

# Extra Innings Instructions

The following is the manual for **Extra Innings** as presented in 1984 (Fourth Edition). **Extra Innings** was designed by Jack Kavanagh. All copyrighted materials reprinted with permission.

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Thousands and thousands of baseball games have been invented, mostly by young boys wanting a way to experience the fun of the game when they couldn't get out on a field with a team.

They have used dice, decks of cards, pencils for bats and pieces of rubber for balls. They have designed elaborate playing fields or kept the action in their heads.

Almost all of the games designed for self entertainment have simply simulated a regular baseball game. The games which translate actual player's statistics into his expected performance have been few and far between.

**Extra Innings** provides its players all the realism of actual performances but approaches the subject with the plainness of a game played on a kitchen table. You'll find **Extra Innings** easy to learn and play it with the satisfaction of players performing to your expectations.

In the following paragraphs we are going to explain the game to you as if you were sitting across the table from us. We'll tell you how we play the game. We designed it for our own entertainment and think that others will enjoy it the way we do. Still, you shouldn't accept our process on blind faith. Feel free to make any changes you wish. The whole idea is to provide you with a form of entertainment. While **Extra Innings** is "totally" developed and has pleased thousands of table gamers since it was introduced in 1970, each of us has individual ideas we might want to implement. Do it!

Now, to teach you the game. While I would like to take it for granted that anyone wishing to play table baseball knows how to score a game, let's make sure we are all using the same basic techniques. **Extra Innings** is explained, for brevity, by using the standard numbering of positions, used by all who keep boxscores.

These are: Pitcher (1); Catcher (2); First Baseman (3); Second Baseman (4); Third Baseman (5); Shortstop (6); Left Fielder (7); Center Fielder (8); and Right Fielder (9). From here on we'll relate positions to these numbers. Now, let's start learning the game.

The two charts which you will use constantly (until you've memorized them) are the First Roll Chart and the Second Roll Chart. They've been condensed to their numerical expressions for convenience. Incidentally, our own style of playing **Extra Innings** is to tack all the charts onto a composition board and lean it against the wall where we sit at our table. The charts are at eye level and can be consulted at a glance.

**FIRST ROLL CHART.** We believe the terse descriptions are sufficient to let you get started on play without tying you up at this point with our reasons for the designations we have made.

**SECOND ROLL CHART.** After you have made the First Roll of the dice, it either has had no application in the present situation; directly affected the batter (a walk or a hit batter); or signaled an effect on the batter's action on the Second Roll (such as an error to be charged or a double play to be made if runners are on base). You now make the Second Roll. You are going to learn if the batter has made a base hit or an out.

Please now look at the Second Roll Chart. We have provided you with a great variety of play actions condensed into a small piece and very easily memorized with a little practice.

**Every reading on this chart is a form of a putout.** However, the first thing checked when the Second Roll is made is whether the reading is a base hit **for this batter**.

This is the way **Extra Innings** produces accurate batting averages and extra base hits for each player. You always read the dice in this sequence: red-white-green. This provides a total of 216 combinations (6x6x6) arranged from 1-1-1 through 6-6-6. There is a Master Chart with the game which gives the percentage equivalent for each reading. If this instruction is difficult for you to grasp, look at the Master Chart.

Each player is given a base hit range on the team rosters. This hitting range starts at 1-1-1 and reads upward to that batter's rating. If you look at any player's rating you will see he has a rating against left-handed pitching and against right-handed pitching. Over extended play he will bat against both kinds of pitching and reach combined results to hit his expected average.

For the purposes of learning the play of the game, you read the three dice (always in sequence: red, white, green). If the reading is within the batter's hitting range you record his safe hit and look further to know if it is a single or an extra base hit. The batter's rating gives you this.

**Only if it is not a base hit** (and the hitting range for all batters starts at 1-1-1) do you consult the Second Roll Chart for the form of the putout.

Before doing that, let's be sure you understand when the roll is interpreted as a base hit, and for how many bases. Let's use a good illustration, Babe Ruth of the 1927 Yankees. Ruth's hitting lines are given as: 1-4-6 1-5-3 2-1-3 2-6-6/3-1-6.

Any roll of the dice from 1-1-1 thru 1-4-6 is a home run for The Babe. He has a triple from 1-5-1 thru 1-5-3 and a double from 1-5-4 thru 2-1-3. From 2-1-4 thru 2-6-6 is a single against a left-handed pitcher and 2-1-4 thru 3-1-6 against a right-hander.

Ruth makes an out on any reading from 3-1-1 to 6-6-6 against a left-handed pitcher, and from 3-2-1 to 6-6-6 against a right-handed pitcher. Re-read that explanation, and to be sure you understand how it works, try it with any rated batter so you understand how each player is rated for batting average and for power factors. Got it? Let's look at how put outs are read from the Second Roll Chart.

Even though most of the low range - starting at 1-1-1 - will be interpreted as base hits, we have begun our chart with 1-1-1 and ended with 6-6-6. These are all given as put outs and are divided into zones to describe the manner of putout.

From 1-1-1 up to 3-6-6 (when not a base hit) is a fly out. We read the third die (green) to tell us which outfielder caught the ball (7 is left fielder; 8 is center fielder; 9 is right fielder). The chart is also divided to show variations in action according to the number of outs when the roll is made and whether the batter is left- or right-handed. The designations are weighted to provide more pulled balls and to have the center fielder handle more fly balls than the other outfielders. Basically, a one or two on the green die goes to left field; a three or four **always** to center field; a five or six to right field. Departures from this pattern are on the two and five. (I assure you, you will have even this nuance memorized after not too many games played so that you will know - even without looking at the Second Roll Chart - which outfielder caught the ball when a roll in the 1-1-1 thru 3-6-6 zone is not a base hit.

The next zone runs from 4-1-1 thru 4-4-6 and all such rolls are infield pop outs. It is always a pop fly (or foul ball) caught by the player whose score card designation corresponds with the number of the green die. The exception is a "one" on the green die. The ball goes to the second baseman if the batter is left-handed; to the shortstop if he is right-handed. Otherwise, if a 2, to the catcher; a 3 to the first baseman; a 4 to the second baseman; a 5 to the third baseman; a 6 to the shortstop.

Nominally, only the green die provides the final designation. However, when the white and green dice are the same, read this as a line drive (ignore 2-2, the catcher). Should a hit-and-run play be on, the line drive reading would provide a double play.

The next zone, 4-5-1 thru 6-6-6 covers ground balls. These have been divided into two groups: with no runner on first base and with a runner on first base (setting up a possible force play).

As we can now include the pitcher (1) among the designations each green die reading explicitly directs the ball to the appropriate position.

There are some notations at the bottom of this chart, referring to SD and LD fielders. We will cover that in a later section.

**Let us review the Second Roll Chart.** Memorizing it is the key to speedy play. You'll soon learn to disregard the non-applicable and interpret each roll at a glance. The first die (red) gives you your first information. As you become familiar with the hitting lines assigned to various batters, you will know if the one at bat has a hit or not. You might have to consult his rating to be sure, if the roll is in the high-end "hitting range", starting with a two or three on the red die. However, for the most part, the roll will signal an out and, if below 4-1-1, handled by an outfielder. If 4-1-1 or higher, it will be handled by an infielder (pitcher and catcher included) and be a ground ball if between 4-5-1 and 6-6-6. Try to learn that step first. The designations by positions, being keyed, almost entirely, to scorecard position numbering, will be assimilated as you play the games.

We will deal with strikeout designations later as this is a pitcher factor, plus the batter's own tendencies. A strikeout will change the form of put out in a manner similar to the way a base hit alters a put out. We will read strikeouts from 6-6-6 downward and they will nullify ground outs (which is why the zone for ground balls is larger than the zones for outfield flies and infield pop outs.)

The Second Roll Chart compresses all the action. It is the key element of the game. At this point you are ready to play Extra Innings and learn the rest of the charts as you require them.

**PLAYING THE GAME:** You have selected the opposing teams and written the lineups in your score pad. As each batter comes to the plate he'll reach base or make an out. When he gets a base hit it is often important to know where the ball went. Just as put outs are directed to outfield positions, so are base hits. All base hits are presumed to go to the outfield. (Infield hits will be covered in a moment). The third die (green) tells you where the ball was hit. The same directional signals from the Second Roll Chart will tell you if the ball went to left, center, or right.

Later, when we take up defensive ratings you will see that knowing where the hit was directed is very important.

Any single which has a one as the second (white) die is an infield hit. There is a separate chart for this situation, not often consulted. Its principal effect is on the advancing of base runners.

Let's start with the First Roll Chart. We have chosen to have two rolls on each batter to isolate actions which do not effect the batting average. A player's batting average is determined by dividing his official at bats into his base hits. To be sure we get accurate batting averages we exclude any actions which can give the hitter a time at bat, without a chance for a hit, such as reaching base on an error, from the Second Roll and deal with them in the First Roll action.

Most of the readings on the First Roll Chart are self evident. Walks are primarily a pitcher's characteristic and each is rated, from 1-1-1 to the top of his individual range. Later, when you are ready for it, we'll introduce the counter effect of the individual batter.

We have designated injuries for those who enjoy the flavor of mayhem and a range for Rare Events as some table gamers like to embellish real life statistics with events such as game postponements, delays, managers ejected, etc.

The Double Play designations require deferment. Obviously, if there are no runners on base for the batter's turn, no DP can result. Each team is rated according to its ability to turn DPs. Also, there is a manner to rate All-Star, or draft league, teams or any composite of players.

For now know that a double play will be signaled from 2-6-1 through 3-2-6 if there is a runner on first base only (never with more than this one runner).

A roll in the range from 3-3-1 to 3-4-4 refers you to the Double Play Chart for interpretation.

