

GAMEPLANNING WITH NEURAL NETWORKS

PATRICK POWERS

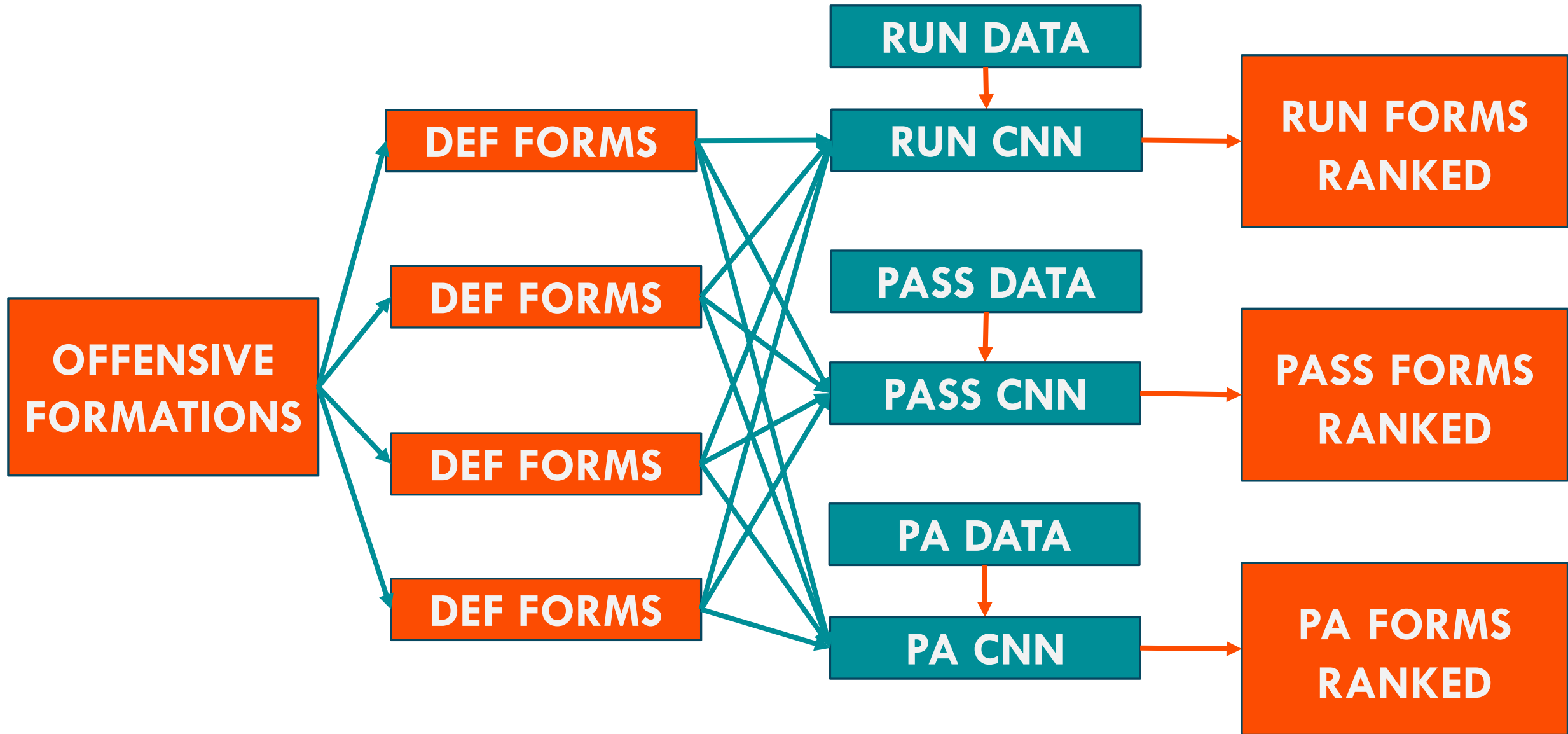
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INTRODUCTION

- This presentation outlines a mock gameplan created by a coach using convolutional neural networks, k-means clustering, and domain expertise
- The training data contains base downs, which includes all 1st and 2nd downs within the -10 and the -25, except all such plays within the final 2 minutes of each half (Miami offense and Cleveland defense excluded)
- The offensive and defensive base down alignments are split into runs, passes, and play action passes
- Each train a separate convolutional neural network and project the expected yardage based on each formation
- Miami's offensive formations are next clustered, followed by Cleveland's defensive looks it has shown to each offensive formation cluster
- Each Offensive and Defensive Cluster then pass through the run, pass and play action neural networks to predict yardage values
- Formations are ranked by expected value with the run, pass, and play action by their expected yards per play, Explosive Play percentage (12+ yards for runs, 16+ yards for passes), and Negative Play percentage
- From the results the coach selected the optimal formations for the next game and design the plays around them

MODEL DESIGN



PRESENTATION OF THE DATA

- The coach picked 6 runs, 6 passes, and 3 play action looks for the Miami offense to install for the game against Cleveland
- With the looks selected, the coach used domain expertise to pick plays to succeed within these looks
- The Call Sheet, Concept Sheet, Formation Sheet, and Wednesday Script show different presentations of the base downs plays to be installed the Wednesday of game week
- Runs, Passes, and Play Actions each have 1-2 pages dedicated to the anticipated defensive alignment and summary statistics of the expected performance
 - The shaded area on the formation charts signifies the area owned pre-snap by the offense and defense
 - The size of the dots represents how much space each player controls normalized by position, which the coach used to determine who to target and who to avoid
- Each formation has 2 plays per look, which are drawn up against the model's predicted alignment of the Cleveland Browns against the formation



MIAMI DOLPHINS GAME PLAN - BASE OFFENSE

**VS CLEVELAND BROWNS
WEEK 10 - NOVEMBER 13, 2022**

BASE PERSONNELS AND CALL SHEET

DEPTH CHART

LETTER	#	POS	NAME
X	10	WR	TYREEK HILL
	11	WR	CEDRICK WILSON JR
Z	17	WR	JAYLEN WADDLE
	85	WR	RIVER CRACRAFT
Y	88	TE	MIKE GESICKI
	81	TE	DURHAM SMYTHE
F	14	WR	TRENT SHERFIELD
	30	FB	ALEC INGOLD
H	31	RB	RAHEEM MOSTERT
	23	RB	JEFF WILSON
	3	RB	MYLES GASKIN
	2	RB	CHASE EDMONDS

PERSONNEL GROUPS

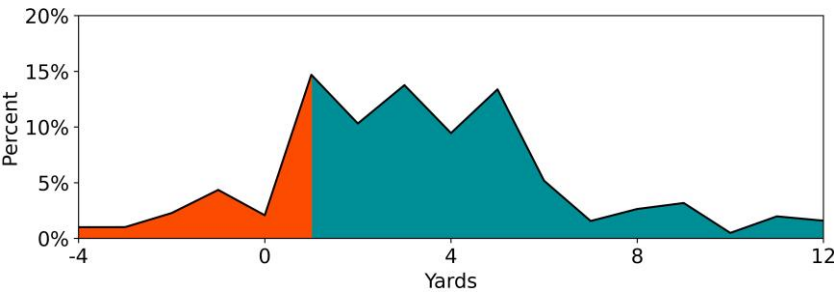
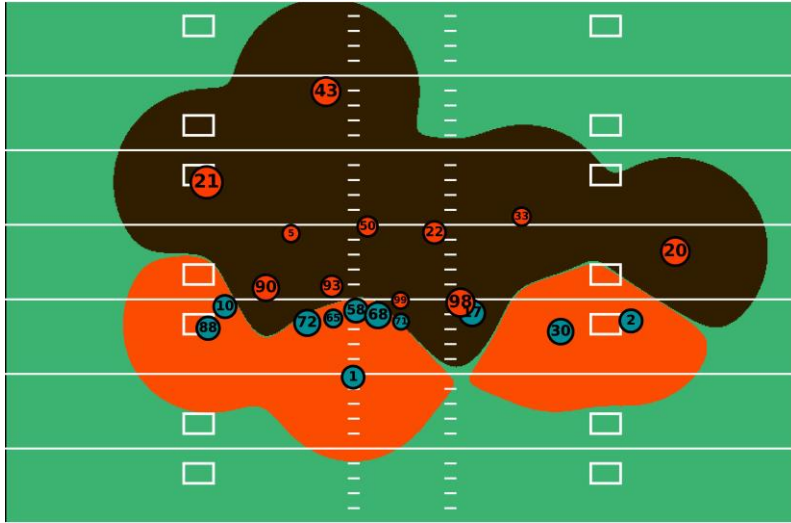
PERS	LETTER	1ST	2ND
11	X	TYREEK HILL	CEDRICK WILSON JR
	Z	JAYLEN WADDLE	RIVER CRACRAFT
	Y	MIKE GESICKI	DURHAM SMYTHE
	F	TRENT SHERFIELD	
21	H	RAHEEM MOSTERT	JEFF WILSON
	X	TYREEK HILL	CEDRICK WILSON JR
	Z	JAYLEN WADDLE	RIVER CRACRAFT
	Y	MIKE GESICKI	DURHAM SMYTHE
	F	ALEC INGOLD	
	G	RAHEEM MOSTERT	JEFF WILSON

CALL SHEET

TYPE	#	PERSONNEL	FORMATION	CONCEPT
RUNS	1	11	TITE DEUCE 8	STICK Q-WRAP ST
	2	11	TITE DEUCE 8	TWIG H-SMOKE Q-KICK WK
	3	21	TROY FLOP A H-LAUNCH	SWING Q-KICK ST
	4	21	TROY FLOP A H-LAUNCH	COUNTER GY
	5	21	TITE DOS FLOP B	BASH WK SHOVEL
	6	21	TITE DOS FLOP B	DINGO STAY
	7	11	TRIO SPLIT STACK B	DINGO ST READ
	8	11	TRIO SPLIT STACK B	DART ST READ
	9	11	TITE TROY FLOP B F-FLY	DALLAS ST STAY X-OUT
	10	11	TITE TROY FLOP B F-FLY	SPEED OPTION WK
	11	11	DOS FLOP A	TEXAS READ
	12	11	DOS FLOP A	TRAP ST
PA	13	11	NASTY TROY ZEUS U	JUMP DUO FLOOD Z-CROSS
	14	11	NASTY TROY ZEUS U	JUMP DINGO SPLIT X-CROSS
	15	11	DOS B	JUMP BASH SLICE
	16	11	DOS B	JUMP POWER DRIVE X-POCO
	17	11	DOS FLIP A	JUMP BASH ST HANGER SWIRL
	18	11	DOS FLIP A	JUMP BASH ST WIZ Z-CROSS
PASS	19	11	TITE STACK TREY A	QUICK 50 STICK YETI
	20	11	TITE STACK TREY A	60 TRACER CHIP Y-FLAT
	21	21	TITE DOS FLOP A	QUICK 90 BURST STICK
	22	21	TITE DOS FLOP A	50 MESH
	23	21	CLOSE STACK TWINS FLEX A	QUICK 80 SNAG
	24	21	CLOSE STACK TWINS FLEX A	60 DRIVE SEMO
	25	11	TITE DEUCE B F-FLY	QUICK 100 SNAG
	26	11	TITE DEUCE B F-FLY	70 MILLS
	27	21	TRIO B F-JET	QUICK 90 STICK SLANT
	28	21	TRIO B F-JET	FOLD 60 HANGER
	29	11	NASTY DEUCE 6	QUICK 50 BURST SPACING
	30	11	NASTY DEUCE 6	50 SWAP X-SHALLOW

