

# 00747D Program Description I

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Program Title FOOTBALL

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Program Description, Equations, Variables FOOTBALL PROGRAM KEEPS TRACK OF MOST OF THE ELEMENTS OF A FTBL GAME, LIKE YARDLINE, DOWN, YDS TO 1ST AND SCORE. THERE ARE 13 OPTIONS FOR THE OFFENSIVE PLAYER AND 4 OPTIONS FOR THE DEFENSIVE PLAYER.

EACH PLAY HAS A DATASET THAT GOVERNS THE POSSIBLE RANGE OF EVENTUALITIES.

a, b, c, c

c, b ARE YARDAGE MAX.S FOR THAT PLAY (IF PASS PLAY, THEN MAX = 2 \* NORMAL MAX)

a IS USED FOR ADD-ON YARDAGE ON PASSES, MINUS YARDS ON GROUND PLAYS.

a IS ALSO THE PROBABILITY OF SUCCESS FOR A PASS.

$$\text{PROB} = 100 * \frac{1}{a}$$

DEFENSE 1  $2 * \text{RND}(c) - 3 * (\pm a)$   
DEFENSE 2  $\text{RND}(c) - (\pm a)$   
DEFENSE 3  $2 * \text{RND}(b) - (\pm 3 * a)$   
DEFENSE 4  $\text{RND}(b) - (\pm a)$

WHERE IF  $a > 10$ ,  $a$  IS NEG.

WHERE  $\text{RND}(x)$  GENERATES A P-RANDOM NR UP TO  $x$

THE RANDOMIZATION METHOD IS THE  $\text{TAN}^{-1}$ , DUE TO SPACE LIMITATIONS.

Operating Limits and Warnings IF PLAYER ONE'S SCORE GETS ABOVE 100, THE SCORING ROUTINE WILL PRESENT GARBAGE. YOU WILL HAVE TO KEEP TRACK OF THE SCORE INDEPENDENTLY IN THIS UNLIKELY CASE.

This program has been verified only with respect to the numerical example given in *Program Description II*. User accepts and uses this program material AT HIS OWN RISK, in reliance solely upon his own inspection of the program material and without reliance upon any representation or description concerning the program material.

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Program Description, Equations, Variables

## OFFENSIVE PLAYS

1 = QB SNEAK

2 = PLUNGE/DIVE

3 = SLANT/RIDE

4 = DRAW

5 = FLOW-COUNTER

6 = SCREEN PASS

7 = LOOK-IN PASS

8 = SIDELINE PASS

9 = DEEP PASS

10 = PUNT

11 = KICK-OFF

12 = FIELD GOAL

13 = RUNBACK

TO COMPLETE THE DATA CARD, KEY THIS  
IN AND STORE IT ON A 2ND CARD.

0.002 STO 1

1.006 STO 2

2.009 STO 3

3.012 STO 4

4.015 STO 5

5.117 STO 6

4.421 STO 7

3.524 STO 8

2.836 STO 9

100 STO D

10 STO E

f PZS

8.019 STO 0

13.017 STO 1

6.117 STO 2

2.025 STO 3

100 STO 7 → 1 STO 9

DEFENSES

1 : STUNT (PRESSURE VS RUN)

2 : PRO (CONTAINMENT VS RUN)

3 : BLITZ (PRESSURE VS PASS)

4 : NICKLE (CONTAINMENT VS PASS)

