

DX11B

DIAGNOSTIC (MAINTENANCE
MD-11-DZDXF-D
CLOCK #2)

EP-DZDXF-D-DL
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JUN 1978
digital
MADE IN USA

The image displays a grid of 120 punched cards, organized into 12 rows and 10 columns. Each card contains technical data, including alphanumeric strings, tables, and diagrams. The cards are dark blue with white text and punch holes. The data on the cards is dense and appears to be diagnostic or maintenance information for a specific system, as indicated by the header text. The cards are arranged in a regular grid pattern, with some cards missing in the bottom right corner, leaving a blank space on the right side of the page.

IDENTIFICATION

PRODUCT CODE: MAINDEC-11-DZDXF-D-D
PRODUCT NAME: DX11B DIAGNOSTIC (MAINTENANCE
 CLOCK #2)
DATE CREATED: JUNE 21, 1974
MAINTAINER: DIAGNOSTIC GROUP
AUTHOR: J. FRIEDRICH

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632	DYNAMIC SWITCH SETTINGS (SWR #1)
667	CLOCK, ISSUE N MAINTENANCE CLOCK PULSES
668	SS, SELECTION MACRO
669	SHORT, SHORT TT TRACE UPDATE AND SELECT
670	DEFINE, ENT DEFINITIONS
671	ESAVE, SAVE REGISTER FOR ERROR PRINT
672	ERSTOR, RESTOR ERROR REGISTERS
673	SAVE, SAVE ARG ON STACK
674	RESTOR, RESTOR ARG FROM STACK
675	SCOPELOOP, SUBROUTINE TO EXECUTE SCOPE CODE
676	CLEAR, CLEAR FROM ARG1, ARG2 WORDS
677	CLRSUB, SUBROUTINE TO CLEAR FROM ARG1, ARG2 WORDS
678	DUMP, OCTAL DUMP OF ARG
679	SDUMP, OCTAL DUMP OF ARG, LEADING ZEROS SUPPRESSED
680	NUMBER, TEST NUMBER INCREMENTER
681	SCOPEM, SCOPE
682	ERCALL, ERROR CALL ENT
683	STEPTSSF, SINGLE STEP TSSF
684	CHECKFOR, CHECK FOR PHASE ARG
685	CHECK, CHECK FOR PHASE, STATE ARG
686	SNAPSHOTPH, ?
687	LDNLK, LOAD AND LOCK MCLK MACRO
688	CLKCHK, CLOCK AND CHECK PHASE+STATE
689	LOAD, LOAD BIT IN REGISTER + MAP
690	REMOV, REMOVE BIT FROM REGISTER + MAP
854	MISCELLANEOUS DEFINITIONS
956	TRAP DEFINITIONS
1219	DX REGISTERS
1119	POWER FAIL
1173	STATUS POINTER WORD TABLE
1485	TUMBLE TABLE
1494	T1 MAINTENANCE CLOCK [SS SPW(15100)=0
1617	T2 MAINTENANCE CLOCK [SS SPW(15100)NOT ZERO
2590	T3 MAINTENANCE CLOCK OUTPUT [IBM READ TEST
3279	T4 MAINTENANCE CLOCK INPUT [IBM WRITE] TEST
3858	T5 END OF TEST STRING
4521	MONITOR
4785	MONITOR FILES
5018	MONITOR SUBROUTINES
5392	TTY ASCII OUTPUT ROUTINE
5427	SAVE AND RESTORE REGISTERS
5457	OCTAL DUMP ROUTINE
5543	ODT
6247	MESSAGES

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1. ABSTRACT

THE FUNCTION OF THE DX11B DIAGNOSTICS IS TO VERIFY THAT THE DX11B IMPLEMENTS THE FUNCTIONAL FLOW DIAGRAMS ILLUSTRATED IN THE DX11B PRINT SET. THE DX11 DIAGNOSTIC PACKAGE CONSISTS OF FOUR TAPES

1. D2DXA-[REV] MAINTENANCE CLOCK #1
2. DXDXF-[REV] MAINTENANCE CLOCK #2
3. D2DXG-[REV] DX OFFLINE DIAGNOSTIC EXERCISER
4. D2DXH-[REV] DX ONLINE-MAINTENANCE-CABLED EXERCISER

THE DIAGNOSTICS WERE DIVIDED INTO FOUR TAPES BECAUSE OF THE 8K WORD MEMORY LIMIT REQUIRED TO SUPPORT MINIMUM SYSTEMS AND FOR FUNCTIONAL SAFEGUARDS. IT WAS FELT THAT SAFEGUARDS SHOULD BE TAKEN TO INSURE THAT NO ONE INADVERTENTLY RAN THE ONLINE-MAINTENANCE-CABLE EXERCISER WHILE CONNECTED ONLINE TO IBM. IT WAS ALSO FELT THAT THE FUNCTIONAL SEPARATION OF TESTS WOULD FACILITATE

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ADAPTION TO ACT11 AND ODP TESTING; THERE ARE ALSO TWO OTHER MAINJEC'S SUPPORTED BY DIAGNOSTICS THAT RUN THE DX11B1

- 1. COMMUNICATION TEST PROGRAM (CTP)
- 2. GENERAL TEST PROGRAM (GTP) WITH DX OVERLAY
- 3. DEC/X11 WITH DX SOFTWARE MODULE

THESE TESTS OPERATE IN THE MAINTENANCE MODE AND WERE DESIGNED TO DETECT UNIBUS DEVICE INTERACTION PROBLEMS, ADDITIONALLY CTP HAS A "RESPONDER" MODE SO THAT INTERACTION PROBLEMS MAY BE DETECTED WHILE RUNNING ONLINE;

2. REQUIREMENTS

2.1 EQUIPMENT

PDP11 (MINIMUM 8K WORDS MEMORY)
ASR-33 (OR EQUIVALENT)
DX11B

2.2 STORAGE

ALL PROGRAMS LOAD IN 8K OF MEMORY

2.3 OTHER

A WORKING KNOWLEDGE OF ODT VERSION V806A,ODT IS NECESSARY

3. LOADING PROCEDURE

3.1 METHOD

ALL PROGRAMS ARE IN ABSOLUTE FORMAT AND ARE LOADED USING THE ABSOLUTE LOADER;

ABSOLUTE LOADER START ADDRESS =500

MEMORY •
SIZE

4K	17
8K	37
12K	57
16K	77
20K	117
24K	137
28K	157

3.1.1 LOAD ADDRESS OF ABS LOADER INTO SWITCHES

3.1.2 DEPRESS "LOAD ADDRESS" KEY ON CONSOLE

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3.1.3 DEPRESS "START" KEY ON CONSOLE

4. STARTING PROCEDURE

.....
ONLINE DIAGNOSTIC REQUIRES THAT IT BE MAINTENANCE
CABLED -SEE MANUAL FOR DETAILS
.....

.....
NEVER NEVER NEVER RUN THE ONLINE MAINTENANCE CABLED
EXERCISER WHILE CONNECTED TO IBM
.....

- A. SET SWITCH REGISTER TO 000200
- B. DEPRESS "LOAD ADDRESS" KEY
- C. DEPRESS START

THE PROGRAM WILL JUMP TO THE DIAGNOSTIC MONITOR AND
TYPE OUT THE OPERATING INSTRUCTIONS, THIS IS ONCE ONLY
CODE, TO RETYPE THE OPERATING INSTRUCTION THE OPERATOR
MAY EITHER RELOAD THE PROGRAM OR LOAD THE ADDRESS
"MONITOR" IN THE SWITCH REGISTER AND DEPRESS START.

4.1 CONTROL SWITCH SETTINGS

- SR 15 HALT ON ERROR
- SR 14 SCOPE ON TEST OR ERROR
- SR 13 INHIBIT PRINTING
- SR 12 TYPE SHORT ERROR REPORT
- SR 11 INHIBIT INTERACTIONS
- SR 10 CONTROL MAINTENANCE CLOCK (MAINT, CLK, TEST ONLY)
- SR 9 ODI TRAP ON ERROR

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4.2 STARTING ADDRESSES

ADDRESSES	COMMENT
000200	NORMAL START
	WITH 200 LEFT IN THE SWITCHES THE PROGRAMS TYPE OUT FULL INSTRUCTIONS ONCE AND ABBREVIATED INSTRUCTIONS THEREAFTER, WITH THE SWITCHES ZERO THE PROGRAMS SET UP EITHER THE DEFAULT OR PREVIOUSLY SELECTED PARAMETERS AND IMMEDIATELY ASKS FOR THE DYNAMIC SWITCH SETTINGS
MONITOR	RELOAD TAPE FOR RETYPING OF INSTRUCTIONS

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000042 IF THIS LOCATION IS NONZERO THE PROGRAM ASSUMES
IT IS RUNNING UNDER ACT11 OR DDP AND USES THE
DEFAULT PARAMETERS

0,ODT ENTRANCE TO ODT-11X VERSION V006A,ODT
MAY START THE PROGRAM BY TYPE 2001G
<CR>, (MAINTENANCE CLOCK TESTS ONLY)

NOTICE: HE WHO USES ODT IN A MEANS OTHER THAN EXPLICITLY
DIRECTED BY THIS DOCUMENT DOES SO AT HIS OWN RISK;

5. OPERATING PROCEDURE

STARTING FROM 200 WITH SR<07> UP CAUSES THE FOLLOWING GENERAL
TYPEOUT:

MAINDEC-11-D2DXX-X-D (TEST DESCRIPTION) (APR 74)

TYPE: <D>, FOR DEFAULT PARAMETERS
<P>, FOR PREVIOUS PARAMETERS
<S>, FOR SELECT PARAMETERS
<N>, FOR START WITH THIS TEST NUMBER

(5. CONT'D)

D, P, S, N

IN RESPONSE TO THIS LAST QUESTION THE OPERATOR IS REQUIRED
TO TYPE ONE OF THE LETTERS IN THE STRING. AT AUTO START
TIME THE PROGRAM FIRST SETS UP ALL THE DEFAULT PARAMETERS
"DEFAULT PARAMETERS" MEANS THE SET OF OPERATING VARIABLES
SELECTED AT THE FACTORY. FOR EXAMPLE, THE DEFAULT ADDRESS
IS 176200, THE DEFAULT VECTOR ADDRESS IS 300. THEREFORE, AT
AUTO START TYPING "P" FOR PREVIOUSLY SELECTED PARAMETERS IS
EQUIVALENT TO TYPING "D" FOR DEFAULT PARAMETERS.

IF ANY CHARACTER OTHER THAN ONE IN THE STRING IS TYPED THE
MONITOR WILL REJECT THE CHARACTER AND RETYPE THE STRING.

IF, IN RESPONSE TO THE STRING, THE OPERATOR TYPES AN "N" THE
SELECTION SEQUENCE IS ENTERED AND THE FOLLOWING DIALOGUE
TAKES PLACE.

NOTE: THESE ARE THE DEFAULT PARAMETERS; TYPING <D> IS
EQUIVALENT TO TYPING THE DEFAULT PARAMETERS;

TEST NUMBER: 1
BASE ADDRESS: 176200
VECTOR ADDRESS: 300
DX PRIORITY LEVEL: 4

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TYPE CU ADRS'S IN HEX <CR><LF>; <CR><CR> TERMINATES LIST
ADRS: 10 (THIS IS IN HEX)
DEVICES PER CU: 20 (THIS IS IN OCTAL)
LIST ALL LEGAL COMMANDS
COMMAND:
SET SWITCHES

AT ANY TIME DURING THE "SELECTION SEQUENCE A CONTROL C
MAY BE TYPED AND THE MONITOR WILL ASK AGAIN "D,P,S,N?";

"TEST NUMBER"

HERE THE MONITOR IS ASKING FOR THE NUMBER OF THE FIRST TEST
IN THE CHAINING SEQUENCE, THE DEFAULT ANSWER IS "1" ONE,
THE FIRST TEST IN THE CHAIN, IT MAY BE THAT THE OPERATOR IS
ONLY INTERESTED IN THE LAST FEW TESTS AND THEREFORE WOULD
TYPE 22 OR WHATEVER, AT THIS WRITING THERE IS NO CHECK TO
SEE IF THE OPERATOR SELECTED A NONEXISTANT TEST NUMBER (E.G.
PI,=2,4 MEG). SEE TABLE OF CONTENTS IN BEGINNING OF
LISTING.

-TYPING <CR> WILL DEFAULT THIS PARAMETER

(5. CONT'D)

"BASE ADDRESS: 176200"

THIS IS THE BASE ADDRESS FOR THE DX11 AND IS ALSO THE ADDRESS OF THE DXDS,
-TYPING <CR> WILL DEFAULT THIS PARAMETER

"VECTOR ADDRESS: 300"

THE DX11 IS CUT TO INTERRUPT TO ADDRESS 300 AT THE FACTORY;
ON SITE THE DX FOLLOWS, DC'S KL'S DP'S, DM'S DN'S, DMBB'S,
DR11'S, DR1A, DR1B, TYPESETTING AND BUS SWITCHES;
-TYPING <CR> WILL DEFAULT THIS PARAMETER

"TYPE CU ADRS'S IN HEX <CR><LF>; <CR><CR> TERMINATES LIST

ADRS: 10 <CR><LF>
ADRS: 20 <CR><CR>

THIS REQUEST IS FOR THE CONTROL UNIT'S HEXIDECIMAL ADDRESS
OR ADDRESSES, CAUTION!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
DO NOT EXCEED 16 ENTRIES OF CU ADDRESSES, THE PROGRAM
MAY SELF DESTRUCT, IF THE SYSTEM REQUIRES THAT THERE BE
MORE THAN 16 CU ADDRESSES THEN THE DIAGNOSTICS MUST BE
RUN AGAIN FOR THOSE EXCEEDING 16 CAUTION!!!!
IN MAINTENANCE CLOCK & DIAGNOSTIC THE M900 MUST
NOT BE CUT FOR MORE THAN 16 CU ADDRESSES

THE IBM CONTROL UNITS ADDRESSES ARE SPECIFIED IN HEXADECIMAL.
FOR CONTROL UNIT 010(16) THE
RESPONSE TO ADRS: IS 10(HEX) WHICH IS 00010000(2).

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THE DX11 CAN EMULATE UP TO 128(18) CONTROL
UNITS WITH 1 DEVICE EACH OR 1 CONTROL UNIT WITH 128(18)
DEVICES OR AS IS THE DEFAULT CASE 1 CONTROL UNIT WITH 16(18)
DEVICES. THE ADRSI AND RESPONSE WILL CONTINUE
INDEFINITELY AS LONG AS <CR><LF> IS TYPED FOLLOWING THE
CU ADDRESS. THE LIST IS TERMINATED BY TYPING <CR><CR>;
NOTE!!!! TYPING <CR><CR> IN RESPONSE TO THE FIRST ADRSI
WILL DEFAULT THE CU ADDRESS TO 00 AND WILL ALSO
TERMINATE THE LIST. (DEFAULT=18 HEX), THE ACTUAL # MUST BE TYPED IN
"DEVICES PER CUI 20"

THE RESPONSE TO THIS INPUT REQUEST IS IN OCTAL AND REPRESENTS
THE NUMBER OF DEVICES THIS CONTROL UNIT SERVICES. A DX11
EMULATED CONTROL UNIT CAN SERVICE FROM 1 TO 200(8) DEVICES,
NOTE!!!! TYPING <CR> IN RESPONSE TO DEVICES PER CUI
WILL DEFAULT TO 0, THEREBY CAUSING AN ILLEGAL NUMBER
OF DEVICES PER CU MESSAGE. THE ACTUAL # MUST
BE TYPED IN. (DEFAULT=20 OCTAL)
THIS DIAGNOSTIC WILL REJECT <1 AND >20 DEVICES PER CU

(5. CONT'D)

A CHECK IS MADE HERE TO INSURE THAT THE OPERATOR
DID NOT ASSIGN AN IMPOSSIBLE NUMBER OF DEVICES
FOR EACH CONTROL UNIT;

TYPE CU ADRS'S IN HEX <CR><LF> <CR><CR> TERMINATES LIST
ADRSI 00
DEVICES PER CUI 0
ILLEGAL NUMBER OF DEVICES PER CU
DEVICES PER CUI 4
LIST ALL LEGAL COMMANDS
COMMAND!

WHEN A "4" WAS TYPED IN RESPONSE TO DEVICES PER CUI,
THE NUMBER WAS ACCEPTED AND THE MONITOR CONTINUED.

NOTICE! OFFLINE & ONLINE DIAGNOSTICS REQUIRE AT LEAST TWO CU DEVICE ADDRESSES
FOR TESTING MULTIPLEXOR FUNCTIONS. THE M908 MUST ALSO BE STRAPPED FOR >1

"LIST ALL LEGAL COMMANDS"
COMMAND! 400<CR>
STATUS! 0 <CR><LF> TO CONTINUE LIST
<CR><CR> TO TERMINATE LIST

THIS FACILITY WAS BUILT INTO THE DIAGNOSTIC TO ENABLE THE
OPERATOR TO BUILD HIS OWN DEVICE STATUS TABLE (DST).
A <CR> IN RESPONSE TO COMMAND! ASSUMES THE DEFAULT DST;
THE FIRST ENTRY MUST BE NONZERO, THEREFORE IF YOU WISH
YOUR FIRST COMMAND TO BE A TIO=0 YOU MUST TYPE IT IN WITH
PARITY (E.G, 400), FOLLOWING THE COMMAND THE MONITOR WILL
ASK FOR THE CORRESPONDING STATUS.
-TYPING <CR> WILL DEFAULT THIS PARAMETER

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"SET SWITCHES"

HERE THE MONITOR ASKS FOR THE CONSOLE SWITCH SETTINGS.

SW<15> HALT ON ERROR
SW<14> SCOPE LOOP
<SW13> INHIBIT ERROR PRINTOUT
SW<12> SHORT ERROR REPORT
SW<11> INHIBIT ITERATIONS
SW<10> MAINTENANCE CLOCK CONTROL (MAINTENANCE TESTS ONLY)
SW<9> ODL TRAP ON ERROR

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.REM !

LOAD THE SWITCH REGISTER WITH THE APPROPRIATE FUNCTION
AND TYPE <CR>.

5.2 PROGRAM AND/OR OPERATOR ACTION

THE TYPICAL APPROACH SHOULD BE

1. HALT ON ERROR
   WHEN AN ERROR HALT OCCURS
2. CLEAR SW<15>
3. SET SW<14>, SCOPE
4. TYPE <P> FOR PROCEED IF ODT WAS SELECTED
   (SW9=1), OR PRESS CONTINUE ON THE CONSOLE
   IF ODT WAS NOT SELECTED SW9=0
   IF ERROR IS REPETITIVE;
5. SET SW<13> AND SCOPE ERROR

THE ERROR PC SHOULD BRING THE OPERATOR TO A POINT IN THE
LISTING WHERE THE ERROR IS DOCUMENTED, THEN USING THE
PRINTS AND THE FLOWS THE ERROR CAN BE TRACED TO ITS
SOURCE;

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.REM !

AT ANY TIME DURING THE INITIALIZATION OR TESTING THE
OPERATOR CAN TYPE CONTROL C AND CONTROL WILL BE RETURNED TO
THE MONITOR, SOME TESTS ARE 5-10 SECONDS IN DURATION SO
THE RESPONSE TO THE CONTROL C WILL NOT BE INSTANTANEOUS.

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.REM !

THE RESTART ADDRESS IS 200; IF THIS ADDRESS IS LEFT IN THE
CONSOLE SWITCH WHEN "START" IS PRESSED THE MONITOR WILL TYPE
OUT D,P,S,? IF THE SWITCHES ARE ZEROED THE TYPE WILL BE
"SET SWITCHES".
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THERE ARE TWO CALIBRATION TESTS (MAINT CLK1) THAT SHOULD BE RUN IN SCOPE MODE(T15 & T16); IT IS QUITE POSSIBLE THAT USING THE STANDARD OPERATIONS PROCEDURE PREVIOUSLY SUGGESTED THAT THE OPERATOR WILL FALL NATURALLY INTO THESE CALIBRATION TESTS. IF THE SYSTEM HAS BEEN BROUGHT UP ONCE BEFORE AND THE OPERATOR WISHES TO CHECK THE CALIBRATION THE FOLLOWING PROCEDURE SHOULD BE FOLLOWED:

1. EXAMINE TABLE OF CONTENTS FOR THE TEST NUMBER (N) OF CALIBRATION ROUTINES,
2. TYPE N IN RESPONSE TO D,P,S,N?
3. PUT SW<14> UP IN RESPONSE TO "SWITCH SETTINGS"
4. TYPE <CR> IF ERROR TYPE OUT OCCURS SET SW<13>.

5.2.1 MAINTENANCE CLOCK CONTROL (MAINTENANCE CLK1 & CLK2 DIAG. ONLY)

WHEN SWITCH 10 IS SELECTED AND A MAINTENANCE CLOCK PROGRAM IS BEING RUN THE EXECUTION OF THE JSR PC, CLK SUBROUTINE WILL CAUSE A BREAK POINT TRAP TO ODT AND A TYPEOUT OF THE FOLLOWING FORMAT WILL OCCUR:

AAAAAA B0INNNNNN

*

THIS INDICATES THAT THE PROGRAM WAS TRAPPED TO ODT AND IS AWAITING THE COMMAND TO "PROCEED BEFORE EXECUTING THE NUMBER OF MAINTENANCE CLOCK PULSES SPECIFIED BY JSR PC, CLK N". UPON TYPING "P" THE PROGRAM WILL CONTINUE FROM LOCATION AAAAAA;

THIS IS A USEFUL FEATURE IN SEVERAL RESPECTS. FIRST, IT ALLOWS THE OPERATOR TO SINGLE STEP THROUGH THE FLOWS; THE LISTING AIDS WERE ALSO IN THAT IT HIGHLIGHTS THE PHASE AND STATE; IN ADDITION TO WALKING THROUGH THE FLOWS THIS FEATURE ALSO ALLOWS THE OPERATOR TO EXAMINE DONE DISPLAYED DX REGISTERS AND KEY MEMORY LOCATIONS.

IT IS REQUIRED THAT ONLY THE FOLLOWING ODT COMMANDS BE USED

N/	OPENS WORD N
P	PROCEED FROM BREAK POINT
NIG	GOES TO WORD N AND STARTS PROGRAM
<CR>	CLOSES OPEN LOCATION (CARRIAGE RETURN)
<LF>	OPENS NEXT LOCATION (LINE FEED)
*C	CONTROL C, RETURN TO DIAGNOSTIC MONITOR

ANY OTHER COMMANDS ARE USED AT THE OPERATORS OWN RISK. IF OTHER COMMANDS ARE USED THE DX AND THEREFORE THE DIAGNOSTIC MAY BEHAVE STRANGELY, PLEASE RELOAD.

A TYPICAL SEQUENCE

SET SWITCHES

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*P PROCEED  
  
705640 001017044  
*P PROCEED  
  
006032 001017044  
*176204/001500 EXAMINE 0XCS  
176206 /002000 EXAMINE 0XOS  
176210 /00300 EXAMINE 0XBA  
*P PROCEED  
006504 001017044  
* CONTROL C  
D,P,S,N7 MONITOR MODE
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6:

ERRORS

TYPICALLY ERROR REPORTS TAKE THE FOLLOWING FORMAT,

```
ERROR PCI 017274  
ERROR IN TEST; 17  
CUADRS/MO; 000020  
001020742
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THIS INDICATES THAT WHILE EXECUTING TEST #17 ON ERROR STATE WAS DETECTED AND IS DOCUMENTED AT PROGRAM COUNT 017274; THE CONTRL UNIT UNDER TEST OF THE TIME OF ERROR WAS 20(0) AND THE IBM COMMAND WAS A NOP, IN SEVERAL CASES THE COMMAND IS OF NO SIGNIFICANCE;

IF SWITCH 9 IS UP THE ERROR REPORT GENERATOR WILL BREAK TO ODT AS INDICATED BY "001NNNNNN", HERE AGAIN THE POWER OF ODT MAY BE USED TO COLLECT ADDITIONAL DATA CONCERNING THE FAULT,

A TYPICAL APPROACH MIGHT BE (AFTER COLLECTING DATA);
TYPE CONTROL C, RESULTS;

```
D,P,S,N7 N  
TEST NUMBER; 17  
SET SWITCHES
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IN RESPONSE TO SWITCHES SET THE FOLLOWING

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BR<15>=0 HALT ON ERROR  
SR<14>=1 SCOPE  
TYPE <CR>
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IF THE ERROR IS REPEATABLE SET SR<13>, INHIBIT PRINT AND GO AT IT,

NOTICE: A TYPE OUT OF THE FORMAT 001NNNNNN INDICATES
A BREAK POINT ERROR AT NNNNNN, THIS IS AN ODT ERROR

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AND CAN BE CAUSED BY 1, PLAYING GAMES WITH ODT OR
2, AN ILLEGAL BREAK TRAP I.E. T BIT SET OR EXECUTE
A 000003,

(6. CONT'D)

DURING MAINTENANCE CLOCK TESTS THERE EXISTS A SUBROUTINE
CALLED CHKREG, THIS ROUTINE EXAMINES ALL THE DX11
REGISTERS AND VERIFIES THAT THEY ARE IN THE EXPECTED STATE,
CHKREG HAS A SPECIAL ERROR TRAP THAT RESULTS IN THE
FOLLOWING TEXT:

ERROR PCI 017446
ERROR IN TEST: 17
CUADRS/HOI 000020
ORIGIN OF MAP ERROR 017602
REGISTER-CONTENTS-MAP

DXM1: 176777 000400 (DXM1 IS UNREADABLE IGNORE THIS COMPARE)
DXCB1: 074000 000000 (PHASE AND STATE FLOPS ARE NOT TRACED)
DXES1: 000014 000010 (ERROR CONDITION IS THAT BIT2 IS SET)
001020742
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D.P.S.N?

IN THIS REPORT THE REGISTERS ARE NAMED (UNDER REGISTER)
AND THEIR CONTENTS DUMPED (UNDER CONTENTS) SO THAT IT MAY
BE COMPARED WITH THE EXPECTED STATE IN THE MAP (UNDER MAP).

THERE ARE TWO ANOMALIES HERE:

1. THE DXM1 IS OFTEN UNREADABLE THEREFORE IF THE DXM1
IS ALL ONES OR ALMOST ALL ONES DISREGARD THE COMPARISON
IT WAS NOT MADE.
2. THE PHASE AND STATES FLOPS ARE NOT COMPARED SO THAT
CHKREG CAN BE USED IN ROUTINE WITH FREE RUNNING CLOCKS.

THIS MEANS THAT THERE MUST BE A DIFFERENCE BETWEEN
CONTENTS AND MAP IN A REGISTER OTHER THAN THE DXM1 OR BITS
OTHER THAN 074000.

THE EXERCISER PROGRAMS DO TUMBLE TABLE TRACING ON INTERRUPT,
IN THE EVENT OF A TRACE ERROR THE PROGRAM WILL TYPE OUT:

TT TRACE ERROR IN TEST: N1
ORIGIN OF LAST TT UPDATE: N2
TT ENTRY N0: "WHATEVER"
EXPECTED ENTRY: "WHATEVER +1"
TT POINTER N3

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THEN PROCEED WITH THE NORMAL ERROR REPORT, THE ADDRESS XXXXXX SPECIFIES THE LOCATION WHERE THE EXPECTED TT ENTRIES WERE LAST UPDATED.

EXERCISER ERROR REPORTS ALSO INDICATE THE DX MODE WHEN THE ERROR OCCURED: MULTIPLEXOR OR BUSYEN (DX ONLINE AND DX OFFLINE EXERCISERS ONLY)

6.2 ERROR RECOVERY

IN THE EVENT THAT THE DX GETS STUCK IN AN UNRECOVERABLE PHASE AND STATE WHILE MAINTENANCE CLOCK ENABLE IS SET, DEPRESS HALT AND START, THEN LOAD ADDRESS 200 AND START.

ON BREAK PRINT ERRORS RELOAD TAPE

7. RESTRICTIONS

7.1 STARTING RESTRICTIONS

SEE SECTION 4.2

7.2 OPERATING RESTRICTIONS

NEVER NEVER NEVER RUN THE ONLINE=MAINTENANCE=CABLED EXERCISER WHILE CONNECTED TO IBM

8. MISCELLANEOUS

MAINT: CLK1 DIAGNOSTIC ONLY!!!!!!
AT THE END OF THE PROGRAM IT WILL TYPE "END TEST SET SW3=1?". THIS IS TO SIGNIFY THAT SW3 MUST BE SET AT LEAST ONCE DURING THE USE OF THIS DIAGNOSTIC; IT IS NOT NECESSARY TO LEAVE SW3=1 AS IT CONSUMES TOO MUCH DIAGNOSTIC TIME, BASICALLY THIS OPENS THE TEST THAT CHECKS THAT YOU HAVE CORRECTLY ANSWERED ALL THE CU ADDRESSES & DEVICES/CU QUESTIONS CORRECTLY;... IF YOU LIED IT WILL CATCH IT, IE; IF YOU ANSWERED THE DEVICES PER CU WITH 10(0) AND IN ACTUALITY THE DEVICES PER CU ARE CUT TO 4 ON THE M900, THIS TEST WILL CATCH THE ERROR;

WHEN SW3=1 PROGRAM RUN TIME IS GREATLY INCREASED AS IT CHECKS ALL OTHER ADDRESSES FOR ADRECC & ADRECD.

DX ONLINE & DX OFFLINE EXERCISERS!!!!!!
THESE PROGRAMS WILL DEFAULT TO AUTOMATICALLY SETTING SW1=1 & SW4=1, HOWEVER, TO EXECUTE THEIR FUNCTIONS EARLY IN THE PROGRAM RUN TIME, SET THEM BEFORE STRIKING <CR> WHEN THE MONITOR ASKS "SET SWITCHES"

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NOTE: AT LEAST 2 DEVICES/CU MUST BE STRAPPED ON M978

8.1 EXECUTION TIME

THE EXECUTION TIME OF EACH PROGRAM IS VARIABLE AND IS A
FUNCTION OF THE PROGRAM LENGTH AND THE CONTROL UNIT
ADDRESS STRUCTURE, IN GENERAL THEY RUN 10 TO 20 MINUTES.

9. PROGRAM DESCRIPTION

CONTAINED WITHIN LISTING.

10. LISTING

FOLLOWING

11. FLOW CHARTS

SEE PRINT SET

!
.LIST MD

.REM *

MAINDEC=11.DZDXF-D
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146 MAIN ST., MAYNARD, MA, 01754
MAINTAINER: DIAGNOSTICS
AUTHOR: JOHN FRIEDRICH

..... MOD APR 74

REVISION BY W. ARMSTRONG

.SBTTL DYNAMIC SWITCH SETTINGS (SWR #1)

DYNAMIC SWITCH REGISTER SETTINGS

SWR#	SIGNIFICANCE
SET = ONE	
SWR 15	"HALT ON ERROR"
SWR 14	"SCOPE LOOP"
SWR 13	"INHIBIT ERROR REPORT"
SWR 12	"SHORT ERROR REPORT"
SWR 11	"INHIBIT ITERATIONS"
SWR 10	"MAINTAINENCE CLOCK CONTROL"
SWR 09	"ODT TRAP ON ERROR"
	"USER CHANGE INFORMATION"

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"DUE TO REVISION APR 74"
"PLEASE READ INFO BELOW"

NOTE1

AN OPERATOR RESPONSE OF "0" TO THE PROGRAM
"TTY" REQUEST FOR "DEVICES PER CUI" IS NO
LONGER DEFAULTED TO 20 (16 DECIMAL), I.E.

DEVICES PER CUI 0 "ILLEGAL ?"

THE HEADER "CU CHANNEL ADDRESS" USED ON ERROR
OUTPUT HAS BEEN CHANGED TO "CUADRS/MOI". I.E.
IT SIGNIFIES EITHER THE CONTENTS OF THE "DXMO"
REGISTER OR THE CONTROL UNIT BASE ADDRESS WHERE
MEANINGFULL.

..... MOD APR 74

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!DXDS, DX DEVICE STATUS BITS

100000	PARER = 100000	!ERRORS
040000	NXM = 40000	!NONEXISTANT MEMORY REFERENCE
020000	SELST = 20000	!IBM RESETS; SELECTIVE RESET
010000	SYSRST = 10000	! SYSTEM RESET
004000	INFDSC = 4000	! INTERFACE DISCONNECT
034000	!BMRSY SELRST;SYSRST;INFDSC	
002000	UCHKS = 2000	!STATUS FLAGS
001000	CHENDS = 1000	!CHANNEL END SENT
000400	BSYS = 400	!BUSY SENT
000200	CHIS = 200	!CHANNEL INITIATED SELECTION
000100	ESEND = 100	!ENDING STATUS END
000040	CHDEND = 40	!CH DATA END
000020	CUDEND = 20	!CU DATA END
000010	ISSREJ = 10	!ISS REJECT
000004	CHDCHN = 4	!COMMAND CHAINING
000002	STKSTB = 2	!STACKED STATUS B
000001	CHDREJ = 1	!COMMAND REJECT

!DXCS,DX CONTROL UNIT STATUS BITS

100000	PARSTP = 100000	!STOP ON B0S0 PARITY ERROR
040000	CUPBM = 40000	!SELECT FORCED BURST
020000	ENDEN = 20000	!CUEND
010000	CS12 = 10000	!NOT USED
004000	BSYEN = 4000	!ENABLE SET !CUBSY!
002000	CS10 = 2000	!NOT USED
001000	ONLINE = 1000	!ONLINE A
000400	CUBSY = 400	!CU BUSY
000200	DONE = 200	!FUNCTION DONE
000100	INTEN = 100	!INTERRUPT
000040	STKSTA = 40	!STACKED STATUS
000030	XBA = 30	!EXTENDED BASE ADDRESS
000006	FCYN = 6	
000001	DXPRS = 1	!FCTN = 00
000003	DXPI = 3	!READ (INPUT)
000005	DXPO = 5	!WRITE (OUTPUT)
000007	DXPST = 7	!STATUS
000001	GO = 1	!BEGIN FUNCTION

!DXOS DX OFFSET (CUOR) AND STATUS (CUSR) BITS

000200	ATTEN = 200	!ATTENTION
000100	STAMOD = 100	!STATUS MODIFIER
000040	CUEND = 40	!CU END
000020	BSY = 20	!BUSY
000010	CHEND = 10	!CH END
000004	DEVEND = 4	!DEVICE END
000002	UCHECK = 2	!UNIT CHECK
000001	UEXCEP = 1	!UNIT EXCEPT

!DXMO DX MAINTENANCE-OUT BITS

720			
721			
722	100000	ISELECTION CONTROL LINES	
723	040000	OPLO = 100000	OPERATIONAL OUT
724	020000	HLDO = 40000	HOLD OUT
725	010000	SELO = 20000	SELECT OUT
726		SUPO = 10000	SUPPRESS OUT
727			
728	004000	ITAG LINES	
729	002000	ADRO = 4000	ADDRESS OUT
730	001000	CHDO = 2000	COMMAND OUT
731	000400	SRVO = 1000	SERVICE OUT
732		PARO = 400	PARITY OF/FOR BUS OUT
733			
734			
735	100000	ISELECTION CONTROL LINES	
736	040000	OPLI = 100000	OPERATIONAL IN
737	020000	SELI = 40000	SELECT IN
738		REQI = 20000	REQUEST IN
739			
740	010000	ITAG LINES	
741	004000	ADRI = 10000	ADDRESS IN
742	002000	STAI = 4000	STATUS IN
743	001000	SRVI = 2000	SERVICE IN
744	000400	CLKO = 1000	OK TO GO ONLINE (RB)
745		PARI = 400	BUS PARITY (RB)
746			
747			
748	100000		
749	074000	LOCKO = 100000	LOCK OUT
750	002000	PHS = 074000	PHASE STATE BITS
751	001000	FASTCU = 2000	FAST CU
752	000400	SYNC = 1000	SYNCHRONIZATION
753	000200	CUDX = 400	CU DATA CONTROL
754		IOD = 200	INPUT OUTPUT DONE
755			
756	000100		
757	000040	BYPAS = 100	INPR CONTROLS
758	000020	NPRX = 40	BYPASS
759	000010	NPRY = 20	INPR CONTROL SWITCH
760	000004	BALF = 10	INPR TRANSFER DIRECTION
761	000002	ONLINB = 4	BUFFERED ALTERNATOR FLOW
762	000001	ADRECC = 2	ON LINE TO IBM
763		ADRECD = 1	ADDRESS RECOGNITION (CU)
764			ADDRESS RECOGNITION (DEVICE)
765			
766	000001		
767	000002		
768	000004		
769	000010		
770	000020		
771	000040		
772	000200		
773			

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020000
030000
040000
050000
060000
070000

004000
004000
000000

004000
000000
014000
010000
024000
020000
034000
030000
044000
040000
054000
050000
064000
060000
074000

IDXES1 DX EXTRA EXTRA SIGNALS

IRS =1
DSCRSP =2

IBM RESET STORED
DISCONNECT RESPONSE

IDEFINE REGISTER MAP INDICES

DS= 00
CA= 02
CS= 04
OS= 06
BA= 10
BC= 12
MO= 14
MI= 16
CB= 20
ND= 22
ES= 24

IPHASE CONTROL FLOPS OF DXCB

PHASE0=000000
PHASE1=100000
PHASE2=200000
PHASE3=300000
PHASE4=400000
PHASE5=500000
PHASE6=600000
PHASE7=700000

ITIME STATE FLOP AND STATE DEFINATION

TSSF=4000
TS1=4000
TS2=0000

IPHASE AND STATE DEFINITIONS

PHS01#	PHASE0!	TS1
PHS02#	PHASE0!	TS2
PHS11#	PHASE1!	TS1
PHS12#	PHASE1!	TS2
PHS21#	PHASE2!	TS1
PHS22#	PHASE2!	TS2
PHS31#	PHASE3!	TS1
PHS32#	PHASE3!	TS2
PHS41#	PHASE4!	TS1
PHS42#	PHASE4!	TS2
PHS51#	PHASE5!	TS1
PHS52#	PHASE5!	TS2
PHS61#	PHASE6!	TS1
PHS62#	PHASE6!	TS2
PHS71#	PHASE7!	TS1

```

628          370000          PMS72= PHASE7; TS2
629
630          .SBTTL  MISCELLANEOUS DEFINITIONS
631
632          104400          SCOPE=TRAP          ISCOPE LOOP TRAP
633
634          100000          BIT15=100000
635          040000          BIT14=40000
636          020000          BIT13=20000
637          010000          BIT12=10000
638          004000          BIT11=4000
639          002000          BIT10=2000
640          001000          BIT9=1000
641          000400          BIT8=400
642          000200          BIT7=200
643          000100          BIT6=100
644          000040          BIT5=40
645          000020          BIT4=20
646          000010          BIT3=10
647          000004          BIT2=4
648          000002          BIT1=2
649          000001          BIT0=1
650          000000          HERE=0
651
652          ICHANNEL COMMANDS WITH PARITY
653
654          000400          TIOC=400          ITEST I/O
655          000001          WRITEC=001          IWRITE
656          000002          READC=002          IREAD
657          000403          NOPC=403          INOP
658          000004          SENSEC=4          ISENSE
659          000405          ILLC=405          IILLEGAL COMMAND
660
661          IUTILITY FLAGS
662
663          100000          INYOK=100000
664          000002          DOPLIN=2          ISPW BIT FOR NO DST !
665
666          ICHANNEL STATUS
667
668          000010          CE=10          ICH END
669          000004          DE=4          IDEVICE END
670          000002          UC=2          IUNIT CHECK
671          000200          ATTN=200          IATTENTION
672          000100          SM=100          ISTATUS MODIFIER
673          000040          CUE=40          ICU END
674          000020          BSY=20          IBUSY
675
676          ISWITCH DEFINITIONS
677
678          100000          HLYSW=BIT15          IHALT ON ERROR
679          040000          LOPSW=BIT14          ILOOP ON ERROR
680          020000          PNYSW=BIT13          IINHIBIT PRINT
681          010000          SESH=BIT12          ISHORT ERROR SWITCH

```


882	004000	IISW=BIT11	IINHIBIT ITERATIONS
883	002000	MCCSW=BIT10	MAINTENANCE CLOCK CONTROL
884			
885		IPROCESSOR PRIORITY LEVELS	
886			
887	000000	LEVEL0= 000	
888	000040	LEVEL1= 040	
889	000100	LEVEL2= 100	
890	000140	LEVEL3= 140	
891	000200	LEVEL4= 200	
892	000240	LEVEL5= 240	
893	000300	LEVEL6= 300	
894	000340	LEVEL7= 340	
895			
896		IREGISTER DEFINITIONS	
897			
898	000000	R0=X0	
899	000001	R1=X1	
900	000002	R2=X2	
901	000003	R3=X3	
902	000004	R4=X4	
903	000005	R5=X5	
904	000005	TY=X5	
905	000006	R6=X6	
906	000006	SP=X6	
907	000007	PC=X7	
908			
909	000004	TYPE=IOT	
910	000240	NOP=240	
911	177776	PS=177776	IPROCESSOR STATUS
912	177570	SWR=177570	
913	177570	SR=177570	ISWITCH REGISTER
914			
915	000000	E=0	
916	024704	EMTABLE=EMTAG	
917			
918		IEMT DEFINITIONS	
919			
920	001004	104000	ERROR
921	001006	104001	MAPERR
922	001010	104002	TRACER
923	001012	104003	SAVRG
924	001014	104004	RSTRG
925	001016	104005	ACCEPTO
926	001020	104006	KEY, TO, RB
927	001022	104007	PARITY
928	001024	104010	PCW1
929	001026	104011	PCW2
930	001030	104012	PCW3
931			
932			
933		.SBTTL TRAP DEFINITIONS	
934		ITRAP INITIALIZATION	
935			

```

936          000014 000014          .=14          O.BRK,LEVEL7          IBREAK TRAP
937 000014 034516 000340
938
939          000020 000020          .=20          .IOT,LEVEL7          ITTY OUTPUT TRAP,LEVEL 7
940 000020 031614 000340
941
942          000024 000024          .=24          PFAIL,LEVEL7          IPOWER FAIL TRAP
943 000024 001444 000340
944
945          000030 000030          .=30          EMODECODER,LEVEL7     IEMT DECODER TRAP,LEVEL 7
946 000030 024642 000340
947
948          000034 000034          .=34          SCOPEC,LEVEL7         ISCOPE TRAP
949 000034 024754 000340
950
951
952          000200          .=200
953
954 000200 000137 001100  START: JMP      @@BEGIN          IGO TO BEGINNING OF PROGRAM
955
956          001100          .=1100
957
958 001100 012700 001100  BEGIN: MOV      @@BEGIN,SP        ISET UP STACK POINTER
959 001104 012737 000340 177776  MOV      @LEVEL7,PS          IPRIORITY LEVEL 7
960
961          |..... MOD APR 74 .....|
962          |o          11/40,11/45 TRACE TRAP          |
963
964 001112 012737 000002 034416          MOV      @2RTX
965 001120 012737 001154 000010          MOV      @1.ITB,@@10
966 001126 012737 000340 000012          MOV      @340,@@12
967 001134 005046          CLR      -(SP)
968 001136 012740 001144          MOV      @INITZ,-(SP)
969 001142 000000          RTT
970 001144 012737 000000 034416  INITZ: MOV      @6RTX
971 001152 000402          BR      INITC
972 001154 002700 000010          INITB: ADD     @13,SP
973 001160 013737 034416 034414  INITC: MOV     RTX,YESRTI
974 001166 012737 000012 000010          MOV     @17,@@10
975 001174 005037 000012          CLR     @@12
976
977          |..... MOD APR 74 .....|
978
979 001200 005737 000042          TST     @@62          IACT11
980 001204 001404          BEQ     @GN0          IBR IF NO
981          |          JSR     PC@MONDFLT          IINSERT DEFAULT PARAMETERS
982 001206 005037 027444          CLR     @@ONESHOT          IDO NOT EXECUTE TIME CONSUMING TESTS
983 001212 000137 027066          JMP     @@MON11          |
984 001216 005327 000001  BGN0: DEC     @1
985 001222 001002          BNE     @GN1
986 001224 000137 026144          JMP     @@MONITOR
987 001230 032737 000200 177570  BGN1: BIT     @230,SR          ITEST FOR FAST START
988 001236 001402          BEQ     @GN2          IBRANCH IF FAST START
989 001240 000137 026214          JMP     @@MON1,0

```


990	001244	012700	001100	BGN21	MOV	#BEGIN,SP	
991	001250	012737	000340		MOV	#LEVEL7,PS	
992	001256	000137	027034		JMP	#0N10	USE PREVIOUS PARAMETERS
993							
994							
995				.SBTTL			DX REGISTERS
996							
997	001262	176200		DXBASE1		176200	
998	001264	000300		DXIVI		300	IDX INTERRUPT VECTOR ADRS
999	001266	000302		DXISI		302	IDX INTERRUPT STATUS
1000	001270	000200		DXPRI1		LEVEL4	INT PRIORITY ADRS
1001	001272	000140		LESS11		LEVEL3	IDX PRIORITY MINUS ONE
1002	001274	176200		DXDS1		176200	IDEVICE STATUS ->TY
1003	001276	176202		DXCA1		176202	ICOMMAND AND ADDRESS ->TY
1004	001300	176204		DXCS1		176204	ICONTROL UNIT STATUS
1005	001302	176206		DXOS1		176206	IOFFSET AND STATUS
1006	001304	176210		DXBA1		176210	IBUS ADDRESS FOR NPR'S
1007	001306	176212		DXBC1		176212	IBYTE COUNT
1008	001310	176214		DXMO1		176214	IMAINTEANCE OUT
1009	001312	176216		DXMI1		176216	IMAINTEANCE IN
1010	001314	176220		DXCB1		176220	ICONTROL BITS
1011	001316	176222		DXND1		176222	INPR DATA
1012	001320	176224		DXES1		176224	IEXTRA SIGNALS
1013	001322	176226		DXMOB1		176226	IMAINTEANCE OUT BUFFERED
1014	001324	176230		DXES11		176230	IEXTRA EXTRA SIGNALS
1015							
1016							
1017							
1018							
1019							
1020	001326	176202		CUARI		176202	ICU ADDRESS REGISTER
1021	001330	176203		CUCRI		176203	ICU COMMAND REGISTER
1022							
1023							
1024							
1025	001332	176206		CUSRI		176206	ICU STATUS REGISTER
1026	001334	176207		CUORI		176207	ICU OFFSET REGISTER
1027							
1028							
1029							
1030	001336	176214		BUSOI		176214	IBM BUS OUT
1031	001340	176215		CONOI		176215	ICONTROL LINES OUT
1032							
1033							
1034							
1035	001342	176216		BUSII		176216	IBM BUS IN
1036	001344	176217		CONII		176217	ICONTROL LINES IN
1037							
1038							
1039	001346	176224		IDXES			IMISCELLANEOUS BITS
1040	001350	176225		MISCI		176224	ITUMBLE TABLE INDEX REG
1041				TTNDXI		176225	
1042							
1043							

1044 001352 176226
1045 001354 176227
1046
1047
1048
1049 001356 177700
1050 001360 177701
1051 001362 177702
1052 001364 177703
1053 001366 177704
1054 001370 177705
1055 001372 177706
1056 001374 177707
1057
1058
1059
1060 001376 177560
1061 001400 177562
1062 001402 177564
1063 001404 177566
1064
1065
1066
1067 001406
1068 001406 000000
1069 001410 000000
1070 001412 000000
1071 001414 000000
1072 001416 000000
1073 001420 000000
1074 001422 000000
1075 001424 000000
1076 001426 000000
1077 001430 000000
1078 001432 000000
1079 001434 000000
1080
1081
1082
1083
1084 001436 002000
1085
1086
1087
1088 001440 003000
1089
1090
1091
1092 001442 032400
1093
1094
1095
1096
1097

BUSOB: 176226
CONOB: 176227

IBUS OUT BUFFERED
ICONTROL OUT BUFFERED

IREGISTER ADDRESSES

REG0: 177700
REG1: 177701
REG2: 177702
REG3: 177703
REG4: 177704
REG5: 177705
REG6: 177706
REG7: 177707

ITTY ADDRESSES

TKSI: 177560
TKBI: 177562
TPSI: 177564
TPBI: 177566

IREGISTER TRACE TABLE

REGTT: 0
TDXOS: 0
TDXCA: 0
TDXCS: 0
TDXOS: 0
TDXBA: 0
TDXMQ: 0
TDXMI: 0
TDXCB: 0
TDXND: 0
TDXES: 0
TDXES1: 0
TTTNDX: 0

IREGISTER TRACE TABLE
IDEVICE STATUS TRACE
ICOMMAND AND ADDRESS TRACE
IGU STATUS TRACE
IOFFSET AND STATUS TRACE
IBUS ADDRESS TRACE
IMAINTEANCE-OUT TRACE
IMAINTEANCE-IN TRACE
ICONTROL BIT TRACE
INPR DATA TRACE
IEXTRA SIGNAL TRACE
IEXTRA SIGNAL TRACE 1
ITTNDX TRACE

ISTATUS POINTER WORD ADDRESS

SPWI: 2000

ITUMBLE TABLE ADDRESS

TTI: 3000

IDEVICE STATUS TABLE ADDRESS

DSTI: DSTADRS IDST MUST BE MOD(400)

.SBTTL POWER FAIL


```

1298
1299
1100
1101
1102 001444 104003
1103 001446 010637 001606
1104 001452 012737 001530 000024
1105 001460 032777 020000 177622
1106 001466 001417
1107 001470 032777 100000 177614
1108 001476 001001
1109 001500 104000
1110 001502 032777 004000 177622
1111 001510 001001
1112 001512 104000
1113 001514 122777 000014 177620
1114 001522 001401
1115 001524 104000
1116 001526 000000
1117
1118
1119
1120 001530 000240
1121 001532 013776 001606
1122 001536 104004
1123 001540 012737 001444 000024
1124 001546 013777 001430 177526
1125 001554 004737 031050
1126 001560 005027
1127 001562 000000
1128 001564 005337 001562
1129 001570 001375
1130 001572 000004 001610
1131
1132
1133
1134
1135
1136
1137 001576 012637 177776
1138 001602 000177 023276
1139 001606 000000
1140 001610 050137 053517 051105
1141 001616 043040 044501 042514
1142 001624 057504 000
1143 001630
1144
1145
1146
1147
1148
1149
1150 001630
1151 002000

```

POWER FAIL ROUTINE
IF SELECTED VERIFY STATUS IN IS UP
AND CE AND DE ARE PRESENTED AS STATUS

```

PFAIL: SAVRG
MOV R6,SAVR6
MOV #PWRUP,24
BIT #SELO,0DXMO
BEQ 15
BIT #CPLI,0DXMI
BNE ,+2 ;BRANCH IF NO ERROR CONDITION
ERROR
BIT #STAI,0DXMI
BNE ,+2 ;BRANCH IF NO ERROR CONDITION
ERROR
CMPB #CE,DE,0BUSI
BEQ ,+2 ;BRANCH IF NO ERROR CONDITION
ERROR
HALT
15:

```

POWER UP ROUTINE

```

PWRUP: NOP ;PATCH ANYONE?
MOV SAVR6,R6
RSTPC
MOV #PFAIL,24 ;RESTORE POWER FAIL VECTOR
MOV SPW,0DXOS ;RESTORE OFFSET REG
JSR PC,RESRES ;RESET AND RESTORE
CLR (PC)+ ;STALL FOR MECHANICS
DEC ,+2
BNE ,+4
TYPE ,PFLD ;POWER FAILED

```

```

MOV (SP)+,PS
JMP @RETURN
SAVR6:
PFLD1 ,ASCIZ "POWER FAILED"

```

.EVEN

```

.SBTL STATUS POINTER WORD TABLE
.ENDSTR=, ;DEFINE END OF START CODE
.2000

```

Address	SPW	SPW	DESCRIPTION						
1152			DEFAULT STATUS POINTER WORD (SPW)						
1153			DEFAULT EMULATION IS OF ONE CONTROL UNIT						
1154			WITH CAPACITY OF 16 DEVICES						
1155	000000		No						
1156									
1157			STATUS POINTER WORDS FOR CU 0						
1158									
1159	002000	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1160	002002	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1161	002004	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1162	002006	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1163	002010	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1164	002012	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1165	002014	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1166	002016	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1167	002020	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1168	002022	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1169	002024	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1170	002026	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1171	002030	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1172	002032	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1173	002034	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1174	002036	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1175									
1176			STATUS POINTER WORDS FOR CU 1						
1177									
1178	002040	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1179	002042	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1180	002044	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1181	002046	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1182	002050	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1183	002052	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1184	002054	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1185	002056	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1186	002060	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1187	002062	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1188	002064	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1189	002066	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1190	002070	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1191	002072	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1192	002074	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1193	002076	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1194									
1195			STATUS POINTER WORDS FOR CU 2						
1196									
1197	002100	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1198	002102	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1199	002104	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1200	002106	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1201	002110	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1202	002112	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1203	002114	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1204	002116	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1205	002120	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST

1206	002122	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1207	002124	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1208	002126	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1209	002130	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1210	002132	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1211	002134	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1212	002136	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST

STATUS POINTER WORDS FOR CU 3

1213									
1214									
1215									
1216	002140	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1217	002142	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1218	002144	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1219	002146	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1220	002150	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1221	002152	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1222	002154	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1223	002156	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1224	002160	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1225	002162	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1226	002164	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1227	002166	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1228	002170	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1229	002172	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1230	002174	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1231	002176	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST

STATUS POINTER WORDS FOR CU 4

1232									
1233									
1234									
1235	002200	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1236	002202	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1237	002204	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1238	002206	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1239	002210	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1240	002212	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1241	002214	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1242	002216	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1243	002220	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1244	002222	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1245	002224	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1246	002226	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1247	002230	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1248	002232	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1249	002234	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1250	002236	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST

STATUS POINTER WORDS FOR CU 5

1251									
1252									
1253									
1254	002240	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1255	002242	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1256	002244	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1257	002246	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1258	002250	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1259	002252	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST

1260	002254	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1261	002256	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1262	002260	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1263	002262	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1264	002264	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1265	002266	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1266	002270	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1267	002272	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1268	002274	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1269	002276	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST

STATUS POINTER WORDS FOR CU 6

1273	002300	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1274	002302	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1275	002304	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1276	002306	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1277	002310	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1278	002312	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1279	002314	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1280	002316	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1281	002320	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1282	002322	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1283	002324	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1284	002326	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1285	002330	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1286	002332	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1287	002334	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1288	002336	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST

STATUS POINTER WORDS FOR CU 7

1292	002340	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1293	002342	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1294	002344	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1295	002346	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1296	002350	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1297	002352	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1298	002354	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1299	002356	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1300	002360	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1301	002362	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1302	002364	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1303	002366	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1304	002370	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1305	002372	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1306	002374	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1307	002376	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST

STATUS POINTER WORDS FOR CU 10

1311	002400	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1312	002402	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST
1313	002404	031400	ERRDST	IDEVICE	STATUS	TABLE	IS	AT	ERRDST

