

DataGeneral

TECHNICAL STATEMENT

LISTING

068-001654-00

PROGRAM

CXS30 MEMORY BANK SELECTOR
DIAGNOSTIC

TAPE

097-001654-00

ABSTRACT

THIS PROGRAM IS DESIGNED TO TEST THE FUNCTIONS OF THE CS30 MEMORY BANK SELECTOR. IT HAS LOOP ON ERROR FUNCTIONS AS WELL AS A DEBUG MODE FOR TROUBLE SHOOTING THE BANK SELECTOR CARD.

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? NAME: BANKSEL.TX PART NUMBER: 097-001654
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? DESCRIPTION: SMALL BUSINESS DIAGNOSTIC FOR CS/30
? MEMORY BANK SELECTOR
? REVISION HISTORY:
? REV. DATE
? 00 02/05/79
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1.0 ABSTRACT
THIS PROGRAM IS DESIGNED TO TEST THE FUNCTIONS OF THE CS/30 MEMORY BANK SELECTOR. IT HAS LOOP ON ERROR FUNCTIONS AS WELL AS A DEBUG MODE FOR TROUBLESHOOTING THE BANK SELECTOR CARD.
2.0 MACHINE REQUIREMENTS
CS/30 WITH 52K WORDS OF MEMORY, MEMORY BANK SELECT BOARD AND AN 8K MEMORY BOARD SELECTED AS BANK ONE. A MODEL 6050, 10 MBYTE DISK IS OPTIONAL, BUT REQUIRED FOR TESTING OF DATA CHANNEL OPERATIONS. ADDITIONALLY, UP TO 6 MORE 8K MEMORY BOARDS MAY BE SEQUENTIALLY PUT IN THE SYSTEM.
3.0 OPERATING PROCEDURE
AFTER LOADING DTOS, TYPE 'LOAD BANKSEL'. THE DEFAULT SWITCH REGISTER SETTING OF '00000' WILL LOOP ON ERROR, PRINT TO CONSOLE ALL ERROR MESSAGES, THE NUMBER OF SEQUENTIAL BANKS FOUND IN THE SYSTEM, AND THE END OF PASS COUNTER.
TO MODIFY THE SWITCH REGISTER, SEE MMDTOS MANUAL OR THE LISTING OF OPTIONS IN THE DLIB SECTION AT THE END OF THE PROGRAM LISTING.
INSTRUCTIONS FOR UDT ARE ALSO FOUND IN ANY DTOS BOOK AS WELL AS THE END OF THE PROGRAM LISTING.
THE STARTING ADDRESS OF THE PROGRAM IS 200.
4.0 ERROR DESCRIPTIONS
ALL ERRORS ARE PRINTED OUT WITH A ONE LINE EXPLANATION OF THE APPARENT FAULT, AS WELL AS THE ERROR AND TEST NUMBERS, THE CARRY, ACCUMULATORS, AND PC AT TIME OF ERROR THE FRACTIONAL PORTION OF THE FOLLOWING ERROR DESCRIPTIONS CORRESPONDS TO THE TEST NUMBER AND THE ERROR NUMBER THAT IS PRINTED OUT BY DDOS.

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4.1 BANK SELECT NOT RECOGNIZED OR NO RESPONSE TO DIA
4.2 NO RESPONSE TO DIA INSTRUCTION
4.3 NO RESPONSE TO DIC INSTRUCTION
4.4 CONSECUTIVE DIC'S ARE NOT SWITCHING FENCE REG.
4.5 DIC FAILED TO SELECT LOW FENCE
4.6 DIC FAILED TO SELECT HIGH FENCE
4.7 LOW FENCE ZERO INTERACTION
4.8 THESE NEXT FOUR TESTS DETERMINE THE ABILITY OF THE BOARD TO READ ALL COMBINATIONS OF FENCE REGISTERS BY OVERWRITING A KNOWN VALUE.
4.9 THIS TEST HAS A BASE VALUE OF ZERO.
4.10 LOW FENCE ONES FAILURE
4.11 HIGH FENCE ZEROS FAILURE
4.12 HIGH FENCE ONES FAILURE
4.13 LOW FENCE ZERO INTERACTION
4.14 LOW FENCE ONES INTERACTION
4.15 HIGH FENCE ZEROS INTERACTION
4.16 HIGH FENCE ONES INTERACTION
4.17 NIO CLEAR FAILED TO CLEAR DCH BANK
4.18 AN NIOC SHOULD RESET THE DIA LINE TO 177770
4.19 AC1 HAS FAULTY DATA.
4.20 DATA CHANNEL LOAD OR READ FAULT
4.21 CLEAR PULSE FAILURE ON DCH BANK
4.22 CLEAR PULSE FAILURE ON LOWER FENCE
4.23 CLEAR PULSE FAILURE ON HIGH FENCE