Make the Second Roll. If the batter has hit safely, **there is no double play!** If he has made an out, **do not** interpret according to Second Roll Chart readings. Instead, refer to the Double Play Chart. Do not roll the dice again. Just apply the reading of them to the Double Play Chart.

We wish we could provide you a more easily memorized expression of double plays but we want to cover all the contingencies and have found no easier way to do it. You'll note that readings which begin with a 4 on the first die (red) always go to the second baseman, with a 5 to the third baseman, and with a 6 to the shortstop. Double plays will not often be signaled in the average game and, even when they are, might be irrelevant if no runners are on base, or erased by a subsequent base hit. The use of this chart is infrequent but important.

Error designations also require deferment until the Second Roll has been made. As with double plays, errors are a team characteristic. Each team is given an error rating. If a First Roll is within this range, the error is added to the subsequent action.

If the batter hits safely, the error is added on to the hit and the error charged to the player where the hit was designated. If the batter singles to left, the left fielder is charged with an error on the play, allowing all runners an additional base(s).

If the batter has made an out, he reaches base on the error which is charged to the defensive player to whom the ball was hit.

If the Second Roll is "doubles" (white and green dice are identical) the play is a two-base error.

If there are runners on base when the error occurs, the action is handled the same way as described in the base runner advancement following a base hit. (See Advancing On Base Hits Chart). Substitute a one-base error for a single; a two-base error for a double.

**Error on Stolen Base Attempt.** On "optional steal" apply reading of subsequent "First Roll" assigning error - if signaled - on the steal which was attempted. If runner had been out, make him safe. If safe, advance him another base. Now, make another First Roll for the batter at the plate.

Charge error to catcher's throw if third die is a one or two; to 2B if a three or four; to SS if a five or six. If steal attempt is to third, charge 3B with error if the third die is three, four, five or six.

On a signaled "automatic steal", after action has been taken via the Stolen Base Chart, re-do sequence on batter - make a new First Roll.

We have included an "automatic steal" on the First Roll Chart. This is to acknowledge that when we play the game on a solitaire basis, we too often neglect to elect the option to steal a base (and weaker stolen base ratings never attempt a steal, otherwise). When we play "face-to-face" games we disregard the automatic steal as the presence of an opponent introduces an element which stimulates us into remembering to call for a steal attempt.

Remember, we are describing how we handle "EI". If alternate styles suit you, use them by all means.

**OTHER FIRST ROLL ACTIONS WHICH COMPLETE THE BATTER'S TURN.** Most of the actions which can happen to a batter, other than having him hit safely or make an out (actions for the Second Roll Chart) require no text elaboration. The chart's explanation should be sufficient.

We will enlarge on the ratings of pitchers for giving up walks when we describe how they are rated for this. However, this is as appropriate a place as any to tell you that certain batters influence walks. We use a Plus Walks (PW) and a Minus Walks (MW) factor. For the play of the game, know that a PW batters adds three to the second (white) die. If the First Roll had read, for illustration, 1-3-1 it would be adjusted to 1-6-1 for a PW rated batter. On the other hand, if the batter was one who walks less frequently than average, his MW rating would reduce the second die (white) by three. A roll of 1-5-1 would be lowered to 1-2-1. (No pitcher can be adjusted higher than 1-6-6)

This is one of the finer points of play. Use of it is at the discretion of the games player. It makes "EI" a more thorough game.

There's a modifying condition to Hit Batters. With just 216 combinations available we found that one combination provided too few and two had too many batters getting plunked. So, we conditioned the circumstances listed.

When a pickoff play is signaled, we must send you to a special chart for quick consultation.

The wild pitch (or passed ball) also required some modifying to have it occur with expected frequency. There is a reference to an SD player here. Let it mystify you temporarily. The designating of certain players as Superior Defense (SD) or Limited Defense (LD) sometimes have an effect on play results.

The balk has a reference to base runner ratings and we will develop that for you where appropriate.

Catcher interference is an event of low incidence so we have modified it by requiring the batter strike out on the Second Roll Chart.

A further word about injuries is useful. The circumstances we have described from 2-2-4 thru 2-3-5 are rather arbitrary values. However, we should address the special circumstance of injury following a hit batter. If you want him, sometimes, to be required to leave the game, we propose this be done when both the pitcher and the batter are either left-handed or right-handed. Most batters are hit by pitches thrown from the same side. One of the advantages to batting a right-handed hitter against a left-handed pitcher (or vice versa) is that curve balls break in to him and are - theoretically - easier to hit and to avoid being hit by.

Most of us do not have the leisure time to conduct full schedules of 154 or 162 games among eight, or more, teams. Those who do might wish to employ some form of systematically sidelining injured players. For the occasional game, or tournament among teams, it is impractical. The only thing to be determined is whether the injury (hit batter) forces the player from the game. The other injuries indicated would obviously require the player to be replaced - or, why bother to note the event?

## **HOW TO RATE YOUR OWN TEAMS AND PLAYERS.**

**Extra Innings** was the first table baseball game, in 1970, to reveal its rating methods. We had designed the game in the first place because we wished to re-play certain past seasons, or use teams or individuals, which had not been rated by a game company. Further, we disliked being held captive to formulas which hardly required such closely guarded concealment. From a practical point, most table gamers would just as soon pay a modest price to purchase rosters already computed for them as the alternative is to spend an hour or more rating each team from the statistics. Most table gamers don't want to rate teams themselves. They'd rather play the games. But, for those who wish to do it themselves, or who want to recreate some team or league from the distant past, the method is gladly given.

**RATING BATTERS.** We have provided you with the charts to set each batter's hitting range to arrive at his projected average. We do not have access to the records of how each player hits against left- and right-handed pitchers. We use the same records available to everyone. Our basic source is The Official Baseball Guide published by The Sporting News, for contemporary teams.

For teams from the past we use David Neft and company's "The Sports Encyclopedia: Baseball". We supplement this with information gleaned, if necessary, from MacMillan's "The Baseball Encyclopedia". Any baseball fan whose intensity attracts him to "real life" baseball games should own these volumes as a matter of course.

We presume that batters will face right-handed pitching 80% of the time and left-handed pitching 20% of the time. We're not measuring the number of right- and left-handed pitchers in the major leagues as much as we are counting the innings pitched by them. Most starting pitchers are right-handed. Relief pitchers are generally more evenly divided. We have weighted our projections so that a batter, facing the average mix in the course of a season, will find his true average over the course of a season's play.

We realize the age of the specialist finds many part-time players batting against pitchers who throw from the opposite side almost exclusively. You can select the reading for a right-handed batter, or left-handed, on the Master Chart which comes closest to that player's average and use only that, if you promise yourself to use him only against pitchers the way his manager has used him.

**Rating for power** does require some work on your part. The formula, starting with home runs, is to divide the player's homers by at bats and multiply by 216. Illustration: the player you are rating has 525 at bats and 25 home runs; 525 into 25 is .047. Multiply by 216 (possible dice

combinations) and you get 10.19 on the Master Chart. Read the chart from 1-1-1 and 10.19 equals 10 lines. For this batter a reading from 1-1-1 thru 1-2-4 is a home run. Next you do his triples and then doubles. Divide the at bats into the triples and multiply by 216 and find the closest reading on the Master Chart. Add the number of lines to those already designated for homers. Do the same process with doubles. You have now rated the batter for power factors to go with his rating for base hits. Any hit which isn't for extra bases is, obviously, a single. Other ratings given batters deal with their propensity to strike out or not and to draw walks or be too impatient to. These are the PW and MW and PK and MK ratings referred to earlier.

**Strikeouts By Batters (PK and MK).** It is important to give to batters the correct characteristics for striking out frequently or being a good contact hitter. Not only does this increase the performance fidelity of individual players - with Mantles, Ruths, Kingmans, etc, striking out with frequency or Joe Sewells, Foxes, etc, rarely fanning - it affects the play action of the game.

We count the pitcher's strike out lines downward from 6-6-6. We have assigned the readings on the Second Roll Chart, from 4-5-1 thru 6-6-6, as infield ground outs. With a runner, or runners on base, these groundouts sometimes advance base runners. The contact hitter benefits from a reduced strike out range as he'll sometimes advance a runner whereas a strikeout will not. (as double plays are signaled on the First Roll Chart, the propensity for hitting ground balls instead of striking out is not a penalty). We identify a PK (Plus Strikeouts) batter as one who fans 20% or more times at bat. A PK batter increases the pitcher's strike out rating by three numbers on the second (white) die. A pitcher with a 6-2-1 strike out rating, against a PK batter, would be rated as 5-5-1.

A batter is rated MK (Minimum Strike Outs) if he fans less than 10% of his at bats. A batter rated MK decreases the pitcher's strike out rating by two numbers on the second (white) die. A pitcher with a 6-2-1 strike out rating, against an MK batter, would be rated 6-4-1.

**Walks By Batters (PW and MW).** To let the batter influence walks given, we assign ratings to those whose walk totals are outside the average range. Some batters get more walks than others because they are "pitched around" to avoid giving them a good ball to hit in a clutch situation.

Of course, some batters try to draw a base on balls and their skill should be regarded in a table game version.

Any batter who walks 20% or more of his plate appearances is rated PW. A PW rated batter increases a pitcher's walk rating by three numbers on the second (white) die. A pitcher rated 1-3-1 for walks would move up to 1-6-1 when facing a PW rated batter.

Conversely, there are batters who draw fewer walks than are usually experienced. Batters who walks less than 5% of their plate appearances are rated MW. This decreases the pitcher's walk rating by two numbers on the second (white) die.

At this point we have given you the processes by which batters are rated. You know how to create the batting average and how to divide base hits into home runs, triples, doubles, and singles. You know how to identify the batter's effect (if any) on walks and strike outs. Let's turn our attention to pitching.

