

**PART 8**  
**DISKS**



# CHAPTER 11

## RK8-E DISK DRIVE CONTROLLER

### SECTION 1 INTRODUCTION

#### 11.1 PURPOSE

The RK8-E (Figure 11-1) provides the interface between the PDP-8/E OMNIBUS and the RK05 Disk Drive. As a part of this function the RK8-E

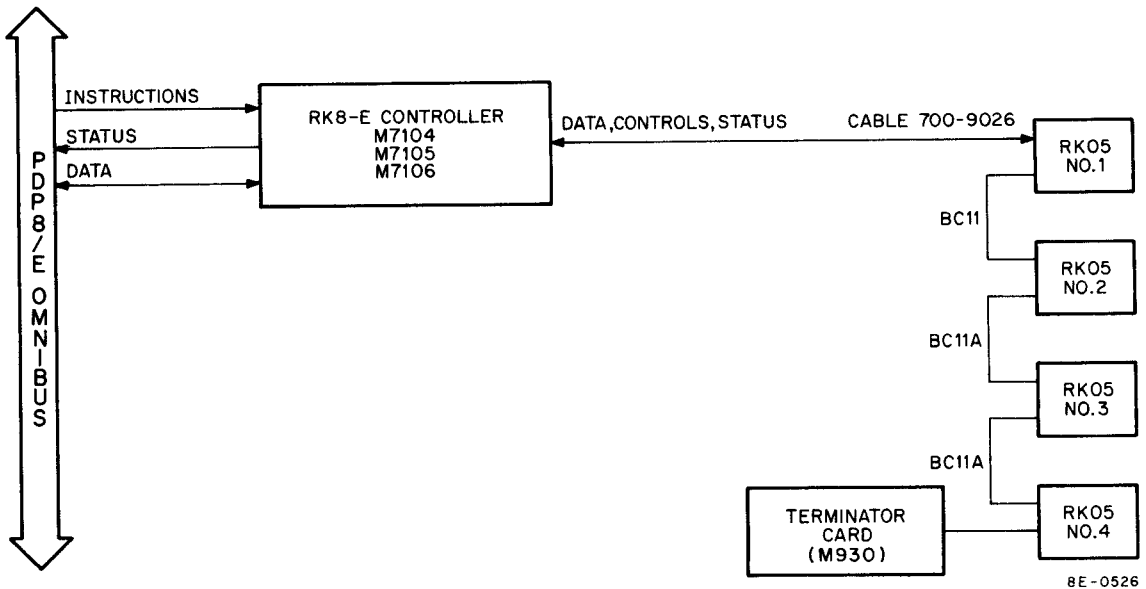


Figure 11-1 RK8-E Controller and RK05 Disk Drive System Block Diagram

- Decodes programmed IOT instructions.
- Accepts and stores current address, command, and extended memory address words.
- Selects the designated RK05 and starts the designated operation.
- Jointly (with the selected RK05) locates the disk address (track, sector, and surface).
- Generates interrupts and skips for status checking operations.

- f. Generates break requests to initiate single cycle data breaks (data transfers to or from memory).
- g. Buffers the input/output data and performs related conversions (serial to parallel and parallel to serial).
- h. Performs housekeeping chores for single cycle data break data transfers (i.e., increments Current Address Register and provides sequential memory addresses).
- i. Counts bits and words in a transfer to determine when to end a data transfer.
- j. Generates and checks CRC (parity) for each sector.
- k. Provides flags to indicate current conditions and error status.
- l. Provides logic to aid in the maintenance of the RK8-E and RK05.

## 11.2 PHYSICAL DESCRIPTION

The RK8-E consists of the following quad modules, which are inserted into the OMNIBUS and used to control up to 4 (maximum) RK05 Disk Drives.

- M7104, RK8-E Data Buffer Register and Status Module
- M7105, RK8-E Major Registers Module
- M7106, RK8-E Control Module

The RK8-E modules are inserted into the OMNIBUS and connected together with H851 Top Connectors. The RK8-E is connected to the RK05 Disk Drives by a 7009026 cable.

### 11.2.1 RK05 Disk Drive

The RK05 Disk Drive contains the drive electronics and mechanism for accepting and releasing the disk, positioning the read/write heads, and reading and writing data from the RK8-E control. The drive contains a removable disk cartridge, control logic, and a power supply. No power is supplied to the RK05 by the RK8-E, and the RK05 supplies no power to the RK8-E. Table 11-1 lists the RK05 Disk Drive specifications.

#### NOTE

**The specifications in Table 11-1 apply to the RK05 when it is used with the RK8-E and a 16-sector cartridge. The RK05 may be used in other systems with other controllers and sector formats.**

## 11.3 RECORDING METHODS AND FORMATS

This section describes the recording methods and the format used to write data on and read data from the RK05 Disk Drives.

Table 11-1  
RK05 Disk Drive Specifications

Characteristic	Specification
Cylinder, Track, and Sector	
Cylinder Density	200 CPI
Cylinders/Drive	203
Tracks/Cylinder	2
Sectors/Track	16
Sectors/Cylinder	32
Bit Density and Storage	
Bit Density	2200 BPI
Bits/Cylinder	120,000
Bits/Sector	3750
Bits/Drive	24 million
Data Word Storage	
Words/Sector	$400_8$ or $256_{10}$
Words/Track	$10,000_8$ or $4096_{10}$
Words/Cylinder	$20,000$ or $8192_{10}$
Words/Disk	1616K
Transfer Rate	
Word Transfer	8.32 usec
Bit Transfer Rate	1440 kHz
Recording Method	Double Frequency

### 11.3.1 Double Frequency Recording Method

The RK8-E uses the double frequency recording method. During a write operation, the RK8-E control generates timing pulses called Write Data Clock pulses (Figure 11-2). The time between the pulses is called a bit cell (space for writing data). A pulse within the bit cell represents a data 1 and the absence of a pulse represents a data 0. The clock pulse and data (0 or 1) are sent to the drive as Write Data and Clock pulses. Each pulse is recorded on the disk as a flux transition. A pulse representing a data 1 and the clock pulses cause a change in direction of current flow through the write heads and thus a change in the magnetic flux on the surface of the disk. Zero data bits do not cause a change in current flow through the write head; thus, there is no change in the magnetic flux on the surface of the disk.

During a read operation, the drive electronics separates the bit cell flux transitions and the data flux transitions. The bit cell flux transitions are sent to the RK8-E as Read Data Clock pulses and the data transitions are sent as Read Data pulses (serial bits of data).