NEWSLETTER

RETIRED CHARTERED ENGINEERS ASSOCIATION
WORTHING

Hon. Secretary: S. Oliver. Elphin, North Drive, Angmering, BN16 4JJ ☎ 01903 787116

FORTHCOMING EVENTS

26th Oct	Thursday	Coffee - with Partners at Beach Hotel, Worthing
1st Nov	Wednesday	Coffee - at Albion Inn, 110 Church Road, Hove
7th Nov	Tuesday	**Visit-** H.P.C. Engineering, Burgess Hill at 2.00 p.m. see pages 2 & 8 for information and application form
16th Nov	Thursday	Coffee - at The Spotted Cow, Angmering
24th Nov	Friday	**Cooch Memorial Lecture -** "Safety at Sea" by A. Crook 2.30 p.m. Worthing Library
30th Nov	Thursday	Coffee - with Partners at Beach Hotel, Worthing
5th Dec	Tuesday	**Talk** - "Railways in West Sussex" by W. Gage, guest at 2.30 p.m. Field Place
6th Dec	Wednesday	Coffee - at Albion Inn, 110 Church Road, Hove
11th Dec	Monday	Copy date for next Newsletter
21st Dec	Thursday	Coffee - at The Spotted Cow, Angmering
28th Dec	Thursday	Coffee - with Partners at Beach Hotel, Worthing
Every	Monday	Coffee at Denton Lounge, Worthing Pier

Coffee mornings commence at 10.30 a.m., except at The Beach, which is from 10.45 a.m.

We welcome the following new member:

2000 **RAPLEY, J.E.R.** M.I.Mech.E.,MCIT.,MILT. *7Carters Way, Wisborough Green, Billingshurst. RH14 0BX (01403 700425)* 1939 Service manager Morris distributors 1939-46 Warrent officer RAOC REME 1946-49 Chiefengineer phone car hire 1949-70 Managing director Perivale Motors Ltd 1970-75 Chiefengineer Godfrey Davis Post war commanding officer army groups RD workshop 23 CORPS troop workshop, army troops workshop Territorial army *Interests:* Travel, Gardening, Photography,Cuisine	

Will new members please check the above data and inform the Hon. Sec. of any errors or omissions so that the information can be incorporated correctly into next session's handbook.

Annual Subscriptions

These are now due. Please send your cheques for £12 to the Hon. Treasurer, R.P. Marshall, 28a Downview Rd, Worthing, BN11 4QH.

If you are not sure whether you have already paid, and to save sending out reminders, please contact the Hon. Treasurer on 01903 248516.

Visit to H.P.C. Engineering, **Victoria Gardens, Burgess Hill, on** Tuesday, 7th November, 2000 at 2.00 p.m.

HPC are a leading company in the use of CNC machine tools, which are used both in the production of hydraulic valves and sub-contract services for other companies.

Number of participants is restricted to 20 (first come, first served)
Successful applicants will be advised, please do not turn up if not invited
Members only, no guests permitted.