### **Rating Pitchers - and the ERA Adjustment Chart**

Historically, giving a pitcher his true effect on the outcome of a table game has been elusive. The very first 'real life' table game ever marketed, "National Pastime", in 1931, rated batters but not pitchers. When APBA "salvaged" the original game, grades for pitchers were introduced.

**Extra Innings** graded pitchers in its first edition but a table gamer, Jeff Saragin, proposed a more precise measurement. The ERA Adjustment Chart.

This is an area of table gaming which attracts the attention of those who strive for the purest of mathematical application. We have a standard defense to ward off too explicit applications. Any proposal which increases the complexity of play, and makes it more difficult to memorize, is rejected. Also, any data which is not available for all seasons since 1900, is not used.

In constructing the ERA Adjustment Chart we have arbitrarily removed singles, doubles, triples and home runs from batters when facing pitchers whose ERA was below league average and added them to batters when the pitcher had a higher ERA than the league average.

The "norm" we use on the chart is 3.27 to 3.41. This was the normal range when we developed the chart. Questions arise when using this chart in replays among teams from different years. We let the chart prevail as is in a tournament, for example, among teams drawn from various seasons. If we are recreating a league we adjust to the chart if the "norm" for that league doesn't correspond to the "norm" we set.

As with many applications which appear in text to be complex, consultation of this chart will be infrequent. The pitcher's ERA will only shift a batter's hitting lines by a few (in most circumstances), so unless the roll comes very close to the batter's hitting maximum, there'll be no need to verify via the ERA chart.

### **Rating Pitchers for Strike Outs**

When we introduced you to the Second Roll Chart we told you that pitchers changed numbers reading from 6-6-6 downward from ground balls into strike outs.

To determine a pitcher's strike out rating, we must know how many innings he pitched, how many hits he gave up, and how many strike outs he had. We take innings pitched and multiply that by 3, then add that to hits allowed. Next we take that number, and divide it into his strikeouts. Then, we multiply this result by 216. Count the number of lines you calculated down from 6-6-6 and that is this pitcher's rating. When applying the Second Roll Chart you would interpret anything so effected as a strike out instead of a ground out.

### **Rating Pitchers for Walks**

Walks do not effect the Second Roll Chart. They are identified on the First Roll Chart, starting at 1-1-1 and read through 1-6-6. Each pitcher is rated to give walks in this way: Innings pitched, multiplied by three, plus hits, plus walks for a total which is divided into 90% of his walks. (We can give all thanks to digital calculators!) 10% of the walks a pitcher issues are expected to be intentional. As not all surrogate managers will grant intentional walks, or withhold them, in absolute accord with the past records, we tilt the balance a bit (Yes, you can give an intentional walk playing **Extra Innings** anytime you wish).

When you know the percentage of walks given up by a pitcher (the number calculated above), multiply by 216 to find the lines on the Master Chart. Count them from 1-1-1 upward.

We'll hold off on defensive ratings, running ratings, team ratings for double plays and errors, to get you back into a game for learning purposes.

At this point you've prepared you've prepared your boxscore, written lineups, and know why, and how, batters and pitchers are rated for the personalized effect on the game.



As you play the game you will find one of the things you need to know, after a base hit is made with runners on base, is the movement of the runners. See Advancing On Base Hits Chart.

We'll refer you to a separate Infield Singles Chart for movement of baserunners in that situation.

You'll also find that defensive ratings effect the movements of base runners. This makes as good a place as any to explain the defensive side of **Extra Innings**.

Let's begin by establishing that players simply cannot be rated defensively by available statistics. A degree of subjectivity is required although this can be guided by stats when the player is one with whom we are unfamiliar.

Defensive ratings are a matter of opinion. We give ours when we rate teams and players for **Extra Innings**. Yours might differ. Adopt your own.

We use two ratings, Superior Defense (SD) and Limited Defense (LD). These are players whose skills are greater or lesser than most players. They often save games or lose them and always influence games. The effect of an SD- or LD-rated player is both a touch of realism and a value in "gamesmanship".

In declaring a player Superior in Defense, we are motivated by his range and tendency to avoid errors. These two values are not always found in the same player. By giving a team it's own rating for errors, we shift the emphasis in rating the team's individual players to range, fielding averages are a weak measurement of ability.

In **Extra Innings** we do not have the defense characteristics of the players change hits into outs or vice versa. That is already part of a player's planned performance. However, the SD and LD players alter the effect of hits, holding some to singles that otherwise would be extra bases, or, extending a single into extra bases. Also, we make it possible for an SD fielder to convert an error designation into a put out. (This does not alter batting averages as a hitter is charged with an at bat for either reaching base on an error or being put out on the play).

And we make it possible for an LD player to enable a batter to reach base on an error that, otherwise, would have been a put out. In this way, we influence a season's fielding average (assuming table gamers will compile them) to have the best fielders have the best fielding averages and the worst have the lowest.

When an SD or LD player has an effect on interpretations this is noted as a footnote to the chart covering the situation.

Certain strong throwing outfielders are rated T-1. They are chosen subjectively, to be sure, with guidance from assists credited to them in their stats. Their influence on limiting base runner advances, or the attempt to score from third on a fly ball, will be noted in the appropriate charts.

**Team Rating for Double Plays.** Double plays result from the fielding skills of the players and the opportunities to make double plays. Teams with strong pitching staffs usually have fewer chances to make a DP.

Therefore, we correlate a staff's ERA with the double plays made by the team in actual competition. First, we determine the number of DPs per game made by the team. Divide the number of DPs by the number of games played. Now look up the staff ERA of the team. Apply the following:

Team ERA	Number of Lines
0.00 to 1.99	21.68 x DP/G
2.00 to 2.99	19.09 x DP/G
3.00 to 3.99	17.54 x DP/G
4.00 to 4.99	16.47 x DP/G
5.00 to 5.99	15.67 x DP/G
6.00 and up	15.00 x DP/G

Illustration: If a team had an ERA of 3.50 and 1.1 DPs per game. Multiply 1.1 times 17.54 equals 19.29 which rounds of to 19 lines on the Master Chart. The team's Double Play range would be 3-1-1 to 3-4-1.

For teams taken from the top 400 or any draft source create a team DP range by setting it to 3-1-1 thru 3-3-5. Make the following adjustments: If SS is SD add two lines. If 2B is SD add two lines. If 3B or 1B is SD add one line for each. For LD players at infield positions reverse the above process and deduct lines.

**Team Rating for Errors.** Put aside, for the moment, the fact that many table gamers play with All-Star teams, or shift players around according to their own activities as "general managers". Play by mail leagues like to "draft players".

We have a method for dealing with rating a team made up of assorted players for errors. Let's tackle rating actual teams.

Each team for which we have provided a prepared roster has been rated. These ratings start at 3-5-1 and continue to the end of the First Roll Chart. Each team's rating starts at 3-5-1 and continues to the end of its error range. We determine this by subtracting the team's fielding average from 1.000. If a team made no errors it would have a collective fielding average of 1.000.

A team with a .982 fielding average would have its error range determined this way: subtract .982 from 1.00. This defines that the team erred on .018 of its plays. The Master Chart of decimal equivalents shows this to be four lines. We would give the team an error range of 3-5-1 to 3-5-5.

When using All-Star squads, draft leagues, etc, give each team an error range of 3-5-1 thru 3-5-6. The presence of SD or LD players in such lineups does not affect the error range.

**Runner Ratings.** Like defensive ratings, grading runners is a subjective matter, guided by statistics. Foot speed and instinct are not always combined. There are two game situations which running ability affect. These are stealing bases and advancing on batted balls (baserunning).

We rate runners for you but invite you to do your own work in this field, particularly if you intend to tackle rosters on your own.

We have settled on these categories: Superior (combines great speed and instincts - abbr. SUP); Above Average (does it on speed or instinct - abbr. AAR); Average (most athletes at major league level have reasonable running ability - no abbr.); Slow (bat or other skills makes up deficit in running - abbr. SLO).

**Stolen Bases.** Except for the situation we built into the First Roll Chart, steal attempts are optional at the choice of the surrogate manager. There is a Stolen Base Chart which requires a separate dice roll and reading.

We have resisted specifically grading catchers on throwing ability. A pitcher's windup or inattention can have too much influence on the successful steal attempt. However, we have footnoted the chart to provide a reduction in the odds when an SD-rated catcher is behind the plate.

**Errors on Stolen Bases.** When, on a stolen base attempt, the second and third dice are the same, charge an error on the play, advancing the runner(s) an extra base if the steal attempt was successful. If the runner had been out give him the base but also credit him with a stolen base and advance him on the error one base. Charge errors as follows: 1-1 and 2-2 catcher; 3-3 and 4-4 second baseman; 5-5 and 6-6 shortstop. No error on 1-1 if catcher is rated SD. If steal attempt is to third base, charge error to third baseman on 3-3, 4-4, 5-5 or 6-6. If to home, to catcher on 1-1, 2-2, 3-3 and to pitcher on 4-4, 5-5, 6-6.

You will find that other charts for special actions have a reference to the running grade of players and will realize that we have made it more possible, for example, for a fast runner to score on a sacrifice fly than a slow one.

From this point on we think you can pick up the game by playing it and using the charts we have not yet discussed. They should be clear enough from here on as you have learned the fundamentals of the game.

Many table gamers fret over values like tiring pitchers, stretching base hits, home team advantage, etc. **Extra Innings** is based upon fixed stats which means that tinkering tends to distort the expected performances. However, the table gamer who adopts **Extra Innings** has the tools to use to alter the game in any particular he/she wishes. Please feel at liberty to do so.

