RC 707 MAGNETIC TAPE STATION AND RC 4311 MAGNETIC TAPE STATION CONTROLLER

The magnetic tape station employs standard 7-track, ½ inch magnetic tape with recording densities of 200, 556, and 800 bits/inch (two of three). The tape length is 2450 feet (800 m), equivalent to 16.3 million characters at 556 bits/inch (and without interblock gaps). The tape speed is 45 inches/second, giving a transfer rate of 25,000 or 36,000 characters/second at 556 or 800 bits/inch.

Data is transferred via the high-speed data channel to and from the internal store of the RC 4000. The magnetic tape station controller converts 24-bit data words to 4 characters of 7 bits and vice versa during data transfer.

The tape transport has a single servo driven capstan, vacuum tape buffer chambers, servo controlled reel motors, and built-in tape cleaners. The tape is held in contact with the capstan by a low, uniform tension derived from the vacuum chambers, also during rewinding to ensure proper tape packing. A dual-stack read/write head assembly provides real read-after-write checking of all data.

The tape station is housed in a separate cabinet with castors. The tape transport has a hinged, transparent access door, and the station cabinet removable front, side, and rear panels. The controller is placed in an input/output controller cabinet along with other controllers. The tape station and controller are connected by means of a cable, maximum 12 m long.

Operation

The tape station is operated by the standard input/output instruction, which initiates tape movement and transfer operations. The controller executes an operation without engaging the computer and generates an interrupt signal when the operation is completed. During transfer operations data is transferred via
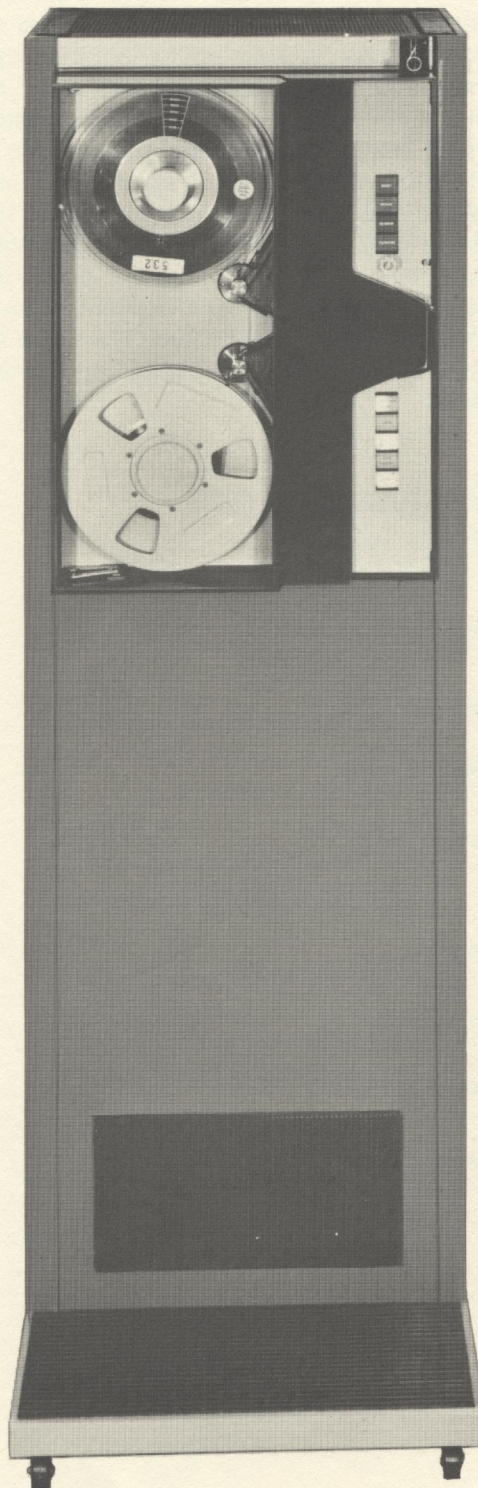
the high-speed data channel to or from the internal store of the RC 4000 by means of cycle stealing. The tape can be moved to upspace a file or block, backspace a file or block, or rewind or unload tape.

Data input from tape is initiated by an instruction sequence defining internal store array and input operation. During the input operation, 24-bit words are merged from each group of 4 characters on the tape. Data output to tape is initiated by an instruction sequence defining internal store array and output operation. During the output operation, 24-bit words are split into 4 characters on the tape. When an input operation is completed, the block length can be sensed from the program. The tape station provides status bits indicating parity error, end-of-tape sensed, beginning-of-tape sensed, write-enable ring sensed, and so forth. The status bits can be sensed by an instruction (sense command).

The tape station has a local/remote switch, which can be set manually. In local mode the operator can load and unload tape, and maintenance can be carried out. In remote mode the tape station is program controlled.

Data Format

Each character on the tape consists of 7 bits, one of which is a parity bit generated/checked in the controller to provide even/odd transversal parity in all characters. A 4 character group (exclusive of parity bits) defines a data word of 24 bits. A number of consecutive words constitutes a data block, which can contain up to 16,384 words. A longitudinal redundancy check character (LRCC) is generated/checked in the controller to provide even longitudinal parity in each block.

A tape mark is a block consisting solely of a character with the decimal value 15 (with even transversal parity).

CHARACTERISTICS

Magnetic Tape
7-track, ½ inch, international compatibility
length: 2450 feet (800 m)

Tape Transport
equivalent to Ampex TM 7

Recording Densities
two of three: 800, 556, and 200 bits/inch

Recording Mode
NRZ 1 (non-return to zero)

Tape Capacity
5.7 million words at 800 bits/inch
4 million words at 556 bits/inch
1.4 million words at 200 bits/inch

Word Size
24 bits, equivalent to 4 characters on tape

Block Length
1 to 16,384 words

Interblock Gap
¾ inch

Access Time
9 ms from start to block begin

Transfer Rates
36,000 char/sec at 800 bits/inch
25,000 char/sec at 556 bits/inch
9,000 char/sec at 200 bits/inch

Tape Speed
read/write: 45 inches/sec
rewind: approx. 180 inches/sec
rewind time for 800 m: less than 3 minutes

Power
220 V ± 10 %, 50 Hz ± 4 %
stand-by current: 3 A
operating current: 6 A
The controller is supplied from the power supply in a controller cabinet.

Ambient Air
temperature: 10 to 40°C
relative humidity: 30 to 70 %

Cooling Air
300 m³/hour from ambient
730 kcal/hour

Size and Weight
width: 57.2 cm
depth: 57.0 cm
height: 179.9 cm
weight: 166.0 kg
The controller is placed in a controller cabinet.

rc 4000 COMPUTER®