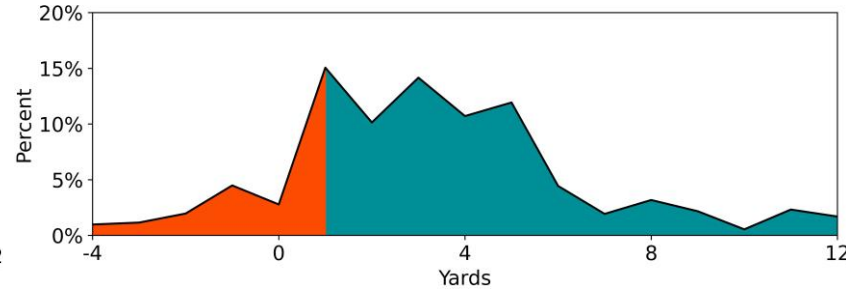
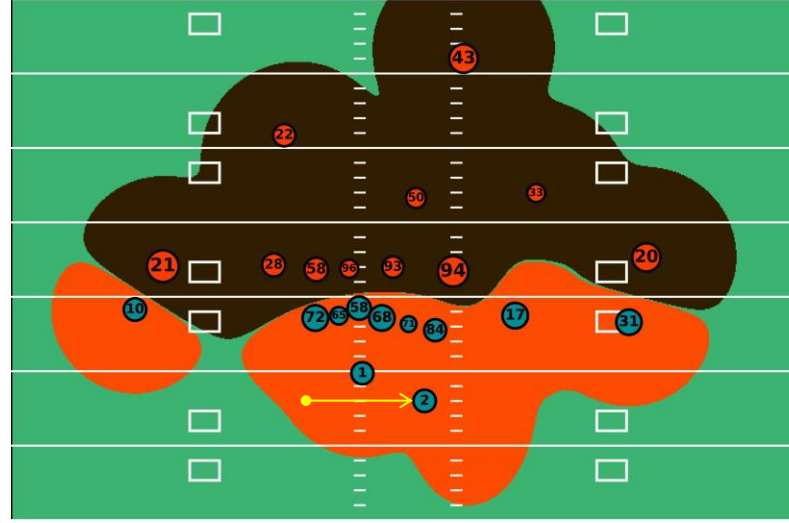
BASE RUN FORMATIONS

(11) TITE DEUCE 8



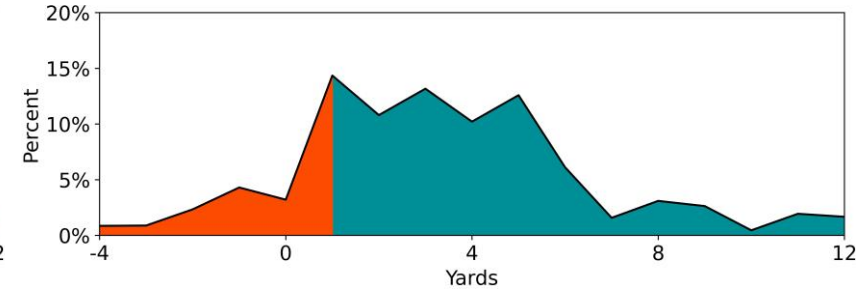
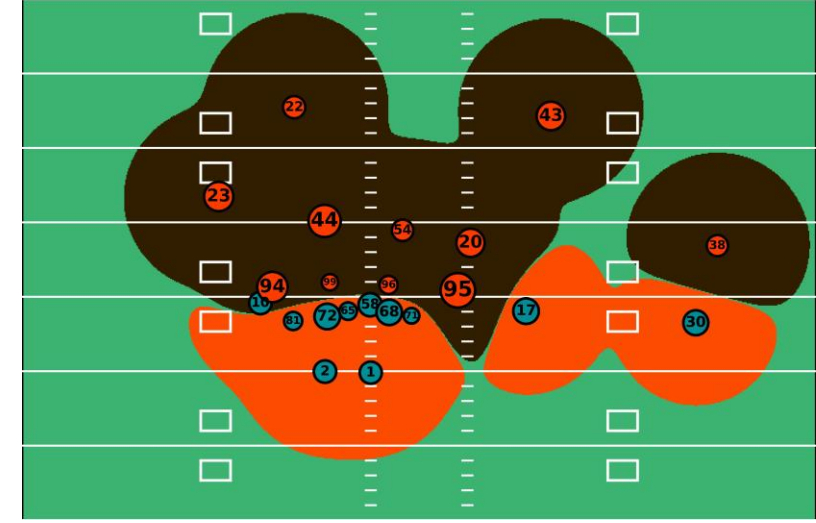
EXPECTED DEFENSE: OVER MIKE 3
YARDS PER PLAY: 4.74
EPA PER PLAY: 0.10
EXPLOSIVE PERCENTAGE: 11.0%
NEGATIVE PERCENTAGE : 10.3%

(21) TROY FLOP A H-LAUNCH



EXPECTED DEFENSE: BEAR MIKE 1
YARDS PER PLAY: 4.66
EPA PER PLAY: 0.09
EXPLOSIVE PERCENTAGE: 10.6%
NEGATIVE PERCENTAGE : 10.0%

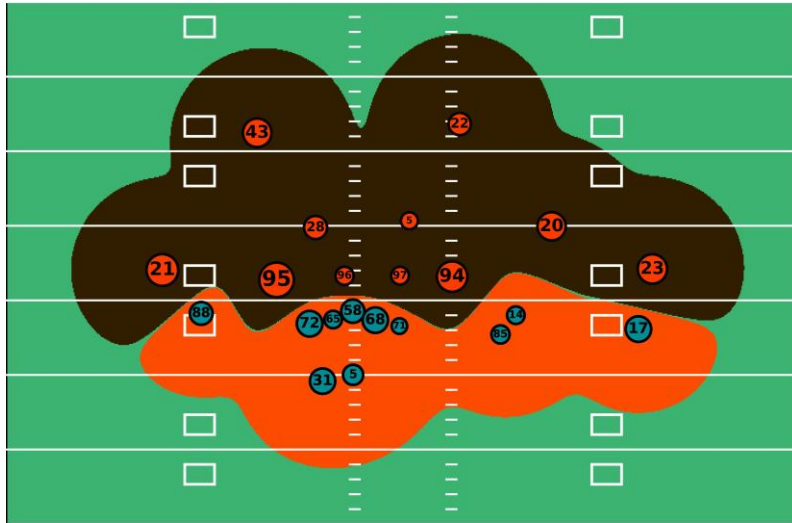
(21) TITE DOS FLOP B



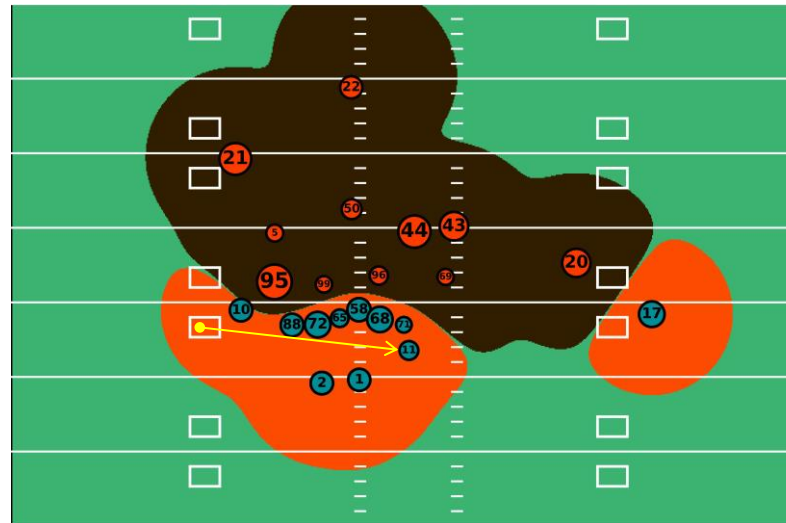
EXPECTED DEFENSE: OVER SPLIT 4
YARDS PER PLAY: 4.61
EPA PER PLAY: 0.08
EXPLOSIVE PERCENTAGE: 9.9%
NEGATIVE PERCENTAGE : 10.0%

BASE RUN FORMATIONS

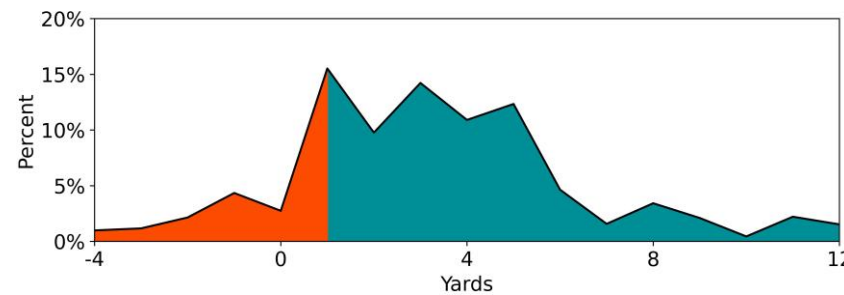
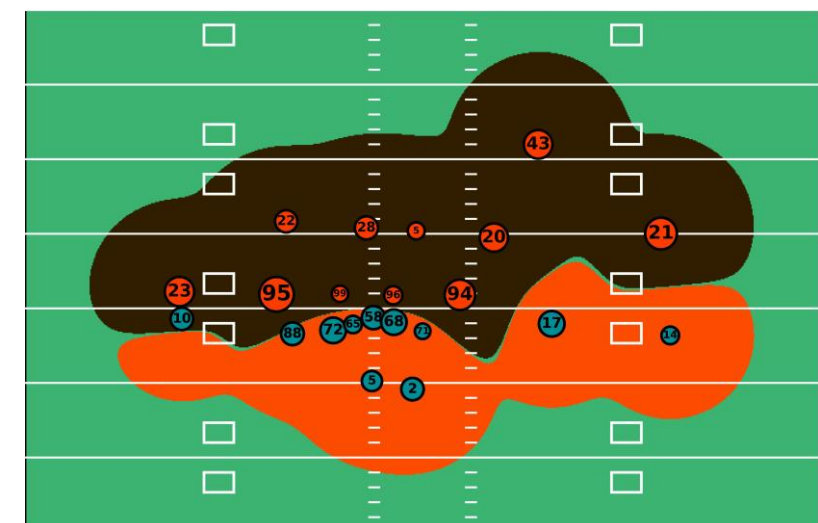
(11) TRIO SPLIT STACK B



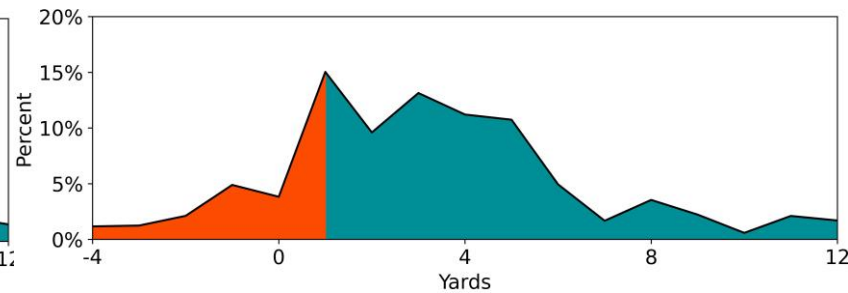
(11) TITE TROY FLOP B F-FLY



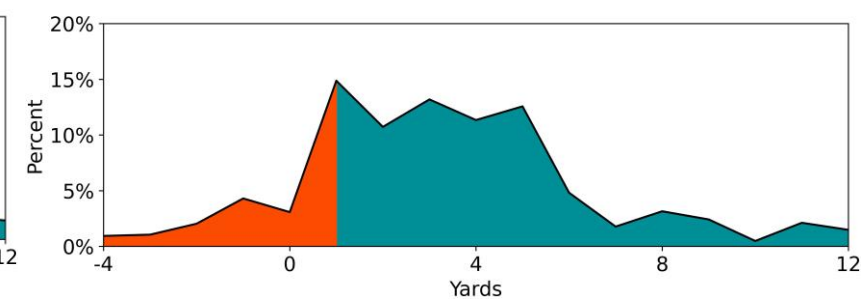
(11) DOS FLOP A



EXPECTED DEFENSE: OVER SPLIT 3
YARDS PER PLAY: 4.56
EPA PER PLAY: 0.07
EXPLOSIVE PERCENTAGE: 9.9%
NEGATIVE PERCENTAGE : 10.2%



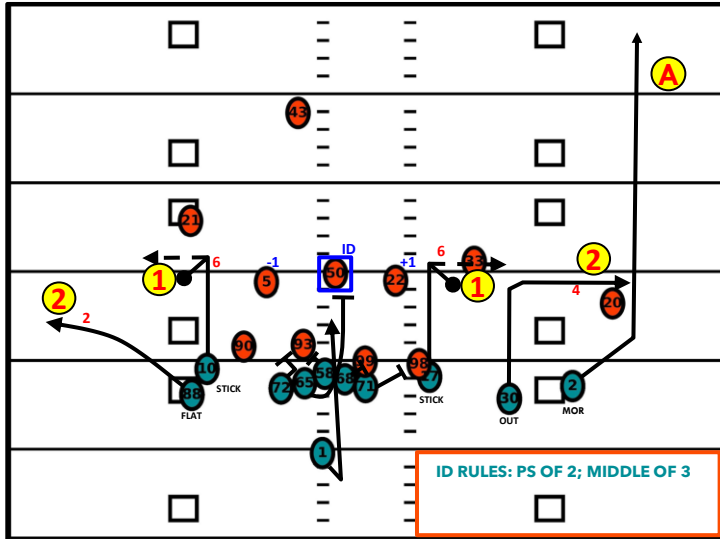
EXPECTED DEFENSE: OVER SPLIT 1
YARDS PER PLAY: 4.56
EPA PER PLAY: 0.07
EXPLOSIVE PERCENTAGE: 10.2%
NEGATIVE PERCENTAGE : 11.1%



