SPECIAL FEATURE
EXTENDED PRECISION FLOATING POINT
FOR 709 MACHINE

B/M 580043 EC 298817

SECTION 2

A. PURPOSE OF TEST

This section provides a comprehensive test of the Extended Precision Floating Point arithmetic instructions.

EMP	+0673	Extended Floating Multiply
EDP	+0672	Extended Floating Divide and Proceed
EUA	-0672	Extended Unnormalized Floating Add
EAD	+0671	Extended Floating Add
ESB	-0671	Extended Floating Subtract

B. METHOD OF TEST

Section 2 assumes that ELD and EST as checked in Section 1 are functional.
And extended instruction is given and the results are examined by fixed-point instructions. The results are checked by the Program Check Subroutine. The correct resutls of each test routine are found in the three octal locations following the TSX CHECK instruction.

C. PROGRAM CONTROL

This program provides separate subroutines for controlling the operation of the program within the machine. These controls are grouped under the heading of MONITOR. Monitor is discussed under SUBROUTINE DESCRIPTION.

1. CARD DECK

9EFPA	028	9LD02A - High End Loader
	029 - 185	Section 2 Program
	186 - 214	9DEPR - Diagnostic Print Routine
	215	Section 2 Tra Card (TRA 05211)
	216 - 217	Two Blank Cards

See Introductory Write-Up for comments on operating this section seperately or in conjunction with Section 1.

SECTION 2

2. SENSE SWITCH CONTROL

Sense Switch 1
UP - Test SSW 4 or continue test routine.
DN - Repeat test routine or a loop within a test routine.
Sense Switch 2
UP - Indicate all errors, test SSW 3.
DN - Bypass all errors.
Sense Switch 3
UP - Print all program control and error requests.
DN - Bypass all printing requests and halt on errors.
Sense Switch 4
UP - Proceed to next test routine.
DN - Repeat each test routine 50 octal times before proceeding to next test routine.
Sense Switch 5
NOT USED
Sense Switch 6
UP - End program on completion of all test routines and simulate the load cards button to read in next diagnostic program.
With SSW 3 UP print test completed.
DN - Repeat program upon completion of last test routine.

3. SENSE LITE INDICATIONS

SLT 1 Error in OV Tgrs.
SLT 2 Error in ACC S-35
SLT 3 Error in MQ S-35
SLT 4 Error in decrement or address of LOC ZERO.

4. I/O CHECK LIGHT CONTROL

The I/O check light is used in this program as an indication to the Manual Restart Control (Part 5 - MONITOR) that the manual reset button has been used.

The I/O light is turned on at the beginning of each test routine. On a condtion of manual reset, the I/O lite is turned off to indicat to the manual restart routine that entry to subroutine was a legal one.

D. NORMAL STOPS

NONE

SECTION 2

E. ERROR STOPS

Both error stops are under control of the 9DEPR Diagnostic Print Routine.

To stop - SSW 2 UP and SSW 3 DN.
6517 - Error stop for entry with the TSX ERROR,4 instruction.
6545 - Error stop for entry with the TSX ERROR-1,4 instruction.

On all halts, an error bit code and true error location is provided in the SI REG. See listing write-up preceding the Program Check Subroutine for bit code used.

The four Sense Lites also provide error indications. See Part C of this write-up.

F. PROGRAM CONTROL AND ERROR PRINTOUTS

1. All printouts are under control of SSW 3.

2. All error printouts are under control of both SSW 2 and SSW 3 as standardized by the DEPR Error Print Subroutine.

3. Consult the write-up and listing of DEPR for detailed account of the diagnostic print subroutine.

4. The correct results of each test routine can be found in the three octal locations of the test routine.

5. See Page 1.0008 for example of program control and error printouts.

G. TEST ROUTINE FORMAT

All the test routines in this program were written in the followuing format, exccept for the exceptions as noted.

The main headings, arranged in order as they would appear in a test routine, refer to either a single symbolic instruction or a group of symbolic instructions.

The brief discussion following a heading gives the purpose for using such heading in the format.

1. BCD 10PN

To provide BCD word for operation location in 9DEPR.

SECTION 2

2. TSX CLEAR,4
   Program control is transfered to MONITOR (Part 1) for checking program sequence. If program is operating in proper sequence, control is transferred to Part 2 of MONITOR for initializing. EXCEPTION: In first test routine, program sequence is not checked. Only initializing is done.

3. TEST ROUTINE INSTUCTIONS

4. TSX CHECK,4
   Control is tranferred to the Program Check Routine. This routine checks the results of this test routine with the correct results as provided in the following three locations. On an error indication, control is transferred or halt, SSW 1 and SSW 4 are interrogated.
   On a condition of no error indication, control is transferred to 4,4(TSX OK,4).

5. THREE OCTAL LOCATIONS
   These locations contain the correct result of the test routine.
   OCT or PZE - Gives the OV, QP and Trap conditions.
   OCT - Correct contents of ACC S-35.
   OCT - Correct contents of MQ S-35.

6. TSX OK,4
   If test routine checks OK, control is transferred to 9DEPR for interrogation of SSW 1 and SSW 4.

7. TRA X
   To provide return to beginning of test routine under control of SSW 1 or SSW 4 in 9DEPR. In our case, return is to TSX CLEAR,4.

EXCEPTIONS:

a) In test routines that check for false trapping or divide check conditions - TSX ERROR - 1,4
   NOP ADDRESS (Either DCTER or TRPER)

   On these above errrors, a print out will occur before the results of the test routine are checked. The NOP instruction gives the BCD word to be inserted in the operations part of the 9DEPR printout.

b) In Scoping Loop Routines -
SWT 1 is provided for a closed loop on an extended instruction. Separate temporary (temp) locations are provided for each loop routine.

c) In Reliability Section (NxN/N)
SWT 1 is provided for looping after each operation before the zero column is shifted left.

H. SUBROUTINE DESCRIPTIONS

1. PROGRAM CHECK SUBROUTINE

This subroutine checks the arithmetic results of each test routine. These arithmetic resutls are checked with data provided by the test routine as found in the three locations following the TSX CHECK instruction.

See write-up in listing on Page 86 for other comments.

2. MONITOR

Monitor is divided into six parts to include all program control subroutines used in this diagnostic program.

Part 1 PROGRAM SEQUENCE CHECK

This subroutine checks to see if program is following each test routine in proper sequence. Only the three following conditions are considered by this subroutine as being proper sequences:

a) The repeating of a test routine when under control of SSW 1 or SSW 4.

b) Proceeding in sequence from each test routine to the next following test routine.

c) The condition of a manul transfer as set in machine from the keys.

This subroutine provides this program with the means for detecting random addressing errors.

SECTION 2

Part 2 RESET AND RETURN CONTROL

This subroutine will reset all MF registers, turn off all sense lights, turn off MQ and AC OV triggers, set program into the floating point trap mode, reset nullify trigger, turn off divide check trigger, clear test routine temporary locations, and initialize location zero.

The beginning test location is set in SI REG to indicate error location for the divide check and trap failure errors.
The I/O check light is turned on for the manual restart subroutine (Part 5).

Part 3 SPACE SUBROUTINE

This subroutine, under control of SSW 3, will print space error using the standard 9DEPR print routine. With SSW 2 DN, the error inidication is bypassed. After printing or halting, the program will return to last test routine that was completed in proper sequence.

Part 4 PROGRAM START AND STOP CONTROL

START - This portion of the subroutine fills all unused portions of storage with TSX SPACE,4. The pass and error count locations are cleared. The program will be identified with SSW 3 UP.

STOP - This portions of the subroutine provides program control after the completion of each program pass.
With SSW 6 DN, the program counters are stepped and program returned to the beginning test routine. After 100 program passes, with SSW 3 UP, a printout of total passes is provided.
With SSW 6 UP, the load cards button is simulated to read in next diagnostic program. If SSW 3 is UP at the same time, a printout of statistics and total program passes is provided.

Part 5 MANUAL RESTART CONTROL

This subroutine, on a condition of manual reset with SSW 1 DN, will return the program to the test routine that was interrupted at the time of the manual reset. With SSW 1 UP, the program will return to the beginning test routine.

SECTION 2

The I/O check light is used to indicate to this subroutine that entry was due to manual reset. The I/O check light is turned on at the beginning of each test routine and is turned off only on a manual reset.

On conditions that the I/O check light is not off or address of location zero is no 00001, this subroutine will transfer to Part 3 to print sequence error from location 00002.

Part 6 FLAOTING POINT TRAP CONTROL

This subroutine provides program control of all traps that occured during operation of the test routines. On legal traps, the program is returned back to test routine that provided return address. On all legal traps, XRC should be zero.

On a condition of a legal trap with XRC not zero, the program will printout error, under control of SSW 2 and SSW 3, before returning to the test routine. The printout uses the standard 9DEPR format with the designation of I TIME for the operation code.

On a condition of entry to subroutine with no return address provided, this subroutine will determine whether error was due to a trapping or skipping condition. If program skipped to location 00001, program control is tranfered to SPACE subrouine. If program trapped to location 00001, a printout under control of SSW 2 and SSW 3 is provided before program is returned to trap location address plus one.

SECTION 2

PROGRAM CONTROL AND ERROR PRINTOUTS

PROGRAM CONTROL PRINTOUTS

9EFP SECTION 2, EXTENDED PRECISION FLOATING POINT TEST BEGINS.

9EFP, 100 PASSES. TOTAL OF 4000 PASSES COMPLETED.

9EFP, EX. PREC. TEST ENDS. 4095 TOTAL PASSES COMPLETED.

ERROR REPORT BY TYPE OF ERROR.

TOTAL	OV	P+Q	ACC	MQ	ZERO
145	4	13	57	33	36

PROGRAM ERROR PRINTOUTS (Using 9DEPR)

```
TEST LOC 00524, OPN EMP   ,ERROR LOC 00544, 0 LOC 500000000000,SW 000001
LITE 0100, MQ 200000000000, XRA 00000, XRB 00554, XRC 77234,  TRAP TRG 0
ACC +,Q 1,P 1,357777000000, DIV CK 0, ACC OVFL 1,
INDS 000000000000, KEYS 002000002120

TEST LOC 02015, OPN DCTERR,ERROR LOC 02023, 0 LOC 500000000000,SW 000001
LITE 0000, MQ 237777777776, XRA 00000, XRB 00000, XRC 75755,  TRAP TRG 0
ACC +,Q 0,P 0,040004777777, DIV CK 1, ACC OVFL 0,
INDS 000000002015, KEYS 002000002160

TEST LOC 02166, OPN EMPEDP,ERROR LOC 02156, 0 LOC 500000000000,SW 000001
LITE 0010, MQ 777777777774, XRA 00043, XRB 00000, XRC 75622,  TRAP TRG 0
ACC -,Q 0,P 0,440001777777, DIV CK 0, ACC OVFL 0,
INDS 000000000000, KEYS 002000005124

TEST LOC 05554, OPN I TIME,ERROR LOC 05560, 0 LOC 500000000000,SW 000001
LITE 0000, MQ 200000000000, XRA 00000, XRB 01612, XRC 77216,  TRAP TRG 1
ACC +,Q 1,P 1,347002000000, DIV CK 0, ACC OVFL 0,
INDS 000000076166, KEYS 002000001602

TEST LOC 05172, OPN SPACE ,ERROR LOC 05200, 0 LOC 500000000000,SW 000001
LITE 0111, MQ 777777777776, XRA 00005, XRB 00000, XRC 24502,  TRAP TRG 0
ACC -,Q 0,P 0,040004000000, DIV CK 0, ACC OVFL,
INDS 002170053275, KEYS 000000000000
```

```
*****************************************************************
*                                                               *
*                  B/M  580043       EC  298817                 *
*                                                               *
*****************************************************************

*****************************************************************
*                                                               *
*          ******   ******   ******   *******       *********     *
*          *        *        *           *           *   *       *
*          *        *        *           *           *   *       *
*          *        *        *           *           *   *       *
*          ******   ****     *           *           *   *       *
*               *   *        *           *           *   *       *
*               *   *        *           *           *   *       *
*               *   *        *           *      **   *   *       *
*          ******   ******   ******      *      **  *********     *
*                                                               *
*****************************************************************
```

*LOW END FOR COTNROL OF FP TRAP AND MANUAL RESTART.

```
                  00000         ORG
00000 -1 00000 0 00000          STR             FOR MANUAL RESTART
00001  0074 00 4 05160          TSX SPACE,4
00002  0021 00 0 05500          TTR RESTR
00003  0074 00 4 05160          TSX SPACE,4
00004  0074 00 4 05160          TSX SPACE,4
00005  0074 00 4 05160          TSX SPACE,4
00006  0074 00 4 05160          TSX SPACE,4
00007  0074 00 4 05160          TSX SPACE,4
00010  0021 00 0 05517          TTR TRAP+1      FOR F. P. TRAP.
00011  0074 00 4 05160          TSX SPACE,4       FOR MONITOR.
00012  0074 00 4 05160          TSX SPACE,4       FOR MONITOR.
00013  0074 00 4 05160          TSX SPACE,4       FOR MONITOR.
00014  0074 00 4 05160          TSX SPACE,4       FOR MONITOR.
00015  0074 00 4 05160          TSX SPACE,4       FOR MONITOR.
00016  0074 00 4 05160          TSX SPACE,4       FOR MONITOR.
00017  0074 00 4 05160          TSX SPACE,4       FOR MONITOR.
00020  0074 00 4 05160          TSX SPACE,4       FOR MONITOR.
00021  0074 00 4 05160          TSX SPACE,4       FOR MONITOR.
00022  0074 00 4 05160          TSX SPACE,4       FOR MONITOR.
00023  0074 00 4 05160          TSX SPACE,4       FOR MONITOR.
00024  0074 00 4 05160          TSX SPACE,4       FOR MONITOR.
00025  0074 00 4 05160          TSX SPACE,4       FOR MONITOR.
00026  0074 00 4 05160          TSX SPACE,4       FOR MONITOR.
00027  0074 00 4 05160          TSX SPACE,4       FOR MONITOR.

                                    PROGRAM STARTS AT 30.
```

