ArqamFC Data Specification v1.1

New additions:

- [Half Start and End: Late video start and Early Video End](#)
- [Clearance Body Part](#)
- [No touch pass](#)
- [Inswinging and Outswinging corners](#)
- [Shot from a Kick off](#)
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- [Off Target shot saved by the keeper.](#)
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Introduction:

Our data will model a game as a series of point-in-time events. Each event represents an action during the open play, or information about stops in play, substitutions etc.

Event List

ID	Event Name	Definition
2	Ball Recovery	An attempt to recover a loose ball
3	Dispossessed	Player loses ball to an opponent as a result of being tackled by a defender without attempting a dribble
4	Duel	A duel is a 50-50 contest between two players of opposing sides in the match.
~~5~~	~~Camera On*~~	~~Signals the stop of the camera to capture gameplay for a replay/video cut.~~
6	Block	Blocking the ball by standing in its path.

8	Offside	Offside infringement. Cases resulting from a shot or clearance (non-pass). For passes resulting in an offside check [pass outcomes section]().
9	Clearance	Action by a defending player to clear the danger without an intention to deliver it to a teammate.
10	Interception	Preventing an opponent's pass from reaching their teammates by moving to the passing lane/reacting to intercept it.
14	Dribble	An attempt by a player to beat an opponent
16	Shot	An attempt to score a goal, made with any (legal) part of the body.
17	Pressure	Applying pressure to an opposing player who's receiving, carrying or releasing the ball.
18	Half Start*	Signals referee whistle to start a match period.
19	Substitution	
20	Own Goal Against	An own goal scored against the team.
21	Foul Won	A foul won is defined as where a player wins a free-kick or penalty for their team after being fouled by an opposing player.
22	Foul Committed	Any infringement that is penalised as foul play by a referee. Offside are not tagged as a foul committed.
23	Goal Keeper	Actions that can be done by the goalkeeper.
24	Bad Behaviour	When a player receives a card due to an infringement outside of play.
25	Own Goal For	An own goal scored for the team.
26	Player On	A player returns to the pitch after a Player Off event.
27	Player Off	A player goes/ is carried out of the pitch without a substitution.
28	Shield	Player shields ball going out of bounds to prevent opponent from keeping it in play.
~~29~~	~~Camera off~~	~~Video broadcast leaves gameplay and show a replay or video is cut.~~
30	Ground Pass*	A pass where the ball doesn't come off the ground.
31	Low Pass**	A pass where the ball comes off the ground but stays under shoulder level at peak height.

32	High Pass	A pass where the ball goes above shoulder level at peak height.
33	50/50	2 players challenging to recover a loose ball.
34	Half End*	Signals the referee whistle to finish a match part.
35	Starting XI	Indicates the players in the starting 11, their position and the team's formation.
36	Tactical Shift	Indicates a tactical shift made by the team, shows the players' new positions and the team's new formation.
37	Error	When a player is judged to make an on-the-ball mistake that leads to a shot on goal.
38	Miscontrol	Player loses ball due to bad touch
39	Dribbled Past	Player is dribbled past by an opponent.
40	Injury Stoppage*	A stop in play due to an injury.
41	Referee Ball-Drop*	Referee drops the ball to continue the game after an injury stoppage.
42	Ball Receipt	

*if the pass was intended to be played on the ground and had few tiny jumps due to pitch conditions it's still coded as ground pass.

**For throw in and headers, passes that are played downwards are coded as low passes even though it starts above shoulder height. Other passes that are played upwards are high passes.

Events:

Half Start [ID: 18]

Possible Extra values:

ID	Extra	Value	Definition
266	Extra 1	Late Video Start	Signals that the match video wasn't complete and started after KO

For every half start event that has a late video start extra, the duration should show how much play time the video missed.

Half End [ID: 34]

Possible Extra values:

ID	Extra	Value	Definition
265	Extra 1	Early Video End	Signals that the match video wasn't complete and it ended before the period final whistle
298	Extra 1	Match suspended	Referee decides to end/postpone the game

For every half start event that has an early video end extra, the duration should show how much play time the video missed (remaining time + injury time if available).

