

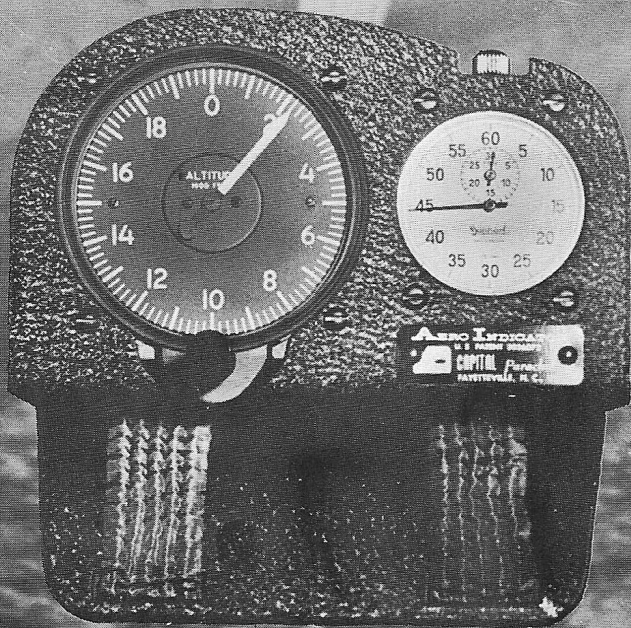
# PARACHUTE

MAY 1963

FIFTY CENTS



J. HAYS



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**BOX 409**

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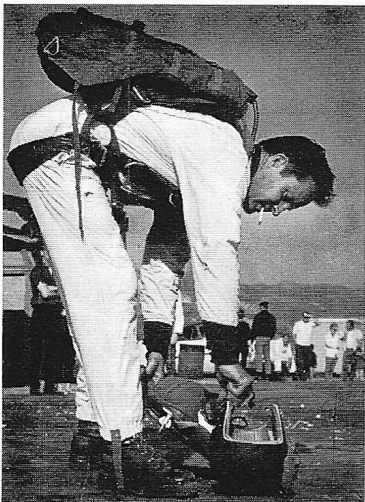
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#### COVER

*Howard Curtis at Piru during shooting for April 12 issue of Life magazine. Photo by J. Hays*

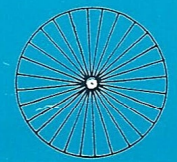
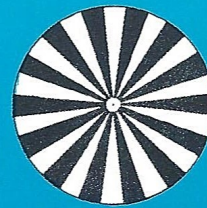
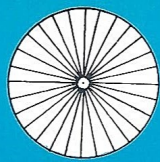
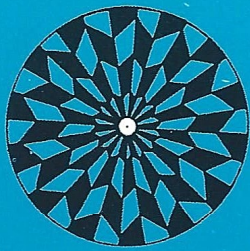


#### FEATURES

- Style versus Time . . . . *by Daryl Henry* 6
- Jumpmaster Training . . . . 11
- Chuting Stars . . . . 12
- Jumping the 16mm Gun Camera . . . . *by Doyle Fields* 14
- "Piru" . . . . *by Ron Simmons* 16
- The KAP-3 Automatic Opener . . . . *by Ken Sisler* 18
- Masters Meet . . . *reported by John D. Gaffney* 20

#### DEPARTMENTS

- Around The Drop Zone 4
- Letters To The Editor 5
- P.S. 23



# ★ ★ ★ AROUND THE DROP ZONE ★ ★ ★

## TAFT, CALIFORNIA

May 18 & 19, 1963

Cal Poly Parachute Club Meet

### FOUR EVENTS:

1. Accuracy-Novice only - 5 sec. D.F.
2. Accuracy-2 Jumps - 18-20 sec. D.F.
3. Night Accuracy - 2p sec. D.F.
4. Double Baton Pass & Accuracy, 3 man team - 30 second D.F.

For more information contact:

Rodney White  
Cal Poly Parachute Club  
S.L.O. Box 1113  
San Luis Obispo, Calif.

## PORT ORCHARD, WASHINGTON

June 15 & 16, 1963

Sponsored by Washington School of Parachuting. First Annual Parachute Meet.

### FIVE EVENTS:

- I. Novice Accuracy - 2 jumps from 2800 feet.
- II. Accuracy - 26-75 Jumps - 2 jumps from 4500 feet.
- III. Style & Accuracy - over 75 Jumps - 2 jumps from 7200 feet.
- IV. Accuracy only - over 75 Jumps - 2 jumps from 3500 feet.
- V. Team baton pass - 3 man, 1 jump from 6,000 feet.

For more information contact:

JIM JACOBS  
6821 So. Gove St.  
Tacoma, Washington

Five 82nd Airborne Division Tactical Free Fall specialists jumped in with vital information to aggressor forces during Operation Sphinx III, the annual STRAC intelligence exercise conducted at Ft. Bragg, N.C. last March.



We have been informed by Mr. Robert Spring that a new parachute center is under construction at Sweetsburg, Quebec, Canada. This center is due to open in June of this year, and appears quite promising.



Our avid readers have already seen the "Skydiving Chute-em-up" article in the April 12 issue of Life magazine. In case some of you have wondered about the details, we would like to mention that the three man get together shown was taken by our friend Bob Buquor, and that the jumpers in it are Doyle Fields, Leigh Hunt, and Howard Curtis. The exit shot on the first page of the article was taken by the pilot, Bob Reddick. Bob triggered a camera that was mounted on the tail of the jump aircraft. Other points that we would like to add at this time are: Doyle Fields actually uses a helmet camera, not the hand held in the photo. Also, prior to the Life magazine article, the Ripcord show was done by ParaVentures during the first year. It was then done by SkyDiving Inc., with Lyle Cameron doing the air to air filming. At the time of the Life article, Mr. Cameron was no longer affiliated with the show, and the present crew, with Leigh Hunt in charge, obtained all of the credit.



## BUTLER, PENNSYLVANIA

JUNE 1 & 2, 1963

BUTLER FARMS SHOW GROUND

Roe Airfield, four miles south of Butler on State Route No. 68.

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P.C.A. & FAA rules enforced

### THREE EVENTS:

- I. Individual accuracy - 30 sec. D.F.
- II. Team accuracy - 3 man, 20 sec. D.F.
- III. Novice accuracy - S.L. to 10 sec. D.F.

For more information contact:

PAT LAWTON, A.S.O.  
1131 Roosevelt Rd., Pgh. 2, Pa.  
Phone: 366-0429

OR

DICK SMITH, C.S.O.  
362 Plumer Ave., Pgh. 2, Pa.  
Phone: 761-1239



## ASPEN, COLORADO

June 22 & 23, 1963

Aspen Skydiver Meet

### THREE EVENTS:

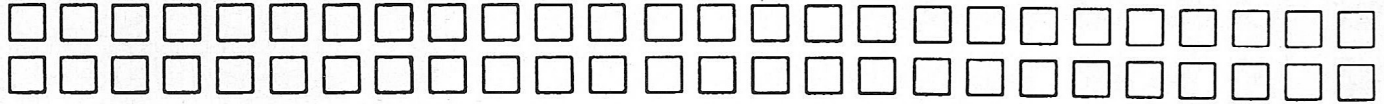
1. Individual Accuracy - 10 sec. D.F.
2. Style & Accuracy - 20 sec. D.F.
3. Baton Pass & Accuracy, Three Man Team, 20 sec. D.F.

D.Z. Elevation is 8,000 feet.

For more information contact:

Peter Prins  
P.O. Box 717  
Aspen, Colorado  
Phone: 925-3466

# LETTERS TO THE EDITOR



I would like to call attention to two current FAA regulations which are constantly being violated by numerous individuals and parachute clubs with which they are associated.

The first is the modification of reserve or chest pack parachutes by both licensed and unlicensed personnel.

F.A.A. Safety Regulation 204 states that a licensed parachute technician may certificate a surplus govt. parachute only if it conforms to a current set of approved drawings and specifications.

The altering of T-5A, and T7-A containers or their component parts and attached parachutes is therefore unlawful. Many sport parachutists are guilty of using altered equipment and many parachute technicians are jeopardizing their licenses by certifying altered equipment. The greater majority of these infractions stem from civilians copying the actions of military parachutists who, by law, are exempted from the F.A.A.'s regulations providing they are jumping on a military reservation or in a military training exercise.

The following are examples of the most wide spread violations:

1. Packing a 26 ft. conical canopy in a 24 ft. T-5A or T-7A container.

2. Reversing the canopy within the container so that the butterfly snaps will be more accessible on "dropped" reserves.

3. Bending or removing pack frames together with extending the flap tabs so that the parachute will conform to the shape of the body.

4. The use of riser assemblies instead of the approved spreader assemblies.

5. The alteration of 28 ft. QAC reserves by substituting butterfly snaps for the "D" rings and relocating the snap mounts at the top of the container.

The second group of regulations concerns the New Part 65 of the Federal Aviation Regulations. While most parachutists are familiar with the new Part 105, thanks to

PARACHUTE and others, the majority are not aware that the F.A.A. has rescinded the old Part 25 (Certification of Airmen other than Flight Crew Members) and enacted a new Part 65 to replace it. The new part 65 became effective on November 1, 1962 and it is the concern of all sport parachutists in that it describes the duties and responsibilities of parachute riggers, etc.