*SHORT TEST OF EST AND ELD

* EST, -0673, ELD, +0670.

```
                                    SHORT LOOP FOR SCOPE.

                 00030          ORG 24
00030  0020 00 0 00032  9EFP   TRA *+2
00031  256263606060           BCD 1EST
00032  0074 00 4 05122  EST    TSX RESET,4    CLEAR, SET MONITOR.
00033  0600 00 0 06436         STZ SHOP
00034  0600 00 0 06437         STZ SHOP+1     CLEAR
00035 -0754 00 0 00000         PXD
00036  0765 00 0 00043         LRS 35
00037 -0673 00 0 06436         EST SHOP       ***
00040  0760 00 0 00161         SWT 1          * *
00041  0020 00 0 00045         TRA *+4          *
00042  0020 00 0 00037         TRA *-3        *** REPEAT FOR SCOPING
                 00043         BSS 2              FOR FUTURE USE
00045  0074 00 4 06511         TSX OK,4        PROCEED
00046  0020 00 0 00032         TRA EST

                                    CHECK EST STORES ALL BITS
                                    EXCEPT ACC 18-35

00047  256263606060           BCD 1EST
00050  0074 00 4 05066  ESTA   TSX CLEAR,4    MONITOR
00051  0500 00 0 06427         CLA AONES      LOAD S,1-35
00052  0560 00 0 06427         LDQ AONES
00053  0600 00 0 06436         STZ SHOP
00054  0600 00 0 06437         STZ SHOP+1     CLEAR.
00055 -0673 00 0 06436         EST SHOP       SET ALL ONES TO STORAGE
                                    EXCEPT FROM ACC 18-35
00056  0761 00 0 00000         NOP
00057  0074 00 4 04700         TSX CHECK,4    SEE THAT ACC S,1-17, AND
                                              MQ S,1-35 ARE UNCHANGED.
00060 +000000000000           OCT 0
00061 -377777000000           OCT -377777000000 CORRECT ACC CONTENTS.
00062 -377777777777           OCT -377777777777 CORRECT MQ CONTENTS
00063  0020 00 0 00065         TRA *+2        PROCEED
00064  0761 00 0 00050         NOP ESTA
00065  0761 00 0 00000         NOP
00066  0500 00 0 06436         CLA SHOP
00067  0560 00 0 06437         LDQ SHOP+1     CHECK STORAGE
00070  0074 00 4 04700         TSX CHECK,4
00071 +000000000000           OCT
00072 -377777000000           OCT -377777000000 CORRECT ACC CONTENTS
00073 -377777777777           OCT -377777777777 CORRECT MQ CONTENTS
00074  0074 00 4 06511         TSX OK,4
00075  0020 00 0 00050         TRA ESTA

                                    CHECK EST, DOES NOT STORE INTO 18-35.

00076  256263606060           BCD 1EST
00077  0074 00 4 05066  ESTB   TSX CLEAR,4    MONITOR
00100  0761 00 0 00000         NOP
00101  0500 00 0 06427         CLA AONES      ALL ONES
00102  0601 00 0 06436         STO SHOP
00103  0761 00 0 00000         NOP
00104 -0754 00 0 00000         PXD            CLEAR ACC
```

```
00105 -0673 00 0 06436         EST SHOP       SHOULD NOT CLEAR 18-35
00106  0500 00 0 06436         CLA SHOP
00107  0560 00 0 06437         LDQ SHOP+1
00110  0074 00 4 04700         TSX CHECK,4
00111 +000000000000            OCT            NO OV, NO PQ, NO TRAP
00112 +000000777777            OCT 000000777777 CORRECT ACC
00113 +000000000000            OCT 0          MQ
00114  0074 00 4 06511         TSX OK,4       PROCEED OR
00115  0020 00 0 00077         TRA ESTB       REPEAT

                                   SHORT ROUTINE FOR SCOPE

00116  254324606060            BCD 1ELD
00117  0074 00 4 05066  ELD     TSX CLEAR,4    MONITOR
00120 -0754 00 0 00000         PXD            CLEAR
00121  0765 00 0 00043         LRS 35
00122  0600 00 0 06436         STZ SHOP
00123  0600 00 0 06437         STZ SHOP+1
00124  0670 00 0 06436         ELD SHOP       ***
00125  0760 00 0 00161         SWT 1          * *
00126  0020 00 0 00132         TRA *+4          *
00127  0020 00 0 00126         TRA *-1        *** REPEAT FOR SCOPING
                 00130         BSS 2
00132  0074 00 4 06511         TSX OK,4       PROCEED OR
00133  0020 00 0 00117         TRA ELD             REPEAT


                                   CHECK ELD ALTERNATE ONES, UNLIKE SIGNS
00134  254324606060            BCD 1ELD
00135  0074 00 4 05066  ELDA    TSX CLEAR,4    MONITOR
00136  0500 00 0 06431         CLA ALTON      ALTERNATE ONES MINUS
00137  0601 00 0 06436         STO SHOP
00140  0500 00 0 06432         CLA ALTNP      ALTERNATE ONES PLUS
00141  0601 00 0 06437         STO SHOP+1
00142  0761 00 0 00000         NOP
00143  0761 00 0 00000         NOP            FUTURE USE.
00144  0670 00 0 06436         ELD SHOP
00145  0074 00 4 04700         TSX CHECK,4
00146 +000000000000            OCT            NO OV, NO PQ, NO TRAP
00147 -125252525252            OCT -125252525252 CORRECT ACC CONTENTS
00150 +252525252525            OCT 252525252525 CORRECT MQ CONTENTS
00151  0074 00 4 06511         TSX OK,4
00152  0020 00 0 00135         TRA ELDA
*****************************************************************



*SINCE THE EMP INSTRUCTION IS ORED TO PRI OP 2,0 IN IT EXECUTRION,
*A BREIF TEST OF MPY IS PERFORMED BEFORE TESTING THE EMP INST.



*       *** BEGINNING MPY TEST****

*       ROUTINE FOR SCOPING MPY INSTRUCTION OPERATIONS
```

```
00153  444770626060            BCD 1MPYS
00154  0074 00 4 05066  MPYS   TSX CLEAR,4
00155  0560 00 0 06104         LDQ BS135      L  -377777777777
00156  0200 00 0 06104         MPY BS135
00157  0760 00 0 00161         SWT 1
00160  0020 00 0 00166         TRA MPYA       GO ON
00161  0020 00 0 00155         TRA MPYS+1     REPEAT
00162  0761 00 0 00000         NOP
00163  0761 00 0 00000         NOP
00164  0761 00 0 00154         NOP MPYS



*CHECKING FOR ENDING OPERATION IN E TIME WITH ZERO MULTIPLICAND

00165  444770606060            BCD 1MPY
                                    MULT S+   MCND S+
00166  0074 00 4 05066  MPYA   TSX CLEAR,4
00167  0500 00 0 06102         CLA P52S       PUTTING SET PATTERN IN ACC
00170  0560 00 0 06105         LDQ B135       L +377777777777 35 BIT MULT
00171  0200 00 0 06114         MPY K1+1       L +000000000000 35 BIT MCND
00172  0074 00 4 04700         TSX CHECK,4
00173 +000000000000            OCT +0         NO OV, NO PQ, NO TRAP
00174 +000000000000            OCT 000000000000 CONTENTS OF ACC
00175 +000000000000            OCT 000000000000 CONTENTS OF MQ
00176  0074 00 4 06511         TSX OK,4
00177  0020 00 0 00166         TRA MPYA

*THE ZERO MULTIPLICAN SHOULD CLEAR ACC AND MQ AND END OP IN E TIME.
*THE OV TRGS SHOULD BE OFF AND COL P AND Q ZERO.

                                    MULT S-   MCND S+
00200  444770606060            BCD 1MPY
00201  0074 00 4 05066  MPYB   TSX CLEAR,4
00202  0560 00 0 06104         LDQ BS135      L -377777777777 MULT S-
00203  0200 00 0 06114         MPY K1+1       L +000000000000 MCAND S+
00204  0074 00 4 04700         TSX CHECK,4
00205 +000000000000            OCT 000000000000
00206 -000000000000            OCT 400000000000 CONTENTS OF ACC
00207 -000000000000            OCT 400000000000 CONTENTS OF MQ
00210  0074 00 4 06511         TSX OK,4
00211  0020 00 0 00201         TRA MPYB

*A CHECK IS MADE WITH SIGNS UNLIKE. SINCE A ZERO MULTIPLICAND IS USED
*THE OPERATION SHOULD END IN E TIME WITH BITS IN THE SIGN COLUM
*OF BOTH THE ACC AND MQ. THE OV TRGS SHOULD BE OFF AND COL P AND Q ZERO.


                                   MULT S+    MCND S-
00212  444770606060            BCD 1MPY
00213  0074 00 4 05066  MPYC   TSX CLEAR,4
00214  0560 00 0 06105         LDQ B135       L +377777777777 MULT S+
00215  0200 00 0 06120         MPY K3+1       L -000000000000 MCAND S-
00216  0074 00 4 04700         TSX CHECK,4
```

```
00217 +000000000000           OCT 000000000000
00220 -000000000000           OCT -0          CONT OF ACC
00221 -000000000000           OCT -0          CONT OF MQ
00222  0074 00 4 06511        TSX OK,4
00223  0020 00 0 00213        TRA MPYC

* CHECK IS MADE WITH SIGNS UNLIKE AND TRVERSED FROM TEST MPY B.
*THE MACHINE SHOULD END OPN IN E TIME-ZERO MULTIPLICAND-WITH
*BITS IN THE SIGN POSITION OF ACC AND MQ. THE OV TRGS SHOULD BE
*OFF AND COL P AND Q ZERO.


                                  MULT S-    MCND S-
00224  444770606060           BCD 1MPY
00225  0074 00 4 05066  MPYCA  TSX CLEAR,4
00226  0560 00 0 06163        LDQ D11         L -37777777777 MULT S+
00227  0200 00 0 06162        MPY D10         L -00000000000 MCAND S-
00230  0074 00 4 04700        TSX CHECK,4
00231 +000000000000           OCT +0          NO OV, NO P+Q, NO TRAP
00232 +000000000000           OCT +0          CONT OF ACC
00233 +000000000000           OCT +0          CONT OF MQ
00234  0074 00 4 06511        TSX OK,4
00235  0020 00 0 00225        TRA MPYCA

*CHECK IS MADE WITH BOTH SIGNS MINUS. MACHINE SHOULD END OPN IN
*E TIME, ZERO MULTIPLICAND. OV TRGS OFF, COL P+Q ZERO.
*THE FOLLOWING ROUTINES GIVE A GENERAL CHECK OF THE MPY INST.
*THE SHIFT COUNTER IS CHECKED TO SEE IF IT IS SET TO 35, BASE 10.

00236  444770606060           BCD 1MPY
00237  0074 00 4 05066  MPYD  TSX CLEAR,4
00240  0560 00 0 06106        LDQ B1235       L +3000000001
00241  0200 00 0 06124        MPY K5+1        L +3000000000
00242  0074 00 4 04700        TSX CHECK,4
00243 +000000000000           OCT 000000000000
00244 +220000000000           OCT 220000000000 CONT OF ACC
00245 +300000000000           OCT 300000000000 CONT OF MQ
00246  0074 00 4 06511        TSX OK,4
00247  0020 00 0 00237        TRA MPYD

*THIS ROUTINE CHECKS TO SEE IF SHIFT COUNTER WAS SET TO 35. THIS
*IS INDICATED BY THE PRESENCE OF A BIT IN COL 1 AND 4 OF ACC AND
*COL 1 AND 2 OF MQ IF 35 SHIFTS TOOK PLACE IN OPERATION.
*OV TRG SHOULD BE OFF AND COL P + Q ZERO.



00250  444770606060           BCD 1MPY
00251  0074 00 4 05066  MPYE  TSX CLEAR,4
00252  0761 00 0 00000        NOP
00253  0560 00 0 06105        LDQ B135        L +3777777777 35 BIT MULT
00254  0200 00 0 06105        MPY B135                      35 BIT MCND
00255  0761 00 0 00000        NOP
00256  0074 00 4 04700        TSX CHECK,4
00257 +000000000000           OCT 000000000000
```

```
00260 +377777777776           OCT 377777777776 CONTENTS OF ACC
00261 +000000000001           OCT 000000000001 CONTENTS OF MQ
00262  0074 00 4 06511         TSX OK,4
00263  0020 00 0 00251         TRA MPYE

*THIS ROUTINE GIVES A GENERAL CHECK OF THE MPY OPERATION, BY USING A
*MULTIPLIER OF ALL ONES AND MULTIPLCAND OF ALL ONES.


*      *** BEGINNING EMP TEST - 2.07.90 AND 2.07.94 ***


*      CLOSED ROTUINE FOR SCOPING EMP

00264  254447606060            BCD 1EMP
00265  0074 00 4 05066  EMPS   TSX CLEAR,4
00266  0500 00 0 00274         CLA EMPSA
00267  0560 00 0 00275         LDQ EMPSA+1
00270  0673 00 0 00274         EMP EMPSA
00271  0760 00 0 00161         SWT 1
00272  0020 00 0 00302         TRA EMPA       GO ON
00273  0020 00 0 00266         TRA EMPS+1     REPEAT
00274 +040000000000     EMPSA  OCT 040000000000
00275 -077777777777            OCT 477777777777
00276  0761 00 0 00000         NOP
00277  0761 00 0 00000         NOP
00300  0761 00 0 00265         NOP EMPS       FOR DEPR



*CHECKING FOR ENDING OPERATION IN E TIME WITH ZERO MULTIPLICAN
*CHECKING SIGN CONTROLS, SIGNS ALIKE.

                                    MULT S+   MCND S+
00301  254447606060            BCD 1EMP
00302  0074 00 4 05066  EMPA   TSX CLEAR,4
00303  0761 00 0 00000         NOP
00304  0500 00 0 06121         CLA K4         L+040000000000 CH MULT 3-17
00305  0560 00 0 06122         LDQ K4+1       L-07777777777 FR MULT 1-35
00306  0673 00 0 06113         EMP K1         L+040000000000 CH MCND 3-17.
                                              L+000000000000 FR MCND 1-35
00307  0761 00 0 00000         NOP
00310  0074 00 4 04700         TSX CHECK,4    PROGRAM CHECK ROUTINE
00311 +000000000000            OCT +0         NO OV, NO PQ, NO TRAP
00312 +000000000000            OCT 000000000000 CONTENTS OF ACC
00313 +000000000000            OCT 000000000000 CONTENTS OF MQ
00314  0074 00 4 06511         TSX OK,4
00315  0020 00 0 00302         TRA EMPA
*WITH ZERO MULTIPLICAND THE MACHINE SHOULD END OPN IN E TIME. THIS
*CHECK IS MADE BY ORING INTO PRI OP 2,0-MPY. 2.07.94.
*CHECKING SIGN CONTROLS, SIGNS UNLIKE.
                                    MULT S-   MCND S+
00316  254447606060            BCD 1EMP
00317  0074 00 4 05066  EMPB   TSX CLEAR,4    MONITOR AND RESET
00320  0761 00 0 00000         NOP
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00321  0500 00 0 06115         CLA K2          L-040000000000 CH MULT 3-17
00322  0560 00 0 06116         LDQ K2+1        L+000000000000 FR MULT 1-35
00323  0673 00 0 06113         EMP K1          L+040000000000 CH MCND 3-37
                                               L+000000000000 FP MCND 1-35
00324  0761 00 0 00000         NOP
00325  0074 00 4 04700         TSX CHECK,4
00326 +000000000000            OCT +0          NO OV, NO PQ, NO TRAP
00327 -000000000000            OCT 400000000000 CONTENTS OF ACC
00330 -000000000000            OCT 400000000000 CONTENTS OF MQ
00331  0074 00 4 06511         TSX OK,4
00332  0020 00 0 00317         TRA EMPB
*THE SIGNS WERE UNLIKE SO THAT SIGN OF QUOTIENT SHOULD BE MINUS


*CHECK SIGN CONTROL, SIGNS UNLIKE.
                                    MULT S+    MCND S-
00333  254447606060            BCD 1EMP
00334  0074 00 4 05066  EMPC   TSX CLEAR,4    MONITOR AND RESET
00335  0761 00 0 00000         NOP
00336  0500 00 0 06117         CLA K3          L+040000000000 CH MULT 3-17
00337  0560 00 0 06120         LDQ K3+1        L-000000000000 FR MULT 1-35
00340  0673 00 0 06115         EMP K2          L-040000000000 CH MCND 3-17
                                               L+000000000000 FP MCND 1-35
00341  0761 00 0 00000         NOP
00342  0074 00 4 04700         TSX CHECK,4
00343 +000000000000            OCT +0          NO OV, NO PQ, NO TRAP
00344 -000000000000            OCT -0          CONT ACC
00345 -000000000000            OCT -0          CONT MQ
00346  0074 00 4 06511         TSX OK,4
00347  0020 00 0 00334         TRA EMPC


*CHECK SIGN CONTROLS, SIGNS ALIKE
                                    MULT S-    MCND S-
00350  254447606060            BCD 1EMP
00351  0074 00 4 05066  EMPC1  TSX CLEAR,4    MONITOR AND RESET
00352  0761 00 0 00000         NOP
00353  0500 00 0 06115         CLA K2          L-040000000000 CH MULT 3-17
00354  0560 00 0 06116         LDQ K2+1        L+000000000000 FR MULT 1-35
00355  0673 00 0 06115         EMP K2          L-040000000000 CH MCND 3-17
                                               L+000000000000 FP MCND 1-35
00356  0761 00 0 00000         NOP
00357  0074 00 4 04700         TSX CHECK,4
00360 +000000000000            OCT +0          NO OV, NO PQ, NO TRAP
00361 +000000000000            OCT 000000000000 CONTENTS OF ACC
00362 +000000000000            OCT 000000000000 CONTENTS OF MQ
00363  0074 00 4 06511         TSX OK,4
00364  0020 00 0 00351         TRA EMPC1


*CHECKING EMP WITH BIT IN COL 1 OF ACC AFTER MULTIPLY OPERATION.
*NO TRAPPING OR OVERFLOW.

00365  254447606060            BCD 1EMP
00366  0074 00 4 05066  EMPD   TSX CLEAR,4
00367  0761 00 0 00000         NOP
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00370  0500 00 0 06123         CLA K5          L+040000000000 CH MULT 3-17
00371  0560 00 0 06124         LDQ K5+1        L+300000000000 FR MULT 1-35
00372  0673 00 0 06123         EMP K5          MULTIPLICAND
00373  0761 00 0 00000         NOP
00374  0074 00 4 04700         TSX CHECK,4
00375 +000000000000            OCT +0          NO OV, NO PQ, NO TRAP
00376 +040000000000            OCT 040000000000 CONTENTS OF ACC
00377 +220000000000            OCT +220000000000 CONTENTS OF MQ
00400  0074 00 4 06511         TSX OK,4
00401  0020 00 0 00366         TRA EMPD

*WITH A BIT IN COL 1 OF ACC AFTER MPY OPERATION, THE
*FRACTION WOULD NOT HAVE TO BE SHIFTED LEFT AND CHAR REDUCED
*BY ONE.


*CHECKING EMP WITH NO BIT IN COL 1 OF ACC AFTER MULTIPLY OPERATION.
*NO TRAPPING OR OVERFLOWS.

00402  254447606060            BCD 1EMP
00403  0074 00 4 05066  EMPE   TSX CLEAR,4
00404  0761 00 0 00000         NOP
00405  0500 00 0 06125         CLA K6          L+040000000000 CH MULT 3-17
00406  0560 00 0 06126         LDQ K6+1        L+200000000000 FR MULT 1-35
00407  0673 00 0 06125         EMP K6          MULTIPLICAND
00410  0761 00 0 00000         NOP
00411  0074 00 4 04700         TSX CHECK,4
00412 +000000000000            OCT +0          NO OV, NO PQ, NO TRAP
00413 +037777000000            OCT +037777000000 CONTENTS OF ACC
00414 +200000000000            OCT 200000000000 CONTENTS OF MQ
00415  0074 00 4 06511         TSX OK,4
00416  0020 00 0 00403         TRA EMPE

*WITH NO BIT IN COL 1 OF ACC AFTER MULTIPLY OPERATION,
*THE FRACTION WOULD HAVE TO BE SHIFTED LEFT AND CHARACTERISTIC
*REDUCED BY ONE.


*CHECKING TO SEE IF EMP WILL END OPERATION WITH FRACTION
*OF PRODUCT ZERO. NO TRAPPING OR OVERFLOWS.

00417  254447606060            BCD 1EMP
00420  0074 00 4 05066  EMPF   TSX CLEAR,4
00421  0761 00 0 00000         NOP
00422  0500 00 0 06133         CLA K9          L+040000000000 CH MULT 3-17
00423  0560 00 0 06134         LDQ K9+1        L+000000000001 FR MULT 1-35
00424  0673 00 0 06133         EMP K9
00425  0761 00 0 00000         NOP
00426  0074 00 4 04700         TSX CHECK,4
00427 +000000000000            OCT +0          NO OV, NO PQ, NO TRAP
00430 +000000000000            OCT 000000000000 CONTENTS OF ACC
00431 +000000000000            OCT 000000000000 CONTENTS OF MQ
00432  0074 00 4 06511         TSX OK,4
00433  0020 00 0 00420         TRA EMPF

*WITH THE FRACTION OF THE PRODUCT ZERO, THE
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*ACC IS CLEARED TO GIVE A ZERO CHARACTERISTIC



*CHECKING EMP USING AN UNNORMALIZED FRACTIONS. NO TRAPPING OR OVERFLOWS.

00434  254447606060            BCD 1EMP
00435  0074 00 4 05066  EMP1   TSX CLEAR,4    MONITOR
00436  0761 00 0 00000         NOP
00437  0670 00 0 06143         ELD UEP4       CH +40,002 FR .1 DEC4
00440  0673 00 0 06145         EMP UEP16      CH +40,004 FR .1 DEC16
00441  0761 00 0 00000         NOP
00442  0074 00 4 04700         TSX CHECK,4
00443 +000000000000            OCT +0         NO OV, NO PQ, NO TRAP
00444 +040005000000            OCT +040005000000 CONT ACC
00445 +040000000000            OCT +040000000000 CONT MQ
00446  0074 00 4 06511         TSX OK,4       CONTINUE TEST
00447  0020 00 0 00435         TRA EMP1       REPEAT TEST

*AFTER MPY OPER, THE CH RED BY ONE AND FR LT SHIFTED. FINAL RESULT
*IS STILL UNNORMAILIZED.


*CHECK EMP FOR OPERATION. ONE FACTORE UNNORMALIZED.
*MULT E6 TIME E6 TO GIVE E12.
00450  254447606060            BCD 1EMP
00451  0074 00 4 05066  EMP2   TSX CLEAR,4
00452  0761 00 0 00000         NOP
00453  0670 00 0 06147         ELD UEPE6      CH +40,025 FR .172044
00454  0673 00 0 06245         EMP EPE6       CH +40,024 FR .364110
00455  0761 00 0 00000         NOP
00456  0074 00 4 04700         TSX CHECK,4
00457 +000000000000            OCT +0         NO OV, NO PQ, NO TRAP
00460 +040050000000            OCT +040050000000 CONT ACC
00461 +350651224200            OCT +350651224200 CONT MQ
00462  0074 00 4 06511         TSX OK,4
00463  0020 00 0 00451         TRA EMP2

*CHECK EMP FOR OPERATION

00464  254447606060            BCD 1EMP
00465  0074 00 4 05066  EMP3   TSX CLEAR,4    MONITOR
00466  0761 00 0 00000         NOP
00467  0670 00 0 06251         ELD EPE8       CH +40,033 FR +.2765702
00470  0673 00 0 06245         EMP EPE6       CH +40,024 FR +.3641100
00471  0673 00 0 06233         EMP EPE1       CH +40,004 FR +.24
00472  0761 00 0 00000         NOP
00473  0074 00 4 04700         TSX CHECK,4
00474 +000000000000            OCT +0         NO OV, NO PQ, NO TRAP
00475 +040062000000            OCT +040062000000 CONT ACC
00476 +343277244615            OCT +343277244615 CONT MQ
00477  0074 00 4 06511         TSX OK,4
00500  0020 00 0 00465         TRA EMP3
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*CHECK EMP WITH CONDITION OF OVERFLOW UNTIL CH IS REDUCED BY ONE.

00501  254447606060            BCD 1EMP
00502  0074 00 4 05066  EMP6   TSX CLEAR,4    MONITOR
00503  0761 00 0 00000         NOP
00504  0500 00 0 06105         CLA B135       CH +77,777 MULT
00505  0560 00 0 06126         LDQ K6+1       FR + .2 MULT
00506  0673 00 0 06231         EMP EPE0       CH +40,001 FR .2 MCND
00507  0761 00 0 00000         NOP
00510  0074 00 4 04700         TSX CHECK,4
00511 +000000000000            OCT +0         NO OV, NO PQ, NO TRAP
00512 +077777000000            OCT +077777000000 CONT ACC
00513 +200000000000            OCT +200000000000 CONT MQ
00514  0074 00 4 06511         TSX OK,4
00515  0020 00 0 00502         TRA EMP6

*CHECK EMP FOR CONDITION OF UNDERFLOW AFTER CHAR RED BY ONE.
*MAHCINE WILL BE IN 704 MODE. BITS IN P AND Q SHOULD SET
*ACC AND MQ OV TRGS.

00516  254447606060            BCD 1EMP
00517  0074 00 4 05066  EMP7   TSX CLEAR,4    MONITOR
00520  0761 00 0 00000         NOP
00521 -0760 00 0 00004         LFTM           LEAVE 709 FP TRAP MODE.
00522  0500 00 0 06114         CLA K1+1       CH +00,000 MULT
00523  0560 00 0 06126         LDQ K6+1       FR +.2    MULT
00524  0673 00 0 06125         EMP K6         CH +40,000  FR .2 MCND
00525  0761 00 0 00000         NOP
00526  0074 00 4 04700         TSX CHECK,4
00527 -200003000000            OCT -200003000000 AC + MQ OV, P+Q BITS
                                                 NO TRAP.
00530 +377777000000            OCT +377777000000 CONT ACC
00531 +200000000000            OCT +200000000000 CONT MQ
00532  0074 00 4 06511         TSX OK,4
00533  0020 00 0 00517         TRA EMP7

*CHECKING EMP WITH OVERFLOW WITHOUT TRAPPING. BIT IN COL 2
*SHOULD SET ACC OV TRG. P AND Q SHOULD BE ZERO.

                                   *704 TRAPPING MODE*
00534  254447606060            BCD 1EMP
00535  0074 00 4 05066  EMPG   TSX CLEAR,4
00536  0761 00 0 00000         NOP
00537 -0760 00 0 00004         LFTM           LEAVE 709 FP TRAP MODE.
00540  0500 00 0 06127         CLA K7         L+070000000000 CH MULT 3-17
00541  0560 00 0 06130         LDQ K7+1       L+200000000000 FR MULT 1-35
00542  0673 00 0 06127         EMP K7         MULTIPLICAND
00543  0761 00 0 00000         NOP
00544  0074 00 4 04700         TSX CHECK,4
00545 -000000000000            OCT 400000000000 AC OV TRG ON
00546 +117777000000            OCT +117777000000 CONTENTS OF ACC
00547 +200000000000            OCT +200000000000 CONTENTS OF MQ
00550  0074 00 4 06511         TSX OK,4
00551  0020 00 0 00535         TRA EMPG

*THE CHARACTERISTICS OF THE FLOATING POINT NUMBERS USED ARE SUCH THAT
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*THEY SHOULD CAUSE AN OVERFLOW WITH A BIT IN COL 2 OF ACC. THE
*AC OV TRG SHOULD BE TURNED ON. COL P AND Q OF ACC SHOULD BE ZERO.
*BIT IN COL 2 OF ACC AFTER MPY OPER - ACC LT SHIFT 1 - CH RED BY 1.

*CHECKING EMP WITH UNDERFLOW WITHOUT TRAPPING. BITS IN COL
*P AND Q SHOULD SET AC AND MQ OV TRG

00552  254447606060            BCD 1EMP
00553  0074 00 4 05066  EMPH   TSX CLEAR,4
00554  0761 00 0 00000         NOP
00555 -0760 00 0 00004         LFTM           LEAVE 709 FP TRAP MODE.
00556  0500 00 0 06131         CLA K8         L+010000000000 CH MULT 3-17
00557  0560 00 0 06132         LDQ K8+1       L+200000000000 FR MULT 1-35
00560  0673 00 0 06131         EMP K8         MULTIPLICAND
00561  0761 00 0 00000         NOP
00562  0074 00 4 04700         TSX CHECK,4
00563 -200003000000            OCT -200003000000 ACC + MQ OV, P+Q ON,
                                                 NO TRAP
00564 +357777000000            OCT +357777000000 CONTENTS OF ACC
00565 +200000000000            OCT +200000000000 CONTENTS OF MQ
00566  0074 00 4 06511         TSX OK,4
00567  0020 00 0 00553         TRA EMPH

*THE CHARACTERISTICS OF THE FLOATING POINT NUMBERS USED ARE SUCH
*THAT THEY SHOUKLD CAUSE AN UNDERFLOW WITH BITS IN COL P AND Q OF ACC.
*BOTH THE AC AND MQ OV TRG SHOULD BE TURNED ON.
*CHECKING EMP WITH OERFLOW WITH TRAPPING.

00570  254447406060            BCD 1EMP-
00571  0074 00 4 05066  EMPJ   TSX CLEAR,4
00572  0774 00 2 00603         AXT EMPJA,2
00573  0634 00 2 05516         SXA TRAP,2
00574  0761 00 0 00000         NOP
00575  0500 00 0 06127         CLA K7         L+070000000000 CH MULT 3-17
00576  0560 00 0 06130         LDQ K7+1       L+200000000000 FR MULT 1-35
00577  0673 00 0 06127         EMP K7         MULTIPLICAND
00600  0761 00 0 00000         NOP
00601  0074 00 4 06503         TSX ERROR-1,4  FAILED TO TRAP
00602  0761 00 0 05157         NOP TRPER      ON OVERFLOW
00603  0074 00 4 04700  EMPJA  TSX CHECK,4
00604  0 00000 1 00600         PZE EMPJA-3,1 NO OV, NO PQ, ADDRESS
                                             AND COL 15 OF ZERO.
00605 +117777000000            OCT +117777000000 CONTENTS OF ACC
00606 +200000000000            OCT +200000000000 CONTENTS OF MQ
00607  0074 00 4 06511         TSX OK,4
00610  0020 00 0 00571         TRA EMPJ

*THE CHARACTERISTICS OF THE FLOATING POINT NUMBERS USED ARE SUCH THAT
*WILL CAUSE AN OVERFLOW WITH A BIT IN COL 2 OF ACC. THE MACHINE
*WILL STORE THE LOCATION OF EMP+1 INTO LOCATION 00000 AND TRAP TO
*LOCATION 00010. COL P AND Q OF ACC SHOULD BE ZERO. THIS OV
*CONDITION SHOULD SET A BIT IN COL 15 OF L 00000.

*CHECKING EMP WITH UNDERFLOW WITH TRAPPING.

00611  254447406060            BCD 1EMP-
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00612  0074 00 4 05066  EMPK   TSX CLEAR,4
00613  0774 00 2 00624         AXT EMPKA,2
00614  0634 00 2 05516         SXA TRAP,2
00615  0761 00 0 00000         NOP
00616  0500 00 0 06131         CLA K8          L+010000000000 CH MULT 3-17
00617  0560 00 0 06132         LDQ K8+1        L+200000000000 FR MULT 1-35
00620  0673 00 0 06131         EMP K8          MULTIPLICAND
00621  0761 00 0 00000         NOP
00622  0074 00 4 06503         TSX ERROR-1,4   FAILED TO TRAP
00623  0761 00 0 05157         NOP TRPER       ON OVERFLOW
00624  0074 00 4 04700  EMPKA  TSX CHECK,4
00625  0 00003 3 00621         PZE EMPKA-3,3,3 NO OV, PQ BITS, ADDR
                                               + COLS 14+15 OF ZERO.
00626 +357777000000            OCT +357777000000 CONTENTS OF ACC
00627 +200000000000            OCT +200000000000 CONTENTS OF MQ
00630  0074 00 4 06511         TSX OK,4
00631  0020 00 0 00612         TRA EMPK

*CHECKING EMP WITH INDEXING, NO TRAPPING

00632  254447606060            BCD 1EMP
00633  0074 00 4 05066  EMPL   TSX CLEAR,4
00634  0761 00 0 00000         NOP
00635  0500 00 0 06123         CLA K5          K5  +040000000000 CH 3-17
00636  0560 00 0 06124         LDQ K5+1        K5+1 +3000000000000 FR 1-35
00637  0774 00 1 77775         AXT -3,1
00640  0673 00 1 06120         EMP K5-3,1
00641  0761 00 0 00000         NOP
00642  0074 00 4 04700         TSX CHECK,4
00643 +000000000000            OCT +0          NO OV, NO PQ, NO TRAP
00644 +040000000000            OCT +040000000000  CONT ACC
00645 +220000000000            OCT +220000000000 CONT MQ
00646  0074 00 4 06511         TSX OK,4
00647  0020 00 0 00633         TRA EMPL

*CHECKING EMP WITH INDEXING, TRAPPING ON OVERFLOW.

00650  254447406060            BCD 1EMP-
00651  0074 00 4 05066  EMPM   TSX CLEAR,4
00652  0774 00 2 00664         AXT EMPMA,2
00653  0634 00 2 05516         SXA TRAP,2
00654  0761 00 0 00000         NOP
00655  0774 00 1 00003         AXT 3,1
00656  0500 00 0 06127         CLA K7          L+070000000000 CH MULT 3-17
00657  0560 00 0 06130         LDQ K7+1        L+200000000000 FR MULT 1-35
00660  0673 00 1 06132         EMP K7+3,1      MULTIPLICAND
00661  0761 00 0 00000         NOP
00662  0074 00 4 06503         TSX ERROR-1,4   FAILED TO TRAP
00663  0761 00 0 05157         NOP TRPER       ON OVERFLOW
00664  0074 00 4 04700  EMPMA  TSX CHECK,4
00665  0 00000 1 00661         PZE EMPMA-3,1 NO OV, NO PQ, ADDRESS
                                               AND COL 15 OF ZERO.
00666 +117777000000            OCT +117777000000 CONTENTS OF ACC
00667 +200000000000            OCT +200000000000 CONTENTS OF MQ
00670  0074 00 4 06511         TSX OK,4
00671  0020 00 0 00651         TRA EMPM
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*CHECKING EMP WITH INDIRECT ADDRESSING, NO TRAPPING.

00672  254447606060            BCD 1EMP
00673  0074 00 4 05066  EMPN   TSX CLEAR,4
00674  0761 00 0 00000         NOP
00675  0500 00 0 06123         CLA K5          K5  +040000000000 CH 3-17
00676  0560 00 0 06124         LDQ K5+1        K5+1 +3000000000000 FR 1-35
00677  0673 60 0 00675         EMP* *-2
00700  0761 00 0 00000         NOP
00701  0074 00 4 04700         TSX CHECK,4
00702 +000000000000            OCT +0          NO OV, NO PQ, NO TRAP
00703 +040000000000            OCT +040000000000  CONT ACC
00704 +220000000000            OCT +220000000000 CONT MQ
00705  0074 00 4 06511         TSX OK,4
00706  0020 00 0 00673         TRA EMPN

*CHECKING EMP WITH INDIRECT ADDRESSING, TRAPPING ON OVERFLOW.

00707  254447406060            BCD 1EMP-
00710  0074 00 4 05066  EMPO   TSX CLEAR,4
00711  0774 00 2 00722         AXT EMPOA,2
00712  0634 00 2 05516         SXA TRAP,2
00713  0761 00 0 00000         NOP
00714  0500 00 0 06127         CLA K7          L+070000000000 CH MULT 3-17
00715  0560 00 0 06130         LDQ K7+1        L+200000000000 FR MULT 1-35
00716  0673 60 1 00714         EMP* *-2,1      MULTIPLICAND
00717  0761 00 0 00000         NOP
00720  0074 00 4 06503         TSX ERROR-1,4  FAILED TO TRAP
00721  0761 00 0 05157         NOP TRPER       ON OVERFLOW
00722  0074 00 4 04700  EMPOA  TSX CHECK,4
00723  0 00000 1 00717         PZE EMPOA-3,1 NO OV, NO PQ, ADDRESS
                                              AND COL 15 OF ZERO.
00724 +117777000000            OCT +117777000000 CONTENTS OF ACC
00725 +200000000000            OCT +200000000000 CONTENTS OF MQ
00726  0074 00 4 06511         TSX OK,4
00727  0020 00 0 00710         TRA EMPO

*CHECKING EMP WITH INDEXING, INDIRECT ADDRESSING , AND USING EXECUTE.
*          TRAPPING ON OVERFLOW.

00730  254447406060            BCD 1EMP-
00731  0074 00 4 05066  EMPP   TSX CLEAR,4
00732  0774 00 2 00752         AXT EMPPT,2
00733  0634 00 2 05516         SXA TRAP,2
00734  0761 00 0 00000         NOP
00735  0774 00 1 00003         AXT 3,1
00736  0500 00 0 06127         CLA K7          L+070000000000 CH MCNDT 3-17
00737  0560 00 0 06130         LDQ K7+1        L+200000000000 FR MULT 1-35
00740  0522 00 0 00747  EMPPA  XEC EMPPX       MULTIPLICAND
00741  0761 00 0 00000         NOP
00742  0074 00 4 06503         TSX ERROR-1,4  FAILED TO TRAP
00743  0761 00 0 05157         NOP TRPER       ON OVERFLOW
00744  0020 00 0 00752         TRA EMPPT
00745  0761 00 0 00000         NOP
00746  0761 00 0 06127         NOP K7          SAVE ADDRESS.
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00747  0673 60 1 00751  EMPPX  EMP* *+2,1
00750  0761 00 0 00000         NOP
00751  0761 00 0 00000         NOP
00752  0074 00 4 04700  EMPPT  TSX CHECK,4
00753  0 00000 1 00741         PZE EMPPA+1,1 NO OV, NO P+Q, ADDRESS
                                     AND COL 15 OF ZERO.
00754 +117777000000             OCT +117777000000 CONTENTS OF ACC
00755 +200000000000             OCT +200000000000 CONTENTS OF MQ
00756  0074 00 4 06511         TSX OK,4
00757  0020 00 0 00731         TRA EMPP

*CHECKING NORMALIZING CONTROLS. FRACTION ZERO UNTIL ACC AND MQ
*ARE LEFT SHIFTED ONE COLUMN.

00760  254447606060            BCD 1EMP
00761  0074 00 4 05066  EMP5   TSX CLEAR,4    MONITOR
00762  0761 00 0 00000         NOP
00763  0670 00 0 06231         ELD EPE0       CH+40,001 FR .2
00764  0673 00 0 06141         EMP UEP1       CH+40,043 FR .000000000001
00765  0761 00 0 00000         NOP
00766  0074 00 4 04700         TSX CHECK,4
00767 +000000000000             OCT +0         NO OV, NO PQ, NO TRAP
00770 +040043000000             OCT +040043000000 CONT ACC
00771 +000000000001             OCT +000000000001 CONT MQ
00772  0074 00 4 06511         TSX OK,4       CONTINUE TEST
00773  0020 00 0 00761         TRA EMP5       REPEAT TEST

*CHECKING CONTINIOUS EMP OPERATION. SIGNS ALIKE.

00774  254447606060            BCD 1EMP
00775  0074 00 4 05066  EMP4   TSX CLEAR,4    MONITOR
00776  0761 00 0 00000         NOP
00777  0670 00 0 06233         ELD EPE1       CH +40,004 FR .24
01000  0673 00 0 06233         EMP EPE1
01001  0673 00 0 06233         EMP EPE1
01002  0673 00 0 06233         EMP EPE1
01003  0673 00 0 06233         EMP EPE1
01004  0673 00 0 06233         EMP EPE1
01005  0760 00 0 00002         CHS
01006  0761 00 0 00000         NOP
01007  0673 00 0 06233         EMP EPE1
01010  0673 00 0 06233         EMP EPE1
01011  0673 00 0 06233         EMP EPE1
01012  0673 00 0 06233         EMP EPE1
01013  0673 00 0 06233         EMP EPE1
01014  0760 00 0 00002         CHS
01015  0761 00 0 00000         NOP
01016  0673 00 0 06233         EMP EPE1
01017  0673 00 0 06233         EMP EPE1
01020  0673 00 0 06233         EMP EPE1
01021  0673 00 0 06233         EMP EPE1
01022  0673 00 0 06233         EMP EPE1
01023  0673 00 0 06233         EMP EPE1
01024  0761 00 0 00000         NOP
01025  0074 00 4 04700         TSX CHECK,4
01026 +000000000000             OCT +0         NO OV, NO PQ, NO TRAP
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01027 +040071000000           OCT +040071000000 CONT ACC
01030 +261505360566           OCT +261505360566 CONT MQ
01031  0074 00 4 06511        TSX OK,4
01032  0020 00 0 00775        TRA EMP4

*THE SOLUTION TO EACH EMP OPER CAN BE OBTAINED FROM CONSTANT AREA BY
*ADDING THE NUMBER OF E1S AND LOOKING AT CORRESPONDING EPE-- CONST.

*****************************************************************************

*               ************BEGINNING EDP TEST**********

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*SINCE THE EDP IS ORED TO PRI OPN 2,2 IN ITS EXECUTION, A BRIEF TEST
*OF DVP IS PREFORMED BEFORE THE TESTING OF EDP.
*EDP IS ORED TO THE PRI OPN 2,2 DURING-
*          1- 2ND E TIME OF EDP           E TIME OF DVP
*          2- STEP 1, ER TIME OF EDP      CYCLE 1, ER TUME OF DVP
*          3- STEP 2, ER TIME OF EDP      CYCLE 2-18, ER TIME OF DVP

*                       ***TESTING DVP***

*          *** CLOSED ROUTINE FOR SCOPING THE DVP INSTRUCTION ***

01033  246547606060           BCD 1DVP
01034  0074 00 4 05066  DVPS   TSX CLEAR,4
01035  0500 00 0 01043        CLA DVPSA
01036  0560 00 0 01044        LDQ DVPSA+1
01037  0221 00 0 01045        DVP DVPSA+2
01040  0760 00 0 00161        SWT 1
01041  0020 00 0 01052        TRA DVPA       UP-GO ON
01042  0020 00 0 01035        TRA DVPS+1     DN-RETURN
01043 +052525252525     DVPSA  OCT +052525252525 ACC  72 BIT
01044 +252525252525            OCT +252525252525 MQ  DIVIDEND.
01045 -000000000002            OCT -000000000002 SR  DIVISOR
01046 +000000000000            OCT +000000000000 ACC  REMAINDER
01047 -125252525252            OCT -125252525252 MQ  QUOTIENT
01050  0761 00 0 01034        NOP DVPS       FOR DEPR

* **CHECKING OPERATION OF DIV CK TO FUNCTION TO CAUSE END OPERATION
                                  IN THE 1ST ER CYCLE.
                                   SIGNS ALIKE ACC S+ SR S+
01051  246547606060           BCD 1DVP
01052  0074 00 4 05066  DVPA   TSX CLEAR,4    MONITOR AND RESET
01053  0761 00 0 00000        NOP
01054  0500 00 0 06151        CLA D1         L+200000000000 70 BIT
01055  0560 00 0 06152        LDQ D2         L+252525252525 DIVIDEND.
01056  0221 00 0 06151        DVP D1             35 BIT DIVISOR.
01057  0761 00 0 00000        NOP
01060  0760 00 0 00012        DCT
01061  0020 00 0 01064        TRA DVPAA      LITE ON - OK - CHECK RESULT
01062  0074 00 4 06503        TSX ERROR-1,4  LITE OFF - FAILED TO
01063  0761 00 0 05155        NOP DCTER      TURN ON DIV CK TRG.
01064  0074 00 4 04700  DVPAA  TSX CHECK,4
01065 +000000000000            OCT +0         NO OV, NO PQ, NO TRAP
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01066 +200000000000           OCT +200000000000  CONT ACC
01067 +252525252525           OCT +252525252525  CONT MQ
01070  0074 00 4 06511        TSX OK,4       PROCEED
01071  0020 00 0 01052        TRA DVPA       REPEAT

* SINCE THE ACC PORTION OF THE DIVIDENT IS EQUAL TO THE DIVISOR, THE
*OPERATION SHOULD NOT TURN ON THE Q CARRY TRG. WITH T1 ON THE
*DIV CHECK TRG SHOULD BE TURNED ON AT ER5 D1. AN ERROR IS
*INDICATED BY TWO PRINTOUTS IF THE DIV CHECK TRG DID NOT COME ON
*AND CONTENTS OF ACC AND MQ DID NOT CHECK CORRECTLY.


*FOLLOWING THREE ROUTINES CHECK THE SIGN CONTROLS FOR OPERATION.
*THE VALUES FOR THE DIVISO AND DIVIDEND WERE CHOSEN TO TURN ON
* THE DIV CK TRG, TO END OPER IN 1ST ER TIME.

                                  SIGNS ALIKE  ACC S-  SR S-
01072  246547606060           BCD 1DVP
01073  0074 00 4 05066  DVPB   TSX CLEAR,4    MONITOR AND RESET
01074  0761 00 0 00000        NOP
01075  0500 00 0 06153        CLA D3         L-2000000000000  70 BIT DVD.
01076  0560 00 0 06153        LDQ D3         L-2000000000000
01077  0221 00 0 06153        DVP D3         L-2000000000000  DIVISOR
01100  0761 00 0 00000        NOP
01101  0760 00 0 00012        DCT
01102  0020 00 0 01105        TRA DVPBA      LITE ON- OK - CHECK RESULTS
