PALMER METHOD
By Pete Palmer

The NFL passer rating system was developed in 1973 as a solution to the ills of previous systems. These systems involved ranking passers from first place down in various categories and then summing the rankings, with the lowest number being the leader. The particular categories used varied over the years. These were as follows:

1932-37 - Total yards gained
1938-40 - Percentage of completions
1941-43 - Total completions, percentage of completions
1944-48 - Total completions, percentage of completions, total yards gained, total TD passes, total interceptions, percentage of interceptions
1949   - Same as above without total interceptions
1950-59 - Average yards gained per pass (min 100 atts)
1960-61 - Total completions, percentage of completions, total yards gained, total TD passes, average gain per attempt, percentage of interceptions (minimum of 10 attempts per scheduled game)
1962-71 - Percentage of completions, total TD passes, percentage of interceptions, average gain per attempt
1972   - Same as above except percentage of TD passes replaced total TD passes

The new system allowed a rating to be established that was independent of the figures for other passers and that could be calculated for those who did not qualify. In addition, lifetime ratings could be found that would remain unchanged after a passer's career was over. This system was a mathematical formula which involved the same four categories that were used in the old ranking system of 1972. The philosophy behind this system was as follows: in each category, credit a rating of 1 for average performance and a rating of 2 for record performance. The total was then divided by 6 so that a 66.7 rating was average and a rating of 100 was very good.

There were two additional restrictions placed on the system. First, a maximum rating of 2.375 was set for each category. This corresponded to a zero percentage interception figure. Second, a minimum rating of zero was set for each category as well. Thus the system looked like this:

Category/Rating	0	1	2	2.375
Percent comp	30%	50%	70%	77.5%
Average gain	3.00	7.00	11.00	12.50
Percent TDs	0.0%	5.0%	10.0%	11.9%
Percent int	9.5%	5.5%	1.5%	0.0%

At the time, the mathematical formula representing the system was not calculated. However, this can be rather easily done. For percent completions, 30% is a zero, 50% a one, and 70% a two; so this term is simply (%com-30)/20.

Continuing:

Rate = 100 x [(%com-30)/20 + (gain-3)/4 + %td/5 + (9.5-%int] / 6

This formula can be manipulated to convert everything to yards and to combine constant terms as follows:

Rate = 100/24 x (com x 20 + yards + td x 80 - int x 100) / att + 50/24

Now the true picture emerges. Basically the formula is a weighted yards per attempt with a bonus of 20 yards for each completion, an additional 80 yards for each touchdown, and a 100-yard penalty for each interception. So two completions for ten yards each are worth sixty points, the same as one completion for forty yards and one incompletion. A ninety-yard pass play from goal line to the opponent ten is worth

the same as a ten yard TD pass. An eighty-yard non-TD pass is required to offset one pass that is intercepted.

It is my opinion that these bonuses and penalties are out of line. A fairer formula, I believe, is one that gives a twenty-yard bonus for each touchdown and a forty-yard penalty for each interception. There would be no bonus for each completion. Thus a passer who completed five of ten passes for seventy yards would get the same rating as one who completed six of ten for seventy yards. Expressing the method in an adjusted yards per attempt notation would have all the improvements over the old systems that the present system has. But, in addition, it would be easier to understand and fairer in its rewards and penalties. The new rating would be:

$$Rate = (yards + td \times 20 - int \times 40) / att$$

The twenty-yard bonus for touchdowns is justified by the fact that yardage becomes more difficult to get near the opponent's goal line. The forty-yard penalty for interceptions compensates for the loss of the opportunity to drive the other team back by punting if a first down is not made. Of course, in some situations, an intercepted pass is as good as a punt. In other cases, like at the end of a half, the interception could cost nothing at all, so a better rating could be achieved by taking each individual interception (or touchdown) into account. However, given simply overall data, I believe the proposed method more accurately measures passing ability than one currently being used.

AFC PASSERS	ATT	YDS	TD	IN	NFL RATE	NFL RANK	Un-weighted AvgG	NFL RANK	PALMER METHOD	NFL RANK
Marino, Mia	564	5084	48	17	109.0	1	9.01	1	9.51	1
Eason, NE	431	3228	23	8	93.1	3	7.49	12	7.81	4
Krieg, Sea	48O	3671	32	24	83.4	8	7.65	8	6.98	11
Fouts, SD	5O7	3740	19	17	83.1	9	7.38	15	6.79	13
Kenney, KC	282	2098	15	10	80.8	11	7.44	13	7.09	7
Anderson, Cin	275	2107	10	12	80.7	12	7.66	7	6.64	15
Moon, Hou	450	3338	12	14	77.1	16	7.42	14	6.71	14
Elway, Den	380	2598	18	15	76.9	17	6.84	22	6.21	19
Malone, Pit	272	2137	16	17	73.3	18	7.86	6	6.53	16
Ryan, NYJ	285	1939	14	14	71.9	20	6.80	23	5.82	23
Wilson, LARd	282	2151	15	17	71.8	21	7.63	9	6.28	18
McDonald, Cle	493	3472	14	23	67.0	24	7.04	19	5.74	24
Ferguson, Buf	344	1991	12	16	64.6	25	5.79	28	4.63	28
Blackledge, KC	294	1707	6	11	59.2	28	5.81	27	4.72	27