1314	002406	031400	ERRDST	IDEVICE STATUS TABLE	IS	AT	ERRDST
1315	002410	031400	ERRDST	IDEVICE STATUS TABLE	IS	AT	ERRDST
1316	002412	031400	ERRDST	IDEVICE STATUS TABLE	IS	AT	ERRDST
1317	002414	031400	ERRDST	IDEVICE STATUS TABLE	IS	AT	ERRDST
1318	002416	031400	ERRDST	IDEVICE STATUS TABLE	IS	AT	ERRDST
1319	002420	031400	ERRDST	IDEVICE STATUS TABLE	IS	AT	ERRDST
1320	002422	031400	ERRDST	IDEVICE STATUS TABLE	IS	AT	ERRDST
1321	002424	031400	ERRDST	IDEVICE STATUS TABLE	IS	AT	ERRDST
1322	002426	031400	ERRDST	IDEVICE STATUS TABLE	IS	AT	ERRDST
1323	002430	031400	ERRDST	IDEVICE STATUS TABLE	IS	AT	ERRDST
1324	002432	031400	ERRDST	IDEVICE STATUS TABLE	IS	AT	ERRDST
1325	002434	031400	ERRDST	IDEVICE STATUS TABLE	IS	AT	ERRDST
1326	002436	031400	ERRDST	IDEVICE STATUS TABLE	IS	AT	ERRDST

STATUS POINTER WORDS FOR CU 11

1327							
1328							
1329							
1330	002440	031400	ERRDST	IDEVICE STATUS TABLE	IS	AT	ERRDST
1331	002442	031400	ERRDST	IDEVICE STATUS TABLE	IS	AT	ERRDST
1332	002444	031400	ERRDST	IDEVICE STATUS TABLE	IS	AT	ERRDST
1333	002446	031400	ERRDST	IDEVICE STATUS TABLE	IS	AT	ERRDST
1334	002450	031400	ERRDST	IDEVICE STATUS TABLE	IS	AT	ERRDST
1335	002452	031400	ERRDST	IDEVICE STATUS TABLE	IS	AT	ERRDST
1336	002454	031400	ERRDST	IDEVICE STATUS TABLE	IS	AT	ERRDST
1337	002456	031400	ERRDST	IDEVICE STATUS TABLE	IS	AT	ERRDST
1338	002460	031400	ERRDST	IDEVICE STATUS TABLE	IS	AT	ERRDST
1339	002462	031400	ERRDST	IDEVICE STATUS TABLE	IS	AT	ERRDST
1340	002464	031400	ERRDST	IDEVICE STATUS TABLE	IS	AT	ERRDST
1341	002466	031400	ERRDST	IDEVICE STATUS TABLE	IS	AT	ERRDST
1342	002470	031400	ERRDST	IDEVICE STATUS TABLE	IS	AT	ERRDST
1343	002472	031400	ERRDST	IDEVICE STATUS TABLE	IS	AT	ERRDST
1344	002474	031400	ERRDST	IDEVICE STATUS TABLE	IS	AT	ERRDST
1345	002476	031400	ERRDST	IDEVICE STATUS TABLE	IS	AT	ERRDST

STATUS POINTER WORDS FOR CU 12

1346							
1347							
1348							
1349	002500	031400	ERRDST	IDEVICE STATUS TABLE	IS	AT	ERRDST
1350	002502	031400	ERRDST	IDEVICE STATUS TABLE	IS	AT	ERRDST
1351	002504	031400	ERRDST	IDEVICE STATUS TABLE	IS	AT	ERRDST
1352	002506	031400	ERRDST	IDEVICE STATUS TABLE	IS	AT	ERRDST
1353	002510	031400	ERRDST	IDEVICE STATUS TABLE	IS	AT	ERRDST
1354	002512	031400	ERRDST	IDEVICE STATUS TABLE	IS	AT	ERRDST
1355	002514	031400	ERRDST	IDEVICE STATUS TABLE	IS	AT	ERRDST
1356	002516	031400	ERRDST	IDEVICE STATUS TABLE	IS	AT	ERRDST
1357	002520	031400	ERRDST	IDEVICE STATUS TABLE	IS	AT	ERRDST
1358	002522	031400	ERRDST	IDEVICE STATUS TABLE	IS	AT	ERRDST
1359	002524	031400	ERRDST	IDEVICE STATUS TABLE	IS	AT	ERRDST
1360	002526	031400	ERRDST	IDEVICE STATUS TABLE	IS	AT	ERRDST
1361	002530	031400	ERRDST	IDEVICE STATUS TABLE	IS	AT	ERRDST
1362	002532	031400	ERRDST	IDEVICE STATUS TABLE	IS	AT	ERRDST
1363	002534	031400	ERRDST	IDEVICE STATUS TABLE	IS	AT	ERRDST
1364	002536	031400	ERRDST	IDEVICE STATUS TABLE	IS	AT	ERRDST

STATUS POINTER WORDS FOR CU 13

1365
1366
1367

1368	002540	031400	ERRDST	IDEVICE STATUS TABLE IS AT ERRDST
1369	002542	031400	ERRDST	IDEVICE STATUS TABLE IS AT ERRDST
1370	002544	031400	ERRDST	IDEVICE STATUS TABLE IS AT ERRDST
1371	002546	031400	ERRDST	IDEVICE STATUS TABLE IS AT ERRDST
1372	002550	031400	ERRDST	IDEVICE STATUS TABLE IS AT ERRDST
1373	002552	031400	ERRDST	IDEVICE STATUS TABLE IS AT ERRDST
1374	002554	031400	ERRDST	IDEVICE STATUS TABLE IS AT ERRDST
1375	002556	031400	ERRDST	IDEVICE STATUS TABLE IS AT ERRDST
1376	002560	031400	ERRDST	IDEVICE STATUS TABLE IS AT ERRDST
1377	002562	031400	ERRDST	IDEVICE STATUS TABLE IS AT ERRDST
1378	002564	031400	ERRDST	IDEVICE STATUS TABLE IS AT ERRDST
1379	002566	031400	ERRDST	IDEVICE STATUS TABLE IS AT ERRDST
1380	002570	031400	ERRDST	IDEVICE STATUS TABLE IS AT ERRDST
1381	002572	031400	ERRDST	IDEVICE STATUS TABLE IS AT ERRDST
1382	002574	031400	ERRDST	IDEVICE STATUS TABLE IS AT ERRDST
1383	002576	031400	ERRDST	IDEVICE STATUS TABLE IS AT ERRDST

ISTATUS POINTER WORDS FOR CU 14

1384				
1385				
1386				
1387	002600	031400	ERRDST	IDEVICE STATUS TABLE IS AT ERRDST
1388	002602	031400	ERRDST	IDEVICE STATUS TABLE IS AT ERRDST
1389	002604	031400	ERRDST	IDEVICE STATUS TABLE IS AT ERRDST
1390	002606	031400	ERRDST	IDEVICE STATUS TABLE IS AT ERRDST
1391	002610	031400	ERRDST	IDEVICE STATUS TABLE IS AT ERRDST
1392	002612	031400	ERRDST	IDEVICE STATUS TABLE IS AT ERRDST
1393	002614	031400	ERRDST	IDEVICE STATUS TABLE IS AT ERRDST
1394	002616	031400	ERRDST	IDEVICE STATUS TABLE IS AT ERRDST
1395	002620	031400	ERRDST	IDEVICE STATUS TABLE IS AT ERRDST
1396	002622	031400	ERRDST	IDEVICE STATUS TABLE IS AT ERRDST
1397	002624	031400	ERRDST	IDEVICE STATUS TABLE IS AT ERRDST
1398	002626	031400	ERRDST	IDEVICE STATUS TABLE IS AT ERRDST
1399	002630	031400	ERRDST	IDEVICE STATUS TABLE IS AT ERRDST
1400	002632	031400	ERRDST	IDEVICE STATUS TABLE IS AT ERRDST
1401	002634	031400	ERRDST	IDEVICE STATUS TABLE IS AT ERRDST
1402	002636	031400	ERRDST	IDEVICE STATUS TABLE IS AT ERRDST

ISTATUS POINTER WORDS FOR CU 15

1403				
1404				
1405				
1406	002640	031400	ERRDST	IDEVICE STATUS TABLE IS AT ERRDST
1407	002642	031400	ERRDST	IDEVICE STATUS TABLE IS AT ERRDST
1408	002644	031400	ERRDST	IDEVICE STATUS TABLE IS AT ERRDST
1409	002646	031400	ERRDST	IDEVICE STATUS TABLE IS AT ERRDST
1410	002650	031400	ERRDST	IDEVICE STATUS TABLE IS AT ERRDST
1411	002652	031400	ERRDST	IDEVICE STATUS TABLE IS AT ERRDST
1412	002654	031400	ERRDST	IDEVICE STATUS TABLE IS AT ERRDST
1413	002656	031400	ERRDST	IDEVICE STATUS TABLE IS AT ERRDST
1414	002660	031400	ERRDST	IDEVICE STATUS TABLE IS AT ERRDST
1415	002662	031400	ERRDST	IDEVICE STATUS TABLE IS AT ERRDST
1416	002664	031400	ERRDST	IDEVICE STATUS TABLE IS AT ERRDST
1417	002666	031400	ERRDST	IDEVICE STATUS TABLE IS AT ERRDST
1418	002670	031400	ERRDST	IDEVICE STATUS TABLE IS AT ERRDST
1419	002672	031400	ERRDST	IDEVICE STATUS TABLE IS AT ERRDST
1420	002674	031400	ERRDST	IDEVICE STATUS TABLE IS AT ERRDST
1421	002676	031400	ERRDST	IDEVICE STATUS TABLE IS AT ERRDST

1422
1423 :STATUS POINTER WORDS FOR CU 16
1424
1425 002700 031400 ERRDST IDEVICE STATUS TABLE IS AT ERRDST
1426 002702 031400 ERRDST IDEVICE STATUS TABLE IS AT ERRDST
1427 002704 031400 ERRDST IDEVICE STATUS TABLE IS AT ERRDST
1428 002706 031400 ERRDST IDEVICE STATUS TABLE IS AT ERRDST
1429 002710 031400 ERRDST IDEVICE STATUS TABLE IS AT ERRDST
1430 002712 031400 ERRDST IDEVICE STATUS TABLE IS AT ERRDST
1431 002714 031400 ERRDST IDEVICE STATUS TABLE IS AT ERRDST
1432 002716 031400 ERRDST IDEVICE STATUS TABLE IS AT ERRDST
1433 002720 031400 ERRDST IDEVICE STATUS TABLE IS AT ERRDST
1434 002722 031400 ERRDST IDEVICE STATUS TABLE IS AT ERRDST
1435 002724 031400 ERRDST IDEVICE STATUS TABLE IS AT ERRDST
1436 002726 031400 ERRDST IDEVICE STATUS TABLE IS AT ERRDST
1437 002730 031400 ERRDST IDEVICE STATUS TABLE IS AT ERRDST
1438 002732 031400 ERRDST IDEVICE STATUS TABLE IS AT ERRDST
1439 002734 031400 ERRDST IDEVICE STATUS TABLE IS AT ERRDST
1440 002736 031400 ERRDST IDEVICE STATUS TABLE IS AT ERRDST

1441
1442 :STATUS POINTER WORDS FOR CU 17
1443
1444 002740 031400 ERRDST IDEVICE STATUS TABLE IS AT ERRDST
1445 002742 031400 ERRDST IDEVICE STATUS TABLE IS AT ERRDST
1446 002744 031400 ERRDST IDEVICE STATUS TABLE IS AT ERRDST
1447 002746 031400 ERRDST IDEVICE STATUS TABLE IS AT ERRDST
1448 002750 031400 ERRDST IDEVICE STATUS TABLE IS AT ERRDST
1449 002752 031400 ERRDST IDEVICE STATUS TABLE IS AT ERRDST
1450 002754 031400 ERRDST IDEVICE STATUS TABLE IS AT ERRDST
1451 002756 031400 ERRDST IDEVICE STATUS TABLE IS AT ERRDST
1452 002760 031400 ERRDST IDEVICE STATUS TABLE IS AT ERRDST
1453 002762 031400 ERRDST IDEVICE STATUS TABLE IS AT ERRDST
1454 002764 031400 ERRDST IDEVICE STATUS TABLE IS AT ERRDST
1455 002766 031400 ERRDST IDEVICE STATUS TABLE IS AT ERRDST
1456 002770 031400 ERRDST IDEVICE STATUS TABLE IS AT ERRDST
1457 002772 031400 ERRDST IDEVICE STATUS TABLE IS AT ERRDST
1458 002774 031400 ERRDST IDEVICE STATUS TABLE IS AT ERRDST
1459 002776 031400 ERRDST IDEVICE STATUS TABLE IS AT ERRDST

1460
1461 :SBTTL TUMBLE TABLE
1462 : :START OF TUMBLE TABLE
1463
1464 003000 000400 :BLKW 256, :RESERVE 265, WORDS FOR IT
1465
1466 : :ENDTT=,
1467
1468
1469

```

1470 ) .....
1471 )TEST 1 MAINTENANCE CLOCK ISS SPW(15100)=0
1472 ) .....
1473 TST11 SCOPE
1474 004000 104400 MOV #400,0#ICOUNT ;ITERATION COUNT
1475 004002 012737 000400 025100 MOV #1,0#ERTSTN ;SAVE TEST # FOR ERROR REPORT
1476 004010 012737 000001 026126 MOV #SCP1,0#RETURN ;SCOPE LOOP RETURN ADRS
1477 004016 012737 004024 025104
1478 SCP11
1479
1480 .REN *
1481 .LIST
1482
1483 THE FUNCTION OF THIS TEST IS TO VERIFY THAT WHEN SPW (15100)=0
1484 AND SPW (07100) IS NON ZERO, THE DST FETCH IS BYPASSED;
1485
1486 *
1487
1488 ;INITIALIZE SPW TO BYPASS DST FETCH
1489 ;BY SETTING SPW(15100)=0 AND SPW(07100)=FLOATING ONES
1490
1491 004024 012727 000001 NDSTC1 MOV #1,(PC)+ ;FIRST FLOATING ONE
1492 004030 000000 2 BNE ;
1493 004032 013702 004030 MOV NDSTC,R2 ;LOAD R2 WITH CONTENTS OF SPW
1494 004036 013701 001430 MOV SP,R1 ;LOAD SPW ADRS IN R1
1495 004042 004737 030462 JSR PC,SP,1 ;BUILD SPW
1496
1497 004046 004737 024344 JSR PC,0#DXRES ;RESET DX AND TT TRACE
1498 004052 153777 027452 175246 BISH 0#DEV,0#CUAR ;LOAD CUAR ADDRESS
1499 004060 123777 027452 175240 CMPB 0#DEV,0#CUAR ;VERIFY LOAD
1500 004066 001401 BEQ ,+4 ;BRANCH IF NO ERROR CONDITION
1501 004070 104000 ERROR ;GUAR LOAD ERROR
1502 004072 153737 027452 024070 BISH 0#DEV,0#CAMAP ;UPDATE MAP
1503 004100 052777 000002 175212 BISH #MCLKEN,0#XES ;SET MCLKEN IN REGISTER ES
1504 004106 052737 000002 024290 BISH #MCLKEN,0#ESMAP ;SET MCLKEN IN MAP OF ES
1505 004114 004737 024052 JSR PC,CHKREG
1506
1507 ;START SEQUENCE OFF IN PHS01
1508
1509 004120 032777 004000 175166 BIF #TSSF,0#DXCB ;
1510 004126 001010 BNE 15 ;
1511 004130 004537 023560 JSR R5,0#CLK ;ROUTINE TO ISSUE CLOCK PULSES
1512 004134 000001 1 ; 1 CLOCK PULSE(S)
1513 004136 032777 004000 175190 BIF #TSSF,0#DXCB ;
1514 004144 001001 BNE ,+7 ;BRANCH IF NO ERROR CONDITION
1515 004146 104000 ERROR ;TIME STATE ERROR
1516 004150 004737 024052 ISI JSR PC,CHKREG
1517
1518 ;ESTABLISH CONFIDENCE IN DX STABILITY
1519
1520 004154 004537 023560 JSR R5,0#CLK ;ROUTINE TO ISSUE CLOCK PULSES
1521 004160 000144 100, ; 100, CLOCK PULSE(S)
1522 004162 004737 024052 JSR PC,CHKREG
1523 004166 004737 023430 JSR PC,PH5T ;CHECK CONTROL BITS FOR

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1578	004450	104000			ERROR					
1579	004452	052737	040000	024192	BIS	#HLDD,0#MOMAP				
1580	004460	004737	024052		JSR	PC;CHKREG				
1581	004464	004537	023560		JSR	R5;0#CLK				
1582	004470	000010			10					
1583	004472	004737	024052		JSR	PC;CHKREG				
1584										
1585										
1586										
1587										
1588										
1589										
1590	004476	052777	020000	174604	BIS	#SELO,0DXMO				
1591	004504	032777	020000	174976	BIF	#S#LO,0DXMO				
1592	004512	001401			BEO	,+4				
1593	004514	104000			ERROR					
1594	004516	004537	023560		JSR	R5;0#CLK				
1595	004522	000002			2					
1596	004524	032777	020000	174596	BIF	#SELO,0DXMO				
1597	004532	001001			BNE	,+3				
1598	004534	104000			ERROR					
1599	004536	052737	020000	024192	BIS	#SELO,0#MOMAP				
1600										
1601										
1602										
1603										
1604										
1605	004544	022777	176777	174940	CMP	#176777,0DXMI				
1606	004552	001405			BEO	DUNREAD				
1607	004554	022777	177777	174530	CMP	#177777,0DXMI				
1608	004562	001401			BEO	,+4				
1609	004564	104000			ERROR					
1610										
1611										
1612										
1613	004566	032777	000400	174504	DUNREAD	#CUBSY,0DXCS				
1614	004574	001401			BEO	,+4				
1615	004576	104000			ERROR					
1616	004600	004737	023430		JSR	PC;PHST				
1617	004604	004000			PHS01					
1618										
1619										
1620										
1621	004606	032777	004000	174464	BIF	#BSYEN,0DXCS				
1622	004614	001401			BEO	,+4				
1623	004616	104000			ERROR					
1624	004620	004737	024052		JSR	PC;CHKREG				
1625										
1626										
1627										
1628	004624	004537	023560		JSR	R5;0#CLK				
1629	004630	000001			1					
1630	004632	004737	023430		JSR	PC;PHST				
1631	004636	000000			PHS02					

I RAISE SELECT=OUT
IA PAIR OF MAINTENANCE CLOCK PULSES SHOULD
I RAISE SEL0 AND LE VE THE DX IN PHS01
I AND WITH THE DEVICE ADDRESS RECOGNIZED (ADRECC=1)

I ADDRESS IS RECOGNIZED
I CHECK FOR ERRONEOUS PROPOGATION OF SELECT=IN
I OR PRESENTATION OF STATUS=IN

I CONTROL UNIT BUSY (CUBSY) SHOULD NOT BE SET

I SEE IF ANYTHING UNEXPECTED HAPPENED

I ADVANCE TO PHASE ZERO TIME STATE 2 (PHS02)

10 CLOCK PULSE(S)

2 CLOCK PULSE(S)

PHS01

1 CLOCK PULSE(S)

PHS02


```

1632
1633
1634
1635 004640 032777 100000 174446      BIT    #LOCKO,@DXCB      ICHECK LOCKO SET
1636 004646 001001                BNE    ,+4              IBRANCH IF NO ERROR CONDITION
1637 004650 104000                ERROR                    ILOCKO NOT SET
1638 004652 052737 100000 024230      BIS    #LOCKO,@CBMAP    IUPDATE MAP
1639
1640 004660 032777 001000 174426      BIT    #SYNC,@DXCB      ICHECK SYNC SET
1641 004666 001001                BNE    ,+4              IBRANCH IF NO ERROR CONDITION
1642 004670 104000                ERROR                    ISYNC NOT SET
1643 004672 052737 001000 024230      BIS    #SYNC,@CBMAP    IUPDATE MAP
1644
1645
1646
1647 004700 032777 000100 174406      BIT    #BYPAS,@DXCB     IVERIFY ISS IN PROGRESS
1648 004706 001401                BEQ    ,+4              IBRANCH IF NO ERROR CONDITION
1649 004710 104000                ERROR                    IBYPAS SET
1650 004712 004737 024052                JSR    PC,CHKREG
1651
1652
1653
1654 004716 004537 023560                JSR    RS,@CLK          IROUTINE TO ISSUE CLOCK PULSES
1655 004722 000001                1
1656 004724 004737 023430                JSR    PC,PHST          ICHECK CONTROL BITS FOR
1657 004730 014000                PHS11                  ITHIS PHASE AND STATE
1658
1659
1660
1661 004732 032777 001000 174394      BIT    #SYNC,@DXCB     IVERIFY SYNC CLEARED
1662 004740 001401                BEQ    ,+4              IBRANCH IF NO ERROR CONDITION
1663 004742 104000                ERROR                    ISYNC SET
1664 004744 042737 001000 024230      BIC    #SYNC,@CBMAP    IUPDATE MAP
1665 004752 032777 000400 174320      BIT    #CUBSY,@DXCS    ICU BUSY SHOULD NOT BE SET
1666 004760 001401                BEQ    ,+3              IBRANCH IF NO ERROR CONDITION
1667 004762 104000                ERROR                    ICUBSY SET
1668 004764 127777 174340 174334      CMPB   @BUS0,@CUAR     IVERIFY DEVICE ADRS IN ADRS REG
1669 004772 001401                BEQ    ,+4              IBRANCH IF NO ERROR CONDITION
1670 004774 104000                ERROR                    ICUAR TO BUS0 TRANSFER ERROR
1671 004776 113737 027452 024070      MOVB   @DEV,@CBMAP    IUPDATE MAP
1672
1673
1674
1675
1676
1677 005004 032777 000200 174262      BIT    #CHIS,@DXDS     ICHIS SET IN DEVICE STATUS REG
1678 005012 001001                BNE    ,+3              IBRANCH IF NO ERROR CONDITION
1679 005014 104000                ERROR                    ITHIS NOT SET
1680 005016 052737 000200 024056      BIS    #CHIS,@DSMAP    IUPDATE MAP
1681
1682
1683
1684 005024 032777 100000 174200      BIT    #OPLI,@DXMI     IVERIFY OPLI SET
1685 005032 001001                BNE    ,+4              IBRANCH IF NO ERROR CONDITION

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1686 005034 104000 ERROR IOPLI NOT SET
1687 005036 052737 100000 024174 BIS #OPLI,#OIMMAP IUPDATE MAP
1688 005044 032777 000400 174240 BIT #PARI,#DXMI ICHECK FOR PARITY IN
1689 005052 001001 BNE ,+4 IBRANCH IF NO ERROR CONDITION
1690 005054 104000 ERROR IPARI NOT SET
1691 005056 052737 000400 024174 BIS #PARI,#OIMMAP IUPDATE MAP
1692 IDXB A LOAD USES ITS OWN CLOCK
1693
1694 IBUS ADDRESS (15110) EQUALS OFFSET REG
1695 IBUS ADDRESS (00100) EQUALS CUAR (07100)
1696
1697 005064 117727 174236 MOVB #CUAR,(PC)+ ISAVE CUAR(07100)
DIMAGBAID IHERE, IMAGE OF EXPECTED BA
1698 005070 000000 ASL #DIMAGBA IMAKE DEV ADRS MOD(2)
1699 005072 006337 005070 BIC #17001,#DIMAGBA ICLEAR ALL BUT SHIFTED ADRS
1700 005076 042737 177001 005070 MOV #DXDS,(PC)+ ISAVE OFFSET AND STATUS
1701 005104 017727 174172 DIMAGOSIF IHERE, OFFSET IMAGE
1702 005110 000000 BIC #1777,#DIMAGOS ICLEAR ALL BUT OFFSET
1703 005112 042737 001777 005110 BIS #DIMAGOS,#DIMAGBA ICREATE BA IMAGE
1704 005120 053737 005110 005070
1705
1706 IVERIFY BUS ADDRESS REGISTER WAS LOADED CORRECTLY
1707
1708 005126 023777 005070 174150 CMP #DIMAGBA,#DXBA IBA EQUALS EXPECTED BA?
1709 005134 001401 BEQ ,+4 IBRANCH IF NO ERROR CONDITION
1710 005136 104000 ERROR ICUAR TO DXBA TRANSFER ERROR
1711 005140 053737 005070 024126 BIS #DIMAGBA,#BAMAP IUPDATE MAP
1712
1713 005146 004737 024052 JSR PC;CHKREG
1714
1715 IPHASE ONE ADDRESS RESPONSE
1716 IADVANCE DX TO PHASE ONE TIME STATE 2
1717 ISYNC IS ZERO QUALIFYING THE SIGNAL "BAARN"
1718
1719 005152 004537 023560 JSR R5;CCLK IROUTINE TO ISSUE CLOCK PULSES
1720 005156 000001 1 I 1 CLOCK PULSE(S)
1721 005160 004737 023430 JSR PC;PHST ICHECK CONTROL BITS FOR
1722 005164 010000 PHS12 ITHIS PHASE AND STATE PHS12
1723
1724
1725 005166 032777 000040 174120 BIT #NPRX,#DXCB INPRX=0?
1726 005174 001001 BNE ,+4 IBRANCH IF NO ERROR CONDITION
1727 005176 104000 ERROR INPRX NOT ZERO
1728 005200 052737 000040 024230 BIS #NPRX,#CBMAP IKEEP MAP UP TO DATE
1729
1730 005206 032777 001000 174100 BIT #SYNC,#DXCB IVERIFY SYNC="1"
1731 005214 001001 BNE ,+4 IBRANCH IF NO ERROR CONDITION
1732 005216 104000 ERROR ISYNC NOT SET
1733 005220 052737 001000 024230 BIS #SYNC,#CBMAP IUPDATE MAP
1734
1735 005226 032777 031000 174040 BIT #J1000,#DXDS ICHECK FOR NO IBM RESEY
1736 005234 001401 BEQ ,+4 IBRANCH IF NO ERROR CONDITION
1737 005236 104000 ERROR IIBM RESEY
1738
1739 IVERIFY BUS ADDRESS DATA WAS TRANSFERRED INTO DXND

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1740								
1741	005240	027777	177624	174090	CMF	00IMAGBA,0DXND	ICHECK NPR DATA	
1742	005246	001401			BEO	,+1	IBRANCH IF NO ERROR CONDITION	
1743	005250	104000			ERROR		ISPW TO DXND TRANSFER ERROR	
1744	005252	057737	177612	024272	BIS	00IMAGBA,0NDMAP	IUPDATE MAP	
1745								
1746	005260	004737	024052		JSR	PCCHKREG		
1747	005264	004537	023560		JSR	R5;00CLK	ROUTINE TO ISSUE CLOCK PULSES	
1748	005270	000001			1			1 CLOCK PULSE(S)
1749								
1750	005272	032777	000040	174014	BIF	0NPRX,0DXCB	ITEST FOR NPRX	
1751	005300	001401			BEO	,+4	IBRANCH IF NO ERROR CONDITION	
1752	005302	104000			ERROR		INPRX SET	
1753	005304	042737	000040	024230	BIC	0NPRX,0CBMAP	IUPDATE MAP	
1754	005312	032777	000040	174000	BIF	0NPRTO,0DXES	ITEST FOR NPR TIME OUT	
1755	005320	001401			BEO	,+1	IBRANCH IF NO ERROR CONDITION	
1756	005322	104000			ERROR		INPRTO SET	
1757								
1758	005324	004737	024052		JSR	PCCHKREG		
1759								
1760	005330	004737	023430		JSR	PCPHST	ICHECK CONTROL BITS FOR	
1761	005334	014000			PHS11		THIS PHASE AND STATE	PHS11
1762								
1763	005336	004537	023560		JSR	R5;00CLK	ROUTINE TO ISSUE CLOCK PULSES	
1764	005342	000001			1			1 CLOCK PULSE(S)
1765	005344	004737	023430		JSR	PCPHST	ICHECK CONTROL BITS FOR	
1766	005350	010000			PHS12		THIS PHASE AND STATE	PHS12
1767	005352	004737	024052		JSR	PCCHKREG		
1768	005356	004537	023560		JSR	R5;00CLK	ROUTINE TO ISSUE CLOCK PULSES	
1769	005362	000001			1			1 CLOCK PULSE(S)
1770	005364	004737	023430		JSR	PCPHST	ICHECK CONTROL BITS FOR	
1771	005370	024000			PHS21		THIS PHASE AND STATE	PHS21
1772								
1773								
1774								
1775								
1776								
1777								
1778	005372	032777	000100	173714	BIF	0BYPAS,0DXCB	IVERIFY 0XND(15100)=0 SET BYPAS	
1779	005400	001001			BNE	,+4	IBRANCH IF NO ERROR CONDITION	
1780	005402	104000			ERROR		IBYPAS NOT SET	
1781	005404	052737	000100	024230	BIS	0BYPAS,0CBMAP	IUPDATE REG MAP	
1782	005412	042777	100000	173670	BIC	0PLO;HLDO;SELO,0DXMO	IDX RESEX	
1783	005420	042777	000002	173672	BIC	0MCLKEN,0DXES		
1784	005426	052777	000001	173644	BIS	0DXFRS,0DXCS		
1785	005434	106337	004030		ASLB	0NDSTC		
1786	005440	103402			BCS	15		
1787	005442	000137	004032		JMP	0NDSTC+2		
1788	005446	004737	030414		JSR	PCSPW,SETUP		
1789								
1790								
1791								

IADVANCE TO STATUS PREPARATION (PHASE TWO TIME STATE ONE)
IVERIFY SIG3 EVENTS TRANSFERRED
ICOPY A ONE INTO BYPAS IF 0XND(15100)=0 (NO 05?)

```

1792 | .....
1793 | TEST 2 MAINTENANCE CLOCK ISS SPW(15100)NOT ZERO
1794 | .....
1795 005452 104400 TS921 SCOPE
1796 005454 012737 000040 025100 MOV #32,,00ICOUNT ITERATION COUNT
1797 005462 012737 000002 020126 MOV #2,00ERTSTN ISAVE TEST # FOR ERROR REPORT
1798 005470 012737 005476 025104 MOV #S:P2,00RETURN ISCOPE LOOP RETURN ADRS
1799 005476 SCP21
1800
1801 .REM *
1802
1803 THE FUNCTION OF THIS TEST IS TO VERIFY THAT THE DX11 CAN EXECUTE
1804 A CHANNEL INITIATED SELECTION AND PRESENT STATUS THROUGH A DEVICE
1805 STATUS TABLE FETCH?
1806
1807 *
1808
1809
1810 005476 004737 024344 JSR PC;00DXRES IRESET DX AND TT TRACE
1811 005502 153777 027452 173616 BISH 00DEV,0CUAR ILOAD CUAR/ADDRESS
1812 005510 123777 027452 173610 CMPB 00DEV,0CUAR IVERIFY LOAD
1813 005516 001401 BEQ ,* IBRANCH IF NO ERROR CONDITION
1814 005520 104000 ERROR ICUAR LOAD ERROR
1815 005522 153737 027452 024070 BISH 00DEV,0CAMAP IUPDATE MAP
1816 005530 052777 000002 173562 BIS 0MCLKEN,0DXES ISET MCLKEN IN REGISTER ES
1817 005536 052737 000002 024290 BIS 0MCLKEN,0ESMAP ISET MCLKEN IN MAP OF ES
1818 005544 004737 024052 JSR PC;CHKREG
1819
1820 ISTART SEQUENCE OFF IN PHS01
1821
1822 005550 032777 004000 173536 BIT 0TSSF,0DXCB I
1823 005556 001010 BNE 15 I
1824 005560 004537 023560 JSR R5;00CLK IROUTINE TO ISSUE CLOCK PULSES
1825 005564 000001 I I
1826 005566 032777 004000 173520 BIT 0TSSF,0DXCB I 1 CLOCK PULSE(S)
1827 005574 001001 BNE ,* IBRANCH IF NO ERROR CONDITION
1828 005576 104000 ERROR ITIME STATE ERROR
1829 005600 004737 024052 ISI JSR PC;CHKREG
1830
1831 IESTABLISH CONFIDENCE IN DX STABILITY
1832
1833 005604 004537 023560 JSR R5;00CLK IROUTINE TO ISSUE CLOCK PULSES
1834 005610 000144 I I 100, CLOCK PULSE(S)
1835 005612 004737 024052 JSR PC;CHKREG
1836 005616 004737 023430 JSR PC;PHST ICHECK CONTROL BITS FOR
1837 005622 004000 PHS01 ITHIS PHASE AND STATE PHS01
1838
1839 IPUT DEVICE ADRS ON BUS0
1840 ICLOCK ADRS ONTO BUS0
1841 ISET ADRS IN MAP
1842 005624 053777 027452 173496 BIS 00DEV,0DXMO ILOAD DEVICE ADRS ON BUS0
1843 005632 123777 027452 173476 CMPB 00DEV,0BUS0 INO BUFFER FLOPS FOR BUS0
1844 005640 001401 BEQ ,* IBRANCH IF NO ERROR CONDITION
1845 005642 104000 ERROR IDXMO LOAD ERROR
1845 005644 004537 023560 JSR R5;00CLK IROUTINE TO ISSUE CLOCK PULSES

```


1846	005650	000002			2					2 CLOCK PULSE(S)
1847	005652	053737	027452	024192	BIS	@DEV,@MOMAP		IUPDATE REGISTER MAP		
1848	005660	004737	023720		JSR	PCICPARO		ICOPY PARO INTO CLK0 IMAGE		
1849	005664	004737	024052		JSR	PCICHKREG				
1850	005670	004537	023560		JSR	R5;@CLK		IROUTINE TO ISSUE CLOCK PULSES		
1851	005674	000010			10					10 CLOCK PULSE(S)
1852	005676	004737	024052		JSR	PCICHKREG				
1853	005702	004737	023430		JSR	PCIPHST		ICHECK CONTROL BITS FOR		
1854	005706	004000			PHS01			IThis PHASE AND STATE		PHS01
1855										
1856										
1857	005710	052777	004000	173372	BIS	@ADRO,@DXMO		ISET ADRO OUT		
1858	005716	032777	004000	173364	BIT	@AURO,@DXMO		INOT WITHOUT CLOCK		
1859	005724	001401			BEG	,+3		IBRANCH IF NO ERROR CONDITION		
1860	005726	104000			ERROR			IADRO NO ZERO		
1861	005730	004537	023560		JSR	R5;@CLK		IROUTINE TO ISSUE CLOCK PULSES		
1862	005734	000002			2					2 CLOCK PULSE(S)
1863	005736	032777	004000	173344	BIT	@ADRO,@DXMO		IVERIFY SET AFTER CLOCK		
1864	005744	001001			BNE	,+4		IBRANCH IF NO ERROR CONDITION		
1865	005746	104000			ERROR			IADRO NOT SET		
1866	005750	052737	004000	024192	BIS	@ADRO,@MOMAP		IUPDATE REG MAP		
1867	005756	032777	000002	173330	BIT	@ADRECC,@DXCR		ITEST FOR ADRECC		
1868	005764	001001			BNE	,+4		IBRANCH IF NO ERROR CONDITION		
1869	005766	104000			ERROR			IADRECC NOT SET		
1870	005770	052737	000002	024230	BIS	@ADRECC,@CBMAP		IUPDATE MAP		
1871	005776	032777	000001	173310	BIT	@ADRECD,@DXCB		ITEST FOR ADRECD		
1872	006004	001001			BNE	,+6		IBRANCH IF NO ERROR CONDITION		
1873	006006	104000			ERROR			IADRECD NOT SET		
1874	006010	052737	000001	024230	BIS	@ADRECD,@CBMAP		IUPDATE MAP		
1875	006016	004737	024052		JSR	PCICHKREG				
1876	006022	004537	023560		JSR	R5;@CLK		IROUTINE TO ISSUE CLOCK PULSES		
1877	006026	000010			10					10 CLOCK PULSE(S)
1878	006030	004737	024052		JSR	PCICHKREG				
1879	006034	004737	023430		JSR	PCIPHST		ICHECK CONTROL BITS FOR		
1880	006040	004000			PHS01			IThis PHASE AND STATE		PHS01
1881										
1882										
1883	006042	052777	040000	173240	BIS	@HLDO,@DXMO		IRaise HOLD-OUT		
1884	006050	032777	040000	173232	BIT	@HLDO,@DXMO		INOT WITHOUT CLOCK		
1885	006056	001401			BEG	,+4		IBRANCH IF NO ERROR CONDITION		
1886	006060	104000			ERROR			IHLDO NOT BUFFERED		
1887	006062	004537	023560		JSR	R5;@CLK		IROUTINE TO ISSUE CLOCK PULSES		
1888	006066	000002			2					2 CLOCK PULSE(S)
1889	006070	032777	040000	173212	BIT	@HLDO,@DXMO		IVERIFY HLDO Clocked		
1890	006076	001001			BNE	,+3		IBRANCH IF NO ERROR CONDITION		
1891	006100	104000			ERROR			IHLDO NOT SET		
1892	006102	052737	040000	024192	BIS	@HLDO,@MOMAP		IUPDATE REG MAP		
1893	006110	004737	024052		JSR	PCICHKREG				
1894	006114	004537	023560		JSR	R5;@CLK		IROUTINE TO ISSUE CLOCK PULSES		
1895	006120	000010			10					10 CLOCK PULSE(S)
1896	006122	004737	024052		JSR	PCICHKREG				
1897										
1898										
1899										

