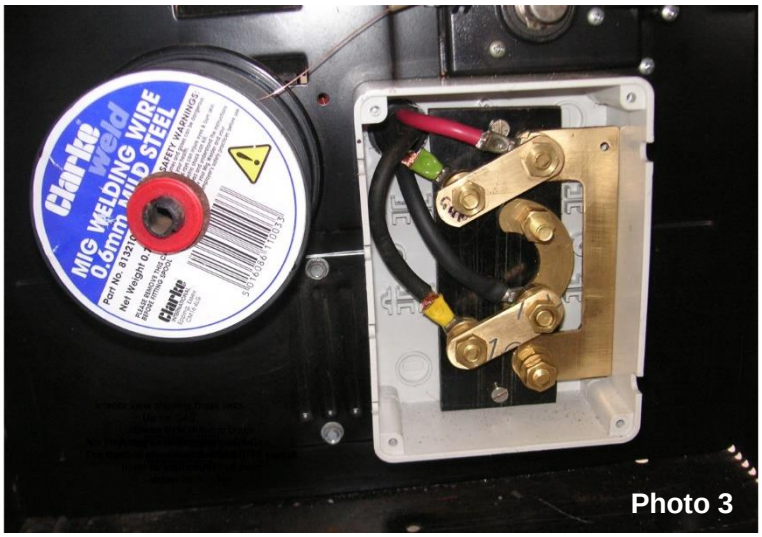


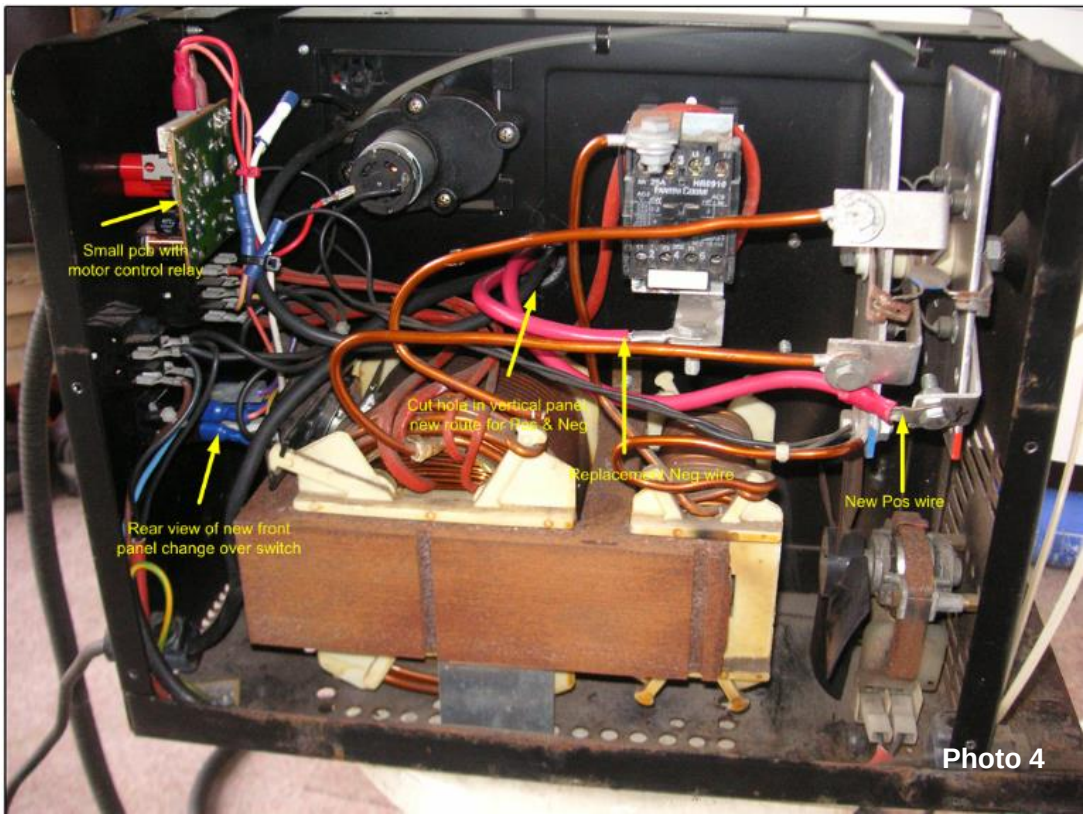
Photo 1
BOC Mig Welder Before Conversion To *GAS*/*No GAS* Option.