## FIRST ROLL CHART

- 1-1-1 thru 1-6-6:** See pitcher's walk rating.
- 2-1-1:** Hit batter (if no runner(s) on base)
- 2-1-2:** Hit batter (if runner(s) on base)
- 2-1-3:** Pickoff by Pitcher (see Pick Off Chart)
- 2-1-4:** Pickoff by Catcher (see Pick Off Chart)
- 2-1-5:** Wild Pitch - any runners advance one base
- 2-1-6:** Wild Pitch or Passed Ball. If catcher is rated SD, it is a Wild Pitch, otherwise it is a Passed Ball - any runners advance one base
- 2-2-1:** Passed Ball. If catcher is rated SD it does not apply if a runner is on third base
- 2-2-2:** Balk. Imposed only if a Superior (SUP) or Above Average (AAR) runner is on base
- 2-2-3:** Interference by catcher (only if batter strikes out on Second Roll)
- 2-2-4:** Injury to shortstop if batter doubles to CF; to second baseman if double to LF or RF
- 2-2-5:** Injury to runner if batter has a triple
- 2-2-6:** Injury to runner if force at second base
- 2-3-1:** Injury to runner if tagged out at plate
- 2-3-2:** Injury to defensive player on foul out
- 2-3-3:** Injury to defensive player on deep fly ball
- 2-3-4:** Injury to batter on infield hit with less than two outs. Injury to first baseman when two out.
- 2-3-5:** Injury to pitcher if he makes put out
- 2-3-6:** Ground Rule Double - if followed by any extra base hit
- 2-4-1 thru 2-5-6:** Reserved for "Rare Events"
- 2-6-1 thru 3-2-6:** Double Play only if first base occupied (if right-handed batter, 6-4-3; if left-handed, 4-6-3)
- 3-3-1 thru 3-4-4:** Double Play any base runner situation. See team's DP rating, then read DP chart
- 3-4-5 thru 3-4-6:** Triple Play if followed by infield line drive
- 3-5-1 thru 6-6-6:** Error range. See team rating for errors

AUTOMATIC STEAL. Does not apply if baserunner (or lead runner, if more than one), is rated Slow (SLO) or if any runner on third. Does not apply if team at bat is three or more runs behind or five or more runs ahead. Does not apply to runner on second base with two out. Otherwise:

**4-4-4:** Lead runner must be Superior (SUP) or Above Average (AAR) - use Stolen Base Chart

**5-5-5 and 6-6-6:** Use Stolen Base Chart

## SECOND ROLL CHART

1-1-1 thru 3-6-6: Outfield Fly Out								4-1-1 thru 4-4-6: Infield Popout							
Left-Handed Batter				Right-Handed Batter				Left-Handed Batter				Right-Handed Batter			
3rdDie	0 Out	1 Out	2 Out	3rdDie	0 Out	1 Out	2 Out	3rdDie	0 Out	1 Out	2 Out	3rdDie	0 Out	1 Out	2 Out
1	7	7	7	1	7	7	7	1	4fo	4	4	1	6fo	6	6
2	8	8	7	2	7	7	7	2	2fo	2	2fo	2	2fo	2	2fo
3	8	8	8	3	8	8	8	3	3	3fo	3	3	3	3fo	3
4	8	8	8	4	8	8	8	4	4	4	4	4	4	4	4
5	9	9	9	5	8	8	9	5	5	5	5	5	5	5	5
6	9	9	9	6	9	9	9	6	6	6	6	6	6	6	6
Note: If reading on first die is a 3, fly out is deep, otherwise shallow.															

  

4-5-1 thru 6-6-6 (when not a strikeout): Infield Ground Out															
No Runner on First								Runner on First (Possible force out)							
Left-Handed Batter				Right-Handed Batter				Left-Handed Batter				Right-Handed Batter			
3rdDie	0 Out	1 Out	2 Out	3rdDie	0 Out	1 Out	2 Out	3rdDie	0 Out	1 Out	2 Out	3rdDie	0 Out	1 Out	2 Out
1	1-3	1-3	1-3	1	1-3	1-3	1-3	1	1-3	1-6	3ua	1	1-3	1-6	3ua
2	4-3	4-3	4-3	2	6-3	6-3	6-3	2	4-6	4-6	4-6	2	6-4	6-4	6-4
3	3ua	3-1	3ua	3	3ua	3-1	3ua	3	3ua	3-6	3ua*	3	3-6	3ua*	3ua*
4	4-3	4-3	4-3	4	4-3	4-3	4-3	4	4-3^	4-3^	4-6	4	4-6	4-6	4-3^
5	5-3	5-3	5-3	5	5-3	5-3	5-3	5	5-4	5-4	5-3!	5	5-4	5-4	5-3!
6	6-3	6-3	6-3	6	6-3	6-3	6-3	6	6-4	6-4	6ua	6	6-4	6-3+	6-3+
* - SD at 1B changes to 3-6 ^ - SD at 2B changes to 4-6 ! - SD at 3B changes to 5ua if force at third + - SD at SS changes to 6-4															

  

**SD and LD effect on BASE HITS:** Only when second (white) and third (green) dice are identical: if ball hit to SD player, reduce double or triple to single; if ball hit to LD player, increase hit by one base.

**SD and LD effect on PUT OUTS:** Only when second (white) and third (green) dice are identical: if ball is hit to LD player, batter reaches first base on error by that player (on foulouts, charge fielder with error, but batter does not reach, and must re-roll at First Roll).

**SD effect on ERRORS:** Only when second (white) and third (green) dice are identical: if ball is hit to SD player, no error occurs. Change error to put out. If error is to be added on to a hit, do NOT add error.

## ADVANCING ON BASE HITS CHART

If batter has made a hit on Second Roll and runners are on base, read the second (white) die.

**SINGLES:** Runner on first advances two bases if second (white) die is one to three. Runner on second scores if second (white) die is one thru five.

**DOUBLES:** Runner on first scores if second (white) die is one thru four. With two outs, runner on first scores.

Adjustments to readings for defensive ratings:

- Ball hit to SD player: lower second (white) die by one
- Ball hit to LD player: increase second (white) die by one
- Ball hit to T-1 player (who is not also SD): lower second (white) die by one

Adjustments to readings for base runner ratings:

- If runner is Slow (SLO) base runner: lower second (white) die by one
- If runner is Above Average (AAR) or Superior (SUP) base runner: increase second (white) die by one

**INFIELD SINGLES:** All base hits, as read on Second Roll Chart, go to the outfielder designated. The exception is any single when the second (white) die is a one. The ball is handled by the player indicated by the third (green) die (1=pitcher, 2=catcher, etc). Runners advance one base only if forced on play or two outs. There is no opportunity for an SD player to alter the outcome of the play.

## DOUBLE PLAY CHART

When signaled in 3-1-1 thru 3-4-4 range on first roll.

	Runner on 1st/1st & 3rd		Runners on 1st & 2nd		Bases Loaded (Infield In)*		Runners on 2nd & 3rd		Runner on 2nd Only		Runner on 3rd Only	
	0 Out	1 Out	0 Out	1 Out	0 Out	1 Out	0 Out	1 Out	0 Out	1 Out	0 Out	1 Out
<b>1-1-1 thru 3-6-6</b>	6-4-3	6-4-3	6-4-3	6-4-3	6-4-3 (6-2-3)	6-4-3 (6-2-3)	6-5	6-5	6ua	6-4	6-5	6-5
<b>4-1-1 thru 4-6-6</b>	4-6-3	4-6-3	4-6-3B	4-6-3	4-6-3E (4-2-3)	4-6-3 (4-2-3)	4-5	4ua	4ua	4-6	4-5	4-5
<b>5-1-1 thru 5-5-6</b>	5-4-3	5-4-3	5-4-3B	5-4-3	5-4-3E (5-2-3)	5-4-3 (5-2-3)	5ua	5-4	5-4	5-4	5ua	5ua
<b>5-6-1 thru 5-6-6</b>	1-4-3	1-6-3	1-5-4C	1-5-3	1-2-3D	1-2-3	1-5	1-6	1-4	1-6	1-5	1-5
<b>6-1-1 thru 6-1-6</b>	2-4-3	2-6-3	2-5-4C	2-5-3	5-2-3	5-2-3	2-5	2-5	2-4	2-6	2-5	2-5
<b>6-2-1 thru 6-6-6</b>	3-6-3	3-6-1	3uaA	3ua	3uaE	3ua	3-5	3-4	3-6	3-4	3-5	3-5

A - Runner on second remains there

B - Runner from second advances to third

C - Batter reaches first on fielder's choice

D - Runners from first & second advance to next base

E - Runner scores from third

Runner from third scores on all plays when batter is retired from first

\* Read play in Brackets if Infield playing IN

## STOLEN BASE CHART

Action takes place BEFORE First Roll. After it is completed, proceed with First Roll on the batter. Remember, all players on the roster have been rated for stealing bases: Slow (SLO), Average, Above Average (AAR) and Superior (SUP).

<b>To steal SECOND BASE:</b>	<b>Right-Handed Pitcher</b>	<b>Left-Handed Pitcher</b>
Slow Base Stealer	1-1-1 thru 1-6-6	1-1-1 thru 1-5-6
Average Base Stealer	1-1-1 thru 3-4-5	1-1-1 thru 3-3-3
Above Average Base Stealer	1-1-1 thru 4-4-6	1-1-1 thru 4-3-6
Superior Base Stealer	1-1-1 thru 5-3-6	1-1-1 thru 5-2-6
<b>To steal THIRD BASE:</b>	<b>Right-Handed Pitcher</b>	<b>Left-Handed Pitcher</b>
Slow Base Stealer	1-1-1 thru 1-5-6	1-1-1 thru 1-6-6
Average Base Stealer	1-1-1 thru 2-3-6	1-1-1 thru 2-4-6
Above Average Base Stealer	1-1-1 thru 4-3-6	1-1-1 thru 4-4-6
Superior Base Stealer	1-1-1 thru 5-2-6	1-1-1 thru 5-3-6
<b>To steal HOME:</b>	<b>Right-Handed Pitcher</b>	<b>Left-Handed Pitcher</b>
Slow Base Stealer	cannot steal home	cannot steal home
Average Base Stealer	1-1-1 thru 1-5-6	1-1-1 thru 1-6-6
Above Average Base Stealer	1-1-1 thru 2-3-6	1-1-1 thru 2-4-6
Superior Base Stealer	1-1-1 thru 4-3-6	1-1-1 thru 4-4-6

### Notes:

Numbers listed are success ranges.