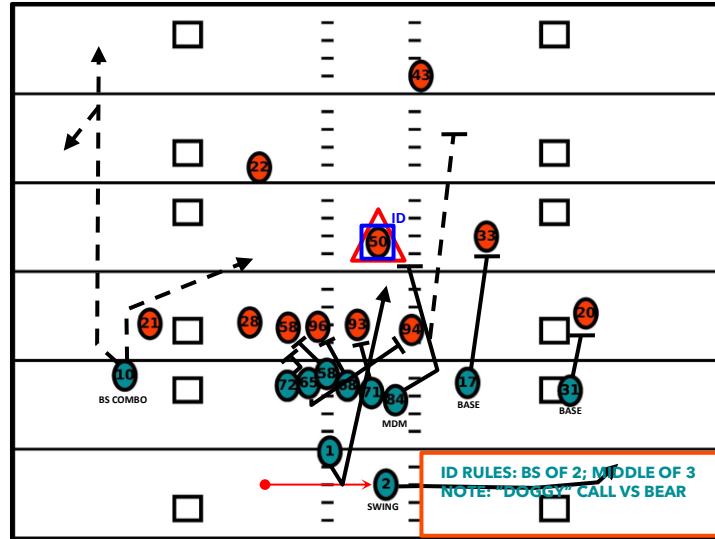
EXPECTED DEFENSE: OVER SPLIT 3
YARDS PER PLAY: 4.55
EPA PER PLAY: 0.07
EXPLOSIVE PERCENTAGE: 9.7%
NEGATIVE PERCENTAGE : 9.7%

BASE RUN PLAYS

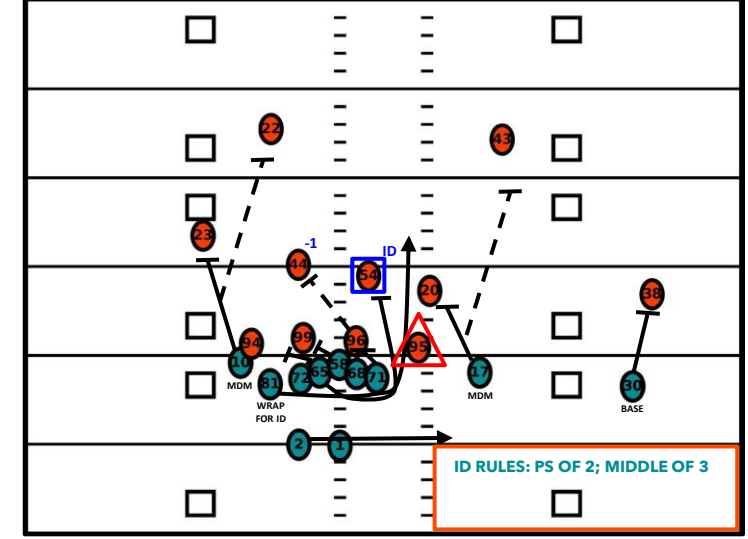
(11) TITE DEUCE 8 STICK Q-WRAP ST



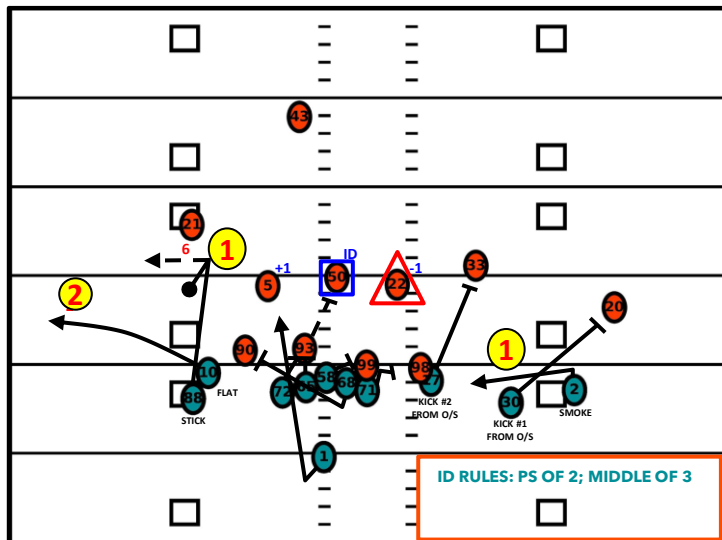
(21) TROY FLOP A H-LAUNCH SWING Q-KICK ST



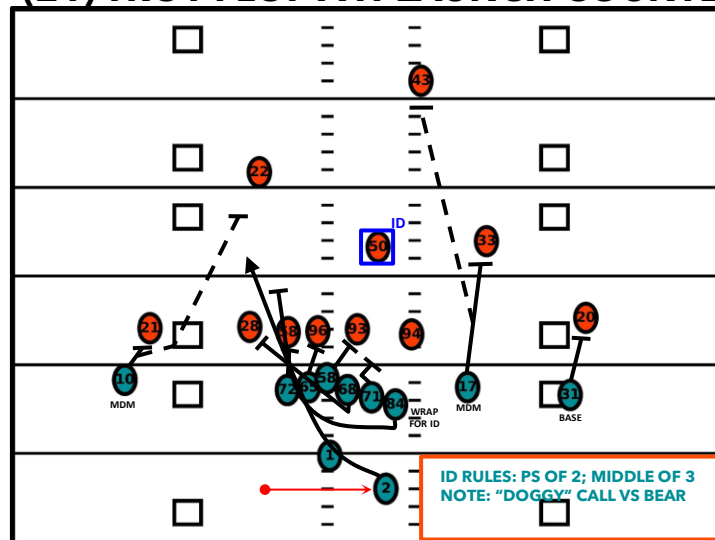
(21) TITE DOS FLOP B BASH WK SHOVEL



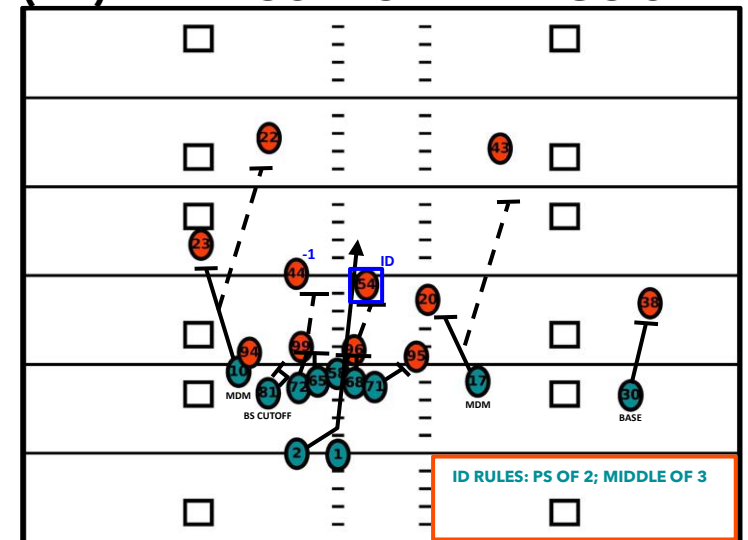
(11) TITE DEUCE 8 TWIG H-SMOKE Q-KICK WK



(21) TROY FLOP A H-LAUNCH COUNTER

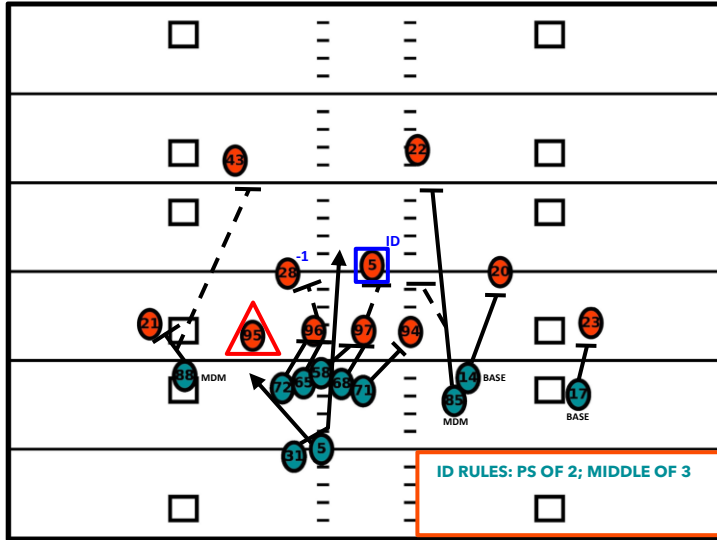


(21) TITE DOS FLOP B DINGO STAY

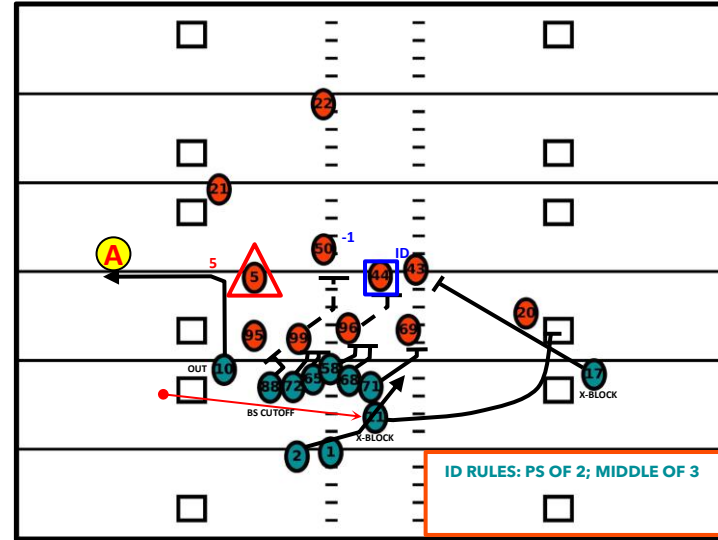


BASE RUN PLAYS

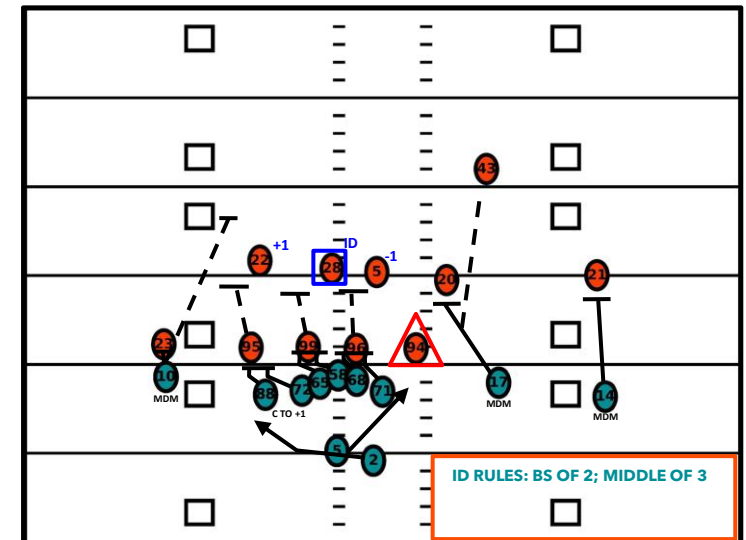
(11) TRIO SPLIT STACK B DALLAS ST READ



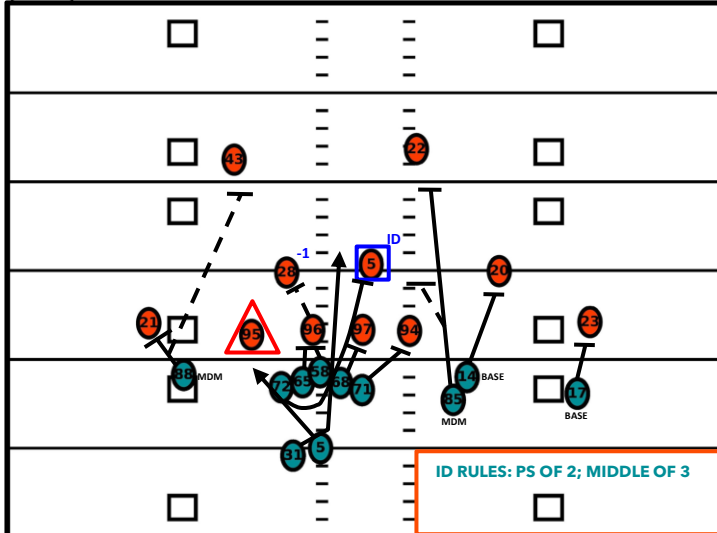
(11) TITE TROY FLOP B F-FLY DALLAS ST STAY X-OUT