Photo 2
Mig Welder Front Panel Which Shows Additional Switch Which Maintains Polarity To PCB Irrespective Of *Gas* Or *No Gas.*

Photo 3
Mig Welder Links

Photo 4
Modified Welder





Why Do We Use A 50 Hz Frequency Mains Supply Here In The UK ?

Here in the UK the mains electrical frequency is 50 cycles or 50 Hz (the H = Hertz the German man who discovered it) and Tesla a Russian who discovered AC electricity.

Why 50 Hz ?

There are many reasons why 50Hz (60 is used in some countries) is a popular mains frequency. Several are due to the mechanical and electrical limitations of the early generators.

In the late 19th century when electrical power generation was in its infancy, the design of generating plant was severely restricted by the mechanical and electrical constraints; mechanical strength, bearings, and electrical insulation. Castings would have been of cast iron, not cast or fabricated steel, bearings would have been plain journals and electrical insulation would probably have been *Gutta Percha*. Generators would have been air cooled, not the hydrogen-cooled ones we have today.

50Hz is 50 cycles or rotations per second and this is the equivalent to 3000rpm. 3000rpm is a reasonable speed for the steam turbines that turn the generators. The modern final stage turbine blades can have an effective length of 2 metres and this means that the tip of the blade is travelling at around 630m/s or 1400mph. So, higher frequency (speed) would limit the maximum size of the turbine, unless the intermediate gearing was employed at additional cost. A lower frequency would cause filament bulbs to flicker noticeably.

So why not a higher than 50Hz supply?

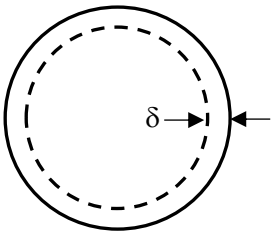
A significantly higher frequency (as used on aircraft, for example) would cause 'skin effects' in transmission lines and this would reduce their current carrying capacity or result in unwanted heating. At 50Hz the electricity only travels in the outer 9.2mm of the copper conductor, so anything larger than 18.4mm in diameter is a waste of material, unless it is there for mechanical strength.

To reduce weight and cost, many large conductors are made of copper - aluminium so that the electricity flows through the higher conductivity copper skin, whilst the aluminium core provides the mechanical support. You may have noticed, when looking at electrical pylons, that the conductors are often in groups of three, (all three in effect are one conductor), and thought, why not use just one conductor on its own? A single wire using the amount of metal per kilometre would have higher losses due to 'skin effect'. All conductors have volt-loss and heating losses, the more you enclose together, the more cumulative heating and volt-loss/drop. This means that cables in conduit, trunking and other type of enclosure have to be de-rated, which is so often ignored.

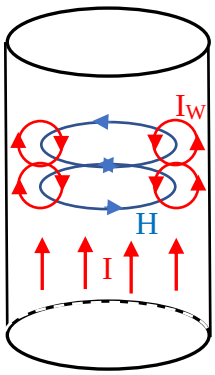
You may have noticed that motors made in USA, or for the US market, have higher speed than ours here in UK. For a 2-pole motor on a 50Hz supply, the theoretical speed is 3000rpm, and the actual speed is 2800rpm. The same motor on a 60Hz supply will be 3600rpm

In general terms it's OK for us hobby people to use a motor made for the US 60Hz market on our 50 Hz supply, and the same with transformers. The losses, however are different.

Poles come in pairs, you can't just have one, and just like a magnet you can't just have a north pole.
A 4-pole motor has a speed of 1425 rpm, and a 6-pole 960rpm.



Distribution of current flow in a cylindrical conductor, shown in cross-section.
For alternating current, the current density decreases exponentially from the surface towards the inside. The skin depth δ is defined as the depth where the current density is just 1/e (about 37%) of the value at the surface. It depends on the frequency of the current and the electrical and magnetic properties of the conductor



Skin depth is due to the circulating eddy currents (arising from a changing H field) cancelling the current flow in the centre of the conductor and reinforcing it in the skin

Army Manoeuvres And Further Holidays In Egypt:

One thing about the army, when I was in Egypt 1954, we used to have “right-wing, pro-British, stiff top upper lip” Saturday morning talks by senior non-commissioned officers. We were sitting down on the sand for maybe an hour or two, with bums getting stiff, while they were on a chair.

