

INSTALLATION MANAGEMENT AT COMMERCIAL AND COLLEGE SETTINGS

PRESENTED TO THE 1980
NORTH AMERICAN MEETING OF THE
HEWLETT-PACKARD GENERAL SYSTEMS
USERS GROUP

FEBRUARY 25-29, 1980

CONVENTION CENTER
SAN JOSE, CALIFORNIA

PRESENTED BY

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- FIRST - WE INTEND TO PROVIDE GUIDANCE AND ADVICE TO NEW HEWLETT-PACKARD USERS WHICH WOULD BE HELPFUL WHEN INSTALLING NEW HEWLETT-PACKARD SYSTEMS.
- SECOND - WE WISH TO PROVIDE OLD USER'S WITH SOME NEW IDEAS AND SUPPLY ENOUGH INFORMATION ABOUT OUR OWN OPERATIONS, TO ALLOW THEM TO COMPARE THEIR OPERATING EFFICIENCY TO THE EFFICIENCY OF THE INSTALLATIONS DESCRIBED.
- THIRD - THE THIRD PURPOSE OF THIS SESSION IS TO PROVIDE A FOUNDATION FOR INTERFACE AND DISCUSSION AMONG THE PARTICIPANTS OF THIS SESSION ON THE SUBJECT OF UTILIZATION OF THE MPE OPERATING SYSTEM IN THE MANAGEMENT OF AN INSTALLATION'S OPERATION.

IN ORDER TO ACCOMPLISH THE PURPOSE OF THIS SESSION, WE INTEND TO PRESENT INFORMATION DESCRIBING THE OPERATION OF A COMMERCIAL ENVIRONMENT AND AN EDUCATIONAL ENVIRONMENT IN AS MUCH DETAIL AS THE TIME WILL ALLOW. THE DIVERSE NATURE OF THESE TWO INSTALLATIONS SHOULD PROVIDE ADEQUATE BACKGROUND IN HOW THE HEWLETT-PACKARD SYSTEM IS BEING USED. NEITHER SPEAKER IN THIS SESSION MEANS TO SUGGEST BY THE PRESENTATION OF THEIR INSTALLATION OPERATION THAT THE MEANS UTILIZED TO MANAGE THEIR OPERATION IS EITHER THE BEST OR THE ONLY WAY A SYSTEM CAN BE STRUCTURED AND MANAGED.

DESCRIPTION OF A COMMERCIAL ENVIRONMENT

MARITIME TERMINALS, INCORPORATED IS THE OPERATING COMPANY FOR NORFOLK INTERNATIONAL TERMINALS WHICH IS THE LARGEST CONTAINER TERMINAL IN THE PORT OF HAMPTON ROADS, VIRGINIA. THE FACILITY HAS THREE CONTAINER BERTHS WHICH ARE UTILIZED FOR LOADING AND UNLOADING OF CONTAINERIZED CARGO FOR IMPORT AND EXPORT VIA OCEAN GOING VESSELS. THE CONTAINER BERTHS ARE EQUIPPED WITH FOUR PORTAINER CRANES AND ARE SUPPORTED BY 55 ACRES OF PAVED AND LIGHTED CONTAINER STORAGE AREAS. THE YARD OPERATION IS ALSO SUPPLEMENTED BY THE USE OF EIGHT 40 TON TRANSTAINERS USED TO STACK THE CONTAINERS OFFLOADED FROM THE VESSELS. FOR BREAK/BULK CARGO THERE ARE TWO LARGE COVERED CONCRETE PIERS WHICH CAN ACCOMMODATE UP TO EIGHT SHIPS AT A TIME AND COVER 900,000 SQUARE FEET.

THE PIERS ARE SERVED BY EIGHT WAREHOUSES UTILIZED FOR THE PURPOSE OF LOADING AND UNLOADING CARGO FROM BOTH TRUCK AND RAIL.

IN ADDITION TO THE WAREHOUSE AND PIER FACILITIES, NORFOLK INTERNATIONAL TERMINALS ALSO PROVIDES SERVICE FOR FUMIGATION, DEFROST, MEAT INSPECTION, FROZEN MEAT STORAGE, STUFFING AND STRIPPING OF CONTAINERIZED CARGO AND EXPORT PACKING FACILITIES.

THE ENTIRE OPERATION OF THE TERMINAL FACILITY IS MONITORED BY AN ONLINE CARGO CONTROL SYSTEM IMPLEMENTED ON A HEWLETT-PACKARD 3000 SERIES II MODEL 6 COMPUTER. THE EQUIPMENT CONFIGURATION OF THE SYSTEM CONSISTS OF THE FOLLOWING:

384K BYTES OF MEMORY

220M BYTES OF DISC STORAGE

1 600LPM PRINTER

1 800BPI TAPE DRIVE

4 2631A R/O PRINTER TERMINALS

5 2621A CRT TERMINALS

1 GE TERMINET 30 (CONSOLE)

1 HOUSTON INSTRUMENT TERMINAL PRINTER

17 2640B CRT TERMINALS

ELEVEN OF THE ABOVE TERMINALS ARE LOCATED AT PREMISES REMOTE TO THE COMPUTER BUILDING AND ARE THEREFORE CONNECTED VIA GANDALF LIMITED DISTANT MODEMS.

EXCEPT FOR A BRIEF PERIOD DURING THE NIGHT BATCH PROCESSING, THE COMPUTER SYSTEM IS AVAILABLE TO THE USERS 24 HOURS A DAY; SEVEN DAYS PER WEEK. THE PEAK LOAD ON THE SYSTEM HOWEVER OCCURS DURING THE NORMAL 8 TO 5 WORKDAY; MONDAY THROUGH FRIDAY. A TYPICAL MIX OF SESSIONS RUNNING DURING THAT PERIOD OF TIME MAY BE AS FOLLOWS:

3 SESSIONS FOR PROGRAM DEVELOPMENT (EDITOR)

1 SESSION WORD PROCESSING OR TEXT EDITING (EDITOR)

5 JOBS RUNNING TO DIRECT OUTPUT TO PRINTER TERMINALS
(SPOOLTERM/3000)

2 SESSIONS MAKING INQUIRIES ONLY ON THE CARGO CONTROL DATA BASE

1 SESSION INPUTTING ACCOUNTS RECEIVABLE TRANSACTIONS (DEL)

1 SESSION INPUTTING PAYROLL TRANSACTIONS (DEL)

1 JOB (COMPILE, BALANCE PAYROLL, A/R BALANCE, ETC.)

2 SESSIONS UPDATING THE INVENTORY CONTROL DATABASE (DEL)

11 SESSIONS UPDATING THE CARGO CONTROL DATABASE (DEL)

SUMMARY: SESSIONS = 21 JOBS = 6

NOTE* QUANTUM = 350 JOB PRIORITY = DS,ES LIMIT = 6,24 OUTFENCE = 2

THE ABOVE INSTALLATION HANDLES FIVE MAJOR AREAS OF DATA
PROCESSING.