Pass [ID: various]

An intended kick from one player to his teammate with the following differences:

ID	Event Name	Definition
30	Ground Pass	Ball doesn't come off the ground
31	Low Pass	Ball comes off the ground but is under shoulder level at peak height

32	High Pass	Ball goes above shoulderF level at peak height

Possible Outcomes:

ID G,L,H	Outcome	Definition
NA	None	Pass is complete
181,179, 180	Incomplete	Ball does not reach a teammate and is still in play
152,150, 151	Out	Ball goes out of bounds
155,153. 154	Pass Offside	Ball reaches teammate but pass is judged offside
158,156, 157	Injury Clearance	Ball is played out of bounds to stop play for an injury
216,214. 215	Unknown	Outcome is unknown (i.e. foul was called while in mid-flight)

Possible values of Extra 1 (source of pass):

ID	Extra 1	Definition
NA	None	Open-play pass
NA,159, 160	Throw-In	A pass from a throw-in
164,162 ,163	Free Kick	A pass from a free kick
167,165 ,166	Goal Kick	A pass from a goal kick
170,168 ,169	Corner	A pass from a corner kick
173,171 ,172	Kick Off	A pass from a kick off at the beginning of a match or after scoring
184,182 ,183	Recovery	One touch pass off a loose ball recovery

187,185 ,186	Interception	One touch pass off an interception

Possible values of Extra 2 (body parts):

ID	Extra 2	Definition
NA	None	Used in throw-ins and aerial duels
190,188 ,189	Right Foot	Pass with right foot
193,191 ,192	Left Foot	Pass with left foot
NA,194, 195	Head	Pass with head
199,197 ,198	Keeper Arm	Pass thrown from keepers hands
202,200	Other	Other body part (chest,back, etc.)
NA,211, 212	Drop Kick	Pass is a keeper drop kick
275,276 ,277	No Touch	A player deliberately let the a pass go past him instead of receiving it to deliver it to a teammate behind him

Possible entries of Extra 3, 4, 5 and 6:

ID	Field	Value	Definition
NA, 177, 178	Extra 3	Aerial Won	Pass off aerial duel
207, 204, 205	Extra 4	Miss-communication	Pass was accurate but receiving player misread the pass OR the run from the receiving player was correct and passer played in his previous position
295, 296, 297	Extra 5	Out	If the injury clearance pass has been played out of bounds
210, 208, 209	Extra 6	Through Ball	Pass cuts last line of defence
NA, 270, 272	Extra 6	Inswinging	For inswinging corners
NA, 271, 273	Extra 6	Outswinging	For outswinging corners
NA, 280, 281	Extra 6	Straight	Corner is neither inswinging or outswinging
219, 217, 218	Extra 3	Backheel	Pass is a backheel
222, 220, 221	Extra 4	Deflected	Pass was deflected but reached its destination

Other fields:

Name	Use
Player 2	Receiver (or intended receiver) of the ball
Field Position	Position of the intended receiver of the ball in an incomplete pass

Start Location	Position of pass start
End Location	Position of pass end*

*the end location of an offside pass is always the location of the player called offside.

Constraints:

Condition	Constraint
Event = Ground Pass	Extra 3 <> aerial won
All	Pass must have player 1
Extra 1 <> throw-in Extra 3 = none	If pass is throw-in or aerial won, doesn't need body-part in Extra 2 otherwise must have it
Extra 4 = miss-communication	If Extra 4 is miss-communication then pass must have an outcome
Player 2 = Null	Pass cannot have Field Position
Player 2 = Value Outcome = Null	Pass cannot have Field Position
Player 2 = Value Outcome <> Null/Pass Offside	Pass must have Field Position
All	Start Location = Value End Location = Value
Extra 1 = throw-in/corner	Start Location must be on the coordinates of the sideline for throw-ins, and on corner coordinates for corner kicks.
Outcome = Out	End location must be on the coordinates of the sideline.
Extra 6 = Outswinging/Inswinging/Straight	Extra 1 must be a corner and Event should be a high or a low pass
Ball Speed	If ball speed is > 30 and pass distance is >5, ball speed too fast If speed < 5 and not a header and not a high pass and distance > 5 then ball speed too slow

Possession Chain:

Outcome	Extra 1	Link
None	None	Middle
None	Value	Start
Value	None	Break
Value	Value	Row-Chain

Ball Reception [Derived]

Every pass has a duration that represents the time the pass took in flight (before being received). As a result, timestamp + duration = time of ball reception or defensive action (if pass is incomplete). If player is unable to control the ball, a miscontrol action follows immediately.

Player 2 is added in the field position column in incomplete passes where the target is clear to the data collector. If target is unclear then player 2 is empty.