Operating Limits and Warnings NO LONG BOMBS CAN BE USED WHEN YDLINE  
IS < 20

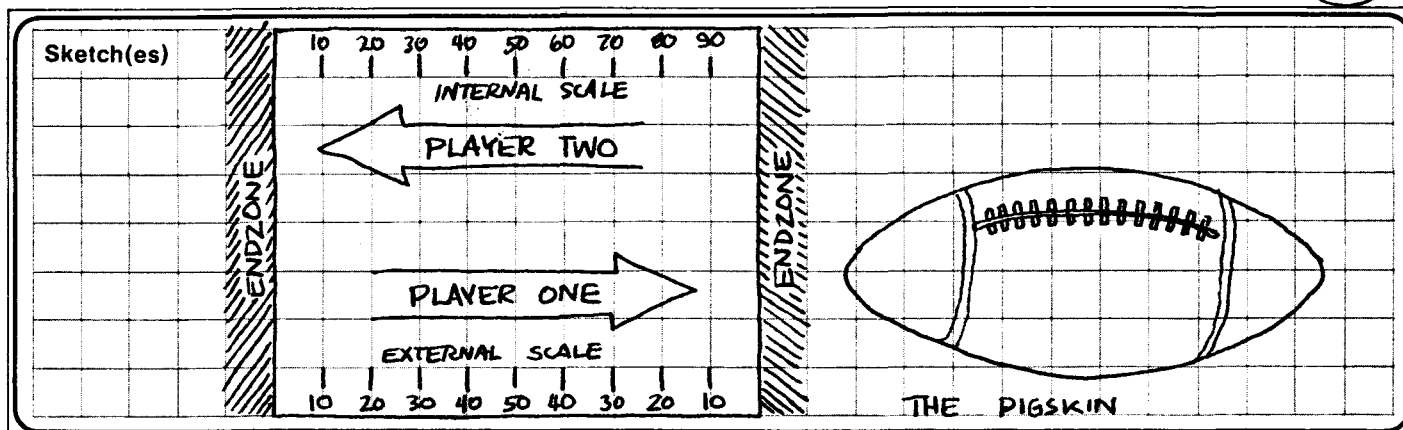
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|                                           |          |                             |      |      |                                              |
|-------------------------------------------|----------|-----------------------------|------|------|----------------------------------------------|
| Sample Problem(s)                         |          | PLAY FOOTBALL               | 6 B  | 0    | SCREEN PASS                                  |
| 0.123456789                               | STO of a | INITIALIZE SEED             | 3 A  | 27   | BLITZ GOOD FOR 27 YARDS                      |
| fe                                        | 30       | KICK OFF POINT              |      | 2    | STANDARD 5 OUTPUT                            |
| 11 B                                      | 39       | YARDS GAINED                |      | 1    |                                              |
|                                           | 1        | PLAYER #                    |      | 1    |                                              |
|                                           | 31       | YDLINE                      |      | 10   | IS REALLY 1ST & GOAL, BUT IT DOESN'T MATTER. |
|                                           | 1        | DOWN                        | 2 B  | 0    | PLUNGE/DIVE                                  |
| THIS IS DELIBERATE, ONLY HAPPENS 1ST TIME | 100      | YDS TO FIRST                | 1 A  | 7    | STUNT GOOD FOR 7 YARDS INTO ENDZONE          |
| C                                         | 2        | TURNOVER BALL TO 2ND PLAYER | fe   | 6.00 | TD!                                          |
|                                           | 31       | YDLINE #                    | 11 B | 70   | PREPARE TO KICK-OFF                          |
|                                           | 1        | FIRST                       |      | 57   | KICK OF 57 YARDS                             |
|                                           | 10       | ↓ 10                        |      | 2    | STANDARD 5 OUTPUT                            |
| 13 B                                      | 34       | RUNBACK 34 YDS              |      | 13   |                                              |
|                                           | 2        | 2ND PLAYER                  |      | 2    |                                              |
|                                           |          |                             |      | 2    | IGNORE AFTER KICKOFF BECAUSE                 |
| Solution(s)                               | 35       | YDLINE                      |      | 3    |                                              |
|                                           | 1        | FIRST                       | C    | 1    | TURNOVER TO 1ST PL                           |
|                                           | 10       | AND TEN                     |      | 13   |                                              |
| 5 B                                       | 0        | FLOW-COUNTER                |      | 1    |                                              |
| 4 A                                       | 7        | NICKLE GAIN OF 7 YARDS      |      | 10   |                                              |
|                                           | 2        |                             |      | 10   |                                              |
|                                           | 28       | STANDARD 5 OUTPUT           | 13 B | 42   | RUNBACK OF 42 YDS                            |
|                                           | 2        |                             |      | 1    | STANDARD 5 OUTPUT                            |
|                                           | 3        |                             |      | 45   |                                              |
|                                           |          |                             |      | 10   |                                              |

Reference(s) HP65 LIB 1313A

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Sketch(es)