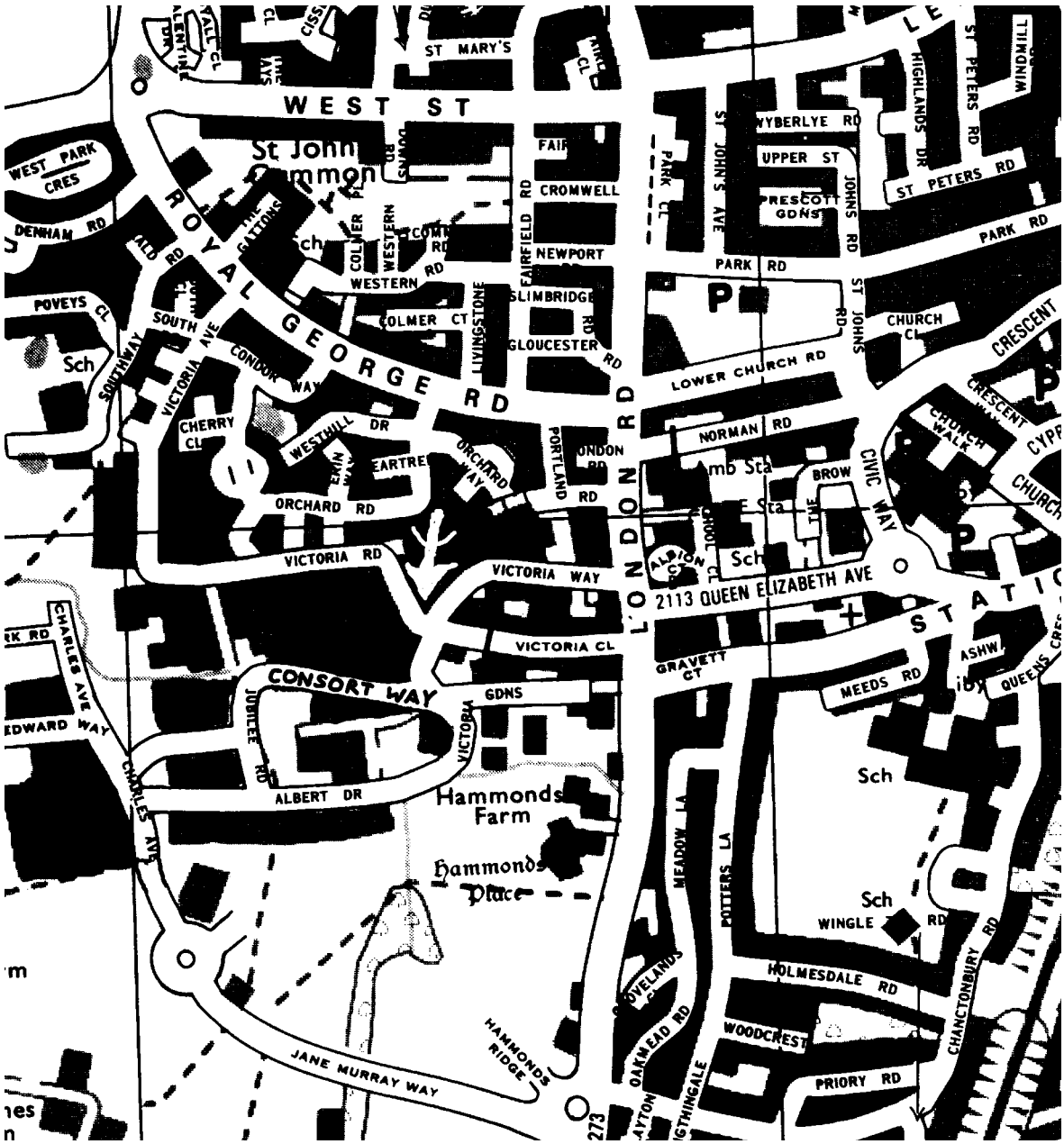
Car parking is very restricted on the industrial estate, please share vehicles. List of those attending will be supplied t o help in this.

Please fill in the application form on page 8 and return to K.J. Wheeler, 14 Musgrave Avenue, East Grinstead, RH19 4BS

Closing date for applications is 31st October 2000

Programme

Welcome tea/coffee in the boardroom with Jim Hunter, Director.
Overview of the company and the work currently undertaken.
Tour of Precision Engineering Division including the workshop.
(Jim Hunter, Ken Holt -Chief Engineer, Colin Smith-Production Manager)
Return to boardroom for light refreshments (tea/coffee, sandwiches and cakes)



A273 to Hassocks & Brighton

Cooch Memorial Lecture "Safety at Sea" by A. Crook, member, at the Worthing Library Lecture Theatre, on Friday, 24th November, 2000 at 2.30 p.m.

Arthur Crook is a Chartered Engineer, a Fellow of the Royal Institution of Naval Architects and a member of our Association and has a distinguished record in ship safety matters having carried out dozens of safety surveys on ships worldwide prior to the issue of the ship's Safety Certificate.

He acts as expert witness in legal disputes and still provides advice on ship safety matters worldwide. His lecture will highlight with the help of visual aids some of the events he has been involved in over the years.

"Railways in West Sussex" talk by W. Gage, guest, at Field Place on Tuesday, 5th December, 2000, at 2.30 p.m.

W. Gage is The Assistant County Archivist at the West Sussex Records Office and is a railway enthusiast, being Hon. Sec. of the Chichester and District Model Engineering Society and constructs live steam model railway locomotives in his spare time. This will be an illustrated talk where most of the material is unpublished.

A welcome return of Bill who will talk about the eccentricities of the "Selsey Tram" which ran from 1897 to 1935 and which never once ran on time.

Don't forget that any **Ladies** interested in the lecture are very **welcome** to attend as guests.

Recordings of Meetings

An audio tape cassette is made of all talks and addresses at each of our General Meetings, thanks to the good services of Eric Roubaud. These tapes are available from the Hon. Sec., but they only go back about two years, as the cassettes are reused.

49th Annual General Meeting - 5th September 2000

Synopsis of Presidential Address by Ken Wheeler called "No bangs on the briny"

This is the story of my company, Norcon (Norris) Ltd. In around 1968 we were asked to design a hydraulic directional control valve operated by low level electrical signals - 12volts or less, with minimal current.

