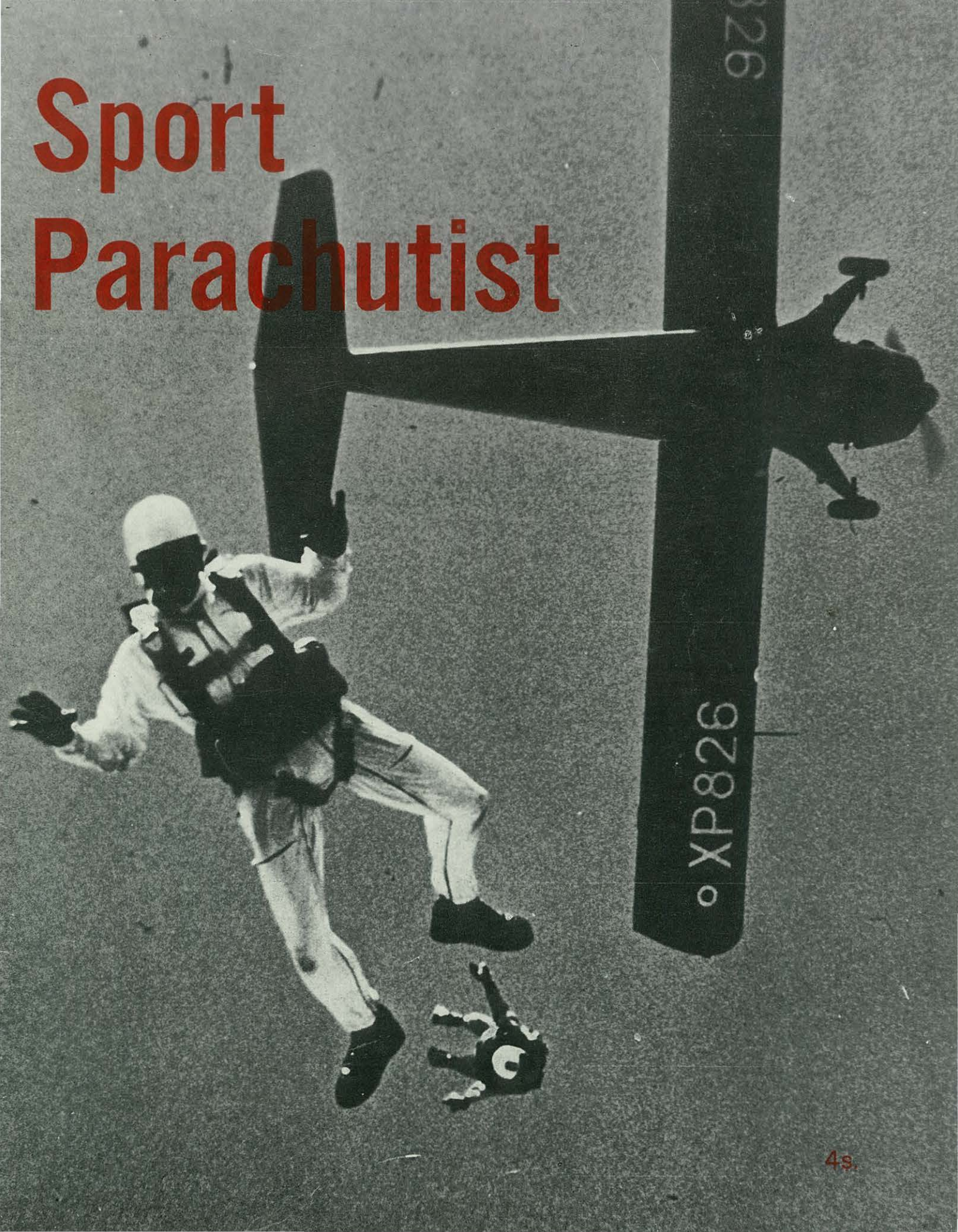
Sport Parachutist



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THE JOURNAL
OF THE BRITISH
PARACHUTE
ASSOCIATION
(A company limited by guarantee)

Sport Parachutist

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The British Parachute Association Ltd,
Artillery Mansions,
75 Victoria Street,
London, SW3
Phone 01-799 3760

CONTENTS

Cover: Sean Friel and Green Jacket colleague follow Dave Waterman out of an Army Beaver. Picture taken from a Kodachrome transparency

The following are target dates on which copy should be in the Editor's hands for the appropriate issue Spring: January 31; Summer: April 30; Autumn: July 31; Winter: October 31.

With regret, the Editor will not be able to undertake the return of any material submitted for the magazine.

Extracts from the Chairman's Report to members—January 1970

Membership

During the past year our membership continued to expand and 1,624 new memberships were registered. Membership renewals in the same period totalled 754 to give a total membership of 2,378 at 31st December, 1969. This is an overall increase of 528 since 31st December, 1968. There has been the normal loss of older members and it is in this sphere that I feel we must exercise some caution to ensure that a gulf is not allowed to develop between the more experienced members and the 'new blood' coming into the sport. I ask the more experienced amongst you to be aware of this possible problem, and to ensure that new members are welcomed into our circle and given the benefit of your experience. I am aware that many of you already give a lot of time to training and assisting new members and on behalf of the Association I thank you for your efforts.

National Championships

The 1969 National Championships were successfully concluded and we were presented with some very good performances in the various events. It was particularly gratifying to see the high standard achieved by some of our Novices. It is hoped, with the assistance of the *Daily Telegraph*, to stage the 1970 National Championships at Goodwood. If this proves to be possible, the *Daily Telegraph* would endeavour to provide other attractions to supplement the parachuting and so create a wider spectator appeal from which we would undoubtedly benefit. The dates have not as yet been finalised but should be two week-ends in late June or early July. We hope to introduce a new event into the Championships—the 'Stand-off Accuracy Event'. Final details of this event will be produced by Mr. O. W. Neumark who, apart from suggesting this new event, will also provide the Trophy.

World Parachuting Championships—1970

The 1970 World Parachuting Championships will be held at Bled, Yugoslavia from 6th to 20th September, and we will be entering a team. A training squad has been selected and training will be commencing soon. We shall be launching an appeal to outside bodies for assistance both financially and in kind but in the meantime I would ask you to show that we are capable of giving a lead in support of our British Team. Some members have quickly and generously responded to the appeals of the Secretary General and the Editor of *Sport Parachutist*—in fact your efforts have added £140 to the £500 which the Secretary General has already got in reserve, and which the Council has approved for expenditure on team training. If you haven't already contributed please do so if at all possible—the more response we can show from within our own ranks then the more success we are likely to achieve with our appeal to outside bodies.

Secretary General

I am sure I speak for all members when I thank Sqn Ldr Bill Paul for his work as Secretary General during the past year. One task which he set himself was to improve relations between 'the office' and members—there can be no doubt that in this he has been completely successful.

Northern Meeting

A Northern Meeting was held at Pudsey in September and again proved to be very successful. The Council was represented by Sqn Ldr Johnson, the Secretary General and myself and we were pleased to meet our Northern members on their home ground. Local problems and future policy was discussed and the meeting was so beneficial to all that I consider it should remain as a permanent feature in the BPA calendar.

National Centre

The Secretary General is currently reviewing our proposed requirements for a National Centre and in addition has had meetings with the CCPR and Sports Council on the possibility of establishing Regional Centres. It may well be that we will see Regional Centres established before a National Centre. Our aim would be to have six Regional Centres, one of which could perhaps become the National Centre.

Parascending

In February the Council agreed to take Parascending under its general control and to this end a sub-committee was formed to act as a Council for Parascenders. A select committee reviewed Parascending Rules and Regulations to ensure that these conformed to BPA requirements. Parascending is recognised as a Sport in its own right and it should be appreciated that Parascending Clubs could well become a good source of recruits to free-fall parachuting. Under the guidance of Mr O. W. Neumark, considerable progress has been made with the training of Ascending Parachute Instructors, all of whom are required to be full BPA members.

Deposit Account

We now have over £2,500 in our deposit account, £500 of which has already been reserved for National Team Training. It was agreed in Council that the remaining £2,000 should be invested with a building society where a better return would be received on our money.

Safety Committee

It is with regret that I have to report that 1969 was a bad year, in so far as fatal accidents are concerned. There were four; one a very senior parachutist, and three pupils who were all at the same stage of progression. Investigations were held, and although these revealed only individual minor problems, the investigations are more valuable when looked at collectively because then a pattern evolves. Sufficient evidence emerged from the collective analysis to indicate that training progression was perhaps too fast and that techniques were not consolidated before the pupil was asked to perform new skills. As a result of this the Safety Committee accepted the need for a revision of training, and in particular, progression . . . It has also become apparent that there are obvious anomalies in, and omissions to, the existing regulations, due mainly to changing techniques and the introduction of new equipment. As a result of the two factors a revision of the regulations has been instituted, taking the form of monthly consideration of different Sections. The method of doing this has been the sampling of all instructors' opinions followed by a monthly meeting of CCIs at differing centres. Despite the demand for changes, the response has been very disappointing, and of the two questionnaires sent to all instructors less than 20 per cent have been returned. At one CCIs meeting only four attended. It has been left to the dedicated few to shoulder the responsibility for this most important aspect of the Sport. It is your Sport and if we are to keep abreast of changes you must give your full support to the work of the Safety Committee.

I take this opportunity to wish all members and clubs every success in 1970, and with the hope that this year will see the Association continue to expand and progress.

G. F. TURNBULL
Chairanm

January 1970

The Black Knights in Switzerland

Chris Copeland

IT was at the beginning of the year that we decided that a trip to the Continent this summer would be a good idea, but as usual the problem was where? Chalon was at first a hot favourite but with four or five experienced relative workers in the Club who wanted to keep off style, the feeling was 'Let's find somewhere where we can do what we like!' Quite a tall order because that cut France right out, leaving Lippspringe and a place nobody knew anything about—Sitterdorf in Switzerland. I remember reading Louis Antiker's excellent article in the *Sport Parachutist* of Summer 1967 and a quick re-read convinced me that this place had possibilities. A phone call to the BPA surprisingly produced very little except the address of the Swiss Para Club —nothing was known about Sitterdorf itself. However the address proved to be sufficient as a telephone number was obtained from a delightful switchboard operator on Continentals, and before I knew what was happening I was talking to the Secretary of the Club—Eric Gratzner. Fortunately Eric speaks excellent English and to both my questions of 'Could we come to Sitterdorf for two weeks at the end of July?' and 'Would the Turbo-Porter be available?' the answers were 'Yes'. Well, we went to Sitterdorf, and I am writing this article with the intention of putting it well and truly on the parachuting map as I think it is the ideal place for a club excursion such as ours, and for those who want to go as high and 'do what they like'.

If you take an ordinary touring type map of Switzerland as I did, you won't find Sitterdorf marked in any way on it as it is only a tiny village. However, find St Gallen which is a large city in North-East Switzerland near Lake Constance, and from there go about eight miles north-west to a small town called Bischofszell. Sitterdorf lies just outside it and anyone will tell you the way from there to the 'Flugplatz'.

I had no difficulties myself in finding it, and arrived there in the evening. It was still light enough to look around and my first impression was 'Where is the DZ?' In front of me was a single grass airstrip, but surrounding this were fields, hedgerows, fences, roads, the odd wood—certainly not like the normal club dropping zones that I was used to in England. Had I come to the wrong airfield? The answer, after a quick scout round, was no. I found a small but excellent pea gravel pit just beyond the airstrip, and a look into the hanger produced two packing tables for four parachutes, and best of all a gleaming white Turbo-Porter. I had heard a lot about this aircraft and my first impression was 'whoever designed this had free falling in mind!' It is dominated by an enormous turbo engine in front and has a large sliding door which is kept closed until you are at altitude. I was to find out later that it seats eight parachutists, two on the floor, with the jumpmaster next to the pilot but facing back down the aircraft.

Satisfied with what I had seen so far I went over to the restaurant to find out where I could put the tents. We had decided to camp on the airfield to save money although if we had wanted to, could have stayed in numerous nearby Pensions. Arthur Bernard, whose wife ran the restaurant was there to greet me and showed me over to a large green field next to the hangar which he assured me was 'all for die Englanders'. The facilities laid on for us could hardly have been better, with toilets and showers next to the hangar, and a large refrigerator in the restaurant for our perishable food.

Shortly after this Mike Norris arrived with Len Melville, John Williams and Tim Andrewes plus all our equipment. This made five of us with the remaining four due to arrive late the next day. Originally we had planned to take a total of twelve but Eric Gregory had marriage plans and neither Taffy Rees nor Geordie Laing could make it for other reasons. This was a severe blow for our mass relative work plans as it left us with only one experienced relative worker—Len Melville, with some others who had only a basic knowledge.

We were up early next morning, welcomed by blue skies and a slight breeze, so sorted out our kit with hopes of getting on to an early lift. However we were alone in our efforts—no Swiss arrived until eleven o'clock by which time it was clouding over! Nevertheless things got moving eventually—a quick phone call to Eric Gratzner to confirm our insurance, a cursory glance at our log books and one or two questions like 'Were we happy to go to 4,000 metres?' and before we knew what was happening we were sitting cramped in the Porter ready for take off with three Swiss who also wanted to go high. The pilot obviously wanted to show his machine off to us and so on wheels off took it into a 45° climb (seen to be believed) which almost crushed the two jumpers seated at the back. However we were not complaining as sixteeen minutes later we exited from 15,000 feet for a very pleasant 75-second delay and our first three-man link. The spot was some way off the wind line but nobody seemed to mind except the jumpmaster who apologised profusely. However Len Melville managed to scrap into the pit and claims he put his foot on the disc so our honour was salvaged somewhat. This was obviously a good start to our parachuting at Sitterdorf and later that day we followed it up with another jump from 13,500 feet.

In the evening we were joined by the remaining four to complete the party, namely Ivor Wilkinson, John Patrick, Paul Cook and John McGill. This gave us five relative jumpers, three students and John McGill who wanted to do style for most of his jumps. With such material at hand, it was obvious that we were not going to break any records when it came to mass link-ups, but we decided to concentrate the first half dozen jumps towards getting a five-man link. Having done this, we would split up, take the students on a basic introduction to relative and finally go for a six-

man link at the end of the fortnight. The problem of filming this did not at this stage worry me too much. Eric Gratner had a Nikon F helmet-mounted camera which he said he would bring along for us in the second week.

The first jump the next morning put paid to our hopes for a six-man when Mike Norris had to take evasive action to avoid another parachutist, took a bad landing, and severely twisted his knee. Although he gamely hobbled round the airfield for the next few days, it was obvious that he was not going to get better in time, so he wisely headed for home. A great blow to our plans, not to mention a bitter disappointment for him.

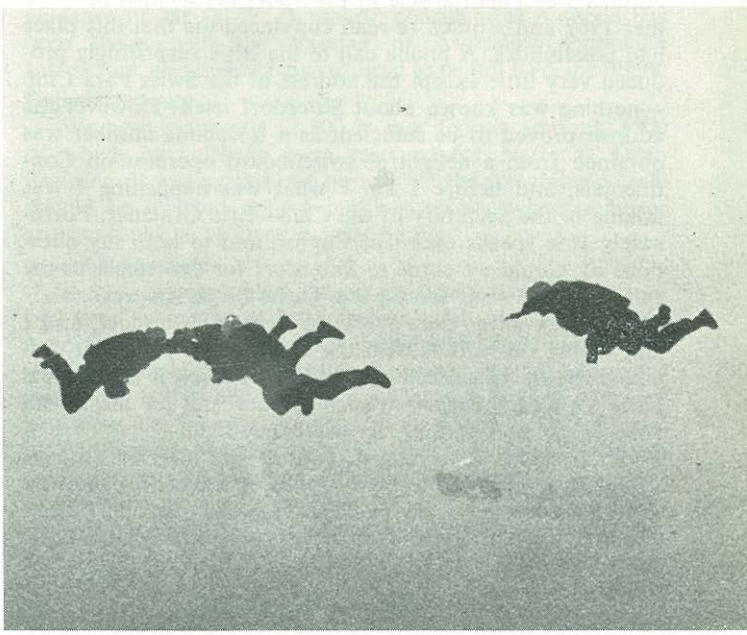
It took us six jumps before we managed our first four-man link. Looking through back issues of *Sport Parachutist* recently I have been unable to find any articles which deal with the art of relative parachuting—a great pity as some advice might have saved us a few jumps. Perhaps those who are not experienced in link-ups involving more than two or three jumpers may be interested in the problems which we found we were up against, and how—on occasions—we solved them!

Firstly we found that a good base man was essential. By good I mean that he had a high rate of fall and was capable of falling flat—not quite as easy as it sounds! His job was to watch the altimeter and give the 'wave-off' at 3,500 feet. After him would go the other 'fast fallers' leaving the 'slow fallers' to go out at the end. The reason for this was that as the linking started, those that were linked gained a lot of lift. A heavy man therefore who was not linked would immediately sink below, and even in a reverse arch position would be unable to come up again. However a light man going out last would have no trouble getting down to the remainder and having done so would remain at the same level until it was his turn to link.

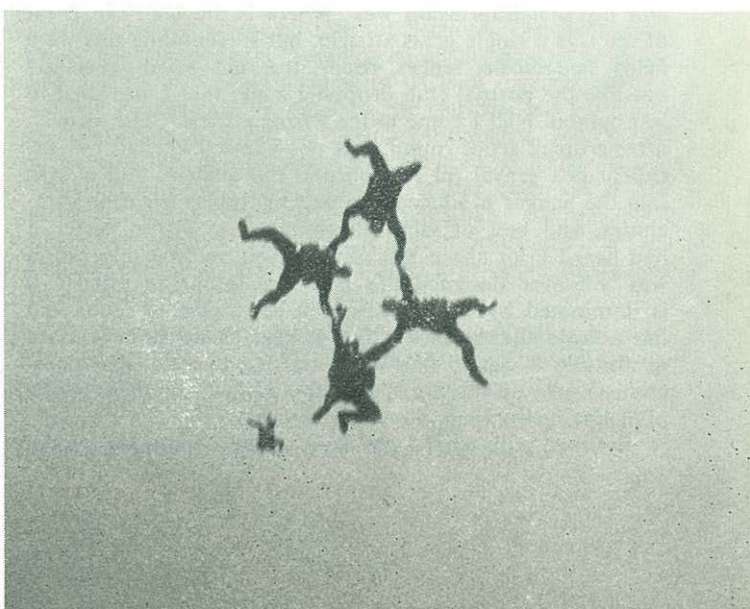
We made many mistakes particularly in the early jumps although we all thoroughly enjoyed making them! The most common one was for a jumper to come in too fast and grab at anything. Instability would immediately result and very rarely would the link be salvaged, if for no other reason than the unstable link would lose height rapidly and those waiting to come in would suddenly find themselves looking down on them instead of being on the same level.

