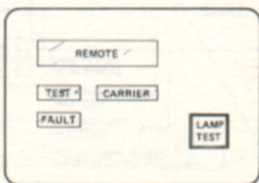
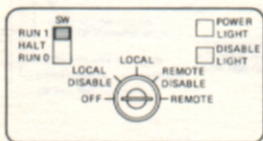


ELECTRONIC CONSOLE COMMANDS



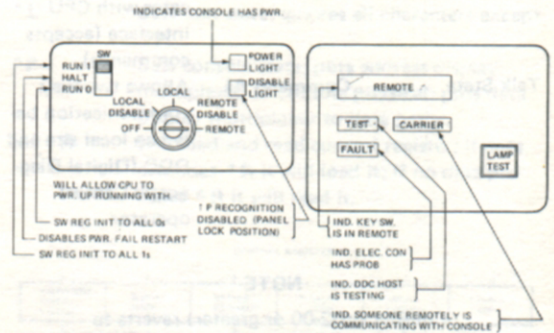
MA-2462

KEYSWITCH POSITION DESCRIPTION

CONTENTS

Keyswitch Position Description	1
Three Separate States	2
Console Control Commands	3
CPU Control QDT-11 Commands	4
Console Message	5
CPU Control Basic Commands	6
Examples	8
To Boot the System	10

ELECTRONIC CONSOLE COMMANDS



TK 1311

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KEYSWITCH POSITION DESCRIPTION

OFF	Turns CPU and electronic console off.
LOCAL DISABLE	AP recognition disabled, disables all console functions.
LOCAL	AP recognition enabled, enables all console functions at local terminal.
REMOTE DISABLE	AP recognition disabled, disables all console functions, forces local copy.
REMOTE	AP recognition enabled, enables all console functions at remote terminal.

THREE SEPARATE STATES

Program I/O State	Command Z	Allows communication with program
Console State	Command ^P	Console communicates with CPU interface (accepts commands)
Talk State	Command ^L	Allows two-way communication between local site and DDC (Digital Diagnostic Center) operator

NOTE

Console (V02-00 or greater) reverts to program I/O state when the following conditions occur:

- 20 seconds have elapsed without using console, and
- Program is running, and
- Character Ready bit is set, and
- Key switch in LOCAL.

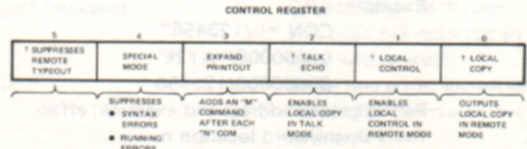
LEGEND:

All **RED** symbols typed by human. All other symbols typed by CPU.

^P	Means typing the control key and the letter P at the same time to perform the command.
\$	Means typing \$ to perform the command.
n	Is used to indicate that a numeric variable is REQUIRED .
[n]	Is used to indicate that a numeric variable is OPTIONAL .
m	Is content of console switch register.
<NL>	Means that a <CR> and <LF> were generated by the CPU.

CONSOLE CONTROL COMMANDS

- ^E** Prints ASCII text that identifies CPU and console code revision;
Example: 11/70 V01-00.
- ^L** Sets talk state; ignores all characters except ^P.
- ^P** Sets console state; puts address display multiplexer to console physical; puts data display multiplexer to data paths.
- [n] ^R** Will load and read control register; if data precedes ^R it will load it; if no data precedes ^R it will read it.



* THESE BITS CAN NOT BE SET FROM LOCAL TERMINAL.

TK-1234

- ^U** Clears the data typed in the temporary data register.
- \$** Sets a flag to indicate a register versus a memory location; **Example:** \$n/XXXXXX will examine contents of general register n.
- '** Data separator before a start or go command; **Example:** 30,17765000G.
- V** Verifies console logic; will print V000377 if no fault is detected.
- Z** Sets serial line multiplexer to program I/O state.
- <RO>** Rub out; deletes the rightmost octal character from the temporary register. DEL KEY causes "rubout" action to occur. **Example:**
 1234\4\3\2\1\0\0 (For V01-00 consoles)
 1234\4321\ (For V02-00 consoles)*

* On V02-00 the backslash only occurs on the first and last character being deleted from the buffer.

CPU CONTROL ODT-11 COMMANDS

- n^D** Dumps successive memory locations continuously, until a character is typed, starting at address n.
- [n] <LF> Deposits any data typed and opens the next sequential location.
- [n] <CR> Deposits any data typed and closes the location to further modification.
- " Changes to hex data format from octal; data is displayed in hex while address display does not change.*
 Changes to octal data format from hex.*
Example: ^P
 CON = 0/123456"
 00000000/"A72E"
 00000000/123456
- n/ Performs load address and examine; effectively opens word location n.
- : Reserved for future expansion.
- [n]@ Deposits any data typed and uses contents of currently open location as address of location to open next.
- B Reserved for future expansion.
- [m,]nG Go command begins at address n with switch register set to m; places console in program I/O. **Example:** 30,17765000G
- P Proceed command places console in program I/O. It continues program from address in program counter.
- n\ Performs load address and examine; effectively opens byte location n. **Example:***
 ^P
 CON= 0/XXXXXX 123456 <CR>
 CON= 0\056 <LF>
 CON= 1\247 <CR>
 CON=

* Command is available on consoles with an ID of V02-00 or greater.

