

C FLIGHT

# TEE EMM



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*Pilot Officer Prune says—  
"Take Tee Emm regularly!  
Prevents that Thinking  
feeling!"*



AIRMANSHIP • GUNNERY • TECHNICAL • INTELLIGENCE  
CREW CO-OPERATION • NAVIGATION • ORGANISATION • ADMINISTRATION, ETC.

*"I hope that these Training Memoranda will continue to be as widely read and studied as they have been during the past two years. It is impossible to exaggerate the importance of constant training in ensuring the highest operational efficiency."*

*Air Chief Marshal, Chief of the Air Staff*

## PAPER WORK IS NECESSARY

**I**N our last issue we published a letter from a Flight Sergeant. He had a bit of a bind about certain Squadron and Flight Commanders—perhaps not entirely unjustified. For the gist of his complaint was that many Squadron and Flight Commanders who are keen flying types have, rather naturally, either a horror of, or contempt for, paper work, office organisation, administration, and so on. They want to get on with the job—fighting or bombing the Hun in the air, not sitting on their fannies at a desk mucking around with bump.

But to maintain any unit as an efficient fighting machine there *must be* administration; administration in turn means organisation; and organisation demands a certain amount of office work. The efficient Squadron or Flight Commander, therefore, is one who not only keeps his unit efficient in the air, but also on the ground and all that that implies; and who realises what it does imply, and does not neglect or despise that side of his job.

Darn it all, if he can fly a Spit or Halifax, bomb Berlin, or lead a unit into action, surely running an office should be easy?

This month, therefore, we start publishing (on the next page) a series of articles designed to help those who are grappling with, or may have to grapple with, office work—and don't think much of it at that!

## BUMPH SPEAKING . . .

### I

**P**PROMOTION brings something more than higher pay. It brings more responsibility—and with responsibility comes administration. During the coming year many a chap will be elevated to a position where—for the first time—the spectre of office work “rears its ugly head.” To many it will be a bind—but it need not be a headache. The purpose of this and following articles is to give a few practical tips which will enable you to do your office work well and quickly.



### BEFORE YOU START

#### RE-ORIENTATION

First of all, do re-align your ideas and accept the fact that *a certain measure of office work is essential*. Don't kick against the pricks. Get down to it and master it. It is something that has got to be done and you at the moment are the person who's got to do it. If you look on office work that way it may be some consolation.

#### THE PLACE

Your office may be crude—even in a packing case—but that doesn't matter. It's what you do in it that counts. But untidiness—even in, or rather, particularly in, a packing case—*does* matter, and will inevitably slow you up and cause muddles: so keep the place tidy. Cleanliness is often unattainable with twelve inches of mud outside, but do your best.

#### THE FURNITURE

Don't imagine that any office you may be given will always be beautifully furnished and all ready for you to get cracking. It may easily be a new Nissen hut bare of everything, or an old office, long empty, from which most of the furniture has been swiped by ardent collectors in other rooms. Your minimum requirements

are something to sit on, something to work on, some means of sorting your work-on-hand, and some place to lock things up. That's all (except for a nail for your coat). So if you have not got any of these things, go to whoever holds the Form 22 (List of Furniture and Barrack Equipment) and tell him that the Senior Equipment Officer possesses a very nice book called A.P. 830, Vol. III. And in Part B, Scale B185, Column 4, he will see what an officer's room ought to have. Many of the nicer tables and things are now reserved for Air Vice Marshals and above—the best of anything being considered good enough for them—but what you can get will do.

Under Section 21B you can get a suitable table (Ref. 898). This has no drawers. If lucky, you *might* get a green-topped table with three drawers. Next, get two Suffolk chairs (Ref. 952). One is for you and the other for any senior officer who comes in and natters. Your juniors, of course, stand. Your equals sit on the table and muck everything about.

To sort your work-on-hand get three letter trays (Ref. 956) which is the minimum number you can do with. A lock-up filing cabinet (Ref. 967) is useful, or failing that, a common cupboard (Ref. 959). A broom is Ref. 862, should you want to spring-clean, and if you have a stove you will want (under Section 21C) some fire-irons (Ref. 420 and 515), a coal-box (Ref. 65) and a coal-scuttle (Ref. 495). A 4 feet by 2 feet notice board is necessary if your walls are other than of wood. Its section and reference No. are 826. A bottle of ink, pen, pencils, some blotting-paper—and there you are. Your workshop is complete. Now for

## HOW TO GET TO WORK

### NOTEBOOKS

Provide yourself with two notebooks and use them like this :—

(1) A rough book in which you should make notes of instructions given to you, or of things which concern you at conferences. Make your jottings brief *but complete*—also legible, if you have that sort of hand-writing—otherwise you may not understand them yourself. And when you have carried out whatever you had to do—neatly strike through the note. Above all don't forget to reach for your book the moment you get a telephone call and write down the caller's name and business. Not only do many instructions come on the 'phone, but you also are apt to say you will do things which, if you don't write them down at the time, you may forget. And it's always a useful record of who telephoned you when about what.

Glance through back pages from time to time to see if there are any notes not struck through, and get cracking on them.

(2) A permanent notebook in which you can record things of a permanent nature. All the different things required of you in your work should go in it; extracts from A.M.O's (of which more anon) which concern you should go in it, too. It should, in fact, become a private manual of your job, and very useful you will find it—especially if you run through it periodically as a refresher. When the book starts filling up you may find it necessary to re-write the contents. If so, arrange the notes under alphabetical headings. This will make for quick reference.

