United States Faceters Guild
Competition Rules and Judging Criteria
Single Stone Competition

USFG-CRJC-SSC-R03

Index

Appendix

1.0 Introduction

To run an orderly and professional competition both the competitor and the judges have to abide by the same rules. Both should study these rules thoroughly and understand their respective responsibilities to comply with them. These rules are constructed to assist the novice up through master cutter to understand and give guidance to competition cutting.

2.0 Why do we compete?

Reasons for competing - Some cutters compete for the honor of winning. Some cutters like to compete against themselves to see how much they can improve.

2.1 We as hobbyists can do much better workmanship than commercial cutters. We have the time and can develop the skill to do this. The cutter can then truthfully say, "S tones they cut are better than any that can be purchased in a jewelry store". The cutter does need the ability to see well and know how to use faceting equipment well. A solid understanding of both the science and art are required to progress to the highest levels.

2.2 The spirit of USFG Single Stone Competitions is to promote all of the above in a friendly and constructive environment, yet in a competitive and professional event.

2.3 To all new USFG cutters, please be advised that the USFG Single Stone Competitions are for the advancing one's faceting skills through the use of our recommended procedures of advancing through the classes, and if followed, will take a faceter up to his or her highest level of achievement.

3.0 USFG Single Stone Competition Classes
The Single-Stone Competition program, with Novice, Intermediate (Pre-Masters), and Masters Classes, will be conducted as a typical single-stone competition in which winners of the classes will be recognized and presented awards.

3.1 Defining Classes in the USFG single stone competition;
Note: Master, Grand Master, World Class Masters will be separate classes; all "Masters" will cut the Master pattern.

3.11 NOVICE: A new faceter with very little experience. To become a certified novice the cutter must score 80 or above, if you score 85 or above you can choose to move up to pre-master class, if you score below 85 you should repeat the novice class. If the cutter scores 85 or above and places first they must move up to pre-master class. Under this rule we say "should repeat the novice class" because a cutter has the right to enter any from novice to masters division up as the cutter so desires.

3.12 PRE-MASTER: A faceter with varying degrees of experience that may have very good faceting skills but never competed in a competition before. A faceter that entered our Novice class and scored above an 85. The cutter must score 85 or above in the pre-master to qualify for pre-master status, score below 85 and you should repeat pre-master. If the cutter scores 90 or above they may move up to MASTER CLASS. If the cutter scores 90 or above and places first, they must move up to Masters Class. If you score at or above 85 but below 90 you are certified, as a pre-master but should repeat in pre-master.

3.14 MASTER: A faceter that has never won a certified masters competition and never competed in the Australian Challenge. A faceter that has scored 90 or above in our Pre-Master class. The cutter must score a 90 or above in the master class to qualify for master status, below 94 the cutter should repeat the master class. A score of 94 or above the cutter may move up to GRAND-MASTER class. If the cutter scores 94 or above and places first they must move up to Grand Master.

3.15 GRAND MASTER: A faceter with a high level of skills and has scored 94 or above in our Masters class, has won previous certified masters competition or qualified for the Australian challenge. To qualify for a Grand Master status you must score 94 or above, less than 94 you will have to repeat until reaching a score of 94 or above. Upon reaching a score of 94 or above the cutter may move up to the WORLD CLASS MASTER, if the cutter scores 94 or above and places first they must move up to World class Master.

3.16 WORLD CLASS MASTER: Only a score of 98 or above gives a cutter the status of World Class Master as certified by the USFG. Only a score of 98 or above gives out a certificate and an award. If a score of 98 or above is not reached by any of the entrants, no awards or certificates will be issued. This is the only class that a cutter may enter as often as the cutter desires and may still receive an award. World class Master is scored like our NAFC, awards and certificates are awarded as a certificate for anyone scoring 98 or above, medallions are awarded to first second and third highest scores only.

3.17 PLEASE NOTE: In addition to Single Stone Competition, the USFG offers experienced or, skilled faceters the opportunity to challenge any USFG Competition Division. If the (Pre-Masters) or the (Masters) division is to be challenged, and if the cutter has never entered a competition or has not received a recommendation by a Master cutter, it would be most advisable that he or she enter the Novice, the Pre-Master, and Masters, in that order.

3.17.1 HOWEVER: If a cutter has earned a Masters (certification) in any USA faceting guild, and / or, if a world class (cutter) strongly advises that cutter could score high in the USFG Masters Division, then the USFG encourages and welcomes the cutters challenge.

3.2 Clarification of participation: The above procedures are suggested procedures and if followed should lead a faceter up to attain his or her highest level of competency. It is highly recommended that you follow the procedures outlined. The USFG has decided that a member may enter any level of class at which they may feel competent at. Some faceters may want to repeat in a class instead of moving up to the next one. If they have scored above the level that would allow them to move up and have not won first place, they may repeat, but will not receive a second qualifying certificate. They must pay the entry fee, they will receive a score sheet and pattern error sheet with there stone. If they score below the qualifying score their first score has validity and they may still move up if they so desire. Be aware that once you qualify for a higher class and cut for it, you may not return to a lower class

4.0 Personal Assessment Program
A program provided to cutters for the personal evaluation of one's skills outside of formal competition. The Personal Assessment Program is conducted in much the same fashion as a regular competition. A master cutter will judge the stone and provide the cutter with Pattern Error Sheet, Judges Score Sheet, and a Judges Comment Sheet. This Program is a one-on-one session with the express purpose of providing cutters with an opportunity for a private evaluation of their skills.

4.1 Stones are sent to... <<fill in details here>>
In addition to providing mailing envelops and postage, the cutter must provide a standard GemCad-type printout of the pattern or a GemCad file on disk for the judge to mark as the pattern error sheet. The cutter should also identify the material used.

4.2 Note: This program is not a substitute for the USFG's annual competition. Any advancement to the next class must be achieved in the USFG's scheduled Annual Single Stone Competition. As a formal entry!

4.3 The cutter will be scored, as in a normal competition with the cutter receiving the Score Sheet, marked Pattern Error Sheet, and a Judges Comment Sheet.

4.4 The entry fee for Personal Assessment is $10.00 for USFG Cutters; non-members entry fee is $25.00, all must include return postage and packaging materials.

5.0 Entry Conditions and Restrictions

The competition committee shall set the time, date and place for submitting forms and actual stones. The competition committee shall be responsible for the return of stones. Competitors must comply with published rules for their particular class; deviations may result in the stone being ineligible. Entrants are to comply with any special conditions for their class such as size, color and material specified.

5.1 If a cutter enters a single stone competition, under the Anonymous Entry provision, the fee shall be the same as a normal entry. The cutter will be treated as any other entrant and only the score shall be published. The only person that will be held in confidence will be the one person on the competition committee that disperses the stones to the judges. This is a controversial concept as some competitions are held anonymous with only the winner published and some demand all entrants be published; at another time this rule could change, but for now it will be open to either entrant. To enter, as "Anonymous" cutters shall submit a written request accompanied with the stone and full Single Stone Competition fees. All other conditions for entry shall apply, i.e., return postage, entry deadlines, etc.

5.2 The Single Stone Competition is ONLY open to current USFG Members

5.3 No cutter may enter more than one class at a time.

5.4 All cutters have the right to challenge higher classes. Remember ONLY one stone may be submitted! Be aware, that if you enter out of sequence (Pre-Master or higher as first entry) your stone can be ruled ineligible or disqualified because of cutting not representative of a higher class.

5.5 If a cutter wins a particular class, and qualifies to move up to the next class, they must do so. That is to say they may not re-recut for the lower class.

5.6 If a cutter only qualifies for the higher class, but does not win, they may choose to cut extra designs in their present competition division as a means of improving present skills in order to be more successful in the next higher competition division.

5.7 All competitors will receive a certificate (suitable for framing) of achievement from the USFG Competition committee. The wording on each certificate will reflect the competitor's accomplishment.

5.8 Once a faceter has been certified in any USFG competition, that certification will remain permanent even if the faceter, when re-cutting in his or her certified class/division, scores below the minimum certification score.

5.9 The entry and payment of registration fees shall constitute acceptance of the rules and agreement to comply with them.

6.0 Processing of Stones / Reporting of Scores

Stones and entry fees will be mailed to a designated Co-Chairman, of the Competition Committee; the Co-Chairman will code the stone (for anonymity), repack and send the stone to a selected judge. The judged stone and comprehensive "mark-up sheet" will be returned to Co-Chairman, who will decode and repackage the stone with the Pattern Error, Score Sheet, and Judges Comment Sheet, and return the package to the individual contestant. The Co-Chairman will then notify the BOD of the results, before they are released to the general USFG membership. All scores will be published but anyone who wants to remain anonymous shall remain so. The Score may be reported as "Anonymous Entry".

6.1 The names of cutters (and scores of stones) that are disqualified or determined to be ineligible, for whatever reason, will be reported to the BOD, but not to the general USFG membership.

7.0 Awards

In general, awards will be given to cutters scoring 1st, 2nd, and 3rd place in the Novice, Pre-Master, and Masters Class, Masters Division only. Grand Master Division will only receive one award, 1st place. Types of awards and certificates will be determined and published with each competition, with the approval of the BOD.

7.1 Eligibility for Awards: To be considered for awards in a particular class, cutters must meet the following minimum criteria.

7.1.1 Novice - Score 85% or higher in a USFG Novice competition.

7.1.2 Pre-Master - Score 90% or higher in a USFG Pre-Master competition.

7.1.3 Master - Score 90% or higher in a USFG Masters competition.

7.1.4 Grand Master - Score 94% or higher in a USFG Masters competition.

7.1.5 World Class Master - At the sole discretion of the BOD, there may be a World-Class designation for Masters who score 98% or above in regular competition.

8.0 Certification
To be certified in a particular class, cutters must meet the following criteria.

8.1 Novice - Score 80% or higher in a USFG Novice competition.

8.2 Pre-Master - Score 90% or higher in a USFG Pre-Master competition.

8.3 Master - Score 90% or higher in a USFG Masters competition.

8.4 Grand Master - Score 94% or higher in a USFG Masters competition.

8.5 World Master - Special certification, at the discretion of the BOD, may be awarded for scores 98% or higher in a USFG Masters competition.