Of most concern, however, is Subpart F (B) which states, "No person may pack, maintain, or alter, any main parachute of a dual parachute pack to be used for intentional jumping in connection with a civil aircraft of the United States unless he has an appropriate current certificate issued under this subpart. However, a person who does not hold such a certificate may pack the main parachute of a dual parachute pack that is to be used by him for intentional jumping". (Underlining mine.)

It is therefore clear that modifications cannot be done by persons who do not hold a current Master Parachute Riggers license. When such work is done the canopy should be stamped showing the person responsible for the modification.

Sport parachuting, on the whole, has received more than fair treatment from F.A.A. officials. However, the honeymoon could end if parachutists continually violate the regulations whether intentionally or unintentionally thru being uninformed.

Best of luck to PARACHUTE; keep up the good work.

Dick Funkhouser  
Champaign, Illinois

Now that the F.A.A. has taken an interest in sport jumping and is regulating our activities and equipment we must do our best to legalize our old "illegal but safe" habits. The whole family of hybrid reserves can be approved as new type chutes but this requires time, money and effort on someone's part as all of

these chutes would have to be drop tested as per F.A.A. regulations. It seems to us that this should be a high priority project of the PCA.

Technically even a master rigger is still restricted to making alterations that have been approved by the manufacturers or the F.A.A. but things are at least advancing, perhaps in another year all F.A.A. regulations will agree with our jump proven ideas on equipment.

B.S.

Could you tell me if the C-11 Canopy is used much for sport and if it has any advantages? Also if the deployment bag is used much and is worth while?

Don Coolidge  
Wellsburo, Pa.

The C-11 canopy is not used in sport jumping and it is jumped only as a novelty, it has no advantages over our regular steerable canopies. With the skirt extensions removed and the lines shortened the C-11 is approximately the same size as the Navy 26" conical so they may see service in reserve packs in the future. Without the skirt extensions the canopy is under legal PCA size for a main chute.

Deployment bags, sleeves and boots are all popular in various sections of the country and properly constructed and used they are all safe. The various deployment devices all do the same job and each has it's own set of advantages and disadvantages.

B.S.

# STYLE versus TIME

*Daryl Henry exiting the Norseman during training for the world meet at Orange, Mass. last July. Photo by Sfc. Joe Gonzales.*



BY DARYL HENRY

*Editors Note: This article first appeared in the Canadian Parachutist, and it is with their permission that we are publishing it on these pages. Daryl Henry has changed several words for clarity in a U.S. publication, and we wish to thank him for writing what we feel is the best sports parachuting article in a very long time. Daryl is, as you might know, the top ranking parachutist in Canada, and placed sixth in the World Championships.*

## PREFACE

The following article was written during the first week of January, 1963. It represents a selection of not all of the author's experience in the intriguing field of contemporary style in sport parachuting. Should it serve to spur your curiosity into a more specialized search for knowledge, and should the results of this search make you a better member of the 1964 Parachuting Team, the efforts of those who made this publication possible, are justified.

## INTRODUCTION

In November, 1960, at Vienna, Austria, delegates from fifteen countries met to decide future FAI requirements in parachuting style competition. Utilizing experience gained since 1956, when style was first added to precision landing to enlarge the scope of international competition, this International Parachuting Committee agreed upon the following. They hoped they had formulated tests of style that would endure throughout the future World Championships. Thus records could be set, challenged and broken, according to an established standard that would not change from year to year.

## THE STYLE TEST

The altitude chosen was 2,000 meters. This allowed a free-fall of sufficient length for performance of figures and also kept the contestant within accurate judging distance at all times. This height corresponds to approximately 6,600', but in any case parachutists in the feet-and-inches countries have established this round figure as the practical equivalent.

In the style test the parachutist is required to open his parachute such that the pilot 'chute is visible to the judges between the 25th and the 30th second of fall. A penalty of fifty points is levied for exceeding these limits. Since the average contestant will pull on the 27th or 28th second to avoid chance of penalization his parachute will be fully open by 600 meters, which is the continental European equivalent to our, 2,000-foot regulation.

The FAI Committee decided upon three sets or series of maneuvers to be performed during the free-fall. The first series consists of the following: LT RT BL LT RT BL. The second: RT LT BL RT LT BL, and the third: LT RT BL RT LT BL. Which of the three sets to be performed would be indicated to the contestant by means of a visual signal located on the ground approximately one-half mile in front of the aircraft at time of exit. The signal consists of a white cloth arrow approximately forty feet in length indicating the heading to adopt during the performance, and two bars placed at right-angles to the arrow half-way along its length. The two bars are approximately four feet by twenty feet and are constructed with reversible slats like venetian blinds, operable from a center point at the intersection with the arrow. One side of the slats are white and the reverse painted to blend with the ground colour, usually green. As the aircraft approaches the predetermined exit point the slats are invisible. At the moment the competitor leaves the aircraft one or both of the bars is exposed, indicating an arrow with a bar to the left, or to the right, or with a bar both to the left and right. These three signals correspond, respectively, to the three series listed

above.

The signal lasts for five seconds. During this time the contestant is required to align himself with the arrow, observe the signal, and prepare to begin his maneuvers.

He can begin the series at his discretion, any time after exit. Two chronometers time his performance; one records the length of delay, and the other the time it takes him to complete the series. If he can complete the figures in less than twenty seconds after he has begun them he receives bonus points at the rate of five per second less than twenty. He is penalized ten points per second for exceeding twenty seconds. For a perfect execution in twelve seconds, therefore, he would receive forty bonus points. These would be added to the basic score of 200 points received for a faultless performance.

A system of penalties was devised for imperfect execution of maneuvers. The chief features of this system are that thirty-five points are deducted from the possible 200 every time the parachutist undershoots a 360° turn, overshoots the turn by more than ninety degrees, or comes out of a back loop more than ninety degrees out of line with the arrow. There is no penalty for falling off sideways during turns, that is for corkscrewing. For going out of control, even on one maneuver, all points are lost.

At the 1962 World Championship the Style Event consisted of two jumps, both to count. At the 1964 Championship (to be held probably in Austria) the only change in this event is that three jumps will be made and the best two counted.

## THE ELEMENT OF SPEED

Three years ago the performance

of two figure-eights and two back loops within twenty seconds was a considerable feat. In 1963, however, there is not one parachutist who, in twenty 30-second delays, cannot be taught to complete a good series in this interval, notwithstanding that he has never learned to turn, nor to loop. This of course requires a man of average ability and capable, concentrated instruction. Most parachutists who have tried the so-called "world series" find they can execute the six figures in twenty seconds on their first try, given of course that they know how to turn and loop. But more than 90% of the contestants at the recent World Championship could do the series in less than twenty seconds.

An average figure-eight can be performed in six seconds. Two of them take twelve seconds. Even a slow back loop does not require more than two seconds, and a series therefore totals sixteen seconds of maneuvering time, with four seconds left over for the pauses between the figures.

We shall first consider the problem of reducing the time required for the performance of a series from twenty seconds down to fifteen seconds. This will apply to those parachutists who have just begun to experiment with world series style. A reduction of the second order, from fifteen down to ten seconds, applying to those parachutists who are potential members of the 1964 Team will be discussed later.

#### FROM TWENTY TO FIFTEEN SECONDS

In essence, speed improvement of this first order can be achieved chiefly by an increase in the speed of individual maneuvers. This may sound obvious but it will be seen that several other factors enter into speed when we discuss an increase of the second order, factors such as an increase in pre-thinking capacity, a reduction in the pauses between maneuvers and special refinements in the method of performing individual turns and loops.

To increase the speed of a given maneuver, one must first know how one performs that maneuver. This knowledge is usually imagined rather than possessed. How many times has somebody asked you what your right foot was doing during a left turn, and your answer has been, "I don't know?" You must study yourself during each

kind of maneuver until you know what you are doing with each part of your body; when you know your individual style you can begin to improve it. We shall consider the accepted method for turning (in competition) and base the style-speed theory on that method.

Let us call the competition turn "composite" turn to distinguish it from "hand", "push" and "body" turns, etc. The characteristics of the composite turn have all been borrowed from other known methods. This synthesis involves the use of all parts of the body. Variations in this method are only slight.

Briefly the body is basically in the "frog" position. The legs are bent backwards and upwards at the knees such that the lower legs form an angle of approximately  $120^\circ$  with the upper legs. The arms are bent so that the hands are on either side of, and about eight inches away from the face. There is no arch to the back.

To perform a turn to the left, the left leg should be bent as much as possible from the knee so that the left foot is touching the buttocks. (If you cannot achieve this you will understand why most European teams spent two hours per day of calisthenics during training!) The right leg remains as it was in the frog. The left shoulder is simultaneously pushed forward (downward with respect to the ground) while the hands and arms remain fixed in relation to the torso as in the frog position. When the left shoulder is pushed forward the right shoulder is retracted and the body in effect has twisted from the waist. Finally, and all at the same time, the upper body is bent sideways to the left as far as possible so that the rigid left elbow is snug against the front of the left hip. Thusly contorted a left turn will rapidly occur.