Above average base stealers are limited to one stolen base attempts per nine inning game, and is unlimited in extra innings.

Superior base stealers are limited to two stolen base attempts per nine inning game, and is unlimited in extra innings.

Slow and Average runners are unlimited in their stolen base attempts.

**DOUBLE AND TRIPLE STEALS:** All action is governed by the lead runner. Others advance whether the front runner is safe or not.

**ERRORS ON STEAL ATTEMPTS:** See Rule Book.

When catcher is rated SD, lower second (white) die success range by one.



## HIT AND RUN CHART

Use only after First Roll has been made and not if an error or double or triple play has been signaled. If used when two are out batter cannot get an extra base hit (any base hit is read as a single) and runner on first base cannot advance beyond third.

**WHEN BATTER HITS SAFELY:** Runner(s) advance one base further than shown on Advancing on Base Hits Chart. A SUP rated runner scores from first base. (If hit is an infield single, runners do not advance an extra base).

**WHEN BATTER FLIES OUT:** If a deep fly all runners return to their base(s) safely. If a shallow fly, lead runner is doubled off base if fly is to a T-1 outfielder.

**WHEN BATTER HITS AN INFIELD POP UP:** Runner(s) return safely to base.

**WHEN BATTER LINES OUT TO INFIELDER** (same reading on second [white] and third [green] die, except 2-2): Lead runner is doubled off base.

**WHEN BATTER FOULS OUT:** Runner(s) return safely to their base(s).

**WHEN BATTER GROUNDS OUT:** Runner(s) advance to next base. Apply Second Roll Chart as though there had been no runner on first.

## INFIELD ALL THE WAY IN CHART

The team in the field can elect to draw the infield in with a runner on third base. This is done before the First Roll. The batter's turn proceeds in the usual manner with this chart applied only if he hits a ground ball. Use the third (green) die to tell you whom the ball was hit to and then, from the second (white) die, use the following chart:

### Runner on Third

Ball Hit To:	Second (White) Die	Not Forced	Is Forced
<b>1B</b>	1	Single	Single
	2	Single	Single
	3	3ua	3ua
	4	3ua	3-2
	5	3-2	3-2
	6	3-2	3-2
<b>2B</b>	1	Single	Single
	2	Single	Single
	3	4-3	4-2
	4	4-3	4-2
	5	4-2	4-2
	6	4-2	4-2
<b>SS</b>	1	Single	Single
	2	Single	Single
	3	6-3	6-2
	4	6-3	6-2
	5	6-2	6-2
	6	6-2	6-2
<b>3B</b>	1	Single	Single
	2	Single	Single
	3	5-3	5-2
	4	5-3	5-2
	5	5-2	5-2
	6	5-2	5-2

**LD and SD Effect:** LD-rated player decreases (from 3 to 2, for example) reading of second (white) die by one. A six is a fielder's choice (runner safe, batter safe). SD-rated player increases (from 2 to 3, for example) reading of second (white) die by one.

## INFIELD HALF-WAY IN CHART

The team in the field can elect to draw the infield in with a runner on third base. This is done before the First Roll. The batter's turn proceeds in the usual manner with this chart applied only if he hits a ground ball. Use the third (green) die to tell you whom the ball was hit to and then, from the second (white) die, use the following chart:

### Runner on Third

Ball Hit To:	Second (White) Die	Not Forced	Is Forced
<b>1B</b>	1	Single	Single
	2	Single	Single
	3	3ua	3ua
	4	3ua	3-2
	5	3-2	3-2
	6	3-2	3-2
<b>2B</b>	1	Single	Single
	2	4-3	4-3
	3	4-3	4-2
	4	4-3	4-2
	5	4-2	4-2
	6	4-2	4-2
<b>SS</b>	1	Single	Single
	2	6-3	6-3
	3	6-3	6-2
	4	6-3	6-2
	5	6-2	6-2
	6	6-2	6-2
<b>3B</b>	1	Single	Single
	2	Single	Single
	3	5-3	5-3
	4	5-3	5-2
	5	5-2	5-2
	6	5-2	5-2

**LD and SD Effect:** LD-rated player decreases (from 3 to 2, for example) reading of second (white) die by one. A six is a fielder's choice (runner safe, batter safe). SD-rated player increases (from 2 to 3, for example) reading of second (white) die by one.

## PICK OFF PLAY CHART

### 2-1-3: Attempt by Pitcher

Base Situation	Left-Handed Pitcher			Right-Handed Pitcher		
	0 Out	1 Out	2 Out	0 Out	1 Out	2 Out
Runner on 1st	safe	E1	out-1B	safe	out-1B	E1
Runner on 2nd	E1	out-2B	safe	safe	E1	safe
Runners on 1st and 2nd	out-1B	safe	out-2B	safe	out-2B	safe
Runners on 1st and 3rd	safe	E1	out-1B	safe	out-1B	E1
Runners on 2nd and 3rd	E1	out-2B	safe	safe	E1	safe
Bases Loaded	out-1B	safe	out-2B	safe	out-2B	safe

E1 - Error by pitcher, all runners advance one base.

Note: Pitchers never throw to third base.

### 2-1-4: Attempt by Catcher

Base Situation	SD-Rated Catcher			LD-Rated Catcher		
	0 Out	1 Out	2 Out	0 Out	1 Out	2 Out
Runner on 1st	out-1B	safe	out-1B	safe	E2	out-1B
Runner on 2nd	safe	out-2B	E2	safe	E2	safe
Runner on 3rd	safe	out-3B	out-3B	safe	out-3B	out
Runners on 1st and 2nd	out-1B	out-2B	safe	out-1B	safe	safe
Runners on 1st and 3rd	safe	safe	out-3B	safe	safe	out-1B
Runners on 2nd and 3rd	out-3B	safe	out-2B	safe	safe	out-3B
Bases Loaded	out-3B	safe	out-2B	safe	safe	out-3B

E2 - Error by catcher, all runners advance one base.

Note: If call is "safe", runner(s) remain at base(s).

If runner is out at designated base, any other runners may elect to advance on play. Handle as a stolen base attempt. Make roll for this an optional action. Do not credit stolen base or caught stealing.

Put outs made at second are made by the shortstop if batter is left-handed and by second baseman if batter is right-handed.

out-1B means out at first base, etc.

## **SQUEEZE PLAY CHART**

To be used only with runner on third and less than two out.

Defensive team must decide whether to play in or back.

### **When infield is playing back**

#### **"Suicide Squeeze"**

**1-1-1 thru 2-6-6**

**3-1-1 thru 3-6-6**

**4-1-1 thru 5-6-6**

**6-1-1 thru 6-6-6**

#### **Offensive team must announce before first roll**

Everyone safe. Credit batter with sacrifice.

Runner safe. Batter out (1 to 3). Credit batter with sacrifice.

Runner out (1 to 2). Batter reaches first on FC.

Double play (1 to 2 to 3)

#### **"Safety Squeeze"**

**1-1-1 thru 1-6-1**

**1-6-2 thru 2-5-6**

**2-6-1 thru 3-6-6**

**4-1-1 thru 4-4-4**

**4-4-5 thru 6-6-6**

#### **Offensive team must announce before first roll.**

Everyone safe. Credit batter with sacrifice.

Runner safe. Batter out (5 to 3). Credit batter with sacrifice.

Runner out (1 to 2). Batter reaches first on FC.

Double play (1 to 2 to 3)

Runner holds third base. Batter out (5 to 3). If bases loaded, or 1st and 3rd, batter strikes out.

### **When infield is playing in**

#### **"Suicide Squeeze"**

**1-1-1 thru 2-2-2**

**2-2-3 thru 3-1-4**

**3-1-5 thru 6-1-4**

**6-1-5 thru 6-6-6**

#### **Offensive team must announce before first roll**

Everyone safe. Credit batter with sacrifice.

Runner safe. Batter out (3ua). Credit batter with sacrifice.

Runner out (1 to 2). Batter reaches first on FC.

Double play (1 to 2 to 3)

#### **"Safety Squeeze"**

**1-1-1 thru 1-6-1**

**1-6-2 thru 3-1-1**

**3-1-2 thru 3-6-6**

**4-1-1 thru 4-4-4**

**4-4-5 thru 6-6-6**

#### **Offensive team must announce before first roll.**

Everyone safe. Credit batter with sacrifice.

Runner safe. Batter out (3ua). Credit batter with sacrifice.

Runner out (1 to 2). Batter reaches first on FC.

Pop up double play (1 to 5).

Runner holds third base. Batter out (5 to 3). If bases loaded, or 1st and 3rd, batter strikes out.

## SACRIFICE BUNT CHART

Eliminates First and Second Rolls

Runner on first or runners on first and second only. Not to be used for a squeeze play.

