

**SAS/AF, EXTENDED TABLES, FSEDIT & SCL coding put together for
easy location, input or additional information**

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ABSTRACT

Time is money in many types of businesses but it has a large impact in the Airline Industry, when an aircraft is on the ground and waiting for a part. SAS/AF, Extended Tables and SCL coding have been a good solution to this problem at Northwest Airlines.

SAS/AF is easy to use by all levels of our employees, from Clerks to Mechanics, Managers to Directors. Extended Tables gives us a fact view of things we need, then connected to an FSEDIT we can enter, update or delete information. Minimum entry is the key to a successful system, therefore we have added SCL coding to bring in additional information fields.

This paper will show what has been developed to bring all of these SAS tools together.

INTRODUCTION

The system that is described here is called the "Material Shortage System". Various screens will refer to this name. Northwest Airlines had various files and groups of people trying to keep track of parts for aircraft when needed. It was determined that a single system was needed to pull everything together so that there was only one place to look for and control parts movement.

SAS/AF was chosen as our tool for this effort. Reviewing the requirements for viewing information led us to Extended Tables. We needed to create, update and delete information once it was found within the extended table, which brought us to use FSEDIT. Key strokes needed to be kept to a minimum, which caused us to add SCL coding to the FSEDIT based on selected file input. With all this in mind, the "Material Shortages System" was created.

SOLUTION

Entering into SAS/AF, our Primary Menu, Example #1 is displayed on the screen.

```

                                EXAMPLE #1

Command ==>

Welcome to the NWA Materials Shortage System

Select the location and type the number on the Command Line.
Press Enter

1. MSP
2. ATL
3. DLH
4. SIN
5. MEM

99. EXIT SYSTEM

```

The selection made gives the system information on what areas you are interested in viewing. The first five selections will bring you to your next selection menu, example #2.

```

                                EXAMPLE #2

Command ==>

Select the appropriate choice and press ENTER.

Hangars:
1. By Fleet or Tail Number.
2. Enter a New Tail Number
Shops/Hangars by:
3. Cost Center
4. Analyst Code
5. Production Scheduler Code
6. Crew
7. Selection By Shop Order #, Repair Order #, Shortage # or
   Stock # and Serial #, MFG Part # or
   NWA Part Number.

Reports:
8. Material Support and Shops
9. Hangars
10. Special

99. Exit System
PF3/PF15 Return to previous MENU.

```

Items 1 - 6 all use Extended Tables for displaying the information related to your selection. For this paper, we will only use option #1. Example #3 shows the screen as seen by the user and Example #3A shows the screen and how it is defined for use of the Extended Table.

EXAMPLE #3

Command ==>

Make your selection and then press ENTER
 To select the Tail Number of your choice : ____ or Fleet: ____

Short No	Stock Number	Qty	Date Req	Response	Tail No.	Description
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EXAMPLE #3A

Command ==>

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00001 & Make your selection and then press ENTER
00002 To select the Tail Number of your choice : &CCC or Fleet: &F
00003 Short No Stock Number Qty Date Req Response Tail No. Descriptio
00004 ----
00005 & &SHORTN &STOCKNU ____ &QTY_ &REQDATE &RESDATE &TAI &VEND ____
00006 &H &COMMENT _____
00007 &J &COMM _____
00008 &COM5 _____
00009 &COM6 _____
00010
00011 FIELD 4
00012
00013
00014
00015
00016
00017
00018
00019
00020
  
```

The selected fields from the record are defined and were kept to a minimum in order to get multiple records on the screen at once. The number of records is determined by their size, the type of screen you are using and they will fill dynamically. One field for each record has been added and this is to be used to indicate which record you are selecting to be viewed and/or updated (FIELD 4).

Basic housekeeping takes place in the source code for this program, but the key here is the CALL SETROW and CALL EXECCMD in conjunction with the GETROW and PUTROW, Example #4. This keeps track of where you are in the Extended Table.

EXAMPLE #4

```

IF (MODIFIED(CCC)) THEN DO;
000108  CALL SETROW(0,0,' ','Y');
000109  CALL EXECCMD('KEYFIELD SHORTNO');
000110  END;
000111  IF (MODIFIED(FLEET)) THEN DO;
000112  CALL SETROW(0,0,' ','Y');
000113  CALL EXECCMD('KEYFIELD SHORTNO');
000114  END;

```

When something is entered in Field #4 and you press Enter, the PUTROW is invoked and relates to the shortage number being selected. This is fed to a CALL FSEDIT which uses a Where Clause to obtain the required record, Example #4A.

EXAMPLE #4A

