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*AVIATION SERVICE AND REPAIR DIVISION*

NEWSLETTER

of the

AVIATION

SERVICE AND REPAIR DIVISION

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## EDITORIAL

News of the Division's activities during the past quarter is rather brief, due in part, no doubt to diverted thoughts of summer-time activities and holidays.

For those who were able to "get away from it all", I trust you found the weather and excitement to raise any wilting spirits in readiness for another year. And for those who couldn't get away, (either for new bills to pay, old bills to pay, or just bills to pay) well, congested traffic, inflated prices and dictatorial landlords are all comforting thoughts.

Incidentally, I wonder how many noticed the two editorial faux pas which have slipped through recently. The first, was the reference to a drawing of a boy's face in the scraperboard article of the last NEWSLETTER. The drawing was omitted for space reasons but somehow the reference got overlooked. The second mistake appears on this quarter's reminder chitty. CONTRIBUTION is of course incorrect - even in a publications department. I apologise for both errors.

Finally, again the appeal. This first year's NEWSLETTER has not been the success it could be, but let us make up for it by having a bumper Christmas Number to give 1963 a good start.

To all who made an effort this quarter, thank you and keep it up.

A.C. ADAMS

Publications Department.

As those of you in the workshop are aware we have now started to receive items of Bendix PB.20 Autopilot for repair. This Autopilot is fitted to the Boeing 707 aircraft. El Al Israeli Airline has been the first customer to take advantage of our repair facilities and Cunard Eagle has also started to send in items. However, Cunard's 707 aircraft will now come under the recently announced Cunard-BOAC consortium though on a recent visit by officials from B.O.A.C. it was agreed that they should also send a major part of their equipments to us. There seems little doubt that other airlines will take advantage of this facility, adding up to a very large programme indeed. Some mention of our exchange contracts with B.E.A. and Rolls-Royce should be made and it can be reported that all is well. Input from B.E.A. has not been quite up to programme but this is mainly due to their having troubles with restricted services caused by the recent spate of strikes, lack of passengers and various modification programmes to the Vanguard aircraft during last winter.

As reported in the last issue of the News Letter our A.I.M. Gyro instrument project has now been passed over to Transport Aircraft Controls Division but we can record a first order received from the German airline Lufthansa just before transfer.

As mentioned previously numerous contracts are now with us from the Ministry of Aviation in connection with the Lightning and Buccaneer aircraft. This is the start of a repair programme that will last for several years to come. It has in fact balanced the situation in the workshop to a more satisfactory degree since up until now we have had a predominance of flowmeters. Even so that programme also is being augmented by a fairly large contract from the Air Ministry for the Gannet Flowmeter.

We have received some fairly large contracts to keep our publications people busy for some time to come, all adding up to a very healthy Division whose activities and interests cover an ever increasing field. With the maiden flight of the VC.10 recently achieved most of you will recognise a new project shortly to take place in our activities. Whilst the future prospect shows a very full order book we still have the problems of space to consider and, even with the new clean area shortly to be constructed in the new building, we shall need more room than we now possess.

The growth in the quantity and variety of the work carried out by the Division has made it increasingly necessary for drawings to be readily available at any time during normal working hours. It will be obvious that the correct issue number should be supplied and that there should be no delay in meeting a requirement.

The Air Registration Board also require us to maintain a Technical Record of all equipment handled by us and this is particularly important in view of our commitments to B.O.A.C. and Vickers in respect of the VC.10 aircraft.

The Divisional Manager therefore instructed Mr. E.G. Wallis to investigate the position and to make appropriate recommendations. These having been approved, an organisation has been set up to cover the requirements. With a staff of three, Mr. Wallis has started operations in a new block of office accommodation adjacent to the Divisional workshop, and since the two functions are entirely different from each other it is proposed to outline each in turn.

### Drawing Library

This is the focal point in the Division for the handling of drawings and all technical data relevant thereto. This includes all Specifications, Overhaul and Maintenance Manuals, Modification leaflets etc, etc. All requests for this information should therefore be addressed to the Library and it is the ultimate aim to be able to satisfy all requests within a few minutes.