1. PAYROLL
2. ACCOUNTS RECEIVABLE
3. PARTS INVENTORY
4. CARGO CONTROL SYSTEM
5. WORD PROCESSING

DATABASE SNAPSHOT

TWO DATABASE SYSTEMS ARE MAINTAINED BY THE HEWLETT PACKARD 3000
SYSTEM; CARGO CONTROL DATABASE AND THE PARTS INVENTORY DATABASE. A
BRIEF SNAPSHOT OF THE TWO DATABASES IS AS FOLLOWS:

CARGO CONTROL DATA BASE - CONTAINS 84 ITEM ELEMENTS, 5 MASTER DATA
SETS, 3 DETAIL DATASETS. MAINTAINS AN
AVERAGE OF 10,000 MAJOR ENTRIES, CONTAINS A
MAXIMUM OF 3 LINKAGE PATHS, REQUIRES 60K
SECTORS OF DISC STORAGE.

PARTS INVENTORY DATA BASE - CONTAINS 55 ITEM ELEMENTS, 6 MASTER DATA
SETS, 5 DETAIL DATA SETS, MAINTAINS AN
AVERAGE OF 7,000 MAJOR ENTRIES, MAINTAINS
MAXIMUM OF 5 LINKAGE PATHS, REQUIRES 27K
SECTORS OF DISC STORAGE.

AS YOU CAN TELL FROM THE DESCRIPTION OF OUR ENVIRONMENT, OUR
SYSTEM PROVIDES FOR THE INFORMATIONAL NEEDS OF MANY USER DEPARTMENTS.
BECAUSE OF THE FACT THAT OUR COMPANY'S SOLE PRODUCT IS SERVICE TO OUR

DESCRIPTION OF A COMMERCIAL ENVIRONMENT

CUSTOMERS, THIS SYSTEM NEEDS TO BE ABLE TO PROVIDE ACCURATE, UP-TO-DATE, AND TIMELY REPORTS. THIS IS PROVIDED TO OUR USERS THROUGH A COMBINATION OF BOTH BATCH AND ONLINE DATA INFORMATION RETRIEVAL, EXCEPT FOR THE ACCOUNTS RECEIVABLE AND PAYROLL SYSTEMS WHICH ARE WRITTEN IN RPG AND ARE REMNANTS OF OUR PREVIOUS BATCH ORIENTED SYSTEM CONVERTED FROM AN IBM 370/115. THE MAJOR PORTION OF OUR ONLINE SYSTEM PROVIDES OUR USERS WITH UP-TO-DATE INFORMATION THROUGH THE RETRIEVAL AND INQUIRY CAPABILITIES DESIGNED INTO THE ONLINE SYSTEM. EXTENSIVE USE OF THE QUERY LANGUAGE AND THE REMOTE TERMINAL PRINTING CAPABILITIES, THE USERS ARE ABLE TO RETRIEVE CURRENT UP-TO-DATE INFORMATION IN ORDER TO PROVIDE OUR CUSTOMERS WITH FAST AND EFFICIENT SERVICE.

THERE IS A MAJOR PHILOSOPHY WHICH HAS BEEN PERMEATED AND MAINTAINED THROUGH OUT THE LIFE OF OUR CURRENT HEWLETT-PACKARD OPERATING SYSTEM. THAT PHILOSOPHY DICTATES THAT USER DEPARTMENTS, NOT THE DATA PROCESSING DEPARTMENT, ARE RESPONSIBLE FOR INPUTTING AND MAINTENANCE OF THEIR OWN DATA. THE DATA PROCESSING DEPARTMENT MERELY SERVES AS A DEPARTMENT WHICH PROVIDES TO THE USER A MEANS OF MAINTAINING HIS OWN INFORMATION. THE CONTROL OF ALL INFORMATION INTO AND OUT OF THE COMPUTER SYSTEM IS THE RESPONSIBILITY OF THE USER DEPARTMENTS, EXCEPT WHERE INFORMATION IS RECEIVED FROM SOURCES OUTSIDE OF OUR COMPANY'S OPERATION. ALL INFORMATION ENTERED INTO OUR COMPUTER SYSTEM IS DONE VIA ONLINE CRT ENTRY. AS CRT ENTRY DEVICES BECOME MORE AND MORE AVAILABLE TO USERS OF COMPUTER SYSTEMS, I BELIEVE YOU WILL SEE A CONTINUATION OF THE TREND AWAY FROM BATCH DATA ENTRY THROUGHOUT THE INDUSTRY WITH THE END RESULT RESEMBLING THE MANNER IN WHICH WE CURRENTLY ARE HANDLING DATA ENTRY ON OUR SYSTEM.

THE ACCOUNTING STRUCTURE IMPLEMENTED UNDER MPE III NEEDS TO TAKE INTO CONSIDERATION THE NEEDS OF THE USERS BOTH INSIDE AND OUTSIDE OF THE DATA PROCESSING DEPARTMENT. THE TYPE OF DATA TO BE MAINTAINED ON THIS SYSTEM AND THE SECURITY OF THAT INFORMATION WILL ALSO DICTATE THE STRUCTURE IMPLEMENTED. THE FOLLOWING IS A REPRESENTATIVE LIST OF OUR CURRENT ACCOUNT STRUCTURE:

SYS (ACCOUNT)

JOB
UTILITY

MTI (ACCOUNT)

JOB
COMPILE
DOCUMENT
DATAFILE
DATABASE
LIBRARY

DETAIL DESCRIPTION - ACCOUNT STRUCTURE

JOB.SYS

THE JOB GROUP IN THE SYS ACCOUNT IS USED TO STORE A FEW SPECIAL UTILITIES WHICH ARE UTILIZED BY THE SYSTEM MANAGER IN ORDER TO MAINTAIN THE SYSTEM. THE JOBS MAINTAINED WITHIN THIS GROUP MAY RELATE TO THE CONTRIBUTED LIBRARY INSTALLATION AND MAINTENANCE AND SPECIAL BACKUP AND RECOVERY JOB PROCEDURES.

UTILITY

UTILITY IN THE SYS ACCOUNT IS ESTABLISHED FOR THE PURPOSE OF STORING SPECIAL UTILITY PROGRAMS WHICH EITHER REQUIRE SYSTEM MANAGER CAPABILITY OR BECAUSE OF THEIR NATURE BYPASS ALL SECURITY PROVISIONS OF THIS SYSTEM ARE STORED IN A UNIQUE ACCOUNT AVAILABLE ONLY TO THE SYSTEM MANAGER (I.E. GETFILE). PROGRAMS STORED IN THIS ACCOUNT SHOULD NEVER BE STORED IN THE PUB ACCOUNT AND AVAILABLE TO ALL USERS OF THE SYSTEM. THE USE OF LOCKWORDS ON THESE UTILITIES ARE ALSO ADVISABLE.

MTI (USERS ACCOUNT)

JOB

THE JOB GROUP IS ESTABLISHED TO MAINTAIN ALL FILES WHICH HAVE BEEN ESTABLISHED AS JOBS AND CAN BE STREAMED. THESE JOBS ARE NORMALLY USED BY THE COMPUTER OPERATOR TO INITIATE ANY BATCH PROCESSING WHICH

MAY RELATE TO PAYROLL, ACCOUNTS RECEIVABLE, OR OTHER BATCH PROCESSES.