```

000126  GETROW:
000127  IF FETCHOBS(MSTR,_CURROW_) < 0 THEN CALL ENDTABLE();
000128  RETURN;
000129  PUTROW:
000130  CALL FSEDIT("MSTR.MASTER(WHERE=(SHORTNO= "||SHORTNO||"))",
000131  'HELPPAD.HELPPAD.PARTS'||FIELD1||'.SCREEN');
000132  FIELD4 = ' ';
000133  RETURN;

```

Example #5 shows the selection of items requested for fleet 55.
Our screen size gives us three records at a time.

EXAMPLE #5

Extended Table By Tail Numbers
Command ==>

NOTE: The current keyfield is SHORTNO.
Make your selection and then press ENTER
To select the Tail Number of your choice : _____ or Fleet: 55
Short No Stock Number Qty Date Req Response Tail No. Description

FIELD #4

>	7726	55-2700-4-0185	1	12APR96	15APR96	5530	VALVE, CHECK, PWR
HP	PO CHANGED AS OF 07JAN97						
—	EXP PO, MAM 4/15/96						
—	06MAY PLEASE CORRECT END ASSY STOCK NUMBER.....JON						
—	16MAY TEIJIN SEIKI HAS TO MANUFACTURE IN JAPAN..05JUL96..JON						
>	11314	09-2500-3-3604	50	01JUL96		5525	QUADRANT, UOP 881
HP	PO CHANGED AS OF 07JAN97						
—	7/1 BYR WILL EXPEDITE ORDER.....JACKIE						
—	7/5 W/S 7/19.....JACKIE						
—	8/9 RE-EXPEDITED VIA FAX.....JACKIE						
>	11436	00-2500-4-0036	5	03JUL96	03JUL96	5525	TABLE, ASSY; SIDE
HP	PO CHANGED AS OF 07JAN97						
—	03JUL: PO 816409-1-8 PTC EST W/S 8/5/96..IF THERE IS SO MANY						
—	BROKEN PARTS IN SHOP?WHY HAVE YOU NOT SCRAPPED SAME SO IN-						
—	VENTORY KNOWS THAT THERE IS A PROBLEM AND ORDER REPLACEMENTS						

Examples # 6 shows a record selected from Example #5 by using Field #4 to select the item.

EXAMPLE #6

+FSEDIT MSTR.MASTER (Subset) Obs 1268 Screen 1

Command ==>

NOTE: This application uses 3 screens.
MATERIAL SHORTAGE REQUIREMENTS

Emp No: 075176 Shortage Date: 18OCT96 Shortage No: 13335

Emp Name OBRIEN, THOMAS W Cost Ctr No: 8270 Crew No: _____

A/C Tail No: 5508 Bay No: _____ Card Ref No: _____ WCJO No: _____

NWA Stk No: 55-2700-3-1378 Mfg Part No: 654N0244-61

Desc: SUPPORT, CARRIAGE 11 Qty: 1 UI: EA Req'd Date: _____

Hold Status: VR Shop Order: _____ Rep Order: _____ ON9 No: _____

End Assy Stk No: _____ End Assy Desc: _____

End Assy Serial No: _____ TT _____ End Assy Qty: _____ Exp Status: _____

Received Date: _____ Received By: _____ Routed to Shop: _____

Cancelled Date: _____ Cancelled By: _____ Routing: _____

Reason Cancelled: _____ SEE Comments Type Check: _____ Robbed Part _____

Analyst - NWA Stk No JL End Assy Stk No _____ Buyer Cd _____ Prod Sched _____

Emp No: 094039 Emp Name: DEAN, JAMES H Response Date: 28OCT96

P O No: _____ S O No: _____ Qty Shipping: _____

Vendor: _____ Ship Date: _____ Rec Date _____

Ship Mode: _____ Waybill No: _____

Expedite PO _____ Surplus/Excess _____ Expedite SO _____ Resp Hold HP _____ SEE Comments

F3/F15 Return to Previous Screen F6=Dup F9=ADD F11=Comment Screen

To Cancel Type CANCEL on the Command Line and Press ENTER

EXAMPLE #7

FSEDIT MSTR.MASTER (Subset)
Command ==>

New Screen 1

MATERIAL SHORTAGE REQUIREMENTS

Emp No: _____ Shortage Date: 07FEB97 Shortage No: 13469
 Emp Name _____ Cost Ctr No: 8610 Crew No: _____
 A/C Tail No: _____ Bay No: _____ Card Ref No: _____ WCJO No: _____
 NWA Stk No: _____ Mfg Part No: _____
 Desc: _____ Qty: _____ UI: EA Req'd Date: _____
 Hold Status: _____ Shop Order: _____ Rep Order: _____ OM9 No: _____
 End Assy Stk No: _____ End Assy Desc: _____
 End Assy Serial No: _____ TT _____ End Assy Qty: _____ Exp Status: _____
 Received Date: _____ Received By: _____ Routed to Shop: _____
 Cancelled Date: _____ Cancelled By: _____ Routing: _____
 Reason Cancelled: _____ NO Comments Type Check: _____ Robbed Part _____
 Analyst - NWA Stk No _____ End Assy Stk No _____ Buyer Cd _____ Prod Sched _____
 Emp No: _____ Emp Name: _____ Response Date: _____
 P O No: _____ S O No: _____ Qty Shipping: _____
 Vendor: _____ Ship Date: _____ Rec Date _____
 Ship Mode: _____ Waybill No: _____
 Expedite PO _____ Surplus/Excess _____ Expedite SO _____ Resp Hold _____ NO Comments
 F3/F15 Return to Previous Screen F6=Dup F9=ADD F11=Comment Screen
 To Cancel Type CANCEL on the Command Line and Press ENTER

Each record has two display screens, Examples #7 & 7A. The first is the basic information about what is needed. The second screen is used for comments. Both screens have an upper and lower section. Each section is filled in by a different person. The upper half of both screens is filled in by the person requesting the part and the bottom half is filled in by the person obtaining the part. To save time, we have two flags on the first screen that alert you to comments on the second screen. If comments are present, "SEE COMMENTS" is stated and "NO COMMENTS" when applicable.

To create a new item, a clear screen is obtained by pressing PF9, Example #7.

EXAMPLE #7A

FSEDIT MSTR.MASTER (Subset)
Command ==>

New Screen 2

Critical Material Requirements
COMMENTS: _____

Automatic Close Date: _____

Material Management Response
Comments: _____

F10=Return to Screen 1

You will notice the "Shortage Date", "Shortage No" and "Cost Ctr No" are already filled in. These have been determined based on how the user has entered the system.

The fields to be entered, if applicable, are 'Emp No', 'Crew No', 'A/C Tail No', 'Bay No', 'Card Ref No', 'WCJO No' and either the Northwest 'Stk No' or 'Mfg Part No'. If the stock number or manufacturer's part number is not available, the 'OM9 No' is required. Based on the number entered, SCL is used to search files for the 'Desc', 'Routed to Shop' and 'Routing' fields. Plus, based on the 'Emp No' entered, the 'Emp Name' will be pulled into the system. Also, the number not entered manually (manufacturer's part number or NWA stock number) is filled in automatically.

If the 'Assy Stk No' is entered, it will populate the 'End Assy Desc'. 'Req'd Date' is a required field and must be entered to complete the new request for parts. See Example #8 for SCL code to bring in fields from another file.

EXAMPLE #8 (Page 1)