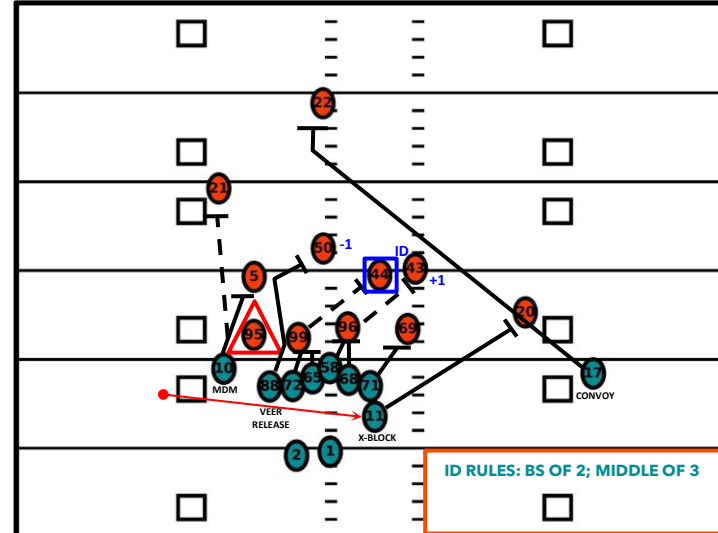
(11) DOS FLOP A TEXAS READ



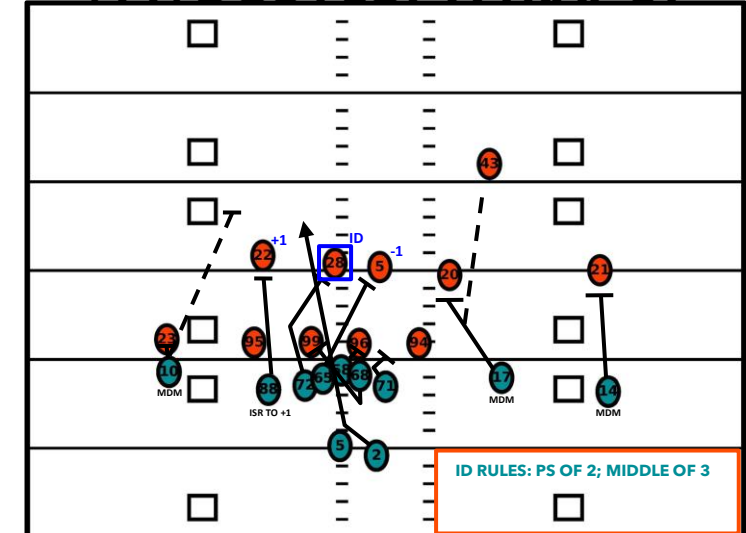
(11) TRIO SPLIT STACK B DART ST READ



(11) TITE TROY FLOP B F-FLY SPEED OPTION WK

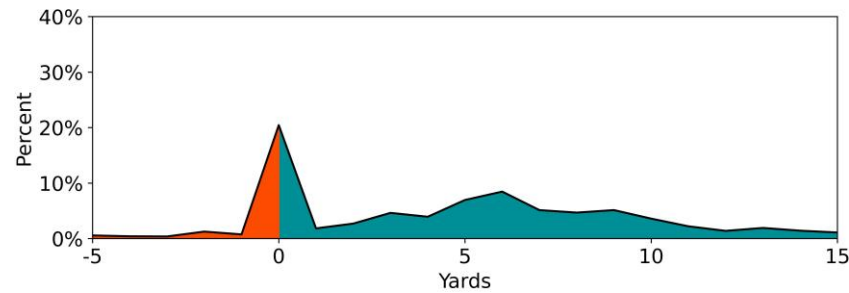
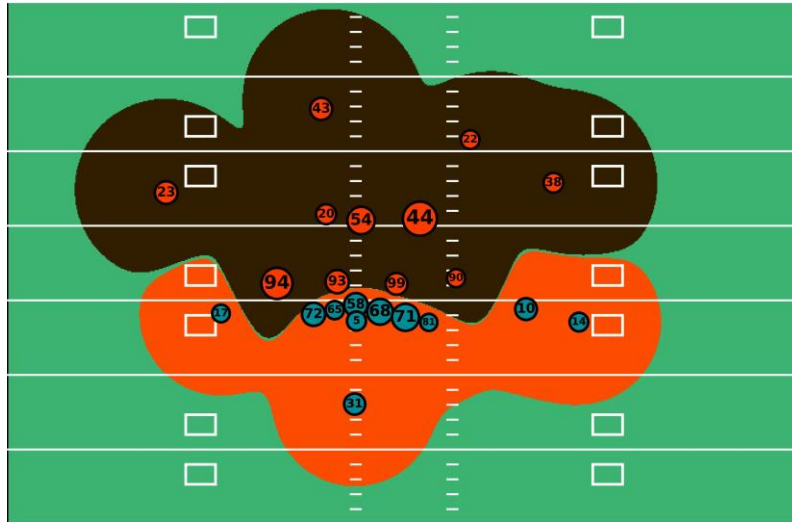


(11) DOS FLOP A TRAP ST



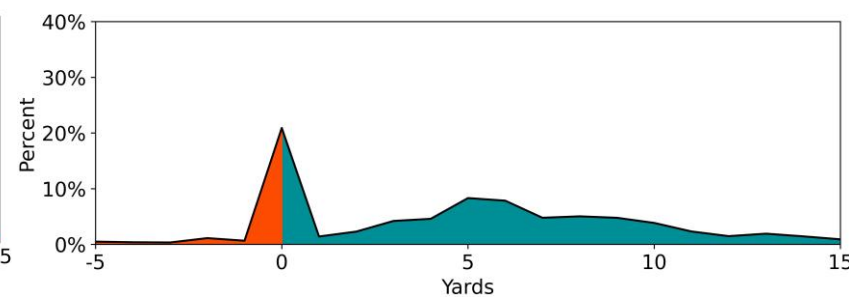
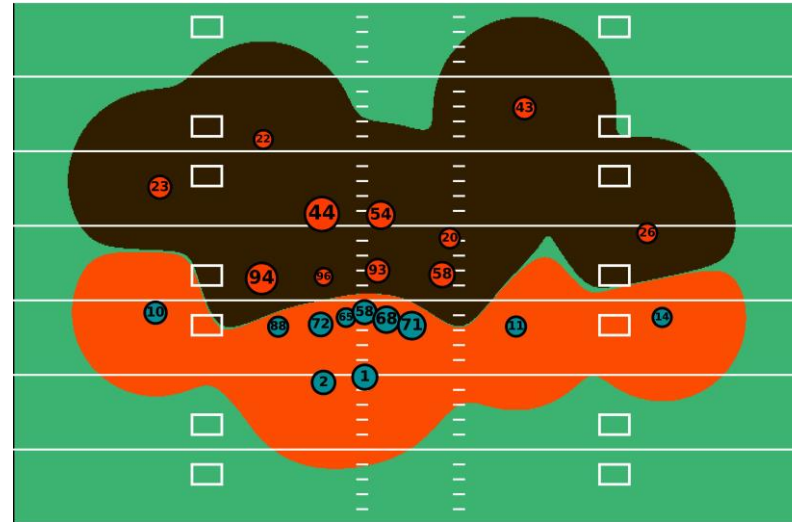
BASE PLAY ACTION FORMATIONS

(11) NASTY TROY ZEUS U



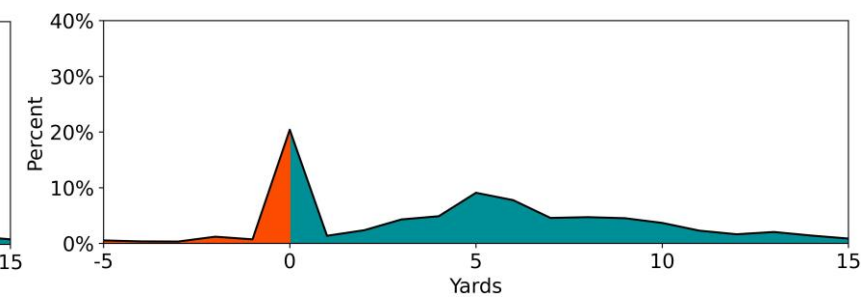
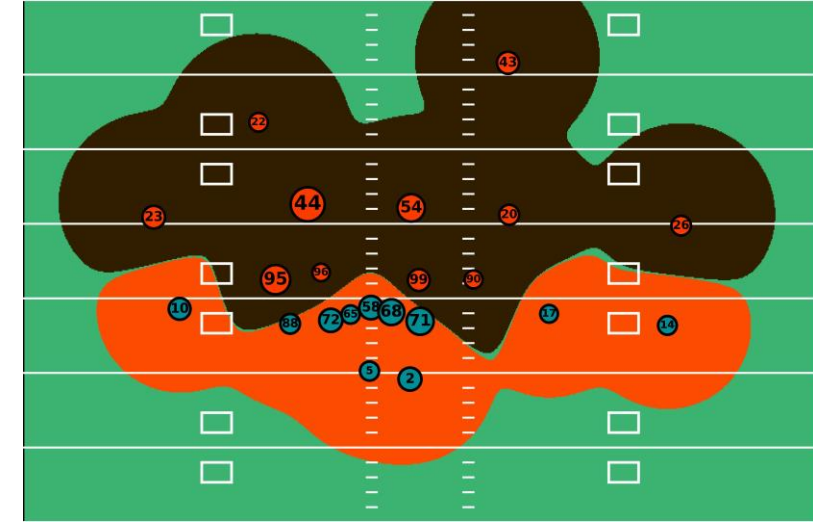
EXPECTED DEFENSE: OVER STACK 3
YARDS PER PLAY: 6.62
EPA PER PLAY: 0.35
EXPLOSIVE PERCENTAGE: 14.4%
NEGATIVE PERCENTAGE : 10.1%

(11) DOS B



EXPECTED DEFENSE: OVER SPLIT 4
YARDS PER PLAY: 6.61
EPA PER PLAY: 0.35
EXPLOSIVE PERCENTAGE: 14.2%
NEGATIVE PERCENTAGE : 9.7%

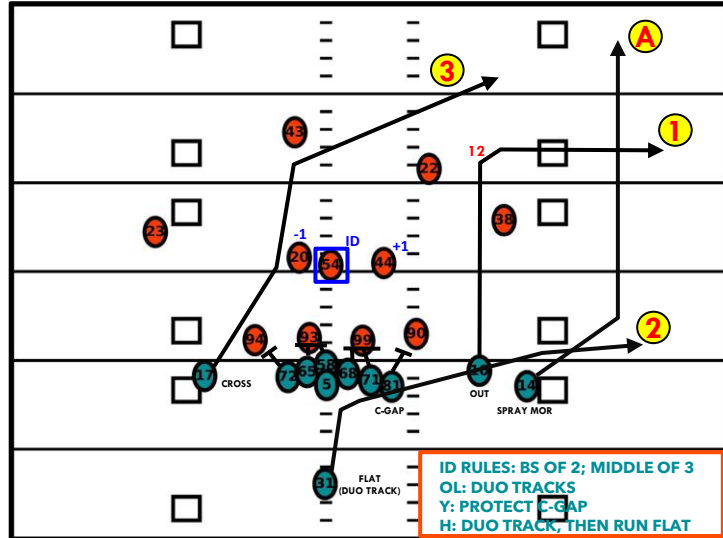
(11) DOS FLIP A



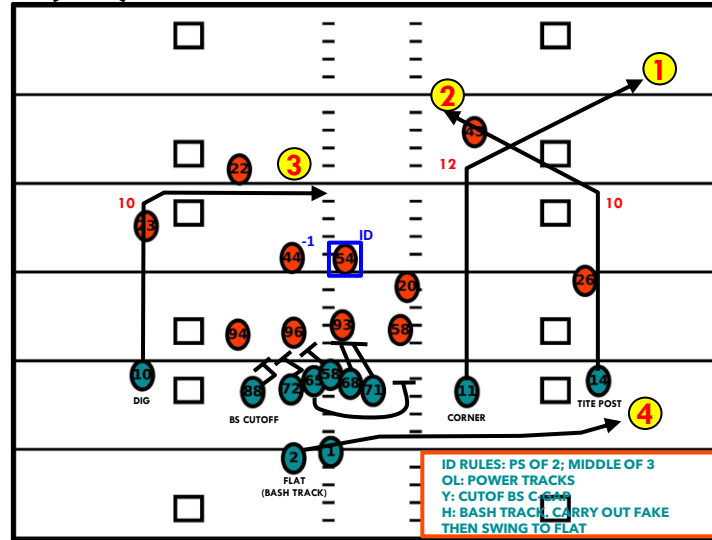
EXPECTED DEFENSE: EVEN SPLIT 3
YARDS PER PLAY: 6.57
EPA PER PLAY: 0.34
EXPLOSIVE PERCENTAGE: 14.3%
NEGATIVE PERCENTAGE : 9.8%