IRaise ADDRESS OUT

IRaise HOLD-OUT

IRaise SELECT-OUT
IA PAIR OF MAINTENANCE CLOCK PULSES SHOULD

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1900          I RAISE SEL0 AND LEAVE THE DX IN PHS01
1901          I AND WITH THE DEVICE ADDRESS RECOGNIZED (ADRECC=1)
1902
1903 006126 052777 020000 173194          BIS      #SEL0,0DXM0          I RAISE SELECT=OUT
1904 006134 032777 020000 173146          BIT      #SEL0,0DXM0          I NOT WITHOUT CLOCK
1905 006142 001401                          BEQ      ,+4                  I BRANCH IF NO ERROR CONDITION
1906 006144 104000                          ERROR                                         I SEL0 NOT BUFFERED
1907 006146 004537 023560          JSR      R5,0CLK              I ROUTINE TO ISSUE CLOCK PULSES
1908 006152 000002                          2                                          I
1909 006154 032777 020000 173126          BIT      #SEL0,0DXM0          I VERIFY SEL0 CLOKED
1910 006162 001001                          BNE     ,+1                  I BRANCH IF NO ERROR CONDITION
1911 006164 104000                          ERROR                                         I SEL0 NOT SET
1912 006166 052737 020000 024192          BIS      #SEL0,0MOMAP         I UPDATE MAP
1913
1914          I ADDRESS IS RECOGNIZED
1915          I CHECK FOR ERRONEOUS PROPOGATION OF SELECT=IN
1916          I OR PRESENTATION OF STATUS=IN
1917
1918 006174 022777 176777 173110          CMP      0176777,0DXM1        I DXM1 SHOULD BE UNREADABLE
1919 006202 001405                          BEQ      UNREAD
1920 006204 022777 177777 173100          CMP      0177777,0DXM1        I DXM1 MAY HAVE CLKO
1921 006212 001401                          BEQ      ,+4                  I BRANCH IF NO ERROR CONDITION
1922 006214 104000                          ERROR                                         I DXM1 STATE ERROR
1923
1924          I CONTROL UNIT BUSY (CUBSY) SHOULD NOT BE SET
1925
1926 006216 032777 000400 173094          UNREADI BIT #CUBSY,0DXCS      I CUBSY SHOULD NOT BE SET
1927 006224 001401                          BEQ      ,+4                  I BRANCH IF NO ERROR CONDITION
1928 006226 104000                          ERROR                                         I CUBSY NOT ZERO
1929 006230 004737 023430          JSR      PC,PHST              I CHECK CONTROL BITS FOR
1930 006234 004000          PHS01                          I THIS PHASE AND STATE
1931
1932          I SEE IF ANYTHING UNEXPECTED HAPPENED
1933
1934 006236 032777 004000 173034          BIT      #BSYEN,0DXCS        I BUSY ENABLE SHOULD NOT BE SET
1935 006244 001401                          BEQ      ,+4                  I BRANCH IF NO ERROR CONDITION
1936 006246 104000                          ERROR                                         I BSYEN SET
1937 006250 004737 024052          JSR      PC,CHKREG
1938
1939          I ADVANCE TO PHASE ZERO TIME STATE 2 (PHS02)
1940
1941 006254 004537 023560          JSR      R5,0CLK              I ROUTINE TO ISSUE CLOCK PULSES
1942 006260 000001                          1                                          I
1943 006262 004737 023430          JSR      PC,PHST              I CHECK CONTROL BITS FOR
1944 006266 000000          PHS02                          I THIS PHASE AND STATE
1945
1946          I LOCKOUT AND SYNC SHOULD = "1"
1947
1948 006270 032777 100000 173016          BIT      #LOCK0,0DXCB        I CHECK LOCK0 SET
1949 006276 001001                          BNE     ,+4                  I BRANCH IF NO ERROR CONDITION
1950 006300 104000                          ERROR                                         I LOCK0 NOT SET
1951 006302 052737 100000 024230          BIS      #LOCK0,0CBMAP       I UPDATE MAP
1952
1953 006310 032777 001000 172776          BIT      #SYNC,0DXCS

```

PHS01

2 CLOCK PULSE(S)

1 CLOCK PULSE(S)

PHS02

1954	006316	001021			BNE	,+4		IBRANCH IF NO ERROR CONDITION
1955	006320	104000			ERROR			ISYNC NOT SET
1956	006322	052737	001000	024230	BIS	#SYNC,#PCBMAP		IUPDATE MAP
1957								
1958								
1959								
1960	006330	032777	000100	172756	BIT	#BYPAS,#DXCB		IVERIFY ISS IN PROGRESS
1961	006336	001401			BEO	,+4		IBRANCH IF NO ERROR CONDITION
1962	006342	104000			ERROR			IBYPAS SET
1963	006342	004737	024052		JSR	PC,CHKREG		
1964								
1965								
1966								
1967	006346	004537	023560		JSR	R510#CLK		IROUTINE TO ISSUE CLOCK PULSES
1968	006352	000001			1			1 CLOCK PULSE(S)
1969	006354	004737	023430		JSR	PC,PHST		ICHECK CONTROL BITS FOR
1970	006360	014000			PHS11			IThis PHASE AND STATE
1971								PHS11
1972								
1973								
1974	006362	032777	001000	172724	BIT	#SYNC,#DXCB		IVERIFY SYNC CLEARED
1975	006370	001401			BEO	,+4		IBRANCH IF NO ERROR CONDITION
1976	006372	104000			ERROR			ISYNC SET
1977	006374	042737	001000	024230	BIC	#SYNC,#PCBMAP		IUPDATE MAP
1978	006402	032777	000400	172670	BIT	#CUBSY,#DXCS		ICU BUSY SHOULD NOT BE SET
1979	006410	001401			BEO	,+4		IBRANCH IF NO ERROR CONDITION
1980	006412	104000			ERROR			ICUBSY SET
1981	006414	127777	172716	172704	CHPB	#BUS0,#CUAR		IVERIFY DEVICE ADRS IN ADRS REG
1982	006422	001401			BEO	,+4		IBRANCH IF NO ERROR CONDITION
1983	006424	104000			ERROR			ICUAR TO BUS0 TRANSFER ERROR
1984	006426	113737	027452	024070	MOVB	#DEV,#CAMAP		IUPDATE MAP
1985								
1986								
1987								
1988								
1989								
1990	006434	032777	000200	172632	BIT	#CHIS,#DXDS		ICHIS SET IN DEVICE STATUS REG
1991	006442	001001			BNE	,+4		IBRANCH IF NO ERROR CONDITION
1992	006444	104000			ERROR			IThis NOT SET
1993	006446	052737	000200	024056	BIS	#CHIS,#DSMAP		IUPDATE MAP
1994								
1995								
1996								
1997	006454	032777	100000	172630	BIT	#OPLI,#DXMI		IVERIFY OPLI SET
1998	006462	001001			BNE	,+4		IBRANCH IF NO ERROR CONDITION
1999	006464	104000			ERROR			IOPLI NOT SET
2000	006466	052737	100000	024174	BIS	#OPLI,#MIMAP		IUPDATE MAP
2001	006474	032777	000400	172610	BIT	#PARI,#DXMI		ICHECK FOR PARITY IN
2002	006502	001001			BNE	,+4		IBRANCH IF NO ERROR CONDITION
2003	006504	104000			ERROR			IPARI NOT SET
2004	006506	052737	000400	024174	BIS	#PARI,#MIMAP		IUPDATE MAP
2005								
2006								
2007								

INEXT CLOCK TICK SHOULD FORCE THE DX
INTO THE ADDRESS RESPONSE PHASE ONE TIME STATE 1

IROUTINE TO ISSUE CLOCK PULSES

ICHECK CONTROL BITS FOR
IThis PHASE AND STATE

ISYNC SHOULD BE CLEARED

IVERIFY SYNC CLEARED
IBRANCH IF NO ERROR CONDITION
ISYNC SET
IUPDATE MAP
ICU BUSY SHOULD NOT BE SET
IBRANCH IF NO ERROR CONDITION
ICUBSY SET
IVERIFY DEVICE ADRS IN ADRS REG
IBRANCH IF NO ERROR CONDITION
ICUAR TO BUS0 TRANSFER ERROR
IUPDATE MAP

IADRS-OUT SHOULD COPY INTO CHIS IF ADRECC=1
IThis INDICATES A CHANNEL INITIATED SELECTION IS IN
IPROGRESS

ICHIS SET IN DEVICE STATUS REG
IBRANCH IF NO ERROR CONDITION
IThis NOT SET
IUPDATE MAP

IOPERATIONAL-IN SHOULD BE SET

IVERIFY OPLI SET
IBRANCH IF NO ERROR CONDITION
IOPLI NOT SET
IUPDATE MAP
ICHECK FOR PARITY IN
IBRANCH IF NO ERROR CONDITION
IPARI NOT SET
IUPDATE MAP

IDXBA LOAD USES ITS OWN CLOCK

IBUS ADDRESS (15110) EQUALS OFFSET REG

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2008          IBUS ADDRESS (00100) EQUALS CUAR (07100)
2009
2010 006514 117727 172600          MOVB      0CUAR,(PC)+      ;SAVE CUAR(07100)
2011 006520 000000          IMAGBAI 0                ;HERE, IMAGE OF EXPECTED BA
2012 006522 006337 006520          ASL      00IMAGBA        ;MAKE DEV ADRS MOD(2)
2013 006526 042737 177001 006520          BIC      #17001,00IMAGBA ;CLEAR ALL BUT SHIFTED ADRS
2014 006534 017727 172542          MOV      0DXOS,(PC)+      ;SAVE OFFSET AND STATUS
2015 006540 000000          IMAGOSI 0                ;HERE, OFFSET IMAGE
2016 006542 042737 001777 006540          BIC      #1777,00IMAGOS  ;CLEAR ALL BUT OFFSET
2017 006550 053737 006540 006520          BIS      00IMAGOS,00IMAGBA ;CREATE BA IMAGE
2018
2019          IVERIFY BUS ADDRESS REGISTER WAS LOADED CORRECTLY
2020
2021 006556 023777 006520 172520          CMP      00IMAGBA,0DXBA   ;BA EQUALS EXPECTED BA?
2022 006564 001401                BEQ      ,+4              ;BRANCH IF NO ERROR CONDITION
2023 006566 104000          ERROR                ;CUAR TO DXBA TRANSFER ERROR
2024 006570 053737 006520 024126          BIS      00IMAGBA,00BAMAP ;UPDATE MAP
2025
2026 006576 004737 024052          JSR      PC,CHKREG
2027
2028          IPHASE ONE=ADDRESS RESPONSE
2029          IADVANCE DX TO PHASE ONE TIME STATE 2
2030          ISYNC IS ZERO QUALIFYING THE SIGNAL"BAAR"
2031
2032 006602 004537 023560          JSR      R5,00CLK        ;ROUTINE TO ISSUE CLOCK PULSES
2033 006606 000001                1                ; 1 CLOCK PULSE(S)
2034 006610 004737 023430          JSR      PC,PHS12        ;CHECK CONTROL BITS FOR
2035 006614 010000          PHS12                ;THIS PHASE AND STATE
2036
2037
2038 006616 032777 000040 172470          BIT      0NPRX,0DXCB     ;NPRX=0?
2039 006624 001001                BNE      ,+4              ;BRANCH IF NO ERROR CONDITION
2040 006626 104000          ERROR                ;NPRX NOT ZERO
2041 006630 052737 000040 024230          BIS      0NPRX,00CBMAP   ;KEEP MAP UP TO DATE
2042
2043 006636 032777 001000 172490          BIT      0SYNC,0DXCB     ;VERIFY SYNC="1"
2044 006644 001001                BNE      ,+4              ;BRANCH IF NO ERROR CONDITION
2045 006646 104000          ERROR                ;SYNC NOT SET
2046 006650 052737 001000 024230          BIS      0SYNC,00CBMAP   ;UPDATE MAP
2047
2048 006656 032777 031000 172410          BIT      0J1000,0DXOS    ;CHECK FOR NO IBM RESET
2049 006664 001401                BEQ      ,+4              ;BRANCH IF NO ERROR CONDITION
2050 006666 104000          ERROR                ;IBM RESET
2051
2052          IVERIFY BUS ADDRESS DATA WAS TRANSFERRED INTO DXND
2053
2054 006670 027777 177624 172420          CMP      0IMAGBA,0DXND   ;CHECK NBR DATA
2055 006676 001401                BEQ      ,+4              ;BRANCH IF NO ERROR CONDITION
2056 006700 104000          ERROR                ;SPW TO DXND TRANSFER ERROR
2057 006702 057737 177612 024272          BIS      0IMAGBA,00NDMAP ;UPDATE MAP
2058
2059 006710 004737 024052          TETAGI JSR      PC,CHKREG
2060 006714 004537 023560          JSR      R5,00CLK        ;ROUTINE TO ISSUE CLOCK PULSES
2061 006720 000001                1                ; 1 CLOCK PULSE(S)

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2062									
2063	006722	032777	000040	172364	BIT	#NPRX, #DXCB	ITEST FOR NPRX		
2064	006730	001401			BEO	, +1	IBRANCH IF NO ERROR CONDITION		
2065	006732	104000			ERROR		INPRX SET		
2066	006734	042737	000040	024230	BIC	#NPRX, #SCBMAP	IUPDATE MAP		
2067	006742	032777	000040	172390	BIT	#NPRTO, #DXES	ITEST FOR NPR TIME OUT		
2068	006750	001401			BEO	, +4	IBRANCH IF NO ERROR CONDITION		
2069	006752	104000			ERROR		INPRTO SET		
2070									
2071	006754	004737	024052		JSR	PC,CHKREG			
2072									
2073	006760	004737	023430		JSR	PC,PHST	ICHECK CONTROL BITS FOR		
2074	006764	014000			PHS11		IThis PHASE AND STATE		PHS11
2075									
2076	006766	004537	023560		JSR	R5,00CLK	IROUTINE TO ISSUE CLOCK PULSES		
2077	006772	000001			1				1 CLOCK PULSE(S)
2078	006774	004737	023430		JSR	PC,PHST	ICHECK CONTROL BITS FOR		
2079	007000	010000			PHS12		IThis PHASE AND STATE		PHS12
2080	007002	004737	024052		JSR	PC,CHKREG			
2081	007006	004537	023560		JSR	R5,00CLK	IROUTINE TO ISSUE CLOCK PULSES		
2082	007012	000001			1				1 CLOCK PULSE(S)
2083	007014	004737	023430		JSR	PC,PHST	ICHECK CONTROL BITS FOR		
2084	007020	024000			PHS21		IThis PHASE AND STATE		PHS21
2085									
2086									
2087									
2088									
2089									
2090									
2091	007022	032777	000100	172264	BIT	#BYPAS, #DXCB	IVERIFY DXND(15100)=0 SET BYPAS		
2092	007030	001401			BEO	, +4	IBRANCH IF NO ERROR CONDITION		
2093	007032	104000			ERROR		IBYPAS NOT SET		
2094	007034	042737	000100	024230	BIC	#BYPAS, #SCBMAP	IUPDATE REG MAP		
2095									
2096									
2097									
2098									
2099									
2100	007042	127777	177452	172262	CHPB	#IMAGBA, #CUSR	IVERIFY SPW(07100) STATUS PRESENT		
2101	007050	001401			BEO	, +4	IBRANCH IF NO ERROR CONDITION		
2102	007052	104000			ERROR		ISPW TO CUSR TRANSFER ERROR		
2103	007054	117737	172252	024114	MOVB	#CUSR, #00SHAP	IUPDATE REG MAP		
2104	007062	127777	172240	172252	CHPB	#CUAR, #BUS1	IVERIFY ADRS ON BUS1 FOR ECHO		
2105	007070	001401			BEO	, +1	IBRANCH IF NO ERROR CONDITION		
2106	007072	104000			ERROR		ICUAR TO BUS1 TRANSFER ERROR		
2107	007074	017727	172212		MOV	#DXM1, (PC)+	ISAVE DXM1		
2108	007100	000000			0		HERE		
2109	007102	042737	177000	007100	BIC	#177000, #SMIP	ICLEAR ALL BUT ADRS+PARITY		
2110	007110	023737	027452	007100	CHP	#00EV, #SMIP	ICOMPARE DEV ADRS+PARITY		
2111	007116	001401			BEO	, +2	IBRANCH IF NO ERROR CONDITION		
2112	007120	104000			ERROR		IMI LOAD ERROR		
2113	007122	042737	000777	024174	BIC	#777, #MIMAP	IUPDATE MAP		
2114	007130	053737	007100	024174	BIS	SMIP, #MIMAP	ISYNC ZERO		
2115	007136	032777	001000	172190	BIT	#SINC, #DXCB			

ADVANCE TO STATUS PREPARATION (PHASE TWO TIME STATE ONE)
 VERIFY SIG3 EVENTS TRANSFERRED
 COPY A ZERO INTO BYPAS IF DXND(15100) NOT ZERO (DO DSY)

VERIFY THE LOW (NONZERO) BYTE OF SPW WAS PRESENT
 AS STATUS BY LOADING DXND(07100) INTO CUSR

SMIP1

2116	007144	001401			BEO	,*4		IBRANCH IF NO ERROR CONDITION	
2117	007146	104000			ERROR			ISYNC SET	
2118	007150	042737	001000	024230	BIC	#SYNC,#0CBMAP		IUPDATE MAP	
2119									
2120									
2121									
2122	007156	004737	024052		JSR	PC7CHKREG			
2123	007162	004537	023560		JSR	R5700CLK		IROUTINE TO ISSUE CLOCK PULSES	
2124	007166	000001			1				1 CLOCK PULSE(S)
2125	007170	004737	023430		JSR	PC7PHST		ICHECK CONTROL BITS FOR	
2126	007174	020000			PHS22			IThis PHASE AND STATE	PHS22
2127	007176	004537	023560		JSR	R5700CLK		IROUTINE TO ISSUE CLOCK PULSES	
2128	007202	000011			11				11 CLOCK PULSE(S)
2129	007204	004737	023430		JSR	PC7PHST		ICHECK CONTROL BITS FOR	
2130	007210	024000			PHS21			IThis PHASE AND STATE	PHS21
2131	007212	004737	024052		JSR	PC7CHKREG			
2132									
2133									
2134									
2135	007216	042777	004000	172004	BIC	#ADRO,#DXMO		IDROP ADRO	
2136	007224	032777	004000	172056	BIT	#AYRO,#DXMO		INOT WITHOUT CLOCK	
2137	007232	001001			BNE	,*4		IBRANCH IF NO ERROR CONDITION	
2138	007234	104000			ERROR			IADRO NOT SET	
2139	007236	004537	023560		JSR	R5700CLK		IROUTINE TO ISSUE CLOCK PULSES	
2140	007242	000002			2				2 CLOCK PULSE(S)
2141	007244	004737	023430		JSR	PC7PHST		ICHECK CONTROL BITS FOR	
2142	007250	024000			PHS21			IThis PHASE AND STATE	PHS21
2143	007252	032777	004000	172030	BIT	#ADRO,#DXMO		IADRO SHOULD DROP	
2144	007260	001401			BEO	,*3		IBRANCH IF NO ERROR CONDITION	
2145	007262	104000			ERROR			IADRO SET	
2146	007264	042737	004000	024192	BIC	#ADRO,#0MOMAP		IUPDATE MAP	
2147									
2148									
2149									
2150	007272	032777	000002	172014	BIT	#ADRECC,#DXCB		ITEST FOR NO ADRECC	
2151	007300	001401			BEO	,*4		IBRANCH IF NO ERROR CONDITION	
2152	007302	104000			ERROR			IADRECC SET	
2153	007304	042737	000002	024230	BIC	#ADRECC,#0CBMAP		IUPDATE CB MAP	
2154	007312	032777	000001	171774	BIT	#ADRECD,#DXCB		ITEST FOR NO ADRECD	
2155	007320	001401			BEO	,*3		IBRANCH IF NO ERROR CONDITION	
2156	007322	104000			ERROR			IADRECD SET	
2157	007324	042737	000001	024230	BIC	#ADRECD,#0CBMAP		IUPDATE CB MAP	
2158	007332	004737	024052		JSR	PC7CHKREG			
2159	007336	004537	023560		JSR	R5700CLK		IROUTINE TO ISSUE CLOCK PULSES	
2160	007342	000001			1				1 CLOCK PULSE(S)
2161	007344	004737	023430		JSR	PC7PHST		ICHECK CONTROL BITS FOR	
2162	007350	020000			PHS22			IThis PHASE AND STATE	PHS22
2163	007352	032777	010000	171732	BIT	#ADRI,#DXMI		IADRS-IN SHOULD BE UP	
2164	007360	001001			BNE	,*4		IBRANCH IF NO ERROR CONDITION	
2165	007362	104000			ERROR			IADRI NOT SET	
2166	007364	052737	010000	024174	BIS	#ADRI,#0MIMAP		IUPDATE MAP	
2167	007372	004737	024052		JSR	PC7CHKREG			
2168	007376	004537	023560		JSR	R5700CLK		IROUTINE TO ISSUE CLOCK PULSES	
2169	007402	000010			10				10 CLOCK PULSE(S)

2170	007404	112777	000000	171676	MOVB	#07,0DXMO	REMOVE ADRS FROM BUS0	
2171	007412	112737	000000	024192	MOVB	#07,0MOMAP	UPDATE MAP	
2172	007420	004537	023560		JSR	R5,0CLK	ROUTINE TO ISSUE CLOCK PULSES	
2173	007424	000002			2			2 CLOCK PULSE(S)
2174	007426	004737	024092		JSR	PC,CHKREG		
2175					IRELEASE ALL ONES STATUS FROM BUS1			
2176	007432	012737	000403	027454	MOV	#NOPC,CMD	LOAD COMMAND	
2177	007440	053777	027454	171642	BIS	CM2,0DXMO	LOAD CMD + PARITY ON BUS0	
2178	007446	053737	027454	024192	BIS	CM2,0MOMAP	UPDATE MAP	
2179	007454	004537	023560		JSR	R5,0CLK	ROUTINE TO ISSUE CLOCK PULSES	
2180	007460	000002			2			2 CLOCK PULSE(S)
2181	007462	032777	001000	171622	BIT	#CLK0,0DXMI	TEST FOR CLOCK-OUT	
2182	007470	001001			BNE	,+0	BRANCH IF NO ERROR CONDITION	
2183	007472	104000			ERROR		CLK0 NOT SET	
2184	007474	052737	001000	024174	BIS	#CLK0,0MIMAP	UPDATE M1 MAP	
2185	007502	004737	024092		JSR	PC,CHKREG		
2186					ISTILL WAITING IN PHS21 FOR CMD0			
2187	007506	052777	002000	171574	BIS	#CMD0,0DXMO	RAISE COMMAND-OUT	
2188	007514	032777	002000	171506	BIT	#CMD0,0DXMO	NOT WITHOUT CLOCK	
2189	007522	001401			BEG	,+0	BRANCH IF NO ERROR CONDITION	
2190	007524	104000			ERROR		CMD0 NOT BUFFERED	
2191	007526	004537	023560		JSR	R5,0CLK	ROUTINE TO ISSUE CLOCK PULSES	
2192	007532	000001			1			1 CLOCK PULSE(S)
2193	007534	032777	002000	171546	BIT	#CMD0,0DXMO	CMD0 SHOULD BE UP	
2194	007542	001001			BNE	,+0	BRANCH IF NO ERROR CONDITION	
2195	007544	104000			ERROR		CMD0 NOT SET	
2196	007546	052737	002000	024192	BIS	#CMD0,0MOMAP	UPDATE MAP	
2197					ID0 NPR FETCH OF STATUS FROM DST			
2198					IVERIFY DXND(15100) INTO DXBA(15100)			
2199								
2200	007554	017727	171536		MOV	0DXND,(PC)+	SAVE DXND	
2201	007560	000000			P2ND1	0	HERE	
2202	007562	017727	171516		MOV	0DXBA,(PC)+	SAVE DXBA	
2203	007566	000000			P2BA1	0	HERE	
2204	007570	123737	007561	007567	CMPB	0P2ND+1,0P2BA+1	VERIFY DXND(15100) TO BA(15100)	
2205	007576	001401			BEG	,+0	BRANCH IF NO ERROR CONDITION	
2206	007600	104000			ERROR		ON TO BA TRANSFER ERROR	
2207	007602	123727	007566	000002	CMPB	0P2BA,02	VERIFY BUS0(07101) TO BA(07101)	
2208	007610	001401			BEG	,+0	BRANCH IF NO ERROR CONDITION	
2209	007612	104000			ERROR		BUS0 TO BA TRANSFER ERROR	
2210	007614	017737	171464	024126	MOV	0DXBA,0BAMAP	UPDATE MAP	
2211	007622	004537	023560		JSR	R5,0CLK	ROUTINE TO ISSUE CLOCK PULSES	
2212	007626	000001			1			1 CLOCK PULSE(S)
2213	007630	004737	023430		JSR	PC,PHST	CHECK CONTROL BITS FOR	
2214	007634	020000			PHS22		THIS PHASE AND STATE	PHS22
2215	007636	032777	010000	171446	BIT	#ADR1,0DXMI	ADRS-IN SHOULD BE DOWN	
2216	007644	001401			BEG	,+0	BRANCH IF NO ERROR CONDITION	
2217	007646	104000			ERROR		ADR1 DIS NOT DROP	
2218	007650	042737	010000	024174	BIC	#ADR1,0MIMAP	UPDATE MAP	
2219	007656	123777	027454	171444	CMPB	CM2,0CUCR	CMD SHOULD BE IN CUCR	
2220	007664	001401			BEG	,+0	BRANCH IF NO ERROR CONDITION	
2221	007666	104000			ERROR		CMD LOAD ERROR	
2222	007670	113737	027454	024071	MOVB	CM0,0CAMAP+1	UPDATE CMD SIDE OF CA MAP	
2223	007676	032777	000100	171410	BIT	#BYPAS,0DXCB	VERIFY BYPAS SET	

2224	007774	001001			BNE	,+4		IBRANCH IF NO ERROR CONDITION	
2225	007776	104000			ERROR			IBYPAS NOT SET	
2226	007710	052737	000100	024230	BIS	#BYPAS,#CBMAP		IUPDATE MAP	
2227	007716	032777	000040	171370	BIT	#NPRX,#DXCB		IVERIFY NPRX SET	
2228	007724	001001			BNE	,+0		IBRANCH IF NO ERROR CONDITION	
2229	007726	104000			ERROR			INPRX NOT SET	
2230	007730	052737	000040	024230	BIS	#NPRX,#CBMAP		IUPDATE MAP	
2231	007736	032777	001000	171350	BIT	#SYNC,#DXCB		IVERIFY SYNC SET	
2232	007744	001001			BNE	,+1		IBRANCH IF NO ERROR CONDITION	
2233	007746	104000			ERROR			ISYNC NOT SET	
2234	007750	052737	001000	024230	BIS	#SYNC,#CBMAP		IUPDATE MAP	
2235	007756	013701	001442		MOV	DS1,R1		ILOAD ADDRESS OF DST	
2236	007762	027761	171330	000002	CMF	0DXND,2(R1)		IVERIFY DS1 TO DXND TRANSFER	
2237	007770	001401			BEQ	,+3		IBRANCH IF NO ERROR CONDITION	
2238	007772	104000			ERROR			IDST TO DXND TRANSFER ERROR	
2239	007774	017737	171310	024272	MOV	0DXND,#NDMAP		IUPDATE MAP	
2240	010002	004737	024052		JSR	PC,CHKREG			
2241	010006	004537	023560		JSR	R5,#CLK		IROUTINE TO ISSUE CLOCK PULSES	
2242	010012	000002			2				2 CLOCK PULSE(S)
2243	010014	004737	023430		JSR	PC,PHS2		ICHECK CONTROL BITS FOR	
2244	010020	020000			PHS22			IThis PHASE AND STATE	PHS22
2245	010022	032777	000040	171204	BIT	#NPRX,#DXCB		IVERIFY NPRX 0	
2246	010030	001401			BEQ	,+4		IBRANCH IF NO ERROR CONDITION	
2247	010032	104000			ERROR			INPRX NOT ZERO	
2248	010034	042737	000040	024230	BIC	#NPRX,#CBMAP		IUPDATE MAP	
2249	010042	004737	024052		JSR	PC,CHKREG			
2250	010046	004537	023560		JSR	R5,#CLK		IROUTINE TO ISSUE CLOCK PULSES	
2251	010052	000001			1				1 CLOCK PULSE(S)
2252	010054	004737	023430		JSR	PC,PHS2		ICHECK CONTROL BITS FOR	
2253	010060	034000			PHS31			IThis PHASE AND STATE	PHS31
2254	010062	032777	001000	171224	BIT	#SYNC,#DXCB		IVERIFY SYNC 0	
2255	010070	001401			BEQ	,+0		IBRANCH IF NO ERROR CONDITION	
2256	010072	104000			ERROR			ISYNC NOT ZERO	
2257	010074	042737	001000	024230	BIC	#SYNC,#CBMAP		IUPDATE MAP	
2258	010102	017727	171210		MOV	0DXND,(PC)+		ISAVE DXND	
2259	010106	000000			0			HERE	
2260	010110	123777	010107	171214	CMFB	#P3ND+1,#CUSR		IVERIFY DXND(15100) TO CUSR	
2261	010116	001401			BEQ	,+0		IBRANCH IF NO ERROR CONDITION	
2262	010120	104000			ERROR			IDXND(15100) TO CUSR TRANSFER ERROR	
2263	010122	017737	171170	024272	MOV	0DXND,#NDMAP		IUPDATE MAP	
2264	010130	017737	171140	024114	MOV	0D'OS,#OSMAP		IUPDATE MAP	
2265	010136	004737	024052		JSR	PC,CHKREG			
2266	010142	032777	004000	171142	BIT	#STAI,#DXMI		ISTATUS=IN 0	
2267	010150	001401			BEQ	,+1		IBRANCH IF NO ERROR CONDITION	
2268	010152	104000			ERROR			ISTAI NOT ZERO	
2269	010154	042737	004000	024174	BIC	#STAI,#MIMAP			
2270	010162	032777	000200	171104	BIT	#CHIS,#DXDS		ICM INITIATED SELECTION	
2271	010170	001001			BNE	,+1		IBRANCH IF NO ERROR CONDITION	
2272	010172	104000			ERROR			ICHS NOT SET	
2273	010174	052737	000200	024056	BIS	#CHIS,#DSMAP		IUPDATE MAP	
2274	010202	032777	000100	171104	BIT	#BYPAS,#DXCB		IVERIFY BYPAS SET	
2275	010210	001001			BNE	,+1		IBRANCH IF NO ERROR CONDITION	
2276	010212	104000			ERROR			IPARITY ERROR ON CMD	
2277	010214	052737	000100	024230	BIS	#BYPAS,#CBMAP		IUPDATE MAP	

P3ND1


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2278 010222 004737 024052 JSR PC;CHKREG
2279 010226 004537 023560 JSR R5;0#CLK ;ROUTINE TO ISSUE CLOCK PULSES
2280 010232 000001 1 ; 1 CLOCK PULSE(S)
2281 010234 004737 023430 JSR PC;PHST ;CHECK CONTROL BITS FOR
2282 010240 030000 PHS32 ;THIS PHASE AND STATE PHS32
2283 010242 126177 000003 171072 CMPB 3(R1),0BUSI ;VERIFY DST TO BUSI TRANSFER
2284 010250 001401 BEQ ,05 ;BRANCH IF NO ERROR CONDITION
2285 010252 104000 ERROR ;BUSI STATUS ERROR
2286 010254 117737 171062 024174 MOVB 0BUSI,0#MIMAP
2287 010262 032777 000400 171022 BIT #PARI,0DXMI ;CHECK PARITY GENERATOR
2288 010270 001001 BNE ,04 ;BRANCH IF NO ERROR CONDITION
2289 010272 104000 ERROR ;PARITY ERROR
2290 010274 052737 000400 024174 BIS #PARI,0#MIMAP
2291 010302 004737 024052 JSR PC;CHKREG
2292 010306 004537 023560 JSR R5;0#CLK ;ROUTINE TO ISSUE CLOCK PULSES
2293 010312 000007 7 ; 7 CLOCK PULSE(S)
2294 010314 004737 024052 JSR PC;CHKREG
2295
2296 ;WAIT FOR CMDO TO DROP
2297
2298 ;PREP FOR SIG6A
2299
2300 010320 032777 001000 170702 BIT #SRVO,0DXMO ;SRV00?
2301 010326 001401 BEQ ,04 ;BRANCH IF NO ERROR CONDITION
2302 010330 104000 ERROR ;SRVO SET
2303 010332 032777 034000 170734 BIT #IBMRST,0DXDS ;IBM RESET
2304 010340 001401 BEQ ,03 ;BRANCH IF NO ERROR CONDITION
2305 010342 104000 ERROR ;
2306 010344 042777 002000 170736 BIC #CMDO,0DXMO ;DROP COMMAND-OUT
2307 010352 032777 002000 170730 BIT #CMDO,0DXMO ;NOT WITHOUT CLOCK
2308 010360 001001 BNE ,02 ;BRANCH IF NO ERROR CONDITION
2309 010362 104000 ERROR ;CMDO NOT BUFFERED
2310 010364 004537 023560 JSR R5;0#CLK ;ROUTINE TO ISSUE CLOCK PULSES
2311 010370 000002 2 ; 2 CLOCK PULSE(S)
2312 010372 004737 023430 JSR PC;PHST ;CHECK CONTROL BITS FOR
2313 010376 034000 PHS31 ;THIS PHASE AND STATE PHS31
2314 010400 032777 002000 170702 BIT #CMDO,0DXMO ;CMDO SHOULD BE ZERO
2315 010406 001401 BEQ ,03 ;BRANCH IF NO ERROR CONDITION
2316 010410 104000 ERROR ;CMDO STUCK HIGH
2317 010412 042737 002000 024192 BIC #CMDO,0#MOMAP ;UPDATE MAP
2318
2319 ;VERIFY SIG6A EVENTS TRANSPIRED
2320 010420 032777 001000 170646 BIT #CHENDS,0DXDS ;VERIFY CHENDS SET
2321 010426 001001 BNE ,02 ;BRANCH IF NO ERROR CONDITION
2322 010430 104000 ERROR ;CHENDS NOT SET
2323 010432 052737 001000 024096 BIS #CHENDS,0#DSMAP
2324 010440 032777 004000 170644 BIT #SIAI,0DXMI ;VERIFY STATUS-IN UP
2325 010446 001001 BNE ,01 ;BRANCH IF NO ERROR CONDITION
2326 010450 104000 ERROR ;STATUS-IN NOT SET
2327 010452 052737 004000 024174 BIS #STAI,0#MIMAP ;UPDATE MI MAP
2328
2329 010460 004737 024052 JSR PC;CHKREG
2330 010464 004537 023560 JSR R5;0#CLK ;ROUTINE TO ISSUE CLOCK PULSES
2331 010470 000010 10 ; 10 CLOCK PULSE(S)

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2332										
2333	010472	004737	024052							
2334	010476	004737	023430							
2335	010502	034000								
2336	010504	017737	170564	022650						
2337	010512	017737	170560	022710						
2338	010520	012777	024560	170536						
2339	010526	013777	001272	170530						
2340	010534	052777	000100	170536						
2341	010542	032737	000100	024102						
2342										
2343	010550	004737	024052							
2344	010554	052777	001000	170526						
2345										
2346										
2347	010562	004537	023560							
2348	010566	000002								
2349	010570	032777	001000	170512						
2350	010576	001001								
2351	010600	104000								
2352	010602	052737	001000	024102						
2353	010610	032777	004000	170474						
2354	010616	001401								
2355	010620	104000								
2356	010622	042737	004000	024174						
2357	010630	004737	023430							
2358	010634	044000								
2359										
2360										
2361	010636	032777	001000	170440						
2362	010644	001001								
2363	010646	104000								
2364	010650	052737	001000	024126						
2365	010656	105777	170422							
2366	010662	001401								
2367	010664	104000								
2368	010666	105037	024126							
2369	010672	023777	001440	170404						
2370	010700	001401								
2371	010702	104000								
2372	010704	017737	170374	024126						
2373	010712	004737	024052							
2374										
2375	010716	032777	000040	170370						
2376	010724	001401								
2377	010726	104000								
2378	010730	032777	001000	170396						
2379	010736	001401								
2380	010740	104000								
2381	010742	004537	023560							
2382	010746	000001								
2383	010750	004737	023430							
2384	010754	040000								
2385										

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IWAIT FOR SIG6 QUALIFIER SRVO, STA1
JSR PC:CHKREG
JSR PC:PHST
PMS31
ICHECK CONTROL BITS FOR
IThis PHASE AND STATE
ILOAD IT ENTRY ONE
ILOAD IT ENTRY TWO
IPOINT INTER VECTOR TO TRAP
IDX PRY MINUS ONE
ISET INTERRUPT ENABLE
IUPDATE MAP
PMS31

JSR PC:CHKREG
BIS #SRVO, #DXMO
IENABLE SIG6
IADVANCE TO MARK (CHASE FOUR TIME STATE 1)

JSR R5: #CLK
IROUTINE TO ISSUE CLOCK PULSES
I
2
BIT #SRVO, #DXMO
ISRVO IS UP
BNE , #1
IBRANCH IF NO ERROR CONDITION
IERROR
ISRVO NOT SET
BIS #SRVO, #DMONAP
IUPDATE MAP
BIT #SIAL, #DXMI
ISTATUS-IN SHOULD DROP
BNE , #1
IBRANCH IF NO ERROR CONDITION
IERROR
ISTAI STUCK HIGH
BIC #STAI, #DMINAP
IUPDATE MI MAP
JSR PC:PHST
IUPDATE MI MAP
PMS41
ICHECK CONTROL BITS FOR
IThis PHASE AND STATE
PMS41

IB& LOAD IS ASYNC

BIT #BIT9, #DXBA
ITTNOX OFFSET
BNE , #1
IBRANCH IF NO ERROR CONDITION
IERROR
IDXB& (09) NOT SET
BIS #BIT9, #DBAMAP
IUPDATE MAP
TSYB #DXBA
ISET UP FOR TT ENTRY
BNE , #1
IBRANCH IF NO ERROR CONDITION
IERROR
IDXB& LOAD ERROR
CLR #DBAMAP
IUPDATE DBAMAP
CMP #BIT, #DXBA
IDXB& MUST POINT TO TT
BNE , #1
IBRANCH IF NO ERROR CONDITION
IERROR
IDXB& LOAD ERROR
MOV #DXBA, #DBAMAP
IUPDATE MAP
JSR PC:CHKREG

IVERIFY SIG7
BIT #NPRX, #DXCB
INPRX MUST BE ZERO
BNE , #1
IBRANCH IF NO ERROR CONDITION
IERROR
INPRX SET
BIT #SYNC, #DXCB
ISYNC MUST BE ZERO
BNE , #1
IBRANCH IF NO ERROR CONDITION
IERROR
ISYNC SET
JSR R5: #CLK
IROUTINE TO ISSUE CLOCK PULSES
I
1
JSR PC:PHST
ICHECK CONTROL BITS FOR
IThis PHASE AND STATE
PMS42
IVERIFY BUS ADDRESS
PMS42

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2386	010756	017727	170320		MOV	0DX05,(PC)+	ISAVE OFFSET	
2387	010762	000000			IBAZI	0	IHERE, BA IMAGE #2	
2388	010764	042737	001777	010762	BIC	#1777,#0IBAZ	ICLEAR ALL BUT OFFSET	
2389	010772	117727	170352		MOV8	0TTNDX,(PC)+	ISAVE TTNDX	
2390	010776	000000			INDXI	0	IHERE	
2391	011000	005337	010776		DEC	0#INDX	ILOOK BACK TO SEE WHERE DATA WENT	
2392	011004	006337	010776		ASL	0#INDX	IWHD BOUNDARIES	
2393	011010	042737	177001	010776	BIC	#177001,0#INDX	ICLEAR ALL BUT TTNDX BITS	
2394	011016	053737	010776	010762	BIS	0#INDX,0#IBAZ	IBUILD BA IMAGE	
2395	011024	052737	001000	010762	BIS	0BIT9,0#IBAZ	ITT OFFSETS SPW BY 1000	
2396					IVERIFY	DXBA CONTAINS PROPER TT	ADRS	
2397	011032	023777	010762	170244	CMP	0#IBAZ,0DXBA	IIMAGE BA=BA	
2398	011040	001401			BEG	,+4	IBRANCH IF NO ERROR CONDITION	
2399	011042	104000			ERROR		IDXBA LOAD ERROR	
2400					IVERIFY	DS MADE IT TO NO		
2401	011044	027777	170224	170244	CMP	0DX05,0DXND	ICONTENTS OF DS MADE IT TO NO	
2402	011052	001401			BEG	,+4	IBRANCH IF NO ERROR CONDITION	
2403	011054	104000			ERROR		IDS INTO NO TRANSFER ERROR	
2404	011056	057737	170212	024272	BIS	0DX05,0#NDMAP	IUPDATE NO MAP	
2405								
2406					IVERIFY	NO DATA MADE IT TO TUMBLE TABLE		
2407	011064	027777	170204	177670	CMP	0DX05,0IBAZ	IDS MADE IT TO TT?	
2408	011072	001401			BEG	,+	IBRANCH IF NO ERROR CONDITION	
2409	011074	104000			ERROR		IDS INTO TT TRANSFER ERROR	
2410	011076	013737	010762	024126	MOV	0#IBAZ,0#BAMAP	IUPDATE	
2411	011104	032777	001000	170202	BIT	0SYNC,0DXCB	ISIG	
2412	011112	001001			BNE	,+	IBRANCH IF NO ERROR CONDITION	
2413	011114	104000			ERROR		ISYNC NOT SET	
2414	011116	052737	001000	024230	BIS	0SYNC,0#CBMAP	IUPDATE MAP	
2415	011124	117737	170220	024251	MOV8	0TTNDX,0#ESMAP+1	IUPDATE ES MAP	
2416	011132	032777	000100	170194	BIT	0BYPAS,0DXCB	IBYPAS SHOULD DROP	
2417	011140	001401			BEG	,+3	IBRANCH IF NO ERROR CONDITION	
2418	011142	104000			ERROR		IBYPAS SET	
2419	011144	042737	000100	024230	BIC	0BYPAS,0#CBMAP	IUPDATE MAP	
2420	011152	032777	000040	170134	BIT	0NPRX,0DXCB	INPRX SHOULD BE UP	
2421	011160	001001			BNE	,+3	IBRANCH IF NO ERROR CONDITION	
2422	011162	104000			ERROR		INPRX NOT SET	
2423	011164	052737	000040	024230	BIS	0NPRX,0#CBMAP	IUPDATE MAP	
2424	011172	032777	000020	170114	BIT	0NPRT,0DXCB	INPRT SHOULD BE UP	
2425	011200	001001			BNE	,+3	IBRANCH IF NO ERROR CONDITION	
2426	011202	104000			ERROR		INPRT NOT SET	
2427	011204	052737	000020	024230	BIS	0NPRT,0#CBMAP	IUPDATE MAP	
2428	011212	004737	024052		JSR	PC CHKREG		
2429	011216	042777	001000	170064	BIC	0SIVO,0DXMO	IGET REID OF SRVO ON NEXT CLOCK	
2430	011224	042737	001000	024192	BIC	0SIVO,0#MOMAP	IUPDATE MAP	
2431								
2432	011232	004537	023560		JSR	R5,0#CLK	IROUTINE TO ISSUE CLOCK PULSES	
2433	011236	000001			1			1 CLOCK PULSE(S)
2434	011240	004737	023430		JSR	PC,PHST	ICHECK CONTROL BITS FOR	
2435	011244	044000			PHS41		IThis PHASE AND STATE	PHS41
2436	011246	032777	000040	170040	BIT	0NPRX,0DXCB	ITEST FOR NPRX=0	
2437	011254	001401			BEG	,+1	IBRANCH IF NO ERROR CONDITION	
2438	011256	104000			ERROR		INPRX DID NOT DROP	
2439	011260	042737	000040	024230	BIC	0NPRX,0#CBMAP	IUPDATE MAP	

2440									
2441	011266	004537	023560		JSR	R5;0=CLK	ROUTINE TO ISSUE CLOCK PULSES		
2442	011272	000001			1			1 CLOCK PULSE(S)	
2443	011274	004737	023430		JSR	PC;PHST	CHECK CONTROL BITS FOR		
2444	011300	040000			PHS42		THIS PHASE AND STATE		PHS42
2445	011302	013727	001440		MOV	YT;(PC)+			
2446	011306	000000		STT11	0		SAVE YT ADRS		
2447	011310	062737	000002	011306	ADD	#2;STT1	CREATE BA IMAGE		
2448	011316	023777	011306	167700	CMP	STT1,0DXBA	VERIFY CORRECT BUS ADDRESS		
2449	011324	001401			BEG	,+1	BRANCH IF NO ERROR CONDITION		
2450	011326	104000			ERROR		DXBA LOAD ERROR		
2451	011330	013737	011306	024126	MOV	STV1,0AMAP	UPDATE MAP		
2452	011336	004737	024052		JSR	PC;CHKREG			
2453									
2454									
2455									
2456									
2457									
2458									
2459									
2460									
2461									
2462	011342	004537	023560		JSR	R5;0=CLK	ROUTINE TO ISSUE CLOCK PULSES		
2463	011346	000001			1			1 CLOCK PULSE(S)	
2464	011350	004737	023430		JSR	PC;PHST	CHECK CONTROL BITS FOR		
2465	011354	074000			PHS71		THIS PHASE AND STATE		PHS71
2466	011356	027777	167734	167712	CMP	0DXND,0DXCA	ND SHOULD CONTAIN CA		
2467	011364	001401			BEG	,+1	BRANCH IF NO ERROR CONDITION		
2468	011366	104000			ERROR		CA INTO NO TRANSFER ERROR		
2469	011370	017737	167722	024272	MOV	0DXND,0DMAP	UPDATE MAP		
2470	011376	032777	001000	167710	BIT	0SYNC,0DXCB			
2471	011404	001401			BEG	,+1	BRANCH IF NO ERROR CONDITION		
2472	011406	104000			ERROR		SYNC SET		
2473	011410	042737	001000	024230	BIC	0SYNC,0DCBMAP	UPDATE CB MAP		
2474	011416	032777	000040	167670	BIT	0NPRX,0DXCB	NPRX MUST BE ONE		
2475	011424	001001			BNE	,+1	BRANCH IF NO ERROR CONDITION		
2476	011426	104000			ERROR		NPRX NOT SET		
2477	011430	052737	000040	024230	BIS	0NPRX,0DCBMAP	UPDATE CB MAP		
2478	011436	032777	000200	167634	BIT	0DONE,0DXCS	DONE MUST BE SET		
2479	011444	001001			BNE	,+1	BRANCH IF NO ERROR CONDITION		
2480	011446	104000			ERROR		DONE NOT SET		
2481	011450	052737	000200	024102	BIS	0DONE,0DCSMAP	UPDATE MAP		
2482	011456	032777	000200	167634	BIT	0INTREQ,0DXES	TEST FOR INTREQ		
2483	011464	001001			BNE	,+1	BRANCH IF NO ERROR CONDITION		
2484	011466	104000			ERROR		INTREQ NOT SET		
2485	011470	052737	000200	024250	BIS	0INTREQ,0ESMAP	UPDATE MAP		
2486	011476	062737	000400	024250	ADD	04;0,ESMAP	UPDATE TTNDX MAP		
2487	011504	004737	024052		JSR	PC;CHKREG			
2488									
2489									
2490	011510	004537	023560		JSR	R5;0=CLK	ROUTINE TO ISSUE CLOCK PULSES		
2491	011514	000001			1			1 CLOCK PULSE(S)	
2492	011516	004737	023430		JSR	PC;PHST	CHECK CONTROL BITS FOR		
2493	011522	070000			PHS72		THIS PHASE AND STATE		PHS72

2494	011524	032777	000040	167502	BIT	#NPRX,0DXCB	INPRX SHOULD = ZERO	
2495	011532	001401			BEG	,+4	IBRANCH IF NO ERROR CONDITION	
2496	011534	104000			ERROR		INPRX SET	
2497	011536	042737	000040	024230	BIC	#NPRX,CBMAP	IUPDATE MAP	
2498	011544	004737	024052		JSR	PC,CHKREG		
2499								
2500								
2501	011550	004537	023560		JSR	R5,00CLK	ROUTINE TO ISSUE CLOCK PULSES	
2502	011554	000001			1			1 CLOCK PULSE(S)
2503	011556	004737	023430		JSR	PC,PHST	ICHECK CONTROL BITS FOR	
2504	011562	074000			PHS71		IThis PHASE AND STATE	PHS71
2505	011564	004737	024052		JSR	PC,CHKREG		
2506								
2507								
2508								
2509								
2510								
2511	011570	004537	023560		JSR	R5,00CLK	ROUTINE TO ISSUE CLOCK PULSES	
2512	011574	000001			1			1 CLOCK PULSE(S)
2513	011576	004737	023430		JSR	PC,PHST	ICHECK CONTROL BITS FOR	
2514	011602	070000			PHS72		IThis PHASE AND STATE	PHS72
2515	011604	032777	001000	167502	BIT	#SYNC,0DXCB	ISYNC'S UP	
2516	011612	001001			BNE	,+1	IBRANCH IF NO ERROR CONDITION	
2517	011614	104000			ERROR		ISYNC NOT SET	
2518	011616	052737	001000	024230	BIS	#SYNC,0CBMAP	IUPDATE MAP	
2519	011624	032777	000040	167402	BIT	#NPRX,0DXCB	INPRX IS ZERO	
2520	011632	001401			BEG	,+3	IBRANCH IF NO ERROR CONDITION	
2521	011634	104000			ERROR		INPRX NOT ZERO	
2522	011636	042737	000040	024230	BIC	#NPRX,CBMAP	IUPDATE MAP	
2523	011644	032777	000020	167442	BIT	#NPRX,0DXCB	INPRX IS ZERO	
2524	011652	001401			BEG	,+2	IBRANCH IF NO ERROR CONDITION	
2525	011654	104000			ERROR		INPRX NOT ZERO	
2526	011656	042737	000020	024230	BIC	#NPRX,CBMAP	IUPDATE MAP	
2527	011664	005777	167404		TSR	0DXDS	IDEVICE STATUS REG MUST BE ZERO	
2528	011670	001401			BEG	,+3	IBRANCH IF NO ERROR CONDITION	
2529	011672	104000			ERROR		IDS	
2530	011674	005037	024056		CLR	00DSMAP	IUPDATE MAP	
2531	011700	004737	024052		JSR	PC,CHKREG		
2532								
2533	011704				YESI			
2534	011704	004537	023560		JSR	R5,00CLK	ROUTINE TO ISSUE CLOCK PULSES	
2535	011710	000001			1			1 CLOCK PULSE(S)
2536	011712	004737	023430		JSR	PC,PHST	ICHECK CONTROL BITS FOR	
2537	011716	074000			PHS71		IThis PHASE AND STATE	PHS71
2538	011720	004737	024052		JSR	PC,CHKREG		
2539	011724	004537	023560		JSR	R5,00CLK	ROUTINE TO ISSUE CLOCK PULSES	
2540	011730	000010			10			10 CLOCK PULSE(S)
2541	011732	004737	024052		JSR	PC,CHKREG		
2542	011736	042777	000002	167394	BIC	#MCLKEN,0DXES	ICLEAR MAINT CLK EN	
2543	011744	032777	000002	167346	BIT	#MCLKEN,0DXES		
2544	011752	001401			BEG	,+2	IBRANCH IF NO ERROR CONDITION	
2545	011754	104000			ERROR		IMCLKEN STUCK HIGH	
2546	011756	042777	000200	167314	BIC	#DONE,0DXCS	ICLEAR DONE AND LOCKO	
2547	011764	032777	000200	167306	BIT	#DONE,0DXCS		

2548	011772	001401			BEO	,+4		I BRANCH IF NO ERROR CONDITION
2549	011774	104000			ERROR			I DONE STUCK
2550	011776	032777	100000	167310	BIT	@LOCKO,@DXCB		I LOCKO MUST BE ZERO
2551	012004	001401			BEO	,+2		I BRANCH IF NO ERROR CONDITION
2552	012006	104000			ERROR			I LOCKO STUCK HIGH
2553	012010	052777	000001	167202	BIS	@DXFRS,@DXCS		I RETURN TO PHASE ZERO
2554	012016	017727	167272		MOV	@D*CB,(PC)+		I SAVE CB
2555	012022	000000			SCBBI	0		I HERE
2556	012024	042737	004000	012022	BIC	@TSSF,SCBB		I CLEAR TIME STATE FLOP
2557	012032	005737	012022		TST	SCBB		
2558	012036	001401			BEO	,+4		I BRANCH IF NO ERROR CONDITION
2559	012040	104000			ERROR			I NOT PHASE ZERO
2560								
2561								
2562	012042	004737	030414		JSR	PC,SPW,SETUP		I REBUILD SPW
2563								

Address	Hex	Hex	Hex	Hex	Hex	Instruction	Comment
2618	012376	104000				ERROR	ERROR IF NOT TS1
2619						ILOOK FOR QUALIFICATION OF SIG17	
2620	012400	032777	100000	166704	MCR1	BIT #00LI, #DXMI	IVERIFY DPLI SET (CU SELECTED)
2621	012406	001001				BNE .+3	IBRANCH IF NO ERROR CONDITION
2622	012410	104000				ERROR	I SELECTION ERROR
2623	012412	052737	100000	024174		BIS #DPLI, #MMHMAP	IUPDATE MAP
2624	012420	032777	001000	166606		BIT #SYNC, #DXCB	IVERIFY SYNC=1
2625	012426	001001				BNE .+3	IBRANCH IF NO ERROR CONDITION
2626	012430	104000				ERROR	ISYNC NOT SET
2627	012432	052737	001000	024230		BIS #SYNC, #CBCMAP	IUPDATE MAP
2628	012440	127727	166704	000002		CMPB #TTNDX, #2	ICHECK TTNDX
2629	012446	001401				BEQ .+4	IBRANCH IF NO ERROR CONDITION
2630	012450	104000				ERROR	ITTNDX INC ERROR
2631	012452	117737	166672	024291		MOVB #TTNDX, #ESHAP+1	IUPDATE MAP
2632	012460	022777	100000	166622		CMP #DLO, #SELO:HLDO, #DXMO	
2633	012466	001401				BEQ .+4	IBRANCH IF NO ERROR CONDITION
2634	012470	104000				ERROR	IDXMO WRITE ERROR
2635	012472	017737	166612	024192		MOV #DXMO, #MMHMAP	IUPDATE MAP
2636	012500	123777	027454	166622		CMPB #CMD, #CUCR	IVERIFY COMMAND LOAD
2637	012506	001401				BEQ .+3	IBRANCH IF NO ERROR CONDITION
2638	012510	104000				ERROR	ICOMMAND LOAD ERROR
2639	012512	113737	027454	024071		MOVB #CMD, #CAMAP+1	IUPDATE MAP
2640	012520	123777	027452	166600		CMPB #DEV, #CUAR	IVERIFY ADRS LOAD
2641	012526	001401				BEQ .+3	IBRANCH IF NO ERROR CONDITION
2642	012530	104000				ERROR	IADRS LOAD ERROR
2643	012532	113737	027452	024070		MOVB #DEV, #CAMAP	IUPDATE MAP
2644	012540	027777	166532	166550		CMP #DCA, #DXND	IVERIFY CA TO ND TRANSFER
2645	012546	001401				BEQ .+3	IBRANCH IF NO ERROR CONDITION
2646	012550	104000				ERROR	IDXND LOAD ERROR
2647	012552	017737	166540	024272		MOV #DXND, #NDMAP	IUPDATE MAP
2648	012560	004737	024052			JSR PC, #CHKREG	
2649	012564	052777	000004	166506		BIS #4, #DXCS	ISET FUNCTION "OUTPUT"
2650	012572	032777	000004	166500		BIT #4, #DXCS	IVERIFY FUNCTION SET
2651	012600	001001				BNE .+3	IBRANCH IF NO ERROR CONDITION
2652	012602	104000				ERROR	IFUNCTION DID NOT LOAD
2653	012604	052737	000004	024102		BIS #4, #CSMAP	IUPDATE MAP
2654	012612	004737	024052			JSR PC, #CHKREG	
2655	012616	004537	023560			JSR R5, #CLK	IROUTINE TO ISSUE CLOCK PULSES
2656	012622	000010				10	10 CLOCK PULSE(S)
2657	012624	004737	023430			JSR PC, #PHST	ICHECK CONTROL BITS FOR
2658	012630	074000				PHS71	IThis PHASE AND STATE PHS71
2659	012632	004737	024052			JSR PC, #CHKREG	
2660	012636	052777	000001	166434		BIS #GO, #DXCS	ISET FUNCTION "GO"
2661	012644	004537	023560			JSR R5, #CLK	IROUTINE TO ISSUE CLOCK PULSES
2662	012650	000001				1	1 CLOCK PULSE(S)
2663	012652	004737	023430			JSR PC, #PHST	ICHECK CONTROL BITS FOR
2664	012656	070000				PHS72	IThis PHASE AND STATE PHS72
2665	012660	032777	000001	166412		BIT #GO, #DXCS	IVERIFY GO SET
2666	012666	001001				BNE .+3	IBRANCH IF NO ERROR CONDITION
2667	012670	104000				ERROR	IGO NOT SET
2668							
2669	012672	052737	000001	024102		BIS #GO, #CSMAP	IUPDATE MAP
2670	012700	004737	024052			JSR PC, #CHKREG	
2671							INEXT CLOCK PULSE SHOULD FORCE THE DX

Address	Hex	Hex	Hex	Hex	Hex	Instruction	Comments
2672						INTO PHASE 6 TIME STATE 1	
2673	012704	004537	023560			JSR R5;@CLK	ROUTINE TO ISSUE CLOCK PULSES
2674	012710	000001				1	1 CLOCK PULSE(S)
2675	012712	004737	023430			JSR PC;PHST	CHECK CONTROL BITS FOR
2676	012716	064000				PHS61	THIS PHASE AND STATE PHS61
2677							
2678						VERIFY CUI6 EVENTS TRANSPIRED	
2679	012720	032777	100000	166366		BIT @LOCKO,@DXCB	LOCK-OUT MUST BE SET
2680	012726	001001				BNE ,+3	BRANCH IF NO ERROR CONDITION
2681	012730	104000				ERROR	LOCKO NOT SET
2682	012732	052737	100000	024230		BIS @LOCKO,@CBMAP	UPDATE MAP
2683	012740	032777	000100	166346		BIT @BYPAS,@DXCB	BYPAS MUST BE=1
2684	012746	001001				BNE ,+3	BRANCH IF NO ERROR CONDITION
2685	012750	104000				ERROR	BYPAS NOT SET
2686	012752	052737	000100	024230		BIS @BYPAS,@CBMAP	UPDATE MAP
2687	012760	032777	000400	166326		BIT @CUDX,@DXCB	CUDX MUST BE=1
2688	012766	001401				BEQ ,+3	BRANCH IF NO ERROR CONDITION
2689	012770	104000				ERROR	CUDX SET
2690	012772	042737	000400	024230		BIC @CUDX,@CBMAP	UPDATE MAP
2691	013000	032777	000010	166306		BIT @BALF,@DXCB	BALF MUST BE 0
2692	013006	001401				BEQ ,+4	BRANCH IF NO ERROR CONDITION
2693	013010	104000				ERROR	BALF SET
2694	013012	042737	000010	024230		BIC @BALF,@CBMAP	UPDATE MAP
2695	013020	032777	001000	166266		BIT @SYNC,@DXCB	A COUPLE OF JOBS SYNC=0
2696	013026	001401				BEQ ,+3	BRANCH IF NO ERROR CONDITION
2697	013030	104000				ERROR	SYNC NOT ZERO
2698	013032	042737	001000	024230		BIC @SYNC,@CBMAP	UPDATE MAP
2699	013040	032777	000200	166246		BIT @IOD,@DXCB	I IOD=0
2700	013046	001401				BEQ ,+4	BRANCH IF NO ERROR CONDITION
2701	013050	104000				ERROR	I I/O DONE SET
2702	013052	042737	000200	024230		BIC @IOD,@CBMAP	UPDATE MAP
2703	013060	004737	024052			JSR PC;CHKREG	
2704	013064						
2705	013064	004537	023560			JSR R5;@CLK	ROUTINE TO ISSUE CLOCK PULSES
2706	013070	000001				1	1 CLOCK PULSE(S)
2707	013072	004737	023430			JSR PC;PHST	CHECK CONTROL BITS FOR
2708	013076	060000				PHS62	THIS PHASE AND STATE PHS62
2709	013100	020177	166200			CMR R1;@DXBA	VERIFY BUS ADDRESS IS CORRECT
2710	013104	001401				BEQ ,+4	BRANCH IF NO ERROR CONDITION
2711	013106	104000				ERROR	INCORRECT BUS ADDRESS
2712	013110	017737	166170	024126		MOV @DXBA,@BAHAP	UPDATE MAP
2713	013116	032777	000040	166170		BIT @NPRX,@DXCB	VERIFY NPRX=1
2714	013124	001001				BNE ,+3	BRANCH IF NO ERROR CONDITION
2715	013126	104000				ERROR	NPRX DID NOT SET
2716	013130	052737	000040	024230		BIS @NPRX,@CBMAP	UPDATE MAP
2717	013136	032777	001000	166150		BIT @SYNC,@DXCB	VERIFY SYNC=1
2718	013144	001001				BNE ,+4	BRANCH IF NO ERROR CONDITION
2719	013146	104000				ERROR	SYNC NOT SET
2720	013150	052737	001000	024230		BIS @SYNC,@CBMAP	UPDATE MAP
2721	013156	032777	000020	166130		BIT @NPRT,@DXCB	VERIFY NPRT=0
2722	013164	001401				BEQ ,+3	BRANCH IF NO ERROR CONDITION
2723	013166	104000				ERROR	NPRT NOT ZERO
2724	013170	042737	000020	024230		BIC @NPRT,@CBMAP	UPDATE MAP
2725	013176	004737	024052			JSR PC;CHKREG	

2726	013202	004537	023560		JSR	R5,00CLK	ROUTINE TO ISSUE CLOCK PULSES	
2727	013206	000001			1			1 CLOCK PULSE(S)
2728	013210	004737	023430		JSR	PC,PHST	CHECK CONTROL BITS FOR	
2729	013214	004000			PHS61		THIS PHASE AND STATE	PHS61
2730	013216	032777	000040	166070	BIT	#NPRX,0DXCB	VERIFY NPRX=0	
2731	013224	001401			BEQ	,+4	BRANCH IF NO ERROR CONDITION	
2732	013226	104000			ERROR		INPRX SET	
2733	013230	042737	000040	024230	BIC	#NPRX,0CBMAP	UPDATE MAP	
2734	013236	032777	000020	166050	BIT	#NPRT,0DXCB	VERIFY NPRT=1	
2735	013244	001401			BEQ	,+1	BRANCH IF NO ERROR CONDITION	
2736	013246	104000			ERROR		INPRT SET	
2737								
2738	013250	042737	000020	024230	BIC	#NPRT,0CBMAP	UPDATE MAP	
2739	013256	021177	166034		CHP	0R1,0DXND	VERIFY DATA TRANSFER	
2740	013262	001401			BEQ	,+1	BRANCH IF NO ERROR CONDITION	
2741	013264	104000			ERROR		INPR DATA TRANSFER ERROR	
2742	013266	004737	024052		JSR	PC,CHKREG		
2743	013272	004537	023560		JSR	R5,00CLK	ROUTINE TO ISSUE CLOCK PULSES	
2744	013276	000001			1			1 CLOCK PULSE(S)
2745	013300	023777	027510	166000	CHP	#COUNT,0DXBC	VERIFY BYTE COUNT	
2746	013306	001401			BEQ	,+4	BRANCH IF NO ERROR CONDITION	
2747	013310	104000			ERROR		BYTE COUNT ERROR	
2748	013312	017737	165770	024140	MOV	0DXBC,0BCMAP	UPDATE MAP	
2749	013320	032777	000200	165706	BIT	#I00,0DXCB	VERIFY I00=0	
2750	013326	001401			BEQ	,+4	BRANCH IF NO ERROR CONDITION	
2751	013330	104000			ERROR		I00 PREMATURELY SET	
2752	013332	042737	000200	024230	BIC	#I00,0CBMAP	UPDATE MAP	
2753	013340	032777	000040	165746	BIT	#NPRX,0DXCB	VERIFY NPRX=0	
2754	013346	001401			BEQ	,+4	BRANCH IF NO ERROR CONDITION	
2755	013350	104000			ERROR		INPRX NOT ZERO	
2756	013352	042737	000040	024230	BIC	#NPRX,0CBMAP	UPDATE MAP	
2757	013360	032777	000400	165726	BIT	#CUDX,0DXCB	VERIFY CUDX=0	
2758	013366	001401			BEQ	,+4	BRANCH IF NO ERROR CONDITION	
2759	013370	104000			ERROR		CUDX NOT ZERO	
2760	013372	042737	000400	024230	BIC	#CUDX,0CBMAP	UPDATE MAP	
2761	013400	004737	024052		JSR	PC,CHKREG		
2762	013404	004537	023560		JSR	R5,00CLK	ROUTINE TO ISSUE CLOCK PULSES	
2763	013410	000001			1			1 CLOCK PULSE(S)
2764	013412	004737	023430		JSR	PC,PHST	CHECK CONTROL BITS FOR	
2765	013416	004000			PHS61		THIS PHASE AND STATE	PHS61
2766	013420	032777	001000	165066	BIT	#SYNC,0DXCB	VERIFY SYNC=0	
2767	013426	001401			BEQ	,+1	BRANCH IF NO ERROR CONDITION	
2768	013430	104000			ERROR		SYNC DID NOT CLEAR	
2769	013432	042737	001000	024230	BIC	#SYNC,0CBMAP	UPDATE MAP	
2770					VERIFY	NPR TRANSFERRED DATA FROM MEMORY INTO DXND		
2771	013440	021177	165052		CHP	0R1,0DXND	CHECK DXND DATA	
2772	013444	001401			BEQ	,+4	BRANCH IF NO ERROR CONDITION	
2773	013446	104000			ERROR		INPR DATA TRANSFER ERROR	
2774					VERIFY	DXND(15100) TO CUCR TRANSFER		
2775	013450	017727	165042		MOV	0DXND,(PC)+	SAVE DXND	
2776	013454	000000			MCRND:	0	HERE	
2777	013456	123777	013455	165044	CHPB	0MCRND+1,0CUCR	VERIFY DXND(15100) TO CUCR	
2778	013464	001401			BEQ	,+1	BRANCH IF NO ERROR CONDITION	
2779	013466	104000			ERROR		DXND (15100) TO CUCR TRANSFER ERROR	

2780	013470	117737	165634	024071	MOVB	@CUCR,@CAMAP+1	IUPDATE MAP	
2781	013476	127777	165614	165626	CMPB	@DXND,@CUSR	IVERIFY DXND(7) TO CUSR	
