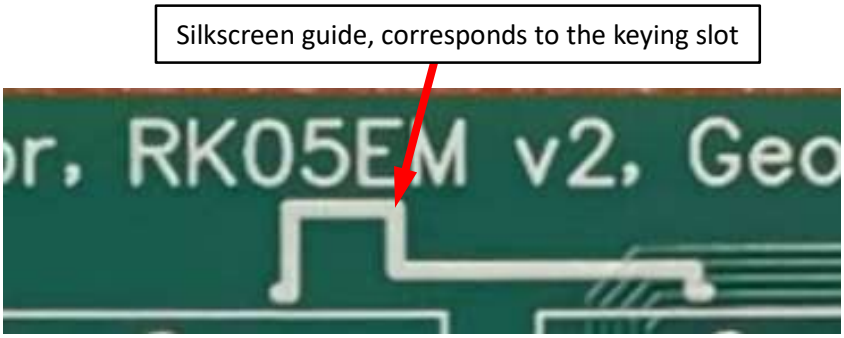
Connecting the Tester to the Disk Drive:

- The order of the following setup steps isn't important except to turn the power on as the last step.
- Plug in a terminator board and an RK05 Tester Cable Adapter Board into the two bus slots on the Tester. Both slots are electrically the same so the RK05 Tester Cable Adapter Board and terminator board can go in either slot. When connecting the "A5" RK05-to-Tester Cable, it is important to plug the end with the "RK05 Tester Cable Adapter" board into the Tester! The component sides of the adapter board and terminator should face up. It's easier to access the Adapter Board when the terminator board is installed in the top slot.

There is a keying slot between the two sets of gold contact fingers on both the terminator board and on the cable. There is a guide on the emulator main board silkscreen that shows the proper orientation of this keying slot.



Connecting the Tester to a Disk Drive

- RK05: Connect the unconnected end of the "A5" RK05-to-Tester Cable to the A7 or A8 slot in the Logic Assembly of the RK05 disk drive. This is the end of the cable with the M993GW adapter card. If this disk drive is the last drive in the chain then plug an M930GW Bus Terminator or a DEC M930 terminator into the other of slot A7 or A8 not occupied by the M993GW adapter card.

- Diablo Series 30:
    - Begin with the "A5" RK05-to-Tester Cable and disconnect the two flat cables from the M993GW adapter card.
    - Connect the two flat cables to one of the Diablo Adapter boards. The possible Diablo adapters are: "Diablo Connector Adapter S", "Diablo Connector Adapter P Keystone", or "Diablo Connector Adapter P".
    - Connect the flat cable from J1 of the RK05 Tester Cable Adapter to J1B of the Diablo Connector Adapter.
    - Connect the other flat cable, from J2 of the RK05 Tester Cable Adapter, to J2B on the Diablo Connector Adapter. J1A and J2A on the Diablo Connector Adapter are reserved for the Diablo Terminator.
    - Plug the Diablo Adapter board into one of the MRAC42 connectors, P2 or P5, on the back of the Diablo Series 30 disk drive. It's not necessary to plug anything into the remaining MRAC42 connector on the disk drive. All daisy-chaining of cables and terminations can be accomplished using the single Diablo Adapter board. However, it is also possible to use the original Diablo cables, such as the Diablo 11245-60, in conjunction with the Diablo Adapter boards.
    - In most cases, the Tester will be connected to only a single disk drive, so plug the Diablo Terminator into J1A and J2A of the Diablo Adapter board while being careful to engage the 2-pin 5V_TERM power connection at J3.
    - Connect the Diablo power supply and power cable to the P1 power connector on the back of the Diablo Series 30 disk drive.

Emulator Power Supply

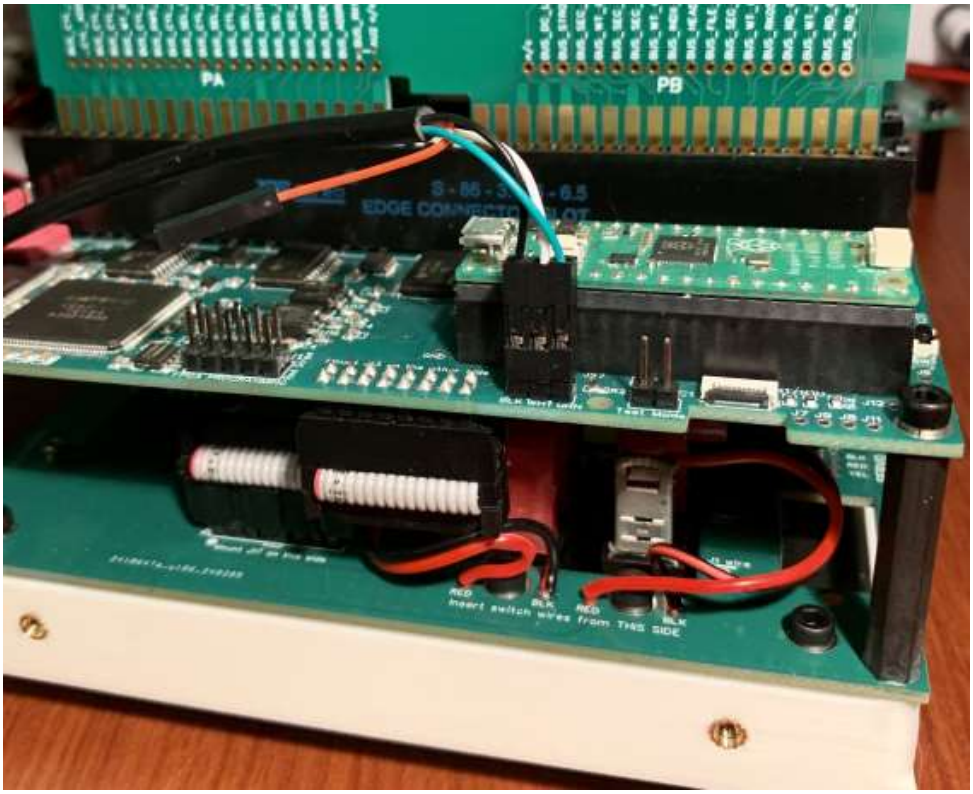
- Connect one end of the red/black power cable to the power header on the Emulator/Tester. Connect the other end of the power cable to any one of the three power headers on either the Emulator Power Supply. Up to three Emulator/Testers can be connected to a single Emulator Power Supply.