Sample Problem(s)

|    |              |                                     |    |                     |
|----|--------------|-------------------------------------|----|---------------------|
| 9B | 0            | LONG BOMB                           | 1  |                     |
| 4A | 9.9999999+99 | INCPED AT LINE OF SCR.              | 10 |                     |
| C  | 2            | TURN OVER BUT                       | 0  | LONG BOMB           |
|    | 45           | NO RUNBACK WHEN INCPED ON LINE/SCR. | 0  | UNSUCCESSFUL        |
|    | 1            |                                     | 2  |                     |
|    | 10           | PLAYER 2 HAS BALL AGAIN             | 39 | ST 5                |
| 3B | 0            | SLANT/RIDE                          | 2  |                     |
| 4A | 2            | NICKEL FOR 2                        | 10 |                     |
|    | 2            |                                     | 0  | LOOK-IN PASS        |
|    | 47           | STANDARD 5                          | 16 | NICKLE PASS GOOD?   |
|    | 2            |                                     | 2  |                     |
|    | 8            |                                     | 23 | ST 5                |
|    |              |                                     | 1  |                     |
| 8B | 0            | SIDELINE PASS                       | 10 |                     |
| 2A | 7            | PRO FOR 7                           | 0  | QB SNEAK FOR ONE YD |
|    | 2            |                                     | 1  |                     |
|    | 46           | ST 5                                | 2  |                     |
|    | 3            |                                     | 22 | ST 5                |
|    | 1            |                                     | 2  |                     |
| 4B | 0            | DRAW vs STUNT                       | 9  |                     |
| 1A | 7            | FOR 7                               | 0  | FLOW-COUNTER        |
|    | 2            |                                     | 8  | PRO FOR 8 YDS       |
|    | 39           |                                     | 2  |                     |

Reference(s)

Sketch(es)

Sample Problem(s)

|    |    |     |    |                    |
|----|----|-----|----|--------------------|
|    |    | 7B  | 0  | LOOKIN PASS        |
|    | 14 | 4A  | -4 | QB LOST MORE YDS   |
|    | 3  |     | 2  |                    |
|    | 1  |     | 13 |                    |
| 1B | 0  |     | 4  | GOTTA GO FOR THE   |
| 1A | 2  |     | 11 | FIELD GOAL         |
|    | 2  | 12B | 0  | FIELD GOAL ATTEMPT |
|    | 12 |     | 2  | NO GOOD *          |
|    | 1  |     | 13 | IGNORE **          |
|    | 10 |     | 4  |                    |
| 2B | 0  |     | 11 |                    |
| 3A | 8  | C   | 1  | TURNOVER           |
|    | 2  |     | 13 |                    |
|    | 4  |     | 1  |                    |

Solution(s)

|    |    |                |                             |
|----|----|----------------|-----------------------------|
|    | 2  |                | 10                          |
|    | 2  |                |                             |
| 8B | 0  | SIDELINE PASS  |                             |
| 3A | -5 | SACKED THE QB! | * HAD IT BEEN GOOD, YOU     |
|    | 2  |                | WOULD HAVE SEEN A YARDAGE,  |
|    | 9  |                | THEN THE NEW SCORE          |
|    | 3  |                | ** NO NEED TO RESTORE THE   |
|    | 7  |                | PREVIOUS YDLINE BECAUSE YDS |
|    |    |                | GAINED = 0                  |

Reference(s)

|                          |              |          |                          |                                                  |
|--------------------------|--------------|----------|--------------------------|--------------------------------------------------|
| SEED STO 0<br>INITIALIZE | FOOTBALL     |          | DOWN BALL<br>ON 20 YDLNE | SET UP<br>FOR KICKOFF                            |
| DEFENSE<br>#             | OFFENSE<br># | TURNOVER | THE<br>SCORE             | PLAYER NR.<br>YARDLINE<br>DOWN NR.<br>YDS TO 1ST |