This particular Warrant Officer, who had gained the Military Medal for bravery, was telling us about being brave when under fire, not to panic, keep cool until you see the enemy’s eyes, then fire and not run away etc. He asked me for an answer and me not liking the army said I would rather be a live coward than a dead hero. Poor guy, he nearly exploded, and from then on I was a marked man.

Being stuck out miles from normal life I’m amazed we all didn’t go nutty, no radio, no newspapers (only when the officer had read them), basic cinema run by ourselves, and that was it. But after work and with no army duties, I was able to go to school and catch up on what I missed out on during WW11, so for that I’m grateful. The Army changed my life, as it did for thousands of others.

Following on from the holidays described in the May newsletter, we went again the next year. The airline tickets were the same price as the previous year, with same airline, and nothing had changed, smoking on the left, non-smokers on the right. The exchange rate was around LE 3.5/4 to £1 and could be better if you were prepared to haggle.

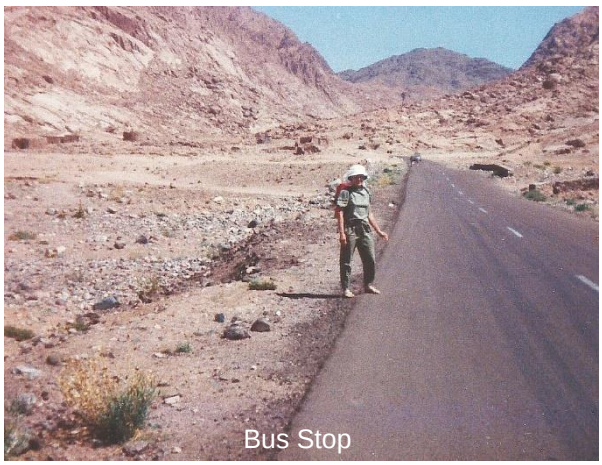
By this time our Arabic had come on in leaps and bounds, but not the written, no way. This time we planned to visit the Sinai desert, Mount Sinai (to see the stars and the Milky Way), and St. Catherine’s monastery. I wanted to see Arab dhows being made down the Red Sea. We were well prepared this time. We each took in our own rucksack a sleeping bag and fly nets, a plastic bowl, a plastic mug and a spoon (green for Mary and red for me). This was to avoid cross contamination should either of us get tummy upset.

On arrival at Cairo airport, we caught the No.8 bus into the city and headed for *Hotel Tulip*. Amazingly the night porter remembered us, and even our surname. In Egypt, it is a requirement to show your visa and passport on arrival at the accommodation. I don’t suppose they get many English tourists staying at *Hotel Tulip*, as almost all UK tourists would have been on a package holiday, with a bar and pool. At *Hotel Tulip* they have big old-fashioned iron bedsteads, marble top dressing tables, wash stands and a winding stair case around the lift shaft. It was all British Empire Colonial style. only Noel Coward was missing.

After a day or two in the city catching up in the museum, we caught the service train south to Luxor and Karnack, and stayed at same place as before. We visited some sites we hadn’t seen previously, and had a look in the mosque and climbed up the minaret. What a view of the town area and archaeological sites in the distance!

Two or maybe three days later, we caught a bus across the desert to Hurghada, which is on the East coast of the Red Sea. At that time, it was just a small town/ large village, with a few permanent buildings, a small hotel and a police station.

Catching a bus: Buses usually congregate on a rough patch of land outside of the towns with the mandatory tea shack. There were maybe twenty or more buses parked in a higgledy-piggledy fashion, and it is very easy for foreigners like us, to get on the wrong one. The signs, such as they are, are all in Arabic and our Arabic is limited, anyway no hiccups. On the buses there are signs *NO SMOKING* in several languages, and cigarettes are very cheap in Egypt as they grow tobacco. As soon as the driver gets on the bus, he turns on the radio full blast and lights up.


Bus Stop

The radio is very loud, especially when it is Friday prayer time, and it is so noisy everyone has to shout out loud. Consequently no one can hear, it’s just a noise, until passengers later fall asleep. Amazingly, on long bus journeys there are always tea shack/shops, way out in the desert under a couple of trees, a sort of small oasis. After a stop, on you go for another two or three hours to the next tea shack. There are never any toilets or hand washing facilities, water is too precious for such things.

