SERIES 32
PROCESSOR TEST
PART 2

Consists Of:

Test Program Description	B06-155R02A15
Test Program Listing	06-155R02A13
Bootstrap Object Tape	06-155R02M17
R03 Patch Information	Sheet i/ii

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R03 Patch Information

In the R02 version of program 06-155, the use of a console device that generates a parity list causes error '0107' or error '010A'. Until the program is formally revised, it can be patched as follows:

Location	Old Hex	New Hex		
0DCE	C840	4300		B Patch 1
0DD0	0035	37C0		
0DE4	D250	4300		B Patch 2
0DE6	3260	37D4		
37C0	XXX	4840	Patch 1	LH R4, Temp
37C2		3360		
37C4		C440		NHI R4,X'7F7F'
37C6		7F7F		
37C8		4040		STU R4,TEMP
37CA		3360		
37CC		C840		LHI R4.X'35'
37CE		0035		
37D0		4300		B T1A10A+4
37D2		0DD2		
37D4		C450	Patch 2	NHI R5.X'7F7F'
37D6		7F7F		
37D8		D250		STB R5,BUFR3
37DA		3260		
37DC		4300		B X'DE8'
37DE		0DE8		

Note: This patch has been incorporated in object 06-155R02.1 on Multi-Media packages.

SERIES 32 PROCESSOR TEST PART 2

Series 32 Processor Test Part 2	06-155R02

Related Documents

Test Program Listing	06-155R02M91A13
Test Program Paper Tape	06-155R02M17

Test Programs to be Run Prior to Loading this Test

Series 32 Basic Test	06-158
Series 32 Processor Test Part 1	06-154

Other Applicable Test Programs

Series 32 Memory Test	06-156
Common Teletype Basic Confidence Test	06-004
Common CRT Test	06-146
Common Current Loop Interface Test	06-184
Common Carousel 300 Test	06-183

PURPOSE OF TEST

This program is designed to test all the features of the Series 32 Machine which require some manual intervention to test them. This program also exercises all the I/O instructions. The program consists of a total of nine subtests. Each subtest can be individually selected. Refer to the program listing for the detailed description of each subtest. The subtests check the instructions/features described below:

SUBTEST 1: Checks all I/O instructions (WB, RB, etc.) to print on the console device, then, using different read instructions, reads the keys.

SUBTEST 2: Mode = Halfword Mode (PSW Bit 11 = 1). Model 7/32 with Halfword Mode Feature only. Instructions tested: AI, AIR. Uses the console device to generate and check external interrupt handling in halfword mode.

SUBTEST 3: Uses the console device to generate and check external interrupt handling. Checks the system queue service interrupt and the console interrupt.

SUBTEST 4: Checks all the single precision Floating Point Instructions. (Use only for firmware implemented floating point).

SUBTEST 5: Checks all the features of the Auto Driver Channel using the console device.

SUBTEST 6: Checks all the features of the Console Panel Display.

SUBTEST 7: Tests the Initialization Operation. The user must initialize the machine after characters PRESS INIT are printed. The program checks for the correct PSW swap and register storage.

SUBTEST 8: This test is identical to Subtest 7 except that the auto-restart feature and the machine malfunction interrupt are tested.

SUBTEST 9: This test has six sections: S3P1, S3P2,..., and S3P6 testing the LRA instruction in different protect modes. Each section increments to 10000 on the display.

NOTE:

For detailed description of each subtest see the listing.

MINIMUM HARDWARE REQUIRED

Processor

Series 32 Processor
16KB of Memory

Console Input Device

Teletype, CRT on PASLA, Carousel 15,30, or 300

Paper Tape Reader

Teletype or High Speed Paper Tape Reader/Punch

Display Panel

Optional

REQUIREMENTS OF MACHINE UNDER TEST

This program assumes that the programs indicated in the "Test Programs to be Run Prior to Loading this Test" section have been run without detecting an error.

Device Address

See Appendix 1

LOADING PROCEDURE

Test Tape Format

Absolute, non-zoned object tape (M17) with front end boot loader. The test program occupies approximately 16KB of memory.

Normal Loading Procedure

Manually enter the X'50' sequence shown below, into memory:

	LOCATION	CONTENTS
	X'30'	X'0000'
	X'32'	X'0000'
	X'34'	X'0000'
	X'36'	X'0050'
	X'50'	X'D500'
	X'52'	X'00CF'
	X'54'	X'4300'
	X'56'	X'0080'
For TTY	X'78'	X'0294'
HSPTR	X'78'	X'0399'
HSPTR/P	X'78'	X'1399'

Place the program tape in the paper tape reader.

Execute at address X'30'.

When the processor halts, observe the halfword, displayed on the console display register D1. If it is X'374B', loading is complete; otherwise, repeat the loading procedure.

Multi-Media Diagnostic Loading Procedure.

To load this program from the INTERDATA Multi-Media Diagnostic System, refer to Publication 06-176A15.

PROGRAM EXECUTION

Refer to Appendix 1 and set up the addresses for console input device and the list device.

Address memory location X'A00'. Execute and observe the following title output to the list device:

```
S32PT2 R02
CPU
*
```

OPERATING PROCEDURES

Normal Testing.

Each test in Part 2 assumes that Part 1 was run successfully without detecting an error. Therefore, to get any meaningful results from the error messages (Appendix 4), Part 1 must be run prior to Part 2. Load Part 2 of the Series 32 Processor Test and observe that the following is printed:

```
S32PT2 R02
CPU
```

Depress 2 keys corresponding to the Processor under test (see Appendix 3). For example, if the Processor under test is a Model 7/32 with no Display, depress Keys 7D.

Observe that the following is printed:

```
SUBTEST
*
```

Now, select desired subtest in accordance with the following table.

PROCESSOR	SUBTEST SELECTION
1. Model 7/32 with Display Panel	1, 2, 3, 5, 6, 7
2. Model 7/32 without Display Panel	1, 2, 3, 5, 7
3. Model 8/32 with Display Panel	1, 3, 5, 6, 7
4. Model 8/32 without Display Panel	1, 3, 5, 7

Subtest 8 should be selected only if the processor under test has the Power Fail Auto-Restart option.

Subtest 2 should be selected only in the case of Model 7/32 equipped with the Halfword Mode feature. Executing subtest 2 on the 7/32C processor results in a '2F2' failure (illegal instruction).

Subtest 4 should be selected only on a processor with the firmware implemented single precision floating point option. Subtest 4 must not be used to test the hardware floating point option of the 7/32C or the 8/32.

Subtest 9 should be selected only on a processor which contains the LRA as part of the instruction set.

NOTE:

If a Loader Storage Unit is installed, it must be turned off prior to selecting subtests 7 or 8.

Optional Testing

If the processor under test is equipped with the multi-level priority interrupt feature, the console device may be connected at a priority interrupt level other than 0 (zero) to test the multi-level interrupt system during execution of subtests 3 and 5. This change does not affect the execution of the other subtests.

Expected results for each subtest are given in Appendix 2. If the actual printout differs from expected, see appropriate error messages in Appendix 4 for further action.

ERROR PROCEDURES

In the case of an error, further action depends on the type of error.

(Refer to Appendix 4 for a description of each error number). The error number is also copied into the console panel indicators as shown in Figure 1 or Appendix 3.

Upon the detection of a spurious interrupt, the error number is copied into the console panel indicators, as shown in Figure 1 of Appendix 3. The processor is halted by loading a PSW of X'8000'. When the RUN switch is depressed, an error message is printed on the Teletype.

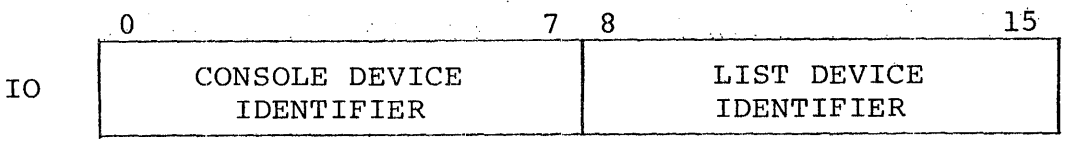
In some cases, a detected error will cause the WAIT light on the console panel display to be turned on. The user should examine PSW LOC (Function 5). Depressing the RUN switch should cause an error message to be displayed.

Since LRA instruction can be used to simulate MAC operation, the calculate address routine should be understood by the user. (See the Model 7/32 Processor User's Manual, Publication Number 29-405 or Model 8/32 Processor User's Manual, Publication Number 29-428). When the error printout shows the program address and the segmentation register, the real address can be computed and compared against the result of the LRA instruction. The software subroutine doing this calculation is labeled ADRCAL and is checked in each section of Subtest 9.

APPENDIX 1

USER DEVICE DEFINITION

The halfword labeled IO (see the listing) has the default value for Teletype as an input-output console device. If the set-up is different, it must be changed as follows:



KEYBOARD DEVICE IDENTIFIER	EXPLANATION
X'01'	GDT on PASLA/PALM Interface, strapped for FDX and the highest baud rate.
X'02'	TTY on TTY Interface GDT/CRT on Current Loop Interface Carousel 15, 30
X'04'	Carousel 300 on PASLA/PALM Interface strapped for FDX at highest baud rate.

LIST DEVICE IDENTIFIER	EXPLANATION
X'01'	As above.
X'02'	As above.
X'04'	As above

The GDT (Graphic Display Terminal), CRT or Carousel 300; if used on PASLA/PALM Interface, should be strapped for the device address of X'10' and X'11' for receiving and transmitting side respectively. If it is different, the halfword labeled PASADR (see the listing) must be changed accordingly.

The Teletype or Current Loop Interface, if used, should be strapped for the device address of X'02'. If it is different, the halfword labeled TTYADR (see the listing) must be changed accordingly.

APPENDIX 2

EXPECTED RESULTS

SUBTEST 1

```
SUBTEST
*
1                       INPUT BY USER
DEPRESS KEYS            PRINTED BY PROGRAM      WB
1234567890
1234567890              INPUT BY USER           RDR, RD, RH, RHR, RBR
DEPRESS KEYS            PRINTED BY PROGRAM      WBR, WH, WHR, WDR, WD
1234567890
1234567899              INPUT BY USER           RB
NO ERROR
```

SUBTEST 2

```
SUBTEST
*
2
PRESS BRK               PRINTED BY PROGRAM
NO ERROR
```

SUBTEST 3

```
SUBTEST
*
3                       INPUT BY USER
TTY PRIOR LEV           PRINTED BY PROGRAM  }
*                                           }   model 8/32 ONLY
0                       INPUT BY USER       }
PRESS BRK               PRINTED BY PROGRAM
NO ERROR
```

SUBTEST 4

```
SUBTEST
*
4                       INPUT BY USER
NO ERROR                PRINTED BY PROGRAM
```

SUBTEST 5

```
SUBTEST
*
5
TTY PRIOR LEV           PRINTED BY PROGRAM  }
*                                           }   MODEL 8/32 ONLY
0                       INPUT BY USER       }
```

1234567890	PRINTED BY PROGRAM	(See Routine S5A3, B=0)
1234567890	PRINTED BY PROGRAM	(S5A4, B=0, E=1.ADC)
ABCDEFGHIJ	PRINTED BY PROGRAM	(S5A4, B=1, E=1.ADC)
1234567890	PRINTED BY PROGRAM	(S5A8, B=1, T=1.ADC)
DEPRESS KEYS	PRINTED BY PROGRAM	(Using WBR)
1234567890	PRINTED BY PROGRAM	(Using WBR)
1234567890	INPUT BY USER	(S5A9, F=1.ADC)
1234567890	PRINTED BY PROGRAM	(From input buffer using WBR)
DEPRESS KEYS	PRINTED BY PROGRAM	(Using WBR)
1234567890	PRINTED BY PROGRAM	(Using WBR)
1234567890	INPUT BY USER	(S5A10, E=1, B=1, T=1.ADC)
ABCDEFGHIJ	PRINTED BY PROGRAM	(From input buffer using WBR)

SUBTEST 6

SUBTEST	
*	
6	
ABCDEF	USER DEPRESS BREAK KEY TO SELECT EACH TEST FEATURE

SUBTEST 7

SUBTEST	
*	
7	
REG SETS AVAIL	MODEL 8/32 ONLY (SEE NOTES)
*	
8	
INITIALIZE	
PRESS BRK	(USER DEPRESSES "INT" BUTTON, PRESSES "BRK" KEY)
POWER OFF/ON	
PRESS BRK	(USER TURNS POWER SWITCH OFF/ON, PRESSES "BRK" KEY)
NO ERROR	

SUBTEST 8

SUBTEST	
*	
8	
REG SETS AVAIL	MODEL 8/32 ONLY (SEE NOTES)
*	
8	
INITIALIZE	
PRESS BRK	(USER DEPRESSES "INT" BUTTON, PRESSES "BRK" KEY)
POWER OFF/ON	
PRESS BRK	(USER TURNS POWER SWITCH OFF/ON, PRESSES "BRK" KEY)
NO ERROR	

SUBTEST 9

SUBTEST	
*9	
NO ERROR	DISPLAY COUNTS FROM 00000 to 100000 6 times

APPENDIX 3

CONSOLE PANEL INDICATORS

When an error is detected, the error number (ERRNO) is copied to the Display Panel as shown below:

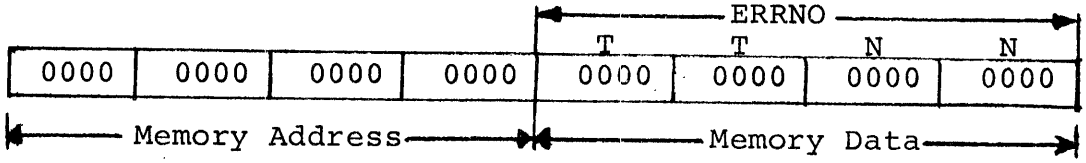


FIGURE 1.

TABLE A3-1

KEYS	MODELS DENOTED
7X	7-32 WITH DISPLAY
7D	7-32 NO DISPLAY
8X	8-32 WITH DISPLAY
8D	8-32 NO DISPLAY

NOTE

The two characters, denoting the model under test, are stored in memory location labelled CPUNO (see the listing).

APPENDIX 4

ERROR MESSAGES

SUBTEST NO.	ERROR NO.	TYPE OF FAILURE, INSTRUCTION FAILED
1	0101	WB
	0102	RDR
	0103	RD (Even Address)
	0104	SS, SSR
	0105	RD (Odd Address)
	0106	RH (Even Address)
	0107	RH (Odd Address)
	0108	RBR
	0109	RB
	010A	RHR
	010B	WBR, WH, WD, WHR, WDR
2	0201	False SYNC from device zero was incorrect "AIR" (OPCODE = DF) in halfword mode.
	0202	False SYNC from device zero was incorrect. "AI" (OPCODE = 9F) in halfword mode.
	0203	No interrupt was generated from the Teletype when the Teletype mode was changed from read to write.
	0204	Incorrect Dev. Adr., status received from the Teletype when the interrupt was acknowledged. Old PSW not stored at LOC X'40'. AIR (OPCODE = DF) in halfword mode.
2	0205	No interrupt was generated by the BRK key on the Teletype.
2	0206	Incorrect status, Dev. Adr. received when an interrupt was acknowledged from the Teletype. AI (OPCODE = 9F) in halfword mode.

SUBTEST NO.	ERROR NO.	TYPE OF FAILURE, INSTRUCTION FAILED
3	0301	An interrupt was generated from the Teletype when it was disabled in the PSW.
	0302	No interrupt was generated by the Teletype when the Teletype mode was changed from read to write. The test was terminated by depressing the BRK key on the Teletype.
	0303	Register 0 through 3 of REG. set 0 are not set correctly when an interrupt was generated from the Teletype by changing mode from read to write.
	0304	Registers 0 through 3 of REG. set 0 are not set correctly when an interrrupt was generated by pressing the BRK. key on the Teletype.
	0305	No interrupt was generated from the Teletype when the break key was depressed.
	0306	System Queue Service Interrupt generated when enabled, with System Queue empty.
	0307	No System Queue Service Interrupt generated when enabled, with entry in System Queue.
	0308	Registers 13, 14, 15 (of set designated by bits 24-27 of the System Queue Service Interrupt New PSW status) not set correctly when System Queue Interrupt generated.
	0309	Console Interrupt Not Generated.
	030A	New PSW status not correct. Console interrupt
	030B	Registers 0, 1, 2, 3, 4 of set 0 not set correctly when console Interrupt Generated.
	030C	Failure of Teletype to interrupt on proper priority level (Model 8/32 only).
4	0401-0411	Error in floating point load or store operation LE, LER, STE

SUBTEST NO.	ERROR NO.	TYPE OF FAILURE, INSTRUCTIONS FAILED
		a. If, after a load and a store operation, the actual stored value does not match the expected value (because of improper normalization or incorrect information transfer) the following information is printed: (4 halfwords) ERROR NNNN RRRR RRRR SSSS SSSS where NNNN is the error number RRRR RRRR is the actual stored value The operand used for the Load Operation can be found from the program listing. b. If the Condition Code is not set properly after a load operation, the following information is printed (1 halfword): ERROR NNNN NNNN is the error no. 000C C is the actual Condition Code Expected value of the Condition Code can be found from the program listing. c. If the floating point fault interrupt is not handled correctly, only the error number is printed.
	0412 - 0421	Error in Floating Point Addition or Subtraction. AE, AER, SER, SE a. If the expected result does not match the actual result or the Condition Code setting is not correct, the following information is printed: (The operation performed and the instruction used can be found from the program listing). ERROR NNNN AAAA AAAA BBBB BBBB RRRR RRRR SSSS SSSS 000X 000Y where NNNN ---- Error Number AAAA AAAA - The first operand BBBB BBBB - The second operand RRRR RRRR - Actual result

SUBTEST NO.	ERROR NO.	TYPE OF FAILURE, INSTRUCTIONS FAILED
		SSSS SSSS - Expected result X ---- Actual Condition Code Y ---- Expected Condition Code b. If a floating point fault interrupt is taken incorrectly or if fault interrupt is not taken when it was expected, only the error number is printed. (The operation performed can be found from the program listing and the first operand, the second operand and the result can be known by examining floating point registers 6, 8, and 4 respectively).
4	0422 0425	Error in Floating Point Multiplication ME, MER The format for the error printout is same as for error numbers from 0412 to 0421.
4	0426 0429	Error in Floating Point Division. DE, DER Error printout has the same format as for error numbers from 0412 to 0421.
4	042A 0431	Error in Floating Point Multiplication or Division ME, MER, DE If any error other than incorrect floating point fault interrupt is detected, the following information is printed (in addition to error number): RRRR SSSS 000X 000Y RRRR - actual result SSSS - expected result X - actual Condition Code Y - expected Condition Code (The operation performed can be found from the listing).

SUBTEST NO.	ERROR NO.	TYPE OF FAILURE, INSTRUCTIONS FAILED
4	0432-0441	Error in Floating Point Compare operation CE, CER The following information (in addition to error number) is printed, if any error other than incorrect Floating Point Fault Interrupt is detected. 000X 000Y where X --- actual Condition Code Y --- expected Condition Code The operands compared and the instruction used can be found from the program listings.
	0450-0460	LME, STME
4	0470-047F	Error in conversion from Fixed-Point to Floating Point. FLR
4	0480-048F	Error in conversion from Floating Point to Fixed-Point. FXR

SUBTEST NO.	ERROR NO.	ERROR DETECTED (WHERE)
5	0500	Test terminated by 'BRK' Key. Failure to detect Immediate Interrupt caused program to enter wait loop (all sections).
	0501	PSW and registers not handled properly on Auto Driver Channel operation. See list (S5A1).
	0502	Status error not indicated properly on aborted Auto Driver Channel operation. See list (S5A2).
	0503	Improper status returned or registers handled improperly on successful Auto Driver Channel write operation. See list (S5A3).
	0504	'B' bit in CCB not toggled on reaching buffer limit, or registers handled improperly. (S5A4).
	0505	Improper status returned, or Buffer 1 byte count not adjusted properly, on ADC operation. See list (S5A4).
	0506	Translation was performed when not specified, or Buffer 0 byte count was not adjusted properly. See list. (S5A6).
	0507	Subroutine was entered when not expected. See list (S5A6).
	0508	Translation not performed properly when specified. (S5A8).
	0509	CRC 16 not performed correctly when specified.
	050A	LRC not performed correctly when specified.
	050B	Failure of SINT to result in interrupt on the proper priority level (Model 8/32 only).

SUBTEST 6. On entering Subtest 6, the character A is printed on the Teletype.

1)	Characters in TTY Message:	A
	Console Mode:	Normal
	Data Displayed:	Console Status Byte (2 right hexadecimal digits)
2)	Characters in TTY Message:	A B
	Console Mode:	Incremental
	Data Displayed:	0 00000000 F FFFFFFFF 0 00000000
3)	Characters in TTY Message:	ABC
	Console Mode:	Incremental
	Data Displayed:	All hexadecimal digits displayed as a counter (0 F)
4)	Characters in TTY Message:	ABCD
	Console Mode:	Normal
	Data Displayed:	5A A5 5A5A A5A5,etc. Only the right hand side of the display is seen to Shift.
5)	Characters in TTY Message:	ABCDE
	Console Mode:	Incremental
	Data Displayed:	The above pattern is seen shifted through display.
6)	Characters in TTY Message:	ABCDEF
	Console Mode:	Incremental
	Data Displayed:	Contents of switch register.

SUBTEST NUMBER	ERROR NUMBER	TYPE OF FAILURE, INSTRUCTION FAILED
7	0701	Reg. set F was modified when the Initialize switch was depressed or when Power ON/OFF switch was turned OFF and ON again.
	0702	Reg. set 0 was modified when initialized.
	0703	When initialized, reg. set F was not stored starting at reg. save pointer in memory location X'86'.
	0704	Machine Malfunction Interrupt was detected when disabled in the PSW.
	070B	Floating point registers not stored on power fail or initialize (where so equipped).
8	0801	Reg. set F was modified when the Initial switch was depressed or when the power was turned OFF and then ON.
	0802	Reg. set 0 was modified when initialized.
	0803	When initialized, reg. set F was not stored starting at the location specified by the register save pointer in memory location X'86'.
8	0805	No machine malfunction interrupt was detected.
	0806	Cond. Code in the PSW was not 0001 (L=1) when early power fail Machine Malfunction Interrupt was detected by turning the power OFF and ON.
	0808	Cond. Code in the PSW was not 0000 after power restore Machine Malfunction Interrupt when the power was turned back ON.
	0809	Power restore machine malfunction interrupt did not occur when enabled in current PSW.
	080B	Floating point registers not stored on power fail or initialize (where so equipped).

SUBTEST NUMBER	ERROR NUMBER	TYPE OF FAILURE
9	0901	LRA, not present (Condition Code)
	0902	LRA RX3, not writable (Condition Code)
	0903	LRA, RX2, translate and not writable (CC)
	0904	LRA, not executable (Condition Code)
	0905	LRA, translate and not executable (CC)
	0906	LRA, limit violation (Condition Code)

Other Errors Common to All The Tests

ERROR NO.	TYPE OF FAILURE
0NF1	Arithmetic Fault Interrupt (See Note 2)
0NF2	Illegal Instruction Interrupt (Note 2)
0NF3	Machine Malfunction Interrupt (Notes 2, 3)
0NF4	External Interrupt (HW Mode) (Note 2)
0NF5	Memory Access Controller Interrupt
0NF6	System Queue Service Interrupt
0NF7	SVC Executed From one of the Locations from X'80' through X'CE' (note 2).
0NF8	Incorrect Service Pointed used (One of X'D0' through X'2CE') (Note 2)

NOTES

1. N = Test Number from 1 through 9.

2. Certain registers of Set 0 are used by the Microprogram for Interrupt Handling. Prior to printing an error message, the fullword 16 registers of Set 0 are stored in memory starting at location labelled REGSAV. These locations may be opened to study the old PSW at the time of the interrupt, etc.

3. The new PSW is captured in Register Zero and stored in memory location labelled REG 0. The last 4 bits define the type of failure as described below.

C	V	G	L	
X	1	0	0*	Parity Error on Data Fetch
0	0	1	0*	Parity Error on Instruction Fetch
X	0	0	1	Power Fail
0	0	0	0	Power Restore
1	X	0	X	Parity Error or Power Failure during an Auto Driver Channel operation.

*On an 8/32, the G flag set indicates a Parity Error. The V flag set indicates an Alignment Interrupt Error.