In addition to these two notebooks you *must* have a pocket diary—not for use as a diary, but as an appointment book. If a return is wanted on the last day of each month, enter the requirement on the last day of each month in the diary. If you have to report somewhere or attend a conference, note it down with the time and date. All other forward dates should be entered, but this entering is valueless, of course, unless you *use* it. So, make a habit of looking at your diary *every evening* to see if there is anything booked for the following day. Don't leave it until the next morning. The conference you find you are due to attend may be earlier than you are—and have started already!

In further articles we shall give you some tips on how to organise your desk, your correspondence, and your filing, how to write reports, on how to take over and hand over, and many other matters which we hope will be of use.



## DINGHY DRILL DOES SAVE LIVES

**T**HE wife of a sergeant whose aircraft crashed in the sea when returning from a raid on Duisberg last July has sent us a letter written from Germany where he is now a P.O.W. He received a knock on the head as they ditched, and one member of the crew unfortunately wasn't seen again, but the other five were saved. After saying in the letter how thankful the writer is to be still alive he goes on:—

"The thing that saved my life in July was the crew drill I had been taught in the R.A.F. and I cannot pay too high a tribute to the R.A.F. for this, and I should esteem it a great favour if you would pass this tribute on to the Air Ministry in a letter on my behalf, as if only young crews can have this very important duty impressed on them, I'm sure more lives will be saved. The crew did everything they had been taught and they tell me I released the dinghy after I had been hit. This action was entirely automatic and could not have happened if I had not been well trained, and I leave you to imagine what the result would have been to me if there had been no dinghy, so please do just write a line of appreciation to Air Ministry for me. I know they will like to know their efficient training has saved five lives at least."

Well, there it is straight from the stable, and through the medium of TEE EMM we have pleasure in passing it on (i) as a pat on the back for all instructors who sweat at training air crews in the sometimes boring and monotonous drills for ditching; (ii) as an encouragement to captains to see that their crews constantly practise said drills; and (iii) as a Thought For To-day for all young crews who may feel that they needn't bother too much about learning their dinghy drill, they'll manage somehow, if the worst comes to the worst.

## LAY OFF THE BOYS!

**T**HIS isn't a warning to some forward young frippet that she should devote less of her time to chasing after the opposite sex. As a matter of fact, we've spelt it wrong: we meant to say "Lay off the Buoys!" and we mean it as a warning to pilots to spend more of their time practising their marksmanship in the correct methods and less time shooting at inoffensive navigational buoys.

It's quite true. Complaints are repeatedly coming in from the Navy of their buoys being sunk by friendly aircraft. Is anyone among you reading this guilty of buoy sinking? If so, for God's sake pull your finger out and think of something else instead—something that at very least will have no effect either way on the war effort instead of definitely hampering it.

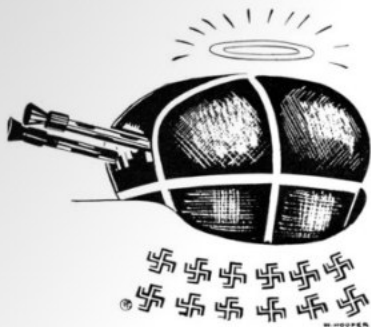
For when you light-heartedly fire at and sink a buoy the Trinity House vessels have to spend a whole arduous day—often a risky one—replacing it; and two more such days have to be spent by mine-sweepers assuring a safe passage. Would you honestly care to meet these crews on their return, cold, wet and tired from the job, and say "I'm the chap that's responsible for your extra work. I just did it for fun or for the odd spot of practice?" Would you face what they'd have to say—or possibly do? We doubt it very much.

And that surely means that it isn't quite so clever after all. There are plenty of people in this world already who are pretty good at doing silly things as long as they're not found out and don't have to face the music, without you joining the gang. It's just as bad if not worse than ringing a fire-alarm bell and running away—and we're sure you wouldn't be guilty of that.

So for the sake of our good relations with all foreign powers—including the Trinity House Brethren and the Royal Navy—please give the game a miss!



## THE DUTIES OF A GUNNERY LEADER



*Continuing the article we started last month from a pupil who has recently completed his Gunnery Leader Course at C.G.S.*

**L**AST month we were talking about the training scheme which the good Gunnery Leader will inaugurate and keep going in his Squadron, and dealt in particular with the class-room work and ground training. But no training scheme for operational A.G.'s. can be complete if it merely turns them into "land-lubbers." Naturally it would be ideal to do all their training in the air. In practice the opposite is nearer the truth. Still, whenever compatible with aircraft requirements, a G.L. should endeavour to get his gunners "off the deck." Drogue, air-to-ground and air-to-sea firing and fighter affiliation are indispensable where efficiency is desired in shooting down the Hun.

A.P.C.'s. have been established by Coastal Command to provide facilities

for air gunnery practices and can be approached, either directly, or through the Group G.L., and it is their main joy in life to provide target-towing aircraft. Bomber Command has its Group Gunnery Flights purely for air gunners, and you can arrange attachments of your air gunners to the one in your group when possible, whereby they will receive full refresher training in concentrated air gunnery practices. The instructors in the A.P.C.'s. and G.G.F.'s. are a very hard-worked body of men, and what with the insistent demands on their time and uncertainties of ops, it often will be difficult to fix a date. Still, if at first you don't succeed . . . and Rome was not bombed in a night—even if Cologne was.