Have you noticed which hand the Arabs use when eating and ever thought why? Once I was on a long journey and getting a bit desperate for a pee. It was in the back of beyond, out in the desert, with no signs of a building.
I asked the bus driver if he would stop the bus for a call of nature. Of course, he said, no problem at all, as though it was normal procedure. The bus stopped, the driver stood up and told ALL the men in no uncertain manner to get off, and to go to the driver side of the bus. The driver joined us men, then it was the ladies turn. They knew of the procedure, or so I am told, they stayed on the entrance side of the bus. After 10 minutes or so the driver shouted to the ladies to get back on, and after a pause, he led us men back on, and on we travelled, leaving some wet patches behind in the bright sun light.

Whilst chatting to the Egyptians, they often spoke to one another about us in a sort of joking manner, at their normal conversational speed, and as such, we were unable to follow the conversation. I asked in a very polite manner, what were they saying about me? In reply, they said, they were curious about my Arabic accent. When I told them of my time in the 1953/55 era, as part of an occupying force, and how we lads picked up Arabic from the workmen who worked alongside of us, they understood, with no ill feeling.

Until it was pointed out to me, I didn't realise the Arabic language has gender, also I didn't realise I was addressing everyone as a man, (Masculine) which had been causing some smiles.

On arrival in Hurghada, we booked ourselves in the "hotel" for two nights, then had a wander round and saw a crowd around one of the buildings. It turned out to be the local bakery. Hygiene isn't much thought about by the Egyptian labouring class. Anyway, we bought two chapattis which were cooling on the wall (aish) and four bananas. We each put two bananas inside the chapattis and ate them (delicious), whilst having natter with the children. The kids told us where the workmen hired their bikes for work, and asked us to take a photograph of them. Further down the coast was the location of the dhow builders. There was no proper layout as we would expect here in UK. Please remember the labourers are really so poor they don't own the bikes, but hire them day by day. Also, they only get paid for days worked, there are no holidays or sick pay and most men are hired on a day to day basis, so there is no regular work.

We hired bikes and found the dhow builders. On the sea shore logs were laying around. Some dhows were almost complete and others were just being started. Men were cutting up logs into planks, not a power tool in site, almost like Biblical times. One man was in a pit naked except for a rag across his eyes, the other man stood on top of the log with the minimum of clothes on. I'm sure you have seen similar things on TV. There wasn't a permanent building at all, the men who lived on site lived under four posts and a piece of damaged hessian dangling in the breeze.

Strange as it may seem to us, out in the blazing hot sunshine was a man with large wooden box on three bike wheels. On top of the box was a charcoal stove with a large saucepan full of vegetable soup, bubbling away. Two bowls for 10p but you had to have your own bowls. No problem for us, as we had brought plastic bowls with us from the UK. Tea is sold in glasses, no milk and lots of sugar. Where the man got his water from I have no idea, certainly he didn't waste it on washing up, it was too precious for that. A long hot interesting day. We returned the bikes back to the hire place. Then back to the hotel for a shower and a chat with the woman police officer. Her name was Mary, a Christian in a Muslim country, and she spoke very good English.

Next day we were wandering along the beach and by chance got chatting to a boat owner/fisherman, he told us he took tourists out on his boat to a big reef out at sea, where exotic fish are to be seen.

After some deliberation and much haggling on the cost of the boat hire, we decided to give it a go. The man and seven passengers, including a home cooked lunch of fish and rice, LE20 for the day. The boatman was proud to tell us he had a toilet for the ladies, which wasn't attached when out fishing, it was just for the tourists. So I/we managed to locate four Australians, mum, dad and two children on a year's holiday/world tour, and a young French lady. We arranged to meet at 06.00 on the beach. All turned up on time and away we went.
The boatman had fishing lines and plenty of offal as bait. He explained as best as he could, which fish were dangerous and not to be touched, and which fish to keep, as they were to be part of our lunch. Out we went for maybe two hours, no life belts, radio or compass, he just knew where to go. Fishing on the way, we caught quite a lot of edible fish, which the man kept ready for lunch. The dangerous ones were offal for future bait use.

On arrival at the reef we all jumped overboard and saw such exotic colourful fish. The reef was a sort of very big underwater vertical rocky wall with plants and fish everywhere. There was a fast-flowing current so we had to be diligent with the children, as it was easy for them to be washed away. The boatman had been telling us he would throw some offal in the water when we all got in, to attract other fish. What an experience we all had! We felt a bit ill at ease as we had never seen such a scramble of fish, some very big and some so tiny.