PROG= S32PT2 ASSEMBLED BY CAL 03-066R06-00 (32-BIT)

```
                    **0615501                                                    XP200000
                    **S32PT2                                                     XP200010
                            SCRAT                                                XP200020
                            CROSS                                                XP200030
                            TARGT 32                                             XP200040
                            NORX3                                                XP200050
                            WIDTH 120                                            XP200060
                    S32PT2  PROG  SERIES 32 PROCESSOR TEST PART 2      06-155R02M91A13   XP200070
                    *                                                            XP200080
                    * COPYRIGHT Perkin-Elmer Corporation January 1975             XP200090
                    *                                                            XP200100
                    * PROGRAM USES SERIES 32 INSTRUCTION SET.                     XP200110
                    *                                                            XP200120
                    * PURPOSE OF TEST:                                           XP200130
                    *   THIS PROGRAM IS DESIGNED TO CHECK ALL THE I/O INSTRUCTIONS,  XP200140
                    * EXTERNAL INTERRUPTS, AUTO DRIVER CHANNEL, DISPLAY PANEL INDICATORS  XP200150
                    * POWER FAIL AND INITIALIZATION PROCEDURES,                  XP200160
                    * AND FLOATING POINT INSTRUCTIONS IN SERIES 32 PROCESSORS.   XP200170
                    *                                                            XP200180
                    * ASSUMPTIONS:                                               XP200190
                    *  IT IS ASSUMED THAT THE FOLLOWING TESTS HAVE BEEN RUN WITHOUT  XP200200
                    * DETECTION OF AN ERROR PRIOR TO LOADING SERIES 32 PROCESSOR  XP200210
                    * TEST PART 2:                                               XP200220
                    *       SERIES 32 BASIC TEST                 06-158          XP200230
                    *       SERIES 32 PROCESSOR TEST PART 1      06-154          XP200240
                    * THE FOLLOWING TESTS ARE ALSO APPLICABLE:                   XP200250
                    *       SERIES 32 MEMORY TEST                06-156          XP200260
                    *       TELETYPE BASIC CONFIDENCE TEST       06-004          XP200270
                    *       CRT TEST                             06-146          XP200280
                    *       CAROUSEL 300 TEST                   06-183           XP200290
                    *       COMMON CURRENT LOOP INTERFACE TEST 06-184            XP200300
                    *                                                            XP200310
                    * NORMAL TESTING:                                            XP200320
                    *  A CONSOLE DEVIVE MUST BE ATTACHED AT THE ADDRESS INDICATED  XP200330
                    *  BY LOCATION IO ( SEE LISTING )                            XP200340
                    *                                                            XP200350
                    *               IO= 0101 FOR CRT ON PASLA                    XP200360
                    *                 = 0202 FOR TTY, CRT ON CURRENT LOOP INT CAR 15,30  XP200370
                    *                 = 0404 FOR CAROUSEL 300 ON A PASLA         XP200380
                    *  FOR THE DEVICES ATTACHED TO A PASLA , THE LOCATION  PASADR ( SEE  XP200390
                    *  LISTING ) MUST CONTAIN THE PASLA ADDRESS                  XP200400
                    *     DEFAULT VALUES ARE                                     XP200410
                    *               IO= 0202                                     XP200420
                    *               PASADR= 1011                                 XP200430
                    * AFTER THESE PARAMETERS ARE SET UP CORRECTLY EXECUTE        XP200440
                    *  FROM X'A00', ENTEER THE PROCESSOR IDENTIFIER AND SUBTESTS  XP200450
                    * 1 TO 9 MAY BE SELECTED INDIVIDUALLY. ERROR MESSAGES ARE PRINTED ON  XP200460
                    * THE CONSOLE                                                XP200470
                    *                                                            XP200480
                    *   SUBTEST 2 CHECKS THE EXTERNAL INTERRUPT HANDLING FOR MODEL 7/32  XP200490
                    * IN THE HALFWORD MODE (PSW BIT 11 = 1). THEREFORE, SUBTEST 2 SHOULD  XP200500
                    * BE RUN ONLY ON MODEL 7/32 EQUIPPED WITH THE HALFWORD MODE FEATURE.  XP200510
                    *                                                            XP200520
```

```
54  * OPTIONAL TESTING:                                                    XP200530
55  *   SUBTEST 4 SHOULD BE SELECTED ONLY IF THE PROCESSOR UNDER TEST IS    XP200540
56  * EQUIPPED WITH THE FLOATING POINT OPTION.                            XP200550
57  *  NOTE:   IF THE USER HAS THE HARDWARE FLOATING POINT OPTION (DFU)    XP200560
58  *       USE FLOATING POINT TEST 06-193                                 XP200570
59  *   SUBTEST 8 SHOULD BE SELECTED ONLY IF THE PROCESSOR UNDER TEST IS   XP200580
60  * EQUIPPED WITH THE POWER FAIL AUTO RESTART OPTION.                    XP200590
61  *   IF THE PROCESSOR UNDER TEST IS EQUIPPED WITH THE LOADER STORAGE     XP200600
62  * UNIT OPTION (LSU), THE LSU SHOULD BE TURNED OFF PRIOR TO RUNNING     XP200610
63  * SUBTESTS 7 OR 8.                                                    XP200620
64  *    SUBTEST 9 SHOULD BE SELECTED ONLY IF THE INSTRUCTION SET         XP200630
65  * INCLUDES THE LOAD REAL ADDRESS (LRA) INSTRUCTION                    XP200640
66  *                                                                     XP200650
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                                  68  *     PROCESSOR TEST BOOT LOADER                                    XP200670
000000I                           69          ORG   X'80'                                                 XP200680
          0000 0000               70  R0      EQU   0                                                   XP200690
          0000 0001               71  R1      EQU   1                                                   XP200700
          0000 0002               72  R2      EQU   2                                                   XP200710
          0000 0003               73  R3      EQU   3                                                   XP200720
          0000 0004               74  R4      EQU   4                                                   XP200730
          0000 0005               75  R5      EQU   5                                                   XP200740
          0000 0006               76  R6      EQU   6                                                   XP200750
          0000 0007               77  R7      EQU   7                                                   XP200760
          0000 0008               78  R8      EQU   8                                                   XP200770
          0000 0009               79  R9      EQU   9                                                   XP200780
          0000 000A               80  R10     EQU   10                                                  XP200790
          0000 000B               81  R11     EQU   11                                                  XP200800
          0000 000C               82  R12     EQU   12                                                  XP200810
          0000 000D               83  R13     EQU   13                                                  XP200820
          0000 000E               84  R14     EQU   14                                                  XP200830
          0000 000F               85  R15     EQU   15                                                  XP200840
                                  86  *                                                                 XP200850
                                  87  *                                                                 XP200860
000080    4300 0088               88          B     LOADER                                              XP200870
000084    3368                    89          DC    Z(OLDPSW)                                           XP200880
000086    338C                    90          DC    Z(REGSAV)                                           XP200890
000088    2431                    91  LOADER  LIS   R3,1                                                XP200900
00008A    2431                    92          LIS   R3,1            CONSOLE ADDRESS                     XP200910
00008C    C800 0080               93          LHI   R0,X'80'        OUTPUT COMMAND                      XP200920
000090    9E30                    94          OCR   R3,R0           CONSOLE DISPLAY NORMAL MODE         XP200930
000092    C820 0A00               95          LHI   R2,X'A00'       START ADDRESS OF PROGRAM            XP200940
000096    E640 348B               96          LA    R4,PROGTOP      END ADDRESS OF PROGRAM              XP200950
00009A    D3A0 0078               97          LB    R10,X'78'       (78) = INPUT DEVICE ADDRESS         XP200960
00009E    DEA0 0079               98  OC      OC    R10,X'79'       (79) = INPUT DEVICE COMMAND         XP200970
0000A2    9DAE                    99  SENSE1  SSR   R10,R14         (R14) = DEVICE STATUS               XP200980
0000A4    2013                   100          BTBS  1,3             UNAVAILABLE                         XP200990
0000A6    2082                   101          BTBS  8,2             BUSY                                XP201000
0000A8    9BAB                   102          RDR   R10,R11         (R11) = DATA BYTE                   XP201010
0000AA    08BB                   103          LR    R11,R11                                             XP201020
0000AC    2235                   104          BZS   SENSE1          IGNORE LEADER FRAMES                XP201030
0000AE    D2E2 0000              105  STORE   STB   R11,0(R2)       STORE LEGITIMATE DATA.              XP201040
0000B2    9412                   106          EXBR  R1,R2                                               XP201050
0000B4    9831                   107          WHR   R3,R1           DISPLAY STORAGE ADDRESS             XP20106C
0000B6    9DAE                   108  SENSE2  SSR   R10,R14                                            XP201070
0000B8    2091                   109          BTBS  9,1             BUSY OR UNAVAILABLE                 XP201080
0000BA    9BAB                   110          RDR   R10,R11                                             XP201090
0000BC    C120 00AE              111          BXLE  R2,STORE        GET NEXT BYTE                       XP201100
          0000 00C0              112  HALT    EQU   *                                                   XP201110
0000C0    C800 4000              113          LHI   R0,X'4000'                                          XP201120
0000C4    1101                   114          SLLS  R0,1                                                XP201130
0000C6    9510                   115          EPSR  R1,R0                                               XP201140
0000C8    22C4                   116          BS    HALT                                                XP201150
                                 117  *                                                                 XP201160
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000000CA                    119          ORG   X'A00'                                                    XP201180
000A00   4300 0A1A          120          B     ENTRY1                                                    XP201190
000A04                      121          DO    6                                                         XP201200
000A04   0000               122          DCX   0                  FILLER                                 XP201210
000A06   0000               122          DCX   0                  FILLER
000A08   0000               122          DCX   0                  FILLER
000A0A   0000               122          DCX   0                  FILLER
000A0C   0000               122          DCX   0                  FILLER
000A0E   0000               122          DCX   0                  FILLER
                            123  *                                                                         XP201220
                            124  * ***************************************************************        XP201230
                            125  *                                                              **        XP201240
000A10   0202               126  IO       DCX   0202               I/O DEVICE POINTERS          **        XP201250
000A12   0101               127  CRTADR   DCX   0101               CRT ON PASLA INDICATOR                 XP201260
000A14   0202               128  TTYADR   DCX   0202               TTY   INPUT/OUTPUT ADDRESSES **        XP201270
000A16   0404               129  CARADR   DCX   0404               CAROUSEL ON PASLA INDICATOR            XP201280
000A18   1011               130  PASADR   DCX   1011               PASLA I/O ADDRESS                      XP201290
                            131  *                                                              **        XP201300
                            132  *NOTE- THIS PROGRAM REQUIRES SAME CONSOLE DEVICE FOR READ/WRITE.**        XP201310
                            133  *                                                              **        XP201320
                            134  * ***************************************************************        XP201330
                            135  *                                                                         XP201340
000A1A   2400               136  ENTRY1   LIS   R0,0                                                     XP201350
000A1C   4000 0030          137           STH   R0,X'30'                                                 XP201360
000A20   C810 00F0          138           LHI   R1,X'F0'           NEW PSW STATUS & LOC'N                XP201370
000A24   4010 0032          139           STH   R1,X'32'           FOR ILLEGAL INSTRUCTION INTERRUPT     XP201380
000A28   4000 0034          140           STH   R0,X'34'                                                 XP201390
000A2C   C810 0A36          141           LHI   R1,FWMODE1                                               XP201400
000A30   4010 0036          142           STH   R1,X'36'                                                 XP201410
000A34   0000               143           DC    X'0'                                                     XP201420
000A36   E610 2BFE          144  FWMODE1  LA    R1,ILGINT          RESTORE HANDLER                       XP201430
000A3A   5010 0034          145           ST    R1,X'34'                                                 XP201440
                            146  **  PROCESSOR IS NOW IN FULLWORD MODE REGISTER SET F                      XP201450
                            147  ************************************************************             XP201460
000A3E   2410               148           LIS   R1,0                                                     XP201470
000A40   4010 3356          149           STH   R1,CRTFLG          DEFAULT 'NO CRT'                      XP201480
000A44   4010 335C          150           STH   R1,PRILEV          DEFAULT 'LEVEL = 0'                   XP201490
                            151  *                                                                         XP201500
000A48   C820 00C0          152           LHI   R2,X'C0'                                                 XP201510
000A4C   9E12               153  SYSCLR   OCR   R1,R2              DISARM  ALL EXTERNAL DEVICE INTPTS.   XP201520
000A4E   2611               154           AIS   R1,1                                                     XP201530
000A50   C510 0400          155           CLHI  R1,X'400'          1024 DEVICE ADDRESSES                 XP201540
000A54   2084               156           BLS   SYSCLR                                                   XP201550
                            157  *                                                                         XP201560
000A56   D300 0A10          158           LB    R0,IO                                                    XP201570
000A5A   C500 0004          159           CLHI  R0,4                                                     XP201580
000A5E   4230 0A6A          160           BNE   IOOUT                                                    XP201590
000A62   C800 F000          161           LHI   R0,X'F000'                                               XP201600
000A66   4000 3352          162           STH   R0,FIRSTCMD                                              XP201610
         0000 0A6A          163  IOOUT    EQU   *                                                        XP201620
000A6A   D300 0A10          164           LB    R0,IO              PICK UP POINTER 1                     XP201630
000A6E   C500 0002          165           CLHI  R0,2                                                     XP201640
000A72   4330 0A8A          166           BE    TTYIO                                                    XP201650
000A76   7310 0A18          167  CRTIO    LHL   R1,PASADR                                                XP201660
000A7A   7320 3350          168           LHL   R2,CRTOUT                                                XP201670
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000A7E  DE10 3352          169          OC    R1,FIRSTCMD         SET UP PASLA FORMAT                XP201680
000A82  2531               170          LCS   R3,1                                                    XP201690
000A84  4030 3356          171          STH   R3,CRTFLG           SET THE FLAG FOR CRT I/O           XP201700
000A88  2305               172          BS    IO2                                                     XP201710
000A8A  7310 0A14          173  TTYIO   LHL   R1,TTYADR                                               XP201720
000A8E  7320 334E          174          LHL   R2,TTYOUT                                               XP201730
000A92  9411               175  IO2     EXBR  R1,R1                                                   XP201740
000A94  4010 3358          176          STH   R1,OUTDEV           SET UP I/O DEVICE ADDRESSES        XP201750
000A98  4020 335A          177          STH   R2,OUTCMD           SET UP INPUT/OUTPUT COMMANDS       XP201760
                           178  **      PRINT THE TITLE S32PT2 AND SELECT THE CPUNO                    XP201770
000A9C  E640 30CC          179          LA    R4,TITLE                                                XP201780
000AA0  D320 3358          180  PRQTN   LB    R2,OUTDEV                                               XP201790
000AA4  DE20 335A          181          OC    R2,OUTCMD           DEVICE IN WRITE MODE               XP201800
000AA8  9D23               182  WT1     SSR   R2,R3               R3 = TTY STATUS                    XP201810
000AAA  2091               183          BTBS  9,1                                                     XP201820
000AAC  DA24 0000          184          WD    R2,0(R4)                                                XP201830
000AB0  2641               185          AIS   R4,1                                                    XP201840
000AB2  C540 30EB          186          CLHI  R4,TITEND                                               XP201850
000AB6  2037               187          BNES  WT1                                                     XP201860
000AB8  9D23               188          SSR   R2,R3               WAIT UNTIL NOT BUSY                XP201870
000ABA  2081               189          BTBS  8,1                                                     XP201880
000ABC  D320 3359          190          LB    R2,INDEV                                                XP201890
000AC0  DE20 335B          191          OC    R2,INCMD                                                XP201900
000AC4  DB20 3370          192          RD    R2,TEMP             PASLA DUMMY READ                   XP201910
000AC8  9D23               193          SSR   R2,R3               R3 = TTY STATUS                    XP201920
000ACA  2281               194          BFBS  8,1                 WAIT FOR BUSY                      XP201930
000ACC  9D23               195          SSR   R2,R3                                                   XP201940
000ACE  2081               196          BTBS  8,1                                                     XP201950
000AD0  9B24               197          RDR   R2,R4                                                   XP201960
000AD2  C440 007F          198          NHI   R4,X'7F'            ZERO OUT PARITY                    XP201970
000AD6  C540 0037          199          CLHI  R4,C'7'                                                 XP201980
000ADA  2334               200          BES   KEY1                                                    XP201990
000ADC  C540 0038          201          CLHI  R4,C'8'                                                 XP202000
000AE0  213E               202          BNES  KEYERR                                                  XP202010
000AE2  D240 3354          203  KEY1    STB   R4,CPUNO                                                XP202020
000AE6  9D23               204          SSR   R2,R3                                                   XP202030
000AE8  2081               205          BTBS  8,1                                                     XP202040
000AEA  9B24               206          RDR   R2,R4               R4 = SECOND KEY PRESSED            XP202050
000AEC  C440 007F          207          NHI   R4,X'7F'            ZERO OUT PARITY                    XP202060
000AF0  C540 0058          208          CLHI  R4,C'X'             MODEL 7X(7/32) OR 8X(8/32) ?       XP202070
000AF4  2338               209          BES   KEY2                                                    XP202080
000AF6  C540 0044          210          CLHI  R4,C'D'             LOOK FOR NO DISPLAY MACHINE        XP202090
000AFA  2335               211          BES   KEY2                                                    XP202100
000AFC  E640 30CA          212  KEYERR  LA    R4,QUESTN                                               XP202110
000B00  4300 0AA0          213          B     PRQTN                                                   XP202120
000B04  D240 3355          214  KEY2    STB   R4,CPUNO+1                                             XP202130
                           215  ************************************************************          XP202140
        0000 0B08          216  RENTRY  EQU   *                                                       XP202150
000B08  2400               217          LIS   R0,0                                                    XP202160
000B0A  4000 0030          218          STH   R0,X'30'            ILLEG INSTR NEW PSW & LOC          XP202170
000B0E  4810 3378          219          LH    R1,PROCPSW          MAY BE MODIFIED TO ENTER SUBTESTS  XP202180
                           220  *                                 WITH DIFFERENT PSW BITS SET        XP202190
000B12  4010 0032          221          STH   R1,X'32'                                                XP202200
000B16  4000 0034          222          STH   R0,X'34'            *                                  XP202210
000B1A  C810 0B24          223          LHI   R1,FWMODE           *                                  XP202220
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000B1E  4010 0036          224          STH   R1,X'36'            *                                XP202230
000B22  0000               225          DC    X'0'               GENERATE ILLG. INSTR. INTRPT.    XP202240
                           226  **  PROCESSOR IS NOW IN FULLWORD MODE                               XP202250
                           227  **  SET UP LOW CORE FOR SPURIOUS INTERRUPTS                         XP202260
000B24  E610 2BFE          228  FWMODE  LA    R1,ILGINT                                            XP202270
000B28  5010 0034          229          ST    R1,X'34'           ILLEGAL INSTR. NEW PSW LOC       XP202280
000B2C  2400               230          LIS   R0,0                                                 XP202290
000B2E  5000 0020          231          ST    R0,X'20'           MACHINE MALFUNCTION INTRPT.      XP202300
000B32  5000 0024          232          ST    R0,X'24'           OLD PSW                          XP202310
000B36  5000 0028          233          ST    R0,X'28'           RESERVED,MUST BE ZERO            XP202320
000B3A  5000 002C          234          ST    R0,X'2C'                                            XP202330
000B3E  5000 0030          235          ST    R0,X'30'           ILLEGAL INSTR. NEW PSW STATUS    XP202340
000B42  5000 0038          236          ST    R0,X'38'           MACHINE MALFUNCTION INTRPT.      XP202350
000B46  E610 2C02          237          LA    R1,MALFTN          NEW PSW LOC.                     XP202360
000B4A  5010 003C          238          ST    R1,X'3C'                                            XP202370
000B4E  5000 0040          239          ST    R0,X'40'           OLD PSW , HW EXT.INTRPT          XP202380
000B52  C810 2C10          240          LHI   R1,XINTHW          -- HW EXT INTPT                  XP202390
000B56  5010 0044          241          ST    R1,X'44'           NEW PSW LOC, HW MODE EXT INTERRUPT XP202400
000B5A  5000 0048          242          ST    R0,X'48'           ARITH.FAULT NEW PSW              XP202410
000B5E  E610 2BFA          243          LA    R1,ARTFLT                                           XP202420
000B62  5010 004C          244          ST    R1,X'4C'                                            XP202430
000B66  5000 3380          245          ST    R0,TABLE           INITIALIZE TABLE                 XP202440
000B6A  5000 3384          246          ST    R0,TABLE+4                                          XP202450
000B6E  E610 3380          247          LA    R1,TABLE           SYSTEM QUEUE POINTER             XP202460
000B72  5010 0080          248          ST    R1,X'80'                                            XP202470
000B76  E610 3368          249          LA    R1,OLDPSW          CURRENT PSW SAVE POINTER         XP202480
000B7A  4010 0084          250          STH   R1,X'84'                                            XP202490
000B7E  E610 338C          251          LA    R1,REGSAV          REG.SAVE POINTER (SET 0)         XP202500
000B82  4010 0086          252          STH   R1,X'86'                                            XP202510
000B86  5000 0088          253          ST    R0,X'88'           SYST.Q SERVICE INTRPT. NEW PSW   XP202520
000B8A  E610 2C0C          254          LA    R1,CHANIO                                           XP202530
000B8E  5010 008C          255          ST    R1,X'8C'                                            XP202540
000B92  5000 0090          256          ST    R0,X'90'           MEMORY ACCESS CONTROLLER INTRPT. XP202550
000B96  E610 2C08          257          LA    R1,MACINT          NEW PSW                          XP202560
000B9A  5010 0094          258          ST    R1,X'94'                                            XP202570
000B9E  5000 0098          259          ST    R0,X'98'           SVC INTRPT,NEW PSW               XP202580
000BA2  E630 2C14          260          LA    R3,SVCERR                                           XP202590
000BA6  C810 009C          261          LHI   R1,X'9C'                                            XP202600
000BAA  4031 0000          262  X9C     STH   R3,0(R1)           SVC CALL,ERR.TRAP                XP202610
000BAE  2612               263          AIS   R1,2                                                XP202620
000BB0  C510 00BC          264          CLHI  R1,X'BC'                                            XP202630
000BB4  2035               265          BNES  X9C                                                 XP202640
000BB6  5001 0000          266  XBC     ST    R0,0(R1)           RESERVED ,MUST BE ZERO           XP202650
000BBA  2614               267          AIS   R1,4                                                XP202660
000BBC  C510 00D0          268          CLHI  R1,X'D0'                                            XP202670
000BC0  2035               269          BNES  XBC                                                 XP202680
000BC2  E630 2C18          270          LA    R3,DEVERR                                           XP202690
000BC6  4031 0000          271  XDOB    STH   R3,0(R1)                                            XP202700
000BCA  2612               272          AIS   R1,2                                                XP202710
000BCC  C510 02D0          273          CLHI  R1,X'2D0'                                           XP202720
000BD0  2035               274          BNES  XDOB                                                XP202730
                           275  ************************************************************      XP202740
000BD2  D320 3358          276  MANUAL  LB    R2,OUTDEV                                           XP202750
000BD6  DE20 335A          277          OC    R2,OUTCMD          DEVICE IN WRITE MODE             XP202760
000BDA  E640 30B4          278          LA    R4,PRTSUBT         PRINT CHARACTERS                 XP202770
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000BDE  9D23           279  SBWT    SSR   R2,R3          SUBTEST                        XP202780
000BE0  2091           280          BTBS  9,1            *                              XP202790
000BE2  DA24 0000      281          WD    R2,0(R4)       CR , LF                        XP202800
000BE6  2641           282          AIS   R4,1                                         XP202810
000BE8  C540 30CA      283          CLHI  R4,PRTSUBZ+1                                  XP202820
000BEC  2087           284          BLS   SBWT                                          XP202830
                       285  *                                                          XP202840
000BEE  D320 3359      286          LB    R2,INDEV                                      XP202850
000BF2  DE20 3358      287          OC    R2,INCMD       DEVICE IN READ MODE            XP202860
000BF6  DB20 3370      288          RD    R2,TEMP        PASLA DUMMY READ               XP202870
000BFA  9D23           289          SSR   R2,R3                                         XP202880
000BFC  2281           290          BFBS  8,1            WAIT FOR BUSY = 1              XP202890
000BFE  9D23           291          SSR   R2,R3                                         XP202900
000C00  2081           292          BTBS  8,1                                           XP202910
000C02  9B21           293          RDR   R2,R1          R1 = NUM. KEY DEPRESSED        XP202920
000C04  C410 007F      294          NHI   R1,X'7F'       ZERO OUT PARITY                XP202930
000C08  C510 0031      295          CLHI  R1,X'31'       X'30' FOR SELF SEQUENCING      XP202940
000C0C  4280 0C2C      296          BL    BADKEY                                        XP202950
000C10  C510 0040      297          CLHI  R1,X'40'                                      XP202960
000C14  238C           298          BNLS  BADKEY                                        XP202970
000C16  D210 30F7      299          STB   R1,TESTNO                                     XP202980
000C1A  9D23           300          SSR   R2,R3          WAIT TILL SECOND KEY IS        XP202990
000C1C  2091           301          BTBS  9,1            DEPRESSED ON THE TTY           XP203000
000C1E  9B24           302          RDR   R2,R4          R4 = SECOND KEY                XP203010
000C20  C440 007F      303          NHI   R4,X'7F'       ZERO OUT PARITY                XP203020
000C24  C540 000D      304          CLHI  R4,13          IS THE SECOND KEY CR KEY       XP203030
000C28  4330 0C5C      305          BE    DOTEST                                        XP203040
000C2C  D320 3358      306  BADKEY  LB    R2,OUTDEV                                     XP203050
000C30  DE20 335A      307          OC    R2,OUTCMD      DEVICE IN WRITE MODE           XP203060
000C34  9D23           308          SSR   R2,R3          CHECK DU,BUSY                  XP203070
000C36  2091           309          BTBS  9,1                                           XP203080
000C38  C800 003F      310          LHI   R0,C'?'        ?                              XP203090
000C3C  9A20           311          WDR   R2,R0                                         XP203100
000C3E  9D23           312          SSR   R2,R3                                         XP203110
000C40  2091           313          BTBS  9,1                                           XP203120
000C42  240D           314          LIS   R0,13          CR                             XP203130
000C44  9A20           315          WDR   R2,R0                                         XP203140
000C46  9D23           316          SSR   R2,R3                                         XP203150
000C48  2091           317          BTBS  9,1                                           XP203160
000C4A  C800 000A      318          LHI   R0,X'A'        LINE FEED                      XP203170
000C4E  9A20           319          WDR   R2,R0                                         XP203180
000C50  9D23           320          SSR   R2,R3                                         XP203190
000C52  2081           321          BTBS  8,1                                           XP203200
000C54  DA20 316C      322          WD    R2,NULL                                       XP203210
000C58  4300 08D2      323          B     MANUAL                                        XP203220
000C5C  D320 3358      324  DOTEST  LB    R2,OUTDEV      DEVICE IN WRITE MODE           XP203230
000C60  DE20 335A      325          OC    R2,OUTCMD                                     XP203240
000C64  9D23           326          SSR   R2,R3                                         XP203250
000C66  2081           327          BTBS  8,1                                           XP203260
000C68  DA20 316C      328          WD    R2,NULL                                       XP203270
000C6C  9D23           329          SSR   R2,R3                                         XP203280
000C6E  2081           330          BTBS  8,1                                           XP203290
000C70  243A           331          LIS   R3,10                                         XP203300
000C72  9A23           332          WDR   R2,R3                                         XP203310
000C74  9D23           333          SSR   R2,R3                                         XP203320
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000C76  2081          334          BTBS  8,1                                  XP203330
000C78  DA20 316C     335          WD    R2,NULL          FOR CRT             XP203340
000C7C  9D23          336          SSR   R2,R3                                XP203350
000C7E  2081          337          BTBS  8,1              WAIT FOR NOT BUSY   XP203360
000C80  CB10 0030     338          SHI   R1,X'30'         R1 = TEST NUMBER    XP203370
000C84  D210 335F     339          STB   R1,ERRNO+1                           XP203380
000C88  1112          340          SLLS  R1,2                                 XP203390
000C8A  D120 3228     341          LM    R2,BUFR0         INITIALIZE          XP203400
000C8E  2401          342          LIS   R0,1             CONSOLE ADDRESS     XP203410
000C90  DFC0 334C     343          OC    R0,DISINC                            XP203420
000C94  9802          344          WHR   R0,R2            CLEAR DISPLAY       XP203430
000C96  9802          345          WHR   R0,R2                                XP203440
000C98  98C2          346          WHR   R0,R2                                XP203450
000C9A  4301 0C9A     347          B     BRTOTEST-4(R1)                       XP203460
000C9E  4300 0CC2     348 BRTOTEST B     SUBT1            I/O INSTRUCTIONS IN FW MODE  XP203470
000CA2  4300 0F26     349          B     SUBT2            AI , AIR INSTRUCTIONS IN HW MODE  XP203480
000CA6  4300 10C0     350          B     SUBT3            EXTERNAL INTERRUPT TEST  XP203490
000CAA  4300 1390     351          B     SUBT4            FLOATING POINT TEST  XP203500
000CAE  4300 1CE8     352          B     SUBT5            CHANNEL COMMAND WORD TEST  XP203510
000CB2  4300 229E     353          B     SUBT6            CONSOLE PANEL TEST  XP203520
000CB6  4300 2498     354          B     SUBT7            INITIALIZE , POWER ON/OFF TEST  XP203530
000CBA  4300 2498     355          B     SUBT8            MACHINE MALFUNCTION INTRPT. TEST  XP203540
000CBE  4300 2788     356          B     SUBT9            LOAD REAL ADDRESS TEST  XP203550

                      358 *                                                    XP203570
                      359 *                                                    XP203580
                      360 *                                                    XP203590
        0000 0CC2     361 SUBT1    EQU   *                                     XP203600
                      362 *                                                    XP203610
                      363 * SUBTEST 1 TESTS ALL THE I/O INSTRUCTIONS.  WHEN ENTERED, THE  XP203620
                      364 * PROGRAM EXECUTES A WB INSTRUCTION TO PRINT A REQUEST TO THE  XP203630
                      365 * USER.  AT THE TERMINATION OF THE WB, THE CONSOLE STATUS IS  XP203640
                      366 * CHECKED.                                           XP203650
                      367 * THE USER, FOLLOWING DIRECTIONS, DEPRESSES THE KEYS 1234567890.  XP203660
                      368 * THESE ARE READ USING RDR, RD, RH, RHR, AND RBR INSTRUCTIONS.  XP203670
                      369 * NECESSARY STATUS AND DATA VALIDITY CHECKS ARE MADE DURING THIS  XP203680
                      370 * OPERATION.                                         XP203690
                      371 * WBR, WH, WHR, WD AND WDR INSTRUCTIONS ARE USED TO PRINT THE  XP203700
                      372 * REQUEST A SECOND TIME.  THE USER, FOLLOWING DIRECTIONS,  XP203710
                      373 * DEPRESSES ONCE AGAIN THE KEYS 1234567890.  A RB IS USED TO  XP203720
                      374 * READ THIS DATA, AND NECESSARY STATUS AND DATA VALIDITY CHECKS  XP203730
                      375 * ARE MADE.                                          XP203740
                      376 ************************************************************  XP203750
                      377 *                                                    XP203760
                      378 ** MACHINE MODE = FW MODE; BIT11=1,BIT23=0          XP203770
                      379 **  CHECK ALL I/O INSTRUCTIONS IN FW MODE           XP203780
        0000 0CC2     380 SS       EQU   *                                     XP203790
        0000 0CC2     381 SSR      EQU   *                                     XP203800
000CC2  D320 3358     382          LB    R2,OUTDEV                            XP203810
000CC6  C800 0656     383          LHI   R0,X'656'        LOOP COUNT FOR 7/32  XP203820
000CCA  2410          384          LIS   R1,0                                 XP203830
000CCC  DE20 335A     385          OC    R2,OUTCMD        DEVICE IN WRITE MODE  XP203840
000CD0  EA10 001F     386 DLY1     RRL   R1,31                                XP203850
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000CD4  2701           387          SIS   R0,1                                    XP203860
000CD6  2033           388          BNZS  DLY1          DELAY FOR APPR 120 MILLISEC.  XP203870
000CD8  2501           389          LCS   R0,1                                    XP203880
000CDA  4000 3370      390          STH   R0,TEMP                                 XP203890
000CDE  C870 00FF      391          LHI   R7,X'FF'                                XP203900
000CE2  9567           392          EPSR  R6,R7         FORCE COND. CODE TO X'F'  XP203910
000CE4  DD20 3370      393          SS    R2,TEMP                                 XP203920
000CE8  9555           394          EPSR  R5,R5         CATCH COND. CODE          XP203930
000CEA  7310 3370      395          LHL   R1,TEMP                                 XP203940
000CEE  4000 3370      396          STH   R0,TEMP                                 XP203950
000CF2  DD20 3371      397          SS    R2,TEMP+1     ODD BOUNDARY              XP203960
000CF6  9599           398          EPSR  R9,R9         CATCH CONDITION CODE      XP203970
000CF8  73D0 3370      399          LHL   R13,TEMP                                XP203980
000CFC  94DD           400          EXBR  R13,R13                                 XP203990
000CFE  051D           401          CLR   R1,R13        (SAME) 1-BYTE XFER FOR SS, SSR?  XP204000
000D00  213E           402          BNES  T1R4                                    XP204010
000D02  9567           403          EPSR  R6,R7         FORCE COND. CODE TO X'F'  XP204020
000D04  9D23           404          SSR   R2,R3                                   XP204030
000D06  9588           405          EPSR  R8,R8         CATCH COND. CODE          XP204040
000D08  0589           406          CLR   R8,R9                                   XP204050
000D0A  2139           407          BNES  T1R4                                    XP204060
000D0C  0558           408          CLR   R5,R8         COND. CODE SAME FOR SS, SSR ?  XP204070
000D0E  2137           409          BNES  T1R4                                    XP204080
000D10  C430 000F      410          NHI   R3,X'F'       EXTRACT STATUS BYTE BITS 4:7.  XP204090
000D14  C480 000F      411          NHI   R8,X'F'       EXTRACT CONDITION CODE (SSR)  XP204100
000D18  0538           412          CLR   R3,R8         STATUS BYTE BITS 4:7 MOVED TO  XP204110
000D1A  2334           413          BES   T1A1          COND CODE PROPERLY ?      XP204120
000D1C  24D4           414  T1R4    LIS   R13,4         ERROR 0104 - SS,  SSR  *****  XP204130
000D1E  4300 0F1A      415          B     T1R                                     XP204140
        0000 0D22      416  WB      EQU   *                                       XP204150
000D22  D320 3358      417  T1A1    LB    R2,OUTDEV                               XP204160
000D26  DE20 335A      418          OC    R2,OUTCMD     DEVICE IN WRITE MODE      XP204170
000D2A  9D23           419          SSR   R2,R3         R3 = TTY STATUS           XP204180
000D2C  2081           420          BTBS  8,1           CHECK DU,BUSY             XP204190
000D2E  2014           421          BTBS  1,4                                     XP204200
000D30  D620 32B8      422          WB    R2,T1WB       'DEPRESS KEYS 1234567890'  XP204210
000D34  42F0 0D42      423          BTC   15,T1R1                                 XP204220
000D38  9D23           424          SSR   R2,R3         STATUS AFTER WB = 0?      XP204230
000D3A  4270 0D42      425          BTC   7,T1R1                                  XP204240
000D3E  2083           426          BTBS  8,3                                     XP204250
000D40  2304           427          BS    T1A2                                    XP204260
000D42  24D1           428  T1R1    LIS   R13,1         ERROR 0101 - WB   *****  XP204270
000D44  4300 0F1A      429          B     T1R                                     XP204280
        0000 0D48      430  RDR     EQU   *                                       XP204290
000D48  D320 3359      431  T1A2    LB    R2,INDEV                                XP204300
000D4C  DE20 335B      432          OC    R2,INCMD      DEVICE IN READ MODE       XP204310
000D50  9D23           433          SSR   R2,R3         WAIT FOR BUSY = 1         XP204320
000D52  2281           434          BFBS  8,1                                     XP204330
000D54  9D23           435          SSR   R2,R3                                   XP204340
000D56  2081           436          BTBS  8,1                                     XP204350
000D58  9B21           437          RDR   R2,R1         READ KEY 1 IN R1          XP204360
000D5A  C410 007F      438          NHI   R1,X'7F'                                XP204370
000D5E  C510 0031      439          CLHI  R1,X'31'                                XP204380
000D62  2334           440          BES   T1A3                                    XP204390
000D64  24D2           441  T1R2    LIS   R13,2         ERROR 0102 - RDR  *****  XP204400
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000D66  4300 0F1A          442          B     T1R                                          XP204410
        0000 0D6A          443  RD      EQU   *                                            XP204420
000D6A  9D23               444  T1A3    SSR   R2,R3                                       XP204430
000D6C  2081               445          BTBS  8,1                                          XP204440
000D6E  DB20 3371          446          RD    R2,TEMP+1      TEMP+1 = KEY 2 = X'32'       XP204450
000D72  D300 3371          447          LB    R0,TEMP+1                                    XP204460
000D76  C400 007F          448          NHI   R0,X'007F'                                   XP204470
000D7A  C500 0032          449          CLHI  R0,X'32'                                     XP204480
000D7E  2334               450          BES   T1A6                                         XP204490
000D80  24D3               451  T1R3    LIS   R13,3          ERROR 0103 - RD (ODD BOUND)  *****  XP204500
000D82  4300 0F1A          452          B     T1R                                          XP204510
                           453  *                                                          XP204520
000D86  D320 3359          454  T1A6    LB    R2,INDEV                                     XP204530
000D8A  9D23               455          SSR   R2,R3                                        XP204540
000D8C  2081               456          BTBS  8,1                                          XP204550
000D8E  DB20 3370          457          RD    R2,TEMP        TEMP = KEY 3 = X'33'         XP204560
000D92  7300 3370          458          LHL   R0,TEMP                                      XP204570
000D96  C400 7F7F          459          NHI   R0,X'7F7F'                                   XP204580
000D9A  C500 3332          460          CLHI  R0,X'3332'                                   XP204590
000D9E  2334               461          BES   T1A8                                         XP204600
000DA0  24D5               462  T1R5    LIS   R13,5          ERROR 0105 - RD (EVEN BOUND)  *****  XP204610
000DA2  4300 0F1A          463          B     T1R                                          XP204620
        0000 0DA6          464  RH      EQU   *                                            XP204630
000DA6  D320 3359          465  T1A8    LB    R2,INDEV                                     XP204640
000DAA  9D23               466          SSR   R2,R3                                        XP204650
000DAC  2081               467          BTBS  8,1                                          XP204660
000DAE  D920 3370          468          RH    R2,TEMP        TEMP = KEY 4                 XP204670
000DB2  D300 3370          469          LB    R0,TEMP                                      XP204680
000DB6  C400 007F          470          NHI   R0,X'7F'                                     XP204690
000DBA  C500 0034          471          CLHI  R0,X'34'                                     XP204700
000DBE  2334               472          BES   T1A10                                        XP204710
000DC0  24D6               473  T1R6    LIS   R13,6          ERROR 0106 - RH (EVEN BOUND)  *****  XP204720
000DC2  4300 0F1A          474          B     T1R                                          XP204730
000DC6  9D23               475  T1A10   SSR   R2,R3                                       XP204740
000DC8  2081               476          BTBS  8,1                                          XP204750
000DCA  D920 3370          477          RH    R2,TEMP                                      XP204760
000DCE  C840 0035          478  T1A10A  LHI   R4,X'35'                                     XP204770
000DD2  D440 3371          479          CLB   R4,TEMP+1                                    XP204780
000DD6  2334               480          BES   T1A11                                        XP204790
000DD8  24D7               481  T1R7    LIS   R13,7          ERROR 0107 - RH (ODD  BOUND)  *****  XP204800
000DDA  4300 0F1A          482          B     T1R                                          XP204810
                           483  *                                                          XP204820
        0000 0DDE          484  RHR     EQU   *                                            XP204830
000DDE  9D23               485  T1A11   SSR   R2,R3                                       XP204840
000DE0  2081               486          BTBS  8,1                                          XP204850
000DE2  9925               487          RHR   R2,R5                                        XP204860
000DE4  D250 3270          488          STB   R5,BUFR3                                     XP204870
000DE8  D340 3270          489          LB    R4,BUFR3                                     XP204880
000DEC  C540 0035          490          CLHI  R4,X'36'                                     XP204890
000DF0  2334               491          BES   T1A11B                                       XP204900
                           492  *                                                          XP204910
000DF2  24DA               493  T1R10   LIS   R13,10         ERROR 010A - RHR             *****  XP204920
000DF4  4300 0F1A          494          B     T1R                                          XP204930
        0000 0DF8          495  RBR     EQU   *                                            XP204940
000DF8  D150 3228          496  T1A11B  LM    R5,BUFR0                                     XP204950
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000DFC  D060 3274          497          STM   R6,BUFR3+4                                    XP204960
000E00  E6B0 3270          498          LA    R11,BUFR3                                     XP204970
000E04  E6C0 3273          499  T1A11C  LA    R12,BUFR3+3                                   XP204980
000E08  972B               500          RBR   R2,R11          READ KEYS 7,8,9,0             XP204990
000E0A  5800 3270          501          L     R0,BUFR3                                      XP205000
000E0E  F400 7F7F 7F7F     502          NI    R0,Y'7F7F7F7F'                                XP205010
000E14  F500 3738 3930     503          CLI   R0,Y'37383930'                                XP205020
000E1A  2134               504          BNES  T1R8                                          XP205030
000E1C  D300 3274          505          LB    R0,BUFR3+4                                    XP205040
000E20  2334               506          BZS   T1A11D                                        XP205050
000E22  24D8               507  T1R8    LIS   R13,8           ERROR 0108 - RBR        *****  XP205060
000E24  4300 0F1A          508          B     T1R                                           XP205070
                           509  *                                                           XP205080
        0000 0E28          510  WDR     EQU   *                                             XP205090
        0000 0E28          511  WD      EQU   *                                             XP205100
        0000 0E28          512  WBR     EQU   *                                             XP205110
000E28  E640 314E          513  T1A11D  LA    R4,T1MSG2                                     XP205120
000E2C  E650 3165          514          LA    R5,T1MSGEND-7                                 XP205130
000E30  D320 3358          515  T1A12   LB    R2,OUTDEV                                     XP205140
000E34  DE20 335A          516          OC    R2,OUTCMD       DEVICE IN WRITE MODE.         XP205150
000E38  9D23               517          SSR   R2,R3                                         XP205160
000E3A  2081               518          BTBS  8,1                                           XP205170
000E3C  DA20 316C          519          WD    R2,NULL                                       XP205180
000E40  9D23               520          SSR   R2,R3           USE WBR INSTRUCTION TO        XP205190
000E42  2081               521          BTBS  8,1             OUTPUT THE CHARACTERS         XP205200
000E44  9624               522          WBR   R2,R4           CR,LF,DEPRESS KEYS,CR,LF,123456 XP205210
000E46  42F0 0EB4          523          BTC   15,T1R11                                      XP205220
000E4A  9D23               524          SSR   R2,R3                                         XP205230
000E4C  4270 0EB4          525          BTC   7,T1R11                                       XP205240
000E50  2083               526          BTBS  8,3                                           XP205250
000E52  D300 3166          527          LB    R0,T1MSGEND-6                                 XP205260
000E56  9A20               528          WDR   R2,R0           WRITE CHAR 7                  XP205270
000E58  9D23               529          SSR   R2,R3                                         XP205280
000E5A  4270 0EB4          530          BTC   7,T1R11                                       XP205290
000E5E  2083               531          BTBS  8,3                                           XP205300
000E60  DA20 3167          532  T1A14   WD    R2,T1MSGEND-5   WRITE CHAR 8                 XP205310
000E64  9D23               533  T1A15   SSR   R2,R3                                         XP205320
000E66  4270 0EB4          534          BTC   7,T1R11                                       XP205330
000E6A  2083               535          BTBS  8,3                                           XP205340
000E6C  DA20 3168          536          WD    R2,T1MSGEND-4   WRITE CHAR 9                 XP205350
000E70  9D23               537          SSR   R2,R3                                         XP205360
000E72  4270 0EB4          538          BTC   7,T1R11                                       XP205370
000E76  2083               539          BTBS  8,3                                           XP205380
000E78  D340 3169          540          LB    R4,T1MSGEND-3                                 XP205390
000E7C  9A24               541          WDR   R2,R4           WRITE CHAR 0                  XP205400
000E7E  9D23               542          SSR   R2,R3                                         XP205410
000E80  4270 0EB4          543          BTC   7,T1R11                                       XP205420
000E84  2083               544          BTBS  8,3                                           XP205430
000E86  D340 316A          545          LB    R4,T1MSGEND-2                                 XP205440
000E8A  9A24               546          WDR   R2,R4           CARR RETN                     XP205450
000E8C  9D23               547  T1A16   SSR   R2,R3                                         XP205460
000E8E  4270 0EB4          548          BTC   7,T1R11                                       XP205470
000E92  2083               549          BTBS  8,3                                           XP205480
000E94  DA20 316B          550          WD    R2,T1MSGEND-1   LINE FEED                    XP205490
000E98  9D23               551          SSR   R2,R3                                         XP205500
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000E9A  4270 0EB4          552          BTC   7,T1R11                                                  XP205510
000E9E  2083               553          BTBS  8,3                                                      XP205520
000EA0  D340 316C          554          LB    R4,T1MSGEND                                              XP205530
000EA4  9A24               555          WDR   R2,R4              NULL                                  XP205540
000EA6  9D23               556          SSR   R2,R3                                                    XP205550
000EA8  2081               557          BTBS  8,1                                                      XP205560
000EAA  DA20 316C          558          WD    R2,NULL                                                  XP205570
000EAE  9D23               559          SSR   R2,R3                                                    XP205580
000EB0  2081               560          BTBS  8,1                                                      XP205590
000EB2  2304               561          BS    T1A18                                                    XP205600
000EB4  24DB               562  T1R11   LIS   R13,11             ERROR 010B - WBR,WH,WD,WHR,WDR *****   XP205610
000EB6  4300 0F1A          563          B     T1R                                                      XP205620
        0000 0EBA          564  RB      EQU   *                                                        XP205630
000EBA  D320 3359          565  T1A18   LB    R2,INDEV           DEVICE IN READ MODE                   XP205640
000EBE  DE20 335B          566          OC    R2,INCMD                                                 XP205650
000EC2  9D23               567          SSR   R2,R3                                                    XP205660
000EC4  2281               568          BFBS  8,1                                                      XP205670
000EC6  9D23               569          SSR   R2,R3                                                    XP205680
000EC8  2081               570          BTBS  8,1                                                      XP205690
000ECA  D160 3228          571          LM    R6,BUFR0                                                 XP205700
000ECE  D060 3270          572          STM   R6,BUFR3                                                 XP205710
000ED2  D720 32B0          573          RB    R2,S1BUF           READ KEYS 1234567890                  XP205720
000ED6  42F0 0F18          574          BTC   15,T1R9                                                  XP205730
000EDA  9D23               575          SSR   R2,R3                                                    XP205740
000EDC  4270 0F18          576          BTC   7,T1R9                                                   XP205750
000EE0  2283               577          BFBS  8,3                                                      XP205760
000EE2  5800 3270          578          L     R0,BUFR3                                                 XP205770
000EE6  F400 7F7F 7F7F     579          NI    R0,Y'7F7F7F7F'                                           XP205780
000EEC  F500 3132 3334     580          CLI   R0,Y'31323334'                                           XP205790
000EF2  4230 0F18          581          BNE   T1R9                                                     XP205800
000EF6  5800 3274          582          L     R0,BUFR3+4                                               XP205810
000EFA  F400 7F7F 7F7F     583          NI    R0,Y'7F7F7F7F'                                           XP205820
000F00  F500 3536 3738     584          CLI   R0,Y'35363738'                                           XP205830
000F06  4230 0F18          585          BNE   T1R9                                                     XP205840
000F0A  4800 3278          586          LH    R0,BUFR3+8                                               XP205850
000F0E  C400 7F7F          587          NHI   R0,X'7F7F'                                               XP205860
000F12  C500 3930          588          CLHI  R0,X'3930'                                               XP205870
000F16  2336               589          BES   T1END                                                    XP205880
000F18  24D9               590  T1R9    LIS   R13,9              ERROR 0109 - RB          *****       XP205890
000F1A  D2D0 335E          591  T1R     STB   R13,ERRNO                                                XP205900
000F1E  4300 2C58          592          B     ERRORB                                                   XP205910
000F22  4300 2CE2          593  T1END   B     NOERR                                                    XP205920


                           595  *                                                                      XP205940
                           596  *                                                                      XP205950
                           597  *                                                                      XP205960
        0000 0F26          598  SUBT2   EQU   *                                                        XP205970
                           599  *                                                                      XP205980
                           600  * SUBTEST 2 TESTS THE INSTRUCTIONS AI ((ACKNOWLEDGE INTERRUPT) AND AIR XP205990
                           601  * (ACKNOWLEDGE INTERRUPT REGISTER) IN THE HALFWORD MODE.  THE MNEMONICS XP206000
                           602  * USED TO ASSEMBLE THIS PROGRAM ARE ACK FOR AI (OPCODE=DF AND ACKR FOR  XP206010
                           603  * AIR (OPCODE=9F).  WHEN SUBTEST 2 IS ENTERED, THE PROGRAM PUTS THE     XP206020
                           604  * PROCESSOR IN THE HALFWORD MODE.  IT THEN TESTS THE AI AND AIR         XP206030
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                                605  * INSTRUCTIONS FOR A FALSE SYNC FROM A NON-A-DRESSED DEVICE (NO          XP206040
                                606  * EXTERNAL INTERRUPTS ARE PENDING).  NEXT, THE CONSOLE IS PUT INTO READ  XP206050
                                607  * MODE WITH INTERRUPTS ENABLED; FOLLOWING THIS, THE MODE IS CHANGED TO   XP206060
                                608  *  WRITE MODE BY GIVING AN OUTPUT COMMAND TO WRITE WITH INTERRUPT        XP206070
                                609  * ENABLED.  THIS SHOULD SET BUSY FLAG TO ZERO AND GENERATE AN           XP206080
                                610  * INTERRUPT.  IF AN INTERRUPT IS GENERATED, PSW SWAPS ARE DONE          XP206090
                                611  * PROPERLY, AND THE CORRECT DEVICE NUMBER AND STATUS ARE RECEIVED,      XP206100
                                612  * THE TEST PROCEEDS; OTHERWISE, AN ERROR MESSAGE IS PRINTED.           XP206110
                                613  * NEXT, THE CHARACTERS PRESS BRK ARE PRINTED AND THE TELETYPE IS PUT    XP206120
                                614  * INTO THE READ MODE WITH INTERRUPTS ENABLED.  THE USER, FOLLOWING      XP206130
                                615  * DIRECTIONS, DEPRESSES THE BREAK KEY.  IF NO INTERRUPT IS GENERATED,   XP206140
                                616  * IF PSW SWAPS ARE INCORRECT, OR IF THE AIR INSTRUCTION GIVES INCORRECT XP206150
                                617  * DEVICE NUMBER OR STATUS, AN ERROR MESSAGE IS PRINTED.  OTHERWISE,     XP206160
                                618  * THE MESSAGE NO ERROR IS PRINTED, AND THE SUBTEST TERMINATES.          XP206170
                                619  *                                                                      XP206180
                                620  ****                                                                   XP206190
                                621  *                                                                      XP206200
                                622  * USER NOTE:  THIS TEST MAY BE RUN ONLY ON A MODEL 7/32 WITH THE       XP206210
                                623  * HALFWORD MODE FEATURE.                                               XP206220
                                624  *        THIS TEST TO BE RUN ONLY ON MODEL 7/32 PROCESSOR              XP206230
                                625  *        IN HALF-WORD MODE.                                            XP206240
                                626  ********************************************************             XP206250
                                627  **  MACHINE MODE = HW MODE  ,BIT 11 = 1 ,BIT 23 = 0.                   XP206260
                                628  **       CHECK INSTRUCTIONS ACK, ACKR                                  XP206270
                                629  **  GENERATE A TELETYPE INTERRUPT BY                                   XP206280
                                630  **  1)CHANGING MODE FROM READ TO WRITE                                 XP206290
                                631  **  2)DEPRESSING THE BREAK KEY                                         XP206300
000F26  D300 3354               632          LB    R0,CPUNO                                                XP206310
000F2A  C500 0037               633          CLHI  R0,C'7'            7/32 ?                             XP206320
000F2E  4230 0C2C               634          BNE   BADKEY                                                    XP206330
000F32  F870 0010 00F0          635          LI    R7,Y'1000F0'       SELECT HALFWORD MODE.               XP206340
000F38  9567                    636          EPSR  R6,R7                                                     XP206350
000F3A  4300 0FA8               637          B     S2L1                                                      XP206360
000F3E  24D1                    638  S2R1    LIS   R13,1              ERROR 0201 - BAD FALSE SYNC,  *****  XP206370
000F40  2304                    639          BS    S2R                'AIR' IN HALFWORD MODE              XP206380
000F42  24D2                    640  S2R2    LIS   R13,2              ERROR 0202 - BAD FALSE SYNC,  *****  XP206390
000F44  2302                    641          BS    S2R                'AI' IN HALFWORD MODE               XP206400
000F46  24D6                    642  S2R6    LIS   R13,6              ERROR 0206 - BAD DEV ADR, STATUS****  XP206410
                                643  *                               ON HW MODE EXTERNAL INTERRUPT       XP206420
000F48  4800 3356               644  S2R     LH    R0,CRTFLG          CRT ?                               XP206430
000F4C  2135                    645          BNZS  S2RX               IF CRT, DO NOT WAIT FOR RLS         XP206440
000F4E  9D23                    646          SSR   R2,R3              WAIT TILL BRK KEY IS RELEASED       XP206450
000F50  C430 0020               647          NHI   R3,X'20'                                               XP206460
000F54  2036                    648          BNZS  S2R                                                    XP206470
000F56  D2D0 335E               649  S2RX    STB   R13,ERRNO                                             XP206480
000F5A  C8E0 2C58               650          LHI   R14,ERRORB                                             XP206490
000F5E  4300 2A24               651          B     HWTOFW             CHANGE TO FULLWORD MODE             XP206500
                                652  **  INTERRUPT DETECTED BY PRESSING THE BRK KEY ON TTY                  XP206510
000F62  4000 3370               653  S2INT2  STH   R0,TEMP           INTRPT.FROM TTY BRK KEY             XP206520
000F66  DF30                    654          DC    X'DF30'            ACK   R3,TEMP                       XP206530
000F68  3370                    655          DC    Z(TEMP)                                                 XP206540
000F6A  0523                    656          CLR   R2,R3              R3 = TTY ADR. ?   (CLHR)            XP206550
000F6C  4230 0F46               657  S2R6A   BNE   S2R6                                                   XP206560
000F70  C860 0024               658          LHI   R6,X'24'           CHECK TEMP FOR TTY STATUS           XP206570
000F74  D4E0 3370               659  S2INT2B CLB   R6,TEMP                                                XP206580
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000F78  2036          660          BNES  S2R6A                                        XP206590
000F7A  4800 0040     661          LH    R0,X'40'                                     XP206600
000F7E  C400 FFF0     662          NHI   R0,X'FFF0'                                   XP206610
000F82  C500 40F0     663          CLHI  R0,X'40F0'          OLD PSW.                 XP206620
000F86  4230 0F46     664          BNE   S2R6                                         XP206630
                      665  *                                                         XP206640
000F8A  4800 3356     666          LH    R0,CRTFLG                                    XP206650
000F8E  2135          667          BNZS  S2END                                        XP206660
000F90  9D23          668  S2WT    SSR   R2,R3                                        XP206670
000F92  C430 0020     669          NHI   R3,X'20'                                     XP206680
000F96  2033          670          BNZS  S2WT                WAIT FOR RELEASE OF BRK KEY  XP206690
000F98  C8E0 0FA0     671  S2END   LHI   R14,S2END2                                  XP206700
000F9C  4300 2A24     672          B     HWTOFW              CHANGE TO FULLWORD MODE  XP206710
000FA0  E6C0 3102     673  S2END2  LA    R12,NOERRM2                                  XP206720
000FA4  4300 2CE6     674          B     NOERR2              PRINT 'NO ERROR'         XP206730
                      675  *                                                         XP206740
                      676  *                                                         XP206750
                      677  **       PROCESSOR IS IN THE HALFWORD MODE AT THIS POINT   XP206760
        0000 0FA8     678  S2L1    EQU   *                                          XP206770
000FA8  DF00          679          DC    X'DF00'             ACK   R0,TEMP        XP206780
000FAA  3370          680          DC    Z(TEMP)                                    XP206790
000FAC  2400          681          LIS   R0,0                R0 = 0               XP206800
000FAE  2511          682          LCS   R1,1                R1 = FFFF            XP206810
000FB0  9F01          683          DC    X'9F01'             ACKR  R0,R1          XP206820
000FB2  4340 0F3E     684          BFC   4,S2R1              EXPECT TIMEOUT       XP206830
000FB6  0800          685          LR    R0,R0               (LHR)                XP206840
000FB8  4230 0F3E     686          BNZ   S2R1                                       XP206850
000FBC  C510 0004     687          CLHI  R1,4                R1 = 4 = STATUS W. EX.BIT=1 ?  XP206860
000FC0  4230 0F3E     688          BNE   S2R1                                       XP206870
000FC4  2501          689          LCS   R0,1                R0 = FFFF            XP206880
000FC6  9F00          690          DC    X'9F00'             ACKR  R0,R0          XP206890
000FC8  4340 0F3E     691          BFC   4,S2R1                                     XP206900
000FCC  C500 0004     692          CLHI  R0,4                                       XP206910
000FD0  4230 0F3E     693          BNE   S2R1                                       XP206920
                      694  *                                                         XP206930
000FD4  2501          695          LCS   R0,1                R0 = FFFF            XP206940
000FD6  4000 3370     696          STH   R0,TEMP                                    XP206950
000FDA  DF00          697          DC    X'DF00'             ACK   R0,TEMP        XP206960
000FDC  3370          698          DC    Z(TEMP)                                    XP206970
000FDE  4340 0F42     699          BFC   4,S2R2              EXPECT TIMEOUT       XP206980
000FE2  0800          700          LR    R0,R0               (LHR)                XP206990
000FE4  4230 0F42     701          BNZ   S2R2                                       XP207000
000FE8  2404          702          LIS   R0,4                                       XP207010
000FEA  D400 3370     703          CLB   R0,TEMP             EXAMINE BIT SET ?    XP207020
000FEE  4230 0F42     704          BNE   S2R2                                       XP207030
                      705  *                                                         XP207040
000FF2  D320 3359     706          LB    R2,INDEV                                   XP207050
000FF6  D310 335B     707          LB    R1,INCMD            DISABLE INTERRUPT    XP207060
000FFA  9E21          708          OCR   R2,R1               TTY IN READ MODE     XP207070
000FFC  9D23          709          SSR   R2,R3                                      XP207080
000FFE  2281          710          BFBS  8,1                 WAIT FOR BUSY = 1    XP207090
001000  2400          711          LIS   R0,0                                       XP207100
001002  4000 0040     712          STH   R0,X'40'            OLD PSW,EXT.INTRPT.  XP207110
001006  C800 00F0     713          LHI   R0,X'F0'            SEL REG SET F.       XP207120
00100A  4000 0044     714          STH   R0,X'44'            NEW PSW,EXT.INTRPT.  XP207130
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00100E  C830 106A      715          LHI   R3,S2INT                                        XP207140
001012  4030 0046      716          STH   R3,X'46'                                        XP207150
001016  2440           717          LIS   R4,0          R4 = 0 IF INTRPT BY MODE CHANGE    XP207160
001018  C810 0044      718          LHI   R1,X'44'      TTY OC                             XP207170
00101C  4800 3356      719          LH    R0,CRTFLG                                       XP207180
001020  2333           720          BZS   S2B                                             XP207190
001022  C810 0079      721          LHI   R1,X'79'      CRT OC                             XP207200
001026  9E21           722  S2B     OCR   R2,R1         READ MODE, INTPTS ENABLED          XP207210
001028  DFC0           723          DC    X'DFC0'       ACK   R12,TEMP                     XP207220
00102A  3370           724          DC    Z(TEMP)                                         XP207230
00102C  DB20 3370      725          RD    R2,TEMP       PASLA DUMMY READ                   XP207240
001030  9D23           726          SSR   R2,R3                                           XP207250
001032  2281           727          BFBS  8,1           WAIT UNTIL BUSY = 1                XP207260
001034  C800 40F0      728          LHI   R0,X'40F0'                                      XP207270
001038  95D0           729          EPSR  R13,R0        ENABLE EXTERNAL INTRPTS.           XP207280
00103A  C810 0048      730  S2L2    LHI   R1,X'48'      TTY OC                             XP207290
00103E  4800 3356      731          LH    R0,CRTFLG                                       XP207300
001042  2333           732          BZS   S2L2A                                           XP207310
001044  C810 006B      733          LHI   R1,X'6B'      CRT OC                             XP207320
001048  D320 3358      734  S2L2A   LB    R2,OUTDEV                                       XP207330
00104C  9E21           735          OCR   R2,R1         SHOULD GENERATE AN INTERRUPT       XP207340
00104E  4800 3356      736          LH    R0,CRTFLG                                       XP207350
001052  2333           737          BZS   S2L2B                                           XP207360
001054  DA20 316C      738          WD    R2,NULL       FORCE BSY TRANSITION W/CRT         XP207370
001058  D320 3359      739  S2L2B   LB    R2,INDEV                                        XP207380
00105C  9D23           740  S2C     SSR   R2,R3                                           XP207390
00105E  C430 0020      741          NHI   R3,X'20'      LOOK FOR BRK KEY                   XP207400
001062  2233           742          BZS   S2C                                             XP207410
001064  24D3           743  S2R3    LIS   R13,3         ERROR 0203 - NO INTERRUPT    *****  XP207420
001066  4300 0F48      744          B     S2R           .     BY MODE CHANGE               XP207430
                       745  **  INTERRUPT DETECTED BY CHANGING TTY MODE FROM READ TO WRITE  XP207440
00106A  0844           746  S2INT   LR    R4,R4         (LHR)                              XP207450
00106C  4230 0F62      747          BNZ   S2INT2        R4=0 IF INTERRUPT BY MODE CHANGE   XP207460
001070  2551           748          LCS   R5,1                                            XP207470
001072  2561           749          LCS   R6,1                                            XP207480
001074  9F56           750          DC    X'9F56'       ACKR  R5,R6                        XP207490
001076  2145           751          BOS   S2R4                                            XP207500
001078  0525           752          CLR   R2,R5         (CLHR)  R2=R5= TTY ADR. ?          XP207510
00107A  2133           753          BNES  S2R4                                            XP207520
00107C  0866           754          LR    R6,R6         (LHR)  R6 = TTY STATUS ?           XP207530
00107E  2334           755          BZS   S2E                                             XP207540
001080  24D4           756  S2R4    LIS   R13,4         ERROR 0204 - BAD PSW SWAP    *****  XP207550
001082  4300 0F48      757          B     S2R           ON INTPT BY MODE CHANGE            XP207560
                       758  *                                                             XP207570
001086  4870 0040      759  S2E     LH    R7,X'40'      OLD PSW, EXT.INTRPT.               XP207580
00108A  C470 FFF0      760          NHI   R7,X'FFF0'                                      XP207590
00108E  C570 40F0      761          CLHI  R7,X'40F0'                                      XP207600
001092  2039           762          BNES  S2R4                                            XP207610
                       763  *                                                             XP207620
001094  41E0 2A64      764          BAL   R14,PRBRK     PRINT CHAR. "PRESS BRK"            XP207630
001098  D320 3359      765          LB    R2,INDEV                                        XP207640
00109C  9E21           766          OCR   R2,R1         ENABLE INTPTS, READ MODE           XP207650
00109E  DFC0           767          DC    X'DFC0'       ACK   R12,TEMP                     XP207660
0010A0  3370           768          DC    Z(TEMP)                                         XP207670
0010A2  DB20 3370      769          RD    R2,TEMP       PASLA DUMMY READ                   XP207680
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0010A6  9D23              770  S2F     SSR   R2,R3              WAIT FOR BUSY = 1                          XP207690
0010A8  2281              771          BFBS  8,1                                                         XP207700
0010AA  2441              772          LIS   R4,1                                                        XP207710
0010AC  C8D0 40F0         773          LHI   R13,X'40F0'        ENABLE I/O INTPTS                        XP207720
0010B0  953D              774          EPSR  R3,R13                                                      XP207730
0010B2  9D23              775  S2L3    SSR   R2,R3              LOOK FOR BRK KEY                         XP207740
0010B4  C430 0020         776          NHI   R3,X'20'                                                    XP207750
0010B8  2233              777          BZS   S2L3                                                        XP207760
0010BA  24D5              778  S2R5    LIS   R13,5              ERROR 0205 - NO INTERRUPT      *****     XP207770
0010BC  4300 0F48         779          B     S2R                .      BY BREAK KEY                      XP207780


                          781  *                                                                          XP207800
                          782  *                                                                          XP207810
                          783  *                                                                          XP207820
0000 10C0                 784  SUBT3   EQU   *                  CHECK EXTERNAL INTRPTS.                  XP207830
                          785  *                                                                          XP207840
                          786  * SUBTEST 3 TESTS THE HANDLING OF EXTERNAL INTERRUPTS.  ON ENTERING       XP207850
                          787  * SUBTEST 3, LOW CORE IS INITIALIZED FOR INTERRUPTS FROM THE CONSOLE.      XP207860
                          788  * THE CONSOLE IS ISSUED A COMMAND TO PUT IT IN THE READ MODE WITH         XP207870
                          789  * INTERRUPTS DISABLED.  IF AN INTERRUPT OCCURS, AN ERROR MESSAGE IS       XP207880
                          790  * PRINTED.  WHEN THE BUSY FLAG IS SET, AN OUTPUT COMMAND IS ISSUED        XP207890
                          791  * TO ENABLE INTERRUPTS IN THE WRITE MODE.  FOLLOWING THIS, A PSW          XP207900
                          792  * SWAP IS MADE TO ENABLE EXTERNAL INTERRUPTS.  AN INTERRUPT SHOULD        XP207910
                          793  * BE TAKEN, CAUSED BY THE TRANSITION OF BSY.  IF THE INTERRUPT IS         XP207920
                          794  * NOT TAKEN, AN ERROR MESSAGE IS PRINTED.                                 XP207930
                          795  * IF THE INTERRUPT IS TAKEN, A PSW SWAP IS MADE TO DISABLE FURTHER        XP207940
                          796  * EXTERNAL INTERRUPTS.  THE CONSOLE IS THEN ISSUED AN OUTPUT COMMAND      XP207950
                          797  * TO DISARM THE INTERRUPT.  THE NATURE OF THE INTERRUPT IS CHECKED         XP207960
                          798  * TO DETERMINE WHETHER IT WAS CAUSED BY THE TRANSITION OF BSY CHANGE.      XP207970
                          799  * IF IT WAS NOT, AN ERROR MESSAGE IS PRINTED.                             XP207980
                          800  * THE MESSAGE 'PRESS BRK' IS THEN PRINTED.  THE CONSOLE IS PUT IN         XP207990
                          801  * THE READ MODE WITH THE INTERRUPT ENABLED.  A PSW SWAP IS MADE TO        XP208000
                          802  * ENABLE EXTERNAL INTERRUPTS, AND THE USER, FOLLOWING DIRECTIONS,         XP208010
                          803  * DEPRESSES THE BREAK KEY.  WHEN THE KEY IS DEPRESSED, AN INTERRUPT       XP208020
                          804  * SHOULD CAUSE A PSW SWAP.  IF IT DOES NOT, AN ERROR MESSAGE IS           XP208030
                          805  * PRINTED.  IF THE PSW SWAP IS MADE, THE PROGRAM WAITS UNTIL THE BREAK     XP208040
                          806  * KEY IS RELEASED.                                                        XP208050
                          807  * THE SYSTEM QUEUE INTERRUPT NEW PSW IS NEXT SET TO CAUSE A BRANCH TO     XP208060
                          808  * THE ERROR ROUTINE, AND THE SYSTEM QUEUE IS EMPTIED.  A PSW SWAP IS      XP208070
                          809  * MADE TO ENABLE SYSTEM QUEUE INTERRUPTS.  IF THE INTERRUPT IS TAKEN,     XP208080
                          810  * AN ERROR MESSAGE IS PRINTED.                                            XP208090
                          811  * A PSW SWAP IS MADE TO DISABLE THE SYSTEM QUEUE INTERRUPT, AND AN        XP208100
                          812  * ENTRY IS MADE TO THE SYSTEM QUEUE.  THE SYSTEM QUEUE INTERRUPT NEW      XP208110
                          813  * PSW IS SET TO CAUSE A BRANCH TO AN INTERRUPT HANDLER, 'T3SYSQ'.  NEXT   XP208120
                          814  * THE SYSTEM QUEUE INTERRUPT IS ENABLED BY A PSW SWAP.  THE INTERRUPT     XP208130
                          815  * SHOULD BE TAKEN.  IF IT IS NOT, AN ERROR MESSAGE IS PRINTED.  IF THE    XP208140
                          816  * INTERRUPT IS TAKEN, THE (THEN) CURRENT PSW AND REGISTERS 13, 14, AND    XP208150
                          817  * 15 OF THE SET SPECIFIED BY THE SYSTEM QUEUE INTERRUPT NEW PSW ARE       XP208160
                          818  * CHECKED FOR THE SPECIFIED CONTENTS:                                      XP208170
                          819  *         REGISTER 13 = SYSTEM QUEUE ADDRESS                               XP208180
                          820  *         REGISTER 14 = OLD PSW (STATUS)                                   XP208190
                          821  *         REGISTER 15 = OLD PSW (LOCATION)                                 XP208200
                          822  * IF THE CONTENTS OF THESE REGISTERS ARE NOT CORRECT, AN ERROR MESSAGE     XP208210
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                                823  * IS PRINTED.                                                                  XP208220
                                824  * NEXT THE MESSAGE "FUNCTION 0" IS PRINTED.  THE USER MUST DEPRESS THE        XP208230
                                825  * BUTTONS FN AND 0 ON THE CONSOLE.  THIS SHOULD CAUSE AN IMMEDIATE            XP208240
                                826  * INTERRUPT AND A BRANCH TO THE INTERRUPT HANDLER, 'CONINT'.  THE             XP208250
                                827  * REGISTERS IN SET 0 ARE CHECKED FOR THEIR CONTENTS AS FOLLOWS:               XP208260
                                828  *       REGISTER 0 = OLD PSW STATUS                                          XP208270
                                829  *       REGISTER 1 = OLD PSW LOCATION                                        XP208280
                                830  *       REGISTER 2 = INTERRUPTING DEVICE ADDRESS                             XP208290
                                831  *       REGISTER 3 = INTERRUPTING DEVICE STATUS                              XP208300
                                832  * IF THE INTERRUPT DOES NOT OCCUR, OR IF IT IS NOT HANDLED PROPERLY, AN      XP208310
                                833  * ERROR MESSAGE IS PRINTED.  OTHERWISE, THE TEST ENDS BY PRINTING THE        XP208320
                                834  * MESSAGE 'NO ERROR'.                                                        XP208330
                                835  *                                                                           XP208340
                                836  * USER NOTE:  IF THE PROCESSOR UNDER TEST IS A MODEL 8/32, THE MESSAGE      XP208350
                                837  * 'TTY PRIOR LEV' WILL BE PRINTED.  ONE OF THE KEYS 0, 1, 2, OR 3 MUST     XP208360
                                838  * BE DEPRESSED ACCORDING TO THE HARDWARE INTERRUPT PRIORITY LEVEL           XP208370
                                839  * ASSIGNED TO THE CONSOLE (NORMALLY 0), FOLLOWED BY A CARRIAGE RETURN.      XP208380
                                840  * THE DEVICE MAY BE CONNECTED AT A PRIORITY LEVEL OTHER THAN ZERO FOR       XP208390
                                841  * FURTHER TESTING OF THE PRIORITY LEVEL INTERRUPT HARDWARE.  ON MODEL        XP208400
                                842  * 8/32, FAILURE OF THE INTERRUPT TO OCCUR ON THE SPECIFIED PRIORITY         XP208410
                                843  * LEVEL RESULTS IN THE PRINTING OF AN ERROR MESSAGE.                         XP208420
                                844  ************************************************************               XP208430
0010C0  D310 3354               845  S3A      LB    R1,CPUNO                                                    XP208440
0010C4  C510 0038               846           CLHI  R1,C'8'                                                     XP208450
0010C8  2133                    847           BNES  S3A1                                                        XP208460
                                848  **  MACHINE MODE = FW MODE, BIT 11=0 ,BIT 23 = 0                           XP208470
0010CA  41A0 2AC5               849           BAL   R10,GETPRIO          - PRINT 'TTY PRIOR LEV', SET PRILEV    XP208480
                                850  *                                                                           XP208490
0010CE  D340 3358               851  S3A1     LB    R4,OUTDEV                                                   XP208500
0010D2  E610 1104               852           LA    R1,S3A1X                                                    XP208510
0010D6  4014 4400 00D0          853           STH   R1,X'D0'(R4,R4)      OUTPUT SERVICE POINTER                 XP208520
0010DC  D320 3359               854           LB    R2,INDEV                                                    XP208530
0010E0  4012 4200 00D0          855           STH   R1,X'D0'(R2,R2)      INPUT SERVICE VECTOR                   XP208540
0010E6  C850 0040               856           LHI   R5,X'40'             TTY OC                                 XP208550
0010EA  4800 3356               857           LH    R0,CRTFLG                                                   XP208560
0010EE  2333                    858           BZS   S3A1A                                                       XP208570
0010F0  C850 006B               859           LHI   R5,X'6B'             CRT OC                                 XP208580
0010F4  9E25                    860  S3A1A    OCR   R2,R5                ENABLE READ SIDE INTPTS                XP208590
0010F6  2652                    861           AIS   R5,2                                                        XP208600
0010F8  9E45                    862           OCR   R4,R5                ENABLE WRITE SIDE INTPTS               XP208610
0010FA  5870 32C0               863  S3A2     L     R7,S3PSW             ENABLE PROCESSOR INTERRUPTS            XP208620
0010FE  9567                    864           EPSR  R6,R7                                                       XP208630
001100  FAC0 001F               865           RRL   R0,31                DELAY TACTIC                           XP208640
001104  9566                    866  S3A1X    EPSR  R6,R6                                                       XP208650
001106  C360 0800               867           THI   R6,X'0800'                                                  XP208660
00110A  2038                    868           BNZS  S3A2                 ACK ALL INTERRUPTS FROM CONSOLE DEV    XP208670
                                869  *                                                                           XP208680
00110C  E650 117E               870           LA    R5,S3XINT                                                   XP208690
001110  4052 4200 00D0          871           STH   R5,X'D0'(R2,R2)      INPUT SERVICE VECTOR                   XP208700
001116  4054 4400 00D0          872           STH   R5,X'D0'(R4,R4)      OUTPUT SERVICE VECTOR                  XP208710
00111C  2490                    873           LIS   R9,0                 INTERRUPT FLAG = 0                     XP208720
00111E  DE20 335B               874           OC    R2,INCMD             DISABLE INTPTS, READ MODE              XP208730
001122  DB20 3370               875           RD    R2,TEMP              PASLA DUMMY READ                       XP208740
001126  9D23                    876  S3WT1    SSR   R2,R3                WAIT UNTIL TTY IS BUSY                 XP208750
001128  22@1                    877           BFBS  8,1                                                         XP208760
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00112A  C860 0079          878          LHI   R6,X'79'      CRT OC                                  XP208770
00112E  4800 3356          879          LH    R0,CRTFLG                                             XP208780
001132  2134               880          BNZS  S3WT2         CRT I/O IF NON-ZERO                     XP208790
001134  C860 0044          881          LHI   R6,X'44'      TTY OC                                  XP208800
001138  9E26               882          OCR   R2,R6         ENABLE READ SIDE INTPTS                 XP208810
00113A  9D23               883  S3WT2   SSR   R2,R3                                                 XP208820
00113C  2281               884          BFBS  8,1                                                   XP208830
00113E  2491               885          LIS   R9,1          R9 = 1; EXPECT MODE CHANGE INTPT        XP208840
001140  C870 0048          886          LHI   R7,X'48'      TTY OC                                  XP208850
001144  0800               887          LR    R0,R0         CRT ?                                   XP208860
001146  2333               888          BZS   S3WT2A                                                XP208870
001148  C870 006B          889          LHI   R7,X'6B'      CRT OC                                  XP208880
00114C  9E27               890  S3WT2A  OCR   R2,R7         ENABLE WRITE SIDE INTPTS                XP208890
00114E  9D23               891          SSR   R2,R3                                                 XP208900
001150  2081               892          BTBS  8,1           WAIT FOR BSY = 0                        XP208910
001152  0800               893          LR    R0,R0                                                 XP208920
001154  2333               894          BZS   S3WT3                                                 XP208930
001156  DA40 316C          895          WD    R4,NULL       FORCE BSY TRANSITION, CRT               XP208940
00115A  9D23               896  S3WT3   SSR   R2,R3         LOOK FOR BRK KEY                        XP208950
00115C  C430 0020          897          NHI   R3,X'20'                                              XP208960
001160  2233               898          BZS   S3WT3                                                 XP208970
001162  24D2               899  S3R2    LIS   R13,2         ERROR 0302 -  NO INTPT BY       *****   XP208980
                           900  *                           MODE CHANGE                             XP208990
001164  4800 3356          901  S3RWT   LH    R0,CRTFLG     CRT ?                                   XP209000
001168  2137               902          BNZS  S3R           IF CRT, DO NOT WAIT FOR RLS             XP209010
00116A  D320 3359          903          LB    R2,INDEV                                              XP209020
00116E  9D23               904          SSR   R2,R3         WAIT UNTIL BRK KEY IS RELEASED          XP209030
001170  C430 0020          905          NHI   R3,X'20'      THEN PRINT ERR.NO IN R13                XP209040
001174  2038               906          BNZS  S3RWT                                                 XP209050
001176  D2D0 335E          907  S3R     STB   R13,ERRNO                                             XP209060
00117A  4300 2C58          908          B     ERRORB                                                XP209070
                           909  *                                                                   XP209080
        0000 117E          910  S3XINT  EQU   *             EXT.INTRPT.FROM TTY DETECTED            XP209090
00117E  9566               911          EPSR  R6,R6         CATCH CURRENT PSW                       XP209100
001180  D000 338C          912          STM   R0,REG0       SAVE REG.SET 0                          XP209110
001184  D310 3354          913          LB    R1,CPUNO                                              XP209120
001188  C510 0038          914          CLHI  R1,C'8'       MODEL 8/32 ?                            XP209130
00118C  2139               915          BNES  S3XINT1                                               XP209140
00118E  C460 00F0          916          NHI   R6,X'F0'      EXTRACT CURRENT REG SET NUMBER          XP209150
001192  D460 335D          917          CLB   R6,PRILEV+1   EQUAL TO SPECIFIED PRIOR. LEVEL ?      XP209160
001196  2334               918          BES   S3XINT1                                               XP209170
001198  24DC               919  S3R12   LIS   R13,12        ERROR 030C - TELETYPE INTERRUPT*****    XP209180
00119A  4300 1176          920          B     S3R           GIVES WRONG REGISTER SET.               XP209190
                           921  *                                                                   XP209200
00119E  D100 3228          922  S3XINT1 LM    R0,BUFR0      CLEAR THIS REG SET FOR NEXT TIME.       XP209210
0011A2  C8D0 00F0          923          LHI   R13,X'F0'     SELECT REG SET F                        XP209220
0011A6  957D               924          EPSR  R7,R13                                                XP209230
0011A8  DE20 335B          925          OC    R2,INCMD      DISABLE TTY INTERRUPT                   XP209240
0011AC  DB20 3370          926          RD    R2,TEMP                                               XP209250
0011B0  9D23               927          SSR   R2,R3                                                 XP209260
0011B2  2281               928          BFBS  8,1           WAIT FOR BSY = 1                        XP209270
0011B4  0899               929          LR    R9,R9         IF R9 = 0, NO INTPT EXPECTED.           XP209280
0011B6  2134               930          BNZS  S3X2                                                  XP209290
0011B8  24D1               931  S3R1    LIS   R13,1         ERROR 0301 -  INTERRUPT RECEIVED*****   XP209300
0011BA  4300 1164          932          B     S3RWT         .    WHEN DISABLED AT INTERFACE         XP209310
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                        933  *
0011BE  D1B0 338C       934  S3X2   LM    R11,REG0          INTERRUPT PARAMETERS                    XP209320
0011C2  C4B0 FFF0       935         NHI   R11,X'FFF0'                                               XP209330
0011C6  55B0 32C0       936         CL    R11,S3PSW         OLD PSW STATUS                          XP209340
0011CA  4230 11EC       937         BNE   S3R34                                                     XP209350
0011CE  C590 0002       938         CLHI  R9,2              BREAK KEY INTPT EXPECTED ?              XP209360
0011D2  2339            939         BES   S3X3                                                      XP209370
0011D4  083E            940         LR    R3,R14            DEVICE STATUS ON INTERRUPT              XP209380
0011D6  4230 1162       941         BNZ   S3R2              SHOULD BE ZERO                          XP209390
0011DA  D340 3358       942         LB    R4,OUTDEV         MODE CHANGE INTPT WAS EXPECTED          XP209400
0011DE  05D4            943         CLR   R13,R4                                                    XP209410
0011E0  2136            944         BNES  S3R34                                                     XP209420
0011E2  2309            945         BS    S3X4                                                      XP209430
0011E4  D340 3359       946  S3X3   LB    R4,INDEV          BRK KEY INTERRUPT WAS EXPECTED          XP209440
0011E8  05D4            947         CLR   R13,R4                                                    XP209450
0011EA  2335            948         BES   S3X4                                                      XP209460
                        949  *                                                                       XP209470
0011EC  08D9            950  S3R34  LR    R13,R9            ERROR 0303 - BAD REGISTER       *****   XP209480
                        951  *                               ON MODE CHANGE INTERRUPT                XP209490
0011EE  26D2            952         AIS   R13,2             ERROR 0304 - BAD REGISTER ON    *****   XP209500
0011F0  4300 1164       953         B     S3RWT             BREAK KEY INTERRUPT.                    XP209510
                        954  *                                                                       XP209520
0011F4  D320 3359       955  S3X4   LB    R2,INDEV                                                  XP209530
0011F8  4800 3356       956         LH    R0,CRTFLG                                                 XP209540
0011FC  2135            957         BNZS  S3X5              NO WAIT FOR BRK RLS WITH CRT            XP209550
0011FE  9D23            958         SSR   R2,R3                                                     XP209560
001200  C430 0020       959         NHI   R3,X'20'                                                  XP209570
001204  2038            960         BNZS  S3X4                                                      XP209580
001206  C590 0002       961  S3X5   CLHI  R9,2              R9 = 1 IF INTRPT BY MODE CHANGE         XP209590
00120A  4330 125A       962         BE    S3X8              R9 = 2 IF INTRPT BY BRK KEY             XP209600
00120E  C5C0 114E       963         CLHI  R12,S3WT2A+2      CHECK OLD PSW LOC                       XP209610
001212  4280 11EC       964         BL    S3R34                                                     XP209620
001216  C5C0 1162       965         CLHI  R12,S3R2                                                  XP209630
00121A  4380 11EC       966         BNL   S3R34                                                     XP209640
00121E  08EE            967         LR    R14,R14           TTY STATUS = 0 ?                        XP209650
001220  4230 11EC       968         BNZ   S3R34                                                     XP209660
                        969  *                                                                       XP209670
001224  2492            970         LIS   R9,2              R9=2,EXPECT INTRPT BY BRK KEY           XP209680
001226  41F0 2A64       971         BAL   R14,PRBRK         PRINT CHARACTERS PRESS BRK              XP209690
00122A  C860 0044       972         LHI   R6,X'44'          TTY OC                                  XP209700
00122E  4800 3356       973         LH    R0,CRTFLG                                                 XP209710
001232  2337            974         BZS   S3X5A             NOT CRT I/O                             XP209720
001234  C860 0079       975         LHI   R6,X'79'          CRT OC                                  XP209730
001238  9E26            976         OCR   R2,R6                                                     XP209740
00123A  9D23            977         SSR   R2,R3                                                     XP209750
00123C  2281            978         BFBS  8,1               WAIT FOR BUSY = 1, CRT                  XP209760
00123E  2304            979         BS    S3X5B                                                     XP209770
001240  9E26            980  S3X5A  OCR   R2,R6             ENABLE READ INTPTS (TTY ONLY)           XP209780
001242  9D23            981         SSR   R2,R3             WAIT FOR BUSY = 1                       XP209790
001244  2281            982         BFBS  8,1                                                       XP209800
001246  58E0 32C0       983  S3X5B  L     R14,S3PSW         ENAB EXTERNAL INTPTS, SEL REG SET F     XP209810
00124A  95DE            984         EPSR  R13,R14                                                   XP209820
00124C  9D23            985  S3WT5  SSR   R2,R3             R3 = TTY STATUS                         XP209830
00124E  C430 0020       986         NHI   R3,X'20'          LOOK FOR BRK KEY                        XP209840
001252  2233            987         BZS   S3WT5                                                     XP209850
                                                                                                    XP209860
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001254  24D5                988  S3WT6    LIS   R13,5              ERROR 0305 - NO BRK KEY INTPT.  *****  XP209870
001256  4300 1164           989            B     S3BRWT                                                    XP209880
                            990  *                                                                         XP209890
                            991  *                                                                         XP209900
                            992  **  INTERRUPT CAUSED BY DEPRESSING BREAK KEY                             XP209910
00125A  C5C0 124C           993  S3X8      CLHI  R12,S3WT5          CHECK OLD PSW LOC                    XP209920
00125E  4280 11EC           994            BL    S3R34                                                     XP209930
001262  C5C0 1254           995            CLHI  R12,S3WT6                                                 XP209940
001266  4380 11EC           996            BNL   S3R34                                                     XP209950
00126A  C4E0 0024           997            NHI   R14,X'24'                                                 XP209960
00126E  C5E0 0024           998            CLHI  R14,X'24'                                                 XP209970
001272  4230 11EC           999            BNE   S3R34                                                     XP209980
001276  7300 3356          1000            LHL   R0,CRTFLG                                                 XP209990
00127A  2135                1001            BNZS  S3X9                                                    XP210000
00127C  9D23                1002  S3BRK     SSR   R2,R3                                                   XP210010
00127E  C430 0020           1003            NHI   R3,X'20'           BREAK KEY?                           XP210020
001282  2033                1004            BNZS  S3BRK              STILL THERE                          XP210030
001284  D320 3359           1005  S3X9      LB    R2,INDEV                                                XP210040
001288  D340 3358           1006            LB    R4,OUTDEV                                               XP210050
00128C  E610 2C18           1007            LA    R1,DEVERR                                               XP210060
001290  4012 4200 00D0      1008            STH   R1,X'D0'(R2,R2)                                         XP210070
001296  4014 4400 00D0      1009            STH   R1,X'D0'(R4,R4)    RESTORE ERROR VECTORS                XP210080
                            1010 *                                                                        XP210090
                            1011 * TEST HANDLING OF SYSTEM QUEUE SERVICE INTERRUPT                        XP210100
                            1012 *                                                                        XP210110
00129C  E600 3380           1013  S3SQINT  LA    R0,TABLE                                                XP210120
0012A0  5000 0080           1014            ST    R0,X'80'           ADDRESS OF SYSTEM QUEUE              XP210130
0012A4  C800 00F0           1015            LHI   R0,Y'F0'                                                XP210140
0012A8  5000 0088           1016            ST    R0,X'88'           SYS QUEUE INT NEW PSW STATUS         XP210150
0012AC  E600 12EA           1017            LA    R0,ER0306                                               XP210160
0012B0  5000 008C           1018            ST    R0,X'8C'           SYS QUEUE INT NEW PSW LOC            XP210170
                            1019 *                                                                        XP210180
0012B4  D1D0 3228           1020            LM    R13,BUFR0          R13 = R14 = R15 = 0                  XP210190
0012B8  D0D0 3380           1021            STM   R13,TABLE          NO ENTRIES IN TABLE NOW.             XP210200
0012BC  C810 02F0           1022            LHI   R1,Y'02F0'         ENAB SYS QUEUE INT, SEL REG SET F    XP210210
0012C0  9501                1023            EPSR  R0,R1              WILL GO TO ER0306 IF INTPT TAKEN     XP210220
                            1024 *                                                                        XP210230
0012C2  C810 00F0           1025            LHI   R1,Y'F0'                                                XP210240
0012C6  9501                1026            EPSR  R0,R1              DISABLE INTPTS                       XP210250
0012C8  2422                1027            LIS   R2,2                                                    XP210260
0012CA  4020 3380           1028            STH   R2,TABLE           TABLE SIZE = 2, ENTRIES = 0          XP210270
0012CE  E630 12F0           1029            LA    R3,T3SYSQ                                               XP210280
0012D2  5030 008C           1030            ST    R3,X'8C'           SYSQINT NEW PSW LOC                  XP210290
0012D6  6430 3380           1031            ATL   R3,TABLE           ENTRIES = 1, ADDRESS = T3SYSQ        XP210300
0012DA  C810 02F0           1032            LHI   R1,Y'02F0'         ENAB SYS QUEUE INT, SEL REG SET F    XP210310
0012DE  9501                1033            EPSR  R0,R1              BRANCH TO T3SYSQ SHOULD OCCUR HERE   XP210320
                            1034 *                                                                        XP210330
0012E0  24D7                1035  ER0307    LIS   R13,7              ERROR 0307 - SYSQ INT NOT TAKEN*****  XP210340
0012E2  D2D0 335E           1036            STB   R13,ERRNO                                               XP210350
0012E6  4300 2C58           1037            B     ERRORB                                                  XP210360
0012EA  24D6                1038  ER0306    LIS   R13,6              ERROR 0306 - SPURIOUS QUEUE INTPT**   XP210370
0012EC  4300 1384           1039            B     T3R                                                     XP210380
                            1040 *                                                                        XP210390
0012F0  9500                1041  T3SYSQ    EPSR  R0,R0                                                   XP210400
0012F2  5500 0088           1042            CL    R0,X'88'           PROPER SYSQ NEW PSW STAT?            XP210410
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0012F6  4230 131A          1043          BNE   ER0308          IN WRONG REG SET HERE.                  XP210420
0012FA  D310 3354          1044          LB    R1,CPUNO                                                XP210430
0012FE  C510 0038          1045          CLHI  R1,C'8'         IS THIS A MODEL 7/32 ?                  XP210440
001302  2333               1046          BES   SYSQ8                                                   XP210450
001304  2410               1047  SYSQ7   LIS   R1,0            YES - ALL STORES IN REG SET 0           XP210460
001306  9501               1048          EPSR  R0,R1           *** SEL REG SET 0                       XP210470
                           1049  *                                                                     XP210480
001308  C5D0 3380          1050  SYSQ8   CLHI  R13,TABLE       PROPER ADDRESS OF QUEUE ?               XP210490
00130C  2137               1051          BNES  ER0308                                                  XP210500
00130E  C5E0 02F0          1052          CLHI  R14,Y'02F0'     PSW STAT WHEN SYSQ INT TAKEN            XP210510
001312  2134               1053          BNES  ER0308                                                  XP210520
001314  C5F0 12E0          1054          CLHI  R15,ER0307      PSW LOC  WHEN SYSQ INTPT TAKEN          XP210530
001318  2337               1055          BES   T3CON                                                   XP210540
00131A  C810 00F0          1056  ER0308  LHI   R1,X'F0'       RETURN TO REG SET F                     XP210550
00131E  9501               1057          EPSR  R0,R1                                                   XP210560
001320  24D8               1058          LIS   R13,8           ERROR 0308 - BAD REGISTER      *****    XP210570
                           1059  *                             CONTENTS, PSW, SYSTEM QUEUE INTPT.      XP210580
001322  4300 1176          1060          B     S3R                                                     XP210590
                           1061  *  TEST THE CONSOLE INTERRUPT                                         XP210600
                           1062  *                                                                     XP210610
001326  E6C0 316E          1063  T3CON   LA    R12,T3MSG1      PRINT CHARACTERS                        XP210620
00132A  E6D0 317C          1064          LA    R13,T3MSG1Z     FUNCTION 0 (ZERO)                       XP210630
00132E  41E0 2A6C          1065          BAL   R14,WBMSG                                               XP210640
001332  C800 1352          1066          LHI   R0,CONINT                                               XP210650
001336  4000 00D2          1067          STH   R0,X'D2'        ADDRESS OF CONINT HANDLER               XP210660
00133A  F810 0000 E0F0     1068          LI    R1,X'E0F0'                                              XP210670
001340  9501               1069          EPSR  R0,R1           INMED INT, SEL REG SET F, WAIT          XP210680
001342  C810 00F0          1070  FALLOUT LHI   R1,X'F0'        DISABLE INTERRUPTS                      XP210690
001346  9501               1071          EPSR  R0,R1                                                   XP210700
                           1072  *                                                                     XP210710
001348  24D9               1073  ER0309  LIS   R13,9           ERROR 0309 - NO CONSOLE INTPT  *****    XP210720
00134A  D2D0 335E          1074          STB   R13,ERRNO                                               XP210730
00134E  4300 2C58          1075          B     ERRORB                                                  XP210740
001352  9599               1076  CONINT  EPSR  R9,R9           CAPTURE NEW PSW                         XP210750
001354  24DA               1077          LIS   R13,X'A'                                                XP210760
001356  C590 2800          1078          CLHI  R9,Y'2800'      PROPER STATUS ?                         XP210770
00135A  4230 1384          1079  ER030A  BNE   T3R             NO                                      XP210780
00135E  24DB               1080          LIS   R13,X'B'                                                XP210790
001360  C400 FFF0          1081          NHI   R0,X'FFF0'      REMOVE COND. CODE                       XP210800
001364  F500 0000 E0F0     1082          CLI   R0,Y'E0F0'      OLD PSW STAT                            XP210810
00136A  213D               1083          BNES  T3R                                                     XP210820
00136C  C510 1342          1084          CLHI  R1,FALLOUT      WAS IN WAIT MODE                        XP210830
001370  213A               1085          BNES  T3R                                                     XP210840
001372  C520 0001          1086          CLHI  R2,1            CONSOLE DVAD SAVED ?                    XP210850
001376  2137               1087          BNES  T3R                                                     XP210860
001378  4200 0000          1088          NOP                   CONSOLE STATUS ? INDETERMINATE?         XP210870
00137C  4200 0000          1089          NOP                                                           XP210880
001380  0200               1090          NOPR                                                          XP210890
001382  23C5               1091          BS    T3END           ALL DONE                                XP210900
        0000 1384          1092  ER030B  EQU   *               ERROR 030B - BAD PSW, REGS,    *****    XP210910
                           1093  *                             .   ON CONSOLE INTERRUPT                XP210920
001384  D2D0 335E          1094  T3R     STB   R13,ERRNO                                               XP210930
001388  4300 2C58          1095          B     ERRORB                                                  XP210940
00138C  4300 2CE2          1096  T3END   B     NOERR                                                   XP210950
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                    1098  *                                                                    XP210970
                    1099  *                                                                    XP210980
                    1100  *                                                                    XP210990
0000 1390           1101  SUBT4    EQU   *                                                     XP211000
                    1102  *                                                                    XP211010
                    1103  * THIS SUBTEST IS DESIGNED TO TEST EACH OF THE FLOATING POINT        XP211020
                    1104  * ARITHMETIC INSTRUCTIONS, LE, LER, STE, AE, AER, SE, SER, ME,       XP211030
                    1105  * MER, DE, DER, LME, STME, CE, CER, FXR, FLR.                        XP211040
                    1106  * EACH INSTRUCTION IS TESTED THROUGH THE USE OF TABLES OF TEST       XP211050
                    1107  * OPERANDS AND EXPECTED RESULTS.  THE PROGRAM IS ORGANIZED AS        XP211060
                    1108  * FOLLOWS:                                                          XP211070
                    1109  * LOAD/STORE CHECK - THE FLOATING POINT LOAD (LE, LER) AND          XP211080
                    1110  * STORE (STE) INSTRUCTIONS ARE EXECUTED WITH OPERANDS FROM          XP211090
                    1111  * TABLE 'LSDO'.  THE RESULTS ARE COMPARED WITH THE EXPECTED         XP211100
                    1112  * RESULTS, AND THE CONDITION CODE (PSW BITS 28-31) IS COMPARED      XP211110
                    1113  * WITH THE EXPECTED CONDITION CODE.  ANY VARIATION CAUSES AN        XP211120
                    1114  * ERROR MESSAGE TO BE PRINTED.  THE ARITHMETIC FAULT INTERRUPT      XP211130
                    1115  * SHOULD NOT BE TAKEN.                                             XP211140
                    1116  * ADD/SUBTRACT CHECK - THE FLOATING POINT ADD/SUBTRACT INSTRUCTIONS XP211150
                    1117  * (AE, AER, SE, SER) ARE EXECUTED WITH OPERANDS FROM TABLE "AS".   XP211160
                    1118  * THE RESULTS ARE COMPARED WITH THE EXPECTED RESULTS, AND THE      XP211170
                    1119  * CONDITION CODE IS COMPARED WITH THE EXPECTED CONDITION CODE.     XP211180
                    1120  * ANY VARIATION CAUSES AN ERROR MESSAGE TO BE PRINTED.  SOME       XP211190
                    1121  * OPERANDS HAVE BEEN CHOSEN TO CAUSE AN ARITHMETIC FAULT INTERRUPT XP211200
                    1122  * BY EXPONENT OVERFLOW OR UNDERFLOW.  IT IS DETERMINED WHETHER THE XP211210
                    1123  * ARITHMETIC FAULT INTERRUPT WAS TAKEN WHEN IT WAS EXPECTED.  IF IT XP211220
                    1124  * WAS NOT, OR IF THE INTERRUPT WAS TAKEN WHEN IT WAS NOT EXPECTED,  XP211230
                    1125  * AN ERROR MESSAGE IS PRINTED.                                      XP211240
                    1126  * MULTIPLY/DIVIDE CHECK - THE FLOATING POINT MULTIPLY AND DIVIDE    XP211250
                    1127  * INSTRUCTIONS (ME, MER, DE, DER) ARE EXECUTED WITH OPERANDS FROM   XP211260
                    1128  * TABLES 'MUL' AND 'DIV'.  THE RESULTS ARE COMPARED WITH THE        XP211270
                    1129  * EXPECTED RESULTS, AND THE CONDITION CODE IS COMPARED WITH THE     XP211280
                    1130  * EXPECTED CONDITION CODE.  ANY VARIATION CAUSES AN ERROR MESSAGE   XP211290
                    1131  * TO BE PRINTED.  SOME OPERANDS HAVE BEEN CHOSEN TO CAUSE AN       XP211300
                    1132  * ARITHMETIC FAULT INTERRUPT BY EXPONENT OVERFLOW OR UNDERFLOW.     XP211310
                    1133  * IT IS DETERMINED WHETHER THIS INTERRUPT WAS TAKEN WHEN IT WAS     XP211320
                    1134  * EXPECTED.  IF IT WAS NOT, OR IF THE INTERRUPT WAS TAKEN WHEN IT  XP211330
                    1135  * WAS NOT EXPECTED, AN ERROR MESSAGE IS PRINTED.                    XP211340
                    1136  * COMPARE CHECK - THE FLOATING POINT COMPARE INSTRUCTIONS (CE, CER) XP211350
                    1137  * ARE EXECUTED WITH OPERANDS FROM TABLE 'COM'.  THE RESULTS ARE     XP211360
                    1138  * COMPARED WITH THE EXPECTED RESULTS, AND THE CONDITION CODE IS     XP211370
                    1139  * COMPARED WITH THE EXPECTED CONDITION CODE.  ANY VARIATION CAUSES  XP211380
                    1140  * AN ERROR MESSAGE TO BE PRINTED.  THE ARITHMETIC FAULT INTERRUPT   XP211390
                    1141  * SHOULD NOT BE TAKEN.                                             XP211400
                    1142  * LOAD MULTIPLE/STORE MULTIPLE CHECK - THE FLOATING POINT LEAD      XP211410
                    1143  * MULTIPLE AND STORE MULTIPLE (LME, STME) INSTRUCTIONS ARE TESTED   XP211420
                    1144  * WITH DATA FROM TABLE 'FLRGO'.  THE RESULTS ARE COMPARED WITH      XP211430
                    1145  * THE DATA IN THE TABLE.  ANY VARIATION CAUSES AN ERROR MESSAGE     XP211440
                    1146  * TO BE PRINTED.                                                   XP211450
                    1147  * FIX REGISTER, FLOAT REGISTER CHECK - THE FLOATING POINT FIX       XP211460
                    1148  * REGISTER AND FLOAT REGISTER INSTRUCTIONS (FXR, FLR), ARE         XP211470
                    1149  * EXECUTED WITH DATA FROM TABLES 'FIXTAB' AND 'FLOATAB', RESPECTIVELY. XP211480
                    1150  * THE RESULTS ARE COMPARED WITH THE EXPECTED RESULTS, AND THE CONDITION XP211490
                    1151  * CODE IS COMPARED WITH THE EXPECTED CONDITION CODE.  ANY VARIATION XP211500
                    1152  * RESULTS IN THE PRINTING OF AN ERROR MESSAGE.                      XP211510
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                                1153  * THE ARITHMETIC FAULT INTERRUPT SHOULD NOT BE TAKEN.  IF TAKEN,          XP211520
                                1154  * THE INTERRUPT RESULTS IN THE PRINTING OF AN ERROR MESSAGE.              XP211530
                                1155  * USER NOTE:  THIS SUBTEST SHOULD BE SELECTED ONLY IF THE PROCES-         XP211540
                                1156  *             SOR UNDER TEST IS EQUIPPED WITH THE FLOATING POINT         XP211550
                                1157  *             OPTION.                                                   XP211560
                                1158  ************************************************************          XP211570
                                1159  *                                                                       XP211580
                                1160  *        TEST PROGRAM FOR FLOATING POINT INSTRUCTIONS                    XP211590
                                1161  *        LE/LER          ERRORS 0401 - 0411                             XP211600
                                1162  *        STE             ERRORS 0401 - 0411                             XP211610
                                1163  *        AE/AER          ERRORS 0412 - 0421                             XP211620
                                1164  *        SE/SER          ERRORS 0412 - 0421                             XP211630
                                1165  *        ME/MER          ERRORS 0422 - 0425, 042A - 0431                XP211640
                                1166  *        DE/DER          ERRORS 0426 - 0429, 042A - 0431                XP211650
                                1167  *        CE/CER          ERRORS 0432 - 0441                             XP211660
                                1168  *        LME/STME        ERRORS 0450, 0460                              XP211670
                                1169  *        FXR/FLR         ERRORS 0470 - 047F, 0480 - 048F                XP211680
                                1170  *        GENERAL REGISTER ASSIGNMENT                                    XP211690
0000 0000                       1171  DISABL   EQU   0                                                        XP211700
0000 0001                       1172  SWAP     EQU   1                                                        XP211710
0000 0002                       1173  PNT      EQU   2                                                        XP211720
0000 0005                       1174  GR5      EQU   5                                                        XP211730
0000 0006                       1175  GR6      EQU   6                                                        XP211740
0000 0007                       1176  GR7      EQU   7                                                        XP211750
0000 0008                       1177  GR8      EQU   8                                                        XP211760
0000 0009                       1178  GR9      EQU   9                                                        XP211770
0000 000A                       1179  GR10     EQU   10                                                       XP211780
0000 000B                       1180  GR11     EQU   11                                                       XP211790
0000 000C                       1181  GR12     EQU   12                                                       XP211800
0000 000D                       1182  TOT      EQU   13          CONTAINS ERROR NUMBER ONLY                   XP211810
0000 000E                       1183  GR14     EQU   14                                                       XP211820
0000 000F                       1184  GR15     EQU   15                                                       XP211830


                                1186  *        LOAD STORE CHECK                                              XP211850
001390  D100 3228               1187           LM    R0,BUFR0    ALL ZEROS                                   XP211860
001394  D000 3270               1188           STM   R0,BUFR3    PRINT BUFFER                                XP211870
001398  E650 1C16               1189  LDST     LA    GR5,ERROR1                                              XP211880
00139C  C860 00F0               1190           LHI   GR6,X'F0'   *                                 EP0*    XP211890
0013A0  5060 0048               1191           ST    GR6,X'48'   SET FAULT PSW                             XP211900
0013A4  4050 004C               1192           STH   GR5,X'4C'   SET FAULT LOC                             XP211910
0013A8  24D1                    1193           LIS   TOT,1       SET ERROR NUMBER=1                          XP211920
0013AA  C860 10F0               1194           LHI   GR6,X'10F0' ARITH FLT, REG SET F                EP1*  XP211930
0013AE  9556                    1195           EPSR  GR5,GR6     SET CURRENT PSW                             XP211940
0013B0  C800 7777               1196           LHI   R0,X'7777'  SET CC PRINT FLAG                           XP211950
0013B4  4000 3270               1197           STH   R0,BUFR3                                                XP211960
0013B8  6800 2D14               1198           LE    0,LSD0      DATA0  TO REG. 0                            XP211970
0013BC  42F0 2C54               1199           BTC   X'F',ERROR  EXPECTED CC=0                               XP211980
0013C0  4190 1B24               1200           BAL   GR9,COMP0   CHECK RESULT                                XP211990
0013C4  2D18                    1201           DC    Z(LSR0)     ZERO RESULT                                 XP212000
0013C6  24D2                    1202           LIS   TOT,2       SET ERROR NUMBER=2                          XP212010
0013C8  6800 2D1C               1203           LE    0,LSD1      NORMALIZED                                  XP212020
0013CC  4320 2C54               1204           BFC   2,ERROR     EXPECTED CC=2                               XP212030
0013D0  42D0 2C54               1205           BTC   X'D',ERROR                                              XP212040
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0013D4  4190 1B24          1206    BAL   GR9,COMP0          CHECK RESULT                XP212050
0013D8  2D20               1207    DC    Z(LSR1)                                        XP212060
0013DA  24D3               1208    LIS   TOT,3             SET ERROR NUMBER=3          XP212070
0013DC  6820 2D24          1209    LE    2,LSD2             NEG. NORMALIZED             XP212080
0013E0  4310 2C54          1210    BFC   1,ERROR           CC=1                        XP212090
0013E4  42E0 2C54          1211    BTC   X'E',ERROR                                     XP212100
0013E8  4190 1B2C          1212    BAL   GR9,COMP2          CHECK                       XP212110
0013EC  2D28               1213    DC    Z(LSR2)                                        XP212120
0013EE  24D4               1214    LIS   TOT,4             SET ERROR NUMBER=4          XP212130
0013F0  6820 2D2C          1215    LE    2,LSD3             POSITIVE NORMALIZED         XP212140
0013F4  4320 2C54          1216    BFC   2,ERROR           CC=2                        XP212150
0013F8  42D0 2C54          1217    BTC   X'D',ERROR                                     XP212160
0013FC  4190 1B2C          1218    BAL   GR9,COMP2          CHECK                       XP212170
001400  2D30               1219    DC    Z(LSR3)                                        XP212180
001402  2802               1220    LER   0,2               R2 R3 TO R0 & R1            XP212190
001404  4320 2C54          1221    BFC   2,ERROR           CC=2                        XP212200
001408  42D0 2C54          1222    BTC   X'D',ERROR                                     XP212210
00140C  4190 1B24          1223    BAL   GR9,COMP0                                      XP212220
001410  2D30               1224    DC    Z(LSR3)            POSITIVE NORMALIZED         XP212230
001412  24D5               1225    LIS   TOT,5              SET ERROR NUMBER=5          XP212240
001414  6840 2D34          1226    LE    4,LSD4             POSITIVE UNNORMALIZED       XP212250
001418  4320 2C54          1227    BFC   2,ERROR           CC=2                        XP212260
00141C  42D0 2C54          1228    BTC   X'D',ERROR                                     XP212270
001420  4190 1B34          1229    BAL   GR9,COMP4                                      XP212280
001424  2D38               1230    DC    Z(LSR4)                                        XP212290
001426  24D6               1231    LIS   TOT,6              SET ERROR NUMBER=6          XP212300
001428  6840 2D3C          1232    LE    4,LSD5             POSITIVE UNNORMALIZED       XP212310
00142C  4320 2C54          1233    BFC   2,ERROR           CC=2                        XP212320
001430  42D0 2C54          1234    BTC   X'D',ERROR                                     XP212330
001434  4190 1B34          1235    BAL   GR9,COMP4                                      XP212340
001438  2D40               1236    DC    Z(LSR5)                                        XP212350
00143A  24D7               1237    LIS   TOT,7              SET ERROR NUMBER=7          XP212360
00143C  6860 2D44          1238    LE    6,LSD6             NEG. UNNORM.                XP212370
001440  4310 2C54          1239    BFC   1,ERROR           CC=1                        XP212380
001444  42E0 2C54          1240    BTC   X'E',ERROR                                     XP212390
001448  4190 1B3C          1241    BAL   GR9,COMP6                                      XP212400
00144C  2D48               1242    DC    Z(LSR6)                                        XP212410
00144E  2846               1243    LER   4,6               R6& R7 TO R4 &R5            XP212420
001450  4310 2C54          1244    BFC   1,ERROR                                        XP212430
001454  42E0 2C54          1245    BTC   X'E',ERROR                                     XP212440
001458  4190 1B34          1246    BAL   GR9,COMP4                                      XP212450
00145C  2D48               1247    DC    Z(LSR6)                                        XP212460
00145E  24D8               1248    LIS   TOT,8              SET ERROR NUMBER=8          XP212470
001460  6860 2D4C          1249    LE    6,LSD7             POS. UNNORM.                XP212480
001464  4320 2C54          1250    BFC   2,ERROR           CC=2                        XP212490
001468  42D0 2C54          1251    BTC   X'D',ERROR                                     XP212500
00146C  4190 1B3C          1252    BAL   GR9,COMP6                                      XP212510
001470  2D50               1253    DC    Z(LSR7)                                        XP212520
001472  24D9               1254    LIS   TOT,9              SET ERROR NUMBER=9          XP212530
001474  6880 2D54          1255    LE    8,LSD8             NEG. UNNORM.                XP212540
001478  4310 2C54          1256    BFC   1,ERROR           CC=1                        XP212550
00147C  42E0 2C54          1257    BTC   X'E',ERROR                                     XP212560
001480  4190 1B44          1258    BAL   GR9,COMP8                                      XP212570
001484  2D58               1259    DC    Z(LSR8)                                        XP212580
001486  24DA               1260    LIS   TOT,10             SET ERROR NUMBER=X'A'       XP212590
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001488  6880 2D5C          1261          LE    8,LSD9          POS. ILLEG.ZERO                          XP212600
00148C  42F0 2C54          1262          BTC   X'F',ERROR      CC=0                                     XP212610
001490  4190 1B44          1263          BAL   GR9,COMP8                                                XP212620
001494  2D60               1264          DC    Z(LSR9)                                                  XP212630
001496  24DB               1265          LIS   TOT,11          SET ERROR NUMBER=X'B'                    XP212640
001498  68A0 2D64          1266          LE    10,LSD10        NEG. ILLEG.ZERO                          XP212650
00149C  42F0 2C54          1267          BTC   X'F',ERROR      CC=0                                     XP212660
0014A0  4190 1B4C          1268          BAL   GR9,COMP10                                               XP212670
0014A4  2D68               1269          DC    Z(LSR10)                                                 XP212680
0014A6  C8A0 0000          1270          LHI   R10,X'00'       NEW ARITH FLT INTPT PSW STAT     EP2*    XP212690
0014AA  50A0 0048          1271          ST    R10,X'48'                                                XP212700
0014AE  E6A0 1B84          1272          LA    GR10,FAULT1     SET FAULT PSW FOR                        XP212710
0014B2  50A0 004C          1273          ST    GR10,X'4C'      OVERFLOW CHECK                           XP212720
0014B6  24DC               1274          LIS   TOT,12          SET ERROR NUMBER=X'C'                    XP212730
0014B8  68A0 2D6C          1275          LE    10,LSD11        UNDERFLOW EXPECTED                       XP212740
0014BC  4300 1C16          1276  T3B     B     ERROR1                                                   XP212750
0014C0  4340 2C54          1277          BFC   4,ERROR        CC=4                                     XP212760
0014C4  42B0 2C54          1278          BTC   X'B',ERROR                                               XP212770
0014C8  F570 0000 14BC     1279          CLI   GR7,T3B         CHECK ADDRESS                            XP212780
0014CE  4230 1C16          1280          BNE   ERROR1                                                   XP212790
0014D2  4190 1B4C          1281          BAL   GR9,COMP10                                               XP212800
0014D6  2D70               1282          DC    Z(LSR11)                                                 XP212810
0014D8  24DD               1283          LIS   TOT,13          SET ERROR NUMBER=X'D'                    XP212820
0014DA  68C0 2D74          1284          LE    12,LSD12        UNDERFLOW EXPECTED                       XP212830
0014DE  4300 1C16          1285  T3C     B     ERROR1                                                   XP212840
0014E2  4340 2C54          1286          BFC   4,ERROR        CC= 4                                    XP212850
0014E6  42E0 2C54          1287          BTC   X'B',ERROR                                               XP212860
0014EA  F570 0000 14DE     1288          CLI   GR7,T3C         CHECK ADDRESS                            XP212870
0014F0  4230 1C16          1289          BNE   ERROR1                                                   XP212880
0014F4  4190 1B54          1290          BAL   GR9,COMP12                                               XP212890
0014F8  2D78               1291          DC    Z(LSR12)                                                 XP212900
0014FA  24DE               1292          LIS   TOT,14          SET ERROR NUMBER=X'E'                    XP212910
0014FC  68C0 2D7C          1293          LE    12,LSD13        UNDERFLOW EXPECTED                       XP212920
001500  4300 1C16          1294  T3D     B     ERROR1                                                   XP212930
001504  4340 2C54          1295          BFC   4,ERROR                                                  XP212940
001508  42B0 2C54          1296  TSP01   BTC   X'B',ERROR      ERROR 040E                               XP212950
00150C  F570 0000 1500     1297          CLI   GR7,T3D                                                  XP212960
001512  4230 1C16          1298  TSP02   BNE   ERROR1          ERROR 040E                               XP212970
001516  4190 1B54          1299          BAL   GR9,COMP12                                               XP212980
00151A  2D80               1300          DC    Z(LSR13)                                                 XP212990
00151C  28CC               1301          LER   12,12           ZERO                                     XP213000
00151E  42F0 2C54          1302          BTC   X'F',ERROR      CC=0                                     XP213010
001522  4190 1B54          1303          BAL   GR9,COMP12                                               XP213020
001526  2D80               1304          DC    Z(LSR13)                                                 XP213030
001528  24DF               1305          LIS   TOT,15          SET ERROR NUMBER=X'F'                    XP213040
00152A  C890 00F0          1306          LHI   GR9,X'F0'       SEL REG SET F                    EP3*    XP213050
00152E  5090 0048          1307          ST    GR9,X'48'                                                XP213060
001532  9579               1308          EPSR  GR7,GR9         DISABLE FLOAT. PT  FAULT. INTERRUPT      XP213070
001534  E670 1C16          1309          LA    GR7,ERROR1      SET  FLOAT. PT. FAULT                    XP213080
001538  5070 004C          1310          ST    GR7,X'4C'       NEW LOC                                  XP213090
00153C  68E0 2D84          1311          LE    14,LSD14        UNDERFLOW OF NEG. OPERAND                XP213100
001540  4340 2C54          1312          BFC   4,ERROR                                                  XP213110
001544  42B0 2C54          1313          BTC   X'B',ERROR      CC=4                                     XP213120
001548  4190 1B5C          1314          BAL   GR9,COMP14                                               XP213130
00154C  2D88               1315          DC    Z(LSR14)                                                 XP213140
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001546   26D1                1316          AIS   TOT,1              SET ERROR NUMBER=X'10'                XP213150
001550   68E0 2D8C           1317          LE    14,LSD15           NEG. UNDERFLOW                        XP213160
001554   4340 2C54           1318          BFC   4,ERROR            CC=4                                  XP213170
001558   42B0 2C54           1319          BTC   X'B',ERROR                                               XP213180
00155C   4190 1B5C           1320          BAL   GR9,COMP14                                               XP213190
001560   2L90                1321          DC    Z(LSR15)                                                 XP213200
001562   26D1                1322          AIS   TOT,1              SET ERROR NUMBER=X'11'                XP213210
001564   68E0 2D94           1323          LE    14,LSD16           NEG. UNDERFLOW                        XP213220
001568   4340 2C54           1324          BFC   4,ERROR                                                  XP213230
00156C   42B0 2C54           1325          BTC   X'B',ERROR                                               XP213240
001570   4190 1B5C           1326          BAL   GR9,COMP14                                               XP213250
001574   2D98                1327          DC    Z(LSR16)                                                 XP213260
001576   4300 157A           1328          B     ARITH              BRANCH TO 'ARITH'                     XP213270


                             1330  *       ADD/SUBTRACT CHECK                                             XP213290
00157A   C820 00F0           1331  ARITH   LHI   R2,X'F0'           *                              EP4*   XP213300
00157E   5020 0048           1332          ST    R2,X'48'           SET PSW FOR                           XP213310
001582   E630 1C9E           1333          LA    R3,FAULT           FLOATING POINT FAULT                  XP213320
001586   5030 004C           1334          ST    R3,X'4C'           INTERRUPT                             XP213330
00158A   C830 10F0           1335          LHI   R3,X'10F0'         ENABLE FLOATING POINT          EP5*   XP213340
00158E   9523                1336          EPSR  R2,R3              FAULT INTERRUPT                       XP213350
001590   0711                1337          XR    SWAP,SWAP          REMOVE SWAP FLAG                      XP213360
001592   0700                1338          XR    DISABL,DISABL      REMOVE DISABLE FLAG                   XP213370
                             1339  ********************************************************               XP213380
001594   C850 0001           1340  ADSUB   LHI   GR5,1              INITIAL                               XP213390
001598   C860 0001           1341          LHI   GR6,1              INCREMENT                             XP213400
00159C   C870 0006           1342          LHI   GR7,6              FINAL  (NUMBER OF OPERAND PAIRS)      XP213410
0015A0   E620 2EBC           1343          LA    PNT,AS                                                   XP213420
0015A4   C8D0 0012           1344  ASLOOP  LHI   TOT,X'12'          SET ERROR NUMBER=X'12'                XP213430
0015A8   6862 0000           1345          LE    6,0(PNT)           FETCH A                               XP213440
0015AC   6882 0004           1346          LE    8,4(PNT)           FETCH B                               XP213450
0015B0   48A2 0008           1347          LH    GR10,8(PNT)        FETCH EXPECTED                        XP213460
0015B4   48B2 000A           1348          LH    GR11,10(PNT)       (A+B)                                 XP213470
0015B8   48C2 0010           1349          LH    GR12,16(PNT)       FETCH EXPECTED CC                     XP213480
0015BC   68A0 2D0C           1350          LE    10,ZEROF                                                 XP213490
0015C0   2BA6                1351          SER   10,6               GET (-A)                              XP213500
0015C2   68C0 2D0C           1352          LE    12,ZEROF                                                 XP213510
0015C6   2BC8                1353          SER   12,8               GET (-B)                              XP213520
0015C8   2846                1354          LER   4,6                                                      XP213530
0015CA   6A42 0004           1355          AE    4,4(PNT)           (A)+(B)                               XP213540
0015CE   4190 1B98           1356          BAL   GR9,TEST           CHECK                                 XP213550
0015D2   C8D0 0013           1357          LHI   TOT,X'13'          SET ERROR NUMBER=X'13'                XP213560
0015D6   2846                1358          LER   4,6                                                      XP213570
0015D8   2B4C                1359          SER   4,12               (A)-(-B)                              XP213580
0015DA   4190 1B98           1360          BAL   GR9,TEST           CHECK                                 XP213590
0015DE   C8D0 0014           1361          LHI   TOT,X'14'          SET ERROR NUMBER=X'14'                XP213600
0015E2   2848                1362          LER   4,8                                                      XP213610
0015E4   6A42 0000           1363          AE    4,0(PNT)           (B)+(A)                               XP213620
0015E8   4190 1B98           1364          BAL   GR9,TEST           CHECK                                 XP213630
0015EC   C8D0 0015           1365          LHI   TOT,X'15'          SET ERROR NUMBER=X'15'                XP213640
0015F0   2848                1366          LER   4,8                                                      XP213650
0015F2   2B4A                1367          SER   4,10               (B)-(-A)                              XP213660
0015F4   4190 1B98           1368          BAL   GR9,TEST                                                 XP213670
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0015F8  C8D0 0016          1369          LHI   TOT,X'16'          SET ERROR NUMBER=X'16'                XP213680
0015FC  48C2 0016          1370          LH    GR12,22(PNT)       FETCH EXPECTED CC FOR (-A-B)          XP213690
001600  47A0 2D08          1371          XH    GR10,NEG           GET (-A-B) IN GR10 AND GR11           XP213700
001604  284A               1372          LER   4,10                                                     XP213710
001606  2A4C               1373          AER   4,12               (-A)+(-B)                             XP213720
001608  4190 1B98          1374          BAL   GR9,TEST           CHECK                                 XP213730
00160C  C8D0 0017          1375          LHI   TOT,X'17'          SET ERROR NUMBER=X'17'                XP213740
001610  284A               1376          LER   4,10                                                     XP213750
001612  6B42 0004          1377          SE    4,4(PNT)           (-A)-(B)                              XP213760
001616  4190 1B98          1378          BAL   GR9,TEST           CHECK                                 XP213770
00161A  C8D0 0018          1379          LHI   TOT,X'18'          SET ERROR NUMBER=X'18'                XP213780
00161E  284C               1380          LER   4,12                                                     XP213790
001620  2A4A               1381          AER   4,10               (-B)+(-A)                             XP213800
001622  4190 1B98          1382          BAL   GR9,TEST                                                 XP213810
001626  C8D0 0019          1383          LHI   TOT,X'19'          SET ERROR NUMBER=X'19'                XP213820
00162A  284C               1384          LER   4,12                                                     XP213830
00162C  6B42 0000          1385          SE    4,0(PNT)           (-B)-(A)                              XP213840
001630  4190 1B98          1386          BAL   GR9,TEST                                                 XP213850
001634  C8D0 001A          1387          LHI   TOT,X'1A'          SET ERROR NUMBER=X'1A'                XP213860
001638  48A2 000C          1388          LH    GR10,12(PNT)       FETCH EXPECTED                        XP213870
00163C  48B2 000E          1389          LH    GR11,14(PNT)       (A)-(B)                               XP213880
001640  48C2 0012          1390          LH    GR12,18(PNT)       FETCH EXPECTED CC                     XP213890
001644  2846               1391          LER   4,6                                                      XP213900
001646  6B42 0004          1392          SE    4,4(PNT)           (A)-(B)                               XP213910
00164A  4190 1B98          1393          BAL   GR9,TEST           CHECK                                 XP213920
00164E  C8D0 001B          1394          LHI   TOT,X'1B'          SET ERROR NUMBER=X'1B'                XP213930
001652  2846               1395          LER   4,6                                                      XP213940
001654  2A4C               1396          AER   4,12               (A)+(-B)                              XP213950
001656  4190 1B98          1397          BAL   GR9,TEST           CHECK                                 XP213960
00165A  C8D0 001C          1398          LHI   TOT,X'1C'          SET ERROR NUMBER=X'1C'                XP213970
00165E  284C               1399          LER   4,12                                                     XP213980
001660  6A42 0000          1400          AE    4,0(PNT)           (-B)+(A)                              XP213990
001664  4190 1B98          1401          BAL   GR9,TEST           CHECK                                 XP214000
001668  C8D0 001D          1402          LHI   TOT,X'1D'          SET ERROR NUMBER=X'1D'                XP214010
00166C  284C               1403          LER   4,12                                                     XP214020
00166E  2B4A               1404          SER   4,10               (-B)-(-A)                             XP214030
001670  4190 1B98          1405          BAL   GR9,TEST           CHECK                                 XP214040
001674  C8D0 001E          1406          LHI   TOT,X'1E'          SET ERROR NUMBER=X'1E'                XP214050
001678  48C2 0014          1407          LH    GR12,20(PNT)       FETCH EXPECTED CC FOR (B-A)           XP214060
00167C  C5A0 0000          1408          CLHI  GR10,0                                                   XP214070
001680  2333               1409          BES   ZRORST             DIFFERENCE IS ZERO                    XP214080
001682  47A0 2D08          1410          XH    GR10,NEG           COMPLEMENT THE SIGN BIT               XP214090
001686  284A               1411  ZRORST  LER   4,10                                                     XP214100
001688  6A42 0004          1412          AE    4,4(PNT)           (-A)+(B)                              XP214110
00168C  4190 1B98          1413          BAL   GR9,TEST           CHECK                                 XP214120
001690  C8D0 001F          1414          LHI   TOT,X'1F'          SET ERROR NUMBER=X'1F'                XP214130
001694  284A               1415          LER   4,10                                                     XP214140
001696  2B4C               1416          SER   4,12               (-A)-(-B)                             XP214150
001698  4190 1B98          1417          BAL   GR9,TEST           CHECK                                 XP214160
00169C  C8D0 0020          1418          LHI   TOT,X'20'          SET ERROR NUMBER=X'20'                XP214170
0016A0  2848               1419          LER   4,8                                                      XP214180
0016A2  6B42 0000          1420          SE    4,0(PNT)           (B)-(A)                               XP214190
0016A6  4190 1B98          1421          BAL   GR9,TEST                                                 XP214200
0016AA  C8D0 0021          1422          LHI   TOT,X'21'          SET ERROR NUMBER=X'21                 XP214210
0016AE  2848               1423          LER   4,8                                                      XP214220
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0016B0  2A4A           1424          AER   4,10          (B)+(-A)                          XP214230
0016B2  4190 1B98      1425          BAL   GR9,TEST      CHECK                             XP214240
0016B6  CA20 0018      1426          AHI   PNT,24        INCREMENT POINTER                 XP214250
0016BA  C150 15A4      1427          BXLE  GR5,ASLOOP                                      XP214260
0016BE  0800           1428          LR    DISABL,DISABL EXAMINE DISABLE FLAG              XP214270
0016C0  4230 16D2      1429          BNZ   ASOVER                                          XP214280
0016C4  E600 2D10      1430          LA    DISABL,FLAG   DISABLE FLOATING                  XP214290
0016C8  C830 00F0      1431          LHI   R3,X'F0'      POINT FAULT                EP6*   XP214300
0016CC  9523           1432          EPSR  R2,R3         INTERRUPT                         XP214310
0016CE  4300 1594      1433          B     ADSUB                                           XP214320
0016D2  07C0           1434  ASOVER  XR    DISABL,DISABL ENABLE FLOATING                   XP214330
0016D4  C830 10F0      1435          LHI   R3,X'10F0'    POINT FAULT                EP7*   XP214340
0016D8  9523           1436          EPSR  R2,R3         INTERRUPT                         XP214350
0016DA  4300 16DE      1437          B     MULTI         BRANCH TO MULT. DIV. ROUTINE      XP214360


                       1439  *       MULTIPLY/DIVIDE CHECK                               XP214380
0016DE  2451           1440  MULTI   LIS   GR5,1         INITIAL                           XP214390
0016E0  2461           1441          LIS   GR6,1         INCREMENT                         XP214400
0016E2  2478           1442          LIS   GR7,8         FINAL                             XP214410
0016E4  E620 2F4C      1443          LA    PNT,MUL       OBTAIN POINTER TO DATA            XP214420
0016E8  C8D0 0022      1444  MLOOP   LHI   TOT,X'22'     SET ERROR NUMBER=X'22'            XP214430
0016EC  6862 0000      1445          LE    6,0(PNT)      FETCH A                           XP214440
0016F0  6882 0004      1446          LE    8,4(PNT)      FETCH B                           XP214450
0016F4  68A0 2D0C      1447          LE    10,ZEROF                                        XP214460
0016F8  2BA6           1448          SER   10,6          GET (-A)                          XP214470
0016FA  68C0 2D0C      1449          LE    12,ZEROF                                        XP214480
0016FE  2BC8           1450          SER   12,8          GET (-B)                          XP214490
001700  48A2 0008      1451          LH    GR10,8(PNT)   FETCH EXPECTED VALUE OF           XP214500
001704  48B2 000A      1452          LH    GR11,10(PNT)  (A*B)                             XP214510
001708  48C2 000C      1453          LH    GR12,12(PNT)  FETCH EXPECTED CC                 XP214520
00170C  2846           1454          LER   4,6                                             XP214530
00170E  6C42 0004      1455          ME    4,4(PNT)      GET (A)*(B)                       XP214540
001712  4190 1B98      1456          BAL   GR9,TEST                                        XP214550
001716  C8D0 0023      1457          LHI   TOT,X'23'     SET ERROR NUMBER=X'23'            XP214560
00171A  284C           1458          LER   4,12          GET (-B)*(-A)                     XP214570
00171C  2C4A           1459          MER   4,10                                            XP214580
00171E  4190 1B98      1460          BAL   GR9,TEST                                        XP214590
001722  C8D0 0024      1461          LHI   TOT,X'24'     SET ERROR NUMBER=X'24'            XP214600
001726  48C2 000E      1462          LH    GR12,14(PNT)  GET  CC  FOR -(A*B)               XP214610
00172A  C5A0 0000      1463          CLHI  GR10,0                                          XP214620
00172E  2333           1464          BES   ZRO1          ZERO RESULT                       XP214630
001730  47A0 2D08      1465          XH    GR10,NEG      COMPLEMENT  THE SIGN BIT          XP214640
001734  284A           1466  ZRO1    LER   4,10                                            XP214650
001736  2C48           1467          MER   4,8           GET  (-A)* (B)                    XP214660
001738  4190 1B98      1468          BAL   GR9,TEST      CHECK                             XP214670
00173C  C8D0 0025      1469          LHI   TOT,X'25'     SET ERROR NUMBER=X'25'            XP214680
001740  284C           1470          LER   4,12                                            XP214690
001742  6C42 0000      1471          ME    4,0(PNT)      GET (-B)* (A)                     XP214700
001746  4190 1B98      1472          BAL   GR9,TEST      CHECK                             XP214710
00174A  CA20 0010      1473          AHI   PNT,16        INCREMENT POINTER                 XP214720
00174E  C150 16E8      1474          BXLE  GR5,MLOOP                                       XP214730
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001752  2451          1476  DIVIDE  LIS   GR5,1                                    XP214750
001754  2461          1477          LIS   GR6,1                                    XP214760
001756  2478          1478          LIS   GR7,8                                    XP214770
001758  E620 2FCC     1479          LA    PNT,DIV          FETCH POINTER TO DATA   XP214780
00175C  C8D0 0026     1480  DLOOP   LHI   TOT,X'26'        SET ERROR NUMBER=X'26'  XP214790
001760  6862 0000     1481          LE    6,0(PNT)         FETCH A                 XP214800
001764  6882 0004     1482          LE    8,4(PNT)         FETCH B                 XP214810
001768  68A0 2D0C     1483          LE    10,ZEROF                                 XP214820
00176C  2BA6          1484          SER   10,6             GET (-A)                XP214830
00176E  68C0 2D0C     1485          LE    12,ZEROF                                 XP214840
001772  2BC8          1486          SER   12,8             GET (-B)                XP214850
001774  48A2 0008     1487          LH    GR10,8(PNT)      FETCH EXPECTED          XP214860
001778  48B2 000A     1488          LH    GR11,10(PNT)     VALUE OF (A/B)          XP214870
00177C  48C2 000C     1489          LH    GR12,12(PNT)     FETCH EXPECTED CC       XP214880
001780  2846          1490          LER   4,6                                      XP214890
001782  6D42 0004     1491          DE    4,4(PNT)         GET  (A)/(B)            XP214900
001786  4190 1B98     1492          BAL   GR9,TEST         CHECK                   XP214910
00178A  C8D0 0027     1493          LHI   TOT,X'27'        SET ERROR NUMBER=X'27'  XP214920
00178E  284A          1494          LER   4,10                                     XP214930
001790  2D4C          1495          DER   4,12             GET (-A)/(-B)           XP214940
001792  4190 1B98     1496          BAL   GR9,TEST                                 XP214950
001796  C8D0 0028     1497          LHI   TOT,X'28'        SET ERROR NUMBER=X'28'  XP214960
00179A  48C2 000E     1498          LH    GR12,14(PNT)     GET CC FOR -(A/B)       XP214970
00179E  C5A0 0000     1499          CLHI  GR10,0           IF(A/B) NOT ZERO        XP214980
0017A2  2333          1500          BES   ZRO2             COMPLEMENT THE          XP214990
0017A4  47A0 2D08     1501          XH    GR10,NEG         SIGN BIT                XP215000
0017A8  284A          1502  ZRO2    LER   4,10                                     XP215010
0017AA  6D42 0004     1503          DE    4,4(PNT)         GET  (-A)/(B)           XP215020
0017AE  4190 1B98     1504          BAL   GR9,TEST         CHECK                   XP215030
0017B2  C8D0 0029     1505          LHI   TOT,X'29'        SET ERROR NUMBER=X'29'  XP215040
0017B6  2846          1506          LER   4,6                                      XP215050
0017B8  2D4C          1507          DER   4,12             GET   (A)/(-B)          XP215060
0017BA  4190 1B98     1508          BAL   GR9,TEST                                 XP215070
0017BE  CA20 0010     1509          AHI   PNT,16           INCREMENT THE POINTER   XP215080
0017C2  C150 175C     1510          BXLE  GR5,DLOOP                                XP215090

                      1512  *       CHECK FOR THE ACCURACY OF THE ALGORITHMS USED   XP215110
0017C6  24C2          1513          LIS   GR12,2           EXPECTED CC=2           XP215120
0017C8  6840 304C     1514          LE    4,MD1                                    XP215130
0017CC  6C40 3050     1515          ME    4,MD2            (MD1) *(MD2)            XP215140
0017D0  C8D0 002A     1516          LHI   TOT,X'2A'        SET ERROR NUMBER=X'2A'  XP215150
0017D4  48A0 304C     1517          LH    GR10,MD1                                 XP215160
0017D8  48B0 304E     1518          LH    GR11,MD1+2                               XP215170
0017DC  6D40 3050     1519          DE    4,MD2            (MD1)*(MD2)/(MD2)       XP215180
0017E0  4190 1B98     1520          BAL   GR9,TEST                                 XP215190
0017E4  C8D0 002B     1521          LHI   TOT,X'2B'        SET ERROR NUMBER=X'2B'  XP215200
0017E8  48A0 3060     1522          LH    GR10,MD6                                 XP215210
0017EC  48B0 3062     1523          LH    GR11,MD6+2                               XP215220
0017F0  6840 3058     1524          LE    4,MD4                                    XP215230
0017F4  6C40 305C     1525          ME    4,MD5            GET  (MD4)*(MD5)        XP215240
0017F8  4190 1B98     1526          BAL   GR9,TEST                                 XP215250
0017FC  C8D0 002C     1527          LHI   TOT,X'2C'        SET ERROR NUMBER=X'2C'  XP215260
001800  48A0 305C     1528          LH    GR10,MD5                                 XP215270
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001804 48B0 305E 1529          LH    GR11,MD5+2                                XP215280
001808 6D40 3058 1530          DE    4,MD4          OBTAIN (MD4)*(MD5)/(MD4)   XP215290
00180C 4190 1B98 1531          BAL   GR9,TEST       CHECK                      XP215300
001810 C8D0 002D 1532          LHI   TOT,X'2D'      SET ERROR NUMBER=X'2D'     XP215310
001814 48A0 306C 1533          LH    GR10,MD9                                  XP215320
001818 48B0 306E 1534          LH    GR11,MD9+2                                XP215330
00181C 6840 3064 1535          LE    4,MD7                                     XP215340
001820 6C40 3068 1536          ME    4,MD8                                     XP215350
001824 6C40 306C 1537          ME    4,MD9                                     XP215360
001828 6860 3070 1538          LE    6,MD10                                    XP215370
00182C 6C60 3074 1539          ME    6,MD11                                    XP215380
001830 6C60 3078 1540          ME    6,MD12                                    XP215390
001834 2C46      1541          MER   4,6                                       XP215400
001836 6D40 3064 1542          DE    4,MD7                                     XP215410
00183A 6D40 3068 1543          DE    4,MD8                                     XP215420
00183E 6D40 3078 1544          DE    4,MD12                                    XP215430
001842 6D40 3074 1545          DE    4,MD11                                    XP215440
001846 6D40 3070 1546          DE    4,MD10                                    XP215450
00184A 4190 1B98 1547          BAL   GR9,TEST                                  XP215460
00184E C8D0 002E 1548          LHI   TOT,X'2E'      SET ERROR NUMBER=X'2E'     XP215470
001852 48A0 307C 1549          LH    GR10,MD13                                 XP215480
001856 48B0 307E 1550          LH    GR11,MD13+2                               XP215490
00185A 6840 307C 1551          LE    4,MD13                                    XP215500
00185E 6D40 3080 1552          DE    4,MD14                                    XP215510
001862 6D40 3084 1553          DE    4,MD15                                    XP215520
001866 6D40 3088 1554          DE    4,MD16                                    XP215530
00186A 6D40 308C 1555          DE    4,MD17                                    XP215540
00186E 6D40 3090 1556          DE    4,MD18                                    XP215550
001872 6C40 3090 1557          ME    4,MD18                                    XP215560
001876 6C40 308C 1558          ME    4,MD17                                    XP215570
00187A 6C40 3088 1559          ME    4,MD16                                    XP215580
00187E 6C40 3084 1560          ME    4,MD15                                    XP215590
001882 6C40 3080 1561          ME    4,MD14                                    XP215600
001886 4190 1B98 1562          BAL   GR9,TEST                                  XP215610

                 1564  *       CHECK FOR DIVISION BY ZERO                      XP215630
00188A C8D0 002F 1565          LHI   TOT,X'2F'      SET ERROR NUMBER=X'2F'     XP215640
00188E 24CC      1566  DVZ1    LIS   GR12,12        SET CONDITION CODE FOR MODEL 80 XP215650
001890 6860 3060 1567  DVZ2    LE    6,MD6                                     XP215660
001894 48A0 3060 1568          LH    GR10,MD6                                  XP215670
001898 48B0 3062 1569          LH    GR11,MD6+2                                XP215680
00189C 2846      1570          LER   4,6                                       XP215690
00189E 6D40 2D0C 1571          DE    4,ZEROF        DIVIDE BY ZERO             XP215700
0018A2 4190 1B98 1572          BAL   GR9,TEST       CHECK                      XP215710
0018A6 C8D0 0030 1573          LHI   TOT,X'30'      SET ERROR NUMBER=X'30'     XP215720
0018AA 6840 2D0C 1574          LE    4,ZEROF                                   XP215730
0018AE 2B46      1575          SER   4,6            GET (-MD6)                 XP215740
0018B0 47A0 2D08 1576          XH    GR10,NEG       COMPLEMENT THE SIGN BIT    XP215750
0018B4 6D40 2D0C 1577          DE    4,ZEROF                                   XP215760
0018B8 4190 1B98 1578          BAL   GR9,TEST                                  XP215770
0018BC C8D0 0031 1579          LHI   TOT,X'31'      SET ERROR NUMBER=X'31'     XP215780
0018C0 6840 2D0C 1580          LE    4,ZEROF                                   XP215790
0018C4 24A0      1581          LIS   GR10,0                                    XP215800
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0018C6  24B0          1582          LIS   GR11,0                                        XP215810
0018C8  6D40 2D0C     1583          DE    4,ZEROF                                       XP215820
0018CC  4190 1B98     1584  TSP03   BAL   GR9,TEST       ERROR 0431                      XP215830
0018D0  0800          1585          LR    DISABL,DISABL   EXAMINE DISABLE FLAG            XP215840
0018D2  4230 18E4     1586          BNZ   MDOVER                                        XP215850
0018D6  4800 2D10     1587          LH    DISABL,FLAG     DISABLE FLOATING                XP215860
0018DA  C830 00F0     1588          LHI   R3,X'F0'       POINT FAULT             EP8*  XP215870
0018DE  9523          1589          EPSR  R2,R3           INTERRUPT                       XP215880
0018E0  4300 16DE     1590          B     MULTI                                           XP215890
0018E4  0700          1591  MDOVER  XR    DISABL,DISABL   ENABLE FLOATING                 XP215900
0018E6  C830 10F0     1592          LHI   R3,X'10F0'      POINT FAULT INTERRUPT   EP9*  XP215910
0018EA  9523          1593          EPSR  R2,R3           INTERRUPT                       XP215920


                      1595  *       COMPARE CHECK                                       XP215940
0018EC  2451          1596  COMPR   LIS   GR5,1                                         XP215950
0018EE  2461          1597          LIS   GR6,1                                         XP215960
0018F0  2474          1598          LIS   GR7,4                                         XP215970
0018F2  E620 3094     1599          LA    PNT,COM                                       XP215980
0018F6  C8D0 0032     1600  COLOOP  LHI   TOT,X'32'       SET ERROR  NUMBER=X'32'      XP215990
0018FA  6862 0000     1601          LE    6,0(PNT)        FETCH A                       XP216000
0018FE  6882 0004     1602          LE    8,4(PNT)        FETCH B                       XP216010
001902  68A0 2D0C     1603          LE    10,ZEROF                                      XP216020
001906  2BA6          1604          SER   10,6            GET (-A)                      XP216030
001908  68C0 2D0C     1605          LE    12,ZEROF                                      XP216040
00190C  2BC8          1606          SER   12,8            GET (-B)                      XP216050
00190E  24C0          1607          LIS   GR12,0          EXPECTED CC=0                 XP216060
001910  6962 0000     1608          CE    6,0(PNT)                                      XP216070
001914  4190 1C06     1609          BAL   GR9,TCC         CHECK CC                      XP216080
001918  C8D0 0033     1610          LHI   TOT,X'33'       SET ERROR NUMBER=X'33'        XP216090
00191C  29AA          1611          CER   10,10                                         XP216100
00191E  4190 1C06     1612          BAL   GR9,TCC         CHECK  CC                     XP216110
001922  C8D0 0034     1613          LHI   TOT,X'34'       SET ERROR NUMBER=X'34'        XP216120
001926  6982 0004     1614          CE    8,4(PNT)                                      XP216130
00192A  4190 1C06     1615          BAL   GR9,TCC         CHECK  CC                     XP216140
00192E  C8D0 0035     1616          LHI   TOT,X'35'       SET ERROR NUMBER=X'35'        XP216150
001932  29CC          1617          CER   12,12                                         XP216160
001934  4190 1C06     1618          BAL   GR9,TCC         CHECK  CC                     XP216170
001938  C8D0 0036     1619          LHI   TOT,X'36'       SET ERROR NUMBER=X'36'        XP216180
00193C  24C2          1620          LIS   GR12,2          EXPECTED CC=2                 XP216190
00193E  6962 0004     1621          CE    6,4(PNT)        A>B                           XP216200
001942  4190 1C06     1622          BAL   GR9,TCC         CHECK  CC                     XP216210
001946  C8D0 0037     1623          LHI   TOT,X'37'       SET ERROR NUMBER=X'37'        XP216220
00194A  296A          1624          CER   6,10            A> -A                         XP216230
00194C  4190 1C06     1625          BAL   GR9,TCC         CHECK                         XP216240
001950  C8D0 0038     1626          LHI   TOT,X'38'       SET ERROR NUMBER=X'38'        XP216250
001954  296C          1627          CER   6,12            A >-B                         XP216260
001956  4190 1C06     1628          BAL   GR9,TCC         CHECK                         XP216270
00195A  C8D0 0039     1629          LHI   TOT,X'39'       SET ERROR NUMBER=X'39'        XP216280
00195E  298A          1630          CER   8,10            B>-A                          XP216290
001960  4190 1C06     1631          BAL   GR9,TCC         CHECK                         XP216300
001964  C8D0 003A     1632          LHI   TOT,X'3A'       SET ERROR NUMBER=X'3A'        XP216310
001968  6980 2D0C     1633          CE    8,ZEROF         CHECK IF B=0                  XP216320
00196C  2133          1634          BNES  COMPR1          IF NOT BRANCH TO COMPR1       XP216330
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00196E  26D1           1635           AIS   TOT,1              ERROR NUMBER=X'3B'                XP216340
001970  2306           1636           BS    COMPR2                                               XP216350
001972  298C           1637  COMPR1   CER   8,12               B>-B                              XP216360
001974  4190 1C06      1638  TSP04    BAL   GR9,TCC            ERROR 043B                        XP216370
001978  C8D0 003B      1639           LHI   TOT,X'3B'           SET ERROR NUMBER=X'3B'            XP216380
00197C  29CA           1640  COMPR2   CER   12,10              -B>-A                             XP216390
00197E  4190 1C06      1641  TSP05    BAL   GR9,TCC            ERROR 043B                        XP216400
001982  C8D0 003C      1642           LHI   TOT,X'3C'           SET ERROR NUMBER=X'3C'            XP216410
001986  24C9           1643           LIS   GR12,9             EXPECTED  CC=9                    XP216420
001988  29AC           1644           CER   10,12              -A<-B                             XP216430
00198A  4190 1C06      1645  TSP06    BAL   GR9,TCC            ERROR 043C                        XP216440
00198E  C8D0 003D      1646           LHI   TOT,X'3D'           SET ERROR NUMBER=X'3D'            XP216450
001992  69A2 0000      1647           CE    10,0(PNT)          -A<A                              XP216460
001996  4190 1C06      1648           BAL   GR9,TCC            CHECK                             XP216470
00199A  C8D0 003E      1649           LHI   TOT,X'3E'           SET ERROR NUMBER=X'3E'            XP216480
00199E  69A2 0004      1650           CE    10,4(PNT)          -A<B                              XP216490
0019A2  4190 1C06      1651           BAL   GR9,TCC            CHECK                             XP216500
0019A6  C8D0 003F      1652           LHI   TOT,X'3F'           SET ERROR NUMBER=X'3F'            XP216510
0019AA  6982 0000      1653           CE    8,0(PNT)           B<A                               XP216520
0019AE  4190 1C06      1654           BAL   GR9,TCC                                              XP216530
0019B2  C8D0 0040      1655           LHI   TOT,X'40'           SET ERROR NUMBER=X'40'            XP216540
0019B6  29C6           1656           CER   12,6               -B<A                              XP216550
0019B8  4190 1C06      1657  TSP07    BAL   GR9,TCC            ERROR 0440                        XP216560
0019BC  C8D0 0041      1658           LHI   TOT,X'41'           SET ERROR NUMBER=X'41'            XP216570
0019C0  6980 2D0C      1659           CE    8,ZEROF            CHECK IF B=0                      XP216580
0019C4  2133           1660           BNES  COMPR3             IF NOT BRANCH TO COMPR3           XP216590
0019C6  26D1           1661           AIS   TOT,1              INCREMENT ERROR NUMBER            XP216600
0019C8  2307           1662           BS    COMPR4                                               XP216610
0019CA  69C2 0004      1663  COMPR3   CE    12,4(PNT)          -B<B                              XP216620
0019CE  4190 1C06      1664           BAL   GR9,TCC            CHECK CC                          XP216630
0019D2  C8D0 0042      1665           LHI   TOT,X'42'           SET ERROR NUMBER=X'42'            XP216640
0019D6  CA20 0008      1666  COMPR4   AHI   PNT,8                                                XP216650
0019DA  C150 18F6      1667           BXLE  GR5,COLOOP                                           XP216660


                       1669  ** TEST  LME,  STME INSTRUCTIONS                                    XP216680
0019DE  D100 3228      1670           LM    R0,BUFR0                                             XP216690
0019E2  D000 3270      1671           STM   R0,BUFR3           ZERO OUT BUFR3                    XP216700
0019E6  7200 32C4      1672           LME   R0,FLRG0                                             XP216710
0019EA  7100 3270      1673           STME  R0,BUFR3           ALL FLT PT REGS                   XP216720
0019EE  2430           1674           LIS   R3,0               R3 = POINTER                      XP216730
0019F0  5813 32C4      1675  S4A50    L     R1,FLRG0(R3)       R1=FL.PT.REG.0 THRU E FROM MEMORY XP216740
0019F4  5513 3270      1676           CL    R1,BUFR3(R3)                                         XP216750
0019F8  4230 1A2C      1677           BNE   S4R50                                                XP216760
0019FC  2634           1678           AIS   R3,4                                                 XP216770
0019FE  C530 0020      1679           CLHI  R3,X'20'                                             XP216780
001A02  4230 19F0      1680           BNE   S4A50                                                XP216790
001A06  2430           1681           LIS   R3,0                                                 XP216800
001A08  7283 32C4      1682           LME   R8,FLRG0(R3)                                         XP216810
                       1683  **  FL.PT.REG. 0 THRU 6 = FLRG0 THRU 6                              XP216820
                       1684  **  FL.PT.REG. 8 THRU 14 = FLRG0 THRU 6                             XP216830
001A0C  7180 3270      1685           STME  R8,BUFR3                                             XP216840
001A10  D180 32C4      1686           LM    R8,FLRG0                                             XP216850
001A14  5580 3270      1687           CL    R8,BUFR3           FL PT REG 8 = FLRG0?              XP216860
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001A18  213A           1688          BNES  S4R50                                                    XP216870
001A1A  5590 3274      1689          CL    R9,BUFR3+4          FL PT REG 10 = FLRG1 ?               XP216880
001A1E  2137           1690          BNES  S4R50                                                    XP216890
001A20  55A0 3278      1691          CL    R10,BUFR3+8         FL PT REG 12 = FLRG2 ?               XP216900
001A24  2134           1692          BNES  S4R50                                                    XP216910
001A26  55B0 327C      1693          CL    R11,BUFR3+12        FL PT REG 14 = FLRG3 ?               XP216920
001A2A  2335           1694          BES   S4A52                                                    XP216930
001A2C  C8D0 0050      1695  S4R50   LHI   TOT,X'50'          ERROR 0450 - LME,STME                XP216940
001A30  4300 2C54      1696          B     ERROR                                                    XP216950
                       1697  *                                                                      XP216960
                       1698  *                                                                      XP216970
001A34  D100 3228      1699  S4A52   LM    R0,BUFR0                                                 XP216980
001A38  D000 3270      1700          STM   R0,BUFR3            ZERO OUT THE STORAGE AREA            XP216990
001A3C  7180 3270      1701          STME  R8,BUFR3            STORE FL.PT.REG.8,10,12,14 AT BUFR3  XP217000
001A40  D180 32C4      1702          LM    R8,FLRG0            SET REG.8,                           XP217010
001A44  5580 3270      1703          CL    R8,BUFR3            FL.PT.REG.8 STORED AT BUFR3  ?       XP217020
001A48  213A           1704          BNES  S4R60                                                    XP217030
001A4A  5590 3274      1705          CL    R9,BUFR3+4          FL.PT.REG.10 STORED AT BUFR3+4       XP217040
001A4E  2137           1706          BNES  S4R60                                                    XP217050
001A50  55A0 3278      1707          CL    R10,BUFR3+8         FL.PT.REG.12 STORED AT BUFR3+8       XP217060
001A54  2134           1708          BNES  S4R60                                                    XP217070
001A56  55B0 327C      1709          CL    R11,BUFR3+12                                             XP217080
001A5A  2335           1710          BES   S4A62                                                    XP217090
001A5C  C8D0 0060      1711  S4R60   LHI   TOT,X'60'          ERROR 0460 - LME,STME                XP217100
001A60  4300 2C54      1712          B     ERROR                                                    XP217110
001A64  7200 32C4      1713  S4A62   LME   R0,FLRG0            LOAD FL.PT.REG.0 THRU 14 WITH FLRG0  XP217120
001A68  D100 3228      1714          LM    R0,BUFR0                                                 XP217130
001A6C  D000 3270      1715          STM   R0,BUFR3            ZERO OUT THE STORAGE AREA            XP217140
001A70  7100 3270      1716          STME  R0,BUFR3                                                 XP217150
001A74  2430           1717          LIS   R3,0                                                     XP217160
001A76  5803 3270      1718  S4A65   L     R0,BUFR3(R3)                                             XP217170
001A7A  5503 32C4      1719          CL    R0,FLRG0(R3)                                             XP217180
001A7E  4230 1A5C      1720  TSP08   BNE   S4R60               ERROR 0460                           XP217190
001A82  2634           1721          AIS   R3,4                                                     XP217200
001A84  C530 0020      1722          CLHI  R3,X'20'                                                 XP217210
001A88  4230 1A76      1723          BNE   S4A65                                                    XP217220


                       1725  *       TEST FXR, FLR INSTRUCTIONS.                                    XP217240
                       1726  *                                                                      XP217250
001A8C  C820 0000      1727          LHI   R2,X'0'             SEL REG SET 0            EP10*       XP217260
001A90  5020 0048      1728          ST    R2,X'48'                                                 XP217270
001A94  C820 10F0      1729          LHI   R2,X'10F0'          *                        EP11*       XP217280
001A98  9512           1730          EPSR  R1,R2               INITIALIZE PSW                       XP217290
001A9A  E620 1B0E      1731          LA    R2,T4CCK1           RETURN ADDRESS                       XP217300
001A9E  5020 004C      1732          ST    R2,X'4C'                                                 XP217310
001AA2  E620 2E1C      1733          LA    R2,CCTAB0                                                XP217320
001AA6  C8D0 0070      1734          LHI   TOT,X'70'           ERROR CODE BASE                      XP217330
001AAA  0744           1735          XR    R4,R4                                                    XP217340
001AAC  6804 2D9C      1736  T4A1    LE    R0,FIXTAB(R4)       PICK UP DATA                         XP217350
001AB0  2E00           1737          FXR   R0,R0                                                    XP217360
001AB2  9511           1738          EPSR  R1,R1                                                    XP217370
001AB4  C410 000F      1739          NHI   R1,X'F'             BREAK OUT CC                         XP217380
001AB8  5504 2DA0      1740  CCK1A   CL    R0,FIXTAB+4(R4)     EXPECTED RESULTS                     XP217390
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001ABC  4230 1B18          1741  TSP09   BNE   T4R1              ERROR 0471 ON TEST SPEC                XP217400
001AC0  D412 0000          1742          CLB   R1,0(R2)          SAME AS EXPECTED ?                     XP217410
001AC4  4230 1B18          1743          BNE   T4R1              NO.                                    XP217420
001AC8  2648               1744          AIS   R4,8              TO GET NEXT DATA                       XP217430
001ACA  2621               1745          AIS   R2,1              FOR NEXT EXPECTED CC                   XP217440
001ACC  F520 0000 2E22     1746          CLI   R2,NCCTAB0        LAST TIME?                             XP217450
001AD2  4280 1AAC          1747          BL    T4A1              GET ANOTHER                            XP217460
001AD6  C8D0 0080          1748          LHI   TOT,X'80'         ERROR CODE BASE                        XP217470
001ADA  E620 2EAC          1749          LA    R2,CCTAB1                                                XP217480
001ADE  0744               1750          XR    R4,R4                                                    XP217490
001AE0  5804 2E2C          1751  T4A2    L     R0,FLOATAB(R4)                                           XP217500
001AE4  2F00               1752          FLR   R0,R0                                                    XP217510
001AE6  9511               1753          EPSR  R1,R1                                                    XP217520
001AE8  C410 000F          1754          NHI   R1,X'F'           BREAK OUT CC                           XP217530
001AEC  6904 2E30          1755  CCK2A   CE    R0,FLOATAB+4(R4)                                         XP217540
001AF0  4230 1B18          1756          BNE   T4R1                                                     XP217550
001AF4  D412 0000          1757          CLB   R1,0(R2)          SAME AS EXPECTED ?                     XP217560
001AF8  4230 1B18          1758          BNE   T4R1                                                     XP217570
001AFC  2648               1759          AIS   R4,8                                                     XP217580
001AFE  2621               1760          AIS   R2,1                                                     XP217590
001B00  F520 0000 2EBE     1761          CLI   R2,NCCTAB1        LAST TIME?                             XP217600
001B06  4280 1AE0          1762          BL    T4A2              GET ANOTHER                            XP217610
001B0A  4300 1B20          1763          B     S4END                                                    XP217620
001B0E  D0E0 3278          1764  T4CCK1  STM   R14,BUFR3+8       SAVE OLD PSW STAT, LOC (SET 0 NOW)     XP217630
001B12  C810 00F0          1765          LHI   R1,X'00F0'        SEL REG SET F, NO INTERRUPTS   EP12*   XP217640
001B16  9501               1766          EPSR  R0,R1             NOW IN REG SET F                       XP217650
001B18  1043               1767  T4R1    SRLS  R4,3              CONVERT ERRCODE                        XP217660
001B1A  0AD4               1768          AR    TOT,R4                                                   XP217670
001B1C  4300 2C54          1769          B     ERROR                                                    XP217680
                           1770  *                                                                      XP217690
                           1771  *                                                                      XP217700
001B20  4300 0FA0          1772  S4END   B     S2END2            NO ERROR                               XP217710


                           1774  *       SUBROUTINES                                                    XP217730
                           1775  *                                                                      XP217740
                           1776  *       THESE SUBROUTINES STORE THE RESULT IN TEMP, TEMP+2              XP217750
001B24  6000 3370          1777  COMP0   STE   0,TEMP              THIS ROUTINE                           XP217760
001B28  4300 1B64          1778          B     COMPAR              STORES THE 32 BIT                      XP217770
001B2C  6020 3370          1779  COMP2   STE   2,TEMP              RESULT IN 4 SUCCESSIVE                 XP217780
001B30  4300 1B64          1780          B     COMPAR              BYTES IN MAIN MEMORY                   XP217790
001B34  6040 3370          1781  COMP4   STE   4,TEMP                                                    XP217800
001B38  4300 1B64          1782          B     COMPAR                                                   XP217810
001B3C  6060 3370          1783  COMP6   STE   6,TEMP                                                    XP217820
001B40  4300 1B64          1784          B     COMPAR                                                   XP217830
001B44  6080 3370          1785  COMP8   STE   8,TEMP                                                    XP217840
001B48  4300 1B64          1786          B     COMPAR                                                   XP217850
001B4C  60A0 3370          1787  COMP10  STE   10,TEMP                                                   XP217860
001B50  4300 1B64          1788          B     COMPAR                                                   XP217870
001B54  60C0 3370          1789  COMP12  STE   12,TEMP                                                   XP217880
001B58  4300 1B64          1790          B     COMPAR                                                   XP217890
001B5C  60E0 3370          1791  COMP14  STE   14,TEMP                                                   XP217900
001B60  4300 1B64          1792          B     COMPAR                                                   XP217910
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                         1794  *       THIS ROUTINE COMPARES CALCULATED AND EXPECTED RESULTS          XP217930
001B64   73C9 0000       1795  COMPAR  LHL   GR12,0(GR9)                                             XP217940
001B68   48AC 0000       1796          LH    GR10,0(GR12)                                            XP217950
001B6C   48BC 0002       1797          LH    GR11,2(GR12)                                            XP217960
001B70   45A0 3370       1798          CLH   GR10,TEMP          COMPARE                            XP217970
001B74   4230 1C24       1799          BNE   ERROR2                                                  XP217980
001B78   45B0 3372       1800          CLH   GR11,TEMP+2                                             XP217990
001B7C   4230 1C24       1801          BNE   ERROR2                                                  XP218000
001B80   4309 0002       1802          B     2(GR9)                                                  XP218010


                         1804  *       THIS ROUTINE IS ENTERED WHEN FLOAT. PT. FAULT                  XP218030
                         1805  *       INTERRUPT IS TAKEN                                            XP218040
001B84   D0F0 3278       1806  FAULT1  STM   R14,BUFR3+8        SAVE OLD PSW                       XP218050
001B88   58F0 3278       1807          L     R15,BUFR3+8        OLD PSW STAT                       XP218060
001B8C   95FF            1808          EPSR  R14,R15            GO TO SAME REG SET                 XP218070
001B8E   D1F0 3278       1809          LM    R14,BUFR3+8        PICK UP OLD PSW                    XP218080
001B92   087F            1810          LR    R7,R15             TO PASS BACK OLD LOC               XP218090
001B94   26F4            1811          AIS   R15,4              (AIS 15,6 FOR RX3 ASSY.)       *   XP218100
001B96   180E            1812          LPSWR R14                                                     XP218110


                         1814  *       THIS ROUTINE COMPARES THE CALCULATED RESULT AND                XP218130
                         1815  *       CONDITION CODE AGAINST THE EXPECTED RESULT AND CC              XP218140
001B98   95EE            1816  TEST    EPSR  GR14,GR14          OBTAIN CC FROM CURRENT PSW         XP218150
001B9A   C4E0 000F       1817          NHI   R14,X'F'                                                XP218160
001B9E   05EC            1818          CLR   GR14,GR12          COMPARE                            XP218170
001BA0   4230 1C4C       1819          BNE   ERROR3                                                  XP218180
001BA4   0800            1820          LR    DISABL,DISABL      EXAMINE DISABLE FLAG               XP218190
001BA6   4230 1BBA       1821          BNZ   TEST1              IF SET BRANCH TO TEST1             XP218200
001BAA   C3C0 0004       1822          THI   GR12,X'4'          EXAMINE OVERFLOW BIT OF CC         XP218210
001BAE   4330 1BBA       1823          BZ    TEST1              IF RESET GO TO TEST1               XP218220
001BB2   0811            1824          LR    SWAP,SWAP          TEST WHETHER INT. WAS TAKEN        XP218230
001BB4   4330 1C16       1825          BZ    ERROR1             IF INT. NOT TAKEN THEN ERROR       XP218240
001BB8   0711            1826          XR    SWAP,SWAP          REMOVE SWAP FLAG                   XP218250
001BBA   6040 3370       1827  TEST1   STE   4,TEMP            STORE THE CALCULATED RESULT        XP218260
001BBE   40A0 3374       1828          STH   GR10,TEMP1                                              XP218270
001BC2   40B0 3376       1829          STH   GR11,TEMP1+2                                            XP218280
001BC6   C840 0037       1830          LHI   R4,C'7'            MOD 7/32 ?                         XP218290
001BCA   D440 3354       1831          CLB   R4,CPUNO                                                XP218300
001BCE   2137            1832          BNES  X00                                                     XP218310
001BD0   5840 3374       1833          L     R4,TEMP1           EXPECTED RESULTS                   XP218320
001BD4   5540 3370       1834          CL    R4,TEMP            ACTUAL RESULTS                     XP218330
001BD8   4230 1C4C       1835          BNE   ERROR3             REQUIRE EXACT RESULT, MOD 7/32     XP218340
001BDC   C5D0 002A       1836  X00     CLHI  TOT,X'2A'                                               XP218350
001BE0   2184            1837          BLS   X02                                                     XP218360
001BE2   C5D0 002F       1838  X01     CLHI  TOT,X'2F'                                               XP218370
001BE6   218F            1839          BLS   TESTRTN            ACCURACY CHECK INVALID, 8/32       XP218380
001BE8   5840 3374       1840  X02     L     R4,TEMP1                                                XP218390
001BEC   5540 3370       1841          CL    R4,TEMP                                                 XP218400
001BF0   233A            1842          BES   TESTRTN                                                 XP218410
001BF2   2641            1843          AIS   R4,1                                                    XP218420
001BF4   5540 3370       1844          CL    R4,TEMP            8/32 PASSBAND = +-1 BIT ACCURACY   XP218430
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001BF8  2336          1845           BES   TESTRTN                                    XP218440
001BFA  2742          1846           SIS   R4,2                                       XP218450
001BFC  5540 3370     1847           CL    R4,TEMP                                    XP218460
001C00  4230 1C4C     1848           BNE   ERROR3                                    XP218470
001C04  03C9          1849  TESTRTN  BR    GR9                 RETURN                 XP218480

                      1851  *        THIS ROUTINE COMPARES  CC OF CURRENT PSW AGAINST EXPECTED CC  XP218500
001C06  95EE          1852  TCC      EPSR  GR14,GR14           OBTAIN CC FROM  CURRENT PSW       XP218510
001C08  C4E0 000B     1853           NHI   R14,X'B'                                   XP218520
001C0C  05EC          1854           CLR   GR14,GR12                                  XP218530
001C0E  4230 1C86     1855           BNE   ERROR4                                     XP218540
001C12  0811          1856           LR    SWAP,SWAP           EXAMINE SWAP FLAG      XP218550
001C14  0339          1857           BZR   GR9                                        XP218560

                      1859  *        THIS  SUBROUTINE  IS  ENTERED  WHEN  THE  FLOATING  POINT  XP218580
                      1860  *        FAULT  INTERRUPT  IS  NOT  HANDLED  CORRECTLY              XP218590
001C16  0700          1861  ERROR1   XR    R0,R0               RESET  CC  PRINT  FLAG  XP218600
001C18  4000 3270     1862           STH   R0,BUFR3                                   XP218610
001C1C  4000 3272     1863           STH   R0,BUFR3+2                                 XP218620
001C20  4300 2C54     1864           B     ERROR                                      XP218630

                      1866  *-       THIS   SUBROUTINE IS ENTERED WHEN THE ACTUAL VALUE AFTER LOAD  XP218650
                      1867  *        AND  STORE  OPERATION DOES NOT MATCH THE EXPECTED VALUE        XP218660
001C24  0700          1868  ERROR2   XR    R0,R0                                      XP218670
001C26  2414          1869           LIS   R1,4                                       XP218680
001C28  4000 3270     1870           STH   R0,BUFR3                                   XP218690
001C2C  4010 3272     1871           STH   R1,BUFR3+2                                 XP218700
001C30  4800 3370     1872           LH    R0,TEMP                                    XP218710
001C34  4810 3372     1873           LH    R1,TEMP+2                                  XP218720
001C38  4000 3274     1874           STH   R0,BUFR3+4                                 XP218730
001C3C  4010 3276     1875           STH   R1,BUFR3+6                                 XP218740
001C40  40A0 3278     1876           STH   R10,BUFR3+8                                XP218750
001C44  40B0 327A     1877           STH   R11,BUFR3+10        VALUE                  XP218760
001C48  4300 2C54     1878           B     ERROR                                      XP218770

                      1880  *        THIS   SUBROUTINE  IS  ENTERED  WHEN  THE  EXPECTED  XP218790
                      1881  *        AND CALCULATED RESULTS, OR THE EXPECTED AND ACTUAL  XP218800
                      1882  *        CONDITION CODES DO NOT MATCH IN THE FLOATING-POINT  XP218810
                      1883  *        ADD, SUBTRACT, MULTIPLY, OR DIVIDE OPERATIONS.      XP218820
001C4C  0700          1884  ERROR3   XR    R0,R0               RESET  CC  PRINT  FLAG  XP218830
001C4E  40C0 3270     1885           STH   R0,BUFR3                                   XP218840
001C52  C5F0 002A     1886           CLHI  R15,X'2A'           IF ERROR NUMBER        XP218850
001C56  2185          1887           BLS   ERR4C0              IS FROM X'2A' TO X'32' XP218860
001C58  C5F0 0032     1888           CLHI  R15,X'32'           BRANCH TO              XP218870
001C5C  4280 1CCA     1889           BL    ERROR5              ERROR5                 XP218880
001C60  240A          1890  ERR4C0   LIS   R0,10                                     XP218890
001C62  4000 3272     1891           STH   R0,BUFR3+2          TEN HALFWORD VALUES TO BE PRINTED  XP218900
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001C66  6060 3274          1892            STE   6,BUFR3+4          FIRST OPERAND                    XP218910
001C6A  6080 3278          1893            STE   8,BUFR3+8          SECOND OPERAND                   XP218920
001C6E  6040 327C          1894            STE   4,BUFR3+12         ACTUAL RESULT                    XP218930
001C72  40A0 3280          1895            STH   R10,BUFR3+16       EXPECTED                         XP218940
001C76  40B0 3282          1896            STH   R11,BUFR3+18       RESULT                           XP218950
001C7A  40E0 3284          1897            STH   R14,BUFR3+20       ACTUAL CONDITION CODE            XP218960
001C7E  40C0 3286          1898            STH   R12,BUFR3+22       EXPECTED CONDITION CODE          XP218970
001C82  4300 2C54          1899            B     ERROR                                               XP218980


                           1901  *         THIS    SUBROUTINE IS ENTERED WHEN THE ACTUAL AND          XP219000
                           1902  *         EXPECTED CONDITION CODES DO NOT MATCH AFTER                 XP219010
                           1903  *         A FLOATING-POINT COMPARE OPERATION.                        XP219020
001C86  0700               1904  ERROR4    XR    R0,R0              RESET  CC  PRINT  FLAG           XP219030
001C88  4000 3270          1905            STH   R0,BUFR3                                            XP219040
001C8C  2402               1906            LIS   R0,2               TWO  HALF  WORD  VALUES          XP219050
001C8E  4000 3272          1907            STH   R0,BUFR3+2         ARE TO BE PRINTED                XP219060
001C92  40E0 3274          1908            STH   R14,BUFR3+4        ACTUAL CONDITION CODE            XP219070
001C96  40C0 3276          1909            STH   R12,BUFR3+6        EXPECTED CONDITION CODE          XP219080
001C9A  4300 2C54          1910            B     ERROR                                               XP219090


                           1912  *         THIS ROUTINE CHECKS WHETHER OR NOT THE FLOAT. POINT         XP219110
                           1913  *         FAULT INTERRUPT TAKEN IS ERRONEOUS                          XP219120
001C9E  D0E0 3368          1914  FAULT     STM   R14,OLDPSW                                          XP219130
001CA2  0800               1915            LR    DISABL,DISABL      EXAMINE DISABLE FLAG             XP219140
001CA4  4230 1C16          1916            BNZ   ERROR1             IF SET, BRANCH TO ERROR          XP219150
001CA8  C3C0 0004          1917            THI   GR12,X'4'          EXAMINE OVERFLOW BIT OF CC       XP219160
001CAC  4330 1C16          1918            BZ    ERROR1             IF RESET,BRANCH TO ERROR         XP219170
001CB0  4810 2D10          1919            LH    SWAP,FLAG          PUT FLAG IN SWAP                 XP219180
                           1920  *                                                                   XP219190
001CB4  D330 3354          1921            LB    R3,CPUNO                                           XP219200
001CB8  C530 0037          1922            CLHI  R3,C'7'            7/32 ?                           XP219210
001CBC  2333               1923            BES   FAULT7                                             XP219220
001CBE  C200 3368          1924            LPSW  OLDPSW                                             XP219230
001CC2  C830 0000          1925  FAULT7    LHI   R3,0                                               XP219240
001CC6  9543               1926            EPSR  R4,R3              SAVES SET 0, 7/32                XP219250
001CC8  180E               1927            LPSWR R14                RETURN WITH OLD PSW, LOC         XP219260


001CCA  2406               1929  ERROR5    LIS   R0,6                                                XP219280
001CCC  4000 3272          1930            STH   R0,BUFR3+2         SIX HALF WORDS TO PRINT          XP219290
001CD0  6040 3274          1931            STE   4,BUFR3+4          ACTUAL RESULT                    XP219300
001CD4  40A0 3278          1932            STH   R10,BUFR3+8        EXPECTED                         XP219310
001CD8  40B0 327A          1933            STH   R11,BUFR3+10       RESULT                           XP219320
001CDC  40E0 327C          1934            STH   R14,BUFR3+12       ACTUAL CONDITION CODE            XP219330
001CE0  40C0 327E          1935            STH   R12,BUFR3+14       EXPECTED CONDITION CODE          XP219340
001CE4  4300 2C54          1936            B     ERROR                                               XP219350


                           1938  *                                                                   XP219370
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                    1939  *                                                                    XP219380
                    1940  *                                                                    XP219390
0000 1CE8           1941  SUBT5   EQU   *                  CHECK AUTO DRIVER CHANNEL OPERATION  XP219400
                    1942  *                                                                    XP219410
                    1943  * SUBTEST 5 IS DESIGNED TO TEST ALL FEATURES OF THE AUTO DRIVER       XP219420
                    1944  * CHANNEL OPERATION.  THE SUBTEST IS ORGANIZED AS FOLLOWS.  THE      XP219430
                    1945  * USER IS REFERRED TO THE LISTING FOR ADDITIONAL DETAILS.            XP219440
                    1946  * 1)  THE CONSOLE ADDRESS SLOT IN THE INTERRUPT SERVICE POINTER      XP219450
                    1947  *      TABLE IS MADE TO POINT TO THE CCB LOCATED AT 'CCW0'.           XP219460
                    1948  *      THE TEST IS DIVIDED INTO 10 SMALLER ROUTINES.  IN THE CASE    XP219470
                    1949  *      OF AN ERROR, EACH ONE OF THESE ROUTINES CAN BE EXECUTED       XP219480
                    1950  *      INDEPENDENTLY BY PATCHING THE PROGRAM. (SEE APPENDIX 2 FOR CCB) XP219490
                    1951  * 2)  S5A1.  THE CONSOLE IS PUT IN THE WRITE MODE, AND THE PROGRAM   XP219500
                    1952  *      WAITS UNTIL BSY IS ZERO.  A SINT COMMAND IS EXECUTED.  NO     XP219510
                    1953  *      PRINTOUT SHOULD RESULT (EXECUTE BIT IN CCW0 = 0).             XP219520
                    1954  *      IF A PRINTOUT OF 'ZZZZZZZZZZ' RESULTS, TRANSLATION WAS NOT    XP219530
                    1955  *      PERFORMED.  IF THE CHARACTERS 'TTTTTTTTTT' ARE PRINTED,       XP219540
                    1956  *      TRANSLATION WAS PERFORMED.                                    XP219550
                    1957  * 3)  S5A2.  THE CONSOLE IS PUT INTO THE READ MODE, THE CCB AT       XP219560
                    1958  *      'CCW0' INITIALIZED, AND A SINT COMMAND IS EXECUTED.  NO       XP219570
                    1959  *      PRINTOUT SHOULD RESULT (STATUS MASK = 09, F=1, E=1, R/W=1).   XP219580
                    1960  *      IF THE ADC OPERATION IS NOT TERMINATED WITH A BAD STATUS       XP219590
                    1961  *      (CC=0001), AN ERROR MESSAGE IS PRINTED.                       XP219600
                    1962  * 4)  S5A3.  THE CONSOLE IS PUT IN THE WRITE MODE, WITH INTERRUPTS   XP219610
                    1963  *      ENABLED.  THE CCB AT 'CCW0' IS INITIALIZED TO PRINT THE       XP219620
                    1964  *      CHARACTERS 1234567890 FROM BUFFER 0.  (E=1, F=1, B=1, R/W=1).  XP219630
                    1965  *      IF BUFFER 1 IS SELECTED, THE CHARACTERS 'ZZZZZZZZZZ' WILL     XP219640
                    1966  *      BE PRINTED.  IF TRANSLATION OCCURS, CHARACTERS 'TTTTTTTTTT'   XP219650
                    1967  *      WILL BE PRINTED.  THE OLD AND CURRENT PSW'S ARE CHECKED FOR    XP219660
                    1968  *      THE EXPECTED VALUES.  IF THE PSW'S ARE INCORRECT, AN ERROR     XP219670
                    1969  *      MESSAGE IS PRINTED.                                           XP219680
                    1970  * 5)  S5A4.  THE CCB AT 'CCW0' IS INITIALIZED TO PRINT THE CHARACTERS XP219690
                    1971  *      ABCDEFGHIJ, THE CONSOLE IS PUT IN WRITE MODE, AND A SINT INSTRUC- XP219700
                    1972  *      TION EXECUTED.  IF THE B BIT IN THE CCB HAS NOT BEEN TOGGLED  XP219710
                    1973  *      ON RETURN FROM THE INTERRUPT, AN ERROR MESSAGE IS PRINTED.     XP219720
                    1974  *      NEXT, THE CCB AT 'CCW0' IS INITIALIZED TO PRINT THE CHARACTERS XP219730
                    1975  *      '1234567890', AND A SINT IS EXECUTED, WITH THE CONSOLE IN THE XP219740
                    1976  *      WRITE MODE WITH INTERRUPTS ENABLED.                           XP219750
                    1977  * 6)  S5A6.  THIS PORTION OF SUBTEST 5 CHECKS CHARACTER TRANSLATION  XP219760
                    1978  *      IN THE ADC OPERATION.  EACH CHARACTER FROM 0 TO 255 IS PUT     XP219770
                    1979  *      IN BUFFER 0; IF BUFFER 1 IS SELECTED WHEN THE SINT INSTRUCTION XP219780
                    1980  *      IS EXECUTED, CHARACTERS 'ZZZZZZZZZZ' WILL BE PRINTED.  THE    XP219790
                    1981  *      EXECUTE BIT IS SET (E=1).  WHEN THE SINT INSTRUCTION IS        XP219800
                    1982  *      EXECUTED, EACH UNTRANSLATED CHARACTER IS CHECKED (T=0).  IF    XP219810
                    1983  *      THE CHARACTER IS TRANSLATED, CHARACTER 'T' WILL BE PRINTED.    XP219820
                    1984  *      NO PRINTING SHOULD RESULT FROM THIS PART OF SUBTEST 5.         XP219830
                    1985  * 7)  S5A8.  THE CCB AT 'CCW0' IS INITIALIZED TO TRANSLATE AND PRINT XP219840
                    1986  *      TEN CHARACTERS FROM BUFFER 1.  WHEN THE SINT INSTRUCTION IS    XP219850
                    1987  *      EXECUTED, THE CHARACTERS '1234567890' SHOULD BE PRINTED.  IF   XP219860
                    1988  *      BUFFER 0 IS SELECTED, CHARACTERS 'ZZZZZZZZZZ' WILL BE PRINTED. XP219870
                    1989  *      IF TRANSLATION IS NOT PERFORMED CORRECTLY, ANY CHARACTERS MAY  XP219880
                    1990  *      BE PRINTED.                                                   XP219890
                    1991  * 8)  S5A9.  THE MESSAGE 'DEPRESS KEYS 1234567890' IS PRINTED.  THE XP219900
                    1992  *      CCB AT 'CCW0' IS INITIALIZED TO READ 10 KEYS INTO 'BUFR3',     XP219910
                    1993  *      (T=0).  THE TELETYPE IS PUT IN THE READ MODE WITH INTERRUPTS   XP219920
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                                1994  *     ENABLED, AND A PSW SWAP IS MADE TO ENABLE EXTERNAL INTERRUPTS.      XP219930
                                1995  *     THIS SHOULD RESULT IN AN ADC READ OPERATION.  AT TERMINATION       XP219940
                                1996  *     OF THE ADC OPERATION, THE CONTENTS OF 'BUFR3' ARE PRINTED.         XP219950
                                1997  * 9)  S5A10.  THE MESSAGE 'DEPRESS KEYS 1234567890' IS PRINTED.  THE    XP219960
                                1998  *     CCB AT 'CCW0' IS INITIALIZED TO READ 10 KEYS INTO 'BUFR3',         XP219970
                                1999  *     (T=0).  THE CONSOLE IS PUT IN THE READ MODE WITH INTERRUPTS        XP219980
                                2000  *     ENABLED, AND A PSW SWAP IS MADE TO ENABLE EXTERNAL INTERRUPTS.     XP219990
                                2001  *     THIS SHOULD RESULT IN AN ADC READ OPERATION.  AT TERMINATION       XP220000
                                2002  *     OF THE ADC OPERATION, THE CONTENTS OF 'BUFR3' ARE PRINTED.         XP220010
                                2003  * 9)  S5A10.  THE MESSAGE 'DEPRESS KEYS 1234567890' IS PRINTED.  THE    XP220020
                                2004  *     CCB AT 'CCW0' IS INITIALIZED TO READ 10 KEYS INTO 'BUFR3' WITH     XP220030
                                2005  *     TRANSLATION (T=1).  THE TABLE 'TRTABL' IS SET UP FOR THE TRANS-    XP220040
                                2006  *     LATION.  THE TELETYPE IS PUT IN THE READ MODE WITH INTERRUPTS       XP220050
                                2007  *     ENABLED, AND A PSW SWAP IS MADE TO ENABLE EXTERNAL INTERRUPTS.     XP220060
                                2008  *     THIS SHOULD RESULT IN AN ADC READ OPERATION.  AT TERMINATION OF     XP220070
                                2009  *     THE ADC OPERATION, THE CONTENTS OF 'BUFR3' ARE PRINTED.             XP220080
                                2010  *                                                                        XP220090
                                2011  *     USER NOTE:  IN ALL OF THE ABOVE, FAILURE OF THE SINT INSTRUCTION    XP220100
                                2012  *     TO THE CONSOLE TO GENERATE AN INTERRUPT RESULTS IN A WAIT LOOP.     XP220110
                                2013  *     TO EXIT FROM THIS LOOP, DEPRESS THE 'BRK' KEY ON THE CONSOLE.       XP220120
                                2014  *     ON MODEL 8/32, FAILURE OF THE INTERRUPT TO OCCUR ON THE SPECIFIED   XP220130
                                2015  *     PRIORITY LEVEL RESULTS IN THE PRINTING OF AN ERROR MESSAGE.         XP220140
                                2016  *     IF THE PROCESSOR UNDER TEST IS A MODEL 8/32, THE MESSAGE 'TTY       XP220150
                                2017  *     PRIOR LEV' IS PRINTED.  ONE OF THE KEYS 0, 1, 2 OR 3 MUST BE       XP220160
                                2018  *     DEPRESSED ACCORDING TO THE HARDWARE INTERRUPT PRIORITY LEVEL        XP220170
                                2019  *     ASSIGNED TO THE CONSOLE (NORMALLY 0), FOLLOWED BY A CARRIAGE       XP220180
                                2020  *     RETURN.  THE DEVICE MAY BE CONNECTED AT A PRIORITY LEVEL OTHER      XP220190
                                2021  *     THAN ZERO FOR FURTHER TESTING OF THE PRIORITY LEVEL INTERRUPT       XP220200
                                2022  *     HARDWARE.                                                          XP220210
                                2023  *                                                                        XP220220
                                2024  *     PROCESSORS EQUIPPED WITH THE COMMUNICATIONS OPTION CHECK THE        XP220230
                                2025  *     AUTO-DRIVER-CHANNEL USING SDLC IN SERIES 32 PROCESSOR TEST PART     XP220240
                                2026  *     4 (06-195).                                                        XP220250
                                2027  ************************************************************         XP220260
                                2028  **  MACHINE MODE = FW MODE , BIT 11=0, BIT 23=0                         XP220270
001CE8   D310 3354              2029          LB    R1,CPUNO                                                   XP220280
001CEC   C510 0038              2030          CLHI  R1,C'8'                                                    XP220290
001CF0   2133                   2031          BNES  S5A1                                                       XP220300
001CF2   41A0 2AC6              2032          BAL   R10,GETPRIO         - PRINT 'TTY PRIOR LEV', SET PRILEV    XP220310
                                2033  **  NORMAL PRINTOUT IS AS FOLLOWS:                                       XP220320
                                2034  * USER INPUT   PRINTOUT            COMMENTS                            XP220330
                                2035  * ----------------------------------------                             XP220340
                                2036  *              SUBTEST                                                   XP220350
                                2037  *              *                                                         XP220360
                                2038  *   =---->     5                                                         XP220370
                                2039  *              TTY PRIOR LEV       =---> PRINTED FOR MOD 8/32 ONLY       XP220380
                                2040  *              *                   =---> PRINTED FOR MOD 8/32 ONLY       XP220390
                                2041  *   =---->     0                   =--->  (SEE MANUAL)                   XP220400
                                2042  *              1234567890          LINE 1                                XP220410
                                2043  *              1234567890          LINE 2                                XP220420
                                2044  *              ABCDEFGHIJ          LINE 3                                XP220430
                                2045  *              1234567890          LINE 4                                XP220440
                                2046  *              DEPRESS KEYS        LINE 5                                XP220450
                                2047  *              1234567890          LINE 6                                XP220460
                                2048  *   =---->     1234567890          LINE 7                                XP220470
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                                2049  *              1234567890          LINE 8                                    XP220480
                                2050  *              DEPRESS KEYS        LINE 9                                    XP220490
                                2051  *              1234567890          LINE 10                                   XP220500
                                2052  *   ===>       1234567890          LINE 11                                   XP220510
                                2053  *              ABCDEFGHIJ          LINE 12                                   XP220520
                                2054  * ----------------------------------------                                   XP220530


                                2056  ** SINCE EXECUTE BIT = 0, OPERATION SHOULD BE TERMINATED AND CONTROL        XP220550
                                2057  **  PASSED TO S5SBRTN, THEN S5RTN1                                          XP220560
                                2058  **  NO PRINTOUT SHOULD RESULT FROM THIS OPERATION                          XP220570
                                2059  **  IF ANY ERROR OCCURS EACH BUFR IS SET TO PRINT CHAR. Z ' S              XP220580
                                2060  **  IF ANY TRANSLATION OCCURS , CHAR. T ' S WILL BE PRINTED                XP220590
                                2061  *                                                                          XP220600
001CF6  2491                    2062  S5A1     LIS   R9,1                 SUBTEST SECTION TRACER                XP220610
001CF8  F8C0 0001 FFF4          2063           LI    R12,Y'0001FFF4'      E=0, F=1, BUF 0 BYTE CNT = -12        XP220620
001CFE  E6D0 2250               2064           LA    R13,BUFZEND          BUFR0 TO PRINT 'Z'S                   XP220630
001D02  F8E0 0000 FFF4          2065           LI    R14,Y'FFF4'                                                XP220640
001D08  E6F0 2250               2066           LA    R15,BUFZEND          BUFR1 TO PRINT 'Z'S                   XP220650
001D0C  D0C0 2220               2067           STM   R12,CCW0                                                   XP220660
001D10  E680 1DB8               2068           LA    R8,S5RTN1            RETURN                                XP220670
001D14  C800 8054               2069           LHI   R0,Y'8054'           TRANSLATION CHARACTER 'T'             XP220680
001D18  2410                    2070           LIS   R1,0                                                       XP220690
001D1A  4001 348C               2071  S5C      STH   R0,TRTABL(R1)                                            XP220700
001D1E  2612                    2072           AIS   R1,2                                                       XP220710
001D20  C510 0200               2073           CLHI  R1,512                                                     XP220720
001D24  2085                    2074           BLS   S5C                                                        XP220730
001D26  D320 3358               2075           LB    R2,OUTDEV                                                  XP220740
001D2A  DE20 335A               2076           OC    R2,OUTCMD                                                  XP220750
001D2E  9D23                    2077           SSR   R2,R3                                                      XP220760
001D30  2081                    2078           BTBS  8,1                                                        XP220770
001D32  4300 1D36               2079           B     S5SINT                                                     XP220780
                                2080  *                                                                          XP220790
                                2081  *                                                                          XP220800
001D36  E600 1D58               2082  S5SINT   LA    R0,S5SINTB           NEW VECTOR                            XP220810
001D3A  D310 3359               2083           LB    R1,INDEV                                                   XP220820
001D3E  4001 4100 00D0          2084           STH   R0,X'D0'(R1,R1)                                            XP220830
001D44  D310 3358               2085           LB    R1,OUTDEV                                                  XP220840
001D48  4001 4100 00D0          2086           STH   R0,X'D0'(R1,R1)                                            XP220850
001D4E  5870 32E4               2087  S5SINTA  L     R7,S5PSW             ENABLE INTPTS                         XP220860
001D52  9507                    2088           EPSR  R0,R7                                                      XP220870
001D54  EA00 001F               2089           RRL   R0,31                DELAY TACTIC                          XP220880
001D58  9500                    2090  S5SINTB  EPSR  R0,R0                                                     XP220890
001D5A  C300 0800               2091           THI   R0,X'0800'           ACK ALL INTPTS, CONSOLE DEVICE        XP220900
001D5E  2038                    2092           BNZS  S5SINTA                                                    XP220910
001D60  E600 2221               2093           LA    R0,CCW0+1            CHANNEL COMMAND WORD                  XP220920
001D64  D310 3359               2094           LB    R1,INDEV                                                   XP220930
001D68  4001 4100 00D0          2095           STH   R0,X'D0'(R1,R1)      RESTORE VECTOR                        XP220940
001D6E  D310 3358               2096           LB    R1,OUTDEV                                                  XP220950
001D72  4001 4100 00D0          2097           STH   R0,X'D0'(R1,R1)      RESTORE VECTOR                        XP220960
001D78  C590 0009               2098           CLHI  R9,9                                                       XP220970
001D7C  238E                    2099           BNLS  S5WAIT               EXPECT INPUT                          XP220980
001D7E  7310 335C               2100           LHL   R1,PRILEV            INTPT REG SET, 8/32                   XP220990
001D82  1014                    2101           SRLS  R1,4                                                       XP221000
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001D84  D300 3354          2102            LB    R0,CPUNO                                    XP221010
001D88  C500 0037          2103            CLHI  R0,C'7'                                     XP221020
001D8C  2334               2104            BES   S5SINTD                                     XP221030
                           2105  *                                                           XP221040
                           2106  *----------------------------------                         XP221050
                           2107  *                                                           XP221060
                           2108  *         SINT  R1,0(R2)          SINT USED FOR 8/32        XP221070
001D8E  E212               2109  S5SINTC   DCX   E212,0000         OPCODE FOR ABOVE          XP221080
001D90  0000                                                                                 XP221090
001D92  2303               2110            BS    S5WAIT                                      XP221100
001D94  E202 0000          2111  S5SINTD   SINT  0(R2)             SINT USED FOR 7/32        XP221110
001D98  D320 3359          2112  S5WAIT    LB    R2,INDEV                                    XP221120
001D9C  9D23               2113            SSR   R2,R3             LOOK FOR BRK.KEY          XP221130
001D9E  C430 0020          2114            NHI   R3,X'20'                                    XP221140
001DA2  2235               2115            BZS   S5WAIT                                      XP221150
        0000 1DA3          2116  S5SINTZ   EQU   *-1                                         XP221160
                           2117  *                                                           XP221170
                           2118  *----------------------------------                         XP221180
                           2119  *                                                           XP221190
001DA4  7300 3356          2120            LHL   R0,CRTFLG                                   XP221200
001DA8  2135               2121            BNZS  S5ERR0                                      XP221210
001DAA  9D23               2122  S5WAIT2   SSR   R2,R3                                       XP221220
001DAC  C430 0020          2123            NHI   R3,X'20'                                    XP221230
001DB0  2033               2124            BNZS  S5WAIT2                                     XP221240
001DB2  24D0               2125  S5ERR0    LIS   R13,0             ERROR 0500 - NO SINT INTERRUPT *****  XP221250
001DB4  4300 1DE4          2126            B     S5R               EXIT BY PRESSING BREAK KEY.  XP221260
                           2127  *                                                           XP221270
                           2128  *                                                           XP221280
001DB8  C4A0 FFF0          2129  S5RTN1    NHI   R10,X'FFF0'       R10 = OLD PSW STATUS      XP221290
001DBC  55A0 32E4          2130            CL    R10,S5PSW         OLD PSW STAT              XP221300
001DC0  2138               2131            BNES  S5R1A                                       XP221310
001DC2  C5B0 1D92          2132            CLHI  R11,S5SINTC+4     CHECK OLD PSW LOC         XP221320
001DC6  218E               2133            BLS   S5R1                                        XP221330
001DC8  052C               2134            CLR   R2,R12            (R12) = INTERRUPTING DEV. ADDRESS  XP221340
001DCA  2133               2135            BNES  S5R1A                                       XP221350
001DCC  C5D0 0000          2136            CLHI  R13,0             (R13) = 0 (DEVICE STATUS)  XP221360
001DD0  2139               2137  S5R1A     BNES  S5R1                                        XP221370
001DD2  C5E0 2220          2138            CLHI  R14,CCW0          CORRECT CMD WORD ADDR ?   XP221380
001DD6  2136               2139            BNES  S5R1                                        XP221390
001DD8  7320 335C          2140            LHL   R2,PRILEV         PICK UP REG SET EXPECTED  XP221400
001DDC  C5F2 2800          2141            CLHI  R15,X'2800'(R2)   NEW PSW,COND. CODE = 0    XP221410
001DE0  2336               2142            BES   S5A2              OPERATION TERMINATED, E BIT = 0  XP221420
                           2143  *                                                           XP221430
001DE2  24D1               2144  S5R1      LIS   R13,1             ERROR 0501 -  BAD PSW, REGISTERS*****  XP221440
001DE4  D2D0 335E          2145  S5R       STB   R13,ERRNO                                   XP221450
001DE8  4300 2C58          2146            B     ERRORB


                           2148  **  TTY IS IN READ MODE WITH BUSY STATUS , CCW OPERATION TO WRITE  XP221470
                           2149  **  TO THE TTY WILL BE ABORTED WITH STATUS ERROR. STATUS MASK=09  XP221480
                           2150  **      NO PRINTOUT SHOULD RESULT FROM THIS PART.              XP221490
                           2151  ************************************************************  XP221500
001DEC  2492               2152  S5A2      LIS   R9,2              SUBTEST SECTION TRACER    XP221510
001DEE  D320 3359          2153            LB    R2,INDEV                                    XP221520
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001DF2  DE20 335B      2154            OC    R2,INCMD          DEVICE IN READ MODE                    XP221530
001DF6  DB20 3370      2155            RD    R2,TEMP           PASLA DUMMY READ                       XP221540
001DFA  9D23           2156            SSR   R2,R3                                                    XP221550
001DFC  2281           2157            BFBS  8,1                                                      XP221560
001DFE  E680 1E12      2158            LA    R8,S5RTN2                                                XP221570
001E02  C800 0985      2159            LHI   R0,X'0985'        F=1,E=1,R/W=1                          XP221580
001E06  4000 2220      2160            STH   R0,CCW0           STATUS MASK = 09                       XP221590
001E0A  D320 3358      2161            LB    R2,OUTDEV                                                XP221600
001E0E  4300 1D36      2162            B     S5SINT                                                   XP221610
                       2163  *                                                                         XP221620
                       2164  *                                                                         XP221630
001E12  7320 335C      2165  S5RTN2    LHL   R2,PRILEV         PICK UP REG SET EXPECTED               XP221640
001E16  C5F2 2801      2166            CLHI  R15,X'2801'(R2)   NEW PSW CC = 0001                      XP221650
001E1A  2334           2167            BES   S5A3                                                     XP221660
001E1C  24D2           2168  S5R2      LIS   R13,2             ERROR 0502 - BAD STATUS NOT    *****   XP221670
001E1E  4300 1DE4      2169            B     S5R               .    SENT CORRECTLY                    XP221680


                       2171  **  TTY IS PUT IN THE WRITE MODE.  CCW IS SET UP FOR PRINTOUT OF         XP221700
                       2172  **  CHARS. 1234567890, CR, LF. F=1 (FAST MODE SELECTED), SO BUFFER 0     XP221710
                       2173  **  SHOULD BE SELECTED.  BUFFER 1 IS SET UP TO PRINT CHARS ZZZZZZZZZZ    XP221720
                       2174  **  THIS IS AN ERROR PRINTOUT. IF ANY TRANSLATION OCCURS, CHAR. 'T'S    XP221730
                       2175  **  WILL BE PRINTED. THIS TOO IS AN ERROR PRINTOUT.                      XP221740
                       2176  **  WHEN PRINTING IS DONE, EXIT SHOULD BE MADE TO S5RTN3.                XP221750
                       2177  **      PRINTS LINE 1 OF PRINTOUT                                        XP221760
                       2178  ************************************************************            XP221770
001E22  2493           2179  S5A3      LIS   R9,3              SUBTEST SECTION TRACER                 XP221780
001E24  D320 3358      2180            LB    R2,OUTDEV                                                XP221790
001E28  DE20 335A      2181            OC    R2,OUTCMD         DEVICE IN WRITE MODE                   XP221800
001E2C  9D23           2182            SSR   R2,R3                                                    XP221810
001E2E  2081           2183            BTBS  8,1                                                      XP221820
001E30  E680 1E62      2184            LA    R8,S5RTN3                                                XP221830
001E34  E6E0 2242      2185            LA    R14,BUF0END       BUFR0 END ADR. TO PRINT 1234567890     XP221840
001E38  50E0 2224      2186            ST    R14,CCW4                                                 XP221850
001E3C  C800 259D      2187            LHI   R0,X'259D'        STAT=25,E=1,F=1,B=1,R/W=1,C=1          XP221860
001E40  4000 2220      2188            STH   R0,CCW0                                                  XP221870
001E44  2400           2189            LIS   R0,0                                                     XP221880
001E46  4000 2228      2190            STH   R0,CCW8           CRC COUNT                              XP221890
001E4A  C810 0048      2191            LHI   R1,X'48'          TTY OC                                 XP221900
001E4E  4800 3356      2192            LH    R0,CRTFLG                                                XP221910
001E52  2333           2193            BZS   S5A3A                                                    XP221920
001E54  C810 006B      2194            LHI   R1,X'6B'          CRT OC                                 XP221930
001E58  9E21           2195  S5A3A     OCR   R2,R1             ENABLE WRITE SIDE INTERRUPTS           XP221940
001E5A  9D23           2196            SSR   R2,R3                                                    XP221950
001E5C  2081           2197            BTBS  8,1                                                      XP221960
001E5E  4300 1D36      2198            B     S5SINT            REG SET F, ENAB EXT INTPTS             XP221970
                       2199  *                                                                        XP221980
                       2200  *                                                                        XP221990
001E62  7320 335C      2201  S5RTN3    LHL   R2,PRILEV         PICK UP REG SET EXPECTED               XP222000
001E66  C5F2 2801      2202            CLHI  R15,X'2801'(R2)   ERROR IF L = 1, NEW PSW CC             XP222010
001E6A  4330 1EB0      2203            BE    S5R3                                                     XP222020
001E6E  C4A0 FFF0      2204            NHI   R10,X'FFF0'       CHECK OLD PSW STATUS                   XP222030
001E72  55A0 32E4      2205            CL    R10,S5PSW         OLD PSW STAT                           XP222040
001E76  4230 1EB0      2206            BNE   S5R3                                                     XP222050
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001E7A  C5B0 1D98          2207            CLHI  R11,S5WAIT        CHECK OLD PSW LOC                    XP222060
001E7E  2186               2208            BLS   S5R3A                                                  XP222070
001E80  C5B0 1DA3          2209            CLHI  R11,S5SINTZ                                            XP222080
001E84  2383               2210            BNLS  S5R3A                                                  XP222090
001E86  D4C0 3358          2211            CLB   R12,OUTDEV         CHECK INTERRUPTING DEVICE NO         XP222100
001E8A  4230 1EB0          2212  S5R3A     BNE   S5R3                                                   XP222110
001E8E  C3D0 0025          2213            THI   R13,X'25'                                              XP222120
001E92  4230 1EB0          2214            BNZ   S5R3                                                   XP222130
001E96  4800 2222          2215            LH    R0,CCW2            BUFFER 0 COUNT = 1 ?                 XP222140
001E9A  C500 0001          2216            CLHI  R0,1                                                   XP222150
001E9E  2139               2217            BNES  S5R3                                                   XP222160
001EA0  4800 2228          2218            LH    R0,CCW8            CRC COUNT                            XP222170
001EA4  2139               2219            BNZS  S5R9               BAD CRC COUNT                        XP222180
001EA6  4800 2220          2220            LH    R0,CCW0                                                XP222190
001EAA  C500 259D          2221            CLHI  R0,X'259D'                                             XP222200
001EAE  233A               2222            BES   S5A4                                                   XP222210
                           2223  *                                                                       XP222220
001EB0  24D3               2224  S5R3      LIS   R13,3              ERROR 0503 - BAD STATUS OR     *****  XP222230
001EB2  4300 1DE4          2225            B     S5R                .    REGISTER CONTENTS               XP222240
001EB6  24D9               2226  S5R9      LIS   R13,9              ERROR 0509 - BAD CRC CHECKWORD *****  XP222250
001EB8  4300 1DE4          2227            B     S5R                                                    XP222260
001EBC  24DA               2228  S5RA      LIS   R13,10             ERROR 050A - BAD LRC CHECKWORD *****  XP222270
001EBE  4300 1DE4          2229            B     S5R                                                    XP222280

                           2231  **  SET UP CCW TO PRINT LINES 2 AND 3 FROM BUFR 0 AND 1                  XP222300
                           2232  **  BUFR0 IS SET UP TO PRINT CHAR. 1234567890 CR , LF                    XP222310
                           2233  **  BUFR1 IS SET UP TO PRINT CHAR. ZZZZZZZZZZ . THIS IS AN ERROR         XP222320
                           2234  **  F BIT = 0 SO PRINT FROM BUFR0 FIRST AND EXIT TO S5RTN4               XP222330
                           2235  **  THE B BIT IN THE CCW WILL BE CHANGED TO 1                            XP222340
                           2236  **  PRINTS LINE 2 OF PRINTOUT.                                          XP222350
                           2237  ************************************************************           XP222360
001EC2  2494               2238  S5A4      LIS   R9,4                SUBTEST SECTION TRACER               XP222370
001EC4  D320 3358          2239            LB    R2,OUTDEV                                              XP222380
001EC8  9D23               2240            SSR   R2,R3               WAIT TILL PRINTING OF LAST CHAR.     XP222390
001ECA  2081               2241            BTBS  8,1                                                    XP222400
001ECC  F8C0 2584 FFF4     2242            LI    R12,Y'2584FFF4'     F=0,E=1,R/W=1,B=0,COUNT=-12          XP222410
001ED2  E6D0 2242          2243            LA    R13,BUF0END         BUF0 TO PRINT 1234567890 CR,LF       XP222420
001ED6  F8E0 0000 FFF4     2244            LI    R14,Y'FFF4'         BUFR1 BYTE COUNT                     XP222430
001EDC  E6F0 2250          2245            LA    R15,BUFZEND         BUFR1 TO PRINT Z ' S                 XP222440
001EE0  D0C0 2220          2246            STM   R12,CCW0                                                 XP222450
001EE4  E680 1F00          2247            LA    R8,S5RTN4                                              XP222460
001EE8  C810 0048          2248            LHI   R1,X'48'            TTY OC                               XP222470
001EEC  4800 3356          2249            LH    R0,CRTFLG                                              XP222480
001EF0  2333               2250            BZS   S5A4A                                                  XP222490
001EF2  C810 006B          2251            LHI   R1,X'6B'            CRT OC                               XP222500
001EF6  9E21               2252  S5A4A     OCR   R2,R1               ENABLE WRITE SIDE INTPTS             XP222510
001EF8  9D23               2253            SSR   R2,R3               WAIT FOR BUSY = 0                    XP222520
001EFA  2081               2254            BTBS  8,1                                                    XP222530
001EFC  4300 1D36          2255            B     S5SINT                                                 XP222540
                           2256  *                                                                       XP222550
001F00  241C               2257  S5RTN4    LIS   R1,12               SEE IF B BIT TOGGLED BY MICROCODE    XP222560
001F02  7410 2220          2258            TBT   R1,CCW0             CHECK B BIT IN THE CCW               XP222570
001F06  4330 1F2C          2259            BZ    S5R4                IF B=0,ERROR                         XP222580
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001F0A  C4D0 0025          2260          NHI   R13,X'25'                                          XP222590
001F0E  4230 1F2C          2261          BNZ   S5R4                                               XP222600
001F12  4800 2222          2262          LH    R0,CCW2                                            XP222610
001F16  C500 0001          2263          CLHI  R0,1                                               XP222620
001F1A  4230 1F2C          2264          BNE   S5R4                                               XP222630
001F1E  4800 2228          2265          LH    R0,CCW8          LRC COUNT                         XP222640
001F22  C500 00F9          2266          CLHI  R0,X'00F9'                                         XP222650
001F26  4230 1EBC          2267          BNE   S5RA             BAD LRC CHECK                     XP222660
001F2A  2304               2268          BS    S5A5                                               XP222670
001F2C  24D4               2269  S5R4    LIS   R13,4            ERROR 0504 - BUFFER BIT NOT  *****  XP222680
001F2E  4300 1DE4          2270          B     S5R              TOGGLED, OR BAD REGISTER CONTENTS  XP222690


                           2272  **  BUFR1 IS SELECTED, AND OUTPUT IS BEGUN.                       XP222710
                           2273  **  BUFR1 IS SET UP TO PRINT CHAR. ABCDEFGHIJ CR , LF             XP222720
                           2274  **  THIS PRINTS LINE 3 OF THE PRINTOUT                            XP222730
                           2275  * ************************************************************     XP222740
001F32  2495               2276  S5A5    LIS   R9,5             SUBTEST SECTION TRACER            XP222750
001F34  E680 1F68          2277          LA    R8,S5RTN5                                          XP222760
001F38  C8C0 258C          2278          LHI   R12,X'258C'      B=1 , F= 0                        XP222770
001F3C  40C0 2220          2279          STH   R12,CCW0                                           XP222780
001F40  E6F0 225E          2280          LA    R15,BUFAJEND     BUFR1 TO PRINT ABCDEFGHIJ CR,LF   XP222790
001F44  50F0 222C          2281          ST    R15,CCW12                                          XP222800
001F48  D320 3358          2282          LB    R2,OUTDEV                                          XP222810
001F4C  9D23               2283          SSR   R2,R3            WAIT FOR LAST CHAR.               XP222820
001F4E  2081               2284          BTBS  8,1                                                XP222830
001F50  C810 0048          2285          LHI   R1,X'48'         TTY OC                            XP222840
001F54  4800 3356          2286          LH    R0,CRTFLG                                          XP222850
001F58  2333               2287          BZS   S5A5A                                              XP222860
001F5A  C810 006B          2288          LHI   R1,X'6B'         CRT OC                            XP222870
001F5E  9E21               2289  S5A5A   OCR   R2,R1            ENABLE WRITE SIDE INTPTS          XP222880
001F60  9D23               2290          SSR   R2,R3                                              XP222890
001F62  2081               2291          BTBS  8,1                                                XP222900
001F64  4300 1D36          2292          B     S5SINT                                             XP222910
                           2293  *                                                                XP222920
                           2294  *                                                                XP222930
001F68  4800 222A          2295  S5RTN5  LH    R0,CCW10                                           XP222940
001F6C  C500 0001          2296          CLHI  R0,1                                               XP222950
001F70  2139               2297          BNES  S5R5                                               XP222960
001F72  C4D0 0025          2298          NHI   R13,X'25'                                          XP222970
001F76  2136               2299          BNZS  S5R5                                               XP222980
001F78  7320 335C          2300          LHL   R2,PRILEV        PICK UP REG SET EXPECTED          XP222990
001F7C  C5F2 2802          2301          CLHI  R15,X'2802'(R2)  NEW PSW STATUS                    XP223000
001F80  2334               2302          BES   S5A6                                               XP223010
                           2303  *                                                                XP223020
001F82  24D5               2304  S5R5    LIS   R13,5            ERROR 0505 - BAD STATUS, OR  *****  XP223030
001F84  4300 1DE4          2305          B     S5R              .    BAD BUF1 BYTE COUNT           XP223040


                           2307  **  NEXT PART CHECKS CHAR. TRANSLATION                            XP223060
                           2308  **  BUFR1 IS NOT TO BE USED AND SO IT IS SET UP TO PRINT CHAR. ZZZZZZ  XP223070
                           2309  **  IF THE SUBROUTINE IS ENTERED, ERROR 0507 WILL BE PRINTED.      XP223080
                           2310  **  ONE CHAR. (FROM 0 TO 255) IS PUT IN THE BUFFER ON EACH LOOP.   XP223090
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                                2311  **  THE CORRESPONDING ENTRY FOR THAT CHAR. IS SET UP SO THAT          XP223100
                                2312  **  EXIT IS MADE TO SPECIAL CHAR. HANDLER ROUTINE S5A6RTN, WHERE      XP223110
                                2313  **  THE UNTRANSLATED CHARACTER IN R3 OF SET 0 IS CHECKED.            XP223120
                                2314  **  IF THE CHAR. GETS TRANSLATED INSTEAD CHAR. T WILL PRINT          XP223130
                                2315  **  NO PRINTING ON TTY SHOULD RESULT IN THIS PART OF THE TEST        XP223140
                                2316  ************************************************************        XP223150
001F88  2496                    2317  S5A6    LIS   R9,6              SUBTEST SECTION TRACER             XP223160
001F8A  D320 3358               2318          LB    R2,OUTDEV                                            XP223170
001F8E  DE20 335A               2319          OC    R2,OUTCMD                                            XP223180
001F92  9D23                    2320          SSR   R2,R3                                                XP223190
001F94  2081                    2321          BTBS  8,1                                                  XP223200
001F96  E640 0FE9               2322          LA    R4,S5RTN6/2       CHAR HANDLER SUBROUTINE POINTER    XP223210
001F9A  2410                    2323          LIS   R1,0              (R1) = UNTRANSLATED CHAR 0 TO 255  XP223220
001F9C  C860 8054               2324          LHI   R6,X'8054'        TRANSLATED CHAR.  T                XP223230
                                2325  *                                                                    XP223240
001FA0  F8C0 2586 FFFF          2326          LI    R12,Y'2586FFFF'   F=0,E=1,R/W=1,B=0,T=1,COUNT=-1      XP223250
001FA6  E6D0 3271               2327          LA    R13,BUFR3+1                                          XP223260
001FAA  F8E0 0000 FFF5          2328          LI    R14,Y'0000FFF5'                                      XP223270
001FB0  E6F0 2250               2329          LA    R15,BUFZEND                                          XP223280
001FB4  D0C0 2220               2330          STM   R12,CCW0                                             XP223290
001FB8  E680 2002               2331          LA    R8,S5R7           R8=SUBROUTINE ADR. FOR ERROR  7    XP223300
001FBC  0851                    2332  S5A6B   LR    R5,R1             R5 = CHAR. OUTPUT                  XP223310
001FBE  1151                    2333          SLLS  R5,1                                                 XP223320
001FC0  4045 348C               2334          STH   R4,TRTABL(R5)     TRANSLATION SUBR. ADDRESS          XP223330
001FC4  D210 3270               2335          STB   R1,BUFR3          SAVE                               XP223340
001FC8  2501                    2336          LCS   R0,1                                                 XP223350
001FCA  4000 2222               2337          STH   R0,CCW2           BUFR0 BYTE COUNT = -1 ( 2 BYTES)   XP223360
001FCE  4300 1D36               2338          B     S5SINT            *                                  XP223370
                                2339  *                                                                    XP223380
                                2340  *       SHOULD ALWAYS COME HERE FROM SINT (NEVER S5SBRTN).          XP223390
001FD2  9566                    2341  S5RTN6  EPSR  R6,R6             R6 OF SET0 = NEW PSW               XP223400
001FD4  D000 338C               2342          STM   R0,REG0           STORE REG.SET 0                    XP223410
001FD8  D100 3228               2343          LM    R0,BUFR0          RESET REG.SET 0 FOR NEXT TIME      XP223420
001FDC  C870 00F0               2344          LHI   R7,X'F0'                                             XP223430
001FE0  9567                    2345          EPSR  R6,R7                                                XP223440
001FE2  D1A0 338C               2346          LM    R10,REG0          R10 OF SET F = R0 OF SET 0, ETC    XP223450
001FE6  4870 2228               2347          LH    R7,CCW8                                              XP223460
001FEA  4230 1FFC               2348          BNZ   S5R6              NO CHECK COMP TO BE DONE W/TRANS.  XP223470
001FEE  D310 3270               2349          LB    R1,BUFR3                                             XP223480
001FF2  051D                    2350          CLR   R1,R13            UNTRANSLATED CHAR. WAS IN          XP223490
001FF4  2134                    2351          BNES  S5R6              REG 3 OF SET 0                     XP223500
001FF6  C5E0 2220               2352          CLHI  R14,CCW0          ADDR OF CCW IN R4 OF SET 0         XP223510
001FFA  2337                    2353          BES   S5RTN6B                                              XP223520
                                2354  *                                                                    XP223530
001FFC  24D6                    2355  S5R6    LIS   R13,6             ERROR 0506 - BAD TRANSLATION OR*****  XP223540
001FFE  4300 1DE4               2356          B     S5R               .   BUF0 BYTE COUNT                 XP223550
002002  24D7                    2357  S5R7    LIS   R13,7             ERROR 0507 - SUBROUTINE ENTERED  ***  XP223560
002004  4300 1DE4               2358          B     S5R               .    WHEN NOT EXPECTED             XP223570
                                2359  *                                                                    XP223580
002008  4065 348C               2360  S5RTN6B STH   R6,TRTABL(R5)     (R5), SET F = 8054, FOR CHAR T     XP223590
00200C  2611                    2361          AIS   R1,1                                                 XP223600
00200E  C510 0100               2362          CLHI  R1,256                                               XP223610
002012  4230 1FBC               2363          BNE   S5A6B                                                XP223620
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                                2365  **  THIS PART OF THE TEST TRANSLATES TEN CHAR. TO PRINT ON TTY                XP223640
                                2366  **  THE UNTRANSLATED CHAR. ARE  16,255,4,0,1,64,8,128,32,2,50,200,100        XP223650
                                2367  **  THE TRANSLATED CHAR. ARE 1,2,3,4,5,6,7,8,9,  CR,LF                      XP223660
                                2368  **  THIS SHOULD RESULT IN PRINTING LINE 4 OF THE PRINTOUT                    XP223670
                                2369  **  AN INCORRECT TRANSLATION MAY RESULT IN PRINTING OF ANY CHARACTER         XP223680
                                2370  ************************************************************              XP223690
002016  2498                  2371  S5A8      LIS   R9,8                SUBTEST SECTION TRACER                    XP223700
002018  E680 1038             2372            LA    R8,S5RTN8/2                                                 XP223710
00201C  4080 3554             2373            STH   R8,TRTABL+200                                               XP223720
002020  1181                  2374            SLLS  R8,1                SUBROUTINE RETURN                         XP223730
002022  E640 226E             2375            LA    R4,S5A8CH                                                   XP223740
002026  4814 0000             2376  S5A8D     LH    R1,0(R4)            R1 = UNTRANSLATED CHAR.                   XP223750
00202A  1111                  2377            SLLS  R1,1                                                        XP223760
00202C  4804 0002             2378            LH    R0,2(R4)            R0 = TRANSLATED CHAR.                     XP223770
002030  4001 348C             2379            STH   R0,TRTABL(R1)                                               XP223780
002034  2644                  2380            AIS   R4,4                                                        XP223790
002036  C540 229E             2381            CLHI  R4,S5A8CHZ                                                  XP223800
00203A  203A                  2382            BNES  S5A8D                                                       XP223810
                              2383  **  TRTABLE IS SET UP TO TRANSLATE AND PRINT 10 CHAR. 1234567890             XP223820
00203C  F8C0 259E FFF4        2384            LI    R12,Y'259EFFF4'     F=0,E=1,R/W=1,B=1,T=1,COUNT=-12           XP223830
002042  E6E0 2250             2385            LA    R13,BUFZEND         BUF0 TO PRINT Z'S                         XP223840
002046  F8E0 0000 FFF4        2386            LI    R14,Y'FFF4'         BUF1 TO PRINT TRANSLATED DATA             XP223850
00204C  E6F0 226C             2387            LA    R15,S5A6BFND-2                                              XP223860
002050  D0C0 2220             2388            STM   R12,CCW0                                                    XP223870
002054  D320 3358             2389            LB    R2,OUTDEV                                                   XP223880
002058  C810 0048             2390            LHI   R1,X'48'            TTY OC                                    XP223890
00205C  4800 3356             2391            LH    R0,CRTFLG                                                   XP223900
002060  2333                  2392            BZS   S5A8D1                                                      XP223910
002062  C810 006B             2393            LHI   R1,X'6B'                                                    XP223920
002066  9E21                  2394  S5A8D1    OCR   R2,R1               ENABLE WRITE SIDE INTERRUPTS              XP223930
002068  9D23                  2395            SSR   R2,R3               WAIT FOR BUSY = 0                         XP223940
00206A  2081                  2396            BTBS  8,1                                                         XP223950
00206C  4300 1D36             2397            B     S5SINT                                                      XP223960
                              2398  *                                                                           XP223970
002070  D000 338C             2399  S5RTN8    STM   R0,REG0             STORE REG. SET 0                          XP223980
002074  C870 00F0             2400            LHI   R7,X'F0'            SEL REG SET F                             XP223990
002078  9507                  2401            EPSR  R0,R7                                                       XP224000
00207A  4800 2228             2402            LH    R0,CCW8             CHECK WORD                                XP224010
00207E  C500 A467             2403            CLHI  R0,X'A467'                                                  XP224020
002082  4230 1EB6             2404            BNE   S5R9                BAD CRC CHECKWORD                         XP224030
002086  D1A0 338C             2405            LM    R10,REG0            CHECK REG. 3 OF SET 0 FOR                 XP224040
00208A  C5D0 0064             2406            CLHI  R13,100             UNTRANSLATED CHARACTER 100                XP224050
00208E  2334                  2407            BES   S5A9                                                        XP224060
                              2408  *                                                                           XP224070
002090  24D8                  2409  S5R8      LIS   R13,8               ERROR 0508 - BAD TRANSLATION    *****     XP224080
002092  4300 1DE4             2410            B     S5R                                                         XP224090


                              2412  **  CCW IS SET UP TO READ 10 KEYS FROM THE TTY INTO BUFR3                     XP224110
                              2413  **  PRINTS LINES 5, 6 OF PRINTOUT                                           XP224120
                              2414  **  READS LINE 7 FROM KEYBOARD, PRINTS LINE 8.                              XP224130
                              2415  ************************************************************              XP224140
                              2416  **  PRINT CHAR.  DEPRESS KEYS  1-9,0  ETC.                                  XP224150
002096  2499                  2417  S5A9      LIS   R9,9                SUBTEST SECTION TRACER                    XP224160
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002098 41E0 2A50          2418          BAL   R14,PRMSG4          PRINT LINES 5 AND 6 ON TTY                    XP224170
00209C F8C0 2581 FFF6     2419          LI    R12,Y'2581FFF6'     F=1,E=1,R/W=0,B=0,T=0,COUNT=-10 (11)           XP224180
0020A2 E6D0 3279          2420          LA    R13,BUFR3+9         BUFR3 TO READ 10 KEYS                         XP224190
0020A6 C8E0 FFF6          2421          LHI   R14,Y'FFF6'                                                       XP224200
0020AA E6F0 3288          2422          LA    R15,BUFR3+24                                                      XP224210
0020AE D0C0 2220          2423          STM   R12,CCW0                                                          XP224220
0020B2 D130 3228          2424          LM    R3,BUFR0            ZERO OUT BUFR3                                XP224230
0020B6 D030 3270          2425          STM   R3,BUFR3                                                          XP224240
                          2426  *                                                                               XP224250
0020BA E680 20DE          2427          LA    R8,S5RTN9                                                         XP224260
0020BE D320 3359          2428  S5A9B   LB    R2,INDEV                                                          XP224270
0020C2 C810 0044          2429          LHI   R1,X'44'            TTY OC                                        XP224280
0020C6 48C0 3356          2430          LH    R0,CRTFLG                                                         XP224290
0020CA 2333               2431          BZS   S5A9C                                                           XP224300
0020CC C810 0079          2432          LHI   R1,X'79'            CRT OC                                        XP224310
0020D0 9E21               2433  S5A9C   OCR   R2,R1               ENABLE READ SIDE INTERRUPTS                   XP224320
0020D2 DB20 3370          2434          RD    R2,TEMP             PASLA DUMMY READ                              XP224330
0020D6 9D23               2435          SSR   R2,R3               WAIT TILL BUSY = 1                            XP224340
0020D8 2281               2436          BFBS  8,1                                                             XP224350
0020DA 4300 1D36          2437          B     S5SINT              ENABLE INTPTS                                 XP224360
                          2438  * READ CHARACTERS 1234567890 (LINE 7).                                          XP224370
                          2439  *                                                                               XP224380
                          2440  *                                                                               XP224390
     0000 20DE            2441  S5RTN9  EQU   *                                                               XP224400
0020DE 4800 2228          2442          LH    R0,CCW8             CHECK WORD                                    XP224410
0020E2 C500 FFFF          2443          CLHI  R0,-1                                                           XP224420
0020E6 4230 1EBC          2444          BNE   S5RA                BAD LRC COUNT                                 XP224430
0020EA 41E0 2A5A          2445          BAL   R14,CRLF            CR , LF TO TTY                                XP224440
0020EE E6C0 3270          2446          LA    R12,BUFR3                                                         XP224450
0020F2 E6D0 3279          2447          LA    R13,BUFR3+9                                                       XP224460
0020F6 41E0 2A6C          2448          BAL   R14,WBMSG           PRINT THE KEYS READ IN BUFR3                  XP224470
0020FA 41E0 2A5A          2449          BAL   R14,CRLF            THIS SHOULD PRINT LINE 8 ON TTY               XP224480


                          2451  **  SET UP CCW TO READ KEYS 1234567890 FROM KEYBOARD TO BUFR3 WITH              XP224500
                          2452  **  TRANSLATION. PRINT TRANSLATED CHARACTERS ABCDEFGHIJ.                         XP224510
                          2453  **  PRINTS LINES 9, 10                                                          XP224520
                          2454  **  READS LINE 11                                                               XP224530
                          2455  **  PRINTS LINE 12 OF PRINTOUT.                                                 XP224540
                          2456  ************************************************************                  XP224550
0020FE D100 3228          2457  S5A10   LM    R0,BUFR0                                                        XP224560
002102 D000 3270          2458          STM   R0,BUFR3            CLEAR BUFR3                                   XP224570
002106 249A               2459          LIS   R9,10               SUBTEST SECTION TRACER                        XP224580
002108 E680 21BE          2460          LA    R8,S5RTN10                                                      XP224590
00210C F8C0 259A FFF7     2461          LI    R12,Y'259AFFF7'     E=1,F=0,R/W=0,B=1,T=1,COUNT=10,C=1           XP224600
002112 E6D0 3288          2462          LA    R13,BUFR3+24        DESTINATION IF BUF0 SELECTED                  XP224610
002116 F8F0 0000 FFF7     2463          LI    R14,Y'FFF7'                                                     XP224620
00211C E6F0 3279          2464          LA    R15,BUFR3+9                                                     XP224630
002120 D0C0 2220          2465          STM   R12,CCW0                                                        XP224640
                          2466  **  PRINT CHARACTERS DEPRESS KEYS 1-9 ETC.                                     XP224650
002124 41E0 2A50          2467          BAL   R14,PRMSG4          PRINT LINES 9 AND 10 ON TTY                   XP224660
                          2468  **  SET UP TRTABL TO TRANSLATE 1-9,0 INTO CHAR. A-J                            XP224670
002128 C840 8041          2469          LHI   R4,Y'8041'          TRANSLATION CHAR 'A'                          XP224680
00212C 4040 35EE          2470          STH   R4,TRTABL+X'162'    *       A         1 (81)                      XP224690
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002130  4040 34EE          2471            STH   R4,TRTABL+X'62'                                  XP224700
002134  2641               2472            AIS   R4,1                    8042                      XP224710
002136  4040 35F0          2473            STH   R4,TRTABL+X'164'       *      B          2 (B2)   XP224720
00213A  4040 34F0          2474            STH   R4,TRTABL+X'64'                                   XP224730
00213E  2641               2475            AIS   R4,1                    8043                      XP224740
002140  4040 34F2          2476            STH   R4,TRTABL+X'66'        *      C          3 (33)   XP224750
002144  2641               2477            AIS   R4,1                    8044                      XP224760
002146  4040 35F4          2478            STH   R4,TRTABL+X'168'       *      D          4 (34)   XP224770
00214A  4040 34F4          2479            STH   R4,TRTABL+X'68'                                   XP224780
00214E  2641               2480            AIS   R4,1                    8045                      XP224790
002150  4040 34F6          2481            STH   R4,TRTABL+X'6A'        *      E          5 (35)   XP224800
002154  2641               2482            AIS   R4,1                    8046                      XP224810
002156  4040 34F8          2483            STH   R4,TRTABL+X'6C'        *      F          6 (36)   XP224820
00215A  2641               2484            AIS   R4,1                    8047                      XP224830
00215C  4040 35FA          2485            STH   R4,TRTABL+X'16E'       *      G          7 (37)   XP224840
002160  4040 34FA          2486            STH   R4,TRTABL+X'6E'                                   XP224850
002164  2641               2487            AIS   R4,1                    8048                      XP224860
002166  4040 35FC          2488            STH   R4,TRTABL+X'170'       *      H          8 (38)   XP224870
00216A  4040 34FC          2489            STH   R4,TRTABL+X'70'                                   XP224880
00216E  E650 10C0          2490            LA    R5,S5RNA/2             SPECIAL CHAR SUBROUTINE   XP224890
002172  4050 34FE          2491            STH   R5,TRTABL+X'72'        *      I          9 (39)   XP224900
002176  2642               2492            AIS   R4,2                    804A                      XP224910
002178  4040 34EC          2493            STH   R4,TRTABL+X'60'        CHAR. J FOR NUM.0 (30)    XP224920
00217C  4300 20BE          2494            B     S5A9B                                             XP224930
                           2495  *                                                                  XP224940
                           2496  *                                                                  XP224950
002180  9566               2497  S5RNA     EPSR  R6,R6                  HERE WHEN CHAR '9' READ   XP224960
002182  7320 335C          2498            LHL   R2,PRILEV              EXPECTED REG SET          XP224970
002186  C562 2800          2499            CLHI  R6,X'2800'(R2)                                    XP224980
00218A  4230 1EB0          2500            BNE   S5R3                   BAD STATUS ON SUBR. ENTRY XP224990
00218E  C530 0039          2501            CLHI  R3,C'9'                UNTRANSLATED CHAR.        XP225000
002192  4230 2090          2502            BNE   S5R8                   TRANS. ROUTINE ERROR      XP225010
002196  2441               2503            LIS   R4,1                                              XP225020
002198  6140 222A          2504            AHM   R4,CCW10               INCREMENT BUF1 BYTE COUNT XP225030
00219C  4230 2090          2505            BNZ   S5R8                   IS BUF1 BYTE COUNT = ZERO ? XP225040
0021A0  4300 21B4          2506            B     S5RNAX                 SEE NOTE BELOW            XP225050
                           2507  * NOTE-   FOR MODEL 7/32 WITH R03 MICROCODE AND ABOVE, THE PRECEDING XP225060
                           2508  *         BRANCH SHOULD BE NOPPED, FOR MORE THOROUGH TESTING.      XP225070
                           2509            LH    R4,CCW8                                           XP225080
0021A4  4840 2228          2510            CLHI  R4,X'2A75'             UNMODIFIED CHECK CHAR     XP225090
0021A8  C540 2A75          2511            BNE   S5R9                   BAD CRC CHECKWORD         XP225100
0021AC  4230 1EB6          2512            CRC16 R3,CCW8                                           XP225110
0021B0  5F30 2228          2513  S5RNAX    AHI   R3,X'10'               TRANSLATE TO CHAR 'I'     XP225120
0021B4  CA30 0010          2514            STB   R3,BUFR3+8                                        XP225130
0021B8  D230 3278          2515            LPSWR R0                     RETURN TO S5WAIT LOOP     XP225140
0021BC  1800               2516  *                                                                 XP225150
                           2517  S5RTN10   EQU   *                                                 XP225160
0021BE  0000 21BE          2518            BAL   R14,CRLF                                          XP225170
0021C2  41E0 2A5A          2519            LA    R12,BUFR3              PRINT THE TRANSLATED      XP225180
0021C6  E6C0 3270          2520            LA    R13,BUFR3+9            CHARACTERS A THRU J ( LINE 12 ) XP225190
0021CA  E6D0 3279          2521            BAL   R14,WBMSG                                         XP225200
0021CE  41E0 2A6C          2522            BAL   R14,CRLF                                          XP225210
0021D2  41E0 2A5A          2523  *                                                                 XP225220
0021D6  4800 2228          2524            LH    R0,CCW8                                           XP225230
0021DA  C500 0BB5          2525            CLHI  R0,X'0BB5'                                        XP225240
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0021DA  4200 0000          2526          NOP                        S5R9 BAD CRC COUNT                XP225250
                           2527  * NOTE - THIS NOP MAY BE CHANGED TO 'BNE' ON MODEL 7/32 WITH R03       XP225260
                           2528  *        MICROCODE AND ABOVE, IF BRANCH REFERRED TO IN PRECEDING        XP225270
                           2529  *        NOTE IS REMOVED.                                              XP225280
                           2530  *                                                                      XP225290
0021DE  4300 2CEE          2531  S5END    B     SEQUENCE                                                XP225300
                           2532  *                                                                      XP225310


                           2534  ************************************************************          XP225330
                           2535  **  WHENEVER THE CCW OPERATION IS TERMINATED IT EXITS TO S5SBRTN       XP225340
                           2536  **  NEW PSW IS CAPTURED IN REG 5 OF SET 0 . REG SET 0 IS STORED        XP225350
0021E2  9555               2537  S5SBRTN  EPSR  R5,R5              CATCH NEW PSW IN R5 OF SET0        XP225360
0021E4  D000 338C          2538           STM   R0,REG0            SAVE REG.SET 0                     XP225370
0021E8  D320 3358          2539           LB    R2,OUTDEV                                             XP225380
0021EC  DE20 335A          2540           OC    R2,OUTCMD                                             XP225390
0021F0  9D23               2541           SSR   R2,R3                                                 XP225400
0021F2  2081               2542           BTBS  8,1               WAIT FOR BUSY TO DROP              XP225410
0021F4  D100 3228          2543           LM    R0,BUFR0          RESET REG. SET 0 FOR NEXT TIME     XP225420
0021F8  C870 00F0          2544           LHI   R7,X'F0'          DISABLE INTERRUPTS,                XP225430
0021FC  9567               2545           EPSR  R6,R7             SELECT REG SET F                   XP225440
0021FE  D1A0 338C          2546           LM    R10,REG0                                              XP225450
                           2547  *                                                                     XP225460
002202  D370 3354          2548           LB    R7,CPUNO                                              XP225470
002206  C570 0038          2549           CLHI  R7,C'8'           MODEL 8/32 ?                       XP225480
00220A  0238               2550           BNER  R8                                                    XP225490
00220C  7350 33A2          2551           LHL   R5,REG5+2                                             XP225500
002210  C450 00F0          2552           NHI   R5,X'F0'          EXTRACT CURRENT REG SET NUMBER     XP225510
002214  4550 335C          2553           CLH   R5,PRILEV                                             XP225520
002218  0338               2554           BER   R8                RETURN TO S5RTN1,S5RTN2 ETC.       XP225530
00221A  24DB               2555  S5R11    LIS   R13,11            ERROR 050B - SINT GIVES WRONG *****XP225540
00221C  4300 1DE4          2556           B     S5R               REGISTER SET (MODEL 8/32 ONLY)     XP225550


                           2558  **  CHANNEL COMMAND WORD USED IN SUBTEST 5                           XP225570
                           2559  *  ************************************************************     XP225580
002220                     2560           ALIGN 4                                                     XP225590
002220  0000               2561  CCW0     DC    X'0'              CHANNEL COMMND.WORD                XP225600
002222  0000               2562  CCW2     DC    X'0'              BUFFER 0 BYTE COUNT                XP225610
002224  0000 0000          2563  CCW4     DC    0                 BUFFER 0 END ADDRESS               XP225620
002228  0000               2564  CCW8     DC    X'0'              CHECK WORD                         XP225630
00222A  0000               2565  CCW10    DC    X'0'              BUFFER 1 BYTE COUNT                XP225640
00222C  0000 0000          2566  CCW12    DC    0                 BUFFER 1 END ADDRESS               XP225650
002230  0000 348C          2567  CCW16    DC    A(TRTABL)         TRANSLATION TABLE ADDRESS          XP225660
002234  21E2               2568  CCW20    DC    Z(S5SBRTN)        SUBROUTINE ADDRESS                 XP225670
                           2569  *  ************************************************************     XP225680
                           2570  *                                                                   XP225690
                           2571  **  DATA BUFFER TO PRINT CHAR. 1234567890 CR, LF                    XP225700
002236  3132 3334 3536 3738 2572           DC    C'1234567890'                                       XP225710
00223E  3930
002240  0D0A               2573           DC    X'D0A'                                              XP225720
002242  FF                 2574           DB    -1                NULL CHAR FOR CRT                 XP225730
        0000 2242          2575  BUFOEND  EQU   *-1                                                  XP225740
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                                2576  *                                                                  XP225750
                                2577  **  DATA BUFFER TO PRINT CHAR.  ZZZZZZZZZZ                        XP225760
002244  5A5A 5A5A 5A5A 5A5A     2578        DC    C'ZZZZZZZZZZ'                                        XP225770
00224C  5A5A
00224E  0D0A                    2579        DC    X'D0A'                                               XP225780
002250  FF                      2580        DB    -1                    NULL CHAR FOR CRT              XP225790
        0000 2250               2581  BUFZEND EQU   *-1                                                  XP225800
002252  4142 4344 4546 4748     2582        DC    C'ABCDEFGHIJ'                                        XP225810
00225A  494A
00225C  0D0A                    2583        DC    X'D0A'                                               XP225820
00225E  FF                      2584        DB    -1                    NULL CHAR FOR CRT              XP225830
        0000 225E               2585  BUFAJEND EQU  *-1                                                  XP225840
                                2586  **  DATA BUFFER TO SEND THE UNTRANSLATED CHAR.                     XP225850
                                2587  **  16,255,4,0,1,64,8,128,32,2,50,200,100,4                        XP225860
002260  10FF                    2588        DC    X'10FF'               16,255                         XP225870
002262  0400                    2589        DC    X'0400'               4,0                            XP225880
002264  0140                    2590        DC    X'0140'               1,64                           XP225890
002266  0880                    2591        DC    X'0880'               8,128                          XP225900
002268  2002                    2592        DC    X'2002'               32,2                           XP225910
00226A  32C8                    2593        DC    X'32C8'               50,200                         XP225920
00226C  6404                    2594        DC    X'6404'               100,4                          XP225930
        0000 226E               2595  S5A6BFND EQU  *                                                  XP225940
                                2596  *                                                                XP225950
                                2597  *                                                                XP225960
        0000 226E               2598  S5A8CH  EQU   *                                                  XP225970
00226E  0010                    2599        DC    X'10'                 16                             XP225980
002270  8031                    2600        DC    X'8031'                                              XP225990
002272  00FF                    2601        DC    X'FF'                 255                            XP226000
002274  8032                    2602        DC    X'8032'                                              XP226010
002276  0004                    2603        DC    X'4'                  4                              XP226020
002278  8033                    2604        DC    X'8033'                                              XP226030
00227A  0000                    2605        DC    X'0'                  0                              XP226040
00227C  8034                    2606        DC    X'8034'                                              XP226050
00227E  0001                    2607        DC    X'1'                  1                              XP226060
002280  8035                    2608        DC    X'8035'                                              XP226070
002282  0040                    2609        DC    X'40'                 64                             XP226080
002284  8036                    2610        DC    X'8036'                                              XP226090
002286  0008                    2611        DC    X'8'                  8                              XP226100
002288  8037                    2612        DC    X'8037'                                              XP226110
00228A  0080                    2613        DC    X'80'                 128                            XP226120
00228C  8038                    2614        DC    X'8038'                                              XP226130
00228E  0020                    2615        DC    X'20'                 32                             XP226140
002290  8039                    2616        DC    X'8039'                                              XP226150
002292  0002                    2617        DC    X'2'                  2                              XP226160
002294  8030                    2618        DC    X'8030'                                              XP226170
002296  0032                    2619        DC    X'32'                 50                             XP226180
002298  800D                    2620        DC    X'800D'               CR                             XP226190
00229A  00C8                    2621        DC    X'C8'                 200                            XP226200
00229C  800A                    2622        DC    X'800A'               LF                             XP226210
        0000 229E               2623  S5A8CHZ EQU   *                                                  XP226220

                                2625  *                                                                XP226240
                                2626  *                                                                XP226250
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                        2627  *                                                                    XP226260
      0000 229E         2628  SUBT6    EQU   *                  TEST FOR EXTENDED DISPLAY        XP226270
                        2629  *                                                                    XP226280
                        2630  * SHIS SUBTEST IS DESIGNED TO CHECK THE M71-102 CONSOLE PANEL.      XP226290
                        2631  * SWITCHES AND INDICATORS.  A SINGLE CHARACTER (A THROUGH F)        XP226300
                        2632  * IS PRINTED, AND THE PROGRAM LOOPS ON A SMALL ROUTINE UNTIL        XP226310
                        2633  * THE 'BRK' KEY ON THE CONSOLE IS DEPRESSED.                        XP226320
                        2634  * WHEN THE BREAK KEY IS RELEASED, THE PROGRAM TRANSFERS TO THE       XP226330
                        2635  * NEXT ROUTINE AND LOOPS.  WHEN THE BREAK KEY IS DEPRESSED          XP226340
                        2636  * FOLLOWING THE PRINTING OF THE CHARACTER F, THE TEST IS TERMINATED. XP226350
                        2637  ****************************************************************     XP226360
                        2638  **  SUBTEST 6 IS DESIGNED TO TEST THE CONSOLE PANEL INDICATORS       XP226370
00229E  D300 3355       2639          LB    R0,CPUNO+1                                           XP226380
0022A2  C500 0044       2640          CLHI  R0,C'D'            NO-DISPLAY MACHINE ?              XP226390
0022A6  4330 0C2C       2641          BE    BADKEY                                               XP226400
      0000 3270         2642  DISBUF   EQU   BUFR3                                               XP226410
0022AA  C800 0041       2643          LHI   R0,C'A'            PRINT CHARACTER A                 XP226420
0022AE  41E0 2A9E       2644          BAL   R14,WRITE1                                           XP226430
                        2645  *                              OUTPUT TO DISPLAY CONSOLE STATUS     XP226440
0022B2  2411            2646  S61      LIS   R1,1                R1 = 1 = CONSOLE ADR            XP226450
0022B4  C880 0040       2647          LHI   R8,X'40'                                             XP226460
0022B8  9E18            2648          OCR   R1,R8              INCREMENTAL MODE                  XP226470
0022BA  2400            2649          LIS   R0,0                                                 XP226480
0022BC  9D14            2650          SSR   R1,R4              (R4) = CONSOLE STATUS             XP226490
0022BE  9444            2651          EXBR  R4,R4                                                XP226500
0022C0  9814            2652          WHR   R1,R4              WRITE STATUS BYTE                 XP226510
0022C2  9810            2653          WHR   R1,R0              WRITE ZEROS TO DISPLAY            XP226520
0022C4  9810            2654          WHR   R1,R0                                                XP226530
0022C6  E690 22D2       2655          LA    R9,S62             NEXT SEGMENT                      XP226540
0022CA  41E0 2444       2656          BAL   R15,SDELAY                                           XP226550
0022CE  4300 22B2       2657          B     S61                NO BRK SEEN                       XP226560
                        2658  **  OUTPUT TO DISPLAY ALTERNATING ZEROS AND ONES                     XP226570
0022D2  C800 0042       2659  S62      LHI   R0,C'B'            PRINT CHARACTER B                 XP226580
0022D6  41E0 2A9E       2660          BAL   R14,WRITE1                                           XP226590
0022DA  C880 0040       2661          LHI   R8,X'40'           INCREMENTAL MODE                  XP226600
0022DE  0700            2662  S62A     XR    R0,R0              CLEAR R0                          XP226610
0022E0  9E18            2663  S62B     OCR   R1,R8                                                XP226620
0022E2  9A10            2664          WDR   R1,R0              OUTPUT TO DISPLAY 1               XP226630
0022E4  9A10            2665          WDR   R1,R0              OUTPUT TO DISPLAY 2               XP226640
0022E6  9A10            2666          WDR   R1,R0              OUTPUT TO DISPLAY 3               XP226650
0022E8  9A10            2667          WDR   R1,R0              OUTPUT TO DISPLAY 4               XP226660
0022EA  9A10            2668          WDR   R1,R0              OUTPUT TO DISPLAY 5               XP226670
0022EC  E690 22FE       2669          LA    R9,S63             NEXT TEST                         XP226680
0022F0  41E0 2436       2670          BAL   R14,DELAY                                            XP226690
0022F4  C900 FFFF       2671  S62E     CHI   R0,X'FFFF'                                           XP226700
0022F8  223D            2672          BES   S62A                                                 XP226710
0022FA  2501            2673          LCS   R0,1               R0 = FFFFFFFF                     XP226720
0022FC  220E            2674          BS    S62B                                                 XP226730
                        2675  *                              OUTPUT COUNTER TO DISPLAY            XP226740
                        2676  *                                  TEST CONSOLE SHIFT REGISTERS     XP226750
0022FE  C800 0043       2677  S63      LHI   R0,C'C'            PRINT CHARACTER C                 XP226760
002302  41E0 2A9E       2678          BAL   R14,WRITE1                                           XP226770
002306  E640 4000 3270  2679          LA    R4,DISBUF          LOAD R4 & R5 WITH DISPLAY BUFFER  XP226780
00230C  E650 4000 3274  2680          LA    R5,DISBUF+4        WITH LOWER AND UPER LIMITS        XP226790
002312  C800 1032       2681          LHI   R0,X'1032'         LOAD DATA INTO DISPLAY BUFFER     XP226800
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                                                                                  XP226810
002316  4000 4000 3270         STH   R0,DISBUF                                    XP226820
00231C  C800 5476              LHI   R0,X'5476'                                   XP226830
002320  4000 4000 3272         STH   R0,DISBUF+2                                  XP226840
002326  C800 9800              LHI   R0,X'9800'                                   XP226850
00232A  4000 4000 3274         STH   R0,DISBUF+4                                  XP226860
002330  9E18             S63A  OCR   R1,R8         OUTPUT CMD TO RESET DISPLAY    XP226870
002332  DA14 0000              WD    R1,0(R4)      OUTPUT DISPLAY 1               XP226880
002336  DA14 0001              WD    R1,1(R4)      OUTPUT DISPLAY 2               XP226890
00233A  DA14 0002              WD    R1,2(R4)      OUTPUT DISPLAY 3               XP226900
00233E  DA14 0003              WD    R1,3(R4)      OUTPUT DISPLAY 4               XP226910
002342  DA14 0004              WD    R1,4(R4)      OUTPUT DISPLAY 5               XP226920
002346  E690 237C              LA    R9,S64        NEXT TEST                      XP226930
00234A  41E0 2436              BAL   R14,DELAY     WAIT FOR DELAY TIME OUT        XP226940
00234E  E660 4000 3270   S63D  LA    R6,DISBUF     R6 = ADDRESS OF DISPLAY BUFFER XP226950
002354  D376 0000        S63E  LB    R7,0(R6)      GET BYTE FROM BUFFER           XP226960
002358  2671                   AIS   R7,1          ADD 1 TO RIGHT HEX DIGIT       XP226970
00235A  C470 000F              NHI   R7,X'000F'    R7 = STRIPPED RIGHT HEX DIGIT  XP226980
00235E  D396 0000              LB    R9,0(R6)      AGAIN GET BYTE FROM BUFF       XP226990
002362  CA90 0010              AHI   R9,X'0010'    ADD 1 TO LEFT HEX DIGIT        XP227000
002366  C490 00F0              NHI   R9,X'00F0'    R9 = STRIPPED LEFT HEX DIGIT   XP227010
00236A  0679                   OR    R7,R9         COMBINE RIGHT & LEFT HEX DIGITS XP227020
00236C  D276 0000              STB   R7,0(R6)      STORE UPDATED HEX DIGITS       XP227030
002370  2661                   AIS   R6,1          INDEX BUFFER TO NEXT BYTE      XP227040
002372  0556                   CLR   R5,R6         CHECK FOR BUFFER END           XP227050
002374  4380 2354              BNL   S63E          NO                             XP227060
002378  4300 2330              B     S63A          YES, GO OUTPUT BUFFER          XP227070
                         *                                                        XP227080
                         *           OUTPUT TO DISPLAY IN NORMAL MODE             XP227090
                         *                                                        XP227100
00237C  C800 0044        S64   LHI   R0,C'D'       PRINT CHARACTER D              XP227110
002380  41E0 2A9E              BAL   R14,WRITE1                                   XP227120
002384  C880 0080              LHI   R8,X'80'      NORMAL MODE                    XP227130
002388  9E18                   OCR   R1,R8                                        XP227140
00238A  C870 5A5A              LHI   R7,X'5A5A'    R7 & R6 = ALTERNATE LIGHT PATTERN XP227150
00238E  C860 A5A5              LHI   R6,X'A5A5'                                   XP227160
002392  9A17             S64A  WDR   R1,R7         OUTPUT TO DISPLAY X'5A'        XP227170
002394  E690 23B0              LA    R9,S65        NEXT TEST                      XP227180
002398  41E0 2436              BAL   R14,DELAY     WAIT                           XP227190
00239C  9A16                   WDR   R1,R6         OUTPUT TO DISPLAY X'5A'        XP227200
00239E  41E0 2436              BAL   R14,DELAY     WAIT                           XP227210
0023A2  9817                   WHR   R1,R7         OUTPUT TO DISPLAY X'5A5A'      XP227220
0023A4  41E0 2436              BAL   R14,DELAY     WAIT                           XP227230
0023A8  9816                   WHR   R1,R6         OUTPUT TO DISPLAY X'A5A5'      XP227240
0023AA  41E0 2436              BAL   R14,DELAY     WAIT                           XP227250
0023AE  220E                   BS    S64A          NO BREAK KEY GO AGAIN          XP227260
                         *                                                        XP227270
                         *           OUTPUT TO DISPLAY IN INCREMENTAL MODE        XP227280
                         *                                                        XP227290
0023B0  C800 0045        S65   LHI   R0,C'E'       PRINT CHARACTER E              XP227300
0023B4  41E0 2A9E              BAL   R14,WRITE1                                   XP227310
0023B8  E690 240C              LA    R9,S66        NEXT TEST                      XP227320
0023BC  C880 0040              LHI   R8,X'40'      COMMAND FOR INCREMENTAL MODE   XP227330
0023C0  9E18             S65A  OCR   R1,R8                                        XP227340
0023C2  2450                   LIS   R5,0          LOOP COUNTER                   XP227350
0023C4  9A17             S65B  WDR   R1,R7         DISPLAY X'5A', TWO HEX DIGITS
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0023C6  41E0 2436        2737          BAL   R14,DELAY          AT A TIME                                XP227360
0023CA  2651             2738          AIS   R5,1               INCREMENT LOOP COUNTER                   XP227370
0023CC  C950 0005        2739          CHI   R5,X'05'           FIVE TIMES THROUGH LOOP                  XP227380
0023D0  2036             2740          BNES  S65B               NO                                       XP227390
0023D2  2450             2741          LIS   R5,0               LOOP COUNTER                             XP227400
0023D4  9E18             2742          OCR   R1,R8              OUTPUT CMT TO RESET DISPLAY              XP227410
0023D6  9A16             2743  S65C    WDR   R1,R6              OUTPUT TO DISPLAY X'A5'                  XP227420
0023D8  41E0 2436        2744          BAL   R14,DELAY          WAIT                                     XP227430
0023DC  2651             2745          AIS   R5,1               INCREMENT LOOP COUNTER                   XP227440
0023DE  C950 0005        2746          CHI   R5,X'05'           5 TIMES THROUGH LOOP                     XP227450
0023E2  2036             2747          BNES  S65C               NO                                       XP227460
0023E4  2450             2748          LIS   R5,0               LOOP COUNTER                             XP227470
0023E6  9E18             2749          OCR   R1,R8              OUTPUT CMT TO RESET DISPLAY              XP227480
0023E8  9817             2750  S65D    WHR   R1,R7              OUTPUT TO DISPLAY X'5A5A'                XP227490
0023EA  41E0 2436        2751          BAL   R14,DELAY          WAIT                                     XP227500
0023EE  2651             2752          AIS   R5,1               INCREMENT LOOP COUNTER                   XP227510
0023F0  C950 0003        2753          CHI   R5,X'03'           3 TIMES THROUGH LOOP                     XP227520
0023F4  2036             2754          BNES  S65D               NO                                       XP227530
0023F6  2450             2755          LIS   R5,0               LOOP COUNTER                             XP227540
0023F8  9E18             2756          OCR   R1,R8              OUTPUT CMT TO RESET DISPLAY              XP227550
0023FA  9816             2757  S65E    WHR   R1,R6              OUTPUT TO DISPLAY X'A5A5'                XP227560
0023FC  41E0 2436        2758          BAL   R14,DELAY          WAIT                                     XP227570
002400  2651             2759          AIS   R5,1               INCREMENT LOOP COUNTER                   XP227580
002402  C950 0003        2760          CHI   R5,X'03'           3 TIMES THROUGH LOOP                     XP227590
002406  2036             2761          BNES  S65E               NO                                       XP227600
002408  4300 23C0        2762          B     S65A               NO BREAK KEY GO AGAIN                    XP227610
                         2763  *                                                                         XP227620
                         2764  *                          OUTPUT CONTENTS OF SWITCH REGISTER IS        XP227630
                         2765  *                               PRESENTED TO THE DISPLAY. THE SWITCH    XP227640
                         2766  *                               REGISTER IS UPDATED BY FIRST DEPRE-     XP227650
                         2767  *                               SSING 'DTA' & THEN HEX KEYS. BREAK      XP227660
                         2768  *                               KEY ENDS THE TEST.                      XP227670
00240C  C8C0 0046        2769  S66     LHI   R0,C'F'            PRINT CHARACTER F                       XP227680
002410  41E0 2A9E        2770          BAL   R14,WRITE1                                                  XP227690
002414  C880 0080        2771  S66A    LHI   R8,X'80'           COMMAND FOR NORMAL MODE                 XP227700
002418  9E18             2772          OCR   R1,R8                                                       XP227710
00241A  9914             2773          RHR   R1,R4              READ SWITCH REGISTER                    XP227720
00241C  9814             2774          WHR   R1,R4              OUTPUT TO DISPLAY CONTENTS OF SWITCH REXP227730
00241E  E690 242A        2775          LA    R9,S6END                                                    XP227740
002422  41F0 2444        2776          BAL   R15,SDELAY                                                  XP227750
002426  4300 2414        2777          B     S66A                                                        XP227760
00242A  41E0 2A5A        2778  S6END   BAL   R14,CRLF           CARR RETN, LINE FEED                    XP227770
00242E  41E0 2A5A        2779          BAL   R14,CRLF                                                    XP227780
002432  4300 2CEE        2780          B     SEQUENCE                                                    XP227790


                         2782  *                          DELAY ROUTINE                                XP227810
                         2783  *                                                                         XP227820
002436  D010 33D0        2784  DELAY   STM   R1,REG11           ALL REGISTERS                           XP227830
00243A  24A0             2785          LIS   R10,X'0'           CLEAR REG 10                            XP227840
00243C  EAC0 000F        2786  DELAY1  RRL   R12,15             34.5 US PER INSTRUCTION                 XP227850
002440  E6F0 2488        2787          LA    R15,DELAY3         LOCAL RETURN                            XP227860
                         2788  *                                                                         XP227870
002444  D010 33D0        2789  SDELAY  STM   R1,REG11           NESTED SUBR LOOKS FOR BRK               XP227880
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002448  D320 3359          2790           LB    R2,INDEV                                    XP227890
00244C  9D23               2791  SDLY1    SSR   R2,R3                                      XP227900
00244E  48C0 3356          2792           LH    R12,CRTFLG        CRT I/O ?                 XP227910
002452  4330 2474          2793           BZ    SDLY4                                       XP227920
002456  C330 0008          2794           THI   R3,X'08'          BUSY ?                    XP227930
00245A  4230 2482          2795           BNZ   SDLY2                                       XP227940
00245E  C8E0 F000          2796           LHI   R11,X'F000'       DELAY CONSTANT            XP227950
002462  26B1               2797  SDLY5    AIS   R11,1                                       XP227960
002464  2031               2798           BNZS  SDLY5                                       XP227970
002466  9B25               2799           RDR   R2,R5                                       XP227980
002468  0855               2800           LR    R5,R5                                       XP227990
00246A  213C               2801           BNZS  SDLY2             ACCEPT BRK ONLY           XP228000
00246C  5090 3408          2802  SDLY3    ST    R9,REG1F                                    XP228010
002470  4300 244C          2803           B     SDLY1                                       XP228020
002474  9D23               2804  SDLY4    SSR   R2,R3             TTY                       XP228030
002476  C430 0020          2805           NHI   R3,X'20'                                    XP228040
00247A  2334               2806           BZS   SDLY2             BREAK NOT THERE NOW       XP228050
00247C  5090 3408          2807           ST    R9,REG1F          FOR ALTERNATE RETURN ON BRK RLS XP228060
002480  22C6               2808           BS    SDLY4                                       XP228070
002482  D110 33D0          2809  SDLY2    LM    R1,REG11                                    XP228080
002486  03CF               2810           BR    R15               RETURN TO PRI OR SEC DEST XP228090
                           2811  *                                                          XP228100
002488  26A1               2812  DELAY3   AIS   R10,1             1.5                       XP228110
00248A  C9A0 1FFF          2813           CHI   R10,X'1FFF'       3.0                       XP228120
00248E  4230 243C          2814           BNE   DELAY1            1.5                       XP228130
                           2815  *                                47.5 US TOTAL TIME PER LOOP XP228140
002492  D110 33D0          2816           LM    R1,REG11                                    XP228150
002496  030E               2817           BR    R14                                         XP228160


                           2819  *                                                          XP228180
                           2820  *                                                          XP228190
                           2821  *                                                          XP228200
0000 2498                  2822  SUBT7    EQU   *                                          XP228210
                           2823  *                                                          XP228220
                           2824  * SUBTEST 7 TESTS THE OPERATION OF THE AUTOMATIC SHUTDOWN PROCEDURE,  XP228230
                           2825  * AND RESTORE PROCEDURE, WITH THE MACHINE MALFUNCTION INTERRUPT       XP228240
                           2826  * DISABLED (PSW BIT 18=0).  ON ENTERING SUBTEST 7, ALL INTERRUPTS     XP228250
                           2827  * ARE DISABLED.  THE USER REGISTER SET IS SELECTED, AND THE MESSAGE   XP228260
                           2828  * "INITIALIZE PRESS BRK" IS PRINTED.  THE STATUS OF THE CONSOLE IS    XP228270
                           2829  * SENSED AND STORED IN THE LOCATION LABELED 'CONSTAT'.  THE           XP228280
                           2830  * REGISTERS IN THE USER SET ARE LOADED FROM THE TABLE 'BUFR2'.        XP228290
                           2831  * A LOOP IS EXECUTED TO CHECK THE CONTENTS OF THE REGISTERS AGAINST   XP228300
                           2832  * THE DATA IN THE TABLE.  THE USER, FOLLOWING DIRECTIONS, DEPRESSES   XP228310
                           2833  * THE 'INT' KEY ON THE CONSOLE.  IF THE AUTOMATIC SHUTDOWN AND        XP228320
                           2834  * RESTORE FUNCTIONS ARE FUNCTIONING PROPERLY, NO CHANGE IN THE        XP228330
                           2835  * REGISTERS WILL BE DETECTED.  ANY CHANGE WILL RESULT IN THE PRINTING XP228340
                           2836  * OF AN ERROR MESSAGE.  THE PROGRAM CONTINUES TO CHECK THE REGISTERS  XP228350
                           2837  * IN THE USER SET UNTIL THE BREAK KEY IS PRESSED.  WHEN THE BREAK     XP228360
                           2838  * KEY IS RELEASED, LOCATION X'BC' IS CHECKED FOR THE CONSOLE STATUS   XP228370
                           2839  * SAVE DURING AUTOMATIC SHUTDOWN.  IF THE SAVE WAS NOT MADE CORRECTLY, XP228380
                           2840  * AN ERROR MESSAGE IS PRINTED.                                       XP228390
                           2841  * REGISTERS IN SET 0 AND THE USER SET ARE CHECKED TO SEE IF THEY     XP228400
                           2842  * HAVE BEEN STORED.  NO STORAGE RESULTS IN THE PRINTING OF AN        XP228410
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                    2843  * ERROR MESSAGE.  THE USER REGISTER SET IS SELECTED, AND THE              XP228420
                    2844  * MESSAGE "POWER OFF/ON PRESS BRK" IS PRINTED.  THE CONSOLE STATUS        XP228430
                    2845  * IS SENSED AND STORED IN 'CONSTAT'.  THE REGISTERS IN THE USER SET       XP228440
                    2846  * ARE LOADED FROM THE TABLE 'BUFR2'.  A LOOP IS EXECUTED TO CHECK        XP228450
                    2847  * THE CONTENTS OF THE REGISTERS AGAINST THE DATA IN THE TABLE.  THE       XP228460
                    2848  * USER, FOLLOWING DIRECTIONS, TURNS THE POWER SWITCH OFF, THEN ON.        XP228470
                    2849  * IF THE AUTOMATIC SHUTDOWN AND RESTORE OPERATIONS ARE FUNCTIONING        XP228480
                    2850  * PROPERLY, NO CHANGE IN THE REGISTERS WILL BE DETECTED.  ANY             XP228490
                    2851  * CHANGE RESULTS IN THE PRINTING OF AN ERROR MESSAGE.  THE LOOP           XP228500
                    2852  * CONTINUES UNTIL THE USER DEPRESSES THE BREAK KEY ON THE CONSOLE.        XP228510
                    2853  * WHEN THE KEY IS RELEASED, LOCATION X'BC' IS CHECKED FOR PROPER          XP228520
                    2854  * CONSOLE STATUS SAVE ON AUTOMATIC SHUTDOWN.  IF THE SAVE WAS NOT        XP228530
                    2855  * MADE CORRECTLY, AN ERROR MESSAGE IS PRINTED.  A CHECK IS MADE TO        XP228540
                    2856  * DETERMINE WHETHER THE REGISTERS IN SETS 0 AND THE USER SET WERE         XP228550
                    2857  * SAVED PROPERLY.  IF THEY WERE NOT, AN ERROR MESSAGE IS PRINTED.        XP228560
                    2858  * IN SUBTEST 7, IF THE MACHINE MALFUNTION INTERRUPT IS DETECTED           XP228570
                    2859  * WHEN DISABLED, AN ERROR NUMBER IS STORED AND A DELAY LOOP               XP228580
                    2860  * EXECUTED UNTIL THE POWER-DOWN IS COMPLETE.  ON POWER RESTORE, THE       XP228590
                    2861  * LOOP IS EXITED, AND AN ERROR MESSAGE IS PRINTED.                        XP228600
                    2862  * IF NO ERRORS HAVE BEEN DETECTED, THE TEST TERMINATES WITH THE MESSAGE   XP228610
                    2863  * 'NO ERROR'.                                                            XP228620
                    2864  *                                                                        XP228630
                    2865  * USER NOTE:  PROCESSORS WITHOUT THE AUTOMATIC RESTART OPTION REQUIRE     XP228640
                    2866  * THE USER TO DEPRESS THE 'RUN' BUTTON ON THE PANEL ONE OR TWO SECONDS    XP228650
                    2867  * FOLLOWING THE DEPRESSION OF THE 'INIT' BUTTON AND TURNING THE 'POWER'  XP228660
                    2868  * SWITCH OFF AND ON, PRIOR TO DEPRESSING THE CONSOLE 'BRK' KEY.          XP228670
                    2869  * THE "INT" BUTTON MAY BE DEPRESSED AS MANY TIMES AS DESIRED.            XP228680
                    2870  * IF THE PROCESSOR UNDER TEST IS EQUIPPED WITH THE LOADER STORAGE UNIT    XP228690
                    2871  * (LSU) OPTION, THE LSU MUST BE DISABLED PRIOR TO RUNNING THIS SUBTEST.  XP228700
                    2872  * ON MODEL 8/32, THE MESSAGE 'REG SETS AVAIL' IS PRINTED UPON ENTERING    XP228710
                    2873  * THE SUBTEST.  THE USER MUST DEPRESS THE NUMERIC KEY CORRESPONDING TO    XP228720
                    2874  * THE ACTUAL NUMBER OF GENERAL REGISTER SETS AVAILABLE, FOLLOWED BY A     XP228730
                    2875  * CARRIAGE RETURN.                                                       XP228740
                    2876  ********************************************************               XP228750
                    2877  **  MACHINE MODE = FULLWORD                                             XP228760
                    2878  **  TEST INITIALIZE AND POWER ON/OFF                                    XP228770
                    2879  **  MACHINE MALFUNCTION INTERRUPT IS DISABLED IN THE PSW                XP228780



                    2881  *                                                                        XP228800
                    2882  *                                                                        XP228810
0000 2498           2883  SUBT8    EQU   *                                                       XP228820
                    2884  *                                                                        XP228830
                    2885  * SUBTEST 8 IS IDENTICAL TO SUBTEST 7, EXCEPT THAT THE MACHINE           XP228840
                    2886  * MALFUNCTION INTERRUPT IS ENABLED.  WHEN THE 'INT' BUTTON IS            XP228850
                    2887  * DEPRESSED, A PSW SWAP IS MADE TO TRANSFER TO AN INTERRUPT HANDLER       XP228860
                    2888  * ROUTINE LABELED 'S78MMINT'.  THE INTERRUPT AND PSW SWAP ALSO OCCUR      XP228870
                    2889  * WHEN 'POWER' IS TURNED OFF.  IN EACH CASE, THE CONDITION CODE AND       XP228880
                    2890  * PSW'S ARE CHECKED TO DETERMINE WHETHER THE INTERRUPT WAS HANDLED        XP228890
                    2891  * PROPERLY.  THE INTERRUPT ON POWER RESTORE IS ALSO CHECKED.  ANY ERROR   XP228900
                    2892  * CAUSES THE PRINTING OF AN ERROR MESSAGE.                               XP228910
                    2893  * USER NOTE:  THE 'INT' BUTTON MAY BE DEPRESSED AS MANY TIMES AS         XP228920
                    2894  * DESIRED.                                                               XP228930
                    2895  *                                                                        XP228940
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                        2896  * SUBTEST 8 SHOULD BE RUN ONLY ON  A SERIES 32 PROCESSOR EQUIPPED WITH    XP228950
                        2897  * THE AUTOMATIC RESTART OPTION.                                          XP228960
                        2898  * IF THE PROCESSOR UNDER TEST IS EQUIPPED WITH THE LOADER STORAGE UNIT   XP228970
                        2899  * (LSU) OPTION, THE LSU MUST BE DISABLED PRIOR TO RUNNING THIS SUBTEST.  XP228980
                        2900  * ON MODEL 8/32, THE MESSAGE 'REG SETS AVAIL' IS PRINTED UPON ENTERING    XP228990
                        2901  * THIS SUBTEST.  THE USER MUST DEPRESS THE NUMERIC KEY CORRESPONDING TO   XP229000
                        2902  * THE ACTUAL NUMBER OF GENERAL REGISTER SETS AVAILABLE, FOLLOWED BY A     XP229010
                        2903  * CARRIAGE RETURN.                                                       XP229020
                        2904  ************************************************************           XP229030
                        2905  **  MACHINE MODE = FULLWORD                                             XP229040
                        2906  **  TEST INITIALIZE AND POWER OFF/ON                                    XP229050
                        2907  **  MACHINE MALFUNCTION INTERRUPT IS ENABLED                            XP229060
002498  D300 3354             2908          LB    R0,CPUNO                                            XP229070
00249C  C5C0 0037             2909          CLHI  R0,C'7'             MODEL 7/32 ?                  XP229080
0024A0  2333                  2910          BES   S78ENT                                            XP229090
0024A2  41A0 2AF6             2911          BAL   R10,GETREGS         PRINT 'REG SETS AVAIL', SET REGBYTE XP229100
0024A6  2400                  2912  S78ENT  LIS   R0,0                                              XP229110
0024A8  C880 0000             2913          LHI   R8,X'0'             NEW PSW MM INTERRUPT          XP229120
0024AC  5080 0038             2914          ST    R8,Y'38'            MM INTRPT NEW PSW STATUS      XP229130
0024B0  4000 3370             2915  S78     STH   R0,TEMP                                           XP229140
0024B4  9510                  2916  S78A    EPSR  R1,R0               NEW PSW ,REG.SET 0            XP229150
0024B6  D100 3228             2917          LM    R0,BUFR0            EACH REG. OF SET0 = 0         XP229160
0024BA  4000 337A             2918          STH   R0,S78FLAG1         S78FLAG1 = 1 IF MM INTRPT DETECTED XP229170
0024BE  D0E0 3344             2919          STM   R14,S78PSW1         S78PSW1 = NEW PSW AFTER MM INTRPT XP229180
                        2920  *  ZERO S78PSW1, S78PSW2                S78PSW2 = NEW PSW AFTER POWER RESTOR XP229190
                        2921  *                                                                      XP229200
0024C2  E610 338C             2922          LA    R1,REG0                                           XP229210
0024C6  D081 0000             2923  S78ALP  STM   R8,0(R1)            CLEAR ALL POTENTIAL REGISTER  XP229220
0024CA  CA10 0020             2924          AHI   R1,X'20'            STORAGE AREA, INCLUDING       XP229230
0024CE  C510 37CC             2925          CLHI  R1,REG0+X'440'      DOUBLE PRECISION              XP229240
0024D2  2086                  2926          BLS   S78ALP              FLOATING POINT REGISTERS      XP229250
                        2927  *                                                                      XP229260
0024D4  E6F0 24E4             2928          LA    R15,S78ALQ                                        XP229270
0024D8  D0F0 0030             2929          STM   R14,X'30'                                         XP229280
0024DC  7200 304C             2930          LME   0,MD1               LOAD FLT PT REG PATTERN       XP229290
0024E0  C8F0 FFFF             2931          LHI   R15,-1              IF HERE, FLT PT - EQUIPPED    XP229300
0024E4  40F0 3362             2932  S78ALQ  STH   R15,SEQFLG          ELSE, NOT EQUIPPED.           XP229310
0024E8  E6F0 2BFE             2933          LA    R15,ILGINT          RESTORE HANDLER               XP229320
0024EC  D0F0 0030             2934          STM   R14,X'30'                                         XP229330
                        2935  *                                                                      XP229340
0024F0  E600 2702             2936          LA    R0,S78MMINT         MM INTRPT NEW PSW LOC.        XP229350
0024F4  5000 003C             2937          ST    R0,X'3C'                                          XP229360
0024F8  E600 3368             2938          LA    R0,OLDPSW           PSW SAVE AREA                 XP229370
0024FC  4000 0084             2939          STH   R0,X'84'                                          XP229380
002500  E600 338C             2940          LA    R0,REG0             REG.SAVE POINTER              XP229390
002504  40C0 0086             2941          STH   R0,X'86'                                          XP229400
002508  D1C0 3228             2942          LM    R0,BUFR0            ALL REGS, SET 0, EQUAL 0      XP229410
00250C  C200 32E8             2943          LPSW  S78ABPSW            STAT = X'00F0', LOC = S78AB   XP229420
                        2944  *                                                                      XP229430
002510  2400                  2945  S78AB   LIS   R0,0                                              XP229440
002512  4500 3370             2946          CLH   R0,TEMP             IF TEMP NOT ZERO, SECOND TIME.XP229450
002516  2136                  2947          BNZS  S78B                                              XP229460
                        2948  *                                                                      XP229470
002518  E6C0 3110             2949          LA    R12,MSG2            PRINT CHARACTERS              XP229480
00251C  E6D0 312E             2950          LA    R13,MSG2Z           INITIALIZE, PRESS BRK         XP229490
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002520  2305           2951          BS    S78D                                                  XP229500
002522  E6C0 3130      2952  S78B    LA    R12,MSG3          PRINT CHARACTERS                    XP229510
002526  E6D0 314C      2953          LA    R13,MSG3Z         POWER OFF/ON, PRESS BRK             XP229520
00252A  41E0 2A6C      2954  S78D    BAL   R14,WBMSG                                            XP229530
                       2955  *                                                                   XP229540
00252E  2401           2956          LIS   R0,1              CONSOLE ADDRESS                     XP229550
002530  9D01           2957          SSR   R0,R1             PICK UP CONSOLE STATUS              XP229560
002532  C410 0070      2958          MHI   R1,X'70'                                              XP229570
002536  4010 337C      2959          STH   R1,CONSTAT        CONSOLE STATUS SAVE AREA            XP229580
                       2960  *                                                                   XP229590
00253A  D300 30F7      2961  S78D1   LB    R0,TESTNO                                             XP229600
00253E  C500 0037      2962          CLHI  R0,C'7'                                               XP229610
002542  2335           2963          BES   S7D2                                                  XP229620
002544  D100 3228      2964  S8D2    LM    R0,BUFR0          SUBTEST 8 - MM INT ENABLED          XP229630
002548  C200 32F8      2965          LPSW  S8D2PSW           STAT = X'20F0', LOC = S78D3         XP229640
00254C  D100 3228      2966  S7D2    LM    R0,BUFR0          SUBTEST 7, MM INT DISABLED          XP229650
002550  C200 32F0      2967          LPSW  S7D2PSW           STAT = X'00F0', LOC = S78D3         XP229660
002554  D100 31E4      2968  S78D3   LM    R0,BUFR2          REGS IN SET F = DATA FROM BUFR2     XP229670
                       2969  *                                                                   XP229680
002558  0800           2970  S78CHK  LR    R0,R0                                                 XP229690
00255A  2136           2971          BNZS  S7R1E                                                 XP229700
00255C  2412           2972          LIS   R1,2                                                  XP229710
00255E  0512           2973          CLR   R1,R2                                                 XP229720
002560  2133           2974          BNES  S7R1E                                                 XP229730
002562  1111           2975          SLLS  R1,1              R1 = 4                              XP229740
002564  0513           2976          CLR   R1,R3                                                 XP229750
002566  2139           2977  S7R1E   BNES  S7R1D                                                 XP229760
002568  1111           2978          SLLS  R1,1              R1 = 8                              XP229770
00256A  0514           2979          CLR   R1,R4                                                 XP229780
00256C  2136           2980          BNES  S7R1D                                                 XP229790
00256E  1111           2981          SLLS  R1,1              R1 = 10                             XP229800
002570  0515           2982          CLR   R1,R5                                                 XP229810
002572  2133           2983          BNES  S7R1D                                                 XP229820
002574  1111           2984          SLLS  R1,1              R1 = 20                             XP229830
002576  0516           2985          CLR   R1,R6                                                 XP229840
002578  2139           2986  S7R1D   BNES  S7R1C                                                 XP229850
00257A  1111           2987          SLLS  R1,1              R1 = 40                             XP229860
00257C  0517           2988          CLR   R1,R7                                                 XP229870
00257E  2136           2989          BNES  S7R1C                                                 XP229880
002580  1111           2990          SLLS  R1,1              R1 = 80                             XP229890
002582  0518           2991          CLR   R1,R8                                                 XP229900
002584  2133           2992          BNES  S7R1C                                                 XP229910
002586  1111           2993          SLLS  R1,1              R1 = 100                            XP229920
002588  0519           2994          CLR   R1,R9                                                 XP229930
00258A  2139           2995  S7R1C   BNES  S7R1B                                                 XP229940
00258C  1111           2996          SLLS  R1,1              R1 = 200                            XP229950
00258E  051A           2997          CLR   R1,R10                                                XP229960
002590  2136           2998          BNES  S7R1B                                                 XP229970
002592  1111           2999          SLLS  R1,1              R1 = 400                            XP229980
002594  051B           3000          CLR   R1,R11                                                XP229990
002596  2133           3001          BNES  S7R1B                                                 XP230000
002598  1111           3002          SLLS  R1,1              R1 = 800                            XP230010
00259A  051C           3003          CLR   R1,R12                                                XP230020
00259C  2136           3004  S7R1B   BNES  S7R1A                                                 XP230030
00259E  1111           3005          SLLS  R1,1              R1 = 1000                           XP230040
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0025A0  051D            3006           CLR   R1,R13                                                  XP230050
0025A2  2133            3007           BNES  S7R1A                                                   XP230060
0025A4  1111            3008           SLLS  R1,1              R1 = 2000                             XP230070
0025A6  051E            3009           CLR   R1,R14                                                  XP230080
0025A8  2134            3010  S7R1A    BNES  S7R1                                                   XP230090
0025AA  1111            3011           SLLS  R1,1              R1 = 4000                             XP230100
0025AC  051F            3012           CLR   R1,R15                                                  XP230110
0025AE  2339            3013           BES   S78BRK                                                  XP230120
0025B0  D000 33CC       3014  S7R1     STM   R0,REG10          ERROR 0701, 0801 - REG SET F   *****  XP230130
0025B4  C8C0 00F0       3015           LHI   R12,X'F0'                                               XP230140
0025B8  95EC            3016           EPSR  R11,R12                                                 XP230150
0025BA  24E1            3017           LIS   R13,1             MODIFIED                              XP230160
0025BC  4300 26F6       3018           B     S7R                                                     XP230170
                        3019  *                                                                       XP230180
0025C0  D310 3359       3020  S78BRK   LB    R1,INDEV          R1 = TTY ADDRESS                      XP230190
0025C4  4800 3356       3021           LH    R0,CRTFLG                                               XP230200
0025C8  2333            3022           BZS   S78BRKA           NO FIRSTCMD FOR TTY                   XP230210
0025CA  DE10 3352       3023           OC    R1,FIRSTCMD                                             XP230220
0025CE  4800 3356       3024  S78BRKA  LH    R0,CRTFLG                                               XP230230
0025D2  213E            3025           BNZS  S78BRK1                                                 XP230240
0025D4  9D10            3026           SSR   R1,R0             R0 = TTY STATUS                       XP230250
0025D6  C400 0020       3027           NHI   R0,X'20'                                                XP230260
0025DA  4330 2606       3028           BZ    S78NOBRK                                                XP230270
0025DE  D310 3359       3029  S78WT1   LB    R1,INDEV                                                XP230280
0025E2  9D10            3030           SSR   R1,R0                                                   XP230290
0025E4  C400 0020       3031           NHI   R0,X'20'                                                XP230300
0025E8  2035            3032           BNZS  S78WT1            WAIT FOR BRK RLS                      XP230310
0025EA  4300 260C       3033           B     S78X2A                                                  XP230320
0025EE  9D10            3034  S78BRK1  SSR   R1,R0                                                   XP230330
0025F0  C400 0008       3035           NHI   R0,X'08'          BUSY DROP ?                           XP230340
0025F4  2139            3036           BNZS  S78NOBRK                                                XP230350
0025F6  9B10            3037           RDR   R1,R0             SET BUSY = 1                          XP230360
0025F8  0800            3038           LR    R0,R0                                                   XP230370
0025FA  2136            3039           BNZS  S78NOBRK          ACCEPT BRK ONLY                       XP230380
0025FC  C800 8000       3040           LHI   R0,X'8000'        DELAY COUNT                           XP230390
002600  2601            3041           AIS   R0,1                                                    XP230400
002602  2031            3042           BTBS  3,1               DELAY                                 XP230410
002604  2304            3043           BS    S78X2A                                                  XP230420
002606  2400            3044  S78NOBRK LIS   R0,0                                                    XP230430
002608  4300 2558       3045           B     S78CHK                                                  XP230440
                        3046  *                                                                       XP230450
                        3047  *        BREAK KEY SENSED; RELEASED, IF TTY                             XP230460
                        3048  *        CHECK FOR PRIMARY POWER FAIL PROPER CONSOLE STATUS SAVE !       XP230470
00260C  4800 00BC       3049  S78X2A   LH    R0,X'BC'          PPF CONSOLE STATUS SAVE AREA          XP230480
002610  C400 0070       3050           NHI   R0,X'70'          MASK OUT ONWANTED BITS                XP230490
002614  4500 337C       3051           CLH   R0,CONSTAT        CONSOLE STATUS SAVE AREA              XP230500
002618  2304            3052           BS    S78XX             SAVE WAS OKAY.                        XP230510
00261A  24DA            3053           LIS   R13,X'A'          ERROR 070A, 080A - BAD STAT SAVE****  XP230520
00261C  4300 26F6       3054           B     S7R                                                     XP230530
                        3055  *                                                                       XP230540
002620  2400            3056  S78XX    LIS   R0,0                                                    XP230550
002622  9510            3057           EPSR  R1,R0             DISABLE MMINT, SEL REG SET 0          XP230560
                        3058  *                                                                       XP230570
                        3059  **       CHECK REGISTER SET 0                                           XP230580
002624  D000 338C       3060           STM   R0,REG0           STORE REGISTERS OF SET 0              XP230590
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002628 2400           3061          LIS   R0,0                                          XP230600
00262A E630 338C      3062          LA    R3,REG0                                       XP230610
00262E 5503 0000      3063 S78X3    CL    R0,0(R3)                                      XP230620
002632 2337           3064          BES   S78X4                                         XP230630
002634 C8C0 00F0      3065 S7R2B    LHI   R12,X'F0'       SEL REG SET F, NO INTPTS      XP230640
002638 95BC           3066          EPSR  R11,R12                                       XP230650
00263A 24D2           3067 S7R2     LIS   R13,2           ERROR 0702, 0802 - REG SET 0  *****  XP230660
                      3068 *                              .     CHANGED                 XP230670
00263C 4300 26F6      3069          B     S7R                                           XP230680
002640 2634           3070 S78X4    AIS   R3,4                                          XP230690
002642 C530 33CC      3071          CLHI  R3,REGF+4                                     XP230700
002646 208C           3072          BLS   S78X3                                         XP230710
                      3073 *                                                            XP230720
                      3074 **       CHECK REGISTER SET F                                XP230730
002648 C830 00F0      3075          LHI   R3,X'F0'        SEL REG SET F                 XP230740
00264C 9543           3076          EPSR  R4,R3                                         XP230750
00264E 2420           3077          LIS   R2,0                                          XP230760
002650 D300 3354      3078          LB    R0,CPUNO                                      XP230770
002654 C500 0037      3079          CLHI  R0,C'7'         MODEL  7/32 ?                 XP230780
002658 2333           3080          BES   S78X5                                         XP230790
00265A 7320 3360      3081          LHL   R2,REGBYT       ADD BIAS FOR EXTRA REG. STORAGE  XP230800
00265E 2438           3082 S78X5    LIS   R3,8            REGS F0,F1 WERE WORK REGISTERS  XP230810
002660 5842 4300 33CC 3083 S78X6    L     R4,REG10(R2,R3)                               XP230820
002666 5543 31E4      3084          CL    R4,BUFR2(R3)                                  XP230830
00266A 2334           3085          BES   S78X7                                         XP230840
00266C 24D3           3086 S7R3     LIS   R13,3           ERROR 0703, 0803 - REG SET F  *****  XP230850
00266E 4300 26F6      3087          B     S7R             NOT STORED ON POWER DOWN      XP230860
                      3088 *                                                            XP230870
002672 2634           3089 S78X7    AIS   R3,4                                          XP230880
002674 C530 0040      3090          CLHI  R3,64                                         XP230890
002678 208C           3091          BLS   S78X6                                         XP230900
                      3092 *                                                            XP230910
                      3093 *                                                            XP230920
00267A 4800 3362      3094          LH    R0,SEQFLG       SET IF EQUIPPED WITH FLT. PT. XP230930
00267E 4310 269C      3095          BNM   S78X8                                         XP230940
002682 2410           3096 S78FLSAV LIS   R1,0            CHECK STORE OF FLT PT REGS.   XP230950
002684 5801 304C      3097 FLP1     L     R0,MD1(R1)      EXPECTED DATA PATTERN         XP230960
002688 5501 0000      3098          CL    R0,0(R1)        ACTUAL DATA STORED            XP230970
00268C 2334           3099          BES   FLP2                                          XP230980
00268E 24DB           3100 S78R11   LIS   R13,11          ERROR 070B, 080B - FLOATING   *****  XP230990
002690 4300 26F6      3101          B     S7R             POINT REGISTERS NOT STORED,   XP231000
002694 2614           3102 FLP2     AIS   R1,4                                          XP231010
002696 C510 0020      3103          CLHI  R1,X'20'                                      XP231020
00269A 208B           3104          BLS   FLP1                                          XP231030
                      3105 *                                                            XP231040
                      3106 **       REGISTERS HANDLED CORRECTLY - CHECK INTERRUPT HANDLING.  XP231050
00269C D380 30F7      3107 S78X8    LB    R8,TESTNO                                     XP231060
0026A0 C580 0037      3108          CLHI  R8,C'7'                                       XP231070
0026A4 2138           3109          BNES  S8D                                           XP231080
0026A6 4800 3370      3110          LH    R0,TEMP         R0 = TEMP = 0 , FIRST TIME    XP231090
0026AA 4230 26FE      3111          BNZ   S78DONE                                       XP231100
0026AE 2401           3112 S78G     LIS   R0,1            WILL MAKE TEMP NON-ZERO       XP231110
0026B0 4300 24B0      3113          B     S78                                           XP231120
                      3114 *                                                            XP231130
                      3115 **  SUBTEST 8 - CHECK MM INTERRUPT DETECTION.                XP231140
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0026B4  4800 337A  3116 S8D     LH    R0,S78FLAG1        S78FLAG1 = 1, IF MM INTERRUPT          XP231150
0026B8  2134       3117         BNZS  S8E                WAS DETECTED                           XP231160
0026BA  24D5       3118 S8R5    LIS   R13,5              ERROR 0805 - NO MM INTERRUPT  *****    XP231170
0026BC  4300 26F6  3119         B     S7R                .     DETECTED                         XP231180
                   3120 *                                                                       XP231190
                   3121 **  CHECK INITIALIZE MM INTRPT                                          XP231200
                                                                                                XP231210
0026C0  48C0 3370  3122 S8E     LH    R0,TEMP                                                  XP231220
0026C4  213E       3123         BNZS  S8POFF             CHECK POWER RESTORE                    XP231230
0026C6  240F       3124         LIS   R0,15              CHECK COND.CODE FOR NEW PSW            XP231240
0026C8  5400 3344  3125         N     R0,S78PSW1         FOR POWER FAIL                         XP231250
0026CC  C500 0001  3126         CLHI  R0,1               EXPECTED CC = 0001                     XP231260
0026D0  4330 26AE  3127         BE    S78G                                                     XP231270
0026D4  24D6       3128 S8R6    LIS   R13,6              ERROR 0806 - EARLY PFAIL COND  *****   XP231280
0026D6  4300 26F6  3129         B     S7R                .    CODE NOT 0001 AS EXPECTED         XP231290
                   3130 *                                                                       XP231300
                   3131 **  CHECK POWER-OFF MM INTRPT DETECTION                                 XP231310
0026DA  240F       3132 S8POFF  LIS   R0,15              CHECK COND. CODE                       XP231320
0026DC  5400 3344  3133         N     R0,S78PSW1                                               XP231330
0026E0  C500 0001  3134         CLHI  R0,1               EXPECTED COND. CODE = 0001             XP231340
0026E4  2333       3135         BES   S8P2                                                     XP231350
0026E6  24D7       3136 S8R7    LIS   R13,7              ERROR 0807 - EARLY PFAIL COND  *****   XP231360
0026E8  2307       3137         BS    S7R                CODE NOT 0001 (POWER OFF)              XP231370
                   3138 *                                                                       XP231380
0026EA  5800 3348  3139 S8P2    L     R0,S78PSW2         POWER RESTORE                          XP231390
0026EE  C400 000F  3140         NHI   R0,15              COND. CODE = 0  ?                      XP231400
0026F2  2336       3141         BZS   S78DONE                                                  XP231410
0026F4  24D8       3142 S8R8    LIS   R13,8              ERROR 0808 - POWER RESTORE COND*****   XP231420
                   3143 *                                .     NOT 0000                         XP231430
0026F6  D2D0 335E  3144 S7R     STB   R13,ERRNO                                                XP231440
0026FA  4300 2C58  3145         B     ERRORB                                                   XP231450
                   3146 *                                                                       XP231460
                   3147 *                                                                       XP231470
        0000 26FE  3148 S7END   EQU   *                                                        XP231480
        0000 26FE  3149 S8END   EQU   *                                                        XP231490
0026FE  4300 0FA0  3150 S78DONE B     S2END2             NO ERROR


                   3152 **  THIS ROUTINE IS ENTERED WHEN A MM INTRPT IS DETECTED               XP231510
                   3153 **  IN SUBTEST 7 OR 8 ON EARLY POWER FAIL ON INITIALIZE               XP231520
002702  9533       3154 S78MMINT EPSR  R3,R3             CATCH PSW STAT                         XP231530
002704  5030 3344  3155         ST    R3,S78PSW1                                               XP231540
002708  D300 30F7  3156         LB    R0,TESTNO                                                XP231550
00270C  C500 0037  3157         CLHI  R0,C'7'                                                  XP231560
002710  2138       3158         BNES  S78MM2                                                   XP231570
002712  C810 8000  3159         LHI   R1,X'8000'         SUBT 7: INTPT OCCURRED WHEN DISABLED  XP231580
002716  24D4       3160 S7R4    LIS   R13,4              ERROR 0704 - MM INTERRUPT     *****    XP231590
                   3161 *                                DETECTED WHEN DISABLED IN PSW          XP231600
002718  2611       3162         AIS   R1,1               DELAY FOR SEVERAL MILLISECONDS         XP231610
00271A  2032       3163         BNZS  S7R4                                                     XP231620
00271C  4300 26F6  3164         B     S7R                                                      XP231630
                   3165 *                                                                       XP231640
                   3166 *       SET UP FOR POWER RESTORE INTERRUPT (SUBTEST 8 ONLY)             XP231650
002720  07EE       3167 S78MM2  XR    R14,R14                                                  XP231660
002722  E6F0 2760  3168         LA    R15,S78MMI2        ADR. FOR POWER RESTORE MM INTRPT.     XP231670
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002726  D0E0 0038          3169           STM   R14,X'38'                                                XP231680
00272A  24B0               3170           LIS   R11,0                                                    XP231690
00272C  D3C0 3354          3171           LB    R12,CPUNO                                                XP231700
002730  C5C0 0037          3172           CLHI  R12,C'7'          MOD 7/32 ?                             XP231710
002734  2333               3173           BES   S78MM3                                                   XP231720
002736  C8B0 00E8          3174           LHI   R11,X'E8'         MOD 8/32 DELAY MODIFIER                XP231730
00273A  C8E0 2000          3175  S78MM3   LHI   R14,X'2000'       NEW PSW = MMINT ENABLED                XP231740
00273E  40E0 337A          3176           STH   R14,S78FLAG1      MM INT HAS OCCURRED.                   XP231750
002742  950E               3177           EPSR  R0,R14            ENABLE MM INTRPT.                      XP231760
                           3178  *                                                                       XP231770
                           3179  ** DELAY FOR AT LEAST 1 MS.                                             XP231780
002744  2410               3180  S78MM4   LIS   R1,0                                                     XP231790
002746  CA10 0001          3181  S78DELAY AHI   R1,1                                                     XP231800
00274A  C51B 00E8          3182           CLHI  R1,X'E8'(R11)                                            XP231810
00274E  2084               3183           BLS   S78DELAY                                                 XP231820
                           3184  *                                                                       XP231830
                           3185  *                                                                       XP231840
002750  24D9               3186  S8R9     LIS   R13,9             ERROR 0809 - POWER RESTORE INTPT****   XP231850
                           3187  *                               .     NOT TAKEN                        XP231860
002752  D2D0 335E          3188           STB   R13,ERRNO                                                XP231870
002756  C870 00F0          3189           LHI   R7,X'F0'                                                 XP231880
00275A  9567               3190           EPSR  R6,R7                                                    XP231890
00275C  4300 2C58          3191           B     ERRORB                                                   XP231900
                           3192  *                                                                       XP231910
                           3193  **  MM INTRPT. BY POWER RESTORE , REG. SET 0                           XP231920
                           3194  *       SET UP FOR EARLY POWER FAIL MM INT.                             XP231930
                           3195  *                                                                       XP231940
                           3196  *                                                                       XP231950
        0000 2760          3197  S78MMI2  EQU   *                 POWER RESTORE INTERRUPT TAKEN          XP231960
002760  9500               3198           EPSR  R0,R0             R0 = PSW AFTER POWER RESTORE           XP231970
002762  5000 3348          3199           ST    R0,S78PSW2                                               XP231980
002766  0800               3200           LR    R0,R0                                                    XP231990
002768  4230 26F4          3201           BNZ   S8R8                                                     XP232000
00276C  C8E0 0000          3202           LHI   R14,0                                                    XP232010
002770  E6F0 2702          3203           LA    R15,S78MMINT                                             XP232020
002774  D0E0 0038          3204           STM   R14,X'38'         MMINT NEW PSW                          XP232030
002778  C51B 0000          3205           CLHI  R1,X'0000'(R11)   MAX DELAY EXPECTED BEFORE RESTORE      XP232040
00277C  4200 0000          3206           NOP                     * CHECK DELAY HERE                     XP232050
002780  D100 3228          3207  S78MMI3  LM    R0,BUFR0          SET REGS IN SET 0 = 0                  XP232060
002784  4300 253A          3208           B     S78D1                                                    XP232070
                           3209  *                                                                       XP232080
                           3210  *                                                                       XP232090
                           3211  ************************************************************           XP232100
                           3212  *                                                                       XP232110
        00C0 2788          3213  SUBT9    EQU   *                                                        XP232120
                           3214  *                                                                       XP232130
                           3215  * THIS SUBTEST CHECKS THE "LRA" INSTRUCTION                             XP232140
                           3216  *                    -----                                              XP232150
                           3217  * IT IS DIVIDED INTO 6 PARTS, S3P1, S3P2, ETC.                          XP232160
                           3218  * EACH PART IS INDEPENDENT OF THE OTHER AND CAN BE EXECUTED SEPARATELY  XP232170
                           3219  * EACH PART HAS A DUMMY BRANCH AT THE END E.G. S3P1END, S3P2END, ETC.   XP232180
                           3220  * THIS BRANCH CAN BE CHANGED TO LOOP ON ONE PART OF THE TEST.           XP232190
                           3221  *                                                                       XP232200
                           3222  * THE ERROR PRINTOUT OCCURS AS SHOWN BELOW:                             XP232210
                           3223  *ERROR 03NN                                                             XP232220
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                                3224  *R1-BEFOR R1-AFTER SE-BEFOR SE-AFTER       CC                                XP232230
                                3225  *AAAAAAAA BBBBBBBB CCCCCCCC EEEEEEEE 0000000D                                XP232240
                                3226  *                                                                            XP232250
                                3227  * WHERE:                                                                     XP232260
                                3228  * NN= 01 FOR PART1 (NOT PRESENT CONDITION CODE)                             XP232270
                                3229  *      02 FOR PART2 (WRITE-PROTECTED, NO TRANSLATION CHECK)                  XP232280
                                3230  *      03 FOR PART3 (WRITE-PROTECTED, TRANSLATION CHECK)                     XP232290
                                3231  *      04 FOR PART4 (EXECUTE-PROTECT,NO TRANSLATION CHECK)                   XP232300
                                3232  *      05 FOR PART5 (EXECUTE-PROTECT,TRANSLATION CHECK)                      XP232310
                                3233  *      06 FOR PART6 (LIMIT VIOLATION                                        XP232320
                                3234  * A= THE CONTENTS OF R1 BEFORE EXECUTING "LRA" INSTRUCTION.                  XP232330
                                3235  * B= THE CONTENTS OF R1 AFTER EXECUTING "LRA" INSTRUCTION.                   XP232340
                                3236  * C= THE SEGMENTATION REGISTER BEFORE LRA EXECUTION                          XP232350
                                3237  * E= THE SEGMENTATION REGISTER AFTER LRA EXECUTION                           XP232360
                                3238  * D= THE CONDITION CODE AFTER EXECUTING "LRA" INSTRUCTION.                   XP232370
                                3239  **                                                                           XP232380
      0000 2788                 3240  S3P1      EQU   *                                                            XP232390
                                3241  * THIS PART CHECKS "LRA" INSTRUCTION TO RETURN A NOT PRESENT CON CODE       XP232400
                                3242  * R1= CONTAINS THE FIRST OPERAND.                                           XP232410
                                3243  * MACREG= MAC REGISTER CONTAINS Y'0FF12300' (PRESENCE BIT-RESET)            XP232420
                                3244  *                                                                           XP232430
                                3245  * IN THIS PART:                                                           XP232440
                                3246  * "LRA" IS EXECUTED AT EVERY EIGHTH ADR. IN X'0' THRU X'FFFFF'              XP232450
                                3247  * AFTER EACH OPERATION "R1" AND THE CONDITION CODE ARE CHECKED.             XP232460
                                3248  * CONDITION CODE= 0100 ( NOT PRESENT )                                      XP232470
                                3249  **                                                                           XP232480
002788  2410                    3250  S3P1.1    LIS   R1,0              INTIIALIZE R1                             XP232490
00278A  2450                    3251            LIS   R5,0              ZERO OUT R5                               XP232500
00278C  41F0 2BBA               3252            BAL   R15,RGNOP2        STORE # OF REGISTERS TO BE PRINTED        XP232510
002790  F830 0FF1 2300          3253            LI    R3,Y'0FF12300'    LOAD COPY OF SEG REG                      XP232520
002796  41F0 2B70               3254            BAL   R15,SETUP         SET UP COPY OF MAC REGISTERS              XP232530
00279A  0831                    3255  S3P1.3    LR    R3,R1             LOAD R1 INTO WORK REG                     XP232540
00279C  41F0 2BA6               3256            BAL   R15,DISPLAY       DISPLAY ADDRESS                           XP232550
0027A0  5010 3274               3257            ST    R1,BUFR3+4        STORE IN PRINT BUFFER                     XP232560
0027A4  5030 327C               3258            ST    R3,BUFR3+12       STORE IN PRINT BUFFER                     XP232570
0027A8  6310 3300               3259            LRA   R1,MACREG         LOAD REAL ADDRESS                         XP232580
0027AC  5010 3278               3260            ST    R1,BUFR3+8        STORE IN PRINT BUFFER                     XP232590
0027B0  95CC                    3261            EPSR  R12,R12           SAVE PSW                                  XP232600
0027B2  C4C0 000F               3262            NHI   R12,X'F'          MASK OFF CONDITION CODE                   XP232610
0027B6  40C0 3286               3263            STH   R12,BUFR3+22      STORE IN PRINT BUFFER                     XP232620
0027BA  27C4                    3264            SIS   R12,4             TEST CC FOR                               XP232630
0027BC  4230 27E2               3265  S3P1T1    BNZ   ER0301            DESIRED CONDITION (0100)                  XP232640
0027C0  58C0 3300               3266            L     R12,MACREG        LOAD COPY OF SEG REG                      XP232650
0027C4  50C0 3280               3267            ST    R12,BUFR3+16      STORE IN PRINT BUFFER                     XP232660
0027C8  0531                    3268            CLR   R3,R1             DOES EXPECTED=ACTUAL ADDRESS              XP232670
0027CA  213C                    3269  S3P1T2    BNES  ER0301            NO-GO TO ERROR                            XP232680
0027CC  CA50 0100               3270            AHI   R5,X'100'                                                   XP232690
0027D0  0815                    3271            LR    R1,R5             LOAD NEW VALUE INTO R1                    XP232700
0027D2  F550 0010 0000          3272            CLI   R5,Y'100000'      LIMIT YET                                 XP232710
0027D8  4230 279A               3273            BNE   S3P1.3            NO GO AGAIN                               XP232720
0027DC  4300 27E0               3274            B     S3P1END           DUMMY BRANCH                              XP232730
0027E0  2306                    3275  S3P1END   BS    S3P2              GOOD TEST GO TO NEXT SUBTEST              XP232740
0027E2  24D1                    3276  ER0301    LIS   R13,1             LOAD IN ERROR NUMBER                      XP232750
0027E4  D2D0 335E               3277            STB   R13,ERRNO         STORE ERROR NUMBER                        XP232760
0027E8  4300 2CF6               3278            B     ER9SP                                                       XP232770
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                0000 27EC              3279  S3P2     EQU   *                                                        XP232780
                                       3280  * THIS PART CHECKS "LRA" INSTRUCTION TO RETURN A NOT WRITABLE STATUS     XP232790
                                       3281  * R1= CONTAINS THE FIRST OPERAND.                                        XP232800
                                       3282  * MACREG= MAC REGISTER CONTAINS Y'0FF00070' (WRITE PROTECT BIT SET)      XP232810
                                       3283  *                                                                        XP232820
                                       3284  * IN THIS PART:                                                         XP232830
                                       3285  * "LRA" IS EXECUTED AT EVERY EIGHTH ADR. IN X'0' THRU X'FFFFF'           XP232840
                                       3286  * AFTER EACH OPERATION "R1" AND THE CONDITION CODE ARE CHECKED           XP232850
                                       3287  * CONDITION CODE= 0010 ( NOT WRITABLE )                                 XP232860
                                       3288  **                                                                       XP232870
  0027EC  2410                         3289  S3P2.1   LIS   R1,0              INITIALIZE R1                          XP232880
  0027EE  2460                         3290           LIS   R6,0              ZERO OUT R6                            XP232890
  0027F0  F830 0FF0 0070               3291           LI    R3,Y'0FF00070'    LOAD COPY OF SEG REG                   XP232900
  0027F6  41F0 2B70                    3292           BAL   R15,SETUP         SET UP COPY OF MAC REGISTERS           XP232910
  0027FA  5010 3274                    3293  S3P2.3   ST    R1,BUFR3+4        STORE IN PRINT BUFFER                  XP232920
  0027FE  41F0 2BA6                    3294           BAL   R15,DISPLAY       DISPLAY ADDRESS                        XP232930
  002802  5030 327C                    3295           ST    R3,BUFR3+12       STORE IN PRINT BUFFER                  XP232940
? 002806  6310 4000 3300               3296           LRA   R1,MACREG(0,0)    LOAD REAL ADDRESS INSTRUCTION          XP232950
  00280C  5010 3278                    3297           ST    R1,BUFR3+8        STORE IN PRINT BUFFER                  XP232960
  002810  95CC                         3298           EPSR  R12,R12           SAVE PSW                               XP232970
  002812  C4C0 000F                    3299           NHI   R12,X'F'          MASK OFF CONDITION CODE                XP232980
  002816  40C0 3286                    3300           STH   R12,BUFR3+22      STORE IN PRINT BUFFER                  XP232990
  00281A  27C2                         3301           SIS   R12,2             TEST CC FOR                            XP233000
  00281C  4230 2846                    3302  S3P2T1   BNZ   ER0302           DESIRED CONDITION ( 0010)              XP233010
  002820  58C0 3300                    3303           L     R12,MACREG        LOAD COPY OF MAC REGISTER              XP233020
  002824  50C0 3280                    3304           ST    R12,BUFR3+16      STORE IN PRINT BUFFER                  XP233030
  002828  41F0 2B88                    3305           BAL   R15,ADRCAL        CALCULATE REAL ADDRESS                 XP233040
  00282C  0531                         3306           CLR   R3,R1             COMPARE WITH LRA RESULT                XP233050
  00282E  213C                         3307  S3P2T2   BNES  ER0302           YES GO TO ERROR                        XP233060
  002830  CAC0 0100                    3308           AHI   R6,Y'100'                                                XP233070
  002834  0816                         3309           LR    R1,R6             LOAD R6 BACK INTO R1                   XP233080
  002836  F560 0010 0000               3310           CLI   R6,Y'100000'      LIMIT YET?                             XP233090
  00283C  4230 27FA                    3311           BNE   S3P2.3            NO GO AGAIN                            XP233100
  002840  4300 2844                    3312           B     S3P2END           DUMMY BRANCH                           XP233110
  002844  2306                         3313  S3P2END  BS    S3P3              GOOD TEST GO TO NEXT SUBTEST           XP233120
  002846  24D2                         3314  ER0302   LIS   R13,2             LOAD TEST NUMBER                       XP233130
  002848  D2D0 335E                    3315           STB   R13,ERRNO         STORE TEST NUMBER                      XP233140
  00284C  4300 2CF6                    3316           B     ER95P                                                    XP233150
          0000 2850                    3317  S3P3     EQU   *                                                        XP233160
                                       3318  * THIS PART CHECKS "LRA" INSTRUCTION, TRANSLATING EACH ADDRESS INTO    XP233170
                                       3319  * DIFFERENT MEMORY LOCATIONS RETURNING A NOT-WRITABLE CONDITION CODE.   XP233180
                                       3320  * R1= CONTAINS THE FIRST OPERAND                                        XP233190
                                       3321  * MACREG= MAC REGISTER CONTAINS Y'0FF24170' (WRITE PROTECT BIT SET)     XP233200
                                       3322  *                                                                        XP233210
                                       3323  * IN THIS PART:                                                         XP233220
                                       3324  * "LRA" IS EXECUTED AT EVERY EIGHTH ADR. IN X'0' THRU X'FFFFF'           XP233230
                                       3325  * AFTER EACH OPERATION "R1" AND THE CONDITION CODE IS CHECKED            XP233240
                                       3326  * CONDITION CODE= 0010 ( NOT WRITABLE )                                 XP233250
                                       3327  **                                                                       XP233260
  002850  2410                         3328  S3P3.1   LIS   R1,0              INITIALIZE R1                          XP233270
  002852  2460                         3329           LIS   R6,0              ZERO OUT R6                            XP233280
  002854  F830 0FF2 4170               3330           LI    R3,Y'0FF24170'    LOAD IN SEG REG                        XP233290
  00285A  41F0 2B70                    3331           BAL   R15,SETUP         SET UP COPY OF MAC REGISTERS           XP233300
  00285E  41F0 2BA6                    3332  S3P3.3   BAL   R15,DISPLAY       DISPLAY R1                             XP233310
  002862  41F0 2B88                    3333           BAL   R15,ADRCAL        CALCULATE EXPECTED REAL ADDRESS        XP233320
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002866  5010 3274            3334           ST    R1,BUFR3+4           STORE IN PRINT AREA                      XP233330
00286A  5030 327C            3335           ST    R3,BUFR3+12          STORE IN PRINT AREA                      XP233340
        0000 8A8E            3336 MACOFSET  EQU   MACREG-SIM+X'8000'   SET UP DISPLACEMENT VALUE                XP233350
00286E  6310                 3337           DC    X'6310',Z(MACOFSET)  SIMULATE LRA INSTRUC RX2 FORMAT         XP233360
002870  8A8E                 
002872  5010 3278            3338 SIM       ST    R1,BUFR3+8           STORE IN PRINT AREA                      XP233370
002876  95CC                 3339           EPSR  R12,R12              SAVE PSW                                 XP233380
002878  C4C0 000F            3340           NHI   R12,X'F'             MASK OFF CONDITION CODE                  XP233390
00287C  40C0 3286            3341           STH   R12,BUFR3+22         STORE IN PRINT BUFFER                    XP233400
002880  27C2                 3342           SIS   R12,2                TEST CC FOR                              XP233410
002882  4230 28A6            3343 S3P3T1    BNZ   ER0303               DESIRED CONDITION (0010)                 XP233420
002886  58C0 3300            3344           L     R12,MACREG           LOAD COPY OF SEG REG                     XP233430
00288A  50C0 3280            3345           ST    R12,BUFR3+16         STORE IN PRINT BUFFER                    XP233440
00288E  0531                 3346           CLR   R3,R1                IS R1 CORRECT                            XP233450
002890  213B                 3347 S3P3T2    BNES  ER0303               NO GOTO ERROR                            XP233460
002892  2668                 3348           AIS   R6,8                 INCREMENT                                XP233470
002894  0816                 3349           LR    R1,R6                STORE IN REG 1                           XP233480
002896  F560 0010 0000       3350           CLI   R6,Y'100000'         COMPARE TO LIMIT                         XP233490
00289C  4230 285E            3351           BNE   S3P3.3               NO GO AGAIN                              XP233500
0028A0  4300 28A4            3352           B     S3P3END              DUMMY BRANCH                             XP233510
0028A4  2306                 3353 S3P3END   BS    S3P4                 GOOD TEST GO TO NEXT SUBTEST             XP233520
0028A6  24D3                 3354 ER0303    LIS   R13,3                LOAD IN TEST NUMBER                      XP233530
0028A8  D2D0 335E            3355           STB   R13,ERRNO            STORE ERROR NUMBER                       XP233540
0028AC  4300 2CF6            3356           B     ER9SP                                                         XP233550
        0000 28B0            3357 S3P4      EQU   *                                                             XP233560
                             3358 * THIS PART CHECKS "LRA" INSTRUCTION WITH NO TRANSLATION AND RETURNING        XP233570
                             3359 * A NOT EXECUTABLE CONDITION CODE.                                            XP233580
                             3360 * R1= CONTAINS THE FIRST OPERAND.                                             XP233590
                             3361 * MACREG= MAC REGISTER CONTAINS Y'0FF00090' (EXECUTE PROTECT BIT SET)          XP233600
                             3362 *                                                                             XP233610
                             3363 * IN THIS PART:                                                              XP233620
                             3364 * "LRA" IS EXECUTED AT EVERY EIGHTH ADR. IN X'0' THRU X'FFFFF'              XP233630
                             3365 * AFTER EACH OPERATION "R1" AND THE CONDITION CODE IS CHECKED.              XP233640
                             3366 * CONDITION CODE = 0001 (NOT EXECUTABLE)                                    XP233650
                             3367 **                                                                            XP233660
0028B0  2410                 3368 S3P4.1    LIS   R1,0                 ZERO OUT R1                              XP233670
0028B2  2460                 3369           LIS   R6,0                 ZERO OUT R6                              XP233680
0028B4  F830 0FF0 0090       3370           LI    R3,Y'0FF00090'       LOAD SEGMENTATION REGISTER               XP233690
0028BA  41F0 2B70            3371           BAL   R15,SETUP            SET UP COPY OF MAC REGISTERS             XP233700
0028BE  5010 3274            3372 S3P4.3    ST    R1,BUFR3+4           STORE IN PRINT AREA                      XP233710
0028C2  41F0 2BA6            3373           BAL   R15,DISPLAY          DISPLAY ADDRESS                          XP233720
0028C6  5010 3274            3374           ST    R1,BUFR3+4           STORE IN PRINT AREA                      XP233730
0028CA  5030 327C            3375           ST    R3,BUFR3+12          STORE IN PRINT AREA                      XP233740
0028CE  6310 3300            3376           LRA   R1,MACREG            LOAD REAL ADDRESS                        XP233750
0028D2  5010 3278            3377           ST    R1,BUFR3+8           STORE IN PRINT AREA                      XP233760
0028D6  95CC                 3378           EPSR  R12,R12              SAVE PSW                                 XP233770
0028D8  C4C0 000F            3379           NHI   R12,X'F'             MASK OFF CONDITION CODE                  XP233780
0028DC  40C0 3286            3380           STH   R12,BUFR3+22         STORE IN PRINT BUFFER                    XP233790
0028E0  27C1                 3381           SIS   R12,1                TEST CC FOR                              XP233800
0028E2  4230 290C            3382 S3P4T1    BNZ   ER0304               DESIRED CONDITION (0001)                 XP233810
0028E6  58C0 3300            3383           L     R12,MACREG           LOAD COPY OF SEG REG                     XP233820
0028EA  50C0 3280            3384           ST    R12,BUFR3+16         STORE IN PRINT BUFFER                    XP233830
0028EE  41F0 2B88            3385           BAL   R15,ADRCAL           CALCULATE REAL ADDRESS                   XP233840
0028F2  0531                 3386           CLR   R3,R1                DOES REAL = ACTUAL                       XP233850
0028F4  213C                 3387 S3P4T2    BNES  ER0304               NO GO TO ERROR                           XP233860
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0028F6  CA60 0100          3388           AHI   R6,X'100'                                          XP233870
0028FA  0816               3389           LR    R1,R6              STORE BACK IN R1                XP233880
0028FC  F560 0010 0000     3390           CLI   R6,Y'100000'       LIMIT YET                       XP233890
002902  4230 28BE          3391           BNE   S3P4.3             NO GO AGAIN                     XP233900
002906  4300 290A          3392           B     S3P4END            DUMMY BRANCH                    XP233910
00290A  2306               3393  S3P4END  BS    S3P5               GOOD TEST GO TO NEXT SUBTEST    XP233920
00290C  24D4               3394  ER0304   LIS   R13,4                                             XP233930
00290E  D2D0 335E          3395           STB   R13,ERRNO                                         XP233940
002912  4300 2CF6          3396           B     ER9SP                                             XP233950
        0000 2916          3397  S3P5     EQU   *                                                 XP233960
                           3398  * THIS PART CHECKS "LRA" INSTRUCTION TRANSLATING EACH ADDRESS INTO      XP233970
                           3399  * DIFFERENT MEMORY LOCATIONS RETURNING A NOT EXECUTABLE CONDITION CODE  XP233980
                           3400  * R1= CONTAINS THE FIRST OPERAND                                   XP233990
                           3401  * MACREG= MAC REGISTER CONTAINS Y'0FF31290' (EXECUTE PROTECT BIT SET)  XP234000
                           3402  *                                                                  XP234010
                           3403  * IN THIS PART:                                                    XP234020
                           3404  * "LRA" IS EXECUTED AT EVERY EIGHTH ADR. IN X'0' THRU X'FFFFF'     XP234030
                           3405  * AFTER EACH OPERATION "R1" AND THE CONDITION CODE IS CHECKED      XP234040
                           3406  * CONDITION CODE = 0001 (NOT EXECUTABLE)                          XP234050
                           3407  **                                                                 XP234060
002916  2410               3408  S3P5.1   LIS   R1,0               ZERO OUT R1                     XP234070
002918  2460               3409           LIS   R6,0               ZERO OUT R6                     XP234080
00291A  F830 0FF3 1290     3410           LI    R3,Y'0FF31290'     LOAD COPY OF SEG REGISTER       XP234090
002920  41F0 2B70          3411           BAL   R15,SETUP          SET UP COPY OF MAC REGISTERS    XP234100
002924  41F0 2B88          3412  S3P5.3   BAL   R15,ADRCAL         CALCULATE ADDRESS               XP234110
002928  41F0 2BA6          3413           BAL   R15,DISPLAY        DISPLAY ADDRESS                 XP234120
00292C  5010 3274          3414           ST    R1,BUFR3+4         STORE IN PRINT BUFFER           XP234130
002930  5030 327C          3415           ST    R3,BUFR3+12        STORE IN PRINT BUFFER           XP234140
002934  6310 3300          3416           LRA   R1,MACREG          LOAD REAL ADDRESS               XP234150
002938  5010 3278          3417           ST    R1,BUFR3+8         STORE IN PRINT BUFFER           XP234160
00293C  95CC               3418           EPSR  R12,R12            SAVE PSW                        XP234170
00293E  C4C0 000F          3419           NHI   R12,X'F'           MASK OFF CONDITION CODE         XP234180
002942  40C0 3286          3420           STH   R12,BUFR3+22       STORE IN PRINT BUFFER           XP234190
002946  27C1               3421           SIS   R12,1              TEST CC FOR                     XP234200
002948  4230 296C          3422  S3P5T1   BNZ   ER0305             DESIRED CONDITION (0001)        XP234210
00294C  58C0 3300          3423           L     R12,MACREG         LOAD COPY OF SEG REG            XP234220
002950  50C0 3280          3424           ST    R12,BUFR3+16       STORE IN PRINT BUFFER           XP234230
002954  0531               3425           CLR   R3,R1              DOES EXPECTED = ACTUAL ADDRESS  XP234240
002956  213B               3426  S3P5T2   BNES  ER0305             NO GO TO ERROR                  XP234250
002958  2668               3427           AIS   R6,8               INCREMENT BY 8                  XP234260
00295A  0816               3428           LR    R1,R6              STORE BACK IN R1                XP234270
00295C  F560 0010 0000     3429           CLI   R6,Y'100000'       LIMIT YET                       XP234280
002962  4230 2924          3430           BNE   S3P5.3             NO GO AGAIN                     XP234290
002966  43C0 296A          3431           B     S3P5END            DUMMY BRANCH                    XP234300
00296A  2306               3432  S3P5END  BS    S3P6                                              XP234310
00296C  24D5               3433  ER0305   LIS   R13,5                                             XP234320
00296E  D2D0 335E          3434           STB   R13,ERRNO                                         XP234330
002972  4300 2CF6          3435           B     ER9SP                                             XP234340
        0000 2976          3436  S3P6     EQU   *                                                 XP234350
                           3437  * THIS PART CHECKS "LRA" INSTRUCTION TO RETURN A LIMIT VIOLATION  XP234360
                           3438  * CONDITION CODE.                                                 XP234370
                           3439  * R1= CONTAINS THE FIRST OPERAND                                  XP234380
                           3440  * MACREG= MAC REGISTERS CONTAIN Y'00056700'(NOT PRESENT)(LIMIT FIELD=0)  XP234390
                           3441  *                                                                 XP234400
                           3442  * IN THIS PART:                                                   XP234410
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002976  F810 0000 0100  3447  S3P6.1   LI    R1,Y'00100'          STARTING ADDRESS VALUE                XP234460
00297C  0861            3448           LR    R6,R1                LOAD R1 INTO WORK REGISTER            XP234470
00297E  F830 0005 6700  3449           LI    R3,Y'00056700'       LOAD SIMULATED MAC REG                XP234480
                        3450  * NOTE: IN THE COPY OF THE MAC REGISTER THE BUFFER LIMIT IS 00              XP234490
                        3451  * SO FOR EVERY ADDRESS IN THE FORM YXXYY WHERE X IS ANY INTEGER EXCEPT      XP234500
                        3452  * ZERO AND Y IS ANY INTEGER  CAUSES A LIMIT VIOLATION.                      XP234510
002984  41F0 2B70       3453           BAL   R15,SETUP            SET UP COPY OF MAC REGISTERS          XP234520
002988  0851            3454  S3P6.3   LR    R5,R1                SAVE R1                               XP234530
00298A  41F0 2BA6       3455           BAL   R15,DISPLAY          DISPLAY ADDRESS                       XP234540
00298E  5010 3274       3456           ST    R1,BUFR3+4           STORE IN PRINT BUFFER                 XP234550
002992  5030 327C       3457           ST    R3,BUFR3+12          STORE IN PRINT BUFFER                 XP234560
002996  6310 3300       3458           LRA   R1,MACREG            LOAD REAL ADDRESS                     XP234570
00299A  5010 3278       3459           ST    R1,BUFR3+8           STORE IN PRINT BUFFER                 XP234580
00299E  95CC            3460           EPSR  R12,R12              SAVE PSW                              XP234590
0029A0  C4C0 000F       3461           NHI   R12,X'F'             MASK OFF CONDITION CODE               XP234600
0029A4  40C0 3286       3462           STH   R12,BUFR3+22         STORE IN PRINT BUFFER                 XP234610
0029A8  27C8            3463           SIS   R12,8                TEST CC FOR                           XP234620
0029AA  4230 29EA       3464  S3P6T1   BNZ   ER0906               DESIRED CONDITION CODE (1000)         XP234630
0029AE  58C0 3300       3465           L     R12,MACREG           LOAD COPY OF SEG REGISTER             XP234640
0029B2  50C0 3280       3466           ST    R12,BUFR3+16         STORE IN PRINT BUFFER                 XP234650
0029B6  0551            3467           CLR   R5,R1                DID R1 CHANGE                         XP234660
0029B8  4230 29EA       3468  S3P6T2   BNE   ER0906               YES GO TO ERROR                       XP234670
0029BC  2668            3469           AIS   R6,8                 INCREMENT VALUE                       XP234680
0029BE  0816            3470           LR    R1,R6                UPDATE R1                             XP234690
0029C0  F360 0000 FF00  3471           TI    R6,Y'FF00'           TEST FOR LIMIT IN XX FIELD            XP234700
0029C6  4230 2988       3472           BNZ   S3P6.3               GO AGAIN                              XP234710
0029CA  F360 0010 0000  3473           TI    R6,Y'100000'         TEST FOR ADDRESS WRAP                 XP234720
0029D0  2136            3474           BNZS  S3P6.4               NO FINISH UP                          XP234730
0029D2  C660 0100       3475           OHI   R6,X'100'            ADD IN SPECIAL INCREMENT              XP234740
0029D6  0816            3476           LR    R1,R6                UPDATE R1                             XP234750
0029D8  4300 2988       3477           B     S3P6.3               BRANCH AND GO AGAIN                   XP234760
        0000 29DC       3478  S3P6.4   EQU   *                                                          XP234770
0029DC  2480            3479           LIS   R8,0                                                       XP234780
0029DE  41F0 2BA6       3480           BAL   R15,DISPLAY                                                XP234790
0029E2  4300 29E6       3481           B     S3P6END                                                    XP234800
0029E6  4300 2CE2       3482  S3P6END  B     NOERR                                                      XP234810
0029EA  24D6            3483  ER0906   LIS   R13,6                 LOAD ERROR NUMBER                     XP234820
0029EC  D2D0 335E       3484           STB   R13,ERRNO                                                  XP234830
0029F0  4300 2CF6       3485           B     ER9SP                                                      XP234840
                        3486  ************************************************************              XP234850
                        3487  *                                                                         XP234860
                        3488  *                                                                         XP234870
                        3489  **       SUBROUTINES USED IN S32PT2                                       XP234880
                        3490  *                                                                         XP234890
                        3491  *                                                                         XP234900
                        3492  ************************************************************************  XP234910
                        3493  * SUBROUTINE CONVR8 UNPACKS REG0 FROM HEX TO ASCII                        XP234920
                        3494  * TOTAL 8 BYTES ARE STORED IN MEMORY LOCATIONS 0,7(R3)                     XP234930
                        3495  *                                                                         XP234940
                        3496  * SUBROUTINE CONV4 UNPACKS REG0 FROM HEX TO ASCII                         XP234950
                        3497  * TOTAL 4 BYTES ARE STORED IN MEMORY LOCATIONS 0,3(R3)                     XP234960
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                        3498  *                                                                      XP234970
                        3499  * SUBROUTINE CONVR2 UNPACKS REG0 FROM HEX TO ASCII                     XP234980
                        3500  * TOTAL 2 BYTES ARE STORED IN MEMORY LOCATIONS 0,1(R3)                 XP234990
                        3501  *                                                                      XP235000
0029F4  2631            3502  CONVR2   AIS   R3,1                                                    XP235010
0029F6  2442            3503           LIS   R4,2                                                    XP235020
0029F8  2306            3504           BS    CONVR                                                   XP235030
0029FA  2633            3505  CONVR4   AIS   R3,3                                                    XP235040
0029FC  2444            3506           LIS   R4,4                                                    XP235050
0029FE  2303            3507           BS    CONVR                                                   XP235060
002A00  2637            3508  CONVR8   AIS   R3,7                                                    XP235070
002A02  2448            3509           LIS   R4,8                                                    XP235080
002A04  0850            3510  CONVR    LR    R5,R0                                                   XP235090
002A06  C450 000F       3511           NHI   R5,X'F'          MASK UNWANTED BITS                     XP235100
002A0A  CA50 0030       3512           AHI   R5,X'30'                                                XP235110
002A0E  C550 003A       3513           CLHI  R5,X'3A'         IF .LT. 30, NO. = 1 - 9                XP235120
002A12  2182            3514           BLS   CONV1                                                   XP235130
002A14  2657            3515           AIS   R5,7             ELSE NO. = A - F                       XP235140
002A16  D253 0000       3516  CONV1    STB   R5,0(R3)                                                XP235150
002A1A  1004            3517           SRLS  R0,4             GET NEXT BYTE                          XP235160
002A1C  2741            3518           SIS   R4,1                                                    XP235170
002A1E  033E            3519           BZR   R14              RETURN ON R14                          XP235180
002A20  2731            3520           SIS   R3,1                                                    XP235190
002A22  220F            3521           BS    CONVR                                                   XP235200
                        3522  *                                                                      XP235210
                        3523  ************************************************************************XP235220
                        3524  ** THIS SUBROUTINE CHANGES MACHINE MODE FROM HW  TO  FW                XP235230
                        3525  ** IT USES ILLEGAL INSTRUCTION TRAP. RETURN ON REG.14                  XP235240
002A24  2400            3526  HWTOFW   LIS   R0,0                                                    XP235250
002A26  95D0            3527           EPSR  R13,R0           [illegible]                            XP235260
002A28  D1C0 0030       3528           LM    R12,X'30'        STORE LOC.X'30' THRU X'37'             XP235270
002A2C  D0C0 3270       3529           STM   R12,BUFR3                                               XP235280
002A30  24C0            3530           LIS   R12,0            SET UP NEW ILG.INSTR.TRAP              XP235290
002A32  24D0            3531           LIS   R13,0                                                   XP235300
002A34  24F0            3532           LIS   R14,0            NEW PSW = FW MODE,REG.SET 0            XP235310
002A36  C8F0 2A40       3533           LHI   R15,HWTOF2                                              XP235320
002A3A  D0C0 0030       3534           STM   R12,X'30'                                               XP235330
002A3E  0000            3535           DC    X'0'                                                    XP235340
002A40  D1F0 3270       3536  HWTOF2   LM    R14,BUFR3        FW MODE                                XP235350
002A44  D0F0 0030       3537           STM   R14,X'30'        RESTORE OLD TRAP FOR ILG.INSTR.        XP235360
002A48  C800 00F0       3538           LHI   R0,X'F0'         SEL REG SET F                          XP235370
002A4C  9510            3539           EPSR  R1,R0                                                   XP235380
002A4E  030E            3540           BR    R14              RETURN ON REG. 14 OF SET F             XP235390
                        3541  *                                                                      XP235400
                        3542  ************************************************************************XP235410
002A50  C8C0 3150       3543  PRMSG4   LHI   R12,T1MSG                                              XP235420
002A54  C8D0 316C       3544           LHI   R13,T1MSGEND                                            XP235430
002A58  23CA            3545           BS    WBMSG                                                   XP235440
                        3546  *                                                                      XP235450
002A5A  C8C0 30C6       3547  CRLF     LHI   R12,CRLFM                                               XP235460
002A5E  C8D0 30C9       3548           LHI   R13,CRLFM+3      WRITE CR, LF, &NULL                    XP235470
002A62  23C5            3549           BS    WBMSG                                                   XP235480
                        3550  *                                                                      XP235490
002A64  C8C0 3120       3551  PRBRK    LHI   R12,MSG1                                                XP235500
002A68  C8D0 312E       3552           LHI   R13,MSG1Z                                               XP235510
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                                3553 ********************************************************************************  XP235520
                                3554 WBMSG     LB     R2,OUTDEV                                                      XP235530
002A6C  D320 3358               3555           LH     R3,CRTFLG          CRT ?                                       XP235540
002A70  4830 3356               3556           BZS    WBMSG1             NO FIRSTCMD FOR TTY                         XP235550
002A74  2333                    3557           OC     R2,FIRSTCMD                                                    XP235560
002A76  DE20 3352               3558 WBMSG1    OC     R2,OUTCMD                                                      XP235570
002A7A  DE20 335A               3559           SSR    R2,R3                                                          XP235580
002A7E  9D23                    3560           BTBS   9,1                                                            XP235590
002A80  2091                    3561           WD     R2,NULL                                                        XP235600
002A82  DA20 316C               3562 PRWT1     SSR    R2,R3                                                          XP235610
002A86  9D23                    3563           BTBS   9,1                                                            XP235620
002A88  2091                    3564           LB     R15,0(R12)                                                     XP235630
002A8A  D3FC 0000               3565           WDR    R2,R15                                                         XP235640
002A8E  9A2F                    3566           AIS    R12,1                                                          XP235650
002A90  26C1                    3567           CLR    R13,R12                                                        XP235660
002A92  05DC                    3568           BNL    PRWT1                                                          XP235670
002A94  4380 2A86               3569 PRWT2     SSR    R2,R3                                                          XP235680
002A98  9D23                    3570           BTBS   9,1                                                            XP235690
002A9A  2081                    3571           BR     R14                                                            XP235700
002A9C  030E                    3572 ************************************************************                  XP235710
                                3573 WRITE1    LB     R2,OUTDEV                                                      XP235720
002A9E  D320 3358               3574           LHL    R3,CRTFLG                                                      XP235730
002AA2  7330 3356               3575           BZS    WRITE1A                                                        XP235740
002AA6  2333                    3576           OC     R2,FIRSTCMD                                                    XP235750
002AA8  DE20 3352               3577 WRITE1A   OC     R2,OUTCMD                                                      XP235760
002AAC  DE20 335A               3578           SSR    R2,R3                                                          XP235770
002AB0  9D23                    3579           BTCR   1,R14                                                          XP235780
002AB2  021E                    3580           BTBS   8,2                                                            XP235790
002AB4  2082                    3581           WD     R2,NULL            NULL CHAR TO SETTLE LINE                    XP235800
002AB6  DA20 316C               3582           SSR    R2,R3                                                          XP235810
002ABA  9D23                    3583           BTBS   8,1                                                            XP235820
002ABC  2081                    3584           WDR    R2,R0                                                          XP235830
002ABE  9A20                    3585           SSR    R2,R3                                                          XP235840
002AC0  9D23                    3586           BTBS   8,1                                                            XP235850
002AC2  2081                    3587           BR     R14                                                            XP235860
002AC4  030E                    3588 *                                                                               XP235870
                                3589 *                                                                               XP235880
                                3590 ********************@*****************************************                 XP235890
                                3591 GETPRIO   LA     R12,PLEVMSG                                                    XP235900
002AC6  E6C0 3182               3592           LA     R13,PLEVMSZ                                                    XP235910
002ACA  E6D0 3196               3593 GETPRIO2  BAL    R14,WBMSG          'TTY PRIOR LEV'                             XP235920
002ACE  41E0 2A6C               3594           LA     R12,PLEVQ                                                      XP235930
002AD2  E6C0 317E               3595           BAL    R14,READASC                                                    XP235940
002AD6  41E0 2B30               3596           SHI    R4,X'30'                                                       XP235950
002ADA  CB40 0030               3597           BM     GETPRIO2           MUST BE NON-NEGATIVE                        XP235960
002ADE  4210 2ACE               3598           CLHI   R4,4               AND LESS THAN 4.                            XP235970
002AE2  C540 0004               3599           BNL    GETPRIO2                                                       XP235980
002AE6  4380 2ACE               3600           SLLS   R4,4                                                           XP235990
002AEA  1144                    3601           STB    R4,PRILEV+1                                                    XP236000
002AEC  D240 335D               3602           BAL    R14,CRLF                                                       XP236010
002AF0  41E0 2A5A               3603           BR     R10                RETURN                                      XP236020
002AF4  030A                    3604 ************************************************************                  XP236030
                                3605 GETREGS   LA     R12,REGMSG                                                     XP236040
002AF6  E6C0 31CB               3606           LA     R13,REGMSZ                                                     XP236050
002AFA  E6D0 31E2               3607 GETREGS2  BAL    R14,WBMSG          'REG SETS AVAIL'                            XP236060
002AFE  41E0 2A6C
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002B02  E6C0 3198          3608          LA    R12,REGMQ                                          XP236070
002B06  41E0 2B30          3609          BAL   R14,READASC                                        XP236080
002B0A  CB40 0030          3610          SHI   R4,X'30'                                           XP236090
002B0E  C540 0002          3611          CLHI  R4,2                                               XP236100
002B12  2336               3612          BES   GTREG                                              XP236110
002B14  C540 0008          3613          CLHI  R4,8                                               XP236120
002B18  2333               3614          BES   GTREG                                              XP236130
002B1A  4300 2AFE          3615          B     GETREGS2          ERROR                            XP236140
002B1E  C850 0040          3616  GTREG   LHI   R5,X'40'                                          XP236150
002B22  2742               3617          SIS   R4,2                                               XP236160
002B24  1C44               3618          MR    R4,R4                                              XP236170
002B26  4050 3360          3619          STH   R5,REGBYT         REG STORAGE BYTE ADJUST          XP236180
002B2A  41E0 2A5A          3620          BAL   R14,CRLF                                           XP236190
002B2E  030A               3621          BR    R10               RETURN                           XP236200
                           3622  * ********************************************************************** XP236210
                           3623  *  SUBROUTINE READASC GETS UP TO 4 BYTES OF DATA FROM TTY, LESS PARITY. XP236220
                           3624  *  CALLING SEQ - BAL R14,READASC                                   XP236230
                           3625  * ERROR RETURN - THROUGH READ1 ON R14                              XP236240
                           3626  ********************************************************************** XP236250
002B30  2440               3627  READASC LIS   R4,0                                               XP236260
002B32  2410               3628          LIS   R1,0              ACKNOWLEDGED KEY COUNTER         XP236270
002B34  41F0 2B48          3629  ASKEY1  BAL   R15,READ1         GO GET DATA FROM TTY             XP236280
002B38  C500 000D          3630          CLHI  R0,13             CARRIAGE RETURN ?                XP236290
002B3C  033E               3631          BER   R14               YES. RETURN.                     XP236300
002B3E  1148               3632  ASKOK   SLLS  R4,8                                               XP236310
002B40  0640               3633          OR    R4,R0             APPEND CURRENT DATA BYTE         XP236320
002B42  2611               3634          AIS   R1,1              INCREMENT KEY COUNTER            XP236330
002B44  4300 2B34          3635          B     ASKEY1                                             XP236340
                           3636  ********************************************************************** XP236350
                           3637  *  SUBROUTINE READ1 GETS 1 KEY FROM TTY LESS PARITY BIT            XP236360
                           3638  *  CALLING SEQ - BAL R15,READ1                                     XP236370
                           3639  *  ERROR RETN - R14                                                XP236380
                           3640  *  R0 = 1 KEY FROM TTY LESS PARITY BIT.                            XP236390
                           3641  ********************************************************************** XP236400
002B48  D320 3359          3642  READ1   LB    R2,INDEV                                           XP236410
002B4C  4800 3356          3643          LH    R0,CRTFLG                                          XP236420
002B50  2333               3644          BES   RD1A                                               XP236430
002B52  DE20 3352          3645          OC    R2,FIRSTCMD                                        XP236440
002B56  DE20 335B          3646  RD1A    OC    R2,INCMD                                           XP236450
002B5A  9B20               3647          RDR   R2,R0                                              XP236460
002B5C  9D23               3648          SSR   R2,R3                                              XP236470
002B5E  021E               3649          BTCR  1,R14             DEVICE UNAVAILABLE.              XP236480
002B60  2082               3650          BTBS  8,2               BUSY ONLY.                       XP236490
002B62  C530 0004          3651          CLHI  R3,4              FALSE SYNC ?                     XP236500
002B66  033E               3652          BER   R14               YES. NO INTERFACE PRESENT        XP236510
002B68  9B20               3653          RDR   R2,R0             GET DATA BYTE.                   XP236520
002B6A  C400 007F          3654          NHI   R0,X'7F'          STRIP PARITY BIT                 XP236530
002B6E  030F               3655          BR    R15               RETURN TO CALLER.                XP236540
                           3656  ********************************************************************** XP236550
                           3657  ** THIS SUBROUTINE FILLS UP A BUFFER OF 16 FULLWORDS                XP236560
                           3658  **  WITH A COPY OF THE MACREGISTERS TO BE USED                       XP236570
002B70  D390 334C          3659  SETUP   LB    R9,DISINC                                          XP236580
002B74  D3A0 334D          3660          LB    R10,DISNORM                                        XP236590
002B78  0722               3661          XR    R2,R2             ZERO OUT REGISTER 2              XP236600
002B7A  5032 3300          3662  SETUP.1 ST    R3,MACREG(R2)     STORE THE COPY INTO BUFFER       XP236610
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002B7E  2624              3663          AIS   R2,4              INCREMENT COUNTER                    XP236620
002B80  C520 0040         3664          CLHI  R2,X'40'          16 ENTRIES YET ?                     XP236630
002B84  2085              3665          BLS   SETUP.1           NO  GO AGAIN                         XP236640
002B86  030F              3666          BR    R15               RETURN                               XP236650
                          3667  ************************************************************         XP236660
                          3668  **THIS SUBROUTINE CALCULATES THE EXPECTED PHYSICAL ADDRESS           XP236670
                          3669  * PLACES IT IN R3 AND RETURNS ON R15                                 XP236680
                          3670  *                                                                    XP236690
002B88  3451              3671  ADRCAL  EXHR  R5,R1             SWITCH REGISTER AROUND               XP236700
002B8A  C450 000F         3672          NHI   R5,X'0F'          MASK OFF LAST DIGIT                  XP236710
002B8E  1152              3673          SLLS  R5,2              CORRECT INDEX FACTOR                 XP236720
002B90  0831              3674          LR    R3,R1             LOAD IN ADDRESS REGISTER             XP236730
002B92  F430 0000 FFFF    3675          NI    R3,Y'0000FFFF'    MASK OF ADDRESS                      XP236740
002B98  5845 3300         3676          L     R4,MACREG(R5)     LOAD IN CORRECT SEGMENTATION REG     XP236750
002B9C  F440 000F FF00    3677          NI    R4,Y'000FFF00'    MASK OFF SEGMENT RELOCAT FIELD       XP236760
002BA2  0A34              3678          AR    R3,R4             ADD ADDRESSES                        XP236770
002BA4  030F              3679          BR    R15               RETURN                               XP236780
                          3680  ************************************************************         XP236790
                          3681  * THIS SUBROUTINE DISPLAYS THE ADDRESS IN REGISTER ONE                XP236800
                          3682  *                                                                    XP236810
002BA6  2471              3683  DISPLAY LIS   R7,1              LOAD 1 INTO REGISTER 7               XP236820
002BA8  9E79              3684          OCR   R7,R9             INCREMENTAL MODE                     XP236830
002BAA  9481              3685          EXBR  R8,R1                                                  XP236840
002BAC  9878              3686          WHR   R7,R8             WRITE LOWER HALFWORD                 XP236850
002BAE  3411              3687          EXHR  R1,R1                                                  XP236860
002BB0  9481              3688          EXBR  R8,R1                                                  XP236870
002BB2  9878              3689          WHR   R7,R8             WRITE UPPER HALFWORD                 XP236880
002BB4  3411              3690          EXHR  R1,R1                                                  XP236890
002BB6  9E7A              3691          OCR   R7,R10            NORMAL MODE                          XP236900
002BB8  030F              3692          BR    R15               RETURN                               XP236910
                          3693  ************************************************************         XP236920
                          3694  *  THIS SUBROUTINE SETS UP THE ERROR MESSAGE PRINTOUT BUFFER          XP236930
                          3695  *  AND THE # OF REGISTERS TO BE PRINTED OUT                          XP236940
                          3696  *   THE RETURN REGISTER IS R15                                       XP236950
                                                                                                       XP236960
002BBA  C8C0 2BEC         3697  RGNOP2  LHI   R12,PT2                                                XP236970
002BBE  34CC              3698          EXHR  R12,R12           PLACE IN HIGH ORDER POSITION         XP236980
002BC0  C6C0 000A         3699          OHI   R12,X'A'                                               XP236990
002BC4  50C0 3270         3700  RGNOPF  ST    R12,BUFR3         STORE IN BUFFER                      XP237000
002BC8  24C0              3701          LIS   R12,0             ZERO OUT R12                         XP237010
002BCA  50C0 3274         3702          ST    R12,BUFR3+4       ZERO OUT BUFFER                      XP237020
002BCE  50C0 3278         3703          ST    R12,BUFR3+8       POSITIONS 4-32                       XP237030
002BD2  50C0 327C         3704          ST    R12,BUFR3+12      (8 FULLWORDS)                        XP237040
002BD6  50C0 3280         3705          ST    R12,BUFR3+16                                           XP237050
002BDA  50C0 3284         3706          ST    R12,BUFR3+20                                           XP237060
002BDE  50C0 3288         3707          ST    R12,BUFR3+24                                           XP237070
002BE2  50C0 328C         3708          ST    R12,BUFR3+28                                           XP237080
002BE6  50C0 3290         3709          ST    R12,BUFR3+32                                           XP237090
002BEA  030F              3710          BR    R15               RETURN                               XP237100
                          3711  ************************************************************         XP237110
                          3712  *   THIS SUBROUTINE SETS UP THE ERROR MESSAGE'S PRINTOUT LIMITS       XP237120
                          3713  *  THE RETURN REGISTER IS R11                                        XP237130
002BEC  E6C0 319C         3714  PT2     LA    R12,PT2.1         LOAD START OF MESSAGE                XP237140
002BF0  E6D0 31CA         3715          LA    R13,PT2.2         LOAD END OF MESSAGE                  XP237150
002BF4  41E0 2A6C         3716          BAL   R14,WBMSG         PRINT MESSAGE                        XP237160
002BF8  030B              3717          BR    R11               RETURN                               XP237170
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                        3718  **  ERROR ROUTINES FOR ANY SPURIOUS INTERRUPTS DETECTED                    XP237170
                        3719  *                                                                          XP237180
                        3720  *  ************************************************************************ XP237190
                        3721  *                                                                          XP237200
002BFA  24E1            3722  ARTFLT  LIS   R11,1             ARITHMETIC FAULT INTERRUPT               XP237210
002BFC  2309            3723          BS    ERRF6                                                      XP237220
002BFE  24E2            3724  ILGINT  LIS   R11,2             ILLEGAL INSTRUCTION INTERRUPT            XP237230
002C00  2307            3725          BS    ERRF6                                                      XP237240
002C02  9500            3726  MALFTN  EPSR  R0,R0                                                      XP237250
002C04  24E3            3727          LIS   R11,3                                                      XP237260
002C06  2304            3728          BS    ERRF6                                                      XP237270
002C08  24E5            3729  MACINT  LIS   R11,5             MEM.ACCESS CONTROL.INTRPT.               XP237280
002C0A  2302            3730          BS    ERRF6                                                      XP237290
002C0C  24E6            3731  CHANIO  LIS   R11,6                                                      XP237300
002C0E  2306            3732  ERRF6   BS    ERRINT                                                     XP237310
002C10  24E4            3733  XINTHW  LIS   R11,4             HALFWORD MODE EXT INT ERROR              XP237320
002C12  2304            3734          BS    ERRINT                                                     XP237330
002C14  24E7            3735  SVCERR  LIS   R11,7             SVC CALL ERROR                           XP237340
002C16  2302            3736          BS    ERRINT                                                     XP237350
002C18  24E8            3737  DEVERR  LIS   R11,8             I/O DEVICE ERROR                         XP237360
                        3738  *                                                                        XP237370
                        3739  *                                                                        XP237380
002C1A  C6B0 00F0       3740  ERRINT  OHI   R11,X'F0'         ERROR TTF1 TO TTF8                       XP237390
002C1E  D2B0 335E       3741          STB   R11,ERRNO                                                  XP237400
002C22  D000 338C       3742          STM   R0,REG0           STORE REG SET 0                          XP237410
002C26  2450            3743          LIS   R5,0                                                       XP237420
002C28  5050 3270       3744          ST    R5,BUFR3          SUPPRESS REG PRINTOUT                    XP237430
002C2C  956B            3745          EPSR  R6,R11            SEL REG SET F                            XP237440
002C2E  D000 33CC       3746          STM   R0,REG10          STORE REG SET F (USER SET)               XP237450
002C32  2411            3747  ERRINT1 LIS   R1,1                                                       XP237460
002C34  C820 0040       3748          LHI   R2,X'40'                                                   XP237470
002C38  9E12            3749          OCR   R1,R2                                                      XP237480
002C3A  4830 335E       3750          LH    R3,ERRNO                                                   XP237490
002C3E  9813            3751          WHR   R1,R3                                                      XP237500
002C40  D810 3228       3752          WH    R1,BUFR0                                                   XP237510
002C44  D810 3228       3753          WH    R1,BUFR0                                                   XP237520
002C48  F870 0000 8000  3754          LI    R7,Y'8000'                                                 XP237530
002C4E  9567            3755          EPSR  R6,R7             WAIT                                     XP237540
002C50  4300 2C58       3756          B     ERRORB            WRITE ERROR MESSAGE                      XP237550
                        3757  *                                                                        XP237560
                        3758  *                                                                        XP237570
                        3759  *                                                                        XP237580
                        3760  *                                                                        XP237590
                        3761  ********************************************************                 XP237600
        0000 2C54       3762  ERROR   EQU   *                                                          XP237610
002C54  D2D0 335E       3763          STB   TOT,ERRNO           TOT = ERR. NO IN SUBTEST 4             XP237620
                        3764  **      IN ALL THE TESTS OTHER THAN #4, ERRNO IS STORED.                  XP237630
002C58  E6A0 2C84       3765  ERRORB  LA    R10,PRNTRR          LOCAL RETURN                           XP237640
002C5C  2411            3766  ERRB    LIS   R1,1                PANEL ADDRESS                          XP237650
002C5E  4800 335E       3767          LH    R0,ERRNO                                                   XP237660
002C62  C820 0080       3768          LHI   R2,X'80'                                                   XP237670
002C66  9E12            3769          OCR   R1,R2             DISPLAY ERRNO                            XP237680
002C68  9810            3770          WHR   R1,R0                                                      XP237690
002C6A  D300 335E       3771          LB    R0,ERRNO                                                   XP237700
002C6E  E630 30F8       3772          LA    R3,ERNOCH                                                  XP237710
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002C72  41E0 29F4          3773           BAL   R14,CONVR2          CONVERT TO ASCII                    XP237720
002C76  E6C0 30EC          3774           LA    R12,ERRMSG                                              XP237730
002C7A  E6D0 30FC          3775           LA    R13,ERRMSGZ                                             XP237740
002C7E  41E0 2A6C          3776           BAL   R14,WBMSG           'ERROR TTNN'                        XP237750
002C82  030A               3777           BR    R10                 RETURN (OR FALL THROUGH)            XP237760
                           3778  *                                                                      XP237770
                           3779  *                                                                      XP237780
002C84  D300 30F7          3780  PRNTRR   LB    R0,TESTNO           FOR TEST 4,                         XP237790
002C88  C500 0034          3781           CLHI  R0,X'34'            PRINT THE OPERANDS;                 XP237800
002C8C  4230 2CEE          3782           BNE   SEQUENCE            ELSE NEXT TEST                      XP237810
                           3783  *                                                                      XP237820
002C90  D3C0 335E          3784  PRTOPS   LB    R0,ERRNO            PICK UP ERROR NUMBER                XP237830
002C94  C500 0050          3785           CLHI  R0,X'50'            IF GREATER, NO REG PRINTOUT         XP237840
002C98  4380 2CEE          3786           BNL   SEQUENCE                                                XP237850
        0000 2C9C          3787  PRTOPS1  EQU   *                                                       XP237860
002C9C  7390 3272          3788           LHL   R9,BUFR3+2          IF ZERO, PRINT NO REGISTERS         XP237870
002CA0  4330 2CE0          3789           BZ    PREROVR                                                 XP237880
002CA4  C8C0 0020          3790           LHI   R12,X'20'           SPACE AFTER 8 CHARA                 XP237890
002CA8  E630 348C          3791           LA    R3,TRTABL                                               XP237900
002CAC  E680 3274          3792           LA    R8,BUFR3+4                                              XP237910
002CB0  5808 0000          3793  PRGOPS   L     R0,0(R8)                                                XP237920
002CB4  41E0 2A00          3794           BAL   R14,CONVR8                                              XP237930
002CB8  2792               3795           SIS   R9,2                2 HALFWORDS ARE PRINTED             XP237940
002CBA  2337               3796           BZS   PRNTOPS                                                 XP237950
002CBC  2684               3797           AIS   R8,4                                                    XP237960
002CBE  D2C3 0008          3798           STB   R12,8(R3)                                               XP237970
002CC2  2639               3799           AIS   R3,9                                                    XP237980
002CC4  4300 2CB0          3800           B     PRGOPS                                                  XP237990
002CC8  24CD               3801  PRNTOPS  LIS   R12,13              CR                                  XP238000
002CCA  D2C3 0008          3802           STB   R12,8(R3)                                               XP238010
002CCE  244A               3803           LIS   R4,10               LF                                  XP238020
002CD0  D243 0009          3804           STB   R4,9(R3)                                                XP238030
002CD4  E6C0 348C          3805           LA    R12,TRTABL                                              XP238040
002CD8  C8D3 0009          3806           LHI   R13,9(R3)                                               XP238050
002CDC  41E0 2A6C          3807           BAL   R14,WBMSG                                               XP238060
        0000 2CE0          3808  PREROVR  EQU   *                                                       XP238070
002CE0  2307               3809           BS    SEQUENCE            PRINTING DONE                       XP238080
                           3810  *                                                                      XP238090
                           3811  *                                                                      XP238100
002CE2  E6C0 30FE          3812  NOERR    LA    R12,NOERMSG         PRINT CHARACTERS                    XP238110
002CE6  E6D0 310E          3813  NOERR2   LA    R13,NOERMSZ         'NO ERROR'                          XP238120
002CEA  41E0 2A6C          3814           BAL   R14,WBMSG                                               XP238130
002CEE  4800 3362          3815  SEQUENCE LH    R0,SEQFLG           ARE WE AUTONOMOUS ?                 XP238140
002CF2  4300 0B08          3816           B     RENTRY                                                  XP238150
        0000 2CF6          3817  ER9SP    EQU   *                                                       XP238160
002CF6  D2D0 335E          3818           STB   TOT,ERRNO                                               XP238170
002CFA  41A0 2C5C          3819           BAL   R10,ERRB                                                XP238180
002CFE  4890 3270          3820           LH    R9,BUFR3                                                XP238190
002D02  01B9               3821           BALR  R11,R9                                                  XP238200
002D04  4300 2C9C          3822           B     PRTOPS1                                                 XP238210
                           3823  ********************************************************************** XP238220
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DATA TABLES TO SUPPORT SUBTEST 4 (FLOATING POINT)

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                        3825  *                                                                  XP238240
                        3826  *       CONSTANTS USED IN MAIN PROGRAM AND SUBROUTINES              XP238250
                        3827  ************************************************************       XP238260
002D08  8000            3828  NEG     DC    X'8000'                                              XP238270
002D0C                  3829          ALIGN 4                                                    XP238280
002D0C  0000            3830  ZEROF   DC    X'0',X'0'                                            XP238290
002D0E  0000
002D10  7777            3831  FLAG    DC    X'7777'                                              XP238300
                        3832  ************************************************************       XP238310
                        3833  *       DATA AND RESULT TABLE FOR LOAD/STORE CHECK                 XP238320
002D14                  3834          ALIGN 4                                                    XP238330
002D14  0000            3835  LSD0    DC    X'0',X'0'           CC=0  AND                      XP238340
002D16  0000
002D18  0000            3836  LSR0    DC    X'0',X'0'           ZERO VALUE                     XP238350
002D1A  0000
002D1C  0010            3837  LSD1    DC    X'0010',X'0'        CC=2  AND                      XP238360
002D1E  0000
002D20  0010            3838  LSR1    DC    X'0010',X'0'        POSITIVE NORMALIZED            XP238370
002D22  0000
002D24  FF10            3839  LSD2    DC    X'FF10',X'0'        CC=1   AND                     XP238380
002D26  0000
002D28  FF10            3840  LSR2    DC    X'FF10',X'0'        NEGATIVE NORMALIZED            XP238390
002D2A  0000
002D2C  7F10            3841  LSD3    DC    X'7F10',X'0'        CC=2                           XP238400
002D2E  0000
002D30  7F10            3842  LSR3    DC    X'7F10',X'0'        POS.  NORM.                    XP238410
002D32  0000
002D34  0101            3843  LSD4    DC    X'0101',X'0'        CC=2                           XP238420
002D36  0000
002D38  0010            3844  LSR4    DC    X'0010',X'0'        POS. UN.                       XP238430
002D3A  0000
002D3C  4200            3845  LSD5    DC    X'4200',X'1000'     CC=2                           XP238440
002D3E  1000
002D40  4010            3846  LSR5    DC    X'4010',X'0'        POS. UN.                       XP238450
002D42  0000
002D44  F300            3847  LSD6    DC    X'F300',X'01FF'     CC=1                           XP238460
002D46  01FF
002D48  F01F            3848  LSR6    DC    X'F01F',X'F000'     NEG. UN                        XP238470
002D4A  F000
002D4C  4400            3849  LSD7    DC    X'4400',X'00F8'     CC=2                           XP238480
002D4E  00F8
002D50  40F8            3850  LSR7    DC    X'40F8',X'0'        POS. UN                        XP238490
002D52  0000
002D54  C500            3851  LSD8    DC    X'C500',X'1'        CC=1                           XP238500
002D56  0001
002D58  C010            3852  LSR8    DC    X'C010',X'0'        NEG UN                         XP238510
002D5A  0000
002D5C  4600            3853  LSD9    DC    X'4600',X'0'        CC=0                           XP238520
002D5E  0000
002D60  0000            3854  LSR9    DC    X'0',X'0'           POS. ZERO                      XP238530
002D62  0000
002D64  C600            3855  LSD10   DC    X'C600',X'0'        CC=0                           XP238540
002D66  0000
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DATA TABLES TC SUPPORT SUBTEST 4 (FLOATING POINT)

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002D68  0000                3856  LSR10   DC    X'0',X'0'           NEG. ZERO                    XP238550
002D6A  0000
002D6C  0001                3857  LSD11   DC    X'1',X'0'           CC=4                         XP238560
002D6E  0000
002D70  0000                3858  LSR11   DC    X'0',X'0'           POS. UNDERFLOW               XP238570
002D72  0000
002D74  0100                3859  LSD12   DC    X'0100',X'1000'     CC=4                         XP238580
002D76  1000
002D78  0000                3860  LSR12   DC    X'0',X'0'           UNDERFLOW                    XP238590
002D7A  0000
002D7C  0300                3861  LSD13   DC    X'0300',X'0010'     CC=4  POS.                   XP238600
002D7E  0010
002D80  0000                3862  LSR13   DC    X'0',X'0'           UNDERFLOW                    XP238610
002D82  0000
002D84  8008                3863  LSD14   DC    X'8008',X'0'        CC = 4                       XP238620
002D86  0000
002D88  0000                3864  LSR14   DC    X'0',X'0'           NEG. UNDERFLOW               XP238630
002D8A  0000
002D8C  8200                3865  LSD15   DC    X'8200',X'0800'     CC=4                         XP238640
002D8E  0800
002D90  0000                3866  LSR15   DC    X'0',X'0'           NEG. UND. FLOW               XP238650
002D92  0000
002D94  8400                3867  LSD16   DC    X'8400',X'8'        CC=4                         XP238660
002D96  0008
002D98  0000                3868  LSR16   DC    X'0',X'0'           NEG. UNDERFLOW               XP238670
002D9A  0000
                            3869  *                                                              XP238680
                            3870  **        DATA USED FOR TESTING FXR, FLR INSTRUCTIONS         XP238690
        0000 2D9C           3871  FIXTAB    EQU   *                                            XP238700
                            3872  *         NORMALIZED FLOATING-POINT DATA, FIXED-POINT RESULT. XP238710
002D9C  0000 0000           3873            DC    Y'00000000',Y'00000000'                      XP238720
002DA0  0000 0000
002DA4  C110 0000           3874            DC    Y'C1100000',Y'FFFFFFFF'                      XP238730
002DA8  FFFF FFFF
002DAC  4110 0000           3875            DC    Y'41100000',Y'00000001'                      XP238740
002DB0  0000 0001
002DB4  C810 0000           3876            DC    Y'C8100000',Y'F0000000'                      XP238750
002DB8  F000 0000
002DBC  44FF FF00           3877            DC    Y'44FFFF00',Y'0000FFFF'                      XP238760
002DC0  0000 FFFF
002DC4  45FF FF00           3878            DC    Y'45FFFF00',Y'000FFFF0'                      XP238770
002DC8  000F FFF0
002DCC  46FF FF00           3879            DC    Y'46FFFF00',Y'00FFFF00'                      XP238780
002DD0  00FF FF00
002DD4  47FF FF00           3880            DC    Y'47FFFF00',Y'0FFFF000'                      XP238790
002DD8  0FFF F000
002DDC  40FF FFFF           3881            DC    Y'40FFFFFF',Y'00000000'                      XP238800
002DE0  0000 0000
002DE4  C0FF FFFF           3882            DC    Y'C0FFFFFF',Y'00000000'                      XP238810
002DE8  0000 0000
002DEC  4078 9ABC           3883            DC    Y'40789ABC',Y'00000000'                      XP238820
002DF0  0000 0000
002DF4  C078 9ABC           3884            DC    Y'C0789ABC',Y'00000000'                      XP238830
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DATA TABLES TO SUPPORT SUBTEST 4 (FLOATING POINT)

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002DF8  0000 0000
002DFC  4980 0000          3885             DC    Y'49800000',Y'7FFFFFFF'                          XP238840
002E00  7FFF FFFF
002E04  C980 0000          3886             DC    Y'C9800000',Y'80000001'                          XP238850
002E08  8000 0001
002E0C  4971 2345          3887             DC    Y'49712345',Y'7FFFFFFF'                          XP238860
002E10  7FFF FFFF
002E14  C9F0 0000          3888             DC    Y'C9F00000',Y'80000001'                          XP238870
002E18  8000 0001
        0000 2E1C          3889  CCTABO     EQU   *                                                XP238880
002E1C  00                 3890             DB    0                                                XP238890
002E1D  01                 3891             DB    1                                                XP238900
002E1E  02                 3892             DB    2                                                XP238910
002E1F  01                 3893             DB    1                                                XP238920
002E20  02                 3894             DB    2                                                XP238930
002E21  02                 3895             DB    2                                                XP238940
002E22  02                 3896             DB    2                                                XP238950
002E23  02                 3897             DB    2                                                XP238960
002E24  00                 3898             DB    0                                                XP238970
002E25  00                 3899             DB    0                                                XP238980
002E26  00                 3900             DB    0                                                XP238990
002E27  00                 3901             DB    0                                                XP239000
002E28  06                 3902             DB    6                                                XP239010
002E29  05                 3903             DB    5                                                XP239020
002E2A  06                 3904             DB    6                                                XP239030
002E2B  05                 3905             DB    5                                                XP239040
        0000 2E2B          3906  NCCTABO    EQU   *-1                                              XP239050
        0000 2E2C          3907  FLOATAB    EQU   *                                                XP239060
                           3908  *          FIXED POINT DATA, NORMALIZED FLOATING POINT RESULT      XP239070
002E2C  0000 0000          3909             DC    Y'00000000',Y'00000000'                          XP239080
002E30  0000 0000
002E34  FFFF FFFF          3910             DC    Y'FFFFFFFF',Y'C1100000'                          XP239090
002E38  C110 0000
002E3C  0000 0001          3911             DC    Y'00000001',Y'41100000'                          XP239100
002E40  4110 0000
002E44  F000 0000          3912             DC    Y'F0000000',Y'C9100000'                          XP239110
002E48  C810 0000
002E4C  7FFF FFFF          3913             DC    Y'7FFFFFFF',Y'487FFFFF'                          XP239120
002E50  487F FFFF
002E54  7FFF FFF0          3914             DC    Y'7FFFFFF0',Y'487FFFFF'                          XP239130
002E58  487F FFFF
002E5C  0000 000F          3915             DC    Y'0000000F',Y'41F00000'                          XP239140
002E60  41F0 0000
002E64  0000 00F1          3916             DC    Y'000000F1',Y'42F10000'                          XP239150
002E68  42F1 0000
002E6C  0000 0F12          3917             DC    Y'00000F12',Y'43F12000'                          XP239160
002E70  43F1 2000
002E74  0000 F123          3918             DC    Y'0000F123',Y'44F12300'                          XP239170
002E78  44F1 2300
002E7C  000F 1234          3919             DC    Y'000F1234',Y'45F12340'                          XP239180
002E80  45F1 2340
002E84  00F1 2345          3920             DC    Y'00F12345',Y'46F12345'                          XP239190
002E88  46F1 2345
```

