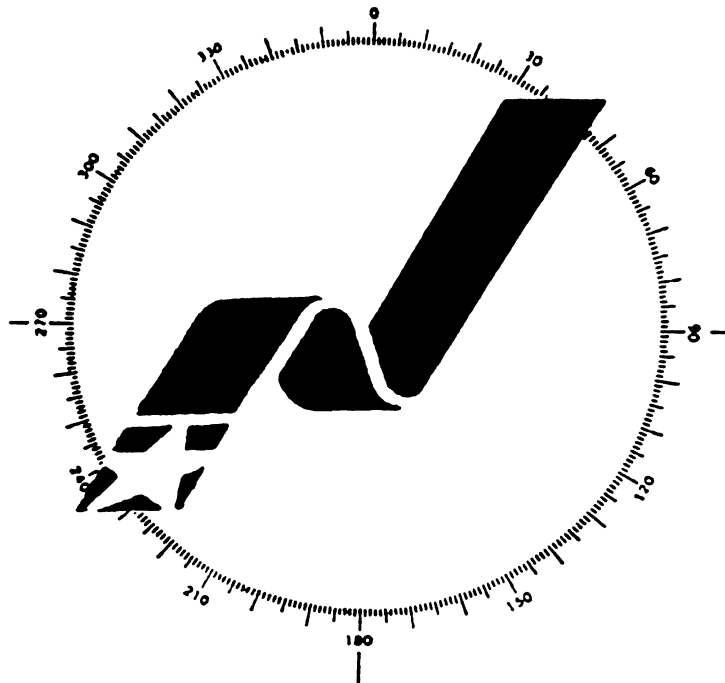


DEBRIEFER HANDBOOK



A Publication Produced for the



COMPETITION COMMITTEE
Balloon Federation of America

Forward

This handbook is not meant to be the final word concerning the skill and art of debriefing. In fact, by the time this handbook reaches your hands it will already have begun revision, rewriting, additions, and deletions.

It is hoped that, over time, many people will contribute their knowledge and experience to this handbook in an effort to share with those who aspire to become more involved with the scoring of competitive flying events, and those who aspire to continue the level of competitive flying that the use of observers and a debriefing staff provide.

Thanks to Ron Wiseman for sharing much of the basic information that he provides to his debriefing staff at the beginning of many U.S. competitive events where he has served as Chief Debriefing Staff.

I have attempted to put into a handbook as much information as I could from my experiences as a debriefer and Chief Debriefing Staff so others may learn, and eventually prepare themselves for future roles.

If you have any questions, please email U.S. Chief Observer, Linda Sams, at aileron74jb@yahoo.com or contact the BFA Office, Attn: Chief Observer.

Debriefing Handbook
First Edition – 1999

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Text by Linda Sams
Edited Text by Ron Wiseman

Debriefing is

- a skill
- an art
- problem solving
- math problems
- teamwork
- using reasoning
- being creative
- teaching
- learning
- long hours of non-stop work
- getting along with others
- tedious at times
- wonderfully satisfying at times
- interviewing
- stints of intense concentration
- synthesizing
- being accountable
- accepting your mistakes
- making judgements
- knowing the rules
- knowing where to get help
- knowing when to get help
- recycling and refolding markers
- launching
- observing
- being on call for the whole event

*So you still think you might want to be a debriefer?
Then read on.....*

Debriefers Responsibilities:

Debriefers are the true “utility vehicles” of an event. As a debriefer you will find yourself arriving at the pilot briefing well ahead of other officials to distribute markers, task sheets, weather sheets, etc. for the briefing. At times, debriefers will be asked to serve as launch masters for the common launch from the field, or they may be asked to observe for a flight when the Chief Observer is short on observers. Frequently debriefers are sent ahead to a different task drop areas to observe pilot drops and may help observers measure if the area or task is difficult for measuring (i.e. curved road, Max Distance task, etc.) Of course, the main responsibility of the debriefer is to be at the debriefing area before observers arrive to prepare for debriefing of the observers, and stay until all information has been gathered to provide for efficient and fair scoring of the event by the Scoring Officer. Also, it is not unusual for some debriefers to be asked to return to an area after debriefing to remeasure problem marker(s) or map at an area of new roads. So you can understand why Debriefers are essentially “on call” the entire event.

Specifically, a debriefer is expected to:

- Attend all pilot briefings, unless excused.
- Arrive at the briefing area at least 20 minutes prior to the start of the briefing.
- Be ready to distribute task sheets, weather sheets, other information, and markers in an orderly and timely fashion.
- Be available to serve as launch director or substitute observer if requested to do so.
- Always report to your debriefing station before observers begin arriving after the flight.
- Debrief the observer to obtain the necessary and complete information needed to develop the competitor’s score.
- Complete each report sheet in such a way that a jury member could understand what happened on the flight, and how you arrived at your result.
- Ensure a separate supplemental report is completed for any information concerning a competitor other than the observer’s assigned pilot.
- Make yourself available to the Chief Debriefers for any additional duties.
- Check with the Chief Debriefers before leaving after the completion of debriefing.