Once we had achieved a four-man, we decided to split up for the next few jumps to introduce the students to relative work. John Patrick, our base man, was particularly glad to do this as he was naturally getting rather tired of being 'bombed'. He was in fact hoping to find another man for the job and Paul Cook courageously volunteered to do it when after our first week we got together again with the aim of getting a five-man link on film. It was at this stage that we nearly had a very serious accident and I think it is worth giving it a mention. Eric Gratzner came up from Zurich for the day bringing with him two other jumpers. Eric is an expert in relative work (he led the Swiss team in the Adriatic Cup 1965 when the Swiss won the Baton pass event) and I was anxious for him to watch or join us for a few jumps. However one of the other jumpers was not so expert and we were to learn this the hard way. Leaving the aircraft last, he went into the reduction position and stayed in it. We had formed a three-man star when he hit us, how fast I would not care to guess. Fortunately no one was hurt but we were sufficiently shaken to ensure that we knew who we were jumping with in the future.

Above and centre: Ivor Wilkinson comes in to join Len Melville, John Patrick and Chris Copeland



Bottom: Taken from below—the four-man link



Our first five-man link came shortly after this incident but as we were never to get it on film it hardly seems worth mentioning. Eric was a very busy man and in fact it was not until our final jump at Sitterdorf that he was able to come up and film us. I think we were lucky in the circumstances therefore to get the photographs appearing with this article, particularly as it was the first time that Eric had jumped with this particular type of camera and he was not sure of the sighting.

For this final jump, we decided to put John Patrick as base, followed by Chris Copeland, Len Melville, Ivor Wilkinson and finally John McGill. Eric would go out after this as sixth man with Tim Andrewes and John Williams following him, keeping clear of the link but trying to "hog in" on the photograph. Steve Longoni, our pilot, pulled out all the stops for this jump, and after only twenty minutes in the Porter we exited from 16,000 feet—our second time from this height. The four-man star came at just below 10,000 feet but a five-man was not to be. John McGill had mistakenly fallen below and was unable to get back up. However to my surprise I saw that Eric, who is not a heavy man, was also below and certainly in no position to take any good photographs. However by doing a series of barrel rolls, he took a lot of pictures from below us, one of which appears here.

So ended a thoroughly enjoyable fortnight at Sitterdorf, and very sad indeed were we to leave. The Swiss had really been tremendously hospitable towards us, and on frequent occasions went out of their way to ensure everything was right for us—especially in the restaurant after jumping had finished! In there the Swiss had built a special 'Para Bar' which was more than well used over the weekends.

The weather had also been superb with only one day when we were unable to parachute because of it. On only one occasion were we forced to take a 'low' one—from 10,500 feet because of cloud. Our normal jump height was between 12,500 feet and 14,000 feet and in addition we had two from 16,000 feet and one from 15,000 feet. Naturally we had to pay for our jumps! The cost per jumper was as follows:

(SFr 10 = £1)

Up to 2,000 feet	SFr 12
3,200 feet	SFr 13
5,000 feet	SFr 15
6,600 feet	SFr 19
8,000 feet	SFr 21
11,000 feet and above	SFr 26

i.e. a jump from 16,000 feet cost £2 12s. 0d.

Incidentally, documents required are Log Book, FAI Licence, and BPA membership for third party insurance. A letter from the BPA confirming details of the insurance is also necessary. (Swiss Insurance costs 43 Swiss Francs.)

Since returning from Sitterdorf I have read Lawrie St John's article in the *Sport Parachutist* of Spring 1968. I'm glad I didn't read it before going as I might well have been put off the place! However what he said then is still largely true today. Sitterdorf is very similar to any civilian club in this country in that parachuting normally only takes place at the weekend. There is no resident Chief Instructor or staff except for an aircraft engineer who services all the aircraft kept at the airfield. There are no rigging facilities but any damaged parachutes can be repaired in Zurich. We lost three days because no pilot was available but were unlucky in this respect. Normally there is a resident pilot but he was on a flying course during the period that we were there, and the two reserve pilots were not always available.

During the weekends, the pace of parachuting was remarkably slow and the Swiss themselves appeared to be satisfied with one or two jumps a day. Although they had a superb set of telemeters they were rarely used. Few seemed interested in relative work or style—just falling free. On one occasion we watched one jumper do a stable delay from 12,000 feet without moving a muscle until the time came for pulling. No streamers were used during the period we were there—the jumpmaster merely judged the exit point himself. However in the almost permanent nil wind conditions this was not difficult.

None of this affected us in any way, although I would hesitate to recommend Sitterdorf for a party of less than eight as this would mean relying on the Swiss to fill the aircraft during the weekdays—a virtual impossibility. Nor would I recommend it for a student unless there is an instructor in the party. In short, a party should go completely self contained taking spare equipment and if photographs are required—a camera!

All negotiations for a trip to Sitterdorf should be done through Eric Gratzner, whose address is: Para Sport Club, Hoglerstrasse 39, 8600 Dubendorf, Switzerland. Tel.: P 051/8506 72. However please do not hesitate to write to us for further details. Our address is: The Black Knights, 7th Parachute Regiment RHA, Lille Barracks, Aldershot, Hants.

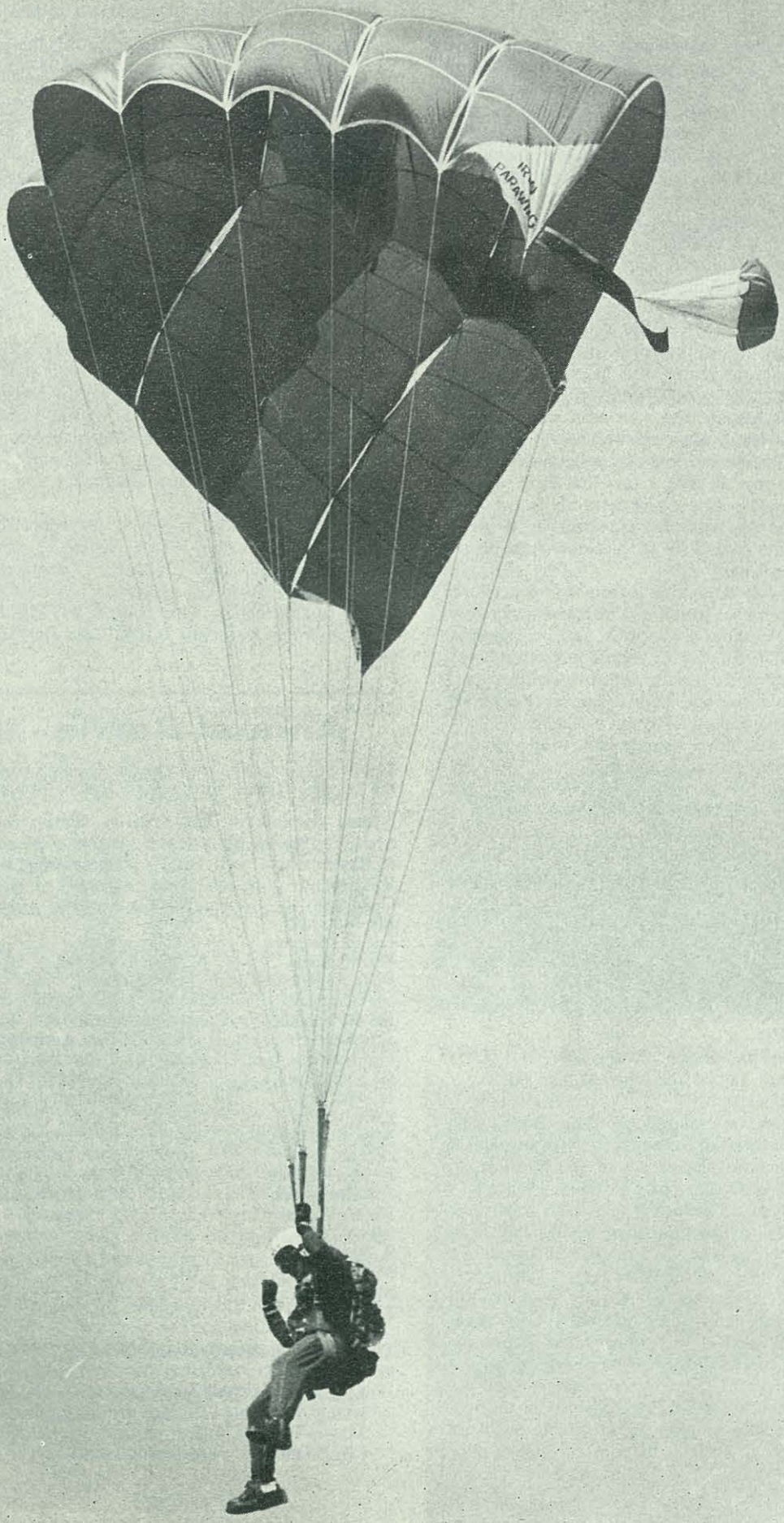
Annual Raffle - 1970

List of prize winners drawn at the Annual General Meeting in the Imperial Hotel, Birmingham, on 10 January, 1970.

Name	Ticket No.	Prize
Mr R. V. Woodroffe	28954	Holiday for two in Majorca
P. Plumb	19250	Parachuting helmet
R. Ring	11663	Brandy
C. Briggs	33611	Sherry
Pte McGrath	26398	Gin
L/Cpl Hughes	10063	Wine
Wendy Rose	23880	Martini
Miss A. Roberts	14199	Beer
M. G. Bushell	21474	Brief case
M. G. Bushell	21475	Scarf
J. Baker	38617	Two parachuting books
G. Gorton	16505	Travel case
G. J. Oldbury	13044	Shopper
D. McCue	23333	Kitchen clock
L/Cpl Peers	07932	Toaster
Miss M. Hanlon	38479	BPA Blazer badge
J. Blackmore	16597	BPA Overall badge
E. H. Houston	37569	Parachuting book
J. Fairweather	35624	BPA Car badge
Mr E. V. Harman	26187	BPA tie
Mrs P. Hassall	30736	Chocolates
S. Booth	00813	Chocolates
Miss B. Clegg	04729	Whisky
Mr P. Davies	25986	Travel clock
R. Grandine	01559	Jump suit

The BPA is indebted to the following for kindly donating prizes—

Messrs Sunair Holidays: holiday for two in Majorca
Irving Air Chute of Great Britain Limited: jump suit
Messrs Britax Limited: parachuting helmet
Mr J. Orchard: parachuting books.


IRVIN
PARAWING

The Irvin Delta II Parawing

Brian Schofield

History

THE Delta II Parawing has been known as the Rogallo Wing, Flexwing, Limp paraglider and the individual deployment glider. Several of these terms have only recently come into being, thus leading one to believe that the Parawing is a recent development. This is not the case, however, for the Parawing was conceived in 1945 by Mr Francis M. Rogallo, an Aeronautical Engineer employed by the US Government. Working at home in his spare time, Mr Rogallo experimented with his new device, testing it in a home-made wind tunnel, free flying it as a hand launched glider and tethered outdoors, as a kite. His private endeavour spanned thirteen years from 1945 to 1958, when America's entry into the exploration of space brought considerable interest from Government agencies in this and other unconventional ideas.

After extensive testing, the practical application of Mr Rogallo's invention was quickly realised. With its gliding ability and pin-point accuracy it could be used for the safe return of astronauts from space, air cargo delivery, individual troop use and other applications where its flying characteristics could be put to advantageous use.

Realising that the Parawing represented a totally new concept in deceleration devices, Irvin Industries began a development programme on the wing in 1966. After three years of extensive testing, which saw the incorporation of many design innovations, the Parawing has been introduced to the world of sport parachuting.

Extensive testing is continued today by various agencies who are looking at advance designs of the Parawing for future applications.

Technical Data

The Delta II has a 254 square feet surface area, consisting of fourteen gores, each having five aerodynamic lifting sail panels. The canopy material is basically 2.25 ounce ripstop nylon cloth, calendered and silicon treated.

Both material and geometric porosity (open area) vary as a function of wing location. However, the total canopy porosity is 3.2 per cent of the wing's surface area under typical descent conditions.

The suspension network consists of ten leading edge lines (five each side to complementary front riser), and six keel lines (alternately to rear risers, three lines each side). These are all nylon and have an ultimate tensile strength of 1,000 pounds. In addition, there are two slot lines, two panel lines, and two steering lines which are connected to the two control lines. These lines are also nylon and have a 750-pound tensile strength. Risers are constructed from 6,500-pound type XIII nylon webbing with 3,600-pound type VIII keepers.

The Parawing's reference size is measured from the trailing edge along the keel and terminates at a focal point of the 90° annular section (the nose!). Thus the Parawing has a reference keel length of 19.5 feet and is written '19.5 ft Lk'.

The high performance of the Irvin Delta II Parawing is due to its basic airfoil design accompanied by the introduction of radial louvres in the wing's upper surface to provide directionally controlled air streams. Such controlled air streams promote laminar flow control, wing shaping and a thrusting action. These louvres give a slight saw-tooth profile to the wing created by incorporating extra width to the trailing edge of the gore panels. They also provide a favourable increase in the stability of the wing when compared to the 'solid' or non-slotted versions.

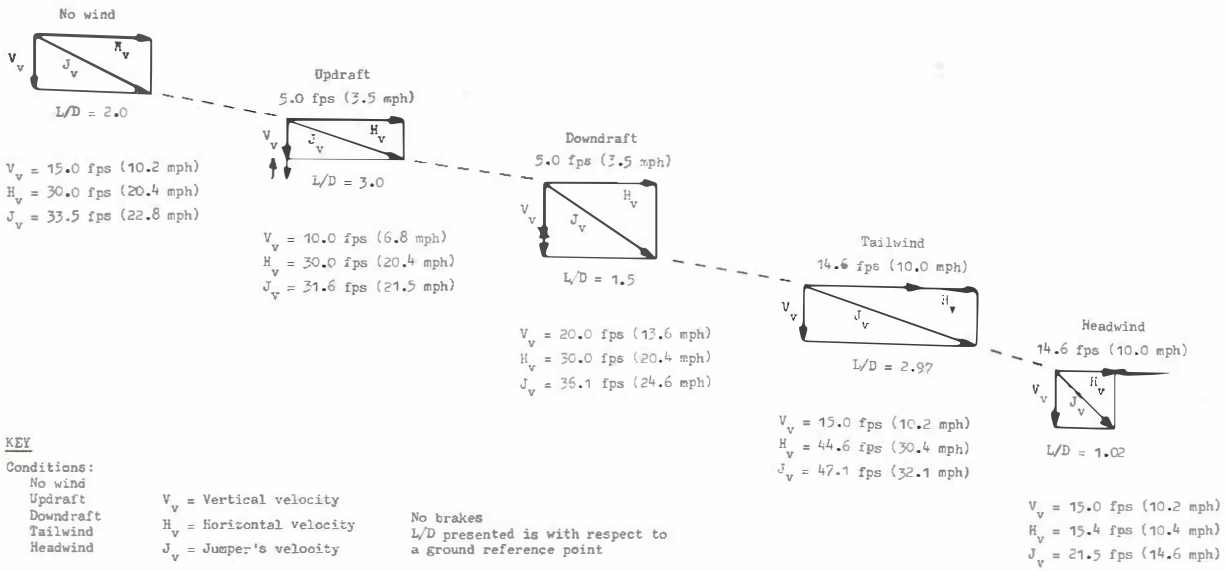
Of Mythology and Politics

The Red Devils first met the Parawing in the winter of 1967, during a visit to the US Army Parachute Team, The Golden Knights. Sfc Dick Morgan was working on the test project in which L/Cpl Don MacNaughton very quickly became involved. Don made several jumps with the early wing, some more successful than others—all of them painful.

Fortunately, by my introduction to the wing in the Spring of 1968, most of the problems, both of opening and flight, had been solved, and though the malfunction rate was still high, I was very impressed with the wing's performance and potential. I became convinced that this beast was the forerunner to a new generation of parachutes, which would both sound the death knell of the PC and open up a completely new dimension in our sport. I determined to follow the project with close interest and at the same time I ordered three wings from the first batch to be produced for commercial purposes.

Early in 1969 I journeyed back to Fort Bragg to take delivery of this order, and pick Dick Morgan's brains. Dick had been on the project for over three years and what better teacher?

Left: Wing on three-quarter brakes. Notice control flap and inverted slots. The OSI wrap is on the left tip, and D bag and pilot chute be seen in typical position between the lobes. Photographs courtesy Peter Ward—Hertfordshire Newspapers



Due to the awful stories of back breaking opening shocks, unexplained collapse in flight, violent uncontrolable spins, stalling into the ground, etc., to be heard at that time (and even now!) I wanted to gather as much factual knowledge, experience—and reassurance—as possible before exposing myself or my team members to these possibilities.

Armed with the results of five days' virtual interrogation of poor old Dick, pages of graphs, line length and trim figures, and the witnessing of over 200 wing descents by the Golden Knights (I was unable to jump there due to 'lack of status'—unofficial visitor) and my three new wings I moved up to Philadelphia to meet Steve Snyder.

Steve is an aeronautical engineer, parachutist extraordinary (D5) and pilot of great repute. Amongst other things he invented the OSI (Opening Shock Inhibitor) which is the whole key to the Delta II. Being a man of enormous enthusiasm and drive, it seemed like only minutes before he had me sitting in his Cessna 205, at 4,500 ft, with a wing in my backpack—and I was terrified! Being British and all that, I had to go, and promptly fell out of the plane whilst trying to get on to the wheel! I made one of the quickest stabilisation and pulls in the history of parachuting, and watched, horrified and entranced, as the thing above me began to sort itself out; this fluttering, unwinding frightening mess proved to be what I now accept as a good opening.

After several adventures I returned to Aldershot with my three new found treasures, only to find a political storm raging as to whether we could jump the wings at all —never mind on demonstrations! The BPA were both sensible and courageous (?) in their backing and handling of the matter.

Having finally gained permission to use the wings in the UK we caught a severe cold at the Twyford Fête. I can't remember why the wings missed, maybe Gus can? Needless to say, this didn't help our cause much, but these things do happen—don't they . . .?

Facts and Figures

At the time of writing, I have over a hundred descents on the wing (and one on a tri-conical reserve—an education in itself) and feel ready to throw a few pearls to you lot . . .