2782	013504	001401			BEO	,+4	I BRANCH IF NO ERROR CONDITION	
2783	013506	104000			ERROR		IDXND(7) TO CUSR TRANSFER ERROR	
2784	013510	117737	165616	024114	MOVB	@CUSR,@OSMAP	IUPDATE MAP	
2785	013516	017737	165574	024272	MOV	@DXND,@NDMAP	IUPDATE MAP	
2786					ICHECK	WHAT CAN BE CHECKED OF SIG9		
2787	013524	032777	000400	165502	BIT	@CUDX,@DXCB	IVERIFY CUDX=1	
2788	013532	001001			BNE	,+2	I BRANCH IF NO ERROR CONDITION	
2789	013534	104000			ERROR		ICUDX NOT SET	
2790	013536	052737	000400	024230	BIS	@CUDX,@CBMAP		
2791	013544	032777	002000	165540	BIT	@SRVI,@DXMI	IVERIFY SRVI=0	
2792	013552	001401			BEO	,+2	I BRANCH IF NO ERROR CONDITION	
2793	013554	104000			ERROR		ISRV NOT ZERO	
2794	013556	042737	002000	024174	BIC	@SRVI,@MIMAP	IUPDATE MAP	
2795	013564	032777	000010	165522	BIT	@BALF,@DXCB	IFIRST DATA BYTE	
2796	013572	001401			BEO	,+4	I BRANCH IF NO ERROR CONDITION	
2797	013574	104000			ERROR		IBALF NOT ZERO	
2798	013576	042737	000010	024230	BIC	@BALF,@CBMAP	IUPDATE MAP	
2799	013604	005201			INC	R1	IINC TO NEXT BYTE ADRS	
2800	013606	020177	165472		CMP	R1,@DXBA	IBA AT NEXT BYTE	
2801	013612	001401			BEO	,+8	I BRANCH IF NO ERROR CONDITION	
2802	013614	104000			ERROR		IDXBA INC ERROR	
2803								
2804	013616	017737	165462	024126	MOV	@DXBA,@BAMAP	IUPDATE MAP	
2805	013624	004737	024052		JSR	PC,CHKREG		
2806	013630	004537	023560		JSR	R5,@CLK	IROUTINE TO ISSUE CLOCK PULSES	1 CLOCK PULSE(S)
2807	013634	000001			I			
2808	013636	004737	023430		JSR	PC,PHST	ICHECK CONTROL BITS FOR	
2809	013642	000000			PHS62		ITHS PHASE AND STATE	PHS62
2810	013644	005201			INC	R1	IINC TO NEXT BYTE ADRS	
2811	013646	020177	165432		CMP	R1,@DXBA	IBA AT NEXT BYTE	
2812	013652	001401			BEO	,+4	I BRANCH IF NO ERROR CONDITION	
2813	013654	104000			ERROR		IDXBA INC ERROR	
2814	013656	017737	165422	024126	MOV	@DXBA,@BAMAP	IUPDATE MAP	
2815	013664	032777	000040	165422	BIT	@NPRX,@DXCB	IVERIFY NPRX SET	
2816	013672	001001			BNE	,+4	I BRANCH IF NO ERROR CONDITION	
2817	013674	104000			ERROR		INPRX NOT SET	
2818	013676	052737	000040	024230	BIS	@NPRX,@CBMAP	IUPDATE MAP	
2819	013704	021177	165406		CMP	@R1,@DXND	IVERIFY NPR DATA	
2820	013710	001401			BEO	,+4	I BRANCH IF NO ERROR CONDITION	
2821	013712	104000			ERROR		INPR DATA TRANSFER ERROR	
2822	013714	017737	165376	024272	MOV	@DXND,@NDMAP	IUPDATE MAP	
2823	013722	127777	165404	165412	CMPB	@CUSR,@BUSI	IVERIFY CUSR TO BUSI	
2824	013730	001401			BEO	,+4	I BRANCH IF NO ERROR CONDITION	
2825	013732	104000			ERROR		ICUSR TO BUSI TRANSFER ERROR	
2826	013734	117737	165402	024174	MOVB	@BUSI,@MIMAP	IUPDATE MAP	
2827	013742	005037	013752		CLR	@1ST	IZERO DATA AND PARITY	
2828	013746	117727	165360		MOVB	@CUSR,(PC)+	ISAVE FIRST BYTE	
2829	013752	000000			.1STI	0	IHERE	
2830	013754	104007	013752		PARITY	,.1ST	ICOMPUTE ODD PARITY	
2831	013760	105037	013752		CLRB	@1ST	ICLEAR ALL BUT PARITY	
2832	013764	017727	165322		MOV	@DXMI,(PC)+	ISAVE DXMI	
2833	013770	000000			.1STII	0	IHERE	

2834	013772	042737	177377	013770	BIC	#177377,0#;1STI	ICLEAR ALL BUT PARITY	
2835	014000	023737	013752	013770	CMF	0#;1ST,0#;1STI	IVERIFY CORRECT PARITY	
2836	014006	001401			BEQ	,+4	IBRANCH IF NO ERROR CONDITION	
2837	014010	104000			ERROR		IPARITY GENERATION ERROR	
2838	014012	017737	165274	024174	MOV	0DXMI,0#MIMAP		
2839	014020	004537	023560		JSR	R5;0#CLK	ROUTINE TO ISSUE CLOCK PULSES	
2840	014024	000001			1			1 CLOCK PULSE(S)
2841	014026	004737	023430		JSR	PC;PHST	ICHECK CONTROL BITS FOR	
2842	014032	004000			PHS61		IThis PHASE AND STATE	PHS61
2843	014034	032777	000040	165252	BIT	#NPRX,0DXCB	IVERIFY NPRX CLEARED	
2844	014042	001401			BEQ	,+3	IBRANCH IF NO ERROR CONDITION	
2845	014044	104000			ERROR		INPRX NOT ZERO	
2846	014046	042737	000040	024230	BIC	#NPRX,0#CBMAP	IUPDATE MAP	
2847	014054	032777	002000	165230	BIT	#SRVI,0DXMI	IVERIFY SRVI=1	
2848	014062	001001			BNE	,+4	IBRANCH IF NO ERROR CONDITION	
2849	014064	104000			ERROR		ISRVI NOT SET	
2850	014066	052737	002000	024174	BIS	#SRVI,0#MIMAP	IUPDATE MAP	
2851	014074	032777	001000	165212	BIT	#SYNC,0DXCB	IVERIFY SYNC SET	
2852	014102	001001			BNE	,+4	IBRANCH IF NO ERROR CONDITION	
2853	014104	104000			ERROR		ISYNC NOT SET	
2854	014106	052737	001000	024230	BIS	#SYNC,0#CBMAP	IUPDATE MAP	
2855	014114	004737	024052		JSR	PC;CHKREG		
2856	014120	004537	023560		JSR	R5;0#CLK	ROUTINE TO ISSUE CLOCK PULSES	
2857	014124	000007			7			7 CLOCK PULSE(S)
2858								
2859	014126	004737	024052		JSR	PC;CHKREG		
2860	014132	052777	001000	165150	BIS	#SRVO,0DXMO	IRaise SERVICE OUT	
2861	014140	004537	023560		JSR	R5;0#CLK	ROUTINE TO ISSUE CLOCK PULSES	
2862	014144	000001			1			1 CLOCK PULSE(S)
2863	014146	004737	023430		JSR	PC;PHST	ICHECK CONTROL BITS FOR	
2864	014152	004000			PHS61		IThis PHASE AND STATE	PHS61
2865	014154	052737	001000	024152	BIS	#SRVO,0#MOMAP	IUPDATE MAP	
2866	014162	004737	024052		JSR	PC;CHKREG		
2867	014166	004537	023560		JSR	R5;0#CLK	ROUTINE TO ISSUE CLOCK PULSES	
2868	014172	000001			1			1 CLOCK PULSE(S)
2869								
2870	014174	004737	023430		JSR	PC;PHST	ICHECK CONTROL BITS FOR	
2871	014200	000000			PHS62		IThis PHASE AND STATE	PHS62
2872	014202	004737	024052		JSR	PC;CHKREG		
2873	014206	004537	023560		JSR	R5;0#CLK	ROUTINE TO ISSUE CLOCK PULSES	
2874	014212	000001			1			1 CLOCK PULSE(S)
2875	014214	004737	023430		JSR	PC;PHST	ICHECK CONTROL BITS FOR	
2876	014220	004000			PHS61		IThis PHASE AND STATE	PHS61
2877	014222	032777	000100	165064	BIT	#BYPAS,0DXCB	IVERIFY BYPAS=0	
2878	014230	001401			BEQ	,+4	IBRANCH IF NO ERROR CONDITION	
2879	014232	104000			ERROR		IBYPAS NOT ZERO	
2880	014234	042737	000100	024230	BIC	#BYPAS,0#CBMAP	IUPDATE MAP	
2881	014242	032777	002000	165042	BIT	#SRVI,0DXMI	IVERIFY SRVI=0	
2882	014250	001401			BEQ	,+3	IBRANCH IF NO ERROR CONDITION	
2883	014252	104000			ERROR		ISRVI DID NOT DROP	
2884	014254	042737	002000	024174	BIC	#SRVI,0#MIMAP	IUPDATE MAP	
2885	014262	032777	000010	165024	BIT	#BALF,0DXCB	IVERIFY BALF=1	
2886	014270	001001			BNE	,+4	IBRANCH IF NO ERROR CONDITION	
2887	014272	104000			ERROR		IBALF NOT SET	

2888	014274	052737	000010	024230	BIS	#HALF,#CBCMAP	IUPDATE MAP	
2889	014302	005237	027510		INC	COUNT		
2890	014306	023777	027510	164772	CHP	#COUNT,#DXBC	I CHECK BYTE COUNT	
2891	014314	001401			BEO	.+4	I BRANCH IF NO ERROR CONDITION	
2892	014316	104000			ERROR		I READ BYTE COUNT ERROR	
2893	014320	017737	164762	024140	MOV	#DXBC,#CBCMAP		
2894	014326	004737	024052		JSR	PC,CHKREG		
2895	014332	004537	023560		JSR	R5,#CLK	I ROUTINE TO ISSUE CLOCK PULSES	
2896	014336	000002			2			2 CLOCK PULSE(S)
2897	014340	004737	023430		JSR	PC,PHST	I CHECK CONTROL BITS FOR	
2898	014344	004000			PHS61		I THIS PHASE AND STATE	PHS61
2899	014346	042777	001000	164734	BIC	#SRVO,#DXMO	I DROP SRVO	
2900	014354	004537	023560		JSR	R5,#CLK	I ROUTINE TO ISSUE CLOCK PULSES	
2901	014360	000001			1			1 CLOCK PULSE(S)
2902	014362	032777	001000	164720	BIT	#SRVO,#DXMO	I VERIFY SRVO=0	
2903	014370	001401			BEO	.+2	I BRANCH IF NO ERROR CONDITION	
2904	014372	104000			ERROR		I SRVO DID NOT DROP	
2905	014374	042737	001000	024192	BIC	#SRVO,#MOMAP	I UPDATE MAP	
2906	014402	004737	024052		JSR	PC,CHKREG		
2907	014406	004537	023560		JSR	R5,#CLK	I ROUTINE TO ISSUE CLOCK PULSES	
2908	014412	000001			1			1 CLOCK PULSE(S)
2909	014414	004737	023430		JSR	PC,PHST	I CHECK CONTROL BITS FOR	
2910	014420	004000			PHS61		I THIS PHASE AND STATE	PHS61
2911	014422	004537	023560		JSR	R5,#CLK	I ROUTINE TO ISSUE CLOCK PULSES	
2912	014426	000001			1			1 CLOCK PULSE(S)
2913	014430	127777	164674	164704	CHPB	#CUCR,#BUSI	I VERIFY SECOND DATA BYTE	
2914	014436	001401			BEO	.+3	I BRANCH IF NO ERROR CONDITION	
2915	014440	104000			ERROR		I CUCR TO BUSI TRANSFER ERROR	
2916	014442	117737	164674	024174	MOVB	#BUSI,#MIMAP	I UPDATE MAP	
2917	014450	032777	000400	164636	BIT	#CUDX,#DXCB	I VERIFY CUDX ZERO	
2918	014456	001401			BEO	.+1	I BRANCH IF NO ERROR CONDITION	
2919	014460	104000			ERROR		I CUDX DID NOT CLEAR	
2920	014462	042737	000400	024230	BIC	#CUDX,#CBCMAP	I UPDATE MAP	
2921	014470	005037	014500		CLR	#,2ST	I ZERO DATA AND PARITY	
2922	014474	117727	164630		MOVB	#CUCR,(PC)+	I SAVE SECOND BYTE	
2923	014500	000000			,2ST		I HERE	
2924	014502	104007	014500		PARITY	,,2ST	I COMPUTE ODD PARITY	
2925	014506	105037	014500		CLRB	#,2ST	I CLEAR ALL BUT PARITY	
2926	014512	017727	164574		MOV	#DXM1,(PC)+	I SAVE DXM1	
2927	014516	000000			,2ST		I HERE	
2928	014520	042737	177377	014516	BIC	#177377,#,2ST	I CLEAR ALL BUT PARITY	
2929	014526	023737	014500	014516	CHP	#,2ST,#,2ST	I VERIFY CORRECT PARITY	
2930	014534	001401			BEO	.+4	I BRANCH IF NO ERROR CONDITION	
2931	014536	104000			ERROR		I PARITY GENERATION ERROR	
2932	014540	117737	164564	024071	MOVB	#CUCR,#CAMAP+1	I UPDATE MAP	
2933	014546	004737	024052		JSR	PC,CHKREG		
2934	014552	004537	023560		JSR	R5,#CLK	I ROUTINE TO ISSUE CLOCK PULSES	
2935	014556	000001			1			1 CLOCK PULSE(S)
2936	014560	004737	023430		JSR	PC,PHST	I CHECK CONTROL BITS FOR	
2937	014564	004000			PHS61		I THIS PHASE AND STATE	PHS61
2938	014566	032777	001000	164520	BIT	#SYNC,#DXCB	I VERIFY SYNC CLEARED	
2939	014574	001401			BEO	.+3	I BRANCH IF NO ERROR CONDITION	
2940	014576	104000			ERROR		I SYNC DID NOT CLEAR	
2941	014600	042737	001000	024230	BIC	#SYNC,#CBCMAP	I UPDATE MAP	

2942	014606	032777	000400	164900	BIT	#CUDX,0DXCB	IVERIFY CUDX SET	
2943	014614	001001			BNE	,+4	IBRANCH IF NO ERROR CONDITION	
2944	014616	104000			ERROR		ICUDX NOT SET	
2945	014620	052737	000400	024230	BIS	#CUDX,00CBMAP	IUPDATE MAP	
2946	014626	121177	164900		CHPB	0R1,0CUSR	ICHECK 3ED DATA BYTE	
2947	014632	001401			BEO	,+4	IBRANCH IF NO ERROR CONDITION	
2948	014634	104000			ERROR		IDXND TO CUSR TRANSFER ERROR	
2949	014636	117737	164470	024114	MOVB	0CUSR,00OSMAP	IUPDATE MAP	
2950	014644	005201			INC	R1		
2951	014646	020177	164432		CHP	R1,0DXBA	IVERIFY DXBA	
2952	014652	001401			BEO	,+4	IBRANCH IF NO ERROR CONDITION	
2953	014654	104000			ERROR		IDXBA INC ERROR	
2954	014656	017737	164422	024126	MOV	0DXBA,00BAMAP	IUPDATE MAP	
2955	014664	121177	164440		CHPB	0R1,0CUCR	ICHECK 4TH DATA BYTE	
2956	014670	001401			BEO	,+4	IBRANCH IF NO ERROR CONDITION	
2957	014672	104000			ERROR		IDXND TO CUCR TRANSFER ERROR	
2958	014674	117737	164430	024071	MOVB	0CUCR,00CAMAP+1	IUPDATE MAP	
2959	014702	032777	001000	164404	BIT	#SYNC,0DXCB	IVERIFY SYNC CLEARED	
2960	014710	001401			BEO	,+3	IBRANCH IF NO ERROR CONDITION	
2961	014712	104000			ERROR		ISYNC SET	
2962	014714	042737	001000	024230	BIC	#SYNC,00CBMAP	IUPDATE MAP	
2963	014722	032777	002000	164302	BIT	#SRVI,0DXMI	ISRVI SHOULD BE UP	
2964	014730	001001			BNE	,+3	IBRANCH IF NO ERROR CONDITION	
2965	014732	104000			ERROR		ISRVI NOT SET	
2966	014734	052737	002000	024174	BIS	#SRVI,00MIMAP	IUPDATE MAP	
2967	014742	004737	024052		JSR	PC,CHKREG		
2968	014746	004537	023560		JSR	R5,00CLK	ROUTINE TO ISSUE CLOCK PULSES	
2969	014752	000001			1			1 CLOCK PULSE(S)
2970	014754	032777	001000	164332	BIT	#SYNC,0DXCB	IVERIFY SYNC SET	
2971	014762	001001			BNE	,+3	IBRANCH IF NO ERROR CONDITION	
2972	014764	104000			ERROR		ISYNC NOT SET	
2973	014766	052737	001000	024230	BIS	#SYNC,00CBMAP	IUPDATE MAP	
2974	014774	032777	000040	164312	BIT	#NPRX,0DXCB	IVERIFY NPRX SET	
2975	015002	001001			BNE	,+4	IBRANCH IF NO ERROR CONDITION	
2976	015004	104000			ERROR		INPRX NOT SET	
2977	015006	052737	000040	024230	BIS	#NPRX,00CBMAP	IUPDATE MAP	
2978	015014	005201			INC	R1	INC ADRS OF DATA	
2979	015016	020177	164262		CHP	R1,0DXBA	IVERIFY CORRECT BUS ADRS	
2980	015022	001401			BEO	,+4	IBRANCH IF NO ERROR CONDITION	
2981	015024	104000			ERROR		IDXBA LOAD ERROR	
2982	015026	017737	164252	024126	MOV	0DXBA,00BAMAP	IUPDATE MAP	
2983	015034	021177	164256		CHP	0R1,0DXND	IVERIFY NPR DATA	
2984	015040	001401			BEO	,+3	IBRANCH IF NO ERROR CONDITION	
2985	015042	104000			ERROR		INPR DATA TRANSFER ERROR	
2986	015044	017737	164246	024272	MOV	0DXND,00NDMAP	IUPDATE MAP	
2987	015052	004737	024052		JSR	PC,CHKREG		
2988	015056	004537	023560		JSR	R5,00CLK	ROUTINE TO ISSUE CLOCK PULSES	
2989	015062	000001			1			1 CLOCK PULSE(S)
2990	015064	032777	000040	164222	BIT	#NPRX,0DXCB	IVERIFY NPRX CLEARED	
2991	015072	001401			BEO	,+3	IBRANCH IF NO ERROR CONDITION	
2992	015074	104000			ERROR		INPRX SET	
2993	015076	042737	000040	024230	BIC	#NPRX,00CBMAP	IUPDATE MAP	
2994	015104	052777	001000	164176	BIS	#SRVO,0DXMO	IRaise SRVO	
2995	015112	004537	023560		JSR	R5,00CLK	ROUTINE TO ISSUE CLOCK PULSES	

3050	015440	004537	023560		JSR	R5(0)CLK	ROUTINE TO ISSUE CLOCK PULSES	
3051	015444	000001			1			1 CLOCK PULSE(S)
3052	015446	004737	023430		JSR	PC,PHST	CHECK CONTROL BITS FOR THIS PHASE AND STATE	PHS62
3053	015452	000000			PHS62			
3054	015454	032777	001000	163626	BIT	SRVO,DXMO	VERIFY SRVO SET	
3055	015462	001001			BNE	,+1	BRANCH IF NO ERROR CONDITION	
3056	015464	104000			ERROR		SRVO NOT SET	
3057	015466	052737	001000	024192	BIS	SRVO,DMOMAP	UPDATE MAP	
3058	015474	004537	023560		JSR	R5(0)CLK	ROUTINE TO ISSUE CLOCK PULSES	
3059	015500	000001			1			1 CLOCK PULSE(S)
3060	015502	032777	002000	163602	BIT	SRVI,DXMI	SRVI MUST DROP	
3061	015510	001401			BEQ	,+1	BRANCH IF NO ERROR CONDITION	
3062	015512	104000			ERROR		SRVI DID NOT DROP	
3063	015514	042737	002000	024174	BIC	SRVI,DMHMAP	UPDATE MAP SRVI=0	
3064	015522	032777	000010	163564	BIT	BALF,DXCB	VERIFY BALF=0	
3065	015530	001001			BNE	,+1	BRANCH IF NO ERROR CONDITION	
3066	015532	104000			ERROR		BALF NOT ZERO	
3067	015534	052737	000010	024230	BIS	BALF,DCBMAP	UPDATE MAP	
3068	015542	042777	001000	163540	BIC	SRVO,DXMO	DROPSRVO	
3069	015550	004537	023560		JSR	R5(0)CLK	ROUTINE TO ISSUE CLOCK PULSES	
3070	015554	000001			1			1 CLOCK PULSE(S)
3071	015556	032777	001000	163524	BIT	SRVO,DXMO	VERIFY SRVO DROPPED	
3072	015564	001401			BEQ	,+1	BRANCH IF NO ERROR CONDITION	
3073	015566	104000			ERROR		SRVO DID NOT DROP	
3074	015570	042737	001000	024192	BIC	SRVO,DMOMAP	UPDATE MAP	
3075	015576	032777	000010	163510	BIT	BALF,DXCB	VERIFY BALF=1	
3076	015604	001001			BNE	,+4	BRANCH IF NO ERROR CONDITION	
3077	015606	104000			ERROR		BALF NOT 1	
3078	015610	052737	000010	024230	BIS	BALF,DCBMAP	UPDATE MAP	
3079	015616	032777	000040	163470	BIT	NPRX,DXCB	VERIFY NPRX=0	
3080	015624	001401			BEQ	,+1	BRANCH IF NO ERROR CONDITION	
3081	015626	104000			ERROR		NPRX NOT 0	
3082	015630	042737	000040	024230	BIC	NPRX,DCBMAP	UPDATE MAP	
3083	015636	005237	027510		INC	COUNT	INCREMENT BYTE COUNT	
3084	015642	023777	027510	163436	CMR	COUNT,DXBC	VERIFY BYTE COUNT	
3085	015650	001401			BEQ	,+4	BRANCH IF NO ERROR CONDITION	
3086	015652	104000			ERROR		BYTE COUNT ERROR	
3087	015654	017737	163426	024140	MOV	DXBC,DCBMAP	UPDATE MAP	
3088	015662	004737	024052		JSR	PC,CHKREG		
3089	015666	004537	023560		JSR	R5(0)CLK	ROUTINE TO ISSUE CLOCK PULSES	
3090	015672	000001			1			1 CLOCK PULSE(S)
3091	015674	122777	000360	163430	CMR	360,DCUSR	CHECK 4TH DATA BYTE	
3092	015702	001401			BEQ	,+4	BRANCH IF NO ERROR CONDITION	
3093	015704	104000			ERROR		DATA ERROR	
3094	015706	117737	163420	024114	MOVB	DCUSR,DMOSMAP	UPDATE MAP	
3095	015714	127727	163410	000377	CMR	DCUSR,0377		
3096	015722	001401			BEQ	,+4	BRANCH IF NO ERROR CONDITION	
3097	015724	104000			ERROR		DATA ERROR	
3098	015726	117737	163376	024071	MOVB	DCUSR,DCAMAP+1	UPDATE MAP	
3099	015734	022777	013737	163394	CMR	13737,DXND	INPR'S DONT STOP TILL IBM DONE	
3100	015742	001401			BEQ	,+1	BRANCH IF NO ERROR CONDITION	
3101	015744	104000			ERROR		DXND LOAD ERROR	
3102	015746	017737	163344	024272	MOV	DXND,DMNDMAP	UPDATE MAP	
3103	015754	004737	024052		JSR	PC,CHKREG		

3104	015760	004537	023560		JSR	R5,00CLK	ROUTINE TO ISSUE CLOCK PULSES	
3105	015764	000001			1			1 CLOCK PULSE(S)
3106	015766	127777	163336	163346	CHPB	0CUCR,0BUST	VERIFY 4TH DATA BYTE	
3107	015774	001401			BEQ	,+4	BRANCH IF NO ERROR CONDITION	
3108	015776	104000			ERROR		DXMI LOAD ERROR	
3109	016000	117737	163324	024174	MOVB	0CUCR,00MIMAP	UPDATE MAP	
3110	016006	005037	016016		CLR	00,4ST	ZERO DATA AND PARITY	
3111	016012	117727	163312		MOVB	0CUCR,(PC)+	SAVE FOURTH BYTE	
3112	016016	000000			0		HERE	
3113	016020	104007	016016		PARITY	,,4ST	COMPUTE ODD PARITY	
3114	016024	105037	016016		CLRB	00,4ST	CLEAR ALL BUT PARITY	
3115	016030	017727	163256		MOV	0DXMI,(PC)+	SAVE DXMI	
3116	016034	000000			0		HERE	
3117	016036	042737	177377	016034	BIC	0177377,00,4ST!	CLEAR ALL BUT PARITY	
3118	016044	023737	016016	016034	CMP	00,4ST,00,4ST!	VERIFY CORRECT PARITY	
3119	016052	001401			BEQ	,+2	BRANCH IF NO ERROR CONDITION	
3120	016054	104000			ERROR		PARITY GENERATION ERROR	
3121	016056	017737	163230	024174	MOV	0DXMI,00MIMAP		
3122	016064	052777	001000	163216	BIS	0SRVO,0DXMO	SET SRVO	
3123	016072	004537	023560		JSR	R5,00CLK	ROUTINE TO ISSUE CLOCK PULSES	
3124	016076	000001			1			1 CLOCK PULSE(S)
3125	016100	032777	001000	163202	BIT	0SRVO,0DXMO	VERIFY SRVO SET	
3126	016106	001001			BNE	,+2	BRANCH IF NO ERROR CONDITION	
3127	016110	104000			ERROR		SRVO NOT SET	
3128	016112	052737	001000	024192	BIS	0SRVO,00MOMAP	UPDATE MAP	
3129	016120	032777	000010	163166	BIT	0BALF,0DXCB	VERIFY BALF SET	
3130	016126	001001			BNE	,+4	BRANCH IF NO ERROR CONDITION	
3131	016130	104000			ERROR		BALF NOT SET	
3132	016132	052737	000010	024230	BIS	0BALF,00CBMAP	UPDATE MAP	
3133	016140	005201			INC	R1		
3134	016142	020177	163136		CMP	R1,0DXBA	VERIFY CORRECT BUS ADRS	
3135	016146	001401			BEQ	,+4	BRANCH IF NO ERROR CONDITION	
3136	016150	104000			ERROR		DXBA LOAD ERROR	
3137	016152	017737	163126	024126	MOV	0DXBA,00BAMAP	UPDATE MAP	
3138	016160	122777	000027	163142	CHPB	02,0CUCR	VERIFY CUCR LOAD	
3139	016166	001401			BEQ	,+2	BRANCH IF NO ERROR CONDITION	
3140	016170	104000			ERROR		CUCR LOAD ERROR	
3141	016172	117737	163132	024071	MOVB	0CUCR,00CANAP+1	UPDATE MAP	
3142	016200	122777	000337	163124	CHPB	0327,0CUSR	VERIFY CUSR LOAD	
3143	016206	001401			BEQ	,+4	BRANCH IF NO ERROR CONDITION	
3144	016210	104000			ERROR		CUSR LOAD ERROR	
3145	016212	117737	163114	024114	MOVB	0CUSR,00OSMAP	UPDATE MAP	
3146	016220	032777	002000	163004	BIT	0SRVI,0DXMI	VERIFY SRVI SET	
3147	016226	001001			BNE	,+4	BRANCH IF NO ERROR CONDITION	
3148	016230	104000			ERROR		SRVI DID NOT SET	
3149	016232	052737	002000	024174	BIS	0SRVI,00MIMAP	UPDATE MAP	
3150	016240	032777	001000	163046	BIT	0SYNC,0DXCB	VERIFY SYNC DROPPED	
3151	016246	001401			BEQ	,+2	BRANCH IF NO ERROR CONDITION	
3152	016250	104000			ERROR		SYNC DID NOT DROP	
3153	016252	042737	001000	024230	BIC	0SYNC,00CBMAP	UPDATE MAP	
3154	016260	004737	024052		JSR	PCCHKREG		
3155	016264	004537	023560		JSR	R5,00CLK	ROUTINE TO ISSUE CLOCK PULSES	
3156	016270	000001			1			1 CLOCK PULSE(S)
3157	016272	004737	023430		JSR	PCPHST	CHECK CONTROL BITS FOR	

Address	Hex	Hex	Hex	Hex	Hex	Instruction	Register	Comment
3158	016276	003000				PHS62		THIS PHASE AND STATE
3159	016300	005201				INC	R1	
3160	016302	020177	162776			CMP	R1,0DXBA	VERIFY CORRECT BUS ADRS
3161	016306	001401				BEQ	,+4	BRANCH IF NO ERROR CONDITION
3162	016310	104000				ERROR		IDXBA LOAD ERROR
3163	016312	017737	162766	024126		MOV	0DXBA,00BAHAP	IUPDATE MAP
3164	016320	021177	162772			CMP	0RL,0DXND	VERIFY CORRECT NPR DATA
3165	016324	001401				BEQ	,+4	BRANCH IF NO ERROR CONDITION
3166	016326	104000				ERROR		INPH DATA TRANSFER ERROR
3167	016330	017737	162762	024272		MOV	0DXND,00NDHAP	IUPDATE MAP
3168	016336	032777	001000	162790		BIT	0SUNC,0DXCB	VERIFY SYNC SET
3169	016344	001001				BNE	,+2	BRANCH IF NO ERROR CONDITION
3170	016346	104000				ERROR		ISYNC NOT SET
3171	016350	052737	001000	024230		BIS	0SYNC,00CBMAP	
3172	016356	032777	000040	162730		BIT	0NPRX,0DXCB	VERIFY NPRX SET
3173	016364	001001				BNE	,+2	BRANCH IF NO ERROR CONDITION
3174	016366	104000				ERROR		INPRX NOT SET
3175	016370	052737	000040	024230		BIS	0NPRX,00CBMAP	IUPDATE MAP
3176	016376	004737	024052			JSR	PCCHKREG	
3177	016402	004537	023560			JSR	R5,00CLK	ROUTINE TO ISSUE CLOCK PULSES
3178	016406	000001				1		1 CLOCK PULSE(S)
3179	016410	032777	000400	162676		BIT	0CUDX,0DXCB	VERIFY CUDX 0
3180	016416	001401				BEQ	,+2	BRANCH IF NO ERROR CONDITION
3181	016420	104000				ERROR		ICUDX NOT 0
3182	016422	042737	000400	024230		BIC	0CUDX,00CBMAP	IUPDATE MAP
3183	016430	032777	002000	162694		BIT	0SRVI,0DXMI	VERIFY SRVI 0
3184	016436	001401				BEQ	,+2	BRANCH IF NO ERROR CONDITION
3185	016440	104000				ERROR		ISRV NOT 0
3186	016442	042737	002000	024174		BIC	0SRVI,00HMAP	
3187	016450	022777	000020	162616		CMP	0CUDEND,0DXDS	VERIFY DEVICE STATUS
3188	016456	001401				BEQ	,+2	BRANCH IF NO ERROR CONDITION
3189	016460	104000				ERROR		IDXDS STATUS ERROR
3190	016462	017737	162606	024096		MOV	0DXDS,00DSMAP	IUPDATE MAP
3191	016470	022777	016772	162620		CMP	0MROAT,0DXND	IDXND STILL GOING
3192	016476	001401				BEQ	,+4	BRANCH IF NO ERROR CONDITION
3193	016500	104000				ERROR		IDXND LOAD ERROR
3194	016502	017737	162610	024272		MOV	0DXND,00NDHAP	IUPDATE MAP
3195	016510	032777	000200	162576		BIT	0IOD,0DXCB	
3196	016516	001001				BNE	,+2	BRANCH IF NO ERROR CONDITION
3197	016520	104000				ERROR		IOD NOT SET
3198	016522	052737	000200	024230		BIS	0IOD,00CBMAP	IUPDATE MAP
3199	016530	032777	001000	162596		BIT	0SUNC,0DXCB	VERIFY SYNC=0
3200	016536	001001				BNE	,+2	BRANCH IF NO ERROR CONDITION
3201	016540	104000				ERROR		ISYNC SET
3202	016542	052737	001000	024230		BIS	0SYNC,00CBMAP	IUPDATE MAP
3203	016550	032777	000010	162536		BIT	0BALF,0DXCB	VERIFY BALF 0
3204	016556	001401				BEQ	,+4	BRANCH IF NO ERROR CONDITION
3205	016560	104000				ERROR		IBALF NOT 0
3206	016562	042737	000010	024230		BIC	0BALF,00CBMAP	IUPDATE MAP
3207	016570	032777	000040	162516		BIT	0NPRX,0DXCB	VERIFY NPRX 0
3208	016576	001401				BEQ	,+4	BRANCH IF NO ERROR CONDITION
3209	016600	104000				ERROR		INPRX NOT 0
3210	016602	042737	000040	024230		BIC	0NPRX,00CBMAP	IUPDATE MAP
3211	016610	005237	027510			INC	00JOUNT	INCREMENT BYTE COUNT

3212	016614	023777	027510	162464		CMP	00XOUNT,0DXBC	IVERIFY BYTE COUNT
3213	016622	001401				BEG	.04	IBRANCH IF NO ERROR CONDITION
3214	016624	104000				ERROR		IBYTE COUNT ERROR
3215	016626	017737	162454	024140		MOV	0DXBC,00BCHAP	IUPDATE MAP
3216	016634	004737	024052			JSR	PC CHKREG	
3217								
3218								
3219	016640	012737	000340	000002		MOV	0L1VEL7,-PS	IRaise PRIORITY
3220	016646	042777	000002	162444		BIC	0MCLKEN,0DXES	ICLEAR MAINT CLK
3221	016654	032777	000002	162436		BIT	0MCLKEN,0DXES	IVERIFY MCLKEN=0
3222	016662	001401				BEG	.03	IBRANCH IF NO ERROR CONDITION
3223	016664	104000				ERROR		IMCLKEN DID NOT CLEAR
3224	016666	012737	001272	177776		MOV	0LESS1,PS	ILOWER STATUS
3225	016674	000001				WAIT		IWAIT FOR DONE INT
3226	016676	032777	000200	162374	MCRDI	BIT	0DONE,0DXCS	ICHECK FOR VALID INTERRUPT
3227	016704	001001				BNE	.02	IBRANCH IF NO ERROR CONDITION
3228	016706	104000				ERROR		IINVALID INTERRUPT
3229	016710	042777	000200	162362		BIC	0DONE,0DXCS	ICLEAR DONE
3230	016716	005777	162364			TST	0DXBC	IVERIFY BYTE COUNT ZERO
3231	016722	001401				BEG	.05	IBRANCH IF NO ERROR CONDITION
3232	016724	104000				ERROR		IBYTE COUNT NOT ZERO
3233	016726	022737	000020	003004		CMP	0CUDEND,003004	IVERIFY TT ENTRY
3234	016734	001401				BEG	.02	IBRANCH IF NO ERROR CONDITION
3235	016736	104000				ERROR		ITT ENTRY ERROR
3236	016740	123737	027452	003006		CMPEB	00DEV,003006	IVERIFY TT ENTRY 2
3237	016746	001401				BEG	.04	IBRANCH IF NO ERROR CONDITION
3238	016750	104000				ERROR		ITT ENTRY ERROR
3239	016752	042777	077777	162330		BIC	077777,0DXMO	IDROP ALL BUT OPLO
3240	016760	005077	162326			CLR	0DXMI	IDROP OPLI
3241	016764	012716	016776			MOV	0MCREX,0SP	IFUDGE RTI RETURN
3242	016770	000002				RTI		
3243								
3244								
3245	016772	125			MCRDATI	,BYTE	125	
3246	016773	017				,BYTE	017	
3247	016774	360				,BYTE	360	
3248	016775	377				,BYTE	377	
3249								
3250	016776	013737	016772	016772	MCREXI	MOV	00MCRDAT,00MCRDAT	IDXND TEST DATA PATTERN
3251								

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3252 | .....
3253 | ITEST 4 MAINTENANCE CLOCK INPUT (IBM WRITE) TEST
3254 | .....
3255 017004 104400 TS941 SC0PE
3256 017006 012737 000400 025100 MOV #400,0#ICOUNT IITERATION COUNT
3257 017014 012737 000004 026126 MOV #4,0#ERTSTN ISAVE TEST # FOR ERROR REPORT
3258 017022 012737 017030 025104 MOV #SCP4,0#RETURN ISCOPE LOOP RETURN ADRS
3259 017030 SCP41
3260
3261
3262 017030 004737 024344 JSR PC7DXRES IDX AND YABLE INITIALIZATION
3263 017034 052777 000100 162236 BIS #INTEN,0DXCS ISET INTERRUPT ENABLE
3264 017042 022777 000100 162230 CMP #INTEN,0DXCS IVERIFIED CONTROL AND STATUS
3265 017050 001401 BEQ ,+3 IBRANCH IF NO ERROR CONDITION
3266 017052 104000 ERROR I
3267 017054 017737 162220 024102 MOV 0DXCS,0#CSMAP IUPDATE MAP
3268 017062 012737 000001 027494 MOV #WITEC,0#CMD ILOAD COMMAND
3269 017070 004737 023024 JSR PC70TTRAIT ITT TRACE TRACE INIT
3270 017074 012737 000200 022690 MOV #CHIS,0#ENTRY1 ILOAD EXPECTED TT ENTRY 1
3271 017102 013737 001272 177776 MOV #0#ESS1,PS ILOWER PROCESSOR STATUS
3272 017110 012737 017110 025220 MOV #,1#0#TERPC IORIGIN OF TRAP ERROR
3273 017116 004737 023120 JSR PC7FASTISS ISELECT
3274
3275 017122 012737 177774 027510 MOV #04,0#COUNT ISOFTWARE BYTE COUNTER
3276 017130 013777 027510 162190 MOV #0#YOUNT,0DXBC ILOAD BYTE COUNT
3277 017136 023777 027510 162142 CMP #0#EOUNT,0DXBC IVERIFY LOAD
3278 017144 001401 BEQ ,+2 IBRANCH IF NO ERROR CONDITION
3279 017146 104000 ERROR I
3280 017150 017737 162132 024140 MOV 0DXBC,0#BCMAP IUPDATE BYTE COUNT
3281 017156 052777 100000 162114 BIS #PARSTP,0DXCS ISET STOP-ON-PARITY ERROR
3282 017164 032777 100000 162106 BIT #PARSTP,0DXCS IVERIFY CONTROL AND STATUS
3283 017172 001001 BNE ,+1 IBRANCH IF NO ERROR CONDITION
3284 017174 104000 ERROR IPANSTP DID NOT SET
3285
3286 017176 052737 100000 024102 BIS #PARSTP,0#CSMAP IUPDATE MAP
3287 017204 012777 022402 162092 MOV #MIND,0DXIV ITRANSFER DONE INTERRUPT
3288 017212 012777 022464 162004 MOV #M#WNP,0DXBA IBUS ADDRESS FOR NPR DATA
3289 017220 022777 022464 162096 CMP #M#WNP,0DXBA IVERIFY LOAD
3290 017226 001401 BEQ ,+3 IBRANCH IF NO ERROR CONDITION
3291 017230 104000 ERROR I
3292 017232 017737 162046 024126 MOV 0DXBA,0#BAMAP IUPDATE MAP
3293 017240 004737 022474 JSR PC7ENPRD IZERO NPR DATA FILE
3294 017244 012702 022464 MOV #M#WNP,R2 IPOINT R2 AT NPR DATA
3295 017250 012701 022494 MOV #M#WNP,R1 IPOINT R1 TO SOURCE FILE FOR WRITE DATA
3296 017254 052777 000002 162036 BIS #MCLKEN,0DXES ISET MAINTENANCE CLOCK ENABLE
3297 017262 032777 000002 162030 BIT #M#LKEN,0DXES IVERIFY SET
3298 017270 001001 BNE ,+3 IBRANCH IF NO ERROR CONDITION
3299 017272 104000 ERROR IMCLKEN NOT SET
3300 017274 052737 000002 024290 BIS #MCLKEN,0#ESMAP
3301 017302 017727 162006 MOV 0D#CB,(PC)+ ISAVE CONTROL BITS
3302 017306 000000 MCHCBI IHERE
3303 017310 042737 107777 017306 BIC #107777,0#MCHCB ICLEAR ALL BUT PHASE FLOPS
3304 017316 022737 070000 017306 CMP #PHASE7,0#MCHCB IVERIFY 0X IN PHASE 7
3305 017324 001401 BEQ ,+2 IBRANCH IF NO ERROR CONDITION

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3326	017326	104000			ERROR				
3327	017330	032777	024000	161756	BIT	#TSSF,0DXCR		EXAMINE TIME STATE FLOP	
3328	017336	001010			BNE	MCW1		BRANCH IF T91	
3329	017340	052777	000001	161792	BIS	#MCLKP,0DXES		ISSUE CLOCK TICK	
3310	017346	032777	004000	161740	BIT	#TSSF,0DXCR		EXAMINE TIME STATE FLOP	
3311	017354	001001			BNE	,+3		BRANCH IF NO ERROR CONDITION	
3312	017356	104000			ERROR				
3313									
3314	017360	032777	100000	161724					
3315	017366	001001			BIT	#OPLI,0DXMI		VERIFY SELECTION COMPLETE	
3316	017370	104000			BNE	,+4		BRANCH IF NO ERROR CONDITION	
3317	017372	052737	100000	024174	ERROR				
3318	017400	127727	161744	000002	BIS	#OPLI,0#MIMAP		UPDATE MAP	
3319	017406	001401			CMPB	#TINDX,#2		CHECK TINDX	
3320	017410	104000			BEQ	,+3		BRANCH IF NO ERROR CONDITION	
3321	017412	117737	161732	024291	ERROR				
3322	017420	032777	001000	161666	MOVW	#TINDX,0#ESMAP+1		UPDATE MAP	
3323	017426	001001			BIT	#SYNC,0DXCR		VERIFY SYNC#1	
3324	017430	104000			BNE	,+1		BRANCH IF NO ERROR CONDITION	
3325	017432	052737	001000	024230	ERROR				
3326	017440	022777	160000	161642	BIS	#SYNC,0#CBMAP		UPDATE MAP	
3327	017446	001401			CMP	#0%LO%SELO%HLDO,0DXMO			
3328	017450	104000			BEQ	,+2		BRANCH IF NO ERROR CONDITION	
3329	017452	017737	161632	024192	ERROR				
3330	017460	123777	027454	161642	MOV	0DXMO,0#MOMAP		DXMO WRITE ERROR	
3331	017466	001401			CMPB	00%ND,0%CUAR		UPDATE MAP	
3332	017470	104000			BEQ	,+4		VERIFY COMMAND LOAD	
3333	017472	113737	027454	024071	ERROR				
3334	017500	123777	027452	161620	BEQ	,+2		BRANCH IF NO ERROR CONDITION	
3335	017506	001401			MOVW	0#CMD,0#CAMAP+1		UPDATE MAP	
3336	017510	104000			CMPB	0#DEV,0%UAR		VERIFY ADRS LOAD	
3337	017512	113737	027452	024070	BEQ	,+2		BRANCH IF NO ERROR CONDITION	
3338	017520	027777	161552	161570	ERROR				
3339	017526	001401			MOVW	0#DEV,0#CAMAP		UPDATE MAP	
3340	017530	104000			CMP	0DXCA,0DXND		VERIFY CA TO ND TRANSFER	
3341	017532	017737	161560	024272	BEQ	,+4		BRANCH IF NO ERROR CONDITION	
3342	017540	004737	024052		ERROR				
3343	017544	052777	000002	161526	MOV	0DXND,0#NDMAP		UPDATE MAP	
3344	017552	032777	000002	161520	JSR	PC,CHKREG			
3345	017560	001001			BIS	#2,0DXCS		SET FUNCTION "INPUT"	
3346	017562	104000			BIT	#2,0DXCS		VERIFY FUNCTION SET	
3347	017564	052737	000002	024182	BNE	,+3		BRANCH IF NO ERROR CONDITION	
3348	017572	004737	024052		ERROR				
3349	017576	004537	023560		BIS	#2,0#CSMAP		UPDATE	
3350	017602	000010			JSR	PC,CHKREG			
3351	017604	004737	023430		JSR	PC,CHKREG			
3352	017610	074000			PHS71				
3353	017612	004737	024052		JSR	PC,CHKREG			
3354	017616	052777	000001	161454	BIS	#GO,0DXCS		SET FUNCTION "GO"	
3355	017624	004537	023560		JSR	R5,0#CLK		ROUTINE TO ISSUE CLOCK PULSES	
3356	017630	000001			1				
3357	017632	004737	023430		JSR	PC,PHST			
3358	017636	070000			PHS72				
3359	017640	032777	000001	161432	BIT	#GO,0DXCS		VERIFY GO SET	

3360	017646	001001			BNE	,+4		IBRANCH IF NO ERROR CONDITION	
3361	017650	104000			ERROR			IGO NOT SET	
3362	017652	052737	000001	024102	BIS	#G0,#GSMAP		IUPDATE MAP	
3363	017660	004737	024052		JSR	PC,CHKREG			
3364					INEXT CLOCK PULSE SHOULD FORCE THE DX				
3365					IINTO PHASE 5 TIME STATE 1				
3366									
3367	017664	004537	023560		JSR	R570#CLK		IROUTINE TO ISSUE CLOCK PULSES	
3368	017670	000001			1				1 CLOCK PULSE(S)
3369	017672	004737	023430		JSR	PC,PHST		ICHECK CONTROL BITS FOR	
3370	017676	054000			PHS51			ITHIS PHASE AND STATE	PHS51
3371					IVERIFY CUIS EVENTS TRANSPIRED				
3372									
3373	017700	032777	100000	161406	BIT	#LOCK0,#DXCB		ILOCK=0? MUST BE SET	
3374	017706	001001			BNE	,+4		IBRANCH IF NO ERROR CONDITION	
3375	017710	104000			ERROR			ILOCK0 NOT SET	
3376	017712	052737	100000	024230	BIS	#LOCK0,#CBMAP		IUPDATE MAP	
3377	017720	032777	000100	161306	BIT	#BYPAS,#DXCB		IBYPAS MUST BE=1	
3378	017726	001001			BNE	,+4		IBRANCH IF NO ERROR CONDITION	
3379	017730	104000			ERROR			IBYPAS NOT SET	
3380	017732	052737	000100	024230	BIS	#BYPAS,#CBMAP		IUPDATE MAP	
3381	017740	032777	000400	161346	BIT	#CUDX,#DXCB		ICUDX MUST BE =1	
3382	017746	001001			BNE	,+4		IBRANCH IF NO ERROR CONDITION	
3383	017750	104000			ERROR			ICUDX NOT SET	
3384	017752	052737	000400	024230	BIS	#CUDX,#CBMAP		IUPDATE MAP	
3385	017760	032777	000010	161326	BIT	#BALF,#DXCB		IBALF MUST BE 0	
3386	017766	001401			BEQ	,+3		IBRANCH IF NO ERROR CONDITION	
3387	017770	104000			ERROR			IBALF SET	
3388	017772	042737	000010	024230	BIC	#BALF,#CBMAP		IUPDATE MAP	
3389	020000	032777	001000	161306	BIT	#SYNC,#DXCB		ISYNC=0	
3390	020006	001401			BEQ	,+4		IBRANCH IF NO ERROR CONDITION	
3391	020010	104000			ERROR			ISYNC NOT ZERO	
3392	020012	042737	001000	024230	BIC	#SYNC,#CBMAP		IUPDATE MAP	
3393	020020	032777	000200	161206	BIT	#I/O,#DXCB		I/O MUST BE 0	
3394	020026	001401			BEQ	,+3		IBRANCH IF NO ERROR CONDITION	
3395	020030	104000			ERROR			I/O DONE SET	
3396	020032	042737	000200	024230	BIC	#I/O,#CBMAP		IUPDATE MAP	
3397	020040	004737	024052		JSR	PC,CHKREG			
3398	020044	004537	023560		JSR	R570#CLK		IROUTINE TO ISSUE CLOCK PULSES	
3399	020050	000001			1				1 CLOCK PULSE(S)
3400	020052	004737	023430		JSR	PC,PHST		ICHECK CONTROL BITS FOR	
3401	020056	050000			PHS52			ITHIS PHASE AND STATE	PHS52
3402	020060	032777	000100	161226	BIT	#BYPAS,#DXCB		IVERIFY BYPAS CLEARED	
3403	020066	001401			BEQ	,+3		IBRANCH IF NO ERROR CONDITION	
3404	020070	104000			ERROR			IBYPAS DID NOT CLEAR	
3405	020072	042737	000100	024230	BIC	#BYPAS,#CBMAP		IUPDATE MAP	
3406	020100	032777	002000	161204	BIT	#SRVI,#DXMI		ISERVICE-IN MUST BE SET	
3407	020106	001001			BNE	,+4		IBRANCH IF NO ERROR CONDITION	
3408	020110	104000			ERROR			ISERVICE-IN NOT SET	
3409	020112	052737	002000	024174	BIS	#SRVI,#MIMAP		IUPDATE MAP	
3410	020120				MCWL 1				
3411	020120	004537	023560		JSR	R570#CLK		IROUTINE TO ISSUE CLOCK PULSES	
3412	020124	000011			11				11 CLOCK PULSE(S)
3413	020126	004737	024052		JSR	PC,CHKREG			

3468	020422	104000			ERROR						
3469	020424	042737	002000	024174	BIC	#SRV1,0#M1MAP					
3470	020432	004737	024052		JSR	PC;CHKREG					
3471											
3472											
3473											
3474	020436	004537	023560		JSR	R5;0#CLK					
3475	020442	000010			10						
3476	020444	004737	023430		JSR	PC;PHST					10 CLOCK PULSE(S)
3477	020450	054000			PHS51						PHS51
3478	020452	004737	024052		JSR	PC;CHKREG					
3479	020456	042777	001777	160624	BIC	#SRV0,1777,0DXMO					
3480	020464	004537	023560		JSR	R5;0#CLK					
3481	020470	000003			3						
3482	020472	105777	160640		TSYB	0BUS0					
3483	020476	001401			BEQ	,+4					
3484	020500	104000			ERROR						
3485	020502	042737	001777	024192	BIC	#SRV0,1777,0#MOMAP					
3486	020510	004737	023720		JSR	PC;COPARO					
3487	020514	032777	002000	160570	BIT	#SRV1,0DXM1					
3488	020522	001001			BNE	,+4					
3489	020524	104000			ERROR						
3490	020526	052737	002000	024174	BIS	#SRV1,0#M1MAP					
3491	020534	004537	023560		JSR	R5;0#CLK					
3492	020540	000007			7						
3493	020542	004737	024052		JSR	PC;CHKREG					7 CLOCK PULSE(S)
3494											
3495											
3496											
3497	020546	005721			TSY	(R1)+					
3498	020550	051177	160534		BIS	0R1,0DXMO					
3499	020554	004537	023560		JSR	R5;0#CLK					
3500	020560	000002			2						
3501	020562	121177	160550		CHPB	0R1,0BUS0					
3502	020566	001401			BEQ	,+4					
3503	020570	104000			ERROR						
3504	020572	111137	024152		MOVB	0R1,0#MOMAP					
3505	020576	042737	000400	024192	BIC	0P1RO,0#MOMAP					
3506	020604	051137	024152		BIS	0R1,0#MOMAP					
3507	020610	004537	023560		JSR	R5;0#CLK					
3508	020614	000002			2						
3509	020616	004737	023720		JSR	PC;COPARO					
3510	020622	004737	024052		JSR	PC;CHKREG					
3511	020626	052777	001000	160494	BIS	#SRV0,0DXMO					
3512	020634	004537	023560		JSR	R5;0#CLK					
3513	020640	000001			1						
3514	020642	004737	023430		JSR	PC;PHST					
3515	020646	050000			PHS52						
3516	020650	032777	001000	160432	BIT	#SRV0,0DXMO					
3517	020656	001001			BNE	,+4					
3518	020660	104000			ERROR						
3519	020662	052737	001000	024192	BIS	#SRV0,0#MOMAP					
3520											
3521											

VERIFY S1611A (GEI READY FOR SECOND DATA BYTE)

Address	Hex	Hex	Hex	Hex	Hex	Instruction	Comments	Notes
3576	021132	000001				1		
3577	021134	004737	023430			JSR PC;PHST	ICHECK CONTROL BITS FOR THIS PHASE AND STATE	1 CLOCK PULSE(S)
3578	021140	050000				PHS52		PHS52
3579	021142	004737	024052			JSR PC;CHKREG	ICUDX,NPRX, SYNC=0	
3580								
3581	021146	004537	023560			JSR R5;@CLK	ROUTINE TO ISSUE CLOCK PULSES	
3582	021152	000001				1		1 CLOCK PULSE(S)
3583	021154	004737	023430			JSR PC;PHST	ICHECK CONTROL BITS FOR THIS PHASE AND STATE	
3584	021160	054000				PHS51		PHS51
3585								
3586							IVERIFY DXND LOAD	
3587	021162	127777	160144	160126		CMPB @CUSR,@DXND	ICUSR TO DXND(71)	
3588	021170	001401				BEG ,+4	IBRANCH IF NO ERROR CONDITION	
3589	021172	104000				ERROR	ICUSR INTO DXND(710) TRANSFER ERROR	
3590	021174	017727	160116			MOV @DXND,(PC)+	ISAVE DXND	
3591	021200	000000				B	HERE	
3592	021202	000337	021200			SWAB @SND	IPUT DXND(5100) INTO (710)	
3593	021206	127737	160116	021200		CMPB @CUCR,@SND	IVERIFY CUCR TO DXND(15100)	
3594	021214	001401				BEG ,+2	IBRANCH IF NO ERROR CONDITION	
3595	021216	104000				ERROR	ICUCR INTO DXND(15100) TRANSFER ERROR	
3596	021220	017737	160072	024272		MOV @DXND,@NDMAP	IUPDATE NAND MAP	
3597	021226	027712	160064			CMP @ND,@R2	IVERIFY NPR TRANSFER	
3598	021232	001401				BEG ,+2	IBRANCH IF NO ERROR CONDITION	
3599	021234	104000				ERROR	INPR DATA TRANSFER ERROR	
3600	021236	032777	001000	160050		BIT @SYNC,@DXCB	ISYNC=1	
3601	021244	001001				BNE ,+4	IBRANCH IF NO ERROR CONDITION	
3602	021246	104000				ERROR		
3603	021250	052737	001000	024230		BIS @SYNC,@CBMAP	IUPDATE MAP	
3604	021256	032777	000400	160030		BIT @CUDX,@DXCB	ICUDX=1	
3605	021264	001001				BNE ,+4	IBRANCH IF NO ERROR CONDITION	
3606	021266	104000				ERROR		
3607	021270	052737	000400	024230		BIS @CUDX,@CBMAP	IUPDATE MAP	
3608	021276	032777	000040	160010		BIT @NPRX,@DXCB	INPRX=1	
3609	021304	001001				BNE ,+2	IBRANCH IF NO ERROR CONDITION	
3610	021306	104000				ERROR		
3611	021310	052737	000040	024230		BIS @NPRX,@CBMAP	IUPDATE MAP	
3612	021316	032777	000020	157770		BIT @NPRT,@DXCB	INPRT=1	
3613	021324	001001				BNE ,+4	IBRANCH IF NO ERROR CONDITION	
3614	021326	104000				ERROR		
3615	021330	052737	000020	024230		BIS @NPRT,@CBMAP	IUPDATE MAP	
3616	021336	004737	024052			JSR PC;CHKREG		
3617	021342	004537	023560			JSR R5;@CLK	ROUTINE TO ISSUE CLOCK PULSES	
3618	021346	000001				1		1 CLOCK PULSE(S)
3619	021350	032777	000020	157736		BIT @NPRT,@DXCB	ICHECK NPRT	
3620	021356	001001				BNE ,+1	IBRANCH IF NO ERROR CONDITION	
3621	021360	104000				ERROR	INPRT ZERO	
3622	021362	052777	000020	157724		BIS @NPRT,@DXCB	ICHECK NPRX	
3623	021370	032777	000040	157716		BIT @NPRX,@DXCB	IVERIFY NPRX CLEARED	
3624	021376	001401				BEG ,+2	IBRANCH IF NO ERROR CONDITION	
3625	021400	104000				ERROR	INPRX NOT ZERO	
3626	021402	042737	000040	024230		BIS @NPRX,@CBMAP	IUPDATE MAP	
3627	021410	032777	000400	157676		BIT @CUDX,@DXCB	ICUDX MUST BE 1	
3628	021416	001001				BNE ,+4	IBRANCH IF NO ERROR CONDITION	
3629	021420	104000				ERROR	ICUDX NOT SET	

3630	021422	052737	000400	024230	BIS	#CUDX, #CBMAP	IUPDATE MAP	
3631	021430	020277	157650		CHP	R2, #DXBA	IVERIFY CORRECT ADDRESS	
3632	021434	001401			BEG	, +4	I BRANCH IF NO ERROR CONDITION	
3633	021436	104000			ERROR		INPH TRANSFER ERROR	
3634								
3635	021440	004537	023560		JSR	R5, #CLK	IROUTINE TO ISSUE CLOCK PULSES	
3636	021444	000002			2			2 CLOCK PULSE(S)
3637	021446	105722			TSTB	(R2)+	IINC TO NEXT NPR WORD	
3638	021450	020277	157630		CHP	R2, #DXBA	IVERIFY DXBA LOAD	
3639	021454	001401			BEG	, +2	I BRANCH IF NO ERROR CONDITION	
3640	021456	104000			ERROR		IDXBA INCREMENT ERROR	
3641	021460	017737	157620	024126	MOV	#DXBA, #BAMAP	IUPDATE MAP	
3642	021466	042777	001777	157614	BIC	#SRV01777, #DXMO		
3643	021474	004537	023560		JSR	R5, #CLK	IROUTINE TO ISSUE CLOCK PULSES	
3644	021500	000002			2			2 CLOCK PULSE(S)
3645	021502	105777	157602		TSTB	#DXMO		
3646	021506	001401			BEG	, +2	I BRANCH IF NO ERROR CONDITION	
3647	021510	104000			ERROR		IBUS0 DID NOT CLEAR	
3648	021512	004737	023720		JSR	PC, COPARO	ICOPY PAR0 INTO CLK0	
3649	021516	032777	001000	157564	BIT	#SRV0, #DXMO	IVERIFY SRV0 DROPEO	
3650	021524	001401			BEG	, +2	I BRANCH IF NO ERROR CONDITION	
3651	021526	104000			ERROR		ISRV0 DID NOT DROP	
3652	021530	042737	001777	024152	BIC	#SRV01777, #MOMAP		
3653	021536	105722			TSTB	(R2)+	IINC TO NEXT BYTE ADRS	
3654	021540	020277	157540		CHP	R2, #DXBA	IVERIFY DXBA ADRS	
3655	021544	001401			BEG	, +4	I BRANCH IF NO ERROR CONDITION	
3656	021546	104000			ERROR		IDXBA INC ERROR	
3657	021550	017737	157530	024126	MOV	#DXBA, #BAMAP	IUPDATE MAP	
3658	021556	032777	000020	157530	BIT	#NPRT, #DXCB	IVERIFY NPRT SET	
3659	021564	001001			BNE	, +4	I BRANCH IF NO ERROR CONDITION	
3660	021566	104000			ERROR		INPRT NOT SET	
3661	021570	052737	000020	024230	BIS	#NPRT, #CBMAP		
3662	021576	032777	000400	157510	BIT	#CUDX, #DXCB	IVERIFY CUDX SET	
3663	021604	001001			BNE	, +4	I BRANCH IF NO ERROR CONDITION	
3664	021606	104000			ERROR		ICUDX NOT SET	
3665	021610	052737	000400	024230	BIS	#CUDX, #CBMAP		
3666	021616	032777	001000	157470	BIT	#SYNC, #DXCB	IVERIFY SYNC 0	
3667	021624	001401			BEG	, +	I BRANCH IF NO ERROR CONDITION	
3668	021626	104000			ERROR		ISYNC NOT 0	
3669	021630	042737	001000	024230	BIC	#SYNC, #CBMAP	IUPDATE MAP	
3670	021636	032777	002000	157446	BIT	#SRV1, #DXM1	IVERIFY SRV1 SET	
3671	021644	001001			BNE	, +4	I BRANCH IF NO ERROR CONDITION	
3672	021646	104000			ERROR		ISRV1 NOT SET	
3673	021650	052737	002000	024174	BIS	#SRV1, #M1MAP	IUPDATE MAP	
3674	021656	004737	024052		JSR	PC, CHKREG		
3675	021662	004537	023560		JSR	R5, #CLK	IROUTINE TO ISSUE CLOCK PULSES	
3676	021666	000002			2			2 CLOCK PULSE(S)
3677	021670	032777	002000	157414	BIT	#SRV1, #DXM1	IVERIFY SRV1 SET	
3678	021676	001001			BNE	, +1	I BRANCH IF NO ERROR CONDITION	
3679	021700	104000			ERROR		ISRV1 DID NOT DROP	
3680	021702	052737	002000	024174	BIS	#SRV1, #M1MAP	IUPDATE MAP	
3681	021710	032777	001000	157376	BIT	#SYNC, #DXCB	IVERIFY SYNC DROPEO	
3682	021716	001401			BEG	, +4	I BRANCH IF NO ERROR CONDITION	
3683	021720	104000			ERROR		ISYNC DID NOT DROP	

3684	021722	042737	001000	024230	BIC	#SYNC,#CBMAP	IUPDATE	
3685	021730	004737	024052		JSR	PC,CHKREG		
3686	021734	000137	020120		JMP	#MCWL	I STAY IN MC WRITE LOOP	
3687	021740	032777	000200	157346	MCWI0D1 BIT	#I0D,#DXCB	IVERIFY I/O DONE SET	
3688	021746	001001			BNE	,+3	I BRANCH IF NO ERROR CONDITION	
3689	021750	104000			ERROR		I IOD NOT SET	
3690	021752	052737	000200	024230	BIS	#IOD,#CBMAP	IUPDATE MAP	
3691	021760	032777	000020	157326	BIT	#NPRY,#DXCB	IVERIFY NPRY SET	
3692	021766	001001			BNE	,+3	I BRANCH IF NO ERROR CONDITION	
3693	021770	104000			ERROR		I NPRY NOT SET	
3694	021772	052737	000020	024230	BIS	#NPRY,#CBMAP		
3695	022000	022777	000020	157206	CMR	#CJEND,#DXDS	IVERIFY CU DATA END	
3696	022006	001401			BEQ	,+3	I BRANCH IF NO ERROR CONDITION	
3697	022010	104000			ERROR		I DXDS STATUS ERROR	
3698	022012	017737	157256	024056	MOV	#DXDS,#DSMAP		
3699	022020	004737	024052		JSR	PC,CHKREG	I FORGET ANYTHING	
3700	022024	004537	023560		JSR	R5700CLK	I ROUTINE TO ISSUE CLOCK PULSES	
3701	022030	000001			1			1 CLOCK PULSE(S)
3702	022032	004737	023430		JSR	PC,PHST	I CHECK CONTROL BITS FOR	
3703	022036	050000			PH52		I THIS PHASE AND STATE	PH52
3704	022040	004737	024052		JSR	PC,CHKREG	I CUDX,NPRX; SYNC=0	
3705								
3706	022044	004537	023560		JSR	R5700CLK	I ROUTINE TO ISSUE CLOCK PULSES	
3707	022050	000001			1			1 CLOCK PULSE(S)
3708	022052	004737	023430		JSR	PC,PHST	I CHECK CONTROL BITS FOR	
3709	022056	054000			PH51		I THIS PHASE AND STATE	PH51
3710								
3711							I VERIFY DXND LOAD	
3712	022060	017737	157232	024272	MOV	#DXND,#DNDMAP		
3713	022066	127777	157240	157222	CMR	#CUSR,#DXND	I CUSR TO DXND(71)	
3714	022074	001401			BEQ	,+4	I BRANCH IF NO ERROR CONDITION	
3715	022076	104000			ERROR		I CUSR INTO DXND(710) TRANSFER ERROR	
3716	022100	017727	157212		MOV	#DXND,(PC)+	I SAVE DXND	
3717	022104	000000			B		I HERE	
3718	022106	000337	022104		SWAB	#SND2	I PUT DXND(15100) INTO (710)	
3719	022112	127737	157212	022104	CMR	#CUCR,#SND2	I VERIFY CUCR TO DXND(15100)	
3720	022120	001401			BEQ	,+3	I BRANCH IF NO ERROR CONDITION	
3721	022122	104000			ERROR		I CUCR INTO DXND(15100) TRANSFER ERROR	
3722	022124	017737	157166	024272	MOV	#DXND,#DNDMAP	I UPDATE DXND MAP	
3723	022132	027712	157160		CMR	#DND,PR2	I VERIFY NPR TRANSFER	
3724	022136	001401			BEQ	,+4	I BRANCH IF NO ERROR CONDITION	
3725	022140	104000			ERROR		I NPR DATA TRANSFER ERROR	
3726	022142	032777	001000	157144	BIT	#SYNC,#DXCB	I SYNC=1	
3727	022150	001001			BNE	,+	I BRANCH IF NO ERROR CONDITION	
3728	022152	104000			ERROR			
3729	022154	052737	001000	024230	BIS	#SYNC,#CBMAP	I UPDATE MAP	
3730	022162	032777	000400	157124	BIT	#CUDX,#DXCB	I CUDX=1	
3731	022170	001001			BNE	,+3	I BRANCH IF NO ERROR CONDITION	
3732	022172	104000			ERROR			
3733	022174	052737	000400	024230	BIS	#CUDX,#CBMAP	I UPDATE MAP	
3734	022202	032777	000040	157104	BIT	#NPRX,#DXCB	I NPRX=1	
3735	022210	001001			BNE	,+3	I BRANCH IF NO ERROR CONDITION	
3736	022212	104000			ERROR			
3737	022214	052737	000040	024230	BIS	#NPRX,#CBMAP	I UPDATE MAP	

3738	022222	032777	000020	157004	BIT	#NPRT,0DXCB	INPRT=1	
3739	022230	001001			BNE	,+4	IBRANCH IF NO ERROR CONDITION	
3740	022232	104000			ERROR		I	
3741	022234	052737	000020	024230	BIS	#NPRT,00CBMAP	IUPDATE MAP	
3742	022242	004737	024052		JSR	PCCHKREG		
3743	022246	004537	023560		JSR	R57,0CLK	IROUTINE TO ISSUE CLOCK PULSES	
3744	022252	000001			I		I	1 CLOCK PULSE(S)
3745	022254	032777	000020	157032	BIT	#NPRT,0DXCB	ICHECK NPRX	
3746	022262	001001			BNE	,+4	IBRANCH IF NO ERROR CONDITION	
3747	022264	104000			ERROR		INPRT ZERO	
3748	022266	052777	000020	157020	BIS	#NPRT,0DXCB	ICHECK NPRX	
3749								
3750								
3751								
3752	022274	032777	000040	157012	BIT	#NPRX,0DXCB	IVERIFY NPRX CLEARED	
3753	022302	001401			BEQ	,+4	IBRANCH IF NO ERROR CONDITION	
3754	022304	104000			ERROR		INPRX NOT ZERO	
3755	022306	042737	000040	024230	BIC	#NPRX,00CBMAP	IUPDATE MAP	
3756	022314	032777	000400	156772	BIT	#CUDX,0DXCB	ICUDX MUST BE 1	
3757	022322	001001			BNE	,+5	IBRANCH IF NO ERROR CONDITION	
3758	022324	104000			ERROR		ICUDX NOT SET	
3759	022326	052737	000400	024230	BIS	#CUDX,00CBMAP	IUPDATE MAP	
3760	022334	020277	156744		CHP	R2(0DXBA	IVERIFY CORRECT ADDRESS	
3761	022340	001401			BEQ	,+4	IBRANCH IF NO ERROR CONDITION	
3762	022342	104000			ERROR		INPRX TRANSFER ERROR	
3763								
3764	022344	032777	000200	156742	BIT	#I0D,0DXCB	IVERIFY I0D SET	
3765	022352	001001			BNE	,+4	IBRANCH IF NO ERROR CONDITION	
3766	022354	104000			ERROR		I0D NOT SET	
3767	022356	052737	000200	024230	BIS	#I0D,00CBMAP	IUPDATE MAP	
3768	022364	004737	024052		JSR	PCCHKREG		
3769	022370	042777	000002	156722	BIC	#MCLKEN,0DXES	ICLEAR MAINTENANCE CLOCK	
3770								
3771								
3772								
3773								
3774								
3775								
3776								
3777								
3778								
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3782								
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3789								
3790								
3791								

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3792 022376 000001      WAIT      I FOR WRITE DONE INTERRUPT
3793 022400 000000      HALT      I RETURN FROM INTERRUPT FAILED
3794
3795 022402 032777 000200 156670 MCWDI  BIT  #DONE,#DXCS  I CHECK FOR VALID INTERRUPT
3796 022410 001001      BNE  ,+4  I BRANCH IF NO ERROR CONDITION
3797 022412 104000      ERROR    I INVALID INTERRUPT
3798 022414 042777 000200 156656  BIC  #DONE,#DXCS  I CLEAR DONE
3799 022422 023727 003004 000020  CMP  #0004,#CUDEND I VERIFY TT ENTRY #1
3800 022430 001401      BEQ  ,+2  I BRANCH IF NO ERROR CONDITION
3801 022432 104000      ERROR    I TT ENTRY ERROR
3802
3803 022434 023777 003006 156634  CMP  #03006,#DXCA  I VERIFY TT ENTRY 2
3804 022442 001401      BEQ  ,+4  I BRANCH IF NO ERROR CONDITION
3805 022444 104000      ERROR    I TT ENTRY ERROR
3806 022446 012716 022512  MOV  #MCWEX,#SP  I RETURN ADDRESS
3807 022452 000002      RTI
3808
3809
3810