A debriefer’s conduct is expected to:

- Refrain from extraneous conversation during briefings.
- Refrain from asking questions of the Competition Director at the briefing
- Not offer any explanation of the task sheet to the pilot -- send the pilot to the Competition Director for clarification.
- Be appropriately attired for possible launching or observing duties if requested to do so.
- Be sensitive (i.e. kind and patient) to the returning observers. They have been working hard – and may just have endured the ‘chase’ from hell’.

Remember you are a race official and information discussed relative to competition is confidential !! Be very aware to not talk around pilots and observers !!

Remember: WE ARE A TEAM !! We work for the Event Director to enable him or her to run a smooth operating competition. Our goal is to produce accurate and timely processing of the scoring results. Each of us must do whatever it takes to get the job done – and without complaint.

Debriefing Equipment:

Just as an observer needs some special equipment to do an adequate job, debriefers, also, need some special equipment and supplies to effectively accomplish their job responsibility. While some items may be provided by the organizer for the debriefing staff, you are responsible for having the equipment you need to do your job effectively. Suggested equipment and supplies:

Equipment that may be provided by for you:

- Credentials (for field access)
- Competition Rules
- Current Competition Map
- Corresponding Grid *
- Regular Area Street/Road Maps
- Red Ballpoint Pen (fine-line) *
- Three-Hole Punch
- Staplers and Staples
- Scissors

Equipment that you are expected to provide:

- Corresponding Grid
- Red Ballpoint Pen (fine-line)
- Pen on Lanyard
- Highlighter Felt Pens (need yellow and red – orange, blue, and green helpful)
- Magnifier
- Calculator (minimum ability to calculate square roots, sine, cosine)
- Ruler (metric – 30 cm.)
- Colored Translucent or Thinline Tape (found in engineering section of store)
- Colored Post-It Tape Flags (suggest at least four different colors)
- Current Event Program (showing pictures of competitor's balloons)
- Post-It Notes
- Notepad

Optional Equipment that you may want:

- Three-Ring Binder
- Paper Clips and Rubber Bands (need only few)
- Roll of Drafting Tape (to tape map to table)
- Long Pins with Colored Tops and Corkboard (if prefer to use pins rather than tape flags)
- Observer Bag with Necessary Supplies (for pinch-hitting duties)
- Watch with Second Hand

First Debrief Expectations:

As a new debriefer you will never be expected to learn the process of debriefing on your own. You may be asked to shadow an experienced debriefer, then gradually ease into doing your own debriefing. Or you may be assigned to work in conjunction with a mentor that you can easily turn to with questions as they arise. Remember, as a new debriefer, you are “in training” and will only begin when you are comfortable. Even after you have some experience, always feel free to ask for guidance. This is especially true if you’re facing a difficult math problem or rules interpretation. As flights and tasks called by the Event Director become more involved and complicated, it is common to become confused or experience ‘brain lock’. In these cases, it helps just to discuss the facts with your mentor, another debriefer, or the Chief Debriefing. Remember: DEBRIEFING IS A TEAM EFFORT !!

Preparation for the Debrief:

The Chief Debriefing, generally, will have all of the debriefers gather prior to the start of a flight’s debriefing, and prior to the arrival of the first observer at debriefing. The purpose is to discuss the task sheet and prepare a “debriefing assist list”. All possible scenarios and aspects of the flight are discussed as well as how the scorer’s box of the observer report sheet is to be completed. Some of the items discussed are: task requirements, required distances and times, marker order, penalties (rule #'s), possible contest landings, any possible scoring problems as a result of a less than clear (i.e. faulty) task sheet, what information goes where in the scoring box, and any other pertinent information needing to be checked. As soon as the task sheet has been discussed and the ‘assist list’ completed and understood by all, it will be duplicated for all debriefers.

A special note for morning flights: It is recommended that arrangements for breakfast between pilot briefing and the start of debriefing be made. Dependent upon the winds and type and number of tasks called for the flight, you may have lots or little time to eat. Once debriefing starts, there is no time to eat – and debriefing may extend well beyond the noon hour.

Each debriefer is expected to prepare their competition map for debriefing the flight. This may include new P.Z.’s to be added, locating Judge Declared goals, marking boundaries of scoring areas for Minimum or Maximum Double Drop tasks, and other necessary items.

Sometimes if the flight is not a straight forward debrief, the first observer to arrive at debriefing will be debriefed by an experienced debriefer with then newer debriefers observing the debriefing. Newer debriefers may choose to observe a few before doing an observer debriefing on their own.