Wings, and other geometric creatures to follow, are not just parachutes, they are high speed, sensitive, flying machines. I readily admit that there are many unknown areas in this new science, but I do know that anyone who jumps them consistently will never go back to 'flat circulars'—to me now even a Mk I PC feels as dead and unresponsive as a double L.

FLIGHT. Once open the flight of the wing is almost incredible:

Performance Data (according to Handbook)

Rate of Descent	
Steady glide	14-16 ft/sec.
50% brake	15-17 ft/sec.
75% brake	16-20 ft/sec.
Full brake	20-30 ft/sec.
Full spiral (after one revolution)	30-50 ft/sec.
Turn rate (360°)	
From straight flight	(four) 4 sec.
After 1 revolution	2.8 sec.
Suspended weight	120-250 lbs.
Maximum lift/drag ratio ...	2/1
Manoeuvres ...	Glide, brake, turn, stall

PACKING. Follow current instructions and you won't go wrong, though I feel that neatness is very important, and we have found that a two-man pack team—with the number two providing tension to the canopy is the best answer. I also feel that the control panel—inside centre section—should be pulled neatly up into its adjacent lobe; this also brings the toggles up snug to the keepers.

OPENINGS. To be seen and experienced to be believed and understood.

concluded on page 23

The making of the Cyprus free-fall high altitude record

Joe Forster (Akrotiri Free-Fall Club)

AT 08.50 hours (local time) on Sunday, 26 October, 1969, Nick Fry and myself exited a single-engined Cessna 206 at 20,100 feet above Nicosia International Airport. Upon landing four minutes later, we had successfully broken the existing Cyprus high altitude free-fall parachute record set up by Maj Peter Kingston, Capt Ray Ryan and FS Ken Jacobs at Dhekelia several months earlier. Those seemingly rapid four minutes were the climax of weeks of hard work put in by many people, both directly and indirectly involved in the descent. The hardest worker of all was Nick Fry himself, who was in fact the source of inspiration and drive in the making of the new record.

Nick is a rare parachutist in that he is a combination of 'jumping bean' and organiser, whose experience comprises two years of sport parachuting and 161 descents, most of which were made at Weston-on-the-Green. His ability enabled him to become Cyprus Overall Parachute Champion of 1969 and Winning-Team leader of the Akrotiri 'Flamingos', of which I also was a member. It became Nick's ambition to set a new record for high altitude jumping when he learned of the success of a Combined Services team jumping from 16,500 feet over Dhekelia, also from a Cessna 206. However, a great deal of background work and a specialist knowledge in the techniques and problems associated with this type of descent had first to be ploughed through. Here is where advanced BPA and RAF parachute instructors Ken Mapplebeck and Jake McLoughlin came in, both having logged scores of descents with oxygen between them. Ken Jacobs, an RAF Air Quartermaster and BPA Instructor also, gave invaluable advice and guidance relating to the use of oxygen and its characteristics. Thus, having obtained both knowledge and personal equipment, the next step was to get airborne.

There were many factors to be considered, the most important being the medical fitness of each jumper. Here we were lucky in that we were both given thorough pre-jump medical inspections and decompression checks at the RAF's Aviation Medical Centre at Akrotiri. Then permission was obtained from the Senior Air Traffic Officer (Cyprus) to jump from 20,000 feet plus. The dropping zone was arranged with ATC Nicosia and the Fire Section (who were to man the DZ with a crash-tender and ambulance), while a detailed and accurate weather report and forecast was given by the Met Office of RAF Nicosia, who very kindly released a weather balloon half-an-hour before we emplaned. But before the jump eventually took place, a total of seven attempts, each one over a weekend period, was made. Call offs were mainly due to low cloud base and extreme temperature ranges between ten and twenty thousand feet. In retrospect it often seemed that we could have jumped on several occasions had we gone up, but in the final analysis, it was our better judgment that prevailed. It was very frustrating to be kitted up on the flight line, aircraft ready, only to be disappointed yet again. One weekend Nick and I couldn't take any more rebuffs from the weather and so, along with Elizabeth Davis we bundled out below a cloud base of five grand to do a smoke Demmo for the hundreds of locals on the balcony of the International Airport. Liz was over from Beirut that Sunday from the High Commission where she works, kit in hand and ready to go, on the basis of an obscure rumour that there was jumping to be had that day.

At last our luck changed for the better and on the following Sunday we were awake at 03.30 hours and airborne four-and-a-half hours later with pilot Jorn Hansen from Denmark at the controls. Daedalus Aviation of Nicosia provided the C206 and the aircraft oxygen supply, which was a demand-system designed to augment the ambient air in the aircraft cabin. The weather was perfect, not a cloud in sight and the temperature at twenty grand was minus 18°C, with the freezing level at eleven thousand feet AGL. We obtained an aerial photograph of Nicosia Airport from ATC, and Nick plotted the theoretical exit point based on estimates of wind strength down to 2,000 feet. Here is where Nick's consistently good spotting was to pay off. With virtually a nil surface-wind and a fairly tight airfield DZ, both of us carrying TUs, there was no room for any mistakes. We made a streamer run at 2,500 feet, and a flare was lit at its impact point. Using the aerial photo we superimposed the theoretical run-in at 20,000 feet, along with the exit point and drift line to put us in an opening area within the capability of our main chutes (allowing also for possible reserve deployment). We were both satisfied and so gave 'thumbs up' to Jorn to fly to height.

The pre-flight briefing was quite straightforward; any serious mishaps in the aircraft and we were to call off the jump; pull in any emergency during free-fall; break off relative at 10,000 feet, below which set up for the opening point; land within reach of each other just in case anything went wrong. And so, armed with one-minute smoke generators, personal oxygen equipment, extra clothing in the form of string vests, roll-neck sweaters, heavy trousers, track suit top and bottom, jump suit, two pairs of woollen socks and ski gloves (adding to a final 230 lb all-up weight), we emplaned.

Jorn's flying as usual was good value for money and the half-way mark was reached within twenty minutes. Out of the door we could see the Turkish coast and the Lebanon, whilst below, St Hilarion Castle on the Kyrenia Mountain Range and Mount Olympus looked quite small.

Gradually the island became a mosaic pattern with the old, walled City of Nicosia looking similar to Adrian Hill's pea-gravel pit. The Mediterranean shimmered in the morning sun and the Akrotiri Peninsula 70 miles away was quite easy to see. We cross-checked our altimeters with those on the aircraft instrument panel and at 18,000 feet Nick took on the job of spotting. This was quite difficult, since above 12,000 feet there is very little impression of movement across the ground and vertical sighting from the jump height was tricky. During the ascent we had carried out self-checks of the type given in the decompression unit (for example, counting backwards in thousands), and watched each other for signs of discomfort, thus monitoring the effects of the cold. Surprisingly enough, although we knew it to be cold we felt quite warm with no ill effects. We left no parts of the body exposed except some areas of the face, which was unavoidable. The oxygen debt due to heat loss and wind-chill factor was very considerable, especially since some thirty minutes were spent at temperatures below freezing point, thus the aircraft oxygen supply was indispensable. The danger of removing a glove even for a few seconds will result in total immobility of that hand due to frost bite, because of the narrow bore of the veins supplying blood to the fingers. Our faces were smeared with Nivea cream to prevent this, although we had the option of a muslin face veil; care was taken not to use petroleum jelly or lanolin since their low flash points could have reacted with the oxygen in the face mask.

On the run-in Nick changed over to his personal oxygen system while I watched. Then it was my turn, but things didn't go quite so smoothly, for I lost some valuable seconds and in that time my attention to detail became a bit sloppy and my head was rolling slightly. Nick stepped in immediately and restored the situation, the blast from the full-flow of oxygen turned me on again like a shot from some high powered drug. We confirmed each other's oxygen system and Nick started to give directions to Jorn on the final approach: 'Five left . . . steady . . . five left again', and so on. Meanwhile I negotiated my exit position and on Nick's signal sat in the door, smoke generator at the ready. During this time we kept an eye on the bottle indicator, which was already down three-and-a-half minutes out of its total of ten. Then, quite casually, I felt Nick tap my shoulder and I hit the prop-wash at 140 knots, pulling the smoke toggle in a tumbling exit. The long awaited descent had begun.

My first impression was that of stepping out of a space capsule and doing a walk in space. When terminal velocity was reached, the feeling was quite eerie in the thinner air. I held a full-spread position and Nick was soon down to my level. I maintained the platform while he closed in, since at the higher rate of fall, the closing speeds would have been dangerously high for two people hand-dragging. However, within reaching distance he signalled his intention to abort a link, gave a nod and tracked away. Checking my altimeters I found I'd still got over 16,000 feet left, so decided to play about with barrel rolls, forward and back loops and discovered that there was no out-of-balance moment due to the weight or shape of the oxygen bottle. Alas, ten grand was soon reached and I began to look for my place on the map, but there was no need to worry, it was right there below—no problems about trying to get in on this spot. There was nothing left to do except track around, but between nine and seven thousand feet I experienced severe misting of goggles and instruments and had to rub them clear in an inclined pull-position. By 3,500 feet I was right over my opening point after checking Nick's whereabouts, and at 2,500 feet we both deployed our main parachutes, thus ending 105 seconds of ecstasy. Goggles off, mask to one side and just to please the crowd below, we headed for Ade's pit, which was 'ground zero'. A series of flares had been lit by armourer Bob Lewis after

Left to right: John Platt (oxygen operator and photographer), Nick Fry, Jorn Hansen (pilot), Joe Forster

The free-fall descent. The Kyrenia mountain range (20 miles distant) has been foreshortened by the camera zoom lens. Joe Forster's smoke has just run out and is visible in the centre of the picture. The arrow identifies a black dot as Joe Forster and the 'N' Nick Fry in max-track. Height approximately 10,000 ft agl

the first sixty seconds of free-fall to help us locate the DZ, and the continuing smoke now served to guide us right into the target area. I managed to scoop a back-pack full of peas reaching for the perimeter of the pit, while Nick was about thirty metres away. Kit off and then congratulations all round. Our thanks for the success of the jump go to Pilot Officer Jan Bennett (WRAF) for considerable work done on the administrative side; to Ken Jacobs who supervised most of the attempts and who would have jumped but for a head cold; Kevin Crome, a long time jumper who helped us to kit up and who also co-ordinated the DZ crew; Gary Beasley, who as a Gas Plant specialist charged the personal oxygen bottles (he also took ground photos); Bob Lewis, who, as armourer operated the DZ pyrotechnics, and last but not least, John Platt (in the picture), who took aerial photos. Finally, to all the various departments at RAF Nicosia for their exact and indispensable assistance they gave us, goes our abundant gratitude.

When we returned to Akrotiri that evening Nick and I were rushed into the Station Broadcasting Studios for a ten-minute interview by Kevin Crome who announced the first major event of the recently formed Akrotiri Free-Fall Club (CCI is Ken Mapplebeck), telling captive audiences that to date we held the Cyprus Military as well as Sport Parachute Altitude Record for delayed free-fall. Nick and I both agreed on one point, an interview in front of a microphone 'live' as they say, is much more nerve racking than any parachute descent!

The main conclusion we drew from this, our first high altitude jump, is that the medical aspect is most critical, and that the most thorough pre-jump medical check may not always detect a possible source of trouble. Nick, it was later found, had a very slight restriction in his right sinus passage which caused a pressure differential of the ears and consequently a slightly discernible loss of orientation during free-fall. Thus his decision to abort relative. Fortunately this defect was not a permanent one but the residue from a head cold several weeks after it had gone!

We wish anyone planning to break this record lots of luck, here in Cyprus or anywhere in the UK, where it may be possible to jump from such heights, and hope that our 'gen' is of use. As for the future, Nick hopes to improve on the record by raising it to 25,000 feet some time next Summer. For me, it's farewell to Cyprus having made 113 descents and lots of friends, and as it turned out, just managing to get in on that 'walk in space'.

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COURSE PROGRAMME–1970

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Course 4/70	21st June	— 10th July
Course 5/70	12th July	— 31st July
Course 6/70	2nd August	— 21st August
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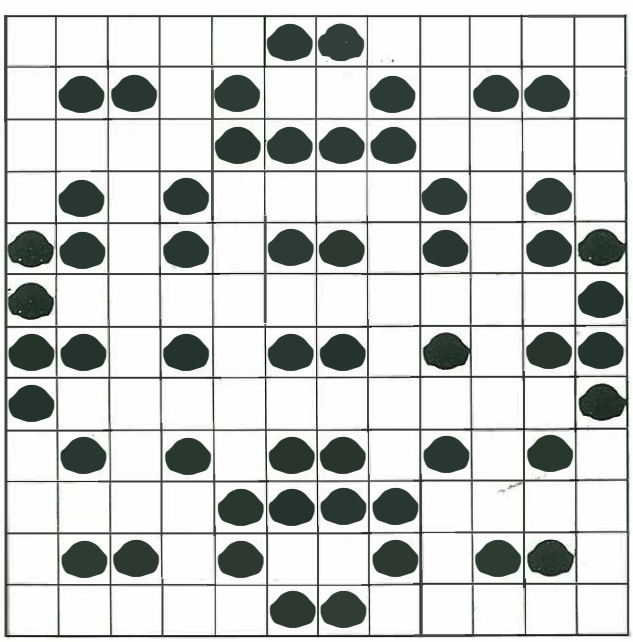
The British Parachute Association is indebted to the Army Parachute Association for their agreement that two civilian BPA members may attend each of the above courses. The cost of a course is £22 and includes 15 jumps, accommodation and messing. All bids from civilian members must be made through the Secretary General BPA to whom a deposit of £5 should be sent when an allocation has been confirmed. Please note that a refund will not be possible, unless cancellation is made through BPA a clear three weeks prior to the commencement of the course.

PARA-CROSSWORD

compiled by Irene Rowe

Clues are given in order of appearance. No prizes for a correct solution this time. Solution on page 18.



CLUES

Across

Landing east of a Great Lake could be ghostly. (5)
Does he switch off just as you're switching on? (5)
Where PLFs are practised, initially. (1,1)
A Red Devil would be, to a novice. (4)
Deserve the wages of success? (4)
Above everyone else, yet finished. (4)
Hobo race, perhaps, to start the day's jumping. (7,3)
No parachutist should be without one—a matter pf principle, perhaps? (4,6)
Sounds like 7, only he never is! (4)
Beginners prefer a big one to land in. (4)
A junior policeman is highly modified. (1,1)
If it's low overhead, you can't be on number nine! (5)
Ambition that gets you near the target. (5)

Down

Theatrical way to leave the plane? (4)
This wind blows no good for parachutists! (3)
When it's on the wing, you can't help getting cold feet! (3)
Sound of a heavyweight over the east? (4)
Maintain it sounds more like a Cockney's working togs! (8)
The parachutist who always comes first, alphabetically, numerically and competitively! (1,1,6)
A deep spot could keep the target in it. (6)
Keen to go, so rig ran better, perhaps. (6)
Hitting it 100 times in a row is a record. (4)
A meteorological one wouldn't produce one of laughter! (4)
Peripheral hem up to hide a bird. (3)
Where the parachutist is in his element? (3)

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Peacock, D.	(P)	R.A.F.S.P.A.
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Born, A. R.		R.A.F.S.P.A.
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Brewin, D.		R.A.F.S.P.A.
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Carr, G.		A.P.A.
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Crawley, T.		Green Jackets Parachute Club
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Hagan, T.		B.S.D.
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Rees, B.		Parachute Regiment
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Seeger, R. A. M.		R.M.S.P.C./J.S.S.P.A.(S)
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MARK MILLER

'Bird's Eye View'

ANY display is a good chance to show off (yes, I admit it!) but a jump for the Television—I just cannot refuse.

The BBC2 programme 'Bird's Eye View' is doing another series, one of which will include film of Flying, Gliding, Sailing, Riding, etc., and of course, US. You may know that all the film in these programmes is taken from a helicopter, so the jump promised to be a little out of the ordinary.

How did we manage to arrange this outstanding TV appearance, you may ask. Well, one or two members of the Booker Flying Club work for the BBC and they had seen our magnificent mass drop at the Booker Air Show of 13 men with smoke from two Rapides. We jump from Booker regularly, so Clive Plummer, who also belongs to the club there, was able to arrange things for us.

Mike Hall, Clive, George Field, Jeff Lancaster, Ron Leader and myself were to do the jumps, with the usual display fee, and I was to get a little extra for taking film in free-fall. Actually this was £4 0s. 0d.—so much for Lyle Cameron's 1,000 dollars a day starting fee!

The event was scheduled for a Wednesday afternoon at Booker; we would take off from there and jump into Russell's Water Common, a few miles away. Everyone turned up, but the weather was so completely grotty that it was cancelled until the next day. This didn't please me or Mike much because we were already losing sleep between long night shifts, and Ron couldn't make it two days running; by the next day we were a little diminished.

Thursday was a day of high white cloud, becoming lower and greyer. The jumping was on, although the director had said that he would prefer "just a few white cumulus clouds in the background".

The film crew wanted to take us exiting the plane with smoke and then follow us on the canopies to the ground. I wanted to take a good length film in free-fall so that had to be postponed to a second jump. The helicopter, a Bell Sioux specially fitted out for the job, couldn't get any higher than about 3,500 feet with cameraman and director aboard, and worse, its door was on the same side as the Rapide's, so it couldn't fly alongside filming. The only solution was for us to fly at it and jump as we passed. Of course this would involve some rather unorthodox spotting techniques, and the only practical way to get over the obstacles was to get the helicopter to sit over the opening point. I accompanied Mike on a 40-minute flight over to the common just to make a drift run (these big film contracts, you know). When we got back he marked the opening point on the DZ aerial photo for the helicopter pilot.

By now there were only four of us, because George was busy combining the harvest in his fields just over the airfield fence, and couldn't afford to leave it.

The helicopter looked very small in the distance when we got back over the common, and in fact the closing speed wasn't anything like as frightening as you might imagine. We passed slightly below it at about 100 yards; Jeff went

Mark Miller exits Rapide over Blackbushe
Photo by Ron Leader

out followed by Clive and I scrambled to the door to film their fall. Clive's P.C. malfunctioned and rotated, so he cut away. I missed this on film—a blot in my copy-book. He says there was so much orange smoke that he could hardly see the canopy to say what was wrong with it. The film crew got it all though, and followed them both down to close-up landing shots. Clive landed safely in a farm alongside the DZ. The farmer had previously accused us of causing premature birth to one of his calves, and although Clive managed to get out of the field pretty sharpish, he came rushing up, protesting, and asked Clive's name.

Quick as a flash: "Mike O'Brien."