If one were falling at terminal velocity on heading in the frog position and one spent one full second adopting the above position, i.e., slowly, he would execute a good  $360^\circ$  turn to the left in approximately two seconds. That is, one third of the time is spent assuming the configuration and only two thirds actually turning. Continuing the series with like care, time required for the performance would not exceed twenty seconds.

It will be understood that this kind of rotation is infinitely better than the sudden and erratic adoption of a less effective configuration, even though the turn from start to finish consumes the same three

seconds.

The kind of back loop best suited to persons of the "twenty-second series" calibre is as follows. From the frog the legs are simultaneously brought together and up under the reserve, knees bent in the extreme. At the same time the arms are extended forward from the shoulders, palms pressing downward against the air cushion, forcing the body upwards and over. If this leg-tucking and arm-pushing is initiated quickly enough, a back loop will result without further effort. The only care that need be exercised is that of resuming the stable frog position after about  $270^\circ$  of the loop is complete.

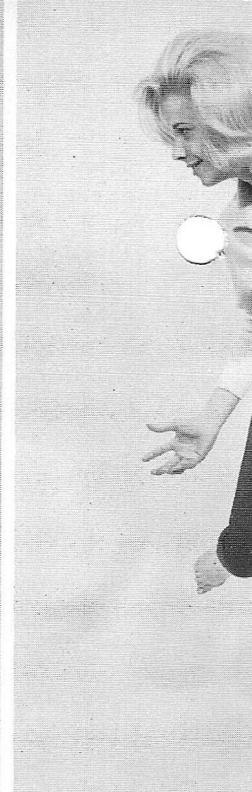
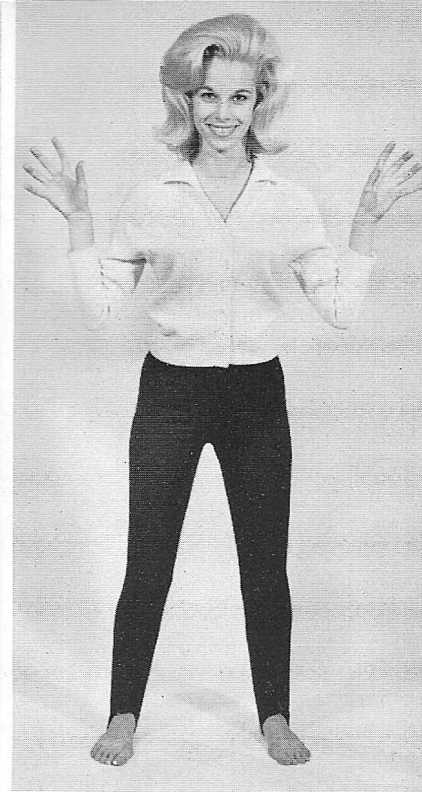
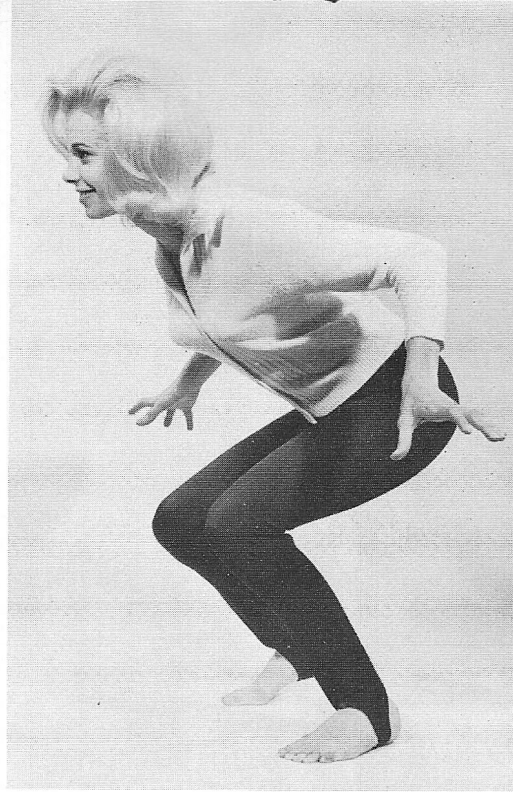
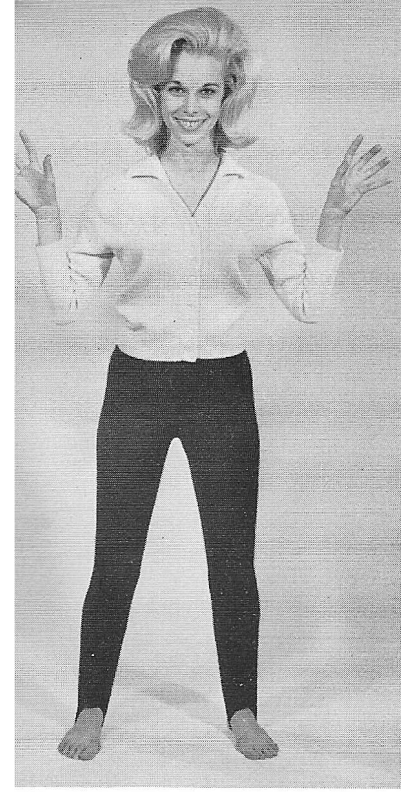
If the loop is begun slower than suggested more assistance is required when half-way over. When on your back, upside down, it will usually be necessary to arch your back forcibly, extend your legs once more and position your arms in a medium delta. This removes the area of air resistance from the upper part of your body (nearest the head) to the lower part (at the feet). The air cushion will then tip the feet upward, the head will fall and you will complete the loop gracefully.

For those just beginning back loops the slower method should be tried first. If the movement is not continuous there is the chance you will end up on your back and remain there. To remain back-to-earth means you have a reverse arch; this means that when entering the  $180^\circ$  axis of the loop you failed to arch, extend your legs, and bring your arms close to your sides. If it possible to perform a back loop in two halves. In fact in France they instruct students to practise the loop in two segments.

If you find you roll off the top of the loop to one side or another the chances are your configuration is not symmetrical. No doubt you did not move both arms and/or both legs together. This absolute symmetry when doing maneuvers along the longitudinal axis of the body is mandatory.

A parachutist using the turn described above, begun slowly, and the slower kind of back loop, the "two-stage" loop with no pause between stages will be able to perform a series in twenty seconds. To reduce this interval to fifteen seconds becomes a matter of faster adoption of the required configuration.

Whereas we allowed one full second to form the turn configuration at the beginning, it should be possible



*The competition backloop*

to throw the body and its appendages into the position within one-tenth of this time, literally in one-tenth of a second. Already we have saved four times nine-tenths seconds or more than three and a half seconds! The problem shifts to one of stopping the turn on heading.

If it takes the hypothetically average man one-tenth of a second to adopt the composite turn configuration, and thereafter two seconds to rotate through 360°, statistics would probably show that he begins to counter the turn three-quarters of the way around, or just when he sees the arrow out of the corner of his scanning eye. Naturally this will vary with the individual, but 270° is a good assumption. The countering process is not difficult. It is, in fact, a separate turn configuration of its own. With the understanding that one must counter a turn with the same force and speed with which he has begun it, a turn begun in one-tenth of a second must end also in the same time. To allow for skidding, or momentum, this countering action must occur prior to alignment with the heading; usually it is initiated at about the 270° axis. At the rate of 180° per second it will take a man about 36° to swing from a left-turn to a right-turn position, allowing him about 60° to skid to a stop on heading.

Should your countering attempts for a fast turn not work, study again the symmetry of your configurations.

The position of your body in a left-turn configuration should exactly mirror your position in a right-turn configuration. The hand, feet and shoulders are most important. It is not uncommon that some people can push their left shoulder further than their right, or bend their left leg more than their right, and so on. The more evenly balanced are your movements the better is your timing, and the better your performance.

We have seen how to increase the speed of an individual turn by quickening the adoption of the turn configuration; one literally throws oneself into the position. So far this has saved us three and a half seconds. If we now increase the speed of the loop by adopting the knees-up position instantly we can reduce the time required from two to one and a half seconds easily. Thus we can save a full second on the loops.

Altogether the time for the series is reduced to about twelve seconds for figures and three seconds left for in-between pauses. The single area of concentration has been one of faster adoption of turn and loop configurations. The idea is to learn the configurations on as many twenty-second series as your patience will permit, then throw into the same configurations for a saving of at least five seconds.

For a series of fifteen to twenty seconds a considerable pause should be made between each of the six figures. This allows the contestant

to concentrate on one figure at a time. For example, prior to the first maneuver in a series, the parachutist should concern himself only with how he will perform that first turn. This turn should be countered, completed on heading, and only then should the concentration shift to the second turn. It will take the mind of a significant part of a second to prepare for the second turn, and since proper preparation is essential, this interval should be used accordingly. The same deliberate method should be followed throughout the series.

In summary the fifteen-second series is a discontinuous grouping of fast individual maneuvers; each figure is an end to itself, thus each figure is capable of being performed perfectly. The parachutist potentially able to achieve a ten-second series must agree with this summary; he must not accept the fifteen-second series that is a continuous, pause-free flow of one poorly performed maneuver after another. The fifteen-second series is nothing more than a training period for the serious contestant. It follows that everyone in the recent World Championship who required this interval or greater to complete a series was either not fully prepared for serious competition, or had followed the wrong training program and had reached the end of the line. (This is not to say that a comparative student should not compete whenever possible.)





