

APPENDIX E-522 P

MANUAL REVISION OF FORECAST DATA

1. PURPOSE

a. This procedure is applicable to established items and covers manual determination of a revised:

- (1) System Quarterly Forecast of Demand.
- (2) Proportion of Recurring Demand Allocable (PRDA).
- (3) Regular/Correcting Alpha Factor.

b. Under certain circumstances, it will be necessary for the Item Managers to manually revise the above data elements. To assist in this determination, an Alpha Factor/Demand Weight Table for Double Exponential Smoothing is provided. This table identifies by Alpha Factor the weight of past demands by forecast period that are rolled up and reflected in the machine computed forecast (QFD). Periods t represents the most currently completed forecast period, 1 month for VIP items, or 1 quarter for non-VIP items. For example, periods $t-1$, $t-2$, $t-3$ represent first oldest, second oldest, third oldest forecast period respectively from t . The weight factors are reflected through a total of 16 periods, or through the period at which the first minus weight is reached. The figures at the bottom of the chart represent the total of all the plus weights and the total of all the minus weights. For any given alpha factor (exception 05), the total plus weights plus the total minus weights will equal 1.000 or 100 percent. It is pointed out that not all minus weights are reflected on the chart. However, if all minus weights were available and totaled (they would extend into periods beyond $t-15$), they would equal the total minus weight reflected on the chart. The PRDA/Demand Weight Table for Single Exponential Smoothing is also provided. This table is constructed in the same manner as the Alpha Factor/Demand Weight Table, except that it reflects weights of past demands as they relate to the machine computed Single Smoothed Averages used in computing the PRDA.

2. APPENDICES USED IN THIS PROCESS

- a. Chapter 34, Supply Control Studies.
- b. Chapter 53, Recurring Demand Forecast.
- c. Appendix B-64, Forecast Data Change Transaction.
- d. Appendix B-119, Preferred Storage Location/Proportion of Recurring Demand Allocable (PRDA) Transaction.
- e. Appendix C-117, Supply Control Work Sheet.
- f. Appendix E-064 P, Forecast Data Change Transaction.
- g. Appendix E-070 P, Management Policy Table Transactions.

h. Appendix E-119 P, Preferred Storage Location/Proportion of Recurring Demand Allocable (PRDA) Transaction.

i. Appendix F-167, Standard Supply Control Study.

j. Appendix F-191, Demand>Returns History Listing.

3. RESPONSIBLE ORGANIZATION ELEMENT

Directorate of Supply Operations, Commodity Branch Item Managers.

4. PROCEDURES/INSTRUCTIONS

a. Revision of the System QFD.

(1) By forecast period, subtract the demands that were entered into machine forecast computations from the demands the Item Manager feels should have been entered into machine forecast computation. The sign (+ or -) of the difference must be recorded. For VIP items, it may be necessary to refer to the Demand>Returns History Listing, appendix F-191, to obtain demands for the past one or two months. For non-VIP items, demands for the past quarters may be derived from the Standard Supply Control Study, appendix F-167, or the Demand>Returns History Listing.

(2) Select from the Alpha Factor/Demand Weight Table for Double Exponential Smoothing, the weight that applies to the Alpha Factor used in the machine computation and the forecast period in which the demands now appear.

(3) Multiply the weight (subparagraph a(2)) by the difference (+ or -) (subparagraph a(1)) and add the product to the current machine computed System QFD. The result is the revised System QFD.

(4) Example:

(a) Alpha Factor = .40.

(b) Demands used in machine computations = 400 for period t.

(c) The Item Manager determines the demands for period t should have been 300.

(d) Weight from the Alpha Factor/Demand Weight Table = .640.

(e) System QFD = 365.

(f) Computations:

1. $300 - 400 = -100$ difference.

2. $-100 \times .640 = -64.$

3. $365 + (-64) = 301$ Revised QFD.

NOTE: For items forecast monthly (VIP Codes M and Y) use one-third the QFD in subparagraph (e) and multiply the result obtained in subparagraph 3 by 3 to get the revised QFD.