BASE PLAY ACTION PLAYS

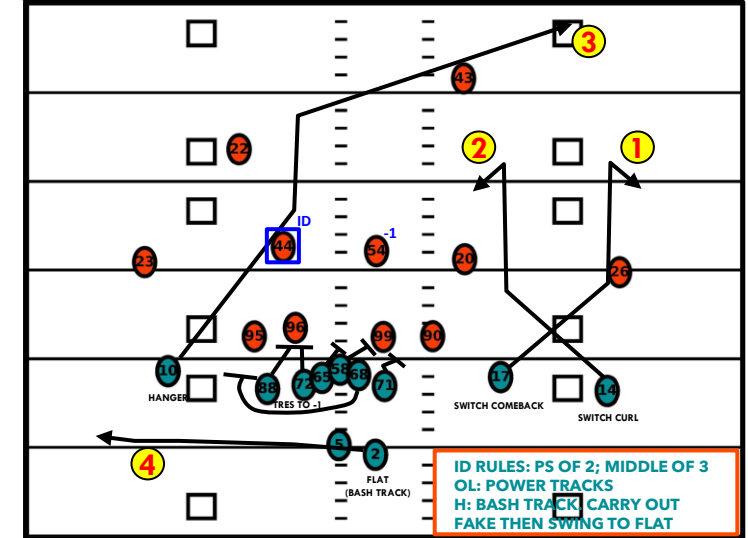
(11) NASTY TROY ZEUS U JUMP DUO FLOOD Z-CROSS



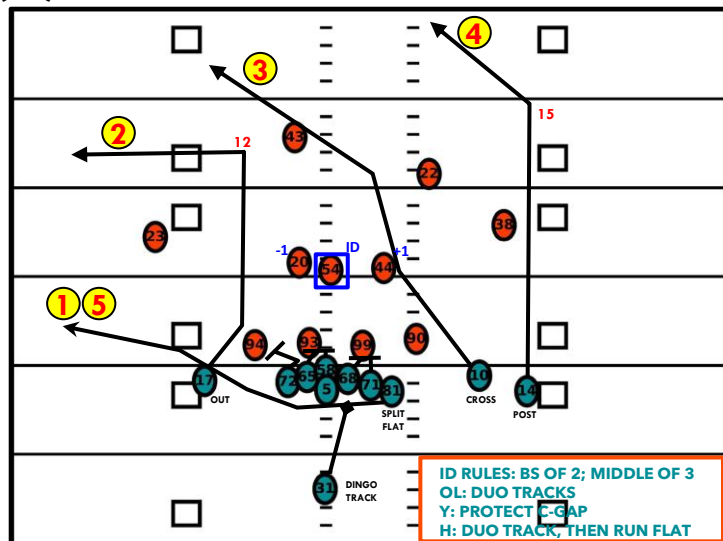
(11) DOS B JUMP BASH SLICE



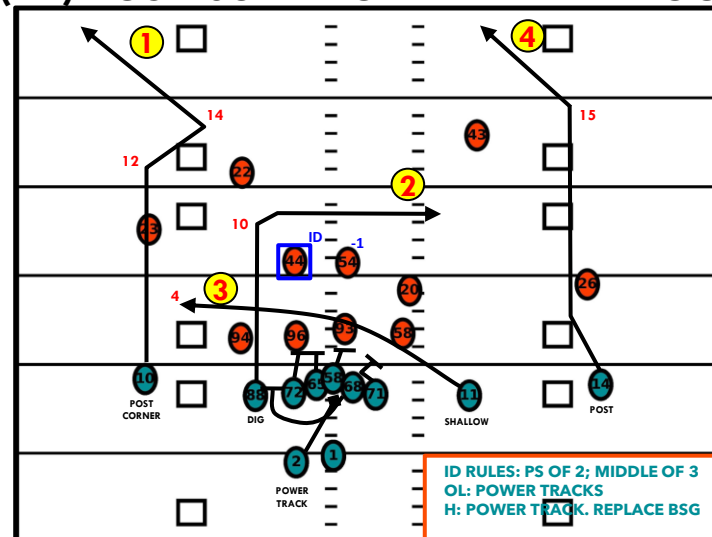
(11) DOS FLIP A JUMP BASH ST HANGER SWIRL



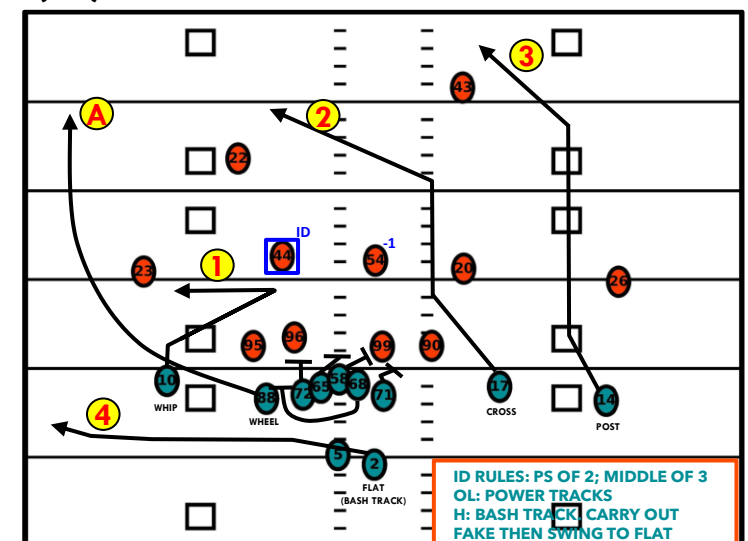
(11) NASTY TROY ZEUS U JUMP DUO FLOOD Z-CROSS



(11) DOS B JUMP POWER DRIVE X-POCO

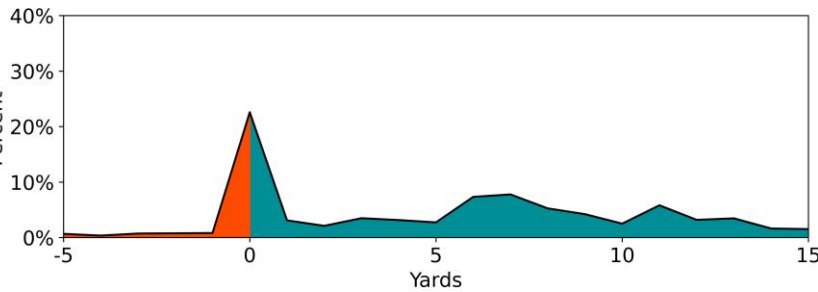
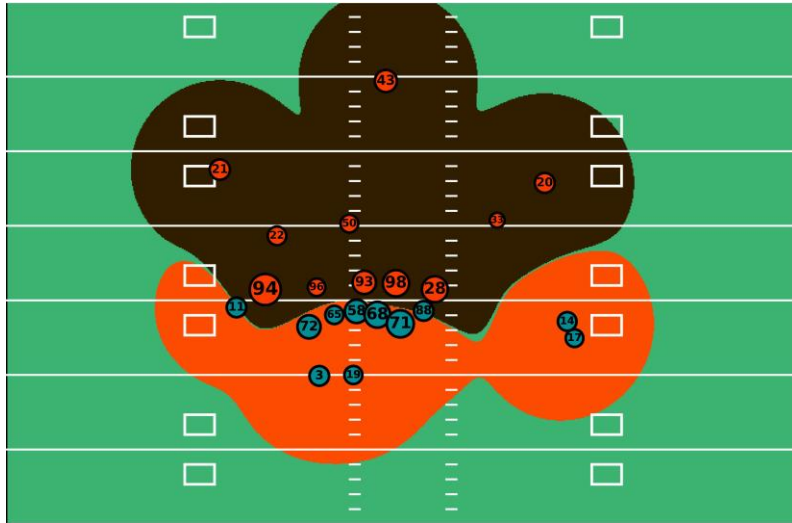


(11) DOS FLIP A JUMP BASH ST WIZ Z-CROSS



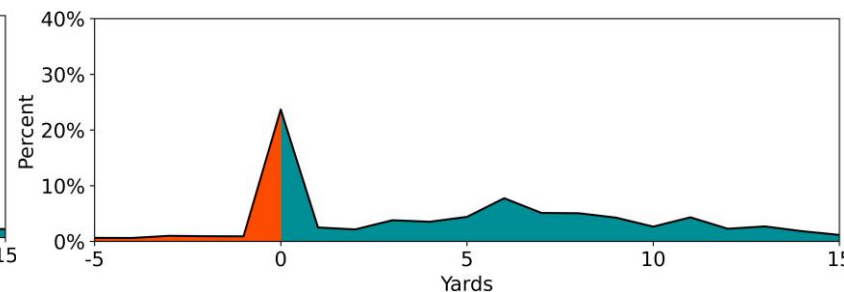
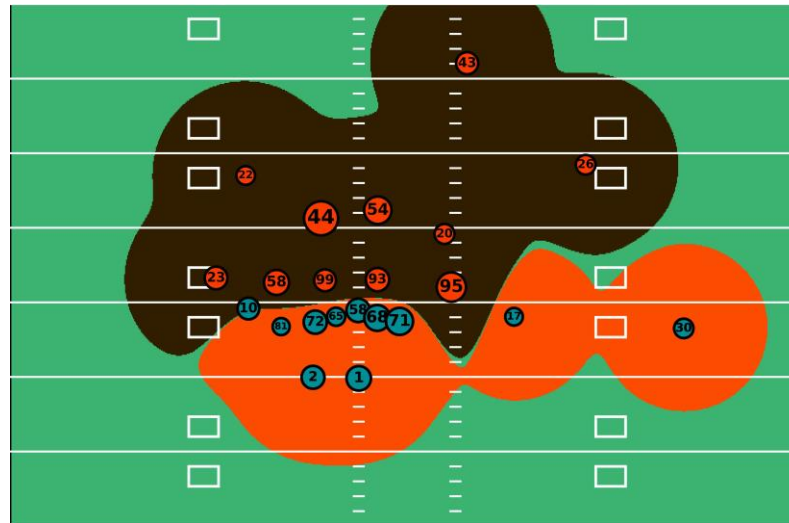
BASE PASS FORMATIONS

(11) TITE STACK TREY A



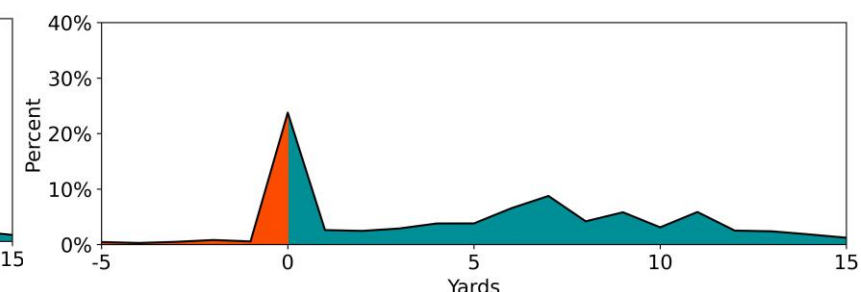
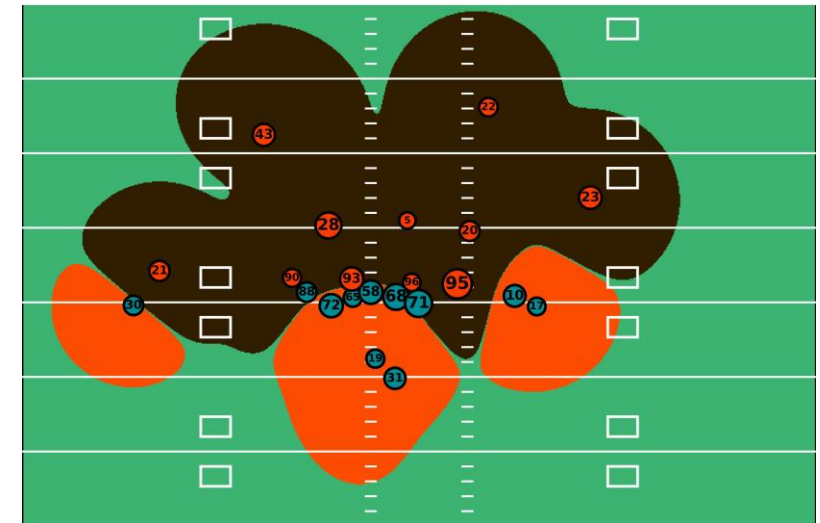
EXPECTED DEFENSE: UNDERLOAD MIKE 3
YARDS PER PLAY: 7.23
EPA PER PLAY: 0.43
EXPLOSIVE PERCENTAGE: 12.7%
NEGATIVE PERCENTAGE : 7.4%