For air-to-sea or air-to-ground firing, full use should be made of any non-operational flights, such as air tests, cross-countries, bombing practices, etc. This should provide no difficulties. With regard to fighter affiliation, two possibilities present themselves to the G.L. Firstly, to contact some roving A.F.D.U. "circus," or secondly and more likely, to interest the nearest fighter station in the benefits this form of exercise confers on them as well as on the gunners. If both fighters and A/G's are equipped with cine-cameras, close study of the films by both together should not only prove instructive, but should give rise to interesting discussions too. The astute G.L. will realise, when arranging these "parties," that a telephone call is better than a letter, and a personal interview preferable to either. In fact, "guest night" in the Mess will provide

him with an ideal bar at which to plead his case.

So much for the various forms of training, improving and maintaining the efficiency of A/G's. A final word of warning. No amount of training or practice is effective when done half-heartedly or spasmodically. Therefore frequent, though small, doses should be the rule, and a well-thought-out training programme to fit in with ops. is essential. Rosters should be made out for the various "synthetics" and bad flying weather utilised to the full. Once you allow your A/G's to get slack, it will be twice as hard to revive their interest. And a bad example acts like a boomerang.

All men, however keen, need supervising, and a lot of time will be spent by G.L.'s checking up on dirty guns, spotty perspex and turret serviceability. The importance of keeping both clean cannot be over-emphasised. In this connection, he frequently will come up against moans, voiced by the less industrious and garnished with epithets and excuses: "Why cannot the armourers clean the guns." Maintaining the peace between ground staffs and aircrew is often difficult. Ignorance breeds contempt—and an A/G who has helped to bomb-up his kite, harmonise his guns or fill and bleed the hydraulic system will be a wiser and

better man and will be inspired with more confidence in his equipment and himself.

A large part of a G.L.'s day is spent in an office dealing with A.M.O.'s., arranging practice training, A.O.'s., returns, reports, correspondence, etc. This is, unfortunately, essential work, and, though savouring of red tape, should be dealt with promptly. If allowed to accumulate, it becomes overwhelming and intractable.

After attending to all his duties, it is a very tired G.L. who staggers back to the Mess at the end of the day to revive his flagging spirits with a well-earned pint. Picture him then, replenished tankard at his elbow, happy smile on his face, shooting a horrible line to an admiring audience of the successes of "his boys"—content in the knowledge that the losses in his squadron have been reduced to a minimum, and in the firm belief that his are the best A/G's in the R.A.F. And, on retiring early to bed, preparatory to next day's ops., if he should dream of Messerschmitt after Messerschmitt falling out of the sky in flames, with a chorus of Mr. Cochrane's Young Ladies, dressed in one-winged brevets, singing "This is Worth Fighting For" in the background, who are we to grudge him that? After all, Gunnery Leaders are only human . . . !

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#### PRINTED LECTURE NOTES

ONE of the most difficult things in the world is lecturing well if you don't happen to be born a lecturer. Nevertheless it has to be done. To make things easier for those who don't take to it like ducks to water a series of twelve "Printed Lecture Notes" have been prepared under the above heading. All you have to do is to get copies and study them, and there you are. Then you've only got to put the stuff over!



## TEE EMM'S Brains Trust

*Tee Emm, being an official publication, everything in it appears with the approval of the Air Member for Training and represents official views on policy. This page, however, we reserve for occasional unofficial correspondence—criticism, comments, suggestions, queries, and so on—to which we have tried to dig out an official reply.*

LETTER. "In the good old days before the war when I used to fly Air Liners, I was a great advocator of the Dalton computer. I was very surprised to find when the Air Force adopted this instrument that their method of operation was quite different from mine, and to my mind very much more complicated.

"I have explained my method to many people who have been having difficulty with the Dalton, with very gratifying results, so I submit it as a suggestion.

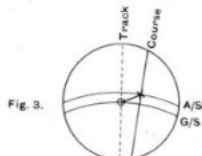
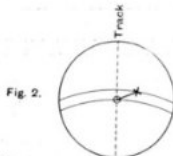
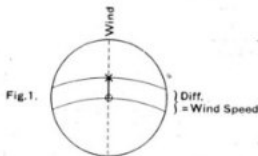
### FINDING COURSE AND GROUND SPEED WITH THE DALTON COMPUTER

1. Set wind and wind speed towards the centre (Fig. 1 below).
2. Set track on centre line (Fig. 2 below).
3. Set air speed on end of wind (Fig. 3 below).
4. You now have a perfectly straightforward triangle giving track and ground speed, course and air speed.

Example :

Wind.	. 010° 20 kts.	} {Course . ?	
Track	. 300°		} {A/S. . 120° kts.
G/S.	. ?		

1. Set outer ring to 10°.
2. Set 100 kts. on centre.
3. Mark a "X" on centre line at 120 kts.
4. Set track (300°) on outer ring.
5. Set 120 kts. at "X."
6. On centre line you now have track 300°, G/S 115 kts.
7. At "X" you have A/S 120 kts., and a course of the track plus 9°, i.e., 309°. Straightforward and easy, with no juggling."



REPLY. Whilst agreeing that the writer's method is sound for this type of problem it is inevitable that the experts will always discover more convenient methods in the light of their experience that are shorter and easier than the standard ideas laid down.

Several reasons for not putting the track on the centre line of the computer are set out below :—

- (i) The previous computer in standard use, the C.S.C., has the course on the centre line, and any changeover would complicate instruction and confuse pupils in the basic stages where both are used.
- (ii) The multiple drift method for finding wind speed and direction would be most awkward by the new method, as each course would have to be converted into a track before plotting.
- (iii) Confusion might be caused in using the suggested method when drift is considered. Although the writer's "X" comes to the right hand or starboard side, the drift is in fact to the port.
- (iv) One of the best features of the Dalton computer is that there is a perfectly straight-forward relationship between the port and starboard sides of the computer and the aircraft.
- (v) Consider this in the case of finding wind speed and direction from the track and ground speed. The drifts in this case must be reversed as in (iii).
- (vi) Finding track and ground speed from course and air speed would, by the writer's method, require "juggling," to which the writer objects.