COMPILE

THE COMPILE GROUP IS ESTABLISHED IN ORDER TO MAINTAIN THE JOBS REQUIRED TO MAINTAIN THE OBJECT PROGRAMS USED BY THE ACCOUNT. THIS GROUP WOULD CONTAIN THE JCL NECESSARY TO COMPILE ALL PROGRAMS AND OTHER UTILITY JOBS WHICH WOULD MAINTAIN USL FILES, RL FILES, AND OTHER SUCH FILES NECESSARY TO CREATE OBJECT PROGRAMS.

DOCUMENT

THE DOCUMENT GROUP IS USED TO STORE INFORMATION RELATED TO BOTH SYSTEM AND USER DOCUMENTATION. THE DOCUMENTATION IS MAINTAINED IN EDITOR FILES SO THAT IT CAN BE EASILY UPDATED AND NEW COPIES OF THE DOCUMENTATION PUBLISHED. ALL DOCUMENTATION FOR SYSTEMS RELATED TO PAYROLL, ACCOUNTS RECEIVABLE, CARGO CONTROL, INVENTORY CONTROL, AND OTHER SUCH SYSTEMS ARE MAINTAINED WITHIN THIS GROUP.

LIBRARY

THIS GROUP CONTAINS ALL SOURCE CODE (PROGRAMS) USED BY THIS ACCOUNT. THESE SOURCE PROGRAMS ARE NOT ACCESSABLE BY USERS OF THIS SYSTEM AND AVAILABLE ONLY TO THOSE WHO HAVE "GL" CAPABILITIES.

DATABASE

THE DATABASE GROUP CONTAINS THE DATABASE AND ALL PROGRAMS WHICH PROCESS THE DATABASE INFORMATION IN ADDITION TO THE SCHEMA AND OTHER FILES USED BY QUERY AND IMAGE IN ORDER TO MAINTAIN THIS INFORMATION. THIS GROUP REQUIRES "PM" CAPABILITIES. AT OUR INSTALLATION THIS GROUP CONTAINS THE CARGO CONTROL DATABASE AND THE INVENTORY DATABASE.

DATAFILE

THIS GROUP CONTAINS DATA WHICH RELATES TO OTHER UNIQUE DATAFILES THAT ARE NOT IMAGE/3000 FILES. INFORMATION MAINTAINED IN THIS GROUP ON OUR SYSTEM RELATES TO PAYROLL AND ACCOUNTS RECEIVABLE WHICH UTILIZES KSAM/3000.

USER FILE

THE USER FILE IS ESTABLISHED IN ORDER TO ALLOW OTHER DEPARTMENTS TO UTILIZE THE EDITOR CAPABILITY IN ORDER TO MAINTAIN SPECIFIC INFORMATION FOR THEIR DEPARTMENT WHICH REQUIRES FREQUENT UPDATING. AN EXAMPLE OF THIS IN OUR INSTALLATION IS THE SHIP ARRIVAL SCHEDULE WHICH IS MAINTAINED ON A DAILY BASIS. YOU MAY FIND IT USEFUL TO ASSIGN A FILE SUCH AS THIS TO EACH INDIVIDUAL DEPARTMENT, HOWEVER, IT USUALLY

IS ADVISEABLE TO LIMIT THE NUMBER OF SECTORS AVAILABLE TO THESE USER FILES.

USER NAMES CREATED FOR OUR SYSTEM ARE STRUCTURED AS FOLLOWS:

CCXXXX = CONTAINER CONTROL (HOME=DATABASE)

TCXXXX = TRUCK CONTROL (HOME=DATABASE)

FNXXXX = FINANCE DEPARTMENT (HOME=DATAFILE)

WHERE:

XXXX = LAST FOUR DIGITS OF USERS SSN

ASSOCIATED WITH EACH ONE OF THESE USER NAMES IS A UNIQUE PASSWORD AND THE CAPABILITIES ASSIGNED ARE IA, BA, SF, ND AND ONCE THIS USER NAME HAS BEEN CREATED THEN THE SET CATALOG COMMAND IS EXECUTED UNDER THIS USER NAME TO LOCK THE USER INTO THE APPROPRIATE ONLINE PROGRAM THROUGH A UDC LOGON FILE. THOSE USERS WHO REQUIRE SPECIAL CAPABILITIES ARE NOT ASSIGNED TO THE LOGON UDC FILE SINCE THEY WILL REQUIRE ACCESS TO QUERY AND THE EDITOR.

USER'S NAMES FOR THE PROGRAMMERS ARE ASSIGNED BY THE LAST NAME. THIS IS DONE IN ORDER THAT THE SYSTEM MANAGER HAS IMMEDIATE KNOWLEDGE OF WHO CREATED A FILE. THEY ARE ASSIGNED THE CAPABILITIES NECESSARY IN ORDER TO MAINTAIN THE DATABASE FILES AND OTHER FILES WITHIN THE ACCOUNT. ONE ADDITIONAL USER NAME IS ASSIGNED TO THE OPERATOR AND IS ASSOCIATED WITH THE HOME GROUP "JOB". THESE USER NAMES ARE ALSO ASSOCIATED WITH A SYSTEM UDC FILE WHICH CONTAINS AT LEAST THE MINIMUM OF THE FOLLOWING COMMANDS.

QY = RUN QUERY.PUB.SYS

SO = RUN SORT.PUB.SYS

FC = RUN FCOPY.PUB.SYS

E = EDITOR

LI = LIST.PUB.SYS

FM = FORMINT.PUB.SYS

S = SHOWJOB

R = RESUME

K = RUN SPOOK.PUB.SYS

D = SHOWDEV

Q = SHOWQ

B = BYE

THE LAST JOB REQUIREMENT FOR THE NIGHT OPERATOR IS TO ESTABLISH THE DAYTIME JOB ENVIRONMENT. THIS IS USUALLY INITIATED THROUGH THE JOB NAMED "START." THIS JOB WILL INITIATE THE FOLLOWING:

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:JOBPRI DS.ES
:QUANTUM 350
:STREAM SPOOL27.JOB
:STREAM SPOOL33.JOB
:STREAM SPOOL34.JOB
:STREAM SPOOL35.JOB
:STREAM PASSPRT.JOB
:E0J
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OPERATOR COMMANDS

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=LIMIT 6,27
=OUTFENCE 2
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ONCE THE ABOVE ENVIRONMENT HAS BEEN ESTABLISHED FOR THE USERS THE SYSTEM IS NOW READY FOR THE DAYTIME PROCESSING.