Ball Recovery [ID: 2]

An attempt to recover a loose ball

Possible Entries:

ID	Field	Value	Definition
NA	Outcome	None	Successful recovery
31	Outcome	Recovery Failure	Ball is lost while attempting to recover a loose ball
NA	Extra 3	None	Recovered a ball from a clearance or lost by opposition
92	Extra 3	Offensive	Recovered ball lost by a teammate off bad touch or dribble
258	Extra 5	Out	If the ball went out of bounds after the failed recovery

Constraints:

Condition	Constraint
All	Field Position must always have a value

All	Must have Player 1

Possession Chain:

Outcome	Extra 3	Link
None	None	Start
None	Value	Middle
Value	None	Row-Chain
Value	Value	Break

Dribble [ID: 14]

An attempt by a player to beat an opponent

Possible Entries:

ID	Field	Value	Definition
27	Outcome	Complete	Dribble attempt was successful
28	Outcome	Incomplete	Player was unable to complete the act of attempting a dribble
91	Extra 1	Overrun	When a dribble goes past the original defender into the possession of another player
NA	Extra 1	None	Normal dribble that didn't get overrun
136	Extra 2	Nutmeg	Dribble went through opposing players legs
NA	Extra 2	None	Dribble that wasn't a nutmeg
284	Extra 3	No Touch	If the player attempted to do the dribble by passing the ball past the opponent instead of receiving it
264	Extra 5	Out	If the ball went out after an incomplete overrun dribble

Constraints:

Condition	Constraint
All	Field Position must always have a value
All	Player 1 must always have a value
All	Outcome must always have a value

Possession Chain:

Outcome	Link
Complete	Middle
Incomplete	Break

Foul Won [ID: 21]

A foul won is defined as where a player wins a free-kick or penalty for their team after being fouled by an opposing player.

Possible entries:

ID	Field	Value	Definition
29	Outcome	Penalty	Winning a penalty
30	Extra 3	Defensive	Winning a foul when out of possession
96	Extra 4	Advantage	Winning a foul that was not called due to advantage played

Constraint:

Condition	Constraint
All	Field Position must always have a value
All	Player 1 must always have a value

Possession Chain:

Extra 3	Extra 4	Link
None	None	Break
Defensive	None	Defense
None	Advantage	Middle
Defensive	Advantage	Defense

Foul Committed [ID: 22]

Any infringement that is penalised as foul play by a referee. Offside are not tagged as a foul committed.

Possible Entries:

ID	Field	Value	Definition
58	Outcome	Yellow Card	Receiving a yellow card for a foul
59	Outcome	Second Yellow	Receiving the a 2nd yellow card for a foul

60	Outcome	Red Card	Receiving a red card for a foul
61	Extra 1	Handball	Foul called due to handball infringement
62	Extra 1	Foul Out	Foul called due to foul out infringement
93	Extra 1	6 Seconds	Foul called due to 6 second infringement
94	Extra 1	Backpass Pick	Foul called due to back-pass pick up infringement
95	Extra 1	Dangerous Play	Foul called due to dangerous play
64	Extra 3	Offensive	Foul committed when in possession of the ball
131	Extra 4	Advantage	Foul committed but play was waved on
226	Extra 1	Dive	Foul committed due to simulation
63	Extra 2	Penalty	Foul committed results in a penalty kick

Constraint:

Condition	Constraint
All	Field Position must always have a value
All	Player 1 must always have a value

Possession Chain:

Extra 3/4	Link
None	Defense
Offensive	Break
Advantage	Defense

Shot [ID: 16]

An attempt to score a goal, made with any (legal) part of the body.

Possible Outcomes:

ID	Outcome	Definition
13	Blocked	A shot that was stopped from continuing by a defender

14	Goal	A shot that was deemed to cross the goal-line by officials
15	Saved	A shot that was saved by the opposing team's keeper
16	Off T	A shot that's initial trajectory ended outside the posts
17	Post	A shot that hit one of the three posts
282	Saved Off T	A shot that was saved by the goalkeeper but was not on target.
283	Saved To Post	If the keeper saves the shot and it bounces off the goal frame
149	Wayward	An unthreatening shot that was way off target or did not have enough power to reach the goal line (or a miskick where the player didn't enough make contact with the ball)

Possible Extras:

ID	Field	Value	Definition
18	Extra 1	Open Play	Shot is not directly from a set-piece
19	Extra 1	Free Kick	Shot is from a direct free kick
20	Extra 1	Penalty	Shot is a penalty kick
21	Extra 1	Corner	Shot direct from a corner kick
278	Extra 1	Kick Off	Shot direct from a kick off
23	Extra 2	Left Foot	Shot attempted with the left foot
22	Extra 2	Right Foot	Shot attempted with right foot
24	Extra 2	Head	Shot attempted with head
25	Extra 2	Other	Other body parts (i.e knee, chest, etc)
26	Extra 3	Aerial Won	An aerial duel was contested for the shot
103	Extra 4	Diving Header	Shot attempted with header while player diving in front of him to reach the ball
100	Extra 4	Normal	A shot that does not fall into any other technique
98	Extra 4	Half Volley	Contact was made off the ground and after a bounce