DATA TABLES TO SUPPORT SUBTEST 4 (FLOATING POINT)

```
002E8C  0F12 3456          3921            DC    Y'0F123456',Y'47F12345'                          XP239200
002E90  47F1 2345
002E94  F123 4567          3922            DC    Y'F1234567',Y'C7EDCBA9'                          XP239210
002E98  C7ED CBA9
002E9C  1234 5678          3923            DC    Y'12345678',Y'48123456'                          XP239220
002EA0  4812 3456
002EA4  2345 6789          3924            DC    Y'23456789',Y'48234567'                          XP239230
002EA8  4823 4567
        0000 2EAC          3925  CCTAB1    EQU   *                                                XP239240
002EAC  00                 3926            DB    0                                                XP239250
002EAD  01                 3927            DB    1                                                XP239260
002EAE  02                 3928            DB    2                                                XP239270
002EAF  01                 3929            DB    1                                                XP239280
002EB0  02                 3930            DB    2                                                XP239290
002EB1  02                 3931            DB    2                                                XP239300
002EB2  02                 3932            DB    2                                                XP239310
002EB3  02                 3933            DB    2                                                XP239320
002EB4  02                 3934            DB    2                                                XP239330
002EB5  02                 3935            DB    2                                                XP239340
002EB6  02                 3936            DB    2                                                XP239350
002EB7  02                 3937            DB    2                                                XP239360
002EB8  02                 3938            DB    2                                                XP239370
002EB9  01                 3939            DB    1                                                XP239380
002EBA  02                 3940            DB    2                                                XP239390
002EBB  02                 3941            DB    2                                                XP239400
        0000 2EBB          3942  NCCTAB1   EQU   *-1                                              XP239410
                           3943  ********************************************************         XP239420
                           3944  *                                                                XP239430
                           3945  *       DATA AND RESULT TABLE FOR ADD / SUBTRACT CHECK           XP239440
002EBC  7EFF               3946  AS        DC    X'7EFF',X'FFFF'     A                            XP239450
002EBE  FFFF
002EC0  7EFF               3947            DC    X'7EFF',X'FFFF'     B                            XP239460
002EC2  FFFF
002EC4  7F1F               3948            DC    X'7F1F',X'FFFF'     SUM                          XP239470
002EC6  FFFF
002EC8  0000               3949            DC    X'0',X'0'           DIFFERENCE                   XP239480
002ECA  0000
002ECC  0002               3950            DC    X'2'                CC OF A+B                    XP239490
002ECE  0000               3951            DC    X'0'                CC OF A-B                    XP239500
002ED0  0000               3952            DC    X'0'                CC OF B-A                    XP239510
002ED2  0001               3953            DC    X'1'                CC OF -A-B                   XP239520
002ED4  7FFF               3954            DC    X'7FFF',X'FFFF'                                  XP239530
002ED6  FFFF
002ED8  79FF               3955            DC    X'79FF',X'FFFF'                                  XP239540
002EDA  FFFF
002EDC  7FFF               3956            DC    X'7FFF',X'FFFF'     SUM                          XP239550
002EDE  FFFF
002EE0  7FFF               3957            DC    X'7FFF',X'FFFF'     DIFFERENCE                   XP239560
002EE2  FFFF
002EE4  0002               3958            DC    X'2'                                             XP239570
002EE6  0002               3959            DC    X'2'                                             XP239580
002EE8  0001               3960            DC    X'1'                                             XP239590
002EEA  0001               3961            DC    X'1'                                             XP239600
```