At the moment we have something like 60,000 drawings in the Library and these are being added to at the rate of about 1,000 per week. On receipt, each document is registered by making out a Drawing Record Card - this is the card you sign when you draw something out. Drawings are filed either as complete units (Unit Files), or in strict numerical order, but if a drawing is included in a Unit File an additional copy is filed numerically. We are thus able to supply either the complete file of drawings or any individual drawing on demand. Both these series of files are kept up to date in respect of issue numbers and all superseded drawings are filed numerically in 'Old Drawing' files; no drawing is destroyed.

A card is raised for each and every document and when we are properly organised we should be able to locate any document immediately - at the moment we are not in this happy position but we do our best.

In addition to supplying information to our workshop operatives, buying branch, estimator and so on, we supply drawings and other information to the Training School and to our service engineers at out-stations. In fact, anyone who requires such information should contact us either personally, by letter, or by telephone.

As this is the Divisional Library, we are taking over the documents previously held by Technical Publications at Rochester to which the above remarks generally apply.

It is our aim to give you the best possible service in the future and I should be most happy to receive any constructive criticism and at a later date, to show anyone round.



## Technical Records

As previously stated, this office has been set up to meet an A.R.B. requirement and it is most important that only the correct information is recorded.

A Record Card is made out for every instrument subject to A.R.B. Release, whether it is new production or a repair or overhaul job. This card carries all relevant details - Serial no. , Type no. , Modification standard, Name of customer, Reason for return, etc, etc. In the case of repairs or overhauls, the Repair Order (R.O.) number is also entered on the card and the R.O. itself filed appropriately. Only one card is raised for each instrument so that after the initial entry, all subsequent entries are made on the same card. It will thus be possible to trace back the history of any instrument produced by the Guided Flight Group and also of any instrument made by an outside firm in respect of any movement within this Group. Obviously we cannot record its history whilst it is outside our orbit. Instructions are being issued to all the Divisions in the Group regarding the routing of information to this office and it is hoped that the importance of complying with this instruction will be appreciated by all concerned. Failure to meet A.R.B. requirements could have very serious repercussions on the Division and, possibly, on E.B.L.

The whole point of the exercise is that, in the unhappy event of an aircraft incident and an official enquiry being held, we should have to produce all the information we had regarding a particular item or items during the time it was within our control - the airline operator would have to furnish similar information covering the time it was within their control. Take a hypothetical example - an aircraft makes a belly landing because of an hydraulic failure and an enquiry is held. We will assume that the airline operator satisfies the A.R.B.

that all proper and reasonable care and maintenance had been observed - in other words they are in the clear. The failure being due, say, to the breaking of a spring in a micro-switch which had been fitted only fifty flying hours before, and after repair by E. B. L. We should then have to produce all our records which might show that we had replaced this spring. We should then have to show that it was made of the correct material and to specification. If we had made the spring ourselves we should have to prove that it was made from raw material obtained from an A.R.B. approved firm and that we had taken every reasonable precaution to ensure that the material was up to standard. If we could prove our case then the enquiry would pass on to the firm who supplied us and this would go on until it was clearly established that the failure was either an 'Act of God' or due to negligence on someone's part. I need not add that during this time the Divisional Inspection Department would be in a state of 'nervous twitch'.

In the case of instruments released to a Military requirement, E.I.D., only repair records are kept and the R.O. forms filed in sequence but a card is raised for each instrument upon which is recorded the R.O. number - again, only one card per instrument.

If we have received the R. O. form we can produce it almost immediately whether you quote the instrument number and type or the R.O. number.

I hope I have been able to show that, what we are trying to accomplish is not only worthwhile but of the utmost importance and I should be glad to attempt to clarify any points which I have either omitted or left obscure.