9.0 Valid Competitions
A valid competition shall have at least three entries per class, or it may be declared "No Competition".

9.1 At the discretion of the Competition Committee and the BOD, any class with less than three entrants may receive one or more awards, depending upon the level of scoring. The award may be a regular (1st or 2nd) or special recognition award.

10.0 Special Cases and Ties
In the case of ties, all cutters with the same score will receive the same award. In a valid competition the top three qualifying scores will receive awards, i.e., 1st, 2nd, and 3rd. In the unlikely event of a tie, and in the spirit of fair competition, all scores resulting in ties will receive multiple awards, as needed.

10.1 If a low number of entries are received (even if only one entry), and the cutter's score is high enough, the Competition Committee may consider giving a special award. Awards may include a certificate, medallion, or trophy. To clarify the last statement, the cutter does not have to score above the minimum. This is at the discretion of the competition committee. It would encourage the high standard competitor, who went to the trouble of entering, even if no-one else or very few did. This special award is not regarded as first place and does not prevent the entrant's eligibility to enter the same class again provided the score merits this decision.

11.0 Pre-Judging

The practice of having outside expertise evaluate the condition of a stone during the cutting process is strictly forbidden in USFG faceting competitions. The cutting of a stone and the competition quality achieved during the cutting must solely depend on the skills of the cutter. If it becomes known that any cutter has had the quality of a stone evaluated by other cutters during or at the end of cutting, that stone would be automatically disqualified from the competition. If such knowledge becomes available after competition results have been finalized, any awards or other recognition will be declared null and void.

12.0 Protest

If protest should arise the written rules shall prevail, if for some reason the protest is not addressed in the judging rules, the judge shall explain his reasoning to the person making the complaint. If the cutter is not satisfied, the competition committee will review the complaint, if the cutter is still not satisfied, the BOD will have the final say in the mitigation of all disputes. There will be a two-week time limit starting from the time the cutter receives his stone and judging sheet for a formal protest to be filed. After a cutter receives their stone back, they must wait three (3) days to file and they have fifteen (15) days thereafter to file a protest.

13.0

<<Reserved for future use>>

15.0 Judging Criteria - Judging Rules with Explanations.

15.1 Scratches: Each facet shall be absent of scratches including the finest of cat hairs. Inclusions or fractures that surface and look like scratches will be judged under this feature.

15.2 Pitting: Each facet shall be absent of pits. The tiniest inclusions and fractures that surface and look like pits will be judged under this feature. Foreign matter on the surface that will not wipe off will be judged as an error. Flaws, fractures, cleavages, partings, and inclusions that surface will be judged under category 1 or 2 on the score sheet if they surface.

15.3 Grooved facets: Facets that show grooving in the polish when held just between shadow and shine. Herringbone effect in Quartz can sometimes show up in the polish in the same manner. Both features will be judged in this category.

15.4 Flat facet and sharp edges: Facet surface true - This refers to the flatness of facets or unevenness of curved facets. Unintentional facets and ghost facets will be penalized under this feature. Facet edges sharp - The junction between facets should be knife-edge. Both of these features will be judged under category 4 on the score sheet. Chipped edges will be judged under the category for chips, not under this feature.

15.5 Facet uniform: Refers to consistency in shape and size of facets in the same series. Facets also have to have consistency with the pattern.

15.6 Meet points: A point where 4 or more facets culminate in a perfect point with no facet over cut and/or no facet under cut.

15.7 Chips: Areas where pieces of material have been chipped off unintentionally. They usually occur along facet edges, at corners, and/or culets.

15.8 Girdle uniform: Facets in the same series around a faceted girdle shall be the same shape and dimensions. Girdle facets shall be an exact replica of the girdle on the pattern.

15.9 L/W ratio: The length to width ratio will be on the design and score sheets. A variance of 0.1 mm +/- will be allowed without deduction. If out, a 3 point 100% error will result.

15.10 Stone width: The competition committee will set the stone width. There will be an allowable margin of 0.1 mm more or less than the stone width set by the committee. The Committee will designate stone widths between 6 mm and 15 mm. If out, a 3 point 100% error will result.

15.11 Girdle thickness: Girdle thickness shall be 0.3 mm +/- 0.1 mm. If the pattern has a scalloped girdle, the thin part of the scallop should not be less than 0.2 mm or greater than 0.4 mm. If out, a 3 point 100% error will result.

14.0 Terms and Definitions

14.1 Angle - The angle of a facet to the plane normal to the axis of the stone. Angles will generally be expressed in positive degrees. The minimum angle shall be 0 (perpendicular to the axis of the stone, the maximum angle of a facet shall be 90 (parallel to the axis of the stone).

14.2 Axis of stone - The line passing through the center of the outline shape when viewed from above the stone and perpendicular to the girdle plane and table.

14.3 BOD - Board of Directors for the United States Faceters Guild.

14.4 Crown - Where a girdle plane exists, the crown is that part of the stone above the girdle plane, i.e., top of the stone. The crown will be clearly marked on the Pattern Sheet.

14.5 Competition Committee - A committee formed to organize, supervise, and facilitate the faceting competitions of the USFG. The Committee shall be composed of a minimum of two people. Two of the members will serve as Co-Chairmen (he or she) with equal standing and rank within the USFG. At least one of the Competition Chairmen shall be a USFG Certified Master Cutter. The competition Co Chairmen may, or may not, be current members of the BOD. As a minimum the Co-Chairmen shall hold the status of Advisory Members to the BOD. The Competition Committee shall be responsible for the organization and implementation of all USFG stone cutting competitions. The BOD shall select the members of the competition committee from the general membership of the USFG. The BOD shall have oversight responsibilities over the activities of the Competition Committee.

14.6 Curved surface - A facet that has been deliberately curved in one or more directions. A continuous curved girdle is judged as one facet, polished or unpolished.

14.7 Culet - The point or line which the pavilion facets meet at the lowest angle(s).

14.8 Culet facet - A small facet parallel to the girdle plane, which cuts off the culet main facets and thus eliminates the culet. To explain further, in modern faceting you will probably never see a true culet facet unless you cut replicas. There are many theories on the use of cutting a flat on the bottom of a stone, maximize final cut weight, another may be to protect the culet from chipping as this point is generally the most vulnerable to damage.

14.9 Culet main facets - Those pavilion facets which share the lowest angle(s), to the girdle plane.

14.10 Cutlet meet - Sometime called the pavilion tip.

14.11 Chips - Areas where pieces of material have been chipped off unintentionally. They usually occur along facet edges, at corners, and/or culets. In USFG competitions this feature shall be assigned one quarter (1/4) pattern point per edge. If the feature is "out" a one (1) point error shall be placed in the 5%, 50%, or 100% columns.

14.12 Cutter(s) - The word cutter(s) is used universally in this text to refer to persons (he or she) who practice the art of faceting stones, i.e., Faceters. Cutter(s) will also refer to persons entering USFG faceting competitions.

14.13 Dimensions - For USFG competitions, all dimensions shall be expressed in millimeters.

14.14 Disqualified - Errors resulting in gross deviations from the competition rules for a particular class, i.e., wrong pattern cut, missing facet tiers, wrong lapidary material cut, etc. The stone will be set aside and no further judging will take place. The judge will provide written explanation for the disqualification. The entrant will forfeit any and all entrance fees. The stone and judging sheets will be returned to the cutter.

14.15 Extra Facets - Facets not defined on the pattern sheet. In general, extra facets are cut by miss-indexing. Keeping with the spirit of competition, at the Novice level a Judge may choose to allow extra facets, with full deduction. At the judges discretion a stone may be declared ineligible or disqualified if the number is excessive or not representative of the class of competition.

14.16 Errors – Any defect in the finished stone. In USFG competitions errors are weighted depending upon the visual severity of that error in the following manner.
That is as follows:
"A" - 5% off if the error is barely visible with a 10X loupe.
"B" - 50% off-if the error is easily seen with the 10 X loupe.
"C" - 100% off if the error is way out and detection with the 10 X loupe shows it to be way out or may even be seen with the naked eye.

14.17 Facet - A deliberate flat or curved surface, usually polished.

14.18 Facet edge - The linear junction between two facets.

14.19 Facet Uniform – Refers to the consistency in shape and size of any facet in the same series. Facets also have to have consistency with the pattern and plan view. In USFG competitions this feature shall be assigned one possible pattern point per facet. If the feature is "out" a one (1) point error shall be placed in the 5%, 50%, or 100% columns.

14.20 Flat facet - Facets shall be flat. This refers to the flatness of facet or un-evenness of curved facets. In USFG competitions this feature shall be assigned one possible pattern point per facet. If the feature is "out" a one (1) point error shall be placed in the 5%, 50%, or 100% columns.

14.21 Floating Meet – A meet formed by the junction of three facets. Technically this is a meet, but is not used in judging. By the nature of cutting floating meets, they will always form perfect meets.

14.22 Ghost facet - A ghost facet is formed when a cutter tries to bring facet meet points "in" with the use of a cheater or the use of a micro adjuster. Both are considered a normal process, but by doing so he creates another facet that may be barely perceptible. This is

called a ghost facet and is not considered to be "extra facet" as in the above definition. This will be judged according to the judging criteria else where in this manual.

14.23 Girdle Facets - The narrow band consisting of either a series of facets or a continuous scalloped, curved surface which outlines the girdle plane and is at right angles to it. The girdle MUST be polished.

14.24 Girdle Thickness - The narrowest dimension of the girdle facets. It may also be called the girdle width. Cutters may use any method they wish for establishing this feature. In USFG competitions the girdle thickness (and acceptable tolerance) will be clearly specified on the pattern sheet(s). **Under no circumstances are USFG judges allowed to use magnified scales, optical comparators, or reticules for judging this feature.** It is suggest that judges may measure the girdle thickness by using a comparative technique with a gauge of known thickness or diameter. Suggestions may include using a jeweler's saw blade, precision wire, or plastic film as a reference gauge. In USFG competitions this feature shall be assigned three pattern points. If the feature is "out" a three (3) point error shall placed in the 100% column.