01103  0074 00 4 06503        TSX ERROR-1,4  LITE OFF - FAILED TO
01104  0761 00 0 05155        NOP DCTER      TURN ON DIV CK TGR.
01105  0074 00 4 04700  DVPBA  TSX CHECK,4    PROG CHECK ROUTINE.
01106 +000000000000           OCT +0         NO OV, NO P+Q, NO TRAP.
01107 -200000000000           OCT -200000000000 CONT ACC
01110 +200000000000           OCT +200000000000 CONT MQ
01111  0074 00 4 06511        TSX OK,4       PROCEED
01112  0020 00 0 01073        TRA DVPB       REPEAT

*SINCE THE ACC AND SR SIGNS ARE BOTH MINUS, THE MQ S IS CLEARED.

* CHECKING SIGN CONTROLS. DIV CK TGR IS TURNED ON AND CHECKED.
* ACC PORTION OF DVD GREATER THEN DIV - CONT OF SR.
                                  SIGNS UNLIKE  ACC S+    SR S-
01113  246547606060           BCD 1DVP
01114  0074 00 4 05066  DVPC   TSX CLEAR,4    MONITOR AND RESET
01115  0761 00 0 00000        NOP
01116  0500 00 0 06152        CLA D2         L+252525252525  70 BIT
01117  0560 00 0 06154        LDQ D4         L+000000000000   DVD.
01120  0221 00 0 06153        DVP D3         L-200000000000  DIV
01121  0761 00 0 00000        NOP
01122  0760 00 0 00012        DCT
01123  0020 00 0 01126        TRA DVPCA      LITE ON- OK - CHECK RESULTS
01124  0074 00 4 06503        TSX ERROR-1,4  LITE OFF- FAILED TO
01125  0761 00 0 05155        NOP DCTER      TURN ON DIV CK TRG.
01126  0074 00 4 04700  DVPCA  TSX CHECK,4    PROG CHECK ROUTINE.
01127 +000000000000           OCT +0         NO OV, NO PQ, NO TRAP
01130 +252525252525           OCT +252525252525  CONT ACC
01131 -000000000000           OCT -0             CONT MQ
01132  0074 00 4 06511        TSX OK,4       PROCEED
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01133  0020 00 0 01114         TRA DVPC

*SINCE THE ACC S + AND SR S -, THE MQ S IS CLEARD AND
*MINUS TO MQ S.

* CHECKING SIGN CONTROLS. DIV CK TRG IS TURNED ON AND CHECKED.
* ACC PORTION OF DVD GREATER THEN DIV - CONT OF SR.
                                SIGNS UNLIKE    ACC S-   SR S+
01134  246547606060             BCD 1DVP
01135  0074 00 4 05066  DVPD    TSX CLEAR,4
01136  0761 00 0 00000          NOP
01137  0500 00 0 06153          CLA D3          L-200000000000   70 BIT DVD
01140  0560 00 0 06152          LDQ D2          L+252525252525  MQ DVD
01141  0221 00 0 06223          DVP D29+1       L+100000000001   DIVISOR
01142  0761 00 0 00000          NOP
01143  0760 00 0 00012          DCT
01144  0020 00 0 01147          TRA DVPDA       LITE ON- OK - CHECK RESULTS
01145  0074 00 4 06503          TSX ERROR-1,4   LITE OFF-  FAILED TO
01146  0761 00 0 05155          NOP DCTER       TURN ON DIV CK TRG.
01147  0074 00 4 04700  DVPDA   TSX CHECK,4     PROG CHECK ROUTINE.
01150 +000000000000             OCT +0          NO OV, NO PQ, NO TRAP
01151 -200000000000             OCT -200000000000  CONT ACC
01152 -252525252525             OCT -252525252525  CONT MQ
01153  0074 00 4 06511          TSX OK,4        PROCEED
01154  0020 00 0 01135          TRA DVPD        REPEAT

*WITH THE ACCS - AND SR+, THE MQ S IS CLEARED AND THE MQ S IS
*MADE MINUS.

*CHECKING OPERATION OF DIVISION DURING ITS REDUCTION CYCLES.

01155  246547606060             BCD 1DVP
01156  0074 00 4 05066  DVPE    TSX CLEAR,4
01157  0761 00 0 00000          NOP
01160  0500 00 0 06154          CLA D4          L+000000000000 ACC DVD
01161  0560 00 0 06151          LDQ D1          L+200000000000 MQ DVD
01162  0221 00 0 06155          DVP D5          L+000000000002  SR DIV
01163  0761 00 0 00000          NOP
01164  0074 00 4 04700          TSX CHECK,4
01165 +000000000000             OCT +0          NO OV, NO PQ, NO TRAP
01166 +000000000000             OCT +0               CONT ACC
01167 +100000000000             OCT +100000000000 CONT MQ
01170  0074 00 4 06511          TSX OK,4        PROCEED
01171  0020 00 0 01156          TRA DVPE

*CHECKING REDUCTION CYCLES.

01172  246547606060             BCD 1DVP
01173  0074 00 4 05066  DVPF    TSX CLEAR,4
01174  0761 00 0 00000          NOP
01175  0500 00 0 06154          CLA D4            L+000000000000 ACC DVD S+
01176  0560 00 0 06152          LDQ D2          L+252525252525 MQ DVD
01177  0221 00 0 06155          DVP D5          L+000000000002 SR DIV
01200  0761 00 0 00000          NOP
01201  0074 00 4 04700          TSX CHECK,4
01202 +000000000000             OCT +0          NO OV, NO PQ, NO TRAP
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01203 +000000000001           OCT +1              CONT ACC
01204 +125252525252           OCT +125252525252 CONT MQ
01205  0074 00 4 06511        TSX OK,4       PROCEED
01206  0020 00 0 01173        TRA DVPF

*CHECKING REDUCTION CYCLES.

01207  246547606060           BCD 1DVP
01210  0074 00 4 05066  DVPG  TSX CLEAR,4
01211  0761 00 0 00000        NOP
01212  0500 00 0 06162        CLA D10          L-000000000000 ACC DVD S-
01213  0560 00 0 06163        LDQ D11        L+377777777777 MQ DVD S+
01214  0221 00 0 06161        DVP D9         L+000000000001 SR DIV S+
01215  0761 00 0 00000        NOP
01216  0074 00 4 04700        TSX CHECK,4
01217 +000000000000           OCT +0         NO OV, NO PQ, NO TRAP
01220 -000000000000           OCT -000000000000 CONT ACC
01221 -377777777777           OCT -377777777777 CONT MQ
01222  0074 00 4 06511        TSX OK,4       PROCEED
01223  0020 00 0 01210        TRA DVPG

*CHECKING REDUCTION CYCLES WITH A REMAINDER, QUOTIENT ZERO.

01224  246547606060           BCD 1DVP
01225  0074 00 4 05066  DVPH  TSX CLEAR,4
01226  0761 00 0 00000        NOP
01227  0500 00 0 06154        CLA D4           L+000000000000 ACC DVD S+
01230  0560 00 0 06160        LDQ D8         L-125252525252 MQ DVD S-
01231  0221 00 0 06151        DVP D1         L+200000000000
01232  0761 00 0 00000        NOP
01233  0074 00 4 04700        TSX CHECK,4
01234 +000000000000           OCT +0         NO OV, NO PQ, NO TRAP
01235 +125252525252           OCT +125252525252 CONT ACC
01236 +000000000000           OCT +0                CONT MQ
01237  0074 00 4 06511        TSX OK,4       PROCEED
01240  0020 00 0 01225        TRA DVPH

**********************************************************************

*ASSUMING FIXED POINT DIVISION IS FUNCTIONAL, THE TEST FOR THE
*EDP INSTRUCTION WILL BEGIN. SYSTEMS 2.07.95 AND 2.07.96.
*EDP --- +0672

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*      CLOSED ROUTINE FOR SCOPING EDP INSTRUCTION.

01241  252447606060           BCD 1EDP
01242  0074 00 4 05066  EDPS  TSX CLEAR,4
01243  0500 00 0 01251        CLA EDPSA
01244  0560 00 0 01252        LDQ EDPSA+1
01245  0672 00 0 01253        EDP EDPSA+2
01246  0760 00 0 00161        SWT 1
01247  0020 00 0 01257        TRA EDPA       UP PROCEAT
01250  0020 00 0 01243        TRA EDPS+1     DN REPEAT
01251 +040000000000     EDPSA  OCT +040000000000 CH DVD 3-17
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01252 -200000000000           OCT -200000000000 FR DVD 1-35
01253 -040000000000           OCT -040000000000 CH DIV 3-17
01254 +200000000000           OCT +200000000000 FR DIV 1-35
01255  0761 00 0 01242        NOP EDPS       FOR DEPR

*TESTING FOR ZERO MQ, DIVIDEND FRACTION. WILL RESET ACC S-35
*AND MQ S-35 TO ZERO AND END OPN AT E10. 2.07.95 EDP T10FF.

01256  252447606060           BCD 1EDP
01257  0074 00 4 05066  EDPA  TSX CLEAR,4
01260  0500 00 0 06164        CLA D12        L+347777777777 CH DVD 3-17
01261  0560 00 0 06162        LDQ D10        L-000000000000  FR DVD 1-35
01262  0672 00 0 06165        EDP D13        L+030000000000  CH DIV 3-17
                                              L-200000000000 FR DIV 1-35
01263  0074 00 4 04700        TSX CHECK,4
01264 +000000000000           OCT +0         NO OV, NO PQ, NO TRAP
01265 +000000000000           OCT +0         CONT ACC
01266 +000000000000           OCT +0         CONT MQ
01267  0074 00 4 06511        TSX OK,4
01270  0020 00 0 01257        TRA EDPA

*TESTING EDP FOR DIV CK.  COL 1,2 OF ACC WORD CLEARED, COL 18-35 OF ACC
* WORD SET TO ALL ONES.  A DIV CK WILL BE MADE.

01271  252447606060           BCD 1EDP
01272  0074 00 4 05066  EDPB  TSX CLEAR,4
01273  0500 00 0 06164        CLA D12        L+347777777777 CH DVD 3-17
01274  0560 00 0 06171        LDQ D16        L+377777777777 FR DVD 1-35
01275  0672 00 0 06172        EDP D17        L+040000000000 CH DIV 3-17
                                              L+100000000000 FR DIV 1-35
01276  0760 00 0 00012        DCT
01277  0020 00 0 01302        TRA EDPBA      ON-CHECK RESULTS
01300  0074 00 4 06503        TSX ERROR-1,4  OFF-FAILED TO TURN
01301  0761 00 0 05155        NOP DCTER        ON DIV CK TGR
01302  0074 00 4 04700  EDPBA  TSX CHECK,4
01303 +000000000000           OCT +0         NO OV, NO PQ, NO TRAP
01304 +047777777777           OCT +047777777777  CONT ACC
01305 +377777777777           OCT +377777777777 CONT MQ
01306  0074 00 4 06511        TSX OK,4
01307  0020 00 0 01272        TRA EDPB

*TESTING EDP FOR DIV CK.  COL 1,2 OF ACC WORD CLEARED, COL 18-35 OF ACC
* WORD SET TO ALL ONES.  A DIV CK WILL BE MADE.
* A CHECK OF THE SIGN CONTROLS IS MADE.
                                   SIGNS ALIKE  ACC S+   SR S-
01310  252447606060           BCD 1EDP
01311  0074 00 4 05066  EDPC  TSX CLEAR,4
01312  0500 00 0 06167        CLA D14        L+040000000000 CH DVD 3-17
01313  0560 00 0 06163        LDQ D11        L-377777777777 FR DVD 1-35
01314  0672 00 0 06174        EDP D18        L+040000000000 CH DIV 3-17
                                              L-100000000000 FR DIV 1-35
01315  0760 00 0 00012        DCT
01316  0020 00 0 01321        TRA EDPCA      ON CK RESULTS
01317  0074 00 4 06503        TSX ERROR-1,4  OFF-FAILED TO TURN
01320  0761 00 0 05155        NOP DCTER        ON DIV CK TGR
01321  0074 00 4 04700  EDPCA  TSX CHECK,4
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01322 +000000000000           OCT +0         NO OV, NO PQ, NO TRAP
01323 +040000777777           OCT +040000777777  CONT ACC
01324 +377777777777           OCT +377777777777 CONT MQ
01325  0074 00 4 06511        TSX OK,4
01326  0020 00 0 01311        TRA EDPC

*CHECKING DCT. THE DIV CK TGR SHOULD NOT COME ON. THE
*ADDERS HAVE TO RIPPLE DOWN BEFORE Q CARRY TRG TURNS ON.
*A CHECK WILL BE MADE OF THE COND OF DIV CK TRG.
*NO TRAPPING OR OVER OR UNDERFLOWS.

01327  252447606060           BCD 1EDP
01330  0074 00 4 05066  EDP1  TSX CLEAR,4    MONITOR AND RESET
01331  0761 00 0 00000        NOP
01332  0500 00 0 06222        CLA D29        L+243210323232 CH DVD 3-17
01333  0560 00 0 06151        LDQ D1         L+200000000000 FR DVD 1-35
01334  0672 00 0 06222        EDP D29        L+243210323232 CH DIV 3-17
                                             L+100000000001 FR DIV 1-35
01335  0761 00 0 00000        NOP
01336  0760 00 0 00012        DCT            TGR SHOULD BE OFF
01337  0074 00 4 06503        TSX ERROR-1,4  ON-  IN ERROR
01340  0761 00 0 05155        NOP DCTER        OFF- OK -GO ON.
01341  0074 00 4 04700  EDP1A  TSX CHECK,4
01342 +000000000000           OCT +0         NO OV, NO PQ, NO TRAP
01343 +040001000000           OCT +040001000000 CONT ACC
01344 +377777777774           OCT +377777777774 CONT MQ
01345  0074 00 4 06511        TSX OK,4
01346  0020 00 0 01330        TRA EDP1

*CHECKING EDP ON DIVIDE CHECK.

01347  252447606060           BCD 1EDP
01350  0074 00 4 05066  EDPC1 TSX CLEAR,4    MONITOR AND RESET
01351  0500 00 0 06224        CLA D30        L+112345232323 CH DVD 3-17
01352  0560 00 0 06171        LDQ D16        L+377777777777 FR DVD 1-35
01353  0672 00 0 06224        EDP D30        L+112345232323 CH DIV 3-17
                                             L+100000000000 FR DIV 1-35
01354  0760 00 0 00012        DCT            TGR SHOULD BE ON-
01355  0020 00 0 01360        TRA EDPC2      ON- CK RESULTS
01356  0074 00 4 06503        TSX ERROR-1,4  OFF- FAILED TO TURN
01357  0761 00 0 05155        NOP DCTER      ON DIV CK TRG.
01360  0074 00 4 04700  EDPC2 TSX CHECK,4
01361 +000000000000           OCT +0         NO OV, NO PQ, NO TRAP
01362 +012345777777           OCT +012345777777 CONT ACC
01363 +377777777777           OCT +377777777777 CONT MQ
01364  0074 00 4 06511        TSX OK,4
01365  0020 00 0 01350        TRA EDPC1

*THE CH OF THE DVD IS EQUAL TO CH DIV *ACC EQUAL SR*.
*NO Q CARRY. AFTER DIVISION MQ COL 1 EQUAL 1.
*THE CHAR SHOULD BE INCR BY ONE. NO MQ LT SHIFT.

01366  252447606060           BCD 1EDP
01367  0074 00 4 05066  EDPD  TSX CLEAR,4
01370  0500 00 0 06200        CLA D20        L+0400000000 CH DVD 3-17
01371  0560 00 0 06201        LDQ D20+1      L+2000000000 FR DVD 1-35
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01372  0672 00 0 06200         EDP D20        L+0400000000 CH DIV 3-17
                                              L+2000000000 FR DIV 1-35
01373  0074 00 4 04700         TSX CHECK,4
01374 +000000000000            OCT +0         NO OV, NO PQ, NO TRAP
01375 +040001000000            OCT +040001000000  CONT ACC
01376 +200000000000            OCT +200000000000 CONT MQ
01377  0074 00 4 06511         TSX OK,4
01400  0020 00 0 01367         TRA EDPD

*THE CH OF THE DVD IS EQUAL TO CH DIV *ACC EQUAL SR*.
*NO Q CARRY. AFTER DIVISION MQ COL 1 EQUAL 0.
*MQ FR SHOULD BE LT SHIFTED ONE. NO INCR IN CHAR.

01401  252447606060            BCD 1EDP
01402  0074 00 4 05066  EDPE   TSX CLEAR,4
01403  0500 00 0 06200         CLA D20        L+0400000000 CH DVD 3-17
01404  0560 00 0 06201         LDQ D20+1      L+2000000000 FR DVD 1-35
01405  0672 00 0 06202         EDP D21        L+0400000000 CH DIV 3-17
                                              L+3000000000 FT DIV 1-35
01406  0074 00 4 04700         TSX CHECK,4
01407 +000000000000            OCT +0         NO OV, NO PQ, NO TRAP
01410 +040000777777            OCT +040000777777 CONT ACC
01411 +252525252524            OCT +252525252524  CONT MQ
01412  0074 00 4 06511         TSX OK,4
01413  0020 00 0 01402         TRA EDPE

*THE CH OF THE DVD IS LESS THEN CH DIV*ACC LESS THEN SR*.
*Q CARRY. AFTER DIVISION MQ COL 1 EQUAL 1.
*THE CHAR SHOULD BE INCR BY ONE. NO MQ LT SHIFT.

01414  252447606060            BCD 1EDP
01415  0074 00 4 05066  EDPF   TSX CLEAR,4
01416  0500 00 0 06165         CLA D13        L+03000000000 CH 3-17 DVD
01417  0560 00 0 06151         LDQ D1         L+20000000000 FR 1-35 DVD
01420  0672 00 0 06200         EDP D20        L+04000000000 CH 3-17 DIV
                                              L+20000000000 FR 1-35 DIV
01421  0074 00 4 04700         TSX CHECK,4
01422 +000000000000            OCT +0         NO OV, NO PQ, NO TRAP
01423 +030001000000            OCT +030001000000 CONT ACC
01424 +200000000000            OCT +200000000000 CONT MQ
01425  0074 00 5 06511         TSX OK,5
01426  0020 00 0 01415         TRA EDPF

*THE CH OF THE DVD IS LESS THEN CH DIV*ACC LESS THAN SR.
*Q CARRY. AFTER DIVISION MQ COL 1 EQUAL 0.
*MQ FR SHOULD BE LT SHIFTED ONE. NO INCR IN CHAR.

01427  252447606060            BCD 1EDP
01430  0074 00 4 05066  EDPG   TSX CLEAR,4
01431  0500 00 0 06165         CLA D13        L+030000000000 CH DVD 3-17
01432  0560 00 0 06151         LDQ D1         L+200000000000 FR DVD 1-35
01433  0672 00 0 06202         EDP D21        L+040000000000 CH DIV 3-17
                                              L+300000000000 FR DIV 1-35
01434  0074 00 4 04700         TSX CHECK,4
01435 +000000000000            OCT +0         NO OV, NO PQ, NO TRAP
01436 +030000777777            OCT +030000777777 CONT ACC
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01437 +252525252524           OCT +252525252524  CONT MQ
01440  0074 00 4 06511        TSX OK,4
01441  0020 00 0 01430        TRA EDPG

*CHECKING SIGN CONTROLS. SIGNS UNLIKE.
                                    ACC  DVD S-     SR DIV S+
01442  252447606060           BCD 1EDP
01443  0074 00 4 05066  EDPH  TSX CLEAR,4
01444  0500 00 0 06176        CLA D19        L-0400000000 CH DVD 3-17
01445  0560 00 0 06201        LDQ D20+1      L+2000000000 FR DVD 1-35
01446  0672 00 0 06204        EDP D22        L+0400000000 CH DIV 3-17
                                             L-2000000000 FR DIV 1-35
01447  0074 00 4 04700        TSX CHECK,4
01450 +000000000000           OCT +0         NO OV, NO PQ, NO TRAP
01451 -040001000000           OCT -040001000000  CONT ACC
01452 -200000000000           OCT -200000000000  CONT MQ
01453  0074 00 4 06511        TSX OK,4
01454  0020 00 0 01443        TRA EDPH

*CHECKING SIGN CONTROLS. SIGNS UNLIKE.
                                    ACC  DVD S+     SR DIV S-
01455  252447606060           BCD 1EDP
01456  0074 00 4 05066  EDPI  TSX CLEAR,4
01457  0500 00 0 06200        CLA D20        L+0400000000 CH DVD 3-17
01460  0560 00 0 06201        LDQ D20+1      L+2000000000 FR DVD 1-35
01461  0672 00 0 06206        EDP D23        L-0400000000 CH DIV 3-17
                                             L-2000000000 FR DIV 1-35
01462  0074 00 4 04700        TSX CHECK,4
01463 +000000000000           OCT +0         NO OV, NO PQ, NO TRAP
01464 -040001000000           OCT -040001000000  CONT ACC
01465 -200000000000           OCT -200000000000  CONT MQ
01466  0074 00 4 06511        TSX OK,4
01467  0020 00 0 01456        TRA EDPI

*CHECKING SIGN CONTROLS. SIGNS ALIKE.
                                    ACC  DVD S-     SR DIV S-
01470  252447606060           BCD 1EDP
01471  0074 00 4 05066  EDPJ  TSX CLEAR,4
01472  0500 00 0 06176        CLA D19        L-0400000000 CH DVD 3-17
01473  0560 00 0 06201        LDQ D20+1      L+2000000000 FR DVD 1-35
01474  0672 00 0 06210        EDP D24        L-0400000000 CH DIV 3-17
                                             L+2000000000 FR DIV 1-35
01475  0074 00 4 04700        TSX CHECK,4
01476 +000000000000           OCT +0         NO OV, NO PQ, NO TRAP
01477 +040001000000           OCT +040001000000  CONT ACC
01500 +200000000000           OCT +200000000000  CONT MQ
01501  0074 00 4 06511        TSX OK,4
01502  0020 00 0 01471        TRA EDPJ

*CHECKING SIGN CONTROLS. SIGNS ALIKE.
                                    ACC  DVD S+     SR DIV S+
01503  252447606060           BCD 1EDP
01504  0074 00 4 05066  EDPK  TSX CLEAR,4
01505  0500 00 0 06204        CLA D22        L+0400000000 CH DVD 3-17
01506  0560 00 0 06205        LDQ D22+1      L-2000000000 FR DVD 1-35
01507  0672 00 0 06204        EDP D22        L+0400000000 CH DIV 3-17
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                                                L-2000000000 FR DIV 1-35
01510  0074 00 4 04700         TSX CHECK,4
01511 +000000000000            OCT +0          NO OV, NO PQ, NO TRAP
01512 +040001000000            OCT +040001000000  CONT ACC
01513 +200000000000            OCT +200000000000  CONT MQ
01514  0074 00 4 06511         TSX OK,4
01515  0020 00 0 01504         TRA EDPK

*CHECKING OVERFLOW WITHOUT TRAPPING. *704 TRAPPING MODE*
*ACC OV LITE SHOULD COME ON. NO P OR Q.

01516  252447606060            BCD 1EDP
01517  0074 00 4 05066  EDPL   TSX CLEAR,4
01520 -0760 00 0 00004         LFTM            LEAVE 709 FP TRAP MODE
01521  0500 00 0 06214         CLA D26         L+077777000000 CH DVD 3-17
01522  0560 00 0 06213         LDQ D25+1       L+200000000000 FR DVD 1-35
01523  0672 00 0 06212         EDP D25         L+007000000000 CH DIV 3-17
                                                L+200000000000 FR DIV 1-35
01524  0074 00 4 04700         TSX CHECK,4
01525 -000000000000            OCT 400000000000 AC OV TRG ON
01526 +131000000000            OCT +131000000000  CONT ACC CH QUOT
01527 +200000000000            OCT +200000000000 CONT MQ FR QUOT
01530  0074 00 4 06511         TSX OK,4
01531  0020 00 0 01517         TRA EDPL

*CHECKING UNDERFLOW WITHOUT TRAPPING. *704 TRAPPING MODE*
*ACC OV AND MQ OV LITES SHOULD COME ON. P OR Q.

01532  252447606060            BCD 1EDP
01533  0074 00 4 05066  EDPM   TSX CLEAR,4
01534 -0760 00 0 00004         LFTM            LEAVE 709 FP TRAP MODE
01535  0500 00 0 06212         CLA D25         L+070000000000 CH DVD 3-17
01536  0560 00 0 06213         LDQ D25+1       L+200000000000 FR DVD 1-35
01537  0672 00 0 06214         EDP D26         L+077777000000 CH DIV 3-17
                                                L+200000000000 FR DIV 1-35
01540  0074 00 4 04700         TSX CHECK,4
01541 -200003000000            OCT 600003000000 AC AND MQ OV, P AND Q ON
01542 +347002000000            OCT +347002000000 CONT ACC CH QUOT
01543 +200000000000            OCT +200000000000 CONT MQ FR QUOT
01544  0074 00 4 06511         TSX OK,4
01545  0020 00 0 01533         TRA EDPM

*CHECKING OVERFLOW WITHOUT TRAPPING. *704 TRAPPING MODE*
*OVERFLOW SHOULD NOT OCCUR UNTIL CHAR IS INCREASED.
*ACC OV LITE SHOULD COME ON. NO P OR Q.

01546  252447606060            BCD 1EDP
01547  0074 00 4 05066  EDPN   TSX CLEAR,4
01550 -0760 00 0 00004         LFTM            LEAVE 709 FP TRAP MODE
01551  0500 00 0 06214         CLA D26         L+077777000000 CH DVD 3-17
01552  0560 00 0 06215         LDQ D26+1       L+200000000000 FR DVD 1-35
01553  0672 00 0 06200         EDP D20         L+040000000000 CH DIV 3-17
                                                L+200000000000 FR DIV 1-35
01554  0074 00 4 04700         TSX CHECK,4
01555 -000000000000            OCT -0          AC OV ON
01556 +100000000000            OCT +100000000000 CONT ACC CH QUOT
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01557 +200000000000            OCT +200000000000 CONT MQ FR QUOT
01560  0074 00 4 06511         TSX OK,4
01561  0020 00 0 01547         TRA EDPN

*CHECKING OVERFLOW TRAPPING. *709 MODE*
*NO OV LITES. NO P OR Q.
*A BIT IN COL 15 AND INST CTR SHOULD BE STORED IN LOC 00000.

01562  252447606060            BCD 1EDP
01563  0074 00 4 05066  EDPO   TSX CLEAR,4
01564  0774 00 2 01573         AXT EDPOT,2
01565  0634 00 2 05516         SXA TRAP,2
01566  0500 00 0 06214         CLA D26        L+077777000000 CH DVD 3-17
01567  0560 00 0 06213         LDQ D25+1      L+200000000000 FR DVD 1-35
01570  0672 00 0 06212         EDP D25        L+007000000000 CH DIV 3-17
                                              L+200000000000 FR DIV 1-35
01571  0074 00 4 06503         TSX ERROR-1,4  FAILED TO TRAP
01572  0761 00 0 05157         NOP TRPER      ON OVERFLOW
01573  0074 00 4 04700  EDPOT  TSX CHECK,4
01574  0 00000 1 01571         PZE EDPOT-2,1  NO OV, NO P+Q, ADDRESS
                                               AND COL 15 ON LOC ZERO.
01575 +131000000000            OCT +131000000000 CONT ACC
01576 +200000000000            OCT +200000000000 CONT MQ
01577  0074 00 4 06511         TSX OK,4
01600  0020 00 0 01563         TRA EDPO

*CHECKING UNDERFLOW TRAPPING. *709 MODE*
*NO OV LITES. P OR Q.
*BITS IN COL 14 AND 15, AND INST CTR SHOULD BE STORED IN LOC 00000.

01601  252447606060            BCD 1EDP
01602  0074 00 4 05066  EDPP   TSX CLEAR,4
01603  0774 00 2 01612         AXT EDPPT,2
01604  0634 00 2 05516         SXA TRAP,2
01605  0500 00 0 06212         CLA D25        L+007000000000 CH DVD 3-17
01606  0560 00 0 06213         LDQ D25+1      L+200000000000 FR DVD 1-35
01607  0672 00 0 06214         EDP D26        L+077777000000 CH DIV 3-17
                                              L+200000000000 FR DIV 1-35
01610  0074 00 4 06503         TSX ERROR-1,4  FAILED TO TRAP
01611  0761 00 0 05157         NOP TRPER      ON UNDERFLOW
01612  0074 00 4 04700  EDPPT  TSX CHECK,4
01613  0 00003 3 01610         PZE EDPPT-2,3,3 NO OV, P+Q ON, ADDRESS
                                               AND COL 14+15 ON LOC 0.
01614 +347002000000            OCT +347002000000 CONT ACC
01615 +200000000000            OCT +200000000000 CONT MQ
01616  0074 00 4 06511         TSX OK,4
01617  0020 00 0 01602         TRA EDPP

*CHECKING OVERFLOW TRAPPING. *709 MODE*
*OVERFLOW SHOULD NOT OCCUR UNTIL CHAR IS INCREASED.
*NO OV LITES. NO P OR Q.
*A BIT IN COL 15 AND INST CTR SHOULD BE STORED IN LOC 00000.

01620  252447606060            BCD 1EDP
01621  0074 00 4 05066  EDPQ   TSX CLEAR,4
01622  0774 00 2 01631         AXT EDPQT,2
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01623  0634 00 2 05516         SXA TRAP,2
01624  0500 00 0 06214         CLA D26        L+077777000000 CH DVD 3-17
01625  0560 00 0 06215         LDQ D26+1      L+200000000000 FR DVD 1-35
01626  0672 00 0 06200         EDP D20        L+040000000000 CH DIV 3-17
                                              L+200000000000 FR DIV 1-35
01627  0074 00 4 06503         TSX ERROR-1,4  FAILED TO TRAP
01630  0761 00 0 05157         NOP TRPER      ON UNDERFLOW
01631  0074 00 4 04700  EDPQT  TSX CHECK,4
01632  0 00000 1 01627         PZE EDPQT-2,1  NO OV, NO P+Q, ADDRESS
                                               AND COL 15 ON LOC ZERO.
01633 +100000000000            OCT +100000000000 CONT ACC
01634 +200000000000            OCT +200000000000 CONT MQ
01635  0074 00 4 06511         TSX OK,4
01636  0020 00 0 01621         TRA EDPQ

*CHECKING EDP WITH INDEXING. NO TRAPPING OR OVERFLOWS.

01637  252447606060            BCD 1EDP
01640  0074 00 4 05066  EDPR   TSX CLEAR,4
01641  0774 00 1 00002         AXT 2,1
01642  0500 00 0 06204         CLA D22        L+040000000000 CH DVD 3-17
01643  0560 00 0 06205         LDQ D22+1      L-200000000000 FR DVD 1-35
01644  0672 00 1 06206         EDP D23,1      L+040000000000 CH DIV 3-17
                                              L-200000000000 FR DIV 1-35
01645  0074 00 4 04700         TSX CHECK,4
01646  0 00000 0 00000         PZE +0         NO OV, NO PQ, NO TRAP
01647 +040001000000            OCT +040001000000 CONT ACC
01650 +200000000000            OCT +200000000000 CONT MQ
01651  0074 00 4 06511         TSX OK,4
01652  0020 00 0 01640         TRA EDPR

*CHECKING EDP WITH INDEXING. TRAPPING ON OVERFLOWS.
*SAME AS TEST EDPO EXCEPT INDEXING.
01653  252447606060            BCD 1EDP
01654  0074 00 4 05066  EDPT   TSX CLEAR,4
01655  0774 00 2 01665         AXT EDPTT,2
01656  0634 00 2 05516         SXA TRAP,2
01657  0774 00 1 00004         AXT 4,1
01660  0500 00 0 06214         CLA D26        L+077777000000 CH DVD 3-17
01661  0560 00 0 06213         LDQ D25+1      L+200000000000 FR DVD 1-35
01662  0672 00 1 06216         EDP D25+4,1    L+007000000000 CH DIV 3-17
                                              L+200000000000 FR DIV 1-35
01663  0074 00 4 06503         TSX ERROR-1,4  FAILED TO TRAP
01664  0761 00 0 05157         NOP TRPER      ON OVERFLOW
01665  0074 00 4 04700  EDPTT  TSX CHECK,4
01666  0 00000 1 01663         PZE EDPTT-2,1  NO OV, NO P+Q, ADDRESS
                                               AND COL 15 ON LOC ZERO.
01667 +131000000000            OCT +131000000000 CONT ACC
01670 +200000000000            OCT +200000000000 CONT MQ
01671  0074 00 4 06511         TSX OK,4
01672  0020 00 0 01654         TRA EDPT

*CHECKING EDP WITH IND ADDR. NO TRAPPING OR OVERFLOWS.

01673  252447606060            BCD 1EDP
01674  0074 00 4 05066  EDPU   TSX CLEAR,4
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01675  0500 00 0 06220         CLA D28        L+050101000000 CH DVD 3-17
01676  0560 00 0 06221         LDQ D28+1      L+300000000000 FR DVD 1-35
01677  0672 60 0 01675         EDP* *-2       L+050101000000 CH DIV 3-17
                                              L+300000000000 FR DIV 1-35
01700  0074 00 4 04700         TSX CHECK,4
01701 +000000000000            OCT +0         NO OV, NO PQ, NO TRAP
01702 +040001000000            OCT +040001000000 CONT ACC
01703 +200000000000            OCT +200000000000 CONT MQ
01704  0074 00 4 06511         TSX OK,4
01705  0020 00 0 01674         TRA EDPU

*CHECKING EDP WITH IND ADDR. TRAPPING WITH UNDERFLOWS.

01706  252447606060            BCD 1EDP
01707  0074 00 4 05066  EDPV   TSX CLEAR,4
01710  0761 00 0 06214         NOP D26        SAVE ADDRESS
01711  0774 00 2 01720         AXT EDPVT,2
01712  0634 00 2 05516         SXA TRAP,2
01713  0500 00 0 06212         CLA D25        L+007000000000 CH DVD 3-17
01714  0560 00 0 06213         LDQ D25+1      L+200000000000 FR DVD 1-35
01715  0672 60 0 01710         EDP* EDPV+1    L+077777000000 CH DIV 3-17
                                              L+200000000000 FR DIV 1-35
01716  0074 00 4 06503         TSX ERROR-1,4  FAILED TO TRAP
01717  0761 00 0 05157         NOP TRPER      ON UNDERFLOW
01720  0074 00 4 04700  EDPVT  TSX CHECK,4
01721  0 00003 3 01716         PZE EDPVT-2,3,3 NO OV, P+Q ON, ADDR AND
                                              COLS 14+15 OF LOC ZERO.
01722 +347002000000            OCT +347002000000 CONT ACC
01723 +200000000000            OCT +200000000000 CONT MQ
01724  0074 00 4 06511         TSX OK,4
01725  0020 00 0 01707         TRA EDPV

*CHECKING EDP WITH INDEXING AND IA. TRAPPING WITH OVERFLOW.
*OVERFLOW SHOULD NOT OCCUR UNTIL CHAR IS INCREASED.
*SAME AS TEST EDPQ EXCEPT FOR INDEXING AND IA.

01726  252447606060            BCD 1EDP
01727  0074 00 4 05066  EDPW   TSX CLEAR,4
01730  0761 00 0 06200         NOP D20        CH 40,000   FR .2 SAVE ADDR
01731  0774 00 2 01741         AXT EDPWT,2
01732  0634 00 2 05516         SXA TRAP,2
01733  0500 00 0 06214         CLA D26        L+077777000000 CH DVD 3-17
01734  0560 00 0 06215         LDQ D26+1      L+200000000000 FR DVD 1-35
01735  0774 00 1 00003         AXT 3,1
01736  0672 60 1 01733  EDPWC  EDP* *-3,1     L+040000000000 CH DIV 3-17
                                              L+200000000000 FR DIV 1-35
01737  0074 00 4 06503         TSX ERROR-1,4  FAILED TO TRAP
01740  0761 00 0 05157         NOP TRPER      ON UNDERFLOW
01741  0074 00 4 04700  EDPWT  TSX CHECK,4
01742  0 00000 1 01737         PZE EDPWT-2,1  NO OV, NO P+Q, ADDRESS
                                               AND COL 15 ON LOC ZERO.
01743 +100000000000            OCT +100000000000 CONT ACC
01744 +200000000000            OCT +200000000000 CONT MQ
01745  0074 00 4 06511         TSX OK,4
01746  0020 00 0 01727         TRA EDPW
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*CHECKING EDP WITH INDEXING, IA, AND USING EXECUTE.
*TRAPPING WITH OVERFLOW SAME AS PREV TEST EXCEPT FOR EXECUTE.

01747  252447606060            BCD 1EDP
01750  0074 00 4 05066  EDPX    TSX CLEAR,4
01751  0774 00 2 01771          AXT EDPXT,2
01752  0634 00 2 05516          SXA TRAP,2
01753  0774 00 1 00003          AXT 3,1
01754  0500 00 0 06214          CLA D26         L+077777000000 CH DVD 3-17
01755  0560 00 0 06215          LDQ D26+1       L+200000000000 FR DVD 1-35
01756  0522 00 0 01765  EDPXA   XEC EDPXC
01757  0074 00 4 06503          TSX ERROR-1,4   FAILED TO TRAP
01760  0761 00 0 05157          NOP TRPER       ON UNDERFLOW
01761  0020 00 0 01771          TRA EDPXT       JUMP AREA FOR XEC.
01762  0761 00 0 00000          NOP
01763  0761 00 0 00000          NOP
01764  0761 00 0 06200          NOP D20         SAVE ADDR, CH 40,000 FR .2
01765  0672 60 1 01767  EDPXC   EDP* *+2,1
01766  0761 00 0 00000          NOP
01767  0761 00 0 00000          NOP
01770  0761 00 0 00000          NOP
01771  0074 00 4 04700  EDPXT   TSX CHECK,4
01772  0 00000 1 01757          PZE EDPXA+1,1   NO OV, NO P+Q, ADDRESS
                                                 AND COL 15 ON LOC ZERO.
01773 +100000000000             OCT +100000000000 CONT ACC
01774 +200000000000             OCT +200000000000 CONT MQ
01775  0074 00 4 06511          TSX OK,4
01776  0020 00 0 01750          TRA EDPX

*CHECKING CONDITION OF UNDERFLOW UNTIL CHAR IS INCREASED BY ONE.
*AFTER DIV MQ COL 1 EQUAL 1.
*NO MQ LEFT SHIFT REQD.

01777  252447606060            BCD 1EDP
02000  0074 00 4 05066  EDP11   TSX CLEAR,4
02001  0761 00 0 00000          NOP
02002  0500 00 0 06226          CLA D31         L+000001000000 CH DVD 3-17
02003  0560 00 0 06153          LDQ D3          L+200000000000 FR DVD 1-35
02004  0672 00 0 06227          EDP D32         L+040002000000 CH DIV 3-17
                                                 L+200000000000 FR DIV 1-35
02005  0761 00 0 00000          NOP
02006  0074 00 4 04700          TSX CHECK,4
02007 +000000000000             OCT +0          NO OV, NO PQ, NO TRAP.
02010 +000000000000             OCT +0              CONT ACC
02011 +200000000000             OCT +200000000000 CONT MQ
02012  0074 00 4 06511          TSX OK,4        CONTINUE TEST
02013  0020 00 0 02000          TRA EDP11       REPEAT TEST

*CHECKING EDP FOR OPERATION.

02014  252447606060            BCD 1EDP
02015  0074 00 4 05066  EDP21   TSX CLEAR,4    MONITOR
02016  0761 00 0 00000          NOP
02017  0670 00 0 06271          ELD EPE16       CH 40,066 FR .216067446771
02020  0672 00 0 06267          EDP EPE15       CH 40,062 FR .343277244615
02021  0761 00 0 00000          NOP
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02022  0760 00 0 00012         DCT             TRIGGER SHOULD BE OFF
02023  0074 00 4 06503         TSX ERROR-1,4   ON- IN ERROR.
02024  0761 00 0 05155         NOP DCTER       OFF-OK - GO ON.
02025  0074 00 4 04700         TSX CHECK,4
02026 +000000000000            OCT +0          NO OV, NO PQ, NO TRAP
02027 +040004777777            OCT +040004777777 CONT ACC
02030 +237777777776            OCT +237777777776 CONT MQ
02031  0074 00 4 06511         TSX OK,4        CONTINUE TEST
02032  0020 00 0 02015         TRA EDP21       REPEAT TEST

*CHECKING EDP BY GIVING CONTINIOUS EDP.

02033  252447606060            BCD 1EDP
02034  0074 00 4 05066  EDP2   TSX CLEAR,4     MONITOR
02035  0670 00 0 06271         ELD EPE16       CH 40,066 FR .21606067446770
02036  0672 00 0 06233         EDP EPE1        CH 40,004 FR .24
02037  0672 00 0 06233         EDP EPE1        CH 40,004 FR .24
02040  0672 00 0 06233         EDP EPE1        CH 40,004 FR .24
02041  0672 00 0 06233         EDP EPE1        CH 40,004 FR .24
02042  0672 00 0 06233         EDP EPE1        CH 40,004 FR .24
02043  0672 00 0 06233         EDP EPE1        CH 40,004 FR .24
02044  0672 00 0 06233         EDP EPE1        CH 40,004 FR .24
02045  0672 00 0 06233         EDP EPE1        CH 40,004 FR .24
02046  0672 00 0 06233         EDP EPE1        CH 40,004 FR .24
02047  0672 00 0 06233         EDP EPE1        CH 40,004 FR .24
02050  0672 00 0 06233         EDP EPE1        CH 40,004 FR .24
02051  0672 00 0 06233         EDP EPE1        CH 40,004 FR .24
02052  0672 00 0 06233         EDP EPE1        CH 40,004 FR .24
02053  0672 00 0 06233         EDP EPE1        CH 40,004 FR .24
02054  0672 00 0 06233         EDP EPE1        CH 40,004 FR .24
02055  0672 00 0 06233         EDP EPE1        CH 40,004 FR .24
02056  0760 00 0 00012         DCT             TGR SHOULD BE OFF
02057  0074 00 4 06503         TSX ERROR-1,4   ON- IN ERROR
02060  0761 00 0 05155         NOP DCTER       OFF- OK -GO ON.
02061  0074 00 4 04700  EDP2A  TSX CHECK,4
02062 +000000000000            OCT +0          NO OV, NO PQ, NO TRAP.
02063 +040000777777            OCT +040000777777 CONT ACC
02064 +377777777764            OCT +377777777764 CONT MQ
02065  0074 00 4 06511         TSX OK,4        CONTINUE TEST
02066  0020 00 0 02034         TRA EDP2        REPEAT TEST

*CHECKING EDP AND EMP.

02067  252447254447            BCD 1EDPEMP
02070  0074 00 4 05066  EDEM   TSX CLEAR,4     MONITOR
02071  0670 00 0 06243         ELD EPE5        CH 40,021 FR .30324
02072  0673 00 0 06261         EMP EPE12       CH 40,050 FR .350651224200
02073  0672 00 0 06263         EDP EPE13       CH 40,054 FR .221411634520
02074  0673 00 0 06261         EMP EPE12       CH 40,050 FR .350651224200
02075  0672 00 0 06263         EDP EPE13       CH 40,054 FR .221411634520
02076  0673 00 0 06261         EMP EPE12       CH 40,050 FR .350651224200
02077  0672 00 0 06263         EDP EPE13       CH 40,054 FR .221411634520
02100  0673 00 0 06261         EMP EPE12       CH 40,050 FR .350651224200
02101  0672 00 0 06263         EDP EPE13       CH 40,054 FR .221411634520
02102  0673 00 0 06261         EMP EPE12       CH 40,050 FR .350651224200
02103  0672 00 0 06263         EDP EPE13       CH 40,054 FR .221411634520
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02104  0760 00 0 00012         DCT             TGT SHOULD BE OFF
02105  0074 00 4 06503         TSX ERROR-1,4   ON- IN ERROR
02106  0761 00 0 05155         NOP DCTER
02107  0074 00 4 04700  EDEM1  TSX CHECK,4
02110 +000000000000            OCT +0          NO OV, NO PQ, NO TRAP
02111 +040000777777            OCT +040000777777 CONT ACC
02112 +377777777774            OCT +377777777774 CONT MQ
02113  0074 00 4 06511         TSX OK,4        CONTINUE TEST
02114  0020 00 0 02070         TRA EDEM        REPEAT TEST

*CHECKING EDP AND EMP FOR RELIABILTY.

*PERFORMING THE OPERATION OF MULTIPLYING N TIMES N AND
*THEN DIVIDING BY N. THE END RESULT SHOULD EQUAL N, EXCEPT
*FOR AN INITIAL CONDITION OF UNNORMALIZED NUMBERS.
*IN THIS ROUTINE, A ZERO COL WILL BE ROTATED FROM COL 35 TO COL 1 OF MQ.
*DUE TO PRECISION OF THE EX PREC OPER, THE BIT IN COL 35 IS LOST.

02115  254447252447            BCD 1EMPEDP
02116  0074 00 4 05066  WUST   TSX CLEAR,4     MONITOR
02117  0761 00 0 00000         NOP
02120  0502 00 0 06375         CLS EONE        GET -040001   -CHAR