*Ann Olson demonstrates positions used in three variation turns*

#### FROM FIFTEEN TO TEN SECONDS

To increase speed still further the interval between maneuvers must now be eliminated. There is a practical limit to the speed of performing each figure and this limit should almost be attained on a good fifteen-second series. The work required to reduce the interval is of a different nature than that we have studied so far.

The characteristic required of the parachutist performing the ten-second series is essentially mental rather than physical. In practise it will be seen that a man can readily attain physical excellence in the execution of an individual maneuver, that is, he reaches a limit imposed by his physique, coordination and physical conditioning. A distinct pause is needed between such fast maneuvers to allow the mind to catch up with the body. Now the mind must be trained to function even faster than the body.

The problem is one of anticipation, or pre-thinking. This is the most difficult achievement. In order to begin the second of the six maneuvers at the same instant as the completion of the first, the second maneuver must be known, contemplated and planned in advance. It must be anticipated just after the beginning of the first figure. This preplanned ability pervades the whole series.

It will be understood that the most crucial part of a given maneuver is the initiation of that maneuver.

Once a turn or loop is begun, and allowing that the countering of that maneuver is by now a mechanical reaction, the mind is therefore free during the maneuver. As soon as you have thrown into a turn your total concentration can turn to the next figure, leaving you more than half, or more than one full second in which to prepare for the next stage. This free-time interval can be observed during any maneuver if you think about it.

As soon as you have initiated a given figure you must learn to think about the next one. The less time you waste here the faster your time. If the first turn in a series is to the left, by the time you are 180° around you should have accomplished three things. You should know what the next maneuver is, have contemplated the body action reaction needed to achieve it, and have planned when to initiate the right turn. If you know what you are doing, this will all be done prior to the time when you have to counter the left turn. As you skid to a stop through the last 90° of the left turn, you can relax and summon the determination and strength to throw into the right turn. If you waste even a fraction of a second of the free-time interval you will have to pause and consider what to do next.

At the half-way point in a figure-eight the countering of the first turn is the same configuration as the initiation of the second turn. There is usually only a difference of degree.

You arrange to stop on heading by feeling out the diminishing velocity of rotation; sometimes you have to slack off to avoid falling short of heading. If this is the case, to begin the next turn you must adopt the extreme composite-turn configuration when in line with the arrow. No turn should be started in anything less than the extreme configuration. Should the turn position have to be relaxed during the countering process and then emphasised to initiate the next figure time will be lost. Ideally the counter and consecutive maneuver are products of exactly the same configuration.

#### ADJUSTMENT IN CONFIGURATION

Slight refinements in configuration can also be added to eliminate a few tenths of a second at this stage. The use of the hands is important, and even the head can all be utilized to achieve the best airfoil.

It will be known that the best hand configuration for maximum air resistance is the "claw" as it is known. This is when the fingers and palm are almost grotesquely concave, in exactly the same manner as when you grasp a grapefruit or like-sized sphere. When, on a left turn, the left hand is foremost or closest to the ground, or the first part of the body to strike the air flow, it should be used to literally grab a handful of air. It becomes a feathered scoop and serves to anchor that side of the

body while the remainder pivots around it. It will be found that there is an optimum position for this anchor hand. If it is too far back, close to the body, it becomes ineffective. Similarly it can be extended too far forward, upsetting the crucial balance of the body air foil. Experiment is the best means of determining one's own hand positions.

When the body is twisted from the waist, with the side to which you want to turn extended forward, that part of the body above the waist should form an inclined plane, like one-half of a two-bladed propeller. In the proper configuration it should be possible to lay a sheet of glass across the palms or finger tips. This imaginary plate of glass should touch the underside of the forearms, the front of the depressed shoulder, the chest, the front of the reserve parachute and finally the cheek. On a left turn you ought to be looking to your left to find the arrow for heading, and therefore your right cheek should be exposed.

At the same time an imaginary sheet of glass should be situated at the lower half of the body, at right angles to the other blade, touching the lower left leg and foot (on the outside of the calf) and the lower right leg (on the inside of the calf) in the case of the left turn. The body is simply a compact two-bladed propeller feathered in the extreme. The more compact and the more feathered the faster the rotation. Tall parachutists should take note and utilize the tightest frog possible.

There are two variations on leg use currently in favor. The first, expounded by some tall individuals, is to use both legs as one unit rather than feather them. The theory here is to use the mass of the legs and feet as a force, and the distance between the pivotal point (the reserve parachute) and the feet as a moment arm. At the start of a turn the upper body is feathered while the feet remain extended in the normal frog. At the instant the turn begins both feet are drawn up behind to touch the buttocks. To counter both legs are extended at the same instant the body adopts the opposite attitude.

To appreciate the result, lie belly-down on a rotatable bar stool, have somebody spin you slowly while you are in the frog position, and then draw both feet up behind you. The rate of rotation will increase so suddenly that you will probably end up on the

floor! Another common manifestation of this simple phenomenon is the figure skater who spins on the tip of one skate-blade. To increase rotation he will draw in his extremities toward the axis of rotation and vice versa. It works in parachuting too but it requires expert coordination. You have to initiate the turn with the upper body and only use the legs afterwards to increase speed by reducing the moment arm. (This variation, and the bar-stool example, are courtesy of Dick Fortenberry, 1962 U.S. Champion.)

The second variation in leg use is simpler. Throughout the complete turn both feet are drawn up behind the buttocks as far as they will go, and they remain there while the upper body does all the work. They are removed from the slip stream in effect (although they will still be feathered by the natural distortion of the torso). This method has application to shorter individuals.

An increase in the speed of back loops can be attained by relying upon the firm use of the legs and not using the arms as a drag surface. The time saved is two-fold. Firstly, the time required to get the arms out in front to push down on the air cushion is avoided. Secondly, the new function given to the arms and shoulders assists rotation. The arms are used both to initiate momentum and for balance. At the instant the legs are brought up to the reserve the forearms are extended at right angles to the body, sideways, with the elbows close to the waist. The forearms then act as lateral stabilizers while the body somersaults. If, while the action of the legs initiates the rotation movement of the body, the rigid arms and shoulders, acting as one homogenous unit, are rotated in conjunction with the direction taken by the body, the effect will be to increase momentum. This inner-directed action is the same employed by high-divers or gymnasts. In other words the legs are used to initiate aerodynamic rotation and the arm-shoulder combination is used to increase inertia. Care should be exercised in this so-called "brute" loop since an uneven or asymmetrical beginning can result in a roll more often than a loop. But properly done this forced maneuver consumes less than a second.

A final word about loops concerns pitching on completion of the maneuver. This is not uncommon and can usually be corrected with ap-

plication of simple theory. When at the end of the third quadrant of the loop, when the body is vertical (head-to-earth), if the legs are not extended quickly enough but the arms returned to their normal position, there is likely to be too much resistance at the upper half of the body (head) causing this part to continue rising past the 360° mark. It will rise thirty degrees or more above the horizontal, then when the configuration returns to normal the body will pitch forward. The problem is one of equalizing resistance at the right time. It is necessary to adopt the normal falling position (frog) at about the 270° mark during the loop so that all momentum has dissipated ninety degrees later. The exact moment to resume the frog depends of course on the speed of the loop. Some persons have a tendency, usually unconscious, to throw the arms forward, above the head when traversing the last 90° of the loop. The reason is usually one of instinct. The common reaction when looking straight down at the earth (from the 270° position) is to raise the arms, however slightly, to prevent oneself from the head-first dive. Raising the arms only increases resistance on the upper part of the body, causing it to rise beyond the 360° level and then to pitch downward.

## TRANSITIONAL PROBLEMS

The task of entering a loop immediately following a turn, with no pause, requires skill and a fair portion of luck. The upper part of the body, with the arms, form the significant countering force to a turn. The lower body and legs can then be used to begin the loop even before the turn is complete. There is an optimum point during the last 90° of a turn when the legs can start to come together and swing up to the reserve. An estimate would put this point at an average of 45° short of heading. When done properly the moment the upper body has reached the heading the legs are tight against the reserve and the body, without pausing, has begun to go up and over in the loop. Asymmetrical adjustments in the arm positions will balance the beginning of this kind of loop.

There is a danger of completing the loop off heading. Since there is a 90° allowance for heading of loops this is not a serious problem except

(continued on page 22)



ADVANCED AIRBORNE INSTRUCTORS, Staff Sergeants Donald L. Thompson (left) and Larry L. Frazier (in harness), of the 101st Airborne Division's Advanced Airborne School, conduct a class on principles of manipulating the parachute for Special Forces National Guardsmen from West Virginia.



# 101st JUMPMASTER SCHOOL

US ARMY PHOTO BY SP4 DOUGLAS LANGE

JUMPING THE 34-FOOT TOWER, Staff Sergeant Ronald L. Thompson, of the 101st Airborne Division's Advanced Airborne School, demonstrates the proper manner of exiting an aircraft in flight with a parachute adjustable equipment bag for 30 National Guardsmen from West Virginia. The Guardsmen, all from the 1st Special Forces, 16th Special Forces Group (Airborne), West Virginia National Guard, in Charleston, travelled to Fort Campbell, Ky., last week-end for three days of intensified training.