CONSOLE MESSAGES

- "? SYN ER" Syntax error; command is given out of sequence or with missing character.
- "? RUN ER" Illegal when CPU running; certain commands are illegal with CPU running.
Example: Start, load address, and initialize.
- "? ER/TXXXXX" Memory reference error; address/data parity error detected during a memory reference.
- Fault Indicator Console logic fault; console logic has detected an error within itself.
- "+" Serial line error; identifies framing or overrun errors with a "+".
- "#" CPU response time out; # is printed if CPU did not respond to a console command.
- "*HXXXXXXXXX/TXXXXX" Programmed halt; console will print "halt notification" and HALT ADDR/status.
- "? CAR ER" Carrier lost.

CPU CONTROL BASIC COMMANDS

- [n] A Prints address display in octal as received from one of eight inputs to address multiplexer.
- n = 0 Program Physical
 - n = 1 Kernel Data
 - n = 2 Kernel Inst.
 - n = 3 Console Physical
 - n = 4 Supervisor Data
 - n = 5 Supervisor Inst.
 - n = 6 User Data
 - n = 7 User Inst.

NOTE

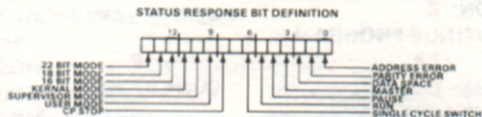
^P or "Power On" set position 3; if octal # precedes A, new position is set.

- C Continues program from address stored in program counter.
- [n] D Deposit; sequential deposits are possible (location must be open).
- E Examine; sequential examines are possible.
- H Halt; address counter and CPU status will be printed.
- I Initialize CPU.
- J Set single bus cycle.
- K Reset single bus cycle.
- nL Load address n.
- [n] M Prints data registers:
- n = 0 Bus Register
 - n = 1 Data Paths (shifter)
 - n = 2 Display Register
 - n = 3 CPU μ ADRS

NOTE

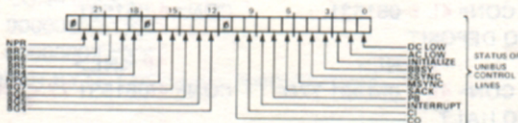
Position 1 is set by ^P, E or "Power on." To change data path's position, type new position n first then type M.

- N Execute next instruction/bus cycle.
- R Read switch register.
- [m,] nS Start the CPU at the address n with switch register set to m.
- T Read CPU status.



TK-1210

- U Print the state of the Unibus in octal.



TK-1223

- nW Write n into switch register.

EXAMPLES

BASIC COMMANDS

WITH ODT

START PROGRAM

^P <NL>

CON= 200S <NL>

CON= Z

CONTINUE PROGRAM

^P

CON= C Z <NL>

READ ROM STATE

^P <NL>

CON= 3MXXXXXXXX

DISPLAY ADRS IN CON PHY

^P <NL>

CON= AXXXXXXXX

TO EXAMINE

^P <NL>

CON= 4L E 051531

TO DEPOSIT

^P <NL>

CON= 4L E 051531 77D

TO HALT

^P <NL>

CON= H 01731240/T14410

TO CK FOR RUNNING CPU

^P

CON= T XX0XX CPU IS RUNNING

An example of how to single step a program using the electronic console is shown below.

^P

CON= 1000/XXXXXX 12737<LF>

00001002/XXXXXX 101<LF>

00001004/XXXXXX 177566<LF>

00001006/XXXXXX 0<CR>

CON= 1000L I N00001006_A

} This program
will print the
letter A

↑
means program moved
character to terminal print buffer not a human

BASIC COMMANDS

WITH ODT

HEXADECIMAL DEPOSIT

ONLY POSSIBLE

UNDER ODT

^P

CON= 0/XXXXXX"

0000000/"XXXX 2AF1 <LF>

0000002/"XXXX 2AF2 <CR>

HEXADECIMAL DISPLAY

^P

^P

CON= "0L E"XXXX <CR>

CON= 0/XXXXXX"

CON= E"XXXX" <CR>

00000000/"XXXX <LF>

CON= EXXXXXX

00000002/"XXXX <CR>

HEXADECIMAL CONTINUOUS EXAMINES

^P

CON= " 0^D

00000000/"XXXX XXXX....

OPEN BYTE LOCATION IN HEX

^P

CON= 0\XXX"

00000000\XX <LF>

00000002\XX

OPEN BYTE LOCATION AND DEPOSIT

^P

CON= 0\XXX <LF>

00000001\XXX <LF>

00000002\XXX 24 <LF>

00000003\XXX

OPEN BYTE LOCATION IN A REGISTER

^P

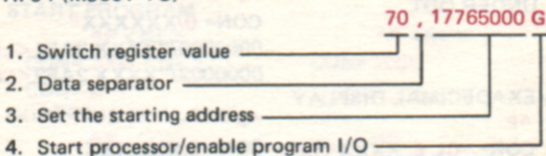
CON= \$0\XXX <LF>

17777700H\XXX <LF>

17777701L\XXX

TO BOOT THE SYSTEM

Bootstrap Example with initial switch value for an RP04 (M9301-YC)



M9301-YC BOOTSTRAP (Type ^P H before attempting to boot.)

10,17765000G	TM11
20,17765000G	TC11
30,17765000G	RK05
40,17765000G	RP03/RP05/RP06
50,17765000G	RK06/RP07
60,17765000G	TU16
70,17765000G	RP04
100,17765000G	RS04
110,17765000G	RX01

Bootstrap Example with an initial switch value for an RP06 (M9312)