DATA TABLES TO SUPPORT SUBTEST 4 (FLOATING POINT)

```
002EEC  7FEF            3962          DC    X'7FEF',X'FFFF'                          XP239610
002EEE  FFFF
002EF0  7A10            3963          DC    X'7A10',X'0000'                          XP239620
002EF2  0000
002EF4  7FF0            3964          DC    X'7FF0',X'0000'     SUM                  XP239630
002EF6  0000
002EF8  7FEF            3965          DC    X'7FEF',X'FFFE'     DIFFERENCE           XP239640
002EFA  FFFE
002EFC  0002            3966          DC    X'2'                                     XP239650
002EFE  0002            3967          DC    X'2'                                     XP239660
002F00  0001            3968          DC    X'1'                                     XP239670
002F02  0001            3969          DC    X'1'                                     XP239680
002F04  7FFF            3970          DC    X'7FFF',X'FFFF'                          XP239690
002F06  FFFF
002F08  7A10            3971          DC    X'7A10',X'0000'                          XP239700
002F0A  0000
002F0C  7FFF            3972          DC    X'7FFF',X'FFFF'     SUM                  XP239710
002F0E  FFFF
002F10  7FFF            3973          DC    X'7FFF',X'FFFE'     DIFFERENCE           XP239720
002F12  FFFE
002F14  0006            3974          DC    X'6'                                     XP239730
002F16  0002            3975          DC    X'2'                                     XP239740
002F18  0001            3976          DC    X'1'                                     XP239750
002F1A  0005            3977          DC    X'5'                                     XP239760
002F1C  0510            3978          DC    X'0510',X'0000'                          XP239770
002F1E  0000
002F20  04FF            3979          DC    X'04FF',X'FFFF'                          XP239780
002F22  FFFF
002F24  051F            3980          DC    X'051F',X'FFFF'     SUM                  XP239790
002F26  FFFF
002F28  0010            3981          DC    X'0010',X'0000'     DIFFERENCE           XP239800
002F2A  0000
002F2C  0002            3982          DC    X'2'                                     XP239810
002F2E  0002            3983          DC    X'2'                                     XP239820
002F30  0001            3984          DC    X'1'                                     XP239830
002F32  0001            3985          DC    X'1'                                     XP239840
002F34  0410            3986          DC    X'0410',X'0000'                          XP239850
002F36  0000
002F38  03FF            3987          DC    X'03FF',X'FFFF'                          XP239860
002F3A  FFFF
002F3C  041F            3988          DC    X'041F',X'FFFF'                          XP239870
002F3E  FFFF
002F40  0000            3989          DC    X'0000',X'0000'                          XP239880
002F42  0000
002F44  0002            3990          DC    X'2'                                     XP239890
002F46  0004            3991          DC    X'4'                                     XP239900
002F48  0004            3992          DC    X'4'                                     XP239910
002F4A  0001            3993          DC    X'1'                                     XP239920
                        3994  *       DATA AND RESULT TABLE FOR MULTIPLY CHECK      XP239930
002F4C  4615            3995  MUL     DC    X'4615',X'FFFF'     A                    XP239940
002F4E  FFFF
002F50  0000            3996          DC    X'0',X'0'           B                    XP239950
002F52  0000
```