LIMIT

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THE LIMIT HAS BEEN ESTABLISHED TO ALLOW FOR FIVE CONTINUOUSLY RUNNING PROGRAMS WHICH DIRECT OUTPUT TO THE REMOTE PRINTER DEVICES, AND ALSO TO ALLOW ONE BATCH JOB TO BE INITIATED AND RUN SIMULTANEOUSLY WITH THE ONLINE PROCESSING SYSTEM. HOWEVER, WE HAVE FOUND FROM EXPERIENCE THAT ALLOWING MORE THAN ONE HEAVY BATCH JOB TO PROCESS AT A TIME DURING OUR HEAVY ONLINE PROCESSING TO BE INEFFICIENT. ALLOWING MORE THAN ONE JOB TO BE INITIATED BY THE USERS ONLY RESULTS IN PHONE CALLS FROM THE DEPARTMENT. PROGRAMMERS HAVE BEEN INFORMED THAT THEIR PROCESSING DOES NOT TAKE PRIORITY OVER THE USERS AND THAT AT NO TIME SHALL ANY TWO COMPILES RUN SIMULTANEOUSLY. SOMETIMES IT MAY BE NECESSARY TO PUT A COMPILE INTO SUSPENSION IN ORDER TO PROCESS A BATCH JOB FOR USER, BUT THIS IS A RARE CASE SINCE MOST COMPILES DO NOT TAKE GENERALLY MORE THAN FIVE (5) MINUTES TO PROCESS EVEN DURING THE ONLINE PROCESSING. SETTING THE LIMIT UP IN THIS WAY ALSO RELIEVES THE PROGRAMMER FROM HAVING TO DETERMINE WHETHER OR NOT IT'S A GOOD TIME TO INITIATE A COMPILE OF A PROGRAM.

OUTFENCE

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USERS DO HAVE THE CAPABILITY TO DIRECT OUTPUT TO THE LINE PRINTER LOCATED IN THE COMPUTER ROOM. THIS SITUATION ARISES WHEN MANY COPIES OF A SIMPLE REPORT OR LONG LISTINGS SUCH AS VESSEL LOADING LISTS ARE REQUIRED. THE RETRIEVAL PRINTERS ARE GENERALLY ONLY USED BY THE USERS TO PRODUCE REPORTS NO LONGER THAN FIVE TO TEN PAGES, AND IN MOST INSTANCES, THE REPORTS ARE NO LONGER THAN ONE PAGE. WHEN SETTING THE OUTFENCE TO 2 YOU ALLOW THE USER TO INPUT THE FILE STATEMENT:

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:FILE LP;DEV=LP,2
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THE USER MAY THEN PRODUCE AS MANY OUTPUT REPORTS AS MEETS HIS NEEDS. ONCE ALL THE OUTPUT HAS BEEN PRODUCED THEN THEY WILL CONTACT THE COMPUTER ROOM AND INDICATE THAT THE PRINTED INFORMATION IS AVAILABLE TO BE PRINTED. AT THIS TIME ALL THE OPERATOR HAS TO DO IS MAKE SURE THAT THE PROPER PAPER REQUIRED IS ON THE PRINTER AND THEN CHANGE THE OUTFENCE TO ONE (1). ALSO, ALL JOBS WHICH ARE USED BY THE USER DURING THE DAYTIME PERIOD HAVE THE OUTCLASS = LP,2 SO THAT ALL \$STDLIST INFORMATION IS PRINTED AT ONE TIME. WHEN THE USER REQUIRES SPECIAL FORMS, THEY HAVE BEEN INSTRUCTED TO USE THE OUTPUT PRIORITY = 1 SO THAT THIS OUTPUT THEN MAY BE MANUALLY MANIPULATED BY THE OPERATOR. THEY WOULD ALSO USE A FILE STATEMENT WHICH WOULD EQUATE TO A SPECIFIC FORM REQUIRED. FOR EXAMPLE, THE FOLLOWING STATEMENT

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:FILE STD3;DEV=LP,1
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WOULD BE USED TO INDICATE THE STANDARD-STOCK-THREE-PART PAPER TO THE OPERATOR. ONCE THE OPERATOR HAS MOUNTED THE PROPER FORM, HE WILL THEN USE THE "ALTFILE" COMMAND TO INITIATE THE PRINTING. ASSIGNING A UNIQUE NAME TO EACH TYPE OF PAPER AVAILABLE FOR THE USERS AND HAVING THEM INPUT THE REQUIRED FORM AT THE TIME THEY CREATE THE OUTPUT CUIS DOWN ON THE REQUIRED COMMUNICATION BETWEEN THE USER AND THE OPERATOR.

JOB STREAMS

THE JOB STREAMS, WHICH ARE INITIATED BY THE USER DURING THE DAYTIME AND PRODUCE PRINTED OUTPUT, CONTAIN COMMANDS WHICH WILL DIRECT THE PRINTED OUTPUT BACK TO THE PROPER REMOTE PRINTER DEVICE. THESE JOBS DO NOT REQUIRE ANY INTERVENTION BY THE DATA PROCESSING DEPARTMENT. THE OUTPUT PRODUCED IN THIS MANNER GENERALLY RELATES TO PAYROLL OR ACCOUNTS RECEIVABLE BATCH PROCESSING AND ARE PRODUCED FROM RPG PROGRAMS. THE OUTPUT IS DIRECTED TO THE REMOTE PRINTER DEVICE THROUGH THE ASYNCHRONOUS TERMINAL CONTROLLER AT A SPEED OF 120 CHARACTERS PER SECOND. ALTHOUGH THE HP2631 TERMINAL PRINTER IS CAPABLE OF RECEIVING AT 240 CPS, WE FOUND THAT MANY TIMES THESE TERMINALS WOULD LOCK UP AS A RESULT OF BUFFER OVERFLOW AND WOULD REQUIRE INTERVENTION BY THE DATA PROCESSING DEPARTMENT TO RESTART THE SPOOLING PROCESS. THEREFORE, WE HAVE BEEN RESIGNED TO THE FACT THAT WE HAVE LESS PROBLEMS AT 120 CPS AND HAVE SET ALL OUR PRINTER TERMINALS AT THIS SPEED.

THOSE USERS WHO HAVE NEED OF THE EDITOR CAPABILITIES FOR PRODUCING REPORTS SUCH AS SHIPS SCHEDULES, TELEPHONE LISTS, ETC. HAVE BEEN INSTRUCTED IN THE MANNER NECESSARY TO DIRECT THE REQUIRED PRINTED OUTPUT TO THE REMOTE PRINTER TERMINAL. MOST OUTPUT PRINTED AT THE REMOTE SITES ARE FORMATED TO BE PRINTED ON 8 1/2 " X 11" STANDARD-STOCK PAPER WITH THE EXCEPTION OF ACCOUNTING WHICH USES THE 11" X 14" STOCK PAPER BECAUSE OF THE OUTPUT OF THE RPG PROGRAMS. THEREFORE, OUR USERS ARE NOT CONCERNED WITH THE PROBLEM OF HAVING TO CHANGE PAPER AND USE SPECIAL FORMS. THIS IS ALSO TRUE WITH OUTPUT PRODUCED FROM THE ONLINE CARGO CONTROL SYSTEM, AND ALSO THE OUTPUT PRODUCED THROUGH THE USE OF QUERY AND THE EDITOR.