14.25 Girdle Uniform – Facets in the same series around a faceted girdle shall be the same shape and dimension. They shall be an exact replica on the pattern sheet. In practice this error would be seen as a difference in girdle thickness from one side of the stone to the other. It is possible for this error to exist even if all of the girdle meets are cheated in. This type of error generally indicates problems with the transfer. In USFG competitions the total points given this feature shall be three (3). If the feature is "out" a three (3) point error shall be placed in the 5%, 50%, or 100% columns.

14.26 Grooved facets - Facets that show grooving in the polish when held just between shadow and shine. Herringbone effect in Quartz can sometimes show up in the polish in the same manner. In USFG competitions this feature shall be assigned one possible pattern point per facet. If the feature is "out" a one (1) point error shall be placed in the 5%, 50%, or 100% columns.

14.27 In or Out - "In", used to state whether a feature is correct or within tolerance. "Out", used to describe when a feature is outside of tolerance. Examples would be width, L/W, girdle width, meet points, etc.

14.28 Index Gear - The toothed wheel used on faceting machines for setting the circumference angle.

14.29 Index Line- A line whose slope, divided by DPT results in a whole number.

14.30 Index Number - The number of the tooth on the index gear. Teeth are numbered consecutively in whole numbers, starting from the highest number on any gear which is also numbered zero, around the gear.

14.31 Ineligible - Errors resulting in major deviations from published competition rules for the specific class, i.e., width, L/W ratio, girdle width, etc. The stone will be scored but no award given. The judge will mark the score sheet with a detailed explanation for this

decision. The entrant will forfeit any and all entrance fees. The stone and judging sheets will be returned to the cutter.

14.32 Ink Mark - A mark (permanent ink) placed on a stone by the judge to identify the indexing of the stone referenced to the pattern error sheet.

14.33 Judge - Persons selected by the competition committee to judge the various classes of USFG competitions. Judges shall have completed the USFG Judging certification program, or be approved by the BOD. Judges generally work with the assistance of a marker to assist with the recording of errors on the pattern error sheet. Judges are (generally) compensated for their time through the distribution of entry fees. The amount of compensation shall be determined by the Competition Committee and approved by the BOD.

14.34 Judges Comments Sheet - A short note provided by the judge to the cutter, with general comments and observations about the stone. Following the "spirit of friendly competition", the comment sheet is intended to provide cutters with both encouragement and highlight areas for improvement, in a constructive and professional manner. At the pleasure of the judge, comments may be typed or hand written.

14.35 Judges Score Sheet - A formal sheet where errors recorded tabulated, and the final score calculated.

14.36 Lighting – **The method of lighting for judging will be at the judge's pleasure.** A single 40 watt incandescent, non-frosted bulb with a metal shade works well for judging surface blemishes such as scratches, inclusions, or fractures that break the surface, herringbone effect in quartz, pitting and grooved facets, flat facets with sharp edges, and chips. It also works well for checking girdle uniformity, table parallel to the girdle thickness. The judge may want a different kind of lighting for checking meet points. Adjacent facets with a single light source can create the illusion of one facet looking longer than another. A broad light source can help to alleviate this problem. A ring light or fluorescent light can work well. A series of three or more single lights, with a bell shaped metal shade so the light can be directed, also works well.

14.37 Lapidary items - For the purpose of competitions a "lapidary item" is defined as a single item of worked natural or man-made lapidary (stone type) material, or naturally occurring organic material in accordance with the definitions in the following sections of this manual. The Pattern Sheet will clearly state whether natural or Man-made materials are permitted.

14.38 Length - The major width of any stone, generally taken flat to flat, but not always. In all cases the width measurement will be clearly defined on the Pattern Sheet.

14.39 Length to Width ratio (L/W) - The ratio of the major axis over the minor axis, i.e., always greater than one. Often, but not always, the L/W is measured via parallel sets of girdle facets. In some cases though, this may be measured flat to point or point to point. The L/W ratio will always be clearly indicated on the pattern sheet with a corresponding tolerance. In USFG competitions this feature shall be assigned three pattern points. If the feature is "out" a three (3) point error shall be placed in the 100% column.

14.40 Magnification - For judging a 10X hand held or eye loupe will be the only magnification allowed. **No exceptions!** Judges are allowed to use corrective eyewear as needed for normal vision.

14.41 Man-made faceting material - Transparent faceting material(s) that owes its existence to the operations of man. This includes such material as YAG, CZ, Corundum, Spinel, glass etc.

14.42 Man-made lapidary material - Stone type materials that owes its existence to the operations of man. It includes reconstituted natural materials such as Mt. St. Helen Ash, etc.

14.43 Marker - The person assisting the judge with the scoring process.

14.44 Measuring – The only measuring tool allowed in USFG competitions shall be a caliper (vernier, dial, or digital) with suitable repeatability and resolution for measuring features such as Width and L/W. The construction of the caliper jaws may be either plastic or metal. If using calipers with metal jaws it is suggested that the contact faces be may protected with cellophane tape to reduce the risk of chipping stones, then zeroed before measuring stone dimensions. Ideally calipers should be periodically checked for accuracy against a known standard. It is suggest that girdle thickness may be measured using a comparative technique with a gauge of known thickness or diameter. Suggestions may include using a jeweler's saw blade, precision wire, or plastic film as a reference gauge. Under no circumstances is the use of magnified scales, optical comparators, or reticules allowed.

14.45 Meet point - A point where four (4) or more facets culminate in a perfect point with no facet over cut and/or no facet under cut. In USFG competitions this feature shall be assigned one possible pattern point per meet, regardless of the number of facets comprising the meet. If the feature is "out" a one (1) point error shall be placed in the 5%, 50%, or 100% columns.

14.46 Natural faceting material - Transparent material(s) that owes its existence to the forces of nature. It includes natural materials, which may be treated to enhance color, transparency or other features. It does NOT include materials, which would not have been facetable in their natural state before treatment, e.g. Mt. St. Helen Ash, which are regarded as man-made.

14.47 Natural Lapidary Material - Stone type material(s) that has been formed in nature. Natural material, which has been dyed, heat or otherwise treated to change or enhance the color, transparency or other feature, may be used unless specifically stated otherwise for a particular section or in the competition schedule.

14.48 Pattern Sheet - A diagram or a particular pattern or cut, with all necessary information for cutting the design. The pattern sheet will also address specifications and issues regarding length, width, L/W ratio, number of facets, girdle design, tolerances, and specific faceting materials for their respective competition classes. Where possible all pattern sheets will incorporate the use of GemCad for the generation of design parameters. For the sake of readability the pattern sheet may be a set, with the diagram and cutting instructions followed by a list if additional competition parameters.

14.49 Pattern Error Sheet - A sheet used by the judge to permanently record the amount and type of errors a finished stone may have. The Pattern Error sheet (to be returned to the cutter) will also serve as a map to assist the cutter in "seeing what errors the judge found" on a stone submitted for competition. Pattern Error sheets will also include an "ink mark" for referencing the indexing of the stone to the pattern errors.

14.50 Pavilion - Where a girdle plane exists, the pavilion is that part of the stone below the girdle plane. The pavilion will be clearly marked on the pattern sheet.

14.51 Plan view - That arrangement of points and lines that one sees when looking directly down or up the vertical axis, whether it's a real or an imaginary stone portrayed on a diagram. You may change angles using a tangent ratio, but you may NOT add or subtract any facets from the plan view diagram. If the table in the diagram states a 55% table, you may not change that percentage. Competitors may adjust the angles and/or indices of a design's facets in order to make meet points. However, such adjustment must not alter the plan view of the design. Alteration of the plan view means a judge, during the normal process of judging the stone, can detect any alteration in the positioning and/or shape of facets. If such alteration is detected, there will be severe penalties applied to the breaking of this rule, the stone may be ruled ineligible or disqualified. Examples of such may include adding or omitting facets, gross deviation of the original pattern or lay out of facets, cutting the wrong design, etc.

14.52 Pits - Any flaw, fracture, cleavage, parting, or inclusion that surface. Foreign matter on the surface that will not wipe off will be judged as a pit. In USFG competitions this feature shall be assigned one possible pattern point per facet. If the feature is "out" a one (1) point error shall be placed in the 5%, 50%, or 100% columns.

14.53 Scratches - Any mark on a facet surface with a length to width ratio over 10:1. Scratches may include any inclusion, fracture, mark, or groove(s) that surface. The finest of scratches may also be defined with the popular term "cat hair". In USFG competitions this feature shall be assigned one possible pattern point per facet. If the feature is "out" a one (1) point error shall be placed in the 5%, 50%, or 100% columns.

14.54 Sharp edges - The junction between facets should be knife-edge, i.e., edges that do not reflect light.

14.55 Stones - The finished product of faceting, i.e., faceted gemstones.

14.56 Table Parallel to Girdle – Advanced competitions may include a category judging this feature. If a level table is indicated on the pattern sheet, it is accepted that this element may be part of the judging process. This feature is typically judged by visual inspection of the finished stone. In USFG competitions this feature shall be assigned one possible pattern point. If the feature is "out" one (1) point error shall be placed in the 5%, 50%, or 100% columns.

14.57 Tolerances - All critical tolerances used for judging will be specifically stated on the pattern sheets. Ratios without tolerances (such as T/W, C/W, P/W, etc.) will be provided on

the pattern sheets for general reference. A judge may determine a stone to be ineligible or disqualified if, in their opinion, deviations from given ratios result in gross violations of the plan view.

14.58 Width - The minor width of the stone, always measured from flat to flat for rounds, ovals may be point to point. For ovals it is always the minor dimension. In special cases, pentagons or trillants may be flat to opposing point. In all cases the width measurement will be clearly defined on the Pattern Sheet. In USFG competitions this feature shall be assigned three pattern points per facet. If the feature is "out" a three (3) point error will be placed in the 100% column.

14.59 USFG - United States Faceters Guild
<<Insert official address>>

16.0 Additional Judging Notes:
(Reference to judging categories, Pattern Error Sheet)

16.1 Categories 1,2,3, and 4 represent polish.

16.2 The girdle shall be polished and judged under the same categories on the score sheet, "1 through 7" as with all other facets. Two other categories are specifically designated for the girdle alone. They are 8 - "Girdle Uniform" and 11-"Girdle Thickness".