"Oh yes, I had a pretty funny letter from you."

Mike Hall and I made another pass and managed to avoid any overt reckless deeds; oh, except that I parted company with my smoke can on the canopy. The film of Mike and me has turned out better than the first pass, so remember—I'm in yellow, and he's in black.

After the usual winding road through the Chilterns back to Booker, I discovered that the pilot who had been hired had gone home, and anyway, the director was sounding a bit doubtful about a second jump—they couldn't afford another pilot. By now we were two; Mike had been called

to go back to work early, and Clive had a P.C. in a mess and a reserve burned by his smoke canister on landing. After running around, Bert Goodchild, our regular pilot, agreed to fly us although he was supposed to be working at the time. The snag was that I needed two jumpers to film exiting, so that it would fit in sequence with the BBC film. The only answer was to grab George who was still harvesting, back at the ranch, you remember. This was duly done by Pamela (his fair wife) who rushed him over the hedge from his combine harvester, and whisked him round the peri-track.

The light was going a bit now and we were not at all sure that the cloud was high enough for a good one. I was lucky that Jeff was with me, because we had been jumping together a fair bit, making another film; at this stage we could link reliably. Jeff and George had smoke for the jump again, but I had no need as the helicopter had finished its part. We were lucky to scrape the cloud base at 6,800 feet. There was one of those distant yellow gaps between the cloud, running all round the horizon—I hope this may enhance the film. I exited first and filmed Jeff and George against the plane momentarily, before concentrating on Jeff. We swanned around a bit, and then linked at about 4,000 feet. I lost him as we broke because I went below him sharply (no, he went above me!)—another blot in my copy-book—but caught him again for a few seconds before he opened. One of the few advantages of a cloud cover is that you can film without worrying about getting 'up-sun.' I had already briefed Bert on the direction of run-in, allowing for the cloud clearing, when an exit shot has to be taken on a run away from the sun. That we made the target was due more to the near nil wind conditions, than to my spotting on the downwind run-in.

Before we left Booker, I was entrusted with the complete wage packet (in cash) for the day, at which I was most flattered; that I was paid more than the others, I hope to become a general trend!

A month or so later we heard that the film came out well, and that mine would make a nice sequence—a feather in my cap!

'Bird's Eye View of Britain at Leisure' will be appearing about Easter on BBC2.

PARA-CROSSWORD solution

Across: Eerie; pilot; DZ; idol; earn; over; drift run; main canopy; idle; area; PC; cloud; drive.

Down: exit; ill; ice; tone; overhaul; Al jumper; offing; raring; disc; gale; emu; air.

BPA Shop

The following items are available to members of the Association only, and can be obtained from the British Parachute Association Office.

	Price (*including postage UK*) £ s. d.
Hand embroidered Blazer Badge in gold and silver wire	3 10 0
Overall Badge, silk B.P.A. Emblem	16 0
Overall Badge, woven B.P.A. Emblem	10 0
B.P.A. Emblem Tie	1 0 0
B.P.A. Lapel Badge	6 6
Car Badge, Enamel and Chromium plate	2 5 0
B.P.A. Car Transfers	1 6
University type B.P.A. Coloured Scarf	1 15 0
Tankard with B.P.A. Badge or alternative item	1 14 6
Ashtray with B.P.A. Badge or alternative item (Large)	1 2 6
(Medium)	15 0
Your name engraved on the above — additional amount	7 6
Pendant on leather thong with free fall figure	8 6
Breakfast cup, saucer and plate. Parachutist engraved on each. Overseas postage of 5s.	2 12 0
Parachutist Log Book	17 6
Parachute Log Cards (Orders of under 12 will be charged at 6d. each card plus 4d. post) per dozen	5 0
'Parachuting for Sport' by J. Greenwood	15 6
Silver Charm — Open parachute design — for bracelets	11 6
Silver Charm—Gilt dipped	13 6
Parachutist Document Folder	10 0

Note: Overseas members should add postage, sea or air mail, as required.

Investigation of accidents

to BPA parachutists and/or malfunctioning of their equipment

Wg Cdr G. F. Turnbull
OBE, AFC, RAF (retd)

1 Introduction

1.1 Free Fall parachuting accidents resulting in fatalities or serious injury occur very infrequently, and as a result of this there is insufficient knowledge and experience regarding the correct method of investigating such accidents.

1.2 These notes have been written to provide a guide for the Chairman and members of Boards of Inquiry. However, it is important for Investigating Officers to realise that no two accidents or investigations follow an identical pattern. The evidence obtained from a detailed examination of the parachute with any attendant damage and abnormalities, and of the parachutist's injuries and the damage to his clothing, parachute equipment and ancillary equipment, must be intelligently interpreted in order to make a satisfactory diagnosis of the cause of the accident.

1.3 These notes deal with the free fall type of parachutes, and with the static line operated parachutes used during the initial training of free fall parachutists.

1.4 The following assumptions have been made
The Chairman of the Board, or at least one member of the Board of Inquiry:
Understands the parts of the parachute, i.e. canopy, peripheral hem, gore, ripcord, etc.;
Understands the basic principles of packing, servicing, and maintenance of parachutes;
Has a practical knowledge of dropping procedures, Dropping Zone control and parachuting training;
Has access to all BPA Rules and Regulations.

2 Immediate action on the Dropping Zone

2.1 *Free Fall Parachute Assemblies*

2.1.1 On observing an accident or a serious malfunction of the parachute assembly, or on receipt of information, the person in charge of the Dropping Zone should proceed immediately to the scene of the accident, either with or before the Doctor. If a fatality or a serious accident has occurred and the parachutist is still in his harness, he should immediately examine the position of the canopy rigging lines and lift webs in relation to the man's body. He should note whether any rigging lines appear to be caught round the man's feet, between his legs, under his arms, or around any portion of his parachute harness or reserve, or if he is clutching any lines in his hands. *Any suspected or very slack lines should be marked by tying a loop of tape or string round them for identification.*

2.1.2 A note should be made as to whether the reserve parachute was used or not. If it was actuated, then care must be taken to note the relative position of the lines and canopy of the reserve in relation to the main canopy, and whether or not there is any sign of entanglement with the main parachute, the parachutist or his equipment.

2.1.3 If the man is dead, a reasonable time can be taken over the examination of the parachute and associated equipment, but if he is alive, medical attention will be of first importance. While the Doctor is examining the parachutist and during his subsequent removal from the harness, the person in charge of the dropping zone should ensure that the parachutes and associated equipment are disturbed as little as possible consistent with medical requirements. If there is a tangled mass of lines on the man's body, this can be lifted up while the parachutist is removed from underneath it. If the lines are round an arm or leg, substitute any available articles for the limb when the man is removed.

2.1.4 Person in charge of the Dropping Zone should note the numbers or other identification of the parachutes, obtain the names of the witnesses and report the malfunction or accident. *It is important that the police are notified as soon as possible and that arrangements are made to notify the next of kin.*
It is just possible that suspicion might arise that the parachutist struck some portion of the aircraft during or subsequent to his exit which would require the aircraft to be impounded for inspection. However, the need to impound the aircraft should be left to the discretion of the person in charge of the Dropping Zone after he had reported the accident and spoken to the Despatcher.

2.1.5 The use or otherwise of the ripcord handles of both main and reserve parachutes should be noted.

2.1.6 The rip pins, cones, eyelets and pack elastics should be examined *in situ* and photographed either on the spot or during subsequent detailed examination.

2.1.7 The altimeter and stop watch should be examined and a photograph taken of the dials before removing them for detailed examination.

2.1.8 Note should be made of the type of goggles and oxygen mask, if any, worn by the parachutist and the method of attachment.

2.1.9 If a canopy with the double L or TU configuration has been used, and has been deployed from the pack, particular note should be made of the position of the blank gore or gores in relation to any abnormalities before any attempt is made to move the parachute assembly for detailed examination.

2.1.10 The auxiliary parachute and connecting cord should be examined and any entanglement with either main or reserve canopies or rigging lines noted.

2.1.11 The canopy sleeve (sock) should be examined and note made as to whether it was permanently attached to the apex of the main canopy and by what method.

2.1.12 The parachute should then be covered with a large waterproof sheet. If this is not available it should be weighed down with weights to prevent the wind disturbing it. While dropping is in progress, a man should be detailed to ensure that the parachutes are not disturbed. It has happened that a parachute has been left unguarded and has been picked up by another parachutist, and all evidence destroyed.

2.1.13 The parachutes should be left for the Board of Inquiry to examine if this is practicable. If not, the parachutes should be moved very carefully onto a tarpaulin or some other suitable sheet and removed to a place of safety with minimum disturbance. BEFORE MOVING THE PARACHUTES, as many photographs should be taken as possible to help the Investigating Officer to reconstruct the details of the parachute's position in relation to the parachutist. If it is not possible to photograph the parachutes *in situ*, then sketch maps and drawings should be made. It cannot be too highly stressed that as much information as possible must be available to the Board of Inquiry.

2.1.14 The log cards belonging to the parachutes involved should be impounded for inspection. If the parachute was packed by somebody other than the parachutist, then until it is established that no packing error has occurred, a random selection of five or six parachute assemblies packed by the Packer in question should be impounded for subsequent inspection. These parachutes may be subsequently released without detailed examination if no suspicion of a packing error arises.

2.1.15 If the incident did not result in a fatal or serious injury to the parachutist, perhaps owing to the successful use of the reserve parachute, the parachutes should be covered and guarded as indicated in para. 2.1.12 and the same general line of action followed. It must be left to the discretion of the person in charge of the Dropping Zone to decide whether parachuting should continue from the particular aircraft involved in the incident, or whether the aircraft should be grounded and impounded for inspection.

2.1.16 As soon as possible after this immediate action has been taken, the Secretary General of the BPA should be notified of the accident and its location and he should be informed whether the Police and next of kin have been notified. He will then initiate the forming of a Board of Inquiry to investigate the accident.

2.2 *Static Line Operated Parachute Assemblies*

2.2.1 The person in charge of the Dropping Zone should proceed as indicated above except that the following addition should be made to the comments in para. 2.1.4: He should also see that the inner bag belonging to the main parachute is not removed from the aircraft and he should instruct that the aircraft is impounded for subsequent inspection.

3 Detailed Examination and Analysis of Evidence

3.1 *Free Fall Parachute Assemblies*

3.1.1 The Chairman of the Board should be fully conversant with the evidence produced at enquiries into previous parachute accidents and have some knowledge of the probable causes of failure. Copies of previous Inquiries are available on request from the Secretary General, BPA.

3.1.2 It is desirable to take photographs of the parachutes at the scene of the accident, preferably with a half plate camera. These photographs should include a general view showing the layout of the canopy and rigging lines, a closer view showing harness and the rigging lines of main and reserve parachutes and photographs of abnormalities seen. If a tangle or twisted area of rigging lines is present, the length from the upper end of this area to the periphery for the two sets of lines should be measured before disentanglement. During the step by step disentanglement the number and direction of the rigging line twists should be noted and further photographs taken of the process if considered desirable. During this examination any lines and gores about which special reference should be made must be referred to by number.

3.1.3 For detailed examination of the canopy, the equipment should be moved to suitable premises, care being taken not to disturb any abnormalities in the fabric (e.g. rolled peripheries that cannot be carefully examined on site). The presence of tears and sears and areas of rolled fabric should then be noted and a sketch made on the planned drawing of the equipment. If photographs have been taken of the exit and/or descent from the aircraft, they should be examined for evidence of cause.

3.1.4 Particular attention must be paid to that area of the canopy in which the blank gore or gores is located when dealing with canopies of TU or double L configuration.

3.1.5 If not prevented by damage, the run of the ripcord assembly should be studied and a careful measurement made of the force required to pull the ripcord.

3.1.6 Detailed notes of any damage to the rip pins, the rip pin base plate and protection cover should be made as this may provide evidence as to whether the rip pins were withdrawn prior to or after impact with the ground.

3.1.7 If the parachute assembly has a barometric power unit or time delay device incorporated in it, this device must be examined to ascertain whether or not it was actuated and whether or not it functioned correctly.

3.1.8 The height at which the parachutist left the aircraft and the pre-arranged time delay before pulling the ripcord should be ascertained.

3.1.9 If the agreed jumping height was above 12,000 feet AMSL, the aircraft and personal oxygen equipment should be examined and tested. The relevant aircraft drills for changing over from aircraft to personal oxygen supply should be noted.

3.1.10 The state and stage of the parachutist's training should be investigated and note made of any pre-jump medical checks and whether these were carried out.

3.1.11 The parachutist's protective clothing should be checked to discover whether it was adequate for the particular descent being undertaken.

3.1.12 The altimeter and stop watch log should be examined to establish serviceability prior to jumping.

3.1.13 A sketch map of the position of the witnesses from the point of impact should be made to enable the Board of Inquiry to assess the value of their evidence and correlate their statements.

3.2 *Parachute Assemblies Actuated by Static Line*

3.2.1 The comments in paragraphs 3.1.1, 3.1.2, 3.1.3 and 3.1.13 apply and in addition the following should be noted.

3.2.2 The aircraft should be examined carefully and attention should be paid to the inner bags, static lines and strops of the parachutist involved in the accident and of the parachutist jumping in front of and behind him as well. The exit or aperture, masking and fuselage after the exit should be examined for untoward marks or evidence of damage. The inner bag involved in the incident should be carefully inspected, special attention being paid to the state of the rigging line loops and any damage fully noted.

3.3 *Investigation by persons other than the Board of Inquiry*

It cannot be stressed too strongly that evidence can be utterly destroyed if anybody tampers with the equipment to see what has happened. It is vitally important that so-called "experts" are not allowed to pull the ripcords and examine the parachutes to see whether they are packed correctly. By doing this, before the Board has a chance to examine it, all hope of getting accurate mute testimony from the equipment is irrevocably destroyed.

4 Some General Causes of Parachute Malfunctions

It has often been, and still is, very difficult to determine whether the responsibility for a parachute malfunction or a fatal accident can be attributed to any particular cause. Therefore any grouping is liable to be controversial. Nevertheless, the cause of malfunctions and fatal accidents can be divided into four main groups in which malfunctions and fatalities may be attributed to fall:

(a) technique, including training;
(b) design of the equipment;
(c) inspection;
(d) aircraft design and flying.

One of the prime causes in the chain of events leading to a parachute malfunction which is readily observed by witnesses is loss of stability, with consequent spinning or tumbling after a free fall or faulty exit technique in the case of a static line descent. In the latter case the fall may take the form of somersaulting, or partial somersault, resulting in the parachutist being upside down during parachute deployment. These faults occur fairly frequently when parachuting from aircraft and do not necessarily result in anything more serious than a twist in the rigging line, a strop burn, or a rigging line caught round the feet or on part of the equipment. However, each of these minor incidents have in some circumstances led to a fatal accident.

5 Difficulties encountered on an investigation

Certain difficulties arise in the examination of the parachutes on the ground because on first sight it is hard to say if an apparent abnormality on the ground was present before the parachute struck the ground or if it has arisen as the unopened parachute collapsed on the ground. Unless there is reason to suspect a blown periphery, the general layout of the canopy will probably be normal. It sometimes happens that when a man is falling through the air, the mouth of the canopy appears to be held together, but on examining the parachute on the ground it is found that the canopy is spread out and the mouth is wide open. Any constriction of the rigging lines further up than half way to the periphery may cause failure, as there may be considerable length of free rigging line above the constriction which will allow the canopy to open out when the parachutist struck the ground.

With regard to the appearance of the rigging lines and harness, if the man is killed instantly, he will probably have rebounded two or three feet into the air after striking the ground. As a result of this the rigging lines or lift webs may become wound round his body. If the man has somersaulted during deployment of the canopy, this may lead to confusion. In the case of entanglement due to somersaulting the rigging lines are often high up between the legs and the appropriate lift web is pulled down towards the crutch. The man has succeeded in disengaging his legs from the lines, the lines may be clutched in his hand. Tangling of the rigging lines is usually obvious. The lines pass into the tangle and up and down inside it and it takes some force to pull out the tangle. In some cases it may be difficult to distinguish between damage which has occurred during the parachute deployment and development stage (air damage) and damage which has occurred on impact with the ground or some other intervening object (impact damage). In most cases it is possible to trace impact damage by repacking the parachute. On so doing the pattern of damage, which may be widely dispersed on the unpacked canopy lines and pack, often becomes concentrated and shows the precise state of deployment or otherwise of the parachute at the moment of impact. It has happened that the main parachute has developed fully and the parachutist has been found to be dead immediately after landing. In such cases it has been found that there has been ample medical evidence of the cause of the death, for example, (a) broken neck due to the body spinning and rigging lines passing round the parachutist's chin and neck causing injury similar to judicial hanging; (b) hard backward landing resulting in a head whip and severe damage to the brain.

The above notes are only intended to serve as a guide for the Board of Inquiry. In all cases the findings should depend on a commonsense review of the available evidence. If it is impossible to come to any definite decision as a result of the evidence, it is not advisable to invoke such causes as bad packing, static electricity or humidity, unless there is very definite evidence that one of these is the cause of the failure. Such findings tend to confuse the issue rather than to clarify it. If the investigation is concerning a Free Fall parachuting accident, and should the Investigating Officer discover after his initial examination that neither the ripcord of the main parachute or reserve had been pulled, then he should request the Doctor to arrange for a detailed post mortem examination to be carried out to ascertain whether the failure to pull could be attributed to medical causes. In all investigations in which the parachutist has suffered injury, it is advisable to obtain a detailed medical report in addition to the Doctor's statement regarding the position of the body and injuries discovered during the *in situ* examination, as this will help the Board of Inquiry to confirm the attitude in which the parachutist struck the ground. If the medical report is not readily understood it is advised that the Doctor and/or Pathologist should be consulted, the pattern of injuries can can then be related to the type of parachute abnormality, the hypothetical position of the parachutist during the descent immediately before impact, and the calculated rate of descent.

One final note of warning. If the parachutist is unconscious or seriously injured, do NOT attempt to move him until qualified medical help is available.

continued from page 8

MALFUNCTIONS. There are few combinations of possibilities, but all of which result in the need to cut away. The only really serious one of these is the violent spinner—and I mean violent! This should not be fought, but jettisoned at once, as extreme dizziness and disorientation occurs rapidly, and the unhappy jumper, on cutting away, is thrown outwards—literally in a flat spin. However . . .