97	Extra 4	Volley	The ball never touched the ground prior to the shot
99	Extra 4	Overhead Kick	Player's back was to goal when taking the shot
101	Extra 4	Backheel	A shot that was taken with the heel
102	Extra 4	Lob	A shot that had a high arc trajectory in order to pass over the opposition player
104	Extra 5	Deflected	Shot was redirected by another players touch but ended with the original outcome
<mark>274</mark>	<mark>Extra 5</mark>	<mark>Out</mark>	<mark>If a wayward/post shot goes out of bounds</mark>
105	Extra 6	First Time	Player's first touch
80	Extra 6	Redirect	Shot redirected from another shot
NA	Attacking Freeze Frame	(Player Name)	Position of attacker when contact was made with shot
NA	Defending Freeze Frame	(Player Name)	Position of defender when contact was made with shot

Constraint:

Condition	Constraint
All	Must have start + end location
Extra 1 <> Penalty	Must have freeze frame
Extra 1 <> Open Play	Extra 2 must be normal, lob, or backheel
Extra 1 <> Open Play	Extra 3 must be none
Extra 4 = Half Volley	Extra 6 must be first time
Outcome <> Blocked or Wayward	Goal location must have a value

Possession Chain:

Extra 1	Link
Open-Play	Break

Not Open-Play	Row-Chain

Duel [ID: 4]

A duel is an 50-50 contest between two players of opposing sides in the match. Duel events doesn't include all challenges (see pairs section). And it indicates two actions:
1- A successful tackle in a ground Ground duel which is when **extra 1 = tackle.**
2- A lost challenge in an aerial duel when **extra 1= Aerial Lost.** Successful aerial challenges is classified under 4 actions: Pass, shot, clearance and miscontrol.

Possible Outcomes:

ID	Outcome	Definition
34	Won	A tackle that ended up in possession of the tackler
142	Success In Play	A tackle that knocked the ball to a teammate
144	Success Out	A tackle that knocked the ball out of bounds in favor of tackler's team
138	Lost In Play	A tackle that knocked the ball to an opponent
139	Lost Out	A tackle that knocked the ball out of bounds in favor of opposition
NA	No Outcome	Aerial Lost

Possible values of Extra 1:

ID	Extra 1	Definition
37	Tackle	Dispossessing opposing team player
38	Aerial Lost	Challenging for an aerial duel and not winning the ball

Constraints:

Condition	Constraint
Extra 1=Tackle	Outcome must have value
All	Player 1 must have value
All	Field position must have value

Possession Chain:

Outcome	Link

Won	Start
Not Won	Defense

Block [ID: 6]

Blocking the ball by standing in its path.

Possible Outcome:

ID	Outcome	Definition
106	Save Block	A block of a shot that was definitely going to be on target by an outfield player

Possible Extras:

ID	Extra	Value	Definition
107	Extra 1	Deflection	Block that did not reverse or strongly redirect the ball's trajectory
259	Extra 5	Out	If the blocked ball goes out of bounds

Constraints:

Condition	Constraint
All	Must have field position
All	Player 1 must be = value

Possession Chain:

Condition	Link
All	Defense

Clearance [ID: 9]

Action by a defending player to clear the danger without an intention to deliver it to a teammate.

Possible Entries:

ID	Field	Value	Definition
42	Extra 3	Aerial Won	Clearance with the head that was also an aerial duel won
261	Extra 2	Right Foot	Clearance with right foot
262	Extra 2	Left Foot	Clearance with left foot
263	Extra 2	Head	Clearance with head
279	Extra 2	Other	Other body part (chest,back, etc.)
260	Extra 5	Out	If the cleared ball goes out of bounds

Constraints:

Condition	Constraint
All	Must have field position
All	Player 1 must be = value

Possession Chain:

Condition	Link
All	Defense

Interception [ID: 10]

Possible Outcomes:

ID	Outcome	Definition
39	Won	A tackle that ended up in possession of the tackler
143	Success In Play	A tackle that knocked the ball to a teammate

145	Success Out	A tackle that knocked the ball out of bounds in favor of tackler's team
140	Lost In Play	A tackle that knocked the ball to an opponent
141	Lost Out	A tackle that knocked the ball out of bounds in favor of opposition

Constraints:

Condition	Constraint
All	Player 1 must have value
All	Outcome must have value
All	Field position must have value

Possession Chain:

Outcome	Link
Won	Start
Not Won	Defense

50/50 [33]

2 players challenging to recover a loose ball.