16.3 Scoring in categories 1 through 8 - Errors will be assigned a weighted value of 5%, 50%, or 100% point deduction depending upon the magnitude of the error. A general definition of the weighted value scoring is as follows: 5% off if the error is barely visible with a 10X loupe, 50% off if the error is barely visible with the naked eye but easily seen with a 10X loupe, or 100% when a most serious error is seen with the 10X loupe and/or if the error is easily seen with the naked eye.

16.4 Scoring in categories 9 through 11 - Errors will be automatically assigned a 3 point 100% deduction.

16.5 THE PLAN VIEW: It is an important serious parameter of evaluation in a faceting competition. The definition: "A plan view is that arrangement of points and lines one sees when looking directly down or up the vertical axis, whether it's a real stone or an imaginary stone as portrayed on a diagram." The following are examples of how a cutter may create a change in "plan view" when cutting a competition stone: The most frequent is, deliberately creating a change in the "plan view" when cutting a competition stone-in-jeopardy by employing a severe change of angle or angles that will create a non-design facet or facets -- this comes under the judges prerogative for making the decision, and/or without question, a mishap of inadvertently leaving out a tier of facets. Both crown and pavilion are subject to penalty if the plan view of either one is in error. If the plan view as defined is not followed in the opinion of the judge, then in all cases the stone will be ineligible and the judge will give written reasons on the judging sheet.

16.6 Pre-judging of stones is strictly forbidden. Any indication of pre-judging will automatically – **and without exception** - disqualify the participant from the competition.

16.7 The minimum final score a judge will award is 50 out of 100 possible points.

16.8 Width - Novice - When a size is given, it is always in millimeters. If it is stated that the size is to be a 10 mm round like a standard round brilliant (SRB) then the measurement is taken at the girdle flat to flat. In the Novice class only, you may have a 0.5 mm error either way without penalty. In other words your stone could measure 9.5 to 10.5mm without penalty. If it is outside those parameters the cutter will be assessed three 100% errors. If in the judge's opinion the measurement is so far out he may declare the stone ineligible.

16.9 Width - Intermediate and Masters - Rounds are measured flat to flat and are given .1 of a mm + or, if a stone is to be cut at 10 mm this means at 9.9 or 10.1 you are within the parameters and no errors will be deducted. If at 9.8 to 10.2 one 100% error will be charged; if at 9.7 to l 0.3 two 100%

errors will be deducted, if at 9.6 to 10.4 three 100% errors will be deducted. Any farther error and the stone will become ineligible.

16.10 Now the rules become a little more difficult to understand, because you may not be able to measure flat to flat or at its narrowest for width. This must always be spelled out clearly on the competition-cutting diagram and is the responsibility of the competition committee. Some examples are an oval, the width is always measured from the narrowest width but with the facets being 93-03 and 45-51 the measurement will be point to point. A coffin or kite cut, the width measurement is taken at the high end of the width, regardless it shall be clear on the diagram were the measurement is to be taken. If the diagram states the stone may be cut from 6 mm to 12 mm, in the case of a round that means it could be cut at 5.9 to 12.1 without error, now in this case any more or less and you will Incur a full 300% error and if very severe may bring ineligible or disqualification at the judges discretion. When you have a pattern with a length to width ratio (L/W) it must be within .1mm + or - or you will incur a 300% error. Example using the above parameters of 6 to 12 mm on an oval, it could just as well be a rectangle. Let's say the width of your stone measures 9.4 mm, well within the rules, this particular diagram calls for a L/W of l .33 so 9.4 X 1 .33 = 1 2.5 it could be 1 2.4 to l 2.6 without error, any more or less and it is a 300% error. In the judge's opinion he may make the stone ineligible or disqualify it depending on the severity of the error. Remember that depending on the complexity of the stone and the computation of the "Y" value a 300% error works out to be in most cases less than one point.

16.11 Shapes, other than even sided rounds - For shapes such as pentagons and/or trillants, the minimum measurement between a flat and opposing point shall be used to determine/defined width of the pattern. In all cases the published pattern sheet will have the specific requirements for each stone to be cut.

<<End of Rules>>

Appendix A

Judging Criteria by Ralph Mathewson

Charles Moon and I have tried to develop a judging system that is as fair for the cutter as possible, with as little subjectivity as possible. We also put strong emphasis on making it the best learning experience possible for the cutter. The whole philosophy behind this new system for judging is to consider the evaluation of every possible parameter that is necessary to cut a perfect stone.

Every possible parameter is given a value of one (1) point.

The competition cutter, besides getting a credit of one (1) point for every perfect parameter of cutting, will also receive, in addition, an assessment of each error, according to its closeness to perfection.

That is as follows:
"A" - 5% off if the error is barely visible with a 10X loupe.
"B" - 50% off-if the error is easily seen with the 10 X loupe.
"C" - 100% off if the error is way out and detection with the 10 X loupe shows it to be way out or may' even be seen with the naked eye.

As a result of this system "the competition cutter" will receive entire credit, for what is perfect on his or her stone and at the same time will receive assessment as to how close, and error is to perfection.

Charles Moon thought it would be a good idea if some credit could be given to cutters for cutting more difficult patterns. I agreed with him and the only way to do that would be to come up with a system to determine a difficulty rating for each pattern. We could then work with those rating numbers on a graph or chart to score each error less severely as the pattern difficulty increased. The difficulty of cutting a pattern is based on the number of facets, number of meet points, and number of facet edges, girdle uniform, the length/width ratio, the stone width, and the girdle thickness. Aggregates of these features are what we call "pattern points".

I made a graph to determine a number used as a multiplier to figure the cutters score, which would give some credit for each point lost as the pattern gets more difficult. I have recently made up a mathematical chart that is much quicker to use and somewhat more accurate than the graph. We called this number derived from this chart "the "Y" value. The "Y VALUE" chart gives a "Y" value of 1 for 100 pattern points, and a "Y" value of 7 for 1000 pattern points.

Directly after the pattern or patterns have been chosen for competition, there are 4 papers that need to be printed for each pattern chosen and the last three for each competitor.

1 - The first paper would be the "Pattern Sheet" This would contain all pertinent information the cutter needs to know. This would be published to advertise for participants in the competition.
2 - "Pattern Error Sheet"

3 - "Judges Score sheet".
4 - "Judges Comment Sheet"

Note, 1,2,3, and 4 will be published as an example to be followed later in this text. Also the "Y" value chart.

It is important that the proper codes are printed (immediately) on all sheets just before use for judging each cutter's stone. This includes the pattern error sheet, the score sheet and judges comments.

Pattern error sheet - The pattern on the pattern error sheet should be printed large enough for easy marking, the pattern error sheet is the first paper used by the judge and marker. The errors are transferred from it to the score sheet. The pattern error sheet is the most important feature for the cutter's insight into the areas where improvement can be made. The cutter needs to look at the stone in conjunction with the "pattern error sheet". Much information can be gleaned from this sheet to help the cutter improve workmanship on stones cut in the future.

Stone reference ink mark - I use a wood dowel with a concave end and a piece of DAP Fun Tak or poster putty in the concave end. I pick the stone up with this and put the reference mark on the dowel. This works better than putting it on the stone, especially if you need to clean the stone while judging. When returning the stone to the cutter, I put a permanent ink mark on the girdle of the stone corresponding with the reference mark on the dowel. This allows the cutter to orient the stone to locate the errors.

Three sheets and the judged stone need to be returned to the Co-Chair (as he is called now) or the person in charge of coding the stones.
The three sheets are:
The pattern error sheet
Judges score sheet
Judges comments

Three reasons for competing:
1. Some cutters compete for the honor of winning.
2. Some cutters like to compete against themselves to see how much they can improve.
3. We as hobbyists can do much better workmanship than commercial cutters. We have the time and can develop the skill to do this. The cutter can then truthfully say that stones they cut are better than any that can purchase in a jewelry store. A cutter does need the ability to see well and know how to use faceting equipment well.

OUR SYSTEM
It is totally fair in scoring one cutter's stone from another. It scores each kind of error with equal value. It gives credit for everything the cutter has done right. Each error is scored somewhat less severely as pattern difficulty increases. It takes into appropriate consideration the amount of errors that can destroy the looks of a stone and grades the stone's score accordingly. The "Y" value used as a multiplier is a determining factor in this.

EXAMPLE: A stone with 550 pattern points has a "Y" value of 4. The stone has 40 errors easily seen with the naked eye. SCORE: 70.90909

Although 40 errors may not be a large percent of 550 pattern points, there are enough to hurt the looks of the stone. This score definitely denotes the stone has problems that need to be fixed. If all 40 errors were 5% errors, the score is 98.79272. This is much higher because errors barely visible with a 10X loupe do not detract from the stone's appearance as the errors easily visible with the naked eye.

Our system has a cutoff score of 50. Fifty points are the lowest score a cutter can receive. The cutter should have that much credit for giving it a try.

Thank you for allowing me to present this judging system.