## *Is Your Accident Really Necessary?*



**Never let a Wellington meet its Waterloo!**

## LIGHTNING AND COMPASSES

IN an article we wrote some time or other in TEE EMM—we're too lazy to look it up at the moment—we talked about lightning and its effect on aircraft. As far as we can remember, the principal effect was outlining in blue fire—a thing which happened to us once when we were fumbling for a light-switch and found someone had removed the cover. Since that, however—we mean since writing the article, not being outlined in blue fire—further investigations into the subject have been made and here's the latest gen. It principally concerns the compass.



When an aircraft is struck by lightning a very common result is that the airframe becomes magnetised, sometimes so highly that the compass needle is held rigid in relation to the aircraft apparently in a state of coma. This coma, however, quickly wears off and consciousness may return to the needle before the flight is completed, but there will still be after-effects in the shape of deviation, probably of over 100°.

During the next one or two months the magnetism in the airframe will continue to get weaker, though at a decreasing rate, until at last it becomes stable but still relatively strong.

At this point the aircraft should be properly demagnetised—an operation which is performed by the Royal Aircraft Establishment—and all but a faint residue of magnetisation will be removed. Any small deviation which remains can then be treated as stable.

Now it is important for all pilots and navigators to remember that once an aircraft has been struck *no reliance at all* should be placed on the compasses for the rest of the trip, nor should the aircraft go on any flights involving compass flying till the deviation has been got down to correctable values. Don't forget this or you may land up God knows where.

Near flashes of lightning, as against those actually striking, don't affect compasses, though they do momentarily deflect the earth's magnetic field. Should you suspect compass inaccuracy in these cases it's probably really due to the associated bumpiness, which you always find in thunderstorms. In some cases where an aircraft has been seriously struck it has been noticed that all the flying instruments temporarily ceased functioning—a sort of sympathetic strike, as it were—but this particular phenomenon has so far foxed the experts. Don't know why the hell; they say. Maybe they'll get the problem buttoned up some time.



## WHY DO THEY DO IT?

### A.P. 1732A AND B



*P.O. Prune says he hasn't the vaguest idea, but he supposes it's done to help.*

The instructors are gathered together and are binding away: "Why do they do it?" ("They" is, of course, the Air Ministry.) "They preach paper shortage at us till we're sick and tired and *then* go and produce two new Instructors' Handbooks—400 pages, mark you, no less. We've done hundreds of hours at this racket and now we're expected to learn a whole new patter because some bright spark at a desk has thought of a new way of teaching medium turns. Why *do* they do it?"

Of course, no instructor would really talk like this. We are quite sure about that. But he might, if tired, after hours on circuits, feel a little piqued at being asked to absorb two new handbooks.

Few of us, at heart, like change. We get accustomed to a system, and if that system produced results, we defend it stoutly. But the R.A.F. can never be static, and Instructors' difficulties, altering conditions and modern requirements have all been exhaustively analysed.

From this, and a good deal more work at the Empire Central Flying School, A.P. 1732A and B have emerged.

1732A, the Instructors' Handbook of Elementary Training, deals with teaching the art of flying, while 1732B proceeds to the applications of that art in advanced training.

Instead of Instructors being handed a patter book, and being expected to cope with problems and questions for themselves, the new books are in the form of a manual. There is an introduction which says why and how they were written, and then a full chapter of notes for the Flying Instructor which give him the answers, before he starts, to so many of those riddles which long puzzled his predecessors. The old patter books necessitated reference to Training Manuals, and if, through stress of work or other causes, this was neglected, the instructor's answers to his pupils were bound to be incomplete. In these handbooks each exercise is discussed, before any Air Instruction is mentioned, and there is also full advice to Instructors as to how to get the best out of their pupils. These handbooks may appear voluminous in comparison with their predecessors, but they give the instructor more help than he has ever enjoyed before. Further, in many ways the method of teaching is altered. Research and experience have dictated this. Look at Medium Turns, in 1732A, for example.

So Instructors, don't dismiss these books as just Air Ministry verbiage. They can help you to help others; in fact, if you make real use of them an exacting job will be far less arduous.



## TEE EMM AND TACTICS

**T**ACTICS are a most important study for all operational aircrews. There is no mystery about tactics, but it is necessary to acquire a sound basic knowledge and to keep up to date with the changes which happen so frequently in war.

Tactics change with the introduction of a new technique by ourselves or by the enemy, or with the special conditions that occur in any particular theatre of war.

New tactics are devised by Operational Commands to meet the requirements of their special equipment and local conditions.

The latest approved tactics are laid down in Tactical Instructions issued by Commands and in Air Ministry Tactical Papers. Those who are anxious to obtain the latest information on tactics should seek it in these Command and Air Ministry Papers, which are available at Station Headquarters, if not at Squadron Headquarters. If there is any difficulty in obtaining these papers the Station Intelligence Officer should be consulted.

Tactics are very secret and cannot be published in an O.U.O. paper like TEE EMM which has such a large circulation that the security level is very low. Articles in TEE EMM must therefore be confined to elementary principles.

Nothing which appears in TEE EMM should be regarded as in any way contradicting Command and Air Ministry Tactical Papers.