(21) TITE DOS FLOP A



EXPECTED DEFENSE: OVER SPLIT 2
YARDS PER PLAY: 7.14
EPA PER PLAY: 0.42
EXPLOSIVE PERCENTAGE: 14.3%
NEGATIVE PERCENTAGE : 8.5%

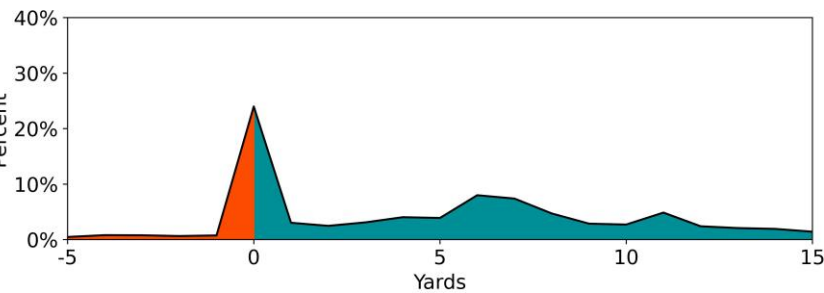
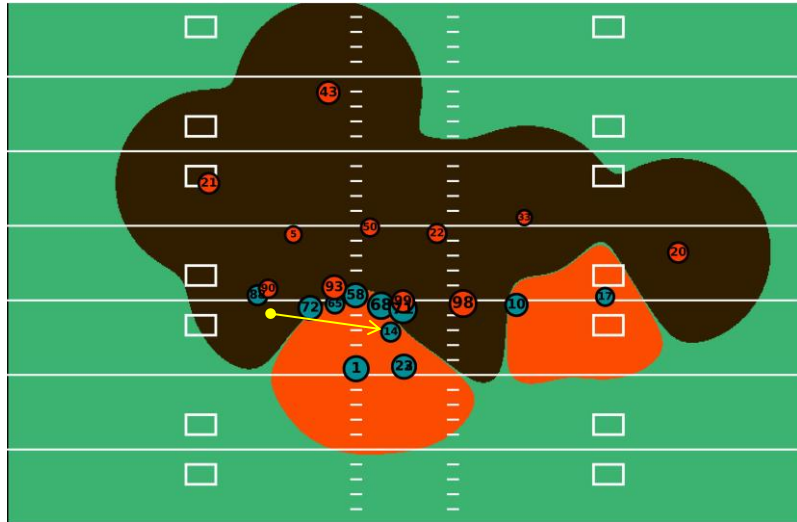
(21) CLOSE STACK TWINS FLEX A



EXPECTED DEFENSE: EVEN SPLIT 2
YARDS PER PLAY: 7.04
EPA PER PLAY: 0.41
EXPLOSIVE PERCENTAGE: 12.7%
NEGATIVE PERCENTAGE : 5.7%

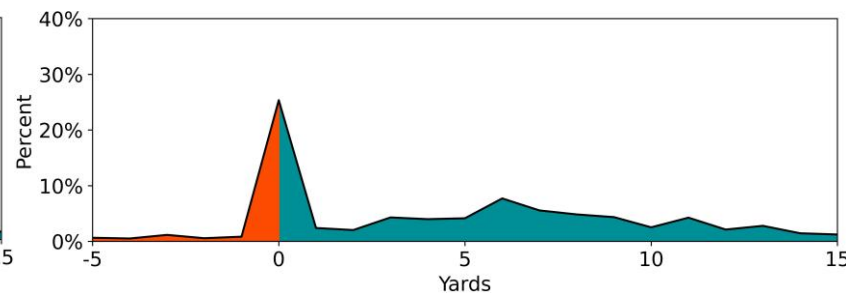
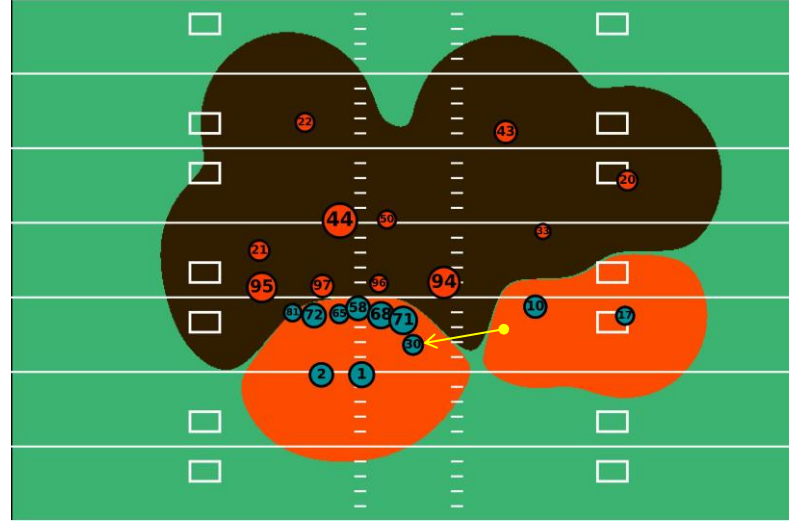
BASE PASS FORMATIONS

(11) TITE DEUCE B F-FLY



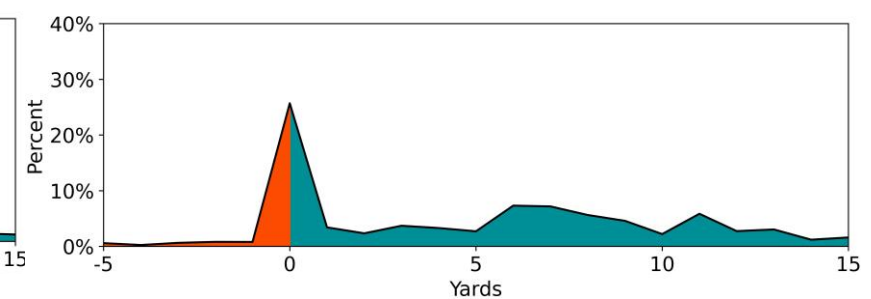
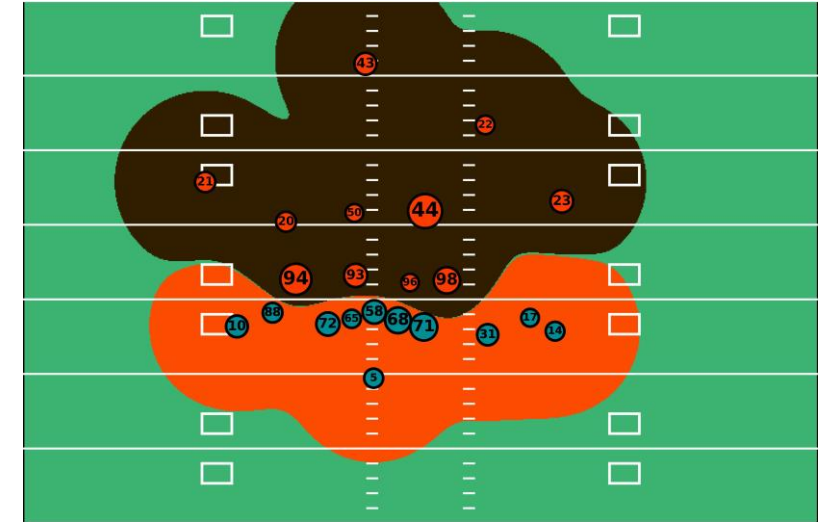
EXPECTED DEFENSE: UNDER SPLIT 3
YARDS PER PLAY: 6.89
EPA PER PLAY: 0.39
EXPLOSIVE PERCENTAGE: 13.0%
NEGATIVE PERCENTAGE : 8.2%

(21) TRIO B F-JET



EXPECTED DEFENSE: UNDER SPLIT 4
YARDS PER PLAY: 6.79
EPA PER PLAY: 0.37
EXPLOSIVE PERCENTAGE: 13.2%
NEGATIVE PERCENTAGE : 7.8%

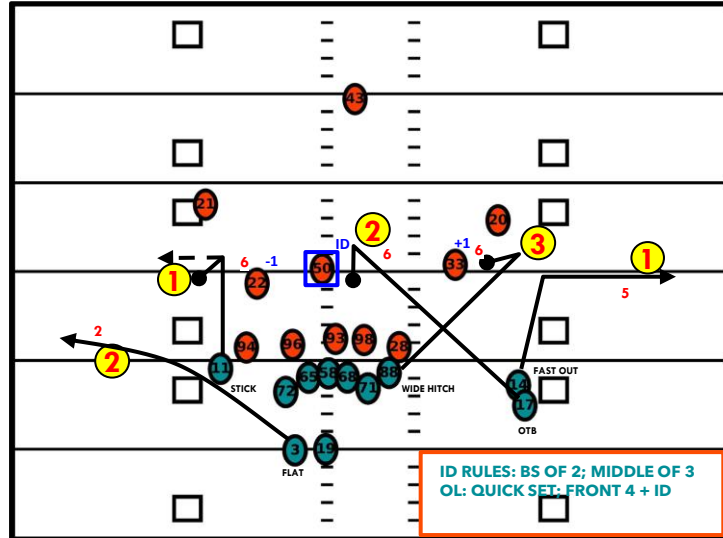
(11) NASTY DEUCE 6



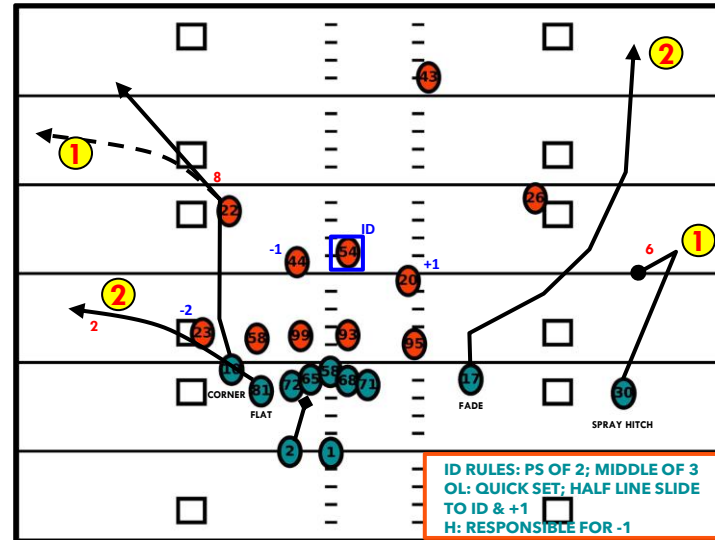
EXPECTED DEFENSE: OVER SPLIT 3
YARDS PER PLAY: 6.70
EPA PER PLAY: 0.36
EXPLOSIVE PERCENTAGE: 11.2%
NEGATIVE PERCENTAGE : 6.3%