"Y" Value Chart

Pattern Points	"Y" Value	Pattern Points	"Y" Value	Pattern Points	"Y" Value
380	2.867	430	3.200	480	3.533
381	2.873	431	3.207	481	3.540
382	2.880	432	3.213	482	3.547
383	2.887	433	3.220	483	3.553
384	2.893	434	3.227	484	3.560
385	2.900	435	3.233	485	3.567
386	2.907	436	3.240	486	3.573
387	2.913	437	3.247	487	3.580
388	2.920	438	3.253	488	3.587
389	2.927	439	3.260	489	3.593
390	2.933	440	3.267	490	3.600
391	2.940	441	3.273	491	3.607
392	2.947	442	3.280	492	3.613
393	2.953	443	3.287	493	3.620
394	2.960	444	3.293	494	3.627
395	2.967	445	3.300	495	3.633
396	2.973	446	3.307	496	3.640
397	2.980	447	3.313	497	3.647
398	2.987	**448**	**3.320**	498	3.653
399	2.993	449	3.327	499	3.660
400	3.000	450	3.333	500	3.667
401	3.007	451	3.340	501	3.673
402	3.013	452	3.347	502	3.680
403	3.020	453	3.353	503	3.687
404	3.027	454	3.360	504	3.693
405	3.033	455	3.367	505	3.700
406	3.040	456	3.373	506	3.707
407	3.047	457	3.380	507	3.713
408	3.053	458	3.387	508	3.720
409	3.060	459	3.393	509	3.727
410	3.067	460	3.400	510	3.733
411	3.073	461	3.407	511	3.740
412	3.080	462	3.413	512	3.747
413	3.087	463	3.420	513	3.753
414	3.093	464	3.427	514	3.760
415	3.100	465	3.433	515	3.767
416	3.107	466	3.440	516	3.773
417	3.113	467	3.447	517	3.780
418	3.120	468	3.453	518	3.787
419	3.127	469	3.460	519	3.793
420	3.133	470	3.467	520	3.800
421	3.140	471	3.473	521	3.807
422	3.147	472	3.480	522	3.813
423	3.153	473	3.487	523	3.820
424	3.160	474	3.493	524	3.827
425	3.167	475	3.500	525	3.833
426	3.173	476	3.507	526	3.840
427	3.180	477	3.513	527	3.847
428	3.187	478	3.520	528	3.853
429	3.193	479	3.527	529	3.860

Appendix B

Pattern Sheet & Pattern Error Sheet

"A" Information on the Score Sheet NOT HIGHLIGHTED, would be on all score sheets, regardless of what pattern is chosen.

"B" Information highlighted in yellow is added when the pattern is chosen. Both "A" AND "B" should be done by the competition committee as soon as the pattern is picked so the score sheets are ready for the judge to use.

"C" Information highlighted in pink is the judge's responsibility. After each stone is judged, errors are transferred from the pattern error sheet to sub column A, B, C under column 4 on the score sheet. The score is then calculated as shown on the score sheet in columns 5, 6, and 7.

Pattern Points

The number of facets in the stone pattern is placed in each of the first 5 categories in column 3 pattern points. This includes the facets on the girdle. This pattern has 73 facets.

Category 6 Meet points: Place the number of meet points in column 3. There are 41 meet points in this pattern.

Category 7 Chips: Place ¼ or 0.25 the number of facet edges in column 3.

Categories 8 through 11: Place a 3 in column 3 for each.

Add the numbers in column 3. This is the total pattern points for the pattern chosen.
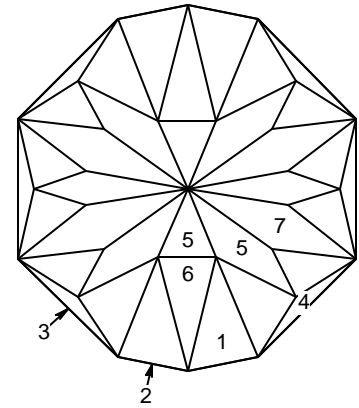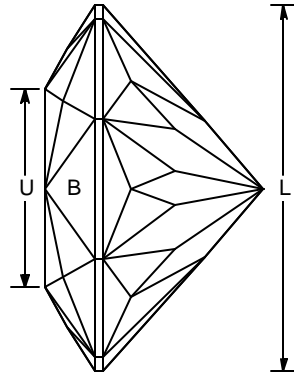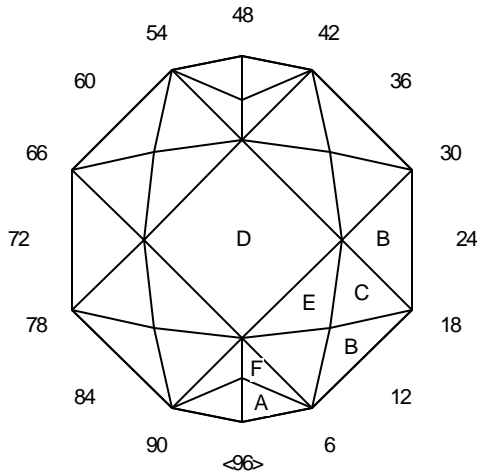
USFG 2002 Pre-Master Single Stone Competition

Designer - no author
Angles for R.I. = 1.770
63 + 10 girdles = 73 facets
2-fold, mirror-image symmetry
96 index
L/W = 1.082 T/W = 0.586 U/W = 0.586
P/W = 0.476 C/W = 0.145
Vol./W³ = 0.240
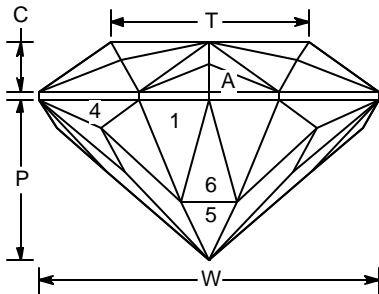
PAVILION

1	43.50°	03-09-15-21-27-33-39-45-51-57-63-69-75-81-87-93	Tempory Centerpoint
2	90.00°	03-45-51-93	Level Girdle, Size, Length, CAM
3	90.00°	12-24-36-60-72-84	CAM across 2 facets
4	60.00°	12-24-36-60-72-84	Level Girdle
5	41.00°	96-12-24-36-48-60-72-84	New PCP; MP 1-4-1 @ 12,24,36,60,72,84
6	41.52°	96-48	Girdle MP; MP 1-1-5-5
7	41.33°	18-30-66-78	Girdle MP and PCP

CROWN

A	32.00°	03-45-51-93	Level Girdle
B	35.00°	12-24-36-60-72-84	Level Girdle
C	27.13°	08-16-32-40-56-64-80-88	Girdle MP
D	0.00°	Table	MP C-B-C
E	17.85°	12-36-60-84	MP D-C-B and C-B-C
F	29.75°	04-44-52-92	Girdle MP and C-E-D
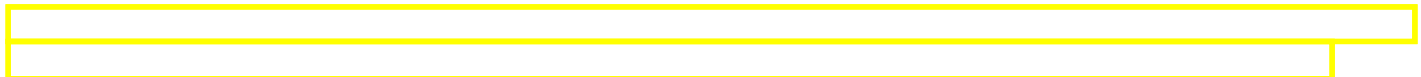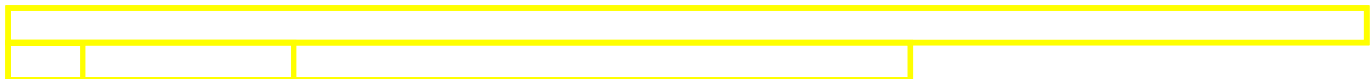
USFG Pattern Error Sheet
Single Stone Competition
Year 2002

L/W = 1.082

Gridle should be polished and judged
under the same categories (1 through 7)
as all other facets, along with category
8 (Girdle Uniform) & 11 (Girdle Uniform)

Girdle displayed around
Crown for easy marking.

Column 1	Column 2
Categories 1,2,3,4 & 7 represent polish.	Signs
1. Scratch or inclusion(s) that come to surface.	/
2. Pitting or Inclusion that surface and look like pits and foreign matter on surface that will not wipe off.	F or ∴
3. Grooved facet or herring bone effect in quartz.	g or h
4. Flat facet & sharp edges.	⊘
5. Facets Uniform.	⊕
6. Meet Points.	◯
7. Chips.	△
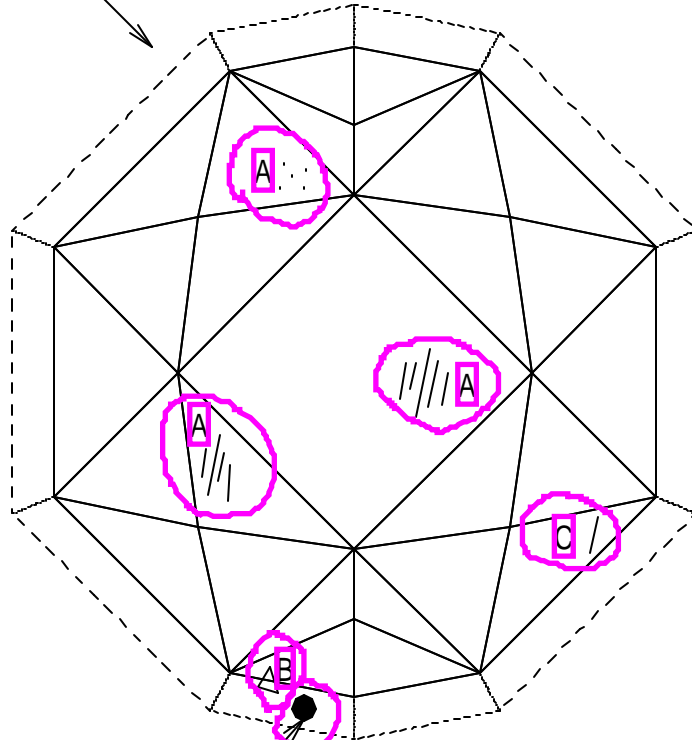
Short form of column 1 and 4 from Score Sheet	5%	50%	100%
	A	B	C
8. Girdle uniform, if not 3 errors will be placed in the 5%, 50%, or 100% column.	3		
9. Length / Width Ratio 0.1 mm +/- will be considered in. A 3 point error is taken if it is more or less L/W = 1.082	//////	//////	
10. Stone Width To be from 8.0 mm to 11.0 mm +/- 0.1 mm, A 3 point error 100% error is taken if it is more or less.	//////	//////	
11. Girdle Thickness 0.3 mm +/- 0.1 mm. more or less will be a 3 point 100% error	//////	//////	
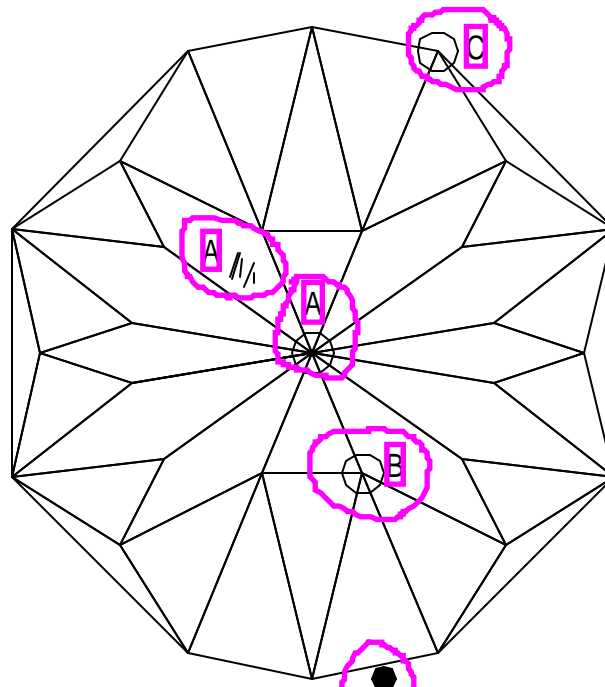
Reference Mark