```

MAINTENANCE CLOCK WRITE DATA

```

3811 022454 000777      MCWDAT1 ,WORD 777
3812 022456 000400      ,WORD 400
3813 022460 000525      ,WORD 525
3814 022462 000652      ,WORD 652
3815

```

MAINTENANCE CLOCK WRITE NPR DATA FILE

```

3817 022464 000000      MCWNPR1 ,WORD 0      I BYTES 1,2
3818 022466 000000      ,WORD 0      I BYTES 3,4
3819 022470 000000      ,WORD 0      I BUFFER FOR ERROR
3820 022472 000000      ,WORD 0      I BUFFER FOR ERROR
3821
3822

```

```

3823 022474 005037 022464      ENPRDI CLR  MCWNPR
3824 022500 005037 022466      CLR  MCWNPR+2
3825 022504 005037 022470      CLR  MCWNPR+4
3826 022510 000207      RTS  PC
3827 022512 000240      MCWEXI NOP  I ZERO NPR DATA FILE
3828
3829

```



```
3830 | .....  
3831 |TEST 5 END OF TEST STRING  
3832 | .....  
3833 022514 104400 TST51 SCPE  
3834 022516 012737 000001 025100 MOV #1,00ICOUNT IITERATION COUNT  
3835 022524 012737 000005 020126 MOV #5,00ERTSTN ISAVE TEST # FOR ERROR REPORT  
3836 022532 012737 022540 025104 MOV #SCP5,00RETURN ISCOPE LOOP RETURN ADRS  
3837 022540 SCP51  
3838  
3839  
3840 .REM *  
3841  
3842 THIS TEST FUNCTIONS AS A TERMINATOR FOR THE CHAINABLE TEST STRING,  
3843 AS SUCH IT TRANSFERS CONTROL TO THE LOOP CONTROL SUBROUTINE.  
3844  
3845 *  
3846  
3847  
3848 022540 000137 027150 JMP 00LPCNTL
```

```

3849          IISS DONE INTERRUPT SERVICE
3850 022544          SEL,DONEI
3851 022544 032777 000200 150526          BIT      @DONE,@DXCS          ICHECK DONE
3852 022552 001001          BNE      ,+4          IBRANCH IF NO ERROR CONDITION
3853 022554 104000          ERROR          IFALSE INTERRUPT
3854 022556 042777 000200 150514          BIC      @DONE,@DXCS          ICLEAR DONE
3855 022564 032777 000200 150506          BIT      @DONE,@DXCS
3856 022572 001401          BEQ      ,+2          IBRANCH IF NO ERROR CONDITION
3857 022574 104000          ERROR          IDONE NOT CLEAR
3858 022576 012746 023022          MOV      @SEL,X,@(SP)          IFAKE A JSR PC,TT,TRACE
3859
3860          ITT,TRACE, ROUTINE TO TRACE TUMBLE TABLE ENTRIES
3861          IAND THE TTNDX
3862 022602          TT,TRACEI
3863
3864 022602 010146          MOV      R1,@(SP)
3865 022604 013701 023010          MOV      @@TRACE,R1          ILOAD R1 WITH SOFTWARE IT
3866 022610 020137 001440          CMP      R1,@TT          ICHECK FOR BOTTOM OF TABLE
3867 022614 001000          BNE      IS          IBRANCH IF NOT BOTTOM
3868 022616 005737 003776          TST      @03776          ILOOK AT TOP OF TT
3869 022622 001401          BEQ      ,+4          IBRANCH IF NO RAP AROUND
3870 022624 104002          TRACER          IREPORT TT TRACE ERROR
3871 022626 000404          BR      2S
3872 022630 005741          1S) TST      -(R1)          ICHECK FOR TT OVERFLOW
3873 022632 001401          BEQ      ,+2          IBRANCH IF NO RAP AROUND
3874 022634 104002          TRACER          ITT OVERFLOW ERROR
3875 022636 005721          TST      (R1)+          IINC TO ENTRY
3876 022640 011127          2S) MOV      (R1),(PC)+          ISAVE ENTRY ONE
3877 022642 000000          SENRY1I 0          IHERE
3878 022644 023727 022642          CMP      @SENRY1,(PC)+          ICOMPARE SAVED ENTRY WITH
3879 022650 000000          ENTRY1I 0          IEXPECTED ENTRY
3880 022652 001407          BEQ      IS          IBRANCH IF DXDS ENTRY OK
3881 022654 013737 022642 023016          MOV      @SENRY1,@TTWAS
3882 022662 013737 022650 023020          MOV      @ENTRY1,@TTSHOULD
3883 022670 104002          TRACER          IREPORT TT TRACE ERROR
3884 022672 005037 022650          1S) CLR      ENTRY1
3885 022676 005021          CLR      (R1)+          ICLEAR ENTRY AND ADVANCE POINTER
3886 022700 011127          MOV      (R1),(PC)+          ISAVE ENTRY TWO
3887
3888 022702 000000          SENRY2I 0          IHERE
3889 022704 023727 022702          CMP      @SENRY2,(PC)+          ICOMPARE SAVED ENTRY WITH
3890 022710 000000          ENTRY2I 0          IEXPECTED ENTRY
3891 022712 001411          TT,T0I  BEQ      2S          IBRANCH IF DXCA ENTRY OK
3892 022714 013737 022702 023016          MOV      @SENRY2,@TTWAS
3893 022722 013737 022710 023020          MOV      @ENTRY2,@TTSHOULD
3894 022730 104002          TRACER          IREPORT TT TRACE ERROR
3895 022732 005037 022710          CLR      ENTRY2
3896 022736 005021          2S) CLR      (R1)+          ICLEAR
3897 022740 022701 004000          CMP      @TST1,R1          ICHECK FOR SOFTWARE
3898 022744 001002          BNE      TT,T1          IBRANCH IF NO OVERFLOW
3899 022746 013701 001440          MOV      @TT,R1
3900 022752 005037 022762          TT,T1I  CLR      @IT,T2
3901 022756 117727 150366          MOV      @TTNDX,(PC)+          ISAVE TTNDX
3902 022762 000000          TT,T2I  0          IHERE

```


3903	022764	006337	022762		ASL	TT,T2	ISCALE MOD(2)	
3904	022770	003737	001440	022762	ADD	00TT,00TT,T2	IADD BASE OF TT TO INDEX	
3905	022776	123701	022762		CMFB	00TT,T2,R1	ICOMPARE TT POINTERS	
3906	023002	001401			BEG	,0	IBRANCH IF HARDWARE AND SOFTWARE TT POINTERS MATCH	
3907	023004	104002			TRACER		IREPORT TT TRACE ERROR	
3908	023006	010127			MOV	R1,(PC)+	ISAVE TT TRACE	
3909	023010	000000			TTRACEI	0	HERE	
3910	023012	012601			MOV	(SP)+,R1		
3911	023014	000207			RTS	PC	IRETURN	
3912	023016	000000			TTWAS:	0	IACTUAL CONTENTS OF TT	
3913	023020	000000			TTSHOULD:	0	IEXPECTED CONTENTS OF TT	
3914								
3915	023022	000002			SEL,XI	RTI		
3916								
3917								
3918								
3919	023024	042777	077777	156256	TRAIINT:	BIC	077777,0DXMO	IDESELECT
3920	023032	112777	000100	156402		MOVB	0SM,0DST	IRESPONSE TO TEST IO
3921	023040	113737	027452	022710	TI,01	MOVB	00DEV,00ENTRY2	ISECOND TT ENTRY = 0XCA
3922	023046	113737	027454	022711		MOVB	00XMO,00ENTRY2+1	I
3923	023054	113777	027454	156246		MOVB	00XMO,0CUCR	ILOAD COMMAND
3924	023062	113777	027452	156236		MOVB	00DEV,0CUAR	ILOAD COMMAND IN CUAR
3925	023070	052777	000100	156202		BIS	0INTEN,0DXCS	ISET INTERRUPT ENABLE
3926	023076	032777	000100	156174		BIT	0INTEN,0DXCS	IVERIFY SEV
3927	023104	001001				BNE	,04	IBRANCH IF NO ERROR CONDITION
3928	023106	104000				ERROR		IINTEN NOT SET
3929	023110	013777	001270	156150		MOV	00DXPRT,0DXIS	ILOAD INT STATUS
3930	023116	012777	022544	156140		MOV	0SEL,DONE,0DXIV	ILOAD INT VECTOR
3931	023124	000207				RTS	PC	
3932								
3933								
3934								
3935								
3936								
3937	023126							
3938	023126	053777	027452	156194		BIS	0DEV,0DXMO	IPUT DEVICE AORS ON OUT TAGS
3939	023134	052777	004000	156146		BIS	0AORS,0DXMO	Iraise AORS-OUT
3940	023142	052777	060000	156140		BIS	0HLDO,SELO,0DXMO	Iraise SELECT-OUT, HOLD-OUT
3941	023150	042777	004000	156132		BIC	0AORS,0DXMO	IREMOVE AORS-OUT
3942	023156	043777	027452	156124		BIC	0DEV,0DXMO	IREMOVE AORS
3943	023164	053777	027454	156116		BIS	0CMD,0DXMO	IPUT COMMAND ON OUT TAGS
3944	023172	052777	002000	156110		BIS	0CMD,0DXMO	Iraise CMD-OUT
3945	023200	043777	027454	156102		BIC	0CMD,0DXMO	IREMOVE CMD
3946	023206	042777	002000	156074		BIC	0C DO,0DXMO	IREMOVE CMD-OUT
3947	023214	105737	027454			TSYB	0CMD	ITEST FOR "TEST I/O" COMMAND
3948	023220	001403				BEG	FISS1	ICLEAR SELO,HLDO IF TIO CMD
3949	023222	105777	156114			TSYB	0BUSI	ITEST BUSI FOR ZERO STATUS
3950	023226	001403				BEG	FISS2	IDON'T CLEAR SELO,HLDO ON 0 STATUS
3951	023230	042777	060000	156092	FISS1:	BIC	0HLDO,SELO,0DXMO	ICLEAR SELO AND HLDO
3952	023236	052777	001000	156044	FISS2:	BIS	0SRVO,0DXMO	IRELEASE STATUS
3953	023244	042777	001000	156036		BIC	0SRVO,0DXMO	I
3954	023252	000207				RTS	PC	
3955								
3956								

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3957
3958 023254
3959 023254 053777 027452 155044
3960 023262 042777 000400 150036
3961 023270 053777 027452 150012
3962 023276 052777 004000 150004
3963 023304 052777 060000 153776
3964 023312 042777 004000 153770
3965 023320 043777 027452 153702
3966 023326 053777 027454 153754
3967 023334 052777 002000 153746
3968 023342 043777 027454 153740
3969 023350 042777 002000 153732
3970 023356 052777 001000 153724
3971 023364 042777 001000 153716
3972 023372 000207
3973
3974
3975
3976 023374 012527
3977 023376 000000
3978 023400 017727 155710
3979 023404 000000
3980 023406 042737 107777 023404
3981 023414 023737 023376 023404
3982 023422 001401
3983 023424 104000
3984 023426 000205
3985
3986
3987
3988 023430 017627 000000
3989 023434 000000
3990 023436 062716 000002
3991 023442 017727 155646
3992 023446 000000
3993 023450 042737 103777 023446
3994 023456 023737 023434 023446
3995 023464 001416
3996 023466 000004 023524
3997 023472 011627
3998 023474 000000
3999 023476 102737 000002 023474
4000 023504 010546
4001 023506 013705 023474
4002 023512 004737 032066
4003 023516 012605
4004 023520 104000
4005 023522 000207
4006 023524 050137 040510 042523
4007 023532 047440 020122 052123
4008 023540 052101 020105 051105
4009 023546 047522 020122 052101
4010 023554 020072 000

```

SEL.ISSI

```

RIS DEV,PCUAR ;PRESET COM/ADD REG DEV ADDRESS
BIC #4 0,PCUAR ;PARITY RESET
RIS DEV,POXMO ;PUT DEVICE ADRS ON OUT TAGS
BIS #ALRO,POXMO ;RAISE ADRS-OUT
RIS #HLDO,SELO,POXMO ;RAISE SELECT-OUT, HOLD-OUT
RIS #ALRO,POXMO ;REMOVE ADRS-OUT
BIC DEV,POXMO ;REMOVE ADRS
RIS CMH,POXMO ;PUT COMMAND ON OUT TAGS
BIS #CHDO,POXMO ;RAISE CMD-OUT
RIS CMH,POXMO ;REMOVE CMD
BIC #CHDO,POXMO ;REMOVE CMD-OUT
BIS #SRVD,POXMO ;RELEASE STATUS
BIC #SRVD,POXMO ;
RTS PC

```

CHKPHS, ROUTINE TO CHECK CONTROL BITS FOR CORRECT PHASE

```

CHKPHS: MOV (R5)+,(PC)+ ;SAVE EXPECTED PHASE
SPHS: 0 ;HERE
MOV #0XCB,(PC)+ ;SAVE CONTROL BITS
SCB: 0 ;HERE
BIC #103777,SCB ;CLEAR ALL BUT PHASE FLOPS
CMP SPHS,SCB ;COMPARE SAVED PHASE WITH EXPECTED
BEQ ,+4 ;BRANCH IF NO ERROR CONDITION
ERROR ;PHASE ERROR
RTS R5 ;RETURN

```

PHST, CHECK PHASE AND STATE CONTROL BITS

```

PHST: MOV #0(SP),(PC)+ ;SAVE EXPECTED PHASE AND STATE
SPHST: 0 ;HERE
ADD #2,SP ;INC RETURN PC
MOV #0XCB,(PC)+ ;SAVE CONTROL BITS
SCB1: 0 ;HERE
BIC #103777,SCB1 ;CLEAR ALL BUT PHASE & STATE
CMP SPHST,SCB1 ;EXPECTED VS ACTUAL
BEQ PHSTE ;EXIT IF OK
TYPE ,PHSTER
MOV #0SP,(PC)+ ;SAVE ERROR ORIGIN
PSYMP: 0 ;HERE
SUB #2,PSYMP ;
MOV TTY,-(SP) ;SAVE TTY
MOV PSYMP,TTY ;TYPE IN OCTAL
JSR PC,PRINTR ;TYPE LEADING ZERO'S
MOV (SP)+,TTY ;RESTORE TTY
ERROR
PHSTE: RTS PC ;RETURN
PHSTER: ,ASCIZ "PHASE OR STATE ERROR AT: "

```



```

4011          023560          .EVEN
4012          .ROUTINE TO ISSUE N MAINT. CLOCK PULSES
4013
4014 023560 012527          CLK1  MOV      (R5)+,(PC)+      ISAVE
4015 023562 000000          CLKC1 0          ICLOCK COUNT HERE
4016 023564 005737 023562          TST      CLKC          ITEST FOR ZERO COUNT
4017 023570 001435          BEQ      CLAE          IBRANCH IF COUNT EMPTY
4018 023572 032737 002000 177570          BIT      #BIT10,SHR          ITEST FOR SINGLE STEP
4019 023600 001423          BEQ      CLK1          IBRANCH IF AUTO CLOCK
4020 023602 000004 036257          TYPE     ,CRLF
4021 023606 010546          MOV      TTY,=(SP)      ISAVE TTY
4022 023610 010505          MOV      R5,TTY          ITYPE IN OCTAL
4023 023612 004737 032066          JSR      PC,PRINTR      ITYPE LEADING ZERO'S
4024 023616 012605          MOV      (SP)+,TTY      IRESTORE TTY
4025 023620 000004 036255          TYPE     ,SPACE
4026 023624 012737 000003 023646          MOV      #BPT,1S      IRESTORE BREAK POINT TRAP
4027 023632 012737 000240 032612          MOV      #NIP,0,UIR      ICODE FOR ODT RESTORE
4028 023640 012737 023640 032546          MOV      #1,0,ADR1      ITELL ODT BREAK LEGAL
4029 023646 000003          ISi     BPT          IBREAK TO ODT
4030 023650 052777 000001 159442          CLK11  BIS      #MCLKP,ODXES      IISSUE MAINT CLK PULSE
4031 023656 005337 023562          DEC      CLKC          IDEC CLOCK COUNT
4032 023662 001372          BNE     CLK1          ICONTINUE IF COUNT NOT ZERO
4033 023664 000205          CLKE1  RTS      R5          IRETURN
4034
4035          .ROUTINE TO FORCE DX INTO TIME STATE 1
4036
4037 023666 032777 004000 159420          TMS11  BIT      #TSSF,ODXCB      ICHECK TIME STATE
4038 023674 001010          BNE     1S          IBRANCH IF TS1
4039 023676 052777 000001 159414          BIS      #MCLKP,ODXES      IADVANCE TO TS1
4040 023704 032777 004000 159402          BIT      #TSSF,ODXCB      ITS1?
4041 023712 001001          BNE     ,+2          IBRANCH IF NO ERROR CONDITION
4042 023714 104000          ERROR
4043 023716 000207          ISi     RTS      PC          ITIME STATE MALFUNCTION
4044
4045
4046
4047          .ROUTINE TO COPY PARO BIT INTO CLKO
4048 023720 032777 000400 159362          COPAR01 BIT      #P1R0,ODXMO
4049 023726 001407          BEQ      1S
4050 023730 052737 001000 024174          BIS      #CLKO,#MIMAP
4051 023736 052737 001000 023764          BIS      #CLKO,#NOMI      INO MI MAP
4052 023744 000406          BR      JS
4053 023746 042737 001000 024174          ISi     BIC      #CLKO,#MIMAP
4054 023754 042737 001000 023764          BIC      #CLKO,#NOMI      ]
4055 023762 000207          JSi     RTS      PC
4056 023764 000000          NOMI1  0          IMASK TO SEE IF MI IS UNREADABLE
4057
4058          .ZEROTT, ROUTINE TO ZERO TUMBLE TABLE
4059
4060          ZEROTT1
4061 023766 010146          MOV      R1,=(SP)
4062 023770 010246          MOV      R2,=(SP)
4063 023772 013701 001440          MOV      TTY,R1
4064 023776 012702 000400          MOV      #2?6,,R2

```

4065 024002 005021
4066 024004 005302
4067 024006 001375
4068 024010 012602
4069 024012 012601
4070 024014 000207
4071
4072
4073
4074 024016
4075 024016 010146
4076 024020 010246
4077 024022 013701 001440
4078 024026 012702 000400
4079 024032 005721
4080 024034 001401
4081 024036 104000
4082 024040 005302
4083 024042 001373
4084 024044 012602
4085 024046 012601
4086 024050 000207
4087
4088
4089
4090
4091
4092
4093
4094
4095
4096 024052 027727 155210
4097 024056 000000
4098 024060 001401
4099 024062 104001
4100 024064 027727 155200
4101 024070 000000
4102 024072 001401
4103 024074 104001
4104 024076 027727 155170
4105 024102 000000
4106 024104 001401
4107 024106 104001
4108 024110 027727 155160
4109 024114 000000
4110 024116 001401
4111 024120 104001
4112 024122 027727 155150
4113 024126 000000
4114 024130 001401
4115 024132 104001
4116 024134 027727 155140
4117 024140 000000
4118 024142 001401

ZT711 CLR (R1)+
DEC R2
BNE ZT71
MOV (SP)+,R2
MOV (SP)+,R1
RTS PC

ITZERO, ROUTINE TO VERIFY TT ZERO

TTZERO1
MOV R1,=(SP)
MOV R2,=(SP)
MOV TT,R1
MOV #256,,R2
TT211 TST (R1)+
BEQ ,+4
ERROR
DEC R2
BNE TT211
MOV (SP)+,R2
MOV (SP)+,R1
RTS PC

IBRANCH IF NO ERROR CONDITION
ILLEGAL TT ENTRY

IROUTINE TO VERIFY THAT NO UNEXPECTED CHANGE
IHAS OCCURRED IN ANY REGISTER

IThis ROUTINE DOES NOT LOOK AT THE PHASE CONTROL OR
ITIME STATE FLIP FLOP SO THAT THIS ROUTINE
IMAY BE USED IN EITHER THE MAINTENANCE OF
IFREE RUNNING CLOCK MODE

CHKREGI CMP 0DXDS,(PC)+
DSKAPI 0
BEQ ,+4
MAPERR
CMP 0DXCA,(PC)+
CANAPI 0
BEQ ,+4
MAPERR
CMP 0DXCS,(PC)+
CSNAPI 0
BEQ ,+4
MAPERR
CMP 0DXOS,(PC)+
OSNAPI 0
BEQ ,+4
MAPERR
CMP 0DXBA,(PC)+
BANAPI 0
BEQ ,+4
MAPERR
CMP 0DXBC,(PC)+
BCNAPI 0
BEQ ,+4

ICOMPARE DXDS WITH
IDS MAP
IBRANCH IF NO ERROR
IREPORT MAP ERROR
ICOMPARE DXCA WITH
ICA MAP
IBRANCH IF NO ERROR
IREPORT MAP ERROR
ICOMPARE DXCS WITH
ICS MAP
IBRANCH IF NO ERROR
IREPORT MAP ERROR
ICOMPARE DXOS WITH
IOS MAP
IBRANCH IF NO ERROR
IREPORT MAP ERROR
ICOMPARE BUS ADRS WITH
IBUS ADRS MAP
IBRANCH IF NO ERROR
IREPORT MAP ERROR
ICOMPARE BYTE COUNT WITH
IBYTE COUNT MAP
IBRANCH IF NO ERROR


```

4119 024144 104001          MAPERR          ;REPORT MAP ERROR
4120 024146 027727 155130      CMP          0DXMO,(PC)+ ;COMPARE MAINTENANCE-OUT WITH
4121 024152 000000          NOMAP: 0          ;MAINTENANCE-OUT MAP
4122 024154 001401          BEQ          ,+4        ;BRANCH IF NO ERROR
4123 024156 104001          MAPERR          ;REPORT MAP ERROR
4124
4125 024160 023777 023764 155124      CMP          0#NOMI,0DXMI ;TEST FOR UNREADABILITY
4126 024166 001405          BEQ          CKRG1      ;BRANCH IF UNREADABLE
4127 024170 027727 155116      CMP          0D#MI,(PC)+ ;COMPARE MAINTENANCE-IN WITH
4128 024174 000000          MIMAP: 0          ;MAINTENANCE-IN MAP
4129 024176 001401          BEQ          ,+4        ;BRANCH IF NO ERROR
4130 024200 104001          MAPERR          ;REPORT MAP ERROR
4131 024202 017727 155106      CKRG1: MOV          0DXCB,(PC)+ ;SAVE DXCB
4132 024206 000000          SDXCB: 0          ;HERE
4133
4134          ;..... MOD APR 74 .....
4135 024210 053737 024342 024230      BIS          CBMAPS,CBMAP ;
4136          ;..... MOD APR 74 .....
4137 024216 042737 074000 024206      BIC          #PHS71,0#SDXCB ;CLEAR PHASE & STATE FLOPS
4138 024224 023727 024206      CMP          0#SDXCB,(PC)+ ;COMPARE SAVED DXCB - PHS71 WITH
4139 024230 000000          CBMAP: 0          ;CONTROL BIT MAP
4140 024232 001401          BEQ          ,+4        ;BRANCH IF NO ERROR
4141 024234 104001          MAPERR          ;REPORT MAP ERROR
4142 024236 017727 155096      MOV          0DXES,(PC)+ ;SAVE DX EXTRA SIGNAL
4143 024242 000000          SDXES: 0          ;HERE
4144 024244 023727 024242      CMP          0#SDXES,(PC)+ ;COMPARE SAVED ES WITH MAP
4145 024250 000000          ESMAP: 0          ;ES MAP
4146 024252 001401          BEQ          ,+4        ;BRANCH IF NO ERROR
4147 024254 104001          MAPERR          ;REPORT MAP ERROR
4148
4149 024256 032777 000002 155034      BIT          0MCLKEN,0DXES ;CHECK FOR MAINTENANCE MODE
4150 024264 001005          BNE          CKEND      ;BRANCH IF MAINT MODE
4151 024266 027727 155024      CMP          0D#NO,(PC)+ ;COMPARE NPR DATA WITH
4152 024272 000000          NOMAP: 0          ;NPR DATA MAP
4153 024274 001401          BEQ          ,+4        ;BRANCH IF NO ERROR
4154 024276 104001          MAPERR          ;REPORT MAP ERROR
4155
4156          ;..... MOD APR 74 .....
4157 024300 043737 024342 024230      CHKEND: BIC          CBMAPS,CBMAP ;
4158 024306 005037 024342          CLR          CBMAPS
4159 024312 000207          RTS          PC          ;RETURN
4160
4161 024314 024056          ;ADDRESS OF MAPS
4162 024316 024070          ADRDSH: DSHAP
4163 024320 024102          ADRCAM: CAMAP
4164 024322 024114          ADRCSM: CSHAP
4165 024324 024126          ADROSH: OSHAP
4166 024326 024140          ADRBAM: BAMAP
4167 024330 024152          ADRBCH: BCHAP
4168 024332 024174          ADRMOM: MOMAP
4169 024334 024230          ADRMIM: MIMAP
4170 024336 024272          ADRCBM: CBMAP
4171 024340 024250          ADRNOM: NOMAP
4172          ADRESH: ESMAP
          ;..... MOD APR 74 .....

```

```

4173
4174 024342 000000
4175
4176
4177
4178
4179 024344 042777 000002 154746 DXRES: BIC #MCLKEN,DXES ;CLEAR MAINT CLK
4180 024352 042777 000200 154720 BIC #DONE,DXCS ;CLEAR DONE & LOCKO
4181 024360 032777 000200 154712 BIT #DONE,DXCS ;VERIFY DONE CLEAR
4182 024366 001401 BEQ ,+3 ;BRANCH IF NO ERROR CONDITION
4183 024370 104000 ERROR ;DONE NOT ZERO
4184 024372 052777 000001 154700 BIS #DXFRS,DXCS ;ISSUE DX RESET
4185 024400 004737 023766 JSR PC-ZEMOYT ;CLEAR TY
4186 024404 004737 024402 JSR PC,RESMAP ;CLEAR REG MAP(EXCEPT OPLO)
4187 024410 052777 000010 154702 BIS #TINDIS,DXES ;SET TIMER DISABLE
4188 024416 004737 023720 JSR PC,COPARO ;COPY PARO INTO CLMO MAP
4189 024422 004737 024052 JSR PC,CHKREG ;VERIFY NO UNEXPECTED REG CHANGE
4190 024426 004737 024016 JSR PC,TTZERO ;VERIFY NO TY ENTRIES
4191 024432 013737 001440 023010 MOV #TT,TTRACE ;INIT SOFTWARE TY POINTER
4192 024440 105777 154704 TSTB #TTNDX ;VERIFY TTNDX ZERO
4193 024444 001401 BEQ ,+4 ;BRANCH IF NO ERROR CONDITION
4194 024446 104000 ERROR ;TTNDX NOT ZERO
4195 024450 005037 022650 CLR #ENTHY1
4196 024454 005037 022710 CLR #ENTHY2
4197 024460 000207 RTS PC
4198
4199
4200
4201
4202
4203
4204
4205
4206
4207
4208
4209 024462 005037 024056
4210 024466 005037 024070
4211 024472 005037 024102
4212 024476 053737 001430 024114
4213 024504 105037 024114
4214 024510 005037 024126
4215 024514 005037 024140
4216
4217 024520 012737 100000 024192
4218 024526 012737 000400 024174
4219
4220 024534 005037 024230
4221 024540 005037 024272
4222 024544 005037 024342
4223 024550 012737 000010 024290
4224 024556 000207
4225
4226

```

.REM *

THIS SUBROUTINE RESTORES THE TRACE MAP TO THE STATE THE REGISTERS SHOULD BE IN FOLLOWING A DX RESET,

```

*
;..... MOD APR 74 .....
; STORAGE REDUCTION MOD
;
RESMAP: CLR #DSMAP
CLR #ZMAP
CLR #YSMAP
BIS #SPH,OSMAP
CLRB #XISMAP
CLR #TAMAP
CLR #BCMAP
;..... MOD APR 74 .....
MOV #OPLO,#MOMAP
MOV #OPRI,#MINMAP
;..... MOD APR 74 .....
CLR #DCBMAP
CLR #IDMAP
CLR #CBCMAPS
MOV #TINDIS,#ESMAP
RTS PC

```



```

4227
4228
4229
4230
4231
4232      024560  104000
4233      024562  000002
4234
4235      024564  032777  000200  154506  INTR1  BIT      @DONE,@DXCS  ;TEST DONE
4236      024572  001001          BNE      ,+      ;BRANCH ON DONE
4237      024574  104000          ERROR
4238      024576  042777  000200  154474  BIC      @DONE,@DXCS  ;CLEAR INT CONDION
4239      024604  052737  100000  024614  BIS      @INTOK,INTPAS ;SET INT PASS FLAG
4240      024612  000002          RTI
4241
4242      024614  000000  INTPAS1  ;      ;INTERRUPT PASS FLAG
4243
4244
4245
4246
4247
4248      024616  032737  100000  024614  INTERR1 BIT      @INTOK,INTPAS ;DID INTERRUPT OCCUR
4249      024624  001405          BEQ      INT     ;BRANCH IF NOT
4250      024626  062716  000002          ADD      @2,@SP      ;INC RETURN PC
4251      024632  042737  100000  024614  BIC      @INTOK,INTPAS ;CLEAR PASS FLAG
4252      024640  000207          RTB      PC
4253
4254
4255
4256      024642
4257      024642  011646
4258      024644  162716  000002
4259      024650  017616  000000
4260      024654  121627  000024
4261      024660  101401
4262      024662  104000
4263      024664  006116
4264      024666  042716  177001
4265      024672  062716  024704
4266      024676  017616  000000
4267      024702  000136
4268
4269
4270      024704
4271
4272      024704  000024
4273
4274
4275      024754  105777  154416
4276      024760  100014
4277      024762  017727  154412
4278      024766  000000
4279      024770  042737  000200  024766
4280      024776  123727  024766  000003

```

4281	025004	001002				BNE	SCOPEH		
4282	025006	000137	026214			JMP	00JON1,0		
4283	025012	032737	040000	177570	SCOPEH	BIT	0BIT14,SR		!TEST FOR SCOPE
4284	025020	001012				BNE	SCOPEH		!BRANCH IF SCOPE SELECTED
4285	025022	032737	004000	177570		BIT	0BIT11,SR		!TEST FOR ITERATIONS
4286	025030	001020				BNE	SCOPEA		!EXIT IF ITERATIONS INHIBITED
4287	025032	005237	029102			INC	SCOPEF		!INCREMENT ITERATION COUNT
4288	025036	023737	029102	029100		CMF	SCOPEF,ICOUNT		!TEST FOR COMPLETION OF ITERATIONS
4289	025044	001410				BEO	SCOPEG		!BRANCH IF COMPLETE
4290	025046	012737	177777	027444	SCOPEB	MOV	00I,ONESHOT		!SO YOU CAN SCOPE ON ONCE ONLY CODE
4291	025054	005726				TSY	(SP)+		!POP RETURN PC
4292	025056	012637	177776			MOV	(SP)+,PS		!RESTOR PROCESSOR STATUS
4293	025062	000177	000010			JMP	0RETURN		!
4294	025066	011637	029104		SCOPEG	MOV	0SP,RETURN		!SET UP SCOPE RETURN ADRS
4295	025072	005037	029102		SCOPEA	CLR	SCOPEF		!CLEAR ITERATION COUNT
4296	025076	000002				RTI			
4297	025100	000001			ICOUNT	1			!NUMBER OF REQUESTED ITERATIONS
4298	025102	000000			SCOPEF	0			!ITERATION COUNT
4299	025104	004000			RETURN	TSY1			!DEFAULT RETURN
4300	025106				TSYTABLE				!BEGINNING OF TABLE OF TEST ADDRESSES
4301		025206				,=,+100			!TEST ADDRESS LIST
4302									
4303									
4304									
4305									
4306	025206								
4307	025206	012737	177777	026072	T,MAPERR	MOV	00I,ERFLG		!FLAG THAT THIS IS MAP ERROR
4308	025214	000137	025356			JMP	00DEF		
4309	025220	000000			TERPC	0			!ORIGIN OF TRACE ERROR
4310					TUMBLE				!TABLE TRACE ERROR TRAP
4311					T,TRACER				
4312	025222	012737	177776	026072		MOV	002,ERFLG		
4313	025230	000004	036574			TYPE	,TRCM1		
4314	025234	010546				MOV	TTY,=(SP)		!SAVE TTY
4315	025236	013705	026126			MOV	ERVSTN,TTY		!TYPE ERTSTN IN OCTAL
4316	025242	004737	032076			JSR	X7,PRINTS		!AND SUPPRESS LEADING ZERO'S
4317	025246	012605				MOV	(SP)+,TTY		!RESTORE TTY
4318	025250	000004	036626			TYPE	,THCM		!TRACE ERROR AT
4319	025254	010546				MOV	TTY,=(SP)		!SAVE TTY
4320	025256	013705	025220			MOV	TERPC,TTY		!TYPE IN OCTAL
4321	025262	004737	032066			JSR	PC,PRINTR		!TYPE LEADING ZERO'S
4322	025266	012605				MOV	(SP)+,TTY		!RESTORE TTY
4323	025270	000004	036726			TYPE	,THC1		
4324	025274	010546				MOV	TTY,=(SP)		!SAVE TTY
4325	025276	013705	025016			MOV	TYHAS,TTY		!TYPE IN OCTAL
4326	025302	004737	032066			JSR	PC,PRINTR		!TYPE LEADING ZERO'S
4327	025306	012605				MOV	(SP)+,TTY		!RESTORE TTY
4328	025310	000004	036750			TYPE	,THC2		
4329	025314	010546				MOV	TTY,=(SP)		!SAVE TTY
4330	025316	013705	025020			MOV	TYSHOULD,TTY		!TYPE IN OCTAL
4331	025322	004737	032066			JSR	PC,PRINTR		!TYPE LEADING ZERO'S
4332	025326	012605				MOV	(SP)+,TTY		!RESTORE TTY
4333	025330	032701	000002			BIT	0BIT1,R1		!TEST FOR DXDS OR DXCA
4334	025334	001003				BNE	15		!BR IF DXCA

Address	OpCode	OpCode	OpCode	OpCode	Type	Comments
4335	025336	000004	036772		TYPE	,TTDS
4336	025342	000402			BR	25
4337	025344	000004	037017	151	TYPE	,TTCA
4338	025350			251		
4339	025350	000402			BR	DEF
4340						
4341						
4342						IENTRY POINT FOR MOST ERRORS
4343	025352					T,ERROR:
4344	025352	005037	026072		CLR	ERFLG
4345	025356	005237	026124		DEF1 INC	ERTCNT
4346	025362	010037	026130		MOV	R0,E,R0
4347	025366	010137	026132		MOV	R1,E,R1
4348	025372	010237	026134		MOV	R2,E,R2
4349	025376	010337	026136		MOV	R3,E,R3
4350	025402	010437	026140		MOV	R4,E,R4
4351	025406	010537	026142		MOV	R5,E,R5
4352	025412	032737	020000	177570	BIT	#BIT13,SR
4353	025420	001131			BNE	PERRPC
4354	025422	000004	036310		TYPE	,ERPC
4355	025426	011627			MOV	0SP,(PC)+
4356	025430	000000			ETMP01 0	
4357	025432	162737	000002	025430	SUB	#2,ETMP0
4358	025440	010546			MOV	TTY,=(SP)
4359	025442	013705	025430		MOV	00ETMP0,TTY
4360	025446	004737	032066		JSR	PC,PRINTR
4361	025452	012605			MOV	(SP)+,TTY
4362	025454	032737	010000	177570	BIT	#BIT12,SR
4363	025462	001110			BNE	PERRPC
4364	025464	022737	177776	026072	CMR	#2,ERFLG
4365	025472	001410			BEO	15
4366	025474	000004	036524		TYPE	,MSG35
4367	025500	010546			MOV	TTY,=(SP)
4368	025502	013705	026126		MOV	ER1STN,TTY
4369	025506	004737	032076		JSR	X7,PRINTS
4370	025512	012605			MOV	(SP)+,TTY
4371	025514	000004	036453		151 TYPE	,MSG26
4372	025520	042737	177400	024192	BIC	#1,7400,MOHAP
4373	025526	010546			MOV	TTY,=(SP)
4374	025530	013705	024152		MOV	MOHAP,TTY
4375	025534	004737	032066		JSR	PC,PRINTR
4376	025540	012605			MOV	(SP)+,TTY
4377						IREGISTER DUMP ROUTINE
4378						
4379	025542	005737	026072		TSY	ERFLG
4380	025546	001456			BEO	PERRPC
4381	025550	000004	036545		TYPE	,MSG36
4382	025554	016627	000004		MOV	4(SP),(PC)+
4383	025560	000000			ETMP11 0	
4384	025562	162737	000004	025500	SUB	#4,00ETMP1
4385	025570	010546			MOV	TTY,=(SP)
4386	025572	013705	025560		MOV	ETMP1,TTY
4387	025576	004737	032066		JSR	PC,PRINTR
4388	025602	012605			MOV	(SP)+,TTY

4389	025604	000004	036144		TYPE	,RDH	
4390	025610	012701	026074		MOV	#ADRA,R1	
4391	025614	012702	001274		MOV	#DXDS,R2	
4392	025620	012703	024314		MOV	#AURDSH,R3	
4393	025624	012137	025642		MOV	(R1)+,RDMP1	
4394	025630	027273	000000	000000	CMF	0(12),0(R3)	JCOMP MAP VS REGISTER
4395	025636	001416			BEO	RDMP2	IDUMP ONLY ON DISCREPANCY
4396	025640	000004			TYPE		
4397	025642	000000			RDMP11	0	
4398	025644	000004	036240		TYPE	,SPAC4	
4399	025650	017205	000000		MOV	0(12),TTY	IDUMP CONTENTS OF REGISTER
4400	025654	004737	032066		JSR	PC,PRINTR	
4401	025660	000004	036255		TYPE	,SPACE	
4402	025664	017305	000000		MOV	0(R3),TTY	IDUMP CONTENTS OF MAP
4403	025670	004737	032066		JSR	PC,PRINTR	
4404	025674	023233			RDMP21	CMF	0(R2)+,0(R3)+
4405	025676	020127	026122		CMF	R1 #ADRAE	JINC R2,R3
4406	025702	001350			BNE	RDMP2	
4407	025704	032737	100000	177570	PERRPC1	#HLTSH,SR	JTEST FOR HALT ON ERROR
4408	025712	001422			BEO	ERRLOP	JBRANCH IF NO HALT
4409	025714	032737	001000	177570	BIT	#BLT9,SR	JTEST FOR INHIBIT ODT
4410	025722	001415			BEO	25	JBR IF ODT NOT SELECTED
4411	025724	000004	036257		TYPE	,CRLF	
4412	025730	012737	000003	025752	MOV	#BPT,15	JRESTORE BREAK POINT TRAP
4413	025736	012737	000240	032612	MOV	#NYP,0,UIN	JCODE FOR ODT RESTORE
4414	025744	012737	025752	032546	MOV	#10,0,ADR1	JTELL ODT BREAK LEGAL
4415	025752	000003			15i	BPT	
4416	025754	000401			BR	ERRLOP	JBREAK TO ODT
4417							
4418							
4419							
4420							
4421							
4422							
4423							
4424							
4425							
4426							
4427							
4428							
4429							
4430							
4431							
4432							
4433							
4434							
4435							
4436							
4437	025756	000000			25i	HALT	JHALT ON ERROR
4438							
4439							
4440	025760				ERRLOP1		
4441	025760	013700	026130		MOV	E,R0,H0	JRESTORE R0
4442	025764	013701	026132		MOV	E,R1,H1	JRESTORE R1


```

4443 025770 013702 026134      MOV      E,R2,R2      JRESTORE R2
4444 025774 013703 026136      MOV      E,R3,R3      JRESTORE R3
4445 026000 013704 026140      MOV      E,R4,R4      JRESTORE R4
4446 026004 013705 026142      MOV      E,R5,R5      JRESTORE R5
4447 026010 032737 040000 177570    BIT      @LOPSW,SR     JTEST FOR SCOPE LOOP
4448 026016 001424                BEQ      EX,R1
4449 026020 012706 001100      MOV      @BEGIN,SP    JREINIT STACK POINTER
4450 026024 012737 177777 027444    MOV      @=,ONESHOT   JREINIT ONESHOT TEST FLAGS
4451 026032 042777 000002 153200    BIC      @MELKEN,@DXES JCLEAR MAINT CLOCK
4452 026040 005077 153244      CLR      @DXMO        JSYSTEM RESET
4453 026044 052777 000001 153226    BIS      @DXFRS,@DXCS JDX RESET
4454 026052 004737 030710      JSR      PC,PREI      JREINITIALIZE DX
4455 026056 013737 001272 177776    MOV      LESS1,PS     JDX PRIORITY MINUS ONE
4456 026064 000177 177014      JMP      @RRTURN
4457
4458 026070 000002      EXPR1: RTI
4459 026072 000000      ERFLG: 0          JERROR CONTROL FLAG #1=MAP ERROR
4460
4461
4462 026074 036329      ADRAI  ADXDS
4463 026076 036334                ADXCA
4464 026100 036343                ADXCS
4465 026102 036352                ADXOS
4466 026104 036361                ADXBA
4467 026106 036370                ADXBC
4468 026110 036377                ADXMO
4469 026112 036406                ADXMI
4470 026114 036415                ADXCB
4471 026116 036424                ADXND
4472 026120 036433                ADXES
4473 026122 036442      ADRAE: ADXES1
4474
4475
4476
4477
4478
4479 026124 000000      JERROR COUNT
4480 026126 000000      ERRCNT: 0
4481
4482
4483
4484
4485 026130 000000      ERYSTN: 0          JTEST NUMBER
4486 026132 000000
4487 026134 000000
4488 026136 000000
4489 026140 000000
4490 026142 000000
4491
4492
4493
4494
4495 026144
4496

```

EXPR1: RTI
ERFLG: 0 JERROR CONTROL FLAG #1=MAP ERROR
JLIST OF ASCII MESSAGE ADDRESSES

ADRAI ADXDS
ADXCA
ADXCS
ADXOS
ADXBA
ADXBC
ADXMO
ADXMI
ADXCB
ADXND
ADXES
ADRAE: ADXES1

JERROR COUNT

ERRCNT: 0
ERYSTN: 0 JTEST NUMBER

JREGISTER STORAGE FOR ERROR REPORTING

E,R0: 0 JSAVED REGISTERS FOR ERROR REPORTING
E,R1: 0 JSAVED REGISTERS FOR ERROR REPORTING
E,R2: 0 JSAVED REGISTERS FOR ERROR REPORTING
E,R3: 0 JSAVED REGISTERS FOR ERROR REPORTING
E,R4: 0 JSAVED REGISTERS FOR ERROR REPORTING
E,R5: 0 JSAVED REGISTERS FOR ERROR REPORTING

.SBTTL MONITOR

J
MONITOR
J

```

4497
4498
4499
4500 026144 012706 001100          MOV  #BEGIN,SP      ISET UP STACK POINTER
4501 026150 012737 000340 177776    MOV  #LEVEL7,PS    IMONITOR AT LEVEL 7
4502 026156 004737 027756          JSR  PC,##MONDFLT  ISET UP DEFAULT PARAMETERS
4503
4504 026162 012737 032224 000000    MOV  #TTY1,##00    ITTY KEYBOARD INT VEC
4505 026170 012737 000200 000002    MOV  #LEVEL4,##02  ILEVEL 4
4506 026176 000004 030200          TYPE ,HOME        IHOME UP AND ERASE SCREEN
4507
4508 026202 000004 001030          HI   TYPE ,HEADER
4509 026206 012737 026330 026204    MOV  #RELOD,##H#2  IHEADER TEXT GETS WIPED BY NPRIS
4510
4511 026214 000005          MON1.01 RESET
4512 026216 005777 153150          TST  #TKB          ICLEAR FLAG
4513 026222 052777 000100 153146    BIS  #INTEN,#TKS   ISET INTERRUPT ENABLE
4514 026230 012706 001100          MOV  #BEGIN,SP    ISET UP STACK POINTER
4515 026234 012737 000340 177776    MOV  #LEVEL7,PS   IMONITOR AT LEVEL 7
4516 026242 000004 035020          TYPE ,FSTART
4517 026246 104006          KEY,TO,R0
4518 026250 122700 000104          CMPB #D,R0        ID = DEFAULT PARAMETERS
4519 026254 001003          BNE  15
4520 026256 004737 027756          JSR  PC,##MONDFLT
4521 026262 000403          BR   25
4522 026264 122700 000120          15i CMPB #IP,R0       IP = PREVIOUSLY SELECTED PARAMETERS
4523 026270 001002          BNE  35
4524 026272 000137 027034          25i JMP  ##MON10
4525 026276 122700 000123          35i CMPB #IS,R0       IS = GO THROUGH AND SELECT PARAMETERS
4526 026302 001426          BEQ  MON1
4527 026304 122700 000116          CMPB #IN,R0       IN = START AT THIS TEST #
4528 026310 001341          BNE  MON1,0
4529 026312 000004 035076          TYPE ,MSG5
4530 026316 104005          ACCEPT0
4531 026320 013737 027470 027472    MOV  OCTNUM,FIRST,TST
4532 026326 000761          BR   25
4533
4534 026330 051137 046105 040517    RELODI ,ASCIZ "RELOAD FOR HEADER TEXT"
4535 026336 020104 047506 020122
4536 026344 042510 042101 051105
4537 026352 052040 054105 000124
4538
4539          ,EVEN
4540          ISET UP TEST PARAMETERS
4541 026360 004737 027756          MON1I JSR  PC,MONDFLT   ISET UP DEFAULT PARAMETERS
4542 026364 000004 035076          TYPE ,MSG5       IFIRST TEST #
4543
4544 026370 104005          ACCEPT0 IACCEPT TEST NUMBER FROM KEYBOARD
4545
4546
4547 026372 005737 027470          TST  OCTNUM       ITEST FOR DEFAULT
4548 026376 001403          BEQ  MON3         IBRANCH ON DEFAULT
4549 026400 013737 027470 027472    MOV  OCTNUM,FIRST,TST ILOAD FIRST TEST #
4550

```



```

4551 026406 000004 035634 MON3I TYPE ,MSG2 ;BASE ADDRESSI
4552
4553
4554 026412 104005 ACCEPTO ;ACCEPT BASE ADDRESS FROM KEYBOARD
4555
4556 026414 005737 027470 TST OCTNUM ;TEST FOR DEFAULT
4557 026420 001403 BEQ MON4 ;BRANCH IF DEFAULT
4558 026422 013737 027470 001202 MOV OCTNUM,DXBASE ;LOAD NON-DEFAULT ADDRESS
4559
4560 026430 000004 036470 MON4I TYPE ,MSG20 ;ACCEPT INTERRUPT VECTOR
4561 026434 104005 ACCEPTO
4562 026436 005737 027470 TST OCTNUM ;TEST FOR DEFAULT
4563 026442 001411 BEQ MON4,1 ;BRANCH IF DEFAULT
4564 026444 013737 027470 001204 MOV OCTNUM,DXIV ;LOAD NON-DEFAULT INT VECTOR ADRS
4565 026452 002737 000002 027470 ADD #2,0OCTNUM ;FORM INT STATUS ADRS
4566 026460 013737 027470 001206 MOV #OCTNUM,#DXIS ;INT STATUS ADDRESS
4567
4568
4569 026466 000004 036101 MON4,1I TYPE ,MSG12 ;PRIORITY
4570 026472 104005 ACCEPTO ;ACCEPT DX PRIORITY LEVEL
4571 026474 005737 027470 TST OCTNUM ;TEST FOR DEFAULT
4572 026500 001425 BEQ MON6 ;BRANCH ON DEFAULT
4573 026502 006337 027470 ASL OCTNUM ;SHIFT PRIORITY
4574 026506 006337 027470 ASL OCTNUM ;INTO PROCESSOR
4575 026512 006337 027470 ASL OCTNUM ;PRIORITY BITS OF
4576 026516 006337 027470 ASL OCTNUM ;PROCESSOR STATUS WORD
4577 026522 006337 027470 ASL OCTNUM
4578 026526 013737 027470 001270 MOV OCTNUM,DXPRT ;LOAD PRIORITY
4579 026534 005337 027470 DEC OCTNUM
4580 026540 042737 000037 027470 BIC #37,0OCTNUM ;CLEAR TNZVC
4581 026546 013737 027470 001272 MOV OCTNUM,LESS1 ;PRIORITY TO ALLOW DX INTERRUPTS
4582
4583
4584
4585
4586
4587 026554 000004 035715 MON6I TYPE ,MSG4 ;LEGAL ADDRESS LIST
4588 026560 012703 027512 MOV #LEGAL,ADRS,R3 ;START OF LEGAL ADRS TABLE
4589 026564 000004 036007 MON7I TYPE ,MSG6 ;ADRSI
4590 026570 004737 031202 JSR PC,GETHEX ;GET HEXADECIMAL CU ADDRESS
4591 026574 104007 031410 PARITY ,HEXNUM ;PUT PARITY (ODD) ON ADRS
4592 026600 013723 031410 MOV HEXNUM,(R3)+ ;SAVE LEGAL ADDRESS
4593 026604 104006 KEY,TO,R0
4594 026606 122700 000015 CMPB #CR,R0 ;ALL DONE?
4595 026612 001364 BNE MON7 ;CONTINUE LIST IF NOT <CR>
4596
4597
4598
4599
4600 026614 013727 031410 MOV HEXNUM,(PC)+
4601 026620 000000 VLUHEX10
4602 026622 042737 000400 026620 BIC #400,VLUHEX
4603 026630 023727 026620 000376 CMP VLUHEX,#376 ;TEST FOR > FF
4604 026636 003403 BLE 15 ;(OK) BRANCHES

```

IGENERATE A LIST OF LEGAL ADDRESSES

..... MOD APR 74

ADDRESS RESPONSE MOD

4605 026640 000004 036126
 4606 026644 000747
 4607 026646 012723 177777
 4608
 4609
 4610
 4611
 4612
 4613
 4614 026652 000004 035654
 4615 026656 104005
 4616 026660 005737 027470
 4617 026664 001003
 4618 026666 000004 036126
 4619 026672 000767
 4620
 4621 026674 013727 027470
 4622 026700 000000
 4623 026702 005337 026700
 4624 026706 013727 026620
 4625 026712 000000
 4626 026714 063737 026700 026712
 4627 026722 105137 026712
 4628 026726 042737 177400 026712
 4629
 4630
 4631
 4632 026734 013737 027470 027474
 4633 026742 004737 030602
 4634
 4635
 4636
 4637
 4638
 4639
 4640
 4641
 4642
 4643
 4644
 4645
 4646
 4647 026746 012704 027736
 4648 026752 012703 027676
 4649 026756 000004 036036
 4650 026762 000004 036067
 4651 026766 104005
 4652 026770 005737 027470
 4653 026774 001417
 4654 026776 104007 027470
 4655 027002 013723 027470
 4656 027006 000004 036512
 4657 027012 104005
 4658 027014 113724 027470

```

TYPE, MSG13          ;OUTPUT " ILLEGAL ?" I.E. > "FF"
BR MON7              ;TRY AGAIN
151 MOV #0,(R3)+     ;MARK END OF LIST
;..... MOD APR 74 .....
;..... #DEV/CU MOD .....