Important Aspects of a Debrief:

During a debriefing session a person can become so involved that the 'large picture' can become lost. These are some general thoughts that should be kept in mind during the debriefing session.

Good debriefing requires all the skills and knowledge of a good observer PLUS the art of a good problem solver, questioner, and listener, as well as sensitivity and patience. The observers have been working hard. They are hot, tired, and probably hungry. They may also have just endured the "chase from hell", or been hip deep in bushes and mosquitoes.

If you encounter an observer who needs help or some training on certain skills, inform the observer and immediately fill out a form for referral to the Chief Observer so that a time may be set to work on problem areas with the observer. Don't do it during the debriefing as timely processing of the flight results is paramount. Do make sure the observer understands the reasons why referral for additional training is being made. Be kind and tactful!

Take breaks during debriefing, as is needed, to avoid fatigue and keep sharp in debriefing. Remember that sloppy work and results only slow the scoring process and create more work later on for YOU as it needs to be redone correctly.

Each report sheet must be completed so that the complete story and facts are there. Complete each report sheet so that the Scoring Officer or Jury member can understand completely what happened on a flight, and how you arrived at your result. Include ALL math work, and make it LEGIBLE. Sign the task sheet legibly also.

If there are any questions or situations that you are unable to resolve, go immediately to the Chief Debriefing Officer for help and advice.

Relationship with the Observer:

Each observer that comes to your station for debriefing brings a unique flight experience and set of observations for the flight. Your handling of the observer and the beginning of the debrief can go along way in determining how easy or how hard the debrief may be in getting the full story of the flight for that competitor. Here are some suggestions to help in establishing a good working relationship with the observer.

It's a nice gesture to have at your station, mints, candies, or something to eat with sugar since many observers will be tired, fatigued, or low in blood sugar from their observing. Inquire of the observer on how the flight went in general, did they fly, was the crew and pilot helpful and friendly. You may enter into a limited conversation to get settled in, but steer the observer in the direction of the task at hand.

Many times the first thing an observer will say is, "This is where we landed." Gently coax the observer back to the launch and proceed from that point. Don't jump around.

It's too confusing and you will miss checking information and possible infractions or other vital information.

Don't let the debrief deteriorate into "stories". Each observer is anxious to share their "war stories", but for timely results you must get down to work. Stay focused. Keep the observer focused. This is where your skill as a questioner comes into play.

Don't let the observer be vague with information. Skilled questioning to pin down their recollections is needed. Do this, especially, if the observer has only minimal information written down. Did the pilot tell them what information to record or did they really know where they were and what was happening? Never trust a "two line drawing" and/or a "noteless" observer sheet. Ask if there were other markers around, other chase crews with competition numbers, where were they in relation to their pilot's marker? Again, skilled questioning.

Don't share other pilot's results while debriefing. If you have other task sheets at your station turn them face down. Remember you are a race official and information discussed relative to competition is confidential. Be very aware to not talk around pilots and observers. Assume anything you say may be overheard and will be repeated.

Road Map for a Good Debrief:

Not all debriefs are going to be perfect or even good, whether it is conducted by an experienced debriefer or by a new debriefer. But there are certain procedures and techniques that debriefers have found through experience to give them the best chance at completing a good debriefing session. Below is a journey through a typical debriefing session -- and thoughts and techniques that will work to improve your chances for having a good debrief.

Have your work area organized and your supplies conveniently located (i.e. calculator, grid, post-it flags, task and assist sheet, reference material, etc.). Clean your competition map of all the post-it flags or pins and marks from the previous debrief. *Note:* Goals for Judge Declared tasks and boundaries of scoring areas should have been marked on your competition prior to the beginning of the debriefing session -- and they need to stay.

As the observers arrive into the debriefing wait area, the Chief Observer will collect markers from the observers not needed in debriefing. The markers collected will be noted at the bottom of the observer form. The Chief Observer will also be checking for pilot signatures on those collected markers. If any altered markers are noticed they will be sent along with the observer to the debriefer.

Take the observer report sheet from the observer. Collect markers and declaration forms immediately. Record the markers you receive in the box at the bottom of report sheet.

Ask observer to locate any notes taken. This is important if there are any circumstances that might 'Disqualify' the pilot immediately. This is rare, but could save you a lot of time if it is the case.

The debriefer will begin checking the information in the upper left box and proceeding down through the boxes in consecutive order until reaching the end of the report sheet. A small red check mark should be placed by each box as the information is verified and found to be complete and correct.

Begin by checking the basic information in the top row of boxes.

Discuss and locate the launch on your debriefer map. Establish the exact location on the map by post-it flag or pin. Discuss permission granted. Record the 8 digit coordinate of the launch site in the scoring box.