(5) Since the demands which influence the system QFD also influence the PRDA, upon revision of the System QFD it will also be necessary to revise the PRDA.

b. Revision of the Proportion of Recurring Demand Allocable (PRDA):

(1) Determine the current Single Smoothed Average for each depot by multiplying the System Single Smoothed Average by each Depots PRDA.

$$St \text{ (Location K)} = St \text{ (System - Location)} \times PRDA \text{ (Location K)}$$

(2) Revise Single Smoothed Average Location E. Location E is any location (or locations) which has received erroneous demands.

(a) By forecast period, subtract the demands which were entered into machine computations from the demands the Item Manager feels should have been entered into machine computations. The sign (+ or -) of the difference must be recorded.

(b) Select from the PRDA/Demand Weight Table for Single Exponential Smoothing, the weight applies to the Alpha used in the machine computation and the forecast period in which the demands now appear.

(c) Multiply the weight (subparagraph b(2)(b)) by the difference (+ or -) (subparagraph b(2)(a)) and add the product to Location Es Single Smoothed Average. The result is a revised Single Smoothed Average for Location E.

(3) Revise Location Ks (all locations) PRDA.

(a) Add revised Location E Single Smoothed Averages to the Single Smoothed Averages applicable to Location C. Location C is any Location (or Locations) which has received correct demands.

NOTE: Location Ks fall into one of two categories, Location E or Location C.

(b) Divide each Location's Single Smoothed Average (Location E and Location C) by the sum derived via paragraph 4b(3)(a) above. The result is the revised PRDA for all locations.

NOTE: The sum of all the PRDAs must equal 1.000. Adjust the largest PRDA, as necessary, to make the sum equal 1.000.

(4) Example:

PRD PRDA SCC = .400
PRDA SUC = .325
PRDA SMC = .275
Machine computed system Single Smoothed Average = 365
Alpha = .40

(a) Determine the current Single Smoothed Average for each location.

St SCC = 365 X .400 = 146.00
St SUC = 365 X .325 = 118.6
St SMC = 365 X .275 = 100.4

(b) Revise Single Smoothed Average Location E. SCC is determined to be Location E. Demand History indicates 200 demands were applicable to SCC. The Item Manager feels only 100 demands should have been applicable. Weight from PRDA/Demand Weight Table, Single Exponential Smoothing (Location), is .40.

1. $100 - 200 = -100.$

2. $-100 \times .400 = -40.$

3. $146 + (-40) = 106,$ Revised Single Smoothed Average SCC.

(c) Revise Location Ks (all Locations) PRDA.

1. Location Es (SCC) Revised Single Smoothed Average = 106.0.

2. Location Cs (SUC and SMC) Single Smoothed Averages are 118.6 and 100.4 respectively.

3. $106.0 + 118.6 + 100.4 = 325.0.$

4. Revised PRDA by Depot is:

$106.0 \div 325 = .326$ PRDA SCC.

$118.6 \div 325 = .364$ Change to .366 PRDA SUC.

$100.4 \div 325 = .308$ PRDA SMC.

NOTE: $.326 + .364 + .308 = .998.$ SUC's PRDA is increased by .002 so the sum of all PRDAs = 1.000.

c. Revision of Regular/Correcting Alpha Factors.

(1) Review the Alpha Factor/Demand Weight Table for Double Exponential Smoothing to determine the weights applied to demands under different Alpha Factors.

(2) Select the Alpha Factor which best represents the weights management wished to apply to demands per forecast period.

(3) In determining the appropriate weights to apply to demands for forecast period, the following considerations apply:

(a) If significant changes in demand (increases or decreases) are not anticipated in the near future, the normal alpha value applicable to the item should not be changed.

(b) If significant changes in demand are anticipated to occur in the near future for that item, then consideration should be given to increasing the normal alpha value so that more weight will be accorded to the most recent demand data.

(c) It must be borne in mind that increasing the alpha value not only increases the weight assigned to recent demand data, but also tends to amplify the changes in successive demand forecasts. Thus during periods when demands do not consistently follow an upward or downward trend, but fluctuate up and down, a high alpha value will result in widely fluctuating demand forecasts.

d. Procedures for manually computing or entering revised data into computer records for machine computations are contained in the following appendices:

(1) System Quarterly Forecast of Demand, appendix E-064 P.