LANDING. Up to about 75th wing flight all landings should be made into wind, thereafter try a few target approaches down wind (into a *soft* pit) in nil or light wind conditions. The main danger of wing landing occurs in nil wind conditions due to the possibility of over braking into the stall mode. The wing will then stall to the left (due to the drag of trailing OSI wrap). The only possible salvage is to let up completely on the side to which you are stalling. *Do not* pull down even further on the opposite side, as this compounds the error—and maybe you as well.

If in doubt for nil wind landing, approach the ground on maximum brakes, then at about 10–15 feet let go toggles, grasp rear risers and pull down hard and equally. This can only be learnt by experience, and is not necessary once confidence and proficiency has been gained. I recommend an altimeter with 100 ft. graduations from 1,000 to zero for approaches. *No violent manoeuvres should be undertaken near the ground.*

In closing, I must say that I feel that the 'geometric' classes of parachute require a new category or licence, and should be restricted to 'D' holders (with a proven cut away ability) only—except where special exemption has been sought and gained. I am not setting myself up as a prophet, but to those who I know will scoff, I say 'Look out, or you'll get left behind—literally and metaphorically'.

Since writing this article a slight modification has been introduced, which has improved the openings tremendously.

Charles Shea-Simonds prosecutes:

The Case for the right-hand pull

THE B.4 or B.12 pack or harness is initially rigged with the ripcord pocket and handle on the left-hand side, requiring a cross pull by the right hand to open the pack. Many clubs are content to use the handle in this position for student training, and the following three reasons are normally given:

1. 'There is more leverage with the handle on the left than on the right.' This is simply not true. I have been to some lengths to prove this using a number of people of different sizes and strengths, pulling on a handle attached to a spring balance. The average person can pull approximately 55 to 60 lbs. with the handle in either position with his right hand (one or two, in fact, were able to exert a stronger pull with the handle on the right-hand side); all this when it only requires 15 lbs. pressure (average) to release the pins.

2. 'The handle is protected when mounted on the left.' This is not a very powerful argument. It is not uncommon to hear of a reserve handle being accidentally pulled but it's extremely rare to hear of a main handle being accidentally pulled. I can't believe it's too much trouble to ask the student to protect his own handle if necessary.

3. 'The French have their ripcords rigged on the left.' Although this is true and we can learn much from our neighbours over the Channel, anyone who gives you this argument is bluffing as he's obviously never seen a French ripcord handle. Although the French handle is rigged on the left, it is, in fact, a much more prominent handle, with a red plastic grip, bent outwards and actually rests nearly two-thirds of the way across the chest to the right. Therefore, to compare the two is irrelevant and misleading.

I am sure that the crux of the argument is—which of the two is SAFER for the student parachutist? So, at this stage let us examine the actual pull itself.

Firstly, in spite of being constantly told to look for the handle on the pull and practising it on the ground, it is amazing how many students feel for and fumble the pull. When the ripcord pocket is rigged on the left, the handle is positioned against the body.

This will obviously accentuate any fumbling of the pull, and, of course, this is made worse by the wearing of gloves other than those made of the thinnest material. With the handle jutting out on the right, however, it is virtually impossible to fumble the pull as groping fingers will readily grip the protruding handle. I have seen numerous students in desperation deploy their reserves having fumbled a cross pull but I can't readily recall an instance when a reserve was deployed following a FUMBLED right-hand pull.

This brings me to the second important reason in favour of the right-hand pull. Now obviously, a bad position will lead to tumbling or the like and thus a panic-stricken or fumbled pull. Therefore, it is possible to link this second argument with the first. The cross pull position is more difficult for the student to achieve by being unnatural because it is unsymmetrical. Additionally, if the left hand is not positioned high over the head, the body will assume a head-down position on opening. The body will also tend to roll left or right as there is little support for the airflow on either side of the shoulders.

However, with a right-hand pull there is a natural symmetry and with the elbows positioned well out from the body, any tendency to roll or to go head down is eliminated.

In examining these arguments, any experienced parachutists should forget their personal preferences and consider carefully which system is the easiest and safest for the student on his first free fall descent. All that is required in the right-hand pull (apart from looking for the handle first) is a simultaneous bending of both elbows to the symmetrical position of the pull.

In 1967, writing in *Skydiver,* Lyle Cameron speaking on cross pulls said: 'They went out with silk canopies', but I would like to believe that the facts speak for themselves and the rigging of the pocket and housing to the right is but a ten-minute job. Finally, of course, whichever system your club is using, it must be the same throughout.

Letters to the Editor

Dear Sir,

One of the most remarkable features of *Sport Parachutist* is its low advertising/editorial ratio. I wonder why this is? More advertising would surely make this a wealthier magazine—and help to ease the perennial shortage of copy.

Many more international firms manufacturing or dealing in parachuting equipment, hotels and boarding houses near club premises, clubs themselves, and drinks and cigarette firms could surely be persuaded to take some space.

Circulation doesn't matter. The fewer copies sold, the lower the advertising rates. I'm sure most companies would rather spend a few bob and reach 1,000 people than save their pennies and waste sales potential.

I'd also be interested to know whether or not *Sport Parachutist* is available other than through the BPA, at newsagents and news-stands, for instance. Don't you think you might pick up extra sales from people who travel a lot by train or bus?

I know when I used to travel a lot by rail, I bought all sorts of magazines on all sorts of subjects just for a change of reading matter. Although much of the material was way above my head, there were stories of general interest and fascinating photographs to keep me entertained. (I'm certain mums, dads, wives, uncles, etc, of BPA members are as interested in the magazine as THEY are.)

Both these ideas might be totally impractical—but I'd be interested in your reaction, just the same.

Yours faithfully,

IRENE ROWE (BPA number 6034)

I was interested to read Major Gardener's article 'Reserve Procedures' in the Autumn issue of *Sport Parachutist,* and particularly his remarks about the importance of tracing the control lines of the Para Commander from the risers to 'a point under the skirt'.

These remarks are long overdue, indeed the same can be said of the entire article, and with more people jumping advanced canopies tips of this nature are most welcome. However I would go one stage further and advise PC users to trace the two control lines through to the steering slots, and so eliminate any chance at all of apex/control line crossover.

It is rather depressing to witness experienced parachutists flaking a canopy and pulling on the sleeve of a PC. This could lead to an apex/control line crossover with a subsequent rotation as the canopy inflates. Having witnessed a Para Commander packed this way completely malfunction, I am convinced the manufacturer's packing instructions are as valid now as they were five years ago. With 1300 Para Commander descents without damage or incident my advice is—'pack by the book'.

Later in the same article, on the subject of cutting away from a malfunctioned main, Major Gardener advises 'with $1\frac{1}{2}$ shots, insert your thumbs into the rings and activate them with a sharp tug.'

The subject of cutting away has interested me for some time, and three years ago I included the subject in a general booklet of 'Notes for Instructors' to help make standard the methods of instruction at Thruxton. After reading the proofs of this booklet, Mick Turner pointed out that the method I had recommended (which was the same as advised by Major Gardener) could, if both sets of capewells did not free simultaneously, result in one set staying in place with a resultant streaming canopy, a jumper suspended at an angle, a vastly increased rate of descent and the possibility of a main/reserve entanglement. I agreed with Mick's remarks and amended the article which is printed below.

> THE PARA COMMANDER
>
> Parachutists using the P.C. are advised to fit $1\frac{1}{2}$ shot capewells. In the event of a fast rotation, to jettison quickly and cleanly, undo both capewell covers, hold firmly both left risers and fire that capewell. Keeping hold of the left risers, fire the right capewell at the same time releasing the left risers. It is extremely dangerous to attempt to fly a reserve canopy under a rotating P.C.

Also in the same article Major Gardener remarked that in the event of a complete malfunction 'the normal procedure for an experienced jumper with a conventional chest-mounted reserve, is to roll on to the back to allow a clean deployment of the reserve', and later goes on to recommend that if altitude and experience permit, the jumper 'rolls on to his right side before pulling'.

Now this procedure has yet to be discussed by the BPA Training and Safety Committee, but the writer is one experienced jumper who in the event of a complete malfunction is going to pull that reserve handle irrespective of being face to earth, back to earth, or inside out, and 'the severe opening shock taken in the middle of the torso', is going to be the most agreeable opening shock the middle of my torso has felt. I would remind jumpers that time passes distance at about 175 fps and you too will pass if you frigg around trying to roll onto your side with this rate of descent.

JOHN MEACOCK

Dear Sir,

The Council of the British Parachute Association has approved my writing a book to be called *Sport Parachuting.* This book is not to be another history of the sport or a collection of well worn jump stories, but a long overdue basic handbook.

It is to be published by Blacks and I hope to complete the manuscript by early summer of 1970. I will, of course, be asking parachutists of repute and experience in particular fields to vet particular chapters. However, if any members of the BPA have any ideas or any points they feel need emphasising or including in the book, I would be delighted to hear from them.

Yours faithfully,

CHARLES SHEA-SIMONDS

Dear Sir,

I feel that Dave Waterman's comments on the Black Knights (see Autumn issue) warrants further amplification, as some of his statements are not entirely correct. I myself was, until recently, a long standing member of the Black Knights and I know exactly how the club was run. Dave, however, can only base his information on hearsay, as to the best of my knowledge he has never taken part in a Black Knights display, certainly not between 1964 and August 1969.

Dave states, 'Most of the parachutists I knew who took up this invitation were relatively inexperienced in display jumping and were only too keen to accept this invitation for free jumps plus about £1 10s. expenses—most incidentally, using their own parachutes.' Not quite correct Dave! Only three or four guest jumpers used their own parachutes—and this entirely through choice. Expenses *did* include accommodation and meals, where necessary, also fares or car allowance, *plus* a *minimum* of £1 10s. for incidentals, mainly to help with the after show 'beer money'. I can recollect one occasion this year when the club paid for the use of the aircraft to ferry a couple of guest jumpers back to their base because they were otherwise faced with an awkward train journey.

He goes on to say, 'What paid for the visit of most of your team to Switzerland for a parachuting holiday with jumps to 16,000 feet?' Wrong again Dave! *Most* of the team did *not* go to Switzerland. Only four members of the team made this trip, taking with them a further eight novice class jumpers from the club. (I think you will agree that novice jumpers need experienced hands around when practising competition and display techniques, etc.)—of course fees from displays paid for this trip! Surely that is what a good club is all about? If eight young jumpers can receive assistance like this through club efforts, each year, it must be a step in the right direction in the parachuting world. I personally do not know of a similar effort by other clubs. Most jumpers seem more than content to pocket what they can from displays, the attitude being, 'I had to pay to reach this standard, etc'.

I'll close with one more observation. Dave says, 'Jumpers are worth every bit of their £10 or more'. Well, a garage charges approximately £2 per hour labour charges. I've yet to meet a fitter or mechanic who receives £80 per week in wages, have you?

TOM OXLEY, BFPO47

A COLOURFUL LOB

Slates of grey, bricks of red,
Where the hell's that green DZ.
Johnnie Cooke on the Bolton Show,
Way off spot, some way to go.
The only space, black road ahead,
TRAFFIC LIGHTS! ! ! They *can't* be red.
At last, at last they can be seen,
He sails right through—they've changed to green!

JOHN COOKE

World Championships 1970

*

NATIONAL TEAM TRAINING AND SELECTION

The training and selection of our National Team for the 1970 World Championships is now under way. If you have not received an invitation to a training/ selection meet, and feel that you are worthy of consideration, please contact the Team Captain (Mr. W. J. Meacock) or the Secretary General.

Verse . . . *and worse*

—being a selection of the missiles which have bombarded the Editor in past weeks

CRACKING UP
(Or the day we came out of our shell)

Relative work is here to stay,
(And 'Peanuts' Perry being "gay"),
We thought it time to change our act—
So came the egg, and that's a fact.
A 'raw egg pass' agreed upon,
The jumpers two their helmets don;
The egg is held by base-man 'Al',
To be transferred to 'Peanuts—Pal'.
Off we go at six-point-two,
Can't waste much time, got things to do;
In he comes as slow as hell,
Mustn't crack this bloody shell,
Down on the ground t'would be a joke,
To see us covered in the yolk.
Hand, wrist, swop—the deed is done,
Now I can sit and watch the fun.
Track apart, look and dump—
Watching 'Peanuts', throat a lump.
Abuse (as usual) pouring forth,
We run in downwind, facing north;
'Peanuts' has the right of way,
(No wing yet, C.9 today),
He gets five and I get one,
A lovely way to end the fun.
Spectators gather round to see
The egg that made Kluang history.
"It's hard-boiled," one dares suggest,
So 'Peanuts', after beating breast,
Does throw the egg up in the sky
And I, deflated, start to cry.
It was quite raw, just as we said—
And on the airfield it was spread—
We dry our eyes and walk away
To plot and scheme another day;
A time, if all goes well boys, when,
We'll scrub round the egg—and pass the HEN.

A.D.S.

A LIFE IN THE DAY OF A 'RAVEN'

Come jump with us says Charlie Shea,
Three Shows booked for next Saturday.
First run in at ten to three
Two minutes later, for all to see
A big black 'Raven' in a tree.
He's croaking something, the word's relayed
'Get the bleeding Fire Brigade!'
Charlie bellows, 'We've got to go,
Got to do another show.'
On the way to Number Two,
My God, what a motley crew.
A 'clutch' of Ravens, what a shower.
The opening point's that cooling tower.
First stick out, what's that he said?
They've gone and jumped the wrong DZ.
Charlie Mahon and Delsoldato
Collide on landing, it's obligato,
For poor old Charles, the unlucky - - - - -,
Ambulance, hospital, X-rays, plastered.
For another Raven a quick reprieve,
His handle's gone, he's wrecked his sleeve.
Three grand up, four men remain,
We've got that first DZ again.
'There they are,' the crowd's a twitter
All on target, free pints of bitter.
All in all 'tis fair to say,
This hasn't been the Ravens' day.
One thought remains, that nursery rhyme
'There were ten little nigger boys, then there were nine . . .'

'THE 29th GORE'

Parachutists who find themselves enthralled by the scenic beauties of their respective DZs probably never even consider the possibility of landing face to face (or posterior to horns!) with a raging bull.

It has happened, though. 'The 29th Gore' is a true, but somewhat distorted account of what happened to a certain member of the Scottish Parachute Club when he touched down on Strathallan Estate some time ago.

Happily, HE escaped with only 28 gores—all on his canopy. He's been avoiding odd numbers ever since.

All the jumping conditions are ideal,
And blithely our hero emplanes,
Sitting tight till the cut of the engine,
Quite free of all stresses and strains.
The spot looked OK so he exits,
And 'frogs' his way earthwards with joy,
Till the time comes for pulling the ripcord,
He's a cool operator, our boy.
But look how that coolness disperses—
His temperature's rising, and fast
For the wind, too, can do aerobatics
And it's fighting our lad to the last.
Oh what will become of our hero?
And what has become of his grin?
There's a big clump of trees down below him
And his chances of missing look thin.
Quite undaunted, he goes for the toggles,
First the right, then the left, with a pull.
Then it comes to our hero's attention
That the trees are concealing a bull!
'Come on, damn you, WORK!' cries the boyo,
Unwittingly blowing his cool.
But conditions are not in his favour
Which can also be said of the bull!
Crosslegged down through the branches,
Till his fall ends, three feet from the ground,
Then our hero recovers composure,
And casts a keen eye all around.
At his back stands El Toro, the villain,
And quickly our hero can see,
That the bull with its quaintly curved horns,
Will be nearer its target than he!
Moments later, his friends come to free him.
But too late! For our hero is sore,
And he bears, to this day, on his jumpsuit,
The marks of the 29th Gore!

Irene Rowe

Irene Rowe

'Those little white lies . . .'

If St Peter ever shuts the Pearly Gates in my face, I'll know the reason why. Parachuting!

Well, the lies I've had to tell about it would make old Beelzebub himself think twice before letting me in!

It all started when I decided to spend a week of my summer holiday at the Scottish Parachute Club's course at Strathallan Estate, Perthshire.

I had joined the club some weeks before and was fully ground trained, so I knew what to expect as far as jumping was concerned. But other people's reaction to my holiday plans left me speechless with confusion!

To begin with, I made the mistake of thinking that when people ask where you're going for your holidays, they REALLY want to know, whereas in truth they're too busy planning their own to take in a word you say.

Like the newsagent who was my first confidant. He tossed the holiday cliché at me like a de-fused time-bomb, and in all innocence, I answered truthfully. 'I'm going parachuting,' I said, and fought back a blush of pride as he gasped with awe.

'Better you than me,' he said with a mixture of admiration and revulsion. 'I'm terrified of guns!'

Silence was the only alternative to explaining that I had absolutely no intention of shooting paras – so I took refuge in it.

One taxi-driver left me speechless, too. Oh, he understood my intentions. In fact, he was quite an expert on the subject.

'Great fun,' he said smugly, inviting questions on the subject. 'You've jumped then?' I asked. 'Well – you know,' he shrugged modestly. 'Have you?' I said I hadn't, which pleased him no end for some reason . . .

'You'll enjoy it. Start off jumping off high walls – to get used to the height, you know,' he added helpfully. And before I could wonder if my instructor had been keeping something from me, he went on: 'Then you jump out of a balloon – one of those big ones, you know? Then it's the real thing. Marvellous! Get in the plane, put on your parachute, and wait for the light flashing. Course, there's always the chance the 'chute doesn't open.'

'Ah, but you have a reserve,' I ventured. Slight pause, then, assuredly, 'Sure – but what good's that if your parachute doesn't open?'

End of conversation. End of many conversations about touch-downs in the crocodile-infested jungles of Borneo, canopies only fifteen feet across that stayed up for hours and stubborn ripcords that magically came free 100 feet off the deck. Too many kooks awaken great wrath!

Just as bad were the people who doubted my sanity. 'You must be mad,' said one. 'What if you fell out of the plane?' Another seemed to think I might use the River Tay as a DZ, while a third thought collision with a flight of wild geese dangerously possible.

But worst of all were the jokers, whose dazzling originality kept me poker-faced for hours.

'Why do you want to jump out? Can't you afford the return fare?' was typical. So were lessons on the pronunciation of 'Geronimo!', offers of umbrellas for practice jumps and speculation as to whether or not I'd suit wings – the angel variety!

Yes, the jokers were worst of all. But it was they who inspired me to invent the Great Lie – or rather, a series of little lies – as a means of beating 'em at their own game.

At first, I let credibility and caution get the better of me. I stuck to fairly tame lies about my holiday plans. Like tours of Bronte country, a pilgrimage to Burns' Cottage, or a fortnight in St Tropez. But however tongue-in-cheek my answers were, people were actually taking me seriously. I had to grow bolder . . .

So from then on, my holiday plans were designed to defy comment.