Possible Outcomes:

ID	Outcome	Definition
108	Won	The player wins the 50/50 contest and regain possession
147	Success To Team	The player wins the 50/50 contest and knocks the ball to a his team's possession
148	Success To Opposition	The player wins the 50/50 contest but knocks the ball to a opponent's possession
109	Lost	The player loses the 50/50 contest

Possible Extra:

ID	Extra 5	Definition
285	Out	If the ball goes out of bounds after a 50/50 challenge

Constraints:

Condition	Constraint
All	Must have field position
All	Outcome must be = value
All	Player 1 must be = value

Possession Chain:

Outcome	Link
Won	Start
Success To Team	Defense
Success To Opposition	Defense
Lost	Defense

GoalKeeper [ID: 23]

Actions that can be done by the goalkeeper. Actions are first categorized by Extra 1, then an outcome and other extras are added.

Possible Outcomes:

ID	Outcome	Definition
50	Won	Retained possession
51	Success	Successful action for collect, parried to teammate in smother

52	Fail	Unsuccessful action
~~53~~	~~Lost~~	~~Unable to retain possession~~
54	Collected Twice	Keeper collected the ball in multiple tries after fumbling first collect
56	Saved Twice	Keeper made the save in multiple tries after fumbling the first save
57	Touched Out	Keeper touched the ball out of bounds
125	In Play Safe	Goalkeeper save where shot is parried to teammate
126	In Play Danger	Goalkeeper save where shot is parried to opposing team player
127	Claim	Keeper sweeper action where keeper collects the ball
128	Clear	Keeper sweeper action where keeper clears the ball
129	Touched In	Goal conceded despite keeper touching the ball
130	No Touch	Goal conceded without keeper touching the ball
288	Success In Play	A smother that knocked the ball to a teammate
289	Success Out	A smother that knocked the ball out of bounds in favor of tackler's team
290	Lost In Play	A smother that knocked the ball to an opponent
291	Lost Out	A smother that knocked the ball out of bounds in favor of opposition
292	Punched out	The keeper punches the ball out of boundaries

Possible Extra 1:

ID	Extra 1	Definition
43	Collected	Keeper coming out to collect a ball

44	Punch	Keeper punch away (similar to clear)
45	Shot Saved	Keeper save from opposing team shot
46	Smother	Equivalent to a tackle for an outfield player, keeper coming out to dispossess a player
47	Penalty Saved	Save from a penalty kick
48	Goal Conceded	Goalkeeper concedes a goal
49	Penalty Conceded	Goalkeeper concedes a goal from a penalty kick
110	Save	Keeper save from a non-shot
111	Keeper Sweeper	When keeper comes off his line and/or out of his box to clear the ball
112	Shot Faced	A shot faced that did not lead to a save or goal conceded
299	Shot Saved Off T	Keeper save from opposing team shot that was going off target
300	Shot Saved to Post	A shot saved by the goalkeeper that hits the post
301	Saved to Post	A save by the goalkeeper that hits the post
302	Penalty Saved to Post	A penalty saved by the goalkeeper that hits the post

Possible Extra 2:

ID	Extra 2	Definition
113	Right Foot	Save was made with right foot
114	Left Foot	Save was made with left foot
115	Head	Save with head
116	Chest	Save with chest
117	Right Hand	Save with right hand
118	Left Hand	Save with left hand

119	Both Hands	Save with both hands

Possible Extra 3:

ID	Extra 3	Definition
120	Set	Keeper was stationary when the shot was taken
122	Prone	Keeper was on the ground when the shot was taken
121	Moving	Keeper was moving when the shot was taken

Possible Extra 4:

ID	Extra 4	Definition
123	Diving	Keeper left his feet in order to make the save
124	Standing	Keeper made the save from a standing position

Possible Extra 5:

ID	Extra	Definition
294	Out	Comes with keeper sweeper clear if the clearance goes out.

Constraints:

Condition	Constraint
All	Player 1= Value
All	Player 2 = Null
All	Extra 1 = Value
Extra 5,6	Extras are null
Outcome = No Touch	Extra 2 = Value

Outcome <> No Touch/Null Extra 1 <> Collected/Punch/Smother/Keeper Sweeper	Extra 2 = Value
Outcome = No Touch Or Outcome = Touched In	Extra 1 =Goal Conceded/PenaltyConceded
Extra 1 = Sweeper Keeper	Extra 2,3,4 = Null
Extra 1 = Collected	Outcome = Success/Fail/Collected Twice
Extra 1 = Punch	Outcome = Fail/In Play Safe/ In Play Danger/Punched Out
Extra 1 = Shot Saved/Penalty Saved/Save	Outcome = Success/In Play Safe/In Play Danger/Saved Twice/Touched Out
Extra 1 = Shot Saved/Penalty Saved/Save	Extra 4 = Value
Extra 1 = Smother	Outcome = Won/Success/Lost
Extra 1 = Sweeper Keeper	Outcome = Claim/Clear
Extra 1 = Shot Faced	Outcome = Null
All	Start Location = Null End Location = Null
Extra 1 = Collected/Punch/Smother/Keeper Sweeper/Shot	Field Position = Value Goal Location = Null

Faced	
Extra 1 <> Goal conceded/penalty conceded	Field Position = Value Goal Location = Value Keeper Location = Value*
Extra 1 <>Shot saved/save/penalty saved	Field Position = Value Goal Location = Value*

Goal location represents the location where the ball crossed the goal line or was supposed to cross the goal line

Keeper location represents the nearest location the keeper's save body part was when the ball crossed the goal line.