There are also sharks in this area of the Red Sea, so the boatman was on the lookout all the time. After a couple of hours, we had had enough of swimming, and the boatman suggested we go to a large sandbank in the distance where he would do the cooking. We larked about a bit with the children and soon the meal was ready, fish and rice, really good and of course lots of char (tea).

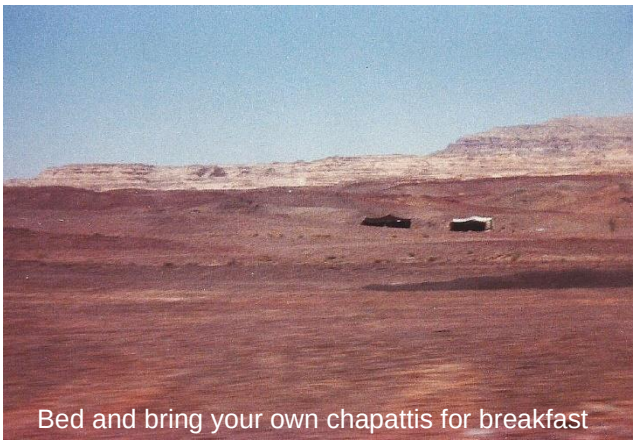
Much to the satisfaction of the boatman, the ladies tested the toilet and then he said, time to return to Hurghada. So, we upped with the anchor, (which was a large rock with a hole in it). The boatman pressed the engine start button and nothing happened. He did it several times, but unlike us he didn't appear at all concerned. '*In-Shaa-Alleh'* (God Willing) it will happen, he said. Knowing a bit about engines I asked the Australian man to lift up the floorboard at one end, and I lifted the other end. I said I would have a look to see if I could locate the problem. A little diesel engine and battery were below the floor. We both could see the problem, instead of proper battery terminal connections, someone had simply wrapped wires around the round battery posts. I told the Aussie to push the wires on his end with a piece of wood lying around, and I would do the same at my end. I then told the boatman to press the start button, and much to our relief the engine started. The boatman said I told you so, '*In- Shaa-Alleh'* (God Willing) would make it happen, and it did.

I asked Mary, which direction should we be going, and can you see land, and neither of us could. When we were on the bikes the day before, we had noticed a big hotel was being constructed further down the coast, and after maybe an hour we could see it on the horizon. Another wonderful day.

Smit-Tak a Dutch salvage company, have an ocean-going tug off shore at Hurghada, waiting for ships in distress coming up the Red Sea to the Suez Canal, and requiring attention.

Back again at the hotel for a shower, a clean-up and a rest, we enquired from the proprietor about a bus up to Suez next day. He said, turn up at 06.30 by the police station which we did. We just stopped a day and a night in Suez, to see some of the shipping passing along the Canal.

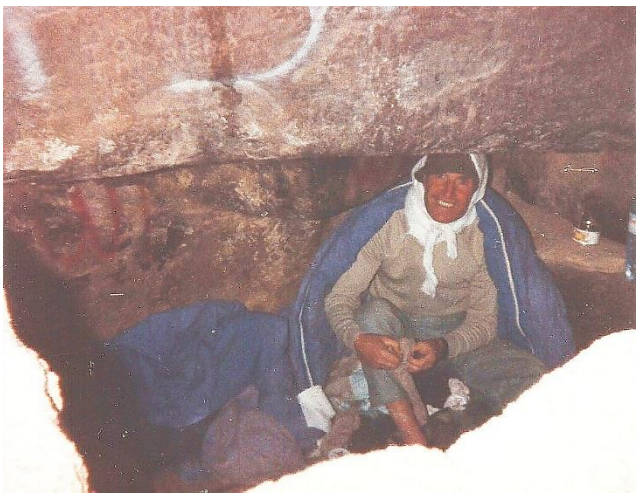
Next day we caught a bus through the tunnel and under the Canal to Sharma el Sheikh and Naama Bay both further up the Gulf of Akabar. This is an area of the Sinai desert where the Israelis and Egyptian fought over in the 1967 war. At the time we were there, the Canadian United Nations peace keepers had the only permanent building, and on the large metal gates it said: *"Don't bother to knock, as we won't answer you".*



Bed and bring your own chapattis for breakfast

Further up the coast, on the way to St.Catherine's Monastery and Mount Sinai, there were just two Bedouin families in tents with goats, and us two. It was very hot, even at five in the morning, and with no shelter from the sun. Again, after much discussion one of the men said we could sleep/shelter in his tent with his wife and family. Typical of Bedouin, you never see or speak to their wives. The reason for the visit to the summit of the mountain was because at that time, there was no artificial light at all in the area. I hoped Mary would able to see the Milky Way and the wonderful stars system, free from artificial light, as I had done back in 1953/55. The next day another bus took us to a location on the road, a couple of miles or so from the Monastery.