NFC PASSERS	ATT	YDS	TD	IN	NFL RATE	NFL RANK	Un-weighted AvgG	NFL RANK	PALMER METHOD	NFL RANK
Montana, SF	432	3630	28	10	103.0	2	8.40	2	8.77	2
Lomax, StL	560	4619	28	16	92.4	4	8.25	3	8.11	3
Bartkowski, Atl	269	2158	11	10	89.8	5	8.02	4	7.35	5
Theismann, Was	477	3391	24	13	86.6	6	7.109	18	7.03	10
Dickey, GB	401	3195	25	19	85.6	7	7.97	5	7.32	6
Danielson, Det	410	3076	17	15	82.8	10	7.50	11	6.87	12
DeBerg, TB	509	3554	19	18	79.3	13	6.9823	20	6.31	17
Kemp, LARm	284	2021	13	7	78.7	14	7.116	16	7.05	9
Simms, NYG	533	4044	22	18	78.0	15	7.59	10	7.06	8
Jaworski, Phi	427	2754	16	14	73.2	19	6.450	25	5.89	21
D.White, Dal	233	1580	11	11	71.5	22	6.78	24	5.84	22
Kramer, Min	236	1678	9	10	70.6	23	7.110	17	6.18	20
Hogeboom, Dal	367	2366	7	14	63.7	26	6.447	26	5.30	25
Todd, NO	312	2178	11	19	60.4	27	6.9817	21	5.25	26

RANKING BY NFL SYSTEM		RANKING BY AVG.YDS/ATT.		RANKING BY PALMER METHOD	
NO	RATE	NO	AvgG	NO	METHOD
1. Marino, Mia	109.0	1. Marino, Mia	9.01	1. Marino, Mia	9.51
2. Montana, SF	103.0	2. Montana, SF	8.40	2. Montana, SF	8.77
3. Eason, NE	93.1	3. Lomax, StL	8.25	3. Lomax, StL	8.11
4. Lomax, StL	92.4	4. Bartkowski, Atl	8.02	4. Eason, NE	7.81
5. Bartkowski, Atl	89.8	5. Dickey, GB	7.97	5. Bartkowski, At1	7.35
6. Theismann, Was	86.6	6. Malone, Pit	7.86	6. Dickey, GB	7.32
7. Dickey, GB	85.6	7. Anderson, Cin	7.66	7. Kenney, KC	7.09
8. Krieg, Sea	83.4	8. Krieg, Sea	7.65	8. Simms, NYG	7.06
9. Fouts, SD	83.1	9. Wilson, LARd	7.63	9. Kemp, LARm	7.05
10. Danielson, Det	82.8	10. Simms, NYG	7.59	10. Theismann, Was	7.03
11. Kenney, KC	80.8	11. Danielson, Det	7.50	11. Krieg, Sea	6.98
12. Anderson, Cin	80.7	12. Eason, NE	7.19	12. Danielson, Det	6.87
13. DeBerg, TB	79.3	13. Kenney, KC	7.44	13. Fouts, SD	6.79
14. Kemp, LARm	78.7	14. Moon, Hou	7.42	14. Moon, Hou	6.71
15. Simms, NYG	78.0	15. Fouts, SD	7.38	15. Anderson, Cin	6.64
16. Moon, Hou	77.1	16. Kemp, LARm	7.116	16. Malone, Pit	6.53
17. Elway, Den	76.9	17. Kramer, Min	7.110	17. DeBerg, TB	6.31
18. Malone, Pit	73.3	18. Theismann, Was	7.109	18. Wilson, LARd	6.28
19. Jaworskl, Phi	73.2	19. McDonald, Cle	7.04	19. Elway, Den	6.21
20. Ryan, NYJ	71.9	20. DeBerg, TB	6.9823	20. Kramer, Min	6.18
21. Wilson, LARd	71.8	21. Todd, NO	6.9817	21. Jaworski, Phi	5.89
22. D.White, Dal	71.5	22. Elway, Den	6.84	22. D.White, Dal	5.84
23. Kramer, Min	70.6	23. Ryan, NYJ	6.80	23. Ryan, NYJ	5.82
24. McDonald, Cle	67.0	24. D.White, Dal	6.78	24. McDonald, Cle	5.74
25. Ferguson, Buf	64.6	25. Jaworski, Phi	6.450	25. Hogeboom, Dal	5.30
26. Hogeboom, Dal	63.7	26. Hogeboom, Dal	6.447	26. Todd, NO	5.25
27. Todd, NO	60.4	27. Blackledge, KC	5.81	27. Blackledge, KC	4.72
28. Blackledge, KC	59.2	28. Ferguson, Buf	5.79	28. Ferguson, Buf	4.63