Possession Chain:

Value	Link	Type
Won/Claim/Collected Twice/Saved Twice	Start	Outcome
Outcome = Success & Extra 1 = Shot Saved/Collected/Save	Start	Outcome + Extra 1
All	Defense	All

Miscontrol [ID: 38]

Player loses the ball due to bad touch

Possible Extras:

ID	Extra	Value	Definition
1	Extra 3	Aerial won	

Constraints:

Condition	Constraint
All	Must have field position
All	Player 1 must be = value

Possession Chain:

	Link
	Break

Starting XI [ID: 35] & Tactical Shift [ID: 36]

Indicates the players' positions in the starting 11, their position and the team's formation.

Possible Fields:

Name	Use
Tactical Formation	The formation of the team
Tactical Position	Position of the player in the formation

Constraints:

Players should be equal to 11 (or 11 minus number of players sent off)

Possession Chain:

Both events are **Independent** links.

Injury Stoppage [ID: 40]

Possible Extra:

ID	Extra 4	Definition
137	In Chain	Ball is the team's possession when the play was stopped

Possession Chain:

Extra 4	Link
Blank	Independent
In Chain	Break

Player Off [ID: 27]

A player goes/ is carried out of the pitch without a substitution.

Possible Extra:

ID	Extra 1	Definition
293	Permanent	Player leaves the field permanently without being subbed off

Constraint:

Player 1 must have a value

Possession Chain:

Always independent.

Other Events

ID	Event Name	Constraints	Possession Chain
3	Dispossessed	Field Position and player 1 must always have a value	Break
8	Offside	Field Position and player 1 must always have a value	Independent
17	Pressure	Field Position and player 1 must always have a value (Field position shows the spot where the player started to apply pressure & the duration of the event shows the duration that he kept applying pressure)	Defense
18	Half Start		Independant
19	Substitution	Player 1 and Player 2 must have value	Independant
20	Own Goal Against	Field Position and player 1 must always have a value	Defense
24	Bad Behaviour	Player 1 must always have a value	Independant
25	Own Goal For		Independant
26	Player On	Player 1 must always have a value	Independant
27	Player Off	Player 1 must always have a value	Independant
28	Shield	Field Position must always have a value	Defense
34	Half End		Independant
37	Error	Field Position and player 1 must always have a value	Defense
39	Dribbled Past	Field Position must always have a value	Defense
41	Referee Ball-Drop	Field Position must always have a value	Independant

Data Validation

After the collection of a match has been completed, the data go through three types of validation: event sequence, player sequence, and event pair validation. Both event and player sequence validation are only concerned with the data of one team. Only event pair validation relates the data of the two teams.

Event Sequence Validation:

Checking sequence of events made by one team.

Seven types of links:

Link	Definition
Start	Start of chain
Middle	Middle of chain
Break	End of chain
Row-Chain	Both a chain starter and ender in one row
Defense	Defensive action
Independent*	Events not related to chains
New Half**	Start of a half

** New Halves can follow any type of link
* Independent links can follow or be followed by any type of link. When looking at sequence of links, independent links are ignored and the next link is considered for validation, e.g. the following sequence of links will be interpreted as shown below:

#	Link		#	Link
1	start		1	start
2	break	Is Interpreted as	2	break
3	independent		3	defense
4	defense			

The following is a list of each type of link, what each link can follow, and what can be followed by each link:

Start:
- Can follow:
  - Break
  - Defense
  - Row-Chain
  - New Half
- Can be followed by:
  - Middle
  - Break

Middle:
- Can follow:
  - Start
  - Middle
- Can be followed by:
  - Middle
  - Break

Break:
- Can follow:
  - Start
  - Middle
- Can be followed by:
  - Start
  - Row-Chain
  - Defense

Row-chain:

- Can follow:
  - Break
  - Row-Chain
  - Defense
  - New Half
- Can be followed by:
  - Start
  - Row-Chain
  - Defense

Defense:
- Can follow:
  - Break
  - Row-Chain
  - Defense
  - New Half
- Can be followed by:
  - Start
  - Row-Chain
  - Defense

New Half:
- Can follow:
  - All
- Can only be followed by:
  - Start
  - Row-Chain
  - Defense

Player validation:

Checking sequence of event-players in one team. Valid sequence depends on events and link types. Independent events are ignored. The following table shows all events that are checked for a valid player sequence. The table should be read as follows: if **event** is assigned this **link**, the next event by the same team should have **same** player or **receiver** of pass as player 1.