QUERY

IN OUR INSTALLATION THE USERS ARE CAPABLE OF PRODUCING PROCEDURES TO RETRIEVE AND PRINT OUTPUT FROM THE DATABASE. THIS ALLOWS THE USER THE FLEXIBILITY OF PRODUCING HIS OWN REPORTS WITHOUT ANY REQUIRED INTERVENTION BY THE DATA PROCESSING DEPARTMENT. ALTHOUGH THE CURRENT QUERY LANGUAGE DOES HAVE SOME UNFORTUNATE RESTRICTIONS, IT STILL ALLOWS OUR USERS TO PRODUCE A NUMBER OF REPORTS THAT OTHERWISE WOULD REQUIRE A WRITTEN PROGRAM BY THE DATA PROCESSING DEPARTMENT. ACCESS INTO THE QUERY IN DATABASE PROGRAM ARE CONTROLLED BY THE "XEQ" COMMANDS AND ASSOCIATED LOCKWORDS. FOR EXAMPLE:

>XEQ DEFINEDB/LOCKWORD

THIS COMMAND WILL ASSIGN THE REQUIRED PARAMETERS FOR THE DATABASE FOR THE USER AND RESTRICT HIS ACCESS THROUGH THE PROPER MODE AND ALSO EXECUTE THE COMMAND

>ASSIGN LOCKOPTION = OFF

WE HAVE FOUND THAT WITHOUT THE ABOVE LOCKOPTION TURNED OFF THAT WE SEE A SIGNIFICANT REDUCTION IN RESPONSE TIME IN THE REST OF OUR ONLINE SYSTEM WHICH ALSO ACCESSES THE SAME DATABASE.

ONLINE TRANSACTION JOURNAL FILES

EACH CRT WHICH ACCESSES THE ONLINE CARGO CONTROL SYSTEM CREATES A TRANSACTION JOURNAL FILE UNIQUE TO THAT CRT THROUGH THE UTILIZATION OF THE LOGICAL DEVICE NUMBER ASSOCIATED WITH THE CRT. FOR EXAMPLE "DBJRN25" IS THE NAME OF A FILE CREATED FOR THE 2640B CRT TERMINAL PLUGGED INTO LOGICAL DEVICE NUMBER 25 ON THE ASYNCHRONOUS TERMINAL CONTROLLER. THE OPEN ROUTINE FOR THE ONLINE PROGRAM WILL CREATE THIS FILE IF IT IS NON-EXISTENT OR MERELY OPEN THE FILE WITH ACCESS=APPEND IF IT EXISTS AT THE TIME OF INITIALIZATION. THE FILE IS CREATED THROUGH THE USE OF STANDARD MPE INTRINSICS AND IS OPEN AS A PERMANENT FILE. CREATING A FILE IN THIS MANNER POSES A PARTICULAR PROBLEM WHICH MUST BE SOLVED. FOR EXAMPLE, WHAT HAPPENS TO THIS FILE AT THE TIME OF A SYSTEM OR POWER FAILURE. IF THE END OF FILE POINTERS OF THIS FILE ARE NOT MAINTAINED BY THE PROGRAM, VALUABLE INFORMATION COULD BE LOST.

SOLUTION: AFTER WRITING THE TRANSACTION TO THE JOURNAL FILE EXECUTE THE FCONTROL INTRINSIC WITH THE FILECODE = 6. THIS PARTICULAR INTRINSIC WILL WRITE THE END-OF-FILE MARKER IN THE DISC FILE, UPDATE AND REWRITE THE DISC FILE LABEL. THIS INTRINSIC REQUIRES VERY LITTLE OVERHEAD IN THE CPU AND WILL INSURE THE DATA ALREADY WRITTEN TO THE JOURNAL FILE. THIS IS THE SAME TECHNIQUE USED BY THE HP SYSTEM SOFTWARE DESIGNERS WHEN CREATING FILES SUCH AS THE "K-FILE" ASSOCIATED WITH THE EDITOR/3000 AND OTHER SYSTEM FILES.

SINCE THE CURRENT VERSION OF COBOL DOES NOT ALLOW YOU ACCESS TO THESE UNIQUE INTRINSICS, THIS TECHNIQUE DOES REQUIRE THAT THE PROGRAM BE WRITTEN IN SPL OR SOME OTHER LANGUAGE AND CALLED FROM A COBOL

PROGRAM ROUTINE. THE ONLY OTHER SOLUTION TO ACHIEVE A SIMILAR RESULT WITH COBOL WOULD BE TO OPEN AND CLOSE THE COBOL FILE AFTER EACH WRITE. HOWEVER, HP HAS INDICATED THAT FUTURE RELEASES OF COBOL WILL CONTAIN THE CAPABILITIES OF UTILIZING A CALL ROUTINE TO STANDARD MPE INTRINSICS.

KEEP IN MIND THAT THE JOURNAL TRANSACTION FILE THAT I AM SPEAKING OF HERE IS NOT THE SAME FILE THAT WOULD BE USED TO LOG DATABASE TRANSACTIONS FOR RECOVERY. THIS FILE IS UTILIZED BY OUR ONLINE SYSTEM IN ORDER TO TRAP INFORMATION ABOUT THE MOVEMENT OF THE CARGO AND THE WORK PERFORMED ON THAT CARGO. FROM THIS DATA WE PROVIDE INFORMATION TO THE CUSTOMER AND ALSO PROVIDE FOR SAME-DAY BILLING FOR THAT WORK PERFORMED. INFORMATION LOGGED IN THESE FILES IS PROCESSED AT NIGHT AND AVAILABLE TO THE USER THE FOLLOWING DAY.

THE BATCH PROCESSING IS PERFORMED AT NIGHT AND PROVIDES THREE (3) MAJOR FUNCTIONS:

1. PRODUCE STATISTICAL REPORTS ON ALL CARGO ON THE TERMINAL AT THE END OF THE WORK DAY AND DISTRIBUTE THIS INFORMATION TO OUR STAFF AND TO THE SHIPLINES WHO ARE OUR CUSTOMERS.
2. PRODUCE ACTIVITY REPORTS FOR MANAGEMENT ON THE ARRIVAL, DEPARTURE, AND MOVEMENT OF CARGO ON THE TERMINAL AND BILL THE CUSTOMER FOR THE SERVICE PERFORMED ON THAT CARGO FOR THAT DAY. THIS INFORMATION COMES FROM THE ONLINE CRT JOURNALS WHICH WERE CREATED DURING THE DAY.
3. STORE ALL INFORMATION FROM DISC WHICH HAS BEEN MODIFIED SINCE THE PREVIOUS TAPE BACKUP TO BE RETAINED IN A VAULT FOR SECURITY PURPOSES.

THE BATCH PROCESSING DONE AT NIGHT HAS EVOLVED OVER A PERIOD OF THREE YEARS. DURING THAT TIME IT HAS BEEN MODIFIED THROUGH THE USE OF VARIOUS TECHNIQUES SO THAT THE LAST PRINTED REPORT FINISHES AT ABOUT THE SAME TIME AS THE LAST REEL OF TAPE IS BEING CREATED BY THE BACKUP PROCEDURE. THE FOLLOWING WILL EXPLAIN SOME OF THE VARIOUS TECHNIQUES THAT WE HAVE UTILIZED IN ORDER TO ACCOMPLISH THIS.