;SET UP MAXIMUM NUMBER OF DEVICES PER CONTROL UNIT
;THIS INFORMATION DETERMINES WHAT THE SPW TABLE LOOKS LIKE
MON51 TYPE ,MSG3      ;MAX # DEVICES/CU
ACCEPTO ;ACCEPT NUMBER OF DEVICES/CU
TST OCYNUM           ;USE 16 ON DEFAULT
BNE X1
TYPE, MSG13          ;OUTPUT " ILLEGAL ?" I.E. = "00"
BR MON9              ;TRY AGAIN

X151 MOV OCYNUM,(PC)+
RDXX1 2
DEC RDXX             ;RANGE MODULO 1
MOV VLUHEX,(PC)+
MDXX1 8
ADD RDXX,MDXX       ;RANGE MASK
COMB MDXX            ;SCALE
BIC #17400,MDXX     ;FORM FINAL
;CU PORTION CLR

;..... MOD APR 74 .....
;
MON5,11 JSR OCYNUM,MAX,DEV,CU ;CHECK FOR LEGAL NUMBER OF DEV PER CU
PC,CKGUA

;GET COMMAND LIST
.REM *

THIS ROUTINE ACCEPTS AN IBM COMMAND LIST FROM THE CONSOL; ALL
COMMANDS MUST BE NON ZERO (I.E; Y10 MUST BE TYPED WITH PARITY
400), WITH EACH COMMAND THE MONITOR ASKS FOR ITS ASSOCIATED DST
STATUS;
*

MON81 MOV #CMD,STAT,R4
MOV #CMD,ADRS,R3
TYPE ,MSG9          ;LEGAL CMD LIST
MON91 TYPE ,MSG10   ;CMD1
ACCEPTO ;ACCEPT LEGAL COMMANDS FROM KEYBOARD
TST OCYNUM
BEQ MON10
PARITY ,OCYNUM
MOV OCYNUM,(R3)+
TYPE ,MSG31        ;"STATUS1"
ACCEPTO
MOVB OCYNUM,(R4)+
    
```



```

4659 027020 104006
4660 027022 120027 000015
4661 027026 001355
4662 027030 012723 177777
4663
4664
4665
4666
4667 027034
4668 027034 012737 177777 027444
4669 027042 005037 020124
4670 027046 000004 030017
4671 027052 104006
4672 027054 122700 000003
4673 027060 001002
4674 027062 000137 020214
4675
4676
4677
4678
4679 027066 113727 177570
4680 027072 000000
4681 027074 004737 030002
4682 027100 004737 030414
4683 027104 004737 030274
4684 027110 004737 030552
4685 027114 004737 030312
4686 027120 004737 031076
4687
4688 027124
4689 027124 012737 000001 027464
4690 027132 012737 027512 027460
4691 027140 117737 000314 027462
4692 027146 000460
4693
4694 027150 000004 030203
4695
4696 027154 002737 000001 027462
4697 027162 005237 027464
4698 027166 023737 027464 027474
4699 027174 003445
4700 027176 012737 000001 027464
4701 027204 027727 000250 177777
4702 027212 001030
4703
4704
4705
4706
4707
4708 027214 012777 000001 152096
4709
4710
4711
4712 027222 000004 030205

```

```

KEY,TO,RS
CMPB R07,0CH
BNE MON9
MOV #1,(R3)+ ILOAD TERMINATOR

```

TASK FOR DYNAMIC SWITCH SETTINGS ON CONSOL SWITCHES

MON101

```

MOV #1,ONESHOT
CLR ERRCNT
TYPE ,MSG7 ISET DYNAMIC SWITCHES
KEY,TO,RS ITYPE ANYTHING
CMPB #3,RP ITEST FOR CONTROL C
BNE MON11 IGO IF NO 0C
JMP #MON1,0

```

ISET UP TABLES

MON111

```

MOV SWR,(PC)+ ISAVE MODE CONTROL SWITCH SETTINGS
PARAI 0 IHERE
JSR PC,CKCUA ICMF ADRS VS MAX DEV PER CU
JSR PC,SPW,SETUP ISET UP STATUS POINTER WORDS
JSR PC,ITT,CLR ICLEAR TUMBLE TABLE
JSR PC,DSY,SETUP ISETUP DEVICE STATUS TABLE
JSR PC,ODAT ISET 360 SIM OUTPUT DATA FILE
JSR PC,REG,SETUP ISCALE ADDRESSES

```

LPCSUI

```

MOV #1,DEV CNT IINIT DEVICE COUNT
MOV #LEGAL,ADRS,ACUA IADRS OF CU ADRS
MOV #ACUA,CUADRS ICU ADDRESS
BR LPC1

```

LPENTLI

```

TYPE ,BELL
ADD #1,CUADRS I
INC DEV CNT IINC DEVICE COUNT
CMP DEV CNT,MAX,DEV,CU
BLE LPC1
MOV #1,DEV CNT IINIT DEVICE COUNT
CMP #ACUA,#-1
BNE LPC2

```

..... MOD APR 74

```

I*
I* OPLI TIMEOUT RESET MOD
I

```

```

MOV #1,DXCS IDX RESET OPLI

```

..... MOD APR 74

```

TYPE ,ENDTST

```

4713 027226 000004 036217
4714 027232 010546
4715 027234 013705 026124
4716 027240 004737 032066
4717 027244 012605

TYPE ;ECH
MOV ;TYL,=(SP)
MOV ;ERRCNT,TTY
JSR ;PC;PRINTR
MOV ;(SP)+,TTY

ERROR COUNT MESSAGE
;SAVE TTY
;TYPE IN OCTAL
;TYPE LEADING ZERO'S
;RESTORE TTY

THE FOLLOWING CODE IS FOR INTERFACE WITH DDP AND ACT11

4721 027246 013700 000042
4722 027252 001405
4723 027254 000005
4724 027256
4725 027256 004710
4726 027260 000240
4727 027262 000240
4728 027264 000240
4729 027266 012737 027512 027400
4730 027274 017737 000160 027462
4731 027302 062737 000002 027460
4732 027310 104007 027462
4733 027314 013737 027462 027452
4734 027322 013737 027452 027456
4735 027330 023737 027464 027474
4736 027336 001404
4737 027340 062737 000001 027456
4738 027346 000403
4739 027350 162737 000001 027456
4740 027356 104007 027456

MOV 0042,R0 ;IF 42 = 0 REMAIN IN DX DIAGNOSTIC
BEQ LP15
RESET ;LINK TO DDP OR ACT11
LOGICAL1
JSR PC;R0
NOP
NOP
NOP
LPC51 MOV ;LEGAL,ADRS,ACUA
LPC21 MOV ;AQUA,CUADRS
LPC11 ADD ;21ACUA
PARITY ,CUADRS
MOV CU;DRS,DEV
MOV DEV,DEV,A ;MULTI THREAD
CMP DEV;CNT,MAX;DEV;CU
BEQ LP13
ADD 01/DEV,A
BR LPC4
LPC31 SUB ;10DEV,A
LPC41 PARITY ,DEV,A

4741
4742
4743 027362 004737 030710
4744 027366 012777 024560 151670
4745 027374 013777 001270 151604
4746 027402 013700 027472
4747 027406 001002
4748 027410 005237 027472
4749 027414 013737 027472 026126
4750 027422 006300
4751 027424 010037 025104 025104
4752 027432 062737 000024 025104
4753 027440 000170 025104

MON121 JSR PC;PRE1 ;DO PRE INIT
MOV ;FALSE,0DXIV ;SET UP FALSE INTERRUPT VECTOR TRAP
MOV DXPRT,0DXIS ;SET UP INTERRUPT PRIORITY
MOV FIRST,TST,R0 ;TEST FOR DEFAULT
BNE MON13 ;BRANCH IF NOT DEFAULT
INC FIRST,TST ;DEFAULT TEST NUMBER IS ONE
MON131 MOV FIRST,TST,ERTSTN
ASL R0
MOV TSTABLE-2(R0),00RETURN
ADD 024,00RETURN
MON141 JMP 0TSTABLE-2(R0) ;JUMP TO SELECTED TEST

.SBTTL MONITOR FILES

ONE PASS FLAGS

4760
4761 027444 177777
4762 027446 000000
4763 027450 000000
4764 027452 000020
4765
4766 027454 000403

FIVESEC=1 ;5 SEC OPLI TIMER TEST
ONESHOT1 -1 ;ONE PASS FLAGS
CARRY1 0 ;CARRY COUNT
TMP1 0 ;TEMPORARY STORAGE
DEVI 20 ;DEVICE ADDRESS TO SELECT - MUST INCLUDE PARITY
 ;I I I, 441 IS DEV=1, CU=2)
CMD1 403 ;COMMAND TO PRESET - MUST INCLUDE PARITY

4767
4768
4769 027456 000421
4770
4771
4772 027460 000000
4773
4774
4775 027462 000000
4776 027464 000000
4777
4778 027466 002000
4779 027470 000000
4780 027472 000000
4781 027474 000000
4782
4783
4784
4785 027476 000777
4786 027500 000000
4787 027502 000000
4788 027504 000000
4789 027506 000000
4790 027510 000000
4791
4792
4793
4794
4795 027512
4796
4797 027512 000000
4798 027514 000000
4799 027516 000000
4800 027520 000000
4801 027522 000000
4802 027524 000000
4803 027526 000000
4804 027530 000000
4805 027532 000000
4806 027534 000000
4807 027536 000000
4808 027540 000000
4809 027542 000000
4810 027544 000000
4811 027546 000000
4812 027550 000000
4813 027552 000000
4814
4815 027554
4816
4817 027554 000000
4818 027556 000000
4819 027560 000000
4820 027562 000000

I (403 IS BASIC NOP COMMAND)
ISECOND DEVICE FOR DUAL TESTS
DEV, AI 421
ACUAI 0 IADRS OF CU ADRS
CUADRSI 0 ICU ADRS
DEVCONTI 0 IDEVICE COUNT
OFFSEI 2000 IOFFSET TO ADDRESS REGISTER
OCYNUMI 0 IOCTAL INPUT FROM TTY
FIRST, TSTI 0 IFIRST TEST TO RUN
MAX, DEV, CUI 0 IMAXIMUM # OF DEVICES/CU
IDIAGNOSTIC VARIABLES
SSYATI 777 ISAVED STATUS
SRCNTI 0 ISOURCE DATA
DSYCNTI 0 IDESTINATION DATA
SAVDEVI 0 ISAVED DEVICE ADDRESS
TSSFTI 0 ITSSF TRACE
COUNTI 0 IUSED BY CH SIM TO COUNT BYTES TRANSFERED
ILEGAL ADDRESS LIST
LEGAL, ADRSI
.WORD 0
.WORD 0
.WORD 0
.WORD 0
.WORD 0
.WORD 0
.WORD 0
.WORD 0
.WORD 0
.WORD 0
.WORD 0
.WORD 0
.WORD 0
.WORD 0
.WORD 0
.WORD 0
.WORD 0
.WORD 0
.WORD 0
.WORD 0
.WORD 0
.WORD 0
SCALD, ADRSI
.WORD 0
.WORD 0
.WORD 0
.WORD 0

4821 027564 000000
4822 027566 000000
4823 027573 000000
4824 027572 000000
4825 027574 000000
4826 027576 000000
4827 027600 000000
4828 027602 000000
4829 027604 000000
4830 027606 000000
4831 027610 000000
4832 027612 000000
4833 027614 000000

.WORD 0
.WORD 0
.WORD 0
.WORD 0
.WORD 0
.WORD 0
.WORD 0
.WORD 0
.WORD 0
.WORD 0
.WORD 0
.WORD 0
.WORD 0

ILIST OF DEFAULT COMMANDS

DFLT.COMD1

4834
4835
4836
4837
4838 027616
4839
4840 027616 000400
4841 027620 000001
4842 027622 000002
4843 027624 000403
4844 027626 000004
4845 027630 000405
4846 027632 177777
4847 027634 177777
4848 027636 177777
4849 027640 177777
4850 027642 177777
4851 027644 177777
4852 027646 177777
4853 027650 177777
4854 027652 177777
4855 027654 177777

TI0C
WRITEC
READC
NOPC
SENSEC
ILLC
-1
-1
-1
-1
-1
-1
-1
-1
-1
-1
-1
-1
-1

ITEST I/O COMMAND
IWRITE COMMAND
IREAD COMMAND
INOP COMMAND
ISENSE COMMAND
ILLGAL COMMAND
ILIST TERMINATOR
ILIST TERMINATOR
ILIST TERMINATOR
ILIST TERMINATOR
ILIST TERMINATOR
ILIST TERMINATOR
ILIST TERMINATOR
ILIST TERMINATOR
ILIST TERMINATOR
ILIST TERMINATOR
ILIST TERMINATOR

IDEFAULT STATUS LIST

DFLT.STAT1

4863 027656 000
4864 027656 000
4865 027659 000
4866 027660 000
4867 027661 014
4868 027662 000
4869 027663 002
4870 027664 002
4871 027665 002
4872 027666 002
4873 027667 002
4874 027670 002

.BYTE 0
.BYTE 0
.BYTE 0
.BYTE CEIDE
.BYTE 0
.BYTE UC
.BYTE UC
.BYTE UC
.BYTE UC
.BYTE UC
.BYTE UC

4875	027671	002	.BYTE	UC
4876	027672	002	.BYTE	UC
4877	027673	002	.BYTE	UC
4878	027674	002	.BYTE	UC
4879	027675	002	.BYTE	UC

4880
4881
4882
4883
4884

LIST OF LEGAL COMMANDS

4885 727676

CMD,ADRSI

4886				
4887	027676	000000	.WORD	0
4888	027700	000000	.WORD	0
4889	027702	000000	.WORD	0
4890	027704	000000	.WORD	0
4891	027706	000000	.WORD	0
4892	027710	000000	.WORD	0
4893	027712	000000	.WORD	0
4894	027714	000000	.WORD	0
4895	027716	000000	.WORD	0
4896	027720	000000	.WORD	0
4897	027722	000000	.WORD	0
4898	027724	000000	.WORD	0
4899	027726	000000	.WORD	0
4900	027730	000000	.WORD	0
4901	027732	000000	.WORD	0
4902	027734	000000	.WORD	0

4903
4904

COMMAND STATUS

4905

CMD,STATI

4906	027736			
4907				
4908	027736	000	.BYTE	0
4909	027737	000	.BYTE	0
4910	027740	000	.BYTE	0
4911	027741	000	.BYTE	0
4912	027742	000	.BYTE	0
4913	027743	000	.BYTE	0
4914	027744	000	.BYTE	0
4915	027745	000	.BYTE	0
4916	027746	000	.BYTE	0
4917	027747	000	.BYTE	0
4918	027750	000	.BYTE	0
4919	027751	000	.BYTE	0
4920	027752	000	.BYTE	0
4921	027753	000	.BYTE	0
4922	027754	000	.BYTE	0
4923	027755	000	.BYTE	0

4924
4925
4926
4927
4928

SET UP DEFAULT PARAMETERS

```

4929
4930 027756
4931 027756 005037 022650
4932 027762 005037 022710
4933 027766 013737 001440 023010
4934 027774 012737 176777 023764
4935 030002 012737 177777 027444
4936 030010 005037 027472
4937 030014 005037 026126
4938 030020 005037 026124
4939 030024 013737 030254 025104
4940 030032 013737 030256 001262
4941 030040 013737 030260 001264
4942 030046 013737 030272 001266
4943 030054 013737 030262 001270
4944 030062 013737 030264 027474
4945 030070 013737 030270 027496
4946 030076 013737 030266 027512
4947 030104 012737 177777 027514
4948 030112 012737 032400 001442
4949 030120 012700 027616
4950 030124 012701 027676
4951
4952 030130 012021
4953 030132 022710 177777
4954 030136 001374
4955 030140 012721 177777
4956 030144 012727 000020
4957 030150 000000
4958 030152 012700 027656
4959 030156 012701 027736
4960 030162 112021
4961 030164 005337 030150
4962 030170 001374
4963
4964 030172 013737 027466 001436
4965 030200 013737 027466 001440
4966 030206 062737 001000 001440
4967 030214 005004
4968 030216 012700 035616
4969 030222 020427 000020
4970 030226 101011
4971 030230 010004 032546
4972 030234 012764 000003 032612
4973 030242 005004 032570
4974 030246 005724
4975 030250 000764
4976 030252 000207
4977
4978
4979 030254 004000
4980 030256 176200
4981 030260 000300
4982 030262 000200

```

```

MONDFLT1
CLR 00ENTHY1 ;TT TRACE ENRV1
CLR 00ENTHY2 ;TT TRACE ENRV2
MOV 00TT,00TTTRACE ;INIT TT TRACE
MOV #176777,00NOM1 ;INI READABILITY MASK
MOV #0,00NESHOT ;ONE PASS FLAGS
CLR FIRST,TST ;DEFAULT TEST #
CLR ERSTN ;ERROR TEST NUMBER
CLR ERRCNT ;ERROR COUNT
MOV #0,FIRST,TST,00RETURN ;FIRST TEST
MOV #0,DXBASE,00DXBASE ;BASE ADDRESS
MOV #0,DXIV,00DXIV ;INT VECTOR ADRS
MOV #0,DXIS,00DXIS ;INT STATUS ADRS
MOV #0,DXPRY,00DXPRY ;PRIORITY LEVEL
MOV #0,MAX,DEV,CU,00MAX,DEV,CU ;MAX DEVICES
MOV #0,DEV,A,00DEV,A ;SECOND DEVICE
MOV #0,LEGAL,ADRS,00LEGAL,ADRS ;CU ADRS
MOV #0,LEGAL,ADRS+2
MOV #DSTADRS,00DST ;INIT DST ADRS
MOV #DFLT,CMD,R0 ;ADRS OF DEFAULT CMD LIST
MOV #CMD,ADRS,R1 ;ADRS OF LEGAL CMD LIST

MON21 MOV (R0)+,(R1)+ ;LOAD DEPAULT CMD LIST
CMP #0,00H0 ;TEST FOR TERMINATOR
BNE MON2
MOV #0,(R1)+ ;LOAD TERMINATOR
MOV #0,00(PC)+

MON2,01 MOV #DFLT,STAT,R0 ;DEFAULT STATUS
MOV #CMD,STAT,R1 ;STATUS FOR EACH COMMAND

MON2,11 MOVB (R1)+,(R1)+
DEC MON2,0
BNE MON2,1

MOV OFFSET,SPW ;LOAD ADRS OF SPW
MOV OFFSET,TT ;LOAD ADRS OF TT
ADD #1,00,TT ; " " " "
CLR R4
MOV #0,TRTC,R0
MON2,21 CMP R4,00,BKP+2 ;ALL DONE?
BHI MON2,3 ;JUMP IF YES
MOV R0,ADR1(R4) ;RESET BKP?
MOV #TRT,0,UI(R4) ;RESET CONTENTS OF TABLE
CLR 0,UT(R4) ;CLEAR COUNT
TST (R4)+ ;INCREMENT BY TWO
BR MON2,2

MON2,31 RTS PC
;DEFAULT PARAMETERS

D,FIRST,TST1 TS11 ;FIRST TEST
D,DXBASE1 176200 ;BASE ADDRESS
D,DXIV1 300 ;INT VECTOR ADRS
D,DXPRY1 LEVEL4 ;DX PRIORITY LEVEL

```


4983 F3F264 000020
4984 F3F266 000020
4985 F3F270 000421
4986 F3F272 000302

D,MAX,DEV,CU1 20
D,LEGAL,ADRS1 320
D,DEV,AI 420
D,OXISI 302

I MAX # DEVICES PER CU
I DEFAULT CU ADRS
I INT STATUS ADRS

4987
4988
4989
4990
4991
4992

.SBTTL MONITOR SUBROUTINES
ITT,CLR, CLEAR TUMBLE TABLE

4993
4994 F3F274
4995 F3F274 013701 001440
4996 F3F300 005021
4997 F3F302 020127 004000
4998 F3F306 001374
4999 F3F310 000207

TT,CLRI
CLRI MOV TT,R1
CLR (R1)+
CMP R1,ENDTT
BNE CL
RTS PC

I BOTTOM OF TT
I CLEAR TT
I TEST FOR END OF TT
I BRANCH IF NOT END

5000
5001
5002
5003
5004

IREINT OUTPUT DATA

5005 F3F312
5006 F3F312 010046
5007 F3F314 012600
5008 F3F316 000207

ODATI
MOV R0,= (SP)
MOV (SP)+,R0
RTS PC

5009
5010
5011
5012
5013
5014
5015
5016
5017
5018
5019
5020
5021
5022
5023
5024
5025
5026

5027 F3F320
5028 F3F320 017627 000000
5029 F3F324 000000
5030 F3F326 017727 177772
5031 F3F332 000000
5032 F3F334 005027
5033 F3F336 000000
5034
5035 F3F340 106337 030332
5036 F3F344 102002

T,PARITYI
SDAPG: 0
YDATI 0
PRTYI 0
PG2I ASLB YDAT
BVC PG2

I FETCH ADDRESS OF SOURCE DATA
I SOURCE DATA ADDRESS
I FLYCH SOURCE DATA
I SOURCE DATA

9237	030346	005137	030336	COM	PRTY		
9238							
9239	030352	106337	030332	PG31	ASLB	TDAT	
9240	030356	001370			BNE	PG2	
9241	030360	005737	030336		TST	PRTY	
9242	030364	100404			BMI	PG0	
9243	030366	052777	000400	177730	BIS	#PARC,#SDAPG	ISSET PARITY BIT
9244	030374	000403			BR	PG5	
9245	030376	042777	000400	177720	PG41	BIC	#PARC,#SDAPG
9246							ICLEAR PARITY BIT
9247	030404	062716	000002	PG51	ADD	#270SP	IADD 2 TO RETURN PC
9248	030410	000072			RTI		
9249							
9250							
9251							
9252							
9253							
9254	030412	177400		MARK1			
9255							
9256	030414			SPW.SETUP1			
9257	030414	012770	027512	MOV	#LEGAL,ADRS,R0		IFETCH ADRS OF LEGAL ADRS LINST
9258	030420	012701	027554	MOV	#SEALD,ADRS,R1		IFETCH ADRS OF SCALED LEGAL ADRS LIST
9259							
9260	030424	012011		SP'01	MOV	(R0)+,R1	IMAKE DUPLICATE ADRS LIST
9261	030426	043711	030412		BIC	MARK,R1	
9262							
9263	030432	006311					
9264	030434	063721	001436		ASL	R1	IMAKE INDX MOD(2)
9265	030440	021027	177777		ADD	SPW,(R1)+	IEQUALS REAL SPW ADRS
9266	030444	001367			CMF	R0,#=1	ITEST FOR TERMINATION
9267					BNE	SP'0	IFETCH NEXT ADRS
9268	030446	012721	177777		MOV	#=1,(R1)+	IMARK END OF SCALED ADRS LIST
9269							
9270	030452	013701	001436		MOV	SPW,R1	IADRS OF SPW
9271	030456	013702	001442		MOV	DST,R2	IADRS OF DST
9272	030462	012700	027554	SP'11	MOV	#SEALD,ADRS,R0	
9273	030466	020110		SP'21	CMF	R1,R0	IRUN THRU LIST
9274	030470	001407			BEG	SP,3	IBRANCH ON LEGAL ADRS
9275	030472	005720			TST	(R0)+	
9276	030474	022710	177777		CMF	#=1,R0	ITEST FOR END OF LIST
9277	030500	001372			BNE	SP,2	IBRANCH IF NOT ENT
9278	030502	012721	031400		MOV	#ERRDST,(R1)+	ILOAD SPW WITH ERROR DST ADRS
9279	030506	000407			BR	SP'0	
9280	030510	013727	027474	SP'31	MOV	MAX,DEV,CU,(PC)+	
9281	030514	000000		SP'41	B		
9282	030516	010221		SP'51	MOV	R2,(R1)+	
9283	030520	005337	030514		DEC	SP,4	
9284	030524	001374			BNE	SP,5	
9285	030526	020137	001440	SP'61	CMF	R1,TT	ITEST FOR END OF SPW
9286	030532	002753			RLT	SP,1	
9287	030534	001405			BEG	SP,7	
9288	030536	005726			TST	(SP)+	IPOP STACK
9289	030540	000004	030652		TYPE	,I3VN	
9290	030544	000137	020214		JMP	MON1,0	IGO BACK TO MONITOR


```

5291 030550 000207
5292
5293
5294
5295 030552
5296 030552 013701 001442
5297 030556 012727 000020
5298 030562 000000
5299 030564 012722 027736
5100 030570 112221
5101 030572 005337 030562
5102 030576 001374
5103 030600 000207
5104
5105
5106
5107
5108 030602 012700 027512
5109 030606 005027
5110 030610 000000
5111 030612 111037 030610
5112
5113
5114
5115
5116 030616 122737 000020 027474
5117
5118
5119
5120 030624 103005
5121 030626 000004 030652
5122 030632 012716 026052
5123 030636 000207
5124 030640 005720
5125 030642 021027 177777
5126 030646 001357
5127 030650 000207
5128 030652 044537 046114 043505
5129 030660 046101 021440 047440
5130 030666 020106 042504 044526
5131 030674 042503 020123 042520
5132 030702 020122 052503 000040
5133
5134
5135
5136
5137 030710 012737 031044 000004
5138 030716 012737 000340 000006
5139 030724 005077 150370
5140 030730 004737 031050
5141
5142
5143
5144 030734 004737 031042

```

```

SP,71 RTS PC
;DEVICE STATUS TABLE SETUP

DST.SETUPI
    MOV DST,R1
    MOV #1,(PC)+
DS,11 0
    MOV #CMD,STAT,R2
DS,21 MOV# (R2)+,(R1)+
    DEC DS,1
    BNE DS,2
    RTS PC

;SUBROUTINE TO CHECK THAT CU ADDRESS AND THE NUMBER OF DEVICES
;PER CU IS LEGAL

CKCUA1 MOV #LEGAL,ADRS,R0
CKC11 CLR (PC)+
CKC21 0
    MOV# #R0,#CKC2 ;FETCH CU ADDRESS
;..... MOD APR 74 .....
;
; ADDRESS RANGE MOD
;
CKC31 CMP# #20,#MAX,DEV,CU ;CHECK LIMIT 16.
;..... MOD APR 74 .....
;
    BHS CKC4 ;BRANCH IF WITHIN LIMITS
    TYPE ,IDVN ;ILLEGAL NUMBER OF DEVICES PER CU
    MOV #MON0,(SP) ;CHANGE RETURN PC
    RTS PC
CKC41 TST (R0)+
    CMP #R0,#=1
    BNE CKC1
    RTS PC
IDVN1 ,ASCIZ "=ILLEGAL # OF DEVICES PER CU ="

.EVEN

;PRE=INIT SUBROUTINE
PREI1 MOV #PREI0,4
    MOV #LEVEL7,6
    CLR #DXES ;CLEAR MAINT CLK
    JSR PC,RESRES ;DX RESET AND RESTORE
;THE FOLLOWING INSTRUCTION GET MODIFIED UPON THE COMPLETION
;OF THE SYSTEM RESET TEST,IF SCOPE PROBLEMS DEVELOP BEFORE THIS TEST
;PASSES THIS INST, CAN BE PATCHED TO A TRESET,NOP.
PREI,11 JSR PC,#NOCLR ;MODIFIED TO CLRMO

```

IS

```

5145 030740 005077 150334 CLR 0DXCS ICLK DONE, LOCKO
5146 030744 004737 031050 JSR PC, RESRES IDX RESEY AND RESTORE
5147 030750 013777 001436 150324 MOV SPW, 0UXOS
5148 030756 023777 001436 150316 CMP SPW, 0DXOS
5149 030764 001401 BEQ ,+2 IBRANCH IF NO ERROR CONDITION
5150 030766 104000 ERROR I
5151 030770 052777 000010 150322 BIS #TIMDIS, 0DXES ITIMER DISABLE
5152 030776 032777 000010 150314 BIT #TIMDIS, 0DXES
5153 031004 001001 BNE ,+2 IBRANCH IF NO ERROR CONDITION
5154 031006 104000 ERROR I
5155 031010 012737 000006 000004 MOV #074
5156 031016 012737 000000 000006 MOV #HALT, 6
5157 031024 004737 023766 JSR PC, ZEROTT IZERO TUMBLE TABLE
5158 031030 004737 024016 JSR PC, TTZERO IVERIFY TT ZERO
5159 031034 000207 RTS PC
5160
5161
5162
5163
5164
5165
5166 031036 005077 150246 CLRMOI CLR 0DXMO IDO SYSTEM RESEY
5167 031042 000207 NOCLR: RTS PC
5168
5169 031044 104000 PREITOI ERROR IPREINIT TIME OUT ERROR
5170
5171
5172 031046 000002 RTI
5173
5174
5175 IDX RESEY AND RESTORE ROUTINE
5176
5177
5178
5179
5180
5181
5182
5183
5184
5185
5186 031050 RESRESI
5187
5188 031050 042777 000200 150222 BIC #DONE, 0DXCS ICLEAR LOCKO
5189 031056 012777 000001 150214 MOV 0DXFRS, 0DXCS IDX RESEY
5190 031064 013737 001440 023010 MOV #074, TTRACE IRELOAD SOFT TT POINTER
5191 031072 000240 NOP IINSERT RESEY 1, 2, 5" HERE IF REQUIRED
5192 031074 000207 RTS PC
5193
5194
5195
5196
5197
5198 IREGISTER ADDRESS SETUP ROUTINE

```


5199						
5200	031076			REG,SETUP1		
5201	031076	013700	001262	MOV	DXBASE,R0	IFETCH BASE ADRS
5202	031102	012701	001274	MOV	0D0DS,R1	IFETCH ADRS OF DXDS ADRS
5203	031106	010021		RS',11	MOV	R0,(R1)+
5204	031110	002700	000002	ADD	#20R0	INC TO NEXT DX ADRS
5205	031114	020127	001320	CMP	R1,0DXES1+2	
5206	031120	001372		BNE	RS,1	
5207						
5208	031122	004537	031150	JSR	R5,SBYTE	IFETCH BYTE REF REG'S
5209						
5210	031126	001276		DXCA		
5211	031130	001326		CUAR		
5212						
5213	031132	001302		DXOS		
5214	031134	001332		CUSR		
5215						
5216	031136	001310		DXMO		
5217	031140	001336		BUS0		
5218						
5219	031142	001312		DXM1		
5220	031144	001342		BUS1		
5221						
5222	031146	001320		DXES		
5223	031150	001346		MISC		
5224						
5225	031152	177777		=1		
5226						
5227	031154	000207		RTS	PC	
5228						
5229	031156			SBYTE1		
5230	031156	012500		MOV	(R5)+,R0	
5231	031160	012501		MOV	(R5)+,R1	
5232	031162	011021		MOV	0R0,(R1)+	
5233	031164	011011		MOV	0R1,0R1	
5234	031166	005221		INC	(R1)+	
5235	031170	021527	177777	CMP	0R0,#=1	
5236	031174	001370		BNE	SBYTE	
5237	031176	005725		TSF	(R)+	IPOP OVER TERMINATOR
5238	031200	000205		RTS	R5	
5239						
5240						
5241						
5242				IACCEPT HEX NUMBER FROM TTY		
5243	031202	005037	031410	GETHEX1	CLR	HEXNUM
5244	031206	010246		MOV	R2,=(SP)	ICLEAR HEXADECIMAL NUMBER LOCATION
5245	031210	010146		MOV	R1,=(SP)	ISAVE R2
5246	031212	010046		MOV	R0,=(SP)	ISAVE R1
5247	031214	005001		ACPTH1	CLR	R1
5248	031216	104000		ACPTH',11	KEY,TO,R0	IFETCH AN ASCII CHAR FROM KEYBOARD
5249	031220	120027	000003	CMPB	R0,03	ICONTROL C?
5250	031224	001002		BNE	AH,2	
5251	031226	000137	026214	JMP	00MON1,0	
5252	031232	122700	000177	AH',21	CMPB	#1,7,R0
						ITEST FOR RUBOUT

5253	031236	001424			BEQ	RUBOUM	
5254	031240	122700	000015		CHPB	#17,R0	JTEST FOR <CR>
5255	031244	001424			BEQ	CARGH	
5256	031246	120027	000040		CHPB	R07#40	JEXIT IF SPACE
5257	031252	001421			BEQ	CARGH	
5258	031254	120027	000000		CHPB	R01#0	JTEST FOR VALID HEX NUMBER
5259	031260	002413			BLT	RUBOUM	
5260	031262	120027	000071		CHPB	R0,8'9	
5261	031266	003021			BGT	AHEX	
5262	031270	042700	177760	AH,31	BIC	#177760,R0	JCONVERT ASCII TO HEX
5263	031274	006301			ASL	R1	
5264	031276	006301			ASL	R1	
5265	031300	006301			ASL	R1	
5266	031302	006301			ASL	R1	
5267	031304	050001			BIS	R0,R1	JCHALK'M UP
5268	031306	000743			BR	ACPTH,1	JFETCH NEXT CHAR
5269							
5270	031310	000004	036243	RUBOUMI	TYPE	,,QUES	JTYPE?
5271	031314	000737			BR	ACPTH	
5272	031316	010137	031410	CARGH:	MOV	R1,HEXNUM	JPLACE HEX NUMBER HERE
5273	031322	012600			MOV	(SP)+,R0	JRESTORE R0
5274	031324	012601			MOV	(SP)+,R1	JRESTOR R1
5275	031326	012602			MOV	(SP)+,R2	JRESTORE R2
5276	031330	000207			RTS	PC	
5277							
5278	031332	005002		AHEX1	CLR	R2	
5279	031334	120062	031412	AHEX0:	CHPB	R0,ATBL(R2)	JLOOK THRU ASCII TABLE
5280	031340	001406			BEQ	AHEX1	JBRANCH ON MATCH
5281	031342	005202			INC	R2	
5282	031344	126227	031412 000000		CHPB	ATBL(R2),#0	JLOOK FOR END OF TABLE
5283	031352	001370			BNE	AHEX0	JBRANCH IF NOT END
5284	031354	000755			BR	RUBOUM	JERROR ON NO MATCH
5285	031356	116200	031422	AHEX1:	MOVB	HTBL(R2),R0	JLOAD BINARY OF FIND
5286	031362	000742			BR	AH,3	
5287							
5288							
5289							
5290							
5291							
5292							
5293		031400					
5294							
5295							
5296							
5297	031400						
5298	031400	002					
5299	031401	002					
5300	031402	002					
5301	031403	002					
5302	031404	002					
5303	031405	002					
5304	031406	002					
5305	031407	002					
5306							

J..... MOD APR 74
 J
 ,#',1377+1
 J ILLEGAL OR MALFUNCTIONING CUAR ERROR STATUS TABLE MODULE 0
 ERRDSYI
 ,BYTE UC JUNIT CHECK ENTRIES
 ,BYTE UC JUNIT CHECK ENTRIES
 ,BYTE UC JUNIT CHECK ENTRIES
 ,BYTE UC JUNIT CHECK ENTRIES
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 ,BYTE UC JUNIT CHECK ENTRIES
 ,BYTE UC JUNIT CHECK ENTRIES
 ,BYTE UC JUNIT CHECK ENTRIES

Address	Hex	Octal	Hex	Hex	Code	Comments
5307	031410	000000			HEXNUM1 0	IHEX NUMBER
5308	031412	041101	042103	043105	ATBL1 ,ASCII 'ABCDEF'	
5309	031420	000000			,WORD 0	
5310	031422	012	013	014	HTBL1 ,BYTE 10',,11',,12',,13',,14',,15'	
5311	031425	015	016	017		
5312						
5313					IACCEPT OCTAL NUMBER FROM TTY	
5314	031430				T,ACCEPT01	
5315	031430	005037	027470		CLR OCTNUM	I CLEAR OCTAL NUMBER LOCATION
5316	031434	010146			MOV R1:=(SP)	ISAVE R1
5317	031436	010046			MOV R0:=(SP)	ISAVE R0
5318	031440	005001			ACPT01 CLR R1	I
5319	031442	104006			ACPT01,11 KEY,TO,R0	IFETCH AN ASCII CHAR FROM KEYBOARD
5320	031444	120027	000003		CMPB R0,03	ICONTROL C?
5321	031450	001002			BNE A0:2	
5322	031452	000137	026214		JMP 00MON1,0	
5323	031456	122700	000177		A0:21 CMPB #177,R0	ITEST FOR RUBOUT
5324	031462	001423			BEO RUBOUT	
5325	031464	122700	000015		CMPB #17,R0	ITEST FOR <CR>
5326	031470	001423			BEO CARG	
5327	031472	120027	000040		CMPB R0:040	IEXIT IF SPACE
5328	031476	001420			BEO CARG	
5329	031500	120027	000000		CMPB R0:00	ITEST FOR VALID OCTAL NUMBER
5330	031504	002412			BLT RUBOUT	
5331	031506	120027	000067		CMPB R0:07	
5332	031512	003007			BGT RUBOUT	
5333	031514	042700	177770		BIC #177770,R0	ICONVERT ASCII TO OCTAL
5334	031520	006301			ASL R1	
5335	031522	006301			ASL R1	
5336	031524	006301			ASL R1	
5337	031526	050001			BIS R0,R1	ICHALK'N UP
5338	031530	000744			BR ACPT0,1	IFETCH NEXT CHAR
5339						
5340	031532	000004	036243		RUBOUT1 TYPE , ,QUES	ITYPE?
5341	031536	000740			BR ACPT0	
5342	031540	010137	027470		CARG1 MOV R1,OCTNUM	IPLACE OCTAL NUMBER HERE
5343	031544	012600			MOV (SP)+,R0	IRESTORE R0
5344	031546	012601			MOV (SP)+,R1	IRESTOR R1
5345	031550	000002			RTI	IRETURN
5346						
5347					IFETCH AN ASCII CHARACTER FROM KEYBOARD	
5348						
5349	031552				T,KEY,TO,R01	
5350	031552	105777	147620		TSTB 0TKS	ITEST FOR DONE
5351	031556	100375			BPL ,03	IWAIT FOR KEYBOARD
5352	031560	117700	147614		MOVB 0TKB,R0	IFETCH CHAR
5353	031564	117777	147610	147612	MOVB 0TKB,0TPB	IECHO
5354	031572	004737	031604		JSR PC,TTYFLG	IWAIT FOR DONE
5355	031576	042700	177600		BIC #17600,R0	I7 BIT ASCII
5356	031602	000002			RTI	
5357					ITEST FOR TRANSMITTER DONE	
5358						
5359	031604				TTYFLG1	
5360	031604	105777	147572		281 TSTB 0TPS	

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5361 031610 100375          RPL      25
5362 031612 000207          RTS      PC
5363          ,SBTTL  TTY ASCII OUTPUT ROUTINE
5364
5365
5366 031614 032737 020000 177570 ,IOTE  BIT  #BIT13,SR      ;TEST FOR INHIBIT PRINT
5367 031622 001040          RNE      ,IOTE
5368 031624 010537 031732          MOV     TTY,,SAV      ;SAVE TTY
5369 031630 017605 000000          MOV     @(),TTY      ;GET ADDRESS TO BE TYPED
5370 031634 122715 000044 ,MORE:  CMPB   #' ',(TTY) ;TERMINATOR?
5371 031640 001425          BEQ     ,TERM
5372 031642 105715          TSTB   (TY)          ;TERMINATOR?
5373 031644 001423          BEQ     ,TERM
5374 031646 122715 000001          CMPB   #' '(TTY)    ;RESTORE OLD SEQUENCE
5375 031652 001416          BEQ     ,REST
5376 031654 122715 000137          CMPB   #' '(TTY)    ;SET UP CR LF
5377 031660 001420          BEQ     ,CRLF
5378 031662 105777 147514          TSTB   @TPS
5379 031666 100375          RPL     ,=
5380 031670 112577 147510          MOVB   (TTY)+,@TPB
5381 031674 000757          BR     ,MORE
5382 031676 005205          ,CRLF: INC    TTY
5383 031700 010546          MOV     TTY,@(6)
5384 031702 012725 031734          MOV     #,CAR,TTY
5385 031706 000752          BR     ,MIRE
5386 031710 012605          ,REST: MOV   (6)+,TTY
5387 031712 000750          BR     ,MORE
5388 031714 004737 031604          ,TERM: JSR   PC,TTYFLG ;WAIT FOR DONE
5389 031720 013705 031732          MOV     ,SAV,TTY
5390 031724 062716 000002          ,IOTE: ADD   @2(6) IPOP
5391 031730 000002          RTI
5392
5393 031732 000000          ,SAVI  0
5394 031734 005015 001002 001002 ,CARI  ,ASCII <CR><LF><2><2><2><2><2><2><1>
5395 031742 001002          001
5396 031746 031746          ,EVEN
5397 031746 000000          ,TYPE: 0
5398          ,SBTTL  SAVE AND RESTORE REGISTERS
5399          ;SAVE REGS 0 TO 4 SUBROUTINE,
5400 031750 012637 032006          T,SAVRCI MOV   (6)+,SVRPC      ;SAVE PC AND PSW,
5401 031754 012637 032010          MOV     (6)+,SVRPSW
5402 031760 010546          MOV     %5,=(6)
5403 031762 010446          MOV     %4,=(6) ;SAVE REGS 0 = 4
5404 031764 010346          MOV     %3,=(6) ;IN STACK,
5405 031766 010246          MOV     %2,=(6)
5406 031770 010146          MOV     %1,=(6)
5407 031772 010046          MOV     %0,=(6)
5408 031774 013746 032010          MOV     SVRPSW,=(6) ;RESTORE PC AND PSW,
5409 032000 013746 032006          MOV     SVRPC,=(6)
5410 032004 000002          RTI          ;EXIT,
5411 032006 000000          SVRPC: 0
5412 032010 000000          SVRPSW: 0
5413          ;RESTORE REGS 0 TO 4 SUBROUTINE,
5414 032012 012637 032050          T,RSTRCI MOV   (6)+,RSTPC      ;SAVE PC AND PSW,

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5415	032016	012637	032052		MOV	(6)+,RSTPSW	
5416	032022	012600			MOV	(6)+,X0	IRESTORE REGS 0 - 4
5417	032024	012601			MOV	(6)+,X1	IFROM STACK,
5418	032026	012602			MOV	(6)+,X2	
5419	032030	012603			MOV	(6)+,X3	
5420	032032	012604			MOV	(6)+,X4	
5421	032034	012605			MOV	(6)+,X5	
5422							
5423	032036	013746	032052		MOV	RSTPSW,(6)	IRESTORE PC AND PSW,
5424	032042	013746	032050		MOV	RSTPC,(6)	
5425	032046	000002			RTI		IEXIT
5426	032050	000000			RSTPC: 0		
5427	032052	000000			RSTPSW: 0		
5428					.SBTTL	OCTAL DUMP ROUTINE	
5429							
5430	032054	000000	000000	000000	PRINT2: .WORD	0,0,0,0	
5431	032062	000000					
5432	032064	000	000		PRINT3: .BYTE	0,0	
5433							
5434	032066	112737	000001	032064	PRINTR: MOVB	#1,PRINT3	ISET ZERO FILL SWITCH
5435	032074	000402			BR	,+2	
5436	032076	005037	032064		PRINTS: CLR	PRINT3	ISUPRESS LEADING ZERO'S
5437	032102	112737	177772	032065	MOVB	#0,PRINT3+1	ISET COUNT
5438	032110	032737	020000	177570	BIT	#BIT13,SR	
5439	032116	001041			BNE	PRTE	
5440	032120	010446			MOV	X4,(6)	ISAVE R4
5441	032122	012704	032054		MOV	#PRINT2,X4	ISET POINTER TO FIRST ASCII CHAR,
5442	032126	105014			CLRB	(4)	ICLEAR FIRST BYTE
5443	032130	000405			BR	PRINTF	IRotate FIRST BIT
5444	032132	105014			PRINTL: CLRB	(4)	ICLEAR BYTE OF CHARACTER
5445	032134	006105			ROL	TTY	IRotate BIT INTO C
5446	032136	106114			ROLB	(4)	IPACK IT
5447	032140	006105			ROL	TTY	IRotate BIT INTO C
5448	032142	106114			ROLB	(4)	IPACK IT
5449	032144	006105			PRINTF: ROL	TTY	IRotate BIT INTO C
5450	032146	106114			ROLB	(4)	IPACK IT
5451	032150	105714			TSTB	(4)	
5452	032152	001402			BEQ	,+6	
5453	032154	105237	032064		INCB	PRINT3	
5454	032160	105737	032064		TSTB	PRINT3	ICHECK FILL SWITCH
5455	032164	001402			BEQ	,+0	
5456	032166	152724	000060		BISB	#10,(4)+	IMAKE INTO ASCII CHAR
5457	032172	105237	032065		INCB	PRINT3+1	
5458	032176	001355			BNE	PRINTL	IREPEAT
5459	032200	022704	032054		CHP	#PRINT2,X4	
5460	032204	001002			BNE	,+0	
5461	032206	112724	000060		MOVB	#10,(4)+	
5462	032212	105014			CLRB	(4)	
5463	032214	000004	032054		TYPE	,PRINT2	ITYPE IT
5464	032220	012604			MOV	(6)+,X4	IRESTORE R5
5465	032222	000207			PRTE: RTS	X7	
5466					TTY WATCH DOG FOR CONTROL C		
5467		000003			CNTLC=3		IASCII CONTROL C
5468							

5469	032224	117727	147150	TTY11	MOVB	@TKB,(PC)+	ISAVE CHAR
5470	032230	000000		SCHAR1	0		HERE
5471	032232	042737	000200 032230		BIC	#200,@SCHAR	ISEVEN LEVEL ASCII
5472	032240	122737	000003 032230		CMFB	#CNTLC,@SCHAR	ICHECK FOR CONTROL C
5473	032246	001004			BNE	TTY10	
5474	032250	000004	032274		TYPE	,AULC	ITYPE CONTROL C
5475	032254	000137	026214		JMP	@MON1,0	
5476	032260	004737	031604	TTY101	JSR	PC,TTYPLG	
5477	032264	113777	032230 147112		MOVB	@SCHAR,@TPB	ECHO CHARACTER
5478	032272	000002			RTI		
5479							
5480	032274	041536	000	ACLC1	,ASCIZ	<130><103>	
5481		032300			,EVEN		
5482							
5483		032400			,=,1377+1		IFORM MOD(400) BOUNDRY
5484							
5485		032400		DSYADRS=,			IDEFAULT DST
5486							
5487	032400	000			,BYTE	0	ITIO
5488	032401	000			,BYTE	0	IWRITE
5489	032402	000			,BYTE	0	IREAD
5490	032403	014			,BYTE	CEIDE	INOP
5491	032404	000			,BYTE	0	ISENSE
5492							
5493	032405	002			,BYTE	UC	ILLEGAL ,UNIT CHECK
5494	032406	002			,BYTE	UC	ILLEGAL ,UNIT CHECK
5495	032407	002			,BYTE	UC	ILLEGAL ,UNIT CHECK
5496	032410	002			,BYTE	UC	ILLEGAL ,UNIT CHECK
5497	032411	002			,BYTE	UC	ILLEGAL ,UNIT CHECK
5498	032412	002			,BYTE	UC	ILLEGAL ,UNIT CHECK
5499	032413	002			,BYTE	UC	ILLEGAL ,UNIT CHECK
5500	032414	002			,BYTE	UC	ILLEGAL ,UNIT CHECK
5501	032415	002			,BYTE	UC	ILLEGAL ,UNIT CHECK
5502	032416	002			,BYTE	UC	ILLEGAL ,UNIT CHECK
5503		032420			,EVEN		
5504							
5505	032420			T,PCH11			
5506	032420	000012			,BLKW	10'	
5507							
5508	032444			T,PCH21			
5509	032444	000012			,BLKW	10'	
5510							
5511	032470			T,PCH31			
5512	032470	000012			,BLKW	10'	
5513							
5514					,SBTTL	ODY	
5515							
5516					I	ODY=11X = V006A	
5517							
5518					I	COPYRIGHT 1969,1970, DIGITAL EQUIPMENT CORPORATION	
5519							
5520		000000		R0	=	X0	I REGISTER
5521		000001		R1	=	X1	I NAMING
5522		000002		R2	=	X2	I CONVENTIONS

5523	000003	R3	=	X3		
5524	000004	R4	=	X4		
5525	000005	R5	=	X5		
5526	000006	SP	=	X6		
5527	000007	PC	=	X7		
5528	177776	ST	=	177776		STATUS REGISTER
5529	032514	O,TMP	=	.		
5530	032514	.	=	O,TMP		
5531						
5532	000016	O,BKP	=	16		NUMBER OF BREAKPOINTS*1 MULT. BY 2
5533	000014	O,TVEC	=	14		TRT VECTOR LOCATION
5534	000340	O,STM	=	340		PRIORITY MASK = STATUS REGISTER
5535	000020	O,TBT	=	20		BIT MASK = STATUS REGISTER
5536	000003	TRT	=	000003		TRT INSTRUCTION
5537						
5538						
5539	177562	O,RDB	=	177562		IR DATA BUFFER
5540	177560	O,RCSR	=	177560		IR C/SR
5541	177566	O,TDB	=	177566		IT DATA BUFFER
5542	177564	O,TCSR	=	177564		IT C/SR
5543) INITIALIZE ODT				
5544) USE O,ODT FOR A NORMAL ENTRY				
5545) USE O,ODT+2 TO RESTART ODT = WIPING OUT ALL BREAKPOINTS				
5546) USE O,ODT+4 TO RE-ENTER (I,E. = FAKE A BREAKPOINT)				
5547						
5548	032634	.	=	+120		SAVE ROOM FOR ODT STACK
5549						
5550	032634	012777	000010	146496	O,ODT:	MOV #TIMDIS,ODXES ;DISABLE TIMER
5551	032642	000421			BR	O,STRY ;NORMAL ENTRY
5552	032644	000425			BR	O,IST ;RESTART
5553	032646	013737	177776	032534	O,ENTR:	MOV ST,O,UST ;RE-ENTER :- SAVE STATUS
5554	032654	013737	000016	177776	MOV	O,TVEC+2,ST ;SET UP LOCAL STATUS
5555	032662	012737	032634	032532	MOV	#O,ODT,O,UPC ;FAKE THE PC
5556	032670	112737	177777	039593	MOVB	#1,O,P ;DISALLOW PROCEED
5557	032676	105037	035551		CLRB	O,S
5558	032702	000137	034534		JMP	O,BK1
5559						
5560	032706	012706	032514		O,STRY:	MOV #O,URB,SP ;SET UP STACK
5561	032712	010637	032530		MOV	SP,O,USP ;FAKE THE SAVED STACK
5562	032716	000413			BR	O,IST1
5563	032720	004037	035030		O,RST:	JSR O,U,SVR ;SAVE REGISTERS
5564	032724	004537	035244		JSR	S,O,REM ;REMOVE ALL BREAKPOINTS
5565	032730	113704	032536		MOVB	O,PRI,R4 ;GET ODT PRIORITY
5566	032734	106004			RORB	R4 ;SHIFT
5567	032736	106004			RORB	R4 ;INTO
5568	032740	106004			RORB	R4 ;POSITION
5569	032742	110437	177776		MOVB	R4,ST ;STORE IN STATUS
5570	032746	105037	035551		O,RST1:	CLRB O,S ;DISABLE SINGLE INSTRUCTION FOR NOW
5571	032752	112737	177777	039593	MOVB	#1,O,P ;DISALLOW PROCEED
5572	032760	012737	000340	000016	MOV	#O,STM,O,TVEC+2 ;STATUS WORD TO TRT VECTOR+2
5573	032766	012737	034516	000014	MOV	#O,BRK,O,TVEC ;PC TO TRT VECTOR
5574	032774	000137	033752		JMP	O,HALL ;CLEAR BREAKPOINT TABLES
5575						
5576						

5577
5578
5579
5580 033000 004537 035424
5581 033004 012704 035610
5582 033010 120024
5583 033012 001413
5584 033014 022704 035616
5585 033020 101373
5586 033022 042700 177770
5587 033026 010004
5588 033030 006304
5589 033032 062704 032514
5590 033036 005202
5591 033040 000471
5592 033042 162704 035601
5593 033046 000770
5594
5595
5596
5597 033050 004537 033124
5598 033054 061202
5599 033056 005202
5600 033060 005202
5601 033062 010237 035542
5602 033066 000137 033544
5603 033072 004537 033124
5604 033076 011202
5605 033100 000770
5606 033102 004537 033124
5607 033106 011201
5608 033110 110101
5609 033112 006301
5610 033114 005201
5611 033116 005201
5612 033120 060102
5613 033122 000757
5614 033124 004737 035462
5615 033130 022737 000002 035540
5616 033136 001003
5617 033140 013702 035542
5618 033144 000205
5619 033146 005726
5620 033150 000411
5621
5622
5623
5624 033152 005702
5625 033154 001003
5626 033156 105037 035551
5627 033162 000410
5628 033164 112737 177777 035551
5629 033172 000404
5630

! SPECIAL NAME HANDLER
! DEPENDS UPON THE EXPLICIT ORDER OF THE TWO TABLES O,TL AND O,UR0

O,REGT1 JSR 5,O,GET !SPECIAL NAME, GET ONE MORE CHARACTER
MOV #O,TL,R4 !TABLE START ADDRESS
O,RSP1 CMPB R0,(R4)+ !IS THIS THE CORRECT CHARACTER?
BEQ O,SP !JUMP IF YES
CMP #O,TL+O,LG,R4 !IS THE SEARCH DONE?
BHI O,RSP !BRANCH IF NOT
BIC #1,7770,R0 !MASK OFF OCTAL
MOV R0,R4

O,SP1: ASL R4
ADD #O,UR0,R4 !GENERATE ADDRESS
INC R2 !SET FOUND FLAG
BR O,SCAN !GO FIND NEXT CHARACTER

O,SP1 SUB #O,TL-7,R4 !GO FIND NEXT CHARACTER
BR O,SP1

! * HANDLER = OPEN INDEXED ON THE PC

O,ORPCI JSR 5,O,TCLS !TEST WORD MODE AND CLOSE
ADD #R2,R2 !COMPUTE
INC R2
INC R2 ! NEW ADDRESS
O,PCS: MOV R2,O,CAD !UPDATE CAD
JMP O,OP2A !GO FINISH UP

O,ORABI JSR 5,O,TCLS !TEST WORD MODE AND CLOSE
MOV #R2,R2 !GET ABSOLUTE ADDRESS
BR O,PCS

O,ORRBI JSR 5,O,TCLS !TEST AND CLOSE
MOV #R4,R1 !COMPUTE NEW ADDRESS
MOVB R1,R1 !EXTEND THE SIGN
ASL R1 !R2=2*(R2)
INC R1 ! *2
INC R1
ADD R1,R2 ! *PC
BR O,PCS

O,TCLSI JSR PC,O,CLSE !CLOSE CURRENT CELL
CMP #2,O,BW !ONLY WORD MODE ALLOWED
BNE O,TCL1 !BRANCH IF ERROR
MOV O,CAD,R2 !CURRENT ADDRESS IN R2
RTS R5

O,TCL1: TST (SP)+
BR O,ERR !POP A WORD AND SHOW THE ERROR

! PROCESS S @ SINGLE INSTRUCTION MODE

O,SGLI TST R2 !SEE IF TURN ON OR TURN OFF
BNE O,S11 !BRANCH IF TURNING IT ON
CLRB O,S !CLEAR THE FLAG
BR O,DCO !CONTINUE THE SCAN

O,S11: MOVB #1,O,S !SET THE FLAG
BR O,DCO

! COMMAND DECODER & OUT11X