**Lead runner is rated:**

		<b>Average</b>	<b>SUP or AAR</b>	<b>SLO</b>
<b>FIRST TRY</b>	Foul Ball	1-1-1 thru 3-6-6	1-1-1 thru 3-6-6	1-1-1 thru 3-6-6
	Successful	4--1-1 thru 5-6-6	4--1-1 thru 6-3-1	4--1-1 thru 5-1-1
	Failure	6-1-1 thru 6-6-6	6-3-2 thru 6-6-6	5-1-2 thru 6-6-6
<b>SECOND TRY</b>	Foul Ball	1-1-1 thru 3-6-6	1-1-1 thru 3-6-6	1-1-1 thru 3-6-6
	Successful	4-1-1 thru 5-6-6	4-1-1 thru 6-3-1	4-1-1 thru 5-1-1
	Failure	6-1-1 thru 6-6-6	6-3-2 thru 6-6-6	5-1-2 thru 6-6-6
<b>THIRD TRY (optional)</b>	Successful	1-1-1 thru 4-3-6	1-1-1 thru 4-6-6	1-1-1 thru 4-1-1
	Failure	4-4-1 thru 6-6-6	5-1-1 thru 6-6-6	4-1-2 thru 6-6-6

**Special data on successful results.** On First Try, batter is retired pitcher to first baseman (1-3). On Second Try, batter is retired catcher to first baseman (2-3). On Third Try, batter is retired catcher to second baseman covering first base (2-4). If roll ends in 6-6, credit batter with a bunt single.

**Special data on unsuccessful attempts** (not including foul balls): If the third (green) die ends in:

**One:** Lead runner is out, others advance one base. If put out at third base, runner out pitcher to third (1-5). If put out at second base, runner out catcher to shortstop (2-6). Batter reaches first on fielder's choice.

**Two:** Lead runner is out, others advance one base. If put out at third base, runner out first to third (3-5). If put out at second base, runner out pitcher to shortstop (1-6). Batter reaches first on fielder's choice.

**Three:** Lead runner is out, others advance one base. If put out at third base, runner out catcher to third (2-5). If put out at second base, runner out first to shortstop (3-6). Batter reaches first on fielder's choice.

**Four:** Batter strikes out. No advance.

**Five:** Batter fouls out to catcher. No advance.

**Six:** Double Play. Lead runner and batter out. If doubled off second base, runner out pitcher to shortstop (1-6). If doubled off first base, runner out catcher to first (2-3).

For errors, see page two.

**ERRORS:** Any failure (not including foul balls on first two tries) which ends in "doubles" on last two (white and green) die, replaces the described action above with an error as follows:

1-1: Error on pitcher. Runner(s) advance two bases, batter safe at first.

2-2: Error on pitcher. Runner(s) advance one base, batter safe at first.

3-3: Error on catcher. If two on, lead runner advances two bases, other one base. If one runner on, runner advances one base. Batter safe at first.

4-4: Error on catcher. Runner(s) advance two bases, batter safe at second.

5-5: Error on first baseman. Runner(s) advance two bases, batter safe at first.

6-6: Error on third baseman. Runner(s) advance two bases, batter safe at first.

## SACRIFICE FLY OPTION CHART

Intention to attempt to advance from second to third or score from third after a fly ball has been hit must be declared **before** the Second Roll is made. Proceed with Second Roll and, if a fly ball results, apply the following:

Use the second (white) die to provide outcome on play:

If fly out is shallow:

- runner is safe if one thru four
- runner out if a four and OF is rated T-1
- runner out if a five
- runner holds if a six

If fly out is deep, runner is safe unless second (white) die is a six, or, a five and OF is rated T-1.

The depth of the fly ball is determined by the first (red) die. If it is a one or a two, the fly ball is hit "shallow". If it is a three, the fly ball was hit "deep".

The team at bat may elect to "play safe" and no attempt to score is made unless a deep fly ball results. No attempt is made to advance from second to third even on a deep fly ball when a team elects to "play safe".

Automatic Application: Particularly when playing solitaire, the game flows so quickly that the option of announcing a Sacrifice Fly attempt before the Second Roll is unused. The above instructions can pertain by eliminating the "play safe" option and allowing an attempt to advance from second to third to apply only to a base runner rated SUP or AAR.

## MASTER NUMBERS CHART

1-1-1: .0046	2-1-1: .1713	3-1-1: .3380	4-1-1: .5046	5-1-1: .6713	6-1-1: .8380
1-1-2: .0093	2-1-2: .1759	3-1-2: .3426	4-1-2: .5093	5-1-2: .6759	6-1-2: .8426
1-1-3: .0139	2-1-3: .1806	3-1-3: .3472	4-1-3: .5139	5-1-3: .6806	6-1-3: .8472
1-1-4: .0185	2-1-4: .1852	3-1-4: .3519	4-1-4: .5185	5-1-4: .6852	6-1-4: .8519
1-1-5: .0231	2-1-5: .1898	3-1-5: .3565	4-1-5: .5231	5-1-5: .6898	6-1-5: .8565
1-1-6: .0278	2-1-6: .1944	3-1-6: .3611	4-1-6: .5278	5-1-6: .6944	6-1-6: .8611
1-2-1: .0324	2-2-1: .1991	3-2-1: .3657	4-2-1: .5324	5-2-1: .6991	6-2-1: .8657
1-2-2: .0370	2-2-2: .2037	3-2-2: .3704	4-2-2: .5370	5-2-2: .7037	6-2-2: .8704
1-2-3: .0417	2-2-3: .2083	3-2-3: .3750	4-2-3: .5417	5-2-3: .7083	6-2-3: .8750
1-2-4: .0463	2-2-4: .2130	3-2-4: .3796	4-2-4: .5463	5-2-4: .7130	6-2-4: .8796
1-2-5: .0509	2-2-5: .2176	3-2-5: .3843	4-2-5: .5509	5-2-5: .7176	6-2-5: .8843
1-2-6: .0556	2-2-6: .2222	3-2-6: .3889	4-2-6: .5556	5-2-6: .7222	6-2-6: .8889
1-3-1: .0602	2-3-1: .2269	3-3-1: .3935	4-3-1: .5602	5-3-1: .7269	6-3-1: .8935
1-3-2: .0648	2-3-2: .2315	3-3-2: .3981	4-3-2: .5648	5-3-2: .7315	6-3-2: .8981
1-3-3: .0694	2-3-3: .2361	3-3-3: .4028	4-3-3: .5694	5-3-3: .7361	6-3-3: .9028
1-3-4: .0741	2-3-4: .2407	3-3-4: .4074	4-3-4: .5741	5-3-4: .7407	6-3-4: .9074
1-3-5: .0787	2-3-5: .2454	3-3-5: .4120	4-3-5: .5787	5-3-5: .7454	6-3-5: .9120
1-3-6: .0833	2-3-6: .2500	3-3-6: .4167	4-3-6: .5833	5-3-6: .7500	6-3-6: .9167
1-4-1: .0880	2-4-1: .2546	3-4-1: .4213	4-4-1: .5880	5-4-1: .7546	6-4-1: .9213
1-4-2: .0926	2-4-2: .2593	3-4-2: .4259	4-4-2: .5926	5-4-2: .7593	6-4-2: .9259
1-4-3: .0972	2-4-3: .2639	3-4-3: .4306	4-4-3: .5972	5-4-3: .7639	6-4-3: .9306
1-4-4: .1019	2-4-4: .2685	3-4-4: .4352	4-4-4: .6019	5-4-4: .7685	6-4-4: .9352
1-4-5: .1065	2-4-5: .2731	3-4-5: .4398	4-4-5: .6065	5-4-5: .7731	6-4-5: .9398
1-4-6: .1111	2-4-6: .2778	3-4-6: .4444	4-4-6: .6111	5-4-6: .7778	6-4-6: .9444
1-5-1: .1157	2-5-1: .2824	3-5-1: .4491	4-5-1: .6157	5-5-1: .7824	6-5-1: .9491
1-5-2: .1204	2-5-2: .2870	3-5-2: .4537	4-5-2: .6204	5-5-2: .7870	6-5-2: .9537
1-5-3: .1250	2-5-3: .2917	3-5-3: .4583	4-5-3: .6250	5-5-3: .7917	6-5-3: .9583
1-5-4: .1296	2-5-4: .2963	3-5-4: .4630	4-5-4: .6296	5-5-4: .7963	6-5-4: .9630
1-5-5: .1343	2-5-5: .3009	3-5-5: .4676	4-5-5: .6343	5-5-5: .8009	6-5-5: .9676
1-5-6: .1389	2-5-6: .3056	3-5-6: .4722	4-5-6: .6389	5-5-6: .8056	6-5-6: .9722
1-6-1: .1435	2-6-1: .3102	3-6-1: .4769	4-6-1: .6435	5-6-1: .8102	6-6-1: .9769
1-6-2: .1481	2-6-2: .3148	3-6-2: .4815	4-6-2: .6481	5-6-2: .8148	6-6-2: .9815
1-6-3: .1528	2-6-3: .3194	3-6-3: .4861	4-6-3: .6528	5-6-3: .8194	6-6-3: .9861
1-6-4: .1574	2-6-4: .3241	3-6-4: .4907	4-6-4: .6574	5-6-4: .8241	6-6-4: .9907
1-6-5: .1620	2-6-5: .3287	3-6-5: .4954	4-6-5: .6620	5-6-5: .8287	6-6-5: .9954
1-6-6: .1667	2-6-6: .3333	3-6-6: .5000	4-6-6: .6667	5-6-6: .8333	6-6-6: 1.0000