JOB PROCEDURES

WE HAVE FOUND FROM OUR EXPERIENCE THAT IT IS BEST TO PRODUCE MANY SMALL JOBS WHICH CONSIST OF ONE PROGRAM OR ONE SORT AND TO LINK THEM TOGETHER UTILIZING THE STREAM COMMAND. THIS MAKES IT POSSIBLE FOR THE OPERATOR TO CONTINUE PROCESSING EVEN THOUGH A PARTICULAR STEP WITHIN THE PROCESS MAY HAVE FAILED THROUGH THE ISSUING OF ANOTHER STREAM COMMAND FOR THE NEXT STEP. HOWEVER, IT SOMETIMES HAPPENS THAT THE SYSTEM MAY FAIL IN THE MIDDLE OF A STEP. WITH PROPER DOCUMENTATION, THE OPERATOR CAN BE INFORMED AS TO WHETHER OR NOT HE CAN RESTART AT THAT POINT IN THE PROCESSING. IF THAT IS NOT POSSIBLE, THEN THE OPERATOR IS GIVEN INSTRUCTIONS ON HOW TO RECOVER IF IT IS REQUIRED. HOWEVER, WE HAVE FOUND FROM OUR EXPERIENCE THAT 95 PERCENT OF THE TIME THE PROCESS IS ABLE TO CONTINUE AT THE POINT AT WHICH IT FAILED.

EACH JOB STEP IS STRUCTURED AS FOLLOWS:

1. JOB COMMAND
2. TELLOP COMMANDS TO INDICATE THE STEP BEING PROCESSED
3. PURGE COMMANDS FOR ALL OUTPUT FILES
4. FILE COMMANDS FOR ALL INPUT FILES

5. BUILD COMMANDS FOR ANY FILES WHICH MAY BE APPENDED DURING THE WEEK AND PURGED THROUGH WEEKLY PROCESSING. THIS COMMAND SHOULD BE PRECEDED BY THE CONTINUE COMMAND
6. RUN COMMAND FOR THE PROGRAM
7. DATA WHICH MAY BE USED THROUGH THE EXCEPT STATEMENT TO CONTROL THE PROGRAM PROCESSING
8. STREAM COMMAND TO INITIATE THE NEXT JOB STEP
9. EOJ COMMAND
10. COMMENT COMMANDS WHICH PROVIDE INFORMATION TO THE OPERATOR AS TO RESTART AND RECOVERY PROCEDURES FOR THE JOB STEP.

CONTROLLING JOB SEQUENCE

WHILE THE NORMAL PROCESSING CONTINUES FROM THE FIRST STEP TO THE LAST STEP ON A DAILY BASIS WITH NO CHANGE IN SEQUENCE, THERE ARE THE OCCASIONAL REPORTS WHICH MUST BE PRODUCED ON A PARTICULAR DAY OF THE WEEK, OR PRODUCED ONCE A WEEK, USUALLY AT THE END OF THE WEEK. IN ORDER TO MODIFY THE SEQUENCE OF THE JOBS, WE UTILIZE THE TEXT EDITOR. FOR EXAMPLE, NORMALLY WHEN STEP10 FINISHES PROCESSING IT PROCEEDS TO STEP11. HOWEVER ON WEDNESDAY, AN ADDITIONAL REPORT IS NEEDED FROM THE SAME INPUT FILE THAT WAS USED IN STEP10. BEFORE PROCESSING BEGINS AT NIGHT, THE OPERATOR STREAMS THE JOB "SETWED". IMBEDDED IN THIS JOB STREAM IS THE FOLLOWING:

 :EDITOR
 /T STEP10
 /FIND "STREAM STEP11"
 /REPLACE *
 R!STREAM STEP20
 /KEEP
 /END
 :BYE

THE JOB STEP20 CONTAINS A STREAM COMMAND WHICH WILL STREAM STEP11 AND PROCESSING CONTINUES AS NORMAL. THIS SAME TECHNIQUE IS UTILIZED TO MODIFY PROGRAM CONTROL SWITCHES IMBEDDED WITHIN THE JOB STREAMS WHICH CONTROL FUNCTIONS SUCH AS ALLOWING THE OPERATOR TO OVERRIDE THE CURRENT DATE IN THE COMPUTER, ETC.

ONCE THE JOB STREAM SEQUENCE HAS BEEN ESTABLISHED AND THE FILE CONTROL SWITCHES HAVE BEEN MODIFIED, THE OPERATOR STREAMS THE JOB "GO" AND THE PROCESSING BEGINS. FROM THIS POINT ON IN THE PROCESSING, THE ONLY OPERATOR INTERVENTION REQUIRED IS TO REPLY TO A DATE REQUEST OR TO REPLY FOR A TAPE. THE CONTROL OF THE PRINTED OUTPUT AND THE FORMS USED IS DONE THROUGH THE OUTFENCE CONSOLE COMMAND AND WILL BE DISCUSSED LATER IN THIS TEXT.

OUR PAYROLL SYSTEM HAS HAD VERY LITTLE MODIFICATION AND WAS A STRAIGHT CONVERSION OF OUR EXISTING RPG PROGRAMS TO THE HP/3000 SYSTEM. THESE PAYROLL PROGRAMS MAKE EXTENSIVE USE OF THE UPSI SWITCH SETTINGS USED BY RPG. THESE SWITCHES INDICATE TO THE SYSTEM WHETHER THE PAYROLL BEING PROCESSED IS A WEEKLY, MONTHLY, OR QUARTERLY AND WHICH DEDUCTIONS ARE TO BE TAKEN OUT. IN ORDER TO MODIFY THESE SWITCH SETTINGS, WE UTILIZE THE "USE" COMMAND OF THE EDITOR. FOR EXAMPLE:

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:EDITOR
/USE PAYUSE
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PAYUSE CONTAINS THE FOLLOWING:

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/TEXT PAY100
Q"WEEKLY = UPSI U1=ON"
Q"MONTHLY = UPSI U1=ON, U2=ON"
Q"QUARTERLY = UPSI U1=ON, U2=ON, U3=ON"
FIND "UPSI"
MODIFY *
LIST ALL OFFLINE
KEEP
(TEXT NEXT JOB STEP TO END OF JOB FLOW)
:
ETC.
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END

THE "LIST ALL OFFLINE" WILL PROVIDE HARDCOPY DOCUMENTATION OF THE MODIFICATIONS MADE BY THE OPERATOR AND WILL BE FILED WITH OTHER DOCUMENTATION PRODUCED BY THE PAYROLL SYSTEM FOR AUDIT PURPOSES.