Proceed to locate the first goal coordinate. Establish the location, if needed, on the map by post-it flag or pin. Record in the scoring box if required.

When locating goals make sure they are valid goals (see rules). If not, apply the appropriate penalty and in the scoring box write the correct task number, penalty, and rule number.

Determine the first drop measurement. This may be by direct measurement or a calculated result from the goal or it may be by developing a drop coordinate using a reference intersection or it may be measured on the field by the measuring team (MOF). Record in the scoring box.

Proceed in like fashion through the remaining tasks. Remember to mark both goal and drop. This is to facilitate checking required distances from goal to goal or mark to goal.

Check any time limits that may apply to either launch, drops, or landing.

Check for correct marker drop colors.

When checking marker drops make sure the flight was flown in the order according to the task sheet, or as altered at the pilot briefing.

If the report sheet is really confusing, check with the Chief Debriefing Officer as how to score and appropriate penalties.

If a pilot receives a penalty with a set number of points write the task number, rule number, and the penalty points on the proper line in the scoring box. If a pilot receives a penalty with a range of points, leave the penalty points empty, but flag the task sheet with a post-it so the Chief Debriefing Officer or Scoring Officer can determine the proper penalty. When all the drops have been verified, by either recording or calculating results, proceed to the landing box. Check for permission, time, and coordinate.

Discuss and locate the landing on your debriefer map. Establish the exact location on the map by post-it flag or pin. Discuss permission granted. Check distances. Record the 8 digit coordinate of the landing site in the scoring box.

When you finish you should see a pilot's entire flight and results on your debriefer map.

Check for any PZ violations.

After drop results are recorded review any other information the observer has written on the back of report sheet. Check to see if it effects any results you may have recorded (i.e. ground contact). Check to see if any information should result in a supplemental being written.

Any questions which you may have and do not require an immediate answer to process the task sheet, flag with a post-it for later discussion with the Chief Debriefeer.

Check for the pilot's signature.

Have the observer sign report sheet, if the observer has not already done so.

Finally, you sign report sheet -- LEGIBLY!!!!!!

When the report sheet is finished, accurately and completely, ask the observer for evaluation forms and their BFA task card. (They may forget.) Now is the time to discuss referral for retraining, etc.

Compliment the observer for some aspect of their work. Thank them and release them.

In addition, you may wish to check the CIA Competition Operations Handbook, Section 4.5 for more information. It can be obtained from the CIA Observer Subcommittee website, <www.fai.org/ballooning/observer.htm>.

Determining Marker Drop Location:

Determining the correct location of a marker drop or the results of a marker drop can be easy or difficult. Sometimes the observer may be confused and the drawing he has on the observer report sheet may be incorrect. Sometimes the observer has a correct drawing but the measurements are not valid or are to a reference point not on the map. Oftentimes the observer has the diagram and measurements correct so that you only have to verify what is there. Whatever the situation, you need to consider the following items to achieve a correct scoring result.

Determine If the Information Provided by the Observer is Correct:

From the diagram drawn by the observer and the 8 digit coordinate location, find the intersection on your map and mark it with a post-it flag or pin.

Determine if the drawing is directionally correct and is accurately drawn to look as it appears on the map. If the two do not appear the same this is the first clue that either there is confusion as to where the marker drop really was or the coordinates could be wrong.

Check the observer's map and go through the flight path and route traveled with the observer. Ask about map features until it is determined where the observer and the marker drop were.

If the correct location still cannot be determined, as a last resort send the observer back out with an experienced observer to get the correct information.

NEVER send an observer back out without permission from the Chief Debriefer and notification to the Chief Observer.

Generally, the observer is correct in recording the location and making the sketch of the location of the marker drop, so the marker result can be determined.

Determine the Marker Result:

The easiest result is a direct measure from a goal intersection. Simply record this measurement in the scoring box.

More complicated is the calculated result. Please see the section on Debriefer Math for an explanation. In addition, please be aware of the following thoughts.

If the observer has a pace factor as part of the measurement, convert the pace factor to metric first.

Determine if the observer has recorded measurements to create a right triangle from a goal intersection. If this is the case proceed using the Pythagorean theorem -- #4 in Debriefer Math.

If the observer was not able to accomplish the above due to obstacles in measuring proceed with #6 in Debriefing Math.

A combination of #4 and #6 may need to be used in some cases .

A common mistake of debriefers in adjusting the coordinates of a drop to a reference intersection is in remembering whether to add or subtract coordinates. You ADD when going East and North and SUBTRACT when going West and South.

Another common mistake is not converting ALL measurements used in calculations to metric.

Occasionally a debriefer may inadvertently reverse digits when copying 8 digit coordinates or results into the scoring box. You can avoid this by letting the observer watch you record the information. It also helps to read them aloud as you record.