```

5631
5632
5633
5634 733174 012700 000077
5635 733200 004537 735370
5636 733204 005037 035540
5637 733210 004537 735922
5638 733214 005003
5639 733216 005005
5640 733220 005004
5641 733222 005002
5642 733224 004537 035404
5643 733230 022700 000060
5644 733234 101013
5645 733236 022700 000067
5646 733242 103410
5647 733244 042700 177770
5648 733250 006304
5649 733252 006304
5650 733254 006304
5651 733256 000004
5652 733260 005202
5653 733262 000760
5654 733264 005001
5655 733266 120061 035565
5656 733272 001405
5657 733274 005201
5658 733276 020127 000023
5659 733302 103334
5660 733304 000770
5661 733306 006301
5662 733310 000171 033314
5663
5664 733314 033360
5665 733316 033370
5666 733320 033402
5667 733322 033464
5668 733324 033000
5669 733326 034310
5670 733330 033476
5671 733332 033050
5672 733334 033472
5673 733336 033624
5674 733340 034010
5675 733342 034124
5676 733344 034120
5677 733346 033646
5678 733350 034420
5679 733352 033072
5680 733354 033102
5681 733356 033152
5682 733360 026214
5683 000046
5684

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I ALL REGISTERS MAY BE USED (R0-R5),

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O,ERRI MOV #17,R0 I 7 TO BE TYPED
JSR 5,U,FTYP I OUTPUT ?
O,DCD1 CLR 0,BW ICLOSE ALL
JSR 5,U,CHLS ITYPE <CR><LF>
O,DCD2I CLR R3 IR3 IS A SAVE REGISTER FOR R2
CLR R5 IR5 IS A SAVE REGISTER FOR R4
O,DCD1I CLR R4 I R4 CONTAINS THE CONVERTED OCTAL
CLR R2 I R2 IS THE NUMBER FOUND FLAG
O,SCANI JSR 5,O,GET IGET A CHAR, RETURN IN R0
CMP #13,R0 ICOMPARE WITH ASCII 0
BHI 0,CLGL ICHECK LEGALITY IF NON-NUMERIC
CMP #17,R0 ICOMPARE WITH ASCII 7
BLO 0,CLGL ICHECK LEGALITY IF NOT OCTAL
BIC #177770,R0 ICONVERT TO BCD
ASL R4 I MAKE ROOM
ASL R4 I IN
ASL R4 I R4
ADD R0,R4 IPACK THREE BITS IN R4
INC R2 IR2 HAS NUMERIC FLAG
BR 0,SCAN I AND TRY AGAIN
O,CLGLI CLR R1 ICLEAR INDEX
O,LGL1I CMPB R0,0,LGCH(R1) IDO THE CODES MATCH?
BEQ 0,LGL2 IJUMP IF YES
INC R1 ISET INDEX FOR NEXT SEARCH
CMP R1,0,CLGT IIS THE SEARCH DONE?
BHS 0,ERR I OOPS!
BR 0,LGL1 IRE-LOOP
O,LGL2I ASL R1 IMULTIPLY BY TWO
JMP 00,LGDR(R1) IGO TO PROPER ROUTINE

O,LGDR I
O,WRD I / OPEN WORD
O,BYT I \ OPEN BYTE
O,CRET I CARRIAGE RETURN CLOSE
O,REGT I S REGISTER OPS
O,GO I G GO TO ADDRESS K
O,OP1 I <LF> MODIFY, CLOSE, OPEN NEXT
O,ORPC I * OPEN RELATED, INDEX * PC
O,OLD I < RETURN TO OLD SEQUENCE AND OPEN.
O,BACK I * OPEN PREVIOUS
O,OFST I O OFFSET
O,WSCH I W SEARCH WORD
O,EFF I E SEARCH EFFECTIVE ADDRESS
O,BKPT I B BREAKPOINTS
O,PROC I P PROCEED
O,ORAB I @ OPEN RELATED, ABSOLUTE
O,ORRB I > OPEN RELATED, REL, BRANCH
O,SNGL I S SINGLE INSTRUCTION MODE
MON1,0 IRETURN TO DIAGNOSTIC MONITOR
O,LGL = ,=0,LGDR ILG L MUST EQUAL 2X CHLGT ALWAYS

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5685										
5686										
5687	#33362	#102F3			0,SEMI1	MOV	R2,R3		IA SEMI-COLON HAS BEEN RECEIVED	
5688	#33364	#104F5				MOV	R4,R5		INUMERIC FLAG TO R3, CONTENTS TO R5	
5689	#33366	#00714				BR	0,UCD1		GO BACK FOR MORE	
5690										
5691										
5692										
5693	#33370	#12737	#00002	#35540	0,WRD1	MOV	#270,BW		IOPEN WORD	
5694	#33376	#00404				BR	0,WB1			
5695	#33400	#06104			0,BYT1	ROL	R4		IGET THE ADDRESS BACK	
5696	#33402	#12737	#00001	#35540	0,BYT1	MOV	#170,BW		IOPEN BYTE	
5697	#33410	#05702			0,WB1	TSY	R2		IGET VALUE IF R2 IS NON-ZERO	
5698	#33412	#01404				BEQ	0,WRD1		ISKIP OTHERWISE	
5699	#33414	#10437	#35544			MOV	R4,0,DOT		I PUT VALUE IN DOT	
5700	#33420	#10437	#35542			MOV	R4,0,CAD		I ALSO IN CAD	
5701	#33424	#22737	#00001	#35540	0,WRD1	CHP	#170,BW		ICHECK BYTE MODE	
5702	#33432	#01407				BEQ	0,WRD2		I JUMP IF BYTE	
5703	#33434	#13704	#35542			MOV	0,OAD,R4			
5704	#33440	#06204				ASR	R4		I MOVE ONE BIT TO CARRY	
5705	#33442	#03756				BCS	0,BYT1		I JUMP IF ODD ADDRESS	
5706	#33444	#17700	#00072			MOV	00,CAD,R0		I GET CONTENTS OF WORD	
5707	#33450	#00402				BR	0,WRD3			
5708	#33452	#17700	#00064		0,WRD2	MOVB	00,CAD,R0		I GET CONTENTS OF BYTE	
5709	#33456	#04537	#35276		0,WRD3	JSR	5,0,CADV		GO GET AND TYPE OUT CAD	
5710	#33462	#00654				BR	0,UCD2		GO BACK TO DECODER	
5711										
5712										
5713										
5714	#33464	#04737	#35462		0,CREY1	JSR	PC,0,CLSE		ICLOSE LOCATION	
5715	#33470	#00645			0,DCDA1	BR	0,DCD		IRETURN TO DECODER	
5716										
5717										
5718										
5719	#33472	#05237	#35556		0,OLD1	INCB	0,SEQ		ISET NEED 0,DOT TO 0,CAD MOVE	
5720	#33476	#05737	#35540		0,OP1	TSY	0,BW		IKLF> RECEIVED	
5721	#33502	#01634			0,ERR2	BEQ	0,ERR		IERHOR IF NOTHING IS OPEN	
5722	#33504	#04737	#35462			JSR	PC,0,CLSE		ICLOSE PRESENT CELL	
5723	#33510	#05737	#35556			TSYB	0,SEQ		ISEE IF < COMMAND	
5724	#33514	#01403				BEQ	0,OP5		IBRANCH IF NOT	
5725	#33516	#13737	#35544	#35542		MOV	0,NOT,0,CAD		IGO TO THE FORMER STREAM	
5726	#33524	#05037	#35556		0,OP5	CLRB	0,SEQ		ICLEAR THE FLAG	
5727	#33530	#03737	#35540	#35542		ADD	0,BW,0,CAD		IGENERATE NEW ADDRESS	
5728	#33536	#13737	#35542	#35544	0,OP2	MOV	0,CAD,0,DOT		IINITIALIZE DOT	
5729	#33544	#04537	#35514		0,OP2A1	JSR	5,0,CHLF		IKCR><LF>	
5730	#33550	#13746	#35540			MOV	0,3W,0(SP)		ISAVE BW	
5731	#33554	#12737	#00002	#35540		MOV	#260,BW		ISET TO TYPE FULL WORD ADDRESS	
5732	#33562	#13700	#35542			MOV	0,CAD,R0		INUMBER TO TYPE	
5733	#33566	#04537	#35276			JSR	5,0,CADV		I TYPE OUT ADDRESS	
5734	#33572	#11637	#35540			MOV	0,SP,0,BW		IRESTORE BW	
5735	#33576	#22726	#00001			CHP	#1,(SP)+		IS IT BYTE MODE?	
5736	#33602	#01405				BEQ	0,OP3		I JUMP IF YES	
5737	#33604	#12700	#00057			MOV	#1,R0		ITYPE A ?	
5738	#33610	#04537	#35370		0,OP4	JSR	5,0,FTYP			

5739	033614	000703			BR	0,WRD1	GO PROCESS IT
5740	033616	012700	000134		O,OP3: MOV	015,R0	ITYPE A \
5741	033622	000772			BR	0,OP4	
5742							
5743							I PROCESS V, OPEN PREVIOUS WORD
5744							
5745	033624	005737	035540		O,BACK: TST	0,BW	I * RECEIVED
5746	033630	001724			BEQ	0,ERR2	IERROR IF NOTHING OPEN
5747	033632	004737	035462		JSR	PC70,CLSE	
5748	033636	163737	035540	035542	SUB	0,BW,0,CAD	IGENERATE NEW ADDRESS
5749	033644	000734			BR	0,OP2	GO DO THE REST
5750							
5751							I B HANDLER * SET AND REMOVE BREAKPOINTS
5752							
5753	033646	012700	035616		O,BKPT: MOV	#0,TRTC,R0	
5754	033652	006304			ASL	R4	I MULTIPLY NUMBER BY TWO
5755	033654	005703			TST	R3	
5756	033656	001423			BEQ	0,REMB	I IF R3 IS ZERO GO REMOVE BREAKPOINT
5757	033660	006205			ASR	R5	I GET ONE BIT TO CARRY
5758	033662	103514			BCS	0,ERR1	I BADNESS IF ODD ADDRESS
5759	033664	006305			ASL	R5	I RESTORE ONE BIT
5760	033666	062704	032546		ADD	#0,ADR1,R4	
5761	033672	005702			TST	R2	
5762	033674	001007			BNE	0,SET1	I JUMP IF SPECIFIC CELL
5763	033676	020014			O,SET: CMP	R0,R4	I IS THIS CELL FREE?
5764	033700	001405			BEQ	0,SET1	I JUMP IF YES
5765	033702	020427	032564		CMP	R4,#0,BKP+0,ADR1	I ARE WE AT THE END OF OUR ROPE
5766	033706	103102			BHIS	0,ERR1	I YES, THERE IS NOTHING FREE
5767	033710	005724			TST	(R4)+	I INCREMENT BY TWO
5768	033712	000771			BR	0,SET	
5769	033714	020427	032564		O,SET1: CMP	R4,#0,BKP+0,ADR1	
5770	033720	101075			BHI	0,ERR1	I ERROR IF TOO LARGE
5771	033722	010514			MOV	R5,R4	I SET BREAKPOINT
5772	033724	000661			BR	0,DCDA	I RETURN
5773							
5774	033726	005702			O,REMB: TST	R2	
5775	033730	001410			BEQ	0,RALL	GO REMOVE ALL
5776	033732	020427	000016		CMP	R4,#0,BKP	
5777	033736	101066			BHI	0,ERR1	I JUMP IF NUMBER TOO LARGE
5778	033740	010004	032546		MOV	R0,0,ADR1(R4)	I CLEAR BREAKPOINT
5779	033744	005064	032570		CLR	0,CT(R4)	I CLEAR COUNT ALSO
5780	033750	000647			O,DCDB: BR	0,DCDA	
5781	033752	005004			O,RALL: CLR	R4	
5782	033754	012700	035616		MOV	#0,TRTC,R0	
5783	033760	020427	000020		O,RM1: CMP	R4,#0,BKP+2	I ALL DONE?
5784	033764	101241			BHI	0,DCDA	I JUMP IF YES
5785	033766	010004	032546		MOV	R0,0,ADR1(R4)	I RESET BRPT
5786	033772	012704	000003	032612	MOV	#T1T,0,UI(R4)	I RESET CONTENTS OF TABLE
5787	034000	005064	032570		CLR	0,CT(R4)	I CLEAR COUNT
5788	034004	005724			TST	(R3)+	I INCREMENT BY TWO
5789	034006	000764			BR	0,RM1	
5790							
5791							I PROCESS 0, COMPUTE OFFSET
5792							

5793	034010	022737	000002	039540	0,OFST1	CHP	#2,0,BW	ICHECK WORD MODE
5794	034016	001036				BNE	0,ERR1	IERROR IF NOT CORRECT MODE
5795	034020	012700	000040			MOV	#1,R0	ITYPE ONE BLANK
5796	034024	004537	039370			JSR	5,0,FTYP	I AS A SEPARATOR
5797	034030	005703				TST	R3	IWAS SEMI-COLON TYPED?
5798	034032	001430				BEO	0,ERR1	INO, CALL IT AN ERROR
5799	034034	163705	035542		0,OF21	SUB	0,CAD,R5	ICOMPUTE
5800	034040	005305				DEC	R5	
5801	034042	005305				DEC	R5	I 16 BIT OFFSET
5802	034044	010500				MOV	R5,R2	
5803	034046	004537	035276			JSR	5,0,CADV	INUMBER IN R2 = WORD MODE
5804	034052	010500				MOV	R5,R2	
5805	034054	006200				ASR	R0	IDIVIDE BY TWO
5806	034056	103414				RCS	0,OF1	IERROR IF 000
5807	034060	022700	177600			CHP	#700,R0	ICOMPARE WITH #200
5808	034064	003011				BGT	0,OF1	IDO NOT TYPE IF OUT OF RANGE
5809	034066	022700	000177			CHP	#177,R0	ICOMPARE WITH #177
5810	034072	002406				BLT	0,OF1	IDO NOT TYPE IF OUT OF RANGE
5811	034074	005337	035540			DEC	0,BW	ISSET TEMPORARY BYTE MODE
5812	034100	004537	035276			JSR	5,0,CADV	INUMBER IN R0 = BYTE MODE
5813	034104	005237	035540			INC	0,BW	IRESTORE WORD MODE
5814	034110	000137	033214		0,OF11	JMP	0,0CD2	IALL DONE
5815								
5816	034114	000137	033174		0,ERR11	JMP	0,ERR	IINTERMEDIATE HELP
5817								
5818								
5819								
5820								
5821								
5822	034120	005201			0,EFF1	INC	R1	ISSET EFFECTIVE SEARCH
5823	034122	000401				BR	0,WDS	
5824	034124	005001			0,WSCH1	CLR	R1	ISSET WORD SEARCH
5825	034126	005703			0,WDS1	TST	R3	ICHECK FOR OBJECT FOUND
5826	034130	001771				BEO	0,ERR1	IERROR IF NO OBJECT
5827	034132	012737	000002	039540		MOV	#210,BW	ISSET WORD MODE
5828	034140	013702	032542			MOV	0,MSK+2,R2	ISSET ORIGIN
5829	034144	013704	032540			MOV	0,MSK,R4	ISSET MASK
5830	034150	005104				COM	R4	
5831	034152	020237	032544		0,WDS21	CHP	R2,0,MSK+4	I IS THE SEARCH ALL DONE?
5832	034156	101274				BHI	0,0CDB	I YES
5833	034160	011200				MOV	0R4,R0	I GET OBJECT
5834	034162	005701				TST	R1	INO
5835	034164	001027				BNE	0,EFF1	I BRANCH IF EFFECTIVE SEARCH
5836	034166	010046				MOV	R0,(SP)	
5837	034170	010503				MOV	R5,R3	IS EXCLUSIVE OR
5838	034172	040500				BIC	R5,R0	I IS DONE
5839	034174	042603				BIC	(SP)+,R3	I IN A VERY
5840	034176	050003				BIS	R0,R3	I FANCY MANNER HERE
5841	034200	040403				BIC	R4,R3	I AND RESULT WITH MASK
5842	034202	001016			0,WDS31	BNE	0,WDS4	I RE-LOOP IF NO MATCH
5843	034204	010446				MOV	R4,(SP)	I REGISTERS R2,R4, AND R5 ARE SAFE
5844	034206	004537	035514			JSR	5,0,CRLF	
5845	034212	010200				MOV	R2,R0	I GET READY TO TYPE
5846	034214	004537	035276			JSR	5,0,CADV	I TYPE ADDRESS

5847	034220	012700	000057	MOV	#17,R0	ISLASH TO R0
5848	034224	004537	035370	JSR	5,0,FTYP	ITYPE IT
5849	034230	011200		MOV	R2,R0	GET CONTENTS
5850	034232	004537	035276	JSR	5,0,CADV	ITYPE CONTENTS
5851	034236	012604		MOV	(SP)+,R4	RESTORE R4
5852	034240	005722		O,WDS4: TST	(R2)+	INCREMENT TO NEXT CELL AND
5853	034242	000743		BR	0,WDS2	RETURN
5854	034244	020075		O,EFF1: CMP	R0,R5	IS (X)OK?
5855	034246	001755		BEO	0,WDS3	ITYPE IF EQUAL
5856	034250	010003		MOV	R0,R3	(X) TO R3
5857	034252	000203		ADD	R2,R3	(X)+X
5858	034254	005203		INC	R3	
5859	034256	005203		INC	R3	(X)+X+2
5860	034260	020305		CMP	R3,R5	IS (X)+X+2=K?
5861	034262	001747		BEO	0,WDS3	BRANCH IF EQUAL
5862	034264	042700	177400	BIC	#17400,R0	WIPE OUT EXTRANEIOUS BITS
5863	034270	110000		MOVB	R0,R0	
5864	034272	000257		CCC		
5865	034274	006300		ASL	R0	MULTIPLY BY TWO
5866	034276	005200		INC	R0	
5867	034300	005200		INC	R0	
5868	034302	000200		ADD	R2,R0	JADD PC
5869	034304	020005		CMP	R0,R5	IS THE RESULT A PROPER REL, BRANCH?
5870	034306	000735		BR	0,WDS3	
5871						
5872						
5873				I PROCESS G = GO		
5874	034310	005703		O,GO: TST	R3	WAS KI TYPES?
5875	034312	001700		BEO	0,ERR1	TYPE ?(CR,LF) IF NOT
5876	034314	112737	000021 039553	MOVB	#0:BKP+3,0:P	CLEAR PROCEED
5877	034322	006205		ASR	R5	CHECK LOW ORDER BIT
5878	034324	103673		BCS	0,ERR1	ERROR IF ODD NUMBER
5879	034326	006305		ASL	R5	RESTORE WORD
5880	034330	010537	032532	MOV	R570,UPC	SET UP NEW PC
5881	034334	112737	000340 177776	MOVB	#0:STM,ST	SET HIGH PRIORITY
5882	034342	004537	035176	JSR	5,0,RST	RESTORE TELETYPE
5883	034346	105037	035552	O,9BIT: CLR	0,T	CLEAR
5884	034352	052737	000020 032534	BIS	#0:TBT,0,UST	BOTH 9-BIT FLAGS
5885	034360	105737	035551	TSTB	0,S	SEE IF WE NEED A T BIT
5886	034364	001005		BNE	0,W02	IF NOT GO NOW
5887	034366	042737	000020 032534	BIC	#0:TBT,0,UST	SET TH 9 BIT
5888	034374	004537	035120	O,GO1: JSR	5,0,RSB	RESTORE BREAKPOINTS
5889	034400	004037	035066	O,GO2: JSR	0,0,RSR	RESTORE REGISTERS
5890	034404	013746	032534	MOV	0,UST,=(SP)	AND STATUS
5891	034410	013746	032532	MOV	0,UPC,=(SP)	AND PC
5892			 MOD APR 74		
5893				11/40,11/45 RTT		
5894				TRACE TRAP MOD		
5895	034414	000002		YESRTI: RTI		
5896	034416	000002		RTXI: RTI		MODIFIED FOR 11/40,11/45 TO RTT
5897			 MOD APR 74		
5898						
5899						
5900				I PROCESS P = PROCEED		

I ONLY ALLOWED AFTER A BREAKPOINT

5921								
5922								
5923								
5924	034420	113700	035553	0,PROCI	MOVB	0,P,R0		
5925	034424	105700			TSYB	R0	I CHECK LEGALITY OF PROCEED	
5926	034426	002632			RLY	0,ERR1	I NOT LEGAL	
5927	034430	005702			TSY	R2	I CHECK FOR ILLEGAL COUNT	
5928	034432	001230			BNE	0,ERR1	I JUMP IF ILLEGAL	
5929	034434	005703			TSY	R3	I WAS COUNT SPECIFIED?	
5930	034436	001402			BEG	0,PR1	I NO	
5931	034440	010560	032570		MOV	R5:0,CT(R0)	I YES, PUT AWAY COUNT	
5932	034444	112737	000340	177776	0,PR1	MOVB	#0,STM,ST	I FORCE HIGH PRIORITY
5933	034452	004537	035176			JSR	5,0,RSTT	I RESTORE TTY
5934	034456	123727	035553	000016	0,C11	CMPB	0,P,#0,BKP	I SEE IF A REAL ONE OR A FAKE
5935	034464	003330				BGT	0,TBIT	I BRANCH IF FAKE
5936	034466	105737	035551			TSYB	0,2	I SEE IF SINGLE INSTRUCTION MODE
5937	034472	001325				BNE	0,ISIT	I IF SO EXIT NOW
5938	034474	112737	000340	177776		MOVB	#0,STM,ST	I SET HIGH PRIORITY
5939	034502	105237	035552			INCB	0,T	I SET T-BIT FLAG
5940	034506	052737	000020	032534		BIS	#0,TBT,0,UST	I SET T-BIT
5941	034514	000731				BR	0,302	
5942								
5943								
5944								
5945								
5946								
5947								
5948								
5949								
5950								
5951								
5952								
5953								
5954								
5924	034516	012637	032532					
5925	034522	012637	032534					
5926	034526	112737	000021	035553				
5927	034534	004037	035030					
5928	034540	105737	035552					
5929	034544	001300						
5930	034546	004537	035244					
5931	034552	105737	032536					
5932	034556	100003						
5933	034560	113705	032534					
5934	034564	000407						
5935	034566	113705	032536					
5936	034572	000257						
5937	034574	106005						
5938	034576	106005						
5939	034600	106005						
5940	034602	106005						
5941	034604	110537	177776					
5942	034610	013705	032532					
5943	034614	105737	035551					
5944	034620	100432						
5945	034622	005745						
5946	034624	010537	032532					
5947	034630	012704	000016					
5948	034634	020564	032546					
5949	034640	001427						
5950	034642	005304						
5951	034644	005304						
5952	034646	002372						
5953	034650	004537	035150					
5954	034654	004537	035514					
I BREAKPOINT HANDLER								
5924	0,BRK1	MOV	(SP)+,0,UPC				I PRIORITY IS 7 UPON ENTRY	
5925		MOV	(S2)+,0,UST				I SAVE STATUS AND PC	
5926		MOVB	#0,BKP+3,0,P				I TELL JP THAT WE CAN CONTINUE	
5927	0,BK1	JSR	0,0,SVR				I SAVE VARIOUS REGISTERS	
5928		TSYB	0,T				I CHECK FOR T-BIT SET	
5929		BNE	0,TBIT				I JUMP IF SET	
5930		JSR	5,0,REM				I REMOVE BREAKPOINTS	
5931		TSYB	0,PR1				I CHECK IF PRIORITY	
5932		BPL	0,BK2				I IS AS SAME AS USER PGM	
5933		MOVB	0,UST,R5				I PICK UP USER UST IF SO	
5934		BR	0,BK3					
5935	0,BK2	MOVB	0,PR1,R5				I OTHERWISE PICK UP ACTUAL PRIORITY	
5936		CCC					I CLEAR CARRY	
5937		RORB	R5				I SHIFT LOW ORDER BITS	
5938		RORB	R5				I INTO	
5939		RORB	R5				I HIGH ORDER	
5940		RORB	R5				I POSITION	
5941	0,BK3	MOVB	R5,ST				I PUT THE STATUS AWAY WHERE IT BELONGS	
5942		MOV	0,UPC,R5				I GET PC, IT POINTS TO THE YRT	
5943		TSYB	0,S				I SEE IF IT WAS SINGLE INSTRUCTION FUN	
5944		BMI	0,B4				I IF SO HANDLE THERE	
5945		TSY	-(R5)					
5946		MOV	R5:0,UPC					
5947		MOV	#0,BKP,R4				I GET A COUNTER	
5948	0,B1	CMP	R5:0,ADR1(R4)				I COMPARE WITH LIST	
5949		BEG	0,B2				I JUMP IF FOUND	
5950		DEC	R4					
5951		DEC	R4					
5952		BGE	0,B1				I RE-LOOP UNTIL FOUND	
5953		JSR	5,0,SVTT				I SAVE TELETYPE STATUS	
5954		JSR	5,0,CHLF					


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5955 034660 012704 035560      MOV      #0, R0, R4      ;ERROR, NOTHING FOUND
5956 034664 012703 035561      MOV      #0, R0+1, R3
5957 034670 004537 035446      JSR      5, 0, TYPE     ;OUTPUT "BE" FOR BAD ENTRY
5958 034674 010520                MOV      R5, R0
5959 034676 002737 000002 032532      ADD      #2, 0, UPC     ;POP OVER THE ADJUSTMENT ABOVE
5960 034704 000445                RR        0, B3        ; ON CONTINUE
5961 034706 112704 000020 0.041  MOVVB   #0, BKP+2, R4    ;SET BREAK POINT HIGH + 1
5962 034712 010564 032546      MOV      R5, 0, ADX1(R4) ;STORE NEXT PC VALUE FOR TYPE OUT
5963 034716 000400                BR        0, B2
5964 034720 110437 035553 0.021  MOVVB   R4, 0, P        ;ALLOW PROCEED
5965 034724 005364 032570      DEC      0, CT(R4)
5966 034730 003252                BGT      0, C1
5967 034732 012764 000001 032570      MOV      #1, 0, CT(R4)  ;JUMP IF REPEAT
5968 034740 004537 035150      JSR      5, 0, SVTT     ;RESET COUNT TO 1
5969 034744 012700 000102      MOV      #10, R0       ;SAVE TELETYPE STATUS, R4 IS SAFE
5970 034750 004537 035370      JSR      5, 0, FTYP
5971 034754 113700 035553      MOVVB   0, P, R0       ;TYPE "B"
5972 034760 002700 000140      ADD      #170, R0      ;CONVERT BREAKPOINT NUMBER TO ASCII
5973 034764 006200                ASR      R0
5974 034766 004537 035370      JSR      5, 0, FTYP
5975 034772 012700 000073      MOV      #1, R0
5976 034776 004537 035370      JSR      5, 0, FTYP
5977 035002 012737 000002 035540      MOV      #2, 0, BW
5978 035010 113704 035553      MOVVB   0, P, R4
5979 035014 016400 032546      MOV      0, ADDR1(R4), R0 ;GET ADDRESS OF BREAK
5980 035020 004537 035276      JSR      5, 0, CADV    ;TYPE ADDRESS
5981 035024 000137 033204      JMP      0, DCD
5982                ; SAVE REGISTERS R0-R6
5983                ; INTERNAL STACK
5984
5985 035030 012637 035546      O.SVRI  MOV      (SP)+, 0, XXX ;PICK REGISTER FROM STACK AND SAVE
5986 035034 010637 032530      MOV      SP, 0, USP    ;SAVE USER STACK ADDRESS
5987 035040 012706 032530      MOV      #0, USP, SP  ;SET TO INTERNAL STACK
5988 035044 010546                MOV      R5, =(SP)    ;SAVE
5989 035046 010446                MOV      R4, =(SP)    ; REGISTERS
5990 035050 010346                MOV      R3, =(SP)
5991 035052 010246                MOV      R2, =(SP)
5992 035054 010146                MOV      R1, =(SP)
5993 035056 013746 035546      MOV      0, XXX, =(SP) ;PUT SAVED REGISTER ON STACK
5994 035062 005746                TST     =(2P)
5995 035064 000200                RTS      R0
5996
5997                ; RESTORE REGISTERS R0-R6
5998
5999 035066 005726                O.RSRI  TST     (SP)+
6000 035070 012637 035546      MOV      (SP)+, 0, XXX ;POP THE EXTRA CELL
6001 035074 012601                MOV      (SP)+, R1    ;GET R0 FROM STACK
6002 035076 012602                MOV      (SP)+, R2    ;RESTORE
6003 035100 012603                MOV      (SP)+, R3    ; REGISTERS
6004 035102 012604                MOV      (SP)+, R4
6005 035104 012605                MOV      (SP)+, R5
6006 035106 013706 032530      MOV      0, USP, SP   ; 1
6007 035112 013746 035546      MOV      0, XXX, =(SP) ; THRU
6008 035116 000200                RTS      R0           ; 5
                        ;RESTORE USER STACK
                        ;PUT R0 ON USER STACK

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6009
6010
6011
6012 035120 012704 000010
6013 035124 017464 032546 032612
6014 035132 013774 035616 032546
6015 035140 005304
6016 035142 005324
6017 035144 002367
6018 035146 000275
6019
6020
6021
6022 035150 113737 177560 039554
6023 035156 113737 177564 039555
6024 035164 105037 177560
6025 035170 105037 177564
6026 035174 000205
6027
6028
6029
6030 035176 004537 035514
6031 035202 105737 177564
6032 035206 100375
6033 035210 032737 004000 177560
6034 035216 001403
6035 035220 105737 177560
6036 035224 100375
6037 035226 113737 035554 177560
6038 035234 113737 035555 177564
6039 035242 000205
6040
6041
6042
6043
6044 035244 105737 035551
6045 035250 001011
6046 035252 005004
6047 035254 016474 032612 032546
6048 035262 005204
6049 035264 005204
6050 035266 020427 000016
6051 035272 003770
6052 035274 000205
6053
6054
6055
6056
6057 035276 012703 000000
6058 035302 012704 177770
6059 035306 022737 000001 039540
6060 035314 001004
6061 035316 102703 000003
6062 035322 005204

; RESTORE BREAKPOINTS 0-7
O,RSB1 MOV #0,BKP,R4 ;RESTORE ALL BREAKPOINTS
O,RS11 MOV #0,ADR1(R4),O,UIN(R4) ;SAVE CONTENTS
MOV O,TRTC,#0,ADR1(R4) ;REPLACE WITH TRAP
DEC R4
DEC R4
BGE O,RS1 ;RE-LOOP UNTIL DONE
RTS R5 ; THEN QUIT

; SAVE TELETYPE STATUS
O,SVTY1 MOVB O,RCSR,O,CSR1 ;SAVE R C/SR
MOVB O,TCSR,O,CSR2 ;SAVE T C/SR
CLRB O,RCSR ;CLEAR ENABLE AND MAINTENANCE
CLRB O,TCSR ; BITS IN BOTH C/SR
RTS R5

; RESTORE TELETYPE STATUS
O,RSTY1 JSR 5,O,CRLF
TSTB O,TCSR ;WAIT READY
BPL #2 ; ON PRINTER
BIT #4000,O,RCSR ;CHECK BUSY FLAG
BEQ O,RSE1 ;SKIP READY LOOP IF NOT BUSY
TSTB O,RCSR ;WAIT READY
BPL #4 ; ON READER
O,RSE11 MOVB O,CSR1,O,RCSR ;RESTORE
MOVB O,CSR2,O,TCSR ; THE STATUS REGISTERS
RTS R5

; REMOVE BREAKPOINTS 0-7
; IN THE OPPOSITE ORDER OF SETTING
O,REM1 TSTB O,S ;SEE IF SINGLE INSTRUCTION IS GOING
BNE O,R2 ;EXIT IF 0
CLR R4 ;REMOVE ALL BREAKPOINTS
O,R11 MOV O,UIN(R4),#0,ADR1(R4) ;CLEAR BREAKPOINT
INC R4
INC R4
CMP R4,#0,BKP
BLE O,R1 ;RE-LOOP UNTIL DONE
O,R21 RTS R5 ;THEN QUIT

; TYPE OUT CONTENTS OF WORD OR BYTE WITH ONE TRAILING SPACE
; WORD IS IN R0
O,CADVI MOV #6,R3 ;# OF DIGITS
MOV #2,R4 ;# OF BITS FIRST-3
CMP #170,BN ;SEE IF WORD MODE
BNE O,SPC ;BRANCH IF 0
SUB #3,R3 ;ONLY DO 3 DIGITS
INC R4 ;DO 2 BITS FIRST

```


6263 035324 000370
 6264 035326 010046
 6265 035330 062704 000003
 6266 035334 005070
 6267 035336 006110
 6268 035340 006170
 6269 035342 005304
 6270 035344 003374
 6271 035346 062700 000060
 6272 035352 004537 035370
 6273 035356 005303
 6274 035360 003363
 6275 035362 112700 000040
 6276 035366 005726
 6277
 6278
 6279
 6280 035370 105737 177564
 6281 035374 100375
 6282 035376 110037 177566
 6283 035402 000205
 6284
 6285
 6286
 6287 035404 105737 177560
 6288 035410 100375
 6289 035412 113700 177562
 6290 035416 042700 177600
 6291 035422 120027 000012
 6292 035426 001406
 6293 035430 004537 035370
 6294 035434 001763
 6295 035436 122700 000040
 6296 035442 001760
 6297 035444 000205
 6298
 6299
 6100
 6101
 6102
 6103 035446 020304
 6104 035450 103754
 6105 035452 112400
 6106 035454 004537 035370
 6107 035460 000772
 6108
 6109
 6110
 6111
 6112 035462 005702
 6113 035464 001412
 6114 035466 022737 000001 035540
 6115 035474 001404
 6116 035476 101005

```

SWAB R2 I AND TURN R0 AROUND
O.SPC1 MOV R2,(SP) I SAVE R0
O.V21 ADD #3,R4 I COMPUTE THE NUMBER OF BITS TO DO
CLR R0
O.V11 ROL (SP) I GET A BIT
ROL R0 I STOP IF AWAY
DEC R4 I DECREMENT COUNTER
RGY O,V1 I LOOP IF MORE BITS NEEDED
ADD #1,R0 I CONVERT TO ASCII
JSR R5,O,FTYP I TYPE IT
DEC R3 I SEE IF MORE DIGITS TO DO
RGY O,V2 I LOOP IF SO
MOVB #1,R0 I SET UP FOR TRAILING SPACE
TSY (SP)+ I GET RID OF JUNK AND FALL THRU TO FTYP

I TYPE ONLY ONE CHARACTER (CONTAINED IN R0)
O.FTYP1 TSYB O,PCSH
BPL ,4
MOVB R0,O,TDB
O.TYP11 RTS R5
I GENERAL CHARACTER INPUT ROUTINE -- ODT11X
I CHARACTER INPUT GOES TO R0

O.GET1 TSYB O,PCSH I WAIT FOR
BPL ,4 I INPUT FROM KBD
MOVB O,KDB,R0 I GET CHARACTER - STRIP OFF PARITY
BIC #177600,R0 I STRIP OFF PARITY FROM CHARACTER
CMPB R0,#012 I SEE IF A <LF>
BEQ O,GET1 I IF SO SAVE THE PAPER
JSR R5,O,FTYP I ECHO CHARACTER
BEQ O,GET I IGNORE NULLS
CMPB #4,R0 I CHECK FOR SPACES
BEQ O,GET I IGNORE SPACES
O.GET11 RTS R5

I GENERAL CHARACTER OUTPUT ROUTINE - ODT11X
I ADDRESS OF FIRST BYTE IN R4,
I ADDRESS OF LAST BYTE IN R3, (R3)>(R4)

O.TYPE1 CMP R3,R4 I CHECK FOR COMPLETION
BLO O,TYP1 I EXIT WHEN DONE
MOVB (R3)+,R0 I GET A CHARACTER
JSR R5,O,FTYP I TYPE ONE CHARACTER
BR O,TYPE I LOOP UNTIL DONE

I CLOSE WORD OR BYTE AND EXIT,
I UPON ENTERING, R2 HAS NUMERIC FLAG, R4 HAS CONTENTS

O.CLS1 TSY R2 I IF NO NUMBER WAS TYPED THERE IS
BEQ O,CLS1 I NO CHANGE TO THE OPEN CELL
CMP #1,O,BW
BEQ O,CLS2 I JUMP IF BYTE MODE
BHI O,CLS1 I JUMP IF ALREADY CLOSED
    
```

6117	035500	010477	000030	MOV	R4,00,CAD	ISTORE WORD
6118	035504	000402		BR	0,CLS1	
6119	035506	110477	000030	0,CLS21 MOV	R4,00,CAD	ISTORE BYTE
6120	035512	000207		0,CLS11 RTS	PC	
6121						
6122	035514	012703	035563	0,CRLF1 MOV	#0,CR+1,R3	ILWA <CR,LF>
6123	035520	000402		BR	0,LRS	
6124	035522	012703	035564	0,CRLS1 MOV	#0,CR+2,R3	ILWA <CR,LF>
6125	035526	012704	035562	0,CRS1 MOV	#0,CR,R4	IFWA
6126	035532	004537	035446	JSR	5,0,TYPE	ITYPE SOMETHING
6127	035536	000205		RTS	R5	
6128						
6129	035540	000000		0,BWI	0	I = 0 = ALL CLOSED, I = 1 = BYTE OPEN, I = 2 = WORD OPEN
6130						I CURRENT ADDRESS
6131						I ORIGIN ADDRESS
6132	035542	000000		0,CAD1	0	ITEMPORARY STORAGE
6133	035544	000000		0,DOT1	0	ISEARCH FLAG = 1 = EFFECTIVE
6134	035546	000000		0,XXX1	,WORD 0	I = 0 = WORD
6135	035550	000		0,WDFG1	,BYTE 0	ISINGLE INSTRUCTION FLAG
6136						I 0 IF NOT ACTIVE
6137	035551	000		0,S1	,BYTE 0	I=1 IF ACTIVE
6138						INO BREAK POINTS MAY BE SET WHILE IN
6139						ISINGLE INSTRUCTION MODE
6140						I T-BIT FLAG
6141						IPROCEED FLAG = -2 IF MANUAL ENTRY
6142	035552	000		0,T1	,BYTE 0	I = -1 IF NO PROCEED ALLOWED
6143	035553	000		0,P1	,BYTE 0	I = 0 IF PCEED ALLOWED
6144						
6145						
6146	035554	000		0,CSR11	,BYTE 0	ISAVE CELL = R C/SR
6147	035555	000		0,CSR21	,BYTE 0	ISAVE CELL = T C/SR
6148	035556	000		0,SEQ1	,BYTE 0	IFLAG FOR < COMMAND
6149						
6150		035560				
6151	035560	042502		0,BDI	,EVEN ,WORD "BE	
6152						
6153	035562	015		0,CRI	,BYTE 015	I <CR>
6154	035563	012			,BYTE 015	I <LF>
6155	035564	052			,BYTE 10	I *
6156						
6157	035565	073		0,LCCHI	,BYTE 11	I /
6158	035566	057			,BYTE 11	I /
6159	035567	134			,BYTE 1\	I \
6160	035570	015			,BYTE 015	I CARRIAGE RETURN
6161	035571	044			,BYTE 1S	I S
6162	035572	107			,BYTE 1G	I G
6163	035573	012			,BYTE 012	I <LF>
6164	035574	137			,BYTE 10	I *
6165	035575	074			,BYTE 1<	I <
6166	035576	136			,BYTE 10	I *
6167	035577	117			,BYTE 10	I O
6168	035600	127			,BYTE 1W	I W
6169	035601	105			,BYTE 1E	I E
6170	035602	102			,BYTE 1B	I B