### Test Equipment

The workshop over the past six months has gradually assumed the proportion of a miniature "scientific laboratory" as no doubt some of you will have seen from the caption of the picture shown in the national papers recently. However, to come down to earth, we would just like to let you know that we are now the proud possessors of a Lec Cabinet which has a range of  $-100^{\circ}$  to  $+100^{\circ}$  centigrade and is therefore extremely useful for storing ice cream, if for no other scientific purposes. In addition to this piece of equipment we have also taken the plunge and gone in for ultrasonic cleaning having decided, rightly or wrongly, that ultrasonics are here to stay. We have settled for the Dawe's equipment which we find extremely useful, although we are still experimenting with various cleaning fluids in order to reduce the toxicity of the fumes which are given off during the cleaning process. Other recent additions in the way of test gear include a d. c. microvoltmeter which will measure d. c. voltages down to 10 microvolts. We sincerely hope that, we are never called upon to measure voltages quite as low as this but we have no doubt that some engineering product will call for this as soon as they know we own such test gear.

### Military Equipment

After much blood, sweat and tears on the part of the workshop staff, together with some external assistance, we have now produced our first Mk. 13 Autopilot Computer converted from Type 'A' to Type 'C'. We are extremely pleased that we are able to achieve this conversion and it is hoped, given a reasonable share of luck, we shall produce these at a rate of one every 7 to 10 days. Incidentally this Computer has raised the question of an absolutely pure

and stabilised d.c. supply and we are hoping to take delivery of such a power supply within the next 4 to 6 weeks. Apart from this Computer we are now busily engaged in "churning out" Autostabiliser Amplifiers, Throttle Actuator Amplifiers, Pilot's Controllers, etc. and shall be pleased to hear of any comments, adverse or otherwise, on the reliability and standard of our workmanship.

### Civil Equipment

We are not sure whether all the blame for this project can be attributed to the Divisional Manager but we are now becoming inundated with overhaul and repair work from the Boeing 707, from such airlines as B.O.A.C., Air France, Deutsche Lufthansa and El Al. This work has of course brought with it many attendant problems especially as some of the Bendix test rigs were "anglicised" by our test equipment section, but to date most of the work has gone reasonably smoothly and we are confident that given an adequate supply of good luck we should be able to meet all our commitments and prove to these airlines and any other interested customer that we

- (a) know something about the Boeing 707 Autopilot and
- (b) are capable of fault diagnosis and subsequent rectification or overhaul with a good standard of workmanship and turnaround in a reasonable space of time.

We are hoping that the experience we gain on the Boeing 707 will stand us in good stead with the forthcoming attractions e. g. VC.10 and B.A.C. 1-11 which of course contain a fair proportion of user items common with the Boeing.

From these few comments you will see that we in the workshop are not exactly on The "breadline" in fact our major problem at the moment is that our operators have only been given one pair of hands each. Since we are unable to modify them in order to give them two or three pairs of hands each our only alternative is to increase our labour force, and to this end if any of you know of any good instrument men whom you can "shanghai", or otherwise persuade that the Service and Repair workshop is "Utopia", we shall be extremely pleased to see them for an informal interview at which we can give them a fuller idea of the nature and complexity of our work and, in return, find out whether they are interested in joining us. Alternatively if you have any suggestions as to where we might recruit suitable labour we would be extremely grateful if you would either give us a ring or drop us a note.

How many of us I wonder, really know what "the other chap" does with his time ? We all have our own headaches but do not always appreciate the fact that everybody else has his own particular problems too.

Take my particular line of work, the major part of which is of course "The Budget". To explain in detail exactly what this entails would take the whole of this Newsletter, but briefly it takes into consideration every item of expenditure, from pins to plant and equipment, wages and salaries of existing and future employees, assessments of holidays, sickness, special leave, etc, etc, etc, — and of course estimates of £.s.d. coming into the Division from various sources The whole of this information has to be checked, amended, balanced, re-amended, re-balanced until it forms a reasonable estimate of the Division's performance for the next 12 months. The result of all this calculation, estimation, consternation and frustration is contained in a document consisting of about 45 sheets and 8,000 separate figures, each one of which is the result of several prior calculations. This is the BUDGET which now has to be approved by management. In the event of it not being approved, any or all of the sheets may have to be re-written. If (in answer to the Budget Officers prayer) it is accepted, then it forms the basis of the Division's financial control and must be adhered to in order to maintain a successful business.