02121  0560 00 0 06105         LDQ B135        L+37777777777 -FRACT
02122  0601 00 0 06436         STO SHOP        INITIAL
02123 -0600 00 0 06437         STQ SHOP+1         VALUES.
02124  0774 00 1 00043         AXT 35,1        FOR ROTATING ZERO COL.

02125  0670 00 0 06436  WUSTA  ELD SHOP
02126 -0773 00 0 00001         RQL 1           ROT ZERO LEFT
02127  0765 00 0 00000         LRS 0           MQ S MADE SAME AS ACC S
02130 -0673 00 0 06436         EST SHOP
02131  0761 00 0 00000         NOP
02132  3 00001 1 02135         TXH *+3,1,1     ALTER ANS DUE TO NORM
02133  0500 00 0 06107         CLA ALTMD
02134  0560 00 0 06110         LDQ ALTMD+1
02135 -0673 00 0 02155         EST WUSTC
                                   ALTER ANS FOR FIRST COND
02136 -3 00042 1 02141         TXL *+3,1,34
02137 -0500 00 0 06111         CAL MSK34       L-377777777774
02140  0320 00 0 02156         ANS WUSTC+1
02141 -0500 00 0 06103         CAL BS134       L-377777777776
02142  0320 00 0 02156         ANS WUSTC+1     DROP BIT IN COL 35
02143  0761 00 0 00000         NOP

02144  0670 00 0 06436  WUSTB  ELD SHOP        NOW PREFORMING
02145  0673 00 0 06436         EMP SHOP           N TIMES N
02146  0672 00 0 06436         EDP SHOP              DIV BY N.
02147  0761 00 0 00000         NOP
02150  0760 00 0 00012         DCT             TRIGGER SHOULD BE OFF.
02151  0074 00 4 06503         TSX ERROR-1,4   ON- IN ERROR.
02152  0761 00 0 05155         NOP DCTER       OFF- OK - GO ON.
02153  0074 00 4 04700         TSX CHECK,4
02154 +000000000000            OCT +0          NO OV, NO PQ, NO TRAP
02155 +000000777777     WUSTC  OCT +000000777777 CORR ACC VAL STO HERE.
02156 +000000000000            OCT +0             CORR MQ VAL STO HERE.
02157  0761 00 0 00000         NOP
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02160  0761 00 0 02116         NOP WUST
02161  0760 00 0 00161         SWT 1          WANT A CLOSED LOOP...
02162  0020 00 0 02164         TRA *+2        UP- NO
02163  0020 00 0 02144         TRA WUSTB      DN- YES-REPEAT SAME VALUE
02164  2 00001 1 02125         TIX WUSTA,1,1  LOOP 35 TIMES
02165  0074 00 4 06511         TSX OK,4       CONTINUE TEST
02166  0020 00 0 02116         TRA WUST       REPEAT TEST

*CHECKING EDP AND EMP WITH USE OF ELD AND EST.

02167  254425246060            BCD 1EMED
02170  0074 00 4 05066  EDEMA  TSX CLEAR,4    MONITOR
02171  0774 00 1 00031         AXT 25,1
02172  0670 00 0 06233         ELD EPE1       CH 40,004 FR .24
02173 -0673 00 0 06436         EST SHOP
02174  0761 00 0 00000         NOP
02175  0670 00 0 06436         ELD SHOP
02176  0673 00 0 06247         EMP EPE7       CH 40,030 FR .230455
02177 -0673 00 0 06440         EST SHOP+2
02200  0670 00 0 06440         ELD SHOP+2
02201  0672 00 0 06241         EDP EPE4
02202  0673 00 0 06233         EMP EPE1       CH 40,004 FR .24
02203 -0673 00 0 06442         EST SHOP+4
02204  0670 00 0 06442         ELD SHOP+4
02205  0673 00 0 06251         EMP EPE8       CH 40,033 FR .2765702
02206  0672 00 0 06261         EDP EPE12      CH 40,050 FR .3506512242
02207 -0673 00 0 06436         EST SHOP
02210  2 00001 1 02175         TIX EDEMA+5,1,1
02211  0761 00 0 00000         NOP
02212  0760 00 0 00012         DCT            TRG SHOULD BE OFF
02213  0074 00 3 06503         TSX ERROR-1,3  ERROR
02214  0761 00 0 05155         NOP DCTER
02215  0761 00 0 00000         NOP
02216  0074 00 4 04700         TSX CHECK,4
02217 +000000000000            OCT +0         NO OV, NO PQ, NO TRAP
02220 +040004000000            OCT +040004000000 CONT ACC
02221 +240000000000            OCT +240000000000 CONT MQ
02222  0074 00 4 06511         TSX OK,4       CONTINUE TEST
02223  0020 00 0 02170         TRA EDEMA      REPEAT TEST

*TEST EUA, -0672, SYSTEMS 2.07.91, 92, 93

                                SHORT ROUTINE FOR SCOPING

02224  256450606060            BCD 1EUQ
02225  0074 00 4 05066  EUA    TSX CLEAR,4    MONITOR
02226  0600 00 0 06436         STZ SHOP
02227  0600 00 0 06437         STZ SHOP+1
02230 -0754 00 0 00000         PXD            CLEAR
02231 -0672 00 0 06436         EUA SHOP       *** DO THIS ONE,
02232  0760 00 0 00161         SWT 1          * * AND THIS ONE,
02233  0020 00 0 02237         TRA *+4   *
02234  0020 00 0 02231         TRA *-3        *** AND THIS ONE, IF ONE IS DOWN
                  02235         BSS 2            FUTURE USE
02237  0074 00 4 06511         TSX OK,4          PROCEED
02240  0020 00 0 02225         TRA EUA
```

```
                                    TEST EUA WITH ACC + MQ ZERO
                                    SHOULD END OP ON EXC. CHAC. DIFFERENCE

02241  256421606060            BCD 1EUA
02242  0074 00 4 05066  EUAA   TSX CLEAR,4    MONITOR
02243  0761 00 0 00000         NOP
02244  0761 00 0 00000         NOP
02245 -0672 00 0 06375         EUA EONE       CH,40001. FR, .2
02246  0074 00 4 04700         TSX CHECK,4
02247 +000000000000            OCT            NO OV, NO PQ, NO TRAP
02250 +040001000000            OCT 040001000000 CORRECT ACC CONTENTS
02251 +200000000000            OCT 200000000000 CORRECT MQ CONTENTS
02252  0074 00 4 06511         TSX OK,4       PROCEED OR
02253  0020 00 0 02242         TRA EUAA          REPEAT

                                    TEST EUA WITH STORAGE ZERO
                                    SHOULD END OP ON EXC. CHAC. DIFFERENCE

02254  256421606060            BCD 1EUA
02255  0074 00 4 05066  EUAB   TSX CLEAR,4    MONITOR
02256  0761 00 0 00000         NOP
02257  0670 00 0 06375         ELD EONE       C,40001, FR, .2
02260 -0672 00 0 06421         EUA EZERO      ZERO
02261  0074 00 4 04700         TSX CHECK,4
02262 +000000000000            OCT            NO OV, NO PQ, NO TRAP
02263 +040001000000            OCT 040001000000 CORRECT ACC CONTENTS
02264 +200000000000            OCT 200000000000 CORRECT MQ CONTENTS
02265  0074 00 4 06511         TSX OK,4
02266  0020 00 0 02255         TRA EUAB

                                    EUA, SIGNS ALIKE, CHAC. EQUAL.
                                    CARRY OUT OF ONE SHOULD GIVE 1 RIGHT SHIFT

02267  256421606060            BCD 1EUA
02270  0074 00 4 05066  EUAC   TSX CLEAR,4    MONITOR
02271  0761 00 0 00000         NOP
02272  0670 00 0 06375         ELD EONE       C,40001, FR, .2
02273 -0672 00 0 06375         EUA EONE       SAME
02274  0761 00 0 00000         NOP
02275  0074 00 4 04700         TSX CHECK,4
02276 +000000000000            OCT            NO OV, NO PQ, NO TRAP
02277 +040002000000            OCT 040002000000 CORRECT ACC CONTENTS
02300 +200000000000            OCT 200000000000 CORRECT MQ CONTENTS
02301  0074 00 4 06511         TSX OK,4
02302  0020 00 0 02270         TRA EUAC

                                    EUA, SIGNS UNLIKE, ACC MINUS, CHAC EQUAL.
                                    RESULT SHOULD BE PLUS.

02303  256421606060            BCD 1EUA
02304  0074 00 4 05066  EUAD   TSX CLEAR,4    MONITOR
02305  0761 00 0 00000         NOP
02306  0670 00 0 06377         ELD ETWO       C,40002, FR, .2
02307 -0760 00 0 00003         SSM
02310  0765 00 0 00000         LRS 0          ACC + MQ SIGN MINUS
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02311 -0672 00 0 06401         EUA ETHRE      C,40002, FR, .3,
02312  0074 00 4 04700         TSX CHECK,4
02313 +000000000000            OCT            NO OV, NO PQ, NO TRAP
02314 +040002000000            OCT 040002000000 CORRECT ACC CONTENTS
02315 +100000000000            OCT 100000000000 CORRECT MQ CONTENTS
                                   EUA SHOULD NOT NORMALIZE.
02316  0074 00 4 06511         TSX OK,4
02317  0020 00 0 02304         TRA EUAD

                                   EUA, SIGNS UNLIKE, ACC PLUS, CHAC. EQUAL
                                   RESULT SHOULD BE MINUS.
                                   BIT IN COL 2, EUA SHOULD NOT NORMALIZE.
                                   IN STORAGE, ONLY SIGN OF CHAC IS MINUS

02320  256421606060            BCD 1EUA
02321  0074 00 4 05066  EUAE   TSX CLEAR,4    MONITOR
02322  0761 00 0 00000         NOP
02323  0670 00 0 06401         ELD ETHRE      C, 40002, FR, .3
02324 -0760 00 0 00003         SSM            SET C. SIGN MINUS
02325 -0673 00 0 06436         EST SHOP       TEMPO
02326  0670 00 0 06377         ELD ETWO       C, 40002, FR, .2
02327  0761 00 0 00000         NOP
02330 -0672 00 0 06436         EUA SHOP       C, -40002, FR, .3
02331  0761 00 0 00000         NOP            SHOULD GET -40002.1
02332  0074 00 4 04700         TSX CHECK,4
02333 +000000000000            OCT            NO OV, NO PQ, NO TRAP
02334 -040002000000            OCT -040002000000 CORRECT ACC CONTENTS.
02335 -100000000000            OCT -100000000000 CORRECT MQ CONTENTS.
02336  0074 00 4 06511         TSX OK,4       PROCEED OR
02337  0020 00 0 02321         TRA EUAE       REPEAT

                                   EUA, BOTH FACTORS MINUS, CHAC EQUAL
                                   RESULT SHOULD BE MINUS.
                                   ONLY SIGNS OF THE CHAC. ARE MINUS
                                   CARRY FROM COL 1 SHOULD CAUSE 1 RIGHT SHIFT.

02340  256421606060            BCD 1EUA
02341  0074 00 4 05066  EUAF   TSX CLEAR,4    MONITOR
02342  0761 00 0 00000         NOP
02343  0670 00 0 06401         ELD ETHRE      C, 40002, FR, .3
02344 -0760 00 0 00003         SSM
02345 -0673 00 0 06436         EST SHOP       C, SIGN MINUS, FR PLUS
02346  0670 00 0 06377         ELD ETWO       C, 40002, FR, .2
02347  0761 00 0 00000         NOP
02350 -0760 00 0 00003         SSM            ACC MINUS
02351 -0672 00 0 06436         EUA SHOP       C, -40002, FR, +.3
02352  0761 00 0 00000         NOP            SHOUKLD GET -40003.24

02353  0074 00 4 04700         TSX CHECK,4
02354 +000000000000            OCT            NO OV, NO QP, NO TRAP.
02355 -040003000000            OCT -040003000000 CORRECT ACC CONTENTS.
02356 -240000000000            OCT -240000000000 CORRECT MQ CONTENTS.
02357  0074 00 4 06511         TSX OK,4       PROCEED OR
02360  0020 00 0 02341         TRA EUAF         REPEAT
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                                    EUA, RESULT ZOER, ACC PLUS, CHAC. EQUAL
                                    SHOULD GET...PLUS ZERO FRACTION, CHAC +04000

02361  256421606060            BCD 1EUA
02362  0074 00 4 05066  EUAG   TSX CLEAR,4    MONITOR
02363  0761 00 0 00000         NOP
02364  0670 00 0 06375         ELD EONE       C, 40001, FR, .2
02365 -0760 00 0 00003         SSM
02366 -0673 00 0 06436         EST SHOP       C, -40001, FR, +.2
02367  0761 00 0 00000         NOP
02370  0670 00 0 06375         ELD EONE       C, 40001, FR, .2
02371  0761 00 0 00000         NOP
02372 -0672 00 0 06436         EUA SHOP       C, -40001, FR, .2
02373  0761 00 0 00000         NOP            SHOULD GET +40001.0

02374  0074 00 4 04700         TSX CHECK,4
02375 +000000000000            OCT            NO OV, NO QP, NO TRAP.
02376 +040001000000            OCT 040001000000 CORRECT ACC CONTENTS
02377 +000000000000            OCT            MQ SHOULD BE + ZERO.
02400  0074 00 4 06511         TSX OK,4       PROCEED OR
02401  0020 00 0 02362         TRA EUAG          REPEAT.

*          THE SIGNIFICANCE OF THE PLUS ZERO HERE, IS THAT THE
*       PROGRAMMER IS INFORMED THAT HE HAS APPROACHED ZERO FROM
*       ABOVE, AS OPPOSED TO APPROACHING ZERO FROM BELOW, AS IS DONE
*       IN ROUTINE * EADR *. IN MANY CALCULATIONS, THIS KNOWLEDGE IS
*       AS IMPORTANT AS THE ALGEBRAIC RESULT.

                                    EUA, RESULT MINUS ZERO, ACC MINUS,
                                    CHAC. EQUAL.
                                    SHOULD GET...MQ, -0, CHAC. -40004

02402  256421606060            BCD 1EUA
02403  0074 00 4 05066  EUAH   TSX CLEAR,4    MONITOR
02404  0761 00 0 00000         NOP
02405  0670 00 0 06415         ELD ENINE      C, 40004, FR, .22
02406 -0760 00 0 00003         SSM            ACC MINUS
02407  0761 00 0 00000         NOP
02410 -0672 00 0 06415         EUA ENINE      C, 40004, FR, .22
02411  0761 00 0 00000         NOP            SHOULD GET, -40004.0
02412  0074 00 4 04700         TSX CHECK,4
02413 +000000000000            OCT            NO OV, NO QP, NO TRAP.
02414 -040004000000            OCT -040004000000 CORRECT ACC CONTENTS
02415 -000000000000            OCT -0         CORRECT MQ CONTENTS
02416  0074 00 4 06511         TSX OK,4       PROCEED OR
02417  0020 00 0 02403         TRA EUAH          REPEAT

*          THE SIGNIFICANCE OF THE MINUS ZERO HERE IS THAT THE
*       PROGRAMMER IS INFORMED THAT HE HAS APPROACHED ZERO FROM
*       BELOW, AS OPPOSED TO APPROACHING ZERO FROM ABOVE, AS IS DONE
*       IN ROUTINE * EADF *. IN MANY CALCULATIONS, THIS KNOWLEDGE IS
*       AS IMPORTANT AS THE ALGEBRAIC RESULT.


                                    EUA, START WITH BITS IN
                                    ACC COLS 1 AND 2,18,19,33,34,35, AND P.
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                                    THESE COLS SHOULD BE CLEARED BY EUA.
                                    SIGNS ALIKE, CHAC EQUAL.
                                    CARRY OUT OF COL 1 SHOULD GIVE 1 RIGHT SHIFT.

02420  256421606060           BCD 1EUA
02421  0074 00 4 05066  EUAI  TSX CLEAR,4    MONITOR
02422  0761 00 0 00000        NOP
02423  0670 00 0 06375        ELD EONE       C, 40001, FR, .2
02424  0761 00 0 00000        NOP
02425 -0501 00 0 06333        ORA COL18
02426 -0501 00 0 06334        ORA COL19
02427 -0501 00 0 06354        ORA COL1
02430 -0501 00 0 06355        ORA COL2
02431 -0501 00 0 06353        ORA COLS       BIT IN P
02432 -0501 00 0 06347        ORA ONE+6      COLS 33,34,35
02433  0761 00 0 00000        NOP
02434 -0672 00 0 06375        EUA EONE       C, 40001, FR, .2
02435  0761 00 0 00000        NOP            SHOULD GET 40002.2,
                                             WITH ACC Q,P,1,2, AND 18-35 CLEAR.
02436  0074 00 4 04700        TSX CHECK,4
02437 +000000000000           OCT            NO OV, NO Q,P, NO TRAP
02440 +040002000000           OCT 040002000000 CORRECT ACC CONTENTS.
02441 +200000000000           OCT 200000000000 CORRECT MQ CONTENTS.
02442  0074 00 4 06511        TSX OK,4       PROCEED OR REPEAT
02443  0020 00 0 02421        TRA EUAI

                                    EUA, CHAC UNLIKE, SMALLER CHAC IN ACC
                                    SIGNS ALIKE. BOTH PLUS

02444  256421606060           BCD 1EUA
02445  0074 00 4 05066  EUAJ  TSX CLEAR,4    MONITOR
02446  0761 00 0 00000        NOP
02447  0670 00 0 06375        ELD EONE       C, 40001, FR, .2
02450 -0672 00 0 06413        EUA EEIT       C, 40004, FR, .2
02451  0761 00 0 00000        NOP            SHOULD GET 40004.22
02452  0074 00 4 04700        TSX CHECK,4
02453 +000000000000           OCT            NO OV, NO Q,P, NO TRAP
02454 +040004000000           OCT 040004000000 CORRECT ACC CONTENTS
02455 +220000000000           OCT 220000000000 CORRECT MQ CONTENTS
02456  0074 00 4 06511        TSX OK,4       PROCEED OR
02457  0020 00 0 02445        TRA EUAJ       REPEAT.

                                    EUA, CHAC UNLIKE, SMALLER CHAC IN ACC.
                                    SIGNS UNLIKE. ACC SIGN MINUS
                                    RESULT SHOULD BE PLUS.

02460  256421606060           BCD 1EUA
02461  0074 00 4 05066  EUAK  TSX CLEAR,4    MONITOR
02462  0761 00 0 00000        NOP
02463  0670 00 0 06375        ELD EONE       C, 40001, FR, .2
02464  0761 00 0 00000        NOP
02465 -0760 00 0 00003        SSM            ACC MINUS.
02466 -0672 00 0 06415        EUA ENINE      C, 40004, FR, .22
02467  0761 00 0 00000        NOP            SHOULD GET 40004.2
02470  0074 00 4 04700        TSX CHECK,4
02471 +000000000000           OCT            NO OV, NO QP, NO TRAP
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02472 +040004000000           OCT 040004000000 CORRECT ACC CONTENTS.
02473 +200000000000           OCT 200000000000 CORRECT MQ CONTENTS.
02474  0074 00 4 06511        TSX OK,4       PROCEED OR
02475  0020 00 0 02461        TRA EUAK       REPEAT

                                  EUA, CHAC. UNLIKE, MSALLER CHAC IN ACC.
                                  SIGNS UNLIKE, ACC SIGN PLUS.
                                  RESULT SHOULD BE MINUS.

02476  256421606060           BCD 1EUA
02477  0074 00 4 05066  EUAL  TSX CLEAR,4    MONITOR
02500  0761 00 0 00000        NOP
02501  0670 00 0 06415        ELD ENINE      C, 40004, FR, .22
02502 -0760 00 0 00003        SSM
02503 -0673 00 0 06436        EST SHOP
02504  0670 00 0 06375        ELD EONE       C, 40001, FR, .2
02505  0761 00 0 00000        NOP
02506 -0672 00 0 06436        EUA SHOP       C, -40004, FR, .22
02507  0761 00 0 00000        NOP            SHOULD GET -40004.2
02510  0074 00 4 04700        TSX CHECK,4
02511 +000000000000           OCT            NO OV, NO QP, NO TRAP
02512 -040004000000           OCT -040004000000 CORRECT ACC CONTENTS
02513 -200000000000           OCT -200000000000 CORRECT MQ CONTENTS
02514  0074 00 4 06511        TSX OK,4       PROCEED OR
02515  0020 00 0 02477        TRA EUAL       REPEAT.

                                  EUA, CHAC UNLIKE, SMALLER CHAC IN ACC.
                                  SIGNS ALIKE, BOTH MINUS
                                  RESULT SHOULD BE MINUS.


02516  256421606060           BCD 1EUA
02517  0074 00 4 05066  EUAM  TSX CLEAR,4    MONITOR
02520  0761 00 0 00000        NOP
02521  0670 00 0 06415        ELD ENINE      C, 40004, FR, .22
02522 -0760 00 0 00003        SSM
02523 -0673 00 0 06436        EST SHOP       CHAC MINUS
02524  0761 00 0 00000        NOP
02525  0670 00 0 06375        ELD EONE       C, 40001, FR, .2
02526 -0760 00 0 00003        SSM            ACC MINUS
02527  0761 00 0 00000        NOP
02530 -0672 00 0 06436        EUA SHOP       C, -40004, FR, .22
02531  0761 00 0 00000        NOP            SHOULD GET -40004.24
02532  0074 00 4 04700        TSX CHECK,4
02533 +000000000000           OCT            NO OV, NO QP, NO TRAP
02534 -040004000000           OCT -040004000000 CORRECT ACC CONTENTS
02535 -240000000000           OCT -240000000000 CORRECT MQ CONTENTS
02536  0074 00 4 06511        TSX OK,4       PROCEED OR
02537  0020 00 0 02517        TRA EUAM       REPEAT

                                  EUA, CHAC UNLIKE, LARGER CHAC IN ACC
                                  SIGNS ALIKE, BOTH PLUS

02540  256421606060           BCD 1EUA
02541  0074 00 4 05066  EUAN  TSX CLEAR,4    MONITOR
02542  0761 00 0 00000        NOP
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02543  0670 00 0 06413         ELD EEIT       C, 40004, FR, .2
02544  0761 00 0 00000         NOP
02545 -0672 00 0 06403         EUA EFOUR      C, 40003, FR, .2
02546  0761 00 0 00000         NOP            SHOULD GET 40004.3
02547  0074 00 4 04700         TSX CHECK,4
02550 +000000000000           OCT            NO OV, NO QP, NO TRAP
02551 +040004000000           OCT 040004000000 CORRECT ACC CONTENTS
02552 +300000000000           OCT 300000000000 CORRECT MQ CONTENTS
02553  0074 00 4 06511         TSX OK,4
02554  0020 00 0 02541         TRA EUAN

                                   EUA, CHAC. UNLIKE, LARGER CHAC IN ACC.
                                   SIGNS UNLIKE, ACC MINUS
                                   RESULTS SHOULD BE MINUS. NOT NORMALIZED

02555  256421606060            BCD 1EUA
02556  0074 00 4 05066  EUAO   TSX CLEAR,4    MONITOR
02557  0761 00 0 00000         NOP
02560  0670 00 0 06413         ELD EEIT       C, 40004, FR, .2
02561 -0760 00 0 00003         SSM            ACC MINUS
02562  0761 00 0 00000         NOP
02563 -0672 00 0 06403         EUA EFOUR      C, 40003, FR, .2
02564  0761 00 0 00000         NOP            SHOULD GET -40004.2
                                   NOTE -Q CARRY OFF UNTIL 3RD STEP.
                                   Q CARRY ON IN 3RD STEP GIVES 1 TO ADDER 35
                                   AND PREVENTS RECOMP.
02565  0074 00 4 04700         TSX CHECK,4
02566 +000000000000           OCT            NO OV, NO QP, NO TRAP
02567 -040004000000           OCT -040004000000 CORRECT ACC CONTENTS
02570 -100000000000           OCT -100000000000 CORRECT MQ CONTENTS
02571  0074 00 4 06511         TSX OK,4       PROCEED OR
02572  0020 00 0 02556         TRA EUAO       REPEAT.

                                   EUA, CHAC UNLIKE, LARGER CHAC IN ACC
                                   SIGNS UNLIKE, ACC PLUS, BUT MQ SIGN MINUS.
                                   RESULT SHOULD BE PLUS. NO NORMALIZED

02573  256421606060            BCD 1EUA
02574  0074 00 4 05066  EUAP   TSX CLEAR,4    MONITOR
02575  0761 00 0 00000         NOP
02576  0670 00 0 06403         ELD EFOUR      C, 40003, FR, .2
02577 -0760 00 0 00003         SSM
02600  0761 00 0 00000         NOP
02601 -0673 00 0 06436         EST SHOP
02602  0502 00 0 06414         CLS EEIT+1     MAKE MQ WORD MINUS
02603  0131 00 0 00000         XCA
02604  0500 00 0 06413         CLA EEIT       C, 40004, FR, -.2
02605  0761 00 0 00000         NOP
02606 -0672 00 0 06436         EUA SHOP       C, -40003, FR, +.2
02607  0761 00 0 00000         NOP            SHOULD GET, +40004.1
02610  0074 00 4 04700         TSX CHECK,4
02611 +000000000000           OCT            NO OV, NO QP, NO TRAP
02612 +040004000000           OCT 040004000000 CORRECT ACC CONTENTS
02613 +100000000000           OCT 100000000000 CORRECT MQ CONTENTS
02614  0074 00 4 06511         TSX OK,4       PROCEED OR
02615  0020 00 0 02574         TRA EUAP       REPEAT
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                                    EUA, CHAC UNLIKE, LARGER CHAC IN ACC.
                                    SIGNS ALIKE, BOTH MINUS.
                                    RESULT SHOULD BE MINUS.

02616  256421606060             BCD 1EUA
02617  0074 00 4 05066  EUAQ    TSX CLEAR,4    MONITOR
02620  0761 00 0 00000          NOP
02621  0670 00 0 06403          ELD EFOUR      C, 40003, FR, .2
02622 -0760 00 0 00003          SSM
02623  0765 00 0 00000          LRS 0          ACC AND MQ MINUS
02624  0761 00 0 00000          NOP
02625 -0673 00 0 06436          EST SHOP
02626  0670 00 0 06413          ELD EEIT       C, 40004, FR, .2
02627 -0760 00 0 00003          SSM            ACC MINUS, MQ PLUS
02630  0761 00 0 00000          NOP
02631 -0672 00 0 06436          EUA SHOP       C, -40003, FR, -.2
02632  0761 00 0 00000          NOP            SHOULD GET, -40004.3
02633  0074 00 4 04700          TSX CHECK,4
02634 +000000000000             OCT            NO OV, NO QP, NO TRAP
02635 -040004000000             OCT -040004000000 CORRECT ACC CONTENTS.
02636 -300000000000             OCT -300000000000 CORRECT MQ CONTENTS.
02637  0074 00 4 06511          TSX OK,4       PROCEED OR
02640  0020 00 0 02617          TRA EUAQ       REPEAT

                                    EUA, EXCESSIVE CHAC. DIF.
                                    LARGER CHAC IN ACC, SIGNS ALIKE.

02641  256421606060             BCD 1EUA
02642  0074 00 4 05066  EUAR    TSX CLEAR,4    MONITOR
02643  0761 00 0 00000          NOP
02644  0670 00 0 06305          ELD LGC2       C, 40051, FR, .2
02645  0761 00 0 00000          NOP
02646 -0672 00 0 06303          EUA LGC1       C, 40005, FR, .01
02647  0761 00 0 00000          NOP
02650  0074 00 4 04700          TSX CHECK,4
02651 +000000000000             OCT            NO OV, NO QP, NO TRAP.
02652 +040051000000             OCT 040051000000 CORRECT ACC CONTENTS
02653 +200000000000             OCT 200000000000 CORRECT MQ CONTENTS
02654  0074 00 4 06511          TSX OK,4       PROCEED OR
02655  0020 00 0 02642          TRA EUAR       REPEAT

                                    EUA, EXCESSIVE CHAC DIF.
                                    SMALLER CHAC IN ACC. SIGNS ALIKE.

02656  256421606060             BCD 1EUA
02657  0074 00 4 05066  EUAR1   TSX CLEAR,4
02660  0761 00 0 00000          NOP
02661  0670 00 0 06303          ELD LGC1       C, 40005, FR, .01
02662  0761 00 0 00000          NOP
02663 -0672 00 0 06305          EUA LGC2       C, 40051, FR, .2
02664  0761 00 0 00000          NOP
02665  0074 00 4 04700          TSX CHECK,4
02666 +000000000000             OCT            NO OV, NO QP, NO TRAP.
02667 +040051000000             OCT 040051000000 CORRECT ACC CONTENTS
02670 +200000000000             OCT 200000000000 CORRECT MQ CONTENTS
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02671  0074 00 4 06511         TSX OK,4       PROCEED OR
02672  0020 00 0 02657         TRA EUAR1      REPEAT

                                   EUA, MQ FR ZERO. SHIFT ACC FR TO ZERO
                                   SIGNS ALIKE

02673  256421606060            BCD 1EUA
02674  0074 00 4 05066  EUAS   TSX CLEAR,4    MONITOR
02675  0761 00 0 00000         NOP
02676  0500 00 0 06342         CLA ONE+1      BIT IN 34
02677  0601 00 0 06437         STO SHOP+1
02700  0500 00 0 06375         CLA EONE       CHAC OF 40001
02701  0601 00 0 06436         STO SHOP
02702  0560 00 0 06421         LDQ EZERO      CLEAR MQ
02703  0500 00 0 06417         CLA ETEN       CHAR OF 40004
02704  0761 00 0 00000         NOP
02705 -0672 00 0 06436         EUA SHOP       C, 40001, FR, .00000000000002
02706  0761 00 0 00000         NOP            SHOULD GET 4004.0
02707  0074 00 4 04700         TSX CHECK,4
02710 +000000000000            OCT            NO OV, NO QP, NO TRAP
02711 +040004000000            OCT 040004000000 CORRECT ACC CONTENTS
02712 +000000000000            OCT               CORRECT MQ CONTENTS
02713  0074 00 4 06511         TSX OK,4       PROCEED OR
02714  0020 00 0 02674         TRA EUAS       REPEAT

                                   EUA, MQ FR ZERO, SHIFT ACC FR TO ZERO
                                   SIGNS UNLIKE, ACC + MQ SIGNS MINUS
                                   RESULT SHOULD BE MINUS
02715  256421606060            BCD 1EUA
02716  0074 00 4 05066  EUAT   TSX CLEAR,4    MONITOR
02717  0761 00 0 00000         NOP
02720  0500 00 0 06342         CLA ONE+1      BIT IN 34
02721  0601 00 0 06437         STO SHOP+1
02722  0500 00 0 06375         CLA EONE
02723  0601 00 0 06436         STO SHOP       CHAC OF 40001
02724  0560 00 0 06421         LDQ EZERO      CLEAR MQ
02725  0502 00 0 06417         CLS ETEN       GET CHAC OF -40004
02726  0761 00 0 00000         NOP
02727  0765 00 0 00000         LRS 0           MQ SIGN MINUS
02730  0761 00 0 00000         NOP
02731 -0672 00 0 06436         EUA SHOP       C, 40001, FR, .000000000002
02732  0761 00 0 00000         NOP
02733  0074 00 4 04700         TSX CHECK,4
02734 +000000000000            OCT             NO OVE, NO QP, NO TRAP
02735 -040004000000            OCT -040004000000 CORRECT ACC CONTENTS
02736 -000000000000            OCT -0            CORRECT MQ CONTENTS
02737  0074 00 4 06511         TSX OK,4       PROCEED OR
02740  0020 00 0 02716         TRA EUAT       REPEAT

                                   EUA WITH OVERFLOW, NOT IN FP TRAP
                                   SIGNS ALIKE

02741  256421606060            BCD 1EUA
02742  0074 00 4 05066  EUAU   TSX CLEAR,4    MONITOR
02743  0761 00 0 00000         NOP
02744  0774 00 1 02753         AXT EUAU1,1    SET TRAP RETURN ADDRESS
```

```
02745  0634 00 1 05516         SXA TRAP,1     IN CASE OF TRAP.
02746  0761 00 0 00000         NOP
02747 -0760 00 0 00004         LFTM           TURN OFF F.P. TRAP
02750  0670 00 0 06307         ELD LGC2+2     C, 77777, FR, .2
02751 -0672 00 0 06307         EUA LGC2+2     SHOULD GET OVERFLOW
02752  0761 00 0 00000         NOP
02753  0074 00 4 04700  EUAU1  TSX CHECK,4
02754 -0 00000 0 00000         MZE            ACC OV ON, NO PQ, NO TRAP
02755 +100000000000            OCT 100000000000 ACC CONTENTS
02756 +200000000000            OCT 200000000000 MQ CONTENTS
02757  0074 00 4 06511         TSX OK,4
02760  0020 00 0 02742         TRA EUAU       REPEAT.

                                   EUA WITH OVERFLOW, IN F.P. TRAP MODE.
                                   SIGNS ALIKE

02761  256421406060            BCD 1EUA-
02762  0074 00 4 05066  EUAV   TSX CLEAR,4    MONITOR
02763  0761 00 0 00000         NOP
02764  0774 00 1 02774         AXT EUAV1,1
02765  0634 00 1 05516         SXA TRAP,1     SET TRAP RETURN.
02766  0761 00 0 00000         NOP
02767 -0760 00 0 00002         EFTM           TURN ON F.P. TRAP
02770  0670 00 0 06307         ELD LGC2+2     C, 77777, FR, .2
02771 -0672 00 0 06307         EUA LGC2+2     SHOULD GET OVERFLOW
02772  0074 00 4 06503  EUAVT  TSX ERROR-1,4
02773  0761 00 0 05157         NOP TRPER      FAILED TO TRAP

02774  0074 00 4 04700  EUAV1  TSX CHECK,4
02775  0 00000 1 02772         PZE EUAVT,1    NO OV, NO PQ, ADDRESS AND
                                              ONE IN COL 15 OF ZERO
02776 +100000000000            OCT 100000000000 ACC CONTENTS
02777 +200000000000            OCT 200000000000 MQ CONTENTS
03000  0074 00 4 06511         TSX OK,4       PROCEED OR
03001  0020 00 0 02762         TRA EUAV       REPEAT

*      EUA WITH INDEXING, NO TRAP


03002  256421606060            BCD 1EUA
03003  0074 00 4 05066  WJSV   TSX CLEAR,4
03004  0761 00 0 00000         NOP
03005  0774 00 1 00004         AXT 4,1
03006  0670 00 0 06311         ELD LGC3       C, 74637, FR, .377777777777
03007 -0672 00 1 06315         EUA LGC4,1     SHOULD GET SAME WORD

03010  0074 00 4 04700         TSX CHECK,4
03011 +000000000000            OCT            NO OV, NO PQ, NO TRAP
03012 +074640000000            OCT 074640000000 AC
03013 +377777777777            OCT 377777777777 MQ
03014  0074 00 4 06511         TSX OK,4       PROCEED OR
03015  0020 00 0 03003         TRA WJSV       REPEAT

*TWENTY-SIZ MILES ACROSS THE SEA.

*      EUA WITH INDEXING, FP TRAP.
```

```
03016  256421406060            BCD 1EUA-
03017  0074 00 4 05066  WFAX   TSX CLEAR,4
03020  0761 00 0 00000         NOP
03021  0774 00 1 03030         AXT WFAXT,1
03022  0634 00 1 05516         SXA TRAP,1     SET TRAP RETURN
03023  0774 00 1 00002         AXT 2,1
03024  0670 00 0 06307         ELD LGC2+2     C, 77777, FP, .2
03025 -0672 00 1 06311         EUA LGC2+4,1   SHOULD GET SAME, AND OV
03026  0074 00 4 06503         TSX ERROR-1,4  FAILED TO TRAP
03027  0761 00 0 05157         NOP TRPER      FAILED TO TRAP

03030  0074 00 4 04700  WFAXT  TSX CHECK,4
03031  0 00000 1 03026         PZE WFAXT-2,1  TRAP ADDRESS, AND BIT IN COL 15
03032 +100000000000            OCT 100000000000 ACC
03033 +200000000000            OCT +200000000000 MQ
03034  0074 00 4 06511         TSX OK,4       PROCEED OR
03035  0020 00 0 03017         TRA WFAX       REPEAT

*      EUA WITH IA, NO TRAP

03036  256421606060            BCD 1EUA
03037  0074 00 4 05066  WMAL   TSX CLEAR,4
03040  0670 00 0 06326         ELD C41+1      C, 40060, FR, .2
03041 -0672 60 0 03040         EUA* *-1       SAME
03042  0761 00 0 00000         NOP
03043  0074 00 4 04700         TSX CHECK,4
03044 +000000000000            OCT            NO OV, NO PQ, NO TRAP
03045 +040061000000            OCT 040061000000 AC
03046 +200000000000            OCT 200000000000 MQ
03047  0074 00 4 06511         TSX OK,4       PROCEED OR
03050  0020 00 0 03037         TRA WMAL       REPEAT

*      EUA WITH IA, TRAP

03051  256421406060            BCD 1EUA-
03052  0074 00 4 05066  WGMS   TSX CLEAR,4
03053  0761 00 0 00000         NOP
03054  0774 00 1 03063         AXT WGMST,1
03055  0634 00 1 05516         SXA TRAP,1     SET TRAP RETURN
03056  0761 00 0 00000         NOP
03057  0670 00 0 06307         ELD LGC2+2     C, 77777, FR, .2
03060 -0672 60 0 03057         EUA* *-1       SAME
03061  0074 00 4 06503         TSX ERROR-1,4  FAILED TO TRAP
03062  0761 00 0 05157         NOP TRPER      ON OVERFLOW

03063  0074 00 4 04700  WGMST  TSX CHECK,4
03064  0 00000 1 03061         PZE WGMST-2,1  TRAP ADDRESS, BIT IN COL 15
03065 +100000000000            OCT 100000000000 ACC
03066 +200000000000            OCT 200000000000 MQ
03067  0074 00 4 06511         TSX OK,4       PROCEED OR
03070  0020 00 0 03052         TRA WGMS       REPEAT

*EAD, EXTENDED FLOATING ADD, +0671
```

```
*ESB, EXTENDED FLOATING SUBTRACT, -0671

                                    SHORT ROUTINE FOR SCOPING

03071  252124606060            BCD 1EAD
03072  0074 00 4 05066  EAD     TSX CLEAR,4    MONITOR
03073  0761 00 0 00000          NOP
03074  0600 00 0 06436          STZ SHOP
03075  0600 00 0 06437          STZ SHOP+1
03076 -0754 00 0 00000          PXD            CLEAR
03077  0765 00 0 00043          LRS 35
03100  0671 00 0 06436          EAD SHOP       *** DO THIS ONE
03101  0760 00 0 00161          SWT 1          * * AND THIS ONE
03102  0020 00 0 03106          TRA *+4          *
03103  0020 00 0 03100          TRA *-3        *** AND THIS ONE IF SW 1
                 03104          BSS 2
03106  0074 00 4 06511          TSX OK,4
03107  0020 00 0 03072          TRA EAD

                                    EAD WITH STORAGE ZERO.
                                    SHOULD END OP ON ZERO SR AND MQ COL 1 A ONE

03110  252124606060             BCD 1EAD
03111  0074 00 4 05066  EADA    TSX CLEAR,4    MONITOR
03112  0761 00 0 00000          NOP
03113  0670 00 0 06375          ELD EONE       C, 40001, FR, .2
03114  0761 00 0 00000          NOP
03115  0671 00 0 06421          EAD EZERO      NORMAL ZERO
03116  0761 00 0 00000          NOP
03117  0074 00 4 04700          TSX CHECK,4
03120 +000000000000             OCT            NO OV, NO QP, NO TRAP
03121 +040001000000             OCT 040001000000 CORRECT ACC CONTENTS
03122 +200000000000             OCT 200000000000 CORRECT MQ CONTENTS
03123  0074 00 4 06511          TSX OK,4       PROCEED OR
03124  0020 00 0 03111          TRA EADA       REPEAT

                                    EAD WITH ACC + MQ ZERO.
                                    SHOULD END OP ON ZERO FR, AND ONE IN MQ 1

03125  252124606060             BCD 1EAD
03126  0074 00 4 05066  EADB    TSX CLEAR,4    MONITOR
03127  0761 00 0 00000          NOP
03130 -0754 00 0 00000          PXD
03131  0765 00 0 00043          LRS 35         CLEAR
03132  0761 00 0 00000          NOP
03133  0671 00 0 06375          EAD EONE       C, 40001, FR .2
03134  0761 00 0 00000          NOP
03135  0074 00 4 04700          TSX CHECK,4
03136 +000000000000             OCT            NO OV, NO QP, NO TRAP
03137 +040001000000             OCT 040001000000 CORRECT ACC CONTENTS
03140 +200000000000             OCT 200000000000 CORRECT MQ CONTENTS
03141  0074 00 4 06511          TSX OK,4       PROCEED OR
03142  0020 00 0 03126          TRA EADB       REPEAT

                                    EAD, ACC + MQ ZERO, STORAGE UN-NORMALIZED
                                    SHOULD NORMALIZE
```

```
03143  252124606060            BCD 1EAD
03144  0074 00 4 05066  EADC   TSX CLEAR,4    MONIOTR
03145  0761 00 0 00000         NOP
03146 -0754 00 0 00000         PXD
03147  0765 00 0 00043         LRS 35         CLEAR
03150  0761 00 0 00000         NOP
03151  0671 00 0 06303         EAD LGC1       C, 40005, FR, .01
03152  0761 00 0 00000         NOP
03153  0074 00 4 04700         TSX CHECK,4
03154 +000000000000            OCT            NO OV, NO QP, NO TRAP
03155 +040001000000            OCT 040001000000 CORRECT ACC CONTENTS
03156 +200000000000            OCT 200000000000 CORRECT MQ CONTENTS
03157  0074 00 4 06511         TSX OK,4       PROCEED OR
03160  0020 00 0 03144         TRA EADC       REPEAT

                                   EAD, SIGNS ALIKE, CHAC EQUAL
                                   NO NORMALIZE NEEDED, CARRY FROM
                                   COL 1 SHOULD GIVE ONE SHIFT RIGHT.

03161  252124606060            BCD 1EAD
03162  0074 00 4 05066  EADD   TSX CLEAR,4    MONITOR
03163  0761 00 0 00000         NOP
03164  0670 00 0 06375         ELD EONE       C 40001, FR, .2
03165  0761 00 0 00000         NOP
03166  0671 00 0 06375         EAD EONE
03167  0761 00 0 00000         NOP
03170  0074 00 4 04700         TSX CHECK,4
03171 +000000000000            OCT            NO OV, NO QP, NO TRAP
03172 +040002000000            OCT 040002000000 CORRECT ACC CONTENTS
03173 +200000000000            OCT 200000000000 CORRECT MQ CONTENTS
03174  0074 00 4 06511         TSX OK,4       PROCEED OR
03175  0020 00 0 03162         TRA EADD       REPEAT

                                   EAD, SIGNS UNLIKE, ACC SIGN MINUS
                                   CHAC EQUAL.
                                   SHOULD GET MINUS ZERO

03176  252124606060            BCD 1EAD
03177  0074 00 4 05066  EADE   TSX CLEAR,4    MONITOR
03200  0761 00 0 00000         NOP
03201  0670 00 0 06375         ELD EONE       C, 40001, FR, .2
03202 -0760 00 0 00003         SSM
03203  0761 00 0 00000         NOP
03204  0671 00 0 06375         EAD EONE
03205  0761 00 0 00000         NOP
03206  0074 00 4 04700         TSX CHECK,4
03207 +000000000000            OCT            NO OV, NO QP, NO TRAP
03210 -000000000000            OCT -0         ACC -ZERO