I was going on the Under 70's Bingo Club's 'Find the Yeti and Win the Snowball' expedition. Spending a week meditating with Evans-the-Soul, the Mahirishi Yogi of the Rhondda Valley. Walking to Red China to have my copy of Chairman Mao's thoughts personally autographed.

I was contemplating a hitch-hiking tour across the Antarctic. Going on a sewer-tour of Venice. Representing Scotland in the World Haggis-eating Marathon in Foochow. Writing a pornographic novel. Tracing the origin of Brown Windsor Soup. Anything, and everything, but parachuting.

No more jokes; no more caustic comments; no more death-and-glory tales. My troubles were over.

And you've no idea how much I saved on postcards!

SAFETY NOTES

Sqn Ldr A. T. Johnson, Chairman, Safety Committee

THE question of which is the most effective reserve deployment technique is often asked of the Safety Committee. Major Gardener's article in the Autumn issue of *Sport Parachutist* presented all the techniques and discussed them. As is stated the technique which is best for you depends on two factors, your equipment and your experience. The Safety Committee fully endorse what Ed has to say and recommend that you discuss with your instructor the technique you feel would be suitable for you and furthermore practice it (on the ground) and if possible in the air using a 'cutaway'.

None of us likes to think too much about malfunctions and reserve deployment but it is essential that we consciously remind ourselves from time to time. Thinking about the problem is important but practice and the simulation of emergency procedures reinforces the thoughts and translates them into more efficient action.

A reminder, however, concerning the use of a chest mounted altimeter as a height reference during reserve deployment. If a backdown position is adopted during reserve deployment, remember that the pressure sensitive altimeter will be enveloped in a zone of low pressure relative to your real altitude and will therefore be reading *too high*. While it is unlikely that anyone will be interested in the altimeter at this time it is still worth while to remind you of this fact. The height difference can vary between 100–300 feet —remember this also if you are ever adopting a back-down position.

Ed also raises several extremely valid points regarding the choice of reserve canopy. The reserve is all too often a neglected part of our equipment. Many of us have the attitude that successful reserve deployment is all that counts. When the reserve is open then that is the end of the emergency and any problems posed by its high rate of descent and poor controllability are part of the risks of the sport. This may have been true several years ago but no longer nowadays. There are canopies available which can make good the deficiencies of the old 24 ft. flat circular. We accept merrily higher wind speeds with our high performance main canopies but this only accentuates the dangers if we are unfortunate to end up on a 24 ft. reserve speeding off the DZ in an 18 or 20 knot wind. Ed's article gives a useful table of reserve canopies and body weights to which I can only add a table of my own to further emphasise the point.

The 24 ft. diameter flat circular parachute with a 200 lb. suspended weight has a rate of descent of 24 fps.

The above table is calculated for a 200 lb. suspended weight and does not take into account the additional hazards of fast horizontal drift and the increase in vertical rate of descent which can be produced by oscillation.

Before leaving the subject of reserves I would like to ask just one last question:

WHEN DID YOU LAST REPACK YOURS?

* * *

To change the subject I thought you might be interested in a few facts about the Apollo Spacecraft Recovery System which we have all seen so dramatically in the past few months. I had the good fortune to attend a lecture given by John Kiker of the NASA Manned Spacecraft Centre, Houston, Texas, to a Symposium on 'Fallschirmtechnick and Bergungssysteme (Parachuting to you) in West Germany recently. Mr Kiker is responsible for the final parachute phase of the Spacecraft recovery and does he have problems!

The 13,000 lb Command Module makes its atmospheric re-entry as you all know and decelerates rapidly with the now well-known fireball effect. At 25,000 feet the module is stabilised by the deployment of two 16.5 feet diameter ribbon drogue chutes ballistically deployed from a mortar. At 10,600 feet a baro switch jettisons these chutes and simultaneously fires out from three separate mortars, three 7.2 foot diameter ringslot pilot chutes which extract the three 83.5 foot diameter ring-sail main parachutes. To reduce the severe opening shock which would be caused by three such monster chutes opening the canopies are reefed and open in two stages, as the velocity of the Apollo Command Module falls off. When the canopies are fully inflated (and they have achieved a 100 per cent success rate so far) the 13,000 lb. vehicle is gently deposited in the sea at about 30 feet per second. Lying on their impact attenuating couches the astronauts have described the landing as varying between 'very mild' and a 'solid jolt'.

One of the problems facing the parachute engineers was that of space. We all know the problems of getting canopies into tight packs (I'm back to the reserve again) but what about the problems of getting three 83.5 foot diameter chutes, plus drogues and pilot chutes, into the space around the top of the module, along with other equipment like buoyancy bags, mortars, electrical gear, etc. The problem was solved by packing with the aid of a hydraulic press and vacuum extraction of the air trapped in the canopy. The nylon was so tight at the end of this operation that it had the density of maple wood! So think of Mr Kiker's problem when you struggle with that tight pack closure. However, packing using such extreme techniques has not resulted in any malfunctions and even in this day of rockets they have still not found a more reliable system to bring the astronauts back the last few thousand feet than the parachute.

P.S. (*A PC packed like this would probably fit into your back pocket—an interesting thought but please don't let anyone follow it up.*)

Rate of Descent	
20–25 fps	Minor injury likely Major injury possible
25–30 fps	Major injury likely Fatal injury possible
30–35 fps	Major injury invariable Fatal injury likely
35 + fps	Fatal injury invariable except in very rare cases.

Major Edward Gardener

Safety Officer, Army Parachute Association

'get it off your back...'

MOST instructors can recall the unpleasant experience of watching a student dribbling unstably off the wing of an aircraft and then rolling into his sleeve or grasping his pilot chute firmly in his hand as he accelerates towards the ground below. A parachute requires two conditions to guarantee a clear deployment—a good flow of air and a stable body. A student is usually on a static jump or a short delay when the air speed is relatively low; he may also be unstable. Hence the problem.

Very little sport parachuting equipment has been developed exclusively for the student. The conventional pack with a single pilot chute and sleeve deployment system was designed for a free fall parachute opening in a stable position at terminal velocity. To cater for the requirements of the basic student we have simply added a static line which does no more than relieve the jumper of the responsibility for pulling the ripcord. New ideas are in the pipeline; in the United States a new deployment system called SEX (*S*tatic line *EX*traction) is being developed. It works on the same principle as the military static line parachute; the canopy is packed in a bag which is permanently attached to the end of the static line. There is no pilot chute; the apex of the canopy is attached to the bag with a tie which only breaks after the lines and canopy are fully stretched.

Unfortunately few clubs can afford special items of expensive equipment which only serve the static line student. However, a highly satisfactory system called Pilot Chute Assist has been developed which only requires a very simple and inexpensive modification to conventional equipment. It is now a mandatory requirement on all static line jumps in the United States. There are several variations in common use for both pin and break cord static lines; some use Velcro tape and others a break tie. I will only describe one system, designed to work with the break cord static line; it is probably the cheapest and simplest available, yet it has proved very reliable since its inception over three years ago.

Take a 26-inch length of 550 lb. nylon rigging line and sear both ends to prevent fraying. Form a 1½-inch loop at one end and stitch it. Stitch the other end to the static line 22 inches from the end (Fig. 1). The stitching is best done on a machine but can be done by hand; it should be done by a qualified rigger.

Pack the parachute in the normal way; but before closing the pack tie the loop on the rigging line to the loop on the pilot chute with 50 lb. static line break cord (Fig. 2).

Now close the pack with the suspension line coming out at the top (Fig. 3).

When the student leaves the aircraft the static line pays out, the static line ties break, the pack opens and the pilot chute is released. But instead of deployment depending entirely upon the drag effect of the pilot chute, the top of the system remains attached to the aircraft until line stretch is complete and the sleeve is at least partially off the canopy. Furthermore, the pilot chute is held at the best angle to catch the air so that it can complete the job as soon as the Pilot Chute Assist tie breaks (Fig. 4).

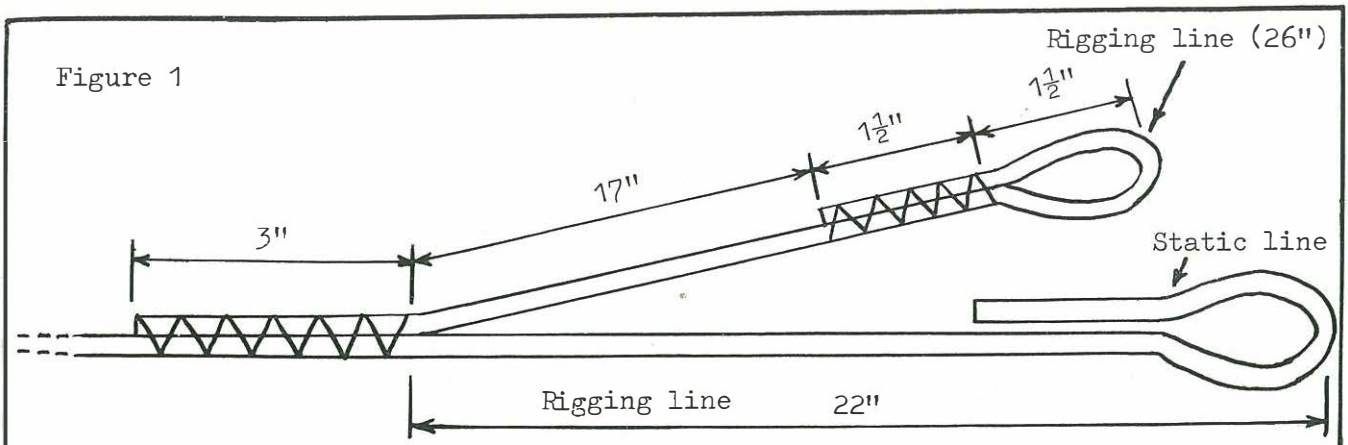
Significant variations in the recommended measurements are inadvisable. The Pilot Chute Assist line *must* be long enough to allow the static line ties to break and the pack to open before any load is placed upon it; if it is too long it may present a snagging hazard.

The Pilot Chute Assist system takes care of the student while he is on static line jumps. But what happens when he progresses to short free fall delays? Here, the experience of the Army Parachute Centre, where literally thousands of student descents are made each year, is worth noting. When the centre first opened, a single pilot chute was used on all student rigs; but the malfunction rate and wear and tear on canopies was found to be unacceptably high. As an experiment, therefore, all student parachutes were fitted with twin MA-1 pilot chutes mounted on a single bridle. The frequency of malfunctions and the incidence of canopy damage dropped dramatically. Twin pilot chutes have been used for staticline jumps (without Pilot Chute Assist) and all free fall jumps ever since.

Pilot Chute Assist does provide a slightly more positive deployment on static line jumps. But the twin pilot chutes certainly provide the student with the safest method of deployment once he is on free fall. The possibility of a burbling pilot chute or the risk of a student trapping a pilot chute under one arm (the pull of the second one will usually drag it free) are virtually eliminated. While the installation of twin MA-1 pilot chutes on all student rigs involves a club in some extra expense, it is a small price to pay when the safety of a student is at stake.

To summarise. The student jumper needs some modification to his basic equipment for static line jumps and preferably also for free falls to ensure clean, rapid deployment. Pilot Chute Assist is the ideal answer for static line jumps. Twin pilot chutes have the advantage of catering for both static line and short delay jumps. One or other of these systems should be introduced in every club.

Figure 1



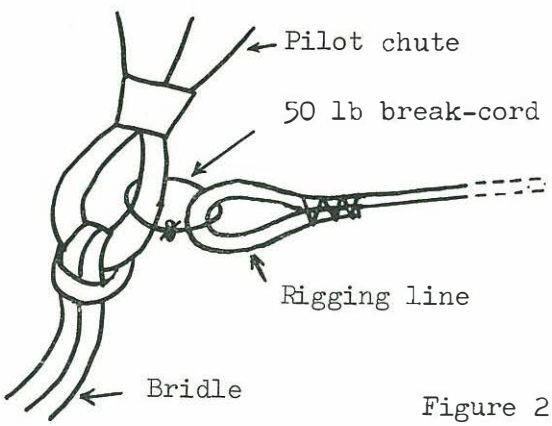
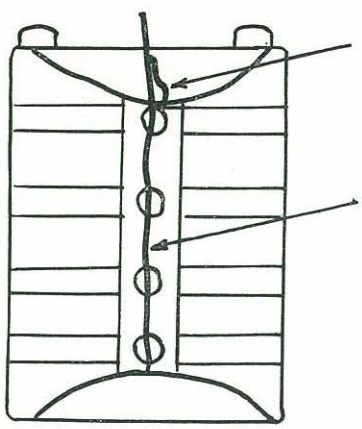


Figure 2



entering top of pack

Static line tied to cones with 50 lb break-cord

Figure 3

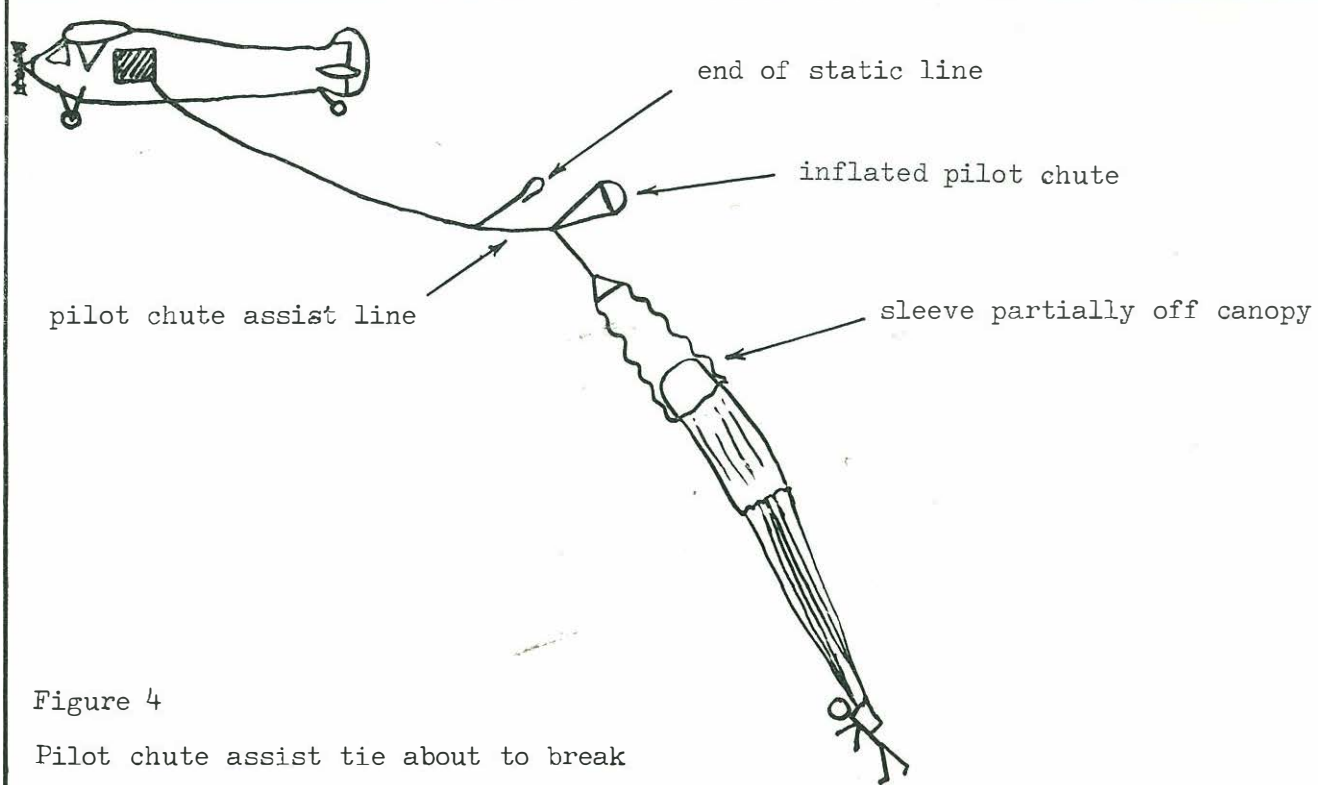


Figure 4

Pilot chute assist tie about to break

Parascending in Cyprus

F. E. THEWLES

DURING April 1969 1st Bn. The Worcestershire Regiment left Bulford for a six-month visit to Cyprus as part of the United Nations force. Amongst the many hundred of boxes carefully packed and labelled for the journey, was one vast crate containing the regimental parascending equipment.

Despite a great deal of work and investigation by Captain Dick Fox we had been unable to establish an area suitable for parascending activities. We duly arrived and, having established ourselves in our new role, started investigations into the whereabouts of suitable areas of land. On initial examination it seemed likely that the only reasonable area was on the centre of the South coast at Zyyi. Here there was a sparse area which would have done at a pinch, but was far from ideal. We were preparing to start work there when we had a stroke of very good luck. One morning Lieutenant Edmund Thewles had cause to go down and meet an early flight into R.A.F. Akrotiri. The aircraft was late so he decided to spend the hour looking at Ladies mile beach, a fine sand beach that runs away to the East from the Akrotiri peninsular. Whilst driving from the airfield cross country to the beach he noticed an area of land that must have been designed for ascending parachuting. It was a salt and sand flat some 20000 yards square and as smooth as a billiard table. As it happened it belonged to the R.A.F. and was used sometimes as a DZ. To cut a very long story short the R.A.F. could not have been more helpful and obliging and within a few days and an equal number of telephone calls we were ready to set off parascending.

Regimental HQ was within 30 minutes drive of the area and at 0430 we set off for our first day's work. We took our "Experts" initially to find out just how things were.

We were on the DZ, kit out and ready to fly at 0500. The sky, as always, was cloudless and the sun was just hauling itself over the horizon away to the East. There wasn't a breath of wind. As a result of the lack of wind we had to make a long run to get the first few bodies up to any height at all. By 0545 there was an offshore breeze of a steady 5 knots. The wind was entirely constant in strength and direction. By 0800 the wind was stead at 10 knots and again, constant. We were enjoying really high launches with the tow vehicle only travelling 200 yards at the most. By 0900 the wind was up to a steady 15 knots and beginning to gust so we broke off for the rest of the day and enjoyed the beach and all it had to offer.

By 1600 the wind was dropping and by 1700 was back to a steady workable 12 knots so we set to again and were able to go on in a steadily decreasing wind until it was almost dark at 1830.

The physical splendour of the country viewed from a dawn or dusk launch defies description, but I believe that it would not be easy to find an area that lends itself better to parascending. From the point of view of access and land and of the fabulous view over the island one has from 1000 feet.