Reference Mark

USFG Single Stone Competition   Score Sheet - Pre-Master   Name of Cut   No-Name   2002

L/W = 1.82

Y = 3.320

Column 1	Column 2 Signs & Symbols	Column 3 Pattern Points	Column 4A 5% Error	Column 4B 50% Error	Column 4C 100% Error	Column 5 % Adjusted Error, Calculation	Column 6 Cutters Points	Column 7 Cutters Score
Catagories 1,2,3,4,& 7 Represent Polish							Subtract the total number of % adjusted errors from the bottom of column 5, from the total pattern points at the bottom of column 3. This will be the cutters points. Place the number at the bottom of this column.	From the bottom of column 6, divide the cutters points from the bottom of column 3. Move the decimal point two places to the right. This will be the cutters score. Place the number at the column.
1. Scratch or inclusion that comes to surface.	/	73	3		1	0.05 x "Y" x "Number of Total Errors in Column 4A" = 5A		
2. Pitting or inclusion that surface and look like pits and/or foreign matter on surface that will not	F or	73	1			Y = 3.320 4A = 8 5A = 1.328		
3. Grooved facet or herring bone effect in quartz.	g or h	73				0.5 x "Y" x 'Number of Total Errors in Column 4B" = 5B		
4. Flat Facet and sharp edges.	⊘	73				Y = 3.320		
5. Facets Uniform.	⊕	73				4B = 2		
6. Meet Points.	○	41	1	1		5B = 3.320		
7. Chips.	△	30		1	1	1.0 x "Y" x "Number of Total Errors in Column 4C" = 5C		
8. Girdle Uniform.	3	3	3			Y = 3.320		
9. Length to width ratio: 0.1mm +/- will be considered in. If out it will be a 3 point 100% error. L/W = 1.082	3	3				4C = 2		
10. Stone width to be: 8.0 mm to 11.0 mm +/- 0.1 mm. If out it will be a 3 point 100% error.	3	3				5C = 6.640		
11. Girdle thickness: To be 0.3 mm +/- 0.1 mm. If out it will be a 3 point 100% error.	3	3				Add 5A & 5B & 5C from the above "% Adjusted Errors" Next write the sum at the bottom of this column. This will be the Total % Adjusted Errors		
Totals	NA	448.00	8	2	2	11.2880	436.7120	97.4804

Judges Signature / Date   John Doe   Cutter's Code   PM7   Judges Comments Next Page

Judges Comments, Example 1.

USFG
Single Stone Competition

Judges Comments:

Cutter Code: N7

This is a nicely cut stone. The polish for the most part is excellent, with one exception, a scratch that shows up when you look at it without a loupe and three facets you can barley see scratched with a 10X loupe when the stone is turned just to the right of the light. Just a little more polish would have cleaned it up.

There are no grooved facets.

The facets are uniform.

There are three meet points out, one of which you can see on the girdle without a loupe, one you almost need a loupe to see it and the culet has two facets that are barley short of meet points using a 10X loupe. It is not bad though.

The rest of the stone is perfect except the girdle has one facet that is slightly wedge shaped next to the one meet point that is out.

Overall it is very nicely cut.

Good job!

John Q. Vaxy

September 6, 2002

Note; The judges comment sheet may be types or handwritten at the judge's discretion.
A blank "fill in" template will be provided to all judges.

Appendix C

FINDING THE "Y" VALUE OF THE EXAMPLE PATTERN:

This pattern has 448 pattern points.

The chart has a total of 8 pages with 3 columns of pattern points with the adjacent "Y" value for each. It goes from 80 pattern points through 1386 pattern points with adjacent "Y" values.

Below is page 3 of the chart with the pattern points of this pattern and adjacent "Y" value highlighted in yellow. THIS "Y" VALUE OF 3.32 is TRANSFERRED TO the SCORE sheet, columns 4 and 5.

FINDING the "Y" VALUE OF THE EXAMPLE PATTERN: This pattern has 448 pattern points.

The chart has a total of 8 pages with 3 columns of pattern points with the adjacent "Y" value for each. It goes from 80 pattern points through 1386 pattern points with adjacent "Y" values.

Below is page 3 of the chart with the pattern points of this pattern and adjacent "Y" value highlighted in yellow. THIS "Y" VALUE of 3.32 IS TRANSFERRED TO the SCORE SHEET, columns 4 and 5.

Appendix D

The "Y" value defined and its uses.

In an effort to streamline the process of finding the "Y" the following mathematical definition is provided.

The concept of using a "Y" value is to adjust the penalty assessed for errors as the difficulty of the cut increases. By doing so the playing field is leveled between the various competition classes as the difficulty of the pattern increases.

Ralph Mathewson originally defined the "Y" vs Total Pattern Points (TPP) as a graphical data set with the following points defined.

TPP = 0, Y = 0
TPP = 100, Y = 1
TPP = 1000, Y = 7

The "Y" value vs total pattern point may be mathematically represented by a simple linear relationship, changing slope at 100 Total Pattern Points. By using simple linear formulas for straight lines, we can easily describe each of the two lines using the common formula $y = mx + b$. In our case a conditional statement is used to address the change in slope at 100 total pattern points.

"Y" Value Calculation - The "Y" value can be easily calculated from the Total Pattern Points (TPP) using this simple algorithm.

If the TPP is less that 100, then
$Y = TPP / 100$

If the TTP is equal to or greater than 100, then
$Y = (TPP / 150) + (1/3)$

Alternately the second equation may be simplified.
$Y = (TPP + 50) / 150$

Example 1.
If the TTP is 87 find the "Y" value.

$Y = 87 / 100$
$Y = .87$

Example 2.

If the TTP is 448 find the "Y" value.

$Y = (448 + 50) / 150$
$Y = 498 / 150$
$Y = 3.32$

In practice the "Y" value is used in the following manner.

The stone is judged; errors are evaluated, and assigned a level severity, i.e., A (5%) error, B (50%) error, or C (100%) error. Respectively the errors are totaled. The "Y" factor is applied to each sub-total.

Example 3.

Total pattern points = 448
$Y = 3.32$
Total A (5%) errors = 8
Total B (50%) errors = 2
Total C (100%) errors = 2

Basic Formula used on the pattern score sheet.
Adjusted % error = (5%, 50%, or 100%) "Severity of error" x "Y" x sub-total of (A, B, or C) errors.

"A-errors" 0.05 x 3.32 x 8 = 1.328
"B-errors" 0.50 x 3.32 x 2 = 3.32
"C-errors" 1.00 x 3.32 x 2 = 6.640

The adjusted sub-totals are then summed.
1.328 + 3.320 + 6.640 = 11.288

The result is then subtracted from the Total Pattern Point for the cut.
448 - 11.288 = 436.712

The cutters final score is figured as a percentage of the total possible pattern points.
(436.712 / 448) x 100% = 97.48035

Typically the score would be rounded and reported to the third significant decimal place. For the case of splitting final scores between cutters, significant figures would be used as necessary to determine ranking.

Additional Analysis of the "Y" factor.
Alternately by changing the Total Pattern Points to 200 or 1000, with the same number and level of errors as the previous example, it can be shown what final scores would equal.

TPP = 200, final score = 97.16666
TPP = 448, final score = 97.48035
TPP = 1000, final score = 97.62000

By using this system it can be seen that the levels of competitions (within a particular class) are fairly equal with respect to total final scores. Alternately as the number of Total Pattern Points increase, so does the level of competition. In each case, cutters are evaluated fairly within their respective classes, i.e., cutters are not over penalized because a stone may have a low number of possible Pattern Points.

Appendix E - Original "Y" Value Chart

"Y" Value Chart

Pattern Points	"Y" Value	Pattern Points	"Y" Value	Pattern Points	"Y" Value
80	0.800	130	1.200	180	1.533
81	0.810	131	1.207	181	1.540
82	0.820	132	1.213	182	1.547
83	0.830	133	1.220	183	1.553
84	0.840	134	1.227	184	1.560
85	0.850	135	1.233	185	1.567
86	0.860	136	1.240	186	1.573
87	0.870	137	1.247	187	1.580
88	0.880	138	1.253	188	1.587
89	0.890	139	1.260	189	1.593
90	0.900	140	1.267	190	1.600
91	0.910	141	1.273	191	1.607
92	0.920	142	1.280	192	1.613
93	0.930	143	1.287	193	1.620
94	0.940	144	1.293	194	1.627
95	0.950	145	1.300	195	1.633
96	0.960	146	1.307	196	1.640
97	0.970	147	1.313	197	1.647
98	0.980	148	1.320	198	1.653
99	0.990	149	1.327	199	1.660
100	1.000	150	1.333	200	1.667
101	1.007	151	1.340	201	1.673
102	1.013	152	1.347	202	1.680
103	1.020	153	1.353	203	1.687
104	1.027	154	1.360	204	1.693
105	1.033	155	1.367	205	1.700
106	1.040	156	1.373	206	1.707
107	1.047	157	1.380	207	1.713
108	1.053	158	1.387	208	1.720
109	1.060	159	1.393	209	1.727
110	1.067	160	1.400	210	1.733
111	1.073	161	1.407	211	1.740
112	1.080	162	1.413	212	1.747
113	1.087	163	1.420	213	1.753
114	1.093	164	1.427	214	1.760
115	1.100	165	1.433	215	1.767
116	1.107	166	1.440	216	1.773
117	1.113	167	1.447	217	1.780
118	1.120	168	1.453	218	1.787
119	1.127	169	1.460	219	1.793
120	1.133	170	1.467	220	1.800
121	1.140	171	1.473	221	1.807
122	1.147	172	1.480	222	1.813
123	1.153	173	1.487	223	1.820
124	1.160	174	1.493	224	1.827
125	1.167	175	1.500	225	1.833
126	1.173	176	1.507	226	1.840
127	1.180	177	1.513	227	1.847
128	1.187	178	1.520	228	1.853
129	1.193	179	1.527	229	1.860