DATA TABLES TO SUPPORT SUBTEST 4 (FLOATING POINT)

```
002F54  0000                3997    DC    X'0',X'0'              A*B                                XP239960
002F56  0000
002F58  0000                3998    DC    X'0'                   CC FOR A*B                         XP239970
002F5A  0000                3999    DC    X'0'                   CC FOR -(A*B)                      XP239980
002F5C  60FF                4000    DC    X'60FF',X'FFFF'        NO NORMALIZATION.                  XP239990
002F5E  FFFF
002F60  5FFF                4001    DC    X'5FFF',X'FFFF'        NO UNDER FLOW                      XP240000
002F62  FFFF
002F64  7FFF                4002    DC    X'7FFF',X'FFFE'        OR OVERFLOW,AND                    XP240010
002F66  FFFE
002F68  0002                4003    DC    X'2'                   NO EFFECT OF ROUNDING              XP240020
002F6A  0001                4004    DC    X'1'                                                      XP240030
002F6C  4078                4005    DC    X'4078',X'8888'        NORMALIZATION IS REQUIRED          XP240040
002F6E  8888
002F70  0520                4006    DC    X'0520',X'0000'        BUT  NO  OVERFLOW OR UNDERFLOW     XP240050
002F72  0000
002F74  04F1                4007    DC    X'04F1',X'1110'        AND NO EFFECT OF ROUNDING          XP240060
002F76  1110
002F78  0002                4008    DC    X'2'                                                      XP240070
002F7A  0001                4009    DC    X'1'                                                      XP240080
002F7C  6010                4010    DC    X'6010',X'0000'        EXPONENT OVERFLOW                  XP240090
002F7E  0000
002F80  6010                4011    DC    X'6010',X'0000'        OCCURS  (ACTUALLY                  XP240100
002F82  0000
002F84  7FFF                4012    DC    X'7FFF',X'FFFF'        THE PRODUCT IS LESS                XP240110
002F86  FFFF
002F88  0006                4013    DC    X'6'                   THAN THE GREATEST                  XP240120
002F8A  0005                4014    DC    X'5'                   REPRESENTABLE NUMBER)              XP240130
002F8C  01FF                4015    DC    X'01FF',X'FFFF'        ROUNDING CHANGES THE               XP240140
002F8E  FFFF
002F90  4030                4016    DC    X'4030',X'0000'        MOST SIGNIFICANT HEX               XP240150
002F92  0000
002F94  0130                4017    DC    X'0130',X'0000'        DIGIT OF FRACTION NO               XP240160
002F96  0000
002F98  0002                4018    DC    X'2'                   NORMALIZATION AND NO               XP240170
002F9A  0001                4019    DC    X'1'                   OVERFLOW OR UNDERFLOW              XP240180
002F9C  0673                4020    DC    X'0673',X'2146'        EXPONENT UNDERFLOW                 XP240190
002F9E  2146
002FA0  3984                4021    DC    X'3984',X'673A'        OCCURS                             XP240200
002FA2  673A
002FA4  0000                4022    DC    X'0',X'0'                                                 XP240210
002FA6  0000
002FA8  0004                4023    DC    X'4'                                                      XP240220
002FAA  0004                4024    DC    X'4'                                                      XP240230
002FAC  07FF                4025    DC    X'07FF',X'FFFF'        EXPONENT UNDERFLOW                 XP240240
002FAE  FFFF
002FB0  3910                4026    DC    X'3910',X'0000'        OCCURS BECAUSE OF                  XP240250
002FB2  0000
002FB4  0000                4027    DC    X'0000',X'0000'        NORMALIZATION                      XP240260
002FB6  0000
002FB8  0004                4028    DC    X'4'                                                      XP240270
002FBA  0004                4029    DC    X'4'                                                      XP240280
002FBC  07FF                4030    DC    X'07FF',X'FFF0'        UNDERFLOW OCCURS BECAUSE           XP240290
```