(2) Proportion of Recurring Demand Allocable (PRDA), appendix E-119 P.

(3) Alpha Factors:

(a) Supply Control Record for the individual NSN (IM input), appendix E-064 P.

(b) Policy Table (Management Input), appendix E-070 P.

(4) Manual Computations:

(a) Procedure for Preparation of the Supply Control Worksheet, appendix E-261 P.

(b) Supply Control Worksheet (DLA Form 949), appendix C-117.

5. FLOWCHART

Flowchart not required. However, the Single and Double Exponential Tables are included for Item Manager use.

ALPHA FACTOR/DEMAND WEIGHT TABLE

DOUBLE EXPONENTIAL SMOOTHING (SYSTEM)

ALPHA FACTORS

P E R I O D	DEMAND WEIGHT											
	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60
*t	.098	.190	.278	.360	.438	.510	.578	.640	.698	.750	.798	.840
t-1	.090	.162	.217	.256	.281	.294	.296	.288	.272	.250	.223	.192
t-2	.083	.138	.168	.179	.176	.162	.140	.115	.088	.063	.039	.019
t-3	.077	.117	.129	.123	.105	.082	.058	.035	.015	0	-.010	-.015
t-4	.071	.098	.098	.082	.059	.036	.016	0	-.010	-.016		
t-5	.066	.083	.073	.052	.030	.010	-.004	-.012				
t-6	.060	.069	.054	.031	.011	-.004						
t-7	.056	.057	.039	.017	0							
t-8	.051	.047	.027	.007	-.006							
t-9	.047	.039	.017	0								
t-10	.043	.031	.010	-.004								
t-11	.040	.025	.005									
t-12	.036	.020	.001									
t-13	.033	.015	-.002									
t-14	.030	.011										
t-15	.028	.003										
Total Plus Weight	.909	1.110	1.116	1.107	1.100	1.094	1.088	1.078	1.073	1.063	1.060	1.051
Total- Minus Weight	-.110	-.116	-.107	-.100	-.094	-.088	-.078	-.073	-.063	-.060	-.051	

*t = The most currently completed forecast period (For VIP monthly; for Non-VIP quarterly).

PRDA/DEMAND WEIGHT TABLE

SINGLE EXPONENTIAL SMOOTHING (LOCATION)

P E R I O D	ALPHA FACTOR											
	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60
	DEMAND WEIGHT											
*t	.050	.100	.150	.200	.250	.300	.350	.400	.450	.500	.550	.600
t-1	.048	.090	.128	.160	.188	.210	.228	.240	.248	.250	.248	.240
t-2	.045	.081	.108	.128	.141	.147	.148	.144	.136	.125	.111	.096
t-3	.043	.073	.092	.102	.105	.103	.096	.086	.075	.063	.050	.038
t-4	.041	.066	.078	.083	.079	.072	.063	.052	.041	.031	.023	.015
t-5	.039	.059	.067	.066	.059	.050	.041	.031	.023	.016	.010	.006
t-6	.037	.053	.057	.052	.044	.035	.026	.019	.012	.008	.005	.002
t-7	.035	.048	.048	.042	.033	.025	.017	.011	.007	.004	.002	.001
t-8	.033	.043	.041	.034	.025	.018	.011	.007	.004	.002	.001	0
t-9	.032	.039	.035	.027	.019	.012	.007	.004	.002	.001	0	
t-10	.030	.035	.030	.021	.014	.009	.005	.003	.001	0		
t-11	.028	.031	.025	.016	.011	.006	.003	.001	.001			
t-12	.027	.028	.021	.013	.008	.004	.002	.001	0			
t-13	.026	.025	.018	.011	.006	.002	.001	0				
t-14	.024	.023	.015	.009	.004	.002	.001					
t-15	.023	.021	.013	.007	.003	.001	.001					

*t = The most currently completed forecast period (For VIP monthly; for Non-VIP quarterly).