At this point it is only fair to point out that the Budget Officer requires the fullest co-operation from the various Departmental Heads both in the preparation and execution of the budget. I am happy to say that in this Division I get it.

After this small insight into some of the aspects of my problems perhaps we can hear, in future issues, about other people in the Division, e. g. "How Managers Manage" or "How Editors Edit" or even "How Inn-spectres Haunt".

There is a growing belief among the Company's legions that there is "somewhere" to which people may be sent to learn the fundamentals of defending themselves when surrounded by trained wiremen in a production area.

This same "somewhere" contains .also according to legend, untold numbers of Royal Air Force personnel who seem to do nothing but appear at specified times to be fed, and ogle the female employees of the Company.

The "somewhere" is occasionally referred to as "overtheotherside", "over there" or "The Flying School".

In fact, all the above titles refer to the A.S.R.D. Technical Services School, whose situation on the side of the airfield remote from the main factory area has contributed to the rather nebulous nature of the School's reputation.

Activities at the School comprise mainly the running of formal courses of instruction on various subjects including Production Wiring Techniques, Aircraft Flight Control Systems, Missile Guidance and Air Data Systems.

During the School's short existence, some 600 students have completed training, ranging from periods of 3 days to 6 months duration, at Rochester and Borehamwood. Trainees have included personnel from the Army, the Royal Navy and the Royal Air Force, in addition to representatives from Companies such as English Electric, Associated Electrical Industries and Cunard Eagle.



The current Training Programme includes courses on all aspects mentioned above, and who knows, we may in future extend our activities into the field of Flower Arrangement or Domestic Science. Provided, of course we find a customer willing to pay!

## THINGS WE READ

Quote from "Mass Length and Time"  
by Norman Feather F.R.S.

R. W. L.

"The principle of the vernier is simply this:-  
if we have two uniformly divided scales, A and B, in contact, of equal lengths of A and B contain  $n$  and  $(n + 1)$  divisions respectively, and if in any arbitrary setting the  $p$ th graduation of A coincides with the  $q$ th graduation of B, the graduations being numbered in the same sense on A and B, then a relative movement of the scales of  $1/(n+1)$ th of a scale division of A ( $1/n$  th of a scale division of B) will bring the  $(p + 1)$ th graduation of A into coincidence with the  $(q + 1)$ th graduation of B, and may thus be detected. "

Phew!!!

Hours of Grace  
From a speech by Herbert Hoover

D.B.S.

Fishing is a chance to wash one's soul with pure air, with the ripple of the stream and the shimmer of the sun on the blue waters.

It brings meekness and inspiration from the glory and wonder of nature, and charity towards fishing-tackle makers. It brings mockery of profits; the quieting of hate and lift of the spirit. And it brings rejoicing that you do not have to decide a darned thing until next week ....

An Assyrian tablet of 2000 B. C. says:

THE GODS DO NOT SUBTRACT  
FROM THE ALLOTTED SPAN OF MEN'S LIVES  
THE HOURS SPENT IN FISHING

DEMOCRACY (Government of the People for the People)

R. M.

Have you ever stopped to wonder  
What it would be like,  
If we could run the shop ourselves  
Exactly as we like.  
Without the Boss's guidance  
And the orders of Big Jim,  
To do away with all R.O.s  
And write our notes on toilet rolls.  
To have a tea break every hour  
And have the say in all the power.  
To come and go just when we please  
And live a life of sleep and ease.  
To earn a fortune every week  
Even when the times are bleak.  
To smoke at all times through the day  
And heck to what the people say.  
To mend the instruments as they break  
With a rubber band and wooden stake.  
Or even with a tattered cord  
With permittance from the A.R. Board.  
And after the day's hard work and strife  
Go home to our beloved wife,  
And say to her without a grin  
What a hard day this has been!