DATA TABLES TO SUPPORT SUBTEST 4 (FLOATING POINT)

```
002FBE  FFF0
002FC0  3910            4031            DC    X'3910',X'0001'     NORMALIZATION IS DONE          XP240300
002FC2  0001
002FC4  0000            4032            DC    X'0',X'0'           BEFORE ROUNDING                XP240310
002FC6  0000
002FC8  0004            4033            DC    X'4'                                               XP240320
002FCA  0004            4034            DC    X'4'                                               XP240330
                        4035  *         DATA AND RESULT TABLE FOR DIVIDE CHECK                   XP240340
002FCC  0000            4036  DIV       DC    X'0',X'0'           ZERO RESULT                    XP240350
002FCE  0000
002FD0  0E25            4037            DC    X'0E25',X'FF24'                                    XP240360
002FD2  FF24
002FD4  0000            4038            DC    X'0',X'0'           A/B                            XP240370
002FD6  0000
002FD8  0000            4039            DC    X'0'                CC FOR A/B                     XP240380
002FDA  0000            4040            DC    X'0'                CC FOR (-A/B)                  XP240390
002FDC  7FFF            4041            DC    X'7FFF',X'FFFE'     NO NORMALIZATION               XP240400
002FDE  FFFE
002FE0  60FF            4042            DC    X'60FF',X'FFFF'     BUT ROUNDING                   XP240410
002FE2  FFFF
002FE4  5FFF            4043            DC    X'5FFF',X'FFFF'     EFFECT                         XP240420
002FE6  FFFF
002FE8  0002            4044            DC    X'2'                                               XP240430
002FEA  0001            4045            DC    X'1'                                               XP240440
002FEC  44FF            4046            DC    X'44FF',X'FFFF'     NORM. REQUIRED BUT             XP240450
002FEE  FFFF
002FF0  0611            4047            DC    X'0611',X'1111'     NO ROUNDING                    XP240460
002FF2  1111
002FF4  7FF0            4048            DC    X'7FF0',X'0000'     EFFECT                         XP240470
002FF6  0000
002FF8  0002            4049            DC    X'2'                                               XP240480
002FFA  0001            4050            DC    X'1'                                               XP240490
002FFC  0912            4051            DC    X'0912',X'3456'     NORMALIZATION                  XP240500
002FFE  3456
003000  0311            4052            DC    X'0311',X'1111'     AND ROUNDING                   XP240510
003002  1111
003004  4711            4053            DC    X'4711',X'1111'     EFFECT                         XP240520
003006  1111
003008  0002            4054            DC    X'2'                                               XP240530
00300A  0001            4055            DC    X'1'                                               XP240540
00300C  0642            4056            DC    X'0642',X'3216'     RESULT IS FLOATING             XP240550
00300E  3216
003010  0642            4057            DC    X'0642',X'3216'     POINT ONE                      XP240560
003012  3216
003014  4110            4058            DC    X'4110',X'0000'                                    XP240570
003016  0000
003018  0002            4059            DC    X'2'                                               XP240580
00301A  0001            4060            DC    X'1'                                               XP240590
00301C  4F12            4061            DC    X'4F12',X'3456'     NORMALIZATION                  XP240600
00301E  3456
003020  1012            4062            DC    X'1012',X'3456'     CAUSES OVERFLOW                XP240610
003022  3456
003024  7FFF            4063            DC    X'7FFF',X'FFFF'                                    XP240620
```