C

OFFIC  
CLAS:

*At 5,000 feet with smoke and baton*

Last month we mentioned the "Chuting Stars" in our travel article, but at that time we had insufficient material for a complete article on this fine group of men. Thanks to Lt. Tom Erickson, PIO of the team, we can let you know a little bit about them now.

The U.S. Navy Parachute Exhibition Team was first formed at Pensacola, Florida, in December 1961. They are on the road most of the time, having traveled over 100,000 miles to give more than 86 exhibitions before an estimated ten million spectators.

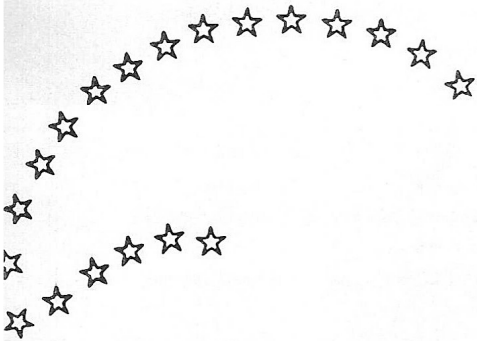
The team first trained under the watchful eyes of "Uncle Lew" Vinson at the El Centro parachute test facility, jumping from a Navy C117D, piloted by Lt. Commander Lester Heller, who also acted as Officer-in-Charge of the Group. The present commander of the "Chuting Stars" is Lt. Commander Bruce Cobb, who also flies the jump aircraft. Bruce is a veteran of the Korean War, having flown 98 combat missions in the F9F Panther jet.

**DOUBLE CROSS OVER:** This is the first jump made by the "CHUTING STARS" during an air show. In this maneuver two jumpers will exit the aircraft in quick succession at an altitude of 12,500 feet above the ground. The first jumper out will stabilize on the jump aircraft's heading momentarily and then go in to the maximum track position on this heading, covering as

much horizontal distance as possible. The second jumper out will also stabilize momentarily and then make a 180° turn, tracking out in the opposite direction away from the first jumper. At the end of ten (10) seconds both jumpers will make 180° turns and track back in towards each other, with a closing speed of about 360 mph. They will actually pass within five (5) to ten (10) feet of each other, both at exactly the same altitude. After crossing the jumpers will repeat the same maneuver, but at a different altitude and time separation. The jumpers will be trailing colored smoke so that you can follow their movements through the sky.

**BATON PASS WITH PHOTO:** In this pass, three (3) jumpers will exit the aircraft in quick succession. The first jumper will stabilize on aircraft heading and he will be holding a 15 inch baton in his left hand. He will continue falling in this position and on aircraft heading until the maneuver is completed. The second jumper will stabilize momentarily on aircraft heading and then turn towards the first jumper. Using variations of the stable, the delta and the track positions, the second jumper will maneuver himself towards the first until they are only separated by inches. He will then reach out and take the baton from the first jumper. Following the exchange they will separate. While all this is going on the third jumper will be photographing the entire maneuver with an automatic camera

# Chuting Stars

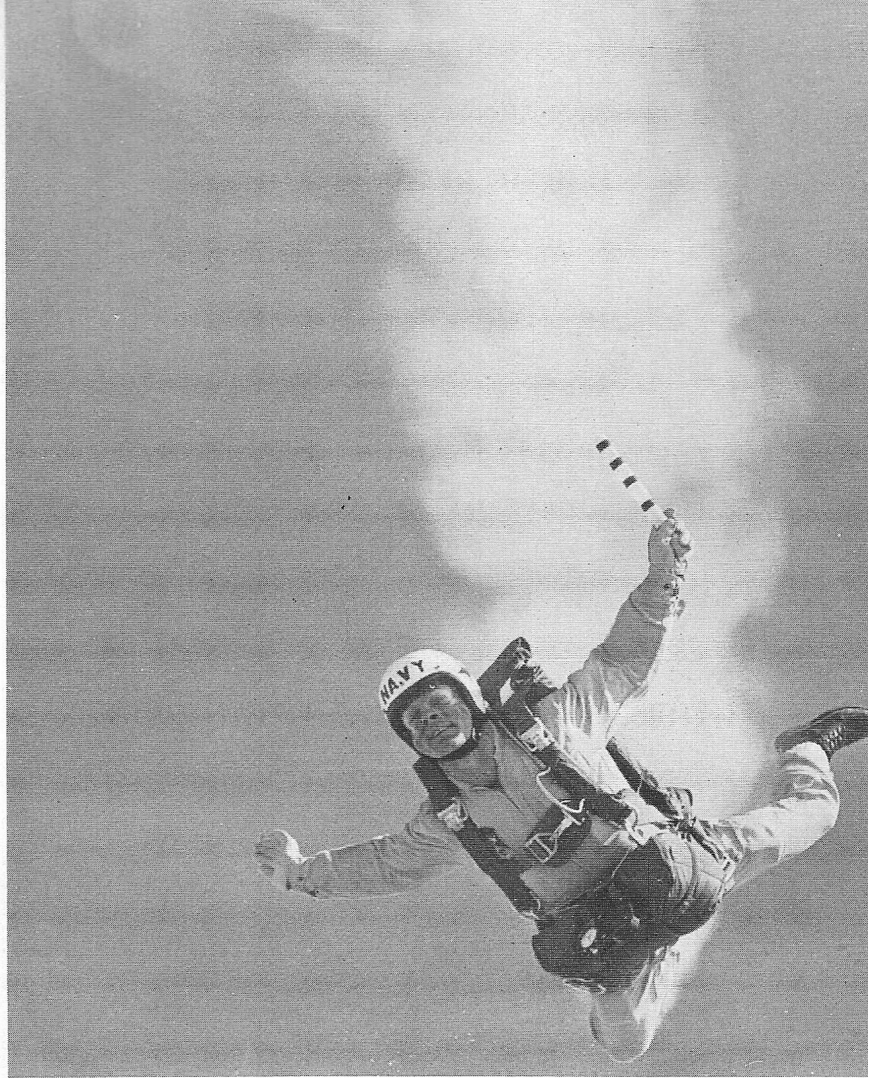


U.S. NAVY PHOTOS BY CHIEF PR KRUSE, PM 2ND  
MAY 1963

he carries strapped to his left wrist. Normally the picture of the said baton pass is used in the next edition of the local news papers.

**STAR BURST:** On this pass four (4) jumpers will exit the aircraft in quick succession, each stabilizing momentarily on aircraft heading. They will then all turn towards each other and form a tight formation with just a few feet of separation. The jumpers will carry flare guns which they will fire simultaneously at the end of 49 seconds free fall. The jumpers will then turn and return towards the center of their formation before actuating their parachutes.

**DOUBLE BREAKAWAY:** Four jumpers will exit the aircraft on this maneuver in two's and holding on to stabilize and fall straight down towards the earth. The second pair will also attempt to stabilize, but they will maneuver themselves until they are directly over the first pair, with a vertical separation of a few hundred feet. At a predetermined time a jumper in the first pair will fire a flare gun that he is carrying and the two jumpers will release their holds on each other and track outbound away from each other for approximately 15 seconds. As the first pair separates, the second pair will fall directly between them, with only a few feet of separation. Again at a predetermined time one of the jumpers in the second group will fire a flare gun and they will release their holds on each other



*Not a Camels ad, but an exhibition jumper with smoke and baton!*

and separate. As they separate the first two jumpers will reverse their course and head towards the jumper in the second group that is on their side to form a cross over.

An accomplished group of parachutists, the men on the "Chuting Stars" are also a hell of a good bunch of men. Perhaps the most experienced jumper on the team is Chief Hal Picard. He is an experienced test jumper with over 700 parachute jumps to his credit. At the present time Hal is the senior jumper in the Navy, second only in number of jumps to Chief Warrant Officer Lew Vinson, who retired from the Navy in April, 1962. Most of the men on this team received their parachuting instruction at the U.S. Navy Parachute Rigger School at Lakehurst, New Jersey. They put you out on free fall on your first jump at Lakehurst, so you don't see very many "rope jumpers" here. Some of the other 1963 team members include Lt. Bish Bischoff, Lt. Paul Salgado, Lt. JG. Frank Pelkey, Parachute Riggers first class Newt Neidig, Bob Collingru, and Al Scmiz, Aviation Machinist Mate 1st Class Bill Prout, Hospital Corpsman 2nd Class Doc Lentz, Parachute Riggers 2nd Class Ron Diebold, Ray Wohlford, and Tony Riek, Aviation Machinist Mate 2nd Class Tom Kelly, Photographers Mate 2nd Class Chip Maury, and Parachute Rigger 3rd class Danny Cox.