On some tasks, marker drops occur in a concentrated area and it becomes necessary to cross reference several report sheets to confirm distances between marker drops. If accurate results cannot be determined in the way this will be a case for the debriefers to visit a drop area and confirm drop marks and measurements.

Another case where debriefers may go out to determine an intersection or measurement occurs when there is construction of a new road replacing a previous road which is on the map but is no longer in the real world.

Also there has been the case where there have been two "X's" appearing at an intersection and it is necessary for the debriefers to visit the intersection to determine measurements to the proper "X".

GPS Use:

The use of a GPS is becoming more common among pilots, however it is NOT to be used for measuring. This is because a GPS typically can have as much as a 100 meter error in its reading due to various technical items. The marker must still be measured in the traditional way or send the observer back into the field for a remeasure. There is always some feature on the map that the observer can measure too.

If the pilot asked the observer to write down the GPS readings, he/she may have done so as a courtesy and a reference for scoring -- but do NOT utilize it in the debriefing process to calculate the scoring results. If you wish to make use of the GPS reading follow these steps.

Make sure the GPS reading was from the proper location.

Verify the scale used (i.e. dddmmm ss.s -or- ddd.mm.mmm -or- User Grid with lat./long.)

Supplemental Reports:

Supplemental reports are created for reporting information about pilots and/or balloon other than for the pilot that the observer is assigned to. It is never created for the pilot that the observer is assigned to, as that information goes on the observer report sheet.

Often times the observer will come to debrief with a situation they may believe warrants the writing of a supplemental report. Discuss the situation and facts. If you feel the situation needs to be developed into a supplemental report because the situation needs to be brought to someone's attention or pertains to another competitor, have the observer fill out a supplemental report at the end of the debrief or while you are doing a math problem. If you are not sure the situation warrants a supplemental report, check with the Chief Debriefing, or have the observer fill out a supplemental report at the end of the debrief and state you will see that it gets looked at. Make sure the observer signs the supplemental report; then you must sign the supplemental report as the debriefer receiving it. The supplemental report is then passed to the Chief Debriefing for processing.

Actions on supplemental reports are handled at all different levels ranging from penalty points applied by the Scoring Officer, to being passed onto the Safety Officer, to being passed on to the Competition Director, to being used as a basis to talk to the pilot, or to being filed for future reference. Once a supplemental report is written and passed on, it is no longer your concern. If the observer should come back to you at a later time wanting to know the result of a supplemental report, tell them it was handled properly and that once the supplemental report is submitted the observer is no longer involved.

Supplemental reports may be written for any of the following reasons.

- Laws were broken (i.e. crew ran a 'stop sign').
- Rule violations (i.e. observed pilot flying too low over a PZ).
- Words or actions offended your sense of decency (i.e. profanity used at an official).
- An observer questions something that just doesn't seem quite right (i.e. was the balloon low so crew member in second chase vehicle could throw markers up to the pilot?).
- Something died (i.e. plant or animal).
- Property was destroyed (i.e. broken gates, crop damage).
- Observed ground contact (i.e. basket brushes through tree tops).
- Other situations that you may be concerned about.

APPENDIXES

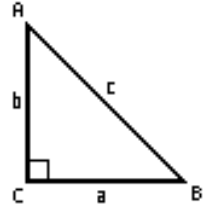
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Appendix A - Debriefing Trigonometry:

The Pythagorean Theorem

The relationship between the legs of a triangle and its hypotenuse is one of the oldest known geometric facts and is called the Pythagorean Theorem.

- **The sum of the squares of the lengths of the legs equals the square of the length of the hypotenuse.**



If a right triangle is drawn and lowercase letters a, b, and c are used to represent the lengths of the sides opposite angles A, B, and C, respectively, then the Pythagorean Theorem takes the form.

$$a^2 + b^2 = c^2$$

If information is given about the lengths of any two sides of a right triangle, the Pythagorean Theorem can be used to find the length of the other side. These ratios of right triangles are important enough to have names. They are called the **sine**, **cosine**, and **tangent** and abbreviated sin, cos, and tan, respectively. For angle A, the ratios are defined as follows:

$$\sin A = \frac{\text{opposite leg}}{\text{hypotenuse}} = \frac{a}{c} \quad \text{-or-} \quad \text{opposite leg} = \text{hypotenuse} \times \sin A$$

$$\cos A = \frac{\text{adjacent leg}}{\text{hypotenuse}} = \frac{b}{c} \quad \text{-or-} \quad \text{adjacent leg} = \text{hypotenuse} \times \cos A$$

$$\tan A = \frac{\text{opposite leg}}{\text{adjacent leg}} = \frac{a}{b} \quad \text{-or-} \quad \text{opposite leg} = \text{adjacent leg} \times \tan A$$