03211 -000000000000            OCT -0         MQ -ZERO
03212  0074 00 4 06511         TSX OK,4       PROCEED OR
03213  0020 00 0 03177         TRA EADE       REPEAT

*         THE SIGNIFICANCE OF THE MINUS ZERO HERE IS THAT THE
*      PROGRAMMER IS INFORMED THAT HE HAS APPROACEHD ZERO FROM
*      BELOW, AS OPPOSED TO APPROACHING ZERO FROM ABOVE, AS IS DONE
*      IN ROUTINE * EADF *. IN MANY CALCULATIONS, THIS KNOWLEDGE IS
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*      AS IMPORTANT AS THE ALGEBRAIC RESULT.

                                    EAD, SIGNS UNLIKE, ACC SIGN PLUS
                                    CHAC EQUAL, MQ SIGN MINUS
                                    SHOULD GET PLUS ZERO
03214  252124606060            BCD 1EAD
03215  0074 00 4 05066  EADF   TSX CLEAR,4    MONITOR
03216  0761 00 0 00000         NOP
03217  0670 00 0 06375         ELD EONE       C, 40001, FR, .2
03220 -0760 00 0 00003         SSM
03221  0761 00 0 00000         NOP
03222 -0673 00 0 06436         EST SHOP       STORAGE MINUS
03223  0560 00 0 06376         LDQ EONE+1     FR, .2
03224  0765 00 0 00000         LRS 0          MQ MINUS
03225  0761 00 0 00000         NOP
03226  0500 00 0 06375         CLA EONE       C, +40001
03227  0671 00 0 06436         EAD SHOP       C, -40001, FR, .2
03230  0761 00 0 00000         NOP            SHOULD GET PLUS ZERO
03231  0074 00 4 04700         TSX CHECK,4
03232 +000000000000            OCT            NO OV, NO QP, NO TRAP
03233 +000000000000            OCT            ACC ZERO
03234 +000000000000            OCT            MQ ZERO
03235  0074 00 4 06511         TSX OK,4       PROCEED OR
03236  0020 00 0 03215         TRA EADF       REPEAT

*          THE SIGNIFICANCE OF THE PLUS ZERO HERE, IS THAT THE
*      PROGRAMMER IS INFORMED THAT HE HAS APPROACHED ZERO FROM
*      ABOVE, AS OPPOSED TO APPROACHING ZERO FROM BELOW, AS IS DONE
*      IN ROUTINE * EADR *. IN MANY CALCULATIONS, THIS KNOWLEDGE IS
*      AS IMPORTANT AS THE ALGEBRAIC RESULT.

                                    EAD, STORAGE ZERO.
                                    ACC CONT, BITS IN- P-2,18,19,33-35.
                                    THESE BITS SHOULD BE CLEAR IN RESULT.
03237  252124606060            BCD 1EAD
03240  0074 00 4 05066  EADG   TSX CLEAR,4
03241  0761 00 0 00000         NOP
03242  0670 00 0 06375         ELD EONE       C, 40001, FR, .2
03243  0761 00 0 00000         NOP
03244 -0501 00 0 06353         ORA COLS
03245 -0501 00 0 06354         ORA COL1       INSERT BITS
03246 -0501 00 0 06355         ORA COL2       TO P,1,2
03247 -0501 00 0 06333         ORA COL18      18,19,
03250 -0501 00 0 06334         ORA COL19
03251 -0501 00 0 06347         ORA ONE+6      33,34,35
03252  0761 00 0 00000         NOP
03253  0671 00 0 06421         EAD EZERO      NORMAL ZERO,
03254  0761 00 0 00000         NOP
03255  0074 00 4 04700         TSX CHECK,4
03256 +000000000000            OCT            NO OV, NO QP, NO TRAP
03257 +040001000000            OCT 040001000000 CORRECT ACC CONTENTS
03260 +200000000000            OCT 200000000000 CORRECT MQ CONTENTS
03261  0074 00 4 06511         TSX OK,4       PROCEED OR
03262  0020 00 0 03240         TRA EADG       REPEAT.

                                    EAD, CHAC UNLIKE, SMALELR CHAC IN ACC
```

```
                                    SIGNS ALIKE. NO CARRY OUT OF ONE
                                    NO NORMALIZING.

03263  252124606060           BCD 1EAD
03264  0074 00 4 05066  EADH  TSX CLEAR,4    MONITOR
03265  0761 00 0 00000        NOP
03266  0670 00 0 06375        ELD EONE       C, 40001, FR, .2
03267  0761 00 0 00000        NOP
03270  0671 00 0 06403        EAD EFOUR      C, 40003, FR, .2
03271  0761 00 0 00000        NOP
03272  0074 00 4 04700        TSX CHECK,4
03273 +000000000000           OCT            NO OV, NO QP, NO TRAP
03274 +040003000000           OCT 040003000000 CORRECT ACC CONTENTS
03275 +240000000000           OCT 240000000000 CORRECT MQ CONTENTS
03276  0074 00 4 06511        TSX OK,4       PROCEED OR
03277  0020 00 0 03264        TRA EADH       REPEAT

                                    EAD, CHAC UNLIKE, SMALLER CHAC IN ACC
                                    SIGNS ALIKE. CHAC DIF OF 42. A ONE IN
                                    MQ 35 ADDS TO ALL ONES IN ACC.
                                    NO NORMALIZING
03300  252124606060           BCD 1EAD
03301  0074 00 4 05066  EADI  TSX CLEAR,4    MONITOR
03302  0761 00 0 00000        NOP
03303  0670 00 0 06313        ELD LGC3+2     C, 74575, FR, .2
03304  0761 00 0 00000        NOP
03305  0671 00 0 06311        EAD LGC3       C, 74637, FR, .3777777777
03306  0761 00 0 00000        NOP
                                    SHIFT MQ1 TO MQ35- ALL ONES IN ACC.
03307  0074 00 4 04700        TSX CHECK,4
03310 +000000000000           OCT            NO OV, NO QP, NO TRAP.
03311 +074640000000           OCT 074640000000 CORRECT ACC CONTENTS
03312 +200000000000           OCT 200000000000 CORRECT MQ CONTENTS
03313  0074 00 4 06511        TSX OK,4       PROCEED OR
03314  0020 00 0 03301        TRA EADI       REPEAT

                                    EAD, CHAC UNLIKE, LARGER CHAC IN ACC.
                                    RIPPLE TO COL 2. LEAVE BITS IN COL 34
                                    AND COL 2 BEFORE NORMALIZING

03315  252124606060           BCD 1EAD
03316  0074 00 4 05066  EADJ  TSX CLEAR,4    MONITOR
03317  0761 00 0 00000        NOP
03320  0670 00 0 06317        ELD LGC4+2     C, 40100, FR, .03777777777
03321  0761 00 0 00000        NOP
03322  0671 00 0 06315        EAD LGC4       C, 40076, FR. .20000000014
                                            CHAC DIF OF 2-PAGE 2.07.91
                                            RIPPLE TO ADD2-PADE 2.07.92
03323  0761 00 0 00000        NOP
03324  0074 00 4 04700        TSX CHECK,4
03325 +000000000000           OCT            NO OV, NO QP, NO TRAP
03326 +040077000000           OCT 040077000000 CORRECT ACC CONTENTS
03327 +200000000004           OCT 200000000004 CORRECT MQ CONTENTS
03330  0074 00 4 06511        TSX OK,4       PROCEED OR
03331  0020 00 0 03316        TRA EADJ       REPEAT.
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```
                                    EAD, CHAC UNLIKE, SMALLER CHAC IN ACC
                                    SIGNS UNLIKE, ACC PLUS.
                                    RESULT MINUS, NO NORMALIZING.

03332  252124606060            BCD 1EAD
03333  0074 00 4 05066  EADK   TSX CLEAR,4    MONITOR
03334  0761 00 0 00000         NOP
03335  0670 00 0 06405         ELD EFIVE      C, 40003, FR .24
03336 -0760 00 0 00003         SSM
03337  0761 00 0 00000         NOP
03340 -0673 00 0 06436         EST SHOP       STORAGE MINUS
03341  0670 00 0 06375         ELD EONE       C, 40001, FR, .2
03342  0761 00 0 00000         NOP
03343  0671 00 0 06436         EAD SHOP       C, -40003, FR, .24
03344  0761 00 0 00000         NOP
03345  0074 00 4 04700         TSX CHECK,4
03346 +000000000000            OCT            NO OV, NO QP, NO TRAP
03347 -040003000000            OCT -040003000000 CORRECT ACC CONTENTS
03350 -200000000000            OCT -200000000000 CORRECT MQ CONTENTS
03351  0074 00 4 06511         TSX OK,4
03352  0020 00 0 03333         TRA EADK

                                    CONTINUOUS EADS, SIGNS ALIKE

03353  252124606060            BCD 1EAD
03354  0074 00 4 05066  EADL   TSX CLEAR,4    MONITOR
03355  0670 00 0 06375         ELD EONE       C,40001, FR, .2
03356  0671 00 0 06375         EAD EONE
03357  0671 00 0 06375         EAD EONE
03360  0671 00 0 06375         EAD EONE
03361  0671 00 0 06375         EAD EONE
03362  0671 00 0 06375         EAD EONE
03363  0671 00 0 06375         EAD EONE
03364  0671 00 0 06375         EAD EONE
03365  0671 00 0 06375         EAD EONE
03366  0671 00 0 06375         EAD EONE
03367  0671 00 0 06375         EAD EONE
03370  0671 00 0 06375         EAD EONE
03371  0671 00 0 06375         EAD EONE
03372  0671 00 0 06375         EAD EONE
03373  0671 00 0 06375         EAD EONE
03374  0671 00 0 06375         EAD EONE
03375  0671 00 0 06375         EAD EONE
03376  0671 00 0 06375         EAD EONE
03377  0671 00 0 06375         EAD EONE
03400  0671 00 0 06375         EAD EONE
03401  0671 00 0 06375         EAD EONE
03402  0671 00 0 06375         EAD EONE
03403  0671 00 0 06375         EAD EONE
03404  0671 00 0 06375         EAD EONE
03405  0671 00 0 06375         EAD EONE
03406  0671 00 0 06375         EAD EONE
03407  0671 00 0 06375         EAD EONE
03410  0671 00 0 06375         EAD EONE
03411  0671 00 0 06375         EAD EONE
03412  0671 00 0 06375         EAD EONE
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03413  0671 00 0 06375         EAD EONE
03414  0671 00 0 06375         EAD EONE
03415  0671 00 0 06375         EAD EONE
03416  0671 00 0 06375         EAD EONE
03417  0671 00 0 06375         EAD EONE
03420  0671 00 0 06375         EAD EONE
03421  0671 00 0 06375         EAD EONE
03422  0671 00 0 06375         EAD EONE
03423  0671 00 0 06375         EAD EONE
03424  0671 00 0 06375         EAD EONE
03425  0671 00 0 06375         EAD EONE
03426  0671 00 0 06375         EAD EONE
03427  0671 00 0 06375         EAD EONE
03430  0671 00 0 06375         EAD EONE
03431  0671 00 0 06375         EAD EONE
03432  0671 00 0 06375         EAD EONE
03433  0671 00 0 06375         EAD EONE
03434  0671 00 0 06375         EAD EONE
03435  0671 00 0 06375         EAD EONE
03436  0671 00 0 06375         EAD EONE
03437  0671 00 0 06375         EAD EONE
03440  0671 00 0 06375         EAD EONE
03441  0671 00 0 06375         EAD EONE
03442  0671 00 0 06375         EAD EONE
03443  0671 00 0 06375         EAD EONE
03444  0671 00 0 06375         EAD EONE
03445  0671 00 0 06375         EAD EONE
03446  0671 00 0 06375         EAD EONE
03447  0671 00 0 06375         EAD EONE
03450  0671 00 0 06375         EAD EONE
03451  0671 00 0 06375         EAD EONE
03452  0671 00 0 06375         EAD EONE
03453  0671 00 0 06375         EAD EONE
03454  0671 00 0 06375         EAD EONE
03455  0671 00 0 06375         EAD EONE
03456  0671 00 0 06375         EAD EONE
03457  0671 00 0 06375         EAD EONE
03460  0671 00 0 06375         EAD EONE
03461  0671 00 0 06375         EAD EONE
03462  0671 00 0 06375         EAD EONE
03463  0671 00 0 06375         EAD EONE
03464  0671 00 0 06375         EAD EONE
03465  0671 00 0 06375         EAD EONE
03466  0671 00 0 06375         EAD EONE
03467  0671 00 0 06375         EAD EONE
03470  0671 00 0 06375         EAD EONE
03471  0671 00 0 06375         EAD EONE
03472  0671 00 0 06375         EAD EONE
03473  0671 00 0 06375         EAD EONE
03474  0671 00 0 06375         EAD EONE
03475  0671 00 0 06375         EAD EONE
03476  0671 00 0 06375         EAD EONE
03477  0671 00 0 06375         EAD EONE
03500  0671 00 0 06375         EAD EONE
03501  0671 00 0 06375         EAD EONE
03502  0671 00 0 06375         EAD EONE
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03503  0671 00 0 06375         EAD EONE
03504  0671 00 0 06375         EAD EONE
03505  0671 00 0 06375         EAD EONE
03506  0671 00 0 06375         EAD EONE
03507  0671 00 0 06375         EAD EONE
03510  0671 00 0 06375         EAD EONE
03511  0671 00 0 06375         EAD EONE
03512  0671 00 0 06375         EAD EONE
03513  0671 00 0 06375         EAD EONE
03514  0671 00 0 06375         EAD EONE
03515  0671 00 0 06375         EAD EONE
03516  0671 00 0 06375         EAD EONE
03517  0671 00 0 06375         EAD EONE
03520  0671 00 0 06375         EAD EONE
03521  0671 00 0 06375         EAD EONE
03522  0074 00 4 04700         TSX CHECK,4
03523 +000000000000            OCT             NO OV, NO QP, NO TRAP
03524 +040007000000            OCT 040007000000 CORRECT ACC CONTENTS
03525 +312000000000            OCT 312000000000 MQ
03526  0074 00 4 06511         TSX OK,4        PROCEED OR
03527  0020 00 0 03354         TRA EADL        REPEAT

                                    EAD, ACC ZERO, NORMALIZE FROM COL 35

03530  252124606060            BCD 1EAD
03531  0074 00 4 05066  EADM   TSX CLEAR,4     MONITOR
03532  0761 00 0 00000         NOP
03533  0500 00 0 06321         CLA C43         CHAC 40043
03534  0560 00 0 06341         LDQ ONE         1 IN COL 35
03535  0761 00 0 00000         NOP
03536 -0673 00 0 06436         EST SHOP
03537  0670 00 0 06421         ELD EZERO       CLEAR ACC, MQ
03540  0671 00 0 06436         EAD SHOP        C, 40043, FR, .00000000001
03541  0761 00 0 00000         NOP
03542  0074 00 4 04700         TSX CHECK,4
03543 +000000000000            OCT             NO OV, NO QP, NO TRAP
03544 +040001000000            OCT 040001000000 CORRECT ACC CONTENTS
03545 +200000000000            OCT 200000000000 CORRECT MQ CONTENTS
03546  0074 00 4 06511         TSX OK,4        PROCEED OR
03547  0020 00 0 03531         TRA EADM        REPEAT


                                    BILL BAILEY, WONT YOU PLEASE COME HOME.


                                    EAD, CHAC ALIKE, ALL ONES TO ALL ONES
                                    SIGNS ALIKE, CARRY OUT OF COL 1

03550  252124606060            BCD 1EAD
03551  0074 00 4 05066  EADN   TSX CLEAR,4     MONITOR
03552  0761 00 0 00000         NOP
03553  0500 00 0 06430         CLA PONES       ONE, 1-35
03554  0601 00 0 06437         STO SHOP+1
03555  0131 00 0 00000         XCA
03556  0500 00 0 06321         CLA C43         CHAC 43
03557  0761 00 0 00000         NOP
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03560  0601 00 0 06436         STO SHOP
03561  0761 00 0 00000         NOP
03562  0671 00 0 06436         EAD SHOP       C, 40043, FR, .377777777777
03563  0761 00 0 00000         NOP
03564  0074 00 4 04700         TSX CHECK,4
03565 +000000000000            OCT            NO OV, NO QP, NO TRAP
03566 +040044000000            OCT 040044000000 CORRECT ACC CONTENTS
03567 +377777777777            OCT 377777777777 CORRECT MQ CONTENTS
03570  0074 00 4 06511         TSX OK,4       PROCEED OR
03571  0020 00 0 03551         TRA EADN       REPEAT

                                   EAD, CHAC UNLIKE, SMALLER CHAC IN ACC
                                   SIGNS ALIKE, ONES IN 2-35, NO NORMALIZE

03572  252124606060            BCD 1EAD
03573  0074 00 4 05066  EADO   TSX CLEAR,4
03574  0761 00 0 00000         NOP
03575  0670 00 0 06323         ELD C43+2      C, 40042, FR, .37777777777
03576  0761 00 0 00000         NOP
03577  0671 00 0 06321         EAD C43        C, 40043, FR, .17777777777
03600  0761 00 0 00000         NOP
03601  0074 00 4 04700         TSX CHECK,4
03602 +000000000000            OCT            NO OV, NO QP, NO TRAP
03603 +040043000000            OCT 040043000000 CORRECT ACC CONTENTS
03604 +377777777776            OCT 377777777776 CORRECT MQ CONTENTS
03605  0074 00 4 06511         TSX OK,4       PROCEED OR
03606  0020 00 0 03573         TRA EADO       FLOAT.

                                   EAD, CHAC UNLIKE, SMALLER CHAC IN ACC
                                   SIGNS UNLIKE, ACC S-, RESULT -ZERO.
03607  252124606060            BCD 1EAD
03610  0074 00 4 05066  EADP   TSX CLEAR,4    MONITOR
03611  0761 00 0 00000         NOP
03612  0670 00 0 06323         ELD C43+2      C, 40042, FR, .37777777777
03613 -0760 00 0 00003         SSM
03614  0761 00 0 00000         NOP
03615  0671 00 0 06321         EAD C43        C, 40043, FR, .1777777777
03616  0761 00 0 00000         NOP
                                              NO Q CARRY ON THIRD STEP
                                              PREVENTS CHANGE OF ACC SIGN
                                              SYSTEM 2.07.92
03617  0074 00 4 04700         TSX CHECK,4
03620 +000000000000            OCT            NO OV, NO QP, NO TRAP
03621 -000000000000            OCT -0         CORRECT ACC
03622 -000000000000            OCT -0         CORRECT M1
03623  0074 00 4 06511         TSX OK,4       PROCEED OR
03624  0020 00 0 03610         TRA EADP       REPEAT

*FILSTRUP, WILL YOU PLEASE STOP THAT INFERNAL DRUMMING.

                                   EAD, CHAC UNLIKE, LARGER CHAC IN ACC
                                   SIGNS ALIKE, ONES IN 2-35, NO NORMALIZE

03625  252124606060            BCD 1EAD
03626  0074 00 4 05066  EADQ   TSX CLEAR,4    MONITOR
03627  0761 00 0 00000         NOP
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03630  0670 00 0 06321         ELD C43        C, 40043, FR .17777777777
03631  0671 00 0 06323         EAD C43+2      CH 40,042 FR .377777777777
03632  0761 00 0 00000         NOP
03633  0074 00 4 04700         TSX CHECK,4
03634 +000000000000            OCT            NO OV, NO QP, NO TRAP
03635 +040043000000            OCT 040043000000 CORRECT ACC
03636 +377777777776            OCT 377777777776
03637  0074 00 4 06511         TSX OK,4       PROCEED OR
03640  0020 00 0 03626         TRA EADQ       REPEAT

                                   EAD, CHAC UNLIKE, LARGER CHAC IN ACC
                                   SIGNS UNLIKE, ACC S-, RESULT -ZERO.

03641  252124606060            BCD 1EAD
03642  0074 00 4 05066  EADR   TSX CLEAR,4    MONITOR
03643  0761 00 0 00000         NOP
03644  0670 00 0 06321         ELD C43        C, 40043, FR, .177777777777
03645 -0760 00 0 00003         SSM
03646  0761 00 0 00000         NOP
03647  0671 00 0 06323         EAD C43+2      C, 40042, FR, .37777777777
03650  0761 00 0 00000         NOP
                                              NO Q CARRY ON THIRD STEP
                                              PREVENTS CHANGE OF ACC SIGN
                                              SYSTEMS 2.07.92
03651  0074 00 4 04700         TSX CHECK,4
03652 +000000000000            OCT            NO OV, NO QP, NO TRAP
03653 -000000000000            OCT -0         CORRECT ACC
03654 -000000000000            OCT -0         CORRECT MQ
03655  0074 00 4 06511         TSX OK,4       PROCEED OR
03656  0020 00 0 03642         TRA EADR       REPEAT

*          THE SIGNIFICANCE OF THE MINUS ZERO HERE IS THAT THE
*      PROGRAMMER IS INFORMED THAT HE HAS APPROACHED ZERO FROM
*      BELOW, AS OPPOSED TO APPROACHING ZERO FROM ABOVE, AS IS DONE
*      IN ROUTINE * EADF *. IN MANY CALCULATIONS, THIS KNOWLEDGE IS
*      AS IMPORTANT AS THE ALGEBRAIC RESULT.

                                   EAD, CHAC UNLIKE, LARGER CHAC IN ACC
                                   SIGNS UNLIKE, ACC MINUS RESULT
                                   SHOULD BE MINUS

03657  252124606060            BCD 1EAD
03660  0074 00 4 05066  EADS   TSX CLEAR,4    MONITOR
03661  0761 00 0 00000         NOP
03662  0670 00 0 06407         ELD ESIX       C, 40003, FR, .3
03663 -0760 00 0 00003         SSM            ACC MINUS
03664  0761 00 0 00000         NOP
03665  0671 00 0 06375         EAD EONE       C, 40001, FR, .2
03666  0761 00 0 00000         NOP            EXCHANGE CHACS, SHIFT ACC FR
                                              RIGHT 2, COMP ACC AND ADD,
                                              Q CARRY ON THIRD STEP, CAUSE
                                              CHANGE ACC S. SYSTEMS 2.07.92
03667  0074 00 4 04700         TSX CHECK,4
03670 +000000000000            OCT            NO OV, NO QP, NO TRAP
03671 -040003000000            OCT -040003000000 ACC, S,1-35
03672 -240000000000            OCT -240000000000 MQ, S,1-35
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03673  0074 00 4 06511         TSX OK,4       PROCEED OR
03674  0020 00 0 03660         TRA EADS       REPEAT.

                                   EAD, CHAC UNLIKE, SMALLER CHAC IN ACC
                                   SIGNS UNLIKE, ACC PLUS, RESULT
                                   SHOULD BE MINUS

03675  252124606060            BCD 1EAD
03676  0074 00 4 05066  EADT   TSX CLEAR,4    MONITOR
03677  0761 00 0 00000         NOP
03700  0670 00 0 06407         ELD ESIX       C, 40003, FR, .3
03701 -0760 00 0 00003         SSM
03702 -0673 00 0 06436         EST SHOP
03703  0670 00 0 06375         ELD EONE       C, 40001, FR, .1
03704  0761 00 0 00000         NOP
03705  0671 00 0 06436         EAD SHOP       C, -40003, FR, .3
03706  0761 00 0 00000         NOP
                                              NO Q CARRY ON THIRD STEP
                                              RECOMP ACC.
03707  0074 00 4 04700         TSX CHECK,4
03710 +000000000000            OCT            NO OV, NO QP, NO TRAP
03711 -040003000000            OCT -040003000000 ACC
03712 -240000000000            OCT -240000000000 MQ
03713  0074 00 4 06511         TSX OK,4
03714  0020 00 0 03676         TRA EADT

                                   EAD, CHAC EQUAL, SIGNS UNLIKE
                                   ACC PLUS, RESULT SHOULD BE MINUS.
                                   NORMALIZE FROM COL 3
03715  252124606060            BCD 1EAD
03716  0074 00 4 05066  EADU   TSX CLEAR,4    MONITOR
03717  0761 00 0 00000         NOP
03720  0670 00 0 06405         ELD EFIVE      C, 40003, FR, .24
03721 -0760 00 0 00003         SSM
03722 -0673 00 0 06436         EST SHOP       CHAC MINUS
03723  0670 00 0 06403         ELD EFOUR      C, 40003, FR, .2
03724  0671 00 0 06436         EAD SHOP       C, -40003, FR, .24
03725  0761 00 0 00000         NOP
03726  0074 00 4 04700         TSX CHECK,4
03727 +000000000000            OCT            NO OV, NO QP, NO TRAP
03730 -040001000000            OCT -040001000000 ACC
03731 -200000000000            OCT -200000000000 MQ
03732  0074 00 4 06511         TSX OK,4       PROCEED OR
03733  0020 00 0 03716         TRA EADU       REPEAT

*KEEP SMILING, PEOPLE WILL WONDER WHAT YOUR UP TO.

                                   EAD, CHAC EQUAL, SIGNS UNLIKE.
                                   ACC MINUS, RESULT SHOULD BE MINUS
                                   NORMALIZE FROM COL 3

03734  252124606060            BCD 1EAD
03735  0074 00 4 05066  EADV   TSX CLEAR,4    MONITOR
03736  0761 00 0 00000         NOP
03737  0670 00 0 06405         ELD EFIVE      C, 40003, FR, .24
03740 -0760 00 0 00003         SSM            ACC MINUS
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03741  0761 00 0 00000         NOP
03742  0671 00 0 06403         EAD EFOUR      C, 40003, FR, .2
03743  0761 00 0 00000         NOP
03744  0074 00 4 04700         TSX CHECK,4
03745 +000000000000            OCT            NO OV, NO QP, NO TRAP
03746 -040001000000            OCT -040001000000 ACC
03747 -200000000000            OCT -200000000000 MQ
03750  0074 00 4 06511         TSX OK,4       PROCEED OR
03751  0020 00 0 03735         TRA EADV       REPEAT

                                   EAD, SIGNS UNLIKE, ACC MINUS. RESULT MINUS
                                   CHAC EQUAL, NORMALIZE FROM COL 35.

03752  252124606060            BCD 1EAD
03753  0074 00 4 05066  EADW   TSX CLEAR,4    MONITOR
03754  0761 00 0 00000         NOP
03755  0670 00 0 06401         ELD ETHRE      C, 40002, FR, .3
03756  0131 00 0 00000         XCA
03757 -0501 00 0 06341         ORA ONE        INSERT ONE IN 35
03760  0131 00 0 00000         XCA
03761 -0760 00 0 00003         SSM            NOW, C-40002, FR, .300000000001
03762  0761 00 0 00000         NOP
03763  0671 00 0 06401         EAD ETHRE      C, 40002, FR, .3
03764  0761 00 0 00000         NOP
                                              END AROUND CARRY
                                              ONE TO ACC 35, NO RECOMP
03765  0074 00 4 04700         TSX CHECK,4
03766 +000000000000            OCT            NO OV, NO QP, NO TRAP
03767 -037740000000            OCT -037740000000 CORRECT ACC
03770 -200000000000            OCT -200000000000 CORRECT MQ
03771  0074 00 4 06511         TSX OK,4       PROCEED OR
03772  0020 00 0 03753         TRA EADW       REPEAT

                                   EAD, SIGNS UNLIKE, ACC PLUS, RESULT PLUS
                                   CHAC EQUAL, NORMALIZE FROM COL. 35

03773  252124606060            BCD 1EAD
03774  0074 00 4 05066  EADX   TSX CLEAR,4    MONITOR
03775  0761 00 0 00000         NOP
03776  0670 00 0 06401         ELD ETHRE      C, 40003, FR, .3
03777 -0760 00 0 00003         SSM
04000 -0673 00 0 06436         EST SHOP
04001  0670 00 0 06401         ELD ETHRE      C, 40003, FR, .3
04002  0131 00 0 00000         XCA
04003 -0501 00 0 06341         ORA ONE        BIT IN 35
04004  0131 00 0 00000         XCA
04005  0761 00 0 00000         NOP
04006  0671 00 0 06436         EAD SHOP       C, -40003, FR, .3
04007  0761 00 0 00000         NOP
04010  0074 00 4 04700         TSX CHECK,4
04011 +000000000000            OCT            NO OV, NO QP, NO TRAP
04012 +037740000000            OCT 037740000000 CORRECT ACC
04013 +200000000000            OCT 200000000000 CORRECT MQ
04014  0074 00 4 06511         TSX OK,4       PROCEED OR
04015  0020 00 0 03774         TRA EADX       REPEAT
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                                    EAD, SIGN OF STORAGE FRAC MINUS
                                    ACC, MQ PLUS, CHAC EQUAL

04016  252124606060            BCD 1EAD
04017  0074 00 4 05066  EADY   TSX CLEAR,4    MONITOR
04020  0761 00 0 00000         NOP
04021  0670 00 0 06375         ELD EONE       C, 40001, FR, .2
04022  0131 00 0 00000         XCA
04023 -0760 00 0 00003         SSM            FR, -.2
04024  0131 00 0 00000         XCA
04025 -0673 00 0 06436         EST SHOP
04026  0670 00 0 06375         ELD EONE       C, 40001, FR, .2
04027  0671 00 0 06436         EAD SHOP       C, 40001, FR, -.2
04030  0761 00 0 00000         NOP
04031  0074 00 4 04700         TSX CHECK,4
04032 +000000000000            OCT            NO OV, NO QP, NO TRAP
04033 +040002000000            OCT 040002000000 ACC
04034 +200000000000            OCT 200000000000 MQ
04035  0074 00 4 06511         TSX OK,4       PROCEED OR
04036  0020 00 0 04017         TRA EADY       REPEAT.

                                    EAD, SIGN OF MQ MINUS, ACC + STORAGE PLUS
                                    CHAC EQUAL.

04037  252124606060            BCD 1EAD
04040  0074 00 4 05066  EADZ   TSX CLEAR,4    MONITOR
04041  0761 00 0 00000         NOP
04042  0670 00 0 06401         ELD ETHRE      C, 40002, FR, .3
04043  0131 00 0 00000         XCA
04044 -0760 00 0 00003         SSM
04045  0131 00 0 00000         XCA            MQ MINUS
04046  0761 00 0 00000         NOP
04047  0671 00 0 06401         EAD ETHRE      C, 40002, FR, .3
04050  0761 00 0 00000         NOP
04051  0074 00 4 04700         TSX CHECK,4
04052 +000000000000            OCT            NO OV, NO QP, NO TRAP
04053 +040003000000            OCT 040003000000 ACC
04054 +300000000000            OCT 300000000000 MQ
04055  0074 00 4 06511         TSX OK,4       PROCEED OR
04056  0020 00 0 04040         TRA EADZ       REPEAT

*OK, LOUIE, DROP THE GUN.

                                    EAD WITH OVER FLOW, NO IN F.P. TRAP.
                                    SIGNS ALIKE, CHAC EQAUL

04057  732521244060            BCD 1,EAD-
04060  0074 00 4 05066  EFADA  TSX CLEAR,4    MONITOR
04061  0774 00 1 04066         AXT EFAD1,1
04062  0634 00 1 05516         SXA TRAP,1     SET TRAP RETURN IN CASE OF TRAP
04063 -0760 00 0 00004         LFTM           TURN OF F.P. TRAP MODE.
04064  0670 00 0 06307         ELD LGC2+2     C, 777777, FR, .2
04065  0671 00 0 06307         EAD LGC2+2     SAME
04066  0074 00 4 04700  EFAD1  TSX CHECK,4
04067 -0 00000 0 00000         MZE            OV ON, NO QP, NO TRAP
04070 +100000000000            OCT 100000000000 ACC
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04071 +200000000000           OCT 200000000000 MQ
04072  0074 00 4 06511        TSX OK,4       PROCEED OR
04073  0020 00 0 04060        TRA EFADA      REPEAT

                                  EAD WITH OVERFLOW, F.P. TRAP ON
                                  SIGNS ALIKE, CHAC EQUAL

04074  252124406060           BCD 1EAD-
04075  0074 00 4 05066  EFADB  TSX CLEAR,4    MONITOR
04076 -0760 00 0 00002        EFTM           F.P. TRAP ON
04077  0774 00 1 04105        AXT EFAD2,1
04100  0634 00 1 05516        SXA TRAP,1     TRAP RETURN ADD
04101  0670 00 0 06307        ELD LGC2+2     C,77777, FR, .2
04102  0671 00 0 06307        EAD LGC2+2
04103  0074 00 4 06503        TSX ERROR-1,4
04104  0761 00 0 05157        NOP TRPER      FAILED TO TRAP
04105  0074 00 4 04700  EFAD2  TSX CHECK,4
04106  0 00000 1 04103        PZE EFAD2-2,1  NO OV, NO QP, ADDRESS AND
                                              COL 15 OF ZERO
04107 +100000000000           OCT 100000000000 ACC
04110 +200000000000           OCT 200000000000 MQ
04111  0074 00 4 06511        TSX OK,4       PROCEED OR
04112  0020 00 0 04075        TRA EFADB      REPEAT

                                  EAD WITH UNDERFLOW, NO IN F.P. TRAP
                                  SIGNS ALIKE, CHAC EQUAL

04113  252124406060           BCD 1EAD-
04114  0074 00 4 05066  EFADD  TSX CLEAR,4    MONITOR
04115  0774 00 1 04122        AXT EFAD3,1
04116  0634 00 1 05516        SXA TRAP,1     SET TRAP ADDRESS IN CASE OF TRAP
04117 -0760 00 0 00004        LFTM           FP TRAP OF
04120  0670 00 0 06425        ELD FLOAT+2    C, 00001, FR, .02
04121  0671 00 0 06425        EAD FLOAT+2
04122  0761 00 0 00000  EFAD3  NOP
04123  0074 00 4 04700        TSX CHECK,4
04124 -200003000000           OCT -200003000000 ACC + MQ OV, Q+P BIT, NO TRAP
04125 +377777000000           OCT 377777000000 ACC S,1-35
04126 +200000000000           OCT 200000000000 MQ
04127  0074 00 4 06511        TSX OK,4       PROCEED OR
04130  0020 00 0 04114        TRA EFADD      REPEAT

                                  EAD WITH UNDERFLOW, F.P. TRAP ON
                                  SIGNS ALIKE, CHAC EQUAL

04131  252124406060           BCD 1EAD-
04132  0074 00 4 05066  EFADE  TSX CLEAR,4    MONITOR
04133  0774 00 1 04142        AXT EFAD4,1
04134  0634 00 1 05516        SXA TRAP,1     RETURN ADDRESS
04135 -0760 00 0 00002        EFTM           FP TRPA ON
04136  0670 00 0 06425        ELD FLOAT+2    C, 00001, FR .02
04137  0671 00 0 06425        EAD FLOAT+2
04140  0074 00 4 06503        TSX ERROR-1,4
04141  0761 00 0 05157        NOP TRPER      FAILED TO TRAP
04142  0074 00 4 04700  EFAD4  TSX CHECK,4
04143  0 00003 3 04140        PZE EFAD4-2,3,3 NO OV, P+Q BITS, ADDRESS AND
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                                        COLS 14+15 OF ZERO.
04144 +377777000000           OCT 377777000000 ACC S,1-35
04145 +200000000000           OCT 200000000000 MQ
04146  0074 00 4 06511        TSX OK,4       PROCEED OR
04147  0020 00 0 04132        TRA EFADE      REPEAT

                                  EAD, UNDERFLOW, SIGNS UNLIKE.
                                  ACC PLUS, RESULT PLUS
                                  NORMALIZE FROM COL 35, SPILL ON LAST SHIFT.

04150  252124406060           BCD 1EAD-
04151  0074 00 4 05066  EFADF  TSX CLEAR,4    MONITOR
04152  0774 00 1 04167        AXT EFAD5,1
04153  0634 00 1 05516        SXA TRAP,1     TRAP RETURN ADDRESS
04154  0560 00 0 06402        LDQ ETHRE+1    FR, .3
04155 -0600 00 0 06437        STQ SHOP+1
04156  0502 00 0 06325        CLS C41        C, 00041, SET MINUS
04157  0601 00 0 06436        STO SHOP
04160  0760 00 0 00003        SSP            ACC PLUS
04161  0131 00 0 00000        XCA
04162 -0501 00 0 06341        ORA ONE        BIT IN 35,
04163  0131 00 0 00000        XCA            NOW, C, 00041, FR, .300000000001
04164  0671 00 0 06436        EAD SHOP       C, -00041, FR, .3
04165  0074 00 4 06503        TSX ERROR-1,4
04166  0761 00 0 05157        NOP TRPER
04167  0074 00 4 04700  EFAD5  TSX CHECK,4
04170  0 00003 3 04165        PZE EFAD5-2,3,3 NO OV, P+Q BITS. ADDRESS
                                        AND COLS 14+15 OF ZERO.
04171 +377777000000           OCT 377777000000 ACC S,-35
04172 +200000000000           OCT 200000000000 MQ
04173  0074 00 4 06511        TSX OK,4       PROCEED OR
04174  0020 00 0 04151        TRA EFADF      REPEAT

*ASIDE FROM THAT, MRS. LINCLON, HOW DID YOU ENJOY THE PLAY---.

*      EAD, INDEXED, IA, WITH UNDERFLOW TRAP


04175  252124406060           BCD 1EAD-
04176  0074 00 4 05066  WPDW   TSX CLEAR,4
04177  0761 00 0 00000        NOP
04200  0774 00 1 04207        AXT WPDWT,1
04201  0634 00 1 05516        SXA TRAP,1     SET TRAP RETURN
04202  0774 00 1 77775        AXT -3,1
04203  0670 00 0 06330        ELD C41+3      C, 00001, FR, .02
04204  0671 60 1 04200        EAD* WPDW+2,1  SHOULD GET SAME
04205  0074 00 4 06503        TSX ERROR-1,4  FAILED TO TRAP
04206  0761 00 0 05157        NOP TRPER      ON UNDERFLOW

04207  0074 00 4 04700  WPDWT  TSX CHECK,4
04210  0 00003 3 04205        PZE WPDWT-2,3,3 TRAP ADD., BITS IN 14 AND 15
                                        AT ZERO, AND P AND Q IN ACC
04211 +377777000000           OCT 377777000000 ACC COLS S,1-35
04212 +200000000000           OCT 200000000000 MQ COLS S,1-35
04213  0074 00 4 06511        TSX OK,4       PROCEED OR
04214  0020 00 0 04176        TRA WPDW       REPEAT
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*      EAD, INDEXED, IA, OVERFLOW TRASP, SIGNS ALIKE
                                  IA WORD HAS A MINUS SIGN.

04215  252124406060            BCD 1EAD-
04216  0074 00 4 05066  WCFM    TSX CLEAR,4
04217  0761 00 0 00000          NOP
04220  0774 00 1 04230          AXT WCFMT,1
04221  0634 00 1 05516          SXA TRAP,1      SET TRAP RETURN
04222  0670 00 0 06307          ELD LGC2+2      C, 77777, FR, .2
04223  0774 00 1 00002          AXT 2,1
04224 -0673 00 1 06440          EST SHOP+2,1
04225  0671 60 1 04226          EAD* *+1,1      C, 77777, FR, .2
04226  0074 00 4 06503          TSX ERROR-1,4   FAILED TO TRAP
04227  0761 00 0 05157          NOP TRPER       ON OVERFLOW

04230  0074 00 4 04700  WCFMT   TSX CHECK,4
04231  0 00000 1 04226          PZE WCFMT-2,1   TRAP ADD, BIT IN 15 AT ZERO.
04232 +100000000000             OCT 100000000000 ADD
04233 +200000000000             OCT 200000000000 MQ
04234  0074 00 4 06511          TSX OK,4        PROCEED OR
04235  0020 00 0 04216          TRA WCFM        REPEAT.

*      EAD, XEC, NO TRAP

04236  252124606060            BCD 1EAD
04237  0074 00 4 05066  KGS71   TSX CLEAR,4
04240  0761 00 0 00000          NOP
04241  0670 00 0 06375          ELD EONE        C, 40001, FR, .2
04242  0020 00 0 04244          TRA *+2
04243  0671 00 0 06375          EAD EONE        TO BE EXECUTED
04244  0522 00 0 04243          XEC *-1         ADD. 1+1 IS 2.
04245  0761 00 0 00000          NOP
04246  0074 00 4 04700          TSX CHECK,4
04247 +000000000000             OCT             NO OV, NO TRAP, NO PQ
04250 +040002000000             OCT 040002000000 ACC
04251 +200000000000             OCT 200000000000 MQ
04252  0074 00 4 06511          TSX OK,4        PROCEED OR
04253  0020 00 0 04237          TRA KGS71       REPEAT

*      EAD, XEC, OVERFLOW TRAP

04254  252124406060            BCD 1EAD-
04255  0074 00 4 05066  WCDC    TSX CLEAR,4
04256  0761 00 0 00000          NOP
04257  0774 00 1 04270          AXT WCDCT,1
04260  0634 00 1 05516          SXA TRAP,1      SEET TRAP RETURN
04261  0670 00 0 06307          ELD LGC2+2      C, 77777, FR, .2
04262  0020 00 0 04265          TRA *+3
04263  0671 00 0 06307          EAD LGC2+2      EXECUTE
04264  0000 00 0 04264          HTR *           SHOULD NEVER GET HERE
04265  0522 00 0 04263          XEC *-2         C, 777777, FR, .2
04266  0074 00 4 06503          TSX ERROR-1,4   FAILED TO TRAP
04267  0761 00 0 05157          NOP TRPER       ON OVERFLOW
04270  0074 00 4 04700  WCDCT   TSX CHECK,4
04271  0 00000 1 04266          PZE WCDCT-2,1   TRAP ADD, BIT IN 15 AT ZERO.
```

```
04272 +100000000000           OCT 100000000000 ACC
04273 +200000000000           OCT 200000000000 MQ
04274  0074 00 4 06511        TSX OK,4       PROCEED OR
04275  0020 00 0 04255        TRA WCDC       REPEAT

*MEANWHILE, BACK AT THE RANCH.

*      EAD, XEC, IA, INDEXED. NO TRAP, SIGNS ALIKE

04276  252124606060           BCD 1EAD
04277  0074 00 4 05066  WAVI   TSX CLEAR,4
04300  0761 00 0 00000        NOP
04301  0670 00 0 06326        ELD C41+1      C, 40060, FR, .2
04302  0774 00 1 00002        AXT 2,1
04303 -0673 00 1 06440        EST SHOP+2,1   C, 40060, FR, .2
04304  0020 00 0 04307        TRA *+3
04305  0671 60 1 04305        EAD* WAVI+6,1
04306  0000 60 1 04307        HTR* WAVI+8,1

04307  0522 60 1 04310        XEC* WAVI+9,1  SHOULD ADD FROM SHOP
                                             ADD 40060.2
04310  0074 00 4 04700        TSX CHECK,4
04311 +000000000000           OCT            NO OV, NO PQ, NO TRAP
04312 +040061000000           OCT 040061000000 ACC
04313 +200000000000           OCT 200000000000 MQ
04314  0074 00 4 06511        TSX OK,4       PROCEED OR
04315  0020 00 0 04277        TRA WAVI       REPEAT

*AND GREETINGS TO ALL THE FOLKS FROM DAYTON.

*      EAD, IA, INDEXED, UNDERFLOW TRAP
                                SIGNS ALIKE

04316  252124406060           BCD 1EAD-