| STEP | INSTRUCTIONS                                                                                                                            | INPUT<br>DATA/UNITS | KEYS                                              | OUTPUT<br>DATA/UNITS |
|------|-----------------------------------------------------------------------------------------------------------------------------------------|---------------------|---------------------------------------------------|----------------------|
| 1    | LOAD SIDE 1 + 2 OF DATA CARD                                                                                                            |                     | <input type="checkbox"/> <input type="checkbox"/> |                      |
| 2    | LOAD SIDE 1 + 2 OF PROGRAM                                                                                                              |                     | <input type="checkbox"/> <input type="checkbox"/> |                      |
| 3    | ENTER SEED (DIFFERENT EACH TIME)<br>INITIALIZE                                                                                          | $0 < n < 1$         | STO o<br>f a                                      |                      |
| 4    | PLAYER ONE KICKS-OFF                                                                                                                    |                     | f e                                               | 30                   |
|      |                                                                                                                                         | 11                  | B                                                 | YDS GAINED           |
|      |                                                                                                                                         |                     | <input type="checkbox"/> <input type="checkbox"/> | PLAYER NR            |
|      |                                                                                                                                         |                     | <input type="checkbox"/> <input type="checkbox"/> | YARDLINE             |
|      |                                                                                                                                         |                     | <input type="checkbox"/> <input type="checkbox"/> | DOWN                 |
|      |                                                                                                                                         |                     | <input type="checkbox"/> <input type="checkbox"/> | YDS TO 1ST           |
| 5    | TURNOVER BALL TO PLAYER 2                                                                                                               |                     | C                                                 | PLAYER NR            |
|      |                                                                                                                                         |                     | <input type="checkbox"/> <input type="checkbox"/> | YARDLINE             |
|      |                                                                                                                                         |                     | <input type="checkbox"/> <input type="checkbox"/> | DOWN                 |
|      |                                                                                                                                         |                     | <input type="checkbox"/> <input type="checkbox"/> | YDS. TO 1ST          |
| 6    | PLAYER 2 CAN CHOOSE TO RUNBACK OR<br>DOWN THE BALL<br>TO RUNBACK BALL,                                                                  | 13                  | B                                                 | YDS GAINED           |
|      |                                                                                                                                         |                     | <input type="checkbox"/> <input type="checkbox"/> | PLAYER NR            |
|      |                                                                                                                                         |                     | <input type="checkbox"/> <input type="checkbox"/> | YARDLINE             |
|      |                                                                                                                                         |                     | <input type="checkbox"/> <input type="checkbox"/> | DOWN                 |
|      |                                                                                                                                         |                     | <input type="checkbox"/> <input type="checkbox"/> | YDS TO 1ST           |
|      | TO DOWN BALL,                                                                                                                           |                     | f d                                               | 80                   |
| 7    | PLAYER 2 INPUTS OFFENSIVE PLAY                                                                                                          | PLAY NR             | B                                                 | 0.00                 |
| 8    | PLAYER 1 SELECTS DEFENSIVE PLAY                                                                                                         | PLAY NR             | A                                                 | STANDARD 5           |
|      | IN GENERAL:                                                                                                                             |                     | <input type="checkbox"/> <input type="checkbox"/> |                      |
|      |                                                                                                                                         |                     | <input type="checkbox"/> <input type="checkbox"/> |                      |
| 9    | ALWAYS INPUT OFFENSE BEFORE<br>DEFENSE. IF THE PLAY NR IS > 10,<br>THE PROG. AUTOMATICALLY SELECTS<br>DEFENSE 1 AND PROCEEDS FROM THERE | OFFENSE<br>PLAY NR  | B                                                 | 0.00                 |
| 10   | ALWAYS USE DEFENSES 1-4, OTHER-<br>WISE PROGRAM BOMBS                                                                                   | DEFENSE<br>PLAY NR  | A                                                 | STANDARD 5           |
| 11   | PLAYERS KEEP CYCLING BETWEEN<br>9 AND 10 UNTIL ONE OF THE<br>FOLLOWING OCCURS:                                                          |                     | <input type="checkbox"/> <input type="checkbox"/> |                      |
| TD   | TOUCHDOWN                                                                                                                               |                     | <input type="checkbox"/> <input type="checkbox"/> | NEW SCORE            |
|      | AFTER A TD,                                                                                                                             |                     | f e                                               | 30 OR 70             |
|      | GOTO STEP 12.3                                                                                                                          |                     | <input type="checkbox"/> <input type="checkbox"/> |                      |
|      | (PROG. AUTO. CALCS. PAJ. FOR YOU)                                                                                                       |                     | <input type="checkbox"/> <input type="checkbox"/> |                      |