## ERA Adjustment Chart

ERA	S	D	T	HR	ERA	S	D	T	HR
0.00-0.90	-23	-6	-3	-8	3.89-4.05	+4	+2	0	+1
0.91-0.97	-22	-6	-3	-8	4.06-4.22	+5	+2	+1	+!
0.98-1.05	-21	-6	-3	-8	4.23-4.39	+6	+2	+1	+2
1.06-1.13	-20	-6	-3	-8	4.40-4.57	+7	+2	+1	+2
1.14-1.21	-19	-6	-3	-8	4.58-4.76	+8	+3	+1	+3
1.22-1.30	-18	-6	-3	-8	4.77-4.95	+9	+3	+2	+3
1.31-1.39	-17	-6	-3	-8	4.96-5.14	+10	+3	+2	+4
1.40-1.48	-16	-6	-3	-8	5.15-5.34	+11	+4	+2	+4
1.49-1.58	-15	-6	-3	-8	5.35-5.55	+12	+4	+2	+5
1.59-1.67	-14	-6	-3	-8	5.56-5.76	+13	+5	+3	+6
1.68-1.78	-13	-5	-3	-6	5.77-5.98	+14	+6	+3	+8
1.79-1.88	-12	-4	-2	-5	5.99-6.20	+15	+6	+3	+8
1.89-1.99	-11	-4	-2	-4	6.21-6.42	+16	+6	+3	+8
2.00-2.10	-10	-3	-2	-4	6.43-6.66	+17	+6	+3	+8
2.11-2.21	-9	-3	-2	-3	6.67-6.90	+18	+6	+3	+8
2.22-2.33	-8	-3	-1	-3	6.91-7.14	+19	+6	+3	+8
2.34-2.45	-7	-2	-1	-2	7.15-7.39	+20	+6	+3	+8
2.46-2.58	-6	-2	-1	-2	7.40-7.65	+21	+6	+3	+8
2.59-2.71	-5	-2	-1	-1	7.66-7.92	+22	+6	+3	+8
2.72-2.84	-4	-2	0	-1	7.93-8.19	+23	+6	+3	+8
2.85-2.98	-3	-2	0	-1	8.20-8.46	+24	+6	+3	+8
2.99-3.12	-2	-1	0	0	8.47-8.75	+25	+6	+3	+8
3.13-3.26	-1	0	0	0	8.76-9.04	+26	+6	+3	+8
3.27-3.41	0	0	0	0	9.05-9.34	+27	+6	+3	+8
3.42-3.56	+1	0	0	0	9.35-9.64	+28	+6	+3	+8
3.57-3.72	+2	+1	0	0	9.65-9.95	+29	+6	+3	+8
3.73-3.88	+3	+2	0	+1	9.96-up	+30	+6	+3	+8

The following pages were not part of the original game, but are innovations created by users.

## ERA Adjustment Chart

### Adjustments for Pitcher Walks

One of the first things you probably figured out with the ERA Adjustment chart is that if you have two pitchers that have the same ERA, one who walked very few batters, and one who walked alot of batters, the one who walked alot, since his ERA is the same, gives up the same number of hits as the other pitcher, so can't come close to matching the other pitcher's ERA. There is simply too great a difference in the total base runners over the course of a season.

Ron Brendel developed the following chart to adjust the pitcher's ERA to compensate for a high or low walk rating. This should help even out the pitcherss base runners allowed totals for a better individualized performance. Look in the BB column for the pitcher's walk rating, and then look at the entry directly to the right for the adjustment to make to a pitcher's ERA in the ERA Adjustment Chart.

BB	ERA	BB	ERA	BB	ERA	BB	ERA	BB	ERA	BB	ERA
1-1-1	+0.71	1-2-1	+0.44	1-3-1	+0.22	1-4-1	-0.02	1-5-1	-0.25	1-6-1	-0.49
1-1-2	+0.65	1-2-2	+0.41	1-3-2	+0.18	1-4-2	-0.06	1-5-2	-0.29	1-6-2	-0.53
1-1-3	+0.61	1-2-3	+0.37	1-3-3	+0.14	1-4-3	-0.10	1-5-3	-0.33	1-6-3	-0.57
1-1-4	+0.57	1-2-4	+0.33	1-3-4	+0.10	1-4-4	-0.14	1-5-4	-0.37	1-6-4	-0.61
1-1-5	+0.53	1-2-5	+0.29	1-3-5	+0.06	1-4-5	-0.18	1-5-5	-0.41	1-6-5	-0.65
1-1-6	+0.49	1-2-6	+0.26	1-3-6	+0.02	1-4-6	-0.22	1-5-6	-0.45	1-6-6	-0.69

So, as examples:

Let's look at the 1952 Boston Red Sox and Mickey McDermott and Mel Parnell. Mickey had a 3.72 ERA, and Mel a 3.62 ERA. Looking up their ERAs in the 1952 ERA Adjustment Chart, we find that Mickey is "no change" and Mel is (just barely) a -1 on singles. Here's the relative stats to look at:

Pitcher	H/9	BB/9	BR/9
Parnell	8.71	3.74	12.45
McDermott	7.72	5.11	12.83

As you can see, there's a good reason why Parnell had just barely a better ERA than McDermott, since he allowed fewer base runners per 9. However, in the "off-the-shelf" model, these two pitchers will allow nearly the same number of hits. In fact, Parnell, who allowed MORE hits/9 than McDermott will allow slightly less than McDermott. BUT, they will replicate their BBs/9. Thus, Parnell has a bigger advantage and will more easily replicate his ERA. If you use the ERA Adjustment innovation, Parnell calculates to an adjusted ERA of 3.64, based on his BB rating of 1-3-6, whereas McDermott will calculate to an adjusted ERA of 3.47, based on his BB rating of 1-5-1. Thus, Parnell now does not adjust hits at all, as he now falls in the "no change" range for the 1952 ERA Adjustment Chart, and McDermott becomes a -2 on singles and -1 on doubles. Thus, McDermott will allow fewer hits now than Parnell, and both pitchers should more closely replicate their ERAs.

**Note:** A form of the data in this chart will be included in calculations for the Advanced Game ratings. The chart will "slide" adjustments based on the average walk rating for each season. A new column, called "Adjusted ERA" will be listed on the Advanced Game ratings in the place of the current ERA column found in the expanded and traditional ratings.

Special thanks to Tom O'Toole for passing this along.

# Walks and Strikeouts

## Adjustments for Pitcher and Batter Walks and Strikeouts

Pitchers are rated by their actual strikeouts and walks. Batters adjust either up or down depending on their abilities to walk or strikeout. However, at the extremes, the really good walk man, like a Babe Ruth, never draws enough walks, and the really bad strikeout man, like a Rob Deer, never strikes out enough.

Ron Brendel developed the following chart to rate batters from a MW2 to a PW4, and MK2 through PK4.

Walk or Strikeout Rating	Ranges
MW2 or MK2	0% to 50% of season average
MW1 or MK1	50.01% to 87% of season average
none	87.01% to 117% of season average
PW1 or PK1	118.01% to 150% of season average
PW2 or PK2	150.01% to 183% of season average
PW3 or PK3	183.01% to 217% of season average
PW4 or PK4	217.01% and up of league average

Next, Ron Brendel simplifies the pitcher walk and strikeout ratings as below:

Calculation (from instructions)	Walk Rating	Strikeout Rating
.001 to .021	1-1-3	6-6-4
.022 to .042	1-1-6	6-6-1
.043 to .069	1-2-6	6-5-1
.070 to .097	1-3-6	6-4-1
.098 to .125	1-4-6	6-3-1
.126 to .153	1-5-6	6-2-1
.154 to .181	1-6-6	6-1-1
.182 to .208	2-1-6	5-6-1
.209 to .236	2-2-6	5-5-1
.237 to .264	2-2-6	5-4-1
.265 to .292	2-2-6	5-3-1
.293 to .319	2-2-6	5-2-1
.320 to .347	2-2-6	5-1-1
.348 and up	2-2-6	4-6-1

To incorporate this system, Ron placed the tables on the First Roll chart for walks and on the Second Roll chart for strikeouts. Those charts include some other results and ratings not covered here. As a result, the regular charts have been modified and are presented here:

## Modified First Roll Chart

### 1-1-1 thru 2-6-6

Compare Batter and Pitcher Walk Ratings

MW2	MW1	Pitcher	PW1	PW2	PW3	PW4
1-1-1	1-1-2	<b>1-1-3</b>	1-1-4	1-1-5	1-1-6	1-2-1
1-1-2	1-1-4	<b>1-1-6</b>	1-2-2	1-2-4	1-2-6	1-3-2
1-1-4	1-2-2	<b>1-2-6</b>	1-3-4	1-4-2	1-4-6	1-5-4
1-1-6	1-2-6	<b>1-3-6</b>	1-4-6	1-5-6	1-6-6	2-1-6
1-2-2	1-3-4	<b>1-4-6</b>	1-6-2	2-1-4	2-2-6	2-4-2
1-2-4	1-4-2	<b>1-5-6</b>	2-1-4	2-3-2	2-4-6	2-6-4
1-2-6	1-4-6	<b>1-6-6</b>	2-2-6	2-4-6	2-6-6	2-6-6
1-3-2	1-5-4	<b>2-1-6</b>	2-4-2	2-6-4	2-6-6	2-6-6
1-3-4	1-6-2	<b>2-2-6</b>	2-5-4	2-6-6	2-6-6	2-6-6