Event	Link	Next Event-Player
GoalKeeper	Start	Same
Interception	Start	Same
Duel	Start	Same
50/50	Start	Same
Dribble	Middle	Same
Foul Won	Middle	Same
Ball Recovery	Start/Middle	Same
Pass	Start/Middle	Receiver

Event-Pair validation:

Checking expected event pairs. Each **left pair** should have its corresponding **right pair** within two seconds. Pass and shot event times are equal to event time + event duration. Each event pair should be within 5 yards of each other (or 5 units when using goal location). FP (field position), SL (start location), EL (end location), and GL (goal location) in the **location** column refer to the location type used to validate the event-pair. In some cases, the left pair's location type is not the same as the right pair's, e.g. incomplete pass and interception.

Event names in the table may be confusing. By "Dribble: Complete" I mean to say that the event is dribble and the outcome is complete. Please refer to the event descriptions if event description is unclear.

Left Pair	Right Pair	Location	Notes
Foul Won	Foul Committed	FP	Foul committed not handball or foul-out
Dribble: Complete	Dribbles Past	FP	
Dribble: Overrun		FP	Complete or incomplete dribble
Duel: Tackle	Dribble: Incomplete	FP	Dribble not Overrun
	Dispossessed	FP	
Pass: Aerial Won	Duel: Aerial Lost	FP	
Shot: Aerial Won	Duel: Aerial Lost	FP	
Shot: Saved	GK: Shot Saved	GL	
	Block: Save Block	EL - FP	Shot EL. Block FP.
Shot: Blocked	Block	EL-FP	Shot EL. Block FP.
Shot: Saved: Penalty	GK: Penalty Saved	GL	
Shot: Goal	GK: Goal Conceded	GL	
Shot: Goal: Penalty	GK: Penalty Conceded	GL	
50/50: Won	50/50: Lost	FP	

Player Off	Player On	None	Same Player
Pass: Incomplete	Interception	EL - FP	
	50/50		
	Ball Recovery		
	Clearance		
	Block		
	Foul Won		
	Foul Committed		
	GK: Collected		
	GK: Punch		
	GK: Keeper Sweeper		
	Pass: Recovery	EL - SL	
	Pass: Interception		

For every event pair, there will be a forward looking Related Pair ID that points to a Match-Level ID so as to identify the pair.
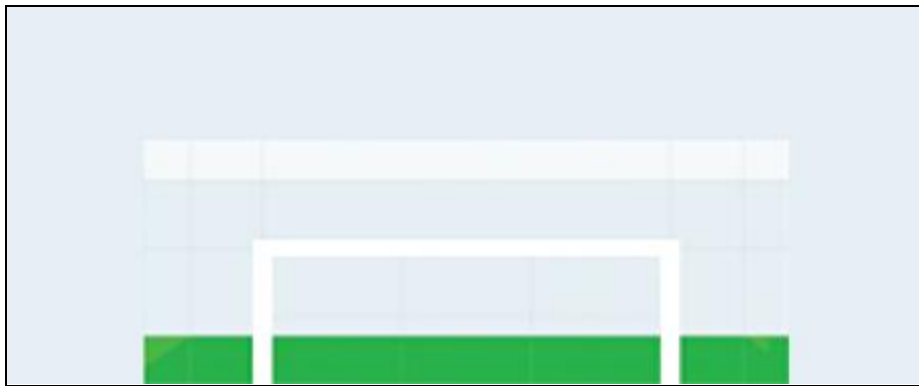
Appendix