## LEARN FROM THE HUN'S MISTAKES

**R**ECENTLY a Spitfire IX Squadron when on patrol one mile off the French Coast received information that German aircraft were escorting a ship 3 miles N.W. of Calais. The Squadron Commander thereupon took his Squadron down through the clouds to investigate and identified an "R" boat. The Squadron circled at 6,000 feet looking for an enemy fighter escort. Having failed to see an enemy escort in the vicinity, the Squadron dived to attack the "R" boat. When at about 5,000 feet seven F.W.190's were seen coming from the direction of the French coast. The Squadron positioned themselves, and attacked the enemy aircraft, destroying one F.W.190 and damaging two others.

The enemy aircraft were obviously escorting the "R" boat. Our Squadron was patrolling above cloud and would not have had any idea of the presence of these enemy aircraft if the Huns had not been chattering on their R/T, giving away their position and letting us know that they were taking part in some form of shipping escort. The German fighters were caught completely unawares which led to them being bounced very successfully.

Take warning therefore from the Hun. When doing patrols of any kind, especially those when escorting ships, KEEP YOUR MOUTH SHUT—THE ENEMY IS ALWAYS LISTENING.

The pilot's daily R/T prayer:

"Oh Lord! Help me to keep my big mouth shut until I have something of vital importance to say."

# Service Terms Illustrated

by

Well-known Newspaper Cartoonists

No. 5. STRUBE of the Daily Express.



THE INTRUDER

## THAT TIRED FEELING

**T**HE more tired you are the less alert you become. Put down in black and white like that it looks darned obvious. It might, of course, look a little less obvious if we put it in our best Whitehalls—thus: "The results of recent research have gone to show that with the increased onset of fatigue in flying personnel there has been a corresponding and consequential diminution of the faculty of alertness." But the statement would still be equally true; and it is one of those truths which is often not realised at the time one is tired. Frequently one thinks one is still functioning on the top line. Actually this is not so.

Now the R.A.F. experts have recently been looking into this question of fatigue and its effect, and have been conducting several experiments, in a specially fitted-up aircraft on the ground. For these they used—rather on the lines of the scientists' guinea-pigs—a large number of pilots with varying flying experience, from the new boy to the old hand. And all their reactions, control movements, and so on, were recorded on one of those little diagram machines and subsequently analysed at leisure.

As a result the experts found out several things. One important one was that after a long flight when your head is turned towards your stable, you are less critical of your actions than when you started out. In the cockpit experiments, for instance, continuous records were taken of (a) side-slip and air-speed, and (b) errors in altitude and compass. The first two together gave a fair picture of the pilot's control over his machine and the accuracy (or inaccuracy) of his bodily

control. The last two were an indication of his mental accuracy in timing his manoeuvres correctly. Naturally, the less experienced a pilot, the more quickly are the effects of fatigue noticeable, but the results are the same to a lesser degree with the older hands.

With the inexperienced pilots small errors in side-slip and air-speed increased rapidly after about half-an-hour's flying, while after an hour they became less frequent but greater in extent. In altitude and direction deterioration began after about an hour, and errors in timing went steadily up. The pilot, in fact, was able to do the right thing, however tired he became, but he did it at the wrong time in the wrong speed. The funny thing was that he was quite unconscious of this and in many cases even thought he was actually improving in his skill.

Similar experiments with skilled pilots showed much the same results. Errors in air-speed, altitude and direction unconsciously increased in frequency and magnitude as time went on and the tiredness developed. They made more movements with greater fluctuations to produce the same result and thus used up more of their flagging energy. The test, which was a representation of a five-hour bombing trip, also showed that the nearer they were to home, the more they seemed to relax and to let themselves be caught napping over some ordinarily simple operation which might have easily resulted in an accident.

Now to fly an aircraft accurately the pilot must be able to treat a whole series of events as one. In instrument flying a glance at a movement over the dial face

of any one instrument should automatically be associated with the corresponding movement on the other instruments so that it is interpreted in terms of what the aircraft is doing or is just going to do. But, as the pilot becomes tired, the signals and the task split up. If a recording needle on a dial moves beyond the proper limits he only feels it is *that* needle which must be corrected, even if the correction is made in such a way that something else is put out of place. The fresh pilot flies his aircraft: the tired pilot tries to control several different recording instruments; that is, he deals one by one with a number of different aspects of his total situation. Thus there is over-correction and under-correction and a greater amount of fluctuation. But—and this is our main purpose in writing—the pilot who *knows* that this kind of thing is likely to happen can perfectly well counteract it, if he remembers always to keep a sharp eye on his instrument panel and every movement smooth and gentle.

It is part of the same story that side instruments—or anything that has to be dealt with only occasionally—are increasingly forgotten by the tired pilot, unless he is on his guard. In the cockpit experiment, petrol, temperature and pressure gauges and the position of the undercarriage were required to be checked periodically. With the inexperienced pilots nearly everybody did these things regularly during the first hour of flying. They then began to forget them sometimes. By the end of the flight 60 per cent. of them failed to check up on any of the side instruments.

It is not, of course, only in flying ability that this deterioration due to

fatigue takes place. Like the small child who whines and becomes fractious towards bed-time, so do tired aircrews tend to get irritable or snap at each other, resulting sometimes in a state of mind which produces inaccuracy and forgetfulness of detail when making the subsequent report on a sortie.

You may well be asking by now what are the experts getting at. It is this. They are all agreed that there is only one real cure for tiredness and that is rest—short or long, according to whether the tiredness is progressive. That is why the powers that be take you off ops. after a period and send you to some other class of work. It is also why you should yourselves try and get as much rest as you can between ops.