04317  0074 00 4 05066  WHO    TSX CLEAR,4    WHO INDEED.
04320  0761 00 0 00000        NOP
04321  0774 00 1 04345        AXT IOWA,1
04322  0634 00 1 05516        SXA TRAP,1     SET TRAP RETURN.
04323  0500 00 0 04332        CLA WHO+11     L. OF EST* SHOP+2,1

04324  0601 00 0 06436        STO SHOP
04325  0774 00 1 00002        AXT 2,1        2 TO XRA
04326  0020 00 0 04340        TRA WHO+17
04327  0671 60 1 04334        EAD* WHO+13,1
04330  0000 60 1 04331        HTR* WHO+10,1

04331  0000 60 1 06332        HTR* C41+5,1
04332 -0673 60 1 06440        EST* SHOP+2,1
04333  0670 60 1 04333        ELD* WHO+12,1
04334  0000 60 1 04335        HTR* WHO+14,1
04335  0000 60 1 04334        HTR* WHO+13,1

04336  0000 00 0 04336        HTR *
04337  0000 00 0 04337        HTR *
04340  0522 60 1 04336        XEC* WHO+15,1  ELD, C, 000001, FR, .02
04341  0522 60 1 04337        XEC* WHO+16,1  EST SHOP
```

```
04342  0522 60 1 04332         XEC* WHO+11,1  EAD, C, 000001, FR, .02

                                               SHOULD UNDERFLOW AND TRAP
04343  0074 00 4 06503         TSX ERROR-1,4  FAILED TO TRAP
04344  0761 00 0 05157         NOP TRPER      ON UNDERFLOW

04345  0074 00 4 04700  IOWA   TSX CHECK,4
04346  0 00003 3 04343         PZE IOWA-2,3,3 TRAP ADD., BITS IN 14 AND 15
                                               AT ZERO, P AND Q BITS IN ACC.
04347 +377777000000            OCT 377777000000 ACC COLS S,1-35
04350 +200000000000            OCT 200000000000 MQ COLS S,1-35
04351  0074 00 4 06511         TSX OK,4       PROCEED OR
04352  0020 00 0 04317         TRA WHO        REPEAT

                                   HOW TO FLOAT A FIXED-POINT NUMBER
                                   WITH EAD

04353  252124606060            BCD 1EAD
04354  0074 00 4 05066  EFAD   TSX CLEAR,4    MONITOR
04355  0761 00 0 00000         NOP
04356  0560 00 0 06347         LDQ ONE+6      FIXED POINT 7.
04357  0500 00 0 06423         CLA FLOAT      CHAC OF 40043
04360  0671 00 0 06423         EAD FLOAT      C, 40043, FR, 0
04361  0761 00 0 00000         NOP
04362  0074 00 4 04700         TSX CHECK,4
04363 +000000000000            OCT            NO OV, NO QP, NO TRPA
04364 +040003000000            OCT 040003000000 ACC
04365 +340000000000            OCT 340000000000 MQ
04366  0074 00 4 06511         TSX OK,4       PROCEED OR
04367  0020 00 0 04354         TRA EFAD       REPEAT.

                                   HOW TO FIX A FLOATING NUMBER WITH EUA

04370  256421606060            BCD 1EUA
04371  0074 00 4 05066  EUEAD  TSX CLEAR,4    MONITOR
04372  0761 00 0 00000         NOP
04373  0670 00 0 06411         ELD ESVN       C, 40003, FR, .34 FLOATING 7.
04374 -0672 00 0 06423         EUA FLOAT      C, 00043, FR, 0
04375  0761 00 0 00000         NOP
                                   FIXED POINT 7 NOW IN MQ
04376  0074 00 4 04700         TSX CHECK,4
04377 +000000000000            OCT            NO OV, NO QP, NO TRPA
04400 +040043000000            OCT 040043000000 ACC
04401 +000000000007            OCT 7          MOQ
04402  0074 00 4 06511         TSX OK,4       PROCEED OR
04403  0020 00 0 04371         TRA EUEAD      REPEAT

*BASIC TEST OF ESB

                                   ESB, EXTENDED FLOATING POINT SUBTRACT
                                   -0671

                                   SHORT TEST FOR SCOPING

04404  256222606060            BCD 1ESB
04405  0074 00 4 05066  ESB    TSX CLEAR,4
```

```
04406  0761 00 0 00000         NOP
04407  0600 00 0 06436         STZ SHOP
04410  0600 00 0 06437         STZ SHOP+1
04411  0670 00 0 06436         ELD SHOP       CLEAR
04412  0761 00 0 00000         NOP
04413 -0671 00 0 06436         ESB SHOP       **** DO THIS ONE
04414  0760 00 0 00161         SWT 1          ** * THIS ONE
04415  0020 00 0 04424         TRA *+7           *
04416  0020 00 0 04413         TRA *-3        **** AND THIS ONE, IF SW1 DOWN
                 04417         BSS 5
04424  0074 00 4 06511         TSX OK,4
04425  0020 00 0 04405         TRA ESB

                                   ESB, ACC PLUS ZERO, SEE THE ESB
                                   WILL CHANGE INCOMING SIGN

04426  256222606060            BCD 1ESB
04427  0074 00 4 05066  ESB1   TSX CLEAR,4
04430  0761 00 0 00000         NOP
04431  0670 00 0 06421         ELD EZERO      CLEAR
04432  0761 00 0 00000         NOP
04433 -0671 00 0 06375         ESB EONE       C, 40001, FR, .2
04434  0761 00 0 00000         NOP            SHOULD GO MINUS
04435  0074 00 4 04700         TSX CHECK,4
04436 +000000000000            OCT            NO OV, NO PQ, NO TRAP
04437 -040001000000            OCT -040001000000 ACC
04440 -200000000000            OCT -200000000000 MQ
04441  0074 00 4 06511         TSX OK,4       PROCEED OR
04442  0020 00 0 04427         TRA ESB1       REPEAT

                                   ESB, CHAC, EQUAL, SIGNS ALIKE,
                                   RESULT SHOULD BE PLUS ZERO
04443  256222606060            BCD 1ESB
04444  0074 00 4 05066  ESBA   TSX CLEAR,4
04445  0761 00 0 00000         NOP
04446  0670 00 0 06417         ELD ETEN       C, 40004, FR, .27
04447  0761 00 0 00000         NOP
04450 -0671 00 0 06417         ESB ETEN       SHOULD GET ZERO
04451  0761 00 0 00000         NOP
04452  0074 00 4 04700         TSX CHECK,4
04453 +000000000000            OCT            NO OV, NO QP, NO TRAP
04454 +000000000000            OCT 0,0        ACC AND MQ PLSU ZERO
04455 +000000000000
04456  0074 00 4 06511         TSX OK,4       PROCEED OR
04457  0020 00 0 04444         TRA ESBA       REPEAT

*          THE SIGNIFICANCE OF THE PLUS ZERO HERE, IS THAT THE
*      PROGRAMMER IS INFORMED THAT HE HAS APPROCHED ZERO FROM
*      ABOVE, AS OPPOSED TO APPROACHING ZERO FROM BELOW, AS IS DONE
*      IN ROUTINE * EADR *. IN MANY CALCULATIONS, THIS KNOWLEDGE IS
*      AS IMPORTANT AS THE ALGEBRAIC RESULT.

                                   ESB. CHAC EQUAL, ACC MINUS, STORAGE PLUS


04460  256222606060            BCD 1ESB
```

```
04461  0074 00 4 05066  ESBB   TSX CLEAR,4
04462  0761 00 0 00000         NOP
04463  0670 00 0 06405         ELD EFIVE      C, 40003, FR, .24
04464 -0760 00 0 00003         SSM
04465  0761 00 0 00000         NOP
04466 -0671 00 0 06405         ESB EFIVE      SHOULD ADD.
04467  0761 00 0 00000         NOP
04470  0074 00 4 04700         TSX CHECK,4
04471 +000000000000            OCT            NO OV, NO QP, NO TRAP
04472 -040004000000            OCT -040004000000 ACC
04473 -240000000000            OCT -240000000000 MQ
04474  0074 00 4 06511         TSX OK,4       PROCEED OR
04475  0020 00 0 04461         TRA ESBB       REPEAT

                                   ESB, CHAC EQUAL, ACC PLUS, STORAGE MINUS
                                   RESULT SHOULD BE PLUS

04476  256222606060            BCD 1ESB
04477  0074 00 4 05066  ESBC   TSX CLEAR,4
04500  0761 00 0 00000         NOP
04501  0670 00 0 06405         ELD EFIVE      C, 40003, FR, .24
04502 -0760 00 0 00003         SSM
04503  0761 00 0 00000         NOP
04504 -0673 00 0 06436         EST SHOP       TEMPO
04505  0761 00 0 00000         NOP
04506  0670 00 0 06405         ELD EFIVE      ACC PLUS
04507 -0671 00 0 06436         ESB SHOP       C, -40003, FR, .24
04510  0761 00 0 00000         NOP            SHOULD ADD
04511  0074 00 4 04700         TSX CHECK,4
04512 +000000000000            OCT            NO OV, NO PQ, NO TRAP
04513 +040004000000            OCT 040004000000 ACC
04514 +240000000000            OCT 240000000000 MQ
04515  0074 00 4 06511         TSX OK,4       PROCEED OR
04516  0020 00 0 04477         TRA ESBC       REPEAT

                                   ESB, CHAC EQUAL, BOTH SIGNS MINUS
                                   SHOULD GET MINUS ZERO

04517  256222606060            BCD 1ESB
04520  0074 00 4 05066  ESBD   TSX CLEAR,4
04521  0761 00 0 00000         NOP
04522  0670 00 0 06375         ELD EONE       C, 40001, FR, .2
04523 -0760 00 0 00003         SSM
04524  0761 00 0 00000         NOP
04525 -0673 00 0 06436         EST SHOP
04526 -0671 00 0 06436         ESB SHOP       C, -40001, FR, .2
04527  0761 00 0 00000         NOP
04530  0074 00 4 04700         TSX CHECK,4
04531 +000000000000            OCT            NO OV, NO QP, NO TRAP
04532 -000000000000            OCT -0,-0      ACC AND MQ MINUS ZERO.
04533 -000000000000
04534  0074 00 4 06511         TSX OK,4       PROCEED OR
04535  0020 00 0 04520         TRA ESBD       REPEAT.
*           THE SIGNIFICANCE OF THE MINUS ZERO HERE, IS THAT THE
*      PROGRAMMER IS INFORMED THAT HE HAS APPROCHED ZERO FROM
*      BELOW, AS OPPOSED TO APPROACHING ZERO FROM ABOVE, AS IS DONE
```

```
*      IN ROUTINE * EADF *. IN MANY CALCULATIONS, THIS KNOWLEDGE IS
*      AS IMPORTANT AS THE ALGEBRAIC RESULT.

                                   ESB, CHAC ALIKE, ACC PLUS, MQ MINUS
                                   STG CHAC PLUS, STG FR MINUS.

04536  256222606060            BCD 1ESB
04537  0074 00 4 05066  ESBE   TSX CLEAR,4
04540  0761 00 0 00000         NOP
04541  0502 00 0 06404         CLS EFOUR+1
04542  0601 00 0 06437         STO SHOP+1
04543  0500 00 0 06403         CLA EFOUR
04544  0601 00 0 06436         STO SHOP
04545  0761 00 0 00000         NOP
04546  0670 00 0 06405         ELD EFIVE      C, 40003, FR, .24
04547 -0760 00 0 00003         SSM
04550  0765 00 0 00000         LRS 0          MQ SIGN MINUS
04551  0760 00 0 00003         SSP            ACC PLUS
04552 -0671 00 0 06436         ESB SHOP       C, 40003, FR, -.2
04553  0074 00 4 04700         TSX CHECK,4
04554 +000000000000            OCT             NO OV, NO PQ, NO TRAP
04555 +040001000000            OCT 040001000000 ACC
04556 +200000000000            OCT 200000000000 MQ
04557  0074 00 4 06511         TSX OK,4       PROCEED OR
04560  0020 00 0 04537         TRA ESBE       REPEAT

                                   ESB, CHAC UNLIKE, SMALLER IN ACC
                                   SIGNS ALIKE, RESULT MINUS

04561  256222606060            BCD 1ESB
04562  0074 00 4 05066  ESBF   TSX CLEAR,4
04563  0761 00 0 00000         NOP
04564  0670 00 0 06375         ELD EONE       C, 40001, FR, .2
04565 -0671 00 0 06407         ESB ESIX       C, 40003, FR, .3
04566  0761 00 0 00000         NOP
04567  0074 00 4 04700         TSX CHECK,4
04570 +000000000000            OCT            NO OV, NO QP, NO TRAP
04571 -040003000000            OCT -040003000000 ACC
04572 -240000000000            OCT -240000000000 MQ
04573  0074 00 4 06511         TSX OK,4       PROCEED OR
04574  0020 00 0 04562         TRA ESBF       REPEAT.

                                   ESB, CHAC UNLIKE, LARGER IN ACC.
                                   SIGNS ALIKE, RESULT PLUS.


04575  256222606060            BCD 1ESB
04576  0074 00 4 05066  ESBG   TSX CLEAR,4
04577  0761 00 0 00000         NOP
04600  0670 00 0 06407         ELD ESIX       C, 40003, FR, .3
04601 -0671 00 0 06375         ESB EONE       C, 40001, FR, .2
04602  0761 00 0 00000         NOP
04603  0074 00 4 04700         TSX CHECK,4
04604 +000000000000            OCT            NO OV, NO PQ, NO TRAP
04605 +040003000000            OCT 040003000000 ACC
04606 +240000000000            OCT 240000000000 MQ
```

```
04607  0074 00 4 06511         TSX OK,4       PROCEED OR
04610  0020 00 0 04576         TRA ESBG       REPEAT
                                   ESB, UNDERFLOW TRAP

04611  256222406060            BCD 1ESB-
04612  0074 00 4 05066  ESBH   TSX CLEAR,4
04613  0761 00 0 00000         NOP
04614  0774 00 1 04623         AXT ESBHT,1
04615  0634 00 1 05516         SXA TRAP,1     SET TRAP RETURN.
04616  0670 00 0 06330         ELD C41+3      C, 000001, FR, .02
04617 -0760 00 0 00003         SSM
04620 -0671 00 0 06330         ESB C41+3      SHOULD ADD AND UNDERFLOW
04621  0074 00 4 06503         TSX ERROR-1,4  FAILED TO TRAP
04622  0761 00 0 05157         NOP TRPER      ON UNDERFLOW
04623  0074 00 4 04700  ESBHT  TSX CHECK,4
04624  0 00003 3 04621         PZE ESBHT-2,3,3 TRAP ADD, BITS IN 14 AND 15 AT
                                               ZERO, BITS IN P AND Q.
04625 -377777000000            OCT -377777000000 ACC COLS S,1-35
04626 -200000000000            OCT -200000000000 MQ
04627  0074 00 4 06511         TSX OK,4       PROCEED OR
04630  0020 00 0 04612         TRA ESBH       REPEAT

                                   ESB OVERFLOW TRAP

04631  256222406060            BCD 1ESB-
04632  0074 00 4 05066  ESBI   TSX CLEAR,4
04633  0761 00 0 00000         NOP
04634  0774 00 1 04646         AXT ESBIT,1
04635  0634 00 1 05516         SXA TRAP,1     SET TRAP RETURN
04636  0761 00 0 00000         NOP
04637  0670 00 0 06307         ELD LGC2+2     C 77777, FR, .2
04640 -0760 00 0 00003         SSM
04641 -0673 00 0 06436         EST SHOP
04642  0670 00 0 06307         ELD LGC2+2
04643 -0671 00 0 06436         ESB SHOP       SHOULD ADD AND OVERFLOW
04644  0074 00 4 06503         TSX ERROR-1,4  FAILED TO TRAP
04645  0761 00 0 05157         NOP TRPER      ON OVERFLOW
04646  0074 00 4 04700  ESBIT  TSX CHECK,4
04647  0 00000 1 04644         PZE ESBIT-2,1  TRAP ADD, BIT IN COL 15
                                               AT ZERO
04650 +100000000000            OCT 100000000000 ACC
04651 +200000000000            OCT 200000000000 MQ
04652  0074 00 4 06511         TSX OK,4       PROCEED OR
04653  0020 00 0 04632         TRA ESBI       REPEAT

*CHECKING EDP, EMP, EAD, AND ESB.

04654  252125442524            BCD 1EAEMED
04655  0074 00 4 05066  EASMD  TSX CLEAR,4    MONITOR
04656  0761 00 0 00000         NOP
04657  0670 00 0 06421         ELD EZERO      NORMAL ZERO
04660  0671 00 0 06255         EAD EPE10      CH 40,042 FR.225005744
04661  0673 00 0 06243         EMP EPE5       CH 40,021 FR .30324
04662 -0671 00 0 06267         ESB EPE15      CH 40,062 FR .343277244615
04663  0671 00 0 06243         EAD EPE5       CH 40,021 FR .30324
04664  0672 00 0 06241         EDP EPE4       CH 40,016 FR .2342
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04665  0671 00 0 06233         EAD EPE1       CH 40,004 FR .24
04666 -0671 00 0 06137         ESB EP20       CH 40,005 FR .24
04667  0761 00 0 00000         NOP
04670  0074 00 4 04700         TSX CHECK,4
04671 +000000000000            OCT +0         NO OV, NO PQ, NO TRAP
04672 +000000000000            OCT +0         CONT ACC
04673 +000000000000            OCT +0         CONT MQ
04674  0074 00 4 06511         TSX OK,4       CONTINUE TEST
04675  0020 00 0 04655         TRA EASMD      REPEAT TEST
04676  0761 00 0 00000         NOP
04677  0020 00 0 05253         TRA DONE       PASS COMPLETE

************************PROGRAM CHECK SUBROUTINE*****************************


*SUBROUTINE TO CHECK DATA FROM THE MAIN PROGRAM.

*      THE CALLING SEQUENCE IS AS FOLLOWS...

*                    A   TSX CHECK,4
*                    A+1 PZE  OV LITES IND IN PREFIX, QP IN DECR,
*                             TRAP COND IN TAG, ADDR OF ZERO IN ADDR.
*                    A+2 OCT  CONTENTS OF ACC S-35.
*                    A+3 OCT  CONTENTS OF MQ S-35.
*                    A+4 RETURN HERE IF SW 1 IS UP.
*                    A+5 RETURN HERE IF SW 1 IS DOWN.


*THE WORD AT A+1 CONTAINS THE EXPECTED CONDITION OF THE ACC. AND
*MQ OVERFLOW TRIGS, AS FOLLOWS.

*                    A BIT IN COL S. IF ACC OV TRIG SHOULD HAVE BEEN ON.
*                    A BIT IN COL 1 IF MQ OV TRIG SHOULD HAVE BEEN ON.


*WITH SW 2 DOWN-CHECK ROUTINE IS BYPASSED AND PROG CHECKS SW 1.

*THIS SUBROUTINE CHECKS THE OV TGRS, ACC, MQ, AND THE CONTENTS OF
*LOCATION ZERO. ALL CHECKS ARE MADE BEFORE AN ERROR INDICATION IS GIVEN.
*ON ERROR, THIS SUBROUTINE TRA TO THE ERROR ROUTINE.

*ON ERROR, THE FOLLOWING INDICATIONS ARE GIVEN--

*      SENSE LITES-
*         SLT 1 ON - ERROR IN OV TRGS.
*         SLT 2 ON - ERROR IN ACC S-35.
*         SLT 3 ON - ERROR IN MQ S-35.
*         SLT 4 ON - ERROR IN DECR OR ADDR OF LOC ZERO.


*      SENSE INDICATOR REGISTER-

*         BIT IN COL 0 - ERROR IN ACC OV TGR.
*         BIT IN COL 1 - ERROR IN MQ OV TGR.
*         BIT IN COL 2 - ACC OV TGR ON IN ERROR.
*         BIT IN COL 3 - MQ OV TGR ON IN ERROR.
```

```
*         BIT IN COL 14- CORRECT INDICATION FOR ACC COL Q
*         BIT IN COL 15- CORRECT INDICATION FOR ACC COL P
*         BIT IN COL 16- ERROR IN Q BIT
*         BIT IN COL 17- ERROR IN P BIT
*         BIT IN COL 18- COL 16 OR 17 OR BOTH OF LOC ZERO
*                        WERE SET IN ERROR.


**********************************************************
**                                                      **
**  SI COLS 21 TO 35 SHOW THE LOCATION OF THE           **
**  TSX INSTRUCTION IN THE MAIN PROGRAM WHICH           **
**  CALLED THIS SUBROUTINE.                             **
**                                                      **
**********************************************************

******THE OV. TRIGS ARE TURNED OFF*********
                                  THE DIVIDE CHECK TRIG IS NOT TESTED.

*THE ACC, MQ, XRS, AND CONTENTS OF LOC. ZERO ARE UNCHANGED.



04700  0760 00 0 00162  CHECK  SWT 2
04701  1 00000 0 04703         TXI *+2         PROCEED TO CHECK
04702  1 00000 0 05054         TXI CHECK+108   DO NOT CHECK, GO TO SW 1 TEST
04703  0600 00 0 06332         STZ IND         RESET ERR INDICATOR
04704  0634 00 1 05041         SXA CHECK+97,1
*5
04705  0634 00 2 05042         SXA CHECK+98,2 SAVE
04706  0634 00 4 05043         SXA CHECK+99,4   ALL
04707 -0600 00 0 06335         STQ MQ             REGISTERS
04710  0601 00 0 06336         STO ACC
04711  0771 00 0 00043         ARS 35
*10
04712  0602 00 0 06337         SLW PQ
04713  0760 00 0 00140         SLF
04714  0534 00 2 06366         LXA COUNT,2    TOTAL ERR COUNT
04715  0441 00 4 00001         LDI 1,4        1RST DATA WORD TO SI.
04716 -0754 00 0 00000         PXD            CLEAR ACC
*15
04717  0140 00 0 04721         TOV *+2        TEST OV TRIGS
04720  0020 00 0 04722         TRA *+2
04721 -0501 00 0 06333         ORA COL18      BIT IN 18 IF ACC OV ON.
04722  0161 00 0 04724         TQO *+2
04723  0020 00 0 04725         TRA *+2
*20
04724 -0501 00 0 06334         ORA COL19      BIT IN 19 IF MQ OV ON.
04725  0625 00 0 04726         STT *+1
04726 -0051 00  000000         IIL **         TURN OFF OK BITS.
04727 -0054 00  600000         LFT 600000     WILL ALL BE OFF IF OK.
04730  1 00001 2 04732         TXI *+2,2,1    ERROR, COUNT AND INDICATE.
*25
04731  0020 00 0 04743         TRA CHECK+35   OK,
04732  0767 00 0 00020         ALS 16
```

```
04733  0043 00 0 00000        OAI            SET OV ERR CONDITIONS IN
                                              IN SI COL 2 AND 3.
04734  0634 00 2 06366        SXA COUNT,2
04735  0534 00 2 06367        LXA COUNT+1,2
*30
04736  1 00001 2 04737        TXI *+1,2,1    COUNT OV ERRORS.
04737  0634 00 2 06367        SXA COUNT+1,2
04740  0534 00 2 06366        LXA COUNT,2
04741  0634 00 2 06332        SXA IND,2      INDICATE ERR TO PROGRAM
04742  0760 00 0 00141        SLN 1          INDICATE OV. ERR TO OPERATOR.

                                  NOW, CHECK P AND Q BITS.


*35
04743  0500 00 0 06337        CLA PQ
04744  0621 00 0 04745        STA *+1
04745 -0051 00  000000        IIL **         TURN OFF OK BITS.
04746 -0054 00  000003        LFT 3          WILL BE OFF IF OK
04747  1 00001 2 04751        TXI *+2,2,1    ERR, COUNT AND INDICATE
*40
04750  0020 00 0 04762        TRA CHECK+50   OK.

04751  0634 00 2 06366        SXA COUNT,2    COUNT TOTAL ERRS.
04752  0534 00 2 06370        LXA COUNT+2,2
04753  1 00001 2 04754        TXI *+1,2,1    COUNT P+Q ERRS
04754  0634 00 2 06370        SXA COUNT+2,2
*45
04755  0534 00 2 06366        LXA COUNT,2
04756  0634 00 2 06332        SXA IND,2      INDICATE ERROR TO PROGRAM
04757  0760 00 0 00142        SLN 2          INDICATE ACC ERR TO OPERATOR.
04760  0767 00 0 00024        ALS 20
04761  0043 00 0 00000        OAI            PUT CORRECT P+Q IN SI 14 AND 15


                                  NOW, CHECK ACC COLS S,1-35

*50
04762  0500 00 4 00002        CLA 2,4        CORRECT ACC VALUE
04763  0340 00 0 06336        CAS ACC
04764  0020 00 0 04766        TRA *+2        NG
04765  0020 00 0 04776        TRA CHECK+62     OK
04766  1 00001 2 04767        TXI *+1,2,1    ERR, COUNT AND INDICATE
*55
04767  0634 00 2 06366        SXA COUNT,2
04770  0534 00 2 06371        LXA COUNT+3,2
04771  1 00001 2 04772        TXI *+1,2,1    COUNT ERRS IN ACC S,1-35
04772  0634 00 2 06371        SXA COUNT+3,2
04773  0534 00 2 06366        LXA COUNT,2
*60
04774  0634 00 2 06332        SXA IND,2      INDICATE ERR TO PROGRAM
04775  0760 00 0 00142        SLN 2          INDICATE ACC ERR TO OPERATOR

                                  NOW, CHECK MQ S,1-35

04776  0500 00 4 00003        CLA 3,4        CORRECT VALUE FOR MQ.
```

```
04777  0340 00 0 06335         CAS MQ
05000  0020 00 0 05002         TRA *+2         NG
*65
05001  0020 00 0 05012         TRA CHECK+74    OK.

05002  1 00001 2 05003         TXI *+1,2,1     ERR, COUNT AND INDICATE
05003  0634 00 2 06366         SXA COUNT,2
05004  0534 00 2 06372         LXA COUNT+4,2
05005  1 00001 2 05006         TXI *+1,2,1     COUNT MQ ERRS.
*70
05006  0634 00 2 06372         SXA COUNT+4,2
05007  0534 00 2 06366         LXA COUNT,2
05010  0634 00 2 06332         SXA IND,2       INDICATE ERR TO PROGRAM
05011  0760 00 0 00143         SLN 3           INDICATE MQ ERR TO OPERATOR


*LADY, WOULD YOU PLEASE REMOVE YOUR HAT.

                                    AND NOW, CK LOC ZERO ADDR AND DECR.


05012 -0500 00 0 00000         CAL             LOC ZERO TO ACC.
*75
05013  0621 00 0 05022         STA CHECK+82    TRAP ADDRESS.
05014  0771 00 0 00005         ARS 5
05015  0625 00 0 05022         STT CHECK+82    OV AND UV IND BITS.
05016 -0320 00 0 06112         ANA MSK2        BITS IN COL 21 AND 22.
05017  0100 00 0 05022         TZE *+3         TO INDICATE
*80
05020 -0500 00 0 06333         CAL COL18
05021 -0602 00 0 05022         ORS CHECK+82          COL 16 AND 17.
05022  0051 00  000000         IIR **
05023  0054 00  777777         RFT 777777      ALL SHOULD BE OFF- IF OK.
05024  1 00001 2 05026         TXI *+2,2,1     ERR, COUNT AND INDICATE
*85
05025  0020 00 0 05035         TRA CHECK+93    OK
05026  0634 00 2 06366         SXA COUNT,2
05027  0534 00 2 06373         LXA COUNT+5,2
05030  1 00001 2 05031         TXI *+1,2,1     COUNT LOC ZERO ERRS
05031  0634 00 2 06373         SXA COUNT+5,2
*90
05032  0534 00 2 06366         LXA COUNT,2
05033  0634 00 2 06332         SXA IND,2       INDICATE ERR TO PROGRAM
05034  0760 00 0 00144         SLN 4           INDICATE LOC ZERO ERR TO OPERATOR.


                                    PLACE TRUE ERR LOC IN SI 21-35.

05035  0535 00 4 05043         LAC CHECK+99,4
05036  0754 00 4 00000         PXA ,4
*95
05037  0057 00  377777         RIR 377777      TURN OFF
05040  0043 00 0 00000         OAI             SET ERR LOC TO SI


                                    RESTORE REGISTERS AND EXIT.
```

```
05041  0774 00 1 00000         AXT **,1
05042  0774 00 2 00000         AXT **,2
05043  0774 00 4 00000         AXT **,4
*100
05044  0500 00 0 06337         CLA PQ
05045  0560 00 0 06336         LDQ ACC
05046  0763 00 0 00043         LLS 35          RESTORE ACC.
05047  0140 00 0 05050         TOV *+1         RESTORE OV TRIG
05050  0560 00 0 06335         LDQ MQ          RESTORE MQ
*105
05051  0520 00 0 06332         ZET IND         WAS THERE AN ERROR
05052  0020 00 0 05057         TRA *+5


                                    IF NO ERR, CHECK SW 1

05053  0761 00 0 00000         NOP             FUTURE USE
05054  0760 00 0 00161         SWT 1
05055  0020 00 4 00004         TRA 4,4         CONTINUE
*110
05056  0020 00 4 00005         TRA 5,4         REPEAT IF SW 1 DOWN.
05057  0600 00 0 06332         STZ IND         RESET INDICATOR ON ERROR AND
05060  2 00003 4 06504         TIX ERROR,4,3   GO TO 9DEPR.
                 05061         BSS 5           USE

*      PROGRAM SEQUENCE AND CONTROL MONITOR.
                                    PART 1, CHECK PROGRAM SEQUENCE.
05066  0760 00 0 00161  CLEAR   SWT 1
05067  0020 00 0 05071         TRA *+2         TEST SW 4
05070  0020 00 0 05073         TRA *+3         TO BE REPEATED
05071  0760 00 0 00164         SWT 4
05072  0020 00 0 05076         TRA *+4         NO REPEATED
*5
05073 -0754 00 4 00000         PXD ,4
05074  0402 00 0 05153         SUB MONIT       TEST FOR REPEAT
05075  0100 00 0 05122         TZE RESET       REPEAT IF ZERO


05076  0600 00 0 06436         STZ SHOP
05077 -0634 00 4 06436         SXD SHOP,4      SAVE TEST ADDRESS
*10
05100  0500 00 4 77776         CLA -2,4        PRECEEDING TEST LOC.
05101  0737 00 4 00000         PAC ,4          COMPLEMENT
05102 -0754 00 4 00000         PXD ,4
05103  0402 00 0 05153         SUB MONIT       WILL GO ZERO FOR NORMAL
05104 -0534 00 4 06436         LXD SHOP,4      RESTORE XRC
*15
05105  0100 00 0 05122         TZE RESET       OK IF ZERO

                                    IF NOT ZERO, CHECK FOR MANUAL TRA

05106  0760 00 0 00004         ENK             CHECK KEYS
05107  0131 00 0 00000         XCA
05110  0737 00 4 00000         PAC ,4          COMP. KEYS ADDRESS
05111  0765 00 0 00025         LRS 21
*20
```

```
05112  0402 00 0 06361         SUB PROP2       ALLOW PRIM OP 0,2 ONLY
05113 -0100 00 0 05120         TNZ *+5         N.G. IF NOT ZERO HERE
05114 -0754 00 4 00000         PXD ,4          NOW CHECK ADDRESS
05115  0402 00 0 06436         SUB SHOP
05116 -0534 00 4 06436         LXD SHOP,4      RESTORE XRC
*25
05117  0100 00 0 05122         TZE RESET       OK IF ZERO


05120 -0534 00 4 06436         LXD SHOP,4      N.G. PROGRAM OUT OF
05121  0021 00 0 05160         TTR SPACE       SEQUENCE
                                               INDICATE SPACE ERROR
                                               AND RETURN TO ROUTINE THAT
                                               WAS LAST STARTED IN
                                               SEQUENCE.

*      MONITOR, PART 2, RESET AND RETURN


05122  0760 00 0 00140  RESET  SLF             LIGHTS OUT
05123  0700 00 0 00000         CPY             TURN ON I/O CHECK LITE
05124 -0634 00 4 05153         SXD MONIT,4
05125 -0535 00 4 05153         LDC MONIT,4
05126  0634 00 4 05151         SXA EXIT-1,4    FOR DCTERR + TRPFLR.
05127  1 00001 4 05130         TXI *+1,4,1     GET RETURN ADDRESS
*5
05130  0634 00 4 05152         SXA EXIT,4
05131  0500 00 0 06362         CLA PROP2+1,
05132  0601 00 0 00000         STO             POST RESTART
05133 -0754 00 0 00000         PXD             CLEAR ACC
05134  0131 00 0 00000         XCA             AND
*10
05135 -0754 00 0 00000         PXD             MQ
05136  0140 00 0 05137         TOV *+1
05137  0161 00 0 05140         TQO *+1
05140 -0760 00 0 00002         EFTM
05141 -0760 00 0 00010         LSNM
*15
05142  0044 00 0 00000         PAI
05143  0774 00 7 00000         AXT 0,7
05144  0600 00 0 05516         STZ TRAP
05145  0760 00 0 00012         DCT
05146  0761 00 0 00000         NOP
*20
05147  0600 00 0 06436         STZ SHOP
05150  0600 00 0 06437         STZ SHOP+1
05151 -0055 00  000000         SIL **          IND FOR DCTERR + TRPFLR.
05152  0020 00 0 00000  EXIT   TRA **          RETURN
05153 +000000000000     MONIT  OCT +0



*      DIV CK ERROR INDICATION.
*      ON PRINTOUT, DECREMENT OF SI REG CONTAINS TEST LOC IN ERRO

05154  242363255151            BCD 1DCTERR
```

```
05155  0761 00 0 00000  DCTER  NOP


*      TRAP FAILURE INDICATION.
*      ON PRINTOUT, DECREMENT OF SI REG CONTAINS TEST LOC IN ERROR
05156  635147264351            BCD 1TRPFLR
05157  0761 00 0 00000  TRPER  NOP


*      MONITOR, PART 3, SPACE ROUTINE.

05160 -0634 00 4 05210  SPACE  SXD BIN,4      SAVE ERR ADDRESS
05161  0534 00 4 06366         LXA COUNT,4
05162  1 00001 4 05163         TXI *+1,4,1    COUNT ERRS
05163  0634 00 4 06366         SXA COUNT,4
05164  0534 00 4 06374         LXA COUNT+6,4  COUNT SPACE ERRS
*5
05165  1 00001 4 05166         TXI *+1,4,1
05166  0634 00 4 06374         SXA COUNT+6,4
05167  0604 00 0 06443         STI SHOP+5     SAVE SI
05170  0020 00 0 05172         TRA *+2        IND ERR AND RETURN

*WE WILL RETURN TO THE ROUTINE THAT WAS LAST STARTED CORRECTLU.

05171  624721232560            BCD 1SPACE
*10
05172  0761 00 0 00000         NOP            FOR FUTURE USE
05173 -0535 00 4 05210         LDC BIN,4
05174 -0634 00 4 05210         SXD BIN,4
05175 -0535 00 4 05153         LDC MONIT,4    ADDRESS OF TEST THAT
05176  0634 00 4 05210         SXA BIN,4      LOST CONTROL
*15
05177  0441 00 0 05210         LDI BIN
05200  0074 00 4 06503         TSX ERROR-1,4  PROGRAM SKIP OUT OF
05201  0761 00 0 05172         NOP *-7        CONTROL. THE ADDRESS
                                              FROM WHICH WE RECOVERED
                                              CONTROL IS IN THE
                                              DECREMENT OF THE SI.
                                              THE STARTING ADDRESS
                                              OF THE TEST WHICH WAS
                                              UNDERWAY IS IN THE
                                              ADDRESS OF THE SI.
05202 -0534 00 4 05153         LXD MONIT,4
05203  0500 00 4 77776         CLA -2,4
*20
05204  0737 00 2 00000         PAC ,2         RESET MONITOR
05205 -0634 00 2 05153         SXD MONIT,2
05206  0441 00 0 06443         LDI SHOP+5     RESTORE SI
05207  0020 00 4 00000         TRA 0,4        RETURN TO ROUTINE
05210  0000 00 0 00000  BIN    HTR            THE LOST CONTROL.

*      MONITOR, PART 4, PROGRAM START AND STOP CONTROL.

                                   FLUID DRIVE

05211  0774 00 1 00045  START  AXT ERROR-2-WOW,1
```

```
05212  0500 00 0 06363         CLA CATCH      TSX SPACE,4
05213  0601 00 1 06503  BURMA  STO ERROR-1,1
05214  2 00001 1 05213         TIX BURMA,1,1
05215  0774 00 1 70077         AXT 32767-PR,1 FILL ER UP
05216  0601 00 1 00000  SHAVE  STO ,1
05217  2 00001 1 05216         TIX SHAVE,1,1
05220 -0774 00 4 00032         AXC EST,4
05221 -0634 00 4 05153         SXD MONIT,4    SET MONITOR
05222  0774 00 1 00011         AXT 9,1        CLEARING OUT PASS AND
05223  0600 00 1 06375         STZ PASS+9,1     ERROR COUNT LOCATIONS.
05224  2 00001 1 05223         TIX *-1,1,1

05225  0761 00 0 00000         NOP
05226  0760 00 0 00163         SWT 3
05227  0020 00 0 05231         TRA *+2        PRINT ID
05230  0020 00 0 05122         TRA RESET      DONT PRINT
05231  0766 00 0 01361         WPRA           EXTRA SPACE
05232  0074 00 4 05600         TSX SPLAT,4    PRINT ID.
05233  0000 06 0 00013         HTR 11,0,6     CONTROL WORD.
05234  112526476062            BCD 69EFP SECTION 2, EXTENDED PRECISION
05235  252363314645
05236  600273602567
05237  632545242524
05240  604751252331
05241  623146456060
05242  264346216331            BCD 5FLOATING POINT TEST BEGINS.
05243  452760474631
05244  456360632562
05245  636022252731
05246  456233606060
05247  0766 00 0 01361         WPRA           SPACE
05250  0060 00 0 05250         TCOA *         WAIT FOR DISCONNECT
05251 -0774 00 4 00032         AXC EST,4
05252  0020 00 0 05122         TRA RESET      BEGIN 9EFP

                                   MONITOR, PART 4, CONTINUED
05253  0760 00 0 00166  DONE   SWT 6
05254  0020 00 0 05322         TRA STOP       END 9EFP IF 6 IS UP

                                   REPEAT PROGRAM IS SW6 DOWN.
                                   PRINT N PASSES COMPLETE
                                   AND TOTAL PASSES IF 3 IS UP
05255  0534 00 1 06364         LXA PASS,1
05256  0534 00 2 06365         LXA PASS+1,2
05257  1 00001 1 05260         TXI *+1,1,1
05260  1 00001 2 05261         TXI *+1,2,1
05261  0634 00 1 06364         SXA PASS,1     SAVE
05262  0634 00 2 06365         SXA PASS+1,2   COUNT

05263  3 00143 1 05266         TXH *+3,1,99   PRINT ON N PASSES.
05264 -0774 00 4 00032         AXC EST,4
05265  0020 00 0 05122         TRA RESET      RESTART


05266  0600 00 0 06364         STZ PASS       CLEAR ON EACH N PASSES
                                              TOTAL PASS COUNTER STILL COUNTS
```

```
05267  0760 00 0 00163         SWT 3          PRINT ON N-TH PASS, ONLY
05270  0020 00 0 05273         TRA *+3        IF SW3 IS UP.
05271 -0774 00 4 00032         AXC EST,4      IF SW3 IS DOWN
05272  0020 00 0 05122         TRA RESET      DONT PRINT.

05273  0754 00 1 00000         PXA ,1
05274  0074 00 4 06027         TSX BTEN,4     TRANSLATE TO BCD
05275  0761 00 0 00000         NOP
05276 -0600 00 0 05307         STQ NPASS+3    N-TH PASS COUNT
05277  0754 00 2 00000         PXA ,2
05300  0074 00 4 06027         TSX BTEN,4     TRANSLATE TO BCD
05301  0761 00 0 00000         NOP
05302 -0600 00 0 05313         STQ NPASS+7    TOTAL PASS COUNT
05303  0766 00 0 01361         WPRA           EXTRA SPACE
05304  0074 00 4 05600  NPASS  TSX SPLAT,4    PRINT N PASSES COMPLETE SIGNAL
05305  0000 07 0 00011         HTR 9,,7
05306  112526477360            BCD 59EFP,        PASSES. TOTAL OF
05307  606060606060
05310  604721626225
05311  623360634663
05312  214360462660
05313  606060606060            BCD 4       PASSES COMPLETED.
05314  604721626225
05315  626023464447
05316  432563252433

05317  0060 00 0 05317         TCOA *         WAIT FOR DISCONNECT.
                                   NOTE..I/O CHECK LITE IS TURNED ON PURPOSEL
05320 -0774 00 4 00032         AXC EST,4
05321  0020 00 0 05122         TRA RESET      REPEAT 9EFP

                                   MONITOR, PART 4, CONTINUED.
                                   SW6 IS UP, PRINT END OF PROG INFO AND LOAD CARD
05322  0600 00 0 06364  STOP   STZ PASS       CLEAR N PASS COUNTER
05323  0534 00 2 06365         LXA PASS+1,2   COUNT LAST PASS IN
05324  1 00001 2 05325         TXI *+1,2,1    TOTAL PASS COUNTER
05325  0634 00 2 06365         SXA PASS+1,2   SAVE TOTAL PASS COUNT, BUT
05326 -3 00001 2 05470         TXL WWDC,2,1    DONT PRINT IF
05327  0760 00 0 00163         SWT 3            ONLY ONE PASS
05330  0020 00 0 05332         TRA *+2           COMPLETED, OR
05331  0020 00 0 05470         TRA WWDC             IF SW3 IS DOWN.

05332  0766 00 0 01361         WPRA           EXTRA SPACE
05333  0754 00 2 00000         PXA ,2
05334  0074 00 4 06027         TSX BTEN,4     TRANSLATE TO BCD.
05335  0761 00 0 00000         NOP
05336 -0600 00 0 05346         STQ WTOP+7     TOTAL PASS COUNT.
05337  0074 00 4 05600  WTOP   TSX SPLAT,4    PRINT
05340  0000 07 0 00012         HTR 10,,7
05341  112526477360            BCD 59EFP, EX. PREC. FP TEST ENDS.
05342  256733604751
05343  252333602647
05344  606325626360
05345  254524623360
05346  606060606060            BCD 5       TOTAL PASSES COMPLETED.
05347  606346632143
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05350  604721626225
05351  626023464447
05352  432563252433

                                   MONITOR, PART 4, CONTINUED.
                                   PRINT ERROR STATISTICS, IF ANY.


05353  0534 00 1 06366         LXA COUNT,1    PRINT ERROR REPORT
05354 -3 00000 1 05470         TXL WWDC,1,0   IF THERE WERE ANY ERRORS.
05355  0766 00 0 01361         WPRA           EXTRA SPACE
05356  0074 00 4 05600         TSX SPLAT,4    PRINT
05357  0000 22 0 00005         HTR 5,,18
05360  255151465160            BCD 5ERROR REPORT BY TYPE OF ERROR.
05361  512547465163
05362  602270606370
05363  472560462660
05364  255151465133
05365  0074 00 4 05600         TSX SPLAT,4    PRINT
05366  0000 07 0 00011         HTR 9,,7
05367  606346632143            BCD 5 TOTAL      OV     P+Q     ACC
05370  606060606060
05371  466560606060
05372  604720506060
05373  606060212323
05374  606060606060            BCD 4      MQ    ZERO   SPACE
05375  445060606060
05376  712551466060
05377  606247212325

05400  0774 00 1 00007         AXT 7,1
05401  0500 00 1 06375         CLA COUNT+7,1
05402  0074 00 4 06027         TSX BTEN,4     TRANSLATE TO BCD
05403  0761 00 0 00000         NOP
05404 -0600 00 1 06445         STQ SHOP+7,1   SPECIAL SALON FOR TRANLATED WORDS
05405  2 00001 1 05401         TIX *-4,1,1

                                   MONITOR, PART 4, CONTINUED
                                   MOVE TRANSLATED WORDS TO BCD IMAGE
05406  0560 00 0 06436         LDQ SHOP
05407 -0600 00 0 05452         STQ WEAM+2
05410 -0754 00 0 00000         PXD            CLEAR
05411 -0500 00 0 06433         CAL BLANK
05412  0560 00 0 06437         LDQ SHOP+1
05413 -0763 00 0 00030         LGL 6*4
05414  0602 00 0 05453         SLW WEAM+3
05415 -0763 00 0 00014         LGL 12
05416  0560 00 0 06433         LDQ BLANK
05417 -0763 00 0 00014         LGL 12
05420  0560 00 0 06440         LDQ SHOP+2
05421 -0763 00 0 00014         LGL 12
05422  0602 00 0 05454         SLW WEAM+4
05423 -0130 00 0 00000         XCL
05424 -0501 00 0 06434         ORA BLANK+1
05425  0602 00 0 05455         SLW WEAM+5
05426  0560 00 0 06441         LDQ SHOP+3
```