```
(1)
(1)
(1)
(1) 736453      137  041440  040525  MSG261 ,ASCIZ "← CUADRS/MOI"
(1)
(1) 036470 053137 041505 047524  MSG281 ,ASCIZ "← VECTOR ADDRESSI "
(1) 736512 051537 040524 052524  MSG311 ,ASCIZ "← STATUSI "
(1) 736524 042537 051122 051117  MSG351 ,ASCIZ "← ERROR IN TESTI "
(1) 736545      137  051117  043511  MSG361 ,ASCIZ "← RIGIN OF MAP ERRORI "
(1) 736574 052137 020124 051124  TRCM11 ,ASCIZ "← TT TRACE ERROR IN TESTI "
(1) 736626 047537 044522 047107  TRCM1 ,ASCIZ "← RIGN OF LAST TT TRACE UPDATEI "
(1) 036667      040  052502  054523  ABSYMI ,ASCIZ "← BUSY ENABLE "
(1) 036706 052515 052114 053111  AMUXMI ,ASCIZ "← MULTIPLEXER CH"
(1) 036726 042537 052116 054522  TRC11 ,ASCIZ "← ENTRY WAS 1"
(1) 036750 042537 052116 054522  TRC21 ,ASCIZ "← ENTRY SHOULD BEI"
(1) 036772 042537 052116 054522  TTDSI ,ASCIZ "← ENTRY WAS FROM DXDS"
(1) 737017      137  047105  051124  TYCAI ,ASCIZ "← ENTRY WAS FROM DXCA"
(1)
6227      000001  ,LIST BEX
,END
```


BCMAP	024140	25870	27480	28930	30160	30870	32150	32870	34050	35590	41170	4166	42150	
BEGIN	001100	954	9580	990	4449	4580	4914							
BELL	036203	4694	62260											
BGN0	001216	980	9840											
BGN1	001230	985	9870											
BGN2	001244	988	9900											
B170	000001	8490												
B171	000002	8480	4333											
B1717	002000	8390	883	4818										
B1711	004000	8380	882	4285										
B1712	017000	8370	881	4362										
B1713	020000	8360	880	4352	5366	5438								
B1714	040000	8350	879	4283										
B1715	100000	8340	878											
B172	000004	8470												
B173	000010	8460												
B174	000020	8450												
B175	000040	8440												
B176	000100	8430												
B177	000200	8420												
B178	000400	8410												
B179	001000	8400	2361	2364	2395	4409								
BSY	000020	7130	8740											
BSYEN	004000	6930	1621	1934										
BSYS	000400	6770												
BUSI	001342	10350	1113	2104	2283	2286	2823	2826	2913	2916	3029	3106	3949	5220
BUSO	001336	10300	1929	1668	1842	1981	34190	3422	3457	3482	3501	3543	5217	
BUSOB	001352	10440												
BYPAS	000100	7560	1647	1978	1981	1960	2891	2894	2223	2226	2274	2277	2410	2419
		2683	2686	2877	2880	3377	3380	3402	3405	3449	3452			
CA	000002	7830												
CAMAP	024070	15020	16710	18150	19840	22220	26390	26430	29800	29320	29580	30980	31410	33330
		33370	39460	41010	4162	42100								
CARG	031540	5326	5328	53420										
CARGH	031316	5255	5257	52720										
CARRY	027446	47620												
CB	000020	7900												
CBMAP	024230	15970	15610	16380	16430	16640	17280	17330	17530	17810	18700	18740	19510	19560
		19770	20410	20460	20660	20940	21180	21930	21570	22260	22300	22340	22480	22570
		22770	24140	24190	24230	24270	24390	24730	24790	24970	29100	25220	25260	26270
		26820	26860	26980	26940	26980	27020	27160	27280	27240	27330	27380	27520	27560
		27600	27690	27980	27980	28180	28460	28540	28880	28880	29200	29410	29450	29620
		29730	29770	29930	30110	30470	30670	30780	30820	31320	31530	31710	31750	31820
		31980	32020	32060	32100	33250	33760	33800	33840	33880	33920	33960	34050	34410
		34520	34560	39380	39420	39500	39690	36030	36070	36110	36150	36260	36380	36610
		36650	36690	36840	36900	30940	37290	37330	37370	37410	37550	37590	37670	41350
		41390	41570	4169	42200									
		4135	4157	41580	41740	42220								
CBMAPS	024342	8680	1113	4067	5490									
CE	000010	6800												
CHEND	000040	7140												
CHEND	000010	6760	2320	2323										
CHENDS	001000	6780	1677	1680	1990	1993	2270	2273	2976	3270				
CHIS	000200	4150	41570											
CHKEND	024300													

CHKPHS	#23374	3976#												
CHKREG	#24052	1505	1510	1522	1536	1539	1562	1565	1589	1583	1624	1658	1713	1746
		1758	1767	1818	1829	1835	1849	1852	1875	1878	1893	1896	1937	1963
		2026	2059	2071	2080	2122	2131	2158	2167	2174	2185	2240	2249	2265
		2278	2291	2294	2329	2333	2343	2373	2428	2452	2487	2498	2505	2531
		2538	2541	2648	2654	2659	2678	2703	2729	2742	2761	2805	2855	2859
		2866	2872	2894	2906	2933	2967	2987	3001	3017	3040	3088	3103	3154
		3176	3210	3342	3348	3353	3363	3397	3413	3442	3478	3478	3493	3518
		3573	3579	3616	3674	3685	3699	3704	3742	3768	4096#	4109		
CKCDA	#33602	4633	4681	5108#										
CKC1	#33606	5109#	5120											
CKC2	#33610	5110#	5111#											
CKC3	#33616	5116#												
CKC4	#33640	5120	5124#											
CKRG1	#24202	4126	4131#											
CLK	#23560	1511	1520	1532	1537	1548	1563	1574	1581	1594	1628	1654	1719	1747
		1763	1768	1824	1833	1845	1858	1861	1876	1887	1894	1907	1941	1967
		2032	2060	2076	2081	2123	2127	2139	2159	2168	2172	2179	2191	2211
		2241	2250	2279	2292	2310	2330	2347	2381	2432	2441	2462	2490	2501
		2511	2534	2539	2655	2661	2673	2705	2726	2743	2762	2806	2839	2856
		2861	2867	2873	2895	2900	2907	2911	2934	2968	2988	2995	3002	3019
		3058	3058	3069	3089	3104	3123	3155	3177	3349	3355	3367	3398	3411
		3428	3430	3444	3474	3480	3491	3499	3507	3512	3531	3575	3581	3617
		3635	3643	3675	3700	3700	3743	4014#						
CLKC	#23562	4015#	4016	4031#										
CLKE	#23664	4017	4033#											
CLKC	#01000	743#	2101	2104	4050	4051	4053	4054						
CLK1	#23650	4019	4030#	4032										
CLRPO	#31036	5106#												
CL1	#30300	4996#	4998											
CMD	#27454	2176#	2177	2178	2219	2222	2574#	2636	2639	3200#	3330	3333	3922	3923
		3943	3949	3947	3966	3968	4766#							
CMDCHN	#00004	683#												
CMD0	#02000	729#	2107	2108	2193	2196	2306	2307	2314	2317	3944	3946	3967	3969
CMDREJ	#00001	685#												
CMD,AD	#27676	4648	4889#	4950										
CMD,ST	#27736	4647	4900#	4959	5099									
CNTLC	#00003	5467#	5472											
CONI	#01344	1036#												
CONO	#01340	1031#												
CONOR	#01354	1045#												
COPARD	#23720	1535	1848	3428	3486	3509	3648	4048#	4100					
COUNT	#27510	2502#	2503	2584	2745	2889#	2890	3012#	3013	3083#	3084	3211#	3212	3275#
		3276	3277	3461#	3462	3465	3555#	3556	3570	4790#				
		4594	4660	5394	6220#									
CR	#000019	4820	4411	6226#										
CRLF	#36257	784#												
CS	#000004	2341	2481#	2581#	2592#	2653#	2669#	3267#	3286#	3347#	3362#	4105#	4163	4211#
CSMAP	#24102	694#												
CS12	#02000	692#												
CS12	#01000	4691#	4696#	4730#	4732	4733	4775#							
CUADRS	#27462	1020#	1498#	1499	1668	1997	1811#	1812	1981	2010	2104	2640	3334	3924#
CUAR	#01326	3959#	3960#	5211										
CUBSY	#00400	696#	1613	1665	1926	1978								

CUCR	701330	10210	2219	2636	2777	2782	2913	2922	2932	2955	2958	3095	3098	3186
		3109	3111	3138	3141	3337	3543	3546	3593	3719	3923			
CUBE, D	700020	6810	2594	3187	3233	3295	3799							
CUDX	700400	7520	2687	2690	2757	2767	2787	2797	2917	2928	2942	2945	3179	3182
		3381	3384	3539	3942	3604	3627	3627	3637	3662	3665	3732	3733	3756
		3759												
CUE	700040	8730												
CUEND	700040	7120												
CUFBN	740000	6900												
CUDR	701334	10260												
CUSR	701332	10250	2100	2103	2260	2701	2784	2823	2828	2946	2949	3029	3033	3091
		3094	3142	3145	3457	3460	3587	3713	5214					
DE	700004	8690	1113	4867	5490									
DEV	727452	1498	1499	1502	1520	1529	1534	1671	1811	1812	1815	1841	1842	1847
		1984	2110	2640	2643	3436	3334	3337	3921	3924	3938	3942	3959	3961
		3965	4733	4734	4764									
DEVONT	727464	4689	4697	4698	4700	4735	4776							
DEVEND	700004	7150												
DEV, A	727456	4734	4737	4739	4740	4769	4945							
DFLT, C	727616	4838	4949											
DFLT, S	727656	4863	4958											
DIMAGB	705070	1698	1699	1700	1704	1708	1711	1741	1744					
DIMAGO	705110	1702	1703	1704										
DOPLIN	700002	8640												
DONE	700200	6970	2470	2481	2546	2547	3226	3229	3799	3798	3851	3854	3855	4180
		4181	4239	4238	5188									
DS	700000	7820												
DSCRSP	700002	7770												
DSMAP	724056	1680	1993	2273	2323	2530	3198	3698	4897	4161	4289			
DSY	701442	1892	2239	3920	4948	5071	5096							
DSYADR	703240	1892	4948	5485										
DSYCNT	727502	4707												
DSY, SE	703052	4684	5099											
DS, 1	703056	5098	5101											
DS, 2	703070	5100	5102											
DTMP	724766	4278	4279	4280										
DUNREA	704566	1606	1613											
DXBA	701304	1006	1700	2021	2202	2210	2361	2365	2369	2372	2397	2448	2595	2596
		2599	2709	2712	2800	2804	2811	2814	2951	2954	2979	2982	3134	3137
		3160	3163	3288	3289	3292	3631	3638	3641	3654	3657	3768	4112	
DXBASE	701262	9970	4958	4940	5201									
DXBC	701306	1007	2503	2584	2587	2745	2748	2899	2893	3013	3016	3084	3087	3212
		3215	3238	3276	3277	3400	3462	3556	3559	4116				
DXCA	701276	1003	2337	2466	2644	3338	3803	4100	5218					
DXCB	701314	1010	1509	1513	1554	1558	1635	1640	1647	1661	1725	1730	1750	1778
		1822	1826	1867	1871	1940	1953	1960	1974	2038	2043	2063	2091	2115
		2150	2154	2223	2227	2231	2245	2254	2274	2375	2378	2411	2416	2420
		2424	2436	2470	2474	2494	2515	2519	2523	2550	2554	2607	2613	2616
		2624	2679	2683	2687	2691	2695	2699	2713	2717	2721	2730	2734	2749
		2753	2757	2766	2787	2795	2815	2843	2851	2877	2885	2917	2938	2942
		2959	2970	2974	2990	3000	3044	3064	3079	3079	3129	3150	3160	3172
		3179	3195	3199	3203	3207	3301	3307	3310	3322	3373	3377	3381	3385
		3389	3393	3402	3438	3449	3453	3535	3539	3547	3566	3600	3604	3608
		3612	3610	3622	3623	3627	3658	3662	3666	3681	3687	3691	3726	3730

DXCS	001300	3734 1004#	3738 1613	3745 1621	3748# 1665	3752 1704#	3756 1926	3764 1934	3978 1978	3991 2340#	4037 2470	4042 2546#	4131 2547	2553#
		2501	2500#	2509	2649#	2650	2667#	2665	3226	3229#	3263#	3264	3267	3201#
		3202	3343#	3344	3354#	3359	3795	3798#	3851	3854#	3855	3925#	3926	4184
		4180#	4181	4184#	4235	4430#	4453#	4708#	5145#	5180#	5189#			
DXDS	001274	1002#	1677	1735	1990	2040	2270	2303	2320	2336	2401	2404	2407	2527
		3107	3190	3695	3698	4096	4391	5202						
DXES	001322	1012#	1903#	1754	1783#	1816#	2067	2482	2542#	2543	2601#	2603	2615#	3220#
		3221	3296#	3297	3309#	3769#	4030#	4039#	4142	4149	4179#	4187#	4451#	5139#
		5151#	5152	5222	5550#									
DXES1	001324	1014#	5209											
DXFI	000003	703#												
DXFO	000005	704#												
DXFRS	000001	702#	1704	2553	4184	4453	5109							
DXFSY	000007	705#												
DXIS	001266	999#	3929#	4566#	4745#	4942#								
DXIV	001264	998#	2330#	2339#	2593#	3287#	3930#	4564#	4744#	4941#				
DXMI	001312	1009#	1107	1110	1605	1607	1684	1688	1910	1920	1997	2001	2107	2163
		2101	2219	2266	2207	2324	2353	2620	2791	2832	2830	2847	2881	2920
		2963	3004	3025	3037	3243	3060	3115	3121	3146	3183	3240#	3314	3486
		3466	3407	3523	3551	3670	3677	4125	4127	5219				
DXMO	001310	1000#	1109	1920#	1944#	1945	1550	1570#	1571	1576	1590#	1591	1596	1702#
		1041#	1057#	1050	1063	1083#	1084	1009	1903#	1904	1909	2135#	2136	2143
		2170#	2177#	2107#	2100	2193	2300	2306#	2307	2314	2344#	2349	2429#	2632
		2635	2860#	2899#	2902	2994#	2997	3010#	3021	3049#	3054	3060#	3071	3122#
		3125	3239#	3326	3329	3429#	3434	3479#	3498#	3511#	3516	3642#	3645	3649
		3919#	3938#	3939#	3940#	3941#	3942#	3943#	3944#	3945#	3946#	3951#	3952#	3953#
		3961#	3962#	3963#	3964#	3965#	3966#	3967#	3968#	3969#	3970#	3971#	4048	4120
		4452#	5160#	5216										
DXMOB	001322	1013#												
DXND	001316	1011#	1741	2054	2200	2236	2239	2250	2263	2401	2466	2469	2644	2647
		2739	2771	2775	2781	2805	2819	2822	2903	2906	3099	3102	3164	3167
		3191	3194	3330	3341	3507	3590	3596	3597	3712	3713	3716	3722	3723
		4151												
DXOS	001302	1005#	1124#	1701	2014	2264	2306	4100	5147#	5148	5213			
DXPRT	001270	1000#	3929	4578#	4945	4943#								
DXRES	024344	1497	1010	2573	3262	4179#								
DXTC	000020	770#												
D,DEV	030270	4945	4989#											
D,DXBA	030256	4940	4980#											
D,DXIS	030272	4942	4986#											
D,DXIV	030260	4941	4981#											
D,DXPR	030262	4943	4982#											
D,FIRS	030254	4939	4979#											
D,LEGA	030266	4946	4984#											
D,MAX	030264	4944	4983#											
E	000013	915#	920#	921#	922#	923#	924#	925#	926#	927#	928#	929#	930#	
EC	000001	1467#												
ECH	036217	4713	6226#											
EMCR	013064	2704#												
EMTABL	024732	916#	920#	921#	922#	923#	924#	925#	926#	927#	928#	929#	930#	
EMTAG	024704	916	4265	4270#										
EMTDEC	024642	946	4250#											
EMTOK	024664	4261	4263#											

ENDEN = 020000	691#													
ENDSTR = 035020	1150#	6222	6226#											
ENDTST = 036205	4712	6220#												
ENDTT = 004000	1406#	4997												
ENTRY1 = 022650	2336#	2570#	2594#	3270#	3879#	3882	3884#	4195#	4931#					
ENTRY2 = 022710	2337#	3890#	3893	3895#	3721#	3922#	4196#	4932#						
ERFLG = 026072	4307#	4312#	4344#	4364	4379	4459#								
ERPC = 036310	4354	6220#												
ERRCNT = 026124	4345#	4479#	4669#	4715	4730#									
ERRDST = 031400	1159	1160	1161	1162	1163	1164	1165	1166	1167	1168	1169	1170	1171	
	1172	1173	1174	1178	1179	1180	1181	1182	1183	1184	1185	1186	1187	
	1188	1189	1190	1191	1192	1193	1197	1198	1199	1200	1201	1202	1203	
	1204	1209	1206	1207	1208	1209	1210	1211	1212	1216	1217	1218	1219	
	1220	1221	1222	1223	1224	1225	1226	1227	1228	1229	1230	1231	1235	
	1236	1237	1238	1239	1240	1241	1242	1243	1244	1245	1246	1247	1248	
	1249	1250	1254	1255	1256	1257	1258	1259	1260	1261	1262	1263	1264	
	1265	1266	1267	1268	1269	1273	1274	1275	1276	1277	1278	1279	1280	
	1281	1282	1283	1284	1285	1286	1287	1288	1292	1293	1294	1295	1296	
	1297	1298	1299	1300	1301	1302	1303	1304	1305	1306	1307	1311	1312	
	1313	1314	1315	1316	1317	1318	1319	1320	1321	1322	1323	1324	1325	
	1326	1330	1331	1332	1333	1334	1335	1336	1337	1338	1339	1340	1341	
	1342	1343	1344	1345	1349	1350	1351	1352	1353	1354	1355	1356	1357	
	1358	1359	1360	1361	1362	1363	1364	1368	1369	1370	1371	1372	1373	
	1374	1379	1376	1377	1378	1379	1380	1381	1382	1383	1387	1388	1389	
	1390	1391	1392	1393	1394	1395	1396	1397	1398	1399	1400	1401	1402	
	1406	1407	1408	1409	1410	1411	1412	1413	1414	1415	1416	1417	1418	
	1419	1420	1421	1425	1426	1427	1428	1429	1430	1431	1432	1433	1434	
	1435	1436	1437	1438	1439	1440	1444	1445	1446	1447	1448	1449	1450	
	1451	1452	1453	1454	1455	1456	1457	1458	1459	5070	5297#			
	4408	4416	4440#											
ERRLOP = 025760	920#	1109	1112	1115	1501	1515	1531	1547	1552	1556	1560	1573	1578	
ERROR = 104000	1593	1598	1609	1615	1623	1637	1642	1649	1663	1667	1670	1679	1686	
	1690	1710	1727	1732	1737	1743	1752	1756	1780	1814	1828	1844	1860	
	1865	1869	1873	1886	1891	1906	1911	1922	1928	1936	1950	1955	1962	
	1976	1980	1983	1992	1999	2003	2023	2040	2045	2050	2056	2065	2069	
	2093	2102	2106	2112	2117	2130	2145	2152	2156	2165	2183	2190	2195	
	2206	2209	2217	2221	2225	2229	2233	2238	2247	2256	2262	2268	2272	
	2276	2289	2289	2302	2405	2309	2316	2322	2326	2351	2355	2363	2367	
	2371	2377	2380	2399	2403	2409	2413	2418	2422	2426	2438	2450	2460	
	2472	2476	2480	2484	2496	2517	2521	2525	2529	2545	2549	2552	2559	
	2586	2591	2598	2605	2612	2618	2622	2626	2638	2634	2638	2642	2646	
	2652	2667	2681	2685	2689	2693	2697	2701	2711	2715	2719	2723	2732	
	2736	2741	2747	2751	2755	2759	2768	2773	2779	2783	2789	2793	2797	
	2802	2813	2817	2821	2825	2837	2845	2849	2853	2879	2883	2887	2892	
	2904	2915	2919	2931	2940	2944	2948	2953	2957	2961	2965	2972	2976	
	2981	2989	2992	2999	3000	3010	3015	3023	3027	3031	3042	3046	3056	
	3062	3066	3073	3077	3081	3086	3093	3097	3101	3108	3120	3127	3131	
	3136	3140	3144	3148	3152	3162	3166	3170	3174	3181	3185	3189	3193	
	3197	3201	3205	3209	3214	3223	3228	3232	3235	3238	3266	3279	3284	
	3291	3299	3306	3312	3316	3320	3324	3328	3332	3336	3340	3346	3361	
	3375	3379	3383	3387	3391	3395	3404	3408	3424	3436	3440	3451	3455	
	3459	3464	3468	3484	3489	3503	3510	3525	3537	3541	3545	3549	3553	
	3558	3568	3589	3595	3599	3602	3606	3610	3614	3621	3625	3629	3633	
	3640	3647	3651	3656	3660	3664	3668	3672	3679	3683	3689	3693	3697	

	3715	3721	3725	3728	3732	3736	3742	3747	3754	3758	3762	3766	3797
	3801	3809	3853	3857	3928	3983	4004	4042	4081	4183	4194	4232	4237
	4262	5158	5154	5169									
ERTSTN	726126	14750	17970	25690	32570	38350	4315	4368	44820	47490	49370		
ES	001030	7920	9200	9210	9220	1230	9240	9250	9260	9270	9280	9290	9300
ESEND	000100	6790											
ESMAP	024253	15040	18170	24150	24850	24800	20060	26310	33000	33210	41450	4171	42230
ETMP0	025430	43560	43570	4359									
ETMP1	025560	43030	43040	4306									
EXR,SM0	000000	20	19	645	647	4372	4409	4442	4703	4934	4967	6226	
EXR1	026070	4448	44500										
E,R0	026130	43460	4441	44850									
E,R1	026132	43470	4442	44860									
E,R2	026134	43480	4443	44870									
E,R3	026136	43490	4444	44880									
E,R4	026140	43500	4449	44890									
E,R5	026142	43510	4446	44900									
FALSE	024560	2338	42320	4744									
FASTCU	002000	7500											
FASTIS	023126	2579	3273	39370									
FCYN	000000	7010											
FIRST	027472	45310	49490	4746	47480	4749	47800	49360					
FISS1	023230	3948	39510										
FISS2	023236	3950	39520										
FIVESE	000001	47000											
FSTART	035620	4516	62200										
GETHEX	031202	4590	52430										
GO	000001	7060	2600	2665	2669	3354	3359	3362					
H	026202	45000	45090										
HEADER	001630	4500	62230										
HERE	000000	8500											
HEXNUM	031410	4591	4592	4600	52430	52720	53070						
HLDO	040000	7230	1570	1571	1576	1579	1782	1803	1804	1809	1892	2632	3320 3940
		3951	3963										
HLTSH	100000	8700	4407										
HOME	036200	4506	62200										
HTBL	031422	5205	53100										
IBA2	010762	23070	23000	23940	23950	2397	2407	2410					
IBMRST	034000	6740	2303										
ICOUNT	025100	14740	17900	29600	32560	38340	4200	42970					
IDVN	030652	5009	5121	51200									
IISH	004000	8020											
ILLC	000400	8590	4849										
IMAGBA	006520	20110	20120	20130	20170	2021	2024	2054	2059	2100			
IMAGOS	006540	20150	20100	2017									
INDX	010776	23900	23910	23920	23930	2394							
INPDSC	004000	6730	674										
INIT0	001154	965	9720										
INITC	001160	971	9730										
INITZ	001144	960	9700										
INTEN	000100	6900	2340	2341	3263	3264	3925	3926	4513				
INTERR	024616	42470											
INTOK	100000	8630	4239	4248	4251								
INTPAS	024614	42390	42420	4248	42510								

INTR	024564	42350													
INTREQ	000200	7720	2482	2485											
IOD	000200	7530	2699	2732	2749	2752	3044	3247	3195	3198	3393	3396	3687	3692	
		3764	3767												
IRR	024640	4249	42520												
IRR2	024626	42500													
IRS	000001	7760													
ISSREJ	000010	6820													
KEY,TO	104006	9260	4517	4593	4659	4671	5248	5319							
LEGAL	027512	4580	4690	4729	47950	49460	49470	5257	5120						
LESS1	001272	10010	2339	2577	3224	3471	4455	45010							
LEVEL0	000000	8870													
LEVEL1	000040	8880													
LEVEL2	000100	8890													
LEVEL3	000140	8900	1001												
LEVEL4	000200	8910	1000	4505	4982										
LEVEL5	000240	8920													
LEVEL6	000300	8930													
LEVEL7	000340	8940	937	940	943	946	949	959	991	3219	4501	4515	5130		
LF	000012	5394	62190												
LOCK0	100000	7480	1639	1630	1940	1951	2550	2679	2682	3373	3376				
LOGICA	027296	47240													
LOPSW	040000	8790	4447												
LPCNTL	027150	3840	46940												
LPCSU	027124	46800													
LPC1	027310	4692	4699	47320											
LPC2	027274	4702	47300												
LPC3	027350	4736	47390												
LPC4	027356	4738	47400												
LPC5	027266	4722	47290												
MAPERR	104001	9210	4099	4103	4107	4111	4115	4119	4123	4130	4141	4147	4154		
MARK	030412	50540	5061												
MAX,DE	027474	46320	4690	4735	47810	49440	5080	5116							
MCCSW	002000	8830													
MCLKEN	000002	7670	1903	1904	1783	1810	1817	2542	2543	2601	2603	2606	3220	3221	
		3296	3297	3300	3769	4149	4179	4451							
MCLKP	000001	7660	2619	3309	4030	4039									
MCRCB	012326	26000	26090	2610											
MCRD	016676	2593	32260												
MCRDAT	016772	2595	2596	2600	3191	32450	32500								
MCREX	016776	3241	32500												
MCRND	013454	27760	2777												
MCR1	012400	2614	26200												
MCWCB	017306	33020	33030	3304											
MCWD	022402	3207	37990												
MCWDAT	022454	3295	30110												
MCWEX	022512	3806	30270												
MCWIOD	021740	3572	36870												
MCWL	020120	34100	3680												
MCWNPR	022464	3200	3209	3294	38170	38230	38240	38250							
MCW1	017360	3300	33140												
MC1,SM	000000	20	9	143	339	647	1094	1139	1791	2089	2176	3921	3947	5240	
		5200	6220												
MC2,SM	000001	20	9	143	339	1791	2089	2176	2199	2223	2296	2320	2324	3921	

		3947	5207	5493	6221	6226								
MDXX	#26712	4625#	4626#	4627#	4628#									
MEM,SM#	#30000	2#	19	365	372	921	994	1152	1467	4325	6226			
MI	#30016	789#												
MI MAP	#24174	1687#	1691#	2000#	2004#	2113#	2114#	2166#	2184#	2218#	2269#	2286#	2297#	2327#
		2356#	2623#	2794#	2826#	2838#	2857#	2884#	2916#	2966#	3007#	3028#	3043#	3063#
		3129#	3121#	3149#	3186#	3117#	3409#	3469#	3498#	3526#	3554#	3673#	3687#	4057#
		4053#	4128#	4168	4218#									
MISC	#01346	1039#	5223											
MO	#30014	788#												
MO MAP	#24152	1534#	1953#	1579#	1599#	1847#	1866#	1892#	1912#	2146#	2171#	2178#	2196#	2317#
		2352#	2430#	2635#	2865#	2905#	3007#	3024#	3057#	3074#	3128#	3329#	3425#	3426#
		3427#	3437#	3485#	3504#	3505#	3506#	3519#	3652#	4121#	4167	4217#	4372#	4374
MONDFL	#27756	4522	4520	4541	4930#									
MONITO	#26144	986	4499#											
MON1	#26360	4526	4941#											
MON1,0	#26214	989	4282	4511#	4528	4674	5097	5251	5322	5475	5682			
MON10	#27034	992	4524	4653	4667#									
MON11	#27066	983	4673	4679#										
MON12	#27362	4743#												
MON13	#27414	4747	4749#											
MON14	#27440	4753#												
MON2	#30130	4952#	4954											
MON2,0	#30150	4957#	4961#											
MON2,1	#30162	4960#	4962											
MON2,2	#30222	4969#	4975											
MON2,3	#30252	4970	4976#											
MON3	#26406	4548	4551#											
MON4	#26430	4557	4560#											
MON4,1	#26466	4563	4569#											
MON5	#26652	4614#	4619	5122										
MON5,1	#26742	4633#												
MON6	#26554	4572	4587#											
MON7	#26564	4589#	4595	4606										
MON8	#26746	4647#												
MON9	#26762	4650#	4661											
MSG10	#36067	4650	6226#											
MSG12	#36101	4569	6226#											
MSG13	#36126	4605	4618	6226#										
MSG2	#35634	4551	6226#											
MSG26	#36453	4371	6226#											
MSG28	#36470	4560	6226#											
MSG3	#35654	4614	6226#											
MSG31	#36512	4656	6226#											
MSG35	#36524	4366	6226#											
MSG36	#36545	4381	6226#											
MSG4	#35715	4587	6226#											
MSG5	#35676	4529	4542	6226#										
MSG6	#36007	4589	6226#											
MSG7	#36017	4670	6226#											
MSG9	#36036	4649	6226#											
N	#00006	1155#	1156	1175#	1194#	1213#	1232#	1251#	1270#	1289#	1300#	1327#	1346#	1365#
		1384#	1403#	1422#	1441#	1460#	1467#	1470	1478#	1792	1800#	2564	2572#	3252
		3260#	3930	3830#										

ND	000022	7910												
NDMAP	024272	17440	23570	22390	22630	24040	24690	26470	27850	28220	29860	31820	31670	31940
		33410	35960	37120	37220	41520	41700	42210						
NDSTC	004030	14920	1493	17850	1787									
NID0	021122	3571	35730											
NIDDR	013320	27490												
NOCLR	031042	5144	51670											
NOMI	023764	48510	48540	48560	4125	49340								
NOP	000240	9100	4827	4413										
NOPC	000403	8570	2176	4843										
NPRT	000020	7580	2424	2427	2523	2526	2721	2724	2734	2738	3612	3615	3619	3622
		3658	3661	3691	3694	3738	3741	3745	3748					
NPRTD	000040	7710	1754	2067										
NPRTX	000040	7570	1729	1728	1750	1753	2038	2041	2063	2066	2227	2230	2249	2248
		2379	2420	2423	2436	2439	2474	2477	2494	2497	2519	2522	2713	2716
		2738	2733	2753	2756	2815	2818	2843	2846	2974	2977	2998	2993	3079
		3082	3172	3179	3207	3510	3947	3550	3608	3611	3623	3626	3734	3737
		3752	3759											
NXM	040000	6700												
OCYNUM	027470	4531	4547	4549	4556	4558	4562	4564	45650	4566	4571	45730	45740	45750
		45760	45770	4578	45790	47000	4901	4616	4621	4632	4652	4654	4655	4658
		47790	53150	53420										
ODAT	030312	4685	53890											
DEF	025356	4308	4339	43450										
OFFSET	027466	47780	4964	4965										
OLE,SM	000000	20	15	4681	5192	6226								
ONESHO	027444	9820	42900	44500	46680	47610	49350							
ONLINA	001000	6950												
ONLINB	000004	7600												
OPLI	100000	7350	1107	1684	1687	1997	2000	2620	2623	3314	3317			
OPLO	100000	7220	1702	2632	3326	4217								
OS	000006	7850												
OSMAP	024114	21030	22640	27840	29490	30940	31450	34600	41090	4164	42120	42130		
O,ADR1	032546	40200	44140	49710	5760	5765	5769	57780	57850	5948	59620	5979	6013	60140
		60470	62100											
O,ASHB	035620	61900	6210											
O,BACK	033624	5673	57490											
O,00	035560	5955	5956	61510										
O,BKP	000016	4969	55320	5765	5769	5776	5783	5876	5914	5926	5947	5961	6012	6050
		6211	6213	6215										
O,BKPT	033646	5677	57530											
O,BK1	034534	5550	59270											
O,BK2	034566	5932	59390											
O,BK3	034604	5934	59410											
O,BRK	034516	937	5573	59240										
O,BW	035540	5615	56300	56930	56960	5701	5720	5727	5730	57310	57340	5745	5748	5793
		58110	58130	58270	59770	6059	6114	61290						
O,BYT	033402	5666	56960											
O,BYT1	033400	56950	5709											
O,B1	034634	59480	5952											
O,B2	034720	5949	5963	59640										
O,B3	035020	5960	59800											
O,B4	034706	5944	59610											
O,CAD	035542	56010	5617	57000	5703	5706	5708	57250	57290	5728	5732	57400	5799	61170

O.CADV	#35276	6119#	6132#															
O.CLGL	#33264	5789	5733	5803	5812	5846	5857	5987	6057#									
O.CLGT	#80023	5644	5646	5654#														
O.CLSE	#35462	5658	6176#															
O.CLS1	#35512	5614	5714	5722	5747	6112#												
O.CLS2	#35506	6113	6116	6118	6120#													
O.CR	#35562	6115	6119#															
O.CREY	#33464	6122	6124	6125	6153#													
O.CRLF	#35514	5667	5714#															
O.CRLS	#35522	5729	5844	5954	6030	6122#												
O.CRS	#35526	5637	6124#															
O.CSR1	#35554	6123	6129#															
O.CSR2	#35555	6022#	6037	6146#														
O.CT	#32570	6023#	6038	6147#														
O.C1	#34456	4973#	5779#	5787#	5911#	5965#	5967#	6212#										
O.DCD	#33204	5914#	5966															
O.DCDA	#33473	5627	5629	5636#	5715	5981												
O.DCDB	#33750	5715#	5772	5780	5784													
O.DCD1	#33220	5780#	5832															
O.DCD2	#33214	5640#	5689															
O.DOT	#35544	5638#	5710	5814														
O.EFF	#34120	5699#	5729	5728#	6133#													
O.EFF1	#34244	5676	5822#															
O.ENTR	#32646	5835	5854#															
O.ERR	#33174	5953#																
O.ERR1	#34114	5820	5834#	5659	5721	5816												
O.ERR2	#33502	5758	5766	5770	5777	5794	5798	58160	5826	5875	5878	5906	5908					
O.PTYP	#35370	5721#	5746															
O.GET	#35404	5635	5738	5796	5848	5878	5974	5976	6072	60800	6093	6106						
O.GET1	#35444	5580	5642	6087#	6094	6096												
O.GO	#34310	6092	6097#															
O.GO1	#34374	5669	5874#															
O.GO2	#34400	5888#																
O.LG	#80006	5886	5889#	5921														
O.LGCH	#35565	5584	6184#															
O.LGDR	#33314	5655	6157#	6176														
O.LGL	#800046	5662	5664#	5683														
O.LGL1	#33266	5683#																
O.LGL2	#33306	5655#	5668															
O.MSK	#32540	5656	5661#															
O.ODT	#32634	5828	5829	5831	6203#													
O.OFST	#34010	5550#	5559	6191														
O.OF1	#34110	5674	5793#															
O.OF2	#34034	5806	5808	5810	5814#													
O.OLD	#33472	5799#																
O.OP1	#33476	5672	5719#															
O.OP2	#33536	5670	5720#															
O.OP2A	#33544	5728#	5749															
O.OP3	#33616	5682	5720#															
O.OP4	#33610	5736	5740#															
O.OP5	#33524	5738#	5741															
O.ORAB	#33072	5724	5720#															
O.ORPC	#33050	5683#	5670															
		5597#	5671															

O,ORRB	#33102	5686#	5688								
O,P	#35553	5556#	5571#	5876#	5904	5914	5926#	5964#	5971	5978	6143#
O,PCS	#33062	5681#	5689	5613							
O,PR1	#32536	5569	5931	5935	6202#						
O,PROC	#34420	5678	5904#								
O,PR1	#34444	5910	5912#								
O,RALL	#33752	5574	5779	5781#							
O,RCSR#	177562	5540#	6022	6024#	6033	6039	6037#	6087			
O,RDB #	177562	5539#	6089								
O,REGT	#33000	5580#	5660								
O,REM	#35244	5564	5930	6044#							
O,REMB	#33726	5756	5774#								
O,RM1	#33760	5783#	5789								
O,RS9	#35120	5888	6012#								
O,RSE1	#35226	6034	6037#								
O,RSP	#33010	5582#	5589								
O,RSR	#35066	5889	5999#								
O,RST	#32720	5552	5563#								
O,RSTT	#35176	5882	5913	6030#							
O,RST1	#32746	5562	5570#								
O,RS1	#35124	6013#	6017								
O,R1	#35254	6047#	6051								
O,R2	#35274	6045	6052#								
O,S	#35551	5557#	5570#	5626#	5628#	5885	5916	5943	6044	6137#	
O,SCAN	#33224	5591	5642#	5653							
O,SEMI	#33362	5664	5687#								
O,SE2	#35556	5719#	5723	5726#	6148#						
O,SET	#33676	5763#	5760								
O,SET1	#33714	5762	5764	5769#							
O,S11	#33164	5625	5620#								
O,SNGL	#33152	5624#	5681								
O,SP	#33042	5583	5592#								
O,SPC	#35326	6060	6064#								
O,SP1	#33030	5580#	5593								
O,STM #	#00340	5534#	5572	5881	5912	5918					
O,STRT	#32706	5551	5560#								
O,SVR	#35030	5563	5927	5985#							
O,SVTT	#35150	5953	5960	6022#							
O,T	#35552	5883#	5919#	5920	6142#						
O,TBIT	#34346	5883#	5919	5917	5929						
O,TBT #	#00020	5535#	5884	5887	5920						
O,TCLS	#33124	5597	5603	5606	5614#						
O,TCL1	#33146	5616	5619#								
O,TCSR#	177564	5542#	6023	6025#	6031	6030#	6080				
O,TDB #	177566	5541#	6082#								
O,TL	#35610	5501	5584	5592	6178#	6184					
O,TMP #	#32514	5529#	5530								
O,TRTC	#35616	4960	5753	5782	6014	6186#					
O,TVEC#	#00014	5533#	5554	5572#	5573#						
O,TYPE	#35446	5957	6103#	6107	6126						
O,TYP1	#35402	6003#	6104								
O,UIV	#32612	4027#	4413#	4972#	5786#	6013#	6047	6214#			
O,UPC	#32532	5555#	5880#	5891	5924#	5942	5946#	5959#	6200#		
O,URC	#32514	5560	5589	6193#							

PG2	030340	50350	5040											
PG3	030352	5036	50390											
PG4	030376	5042	50490											
PG5	030404	5044	50470											
PHASE0	000000	7960	913	814										
PHASE1	010000	7970	919	816										
PHASE2	020000	7980	917	818										
PHASE3	030000	7990	919	820										
PHASE4	040000	8000	921	822										
PHASE5	050000	8010	923	824										
PHASE6	060000	8020	929	826										
PHASE7	070000	8030	927	828	2610	3324								
PHS	074000	7490												
PHST	023430	1523	1940	1966	1616	1630	1656	1721	1760	1769	1770	1836	1853	1879
		1929	1943	1969	2034	2073	2070	2003	2129	2129	2141	2101	2213	2243
		2252	2201	2312	2334	2357	2303	2434	2443	2464	2492	2503	2513	2536
		2657	2663	2675	2707	2720	2764	2800	2841	2863	2870	2875	2897	2909
		2930	3052	3157	3351	3397	3369	3400	3414	3432	3446	3476	3514	3533
		3577	3503	3702	3700	3900								
		3995	40050											
		3996	40000											
PHSTE	023522													
PHSTER	023524													
PHS01	004000	0130	1924	1941	1967	1617	1837	1854	1880	1930				
PHS02	000000	0140	1631	1944										
PHS11	014000	0150	1657	1761	1970	2074								
PHS12	010000	0160	1722	1766	2035	2079								
PHS21	024000	0170	1771	2084	2130	2142								
PHS22	020000	0180	2120	2162	2214	2244								
PHS31	034000	0190	2253	2313	2335									
PHS32	030000	0200	2202											
PHS41	044000	0210	2350	2435										
PHS42	040000	0220	2304	2444										
PHS51	054000	0230	3370	3415	3447	3477	3934	3904	3700					
PHS52	050000	0240	3401	3433	3515	3770	3703							
PHS61	064000	0250	2670	2929	2965	2942	2864	2876	2890	2910	2937			
PHS62	060000	0260	2700	2809	2871	3053	3150							
PHS71	074000	0270	2469	2504	2537	2750	3352	4137						
PHS72	070000	0280	2493	2514	2664	3150								
PNYSW	020000	0000												
PREI	030710	4454	4743	51370										
PREITO	031044	5137	51600											
PREI,1	030734	51440												
PRINTF	032144	5443	54490											
PRINTL	032132	54440	5490											
PRINTR	032066	4002	4023	4321	4326	4331	4300	4375	4387	4400	4403	4716	54340	
PRINTS	032076	4316	4369	54360										
PRINT2	032054	54300	5441	5459	5463									
PRINT3	032064	54320	54340	54360	54370	54530	5454	54570						
PRYE	032222	5439	54690											
PRYY	030336	50330	50370	5041										
PS	177776	9110	9590	9910	11370	25770	32190	32240	32710	42920	44550	45010	45150	
PSYMP	023474	39900	39990	4001										
PHRUP	001530	1104	11200											
P2BA	007566	22030	2204	2207										
P2ND	007560	22010	2204											

R3	=X700003	5774	5928	5831	5833	5845	5849	5852	5857	5868	5907	5991	6002	6112
		9010	4349	4392	4394	4402	4424	4444	4500	4592	4607	4648	4655	4662
		5523	5630	5687	5755	5797	5825	5837	5839	5840	5841	5856	5857	5858
R4	=X700004	5859	5868	5874	5909	5956	5997	6003	6257	6261	6273	6103	6122	6124
		9020	4358	4445	4647	4658	4967	4969	4971	4972	4973	4974	5524	5565
		5566	5567	5568	5569	5381	5582	5584	5587	5588	5589	5592	5640	5640
		5649	5558	5651	5688	5695	5699	5707	5703	5704	5754	5767	5763	5765
		5767	5769	5771	5776	5778	5779	5781	5783	5785	5786	5787	5788	5829
		5830	5841	5843	5851	5947	5948	5952	5951	5955	5961	5962	5964	5965
		5967	5978	5979	5989	6004	6012	6013	6014	6015	6016	6046	6047	6048
		6049	6050	6058	6062	6065	6069	6103	6105	6117	6119	6125		
R5	=X700005	9030	1911	1920	1932	1937	1948	1963	1974	1981	1994	1628	1654	1719
		1747	1763	1768	1824	1833	1845	1850	1861	1876	1887	1894	1907	1941
		1967	2032	2060	2076	2081	2123	2127	2139	2159	2168	2172	2179	2191
		2211	2241	2250	2279	2292	2317	2330	2347	2381	2432	2441	2462	2490
		2501	2511	2534	2539	2555	2661	2673	2705	2726	2743	2762	2806	2839
		2856	2861	2867	2873	2895	2900	2907	2911	2934	2968	2988	2995	3002
		3019	3058	3058	3069	3089	3104	3123	3155	3177	3349	3355	3367	3398
		3411	3420	3430	3444	3474	3480	3491	3499	3507	3512	3531	3575	3581
		3617	3635	3643	3675	3700	3706	3743	3976	3984	4014	4022	4033	4351
		4446	5200	5230	5231	5435	5237	5238	5525	5610	5639	5688	5757	5759
		5771	5799	5800	5801	5802	5804	5837	5838	5854	5860	5869	5877	5879
		5880	5911	5933	5935	5937	5938	5939	5948	5941	5942	5945	5946	5948
		5958	5962	5988	6005	6010	6026	6039	6052	6072	6083	6097	6127	
R6	=X000006	9050	1103	1121	4257	4450	4259	4260	4263	4264	4265	4266	4267	
S	=000001	14670												
SAVDEV	027504	47880												
SAVRC	104003	9230	1102											
SAVR6	001006	11030	1121	1139										
SBYTE	031156	5200	5229	5236										
SCALD	027554	48150	5050	5072										
SCB	023404	39790	3980	3981										
SCB1	023446	39920	3993	3994										
SCB8	012022	25550	2550	2557										
SCB8	032230	54700	5471	5472	5477									
SCOPE	104400	8320	1473	1995	2567	3255	3033							
SCOPEA	025072	4286	4299											
SCOPEB	025046	4284	4290											
SCOPEC	024754	949	4279											
SCOPEF	025102	4287	4288	4295	4298									
SCOPEG	025066	4289	4294											
SCOPEH	025012	4276	4281	4283										
SCP1	004024	1476	1477											
SCP2	005476	1790	1799											
SCP3	012072	2570	2571											
SCP4	017030	3250	3259											
SCP5	022540	3836	3837											
SDAPG	030324	5029	5030	5043	5045									
SDXCB	024206	4132	4137	4138										
SDXES	024242	4143	4144											
SELI	040000	736												
SELO	020000	724	1109	1590	1591	1596	1599	1702	1903	1904	1909	1912	2632	3326
		3940	3951	3963										
SELRST	020000	671	674											

SEL,DO	#22544	38500	3930												
SEL,IS	#23254	39500													
SEL,X	#23022	3850	39150												
SENRY1	#22642	38770	3070	3881											
SENRY2	#22702	38800	3980	3892											
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SESW	#010000	0010													
SM	#000100	0720	3920												
SHIP	#07100	21000	21000	2110	2114										
SND	#21200	35910	35920	3593											
SND2	#22104	37170	37100	3719											
SOSIEN	#000004	7600													
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		4355	43500	4361	43670	4370	43730	4376	4382	43850	4388	44490	45000	45140	
		47140	4717	50000	5007	5020	50470	5000	51220	52440	52450	52460	5273	5274	
		5275	53100	53170	5343	5344	55260	55600	5561	5619	57300	5734	5735	58360	
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		60040	60070	6076											
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SPACE	#36255	4025	4401	62260											
SPAC4	#36246	4390	62260												
SPHS	#23376	39770	3981												
SPHST	#23434	39890	3994												
SPW	#01436	10040	1124	1494	4212	49640	5064	5077	5147	5148					
SPW,SE	#30414	1700	2502	4602	50560										
SP,0	#30424	50600	5060												
SP,1	#30462	1495	50720	5086											
SP,2	#30466	50730	5077												
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SP,5	#30516	50820	5084												
SP,6	#30526	5079	50850												
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SR	#177570	9130	907	4203	4205	4352	4362	4407	4409	4447	5366	5430			
SRCCNT	#27500	47000													
SRVI	#02000	7420	2791	2994	2047	2050	2001	2004	2963	2966	3004	3007	3025	3020	
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STALL	#36261	62260													
STAMOD	#00100	7110													
START	#00200	9540													
STKSTA	#000040	6990													
STKSTB	#000002	6040													
STY1	#11306	24460	24470	2448	2451										
SUPD	#100000	7250													

SVRPC	#32006	5400#	5409	5411#															
SVRPSW	#32010	5401#	5408	5412#															
SWR	#17757J	912#	4018	4679															
SYNC	#01002	751#	1540	1643	1661	1664	1732	1733	1953	1956	1974	1977	2043	2046					
		2115	2119	2231	2234	2454	2257	2378	2411	2414	2470	2473	2515	2518					
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SYSRST	#10000																		
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TDAT	#30332	5031#	5039#	5039#															
TDXBA	#01416	1072#																	
TDXCA	#01410	1069#																	
TDXCB	#01424	1075#																	
TDXCS	#01412	1070#																	
TDXDS	#01406	1068#																	
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TDXMI	#01422	1074#																	
TDXMO	#01420	1073#																	
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TEVAG	#06710	2059#																	
TES	#11704	2533#																	
TIMDIS	#00010	769#	4107	4223	5151	5152	5552												
TIMS1	#23666	4037#																	
TIOC	#00400	854#	4040																
TI,0	#23040	3921#																	
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TKS	#01376	1060#	4279	4913#	5350														
TMP	#27450	4703#																	
TPB	#01404	1063#	5353#	5380#	5477#														
TPS	#01402	1062#	5360	5378															
TRACER	#104002	922#	3070	3074	3883	3894	3907												
TRAI NT	#23024	2575	3269	3919#															
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TRCM1	#36574	4313	6220#																
TRC1	#36726	4323	6220#																
TRC2	#36750	4320	6220#																
TR7	#00003	4972	5930#	5986	6186														
TSSF	#004000	807#	1909	1513	1822	1820	2556	2613	2616	3307	3310	4037	4040						
TSSFT	#27506	4709#																	
TSYABL	#25106	1467	4300#	4751	4753														
TSY1	#04000	1473#	1470	3897	4299	4979													
TSY2	#05452	1795#	1800																
TSY3	#12046	2567#	2572																
TSY4	#17004	3255#	3260																
TSY5	#22514	3833#	3838																
TS1	#004000	808#	813	815	817	819	821	823	825	827									
TS2	#000000	809#	914	816	818	120	822	824	826	828									
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TTDS	#36772	4337	6226#																	
TTNDX	#01350	1040#	2389	2415	2628	2631	3318	3321	3901	4192										
TTTRACE	#23010	3869	3909#	4191#	4933#	5190#														
TTSHDU	#23020	3882#	3993#	3913#	4337															
TTTNDX	#01434	1079#																		
TTWAS	#23016	3881#	3892#	3912#	4325															
TTY	#X000005	904#	4000	4001#	4003#	4321	4022#	4024#	4314	4315#	4317#	4319	4320#	4322#						
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TTVFLG	#31604	5354	5359#	5388	5476															
TTYI	#32224	4504	5469#																	
TTYI2	#32260	5473	5476#																	
TTZERO	#24016	4074#	4190	5158																
TTZ1	#24032	4079#	4083																	
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TT:TRA	#22602	3862#																		
TT:Y	#22712	3891#																		
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TT:Y2	#22762	3900#	3902#	3903#	3904#	3905														
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T:ACCE	#31430	925	5314#																	
T:ERRO	#25352	920	4343#																	
T:KEY:	#31552	926	5349#																	
T:MAPE	#25206	921	4300#																	
T:PARI	#30320	927	5027#																	
T:PCH1	#32420	928	5905#																	
T:PCH2	#32444	929	5908#																	
T:PCH3	#32470	930	5511#																	
T:RSTR	#32012	924	5414#																	
T:SAVR	#31750	923	5400#																	
T:TRAC	#25222	922	4311#																	
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UCHECK#	#000002	716#																		
UCHKS	#002000	675#																		
UENCEP#	#000001	717#																		
UNREAD	#006216	1919	1920#																	
VLUMEX	#26620	4601#	4602#	4603	4624															
WRITEC#	#000001	855#	3260	4841																
XBA	#000030	700#																		
X18	#26674	4617	4621#																	
YESRT1	#34414	973#	5895#																	
ZEROTT	#23766	4060#	4185	5157																
ZNPRD	#22474	3293	3823#																	
ZY91	#24002	4065#	4867																	
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		2189	2194	2205	2208	2216	2227	2224	2228	2232	2237	2246	2255	2261
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.MORE	#31634	5370#	5381	5385	5387									
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.REST	#31710	5375	5386#											
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.1STI	#13770	2833#	2834#	2835										
.2ST	#14500	2921#	2923#	2924	2925#	2929								
.2STI	#14516	2927#	2928#	2929										
.3ST	#15340	3032#	3034#	3035	3036#	3040								
.3STI	#15356	3038#	3039#	3040										
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ACPTM	2#	5248														
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CKREGM	2#	4087														
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DSVB	2#	1468														
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DXBITS	2#	667														
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FASISS	2#	3934													
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LDNLK	667#														
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PRTYM	2#	5889													
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RESTOR	667#	3912	4068	4284	5827										
RRM	2#	4176													
RSRY	2#	5398													
SAVE	667#	3864	4062	4274	5225										
SCOPEL	667#	4273													
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SDUMP	667#	4314	4367												
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SS	667#	2574	3268												
STEPTS	667#														
STRM	2#	931													
S.D	2#	3849													
TABLES	2#	1148													
TRAPCA	2#	667													
TTE	2#	3859													
TYPM	2#	5363													
VPSMCP	2#														
ZEROM	2#	4857													

ADD	972	2447	2486	3904	3990	4250	4265	4565	4626	4696	4731	4737	4752	4966	5047
	5064	5204	5390	5589	5598	5612	5651	5727	5760	5857	5868	5959	5972	6065	6071
ASL	1699	2012	2392	3903	4573	4574	4575	4576	4577	4752	5063	5263	5264	5265	5266
	5334	5335	5336	5588	5609	5648	5649	5650	5661	5754	5759	5865	5879		
ASL ^B	1785	5035	5039												
ASR	5704	5757	5805	5577	5973										
BCS	1786	5705	5758	5588	5878										
REQ	980	988	1106	1114	1500	1530	1546	1572	1592	1606	1608	1614	1622	1648	1662
	1666	1669	1709	1736	1742	1751	1755	1813	1843	1859	1885	1905	1919	1921	1927
	1935	1961	1975	1979	1982	2022	2040	2055	2064	2068	2092	2101	2105	2111	2116
	2144	2151	2155	2189	2205	2208	2216	2220	2237	2246	2255	2261	2267	2284	2301
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	2495	2520	2524	2528	2544	2548	2551	2558	2585	2597	2611	2629	2633	2637	2641
	2645	2688	2692	2696	2700	2710	2722	2731	2735	2742	2746	2750	2754	2758	2767
	2772	2778	2782	2792	2796	2801	2812	2820	2824	2836	2844	2878	2882	2891	2903
	2914	2918	2938	2939	2947	2952	2956	2960	2980	2984	2991	3005	3009	3014	3022
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	3151	3161	3165	3180	3184	3188	3192	3204	3208	3213	3222	3231	3234	3237	3265
	3278	3290	3305	3319	3327	3331	3335	3339	3386	3390	3394	3403	3423	3439	3450
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	4289	4365	4380	4395	4400	4410	4440	4526	4548	4557	4563	4572	4653	4722	4736
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	5861	5875	5910	5949	6034	6092	6094	6096	6113	6115					
BGE	5952	6017													
BGY	5261	5332	5808	5919	5966	6070	6074								
BMI	4970	5585	5644	5770	5777	5784	5832	6116							
BMS	5120	5659	5766												
BIC	1664	1700	1703	1753	1782	1783	1977	2013	2016	2066	2094	2109	2113	2118	2135
	2146	2153	2157	2210	2248	2257	2269	2306	2317	2356	2388	2393	2419	2429	2430
	2439	2473	2497	2522	2526	2542	2546	2556	2609	2690	2694	2698	2702	2724	2733
	2738	2752	2756	2760	2769	2794	2798	2834	2846	2880	2884	2899	2905	2920	2928
	2941	2962	2993	3007	3011	3018	3024	3039	3047	3063	3068	3074	3082	3117	3153
	3182	3186	3206	3210	3220	3229	3239	3303	3308	3392	3396	3405	3426	3441	3492
	3469	3479	3485	3509	3538	3542	3550	3554	3569	3626	3642	3652	3669	3684	3755
	3769	3790	3854	3919	3941	3942	3945	3946	3951	3953	3960	3964	3965	3968	3969
	3971	3980	3993	4053	4054	4137	4157	4179	4180	4238	4251	4264	4279	4372	4451
	4580	4602	4628	5049	5061	5108	5162	5333	5355	5471	5506	5647	5838	5839	5841
	5862	5887	6090												
BIS	1503	1504	1520	1534	1544	1553	1557	1561	1570	1579	1590	1599	1638	1643	1680
	1687	1691	1704	1711	1720	1733	1744	1781	1784	1816	1817	1841	1847	1857	1866
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	4051	4135	4184	4187	4212	4239	4453	4513	5243	5151	5267	5337	5847	5884	5928
BISB	1498	1502	1811	1819	5456										
BIV	987	1105	1127	1118	1529	1513	1545	1558	1554	1558	1571	1576	1591	1596	1613
	1621	1635	1648	1647	1661	1665	1777	1884	1688	1729	1738	1739	1792	1754	1778
	1822	1826	1858	1963	1867	1871	1884	1889	1904	1909	1926	1934	1948	1953	1968
	1974	1978	1998	1997	2001	2038	2443	2048	2263	2267	2291	2119	2136	2143	2192
	2154	2163	2181	2188	2193	2215	2223	2227	2231	2245	2254	2266	2278	2274	2287
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	3195	3199	3283	3287	3221	3226	3282	3297	3307	3317	3314	3322	3344	3359	3373
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	3666	3672	3677	3681	3687	3691	3726	3738	3734	3738	3745	3752	3756	3764	3795
	3851	3855	3926	4318	4837	4848	4848	4149	4181	4235	4248	4283	4285	4333	4352
	4362	4407	4489	4447	5152	5366	5438	6833							
BLE	4684	4699	6851												
BLO	5646	6184													
BLOS	4261														
BLF	5886	5259	9338	5818	5986										
BMI	5842	5944													
BNE	985	1188	1111	1129	1518	1514	1551	1555	1559	1577	1597	1636	1641	1678	1685
	1689	1726	1731	1779	1823	1827	1864	1868	1872	1892	1918	1949	1954	1991	1998
	2002	2039	2044	2137	2164	2182	2194	2224	2228	2232	2271	2275	2288	2388	2321
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	5886	5988	5917	5929	6845	6868									
BPL	4276	5351	5361	5379	5932	6832	6836	6881	6888						
BPT	4826	4829	4412	4415											
BR	971	3871	4852	4336	4339	4416	4521	4532	4686	4619	4692	4738	4975	5844	5879
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	5749	5768	5772	5788	5789	5823	5953	5878	5921	5934	5968	5963	6187	6118	6123
BVC	5836														
CCC	5864	5936													
CLR	967	975	982	1126	2938	2827	2921	3832	3118	3248	3823	3824	3825	3884	3885
	3895	3896	3988	4865	4158	4195	4196	4289	4218	4211	4214	4215	4228	4221	4222
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	5781	5787	5824	6848	6866										
CLRB	2368	2831	2925	3836	3114	4213	5442	5444	5462	5557	5578	5626	5726	5883	6824
	6825														
CMP	1685	1687	1788	1741	1918	1928	2021	2054	2118	2236	2369	2397	2481	2487	2448
	2466	2584	2596	2618	2632	2644	2789	2739	2745	2771	2888	2811	2819	2835	2898

	2929	2951	2979	2983	3013	3040	3084	3099	3118	3134	3160	3164	3187	3191	3212
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	4120	4125	4127	4138	4144	4151	4288	4364	4394	4404	4405	4603	4698	4701	4735
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	5645	5658	5701	5735	5763	5765	5769	5776	5783	5793	5807	5809	5831	5854	5860
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CMPB	1113	1499	1529	1668	1812	1842	1981	2100	2104	2204	2207	2219	2260	2283	2620
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	4522	4525	4527	4594	4660	4672	5116	5249	5257	5254	5256	5258	5268	5279	5282
	5320	5323	5325	5327	5329	5331	5370	5374	5376	5472	5582	5655	5914	6091	6095
COM	5037	5030													
COMB	4627														
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	5951	5965	6015	6016	6069	6073									
	920	921	922	923	924	925	926	927	928	929	930				
EMT	667	1116	3793	4437	5156										
HALT															
INC	2799	2810	2809	2950	2978	3012	3083	3133	3159	3211	3461	3555	4287	4345	4697
	4748	5234	5201	5302	5990	5999	5200	5010	5611	5652	5657	5813	5822	5858	5859
	5066	5867	6048	6349	6062										
INCB	5453	5457	5719	5919											
IOY	909														
JMP	954	983	986	989	992	1138	1707	3572	3686	3848	4267	4282	4293	4308	4456
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	2026	2032	2034	2059	2060	2071	2073	2076	2078	2080	2081	2083	2122	2123	2125
	2127	2129	2131	2139	2141	2158	2159	2161	2167	2168	2172	2174	2179	2185	2191
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	4454	4502	4520	4541	4590	4633	4681	4682	4683	4684	4685	4686	4716	4725	4743
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	5614	5635	5637	5642	5709	5714	5722	5729	5733	5738	5747	5796	5803	5812	5844
	5846	5848	5850	5882	5880	5889	5913	5927	5930	5953	5954	5957	5968	5970	5974
	5976	5980	6030	6072	6093	6106	6126								
MOV	958	959	964	965	966	968	970	973	974	990	991	1103	1104	1121	1123
	1124	1137	1474	1475	1476	1491	1793	1494	1701	1796	1797	1798	2014	2107	2176
	2200	2202	2210	2239	2239	2250	2463	2264	2336	2337	2338	2339	2372	2386	2410

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	3163	3167	3190	3194	3219	3219	3224	3241	3250	3256	3257	3258	3267	3268	3270
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	4367	4368	4370	4373	4374	4376	4382	4385	4386	4388	4390	4391	4392	4393	4399
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	5728	5730	5731	5732	5734	5737	5740	5753	5771	5778	5782	5785	5786	5795	5802
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	5979	5985	5986	5987	5988	5989	5990	5991	5992	5993	6000	6001	6002	6003	6004
	6005	6006	6007	6012	6013	6014	6047	6057	6058	6064	6117	6122	6124	6125	
MOV B	1671	1697	1984	2010	2103	2170	2171	2222	2286	2309	2415	2631	2639	2643	2700
	2784	2826	2828	2916	2922	2932	2949	2958	3033	3094	3098	3109	3111	3141	3145
	3321	3333	3337	3425	3460	3504	3546	3901	3920	3921	3922	3923	3924	4658	4679
	4691	4960	5100	5111	5205	5352	5253	5380	5434	5439	5461	5469	5477	5556	5565
	5569	5571	5600	5620	5708	5863	5976	5881	5904	5912	5918	5926	5933	5935	5941
	5961	5964	5971	5978	6022	6023	6037	6038	6075	6082	6089	6105	6119		
NOP	1120	3027	4726	4727	4728	5191									
RESET	4511	4723													
ROL	4263	5445	5447	5449	5695	6067	6068								
ROLD	5446	5448	5450												
RORB	5566	5567	5568	5937	5938	5939	5940								
RTI	3242	3807	3915	4233	4240	4296	4350	5048	5172	5345	5356	5391	5410	5425	5478
	5895	5896													
RTS	3826	3911	3931	3954	3972	3984	4005	4033	4043	4055	4070	4086	4159	4197	4224
	4252	4976	4999	5000	5091	5103	5123	5127	5159	5167	5192	5227	5238	5276	5362
	5465	5618	5995	6000	6018	6026	6039	6052	6083	6097	6120	6127			
RTY	969														
SUB	3999	4258	4357	4384	4739	5592	5740	5799	6061						
SWAB	3592	3718	6063												
TRAP	832														
TST	979	2527	2557	3238	3497	3570	3860	3872	3875	4016	4079	4291	4379	4512	4547
	4556	4562	4571	4610	4652	4974	5141	5075	5088	5124	5237	5619	5624	5697	5720
	5745	5755	5761	5767	5774	5788	5797	5825	5834	5852	5874	5907	5909	5945	5994
	5999	6076	6112												
TSTB	2365	3482	3637	3645	3653	3947	3949	4192	4275	5350	5360	5372	5378	5451	5454

	5723	5885	5905	5916	5928	5931	5943	6031	6035	6244	6080	6087			
.WAIT	3225	3792													
.ABS	2														
.ASCII	5308	5394	6226												
.ASCIZ	1140	4006	4534	5120	5480	6226									
.BLKW	1464	4272	5506	5909	5512										
.BYTE	3245	3246	3247	3248	4864	4865	4866	4867	4868	4869	4870	4871	4872	4873	4874
	4875	4876	4877	4878	4879	4908	4909	4910	4911	4912	4913	4914	4915	4916	4917
	4918	4919	4920	4921	4922	4923	5290	5299	5300	5301	5302	5303	5304	5305	5310
	5432	5487	5488	5489	5490	5491	5493	5494	5495	5496	5497	5498	5499	5500	5501
	5502	6135	6137	6142	6143	6146	6147	6148	6153	6154	6155	6157	6158	6159	6160
	6161	6162	6163	6164	6165	6166	6167	6168	6169	6170	6171	6172	6173	6174	6175
	6178	6179	6180	6181	6182	6183									
.ENABL	2														
.END	6227														
.ENDC	9	15	143	339	372	647	923	994	1094	1144	1152	1407	1791	1809	2009
	2095	2176	2177	2211	2296	2324	3921	3947	4347	4372	4407	4438	4442	4681	4783
	4935	4976	5007	5192	5240	5306	5493	5503	6223	6226					
.EVEN	1143	4011	4538	5133	5396	5481	5503	6150	6185						
.IF	9	15	143	339	365	372	647	647	921	994	1094	1139	1152	1407	1791
	2089	2176	2197	2223	2296	2320	2324	3921	3947	4305	4372	4409	4440	4681	4783
	4934	4967	5007	5192	5240	5288	5493	6221	6226						
.IFF	6226														
.IFT	6226														
.IRP	3864	3910	4061	4368	4075	4084	4346	4441	5006	5007					
.LIST	2	34	616	867	920	921	922	923	924	925	926	927	928	929	930
	1175	1194	1213	1232	1251	1270	1289	1308	1327	1346	1365	1384	1403	1422	1441
	1460	1467	1478	1478	1992	1800	2764	2572	3252	3260	3830	3830	6226		
.MACRO	667														
.MCALL	2														
.NLIST	2	34	667	920	921	922	923	924	925	926	927	928	929	930	1175
	1194	1213	1232	1251	1270	1289	1308	1327	1346	1365	1384	1403	1422	1441	1460
	1467	1470	1478	1792	1800	2564	2572	3252	3260	3830	3830	6226			
.PAGE	2	34	666	1470	1992	2564	3252	3830	3849						
.REM	2	9	15	34	143	339	647	372	620	1480	1801	3840	4200	4630	
.REPT	667	1156	1159	1170	1197	1216	1235	1254	1273	1292	1311	1330	1349	1368	1387
	1406	1425	1444	4797	4817	4846	4887	4908	5290	5493					
.SBTTL	632	667	830	932	995	1095	1149	1461	1470	1792	2564	3252	3830	4492	4756
	4989	5363	5398	5420	5514	6210									
.TITLE	2														
.WORD	3011	3012	3013	3014	3017	3018	3019	3020	4797	4798	4799	4800	4801	4802	4803
	4804	4805	4806	4807	4808	4809	4810	4811	4812	4813	4817	4818	4819	4820	4821
	4822	4823	4824	4825	4826	4827	4828	4829	4830	4831	4832	4833	4807	4808	4809
	4890	4891	4892	4893	4894	4895	4896	4897	4898	4899	4900	4901	4902	5309	5430
	6134	6151													

ERRORS DETECTED: 0

*MCLK2,MCLK2/SOL/CRF*MCLK2,P11
RUN=TIME: 173 47 10 SECONDS
CORE USED: 5PK

MCLK2 DZDXF-D APRIL 1974 UPDATE W.A. MACY11 27(655) 18 JUL 74 18127 PAGE 148
MCLK2.P11