BANK SELECT NOT RECOGNIZED OR NO RESPONSE TO DIA
AFTER A MNKST AND AN APPROPRIATE WAIT, THE DATA-IN A LINE SHOULD BE SET AT 177770, BANK ZERO. A 177777 (-1) INDICATES THE BANK SELECTOR IS NOT IN THE SYSTEM, OR THE MN603 CHIP IS NON FUNCTIONAL.
AC1 HAS THE VALUE RETURNED FROM THE DIA.
NO RESPONSE TO DIA INSTRUCTION
SIMILAR TO THE PREVIOUS TEST, THIS TIME CHECKING THE DATA-IN B LINE.
AC1 HAS THE DATA RETURNED FROM THE DIA.
NO RESPONSE TO DIC INSTRUCTION
ONCE AGAIN, A 177777 INDICATES A FAILURE OF THE DATA-IN PORTION OF THE MN603.
AC2 HAS THE RETURNED DATA.
CONSECUTIVE DIC'S ARE NOT SWITCHING FENCE REG.
DIC FAILED TO SELECT LOW FENCE
DIC FAILED TO SELECT HIGH FENCE
LOW FENCE ZERO INTERACTION
THESE NEXT FOUR TESTS DETERMINE THE ABILITY OF THE BOARD TO READ ALL COMBINATIONS OF FENCE REGISTERS BY OVERWRITING A KNOWN VALUE.
THIS TEST HAS A BASE VALUE OF ZERO.
LOW FENCE ONES FAILURE
HIGH FENCE ZEROS FAILURE

THE LAST FENCE FAILURE TEST. ALL ONES IN HIGH FENCE OVERWRITTEN BY ALL COMBINATIONS OF ZEROS.
AC2 HAS OVERWRITTEN DATA, AC0 HAS DATA WRITTEN, AC1 HAS DATA RETURNED.
LOW FENCE ZERO INTERACTION
THE NEXT FOUR TESTS CHECK FOR INTERACTION BETWEEN THE LOW AND THE HIGH FENCES.
THIS TEST WRITES ZEROS TO THE LOW FENCE THEN ONES TO THE HIGH FENCE. AN ERROR IS A CHANGE IN THE LOW FENCE AC1 HAS THE FAULTY LOW FENCE.
LOW FENCE ONES INTERACTION
THIS TEST WRITES ONES TO THE LOW FENCE, ZEROS TO THE HIGH FENCE AND FLAGS AN ERROR IF LOW FENCE CHANGES.
AC1 HOLDS THE ERRONEOUS LOW FENCE.
HIGH FENCE ZEROS INTERACTION
ZEROS IN HIGH FENCE ONES IN LOW FENCE.
AC1 HAS FAULTY HIGH FENCE
HIGH FENCE ONES INTERACTION
ONES IN HIGH FENCE, ZEROS IN LOW FENCE.
AC1 HAS BAD HIGH FENCE READING.
NIO CLEAR FAILED TO CLEAR DCH BANK
AN NIOC SHOULD RESET THE DIA LINE TO 177770
AC1 HAS FAULTY DATA.
DATA CHANNEL LOAD OR READ FAULT
SELECTING A NEW DCH BANK SHOULD WORK REGARDLESS OF ORIGINAL BANK OR NEW BANK.
AC2 HAS OLD BANK, AC0 HAS NEW BANK, AC1 HAS BAD
CLEAR PULSE FAILURE ON DCH BANK
CLEAR PULSE SHOULD RESET THE DCH BANK.
AC1 HAS FAULT, SHOULD BE 177770
CLEAR PULSE FAILURE ON LOWER FENCE
THESE TWO TESTS MAKE SURE A CLEAR HAS NO EFFECT ON THE FENCES WHICH MUST BE OVERWRITTEN TO CHANGE.
AC1 WILL SHOW ERROR FROM 077777.
CLEAR PULSE FAILURE ON HIGH FENCE
HIGH FENCE SHOULD NOT CLEAR.
AC1 SHOWS DIFFERENCE FROM 100000.