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05427 -0600 00 0 05456         STQ WEAM+6
05430 -0500 00 0 06433         CAL BLANK
05431  0560 00 0 06442         LDQ SHOP+4
05432 -0763 00 0 00030         LGL 6*4
05433  0602 00 0 05457         SLW WEAM+7
05434 -0763 00 0 00014         LGL 12
05435  0560 00 0 06433         LDQ BLANK
05436 -0763 00 0 00014         LGL 12
05437  0560 00 0 06443         LDQ SHOP+5
05440 -0763 00 0 00014         LGL 12
05441  0602 00 0 05460         SLW WEAM+8
05442 -0763 00 0 00030         LGL 6*4
05443  0560 00 0 06433         LDQ BLANK
05444 -0763 00 0 00014         LGL 12
05445  0602 00 0 05461         SLW WEAM+9
05446  0560 00 0 06444         LDQ SHOP+6
05447 -0600 00 0 05462         STQ WEAM+10    FINAL WORD MOVED

*      ON WITH DOWNBEAT.

                                   MONITOR, PART 4, CONTINUED.
                                   PRINT STATISTICS, CLEAR, AND END PROGRAM
                                   BECAUSE SW6 IS UP.
05450  0074 00 4 05600  WEAM   TSX SPLAT,4    PRINT
05451  0000 07 0 00011         HTR 9,,7
05452  606060606060            BCD 9
05453  606060606060
05454  606060606060
05455  606060606060
05456  606060606060
05457  606060606060
05460  606060606060
05461  606060606060
05462  606060606060
                                   WORDS PLACED HERE BY PREVIOUS ROUTINE
05463  0774 00 1 00007         AXT 7,1
05464  0600 00 1 06445         STZ SHOP+7,1   CLEAR SALON
05465  2 00001 1 05464         TIX *-1,1,1

05466  0766 00 0 01361         WPRA
05467  0760 00 0 01361         SPRA 1         SKIP OUT PAGE


*POLTERGIESTS ARE SPONTANEOUS, ECOTPLASMIC FIGMENTS OF THE IMAGINATION.

                                   RESET AND LOAD CARDS.
05470  0060 00 0 05470  WWDC   TCOA *         WAIT FOR DISCONNECT
05471  0074 00 4 05122         TSX RESET,4
05472  0760 00 0 00005         IOT            TURN OFF. I/O CHECK IS TURNED
05473  0761 00 0 00000         NOP            ON INTENTIONALY BY THE RESET ROUTINE

05474  0762 00 0 01321         RCDA           PUSH LOAD BUTTON
05475  0540 00 0 06435         RCHA WOW
05476  0544 00 0 00000         LCHA
05477  0021 00 0 00001         TTR 1
```

```
                                    MONITOR, PART 5, MANUAL RESTART CONTROL.