- 3-1-1** Hit batter (if no runner(s) on base)
- 3-1-2** Hit batter (if runner(s) on base)
- 3-1-3** Pickoff by Pitcher (see Pick Off Chart)
- 3-1-4** Pickoff by Catcher (see Pick Off Chart)
- 3-1-5** Wild Pitch - any runners advance one base
- 3-1-6** Wild Pitch or Passed Ball. If catcher is rated SD, it is a Wild Pitch, otherwise it is a Passed Ball - any runners advance one base
- 3-2-1** Passed Ball. If catcher is rated SD it does not apply if a runner is on third base
- 3-2-2** Balk. Imposed only if a Superior (SUP) or Above Average (AAR) runner is on base
- 3-2-3** Interference by catcher (only if batter strikes out on Second Roll)
- 3-2-4** Injury to shortstop if batter doubles to CF; to second baseman if double to LF or RF
- 3-2-5** Injury to runner if batter has a triple
- 3-2-6** Injury to runner if force at second base
- 3-3-1 thru 3-4-4** Double Play any base runner situation. See team's DP rating, then read DP chart
- 3-4-5 thru 3-4-6** Triple Play if followed by infield line drive
- 3-5-1 thru 5-6-6** Error range. See team rating for errors
- 6-1-1 thru 6-2-6** Reserved for "Rare Events"
- 6-3-1** Injury to runner if tagged out at plate
- 6-3-2** Injury to defensive player on foul out
- 6-3-3** Injury to defensive player on deep fly ball
- 6-3-4** Injury to batter on infield hit with less than two outs. Injury to first baseman when two out.
- 6-3-5** Injury to pitcher if he makes put out
- 6-3-6** Ground Rule Double - if followed by any extra base hit
- 6-4-1 thru 6-6-6** Double Play only if first base occupied (if right-handed batter, 6-4-3; if left-handed, 4-6-3)

## Modified Second Roll Chart

1-1-1 thru 3-6-6: Outfield Fly Out (when not a strikeout)								4-1-1 thru 4-4-6: Infield Popout (when not a strikeout)							
Left-Handed Batter				Right-Handed Batter				Left-Handed Batter				Right-Handed Batter			
3rdDie	0 Out	1 Out	2 Out	3rdDie	0 Out	1 Out	2 Out	3rdDie	0 Out	1 Out	2 Out	3rdDie	0 Out	1 Out	2 Out
1	7	7	7	1	7	7	7	1	4fo	4	4	1	6fo	6	6
2	8	8	7	2	7	7	7	2	2fo	2	2fo	2	2fo	2	2fo
3	8	8	8	3	8	8	8	3	3	3fo	3	3	3	3fo	3
4	8	8	8	4	8	8	8	4	4	4	4	4	4	4	4
5	9	9	9	5	8	8	9	5	5	5	5	5	5	5	5
6	9	9	9	6	9	9	9	6	6	6	6	6	6	6	6

Note: If reading on first die is a 3, fly out is deep, otherwise shallow.

4-5-1 thru 6-6-6 (when not a strikeout): Infield Ground Out															
No Runner on First								Runner on First (Possible force out)							
Left-Handed Batter				Right-Handed Batter				Left-Handed Batter				Right-Handed Batter			
3rdDie	0 Out	1 Out	2 Out	3rdDie	0 Out	1 Out	2 Out	3rdDie	0 Out	1 Out	2 Out	3rdDie	0 Out	1 Out	2 Out
1	1-3	1-3	1-3	1	1-3	1-3	1-3	1	1-3	1-6	3ua	1	1-3	1-6	3ua
2	4-3	4-3	4-3	2	6-3	6-3	6-3	2	4-6	4-6	4-6	2	6-4	6-4	6-4
3	3ua	3-1	3ua	3	3ua	3-1	3ua	3	3ua	3-6	3ua*	3	3-6	3ua*	3ua*
4	4-3	4-3	4-3	4	4-3	4-3	4-3	4	4-3^	4-3^	4-6	4	4-6	4-6	4-3^
5	5-3	5-3	5-3	5	5-3	5-3	5-3	5	5-4	5-4	5-3!	5	5-4	5-4	5-3!
6	6-3	6-3	6-3	6	6-3	6-3	6-3	6	6-4	6-4	6ua	6	6-4	6-3+	6-3+

\* - SD at 1B changes to 3-6  
^ - SD at 2B changes to 4-6  
! - SD at 3B changes to 5ua if force at third  
+ - SD at SS changes to 6-4

**SD and LD effect on BASE HITS:** Only when second (white) and third (green) dice are identical: if ball hit to SD player, reduce double or triple to single; if ball hit to LD player, increase hit by one base.

**SD and LD effect on PUT OUTS:** Only when second (white) and third (green) dice are identical: if ball is hit to LD player, batter reaches first base on error by that player (on foulouts, charge fielder with error, but batter does not reach, and must re-roll at First Roll).

**SD effect on ERRORS:** Only when second (white) and third (green) dice are identical: if ball is hit to SD player, no error occurs. Change error to put out. If error is to be added on to a hit, do NOT add error.

Possible Strikeouts						
MK2	MK1	Pitcher	PK1	PK2	PK3	PK4
6-6-5	6-6-3	6-6-1	6-5-5	6-5-3	6-5-1	6-4-5
6-6-3	6-5-5	6-5-1	6-4-3	6-3-5	6-3-1	6-2-3
6-6-1	6-5-1	6-4-1	6-3-1	6-2-1	6-1-1	5-6-1
6-5-5	6-4-3	6-3-1	6-1-5	5-6-3	5-5-1	5-3-5

6-5-3	6-3-5	<b>6-2-1</b>	5-6-3	5-4-5	5-3-1	5-1-3
6-5-1	6-3-1	<b>6-1-1</b>	5-5-1	5-3-1	5-1-1	4-5-1
6-4-5	6-2-3	<b>5-6-1</b>	5-3-5	5-1-3	4-5-1	4-2-5
6-4-3	6-1-5	<b>5-5-1</b>	5-2-3	4-5-5	4-3-1	4-1-1
6-4-1	6-1-1	<b>5-4-1</b>	5-1-1	4-4-1	4-1-1	3-4-1
6-3-5	5-6-3	<b>5-3-1</b>	4-5-5	4-2-3	3-5-1	3-1-5
6-3-3	5-5-5	<b>5-2-1</b>	4-4-3	3-6-5	3-3-1	2-5-3
6-3-1	5-5-1	<b>5-1-1</b>	4-3-1	3-5-1	3-1-1	2-3-1
6-2-5	5-4-3	<b>4-6-1</b>	4-1-5	3-3-3	2-5-1	2-2-5
6-2-3	5-3-5	<b>4-5-1</b>	3-6-3	3-2-1	2-3-1	2-1-1
6-2-1	5-3-1	<b>4-4-1</b>	3-5-1	2-6-4	2-1-1	1-4-1

Examples:

Lefty Grove's 1929 walk percentage was between .043 to .069. He's rated 1-2-6. Babe Ruth in 1927 had a walk percentage greater than 2.18 times the league average, so he gets a PW4. With Ruth facing Grove, he can get a walk on a roll of 1-5-4 or less.

Mark Koenig in 1927 had a walk percentage form .51 to .83 times the league average. That deserves an MW1 rating. He can only walk versus Grove on a roll of 1-2-2 or less.

**Note:** A form of the data in this chart will be included in calculations for the Advanced Game ratings.

Special thanks to Tom O'Toole for passing this along.

## Extra Innings Pitcher Fatigue Rating System

This is a fatigue system that I have been using for Extra Innings for some time now. It seems to work well for the many games that I have tested. The system considers two factors of pitcher fatigue during a game:

A: average innings per outing

B: total amount of base runners and runs allowed per game.

Here is how I go about getting each fatigue factor. First let's look at the stats for Pitcher A:

Games	Innings Pitched	ERA	Hits	Walks
31	226	3.14	196	62

First we need to find out how many innings Pitcher A averaged per game. Take innings pitched (226) divide by games played (31) which equals 7.29 or 7 1/3 rd innings. Rounding by thirds .00-.33 is 1/3 third; .34-.66 is 2/3 thirds; and .67-.99 I round up to the next inning.

So now we have created one part of the fatigue factor called the AIP. Now comes the second. Take the number of hits allowed and add it to the total walks allowed. In this case  $196 + 62 = 258$ , now divide 258 by 31 games to obtain the batters allowed to reach number per game, once again in this case 8.32. Now take the pitcher's ERA and add it to the batters allowed per game figure to obtain the second part of the equation. I. E.:  $3.14 + 8.32 = 11.46$  batters allowed to reach base or the BAR rating of 11. If the figure was instead 11.64, I would round up to obtain a rating of 12.

Pitcher A would have an AIP rating of 7 1/3 third  
BAR rating of 11.

Now comes the part of using the ratings in E. I. Since we know that Pitcher A averages 7 1/3 third innings per outing, how does he fatigue earlier or later than normal. This is where the BAR rating comes in. For every runner that reaches base by any means including fielder's choice and errors, I simply subtract one from his BAR rating. Since I used the pitchers ERA, any batter who scores counts off an additional point against the pitchers BAR rating.

Example: Batter B singles thus reducing Pitcher A's BAR rating by one, from 11 to 10. Then batter B scores on a double by Batter C, thus reducing Pitcher A's rating by two more numbers from 10 to 8. If during the course of the game, Pitcher A's BAR rating falls to 0 before he reaches his AIP rating, then he is considered to be tired or fatigued. Whenever this happens at whatever point in the game I then increase the pitchers ERA by .50 until the inning is complete. In this case Pitcher A would see his ERA increase from 3.14 to 3.64. If you choose to keep him in the game then every inning which Pitcher A continues to pitch I would raise his ERA by one full point.

Now let's say that Pitcher A has reached his AIP rating but has yet to yield to his BAR rating. I then would let Pitcher A continue at his same ERA until he has reached the 0 level of his BAR.



Since some pitchers seem to get better as the game goes on, if Pitcher A reached his AIP and has allowed less than 50% of his BAR, I would then decrease his ERA by .50 until the inning is complete. Thus Pitcher A's ERA would then go from  $3.14 - .50 = 2.64$ . He would then continue to pitch with this ERA until he completes the game or his BAR rating goes to 0, which at such a time I would then increase his ERA the same as above by .50 until the inning is complete.