"Y" Value Chart

Pattern Points	"Y" Value	Pattern Points	"Y" Value	Pattern Points	"Y" Value
230	1.867	280	2.200	330	2.533
231	1.873	281	2.207	331	2.540
232	1.880	282	2.213	332	2.547
233	1.887	283	2.220	333	2.553
234	1.893	284	2.227	334	2.560
235	1.900	285	2.233	335	2.567
236	1.907	286	2.240	336	2.573
237	1.913	287	2.247	337	2.580
238	1.920	288	2.253	338	2.587
239	1.927	289	2.260	339	2.593
240	1.933	290	2.267	340	2.600
241	1.940	291	2.273	341	2.607
242	1.947	292	2.280	342	2.613
243	1.953	293	2.287	343	2.620
244	1.960	294	2.293	344	2.627
245	1.967	295	2.300	345	2.633
246	1.973	296	2.307	346	2.640
247	1.980	297	2.313	347	2.647
248	1.987	298	2.320	348	2.653
249	1.993	299	2.327	349	2.660
250	2.000	300	2.333	350	2.667
251	2.007	301	2.340	351	2.673
252	2.013	302	2.347	352	2.680
253	2.020	303	2.353	353	2.687
254	2.027	304	2.360	354	2.693
255	2.033	305	2.367	355	2.700
256	2.040	306	2.373	356	2.707
257	2.047	307	2.380	357	2.713
258	2.053	308	2.387	358	2.720
259	2.060	309	2.393	359	2.727
260	2.067	310	2.400	360	2.733
261	2.073	311	2.407	361	2.740
262	2.080	312	2.413	362	2.747
263	2.087	313	2.420	363	2.753
264	2.093	314	2.427	364	2.760
265	2.100	315	2.433	365	2.767
266	2.107	316	2.440	366	2.773
267	2.113	317	2.447	367	2.780
268	2.120	318	2.453	368	2.787
269	2.127	319	2.460	369	2.793
270	2.133	320	2.467	370	2.800
271	2.140	321	2.473	371	2.807
272	2.147	322	2.480	372	2.813
273	2.153	323	2.487	373	2.820
274	2.160	324	2.493	374	2.827
275	2.167	325	2.500	375	2.833
276	2.173	326	2.507	376	2.840
277	2.180	327	2.513	377	2.847
278	2.187	328	2.520	378	2.853
279	2.193	329	2.527	379	2.860

"Y" Value Chart

Pattern Points	"Y" Value	Pattern Points	"Y" Value	Pattern Points	"Y" Value
380	2.867	430	3.200	480	3.533
381	2.873	431	3.207	481	3.540
382	2.880	432	3.213	482	3.547
383	2.887	433	3.220	483	3.553
384	2.893	434	3.227	484	3.560
385	2.900	435	3.233	485	3.567
386	2.907	436	3.240	486	3.573
387	2.913	437	3.247	487	3.580
388	2.920	438	3.253	488	3.587
389	2.927	439	3.260	489	3.593
390	2.933	440	3.267	490	3.600
391	2.940	441	3.273	491	3.607
392	2.947	442	3.280	492	3.613
393	2.953	443	3.287	493	3.620
394	2.960	444	3.293	494	3.627
395	2.967	445	3.300	495	3.633
396	2.973	446	3.307	496	3.640
397	2.980	447	3.313	497	3.647
398	2.987	448	3.320	498	3.653
399	2.993	449	3.327	499	3.660
400	3.000	450	3.333	500	3.667
401	3.007	451	3.340	501	3.673
402	3.013	452	3.347	502	3.680
403	3.020	453	3.353	503	3.687
404	3.027	454	3.360	504	3.693
405	3.033	455	3.367	505	3.700
406	3.040	456	3.373	506	3.707
407	3.047	457	3.380	507	3.713
408	3.053	458	3.387	508	3.720
409	3.060	459	3.393	509	3.727
410	3.067	460	3.400	510	3.733
411	3.073	461	3.407	511	3.740
412	3.080	462	3.413	512	3.747
413	3.087	463	3.420	513	3.753
414	3.093	464	3.427	514	3.760
415	3.100	465	3.433	515	3.767
416	3.107	466	3.440	516	3.773
417	3.113	467	3.447	517	3.780
418	3.120	468	3.453	518	3.787
419	3.127	469	3.460	519	3.793
420	3.133	470	3.467	520	3.800
421	3.140	471	3.473	521	3.807
422	3.147	472	3.480	522	3.813
423	3.153	473	3.487	523	3.820
424	3.160	474	3.493	524	3.827
425	3.167	475	3.500	525	3.833
426	3.173	476	3.507	526	3.840
427	3.180	477	3.513	527	3.847
428	3.187	478	3.520	528	3.853
429	3.193	479	3.527	529	3.860

"Y" Value Chart

Pattern Points	"Y" Value	Pattern Points	"Y" Value	Pattern Points	"Y" Value
530	3.867	580	4.200	630	4.533
531	3.873	581	4.207	631	4.540
532	3.880	582	4.213	632	4.547
533	3.887	583	4.220	633	4.553
534	3.893	584	4.227	634	4.560
535	3.900	585	4.233	635	4.567
536	3.907	586	4.240	636	4.573
537	3.913	587	4.247	637	4.580
538	3.920	588	4.253	638	4.587
539	3.927	589	4.260	639	4.593
540	3.933	590	4.267	640	4.600
541	3.940	591	4.273	641	4.607
542	3.947	592	4.280	642	4.613
543	3.953	593	4.287	643	4.620
544	3.960	594	4.293	644	4.627
545	3.967	595	4.300	645	4.633
546	3.973	596	4.307	646	4.640
547	3.980	597	4.313	647	4.647
548	3.987	598	4.320	648	4.653
549	3.993	599	4.327	649	4.660
550	4.000	600	4.333	650	4.667
551	4.007	601	4.340	651	4.673
552	4.013	602	4.347	652	4.680
553	4.020	603	4.353	653	4.687
554	4.027	604	4.360	654	4.693
555	4.033	605	4.367	655	4.700
556	4.040	606	4.373	656	4.707
557	4.047	607	4.380	657	4.713
558	4.053	608	4.387	658	4.720
559	4.060	609	4.393	659	4.727
560	4.067	610	4.400	660	4.733
561	4.073	611	4.407	661	4.740
562	4.080	612	4.413	662	4.747
563	4.087	613	4.420	663	4.753
564	4.093	614	4.427	664	4.760
565	4.100	615	4.433	665	4.767
566	4.107	616	4.440	666	4.773
567	4.113	617	4.447	667	4.780
568	4.120	618	4.453	668	4.787
569	4.127	619	4.460	669	4.793
570	4.133	620	4.467	670	4.800
571	4.140	621	4.473	671	4.807
572	4.147	622	4.480	672	4.813
573	4.153	623	4.487	673	4.820
574	4.160	624	4.493	674	4.827
575	4.167	625	4.500	675	4.833
576	4.173	626	4.507	676	4.840
577	4.180	627	4.513	677	4.847
578	4.187	628	4.520	678	4.853
579	4.193	629	4.527	679	4.860

"Y" Value Chart

Pattern Points	"Y" Value	Pattern Points	"Y" Value	Pattern Points	"Y" Value
680	4.867	730	5.200	780	5.533
681	4.873	731	5.207	781	5.540
682	4.880	732	5.213	782	5.547
683	4.887	733	5.220	783	5.553
684	4.893	734	5.227	784	5.560
685	4.900	735	5.233	785	5.567
686	4.907	736	5.240	786	5.573
687	4.913	737	5.247	787	5.580
688	4.920	738	5.253	788	5.587
689	4.927	739	5.260	789	5.593
690	4.933	740	5.267	790	5.600
691	4.940	741	5.273	791	5.607
692	4.947	742	5.280	792	5.613
693	4.953	743	5.287	793	5.620
694	4.960	744	5.293	794	5.627
695	4.967	745	5.300	795	5.633
696	4.973	746	5.307	796	5.640
697	4.980	747	5.313	797	5.647
698	4.987	748	5.320	798	5.653
699	4.993	749	5.327	799	5.660
700	5.000	750	5.333	800	5.667
701	5.007	751	5.340	801	5.673
702	5.013	752	5.347	802	5.680
703	5.020	753	5.353	803	5.687
704	5.027	754	5.360	804	5.693
705	5.033	755	5.367	805	5.700
706	5.040	756	5.373	806	5.707
707	5.047	757	5.380	807	5.713
708	5.053	758	5.387	808	5.720
709	5.060	759	5.393	809	5.727
710	5.067	760	5.400	810	5.733
711	5.073	761	5.407	811	5.740
712	5.080	762	5.413	812	5.747
713	5.087	763	5.420	813	5.753
714	5.093	764	5.427	814	5.760
715	5.100	765	5.433	815	5.767
716	5.107	766	5.440	816	5.773
717	5.113	767	5.447	817	5.780
718	5.120	768	5.453	818	5.787
719	5.127	769	5.460	819	5.793
720	5.133	770	5.467	820	5.800
721	5.140	771	5.473	821	5.807
722	5.147	772	5.480	822	5.813
723	5.153	773	5.487	823	5.820
724	5.160	774	5.493	824	5.827
725	5.167	775	5.500	825	5.833
726	5.173	776	5.507	826	5.840
727	5.180	777	5.513	827	5.847
728	5.187	778	5.520	828	5.853
729	5.193	779	5.527	829	5.860