Trigonometric Ratios

angle	sine	cosine	angle	sine	cosine	angle	sine	cosine	angle	sine	cosine
0	0.0000	1.0000	25	0.4226	0.9063	50	0.7660	0.6428	75	0.9659	0.2588
1	0.0175	0.9998	26	0.4384	0.8988	51	0.7771	0.6293	76	0.9703	0.2419
2	0.0346	0.9994	27	0.4540	0.8910	52	0.7880	0.6157	77	0.9744	0.2250
3	0.0523	0.9986	28	0.4695	0.8829	53	0.7986	0.6018	78	0.9781	0.2079
4	0.0698	0.9976	29	0.4848	0.8746	54	0.8090	0.5878	79	0.9816	0.1908
5	0.0872	0.9962	30	0.5000	0.8660	55	0.8192	0.5736	80	0.9848	0.1736
6	0.1045	0.9945	31	0.5150	0.8572	56	0.8290	0.5592	81	0.9877	0.1564
7	0.1219	0.9925	32	0.5299	0.8480	57	0.8387	0.5446	82	0.9903	0.1392
8	0.1392	0.9903	33	0.5446	0.8387	58	0.8480	0.5299	83	0.9925	0.1219
9	0.1564	0.9877	34	0.5592	0.8290	59	0.8572	0.5550	84	0.9945	0.1045
10	0.1736	0.9848	35	0.5736	0.8192	60	0.8660	0.5000	85	0.9962	0.0872
11	0.1908	0.9816	36	0.5878	0.8090	61	0.8746	0.4848	86	0.9946	0.0698
13	0.2079	0.9781	37	0.6018	0.7986	62	0.8829	0.4695	87	0.9986	0.0523
13	0.2250	0.9744	38	0.6157	0.7880	63	0.8910	0.4540	88	0.9994	0.0349
14	0.2419	0.9703	39	0.6293	0.7771	64	0.8988	0.4384	89	0.9998	0.0175
15	0.2588	0.9659	40	0.6428	0.7660	65	0.9063	0.4226	90	1.0000	0.0000
16	0.2756	0.9613	41	0.6561	0.7547	66	0.9135	0.4067			
17	0.2924	0.9563	42	0.6691	0.7431	67	0.9205	0.3907			
18	0.3090	0.9511	43	0.6820	0.7314	68	0.9272	0.3746			
19	0.3256	0.9455	44	0.6947	0.7193	69	0.9336	0.3584			
20	0.3420	0.9397	45	0.7071	0.7071	70	0.9397	0.3420			
21	0.3584	0.9336	46	0.7193	0.6947	71	0.9455	0.3256			
22	0.3746	0.9272	47	0.7314	0.6820	72	0.9511	0.3090			
23	0.3907	0.9205	48	0.7431	0.6691	73	0.9563	0.2924			
24	0.4067	0.9135	49	0.7547	0.6561	74	0.9613	0.2756			

Appendix B - Debriefer Conversion Sheet

Conversion of Inches to Decimal Equivalent

<u>inches</u>	<u>decimal feet</u>	<u>inches</u>	<u>decimal feet</u>	<u>inches</u>	<u>decimal feet</u>	<u>inches</u>	<u>decimal feet</u>
0 "	= 0.000	3 "	= 0.250	6 "	= 0.500	9 "	= 0.750
0 1/4"	= 0.021	3 1/4"	= 0.271	6 1/4"	= 0.521	9 1/4"	= 0.771
0 1/2"	= 0.042	3 1/2"	= 0.292	6 1/2"	= 0.542	9 1/2"	= 0.792
0 3/4"	= 0.063	3 3/4"	= 0.313	6 3/4"	= 0.563	9 3/4"	= 0.813
1 "	= 0.083	4 "	= 0.333	7 "	= 0.583	10 "	= 0.833
1 1/4"	= 0.104	4 1/4"	= 0.354	7 1/4"	= 0.604	10 1/4"	= 0.854
1 1/2"	= 0.125	4 1/2"	= 0.375	7 1/2"	= 0.625	10 1/2"	= 0.875
1 3/4"	= 0.146	4 3/4"	= 0.396	7 3/4"	= 0.646	10 3/4"	= 0.896
2 "	= 0.166	5 "	= 0.416	8 "	= 0.667	11 "	= 0.916
2 1/4"	= 0.188	5 1/4"	= 0.438	8 1/4"	= 0.688	11 1/4"	= 0.938
2 1/2"	= 0.208	5 1/2"	= 0.458	8 1/2"	= 0.708	11 1/2"	= 0.958
2 3/4"	= 0.229	5 3/4"	= 0.479	8 3/4"	= 0.729	11 3/4"	= 0.979
						12 "	= 1.000