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4.12 HIGH FENCE ONES FAILURE
THE LAST FENCE FAILURE TEST. ALL ONES IN HIGH FENCE OVERWRITTEN BY ALL COMBINATIONS OF ZEROS.
AC2 HAS OVERWRITTEN DATA, AC0 HAS DATA WRITTEN, AC1 HAS DATA RETURNED.
LOW FENCE ZERO INTERACTION
THE NEXT FOUR TESTS CHECK FOR INTERACTION BETWEEN THE LOW AND THE HIGH FENCES.
THIS TEST WRITES ZEROS TO THE LOW FENCE THEN ONES TO THE HIGH FENCE. AN ERROR IS A CHANGE IN THE LOW FENCE AC1 HAS THE FAULTY LOW FENCE.
LOW FENCE ONES INTERACTION
THIS TEST WRITES ONES TO THE LOW FENCE, ZEROS TO THE HIGH FENCE AND FLAGS AN ERROR IF LOW FENCE CHANGES.
AC1 HOLDS THE ERRONEOUS LOW FENCE.
HIGH FENCE ZEROS INTERACTION
ZEROS IN HIGH FENCE ONES IN LOW FENCE.
AC1 HAS FAULTY HIGH FENCE
HIGH FENCE ONES INTERACTION
ONES IN HIGH FENCE, ZEROS IN LOW FENCE.
AC1 HAS BAD HIGH FENCE READING.
NIO CLEAR FAILED TO CLEAR DCH BANK
AN NIOC SHOULD RESET THE DIA LINE TO 177770
AC1 HAS FAULTY DATA.
DATA CHANNEL LOAD OR READ FAULT
SELECTING A NEW DCH BANK SHOULD WORK REGARDLESS OF ORIGINAL BANK OR NEW BANK.
AC2 HAS OLD BANK, AC0 HAS NEW BANK, AC1 HAS BAD
CLEAR PULSE FAILURE ON DCH BANK
CLEAR PULSE SHOULD RESET THE DCH BANK.
AC1 HAS FAULT, SHOULD BE 177770
CLEAR PULSE FAILURE ON LOWER FENCE
THESE TWO TESTS MAKE SURE A CLEAR HAS NO EFFECT ON THE FENCES WHICH MUST BE OVERWRITTEN TO CHANGE.
AC1 WILL SHOW ERROR FROM 077777.
CLEAR PULSE FAILURE ON HIGH FENCE
HIGH FENCE SHOULD NOT CLEAR.
AC1 SHOWS DIFFERENCE FROM 100000.

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4.24 SELECT BANK 0 FAILURE

THIS TEST CHECKS TO MAKE SURE BANK ZERO CAN BE SELECTED PROPERLY.
AC1 WILL SHOW THE FAULTY BANK SELECTED

4.25 SELECT BANK 1 FAILURE

AC1 WILL SHOW THE FAULTY BANK SELECTED

4.26 SELECT BANK 2 FAILURE

AC1 WILL SHOW THE FAULTY BANK.

4.27 SELECT BANK 4 FAILURE

AC1 WILL SHOW THE FAULTY BANK.

4.30 BANK SELECTOR REGISTER DATA ERROR

THIS TEST IS THE SAME AS TEST 20 (4.20) EXCEPT THIS TIME TESTING THE PROGRAM BANK SELECT RATHER THAN THE DCH BANK AC2-OLD BANK ACU-NEW BANK AC1-FAULT

4.31 DATA OVERWRITE FROM BANK 1 TO BANK 0

ACU HAS ORIGINAL DATA AC1 HAS FAULTY DATA.

4.32 DATA OVERWRITE FROM BANK 2 TO BANK 0

SAME AS ABOVE

4.33 DATA OVERWRITE FROM BANK 4 TO BANK 0

SAME AS ABOVE

4.34 PHIL0 ILLEGALLY GENERATED DURING BANK 1 TO 7

TEST EACH BANK TO MAKE SURE IT DOES NOT OVERWRITE DATA IN ANY OTHER BANK.
AC1 WILL NO LONGER BE ZERO IF ERROR.

4.35 DCH INPUT STOPPED GENERATION OF PHIL0

TEST THAT ANY DATA CHANNEL BANK DOES NOT DISTURB PIO AC1 SHOULD HAVE BEEN ZERO.