# 16mm Gun Camera

BY DOYLE FIELDS

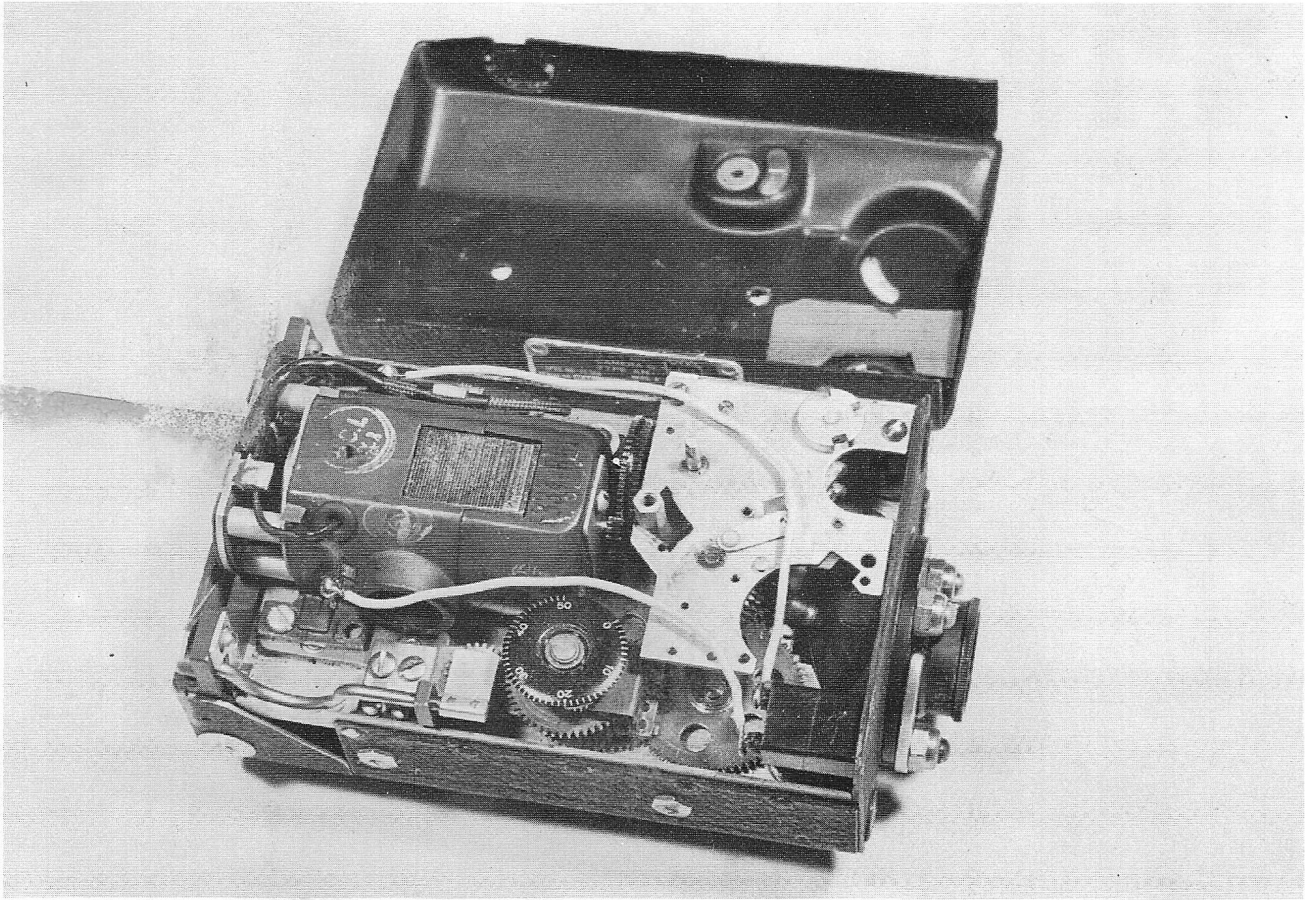


When considering the possibility of obtaining this air to air motion picture footage you will first of all have to consider the financial aspect. The initial cost of a suitable camera set up such as the one shown here is in the neighborhood of \$140. From this point on you can expect to pay about \$10 a jump extra if you are shooting 16mm film, as a 50 foot magazine costs seven dollars, plus two dollars for developing. For good reason you might be better off at the onset to try an 8mm camera, working out the bugs at a fraction of the cost of the larger camera. You can gain experience this way, and will be pleased at the results when you later switch to 16 mill.

Have patience when filming, or forget the whole thing. After jumps when everything looked good, everyone in position and the whole bit, you will sometimes have to explain to your friends that the camera didn't work, or the wiring fouled up, or

*Doyle Fields with new helmet mounted 16mm gun camera*

*Detail shot of gun camera*



something or another went wrong!

Do you still want to try this filming jazz? I feel that the standard 16mm gun camera, AN-N6 and AN-N6A G SAP is the most practical. It is ruggedly constructed, electrically operated, and compact. The self contained film magazine holds 50 feet of film. A footage dial on the camera cover indicates the amount of unexposed film remaining. All parts of this camera are corrosion resistant, and it will withstand almost all of the hard landings and openings that you can give it. It weighs four pounds and will shoot film at 16, 32, and 64 frames per second. I recommend 32 frames per second for our needs. You will no doubt run into sighting arrangement

problems. Experiment on the ground first, but try them while lying down as if in a stable position, with your head raised. I use a ring sight, while others prefer frame sights or bore sights. Try them all and choose the one most suitable to you.

The unmodified gun camera will not run for a period in excess of five seconds. A timer is installed inside, and this shut off device will have to be removed. You will also find quite a few superfluous gears and cogs inside, and these can be stored in an ash can. You will also need a wiring and battery set up. This is no great problem providing that you make as small a battery pack as possible, while soldering all of the wiring properly, and checking to assure that

you have enough amperage to run your camera with efficacy. Your best bet, of course, is to have all of this done by a firm that deals with this type of equipment, rather than doing it yourself.

During the trial period you will come up with a few bugs, but don't be discouraged. Once you do obtain results, you will have achieved your reward quite fully. It will probably take a lot of camera jumps. I have made over 400 of them, resulting in six stitches and many twisted necks, and I am still working out bugs in my equipment. Perhaps you can benefit by some of my experiences, and do not hesitate to query me if you need help. Good luck to you on your new parachuting adventure!

# “Piru”

by RON SIMMONS.

*Editors Note: Bob Reddick has just moved his parachuting facilities to Lake Casitas, California, an area with all of the virtues and none of the setbacks prevalent at the Piru location described in this article.*



*Jack Cupp*

*Anne Batterson with Howard Curtis*



About 30 air miles north west of Los Angeles, nestled in the fertile orange tree covered Santa Clara River valley, lies a small macadam air strip on the Bud Sloane Ranch that we call “Piru”. Actually this is a misnomer, as the small town of Piru, together with its one citrus packing house, lies two miles to the north of this airstrip. So, these few people notwithstanding, the word “Piru” means a place to jump. At least to the Sports Parachuting world!

Several years ago, Stan Parker, Arnold Simms, Hank & Muriel Simbro, Jack Cupp, Lyle Cameron, Les Flick, and David Morura ran across Bob Reddick, a tall — well built ex-rodeo rider and Alaskan bush pilot. Bob would take these Parachutists up to jump, usually

dropping them over cow pastures and farm lands. More often than not they would be told not to come back. Bob Reddick and his wife, Jean, would then spend the next few days driving around the area searching for a new DZ for the following week-end, only to fall into the same pattern again.

In 1961 they finally ran across a place to settle down near Piru. Bud Sloane had no objection to having Bob fly jumpers out of his place, as Bud himself is an aircraft enthusiast; flying his own Cessna 210. At this writing “Piru” consists of the small airstrip with the Reddick’s operating a pretty yellow Norseman, plus a Cessna 180 and Cessna 170. Bob Reddick flies the Norseman, while Spike Yarter and Bix Logan fly the

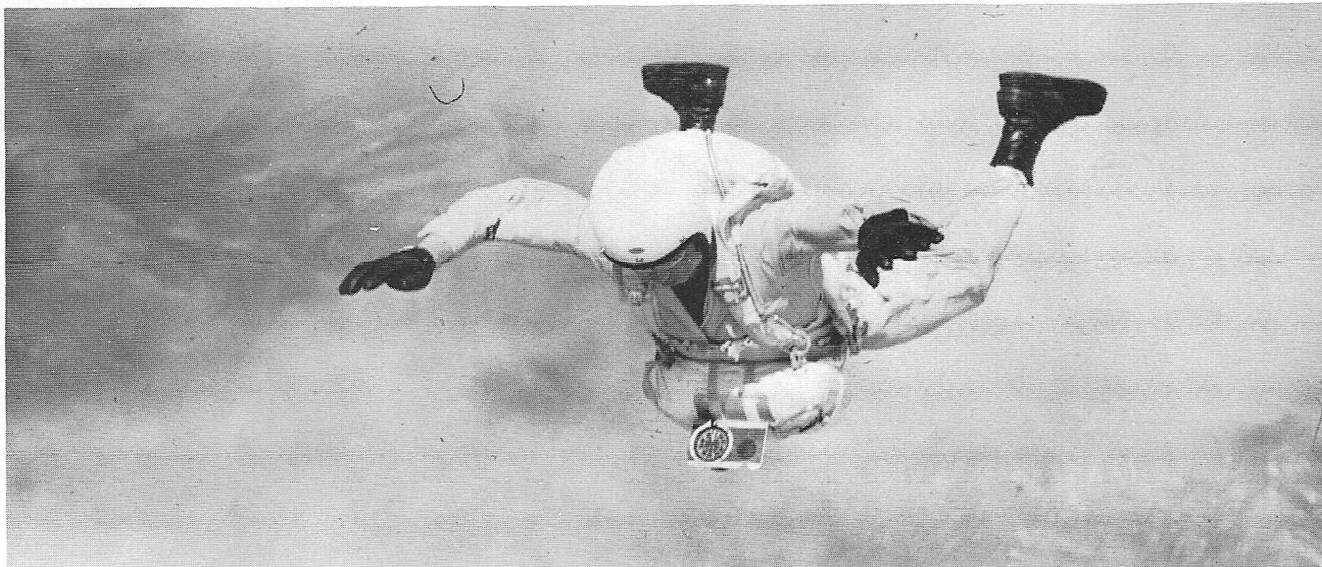


Cessnas. Jean Reddick keeps the jump manifest, while Les Flick and Jim Lizzio run the rigger checks. There are eight outside packing tables, and plenty of parking spaces for cars. A catering truck is usually in the parking lot, so a quick snack is nearby. The "Piru" DZ is located about 350 yards north of the landing strip in the Santa Clara River bed, a large flat wash that is usually dry.