```
000131 IF (MODIFIED(STOCKNUM)) THEN DO;
000132 IF STOCKNUM = ' ' THEN DO;
000133   STNO=OPEN('INVENT.INV_MSTR','I');
000134   VENDESC = ' ';
000135   KEY_NOUN = ' ';
000136   IF STNO NE 0 THEN DO;
000137     CALL SET(STNO);
000138     RC=WHERE(STNO);
000139     RC=WHERE(STNO,'STOCKNUM='||" "||STOCKNUM||" ");
000140     IF RC = 0 THEN DO;
000141       RC2 = FETCH(STNO);
000142       IF RC2 = 0 THEN DO;
000143         ATL=SYMGET('ATL');
000144         IF ATL = ' ' THEN DO;
000145           REPL = 'MSP';
000146         END;
000147       ELSE DO;
000148         REPL = ATL;
000149       END;
000150       IF REPL = 'MSP' AND REPL_STA = 'ATL' THEN DO;
000151         RC2 =FETCH(STNO);
000152       END;
000153       NWAANALY=ANALYST;
000154       VENDESC=SUBSTR(KEY_DESC,1,20);
000155       VENDOR=MFG_PN;
000156     END;
000157   ELSE DO;
000158     ERRORON STOCKNUM;
000159     _MSG_ = 'STOCK NUMBER NOT FOUND';
000160     VENDOR=' ';
000161     CURSOR STOCKNUM;
000162   END;
000163 END;
000164 END;
```

EXAMPLE #8 (Page 2)

```

000165 RCH=CLOSE(STNO);
000166 DEPTX = ' ';
000167 SECTIONX = ' ';
000168 LOCX = ' ';
000169 TO_STN = ' ';
000170 IF SUBSTR(STOCKNUM,9,1) = '3' THEN DO;
000171   SHOP1=OPEN('SHOPS.ROUTING','1');
000172   IF SHOP1 NE 0 THEN DO;
000173     CALL SET(SHOP1);
000174     RC=WHERE(SHOP1);
000175     RC=WHERE(SHOP1,'STOCKNUM='||STOCKNUM||' AND RTG_TYP='||RTG_TYP||' AND DEPT = '||DEPT||'');
000176     IF RC = 0 THEN DO;
000177       RC2 = FETCH(SHOP1);
000178       IF RC2 = 0 THEN DO;
000179         DEPTX = DEPT;
000180         SECTIONX = SECTION;
000181         LOCX = LOC;
000182       END;
000183     END;
000184   END;
000185   RCH=CLOSE(SHOP1);
000186 END;
000187 END;
000188 END;
000189 END;

```

A key point here, is to define your fields being populated to the screen, the very same as they are defined on the file you are accessing. If they do not match, they will not be populated. By combining the SCL with the FSEDIT, we have saved keystrokes, but have added up to 15 seconds of response time to bring in the fields. The trade off is worth it because we now have validated information. One word of caution if trying this method to add information, the response time grows as more files and fields are added. There is a point when response time is not worth the results. We found this out and needed to balance the two.

CONCLUSION

When you have a request to accomplish a task, keep an open mind and try to see what might fit the best. SAS/AF, EXTENDED TABLES, FSEDIT and SCL coding gave us the tools to provide our customers with a good product.

Remember, if you have 300 programmers in a room, you'll have 300 ways to do what you want. Ask others, ideas are valuable.

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