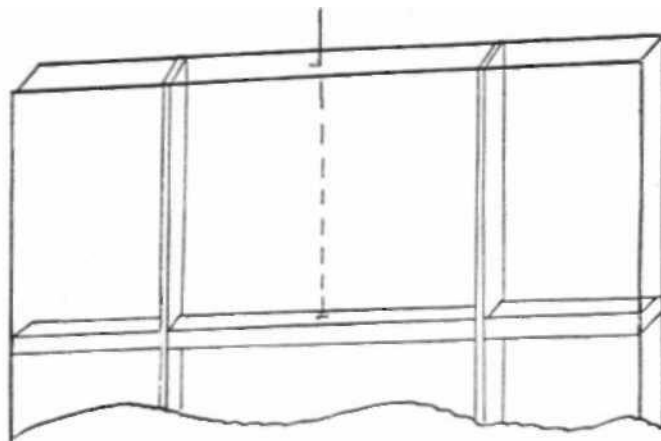
For the "DO IT YOURSELF" enthusiasts who may be interested in a method of fixing coat hooks, etc. to modern flush doors, usually made up on a light wooden frame and hardboard clad the difficulty arises when trying to pick up a cross member in which to secure the screws.

One solution is to drill a small hole, say 1/4 inch, into the top (horizontal) edge. A piece of stiff wire or rod pushed down the hole will then locate the uppermost internal wooden cross member. The depth of wire has only to be measured to find the fixing point.

Remember, however, that this depth is to the face of the member, so about 1/4 inch must be added for the screw position.

#### COMMENT -

Methinks I'll stick to the patent "moisten and press on" plastic type. The last time I tried drilling holes to locate a ceiling joist my wife enquired "Why the pegboard"? - Ed.



## BATTLES

### The Battle of Maidstone

J. P. P. T.

The battle referred to in this account is not the regular battle for parking space on a Saturday morning but happened long before the noise of an internal combustion engine was first heard in busy Week Street.

In 1648 Kent had largely Royalist sympathy and a number of Cavaliers, who had long awaited the opportunity, gathered at Tunstall near Sittingbourne where the young Squire Edward Hales was elected their leader in what was to be an attempt to overthrow Parliament and restore the monarchy. Later, on May 23rd, a meeting was held at Canterbury and a force collected on Barham Downs.

Parliament, deeply alarmed by these events, ordered Sir Thomas Fairfax on May 31st to advance from Blackheath and suppress the rising.

At noon on June 1st, with Hales now replaced by Lord Holland, and the Earl of Norwich to act as commander in the field, the Royalist force comprising 6000 foot and 1000 horse were encamped on Penenden Heath. Fairfax assuming that, the Aylesford crossing would be strongly held moved his forces towards East Farleigh Bridge but was observed by Norwich who despatched some 3000 men to Maidstone and others to Farleigh and Aylesford. At Farleigh the Royalists were soon overcome and Fairfax pushed on towards Maidstone along the Tovil road meeting stubborn resistance all the way. It took the Parliamentary forces two hours to advance from East Farleigh Bridge to Maidstone where at 9.00 p. m. the battle began in earnest. Yard by yard the town was defended as Fairfax fought his way down Stone Street and up Gabriels Hill to the main street. The Royalists were driven from their posts until the last stand in St. Faith's churchyard was broken.

By midnight it was all over and three hundred Royalists were killed or wounded and over 1,400 taken prisoner. Parliamentary losses were probably less. With the fall of Maidstone the Royalist cause in Kent was lost. What remained of Norwich's force marched towards London to join the men of Essex who had also risen but the rising was eventually defeated and Kent gave trouble no more.

### "TO THE FEW"

A. C. A.

The big blue sky became lacerated with a distorted pattern of vapour trails, like skate marks on some huge ice-rink. Long curving arcs denoted the evasive change of course by Heinkel and Dornier, with a sub-pattern of tight turns, slips and skids where the Spitfires and Hurricanes probed to seek a chink in the aerial armour. This was the each-and-every-day scenario of the struggle which has come to be known as the Battle of Britain, fought over these very same Kentish skies, and reached its climax in September 1940.