DATA TABLES TO SUPPORT SUBTEST 4 (FLOATING POINT)

```
003026 FFFF
003028 0006
00302A 0005
00302C 2012
00302E 3456
003030 6112
003032 3456
003034 0000
003036 0000
003038 0004
00303A 0004
00303C 0080
00303E 0000
003040 7F80
003042 0000
003044 0000
003046 0000
003048 0004
00304A 0004

00304C 4288
00304E 8880
003050 4110
003052 0001
003054 4288
003056 8889
003058 4677
00305A 7770
00305C 4010
00305E 0001
003060 4577
003062 7777
003064 41A0
003066 0000
003068 41B0
00306A 0000
00306C 41C0
00306E 0000
003070 41D0
003072 0000
003074 41E0
003076 0000
003078 41F0
00307A 0000
00307C 4178
00307E 9ABC
003080 4223
003082 4567
003084 4398
003086 7654
003088 4432
00308A 5476
00308C 4522
```

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4064          DC    X'6'                                          XP240630
4065          DC    X'5'                                          XP240640
4066          DC    X'2012',X'3456'     EXPONENT                  XP240650
4067          DC    X'6112',X'3456'     UNDERFLOW OCCURS          XP240660
4068          DC    X'0',X'0'           (ACTUAL QUOTIENT IS       XP240670
4069          DC    X'4'                THE LOWEST REPRESENTABLE  XP240680
4070          DC    X'4'                NUMBER)                   XP240690
4071          DC    X'0080',X'0'        EXPONENT                  XP240700
4072          DC    X'7F80',X'0'        UNDERFLOW                 XP240710
4073          DC    X'0',X'0'           OCCURS                    XP240720
4074          DC    X'4'                                          XP240730
4075          DC    X'4'                                          XP240740
4076    *     DATA AND RESULT TABLE FOR MULT./DIVIDE ACCURACY CHECK XP240750
4077    MD1   DC    X'4288',X'8880'                               XP240760
4078    MD2   DC    X'4110',X'0001'                               XP240770
4079    MD3   DC    X'4288',X'8889'                               XP240780
4080    MD4   DC    X'4677',X'7770'                               XP240790
4081    MD5   DC    X'4010',X'0001'                               XP240800
4082    MD6   DC    X'4577',X'7777'                               XP240810
4083    MD7   DC    X'41A0',X'0'                                  XP240820
4084    MD8   DC    X'41B0',X'0'                                  XP240830
4085    MD9   DC    X'41C0',X'0'                                  XP240840
4086    MD10  DC    X'41D0',X'0'                                  XP240850
4087    MD11  DC    X'41E0',X'0'                                  XP240860
4088    MD12  DC    X'41F0',X'0'                                  XP240870
4089    MD13  DC    X'4178',X'9ABC'                               XP240880
4090    MD14  DC    X'4223',X'4567'                               XP240890
4091    MD15  DC    X'4398',X'7654'                               XP240900
4092    MD16  DC    X'4432',X'5476'                               XP240910
4093    MD17  DC    X'4522',X'3344'                               XP240920
```

DATA TABLES TO SUPPORT SUBTEST 4 (FLOATING POINT)