STANDARD 5 output





## REGISTERS

|                |       |                |                              |                |       |                |       |                |        |                |         |                |       |                |                       |                |       |                |          |
|----------------|-------|----------------|------------------------------|----------------|-------|----------------|-------|----------------|--------|----------------|---------|----------------|-------|----------------|-----------------------|----------------|-------|----------------|----------|
| <sup>0</sup>   | 8.019 | <sup>1</sup>   | 13.017                       | <sup>2</sup>   | 6.117 | <sup>3</sup>   | 2.025 | <sup>4</sup>   | YDLINE | <sup>5</sup>   | $\pm a$ | <sup>6</sup>   | a     | <sup>7</sup>   | YDS TO GO<br>TO FIRST | <sup>8</sup>   | SCORE | <sup>9</sup>   | DOWN NR. |
| S <sup>0</sup> | SEED  | S <sup>1</sup> | 0.002                        | S <sup>2</sup> | 1.006 | S <sup>3</sup> | 2.009 | S <sup>4</sup> | 3.012  | S <sup>5</sup> | 4.015   | S <sup>6</sup> | 5.117 | S <sup>7</sup> | 4.421                 | S <sup>8</sup> | 3.524 | S <sup>9</sup> | 2.836    |
| A              | b     | B              | YARDS GAINED<br>ON LAST PLAY |                | C     | c              | D     | 100            |        | E              | 10      |                | I     | DEFENSE NR.    |                       |                |       |                |          |

| STEP | KEY ENTRY | KEY CODE | COMMENTS                      | STEP | KEY ENTRY | KEY CODE | COMMENTS |
|------|-----------|----------|-------------------------------|------|-----------|----------|----------|
| 113  | X=0       | 16-43    |                               | 163  | RTN       | 24       |          |
| 114  | ST06      | 22 06    | IF FUMBLE, GTO 6              | 170  | *LBL6     | 21 16 13 |          |
| 115  | *LBL5     | 21 05    |                               | 171  | 3         | 03       |          |
| 116  | RCLB      | 36 12    | PAUSE ON YARDAGE              | 172  | GT06      | 22 16 12 |          |
| 117  | PSE       | 16 51    |                               | 173  | *LBL8     | 21 08    |          |
| 118  | F0?       | 16 23 00 | MODIFY FOR OWNING PL.         | 174  | F1?       | 16 23 01 |          |
| 119  | CHS       | -22      | ADD TO CURRENT YOLINE         | 175  | GT07      | 22 07    |          |
| 120  | ST+4      | 35-55 04 |                               | 176  | 1         | 01       |          |
| 121  | F1?       | 16 23 01 |                               | 177  | 7         | 07       |          |
| 122  | GT06      | 22 16 12 | IF THIS PLAY NR > 10          | 178  | ST0C      | 35 13    |          |
| 123  | 1         | 01       | DONT INCREMENT DOWN           | 179  | GSB0      | 23 00    |          |
| 124  | ST+9      | 35-55 09 | OR SUBTRACT YARDS             | 180  | 8         | 08       |          |
| 125  | RCLB      | 36 12    | DECREMENT YDS TO 1ST          | 181  | X>Y?      | 16-34    |          |
| 126  | ST-7      | 35-45 07 |                               | 182  | X<Y?      | 16-35    |          |
| 127  | RCL7      | 36 07    |                               | 183  | 7         | 07       |          |
| 128  | X>0?      | 16-44    |                               | 184  | X>Y?      | 16-34    |          |
| 129  | GT06      | 22 16 12 |                               | 185  | 6         | 06       |          |
| 130  | RCL6      | 36 15    |                               | 186  | *LBL6     | 21 16 12 |          |
| 131  | ST07      | 35 07    | 1ST DOWN!                     | 187  | F0?       | 16 23 00 |          |
| 132  | 1         | 01       |                               | 188  | GT06      | 22 16 12 |          |
| 133  | ST09      | 35 09    |                               | 189  | RCLD      | 36 14    |          |
| 134  | RCL6      | 36 06    |                               | 190  | =         | -24      |          |
| 135  | 8         | 08       | IF PUNT, NO 1ST DOWN          | 191  | *LBL6     | 21 16 12 |          |
| 136  | X=Y?      | 16-33    |                               | 192  | ST+8      | 35-55 08 |          |
| 137  | GT0E      | 22 15    |                               | 193  | RCL8      | 36 08    |          |
| 138  | *LBL6     | 21 16 12 | CHECK FOR ENDZONE SITUATIONS. | 194  | DSP2      | -63 02   |          |
| 139  | RCLD      | 36 14    |                               | 195  | RTN       | 24       |          |
| 140  | RCL4      | 36 04    |                               | 196  | *LBL7     | 21 07    |          |
| 141  | X<0?      | 16-45    | LINE < 0                      | 197  | 6         | 06       |          |
| 142  | GT08      | 22 08    | LINE > 100                    | 198  | RCL6      | 36 06    |          |
| 143  | X>Y?      | 16-34    |                               | 199  | X=Y?      | 16-33    |          |
| 144  | GT08      | 22 08    |                               | 200  | GT06      | 22 16 13 |          |
| 145  | RCL9      | 36 09    | IS PLAYER OUT OF DOWNS?       | 201  | Pi        | 16-24    |          |
| 146  | 5         | 05       |                               | 202  | DSP9      | -63 09   |          |
| 147  | X<Y?      | 16-35    | TURNOR IF SO                  | 203  | RTN       | 24       |          |
| 148  | GT0C      | 22 13    | DATA PRINTOUT ROUTINE         | 204  | *LBL6     | 21 06    |          |
| 149  | *LBL6     | 21 15    |                               | 205  | RCLD      | 36 14    |          |
| 150  | DSP0      | -63 00   | PLAYER NR                     | 206  | N!        | 16 52    |          |
| 151  | 1         | 01       |                               | 207  | RTN       | 24       |          |
| 152  | F0?       | 16 23 00 |                               | 208  | *LBL6     | 21 16 15 |          |
| 153  | 2         | 02       |                               | 209  | 3         | 03       |          |
| 154  | RCL4      | 36 04    |                               | 210  | 0         | 00       |          |
| 155  | 5         | 05       |                               | 211  | GT06      | 22 16 12 |          |
| 156  | 0         | 00       | GET YOLINE IN RIGHT FORMAT    | 212  | *LBLd     | 21 16 14 |          |
| 157  | X<Y       | -41      |                               | 213  | 2         | 02       |          |
| 158  | X<Y?      | 16-35    |                               | 214  | 0         | 00       |          |
| 159  | GT06      | 22 16 12 |                               | 215  | *LBL6     | 21 16 12 |          |
| 160  | RCLD      | 36 14    |                               | 216  | RCLD      | 36 14    |          |
| 161  | X<Y       | -41      |                               | 217  | X<Y       | -41      |          |
| 162  | -         | -45      |                               | 218  | F0?       | 16 23 00 |          |
| 163  | *LBL6     | 21 16 12 |                               | 219  | -         | -45      |          |
| 164  | X<Y       | -41      |                               | 220  | ST04      | 35 04    |          |
| 165  | R4        | -31      |                               | 221  | RTN       | 24       |          |
| 166  | RCL9      | 36 09    | DOWN NR                       | 222  | *LBL6     | 21 16 11 |          |
| 167  | RCL7      | 36 07    | YDS TO FIRST                  | 223  | P<S       | 16-51    |          |
| 168  | PPST      | 16-14    | PRINT                         | 224  | RTN       | 24       |          |