BASE PASS PLAYS

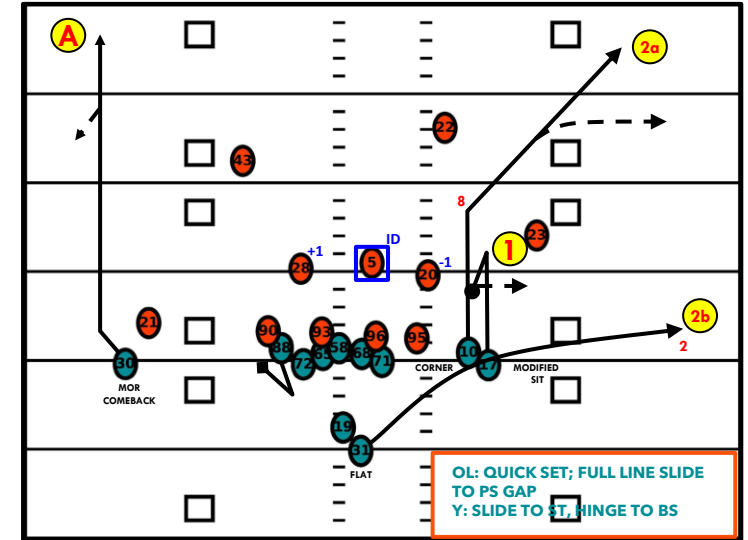
(11) TITE STACK TREY A QUICK 50 STICK



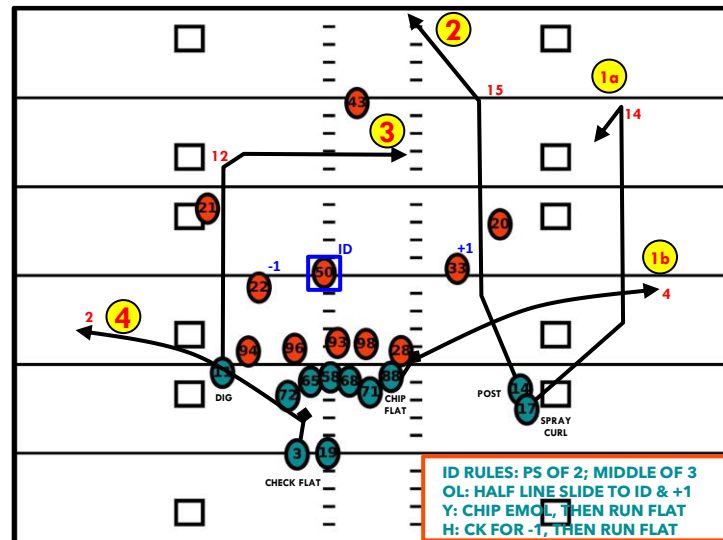
(21) TITE DOS FLOP A QUICK 60 BURST STICK



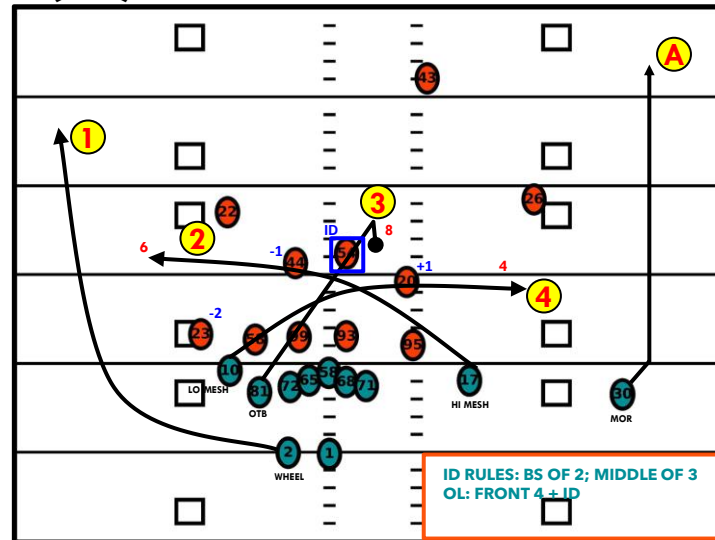
(21) CLOSE STACK TWINS FLEX A QUICK 80 SNAG



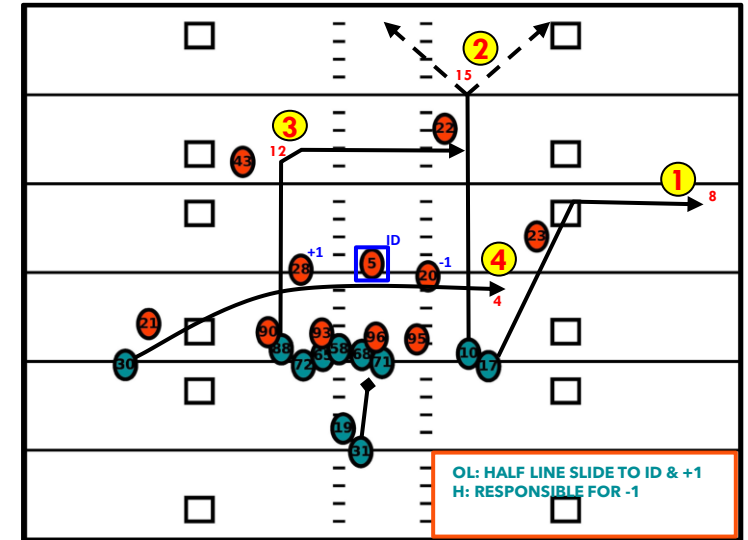
(11) TITE STACK TREY A 60 TRACER CHIP Y-FLAT



(21) TITE DOS FLOP A 50 MESH

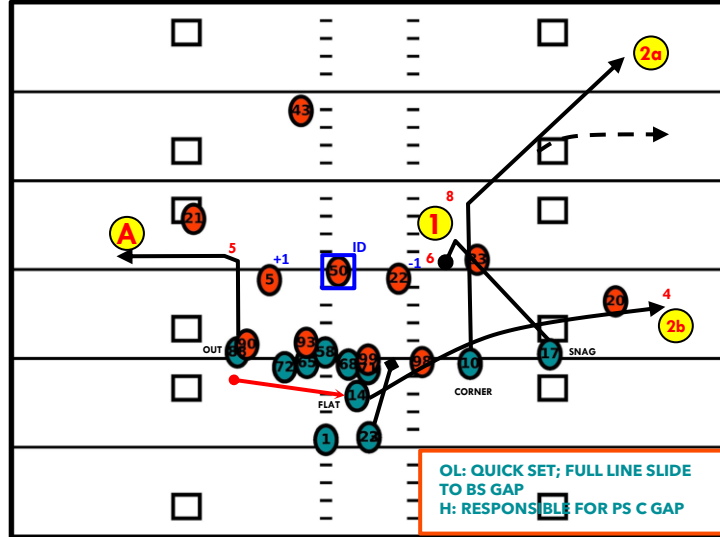


(21) CLOSE STACK TWINS FLEX A 60 DRIVE SEMO

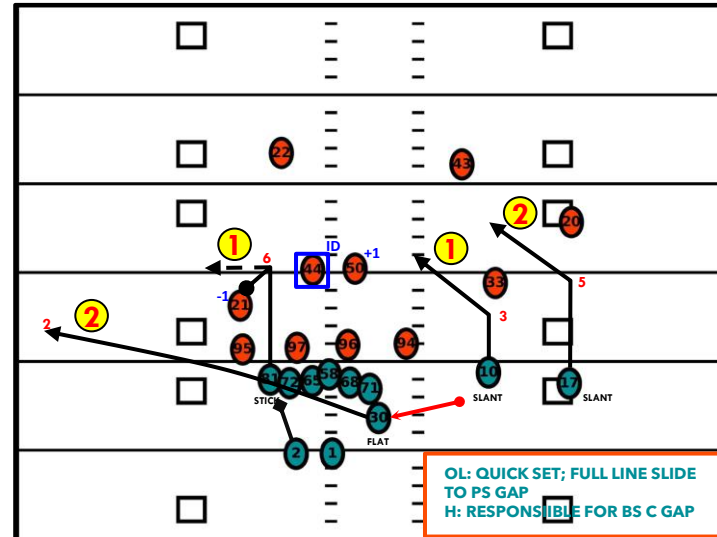


BASE PASS PLAYS

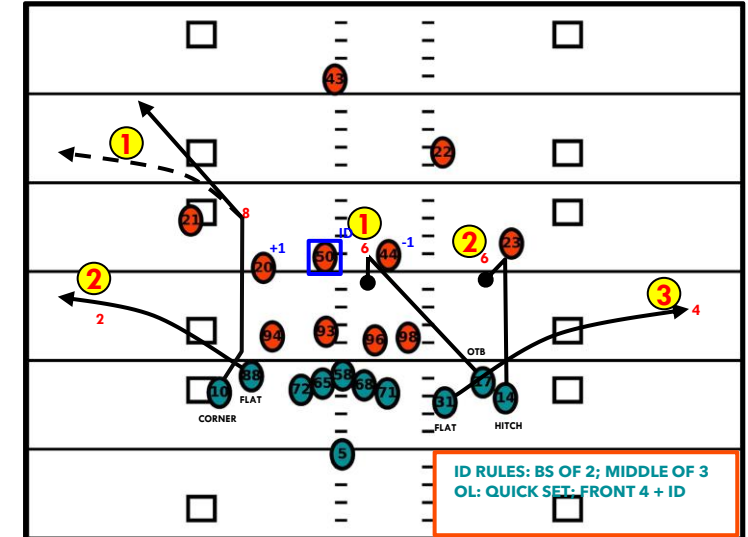
(11) TITE DEUCE B F-FLY QUICK 100 SNAG



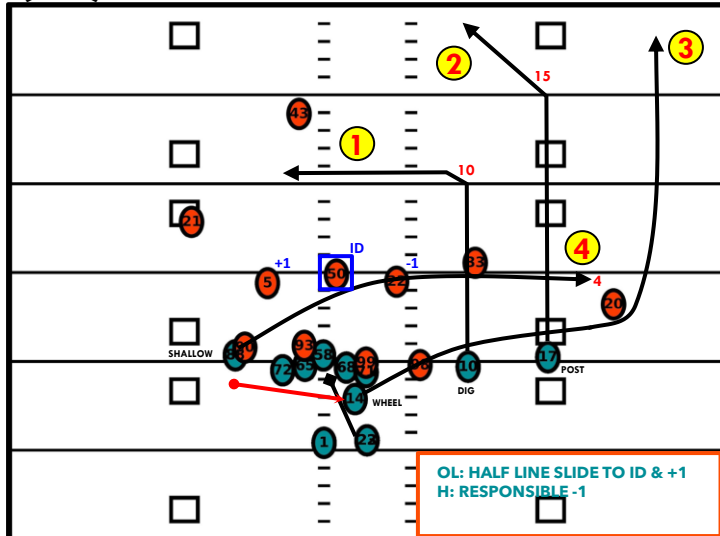
(21) TRIO B F-JET QUICK 90 STICK SLANT



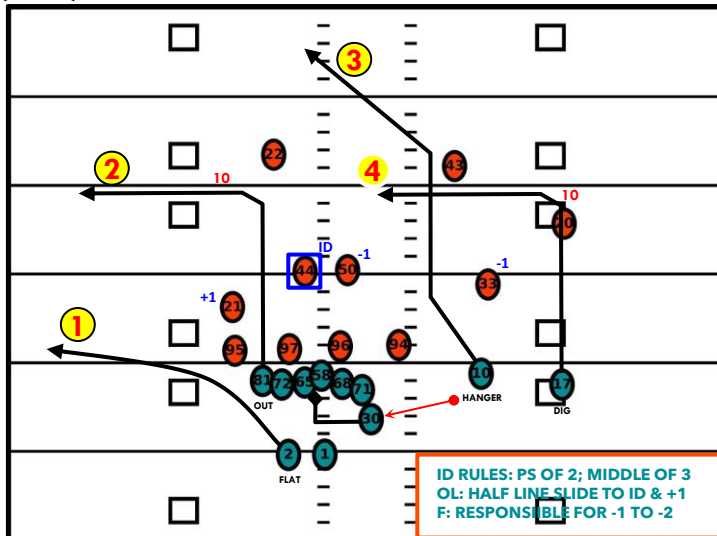
(11) NASTY DEUCE 6 QUICK 50 BURST SPACING