OUTFENCE

PROPER USE OF THE OUTFENCE COMMAND IS ESSENTIAL IN ESTABLISHING A UNIFORM FLOW TO YOUR BATCH PROCESSING. THERE ARE MANY INTERNAL AND EXTERNAL INFLUENCES WHICH DICTATE THE SEQUENCE OF ANY BATCH PROCESSING. HOWEVER, IT IS WELL WORTH THE EXTRA TIME INVOLVED AT THE BEGINNING TO ANALYZE THE ENTIRE PROCESS AND ESTABLISH SOME STRICT GUIDELINES. HAVING DONE THIS, MODIFICATIONS TO THE BATCH SEQUENCE AT A LATER DATE, WHICH IS INEVITABLE, WILL BE LESS DIS-RUPTIVE TO THE ENTIRE SYSTEM. SOME THINGS TO KEEP IN MIND ARE AS FOLLOWS:

1. FORMS CONTROL - ANALYZE ALL THE OUTPUT TO BE PRODUCED AND TRY TO SEQUENCE THE CREATION OF LIKE OUTPUT AS CLOSE TOGETHER AS POSSIBLE WITHIN THE JOB STREAM. FOR EXAMPLE, GROUP THE PRODUCTION OF ONE PART, TWO PART, AND THREE PART PRINTOUTS IN AS LARGE A GROUPS AS POSSIBLE. THIS WILL HOPEFULLY REDUCE THE NUMBER OF TIMES THE PAPER NEEDS TO BE CHANGED ON THE LINE PRINTER.

2. LENGTH OF THE REPORT - ANY REPORT WHICH PRINTS MORE THAN 200 PAGES WOULD BE BETTER BROKEN DOWN INTO A SERIES OF SPOOLER FILES. THIS SHOULD BE DONE THRU PROGRAM CONTROL BY CLOSING THE PRINTER FILE AFTER EVERY 200 PAGES AND OPENING THE FILE AGAIN, AND REPEATING THIS EVERY 200 PAGES UNTIL THE REPORT IS FINISHED. THIS ACCOMPLISHED TWO THINGS; FIRST - ON EXTREMELY LARGE REPORTS THE PRINTING CAN BE BEGUN BEFORE THE PROGRAM HAS ACTUALLY COMPLETED PROCESSING, AND THEREFORE MAKES THE OPERATORS TIME MORE PRODUCTIVE. SECONDLY - ON VERY LARGE REPORTS IT IS POSSIBLE TO RUN OUT OF SPOOLFILE SECTORS AVAILABLE FOR THE JOB AND THE PROGRAM WILL BOMB, IN WHICH CASE YOU WILL NEED TO REVERT TO EITHER MODIFYING THE SYSTEM CONFIGURATION OR THE PROGRAM. THE SIZE OF THIS OUTPUT SPOOLFILE IS CONTROLLED BY THE SYSTEM CONFIGURATION. THE SUGGESTED SIZE IS 384 SECTORS PER SPOOLFILE EXTENT WITH THE MAXIMUM NUMBER OF SPOOLFILE KILOSECTORS SET TO 128.

FOR THOSE SYSTEMS WHO HAVE LIMITED AMOUNT OF FREE DISC SPACE AVAILABLE DURING BATCH PROCESSING IT IS ESSENTIAL AT THAT PROCESSING OF THE SPOOLED OUTPUT BEGIN AS SOON AS POSSIBLE IN ORDER THAT THE FREE SECTORS NECESSARY FOR TEMPORARY FILES DURING BATCH PROCESSING BE AVAILABLE.

ONCE THE OVERALL PICTURE OF THE BATCH PROCESSING HAS BEEN DETERMINED, NOW IS THE TIME TO ESTABLISH THOSE POINTS WITHIN THE BATCH PROCESSING WHERE YOU WISH TO CHANGE THE OUTFENCE CONTROL. IF THERE ARE 6 MAJOR BREAKS IN YOUR BATCH PROCESSING, THEN ESTABLISH THE OUTPUT PRIORITY FOR THE FIRST BATCH OF JOBS AT 7. KEEP IN MIND THAT AN OUTPUT PRIORITY OF 1 WILL REQUIRE OPERATOR INTERVENTION THROUGHOUT THE USE OF THE ALTFILE COMMAND.

EXAMPLE:

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:FILE REPORT;DEV=LP,7
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AT THE BEGINNING OF THE BATCH PROCESSING THE OPERATOR SHOULD SET THE OUTFENCE EQUAL TO 7. WHEN THESE REPORTS ARE READY TO BE PRINTED THE OPERATOR WILL LOWER THE OUTFENCE TO 6 AND BEGIN PRINTING THE OUTPUT PRODUCED. THESE FIRST REPORTS MAY BE ALL SHORT 1 PART REPORTS. THE NEXT SET IS NOW BEING PROCESSED BY THE COMPUTER AND HAS THE OUTPUT PRIORITY OF 6 BUT THESE REPORTS ARE TO BE PRINTED ON 2 PART PAPER. THEREFORE, ONCE ALL THE OUTPUT PRIORITY 7 REPORTS HAVE FINISHED PRINTING THE OPERATOR NOW HAS A BREAK TO CHANGE THE PAPER. ONCE THAT HAS BEEN MOUNTED THE OPERATOR CAN THEN LOWER THE OUTFENCE TO 5 AND BEGIN PRINTING THE OUTPUT PRIORITY 6 REPORTS ON THE 2 PART PAPER. WE HAVE ALSO FOUND THAT IT IS HELPFUL TO INSERT "TELLOP" COMMANDS TO THE OPERATOR THROUGHOUT THE BATCH PROCESSING TO INDICATE THE POINTS IN TIME WHEN THE BREAKS OCCUR.

WE HAVE FOUND THAT IT IS BETTER NOT TO USE THE FORMS CONTROL COMMAND UNLESS IT IS ABSOLUTELY NECESSARY. THE USE OF THIS COMMAND REQUIRES ADDITIONAL OPERATOR INTERVENTION AND IS BETTER CONTROLLED BY PROPER ESTABLISHMENT OF THE OUTFENCE PRIORITIES. THIS COMMAND IS PARTICULARLY FRUSTRATING IN A SITUATION WHERE YOU MAY PRINT AS MANY AS 6 COPIES OF A SPECIAL REPORT. EACH TIME THE REPORT BEGINS PRINTING IT

WILL REQUIRE 2 REPLIES FROM THE OPERATOR. THIS GETS PARTICULARLY FRUSTRATING BY COPY 6. ALL JOB STREAMS USE THE OUTCLASS PARAMETER OF THE "JOB" COMMAND AS FOLLOWS:

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:JOB.....;OUTCLASS=6,2
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THIS WILL RESULT IN ALL JOB STREAM OUTPUT TO BEING HELD UNTIL THE OPERATOR LOWERS THE OUTFENCE TO 1, AT THE END OF PROCESSING THE BATCH. AT THIS TIME ALL THE \$SIDLIST OUTPUT IS PRINTED ON 8 1/2 X 11 PAPER AND FILED WITH THE CONSOLE HARDCOPY FOR THE DAY AS BACKUP DOCUMENTATION.