```
00308E  3344
003090  4699            4094  MD18    DC    X'4699',X'FFFF'                          XP240930
003092  FFFF
                        4095  *       DATA AND RESULT TABLE FOR COMPARE CHECK       XP240940
003094  0010            4096  COM     DC    X'0010',X'1'                             XP240950
003096  0001
003098  0010            4097          DC    X'0010',X'0'                             XP240960
00309A  0000
00309C  3FFF            4098          DC    X'3FFF',X'FFFF'                          XP240970
00309E  FFFF
0030A0  3EFF            4099          DC    X'3EFF',X'FFFF'                          XP240980
0030A2  FFFF
0030A4  0210            4100          DC    X'0210',X'0'                             XP240990
0030A6  0000
0030A8  01FF            4101          DC    X'01FF',X'FFFF'                          XP241000
0030AA  FFFF
0030AC  0010            4102          DC    X'0010',X'0000'                          XP241010
0030AE  0000
0030B0  0000            4103          DC    X'0',X'0'                                XP241020
0030B2  0000
                        4104  *                                                      XP241030
```

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                                4106  *                                                                  XP241050
                                4107  **       MESSAGES OUTPUT TO THE TTY IN S32PT2                      XP241060
                                4108  ************************************************************      XP241070
0030B4  0D0A                    4109  PRTSUBT  DC    X'D0A'              CR , LF                       XP241080
0030B6  FFFF                    4110           DC    X'FFFF'                                           XP241090
0030B8  5355 4254 4553 5420     4111           DC    C'SUBTEST'                                        XP241100
0030C0  0D0A                    4112           DC    X'D0A'                                            XP241110
0030C2  FFFF                    4113           DC    X'FFFF'                                           XP241120
0030C4  2A20                    4114           DC    C'* '                                             XP241130
        0000 30C6               4115  CRLFM    EQU   *                                                 XP241140
0030C6  0D0A                    4116           DC    X'D0A'              CR , LF                       XP241150
0030C8  FFFF                    4117           DCX   FFFF                NULL                          XP241160
        00C0 30C9               4118  PRTSUBZ  EQU   *-1                                               XP241170
0030CA  3F20                    4119  QUESTN   DC    C'? '                                             XP241180
0030CC  0D0A                    4120  TITLE    DCX   D0A                                               XP241190
0030CE  FFFF                    4121           DC    X'FFFF'                                           XP241200
0030D0  5333 3250 5432 5230     4122           DC    C'S32PT2R02'                                      XP241210
0030D8  3220
0030DA  0D0A                    4123           DC    X'D0A'                                            XP241220
0030DC  FFFF                    4124           DC    X'FFFF'                                           XP241230
0030DE  4350 5520               4125           DC    C'CPU'                                            XP241240
0030E2  0D0A                    4126           DCX   D0A                                               XP241250
0030E4  FFFF                    4127           DC    X'FFFF'                                           XP241260
0030E6  2A20                    4128           DC    C'*'                                              XP241270
0030E8  0D0A                    4129           DC    X'D0A'              CR , LF                       XP241280
0030EA  FF                      4130           DB    -1                  NULL                          XP241290
        0000 30EB               4131  TITEND   EQU   *                                                 XP241300
0030EC  FFFF                    4132  ERRMSG   DCX   FFFF                NULLS                         XP241310
0030EE  0D0A                    4133           DCX   D0A                                               XP241320
0030F0  4552 524F 5220          4134           DC    C'ERROR '                                         XP241330
0030F6  3030                    4135  TSTNOCH  DC    C'00'               2-CHAR ASCII TEST NUMBER      XP241340
        0000 30F7               4136  TESTNO   EQU   *-1                HEXADECIMAL TEST NO           XP241350
0030F8  3030                    4137  ERNOCH   DC    C'00'               ASCII ERROR NO, 2 CHARS       XP241360
0030FA  0D0A                    4138           DC    X'D0A'                                            XP241370
0030FC  FF                      4139           DB    -1                  NULL                          XP241380
        0000 30FC               4140  ERRMSGZ  EQU   *-1                                               XP241390
0030FE  FFFF                    4141  NOERMSG  DCX   FFFF                NULLS                         XP241400
003100  0D0A                    4142           DCX   D0A                                               XP241410
003102  FFFF                    4143  NOERRM2  DCX   FFFF                                              XP241420
003104  4E4F 2045 5252 4F52     4144           DC    C'NO ERROR'                                       XP241430
00310C  0D0A                    4145           DC    X'D0A'                                            XP241440
00310E  FF                      4146           DB    -1                  NULL                          XP241450
        0000 310E               4147  NOERMSZ  EQU   *-1                                               XP241460
003110  FFFF                    4148  MSG2     DCX   FFFF                NULLS                         XP241470
003112  FF0D                    4149           DCX   FF0D                                              XP241480
003114  494E 4954 4941 4C49     4150           DC    C'INITIALIZE'                                     XP241490
00311C  5A45
00311E  0D0A                    4151           DC    X'D0A'                                            XP241500
003120  FFFF                    4152  MSG1     DCX   FFFF                NULLS                         XP241510
003122  5052 4553 5320 4252     4153           DC    C'PRESS BRK'                                      XP241520
00312A  4B20
00312C  0D0A                    4154           DC    X'D0A'                                            XP241530
00312E  FF                      4155           DB    -1                  NULL                          XP241540
        0000 312E               4156  MSG2Z    EQU   *-1                                               XP241550
        0000 312E               4157  MSG1Z    EQU   *-1                                               XP241560
```

```
003130  FFFF                  4158  MSG3     DCX   FFFF                NULLS                                XP241570
003132  504F 5745 5220 4F46   4159           DC    C'POWER OFF/ON'                                          XP241580
00313A  462F 4F4E
00313E  0D0A                  4160           DC    X'D0A'                                                   XP241590
003140  5052 4553 5320 4252   4161           DC    C'PRESS BRK'                                             XP241600
003148  4B20
00314A  0D0A                  4162           DC    X'D0A'                                                   XP241610
00314C  FF                    4163           DB    -1                  NULL                                 XP241620
        0000 314C             4164  MSG3Z    EQU   *-1                                                      XP241630
00314E  0D0A                  4165  T1MSG2   DC    X'D0A'                                                   XP241640
003150  4445 5052 4553 5320   4166  T1MSG    DC    C'DEPRESS KEYS'                                          XP241650
003158  4B45 5953
00315C  0D0A                  4167           DC    X'D0A'                                                   XP241660
00315E  FFFF                  4168           DC    X'FFFF'                                                  XP241670
003160  3132 3334 3536 3738   4169           DC    C'1234567890'                                            XP241680
003168  3930
00316A  0D0A                  4170           DCX   D0A                                                      XP241690
00316C  FF                    4171  NULL     DB    -1                  RUBOUT CHAR FOR CRT I/O              XP241700
        0000 316C             4172  T1MSGEND EQU   *-1                                                     XP241710
00316E  FFFF                  4173  T3MSG1   DCX   FFFF                NULLS                                XP241720
003170  4655 4E43 5449 4F4E   4174           DC    C'FUNCTION 0  '                                          XP241730
003178  2030 2020
00317C  FF                    4175           DB    -1                  NULL                                 XP241740
        0000 317C             4176  T3MSG1Z  EQU   *-1                                                     XP241750
00317E  0D0A                  4177  PLEVQ    DCX   D0A                                                      XP241760
003180  3F20                  4178           DC    C'?'                                                     XP241770
        0000 3182             4179  PLEVMSG  EQU   *                                                       XP241780
003182  5454 5920 5052 494F   4180           DC    C'TTY PRIOR LEV'                                         XP241790
00318A  5220 4C45 5620
003190  0D0A                  4181           DCX   D0A                                                      XP241800
003192  2A20                  4182           DC    C'*',X'D0A'                                              XP241810
003194  0D0A
003196  FF                    4183           DB    -1                  NULL                                 XP241820
        0000 3196             4184  PLEVMSZ  EQU   *-1                                                     XP241830
003198  0D0A                  4185  REGMQ    DCX   D0A                                                      XP241840
00319A  3F20                  4186           DC    C'?'                                                     XP241850
00319C  5231 2D42 4546 4F52   4187  PT2.1    DC    C'R1-BEFOR R1-AFTER SE-BEFOR SE-AFTER       CC'          XP241860
0031A4  2052 312D 4146 5445
0031AC  5220 5345 2D42 4546
0031B4  4F52 2053 452D 4146
0031BC  5445 5220 2020 2020
0031C4  2020 4343
0031C8  0D0A                  4188           DC    X'0D0A'                                                  XP241870
0031CA  FF                    4189           DB    X'FF'                                                    XP241880
        0000 31CA             4190  PT2.2    EQU   *-1                                                      XP241890
        0000 31CB             4191  REGMSG   EQU   *                                                       XP241900
0031CC  5245 4720 5345 5453   4192           DC    C'REG SETS AVAIL'                                        XP241910
0031D4  2041 5641 494C
0031DA  0D0A                  4193           DCX   D0A                                                      XP241920
0031DC  FFFF                  4194           DCX   FFFF                                                     XP241930
0031DE  2A20                  4195           DC    C'*'                                                     XP241940
0031E0  0D0A                  4196           DCX   D0A                                                      XP241950
0031E2  FF                    4197           DB    -1                  NULL                                 XP241960
        0000 31E2             4198  REGMSZ   EQU   *-1                                                     XP241970
                              4199  ************************************************************           XP241980
```

```
                                                                                                  XP241990
4200  **       FULLWORD DATA CONSTANTS USED IN S32PT2                                            XP242000
4201  ************************************************************                              XP242010
4202           ALIGN 4                                                                           XP242020
4203  *                                                                                          XP242030
4204  BUFR2    DC    0                                                                           XP242040
4205           DC    1                                                                           XP242050
4206           DC    2                                                                           XP242060
4207           DC    4                                                                           XP242070
4208           DC    8                                                                           XP242080
4209           DC    16                                                                          XP242090
4210           DC    32                                                                          XP242100
4211           DC    64                                                                          XP242110
4212           DC    128                                                                         XP242120
4213           DC    Y'100'                                                                      XP242130
4214           DC    Y'200'                                                                      XP242140
4215           DC    Y'400'                                                                      XP242150
4216           DC    Y'800'                                                                      XP242160
4217           DC    Y'1000'                                                                     XP242170
4218           DC    Y'2000'                                                                     XP242180
4219           DC    Y'4000'                                                                     XP242190
4220           DC    Y'8000'                                                                     XP242200
4221  BUFRO    EQU   *                    THIS BUFFER CONTAINS                                  XP242210
4222           DO    16                 16 FULLWORDS OF ZEROS                                    XP242220
4223           DC    Y'0'
4223           DC    Y'0'
4223           DC    Y'0'
4223           DC    Y'0'
4223           DC    Y'0'
4223           DC    Y'0'
4223           DC    Y'0'
4223           DC    Y'0'
4223           DC    Y'0'
4223           DC    Y'0'
4223           DC    Y'0'
4223           DC    Y'0'
4223           DC    Y'0'
4223           DC    Y'0'
4223           DC    Y'0'
4223           DC    Y'0'
4223           DC    Y'0'
4224           DCY   0                                                                           XP242230
4225           ALIGN 8                  MAY LOAD PSW FROM HERE                                   XP242240
4226  BUFR3    EQU   *                  THIS IS A SCRATCH AREA                                   XP242250
4227           DO    16                 OF TOTAL 16 FULLWORDS                                    XP242260
4228           DC    Y'0'                                                                        XP242270
4228           DC    Y'0'
4228           DC    Y'0'
4228           DC    Y'0'
4228           DC    Y'0'
4228           DC    Y'0'
4228           DC    Y'0'
4228           DC    Y'0'
4228           DC    Y'0'
4228           DC    Y'0'
4228           DC    Y'0'
4228           DC    Y'0'
4228           DC    Y'0'
4228           DC    Y'0'
4228           DC    Y'0'
```

```
0031E4

0031E4   0000 0000
0031E8   0000 0001
0031EC   0000 0002
0031F0   0000 0004
0031F4   0000 0008
0031F8   0000 0010
0031FC   0000 0020
003200   0000 0040
003204   0000 0080
003208   0000 0100
00320C   0000 0200
003210   0000 0400
003214   0000 0800
003218   0000 1000
00321C   0000 2000
003220   0000 4000
003224   0000 8000
         0000 3228

003228
003228   0000 0000
00322C   0000 0000
003230   0000 0000
003234   0000 0000
003238   0000 0000
00323C   0000 0000
003240   0000 0000
003244   0000 0000
003248   0000 0000
00324C   0000 0000
003250   0000 0000
003254   0000 0000
003258   0000 0000
00325C   0000 0000
003260   0000 0000
003264   0000 0000
003268   0000 0000
003270
         0000 3270

003270
003270   0000 0000
003274   0000 0000
003278   0000 0000
00327C   0000 0000
003280   0000 0000
003284   0000 0000
003288   0000 0000
00328C   0000 0000
003290   0000 0000
003294   0000 0000
003298   0000 0000
00329C   0000 0000
```

```
0032A0  0000 0000          4228          DC    Y'0'
0032A4  0000 0000          4228          DC    Y'0'
0032A8  0000 0000          4228          DC    Y'0'
0032AC  0000 0000          4228          DC    Y'0'                                                    XP242280
                           4229  ************************************************************          XP242290
                           4230  **  CONSTANTS USED IN SUBTEST 1                                       XP242300
0032B0  0000 3270          4231  S1BUF   DC    A(BUFR3)                                                XP242310
0032B4  0000 3279          4232          DC    A(BUFR3+9)                                              XP242320
0032B8  0000 3150          4233  T1WB    DC    A(T1MSG)            WB PARAMETERS FOR SUBTEST 1         XP242330
0032BC  0000 316D          4234          DC    A(T1MSGEND+1)                                           XP242340
                           4235  **  CONSTANTS USED IN SUBTEST 3                                       XP242350
0032C0  0000 60F0          4236  S3PSW   DCY   60F0                PSW STATUS                          XP242360
                           4237  **  CONSTANTS USED IN SUBTEST 4.                                      XP242370
        0000 32C4          4238  FLRGO   EQU   *                                                       XP242380
0032C4  0000 0000          4239          DC    0                   CC = 0000                           XP242390
0032C8  4110 0000          4240          DC    Y'41100000'         CC = 0010                           XP242400
0032CC  7FFF FFFF          4241          DC    Y'7FFFFFFF'                                             XP242410
0032D0  FFFF FFFF          4242          DC    Y'FFFFFFFF'         CC = X100                           XP242420
0032D4  4510 0000          4243          DC    Y'45100000'                                             XP242430
0032D8  0000 0000          4244          DC    0                                                       XP242440
0032DC  0000 0000          4245          DC    0                                                       XP242450
0032E0  0000 0000          4246          DC    0                                                       XP242460
                           4247  **  CONSTANTS USED IN SUBTEST 5                                       XP242470
0032E4  0000 60F0          4248  S5PSW   DCY   60F0                PSW STATUS                          XP242480
                           4249  **  CONSTANTS USED IN SUBTESTS 7, 8.                                  XP242490
0032E8                     4250          ALIGN 8                                                       XP242500
0032E8  0000 00F0          4251  S78ABPSW DC   Y'00F0',S78AB                                           XP242510
0032EC  0000 2510
0032F0  0000 00F0          4252  S7D2PSW  DC   Y'00F0',S78D3       MM INT DISABLED                     XP242520
0032F4  0000 2554
0032F8  0000 20F0          4253  S8D2PSW  DC   Y'20F0',S78D3       MM INT ENABLED                      XP242530
0032FC  0000 2554
003300  0000 0000          4254  MACREG   DCY  0                                                       XP242540
003304                     4255          DS    X'40'                                                   XP242550
003344  0000 0000          4256  S78PSW1  DC   0                   PSW STATUS, ON EPF MM INT, TESTS 7,8 XP242560
003348  0000 0000          4257  S78PSW2  DC   0                   PSW STATUS, PWR RESTORE MM INT      XP242570
                           4258  ************************************************************          XP242580
                           4259  ************************************************************          XP242590
                           4260  *                                                                     XP242600
                           4261  *       SYSTEM PARAMETERS AVAILABLE FOR RUNNING OF TEST*****          XP242610
                           4262  *                                                                     XP242620
00334C  4080               4263  DISINC   DCX  4080                CONSOLE OUTPUT COMMANDS             XP242630
        0000 334D          4264  DISNORM  EQU  *-1                                                     XP242640
00334E  C8E4               4265  TTYOUT   DCX  C8E4                TTY WRITE COMMAND                   XP242650
        0000 334F          4266  TTYRD    EQU  *-1                 TTY READ COMMAND                    XP242660
003350  ABB9               4267  CRTOUT   DCX  ABB9                CRT WRITE COMMAND                   XP242670
        0000 3351          4268  CRTRD    EQU  *-1                 CRT READ COMMAND                    XP242680
003352  F800               4269  FIRSTCMD DCX  F800                PASLA FORMAT COMMAND                XP242690
                           4270  *                                                                     XP242700
                           4271  *       VARIABLE SYSTEM PARAMETERS USED FOR EXECUTION OF TEST*****    XP242710
                           4272  *                                                                     XP242720
003354  3758               4273  CPUNO    DC   C'7X'               PROCESSOR IDENTIFIER                XP242730
003356  0000               4274  CRTFLG   DCX  0                   SET IF CRT ON PASLA USED FOR I/O     XP242740
003358  0000               4275  OUTDEV   DCX  0                   DEVICE ADDRESS ON WRITE             XP242750
        0000 3359          4276  INDEV    EQU  *-1                 DEVICE ADDRESS ON READ              XP242760
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00335A  0000                4277  OUTCMD   DCX   0                 OUTPUT COMMAND ON WRITE                XP242760
        0000 335B           4278  INCMD    EQU   *-1               OUTPUT COMMAND ON READ                 XP242770
00335C  0000                4279  PRILEV   DCX   0                 DEVICE INTERRUPT PRIORITY LEVEL        XP242780
00335E  0000                4280  ERRNO    DCX   0                 HEXADECIMAL ERROR NUMBER               XP242790
003360  0000                4281  REGBYT   DCX   0                 ADDITIONAL REGISTER STORAGE AREA       XP242800
                            4282  *                                USED FOR MODEL 8/32.                   XP242810
003362  0000 0000           4283  SEQFLG   DC    0                 NEGATIVE IF FLT PT -EQUIPPED           XP242820
003368                      4284          ALIGN 8                                                        XP242830
003368  0000 0000           4285  OLDPSW   DCY   0,0               OLD PSW SAVE AREA                      XP242840
00336C  0000 0000
003370  0000                4286  TEMP     DCX   0,0                                                      XP242850
003372  0000
003374  0000                4287  TEMP1    DCX   0,0                                                      XP242860
003376  0000
003378  20F0                4288  PROCPSW  DCX   20F0                PSW USED ON SUBTEST ENTRY              XP242870
00337A  0000                4289  S78FLAG1 DC    X'0'                                                    XP242880
00337C  0000                4290  CONSTAT  DC    X'0'               CONSOLE STATUS SAVE AREA               XP242890
003380  0000 0000           4291  TABLE    DCY   0,0,0              SYSTEM QUEUE                           XP242900
003384  0000 0000
003388  0000 0000
                            4292  ************************************************************            XP242910
        0000 338C           4293  REGSAV   EQU   *                  REGISTER SAVE AREA                     XP242920
                            4294  **  REG.SET 0                                                          XP242930
                            4295  ************************************************************            XP242940
00338C  0000 0000           4296  REG0     DC    0                                                       XP242950
003390  0000 0000           4297  REG1     DC    0                                                       XP242960
003394  0000 0000           4298  REG2     DC    0                                                       XP242970
003398  0000 0000           4299  REG3     DC    0                                                       XP242980
00339C  0000 0000           4300  REG4     DC    0                                                       XP242990
0033A0  0000 0000           4301  REG5     DC    0                                                       XP243000
0033A4  0000 0000           4302  REG6     DC    0                                                       XP243010
0033A8  0000 0000           4303  REG7     DC    0                                                       XP243020
0033AC  0000 0000           4304  REG8     DC    0                                                       XP243030
0033B0  0000 0000           4305  REG9     DC    0                                                       XP243040
0033B4  0000 0000           4306  REGA     DC    0                                                       XP243050
0033B8  0000 0000           4307  REGB     DC    0                                                       XP243060
0033BC  0000 0000           4308  REGC     DC    0                                                       XP243070
0033C0  0000 0000           4309  REGD     DC    0                                                       XP243080
0033C4  0000 0000           4310  REGE     DC    0                                                       XP243090
0033C8  0000 0000           4311  REGF     DC    0                                                       XP243100
                            4312  *                                                                     XP243110
                            4313  **       REG SET F                                                    XP243120
                            4314  ************************************************************            XP243130
                            4315  *                                                                     XP243140
0033CC  0000 0001           4316  REG10    DC    1                 DUMMY VALUES                          XP243150
0033D0  0000 0001           4317  REG11    DC    1                                                       XP243160
0033D4  0000 0001           4318  REG12    DC    1                                                       XP243170
0033D8  0000 0001           4319  REG13    DC    1                                                       XP243180
0033DC  0000 0001           4320  REG14    DC    1                                                       XP243190
0033E0  0000 0001           4321  REG15    DC    1                                                       XP243200
0033E4  0000 0001           4322  REG16    DC    1                                                       XP243210
0033E8  0000 0001           4323  REG17    DC    1                                                       XP243220
0033EC  0000 0001           4324  REG18    DC    1                                                       XP243230
0033F0  0000 0001           4325  REG19    DC    1                                                       XP243240
0033F4  0000 0001           4326  REG1A    DC    1                                                       XP243250
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0033F8  0000 0001          4327  REG1B    DC    1                                          XP243260
0033FC  0000 0001          4328  REG1C    DC    1                                          XP243270
003400  0000 0001          4329  REG1D    DC    1                                          XP243280
003404  0000 0001          4330  REG1E    DC    1                                          XP243290
003408  0000 0001          4331  REG1F    DC    1                                          XP243300
00340C                     4332  REG20    DO    16                                         XP243310
00340C  0000 0000          4333           DCY   0                                          XP243320
003410  0000 0000          4333           DCY   0
003414  0000 0000          4333           DCY   0
003418  0000 0000          4333           DCY   0
00341C  0000 0000          4333           DCY   0
003420  0000 0000          4333           DCY   0
003424  0000 0000          4333           DCY   0
003428  0000 0000          4333           DCY   0
00342C  0000 0000          4333           DCY   0
003430  0000 0000          4333           DCY   0
003434  0000 0000          4333           DCY   0
003438  0000 0000          4333           DCY   0
00343C  0000 0000          4333           DCY   0
003440  0000 0000          4333           DCY   0
003444  0000 0000          4333           DCY   0
003448  0000 0000          4333           DCY   0
00344C                     4334  REG30    DO    16                 SET 'F',8/32 WITH 4 REG SETS  XP243330
00344C  0000 0001          4335           DCY   1                  DUMMY                         XP243340
003450  0000 0001          4335           DCY   1                  DUMMY
003454  0000 0001          4335           DCY   1                  DUMMY
003458  0000 0001          4335           DCY   1                  DUMMY
00345C  0000 0001          4335           DCY   1                  DUMMY
003460  0000 0001          4335           DCY   1                  DUMMY
003464  0000 0001          4335           DCY   1                  DUMMY
003468  0000 0001          4335           DCY   1                  DUMMY
00346C  0000 0001          4335           DCY   1                  DUMMY
003470  0000 0001          4335           DCY   1                  DUMMY
003474  0000 0001          4335           DCY   1                  DUMMY
003478  0000 0001          4335           DCY   1                  DUMMY
00347C  0000 0001          4335           DCY   1                  DUMMY
003480  0000 0001          4335           DCY   1                  DUMMY
003484  0000 0001          4335           DCY   1                  DUMMY
003488  0000 0001          4335           DCY   1                  DUMMY
        0000 348C          4336  TRTABL   EQU   *                                          XP243350
        0000 368C          4337  TRTREND  EQU   TRTABL+512                                 XP243360
                           4338  ********************************************************  XP243370
        0000 348B          4339  PROGTOP  EQU   *-1                                        XP243380
00348C                     4340           END                                              XP243390
```

ASSEMBLED BY CAL 03-066R06-00 (32-BIT)

START OPTIONS: SCR,CRO,T=32

NO CAL ERRORS
1 CAL WARNING PREVIOUS WARNING ON PAGE 63
2 PASSES

GR9	0000	0009	1178*	1200	1206	1212	1218	1223	1229	1235	1241	1246	1252	1258	1263
			1268	1281	1290	1299	1303	1306	1307	1308	1314	1320	1326	1356	1360
			1364	1368	1374	1378	1382	1386	1393	1397	1401	1405	1413	1417	1421
			1425	1456	1460	1468	1472	1492	1496	1504	1508	1520	1526	1531	1547
			1562	1572	1578	1584	1609	1612	1615	1618	1622	1625	1628	1631	1638
			1641	1645	1648	1651	1654	1657	1664	1795	1802	1849	1857		
GTREG	0000	2B1E	3612	3614	3616*										
HALT	0000	00C0	112*	116											
HWTOF2	0000	2A40	3533	3536*											
HWTOFW	0000	2A24	651	672	3526*										
ILGINT	0000	2BFE	144	228	2933	3724*									
INPTOP	0000	0000I	4340												
INCMD	0000	335B	191	287	432	566	707	874	925	2154	3646	4278*			
INDEV	0000	3359	190	286	431	454	465	565	706	739	765	854	903	946	955
			1005	2083	2094	2112	2153	2428	2790	3020	3029	3642	4276*		
IO	0000	0A10	126*	158	164										
IO2	0000	0A92	172	175*											
IOOUT	0000	0A6A	160	163*											
KEY1	0000	0AE2	200	203*											
KEY2	0000	0B04	209	211	214*										
KEYERR	0000	0AFC	202	212*											
LADC	0000	0002													
LDST	0000	1398	1189*												
LOADER	0000	0088	88	91*											
LSD0	0000	2D14	1198	3835*											
LSD1	0000	2D1C	1203	3837*											
LSD10	0000	2D64	1266	3855*											
LSD11	0000	2D6C	1275	3857*											
LSD12	0000	2D74	1284	3859*											
LSD13	0000	2D7C	1293	3861*											
LSD14	0000	2D84	1311	3863*											
LSD15	0000	2D8C	1317	3865*											
LSD16	0000	2D94	1323	3867*											
LSD2	0000	2D24	1209	3839*											
LSD3	0000	2D2C	1215	3841*											
LSD4	0000	2D34	1226	3843*											
LSD5	0000	2D3C	1232	3845*											
LSD6	0000	2D44	1238	3847*											
LSD7	0000	2D4C	1249	3849*											
LSD8	0000	2D54	1255	3851*											
LSD9	0000	2D5C	1261	3853*											
LSR0	0000	2D18	1201	3836*											
LSR1	0000	2D20	1207	3838*											
LSR10	0000	2D68	1269	3856*											
LSR11	0000	2D70	1282	3858*											
LSR12	0000	2D78	1291	3860*											
LSR13	0000	2D80	1300	1304	3862*										
LSR14	0000	2D88	1315	3864*											
LSR15	0000	2D90	1321	3866*											
LSR16	0000	2D98	1327	3868*											
LSR2	0000	2D28	1213	3840*											
LSR3	0000	2D30	1219	1224	3842*										
LSR4	0000	2D38	1230	3844*											
LSR5	0000	2D40	1236	3846*											
LSR6	0000	2D48	1242	1247	3848*										

		153	154	155	167	169	173	175	175	176	219	221	223	224
		228	229	237	238	240	241	243	244	247	248	249	250	251
		252	254	255	257	258	261	262	263	264	266	267	268	271
		272	273	293	294	295	297	299	338	339	340	347	384	386
		395	401	437	438	439	682	687	707	708	718	721	722	730
		733	735	766	845	846	852	853	855	913	914	1007	1008	1009
		1022	1023	1025	1026	1032	1033	1044	1045	1047	1048	1056	1057	1068
		1069	1070	1071	1084	1675	1676	1730	1738	1738	1739	1742	1753	1753
		1754	1757	1765	1766	1869	1871	1873	1875	2029	2030	2070	2071	2072
		2073	2083	2084	2084	2085	2086	2086	2094	2095	2095	2096	2097	2097
		2100	2101	2191	2194	2195	2248	2251	2252	2257	2258	2285	2288	2289
		2323	2332	2335	2349	2350	2361	2362	2376	2377	2379	2390	2393	2394
		2429	2432	2433	2646	2648	2650	2652	2653	2654	2663	2664	2665	2666
		2667	2668	2687	2688	2689	2690	2691	2692	2714	2717	2720	2722	2724
		2734	2736	2742	2743	2749	2750	2756	2757	2772	2773	2774	2784	2789
		2809	2816	2916	2922	2923	2924	2925	2957	2958	2959	2972	2973	2975
		2976	2978	2979	2981	2982	2984	2985	2987	2988	2990	2991	2993	2994
		2996	2997	2999	3000	3002	3003	3005	3006	3008	3009	3011	3012	3020
		3023	3026	3029	3030	3034	3037	3057	3096	3097	3098	3102	3103	3159
		3162	3180	3181	3182	3205	3250	3255	3257	3259	3260	3268	3271	3289
		3293	3296	3297	3306	3309	3328	3334	3338	3346	3349	3368	3372	3374
		3376	3377	3386	3389	3408	3414	3416	3417	3425	3428	3447	3448	3454
		3456	3458	3459	3467	3470	3476	3539	3628	3634	3671	3674	3685	3687
		3687	3688	3690	3690	3747	3749	3751	3752	3753	3766	3769	3770	
R10	0000 000A	80*	97	98	99	102	108	110	849	1270	1271	1691	1707	1876
		1895	1932	2032	2129	2130	2204	2205	2346	2405	2546	2785	2812	2813
		2911	2997	3603	3621	3660	3691	3765	3777	3819				
R11	0000 000B	81*	102	103	103	105	110	498	500	934	935	936	1693	1709
		1877	1896	1933	2132	2207	2209	2796	2797	3000	3016	3066	3170	3174
		3182	3205	3717	3722	3724	3727	3729	3731	3733	3735	3737	3740	3741
		3745	3821											
R12	0000 000C	82*	499	673	963	965	993	995	1063	1898	1909	1935	2063	2067
		2134	2211	2242	2246	2278	2279	2326	2330	2384	2388	2419	2423	2446
		2461	2465	2519	2786	2792	2949	2952	3003	3015	3016	3065	3066	3171
		3172	3261	3261	3262	3263	3264	3266	3267	3298	3298	3299	3300	3301
		3303	3304	3339	3339	3340	3341	3342	3344	3345	3378	3378	3379	3380
		3381	3383	3384	3418	3418	3419	3420	3421	3423	3424	3460	3460	3461
		3462	3463	3465	3466	3528	3529	3530	3534	3543	3547	3551	3564	3566
		3567	3591	3594	3605	3608	3697	3698	3698	3699	3700	3701	3702	3703
		3704	3705	3706	3707	3708	3709	3714	3774	3790	3798	3801	3802	3805
		3812												
R13	0000 000D	83*	399	400	400	401	414	428	441	451	462	473	481	493
		507	562	590	591	638	640	642	649	729	743	756	773	774
		778	899	907	919	923	924	931	943	947	950	952	984	988
		1020	1021	1035	1036	1038	1050	1058	1064	1073	1074	1077	1080	1094
		2064	2125	2136	2144	2145	2168	2213	2224	2226	2228	2243	2260	2269
		2298	2304	2327	2350	2355	2357	2385	2406	2409	2420	2447	2462	2520
		2555	2950	2953	3006	3017	3053	3067	3086	3100	3118	3128	3136	3142
		3144	3160	3186	3188	3276	3277	3314	3315	3354	3355	3394	3395	3433
		3434	3483	3484	3527	3531	3544	3548	3552	3567	3592	3606	3715	3775
		3806	3813											
R14	0000 000E	84*	99	108	650	671	764	940	967	967	971	983	984	997
		998	1052	1065	1764	1806	1808	1809	1812	1817	1853	1897	1908	1914
		1927	1934	2065	2138	2185	2186	2244	2328	2352	2386	2418	2421	2445
		2448	2449	2463	2467	2518	2521	2522	2644	2660	2670	2678	2694	2712

		2719	2721	2723	2725	2731	2737	2744	2751	2758	2770	2778	2779	2817
		2919	2929	2934	2954	3009	3167	3167	3169	3175	3176	3177	3202	3204
		3519	3532	3536	3537	3540	3571	3579	3587	3593	3595	3602	3607	3609
		3620	3631	3649	3652	3716	3773	3776	3794	3807	3814			
R15	0000 000F	85*	1054	1807	1808	1810	1811	1886	1888	2066	2141	2166	2202	2245
		2280	2281	2301	2329	2387	2422	2464	2656	2776	2787	2810	2928	2931
		2932	2933	3012	3168	3203	3252	3254	3256	3292	3294	3305	3331	3332
		3333	3371	3373	3385	3411	3412	3413	3453	3455	3480	3533	3564	3565
		3629	3655	3666	3679	3692	3710							
R2	0000 0002	72*	95	105	106	111	152	153	168	174	177	180	181	182
		184	188	190	191	192	193	195	197	204	206	276	277	279
		281	286	287	288	289	291	293	300	302	306	307	308	311
		312	315	316	319	320	322	324	325	326	328	329	332	333
		335	336	341	344	345	346	382	385	393	397	404	417	418
		419	422	424	431	432	433	435	437	444	446	454	455	457
		465	466	468	475	477	485	487	500	515	516	517	519	520
		522	524	528	529	532	533	536	537	541	542	546	547	550
		551	555	556	558	559	565	566	567	569	573	575	646	656
		668	706	708	709	722	725	726	734	735	738	739	740	752
		765	766	769	770	775	854	855	855	860	871	871	874	875
		876	882	883	890	891	896	903	904	925	926	927	955	958
		976	977	980	981	985	1002	1005	1008	1008	1027	1028	1086	1331
		1332	1336	1432	1436	1589	1593	1727	1728	1729	1730	1731	1732	1733
		1742	1745	1746	1749	1757	1760	1761	2075	2076	2077	2111	2112	2113
		2122	2134	2140	2141	2153	2154	2155	2156	2161	2165	2166	2180	2181
		2182	2195	2196	2201	2202	2239	2240	2252	2253	2282	2283	2289	2290
		2300	2301	2318	2319	2320	2389	2394	2395	2428	2433	2434	2435	2498
		2499	2539	2540	2541	2790	2791	2799	2804	2973	3077	3081	3083	3554
		3557	3558	3559	3561	3562	3565	3569	3573	3576	3577	3578	3581	3582
		3584	3585	3642	3645	3645	3647	3648	3653	3661	3661	3662	3663	3664
		3748	3749	3768	3769									
R3	0000 0003	73*	91	92	94	107	170	171	182	188	193	195	204	260
		262	270	271	279	289	291	300	308	312	316	320	326	329
		331	332	333	336	404	410	412	419	424	433	435	444	455
		466	475	485	517	520	524	529	533	537	542	547	551	556
		559	567	569	575	646	647	656	668	669	709	715	716	726
		740	741	770	774	775	776	876	883	891	896	897	904	905
		927	940	958	959	977	981	985	986	1002	1003	1029	1030	1031
		1333	1334	1335	1336	1431	1432	1435	1436	1588	1589	1592	1593	1674
		1675	1676	1678	1679	1681	1682	1717	1718	1719	1721	1722	1921	1922
		1925	1926	2077	2113	2114	2122	2123	2156	2182	2196	2240	2253	2283
		2290	2320	2395	2424	2425	2435	2501	2512	2513	2514	2541	2791	2794
		2804	2805	2976	3062	3063	3070	3071	3075	3076	3082	3083	3084	3089
		3090	3154	3154	3155	3253	3255	3258	3268	3291	3295	3306	3330	3335
		3346	3370	3375	3386	3410	3415	3425	3449	3457	3502	3505	3508	3516
		3520	3555	3559	3562	3569	3574	3578	3582	3585	3648	3651	3662	3674
		3675	3678	3750	3751	3772	3791	3798	3799	3802	3804	3806		
R4	0000 0004	74*	96	179	184	185	186	197	198	199	201	203	206	207
		208	210	212	214	278	281	282	283	302	303	304	478	479
		489	490	513	522	540	541	545	546	554	555	717	746	746
		772	851	853	853	862	872	872	895	942	943	946	947	1006
		1009	1009	1735	1735	1736	1740	1744	1750	1750	1751	1755	1759	1767
		1768	1830	1831	1833	1834	1840	1841	1843	1844	1846	1847	1926	2322
		2334	2375	2376	2378	2380	2381	2469	2470	2471	2472	2473	2474	2475
		2476	2477	2478	2479	2480	2481	2482	2483	2484	2485	2486	2487	2488

		2489	2492	2493	2503	2504	2509	2510	2650	2651	2651	2652	2679	2688
		2689	2690	2691	2692	2773	2774	2979	3076	3083	3084	3503	3506	3509
		3518	3596	3598	3600	3601	3610	3611	3613	3617	3618	3618	3627	3632
		3633	3676	3677	3678	3803	3804							
R5	0000 0005	75*	394	394	408	487	488	496	514	748	752	856	859	860
		861	862	870	871	872	2332	2333	2334	2360	2490	2491	2537	2537
		2551	2552	2553	2680	2705	2735	2738	2739	2741	2745	2746	2748	2752
		2753	2755	2759	2760	2799	2800	2800	2982	3251	3270	3271	3272	3454
		3467	3510	3511	3512	3513	3515	3516	3616	3619	3671	3672	3673	3676
		3743	3744											
R6	0000 0006	76*	392	403	497	571	572	636	658	659	749	754	754	864
		866	866	867	878	881	882	911	911	916	917	972	975	976
		980	2324	2341	2341	2345	2360	2497	2497	2499	2545	2695	2696	2699
		2703	2704	2705	2716	2720	2724	2743	2757	2985	3190	3290	3308	3309
		3310	3329	3348	3349	3350	3369	3388	3389	3390	3409	3427	3428	3429
		3448	3469	3470	3471	3473	3475	3476	3745	3755				
R7	0000 0007	77*	391	392	403	635	636	759	760	761	863	864	886	889
		890	924	1810	2087	2088	2344	2345	2347	2400	2401	2544	2545	2548
		2549	2696	2697	2698	2702	2703	2715	2717	2722	2736	2750	2988	3189
		3190	3683	3684	3686	3689	3691	3754	3755					
R8	0000 0008	78*	405	405	406	408	411	412	1682	1685	1686	1687	1701	1702
		1703	2068	2158	2184	2247	2277	2331	2372	2373	2374	2427	2460	2550
		2554	2647	2648	2661	2663	2687	2713	2714	2733	2734	2742	2749	2756
		2771	2772	2913	2914	2923	2991	3107	3108	3479	3685	3686	3688	3689
		3792	3793	3797										
R9	0000 0009	79*	398	398	406	873	885	929	929	938	950	961	970	1076
		1076	1078	1689	1705	2062	2098	2152	2179	2238	2276	2317	2371	2417
		2459	2655	2669	2693	2699	2700	2701	2702	2718	2732	2775	2802	2807
		2994	3659	3684	3788	3795	3820	3821						
RB	0000 0EBA	564*												
RBR	0000 0DF8	495*												
RD	0000 0D6A	443*												
RD1A	0000 2B56	3644	3646*											
RDR	0000 0D48	430*												
READ1	0000 2B48	3629	3642*											
READASC	0000 2B30	3595	3609	3627*										
REG0	0000 338C	912	934	2342	2346	2399	2405	2538	2546	2922	2925	2940	3060	3062
		3742	4296*											
REG1	0000 3390	4297*												
REG10	0000 33CC	3014	3083	3746	4316*									
REG11	0000 33D0	2784	2789	2809	2816	4317*								
REG12	0000 33D4	4318*												
REG13	0000 33D8	4319*												
REG14	0000 33DC	4320*												
REG15	0000 33E0	4321*												
REG16	0000 33E4	4322*												
REG17	0000 33E8	4323*												
REG18	0000 33EC	4324*												
REG19	0000 33F0	4325*												
REG1A	0000 33F4	4326*												
REG1B	0000 33F8	4327*												
REG1C	0000 33FC	4328*												
REG1D	0000 3400	4329*												
REG1E	0000 3404	4330*												
REG1F	0000 3408	2802	2807	4331*										

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REG2      0000 3394    4298*
REG20     0000 340C    4332*
REG3      0000 3398    4299*
REG30     0000 344C    4334*
REG4      0000 339C    4300*
REG5      0000 33A0    2551   4301*
REG6      0000 33A4    4302*
REG7      0000 33A8    4303*
REG8      0000 33AC    4304*
REG9      0000 33B0    4305*
REGA      0000 33B4    4306*
REGB      0000 33B8    4307*
REGBYT    0000 3360    3081   3619   4281*
REGC      0000 33BC    4308*
REGD      0000 33C0    4309*
REGE      0000 33C4    4310*
REGF      0000 33C8    3071   4311*
REGMQ     0000 3198    3608   4185*
REGMSG    0000 31CB    3605   4191*
REGMSZ    0000 31E2    3606   4198*
REGSAV    0000 338C      90    251   4293*
RENTRY    0000 0B08     216*  3816
RGNOP2    0000 2BBA    3252   3697*
RGNOPF    0000 2BC4    3700*
RH        0000 0DA6     464*
RHR       0000 0DDE     484*
S1BUF     0000 32B0    573    4231*
S2B       0000 1026    720     722*
S2C       0000 105C    740*    742
S2E       0000 1086    755     759*
S2END     0000 0F98    667     671*
S2END2    0000 0FA0    671     673*  1772   3150
S2F       0000 10A6    770*
S2INT     0000 106A    715     746*
S2INT2    0000 0F62    653*    747
S2INT2B   0000 0F74    659*
S2L1      0000 0FA8    637     678*
S2L2      0000 103A    730*
S2L2A     0000 1048    732     734*
S2L2B     0000 1058    737     739*
S2L3      0000 10B2    775*    777
S2R       0000 0F48    639     641   644*   648    744    757    779
S2R1      0000 0F3E    638*    684   686    688    691    693
S2R2      0000 0F42    640*    699   701    704
S2R3      0000 1064    743*
S2R4      0000 1080    751     753   756*   762
S2R5      0000 10BA    778*
S2R6      0000 0F46    642*    657   664
S2R6A     0000 0F6C    657*    660
S2RX      0000 0F56    645     649*
S2WT      0000 0F90    668*    670
S3A       0000 10C0    845*
S3A1      0000 10CE    847     851*
S3A1A     0000 10F4    858     860*
S3A1X     0000 1104    852     866*
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S3A2      0000 10FA   863*   868
S3BRK     0000 127C  1002*  1004
S3P1      0000 2788  3240*
S3P1.1    0000 2788  3250*
S3P1.3    0000 279A  3255*  3273
S3P1END   0000 27E0  3274   3275*
S3P1T1    0000 27BC  3265*
S3P1T2    0000 27CA  3269*
S3P2      0000 27EC  3275   3279*
S3P2.1    0000 27EC  3289*
S3P2.3    0000 27FA  3293*  3311
S3P2END   0000 2844  3312   3313*
S3P2T1    0000 281C  3302*
S3P2T2    0000 282E  3307*
S3P3      0000 2850  3313   3317*
S3P3.1    0000 2850  3328*
S3P3.3    0000 285E  3332*  3351
S3P3END   0000 28A4  3352   3353*
S3P3T1    0000 2882  3343*
S3P3T2    0000 2890  3347*
S3P4      0000 28B0  3353   3357*
S3P4.1    0000 28B0  3368*
S3P4.3    0000 28BE  3372*  3391
S3P4END   0000 290A  3392   3393*
S3P4T1    0000 28E2  3382*
S3P4T2    0000 28F4  3387*
S3P5      0000 2916  3393   3397*
S3P5.1    0000 2916  3408*
S3P5.3    0000 2924  3412*  3430
S3P5END   0000 296A  3431   3432*
S3P5T1    0000 2948  3422*
S3P5T2    0000 2956  3426*
S3P6      0000 2976  3432   3436*
S3P6.1    0000 2976  3447*
S3P6.3    0000 2988  3454*  3472  3477
S3P6.4    0000 29DC  3474   3478*
S3P6END   0000 29E6  3481   3482*
S3P6T1    0000 29AA  3464*
S3P6T2    0000 29B8  3468*
S3PSW     0000 32C0   863    936   983   4236*
S3R       0000 1176   902    907*  920   1060
S3R1      0000 11B8   931*
S3R12     0000 1198   919*
S3R2      0000 1162   899*   941   965
S3R34     0000 11EC   937    944   950*  964   966   968   994   996   999
S3RWT     0000 1164   901*   906   932   953   989
S3SQINT   0000 129C  1013*
S3WT1     0000 1126   876*
S3WT2     0000 113A   880    883*
S3WT2A    0000 114C   888    890*  963
S3WT3     0000 115A   894    896*  898
S3WT5     0000 124C   985*   987   993
S3WT6     0000 1254   988*   995
S3X2      0000 11BE   930    934*
S3X3      0000 11E4   939    946*
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S3X4	0000	11F4	945	948	955*	960							
S3X5	0000	1206	957	961*									
S3X5A	0000	1240	974	980*									
S3X5B	0000	1246	979	983*									
S3X8	0000	125A	962	993*									
S3X9	0000	1284	1001	1005*									
S3XINT	0000	117E	870	910*									
S3XINT1	0000	119E	915	918	922*								
S4A50	0000	19F0	1675*	1680									
S4A52	0000	1A34	1694	1699*									
S4A62	0000	1A64	1710	1713*									
S4A65	0000	1A76	1718*	1723									
S4END	0000	1B20	1763	1772*									
S4R50	0000	1A2C	1677	1688	1690	1692	1695*						
S4R60	0000	1A5C	1704	1706	1708	1711*	1720						
S5A1	0000	1CF6	2031	2062*									
S5A10	0000	20FE	2457*										
S5A2	0000	1DEC	2142	2152*									
S5A3	0000	1E22	2167	2179*									
S5A3A	0000	1E58	2193	2195*									
S5A4	0000	1EC2	2222	2238*									
S5A4A	0000	1EF6	2250	2252*									
S5A5	0000	1F32	2268	2276*									
S5A5A	0000	1F5E	2287	2289*									
S5A6	0000	1F88	2302	2317*									
S5A6B	0000	1FBC	2332*	2363									
S5A6BEND	0000	226E	2387	2595*									
S5A8	0000	2016	2371*										
S5A8CH	0000	226E	2375	2598*									
S5A8CHZ	0000	229E	2381	2623*									
S5A8D	0000	2026	2376*	2382									
S5A8D1	0000	2066	2392	2394*									
S5A9	0000	2096	2407	2417*									
S5A9B	0000	20BE	2428*	2494									
S5A9C	0000	20D0	2431	2433*									
S5C	0000	1D1A	2071*	2074									
S5END	0000	21DE	2531*										
S5ERR0	0000	1DB2	2121	2125*									
S5PSW	0000	32E4	2087	2130	2205	4248*							
S5R	0000	1DE4	2126	2145*	2169	2225	2227	2229	2270	2305	2356	2358	2410	2556
S5R1	0000	1DE2	2133	2137	2139	2144*								
S5R11	0000	221A	2556*											
S5R1A	0000	1DD0	2131	2135	2137*									
S5R2	0000	1E1C	2168*											
S5R3	0000	1EB0	2203	2206	2212	2214	2217	2224*	2500					
S5R3A	0000	1E8A	2208	2210	2212*									
S5R4	0000	1F2C	2259	2261	2264	2269*								
S5R5	0000	1F82	2297	2299	2304*									
S5R6	0000	1FFC	2348	2351	2355*									
S5R7	0000	2002	2331	2357*										
S5R8	0000	2090	2409*	2502	2505									
S5R9	0000	1EB6	2219	2226*	2404	2511								
S5RA	0000	1EBC	2228*	2267	2444									
S5RNA	0000	2180	2490	2497*										
S5RNAX	0000	21B4	2506	2513*										

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S5RTN1      0000 1DB8      2068   2129*
S5RTN10     0000 21BE      2460   2517*
S5RTN2      0000 1E12      2158   2165*
S5RTN3      0000 1E62      2184   2201*
S5RTN4      0000 1F00      2247   2257*
S5RTN5      0000 1F68      2277   2295*
S5RTN6      0000 1FD2      2322   2341*
S5RTN6B     0000 2008      2353   2360*
S5RTN8      0000 2070      2372   2399*
S5RTN9      0000 20DE      2427   2441*
S5SBRTN     0000 21E2      2537*  2568
S5SINT      0000 1D36      2079   2082*  2162   2198   2255   2292   2338   2397   2437
S5SINTA     0000 1D4E      2087*  2092
S5SINTB     0000 1D58      2082   2090*
S5SINTC     0000 1D8E      2109*  2132
S5SINTD     0000 1D94      2104   2111*
S5SINTZ     0000 1DA3      2116*  2209
S5WAIT      0000 1D98      2099   2110   2112*  2115   2207
S5WAIT2     0000 1DAA      2122*  2124
S61         0000 22B2      2646*  2657
S62         0000 22D2      2655   2659*
S62A        0000 22DE      2662*  2672
S62B        0000 22E0      2663*  2674
S62E        0000 22F4      2671*
S63         0000 22FE      2669   2677*
S63A        0000 2330      2687*  2707
S63D        0000 234E      2695*
S63E        0000 2354      2696*  2706
S64         0000 237C      2693   2711*
S64A        0000 2392      2717*  2726
S65         0000 23B0      2718   2730*
S65A        0000 23C0      2734*  2762
S65B        0000 23C4      2736*  2740
S65C        0000 23D6      2743*  2747
S65D        0000 23E8      2750*  2754
S65E        0000 23FA      2757*  2761
S66         0000 240C      2732   2769*
S66A        0000 2414      2771*  2777
S6END       0000 242A      2775   2778*
S78         0000 24B0      2915*  3113
S78A        0000 24B4      2916*
S78AB       0000 2510      2945*  4251
S78ABPSW    0000 32E8      2943   4251*
S78ALP      0000 24C6      2923*  2926
S78ALQ      0000 24E4      2928   2932*
S78B        0000 2522      2947   2952*
S78BRK      0000 25C0      3013   3020*
S78BRK1     0000 25EE      3025   3034*
S78BRKA     0000 25CE      3022   3024*
S78CHK      0000 2558      2970*  3045
S78D        0000 252A      2951   2954*
S78D1       0000 253A      2961*  3208
S78D3       0000 2554      2968*  4252   4253
S78DELAY    0000 2746      3181*  3183
S78DONE     0000 26FE      3111   3141   3150*
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S78ENT     0000 24A6    2910   2912*
S78FLAG1   0000 337A    2918   3116   3176   4289*
S78FLSAV   0000 2682    3096*
S78G       0000 26AE    3112*  3127
S78MM2     0000 2720    3158   3167*
S78MM3     0000 273A    3173   3175*
S78MM4     0000 2744    3180*
S78MMI2    0000 2760    3168   3197*
S78MMI3    0000 2780    3207*
S78MMINT   0000 2702    2936   3154*  3203
S78NOBRK   0000 2606    3028   3036   3039   3044*
S78PSW1    0000 3344    2919   3125   3133   3155   4256*
S78PSW2    0000 3348    3139   3199   4257*
S78R11     0000 268E    3100*
S78WT1     0000 25DE    3029*  3032
S78X2A     0000 260C    3033   3043   3049*
S78X3      0000 262E    3063*  3072
S78X4      0000 2640    3064   3070*
S78X5      0000 265E    3080   3082*
S78X6      0000 2660    3083*  3091
S78X7      0000 2672    3085   3089*
S78X8      0000 269C    3095   3107*
S78XX      0000 2620    3052   3056*
S7D2       0000 254C    2963   2966*
S7D2PSW    0000 32F0    2967   4252*
S7END      0000 26FE    3148*
S7R        0000 26F6    3018   3054   3069   3087   3101   3119   3129   3137   3144*  3164
S7R1       0000 25B0    3010   3014*
S7R1A      0000 25A8    3004   3007   3010*
S7R1B      0000 259C    2995   2998   3001   3004*
S7R1C      0000 258A    2986   2989   2992   2995*
S7R1D      0000 2578    2977   2980   2983   2986*
S7R1E      0000 2566    2971   2974   2977*
S7R2       0000 263A    3067*
S7R2B      0000 2634    3065*
S7R3       0000 266C    3086*
S7R4       0000 2716    3160*  3163
S8D        0000 26B4    3109   3116*
S8D2       0000 2544    2964*
S8D2PSW    0000 32F8    2965   4253*
S8E        0000 26C0    3117   3122*
S8END      0000 26FE    3149*
S8P2       0000 26EA    3135   3139*
S8POFF     0000 26DA    3123   3132*
S8R5       0000 26BA    3118*
S8R6       0000 26D4    3128*
S8R7       0000 26E6    3136*
S8R8       0000 26F4    3142*  3201
S8R9       0000 2750    3186*
SBWT       0000 0BDE     279*   284
SDELAY     0000 2444    2656   2776   2789*
SDLY1      0000 244C    2791*  2803
SDLY2      0000 2482    2795   2801   2806   2809*
SDLY3      0000 246C    2802*
SDLY4      0000 2474    2793   2804*  2808
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SDLY5       0000 2462    2797*  2798
SENSE1      0000 00A2      99*   104
SENSE2      0000 00B6     108*
SEQFLG      0000 3362    2932   3094   3815   4283*
SEQUENCE    0000 2CEE    2531   2780   3782   3786   3809   3815*
SETUP       0000 2B70    3254   3292   3331   3371   3411   3453   3659*
SETUP.1     0000 2B7A    3662*  3665
SIM         0000 2872    3336   3338*
SS          0000 0CC2     380*
SSR         0000 0CC2     381*
STORE       0000 00AE     105*   111
SUBT1       0000 0CC2     348    361*
SUBT2       0000 0F26     349    598*
SUBT3       0000 10C0     350    784*
SUBT4       0000 1390     351   1101*
SUBT5       0000 1CE8     352   1941*
SUBT6       0000 229E     353   2628*
SUBT7       0000 2498     354   2822*
SUBT8       0000 2498     355   2883*
SUBT9       0000 2788     356   3213*
SVCERR      0000 2C14     260   3735*
SWAP        0000 0001    1172*  1337   1337   1824   1824   1826   1826   1856   1856   1919
SYSCLR      0000 0A4C     153*   156
SYSQ7       0000 1304    1047*
SYSQ8       0000 1308    1046   1050*
T1A1        0000 0D22     413    417*
T1A10       0000 0DC6     472    475*
T1A10A      0000 0DCE     478*
T1A11       0000 0DDE     480    485*
T1A11B      0000 0EF8     491    496*
T1A11C      0000 0E04     499*
T1A11D      0000 0E28     506    513*
T1A12       0000 0E30     515*
T1A14       0000 0E60     532*
T1A15       0000 0E64     533*
T1A16       0000 0E8C     547*
T1A18       0000 0EBA     561    565*
T1A2        0000 0D48     427    431*
T1A3        0000 0D6A     440    444*
T1A6        0000 0D86     450    454*
T1A8        0000 0DA6     461    465*
T1END       0000 0F22     589    593*
T1MSG       0000 3150    3543   4166*  4233
T1MSG2      0000 314E     513   4165*
T1MSGEND    0000 316C     514    527    532    536    540    545    550    554   3544   4172*  4234
T1R         0000 0F1A     415    429    442    452    463    474    482    494    508    563    591*
T1R1        0000 0D42     423    425    428*
T1R10       0000 0DF2     493*
T1R11       0000 0EB4     523    525    530    534    538    543    548    552    562*
T1R2        0000 0D64     441*
T1R3        0000 0D80     451*
T1R4        0000 0D1C     402    407    409    414*
T1R5        0000 0DA0     462*
T1R6        0000 0DC0     473*
T1R7        0000 0DD8     481*
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TTYRD      0000 334F      4266*
WB         0000 0D22       416*
WBMSG      0000 2A6C      1065   2448   2521   2954   3545   3549   3554*  3593   3607   3716   3776   3807   3814
WBMSG1     0000 2A7A      3556   3558*
WBR        0000 0E28       512*
WD         0000 0E28       511*
WDR        0000 0E28       510*
WRITE1     0000 2A9E      2644   2660   2678   2712   2731   2770   3573*
WRITE1A    0000 2AAC      3575   3577*
WT1        0000 0AA8       182*   187
X00        0000 1BDC      1832   1836*
X01        0000 1BE2      1838*
X02        0000 1BF8      1837   1840*
X9C        0000 0BAA       262*   265
XBC        0000 0BB6       266*   269
XDOB       0000 0BC6       271*   274
XINTHW     0000 2C10       240   3733*
ZEROF      0000 2D0C      1350   1352   1447   1449   1483   1485   1571   1574   1577   1580   1583   1603   1605
                          1633   1659   3830*
ZRO1       0000 1734      1464   1466*
ZRO2       0000 17A8      1500   1502*
ZRORST     0000 1686      1409   1411*
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