A few months earlier the British Lion had got its tail thoroughly twisted and was finally booted out of immediate action at the evacuation of Dunkirk, The "blitzkrieg" policy of the German, plus more than a hint of treachery within the Allies, had overwhelmed the complacent half-hearted preparedness with which we had imagined to beat the enemy in a few months - or a year at the most. In June 1940, the last resistance ceased on the mainland of Europe, France had fallen and Britain stood al one.

We were not however completely stripped for, years earlier, the hand of Providence had placed inventive genius in the grasp of gifted men who, despite frustrating apathy and often downright opposition from high level "brass", now gave birth to RADAR with which to detect and give early warning of

approaching enemies, and two superb fighter aircraft to combat that same enemy.

Additionally, we now had as Supremo of all command, that bulldog warrior Sir Winston, who by his very tenacity filled the entire nation with a determined, cheerful and undaunted spirit of retaliation.

Finally, and probably the greatest of all factors, there were the "few", the men who flew the Hurri and Spit during that crucial phase of the war. Young men - few of them older than 25 - who preferred not to take either the dangers or the achievements seriously, but were endowed with a restless spirit of aggression and a passionate determination to repel the invader. It is estimated that all told the "few" numbered not many more than a thousand; a very thin BLUE line which stood between us and complete disaster.

Day after day the dispersal tannoys blared out the battle-cry SCRAMBLE! SCRAMBLE! injecting tired limbs and bodies with desperate boosts of activity. The only respites were the short brief spells during refuelling and re-arming, then off and up again to seek, find and destroy.

The short summer nights afforded the pilots little more than restless dozing, indeed with nerves and senses keyed to the pitch they were, sleep in the normal meaning was an impossibility. Meanwhile ground crews laboured to patch, coax and curse the machines into readiness for the inevitable next day.

Slowly the days passed into weeks until the heavy losses convinced the Luftwaffe Command that. England was not the easy nut they had cracked in the other countries of Europe.

Operation SEA LION (the code name given to the military invasion of England) was suspended and attention turned to the indiscriminate bombing of

towns and cities in an attempt to crush civilian morale and force a surrender by sheer fright and chaos. This plan failed too though many of us retain a memory of the horror it cost - but that is another battle and another story.

If there is such a thing as a winning side in any battle, then to this island came the victory. By superior equipment, good leadership and devoted service on the ground, in the factories, the repair shops, the radar stations and operations rooms.

To each and every factor must go a share of the ultimate reward, but particularly during this week, commemorating the Battle of Britain, let us single out the one factor and re-echo the words of that great old man who, in 1940, rose to a cheering House to give the news of Victory and said:-

"Never in the field of human conflict, was so much owed by so many to so few."



## SPORT

Cricket - A.S.R. versus A.E.I.D.

J.T

On Wednesday May 30th twenty good men and true (not True) assembled upon, or to be more accurate descended upon, the "Civil Service" sports arena to decide finally, by feats of skill and great daring, exactly which was the superior section.

The result of this match, although now history, will long be remembered as a lot of self-professed gladiators "dashing" about and proving only that neither section will ever play at the Oval.

Members of the section can however take solace in the fact that during the soccer season, after taking on all comers, we can boast the proud record of never being beaten, and only one game ended in a draw.

P. S, The beer-ups after the matches aren't bad either.

Matter of added interest..... "We Was Robbed".

## ODDMENTS

It may be of interest to note that one of the girls in the Commercial Office has done her bit to forge closer relationship with the Workshop, by announcing her engagement to one of the Inspectors, namely Miss I. Burns and Mr. J. Spice, on the 5th July, 1962.

All members of the Department extend their warm congratulations and heartfelt good wishes for the future to this young couple.

It is noted with pleasure that Mr. T. Farbrace, Chargehand in the Repair Workshop, has recently started his own production line - by becoming the proud father of a 7lb baby girl.

## WORTH A THOUGHT

A. H.

"When you're the anvil, be patient: when you're the hammer, strike"

- Urdu proverb.

"Only the tall bamboo can bend" - attributed to Confucius.

"A cooking pot needs at least three stones to balance upon, which is why a man's happiness is precarious with one or even two wives"

- Burmese saying