Fig.1 shows a circuit for a directional control valve with its associated actuator where the actuator is normally dormant in its last selected position and moves in the appropriate direction in response to an electrical signal until the signal is removed.

Fig. 2 shows a typical conventional valve with its features which prevent the use of very low electrical signal power levels. An obvious solution is to use the hydraulic energy available to drive the valve spool by interposing a pilot valve having a 1.5 mm tungsten carbide ball, which is extremely accurate in terms of roundness, that when seated, no fluid passes between the ball and seat for pressures in excess of 5000psi. The maximum system pressure for the valve is 3000psi.

Fig. 3 compares a conventional valve with its pilot operated alternative. With the latter valve the ball is kept on its seat by a compression spring which when resisted by an energised electro- magnet allows the ball to come off its seat. System pressure fluid enters the spool's axial centre and exhausts through restrictors such that the pressure in the end chamber where the ball remains seated is that of the system and the pressure in the end chamber where the ball unseats is roughly 1/2 system pressure causing a powerful spool shift. The higher the system pressure the lower the electrical power required at the electro-magnet although most applications had system pressures of around 1000psi.

1968 began the age of the supertankers (VLCC's) and a primary problem was to control the opening and closing of the sluice valves on each of the ship's tanks in a pre-determined order On earlier ships this could be done manually by operating control wheels on deck but with around 200 sluice valves on deck lengths exceeding 500 metres some form of automation was essential. The snag was that electrical operation of hydraulic motors to operate the sluice valves takes place in a hazardous flammable atmosphere. There was also the extremely high cost of provision of conventional flameproof valves and conduit and switch circuits with attendant servicing and repair problems most of which would have to be conducted when the flammable atmosphere is present. It was at this time that an innovation in the British coalmining industry where providing the electrical energy passed through open switches and solenoids was kept to specifically defined low levels and such levels were guaranteed from the output from (by definition) an INTRINSICALLY SAFE Power Supply connected to certified IS devices using conductors having defined inductance to resistance ratios then conventional cabling arrangements with open switches etc could be used. For VLCC's this meant that cables between the IS PSU located in the safe area aft could be run in cable trays down the centre line of the deck. The first IS valve and IS PSU was made by Dowty the valve being a miniature conventional solenoid valve made to aerospace standards. A 24 volt IS supply was used, in our view the valve suffered from the inherent problems already outlined above with extreme filtration requirements due to low force spool shift. Along comes Norcon with their patented IS valve and proceeds to secure a substantial part of the market.

Fig.4 shows the schematic layout of an intrinsically safe system. All IS systems and components are certified by the appropriate national body, BASEFFA in the UK, manufacturers being licenced to produce apparatus to their designs and are subject to close quality control procedures and annual inspections. Equipment so made carries BASEFFA labelling and is accompanied by a copy of the certificate and a letter of conformity relating to the product's serial number on dispatch.

Fig. 5 shows the output curves for Norcon IS PSU's where the IIB case is the most used. Approved open contacts, electro-magnets and cabling connected in this circuit will not ignite an area containing flammable ethylene or the lower hazard, propane when operated.

Fig. 6 shows the sluice valve arrangements where manual effort is used to raise/lower the gate within the valve by rotating the handwheel. Powered systems replace the handwheel with a hydraulic motor, electrically signalled directional control valve and switches.

Building a business from scratch allowed for innovative use of manufacturing and accounting philosophies particularly cash flow accounting which were quite contrary to convention. We were unaware that other companies were working along similar lines and I only found out about it just as I retired. The definitions here are those now in common use.

Fundamentally, THROUGHPUT is the rate at which money is generated from sales.

OUTPUT is the rate at which money is spent on producing inventory.

Therefore it is logical to maximise the throughput and minimise the output. It is the flow of materials through the manufacturing process and not the utilisation of labour, which is important, and throughput is restricted by bottlenecks in production. Machine utilisation in the factory is not important, this just produces inventory. But, the maximum use of the machine in the bottleneck is essential as this determines throughput (goods completed and sold)

Outsourcing is the way to ensure that machine tools are fully utilised whereby the sub-contractor takes on other work from a range of customers requiring similar machining operations and Fig. 7 shows the relationship of resource allocation.

Ken Wheeler

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To: K.J. Wheeler, 14 Musgrave Avenue, East Grinstead, RH19 4BS Tel: 01342 321291

I wish to participate in the visit to **HPC Engineering** on Tuesday, 7th November 2000 at 2.00 p.m.

Full Name .....(Block capitals)

Address .....

.....

Phone No.....

Car sharing I can offer.....seats from..…….....I would like a lift from.....

Applications by 31st October, 2000