PERMANENT FILES -VS- TEMPORARY FILES

THE FOLLOWING TECHNIQUE WE HAVE FOUND TO BE EXTREMELY USEFUL, BUT THE USE OF IT DEPENDS UPON THE AMOUNT OF FREE DISC SPACE AVAILABLE AT THE BEGINNING OF THE BATCH PROCESSING. ALL FILES PRODUCED DURING OUR BATCH PROCESSING ARE CREATED AS PERMANENT FILES. AT THE END OF THE BATCH PROCESSING, ALL FILES CREATED DURING THE BATCH ARE STORED ON TAPE. ALL FILES WHICH WERE CREATED AS INTERMEDIATE OR WORKFILES ARE THEN PURGED BY A SINGLE JOB IMMEDIATELY FOLLOWING THE BACKUP OF THOSE FILES TO TAPE AT THE END OF THE BATCH PROCESSING.

HANDLING FILES IN THIS MANNER PRODUCES TWO ADVANTAGES; FIRST - IF IT IS DISCOVERED THE NEXT DAY THAT A PROGRAM FOR SOME REASON WAS NOT RUN PROPERLY THE NIGHT BEFORE, YOU HAVE THE IMMEDIATE INPUT TO THAT PROGRAM. IN MOST CASES ALL THAT WILL BE NECESSARY TO CORRECT THE SITUATION WILL BE TO CORRECT THE PROGRAM OR THE CONTROLS THAT CREATED THE PROBLEM AND RERUN THE JOB STEP AFTER HAVING RESTORED THE INPUT FILES FROM THE BACKUP. THE SECOND ADVANTAGE IS THAT INPUT FILES ARE AVAILABLE FOR TESTING PROGRAM CHANGES PRIOR TO IMPLEMENTATION IN THE PRODUCTION STREAM. UTILIZING THE ABOVE METHOD WILL ALSO GIVE YOU SOME ADDED PROTECTION FROM MURPHY'S LAW. DISAPPEARING TEMPORARY FILES BETWEEN JOB STEPS CAN BE PARTICULARLY FRUSTRATING WHEN DETERMINING WHAT WENT WRONG WITH A PARTICULAR JOB STEP.

I AM SURE THAT THERE WILL BE SOME NEW INSTALLATIONS AND MAYBE EVEN SOME OLD INSTALLATIONS WHICH COULD NOT COST JUSTIFY THE ABOVE TECHNIQUE. THE ADDITIONAL DISC SPACE REQUIRED, THE NUMBER OF TAPES NECESSARY FOR BACKUP, AND THE MACHINE AND OPERATOR TIME INVOLVED TO IMPLEMENT A SYSTEM LIKE THE ABOVE CAN BE COSTLY. HOWEVER, FROM MY OWN EXPERIENCE I HAVE FOUND THAT IT HAS BEEN WORTH EVERY PENNY!

BACKUP RECOVERY PROCEDURES

DAILY BACKUP - THE DAILY BACKUP IS DONE TO TAPE USING THE "STORE" COMMAND. ALL FILES IN ALL ACCOUNTS WHICH HAVE BEEN MODIFIED DURING THE DAY, OR SINCE THE LAST BACKUP ARE STORED TO TAPE. AT THIS POINT IN TIME IT WOULD ALSO BE ADVISEABLE TO DO A STORE ON YOUR DATABASE USING

DBUTIL.PUB.SYS. WE CURRENTLY MAINTAIN 5 SETS OF DAILY BACKUP TAPES.

WEEKLY BACKUP - WEEKLY BACKUP AMOUNTS TO A SYSDUMP OF THE ENTIRE SYSTEM TO TAPE, AND THEN STORED IN A OFF SITE VAULT. THIS TAPE IS CREATED AFTER THE BATCH PROCESSING HAS BEEN COMPLETED AND THE DAILY BACKUP AND PURGES HAVE BEEN DONE. ONCE THIS HAS BEEN COMPLETED THE OPERATOR DOES A SHUTDOWN AND A COLDSTART SO THAT THE JOB, SESSION, AND SPOOLER OUTPUT NUMBERS ARE INITIALIZED BACK TO 1. DURING THIS SAME OPERATION THE OPERATOR ALSO REPLIES "YES" TO THE REQUESTS FOR "RECOVER LOST DISC SPACE?"

MONTHLY PROCESSING - ONCE A MONTH WE INITIATE A RELOAD OF THE ENTIRE SYSTEM TO DISC. THIS IS DONE ONLY AFTER WE HAVE COMPLETED THE PROCESSING OF THE DAILY BACKUP, PURGES, AND WEEKLY SYSDUMP. AT THIS TIME WE INITIATE 1 MORE SYSDUMP SO THAT WE HAVE 2 SYSDUMP SETS AVAILABLE. I RECOMMEND VERY HIGHLY THAT YOU HAVE 2 CURRENT COPIES OF THE SYSDUMP TAPE AVAILABLE SINCE AT THE BEGINNING OF THE RELOAD THE ENTIRE SYSTEM DISCS ARE INITIALIZED BEFORE THE RELOAD BEGINS. IF FOR ANY REASON DURING THE RELOAD ANY OF THE SYSDUMP TAPES CANNOT BE READ BY THE SYSTEM, WITHOUT THE SECOND SYSDUMP TAPE YOU WOULD BE IN A VERY DIFFICULT RECOVERY SITUATION AGAIN, THIS IS ONLY ADDITIONAL PROTECTION FROM MURPHY'S LAW.

SUMMATION

NO TWO HP3000 ENVIRONMENTS ARE ALIKE. THEREFORE, NOT ALL OF THE IDEAS EXPRESSED IN THIS PAPER COULD BE IMPLEMENTED IN ANY ONE INSTALLATION. I ONLY HOPE THAT BY PRESENTING SOME OF THE ABOVE INFORMATION IN SOME DETAIL THAT IT MAY PROVIDE A GUIDE TO SOME NEW INSTALLATIONS AND MAY INITIATE SOME NEW IDEAS IN SOME OLD INSTALLATIONS. I WOULD WELCOME ANY COMMENTS FROM ANY OTHER USERS ABOUT THE APPLICATIONS WHICH WE HAVE DESCRIBED SO THAT THE ABOVE PAPER MAY BE EXPANDED AND IMPROVED.

ONE LAST COMMENT I WOULD LIKE TO MAKE TO THOSE WHO ARE GETTING READY TO INSTALL NEW HP SYSTEMS FOR THE FIRST TIME. IN THE INITIAL PHASE OF ESTABLISHING YOUR OPERATING SYSTEM ON YOUR NEW 3000 SYSTEM, WORK VERY CLOSELY WITH YOUR HP SYSTEM ENGINEER AND ACTIVELY SOLICIT ANY INFORMATION YOU MAY BE ABLE TO OBTAIN FROM ESTABLISHED HP3000 USERS. KEEP IN MIND THAT THE MISTAKES YOU MAKE IN ESTABLISHING YOUR OPERATING SYSTEM AT THE BEGINNING, WILL MOST LIKELY HAUNT YOU THROUGHOUT THE LIFE OF YOUR OPERATING SYSTEM.