A variety of drugs have been investigated to see how far they can prevent fatigue, and what, if any, are their bad effects. Some help to keep one awake, but do not improve judgment or skill, while some are ultimately harmful. Drugs of the benzedrine, ephedrine and pervitin type, if taken in small doses of 5 to 10 milligrammes, stave off sleepiness and increase the sense of well-being, but after a time they decrease the desire to work, and by postponing the desire to sleep they will in the end kill the ability to do so. They should therefore only be used under the medical officer's supervision in an occasional temporary emergency in which the possible dangers from sleepiness are greater than those from work fatigue. They make you feel in top form and believe you are working well and accurately when, in fact, you are making all sorts of mistakes. Moreover, they all work differently on different people and in different circumstances.

So far as muscular fatigue goes certain vitamins are claimed to prolong resistance without any real after-effects, though even this is not yet proved. The evidence about caffeine is conflicting, but sugar in various forms is definitely valuable in certain circumstances.

Stimulants, particularly alcohol, will usually buck you up (or as it is officially written, "produce a period of increased work activity"). But even apart from any hangover, it has to be "heavily paid for later." That is to say its immediate effects are good, but in the long run they are bad. Apart from which you find you start with one; after a time one doesn't

work, so you have two, and then three, and so on till you reach the toper stage.

There is then only one real way of avoiding fatigue, and that is rest and sleep. So get in as much as you can before each operation. There is only one way of curing fatigue which you have not been able to avoid, and that is more rest and more sleep. So get in as much as you can after each op., that you may be as fresh as possible for the next, and not let lack of sleep catch up on you.

And if by now this article has done no more than send you to sleep, it may have done *some* good!



4 Prune always likes to arrive fresh over the target.

### PILOT'S NOTES PLEASE!

But **PLEASE** demand them from **A.P.F.S. FULHAM ROAD** and **NOT** repeat **NOT** from Harrogate.

# He Killed Twelve

He was an R.A.F. Wing Commander—and he killed twelve men.

They were not, however, Huns. They were all skilled R.A.F. aircrew, and he killed them—putting it brutally—while trying to show off.

Twelve men: seven of his own crew, and five officer pilots flying as passengers to gain experience. He also destroyed a large and valuable aircraft and injured six men on the ground. He also killed himself.

Here is what happened. Just a clear case of beating up . . . .

He took off normally from an airfield in the Middle East and reached a height of 600 feet in a steep climbing turn. He then suddenly dived across the camp, passing over some tents at about 15 feet, made another climbing turn through about 270° to over 300 feet and once more dived on the camp. This time he came down to 8 feet only, at which height one wing struck the Mess tent and the aircraft crashed and burnt out.

The Court of Inquiry held the Wing Commander entirely to blame for the accident by flying at a dangerously low height over the camp, and found him guilty of culpable negligence resulting in the loss of twelve lives besides his own, the loss of an aircraft, and injuries to six other men.

In other words he wilfully disobeyed the flying regulations and killed twelve men of the R.A.F. One Flight Lieutenant, four Pilot Officers, one Flight Sergeant, four Sergeants, and two Corporals lost their lives through one man's folly.

Tee Emm publishes this story at the special request of the Chief of the Air Staff, in order to emphasise the fact that the purpose of flying regulations is to safeguard valuable lives.

# BRASS MONKEYS, AND HOW TO AVOID BECOMING ONE

## I.

### EXTREMITIES AND EXTREMIS

**T**HE Brass Monkey Club has had a pretty busy winter this season. Our old friend Sergt. Winde recently qualified for full membership after two hours at 20,000 feet with a hole in his perspex, while wearing his own peculiar version of flying clothing (*i.e.*, a shredded Sidcot outer, over shirt-sleeves and cotton trunks, an artificial silk scarf with horse-shoes on it, and a puce-beige-and-emerald pyjama jacket, the whole ensemble trimmed with frosted *diamanté*).

Rum, isn't it, that the comfort-loving type who always bags the seat nearest the Mess fire is quite often gaily negligent of his physical well-being in the air, suffering untold horrors of frostbite, resulting in lowered morale, loss of concentration, loss of efficiency and frequently loss of fingers and other extremities.

Some squadrons have this flying clothing business nicely sewn up; others affect an easy, go-as-you-please system, so that Final Briefing looks like the annual fancy dress ball of the National Association of Road-Menders and Asphalters. . . . These chaps are tough, they will tell you; they learned what to wear, and when, the hard way. Sometimes it took them ten trips; sometimes they didn't get that far, and are now wearing bowler hats and a pinched look.

We know one squadron which has cut out this dangerous choosiness and has established what the S.M.O. calls a Basic Standard of Clothing for each member of the crew and we're going to tell you all about it. Stop us if you can!

The three major blacks, sartorially speaking, are (a) tight clothing, (b) damp clothing, and (c) inadequate clothing.

Tight clothing results in sluggish circulation, which is one reason why you should not send your long aircrew underwear too often to the laundry. . . . All right, all *right*, Equipment; we know they're labelled "Unshrinkable," but most laundries accept this as a challenge, and they're pretty hot at *reductio ad absurdum*. . . . So if your long pants are now creeping up to your knees, turn 'em in, or hand 'em over to the Group Captain's youngest. A good plan is to save them up until you go on leave (even if they do get a bit high) and let mother wash them the good old-fashioned way. Use them for Ops. only.



"Not too often"

Damp clothing definitely means low temperature at high altitudes, so don't wear your flying boots and clothing for long country walks—and remember that the drying-room was *not* built as a cycle store.

As for inadequate clothing—well, let's concentrate first of all on the extremities—hands and feet being where the frost bug will get you if you don't watch out.