LABELS

FLAGS

SET STATUS

| A               | B                        | C                      | D                     | E                     | F                        | G                                                   | H                             | I                            |
|-----------------|--------------------------|------------------------|-----------------------|-----------------------|--------------------------|-----------------------------------------------------|-------------------------------|------------------------------|
| DEFENSE         | OFFENSE                  | TURNOVER               | SCORE ?               | REVIEW DATA           | 0SET = PLAYER 2 HAS BALL | FLAGS                                               | TRIG                          | DISP                         |
| a INITIALIZE    | b SKIP LABEL FOR JUMPING | c FIELD GOAL           | d DOWN BALL ON TWENTY | e SET UP FOR KICK-OFF | 1SET = PLAY NR IS > 10   | ON OFF                                              | DEG X                         | FIX X                        |
| 0 RANDOMIZATION | 1 STUNT                  | 2 PRO                  | 3 BLITZ               | 4 NICKEL              | 2SET = PASS              | 1 <input type="checkbox"/> <input type="checkbox"/> | GRAD <input type="checkbox"/> | SCI <input type="checkbox"/> |
| 5 MAIN CONTROL  | 6 INTERCEPT              | 7 CHECK FOR FIELD GOAL | 8 SCORING ROUTINE     | 9 MAIN CONTROL        | 3                        | 2 <input type="checkbox"/> <input type="checkbox"/> | RAD <input type="checkbox"/>  | ENG <input type="checkbox"/> |
|                 |                          |                        |                       |                       |                          | 3 <input type="checkbox"/> <input type="checkbox"/> |                               | n 2                          |