"Y" Value Chart

Pattern Points	"Y" Value	Pattern Points	"Y" Value	Pattern Points	"Y" Value
830	5.867	880	6.200	930	6.533
831	5.873	881	6.207	931	6.540
832	5.880	882	6.213	932	6.547
833	5.887	883	6.220	933	6.553
834	5.893	884	6.227	934	6.560
835	5.900	885	6.233	935	6.567
836	5.907	886	6.240	936	6.573
837	5.913	887	6.247	937	6.580
838	5.920	888	6.253	938	6.587
839	5.927	889	6.260	939	6.593
840	5.933	890	6.267	940	6.600
841	5.940	891	6.273	941	6.607
842	5.947	892	6.280	942	6.613
843	5.953	893	6.287	943	6.620
844	5.960	894	6.293	944	6.627
845	5.967	895	6.300	945	6.633
846	5.973	896	6.307	946	6.640
847	5.980	897	6.313	947	6.647
848	5.987	898	6.320	948	6.653
849	5.993	899	6.327	949	6.660
850	6.000	900	6.333	950	6.667
851	6.007	901	6.340	951	6.673
852	6.013	902	6.347	952	6.680
853	6.020	903	6.353	953	6.687
854	6.027	904	6.360	954	6.693
855	6.033	905	6.367	955	6.700
856	6.040	906	6.373	956	6.707
857	6.047	907	6.380	957	6.713
858	6.053	908	6.387	958	6.720
859	6.060	909	6.393	959	6.727
860	6.067	910	6.400	960	6.733
861	6.073	911	6.407	961	6.740
862	6.080	912	6.413	962	6.747
863	6.087	913	6.420	963	6.753
864	6.093	914	6.427	964	6.760
865	6.100	915	6.433	965	6.767
866	6.107	916	6.440	966	6.773
867	6.113	917	6.447	967	6.780
868	6.120	918	6.453	968	6.787
869	6.127	919	6.460	969	6.793
870	6.133	920	6.467	970	6.800
871	6.140	921	6.473	971	6.807
872	6.147	922	6.480	972	6.813
873	6.153	923	6.487	973	6.820
874	6.160	924	6.493	974	6.827
875	6.167	925	6.500	975	6.833
876	6.173	926	6.507	976	6.840
877	6.180	927	6.513	977	6.847
878	6.187	928	6.520	978	6.853
879	6.193	929	6.527	979	6.860

"Y" Value Chart

Pattern Points	"Y" Value	Pattern Points	"Y" Value	Pattern Points	"Y" Value
980	6.867	1030	7.200	1080	7.533
981	6.873	1031	7.207	1081	7.540
982	6.880	1032	7.213	1082	7.547
983	6.887	1033	7.220	1083	7.553
984	6.893	1034	7.227	1084	7.560
985	6.900	1035	7.233	1085	7.567
986	6.907	1036	7.240	1086	7.573
987	6.913	1037	7.247	1087	7.580
988	6.920	1038	7.253	1088	7.587
989	6.927	1039	7.260	1089	7.593
990	6.933	1040	7.267	1090	7.600
991	6.940	1041	7.273	1091	7.607
992	6.947	1042	7.280	1092	7.613
993	6.953	1043	7.287	1093	7.620
994	6.960	1044	7.293	1094	7.627
995	6.967	1045	7.300	1095	7.633
996	6.973	1046	7.307	1096	7.640
997	6.980	1047	7.313	1097	7.647
998	6.987	1048	7.320	1098	7.653
999	6.993	1049	7.327	1099	7.660
1000	7.000	1050	7.333	1100	7.667
1001	7.007	1051	7.340	1101	7.673
1002	7.013	1052	7.347	1102	7.680
1003	7.020	1053	7.353	1103	7.687
1004	7.027	1054	7.360	1104	7.693
1005	7.033	1055	7.367	1105	7.700
1006	7.040	1056	7.373	1106	7.707
1007	7.047	1057	7.380	1107	7.713
1008	7.053	1058	7.387	1108	7.720
1009	7.060	1059	7.393	1109	7.727
1010	7.067	1060	7.400	1110	7.733
1011	7.073	1061	7.407	1111	7.740
1012	7.080	1062	7.413	1112	7.747
1013	7.087	1063	7.420	1113	7.753
1014	7.093	1064	7.427	1114	7.760
1015	7.100	1065	7.433	1115	7.767
1016	7.107	1066	7.440	1116	7.773
1017	7.113	1067	7.447	1117	7.780
1018	7.120	1068	7.453	1118	7.787
1019	7.127	1069	7.460	1119	7.793
1020	7.133	1070	7.467	1120	7.800
1021	7.140	1071	7.473	1121	7.807
1022	7.147	1072	7.480	1122	7.813
1023	7.153	1073	7.487	1123	7.820
1024	7.160	1074	7.493	1124	7.827
1025	7.167	1075	7.500	1125	7.833
1026	7.173	1076	7.507	1126	7.840
1027	7.180	1077	7.513	1127	7.847
1028	7.187	1078	7.520	1128	7.853
1029	7.193	1079	7.527	1129	7.860

"Y" Value Chart

Pattern Points	"Y" Value	Pattern Points	"Y" Value	Pattern Points	"Y" Value
1130	7.867	1180	8.200	1230	8.533
1131	7.873	1181	8.207	1231	8.540
1132	7.880	1182	8.213	1232	8.547
1133	7.887	1183	8.220	1233	8.553
1134	7.893	1184	8.227	1234	8.560
1135	7.900	1185	8.233	1235	8.567
1136	7.907	1186	8.240	1236	8.573
1137	7.913	1187	8.247	1237	8.580
1138	7.920	1188	8.253	1238	8.587
1139	7.927	1189	8.260	1239	8.593
1140	7.933	1190	8.267	1240	8.600
1141	7.940	1191	8.273	1241	8.607
1142	7.947	1192	8.280	1242	8.613
1143	7.953	1193	8.287	1243	8.620
1144	7.960	1194	8.293	1244	8.627
1145	7.967	1195	8.300	1245	8.633
1146	7.973	1196	8.307	1246	8.640
1147	7.980	1197	8.313	1247	8.647
1148	7.987	1198	8.320	1248	8.653
1149	7.993	1199	8.327	1249	8.660
1150	8.000	1200	8.333	1250	8.667
1151	8.007	1201	8.340	1251	8.673
1152	8.013	1202	8.347	1252	8.680
1153	8.020	1203	8.353	1253	8.687
1154	8.027	1204	8.360	1254	8.693
1155	8.033	1205	8.367	1255	8.700
1156	8.040	1206	8.373	1256	8.707
1157	8.047	1207	8.380	1257	8.713
1158	8.053	1208	8.387	1258	8.720
1159	8.060	1209	8.393	1259	8.727
1160	8.067	1210	8.400	1260	8.733
1161	8.073	1211	8.407	1261	8.740
1162	8.080	1212	8.413	1262	8.747
1163	8.087	1213	8.420	1263	8.753
1164	8.093	1214	8.427	1264	8.760
1165	8.100	1215	8.433	1265	8.767
1166	8.107	1216	8.440	1266	8.773
1167	8.113	1217	8.447	1267	8.780
1168	8.120	1218	8.453	1268	8.787
1169	8.127	1219	8.460	1269	8.793
1170	8.133	1220	8.467	1270	8.800
1171	8.140	1221	8.473	1271	8.807
1172	8.147	1222	8.480	1272	8.813
1173	8.153	1223	8.487	1273	8.820
1174	8.160	1224	8.493	1274	8.827
1175	8.167	1225	8.500	1275	8.833
1176	8.173	1226	8.507	1276	8.840
1177	8.180	1227	8.513	1277	8.847
1178	8.187	1228	8.520	1278	8.853
1179	8.193	1229	8.527	1279	8.860

"Y" Value Chart

Pattern Points	"Y" Value	Pattern Points	"Y" Value	Pattern Points	"Y" Value
1280	8.867	1330	9.200	1380	9.533
1281	8.873	1331	9.207	1381	9.540
1282	8.880	1332	9.213	1382	9.547
1283	8.887	1333	9.220	1383	9.553
1284	8.893	1334	9.227	1384	9.560
1285	8.900	1335	9.233	1385	9.567
1286	8.907	1336	9.240	1386	9.573
1287	8.913	1337	9.247	1387	9.580
1288	8.920	1338	9.253	1388	9.587
1289	8.927	1339	9.260	1389	9.593
1290	8.933	1340	9.267	1390	9.600
1291	8.940	1341	9.273	1391	9.607
1292	8.947	1342	9.280	1392	9.613
1293	8.953	1343	9.287	1393	9.620
1294	8.960	1344	9.293	1394	9.627
1295	8.967	1345	9.300	1395	9.633
1296	8.973	1346	9.307	1396	9.640
1297	8.980	1347	9.313	1397	9.647
1298	8.987	1348	9.320	1398	9.653
1299	8.993	1349	9.327	1399	9.660
1300	9.000	1350	9.333	1400	9.667
1301	9.007	1351	9.340	1401	9.673
1302	9.013	1352	9.347	1402	9.680
1303	9.020	1353	9.353	1403	9.687
1304	9.027	1354	9.360	1404	9.693
1305	9.033	1355	9.367	1405	9.700
1306	9.040	1356	9.373	1406	9.707
1307	9.047	1357	9.380	1407	9.713
1308	9.053	1358	9.387	1408	9.720
1309	9.060	1359	9.393	1409	9.727
1310	9.067	1360	9.400	1410	9.733
1311	9.073	1361	9.407	1411	9.740
1312	9.080	1362	9.413	1412	9.747
1313	9.087	1363	9.420	1413	9.753
1314	9.093	1364	9.427	1414	9.760
1315	9.100	1365	9.433	1415	9.767
1316	9.107	1366	9.440	1416	9.773
1317	9.113	1367	9.447	1417	9.780
1318	9.120	1368	9.453	1418	9.787
1319	9.127	1369	9.460	1419	9.793
1320	9.133	1370	9.467	1420	9.800
1321	9.140	1371	9.473	1421	9.807
1322	9.147	1372	9.480	1422	9.813
1323	9.153	1373	9.487	1423	9.820
1324	9.160	1374	9.493	1424	9.827
1325	9.167	1375	9.500	1425	9.833
1326	9.173	1376	9.507	1426	9.840
1327	9.180	1377	9.513	1427	9.847
1328	9.187	1378	9.520	1428	9.853
1329	9.193	1379	9.527	1429	9.860