"Loose and dry" is the order for gloves and boots. Our Basic Clothing Expert has sorted out the glove question and decided that Pilot, Flight Engineer, Navigator and Wireless Operator should wear silk gloves with chamois ones on top, with a pair of leather gloves (as issued to Gunners—not the kind with elastic in the wrist and a zip on the cuff) as a second line of defence against cold when necessary—such as trips back to the chillier regions aft of the spar. The Bomb Aimer will probably find the same set-up adequate, but if he doesn't, he should take a pair of Type "D" electrically heated gloves with him. The Mid-Upper Gunner needs a pair of Type "D" electrics, complete with black silk heated linings, and the Rear Gunner will be happiest wearing the high-wattage variety if he values his finger tips. (We once heard of a captain who bellowed over the intercom to his R/G, "Come on, Charlie, pull your finger out," and received the plaintive reply: "I can't—it's come off.") If you gunners find that the outer leather gloves are too bulky, try a pair of loosely fitting chamois gloves over the black silk electrics instead—but there's nothing like the proper leather gloves at minus 25 Centigrade or lower. Chamois will stretch, even over your bulky black electrics, and once on they can stay put as permanent protection, and you'll find they afford a more positive "feel" than the black silk alone.

Never forget your gloves, even if you are a wireless op., with your own private fug, or a flight engineer with a tendency to heat-stroke. You never know when you've got to turn out do do a job aft, where the ice-gremlins are inclined to stow away. And gloves with holes in them, even if they do indicate bags of service, have been known to cause frost-bite after less than a minute's exposure over the flare-chute.

Now about Feet . . . Your toes need *liebensraum*—enough to wiggle in. First a pair of silk socks or, better still, silk stockings. (How or where you get



"Where the ice-gremlins stow away—"

them is nobody's business but yours—and possibly your popsy's). Next a couple of pairs of loose-fitting woollen socks or stockings which have not, repeat not, been shrunk. "Socks, sea-boots" are a good thing, and cosy for the knees. Bomb-Aimers, Mid-Upper Gunners and Rear Gunners need electrically heated socks, the R/G's again being high-wattage. Electric socks call for zip-fastened flying boots, big enough for their job.

Talking of boots—keep an eye on the lamb's-wool soles; if they become flattened, get cracking with an Exchange Voucher, because they will have lost half their warmth. Keep your boots in good repair, and let them spend their off-duty hours in the drying-room.

We're hoping, as a result of all this patient research, to see a simply colossal drop in the Incidence of Frost-bite among High-Fliers. But we're not through yet. . . .



"—and possibly your Popsy's"

## THIS MONTH'S PRUNERY



**T**HE MOST HIGHLY DEROGATORY ORDER OF THE IRREMOVABLE FINGER (Patron: Pilot Officer Prune) has this month been awarded to Pilot Officer — for the Best and Quickest Reply to an Enquiring Instructor.

When asked by his Instructor what action he would take if, when approaching to land he heard the under-carriage warning horn, he replied: "I should open the throttles slightly to stop the horn blowing and upon landing would remove the fuse."

The M.H.D.O.I.F. has also been awarded to Group Captain — Commanding — Station for Supremely Quick Recognition.

A Navigator on his Station was taking shots with his sextant when the Station Commander motored past. Seeing the Navigator he at once stopped his car, reversed, and bawled out: "Who gave you permission to use a camera?"

## FIRE!

**F**IRES in aircraft have three main causes :

- (i) Enemy action. These fires can start anywhere in the aircraft from engine to tail unit—it depends on the enemy ;
- (ii) Something going wrong in the engine which has nothing to do with the enemy. These fires naturally start in the engine and are known, not unreasonably, as engine fires ;
- (iii) Spontaneous combustion. This is quite rare but when it does occur may be almost anything from a short in one's electrical pants to fusing of the inter-com. during a heated air-bomber *versus* pilot controversy.

In this article we are solely concerned with item (ii), engine fires—and what to do with them. This is a very important subject for your consideration at any time, and particularly so at the moment because the whole procedure has just been completely changed.

Under the old system the extinguisher automatically flooded the engine compartment with fire-extinguishing fluid as soon as the fire started. At the same time the pilot was supposed to turn off the petrol and open the throttle. This was based on the idea that most fires are carburettor fires and the proper course, therefore, is to suck the flames into the bowels of the engine which are designed to digest them without inconvenience.

That procedure is now out of date. The modern carburettor very rarely catches fire in the air and the vast majority of present-day engine outbreaks are due to disintegration of those bits of metal that thrash around inside the crankcase. This disintegration can be caused by running out of oil or coolant, enemy action, overloading, or just plain honest-to-God engine failure. The net result in any case is that pistons, connecting rods, and other vitals cease to follow the paths their designer intended and form a sort of Soviet of miscellaneous salvage. The engine resents this and as a rule at once starts pouring out oil and petrol on everything within reach. The result is nearly always a fire.

Now if the pilot employs the old procedure of pressing the extinguisher button, turning off the petrol and opening the throttle, the fire may go out, but it will probably start up again as soon as the extinguishing fluid is used up—a matter of 10 seconds. The blower and its blowings start playing the part of a giant welding torch and the oil pump does its best to help. All this, plus the air flow over the nacelle, produces enough heat to melt the wing front spar within  $1\frac{1}{2}$  to 2 minutes. Most people find this extremely inconvenient and citizens have been known to leave the premises via the escape hatch without further delay, being more than somewhat apprehensive of future developments.

But under the new system the extinguisher is under the pilot's control via a button in the cockpit. It will not, repeat not, poop off automatically, because, if it did, you'd probably, as we've said, only find the fire on your hands again 10 seconds later. The drill now is at once to CLOSE THE THROTTLE, FEATHER

THE PROPELLER AND TURN OFF THE PETROL. If you get cracking on this you may not need to use your extinguisher at all, but if the blaze is ambitious wait till the prop. has stopped and *then* press the extinguisher button. This is known as "holding your fire" and is in accordance with the best military principles. In other words, keep your extinguisher in tactical reserve, which is also in accordance with the best military principles. The new procedure is giving very good results and there is a growing list of satisfied customers.