The programme of wind behaviour previously mentioned was as regular as clockwork and after a while one could tell the time by the wind strength.

All in all it was a one hundred per cent. success. Members of the Regimental Club goat scores of jumps and many others joined the club.

Finally, I would again like to emphasise our thanks to the R.A.F. for their help and co-operation in allowing us to use their DZ.

Brian Standring

'Cutaway!'

I FIRST saw a 'Cutaway' demonstrated in Germany in 1968, and on another occasion I remember watching Pete Sherman execute one; as I am a great admirer of Pete I started asking questions about the Cutaway as it was something different and presented a challenge.

My opportunity came early in 1969 when after a thorough briefing by the team trainer, and several sessions in the suspended harness I climbed into a Cutaway rig, but first a word on the Rig itself. I use a converted Crossbow Piggyback pack and harness with 1½ shot Capewells, the reserve pack is modified to accommodate the Cutaway parachute, a 22 ft reserve packed in a sleeve with a single high speed extractor; two 'D' rings have been built into the harness for the attachment of a chest mounted reserve, and most important a converted reserve ripcord handle is sewn into the left riser within easy reach of an extended arm.

My first thirty or so Cutaway jumps were with a sleeved parachute but I found that it was not altogether satisfactory; after several malfunctions and many very slow openings I decided to experiment. With the aid of Albert Hooker the Team Rigger we dug out an old 'D' bag somebody had brought back from the States and cut it about a bit to what we thought to be the correct size to take the 22 ft Cutaway parachute. I then discarded the sleeve and started using the little bag. I have subsequently executed 40 Cutaway jumps using the bag and have found that I get far more consistent openings, very fast and clean with the opening shock not appreciably more severe than with a sleeved parachute. It is also easier to pack; with the sleeve it was a two-man job but now I can pack far quicker single handed, an important consideration when demmo timings are a bit tight.

As most of my Cutaway jumps are at public demonstrations when we are often required to land on very tight DZs with all manner of hazards on all sides, getting into the arena is most important, particularly as anyone zapping out is penalised by having to buy a case of beer for the rest of the team!

Leaving the aircraft at upward of 3,000 ft I normally fall stable for 5 seconds or so than dump the cutaway and fly it just along enough for the show effect. I've found it is better to start streaming it as soon as possible because the winds at 5,000 or 6,000 ft are often quite strong and can easily blow one off spot making it impossible to land in the arena. The minimum time beneath the Cutaway canopy the better, unless of course it is convenient to be blown one way or another.

Having decided when to stream I reach up with my left hand and grasp the handle on the left riser, physically checking that my right hand goes to the top Capewell (failure to check properly resulted in a rather hairy experience that I will relate later). I then drop the dust cover and release the Capewell, retaining hold of the handle, checking the right Capewell and releasing that. The right riser and half the rigging whips away and the canopy crumbles and becomes an ugly tangle above. The released portion of the canopy sometimes wraps round the taut left side that I am hanging on to; sometimes it flies up to enmesh in the canopy but always the collapse is dramatic and the acceleration very noticeable.

While falling beneath the streaming canopy, I always keep my legs bent back at the knees to ensure a quick return to basic stability when I let go, also to give unobstructed vision below. At this juncture I like to be facing the DZ in order to assess my spot and decide when to let go, it is usually about a ten to fifteen second stream depending on altitude and at this time the altimeter lags so it is not a reliable guide. I think only experience tells one how high one is and when to let go. Sometimes the streaming canopy rotates gently, never violently, and quite often pockets of air trapped within the canopy cause considerable drag, making it quite hard work to hang on. Until about 30 jumps ago I used a webbing handle on the riser and with a bit of drag caused by these pockets of air my hand would become trapped in the loop making it very difficult to let go; since switching to the metal handle I have had no problems.

When I think I am in about the right position in relation to the target I let go of the tangled mass above and return to free fall, get stable and dump my main around 2,000 ft: after the familiar jerk, a quick look to see a perfectly deployed P.C. above. The Cutaway canopy snakes lazily earthward beating me by about 20 seconds and to be picked up, we hope, by some schoolboy who is rewarded with half a crown and the team autographs. In Glasgow I have found that they prefer cigarettes, however young. We lose on average three canopies a year.

There was an occasion early in the year after a particularly busy demmo schedule, on the last demmo of the tour when, perhaps a little over confident, I released the lower main Capewell instead of the top one. I did not realise this until I came to let go of the handle to part company with the collapsed canopy. I let go, but nothing happened!

I realised immediately and automatically what I had done and what I had to do; almost without thinking I released the right main Capewell and pulled the main ripcord practically in the same motion. Jettisoning both main and Cutaway parachutes and returning to free fall with the ground quite close, I was in a face-down position when my reserve popped. There was no time to get on my back even if I had thought about it.

The pilot chute smacked me in the face, as if in chastisement for my carelessness, a white blur before my eyes for a second and with a bone shattering jerk my little friend was up and away to my relief and to the astonishment of the crowd not so very far below. I landed very hard and fast some distance away, understandably quite shaken. It is a pity it takes a close shave like this to bring home to one the need for the stringent safety precautions and constant alertness so necessary in free fall parachuting. Since this experience I have painted the lower main Capewells red to assist me in quick identification.

I am sure that many chaps (I don't know about the girls) have a strange aversion to the Cutaway. I enjoy it and think it should be a compulsory accomplishment for all 'D' licence holders as many a time a reserve has entangled a malfunctioned main resulting in a heavy landing often injuring the jumper or worse. These accidents might not have happened had the jumper cut away first. Apart from the safety angle the untangling of a cutaway canopy is good training as it is usually a mass of spaghetti requiring patience and perseverance.

'It's all a lotta cock, guv!'

Charles Shea-Simonds

PARACHUTISTS generally are notorious for their inability to put pen to paper and their ability to voice their opinions vehemently (quite often without the assistance of alcohol!). Bearing this in mind, and that the sharing of experience is probably the most important single factor in the promotion of safety in our sport, I decided to conduct a survey on student training among instructors. I circulated a questionnaire and covering letter around a large selection of clubs asking instructors to complete them as an individual effort. I believe the questionnaire reached about 55 instructors and after six weeks I had received the 23 replies from which I have constructed this article. The following are the twenty-three who kindly replied (in alphabetical order): Robert Acraman, Tony Born, Bob Card, Tony Charleton, Anthony Cockburn, John Cole, Brian David, Mike Deakin, Tom Dickson, Gordon Fernie, Ken Forsdyke, Alan Johnson, Geordie Laing, Bill MacLennan, Don MacNaughton, John Meacock, Tony Price, Malcolm Reed, John Robinson, Pete Sherman, Pat Slattery, Brian Thompson and Mike West. Having now mentioned their names, the remainder of this article will be anonymous, including the name of the literary genius who supplied me with the title!

Now for the actual questionnaire itself which started by asking for FAI licence numbers. They ranged from D13 to C793. There were, in fact, 18 D licence holders and only 5 C licence holders. The twenty-three instructors have made a total of 13,805 descents (an average of 600 each), ranging from 1623 (5 instructors have made over 1000 descents) to 120. Two instructors have been BPA qualified for ten years and the most recent addition to instructor status qualified two months ago, but the average has been qualified for 3½ years. One instructor has parachuted in 11 other countries, Germany proving the most popular with 13 of the 23 having jumped there; France: 12; Cyprus: 10; United States: 6; Yugoslavia: 5; Australia, Malaya and the Persian Gulf: 4. The list totalled 28 different countries, with one instructor firmly believing Netheravon to be a foreign country!

Having dealt with each instructor's experience, we now come to the questionnaire proper. I decided, rightly or wrongly, to make the questions multi-choice; one instructor claimed that this was too restrictive but I felt that if any instructor had any point to make apart from the choices I had given, he would make them. This, in fact, proved to be the case and most of the additional remarks made will be quoted.

QUESTION ONE. *Given ideal conditions and the time to run a thorough course, what do you consider is the maximum number of students that can be safely trained by one instructor?* A straightforward question with the numbers varying from 4 to 12. In fact the average of the answers was 7.52.

QUESTION TWO. *Do you consider that the timings allocated in the BPA Minimum Ground Training Programme for students are: (a) too little? (b) too much? (c) about right?* Six considered too little, none considered too much, 17 considered about right. The six that said, "too little," added that extra time should be spent on one or more of the following: Reserve Procedures, Aircraft Exits, PLFs and Aircraft Familiarisation. One of the six is currently running a full-time centre and he added that he has found that the majority of students need at least twenty hours ground training with up to four hours on emergency procedures.

QUESTION THREE. *When you teach reserve procedures, do you: (a) cover the subject very thoroughly? or, (b) give just enough instruction so as not to worry the student unnecessarily?* The answers were almost unanimously in favour of (*a*). In fact 22 of the 23 said (*a*), but the twenty-third said 'give just enough instruction so as they are carried out as a drill'. Surely to enable the student to carry out reserve procedures as a drill you have to cover the subject very thoroughly? Another instructor qualified (*a*) by saying: 'but careful not to overdo the subject'. Very interesting! I recently heard a potential instructor from the same club say 'we instruct on emergency procedures only once during a course—it is not a matter we harp on!' I wonder if he has since been given his instructor's rating?

QUESTION FOUR: *How many students do you think you can safely dispatch and critique on (a) one static line pass? (b) one free fall pass?* Dealing with numbers on the static line pass first, the average of the answers was 2.52; on a free fall pass, 2.24. Two who failed to give definite numbers said it was a function of the DZ length and the aircraft. So presumably one instructor could dispatch eight students from a Rapide on one pass if the DZ was 2½ miles long—interesting thought when the average pilot drops about 150 feet per student on a static line run and the instructor is expected to given an accurate criqique on each student! Five instructors made the point that once the student has reached 10 second delays or more the number on a pass should be reduced to one (unless a second man is followed out and given an aerial critique). However, numbers apart, this question produced two valid comments which I quote verbatim. One instructor said, 'I just cannot keep my eyes on more than one person in free fall and still give them a complete critique'. Another (full-time) instructor writes, 'Static Line students should be dispatched in such a way that after the first man has been dispatched, the second man cannot get onto the wing until the instructor has seen the first man's chute deployed, the removing his arm from across the door for the second man to come forward, etc.

This stops divided attention of the instructor and an accident such as a brake tie snapping and the extractor going around the tail wire whilst in the act of watching the first man.'

QUESTION FIVE: *Do you consider that, where possible, a student should be trained, dispatched and critiqued by the same instructor?* Twenty-one answered 'Yes' and the other two said it didn't make any difference.

QUESTION SIX. *Do you advocate the use of static line assisted deployment, i.e. the base of the pilot chute attached to the end of the static line with 50 lb break cord?* Nineteen said 'Yes', three said 'No' and one wasn't sure. The latter admitted he wasn't sure because he felt it might give a false impression of the opening speed. Of those that said 'Yes', one said, 'In May 1968 I started using this system and have had four thousand descents without any abnormalities whatsoever. I strongly advise this system to be standardised.' Another said, 'In my view it is time that this became MANDATORY' (his capitals). One suggested the use of Velcro Tape as an alternative to 50 lb cord and another said, 'Yes—although I have not used this method'!! (My exclamation marks!).

QUESTION SEVEN. *Which do you consider safest and easiest for the student on his first three fall descents: (a) The cross pull? or, (b) the right-hand pull?* Five reckoned the cross pull, 15 reckoned the right-hand pull, two suggested the cross pull was safest but the right-hand pull was easiest and the other instructor said it didn't make any difference. My comment on this appears on page 23, therefore I feel additional comment superfluous.

QUESTION EIGHT: *If a student encounters an involuntary turn or instability in free fall, do you teach him to: (a) Try and get stable again? (b) Operate his main parachute immediately? or, (c) operate his reserve parachute immediately?* This must surely be one of the most important questions and yet it produced a variety of answers and comments. Eighteen reckoned (*b*). Two thought (*a*) (one of these saying, 'BUT depends on height—if near opening height, then (*b*)' and the other, 'depends what stage he is at, could be (*b*)'). One said (*a*) for 15 second delays, (*b*) for 10 second delays and (*c*) for 5 second delays. (So he presumably has to teach his students a separate system at each progression—very confusing!) The other two ticked both (*a*) and (*b*), one without comment and the other saying, 'Not a fair question!' Perhaps the latter allows his students to decide for themselves. Personally, I'm convinced the majority answer is the right one.

QUESTION NINE. *Once a student has reached 15 second delays, how often do you follow him out to give an aerial critique: (a) every other jump? (b) only when he appears to encounter difficulty? or, (c) Never?* Sixteen went for (*b*), two suggested (*a*) and two said, 'whenever possible'. One instructor reckoned that (*a*) was ideal but (*b*) was normally most practical. Two suggested that an aerial critique at the end of each stage before progressing to longer delays was the best solution. One Chief Instructor made the additional point that in his opinion few instructors were capable of giving a good aerial critique and that it was dangerous practice to do it on less than fifteen second delays.

QUESTION TEN. *You have finished parachuting for the day and intend to make a start at first light the following morning; what precautions do you take about alcohol: (a) warn your students of the dangers of alcohol and leave it to their own judgement? (b) say nothing, relying on what you told them about alcohol at the beginning of their training, but the following morning ground those who you feel have overdone it? or, (c) strongly advise them to give it a rest that evening and have an early night?* I threw in this question as I believe that alcohol is something we all treat far too lightly, when the dangers are very real. It seems to be accepted in many clubs that to be a good parachutist you must consume copious quantities of beer and this illusion has regrettably been fostered by lengthy articles on Cardinal Puff, etc. to be found in parachuting magazines from abroad. The answers were as follows: 10 gave (*c*), 3 gave (*a*) and 3 gave (*b*); 4 gave (*a*) and (*c*) together and two gave (*b*) and (*c*) together. One simply didn't answer the question at all!

QUESTION ELEVEN. *Section III, para 3 of Safety Regulations does not permit potential instructors to dispatch students unless there is a qualified instructor in the aircraft supervising. Do you agree with this?* Twenty-two answered 'Yes' and only one 'No'. The latter's comment being 'Depends on maturity and experience of potential instructor'. One other instructor qualified his 'Yes' by saying 'whilst students are making static line descents'.

QUESTION TWELVE. *Do you advocate the use of elastic bands knotted around the ripcord cable between the 3rd and 4th pins to prevent loss by students of the ripcord handle?* Seventeen said 'No', four said 'Yes' with one of these qualifying his answer by saying 'between the 2nd and 3rd pins . . . and

possibly killing someone on the DZ'. Another wasn't certain but he commented, 'depends upon it being checked after each jump. Might save somebody's skull.' The twenty-third said he was considering adopting the method for much the same reason as the previous two. Personally, I believe this system to be very dangerous and I believe if used there is more chance of killing the student than killing a stray wuffo on the DZ with a lost handle. (See my letter to SPORT PARACHUTIST Volume 5, No. 3, Christmas 1968.) Two instructors who answered 'No' had additional comments; one said, 'I regard this as a bad practice', and the other, 'I disagree completely with this idea. The need for a clean, unretarded high recovery is very necessary.'

QUESTION THIRTEEN. *Do you investigate all reserve deployments and record your findings in writing?* Of the twenty who said 'Yes', five said they only recorded those which were of an abnormal nature or those which involved a main malfunction; one put three exclamation marks after his 'Yes' and another made this comment: 'Although I have put 'yes', this is what I would do, for I have been very lucky. No student I have taken has had a malfunction or a reserve deployment. Those we have on the team are usually well chewed over, then chalked up to hard-earned experience.' Three said 'No' but one of these said it would be 'Yes' if he was Chief Club Instructor. The follow-up to this must surely be to send a copy of any investigations and findings to the Safety Committee for further distribution—the passing on of experience is all important.

QUESTION FOURTEEN. *Appendix C of Safety Regulations gives 10 qualities of a sport parachute instructor. Please read these (you should have a copy of Safety Regulations) and say* honestly *that you: (a) measure up to these qualities in every way; (b) realise your weaknesses as an instructor and are trying to rectify them; (c) disagree completely with these qualities, or, (d) are learning and gaining more experience all the time and that you believe in Sport Parachuting it's impossible to know it all.* Only two instructors put down (*a*) as their answer (one of these qualified as an instructor three months ago and the other wrote on the top of his questionnaire, 'I have now ceased to give instruction as I have had in the past too much pressure put on me to jump students I have not seen trained.' Two answered (*b*), none answered (*c*) and 9 answered (*d*). The remainder, bar one, gave more than one answer: (*b*) and (*d*) together—6; (*a*) and (*d*) together—3. The final instructor didn't commit himself!

Finally, as Question Fifteen I asked instructors to give any further points that they felt may be of interest in the survey.

Here, therefore, is a selection of these points in no particular order.

The instructor who announced that he had now ceased to give instruction said, 'There is, in my opinion, a general lack of regard for Parachuting Safety Regulations. There is little effort to raise standards. Encouragement to make parachute jumps is often given for the wrong reasons.'

One instructor said, 'Student parachutists seem in too much of a hurry to get onto free fall. The number of static line jumps should be increased.'

And another was obviously thinking on these lines when he recorded, 'A static line student should not automatically be progressed after three jumps to dummy ripcord pulls.'

One instructor suggested 1½ shot capewells be obligatory for PCs and similar canopies, and on this subject another wrote, 'I think the reserve procedure for high performance canopies should be studied by the Safety Committee and some standard procedure laid down, as to equipment and method to be used.

The subject of student progression in free fall was raised by three instructors who all reckoned it was normally too fast. To quote one: 'I feel that there is too much *adherance* to the recommended *MINIMUM* progression' and later, 'Although progression from 15 seconds is governed by weather, often it appears to be accepted that tne next stage is 30 seconds. I would like a 20 and 25 seconds stage.'

The category classification lays down a fairly logical minimum progression which the next instructor obviously hasn't read when he says, 'A well publicised and accepted guide is required to create a "norm" for the progression at the early stages of free fall.'

On critiques, one instructor wrote, 'Time should be made available for a mass critique', and, 'All students that have progressed onto delayed falls and are spending their hard-earned cash jumping are being cheated if they are not watched and critiqued after every jump'—surely both very valid comments.

It was suggested that opening heights should be 'upped' and the same instructor stressed the need for a parachutist to be 'competent and safe in the air' before being granted a General Permit. Two instructors called for all information on fatalities to be circulated as soon as possible after they occur, to all instructors 'as it broadens one's outlook to the inherent dangers of the sport, and a lot can be learned'. The final remark I quote was written by the character who supplied the title of this article: 'I believe that the most important point of student training is a thorough basic training, followed by absolute control of the student in the progression.'

