Installation Engineering Handbook 269
Western Electric Company, Incorporated
Northern Illinois Works

Section

503.41

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NO. 3 ESS
SYSTEM VERIFICATION,
COMMON OPERATOR PROCEDURES,
3A CC CONTROL PANEL

CONTENTS

1. GENERAL

1.1 Description

1.11 This section presents some 3A CC Control Panel operator procedures which could be used more than one time during the conduction of Handbook 269 installation testing.

1.12 Reference to a procedure in this section may take the following form:

"Place an address match (compare) at address 000400; COP, 3A CC CP, 3.09".

NOTES: (1) COP - Common Operator Procedures (Handbook 269, Section 503.41)

(2) 3A CC CP - 3A CC Control Panel (Handbook 269, Section 503.41)

(3) 3.09 - Paragraph 3.09

1.2 References

TYPE	NUMBER	TITLE
CPS	FA-1034	Console and 3A CC Interface
SD/CD	1C 901-01	3A CC Control Panel

2. PREREQUISITES

2.1 Hardware and software environmental prerequisites must normally be those which support those requirements of the referencing section.

2.2 Generally power must be applied to the 3A CC and the TEST MODE switch must be "active". The TEST MODE switch permits panel functions in an on-line 3A CC. The MANUAL key must be "active" and the 3A CC must be offline to enable manual functions.

2.3 For most operator procedures associated with the 3A CC control panel (those requiring operation of the EXECUTE switch) bit 13 of Interrupt Mask register must be set to allow "manual panel interrupts". Refer to paragraphs 3.03 and 3.04 of this section.

2.4 Normally, it should be verified that all other 3A CC control panel UP/DOWN toggle switches are in the unoperated or DOWN position when specific procedures are conducted. One exception to this general case could be the HALT switch which may or may not have already been operated (in the UP position) upon entry to common 3A CC control panel procedures. Due to the fact that the 3A CC may have been halted because of a hardware, hardware/software, or operator manipulation upon entry to this section: the operator may have provided additional action on the HALT switch during 3A CC control panel common operator procedures in order to properly obtain the needed results. Operator discretion is required in such cases.

3. COMMON OPERATOR PROCEDURES

3.01 Select a General Register

3.011 Place the SPECIAL/GENERAL EXTENDED switch to the GENERAL EXTENDED position.

3.012 Operate the REGISTER SELECT switches (8,4,2,1) so that their binary equivalent is equal to the decimal general register designation in accordance with the following:

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| GR (3) | REGISTER SELECT SWITCH | | | |
	8	4	2	1
0	D	D	D	D (1)
1	D	D	D	U (2)
2	D	D	U	D
3	D	D	U	U
4	D	U	D	D
5	D	U	D	U
6	D	U	U	D
7	D	U	U	U
8	U	D	D	D
9	U	D	D	U
10	U	D	U	D
11	U	D	U	U
12	U	U	D	D
13	U	U	D	U
14	U	U	U	D
15	U	U	U	U

NOTES: (1) D - Switch in the DOWN position
     (2) U - Switch in the UP position
     (3) All general registers are 16-bit registers.

3.02 Select a Special Register

3.021 Place the SPECIAL/GENERAL EXTENDED switch to the SPECIAL position.

3.022 Operate the REGISTER SELECT switches so that their binary equivalent is equal to the Special Register (SR) designation in accordance with the following:

| SR | NB (3) | REGISTER SELECT SWITCH | | | |
		8	4	2	1
MCTL STAT (4)	20	D	D	D	D (1)
TIM	8	D	D	D	U (2)
SY STA	20	D	D	U	D
ST ADR	20	D	D	U	U
PROG ADR	20	D	U	D	D
MTC STA	16	D	U	D	U
M.MEM STAT	14	D	U	U	D
MCH BUFR	20	D	U	U	U
INT SET	16	U	D	D	D
INT MASK	16	U	D	D	U
HOLD GET	16	U	D	U	D
ERR	22	U	D	U	U
DATA MASK	20	U	U	D	D
DATA IN	16	U	U	D	U
ADR MASK	20	U	U	U	D
ADR IN	20	U	U	U	U

NOTES: 1) D - Switch in the DOWN position.
2) U - Switch in the UP position.
3) NB - Number of bits contained in register.
4) The definition or title of the special register switch designations is as follows:

| SWITCH | |
DESIGNATION	DEFINITION
MCTL STAT	Microcontrol Status Register (read only)
TIM	Timing Counter (read only)
SY STA	System Status Register (read only)
ST ADR	Store Address Register
PROG ADR	Program Address Register
MTC STA	Maintenance State Register
M.MEM STAT	Main Memory Status Register
MCH BUFR	Maintenance Channel Buffer
INT SET	Interrupt Set Register
INT MASK	Interrupt Mask Register
HOLD GET	Hold Get Register
ERR	Error Register
DATA MASK	Data Mask Register
DATA IN	Data Input Register
ADR MASK	Address Mask Register
ADR IN	Address Input Register

3.03 Enable Panel Interrupt

3.031 3A CC panel interrupt is obtained (originated) when the EXECUTE switch is depressed and released and either one of the following conditions is present.