*AN STR INSTRUCTION IS AT ZERO. SO IF YOU HAVE PRESSED RESET
*AND START, THE I/O CHECK LITE WILL BE OFF, AND THE
*ADDRESS AT ZERO WILL BE ON.

05500 -0760 00 0 00007  RESTR  LTM
05501  0760 00 0 00005         IOT             SHOULD BE OFF
05502  0020 00 0 05514         TRA WARL        ERR, NO RESET


05503  0534 00 4 00000         LXA ,4
05504  3 00001 4 05514         TXH WARL,4,1    SHOULD BE ONE
05505 -3 00000 4 05514         TXL WARL,4,0    SHOULD NOT BE ZERO

                                    OK, MANUAL RESET. IF SW1 IS DOWN, RETURN
                                    TO ROUTINE WHICH WAS INTERRUPTED. OTHERWISE

05506  0760 00 0 00161         SWT 1
05507  0020 00 0 05512         TRA *+3

05510 -0534 00 4 05153         LXD MONIT,4     RETURN TO SAME ROUT. SINCE
05511  0020 00 4 00000         TRA 0,4         SW 1 IS DOWN.

05512 -0774 00 4 00032         AXC EST,4       RESTART 9EFP ON RESET WITH
05513  0020 00 0 05122         TRA RESET       SW 1 UP.

05514 -0774 00 4 00002  WARL   AXC 2,4         ERROR, GOT TO LOCATION 2
05515  0020 00 0 05160         TRA SPACE        BY MISTAKE

                                    MONITOR, PART 6, FP TRAP CONTROL

*IF AN ADDRESS HAS BEEN SUPPLIED BY THE MAIN PROGRAM.

*THEN THE TRAP IS OK. XRC SHOULD BE ZERO ON ALL TRAPS.


05516  0000 00 0 00000  TRAP   HTR **          MAIN PROGRAM SUPPLIES ADDRESS
05517 -0760 00 0 00007         LTM
05520 -0520 00 0 05516         NZT TRAP
05521  0020 00 0 05530         TRA WOL         NO ADDRESS SUPPLIED
05522  3 00000 4 05554         TXH WRC,4,0     XRC SHOULD BE ZOER ON TRAP
05523  0534 00 4 05516         LXA TRAP,4      OK, GET RETURN
05524  0600 00 0 05516         STZ TRAP        RESET BEFORE NEXT TRAP
05525  0634 00 4 05527         SXA *+2,4
05526  0774 00 4 00000         AXT ,4          CLEAR XRC
05527  0020 00 0 00000         TRA **          RETURN TO PROGRAM


                                    NO ADDRESS SUPPLIED BY MAIN PROGRAM.
                                    DID WE TRAP IN ERROR, OR SKIP TO 10

05530  0634 00 1 05533  WOL    SXA *+3,1       SAVE
05531  0534 00 1 00000         LXA 0,1
05532  3 00000 1 05536         TXH *+4,1,0     IF NO ADD. AT ZERO-SPACE
05533  0774 00 1 00000         AXT **,1        RESTORE
```

```
05534 -0774 00 4 00010         AXC 8,4        GOT TO 10 IN ERROR
05535  0020 00 0 05160         TRA SPACE

05536  0634 00 1 05552         SXA WRC-2,1    SAVE TRAP ADDRESS.
05537  0534 00 1 05533         LXA *-4,1      RESTORE
05540  0534 00 4 06366         LXA COUNT,4    COUNT
05541  1 00001 4 05542         TXI *+1,4,1      TOTAL
05542  0634 00 4 06366         SXA COUNT,4        ERRORS
05543  0534 00 4 06373         LXA COUNT+5,4  COUNT
05544  1 00001 4 05545         TXI *+1,4,1       TRAP
05545  0634 00 4 06373         SXA COUNT+5,4       ERRORS
05546  0020 00 0 05550         TRA *+2
05547  635121476060            BCD 1TRAP
05550  0074 00 4 06503         TSX ERROR-1,4  TRAP TO 10 WHEN NO TRAP EXCPECTED.
05551  0761 00 0 05550         NOP *-1        WILL RETURN TO LOC
05552  0020 00 0 00000         TRA **         IN ADD. PART OF ZERO

                                   MONITOR, PART 6, CONTINUED.



05553  316063314425            BCD 1I TIME
05554  0600 00 0 06450  WRC    STZ SHOP+10
05555  0634 00 4 06450         SXA SHOP+10,4
05556  0604 00 0 06451         STI SHOP+11
05557  0441 00 0 06450         LDI SHOP+10
05560  0074 00 4 06503         TSX ERROR-1,4  XRC WAS NOT ZERO ON TRAP.
05561  0761 00 0 05554         NOP WRC        EITHER, TRAP WAS AT WRONG TIME.
                                              OR XRC WAS LOADED DURING THE
                                              TRAP OPERATION. THE CONTENTS
                                              OF XRC HAVE BEEN PLACED IN THE SI
05562  0534 00 4 06366         LXA COUNT,4    COUNT
05563  1 00001 4 05564         TXI *+1,4,1      TOTAL
05564  0634 00 4 06366         SXA COUNT,4        ERRORS
05565  0534 00 4 06373         LXA COUNT+5,4  COUNT
05566  1 00001 4 05567         TXI *+1,4,1       TRAP
05567  0634 00 4 06373         SXA COUNT+5,4       ERRORS
05570  0534 00 4 05516         LXA TRAP,4     GET RETURN
05571  0600 00 0 05516         STZ TRAP       RESET BEFORE NEXT TRAP
05572  0634 00 4 05575         SXA *+3,4      SET RETURN.
05573  0441 00 0 06451         LDI SHOP+11    RESTORE SI
05574  0534 00 4 06450         LXA SHOP+10,4  RESTORE XRC
05575  0020 00 0 00000         TRA **         RETURN TO PROGRAM



                                              INDEXABLE BCD PRINT SUBROUTINE.
*THIS  SUBROUTINE USES THREE SYMBOLS, THEY ARE...
                                              SPLAT, THE FIRST WORD OF THE ROUTINE
                                              CI, USED FOR CARD IMAGE, 26 LOCATION
                                              SUBET, THE CONTENTS OF XRC ARE STORED
                                                        IN THE ADDRESS OF SUBET.
*CONDTION  OF THE ACC, MQ, AND ACC OVERFLOW
*TRIGGER  IS NOT GUARANTEED ON EXIT FROM THIS ROUTINE.
                                              THE PRINTER ON CHANNEL A IS USED
                                              YOU MAY ENTER SPLAT+1 IF YOU HAVE
```

```
                                        ALREADY GIVEN WRIT SELECT.
                                        THE RCHA INSTRUCTION IS AT SPLAT+60.
                                        THERE IS NO CHANNEL DELAY IN THE
                                        SUBROUTINE, THEREFORE TAKE CARE NOT
                                        TO USE CI UNTIL AFTER 12 ROW-RIGTH
                                        HAS BEEN WRITTEN. FOR THIS REASON,
                                        YOU MUST GIVE WRS FOR EACH ENTRY
                                        OR ENTER AT SPLAT.
05576  0766 00 0 01341  CRNCH  WPUA     FOR PUNCHING ENTRY.
05577  0020 00 0 05601         TRA *+2
05600  0766 00 0 01361  SPLAT  WPRA     FOR PRINTING ENTRY.
05601  0634 00 1 05675         SXA SPLAT+61,1   SAVE XRA
05602  0634 00 2 05676         SXA SPLAT+62,2   SAVE XRB
05603  0634 00 4 05766         SXA SUBET,4   SAVE ORGINAL XRC.
05604 -0520 00 4 00001         NZT 1,4       IF CONTROL WORD ZERO.

*5
05605  0020 00 4 00002         TRA 2,4       RETURN TO MAIN PROGRAM.

05606 -0500 00 4 00001         CAL 1,4       GET NON-ZERO WORD
05607  0602 00 0 05725         SLW SPLAT+85  SAVE CONTROL WORD
05610 -0734 00 1 00000         PDX **,1      TYPE WHEEL NO. OR COL NO.
05611 -3 00000 1 05701         TXL SPLAT+65,1,0 IF DECR. ZERO, GET
                                           SECOND CONTROL WORD

*10    EVALUATION EXIT ADDRESS.
05612 -0634 00 4 05614         SXD *+2,4     TSX LOCATION.
05613  0737 00 2 00000         PAC 0,2       2S COMPL OF NO. BCD WORDS.
05614  1 00000 2 05615         TXI *+1,2,**
05615  0634 00 2 05677         SXA SPLAT+63,2 EXIT VALUE.

*      SETTING START COL FOR FILLING CARD IMAGE.
05616  0634 00 1 05621         SXA *+3,1     FOR SHIFTING

*15
05617  0774 00 3 00001         AXT 1,3       1 TO XRA AND XRB
05620 -0500 00 0 05722         CAL SPLAT+82  BIT INDEX TO P
05621 -0765 00 1 00000         LGR **,1      SHIFT TO STARTING POINT
05622 -0100 00 0 05625         TNZ *+3       IF ACC IS ZERO, SET FOR
05623 -0600 00 0 05723         STQ SPLAT+83  RIGHT ROW, AND MAKE

*20
05624  1 00001 2 05626         TXI *+2,2,1   XRB A DUECE
05625  0602 00 0 05723         SLW SPLAT+83  OTHERWISE, LEFT ROW.
05626  0774 00 1 00032         AXT 26,1
05627  0600 00 1 05766         STZ CI+26,1   CLEAR CARD IMAGE
05630  2 00001 1 05627         TIX *-1,1,1

                                    FORM CARD IMAGE.

*25
05631  2 00001 4 05632         TIX *+1,4,1   ADDRESS OF FIRST WORD.
05632  0774 00 1 00006         AXT 6,1       CHARACTER COUNT.
05633  0560 00 4 00001         LDQ 1,4       GET THE WORD.
05634  0634 00 1 05666         SXA SPLAT+54,1 SAVE CHARACTER COUNT.
05635 -0754 00 0 00000         PXD           CLEAR ACC
```

```
*30
05636 -0763 00 0 00002        LGL 2         ZONE
05637  0767 00 0 00001        ALS 1         TIMES 2
05640  0734 00 1 00000        PAX 0,1
05641  0634 00 1 05655        SXA SPLAT+45,1 FOR FUTURE REFERENCE.
05642  0760 00 0 00000        CLM

*35
05643 -0763 00 0 00004        LGL 4         DIGIT
05644  0767 00 0 00001        ALS 1         TIMES 2
05645  0602 00 0 05734        SLW CI        TEMP0
05646 -0500 00 0 05723        CAL SPLAT+83  BIT INDEX
05647 -0520 00 0 05734        NZT CI        IS DIGIT ZERO.

*40
05650  3 00000 1 05720        TXH SPLAT+80,1,0 IS ZERO ZONE TOO.
05651  0534 00 1 05734        LXA CI,1      OK, PROCEED
05652  3 00030 1 05660        TXH SPLAT+48,1,24 CHECK FOR ILLEGAL
05653  3 00024 1 05716        TXH SPLAT+78,1,20 SPECIAL CHARACTER.
05654 -0602 60 2 05734        ORS* SPLAT+92,2 XRB PICKS LEFT OR RIGHT.

*45
05655  0774 00 1 00000        AXT **,1      ZONE AGAIN.
05656 -3 00000 1 05660        TXL *+2,1,0   NOTHING FOR ZERO ZONE
05657 -0602 60 2 05732        ORS* SPLAT+90,2 PLACE ZONE BIT.

                                   COLUMN SET.

05660  0771 00 0 00001        ARS 1         SET BIT INDEX TO
05661 -0100 00 0 05665        TNZ *+4       NEXT COLUMN, IF ANY.

*50
05662  3 00001 2 05674        TXH SPLAT+60,2,1 IF BX ZERO,+XRB 1, STOP

05663 -0500 00 0 05722        CAL SPLAT+82  IF NOT, SET TO RIGHT
05664  1 00001 2 05665        TXI *+1,2,1   ROW AND PROCEED.
05665  0602 00 0 05723        SLW SPLAT+83  BX READY FOR NEXT COLUMN.
05666  0774 00 1 00000        AXT **,1      MORE CHARACTERS.

*55
05667  2 00001 1 05634        TIX SPLAT+28,1,1 NEXT COLUMN
05670  0534 00 1 05725        LXA SPLAT+85,1 MORE WORDS MAYBE.
05671 -2 00001 1 05674        TNX *+3,1,1    IF NOT, STOP.
05672  0634 00 1 05725        SXA SPLAT+85,1 YUMMY, GO GET EM.
05673  1 00000 0 05631        TXI SPLAT+25

*60
05674  0540 00 0 05724        RCHA SPLAT+84  LET HER RIP
05675  0774 00 1 00000        AXT **,1
05676  0774 00 2 00000        AXT **,2
05677  0774 00 4 00000        AXT **,4
05700  0020 00 4 00002        TRA 2,4         EXIT

                                   GET NEW CONTROL WORD FROM SOMPLACE
```

```
*65
05701  0634 00 4 05677         SXA SPLAT+63,4 FOR EXIT
05702  0534 00 1 05675         LXA SPLAT+61,1 RESTORE XRA
05703 -0520 60 0 05725         NZT* SPLAT+85 IF CONTROL WORD ZERO
05704  0020 00 0 05675         TRA SPLAT+61  RETURN.
05705 -0500 00 0 05725         CAL SPLAT+85  OLD CONTROL WORD

*70
05706  0625 00 0 05707         STT *+1       BRING OUT INDEX
05707 -0634 00 0 05711         SXD *+2,0     REGISTER, IF ONE IS TAGED.
05710  0737 00 4 00000         PAC 0,4
05711  1 00000 4 05712         TXI *+1,4,0   GET EFFECTIVE ADDRESS.
05712 -0500 00 4 00000         CAL 0,4       NEW CONTROL WORD.

*75
05713 -0734 00 1 00000         PDX 0,1       TYPE WHEEL ID.
05714  0602 00 0 05725         SLW SPLAT+85
05715  1 00001 4 05616         TXI SPLAT+14,4,1 PROCEED

                                   YOUR AN OLD SMOOOTHY.

05716 -0602 60 2 05730         ORS* SPLAT+88,2 PUT EIGTH IN, TAKE
05717  2 00020 1 05654         TIX SPLAT+44,1,16 16 OUTM, - GOOD BUSINESS

*80
05720 -3 00004 1 05657         TXL SPLAT+47,1,4 IF NOT BLANK, SET ZONE.
05721  0020 00 0 05660         TRA SPLAT+48    BLANK.

05722 -0 00000 0 00000         MZE             FOR BIT INDEX.
05723  0000 00 0 00000         HTR             DYNAMIC BIT INDEX.
05724  0000 30 0 05736         IOCD CI+2,,24   BUFFER COMMAND

*85
05725  0000 00 0 00000         HTR             SPECIAL SALON FOR
                                               THE CONTROL WORD
05726  0000 00 0 05741         HTR CI+5
05727  0000 00 0 05740         HTR CI+4        BROW ADDRESSES
05730  0000 00 1 05767         HTR CI+27,1
05731  0000 00 1 05766         HTR CI+26,1     ZONE ROW ADDRESSES

*90
05732  0000 00 1 05761         HTR CI+21,1
05733  0000 00 1 05760         HTR CI+20,1     DIGIG ROW ADDRESSES

               05734  CI     BSS 26
               05766  SUBET  BSS 1
*            BINARY TO OCTAL BCD SUBROUTINE


*      TRANSFORMS THE CONTENTS OF ACC 1-35 TO OCTAL IN BCD FORMAT.
*      TRANSFORMED WORD IN MQ AND ACC, WITH LOW ORDER IN MQ.

*      CALLING SEQUENCE-
*        A   TSX PX,4
*        A+1 PZE   COL 21-  STORAGE FOR SIGN BIT, NOT TRANSFORMED.
*                  COL 34-35-- STOREAGE FOR Q AND P, NO TRANSFORMED.
```

```
*        A+2       RETURN HERE WHEN MORE THAN SIX CHARACTERS.
*         A+3    RETURN HERE WHEN SIX OR LESS CHARACTERS.

*      NO BLANKS ARE INSERTED FOR LEADING ZEROS.


05767  0634 00 1 06017  PX     SXA PX+24,1
05770  0634 00 2 06020         SXA PX+25,2
05771  0634 00 4 06023         SXA PX+28,4    SAVE XRC
05772  0601 00 0 06024         STO FREER
05773  0771 00 0 00043         ARS 35         P AND Q
05774  0621 00 4 00001         STA 1,4        P AND Q TO X+1
05775  0560 00 0 06024         LDQ FREER
05776 -0754 00 0 00000         PXD            CLEAR ACC
05777 -0763 00 0 00001         LGL 1
06000  0767 00 0 00013         ALS 11         SIGN IF MINUS

*10
06001 -0602 00 4 00001         ORS 1,4        SIGN TO X+1
06002 -0765 00 0 00001         LGR 1          DROP SIGN
06003  0774 00 3 00006         AXT 6,3
06004 -0754 00 0 00000         PXD            CLEAR ACC
06005  0767 00 0 00003         ALS 3          ZONE

06006 -0763 00 0 00003         LGL 3          DIGIT
06007  2 00001 1 06005         TIX *-2,1,1    6 TIMES.
06010  0602 00 0 06025         SLW FREER+1
06011 -0754 00 0 00000         PXD            CLEAR ACC
06012  0767 00 0 00003         ALS 3          ZONE

*20
06013 -0763 00 0 00003         LGL 3          DIGIT
06014  2 00001 2 06012         TIX *-2,2,1    6 TIMES
06015 -0130 00 0 00000         XCL            SECOND WORD TO MQ,
06016 -0500 00 0 06025         CAL FREER+1    FIRST TO ACC
06017  0774 00 1 00000         AXT **,1       RESTORE XRA
06020  0774 00 2 00000         AXT **,2       RESOTRE XRB
06021  0100 00 4 00003         TZE 3,4        X+3 FOR 1 WORD.
06022  0020 00 4 00002         TRA 2,4        X+2 FOR 2 WORDS.
06023 +000000000000            OCT +0         TEMP FOR XRC.


               06024  FREER  BSS 3

*              FIXED BINARY TO FIXED DECIMAL BCD


*      TRANSFORMS THE CONTENTS OF ACC P-35 TO DECIMAL BCD.
*      TRANSFORMS WORD IN MQ AND ACC WITH LOW ORDER DIGITS IN MQ.

*      CALLING SEQUENCE
*        A   TSX BTEN,4
*        A+1       RETURN HERE WHEN MORE THEN SIX DECIMAL DIGITS.
*        A+2       RETURN HERE WHEN SIX OR LESS DECIMAL DIGITS.
```

```
*      BLANKS ARE INSERTED FOR LEADING ZEROES-
*      THE SIGN OF NUMBER IS ATTACHED, IF NO. IS LESS THAN 12 DEC DIGITS.
*           BLANK FOR PLUS
*           MINUS FOR MINUS


06027  0634 00 1 06056  BTEN   SXA BTEN+23,1
06030  0634 00 2 06057         SXA BTEN+24,2
06031  0634 00 0 06076         SXA BTEN+39    SAVE XRC.
06032  0602 00 0 06076         SLW FREE       DROP SIGN
06033  0760 00 0 00000         CLM
06034  0601 00 0 06101         STO FREE+3     SAVE SIGN
06035  0600 00 0 06077         STZ FREE+1
06036  0600 00 0 06100         STZ FREE+2
06037  0774 00 2 00002         AXT 2,2
06040  0774 00 1 00044         AXT 36,1

*10
06041 -0754 00 0 00000         PXD            CLEAR ACC.
06042  0560 00 0 06076         LDQ FREE
06043 -0520 00 0 06076         NZT FREE       WHEN ZERO-
06044  0020 00 0 06061         TRA BTEN+26    FINISHED.
06045  0221 00 0 06075         DVP BTEN+38    BY 10 DECIMAL.
06046 -0600 00 0 06076         STQ FREE
06047  0767 00 1 00044         ALS 36,1       SHIFT TO POSITION,
06050  0361 00 2 06101         ACL FREE+3,2   TACK ON LOW ORDER-
06051  0602 00 2 06101         SLW FREE+3,2   SAVE PARTIAL RESULT.
06052  2 00006 1 06041         TIX BTEN+10,1,6 GET NEXT DIGIT, OR

*20
06053  2 00001 2 06040         TIX BTEN+9,2,1 SECOND WORD.
06054  0500 00 0 06100         CLA FREE+2     IF XRB RUNS OUT BEFORE
                                               QUOT. IS ZOER, NO
                                               ROOM FOR SIGN.
06055  0560 00 0 06077         LDQ FREE+1     LOW ORDER TO MQ.
06056  0774 00 1 00000         AXT **,1       RESTORE XRA
06057  0774 00 2 00000         AXT **,2       RESTORE XRB

06060  0020 00 4 00001         TRA 1,4        EXIT-TO X+1 FOR 2 WORDS.
06061  0500 00 0 06101         CLA FREE+3     BRING IN SIGN.
06062 -0501 00 0 06073         ORA BTEN+36    BLANK-MINUS.
06063 -0120 00 0 06065         TMI *+2        WAS WORD MINUS.
06064 -0500 00 0 06074         CAL BTEN+37    NO, GET BLANKS

*30
06065  0767 00 1 00044         ALS 36,1
06066  0361 00 2 06101         ACL FREE+3,2   NON-ZERO DIGITS.
06067 -3 00001 2 06055         TXL BTEN+22,2,1 OUT ON HIGH ORDER
06070 -0130 00 0 00000         XCL
06071 -0500 00 0 06074         CAL BTEN+37    HIGH ORDER BLANK.

06072  1 77777 4 06056         TXI BTEN+23,4,-1 RETURN TO X+2
06073 -006060606040           OCT -406060606040 BLANK MINUS.
06074 -206060606060           OCT 606060606060  BLANK PLUS
06075  0000 00 0 00012         HTR 10         DIVISOR
```

```
                06076  FREE   BSS 4

************************************************************

****   CONSTANT USED FOR MPY AND EMP.

************************************************************


06102 -125252525252     P52S   OCT 525252525252
06103 -377777777776     BS134  OCT -377777777776
06104 -377777777777     BS135  OCT -377777777777
06105 +377777777777     B135   OCT +377777777777
06106 +300000000001     B1235  OCT 300000000001
06107 -040000777777     ALTMD  OCT -040000777777,-377777777774
06110 -377777777774
06111 -377777777774     MSK34  OCT -377777777774  MSK FRO EDPEMP TEST.
06112 +000000060000     MSK2   OCT +000000060000
06113 +040000000000     K1     OCT 040000000000
06114 +000000000000            OCT 000000000000
06115 -040000000000     K2     OCT 440000000000
06116 +000000000000            OCT 000000000000
06117 +040000000000     K3     OCT 040000000000
06120 -000000000000            OCT 400000000000
06121 +040000000000     K4     OCT 040000000000
06122 -077777777777            OCT 477777777777
06123 +040000000000     K5     OCT 040000000000
06124 +300000000000            OCT 300000000000
06125 +040000000000     K6     OCT 040000000000
06126 +200000000000            OCT 200000000000
06127 +070000000000     K7     OCT 070000000000
06130 +200000000000            OCT 200000000000
06131 +010000000000     K8     OCT 010000000000
06132 +200000000000            OCT 200000000000
06133 +040000000000     K9     OCT 040000000000
06134 +000000000001            OCT 000000000001
06135  0761 00 0 00000          NOP
06136  0761 00 0 00000          NOP
06137 +040005000000     EP20   OCT +040005000000,+240000000000
06140 +240000000000
                                    SOME UNNORMALIZED EXT PREC NUMBERS.
06141 +040043000000     UEP1   OCT +040043000000,+000000000001
06142 +000000000001
06143 +040002000000     UEP4   OCT +040002000000,+100000000000
06144 +100000000000
06145 +040004000000     UEP16  OCT +040004000000,+100000000000
06146 +100000000000
06147 +040025000000     UEPE6  OCT +040025000000,+172044000000
06150 +172044000000

****   CONSTANTS USED FOR EDP AND DVP

06151 +200000000000     D1     OCT +200000000000
06152 +252525252525     D2     OCT +252525252525
06153 -200000000000     D3     OCT -200000000000
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```
06154 +000000000000     D4     OCT +0
06155 +000000000002     D5     OCT +2
06156 +125252525252     D6     OCT +125252525252
06157 +104210204041     D7     OCT +104210204041
06160 -125252525252     D8     OCT -125252525252
06161 +000000000001     D9     OCT +1
06162 -000000000000     D10    OCT -0
06163 -377777777777     D11    OCT -377777777777
06164 +347777777777     D12    OCT +347777777777
06165 +030000000000     D13    OCT +030000000000
06166 -200000000000            OCT -200000000000
06167 +040000000000     D14    OCT +040000000000
06170 +340000000000     D15    OCT +340000000000
06171 +377777777777     D16    OCT +377777777777
06172 +040000000000     D17    OCT +040000000000
06173 +100000000000            OCT +100000000000
06174 +040000000000     D18    OCT +040000000000
06175 -100000000000            OCT -100000000000
06176 -040000000000     D19    OCT -040000000000
06177 +100000000000            OCT +100000000000
06200 +040000000000     D20    OCT +040000000000
06201 +200000000000            OCT +200000000000
06202 +040000000000     D21    OCT +040000000000
06203 +300000000000            OCT +300000000000
06204 +040000000000     D22    OCT +040000000000
06205 -200000000000            OCT -200000000000
06206 -040000000000     D23    OCT -040000000000
06207 -200000000000            OCT -200000000000
06210 -040000000000     D24    OCT -040000000000
06211 +200000000000            OCT +200000000000
06212 +007000000000     D25    OCT +007000000000
06213 +200000000000            OCT +200000000000
06214 +077777000000     D26    OCT 077777000000
06215 +200000000000            OCT 200000000000
06216 +010000000000     D27    OCT 010000000000
06217 +200000000000            OCT 200000000000
06220 +050101000000     D28    OCT 050101000000
06221 +300000000000            OCT 300000000000
06222 +243210323232     D29    OCT +243210323232
06223 +100000000001            OCT +100000000001
06224 +012345232323     D30    OCT +12345232323
06225 +100000000000            OCT +100000000000
06226 +000001000000     D31    OCT +000001000000
06227 +040002000000     D32    OCT +040002000000,+200000000000
06230 +200000000000

*      EXTENDED PRECISION FLOATING POINT EQUIVALENTS OF THE
*POWERS OF TEN UP TO AND INCLUDING THE 20TH POWER.

06231 +040001000000     EPE0   OCT +040001000000,+200000000000
06232 +200000000000
06233 +040004000000     EPE1   OCT +040004000000,+240000000000
06234 +240000000000
06235 +040007000000     EPE2   OCT +040007000000,+310000000000
06236 +310000000000
06237 +040012000000     EPE3   OCT +040012000000,+372000000000
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06240 +372000000000
06241 +040016000000     EPE4   OCT +040016000000,+234200000000
06242 +234200000000
06243 +040021000000     EPE5   OCT +040021000000,+303240000000
06244 +303240000000
06245 +040024000000     EPE6   OCT +040024000000,+364110000000
06246 +364110000000
06247 +040030000000     EPE7   OCT +040030000000,+230455000000
06250 +230455000000
06251 +040033000000     EPE8   OCT +040033000000,+276570200000
06252 +276570200000
06253 +040036000000     EPE9   OCT +040036000000,+356326240000
06254 +356326240000
06255 +040042000000     EPE10  OCT +040042000000,+225005744000
06256 +225005744000
06257 +040045000000     EPE11  OCT +040045000000,+272207335000
06260 +272207335000
06261 +040050000000     EPE12  OCT +040050000000,+350651224200
06262 +350651224200
06263 +040054000000     EPE13  OCT +040054000000,+221411634520
06264 +221411634520
06265 +040057000000     EPE14  OCT +040057000000,+265714203644
06266 +265714203644
06267 +040062000000     EPE15  OCT +040062000000,+343277244615
06270 +343277244615
06271 +040066000000     EPE16  OCT +040066000000,+216067446770
06272 +216067446770
06273 +040071000000     EPE17  OCT +040071000000,+261505360566
06274 +261505360566
06275 +040074000000     EPE18  OCT +040074000000,+336026654723
06276 +336026654723
06277 +040100000000     EPE19  OCT +040100000000,+212616214043
06300 +212616214043
06301 +040103000000     EPE20  OCT +040103000000,+255361657053
06302 +255361657053

********************CONSTANTS************************************

                                   USED FOR ADD/SUB, AND SUBROUTINES.

06303 +040005000000     LGC1   OCT 040005000000
06304 +010000000000            OCT 010000000000
06305 +040051000000     LGC2   OCT 040051000000
06306 +200000000000            OCT 200000000000
06307 +077777000000            OCT 077777000000
06310 +200000000000            OCT 200000000000
06311 +074637000000     LGC3   OCT 074637000000 *
06312 +377777777777            OCT 377777777777 *
06313 +074575000000            OCT 074575000000 *
06314 +200000000000            OCT 200000000000 *
06315 +040076000000     LGC4   OCT 040076000000 *
06316 +200000000014            OCT 200000000014
06317 +040100000000            OCT 040100000000
06320 +037777777777            OCT 037777777777
06321 +040043000000     C43    OCT 040043000000
06322 +177777777777            OCT 177777777777
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```
06323 +040042000000            OCT 040042000000
06324 +377777777777            OCT 377777777777
06325 +000041000000     C41    OCT 000041000000
06326 +040060000000            OCT 040060000000
06327 +200000000000            OCT 200000000000
06330  0 00001 0 00000         PZE ,,1
06331  0 20000 0 00000         PZE ,,20M

                 06332  IND    BSS 1          ERROR INDICATOR
06333 +000000400000     COL18  OCT 400000     BIT IN COL 18
06334 +000000200000     COL19  OCT 200000     BIT IN COL 19
06335  0 00000 0 00000  MQ                    TEMPOS
06336  0 00000 0 00000  ACC
06337  0 00000 0 00000  PQ
06340  0 00000 0 00000  ZERO
06341 +000000000001     ONE    DEC 1,2,3,4,5
06342 +000000000002
06343 +000000000003
06344 +000000000004
06345 +000000000005
06346 +000000000006            DEC 6,7,8,9,10
06347 +000000000007
06350 +000000000010
06351 +000000000011
06352 +000000000012
06353 -0 00000 0 00000  COLS   MZE            BIT IN COL S.
06354  2 00000 0 00000  COL1   PTW            BIT IN COL 1
06355  1 00000 0 00000  COL2   PON            BIT IN COL 2
06356  0 40000 0 00000  COL3   PZE ,,4096*4   BIT IN COL 3
06357  0 20000 0 00000  COL4   PZE ,,4096*2   BIT IN COL 4
06360  0 10000 0 00000  COL5   PZE ,,4096     BIT IN COL 5
06361 +000000000200     PROP2  OCT 200
06362 -1 00000 0 00000         STR
06363  0074 00 4 05160  CATCH  TSX SPACE,4
                 06364  PASS   BSS 2          PASS COUNTERS
                 06366  COUNT  BSS 7          COUNT ERRS, TOTAL, OV,
                                              PQ, ACC, MQ, LOC ZERO,
                                              AND SPACE ERRS
06375  0 40001 0 00000  EONE   PZE ,,40M+1    EXTENDED ONE
06376  2 00000 0 00000         PTW            40001.2
06377  0 40002 0 00000  ETWO   PZE ,,40M+2    EXTENDED TWO
06400  2 00000 0 00000         PTW            40002.2
06401  0 40002 0 00000  ETHRE  PZE ,,40M+2    EXTENDED 3
06402  3 00000 0 00000         PTH            40002.2
06403  0 40003 0 00000  EFOUR  PZE ,,40M+3    EXTENDED 4
06404  2 00000 0 00000         PTW            40003.2
06405  0 40003 0 00000  EFIVE  PZE ,,40M+3    EXTENDED 5
06406  2 40000 0 00000         PTW ,,40M      40003.24
06407  0 40003 0 00000  ESIX   PZE ,,40M+3    EXTENDED 6
06410  3 00000 0 00000         PTH            40003.3
06411  0 40003 0 00000  ESVN   PZE ,,40M+3    EXTENDED 7
06412  3 40000 0 00000         PTH ,,40M      40003.34
06413  0 40004 0 00000  EEIT   PZE ,,40M+4    EXTENDED 8
06414  2 00000 0 00000         PTW            40004.2
06415  0 40004 0 00000  ENINE  PZE ,,40M+4    EXTENDED 9
06416  2 20000 0 00000         PTW ,,4096*2   40004.22
```

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06417  0 40004 0 00000  ETEN   PZE ,,40M+4    EXTENDED 10
06420  2 40000 0 00000         PTW ,,40M      40004.24
06421 +000000000000     EZERO  OCT 0,0        NORMAL EXTENDED ZERO.
06422 +000000000000
06423 +040043000000     FLOAT  OCT 040043000000,0
06424 +000000000000
06425 +000001000000            OCT 000001000000
06426 +020000000000            OCT 020000000000
06427 -3 77777 7 77777  AONES  MTH -1,7,-1    ALL ONES S-35
06430  3 77777 7 77777  PONES  PTH -1,7,-1    ALL ONES 1-35
06431 -125252525252     ALTON  OCT -125252525252 ALTERNATE ONES-MINUS
06432 +252525252525     ALTNP  OCT 252525252525 ALTERNATE ONES-PLUS

06433  606060606060     BLANK  BCD 1
06434  000000006060            BCD 10000
                00100  C      EQU 64         100 OCTAL
                01000  M      EQU 512        1000 OCTAL
                10000  10M    EQU 4096 10,000 OCTAL
                40000  40M    EQU 4096*4     40,000 OCTAL
                20000  20M    EQU 4096*2     20,000 OCTAL
06435 -1 00003 0 00000  WOW    IOCT ,,3
                06436  SHOP   BSS 14         WORKING STORAGE
                06504  ERROR  EQU 3396
                06511  OK     EQU 3401
                07700  PR     EQU 4032
                05211         END START
```