

Superbowl $\bar{X}\bar{X}$ MCLIV: Atreides vs Harkonnen

Thematic Music:

<https://www.youtube.com/watch?v=HRwuB3ZntZg>

<https://www.youtube.com/watch?v=NNzGfibkIDI>

<https://www.youtube.com/watch?v=5MfYp3WMmdc>

Welcome Ladies and Gentlemen, Barons and Baronesses, Sardukar, Spacing Guild, and Bene Gesserit alike to what everyone is calling ‘The Match of the Millenium!’: Superbowl $\bar{X}\bar{X}$ MCLIV between the Harkonnen Spice Traders and the Atreides Argonauts. It's the classic game of football, but, as humanity had advanced since the Butlerian Jihad, so too have to rules and regulations of football become ever more complex. Complicated clauses, safety changes, and ancient traditions whose reasoning is long lost- practically only the field, the scoring, and ball are the same, and it now involves a lot of math. It has made judging a fair game much too risky to put in the hands of anyone other than an impartial mentat such as yourself who has knowledge of both mathematics and football!

A few notes before we begin. After the brutal career ending injury Duke Leto I suffered when going up against the Bulls last season, a new rule was established for this season to reduce the lethality of kickoffs- They are kicked from the kicking teams 20 yard line and A fair catch is declared as occurring exactly where the ball lands, or at the receiving teams 40 yard mark, whichever is more advantageous to the receiving team. Extra points are done from the 15 yard line. The game was taking place on the Emperor's personal stadium planet, which has been teraformed to have the gravity and size of Old Earth, and remove wind resistance.

So take a hit from the spice bong and a swig of water of life to ready yourself for the intense calculations required to properly call each play. Don't forget to round to the nearest number for each call!

The Coin Toss:

The Harkonnen Spice Traders won the coin toss.

Play 1:

The team that won the coin toss decided to kick first. When the ball was kicked, It traveled 50 yards.

Play 2:

The team with the ball hikes it back 7 yards, then the QB hands it to the Running back who runs forward 15 yards

Play 3:

The team with the ball hiked it back 3 yards, and then the QB handed it to the Running Back who ran forward in a straight line at 41.5 degrees to the right until he ran out of bounds.

Play 4:

The team with the ball hiked it back 5 yards and were quickly tackled. Duke Leto II was found to have been smoking spice during play, so the Atreides Argonauts received a 10 yard penalty.

Play 5:

The team with the ball calls a timeout and subs in one of their Cheerleaders as a runner. She's got a nice set of titties--probably size D. The giant jugs clause applies, and she can line up after the line of scrimmage with a handicap equal to the current Superbowl number over her bust size if they are both Roman numerals. the team with the ball hikes the ball back five yards and then throws it to the cheerleader, who barely manages to catch the ball.

Play 6:

The team with the ball decided to kick. They kicked at a 45 degree angle and imparted 100 lbf on the 14 oz football over a tenth of a second.

Play 7:

The team with the ball decides to kick. Unfortunately, the designated kicker kicked it at a sub-optimal angle and it only traveled the number of yards equal the number of continents on Old Earth times the number of them you've been shot on.

Play 8:

The team with the ball hiked it back 15 yards. The QB then sprinted forward 10 yards and threw a clean pass at a 15 degree angle at a constant speed of 35 mph. It was caught by the receiver.

Take a hit from the spice bong.

What is the score so far?

Who has possession?

What is the down/yard call for each play?

Bonus:

Calculate the running/passing stats for each team.

SPOILER: SOLUTIONS BELOW!

Solutions:

SCORE:

Atreides 6 – 0 Harkonnen

Downs & Possession:

- 1.) Atreides 1 & 10 at the 40 yard line
- 2.) Atreides 2 & 2 at the 48 yard line
- 3.) Atreides 1 & 10 at the 25 yard line
- 4.) Atreides 2 & 25 at the 40 yard line
- 5.) Atreides TD
- 6.) No Extra point
- 7.) Harkonnen 1 & 10 at the 41 yard line
- 8.) Harkonnen 2 & 1 at the 32 yard line

Math:

- 1.) The Atreides are receiving first, and it went to the 30 yard line. They get a 1st down on the 40 yard line due to the rule mentioned at the beginning.
- 2.) $15-7 = 8$ yards gained, so a second down with 2 to go at the 48 yard line.
- 3.) A football field is 160ft wide, so $160/2 = 80$ ft. $80\text{ft}/3 = 26.66$ yards. Using basic trig, TOA. $\tan(41.5) = 26.66\text{yards} / x$. $26.66\text{yards} / \tan(41.5) = 30.13$ yards \rightarrow 30 yards. Subtract 3 since that's how far behind the line of scrimmage they were, and we get 27 yards for 1 & 10 at the 25 yard line.
- 4.) -5 yards from tackle, -10 yards from penalty. So we need to make up an extra 15 yards. 2&25 at the 40 yard line.
- 5.) $\overline{\text{XXMCLIV}}$ in roman numerals is 21,151, and D is 500, $21,151/500=42$ yards. Since the cheerleader caught it, it's a Touchdown for the Atreides. + 6 points.
- 6.) First, we need to find the velocity. $V = F/m*t$. So $V = 100\text{lb}/(14\text{oz}) * 0.1\text{s} = 34.1608\text{ft/s}$
Now, combine this with the projectile range formula $R = (v * v * \sin^2(\theta)) / g = (34.1608 * 34.1608 * \sin^2(45))/32.174 = 36.27$ ft \rightarrow 12 yards. This is too short for the second point to be made.
- 7.) You said in you fun fact that you were shot on 3 continents, so the ball was kicked $3*7=21$ yards and now the Harkonnens have possession with a first down 1 & 10 at the 41 yard line, since the ball is initially kicked from the 20 yard line.
- 8.) The Harkonens pass from 5 yards behind the line of scrimmage. Use the projectile range formula $R = (v * v * \sin^2(\theta))/g$. 35mph in ft/s is 51.33ft/s. so we have $(51.33 * 51.33 * \sin^2(15))/32.174 = 40.945\text{ft}$. After removing the 5 yards from behind the line of scrimmage we get $40.945\text{ft}/3 - 5$ yards = 8.648 yards \rightarrow 9 yards according to the rounding rules. This puts them at 2 & 1 at the 32 yard line.