3.032 Condition I

A. The MANUAL switch is operated (the MANUAL switch lamp is lighted).

B. The associated CC is OFFLINE (the STBY switch lamp is lighted).

OR

3.033 Condition 2

A. The TEST MODE switch is operated (the TEST MODE switch lamp is lighted).

3.04 Honor Panel Interrupt

3.041 A 3A CC panel interrupt is honored (effective) when the following conditions are all present.

A. Bit 13 of the Interrupt Mask Register is zero.

B. The Block Interrupts flip-flop is zero.

NOTES: (1) The RESET CKTS switch on the 3A CC control panel forces conditions A and B above.

3.05 Display a Register

NOTE: Generally, for this action to be
       effective, the 3A CC must be halted
at some designated point and, if program is
cycling, bit 17 of the System Status Regis-
ter must be set to disable the gating of the
PA to the display buffer. Additionally,
that condition when program is cycling,
interpretation of any actual register
display obtained may be difficult except
under rather controlled conditions.

3.051 Select the general purpose or
       special register concerned in
accordance with either paragraph 3.01 or 3.02
respectively of this section.

3.052 Place the REGISTER DISPLAY switch
       in the UP position.

3.053 Depress and release the EXECUTE
       switch.

3.054 Return the REGISTER DISPLAY switch
       to the DOWN position.

3.06 Load a Register

NOTE: Generally, for this action to be
       effective, the 3A CC must be halted
at some designated point. For that condi-
tion when program is cycling meaningful
utilization of any actual register load
may be difficult except under rather
controlled conditions.

3.061 Select the general purpose or
       special register concerned in
accordance with either paragraph 3.01 or 3.02
respectively of this section.

3.062 Place the REGISTER LOAD switch in
       the UP position.

3.063 Insert the contents with which it is
       required to load the register into
the LOAD AND DISPLAY switches.

3.064 Depress and release the EXECUTE
       switch.

3.065 Return the REGISTER LOAD switch to
       the DOWN position.

3.07 Load and Display a Register

3.08 Insert Incorrect Register Parity

3.081 Select the general purpose or special
       register concerned in accordance with
either paragraph 3.01 or 3.02 respectively of this
section.

3.082 Place the REGISTER LOAD switch in
       the UP position.

3.083 Insert the contents with which it
       is required to load the register
into the LOAD AND DISPLAY switches.

3.084 Place the ENABLE MANUAL PARITY
       switch in the UP position.

3.085 Insert incorrect parity into PL for
       bits 0 to 7 if required.

3.086 Insert incorrect parity into PH for
       bits 8 to 15 or bits 8 to 19 if
required.

NOTE: (1) Parity High (PH) is over those
           additional register bits not
           covered by Parity Low (PL).

3.087 Depress and release the EXECUTE
       switch.

3.09 Compare Address

NOTES: (1) Only one hardware compare
            address request may be con-
            tained within the system at
            any one time.

        (2) Compare address is used with
            an address mask. In any
            event, the contents of the
            Address Mask register should
            be verified to insure that it
            contains the correct mask.

3.091 Display the Address Mask register.
       Insure that it contains the proper
mask for the compare address function required.
If not, load the proper mask into the Address
Mask register in accordance with the procedures
in paragraph 3.06, Load Register, of this section.

3.092 Load the required address into the
       Address Input register in accordance
with the procedures in paragraph 3.06, Load
Register, of this section.

3.093 Place the COMPARE ADR switch in the
       UP position.

3.094 Depress and release the EXECUTE
       switch.

3.10 Compare Data

NOTES: (1) Only one hardware compare data
            request may be contained within
            the system at any one time.

        (2) Compare data is used with a
            data mask. In any event, the
            contents of the Data Mask regis-
            ter should be verified to insure
            that it contains the correct
            mask.

3.101 Display the Data Mask register.
       Insure that it contains the proper
mask for the compare data function required.
If not, load the proper mask into the Data Mask
register in accordance with the procedures in
paragraph 3.06, Load Register, of this section.

3.102 Load the required data into the
       Data Input register in accordance
with the procedures in paragraph 3.06, Load
Register, of this section.