Emulator Power Supply

- Connect a 25 watt USB Type C power module to the USB Type C connector on the Emulator Power Supply. Emulator Power Supply versions v2 and above have a power input switch located near the USB connector.

Connecting a serial console

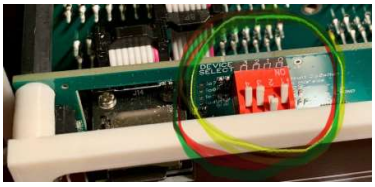
- Connect a USB serial cable to the serial “DEBUG” port, as shown. The black wire is “GND”, white is “TX”, green is “RX”. The red wire on the USB serial cable is unconnected. The silkscreen on the main board indicates which wire color should connect to each of the three pins. Either a 5 volt or 3.3 volt USB serial cable can be used; the emulator has 5 volt tolerant drivers and receivers on the TX and RX signals and is compatible with 3.3 volt or 5 volt signal levels. With USB side of the serial cable plugged into in the computer, set your terminal emulator to use whichever COM port is assigned to the cable. Tip: bring up the Windows Device Manager first, then plug the USB cable into the computer to observe which COM port was just assigned when the USB serial cable was inserted. The baud rate is 460,800 bits per second, 8 bits, no parity.



- Run a terminal emulator application on the connected computer. This will be the method to control the tester and observe the present status of the Tester.
- Plug in the USB Type C charger into a primary power outlet and turn on the on-board power switch. Observe the boot status messages displayed in the terminal emulator window.
- The Tester boots up in PDP-8 RK8-E mode. This can be changed via commands entered via the command line.

Using the Tester:

- Most Tester functions are performed using the command line interface via the connected serial terminal. Refer to the document “RK05 Tester Tests Description.pdf” for a description of Tester commands. Many command words have shortcuts to simplify command entry. These shortcuts are described in the Tests Description document.
- Insert a microSD card into the microSD slot accessible through the front panel. If it is necessary to transfer data from the microSD card to the connected drive then the card must have a valid rk05 emulator file with an “rke” file extension at the root level. Example rke files are provided in the emulator repository on github. When copying data from the connected disk drive to the microSD card, the destination filename is specified in the Disk Read command.
- The 4-position “DEVICE SELECT” dipswitch located behind the front panel is not used by the Tester.



- The RUN/LOAD switch and the WT PROT switch on the front panel of the Tester is currently not used.
- The following front panel indicators are functional in the Tester: PWR, WT, RD
  The other indicators are currently not used. The red LEDs inside the microSD compartment indicate when the microSD card is active and is being read or written. The user should not remove the microSD card when the red LEDs are illuminated.

Commonly used functions:

- To read data from a connected disk drive it is necessary to configure the tester to the proper mode, make the drive ready and confirm that the drive is ready, and read the connected drive to transfer the disk image to the microSD card. There are built-in controller configurations for the following disk controllers: DEC RK8-E, DEC RK11-D and RKV11-D, DEC RK11-E, Xerox Alto. It will soon be possible to read custom controller parameters from a file on the microSD card. The tester defaults to choose drive address 0 but this can be updated by using the Tester ADDRESS command. The selected drive address appears in the Tester command prompt. For example, to read a PDP-11 disk in an RK05 disk drive set to address 2:
    - Load the disk pack into the drive and make the drive ready
    - `MODE CONTROLLER RK11D` to change to RK11-D parameters
    - `ADDR 2` selects drive address 2
    - `DISPLAY STATUS` to confirm that the drive is ready
    - `DISK READ <FILENAME>` to read the disk image and save it to the specified file on the microSD card
- If the RK11-D formatted disk is loaded into a Diablo Series 30 drive then it's important to realize that the Diablo drive doesn't have the capability to respond to the binary-encoded address signals. The signal BUS_RK11D_L is driven by the controller and when active, tells the drive to use the encoded address mode. Since the MODE CONTROLLER RK11D command activates the RUS_RK11_D_L signal, it's necessary to deactivate it after changing the controller mode. In this example we'll assume the Diablo drive is set to drive address 0:
    - Load the disk pack into the drive and make the drive ready
    - `MODE CONTROLLER RK11D` to change to RK11-D parameters
    - **`MODE RK11D OFF`** to disable the encoded select signal, BUS_RK11D_L
    - `DISPLAY STATUS` to confirm that the drive is ready
    - `DISK READ <FILENAME>` to read the disk image and save it to the specified file on the microSD card
- To write an RK11-D formatted image onto a disk in a Diablo Series 30 drive set to address 0, the following command sequence can be used:
    - Load the disk pack into the drive and make the drive ready
    - `MODE CONTROLLER RK11D` to change to RK11-D parameters
    - **`MODE RK11D OFF`** to disable the encoded select signal, BUS_RK11D_L
    - `DISPLAY STATUS` to confirm that the drive is ready
    - `DISK WRITE <FILENAME>` to transfer the disk image from the microSD card to the connected disk drive