- So Remember :*
- (i) FORGET THE OLD DRILL
  - (ii) CLOSE THE THROTTLE
  - (iii) FEATHER THE PROPELLER
  - (iv) TURN OFF THE PETROL, and
  - (v) WHEN THE ENGINE HAS STOPPED, PRESS THE EXTINGUISHER BUTTON.

Do not on any account try to restart the engine. The extinguisher will not work twice and if you do catch fire a second time there is just nothing you can do about it.



*P.O. Prune has his own methods.*

HE'S GOT SOMETHING THERE! OR HAS HE?

**A** ME.109 pilot has his own simple little method of shooting down a bomber so that no member of the crew survives. He says: "First kill the rear gunner; then shoot out the starboard engine; next the port engine. Then wait till the aircraft is too low for baling out, and shoot the tail off." While waiting, we imagine he hangs around shooting down the S.O.S's. as they are sent out! He is now a prisoner of war and we wonder how *that* happened. Perhaps he missed the rear gunner first go off! Too bad!

## WHY A W/T. LOG MUST BE KEPT

**T**HE W/T. Log is sometimes regarded as a bore—perhaps because the Wireless Op. thinks that if the aircraft gets back safely that's the end of his job, perhaps even because he is a little ashamed of his efforts. What's the use, he asks, of writing down all that rubbish?

Well, there *is* a use for it: indeed, there are several very good reasons why a W/T. log ought always to be kept. So let's just here run through what Sergeant Bactune our W/Op. *should* write down in his log, and see what its worth.

The first entries to be made should be brief reminders of the tests carried out before becoming airborne. These can be written in after briefing; then when you have done the tests write in the results—which should, of course, be O.K. The entry then looks like this:—

I/C tested with crew—O.K.

Visual check of equipment—O.K., etc.

This serves as a guard against your forgetfulness and as a witness to *your* efficiency.

Next, during the whole of the flight you should log all meter readings and the action you take on seeing abnormal readings. Think how much time and brain fever the maintenance people are going to be spared if, instead of Bactune just coming back and saying merely "It's u/s," he can show the whole story of what happened. Apart from this, such entries show you know your stuff—and that's always a good line to put across to all concerned.

Log everything you hear during the periods you are on watch. That odd signal that doesn't seem to mean much to you may be just what the Signals Officer needs to complete the puzzle of what happened to another aircraft; it may even be the last thing an aircraft sent before ditching and will give an idea of where the crew are to be found; or it may just save an operator from the guillotine by proving that he *did* send the signal after all. Remember, meaningless as it is to you, *you* may be the only person who's heard it. When you don't hear anything for some time make an entry such as "Quiet" or "Nothing heard" every five minutes to show that you are still on the job. Sergeant Bactune says he's had a rubber stamp made for this one!

Being a member of a crew you will no doubt have other things to do besides



*Sergeant Bactune likes to show he's "on the job."*

listening out—pumping oil or dishing up coffee to the crew. Account for your movements in your log (" Skipper asks for second cup : complains of the service. Pointed out this isn't the Savoy ! ")—then when someone swears you must have been asleep when he was calling you, you can point to your log and say that if anyone can squeeze a minute's sleep into that record of perpetual action he's a better man than you are, Gunga Din. On top of all this the Signals Officers, by careful scrutiny of a dozen different logs can often deduce something of great importance, something with which we won't bore you here. But remember it can be, and is being done, and you're a pretty important cog in the machinery.

We have dealt above with the general principles. Don't forget the special instructions which apply to your particular unit.

And lastly, it's not the faintest use writing things down if nobody can read them. So write *legibly*, and PLEASE don't decorate your logs with rings of coffee stains and the unwanted portions of your sandwiches. The essence of good log keeping can be summed up in three words—NEATNESS, LEGIBILITY and COMPLETE-NESS ; and even if you haven't achieved these yet, hand in your logs anyway and the Signals Officer will point out your mistakes—we hope in a kindly fashion !

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### ENGINEER PUBLICATIONS

**I**N TEE EMM for August last we drew our readers' attention to a most useful little book called " Armament Publications " (A.P. 2264A). From the same stable we have just received an advance copy of an equally useful booklet on the same lines under the title " Engineer Publications " (A.P. 2462A) which Engineer Officers, Instructors and Trainees will find of great help. Divided into three sections it first gives an outline of the main structure of technical publications. The second division boils down to the minimum the individual peculiarities of the different books under their subject-matters. The third is for reference purposes and gives a list of engineering publications available. The whole thing is, in fact, designed to save a lot of time by enabling the user to find at once in what book he will get the gen he wants. There are a number of amusing illustrations scattered through the pages.



*P.O. Prune likes to take his aircraft up for a few hours and practise saving petrol.*



He knew it all.

THE EMM is an O.U.O. publication, which means it is for Official Use Only. And this means that those not entitled to see it are *not* to see it. It is primarily a Training Memorandum for air-crews, instructors and all those in the Air Force connected with these jobs. It is, in short, a Service Training Memorandum written *for* the Service and issued *by* the Service in the person of the Air Member for Training.



**DON'T LET THE SQUADRON BUG  
FOOL YOU!  
READ YOUR  
PILOTS' NOTES.**

WITH APOLOGIES TO THE NATIONAL SAVINGS COMMITTEE.

W. HOOPER.