Appendix C - Debriefers Calculator Sheet

Calculator Usage for Debriefers

(for maps with 1000 meters per 2 centimeter map grid)

1. Converting Feet and Inches to Decimal Feet.
 - a. Key in number of inches Press ÷
 - b. Key in 12 Press =
 - Press +
 - c. Key in number of feet Press =

2. Converting Decimal Feet to Meters.
 - a. Key in number of feet Press ÷
 - b. Key in 3.281 Press =

3. Converting Paces to Meters.
 - a. Obtain pace factor in meters (convert feet to meters in necessary)
 - b. Key in pace factor Press x
 - c. Key in number of paces Press =

4. Converting Meters to Map Numbers.
 - a. Key in number of meters Press ÷
 - b. Key in 10 (i.e. 10 meters per map tick) Press =

5. Finding Hypotenuse to Right Triangle (only for right triangle).
 - a. Key in number of meters on one side Press 'INV'
 - Press x²
 - Press +
 - b. Key in number of meters on other side Press 'INV'
 - Press x²
 - Press =
 - c. Find square root Press √

6. Calculating Non-Trig. Angled Results.
 - a. Key in number of meters Press ÷
 - b. Key in 1000 (i.e. 1000 meters per map grid) Press =
 - Press x
 - d. Key in 2 (i.e. 2 centimeters per map grid) Press =
 - c. Lay ruler in proper direction from reference point (i.e. along a road)
 - d. Count up ruler the number of centimeters Place dot on map for mark
 - e. Use plastic grid overlay to find coordinates of the mark

Appendix D - Debrief Math

Note: Observers should be encouraged to only measure N/S and E/W. However the natural tendency will be to measure parallel/perpendicular to the roads. They should also use their compass (or pilot's if they don't have one) to determine direction, since a distance is relatively useless without a direction – although it can sometimes be gotten from a map. The only time a direct measurement works is to a goal intersection.

1. Converting feet and inches (English) to meters (Metric):

Convert to decimal feet by dividing inches by 12 [or check accompanying conversion table below].
Convert decimal feet to meters by dividing feet by 3.28 or multiplying feet by 0.3048

2. Converting feet (English) or meters (Metric) to map ticks or grid coordinate units:

For feet: 40 feet equals one coordinate unit on map with 1 grid = 4000 feet.

Divide distance by 40 (round to nearest whole number) to get # of coordinate units.

For meters: 10 meters equals one coordinate unit on map with 1 grid = 1000 meters.

Divide distance by 10 (round to the nearest whole number) to get # of coordinate units.

3. Converting distances into an adjustment of the map coordinates:

Determine number of grid coordinate units (map ticks) using step 2 above.

If distance is toward East/North, add number to starting grid coordinate.

If distance is toward West/South, subtract number from starting coordinate.

4. Finding hypotenuse of right triangle for a calculated direct measurement:

Only useful if the measurements are to a goal intersection and not a reference intersection.

Use Pythagorean theorem (sum of squares of both sides of right triangle – square of hypotenuse).

Two measurements (sides of triangle) must be at right angles to each other.

Square each of both distances, add squares together, take square root of that value.

5. Finding East/West and North/South components of a diagonal measurement:

Two measurements (sides of triangle) must be at right angles to each other.

Need to know one of the angles other than the right angle of the triangle be either:

Using the angle measures with the compass in the field,

Laying a compass on the map to measure as best an approximation of angle as you can.

Calculate length of triangle sides by:

For adjacent side next to angle – multiply hypotenuse length by cosine (cos) of angle.

For opposite side across from angle – multiply hypotenuse length by sine (sin) of angle.

6. Developing coordinates measured off a reference point not in an East/West or North/South direction:

Non-trig method:

Only useful if the measurements are to a reference intersection, not a goal intersection.

Convert distance to map distance by using step 2 above.

Lay ruler on map at proper angle, measure map distance.

Determine grid coordinates of this new point by eyeballing it.

Trig method:

Only useful if the measurements are to a reference intersection, not a goal intersection.

Use trig functions of cosine and sine to calculate E/W and N/S distances using step 5 above.

Convert this distance to map distance by using step 2 above.

Determine new grid coordinates by using step 3 above.

Inches to Decimal Conversion Table:

Inches:	1	2	3	4	5	6	7	8	9	10	11
Decimal:	0.083	0.167	0.250	0.333	0.417	0.500	0.583	0.667	0.750	0.833	0.917

Appendix E– Debriefing General Check List

How did this flight go?

Were the pilot and crew polite?

Check launch time to be sure it's within the launch window.

- If outside limit, apply Rule 13.4

Check grid coordinates for launch.

- If none given, locate launch on map with observer / agree on launch point coordinates.