"Piru" is one DZ where an experienced jumper can have a hell of a good time in the air! Eight man get-togethers are commonplace. No one has had a bigger

students, as Bob is primarily interested in flying jumpers, not in training them. A first jump student at "Piru" might be trained by an experienced free fall parachutist with over 250 jumps; or he may be trained by a man wearing an Army uniform with Special Forces insignia (a reservist) who will spot the student and then make another pass and go out on the end of a static line himself. So, thousands of miles from Viet Nam, we have Special Forces Operators, Oranges, Airplanes, Children Playing In The Dirt, and of course, Sports Parachuting!

If you are the type of person that would rather tell



*Danny Paine flies in*



*Rod Pack tries our bubble shield*

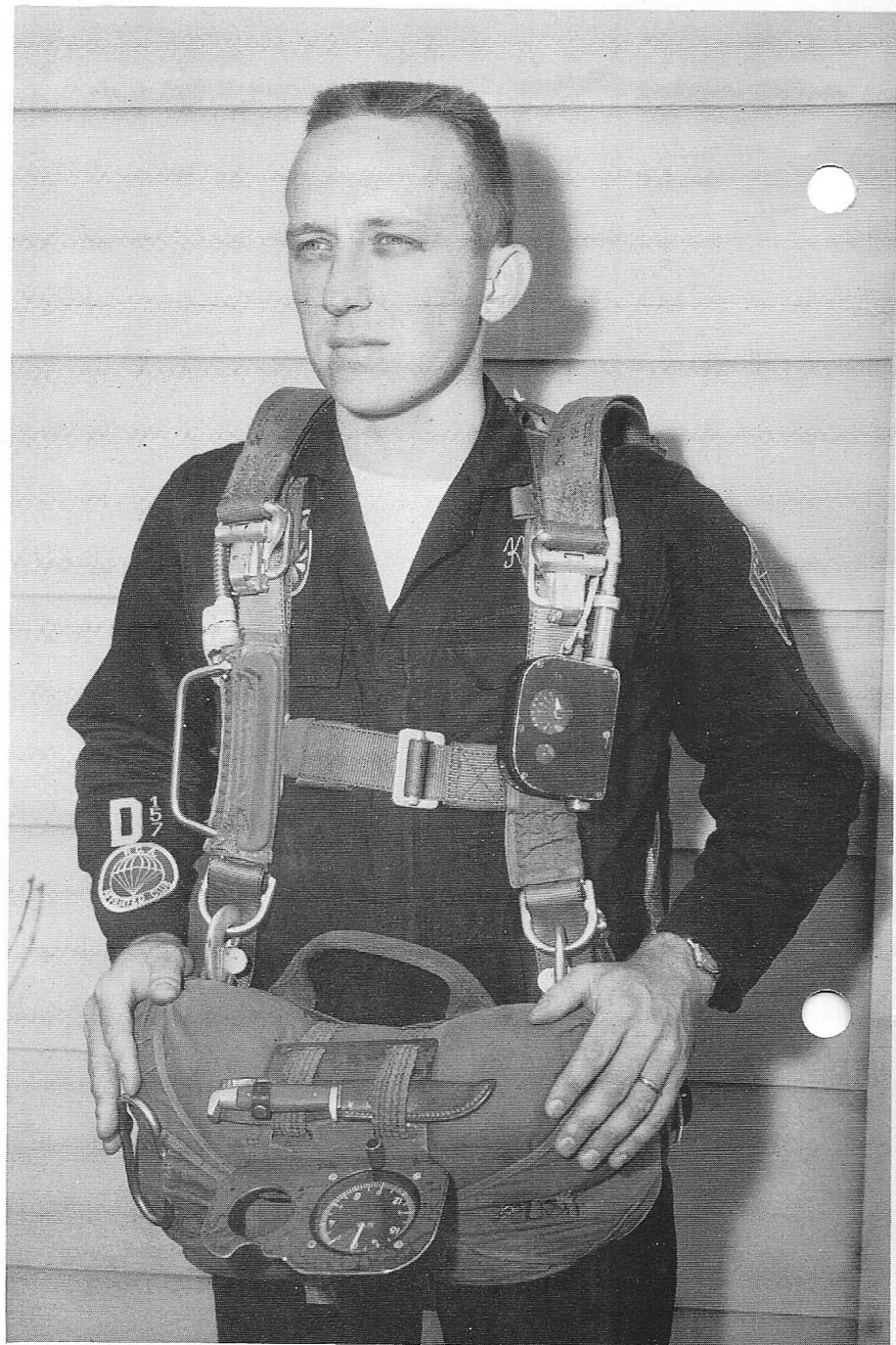
ball than we have – fun jumping over "Piru", and no where will you find a more experienced or more proficient group of relative work jumpers!

On the other side of the coin, "Piru" has its unusual features. This valley can build up a breeze like the big wind tunnel at North American Aviation! Keeping a plowed DZ is futile, as a big rain can bring water down the usually dry river bed-DZ, leaving hard packed sand and all sizes of rocks in its wake. Bob Reddick does not attempt to run a commercial center here in the true sense of the word, rather it is an air lift service for sports parachutists. There is no set system for training

jump stories than fall out of airplanes, *stay away from "Piru"!* No one will listen to you. The jumpers are busy jumping, re-packing, loading the aircraft, and jumping again. These parachutists do not appear to be concerned with luxuries on the ground such as you might see around a top Ski Resort. Their thoughts are 30 to 60 seconds over pulling altitude, straight over the Santa Clara River bed. Whether your choice is to exit the Cessnas and work on a series or shoot pictures, or fun jumping and baton passing from the Norseman, "Piru" is one place where you can get together with a damned good bunch of jumpers and have a real ball!

# KAP-3

BY KEN SISLER



*Author Ken Sisler with complete rig, showing KAP-3 automatic opening device.*

The KAP-3 releaser is intended for the automatic opening of the main back pack parachute. This device can also be used as a safety factor during free fall training when the parachutist cannot for any reason open his parachute by means of the manual ripcord.

The basic KAP-3 equipment consists of a watch with a transmission, which is located between two profiled plates and connected with a pressure gauging system. The instrument for this opener is placed in an aluminum case on which is fixed a scale with a hand indicating from zero to five seconds. A flexible hose leads from the case and is terminated with an eye connected to the parachute. This instrument, with its

watch mechanism, can be set in such a way that it can be put into operation after two to five seconds from the moment of its engagement.

The pressure gauging equipment is provided with a scale, calibrated from 500 up to 4,000 meters. The pressure gauge blocks the watch mechanism up to the last second and does not allow its operation before the jumper reaches the altitude for which the pressure gauge scale is adjusted. When the adjusted altitude is reached, the pressure gauge under the influence of the increasing atmospheric pressure is pressed and releases that watch mechanism. At that time the watch mechanism operates for the remaining eight tenths to one and two tenths seconds and releases the working spring



*Rear view of same KAP-3 installation.*

of the ripcord mechanism which is connected with and cabled to the parachute. When jumping from a lower altitude as that adjusted on the pressure gauge scale, the *watch mechanism* only operates and the instrument opens the parachute after the period set on the scale.

The time limits on the KAP-3 are from two to five seconds, and the approximate altitude limits are from 1,500 to 12,00 feet above sea level. It operates within the temperature limits of -50 degrees up to plus 50 degrees centigrade.

The KAP-3 is the designation for the most commonly used auto opener in the sport parachute world. Unfortunately it is made behind the Iron Curtain and

has seen limited use in the US. After obtaining a KAP-3 through the concentrated efforts of a friend and former student, Ed Vickery, and technical info from Phil Miller, I set out to jump this tremendous little instrument every chance I had. The following is strictly personal observation and is correct to the best of my knowledge.

In 47 jumps with the KAP-3 it has never failed to operate. The highest jump was 15,000 (3 of them) and only 1 jump was made using watch mechanism (5 sec. delay). I have used it through the winter with below zero jump temperatures and on hot fall days. The average jump made with the KAP-3 would be a 30 sec. delay over a DZ that is 260' above sea level.