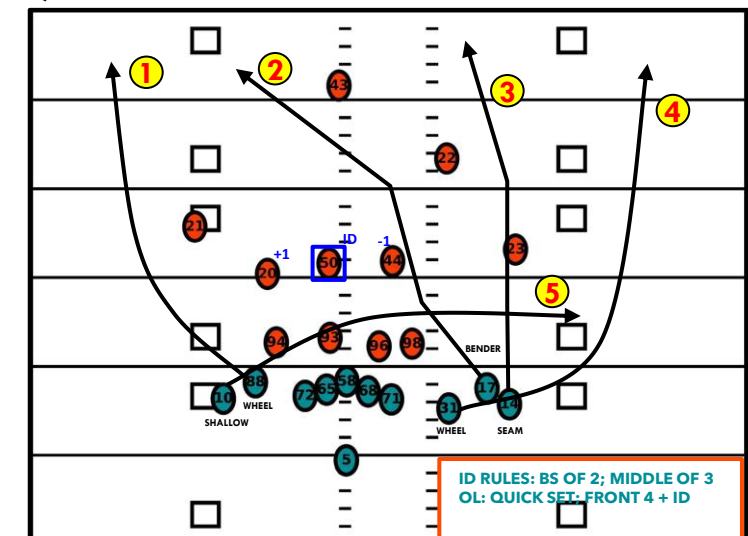
(11) TITE DEUCE B F-FLY 70 MILLS



(21) TRIO B F-JET FOLD 60 HANGER



(11) NASTY DEUCE 6 50 SWAP X-SHALLOW



CONCEPT & FORMATION SHEETS

CONCEPT SHEET

TYPE	#	PERSONNEL	FORMATION	CONCEPT	SCHEME
GAP	1	21	TITE DOS FLOP B	BASH WK SHOVEL	POWER
	2	11	TITE DEUCE 8	STICK Q-WRAP ST	POWER
	3	21	TROY FLOP A H-LAUNCH	COUNTER GY	COUNTER
	4	11	TRIO SPLIT STACK B	DART ST READ	DART
	5	11	TITE DEUCE 8	TWIG H-SMOKE Q-KICK WK	LONG TRAP
	6	21	TROY FLOP A H-LAUNCH	SWING Q-KICK ST	LONG TRAP
ZONE	1	21	TITE DOS FLOP B	DINGO STAY	TIGHT ZONE
	2	11	TRIO SPLIT STACK B	DINGO ST READ	TIGHT ZONE
	3	11	TITE TROY FLOP B F-FLY	DALLAS ST STAY X-OUT	WIDE ZONE (2-MAN)
	4	11	DOS FLOP A	TEXAS READ	WIDE ZONE (3-MAN)
MISC	1	11	TITE TROY FLOP B F-FLY	SPEED OPTION WK	SPEED OPTION
	2	11	DOS FLOP A	TRAP ST	TRAP
PA GAP	1	11	NASTY TROY ZEUS U	JUMP DUO FLOOD Z-CROSS	PA DUO
	2	11	DOS B	JUMP BASH SLICE	PA POWER
	3	11	DOS FLIP A	JUMP BASH ST HANGER SWIRL	PA POWER
	4	11	DOS FLIP A	JUMP BASH ST WIZ Z-CROSS	PA POWER
	5	11	DOS B	JUMP POWER DRIVE X-POCO	PA POWER
PA ZONE	1	11	NASTY TROY ZEUS U	JUMP DINGO SPLIT X-CROSS	PA TIGHT ZONE
OK	1	11	NASTY DEUCE 6	QUICK 50 BURST SPACING	QUICK 5-MAN
	2	11	TITE STACK TREY A	QUICK 50 STICK YETI	QUICK 5-MAN
	3	21	CLOSE STACK TWINS FLEX A	QUICK 80 SNAG	QUICK 6-MAN
	4	21	TITE DOS FLOP A	QUICK 90 BURST STICK	QUICK FULL SLIDE
	5	21	TRIO B F-JET	QUICK 90 STICK SLANT	QUICK FULL SLIDE
	6	11	TITE DEUCE B F-FLY	QUICK 100 SNAG	QUICK FULL SLIDE
DPK	1	21	TITE DOS FLOP A	50 MESH	5-MAN
	2	11	NASTY DEUCE 6	50 SWAP X-SHALLOW	5-MAN
	3	21	TRIO B F-JET	FOLD 60 HANGER	6-MAN
	4	21	CLOSE STACK TWINS FLEX A	60 DRIVE SEMO	6-MAN
	5	11	TITE STACK TREY A	60 TRACER CHIP Y-FLAT	6-MAN
	6	11	TITE DEUCE B F-FLY	70 MILLS	6-MAN

FORMATION SHEET

#	PERSONNEL	FORMATION	CONCEPT	TYPE	TAGS	MOTION
1	11	DOS FLIP A	JUMP BASH ST HANGER SWIRL	2X2 TITE	FLIP; A	
2	11	DOS FLIP A	JUMP BASH ST WIZ Z-CROSS	2X2 TITE	FLIP; A	
3	11	DOS FLOP A	TEXAS READ	2X2 TITE	FLOP; A	
4	11	DOS FLOP A	TRAP ST	2X2 TITE	FLOP; A	
5	21	TITE DOS FLOP A	QUICK 90 BURST STICK	2X2 TITE	TITE; FLOP; A	
6	21	TITE DOS FLOP A	50 MESH	2X2 TITE	TITE; FLOP; A	
7	11	DOS B	JUMP BASH SLICE	2X2 TITE	B	
8	11	DOS B	JUMP POWER DRIVE X-POCO	2X2 TITE	B	
9	21	TITE DOS FLOP B	BASH WK SHOVEL	2X2 TITE	FLOP; B	
10	21	TITE DOS FLOP B	DINGO STAY	2X2 TITE	FLOP; B	
11	21	CLOSE STACK TWINS FLEX A	QUICK 80 SNAG	2X2 TITE	CLOSE; STACK; FLEX; A	
12	21	CLOSE STACK TWINS FLEX A	60 DRIVE SEMO	2X2 TITE	CLOSE; STACK; FLEX; A	
13	11	TITE DEUCE B F-FLY	QUICK 100 SNAG	2X2	TITE; B	F-FLY
14	11	TITE DEUCE B F-FLY	70 MILLS	2X2	TITE; B	F-FLY
15	11	NASTY DEUCE 6	QUICK 50 BURST SPACING	EMPTY	NASTY; 6	
16	11	NASTY DEUCE 6	50 SWAP X-SHALLOW	EMPTY	NASTY; 6	
17	11	TITE DEUCE 8	STICK Q-WRAP ST	EMPTY	TITE; 8	
18	11	TITE DEUCE 8	TWIG H-SMOKE Q-KICK WK	EMPTY	TITE; 8	
19	11	TITE STACK TREY A	QUICK 50 STICK YETI	3X1 TITE	TITE; STACK; A	
20	11	TITE STACK TREY A	60 TRACER CHIP Y-FLAT	3X1 TITE	TITE; STACK; A	
21	21	TROY FLOP A H-LAUNCH	SWING Q-KICK ST	3X1 TITE	FLOP; A	H-LAUNCH
22	21	TROY FLOP A H-LAUNCH	COUNTER GY	3X1 TITE	FLOP; A	H-LAUNCH
23	11	NASTY TROY ZEUS U	JUMP DUO FLOOD Z-CROSS	3X1 TITE	NASTY; ZEUS; U	
24	11	NASTY TROY ZEUS U	JUMP DINGO SPLIT X-CROSS	3X1 TITE	NASTY; ZEUS; U	
25	11	TITE TROY FLOP B F-FLY	DALLAS ST STAY X-OUT	3X1 TITE	TITE; FLOP; B	B-FLY
26	11	TITE TROY FLOP B F-FLY	SPEED OPTION WK	3X1 TITE	TITE; FLOP; B	B-FLY
27	11	TRIO SPLIT STACK B	DINGO ST READ	3X1 NUB	SPLIT; STACK; A	
28	11	TRIO SPLIT STACK B	DART ST READ	3X1 NUB	SPLIT; STACK; A	
29	21	TRIO B F-JET	QUICK 90 STICK SLANT	3X1 NUB	B	F-JET
30	21	TRIO B F-JET	FOLD 60 HANGER	3X1 NUB	B	F-JET

WEDNESDAY PRACTICE SCRIPT

TEAM 1							
#	RP	PERSONNEL	FORMATION	CONCEPT	DEFENSE	OPP	PLAYID
1	R	11	TITE DEUCE 8	STICK Q-WRAP ST	OVER MIKE 3	CAR	20220911011338
2	PA	11	NASTY TROY ZEUS U	JUMP DUO FLOOD Z-CROSS	OVER STACK 3	CIN	20221031000521
3	R	21	TROY FLOP A H-LAUNCH	SWING Q-KICK ST	BEAR MIKE 1	ATL	20221002012273
4	PA	11	DOS B	JUMP BASH SLICE	OVER SPLIT 4	CIN	20221031000215
5	R	21	TITE DOS FLOP B	BASH WK SHOVEL	OVER SPLIT 4	CIN	20221031000285
6	PA	11	DOS FLIP A	JUMP BASH ST HANGER SWIRL	EVEN SPLIT 3	CIN	20221031003508
7	R	11	TITE DEUCE 8	TWIG H-SMOKE Q-KICK WK	OVER MIKE 3	CAR	20220911011338
8	R	21	TROY FLOP A H-LAUNCH	COUNTER GY	BEAR MIKE 1	ATL	20221002012273
9	PA	11	NASTY TROY ZEUS U	JUMP DINGO SPLIT X-CROSS	OVER STACK 3	CIN	20221031000521
10	R	21	TITE DOS FLOP B	DINGO STAY	OVER SPLIT 4	CIN	20221031000285
11	PA	11	DOS B	JUMP POWER DRIVE X-POCO	OVER SPLIT 4	CIN	20221031000215
12	R	11	TRIO SPLIT STACK B	DART ST READ	OVER SPLIT 3	PIT	20220922000465
SKELLY							
#	RP	PERSONNEL	FORMATION	CONCEPT	DEFENSE	OPP	PLAYID
1	P	11	TITE STACK TREY A	60 TRACER CHIP Y-FLAT	UNDERLOAD MIKE 3	ATL	20221002010354
2	P	21	TITE DOS FLOP A	50 MESH	OVER SPLIT 2	CIN	20221031002656
3	P	21	CLOSE STACK TWINS FLEX A	60 DRIVE SEMO	EVEN SPLIT 2	NYJ	20220918010598
4	P	11	TITE DEUCE B F-FLY	70 MILLS	UNDER SPLIT 3	CAR	20220911011338
5	P	21	TRIO B F-JET	FOLD 60 HANGER	UNDER SPLIT 4	LAC	20221009021344
6	P	11	NASTY DEUCE 6	50 SWAP X-SHALLOW	OVER SPLIT 3	ATL	20221002010749
7	P	21	TITE DOS FLOP A	QUICK 90 BURST STICK	OVER SPLIT 2	CIN	20221031002656
8	P	21	CLOSE STACK TWINS FLEX A	QUICK 80 SNAG	EVEN SPLIT 2	NYJ	20220918010598
TEAM 2							
#	RP	PERSONNEL	FORMATION	CONCEPT	DEFENSE	OPP	PLAYID
1	R	11	DOS FLOP A	TRAP ST	OVER SPLIT 3	PIT	20220922002083
2	P	11	NASTY DEUCE 6	QUICK 50 BURST SPACING	OVER SPLIT 3	ATL	20221002010749
3	R	11	TITE TROY FLOP B F-FLY	SPEED OPTION WK	OVER SPLIT 1	NYJ	20220918012894
4	P	21	TRIO B F-JET	QUICK 90 STICK SLANT	UNDER SPLIT 4	LAC	20221009021344
5	R	11	TRIO SPLIT STACK B	DINGO ST READ	OVER SPLIT 3	PIT	20220922000465
6	PA	11	DOS FLIP A	JUMP BASH ST WIZ Z-CROSS	EVEN SPLIT 3	CIN	20221031003508
7	P	11	TITE DEUCE B F-FLY	QUICK 100 SNAG	UNDER SPLIT 3	CAR	20220911011338
8	R	11	TITE TROY FLOP B F-FLY	DALLAS ST STAY X-OUT	OVER SPLIT 1	NYJ	20220918012894
9	R	11	DOS FLOP A	TEXAS READ	OVER SPLIT 3	PIT	20220922002083
10	P	11	TITE STACK TREY A	QUICK 50 STICK YETI	UNDERLOAD MIKE 3	ATL	20221002010354
11	R	11	TITE DEUCE 8	TWIG H-SMOKE Q-KICK WK	OVER MIKE 3	CAR	20220911011338
12	PA	11	DOS FLIP A	JUMP BASH ST HANGER SWIRL	EVEN SPLIT 3	CIN	20221031003508

ATTRIBUTIONS

- https://www.lukebornn.com/papers/fernandez_ssac_2018.pdf
- <https://github.com/anenglishgoat/Metrica-pitch-control>
- <https://github.com/gtpash/mix-data-nfl-rush>
- https://operations.nfl.com/media/4202/bdb_stern.pdf
- https://github.com/eddwebster/football_analytics?tab=readme-ov-file#tracking-data
- **Code, notebooks, and presentation can be found at github.com/ppwrs/Gameplanning-with-Neural-Networks**