3.103 Place the COMPARE DATA switch in
       the UP position.

3.104 Depress and release the EXECUTE
       switch.

3.11 Compare Address and Data

NOTE: If a compare function for both some
       designated address, as described in
paragraph 3.09, and for some designated
data, as described in paragraph 3.10, is
established, an interrupt will occur when
either compare is found, not both.

3.12 Display Contents of Store Address

NOTE: (1) The Store Address Register (SAR)
           must be loaded with the address
of the store word it is required to display.

3.121 Load the store address of the word
       it is required to display into the
Store Address Register (SAR) in accordance with
the procedures in paragraph 3.06, Load Register,
of this section.

3.122 Place the MEMORY DISPLAY switch in
       the UP position.

3.123 Depress and release the EXECUTE
       switch.

3.13 Display Contents of Consecutive Store
      Addresses

3.131 Set up to display the contents of
       the initial store address in accor-
dance with the procedures in paragraphs 3.121 to
3.122, Display Contents of Store Address, of this
section.

3.132 Place the MEMORY INCR ADR switch in
       the UP position.

3.133 Depress and release the EXECUTIVE
       switch.

3.134 Continue to depress and release the
       EXECUTE switch until the entire
store address block it is required to observe has
been displayed.

3.14 Load Store Address

NOTE: (1) The Store Data Register (SDR)
           must be loaded with the data it
           is required to load.

       (2) The "STORE" label of that switch
           in the MEMORY section of the
           3A CC front panel is synonymous
           with the meaning of the word
           "LOAD".

3.141 Load the required data into the
       Store Data register in accordance
with the procedures in paragraph 3.06, Load
Register, of this section.

3.142 Load the store address of the word
       it is required to load (write) into
the SAR in accordance with the procedures in
paragraph 3.06, Load Register, of this section.

3.143 Place the MEMORY STORE switch in
       the UP position.

3.144 Depress and release the EXECUTE
       switch.

3.15 Load Consecutive Store Addresses

3.151 Set up to load the required data of
       the initial store address in accor-
dance with the procedures in paragraphs 3.141 to
3.142, Load Store Address, of this section.

3.152 Place the MEMORY STORE switch in
       the UP position.

3.153 Place the MEMORY INCR ADR switch in
       the UP position.

3.154 Depress and release the EXECUTE
       switch.

3.155 If it is required to write identical
       data into subsequent consecutive
store addresses continue to depress and release
the EXECUTE switch until the entire store address
block into which it is required to load identical
data has been loaded; otherwise, continue with
the immediately following paragraph.

3.156 Place the MEMORY INCR ADR switch in
       the DOWN position.

3.157 Place the MEMORY STORE switch in
       the DOWN position.

3.158 Load the required next word's data
       into the SDR in accordance with the
procedures in paragraph 3.06, Load Register, of
this section.

3.159 Place the REGISTER LOAD switch in
       the DOWN position.

3.1510 Place the MEMORY INCR ADR switch in
        the UP position.

3.1511 Place the MEMORY STORE switch in the
        UP position.

3.1512 Continue with paragraph 3.154 of
        this section until the entire store
address block it is required to load has been
loaded.

3.16 Step Function

NOTES: (1) The step function controls
            program execution, one instruc-
            tion for each EXECUTE switch
            operation.

        (2) It is assumed, that for purposes
            of the following procedures the
            3A CC has been halted by some
            condition: hardware, hardware/
            software combination or direct
            operator manipulation of the
            HALT or RESET CIRCUITS switches.
            (Refer to paragraph 2.4 of this
            section.)

3.161 If the 3A CC is not halted at the
       start of the desired address, con-
tinue with the following paragraph; otherwise, go
to paragraph 3.163.

3.162 Load the store address of the first
       program word it is required to step
through into the SAR in accordance with the
procedures in paragraph 3.06, Load Register of
this section.

3.163 Place the STEP switch in the UP
       position.

3.164   Depress and release the EXECUTE switch.

3.165   Continue with paragraph 3.164 of this section until the STEP function requirements have been satisfied.

3.17   Execute a Program

NOTES: (1) It is assumed that the 3A CC is halted.

(2) The program required to cycle is already in store.

3.171   If the 3A CC is not halted at the start of the desired address, continue with the following paragraph; otherwise, go to paragraph 3.173.

3.172   Load the store address of the first program word it is required to cycle into the SAR in accordance with the procedures in paragraph 3.06, Load Register, of this section.

3.173   Place the HALT switch in the DOWN position.

3.174   Depress and release the EXECUTE switch.

NOTE: (1) It may be required to take further action (to satisfy program cycling) either at the 3A CC control panel or the System Status Panel.

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