In setting the instrument, Ed Vickery and I each adjusted ours as close together as possible. The following jump found Ed un-packing at 2,800' and I opened at 2,200'. The scale for setting the metric altitude is in large increments and you can easily be off several meters. It is a simple matter to set it and leave it in the plane with it cocked, and when the pilot is descending, he can hear it go off and note the altitude. You can also leave the eye of the power cable off the ripcord pin and ride it down under your open canopy and listen for recoil. This may take a few jumps to get the exact setting you want but the fact that it is easily and locally adjustable makes up for the inconvenience. A setting below 2,200' could be made for emergency use if you did not care to be exact to the 100th foot. Once there is a setting there is very little variation in the opening altitude due to changes in barometric pressure. In 6 months I experienced a 200' decrease in opening altitude but this was only on 2 jumps and I had pilot chute hesitations both times.

The instrument takes quite a pull to arm it and it has close to an 80 lb. pull. The cable is supposed to last 500 jumps (or firings) before it weakens. It is not good to leave them cocked nor the power cable kinked sharply. It has a large clip on the back and can be clipped onto the harness in numerous places. I have found the best place on B-4's to be either the wing flap or on front of the harness. There is a small flexible pin which is pulled to engage the KAP-3. It is pulled when you have ascended above the set altitude. Upon removal of the pin, 4 of the 5 seconds run off and the last second is saved for use after hitting the set altitude.

Complaints about the KAP-3 are few. There are only about 20 of them in the US. It is reported that changes in air flow about the body and/or instrument could leave you suspended much higher than intended but this has not occurred to me and I have been through a few gyrations with it on. The length of the power cable is a bit short for American chutes, but still usable.

Negotiations are currently under way for the production of the KAP-3 in the US. It is extremely reliable and simple. It is hoped that the American KAP-3 will someday ride with every parachutist in the interest of safety and NOT as a substitute for good training. Meanwhile, follow the PCA rules, use common sense, and jump safely. This "box of wheels" (as it's known to some) will be the biggest single safety factor to arrive upon the sport parachuting scene in some time.

NOTE: (This instrument IS NOT any variation of the F1B US Military Barometric Opener).



Warren Ferrell of Las Vegas Sky Divers receives second place trophy.



Chris Ebersole of the Falling Angels tries a stand up landing prior to heading for the target in a jump and run accuracy event.



Winner of first place in event IV, Chris Ebersole exits over Deland.

# FIRST MASTERS MEET

reported by JOHN D. GAFFNEY

PHOTOS BY KEN STOKES

The competitors in the first Master's Meet met in Datona Beach, Florida before some sixty five thousand college students celebrating the Easter week-end.

Twenty knot winds forced the cancellation of the first days jumping activities at the beach after about ten jumps. Several jumpers tasted salt water before the jumps were called off.

Sunday the 14th, the jumpers were regrouped at DeLand and the meet proceeded without further incident. The events and winners were as follows:

## EVENT I INDIVIDUAL ACCURACY TWO DIFFERENT ALTITUDES

- First place — Jimmy Roberts,  
Pelican Sky Divers
- Second place — Warren Ferrell,  
Las Vegas Sky Divers
- Third place — Hal Baxter,  
Orangeburg Sport Parachute Club

## EVENT II TEAM ACCURACY

- First place — Hal Baxter, Eddie Suggs, Mark  
Graham, Orangeburg Sport Para-  
chute Club.
- Second place — Wayne Frankenberger, Jimmy  
Godwin, Dick Bartlett, Paraga-

- tors, Inc.
- Third place — Chris Ebersole, Frank Kizis, John  
Gaffney, Falling Angles, Inc.

## EVENT III DOUBLE BATON PASS From 7000'

- First place — Carl Copeland, Jimmy Roberts,  
Bob Holler, Pelican Sky Divers
- Second place — Hal Baxter, Eddie Suggs, Mark  
Craham, Orangeburg Sport Para-  
chute Club
- Third place — Ben Brezin, Paul Poppenhager,  
Bill Childs, So. Florida Parachute  
Association

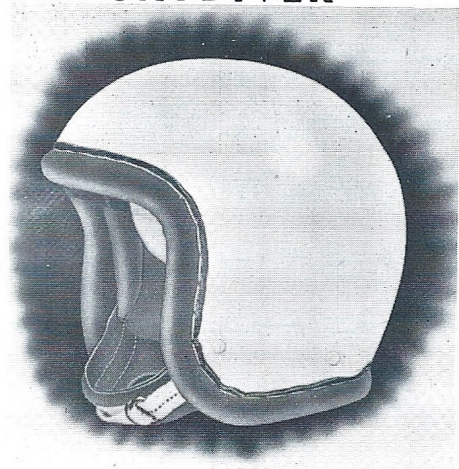
## EVENT IV INDIVIDUAL ACCURACY WATER

- First place — Chris Ebersole,  
Falling Angels, Inc.
- Second place — Hal Baxter,  
Orangeburg Sport Parachute Club
- Third place — Frank Kizis,  
Falling Angels, Inc.

Our judges, Dick Fortenberry, and Gerald Borquin of the Army's "Golden Knights" did a splendid job under very difficult weather circumstances. Next year we look forward to a bigger and better Master's Meet to be held on the beach in Florida.

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(continued from page 10)

if the turn required after the loop begins beyond the heading such that when complete it is somewhat less than a 360° rotation. If the second or last loop is off heading valuable time will be lost resuming the alignment with the arrow, a mandatory position before the watches will stop.

To enter a turn after a loop cannot usually be achieved so smoothly. If your loop is pitch-free you can anticipate the end of the loop and adopt the turn configuration during the last quadrant of the loop. If successful, the instant your body is flat with respect to the ground you will already be in the turn configuration and rotation will begin without hesitation. It requires the coordinated dipping of the shoulder on the side to which you want to turn as you complete the loop. An estimate puts the optimum point at about the 45° mark above the horizontal, or actually the 315° point of the loop.

#### DIVISION OF TIME

Since the series can be started at any time during the 25-30 second delay it follows that there will be an optimum time for best results. Simply the faster you are falling, or the faster the air is hitting you, the faster will be your body's reaction to a change in configuration. Thus a series should not be commenced before the twelfth second. For any performance in less than thirteen seconds, this twelve-second wait is essential. If your series is performed in fifteen seconds you must begin on the tenth second, and so on, always allowing yourself time to complete the series by the twenty-fifth second. You will then have two seconds to stabilize on heading, indicate this to the judges, and then open at the safest time (here safety is a matter of scoring).

#### TRAINING

For proficiency in style the best practise is not to be found in the air. Since the major area is training the mind to direct the body, and since training the mind can take many hours, it follows that several hundred thirty-second delays will be necessary to attain worthwhile results. The answer is to practise on the ground. As it is known, "bench" training is usually scorned. But it is invaluable.

Bench practise is simply lying flat on a bench so that the upper part of the body protrudes over one end, and coordinating the different configurations. It is necessary to repeat the maneuvers as many times as you will, alternating between the three series until your body obeys your mind without hesitation. It is also good to study the different positions of your arms and legs and shoulders to ascertain that your left-turn configuration corresponds exactly to the right-turn one. No doubt your first attempt on the bench will indicate why you went out of control on your last jump . . .

A twenty-second delay can be used for valuable and inexpensive in-the-air training for those persons who are capable of a fifteen-second or better series. In this case one must begin on or about the fifth second (before then is wasteful). Should weather or other considerations necessitate a free-fall of less than twenty-seconds do not lose the opportunity of practising a figure-eight and back loop, or even turn and a loop. It is suggested to practise turn-loop combinations rather than those maneuvers singly. Finally, there is no good reason why every style jump cannot be a practise accuracy jump.

#### CONTEMPORARY STANDARDS

Out of the eighty-odd contestants

who completed the Style Event at the recent World Championship, the top thirty all averaged better than fifteen seconds for their two jumps. Only one man scored a time less than ten seconds. Four men performed a series in less than eleven seconds, and only nine men averaged less than twelve seconds on two jumps. Following is a list of the top ten with their times.

1. Tkachenko	USSR	10.0 & 9.4
2. Arender	USA	10.2 10.4
3. Kazakov	USSR	10.2 10.5
4. Klima	Czech.	10.9 11.4
5. Grivet	France	11.5 11.3
*6. Henry	Canada	12.1 11.4
Mally	Czech.	11.4 12.1
Vrabel	Czech.	11.7 11.8
9. Fortenberry	USA	11.9 12.0
10. Cierniak	Poland	12.1 12.0

\* (Tied for sixth place)

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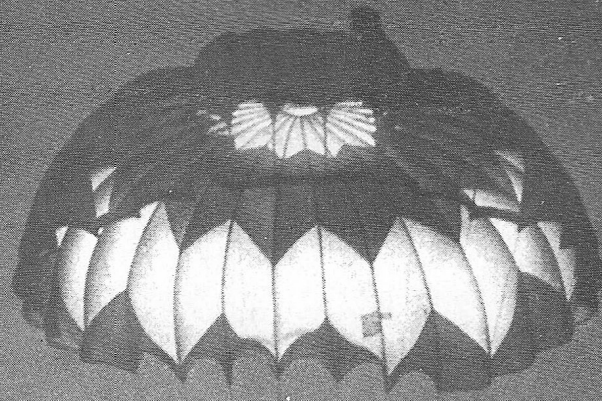
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**P.S.**

*Bob Wright falls with a seat pack in front of photographer Bob Buquor.*



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