Check for any launch distance limit violations.

- If outside limits apply Rule 13.3.2

Check goal references and drop references.

- If you read coordinates different than the observer, make certain you and the observer agree on them – and make necessary corrections.

Be sure sketch includes pertinent details for providing the scoring officer enough data to answer any possible questions.

- Check that North is on the sketch.
- Check that coordinates of intersection/reference point are on sketch
- Verify point measured is listed as goal or reference point
- Include details of measurements taken
- If observer paced distance, write down observer pace factor

Check landing time and grid coordinates.

- If landing close to goal or drop, did observer measure distance
- If landing NOT beyond minimum distance from goal, apply Rule 11.4.1
- Is this to be considered a contest landing
- If after sunset, apply Rule 11.1.3

Did they observe any rule infractions?

- Ground contact, apply Rule 11.4
- Too low over congested area, apply Rule 10.7
- P.Z. violations, apply Rule 7.3.4

Check on observed rule infractions concerning other pilots or crew.

- If so, have observer fill out a supplemental report

Appendix F – Debriefers ‘Task Check List’ Format

Task (number/number/etc)
(date) – (day) (am or pm)

Launch:
 Things that may be significant about launch
 such as: Rule (number)
 Coordinates – within minimums and maximums
 Time – is important
 Permission – needed / received Rule (number)
 Common launch – use tie-off / proper vehicle on field

Task (number) – (task initials) (marker color)
 Things that may be significant about task
 Such as: Rule (number)
 Declaration – when made / in writing
 Distances – from where / state in earth and map distances
 Goal selection – valid / will red areas, powerlines, pz’s highways come into play
 Common coordinates – to use if common goals / need to confirm
 Scoring areas – number / only on road / all area Rule (number)
 Scoring periods – start time / ending time / drop time / important
 Marker – need to check tail for coordinates / which task are coordinates for
 Provisional goal – can pilot have / how declare
 Contest landing – allowed Rule (number)
 PZ’s – important to task / which ones may come into play
 Are tasks flown in order
 Will need to get results from field for scoring
 Any other data that comes to mind

Special Instructions

Things that may be significant about scoring of goals
 Such as:
 Scoring data – where / how to write
 Attachments – what / where / how to
 Scoring ways (ie. No Declaration = No Result)

Task (number) – (task initials) (marker color)
 Etc.

Landing:
 Things that may be significant about landing
 such as: Rule (number)
 Distance – from drop or goal / was it measured by observer if close
 Time – after sunset / is important
 Permission – needed / received

Appendix G – Actual Task Briefing Sheet and Debriefing Assist List



Task Briefing Sheet

Day: Wednesday	Date: July 5, 1999	Time: 1915	Task #'s: 8
Task Names: PDG			
Rule Numbers: 15.1, 14.7			
Task Data			
15.1 PDG		Yellow Marker	
15.1.2 a. 1945 HRS AT THE SIGNALS POINT			
b. 2			
c. 6000 METERS / 13000 METERS			
14.7 LIMITED AREA SCORING - 50 Meters from the center line of any road shown on the competition map.			
Pilots - Do not forget to put your Competition Numbers on the tail of the marker.			
TIE OFFS MUST BE USED BY ALL COMPETITORS.			
LAUNCH DIRECTORS WILL BE WEARING ORANGE VESTS			
PZ's in force for this task: <input checked="" type="checkbox"/> All			
Launch Period: 1945 - 2018		Launch Area: Limited scoring area - Kellogg Field	
Observers: <input type="checkbox"/> To follow with chase crew.		<input checked="" type="checkbox"/> To fly by invitation of the pilot.	
Provisional time for next briefing: 0600 7/6/99			

Sample Debriefers' Assist List

Task #8
Wed., July 5 – pm

LAUNCH

Tie-off	Rule 9.1.3
Launch permission – dir	Rule 9.18
Declaration	Rule 15.1.5
Launch period (19:45 – 2018)	

#8 – TASK – PDG

Yellow Marker

Valid Goal	
Distance: min 6000 (12 cm)	Rule 13.9
Max 13,000 (26 cm)	
Scoring: 50 m either side of	Rule 14.7
Road <u>on map</u>	
Contest landing – by 2103	Rule 11.1.3

LANDING

Time: by 2118 (9:18)	Rule 11.1.3
Permission	Rule 11.1.2
Distance (not less than 200m)	Rule 13.4

*NB

Late declarations
#29 @ 19:46:26
#31 @ 19:47:15
#67 @ 19:46:20

Appendix H - Request / Referral for Retraining:



Request/Referral for Retraining

(Observer) _____ is being referred by
(whom?) _____ for retraining in the area of

Debriefer Signature: _____

Chief Observer Signature: _____

Date Received: _____