I will conclude by thanking the 23 instructors who contributed and I hope that this article will stimulate more thought and discussion; and possibly produce a further article or two for the magazine.

* * *

Ken Forsdyke comments:

I would like to applaud Charles Shea-Simonds' efforts to explore parachutists' thinking and I hope he will continue with this work. The results of his survey carried out among instructors are particularly revealing as the questions were clearly not as innocent as they appeared at first sight. I note too that at least one of the replies came from a retired instructor which shows up those who did not bother to reply. I will comment on only two of the questions and answers.

Question 6: do you advocate static line assisted deployment? Apart from the one who admitted it, how many people didn't know that Council made it mandatory during the last session?

Question 14 looked pretty innocent but the variety of answers must have shaken Charles, or did it? The wording of the question would have made most market research psychologists proud and in certain respects the answers support this view.

I would like to raise another issue regarding instructors which has been stimulated by this survey. *Approachability* and treating jumping as a *sport* are the two qualities of an instructor which I rate highly. I feel sure that there are many

concluded on page 40

Malaysian mail—

a letter from Bill Scarratt

Might I make a few comments on articles published in the Autumn 1969 issue of *Sport Parachutist*?

First, I'd like to start with Dave Waterman's column, 'Relatively Speaking', on points connected with instructors training students. He says, 'if all BPA instructors trained ten students each then we would have a thousand new members each year'. Agreed, Dave, but I think you've missed the point in that *it is in the continuation stage where we all fall down.* The sausage machine at Netheravon proves that. Although most of their work in the summer months is repeated basic courses, continuation of their students is just not planned except for a few individuals for this very reason. The hapless student has to wander around and take what he can get, and in a lot of cases this wasn't very much. No matter how keen the man, it wears a bit thin after a while, and interest moves on, therefore the loss of most of our students is at the beginning. I also realise that with an increased amount of students, activity would increase (or one would hope it would) but this goes back to the original point of instructors continuing to train students.

Another point I'd like to make on the same article concerns Dave's comments on the advertisement by 'The Black Knights' for guest jumpers to take part in their demos.

Now I know that to a civilian, parachuting costs a lot of money, and the services people are a little spoilt, but they do take parachuting to the public's doorstep, there's no doubt about that, but they're in business, and to remain in business, you have to make money. I daresay that 'The Black Knights' charge about £120 on average for an eight-man team jump anywhere in the country and that's chicken feed to a show organiser who knows that on crowd appeal alone he'll make at least 6,000 per cent profit on average on the parachute team alone on entry fees, and that's a fact. Four years with the 'Red Devils' opened my eyes wide. Anyway, Dave, back to the point. In their advertisement they say: 'We provide all equipment etc., less for helmet and boots'. You don't have to jump your *x*-hundred pounds rig, but of course, people do prefer to, for obvious reasons.

Let's look at what they offer in the advertisement. All your expenses over two days (let's say food and accommodation) plus travelling expenses. This knocks a big hole in the fantastic £10. That's providing you jump. Who pays if you don't? Certainly not the show organiser. He wins both ways. The crowd is drawn, so the money is already in. All he pays is a cancellation fee, usually about £40, which just about covers the basics. Any loss is carried by 'The Black Knights'. But the guest jumper still gets paid either way. Of course, thrown in if he jumps, is the extra experience of jumping into tight or confined areas, which you can't get without doing displays. All this, including a good night out in Nottingham or somewhere else exotic with transport provided doesn't seem half bad to me.

They're quite right when they say, 'A member of or team receives no financial reward for jumping', although they should have added the word 'personally'. This is their job as soldiers. So while you're jumping up a storm on the weekend, they may get one jump, and spend the rest of their time travelling. 'Tough' you may say, but the breaks come later, in Switzerland perhaps, with jumps up to 16,000 ft paid for by that villain of the piece or 'saviour of parachuting displays' (whichever way you want it) the Show Organiser. What is made from the guest is very little indeed.

Perhaps one could well ask, who paid for Dave Waterman to go to the USA and France? But one doesn't because it's good luck to you, Dave, but one can't help but suspect the paymaster was not Dave Waterman. Sorry, Dave, but you've got the wrong shaped nose. Nothing personal, my boy. I like to hear you ticking, like most civilians do when the services are involved. But as long as we all keep it in balance and use comments to the good of parachuting, then *Sport Parachutist* will stay a good thing to read.

One final thing Dave, I wish you wouldn't submit pictures of upside down and very bent flying machines. As I'm now more concerned with staying inside serviceable aircraft, instead of leaving them as before, pictures like that make me nervous. How about a 'How it happened' article?

Moving on to Major Gardener's article on 'bits and pieces', I read some good solid stuff here direct from the USAPT, but one thing he wrote, bearing in mind that students read the magazine and take almost everything as gospel, concerned tips on accuracy jumping.

I don't think it wise for anyone to encourage people to jump without goggles, even on accuracy jumps. It costs nothing, or no time at all, to pull down your goggles or lift them up when the canopy has opened. A piece of dirt or a fly in your eye at any speed, at best, ruins an accuracy jump, perhaps in a competition, or at worst blinds you for life. 'A small risk to take', you might say, but what do you gain?

It looks as if John Meacock has finally got rid of the shakes he used to develop at competitions, but I suspect a little bit of temperament sneaks through now and then. Best of luck, John, glad to see that your hard work has paid off.

From the picture of the prizewinners on the centre pages, I see many familiar faces, the old villains you could say, and many new ones too. But the one thing that glares out and makes me sad, because I'm personally involved, is the absence of the Parachute Regiment. My, my, how the mighty are fallen. How can you produce results like that, a professional, full-time team like you? The reasons must be numerous, but isn't it only the results that count. Come on, you've already slipped from being the No. 1 Free-Fall Team to the No. 1 Free-Fall Display Team, not very much you might say, but you're on the slide, and have been for quite a while now. How about sliding uphill for a change. Someone, somewhere please take note.

I see that your photos are up to their usual high standard, Charles, it must be quite a toss up for the editor as to who gets the front cover, yourself or Dave. Let's face it, good pictures are worth more than all the waffling put together, including this article.

In conclusion, and in reply to Jeff Orchard's article, here's one Pommy B who has put pen to paper and I agree with him that you have to directly insult people to get a reaction. So although I've tried to insult and prod without malice and vendetta, it does soften the blow a bit. If anyone does feel strongly about my comments do please write. The address is Air Platoon, 10th PMO Gurkha Rifles, Minden Barracks, c/o GPO Penang, Malaysia.

Dave Waterman is

RELATIVELY SPEAKING

BRITISH sky diving is not dead! It is alive and well and can be seen on occasions at Dunkeswell in Devon.

Imagine 25*s*. for 12,000 ft!

With the departure of Chris Freeman to Kenya, Mike Taylor to Australia, and the loss of Bob King to British team training, our little band which forms the group jumping at Dunkeswell has been forced to re-programme its training, left with a nucleus of only ten jumpers (the rest mysteriously left with different reasons after the free jumping provided by I.T.N. dried up). This nucleus, which consisted of group leader John Beard, Jim Crocker, Chris Freeman and John Cole, Tony Unwin, John Harrison, Bob King, Bob Hirst and Mike Taylor, with American Ned Luker taking still pictures and myself taking cine, produced six-man stars, and one jump included an eight-man contact.

Lack of continuous jumping frustrated our efforts, only 30 jumps having been carried out over a period of three months. Now we have lost three of our regular members and will have to reform the team. It is hoped that they will be able to jump from the sky at Dunkeswell on a regular basis, at least once a month during the summer, and I am certain that an eight-man star will be flying over the U.K. this year.

But seriously, without this "shot in the arm" for the personnel involved in this venture, the sport is in danger of losing some of its superior pundits from sheer frustration.

I received a very charming letter from ex-British jumper Bill Scarratt, telling me he had written to *Sport Parachutist* in reply to my last article, and assured me that there was nothing personal about what he had written. Well, thank you Bill for the letter, but I hope I know you well enough to already appreciate that you are not the "personal" sort of fellow. (I hope the editor was able to include Bill's letter in this issue). I am glad people are prompted to answer my criticisms as it would be a dull magazine and a dull article if it did not occasionally arouse people's feelings enough for them to put pen to paper!

At the A.G.M., I am told the Instructors' Convention endorsed a new ruling to take effect in a year's time—"that all students will be obliged to wear white jump suits". One can, of course, see the logic in this, but it is a rule which is open to abuse, and to my mind, will be abused without a doubt. Just because a student wears a white jump suit, it does not guarantee that his instructor will be watching him. The colour of the student's jump suit does not improve the standard of instruction. Should this be the way in which we should concentrate our efforts?

One rule which I was surprised was not changed was the two instruments ruling. I personally know of only one parachutist who regularly jumps with two altimeters (is not that so Lawrie?). The few others may carry a stop watch as well as an altimeter, but may never think to start it. This is certainly a rule which the Safety Training Committee should look at in the light of the present usage of instruments.

The future of the parachuting sport in Southern England, to my mind, sinks or swims depending on whether we are able to take over Dunkeswell Aerodrome after the Ministry of Defence have finished with it, and in the light of this our Secretary, Bill Paul needs all the help he can get from BAPA members and we should be united behind him instead of splitting up into smaller groups.

Opposite: the three-man base over Dunkeswell, the start of the group record-breaking six-man. Photo by Ned Luker

continued from page 36

parachutists who, like me, have had their jumping spoiled at some stage by an overbearing super-critical or unhelpful instructor. At Halfpenny Green we have tried to develop an attitude and atmosphere conducive to enjoying the sport without turning it into a shambles. There is a difference between allowing discipline to become slack and a sympathetic appreciation of parachutists' fears and problems. The parachutist who said to me recently "He was so overbearing that I was frightened to pull the ripcord for fear of doing it wrong", may have been overstating the case in question but I feel sure that a cool, confident, and relaxed student will perform better than a crushed and nervous one. In my view the former is a safer parachutist and I am personally concerned more with the safety aspect than his progress.

I would like to make one last point which has been the subject of some debate recently. It is felt by some parachutists that members of the panel of examiners appear to place excessive emphasis on parachuting expertise and ability and insufficient emphasis on personal qualities and verbal facility.

PARAMART

(1) SPORT parachute equipment for sale, including new, unused X-type canopies, B.4 packs and harnesses, etc. (2) I still have three £25. 0. 0. shares in the Old Warden Flying and Parachute Group aircraft. These are options which remained unsold at the time our EP.9 crashed. We are now in the process of buying a Cessna 175. These shares will give you appreciably cheaper flying time.
—Contact Jeremy Johnston, Thaxted 213 (daytime) or Great Bardfield 360.

(1) COMPLETE rig. Pioneer black and gold 1.6 LO-PO. (7 TU). B4 harness and pack with comfort kit. 1 reserve (nylon container), £70 or offers.
— T. Fielding, 102 Belford Terrace, North Shields, Northumberland.

C.9 Canopy (quartered) in B4 back pack. Good condition. £45 o.n.o.—H. S. E. Blake, 8, Highfield Road, Berkhamstead, Herts. Telephone 2646.

Recollections of a stoney parachutist

APRIL '65, my apprenticeship at Thruxton on a one man parachute course under the auspices of John Clark, Ray Etchell and Johnny Burgess. What am I doing amidst the realms of the hairy ape-like skydiving fraternity, I ask, falling from the Jackaroo for the fourth time that week. Is this falling out of airplanes stuff really for me? . . . Progression; delayed fall, free-fall, oh, wow! these turns on fifteen seconds are confusing; what did John Harrison say, relax? . . . Hey, it's now late summer '65 and more people are falling from 'planes, is that Nick Grieves and The Hagan? Perhaps we can talk to Meacock and Vos one day. Christ! Clark has made a free-fall down-under . . . Winter has arrived and low altitude bouncy type landings are called for. 'Come on, you can't put eight people out of a Rapide at two-thousand feet in eight seconds'—Yeah, but look, Dave Moody and Martin Mann are linking-up under canopies . . . Boxing Day; a sacred day for families and poor Ramsey has been coerced into letting the sky be full of canopies. These guys is crazy; when are you going to buy a pair of Para-boots, Beard? . . . Look, I'm an experienced sky-diver now, forty jumps including one buddy-jump and I know it all, let's go and make a hook-up with Terry—one more 'fall and we'll do it . . . done it, would you believe that was the guy who rolled hysterically from the Rapide wing . . . unstable exit indeed! . . .

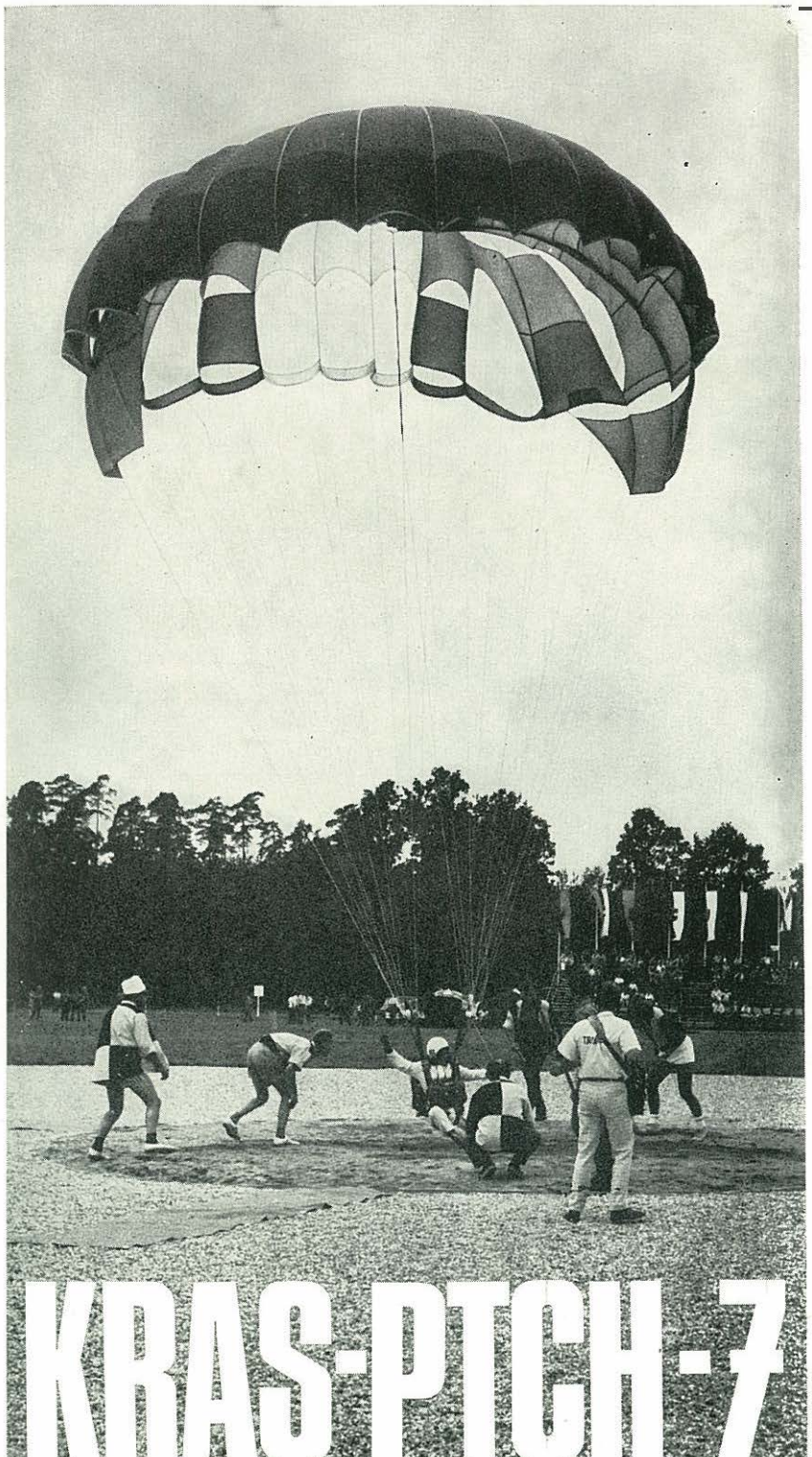
. . . Summer '66, and it's the Hounsome team, 'Get your kit orn!' Those immortal words; too much. We're making good 'falls, spinning's gone, stable openings, this is a sport! Proficiency, pride in the air, your own kit—a skydiver. But who would believe that club-hut on a Saturday night after 'The George', where do all these bodies keep coming from? Oh, man! Kraemer, Moody and Mears together, no rest tonight and Taffy will be making merry Welsh delights at 6 a.m. This isn't a sport; spartan surroundings and discomfort for what? Just what?—Beats me . . . Students seem to come and go, but the Thruxton hard-core remains . . .

. . . Summer '67; ranks have swelled, expertise desired by all . . . four-man stars, five-man, oh, so nearly a six-man; characters appear: Crocker, the indistructible Eddie Hughes, Travis, look, Travis you can't hold on to your sleeve in free-fall! This summer is *par excellence*, a bed at Thruxton, so many 'falls, dedication, companionship and 'The George' . . . Come on now, what am I doing on a hangar roof with T. and P.C. reserves and things all around? My God! Think about it! . . .

. . . University and government grants make '68 a bad year for leaving airplanes . . . Wait a minute, Martlesham is only thirty minutes drive from here, still, two-hundred jumps and a P.C. keep spirits up; oh, dream of free-fall; obsessed? . . . Obsession is detrimental to one's living, bring variety into your interests; though impressive people like Jim McGorry make parachuting difficult not to be an obsession.

. . . Early '69, accidents occurring . . . think back, crazy jumping in high winds, broken legs and backs, people killed. This is a responsible sport, don't kid yourself, the sky ain't nobody's friend!

. . . University passes by, I'm falling in California, the north was groovy, but now the mecca: ELSINORE, I can't take it, warm slipstreams, blue skys, these stony parachutists; so this is the Rumbleseat! . . . Split the scene, I'm free-falling over Orange, such people: Lew Sanborn, Lee Guilfoyle, Nate Pond. Idols? No; no more illusions, parachuting is a sport and parachutists are people . . . Into 'The Inn', these American-type jumpers are treated as human beings! Food, beds, why doesn't it work back home? . . . I am back home, fourteen thousand feet over Devon, with the cream of British sport parachuting and still the same faces: Waterman, Cole, Unwin, St. John; these guys just go on for ever. Superhuman? No, only excitable people enjoying the basic provision of free-fall . . . FREEDOM . . . And that's what it's all about. It's the greatest thing with the greatest people. MIKE



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