We had already decided to leave one of our rucksacks at the Monastery. We just took one bag, some bread, both water bottles, sleeping bags and slowly walked up the mountain. This took most of the day and we were very hot. I think it is 8625 feet to the summit. At the top there is a sort of man-made cave. Apparently when the monk's had undesirable thoughts, they did penance up the mountain, to clear their minds. They would go up there and lived alone, chipping away with hammer and chisel until their minds were cleansed once again.



Preparing to sleep on Mount Sinai

We saw the sun go down and soon the temperature dropped really fast, to below freezing. It was really very cold when it got dark, but we had prepared ourselves for it. There were several depressions in the mountain which sheltered us from the cold and wind. It was a good clear night, we saw the stars, the Milky Way and went to sleep.

By about 04.00 we were woken up by voices. Apparently there was a coach party of religious Israelis around. They had been all night walking up the mountain wanting to see the sun rise, just as we did. The Israelis were so cold, ladies in flimsy dresses and men in shorts. Soon the sun was up, a big ball of fire, and so was the temperature. We walked down the mountain by an alternative route and passed by little pools of ice, soon to be water once again. At the Monastery, we collected the other rucksack, and walked to where we could catch a bus back to Suez, Ismailia and ultimately Alexandria. This took us two or three days. Bus stops are just a real big boulder or just a place where the buses usually stop, nothing formal.

Alex is an ancient city and port, with lots of history. All the powers around the Mediterranean have been to Alex, the Romans, Greeks, Turks, and us British. We took the tram from terminus to terminus to get our bearings and noticed men working on the beach. The men were refurbishing rope or making new rope from washed up scrap rope. They took the rope to pieces and carefully reassembled it avoiding any joins, then spun/twisted it, as when making rope by hand in ancient times. This rope was 3 or 4" in diameter, of different colours and very long lengths. We had a chat with the workmen over a glass of tea, and were told they were unattached labourers hired by the day and paid each day.

From Alex we returned to Cairo by local train, which was slower than the bus but we wanted the experience. On the train were men, women, children, chickens, pigeons, plenty of fruit and vegetables, and wooden seats.

I won't attempt to describe the toilet. The train ambles along, stopping at large villages and small towns, an interesting experience meeting the real Egyptian people. On the train we were curiosities. Why would two English people want to ride with a lot of poor Egyptians, and obviously we were much talked about. The teenage passengers were keen to speak English with us. and that was good. How I wish English teenagers were more appreciative of their chances in education.

Back in Cairo for some Kushari before going to the airport. As we were catching the 03-30 flight to Heathrow, we didn't go back to *Hotel Tulip* but got a leisurely city bus to the airport 10p each.

We have done much the same in Morocco, Tunisia, Crete, Cyprus and Turkey. Arabic is good in Tunisia, not so in Turkey, although, many words are the same from Islam and the Koran. As before, we followed a BBC holiday maker's Turkish language course, and whilst in Turkey visited Effeces, Aspendos and other wonderful sights. We camped or rented a room, and travelled by local buses or dolmush. We spent a wonderful week in Istanbul as guests of a Turkish family, and were taken to all the usual places as seen on TV and much more. The Crusaders passed through Turkey on the way to Jerusalem and left their mark on the way. There are some complete castles/fortresses used by the Crusaders towards Syria. Wasn't Richard the Lion Heart one of them? The Knights Templar and Free Masons fit in somewhere. The Romans were also there, Aspendos is the most complete Roman coliseum I've ever seen. The Turks actually still have shows at Aspendos, one good thing you can have chat with your mate whilst on the toilet. To experience the hospitality of a Muslim family is a great experience. Also listening to a story teller, in spite of not knowing what he's saying is a good experience. To watch the faces of those who can, and to listen to the applause afterwards is good.

Ted Fletcher

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