4.36 FAILED TO WRITE CORRECT BANK ONLY

IF AC0 IS NOT ZERO, THERE WAS A DATA BIT THAT PASSED THRU A BANK, OTHERWISE AC2 WAS THE BANK THAT SHOULD HAVE BEEN READ AND AC1 IS THE BANK THAT WAS READ.

4.37 FAILED TO DATA CHANNEL TO CORRECT BANK ONLY

IF AC0 AND AC3 ARE DIFFERENT, THAN DATA PASSED THRU THE BANKS, ELSE AC1 HAS THE DCH BANK AND AC2 HAS PIO.

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4.40 DATA CHANNEL DISCRIMINATION FAILURE

THIS TEST DATA CHANNELS FROM BELOW THE FENCE, INTO THE BANK, AND THEN ABOVE THE FENCE. LOCATIONS 17776 TO 20012 AND 37776 TO 40012 ARE COMPARE RESPECTIVELY.
THIS TEST IS NOT 100% RELIABLE DUE TO MEMORY CROCKS, SU A RETEST IS ADVISABLE.

4.41 DATA=ADDRESS FAILURE

AC0 HAS BANK #, AC1 HAS THE DATA AND AC2 HAS ADDRESS

4.42 FAILURE IN ARITHMETIC LOGIC STRING CALCULATIONS

A STRING OF ARITHMETIC LOGIC INSTRUCTIONS IS EXECUTED ON A RANDOM SET OF ACCUMULATORS. THE RETURNED VALUES AFTER EXECUTING THE STRING ARE STORED IN LOCATIONS DESIGNATED ACCUM, ACC1M, ACC2M, ACC3M, AND CRYM. THE SAME SET OF ALC AND RANDOM AC'S ARE EXECUTED IN BANK MEMORY AND THE RESULTS ARE COMPARED. THOSE STORED AWAY FROM THE MAIN BANK. ACC0A AND ACC1A ARE USED TO STORE AC'S TO LEAVE ROOM FOR COMPARES.

4.43 ISZ OR DSZ FAILURE

IF AC2 IS NOT GREATER THAN AC3 THEN A DSZ FROM THE BANK HAS CAUSED THE ERROR, ELSE AC2 AND AC1 DIFFER SHOWING AN ISZ WITHIN THE BANK FAILS.

4.44 AUTO INCREMENT OR DECREMENT FROM BANK FAILURE

THIS IS A DATA ADDRESS TEST WITH AUTO INC AND DEC WITHIN BANK ONE AND THE ADDRESSES OUTSIDE THE BANK.
AC2 IS THE DATA AND AC1 IS THE ADDRESS.

4.45 ISZ OR DSZ FAILURE WITH DATA CHANNEL RUNNING

THIS IS THE SAME TEST AS #43 WITH A BACKGROUND DATA CHANNEL A FAILURE WOULD INDICATE SOME INTERACTION BETWEEN DCH AND PIO IN DIFFERENT BANKS.

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5.0 MESSAGE INTERPRETATION

MESSAGES OTHER THAN ERROR MESSAGES ARE PRINTED ON THE TERMINAL FROM TIME TO TIME. THEY ARE INDICATIVE OF OPERATING MODE FOR THE PROGRAM AND THE CS730.

5.01 AUTO MODE DETECTED NO BANK SELECTOR
THIS MESSAGE IS PRINTED UPON A RETURN TO DTOS IN CASE AN ACCEPT WAS CALLED AND NO BANKSELECTOR WAS FOUND

5.02 NUMBER OF BANKS
SELF EXPLANATORY, EXCEPT THAT WITH JUST MAIN MEMORY, THE ANSWER IS 1, WITH ONE BANK, 2, ETC.

5.03 MAP OF BANKS
IN OCTAL, ONE BIT IS SET FOR EACH MEMORY. THIS CHECKS FOR NON-SEQUENTIAL MEMORY. I.E.
1 BANK ZERO (MAIN) ONLY
5 BANKS ZERO AND TWO
17 BANKS ZERO THRU THREE

5.04 PRIMARY DISK OFFLINE
DEVICE CODE 27, THE 6050 DISK WAS FOUND TO BE OFFLINE, ANY DISK MAY BE PUT ON LINE FOR THIS TEST WITHOUT FEAR OF MUTILATION. THERE IS A SERIES OF TESTS THAT ARE PASSED OVER IF THE DISK IS NOT PRESENT.

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**00000 TOTAL ERRORS, 00000 PASS 1 ERRORS

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