Field map coordinates (1,1)-(120,80), 120,80 is bottom right
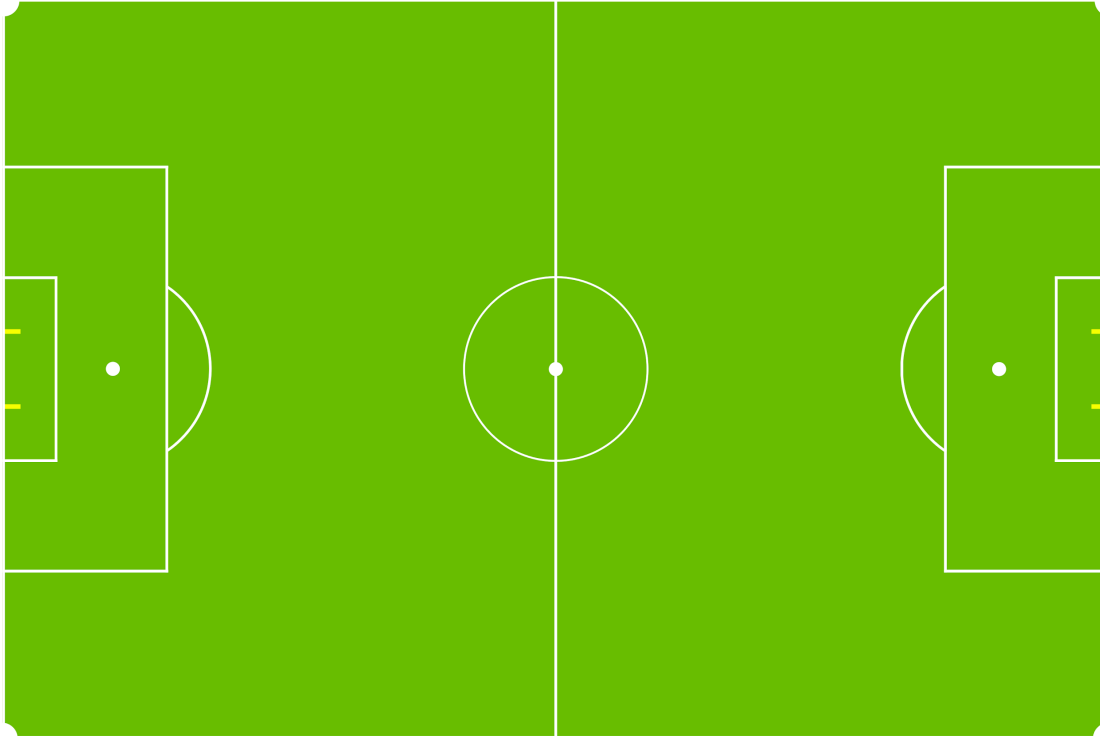
Goal location map coordinates (1,1)-(100,100)
100,100 is bottom right

Goal width is 28-72
Goal height is 100-64

Tactical Positions Guide:

Formations:

1. **Parent formation: 4-4-2**
   a. 4-4-2
      Valid positions:
         GK
         LB- LCB-RCB-RB
         LM-(LCM/LDM)-(RCM/RDM)-RM
         LCF-RCF
   b. 4-4-1-1
      Valid positions:
         GK
         LB- LCB-RCB-RB
         LM-(LCM/LDM)-(RCM/RDM)-RM
         CAM
         CF

c. 4-1-2-1-2

Valid positions:

GK

LB- LCB-RCB-RB

CDM

LCM-RCM

CAM

LCF-RCF

d. 4-2-2-2

Valid positions:

GK

LB- LCB-RCB-RB

(LCM/LDM)-(RCM/RDM)

LAM-RAM

LCF-RCF

2. **Parent Formation 4-3-3**

a. 4-3-3

Valid positions:

GK

LB- LCB-RCB-RB

CDM

LCM-RCM

LW-RW

CF

3. **Parent Formation 4-5-1**

a. 4-5-1

Valid positions:

GK

LB- LCB-RCB-RB

(CDM/CM)

LM-LCM-RCM-RM

CF

b. 4-1-4-1

Valid positions:

GK

LB- LCB-RCB-RB

CDM

LM-LCM-RCM-RM

CF

c. 4-3-2-1

Valid positions:

GK

LB- LCB-RCB-RB

CDM

LCM-RCM

LAM-RAM

CF

d. 4-2-3-1

Valid positions:

GK

LB- LCB-RCB-RB

(LCM/LDM)-(RCM/RDM)

LW-CAM-RW

CF

4. **Parent Formation 3-5-2**

a. 3-5-2

Valid positions:

GK

LCB-CB-RCB

LWB-CDM-RWB

LCM-RCM

LCF-RCF

b. 3-5-1-1

Valid positions:

GK

LCB-CB-RCB

LWB-CDM-RWB

LCM-RCM

CAM

CF

5. **Parent Formation 3-4-3**

a. 3-4-3

Valid positions:

GK

LCB-CB-RCB

LWB-(LCM/LDM)-(RCM/RDM)-RWB

LW-RW

CF

b. 3-4-2-1
   Valid positions:
   GK
   LCB-CB-RCB
   LWB-(LCM/LDM)-(RCM/RDM)-RWB
   LAM-RAM
   CF

c. 3-4-1-2
   Valid positions:
   GK
   LCB-CB-RCB
   LWB-(LCM/LDM)-(RCM/RDM)-RWB
   CAM
   LCF-RCF

Off Camera Mode:

- A new extra "Off Camera" is added in extra 7 for all events collected based on logical assumptions by the collector. These actions should only be the ones who are considered by the collectors essential (Kick off actions, assists, throw ins, goal kicks …..etc). All off camera events will follow the above mentioned validation rules.