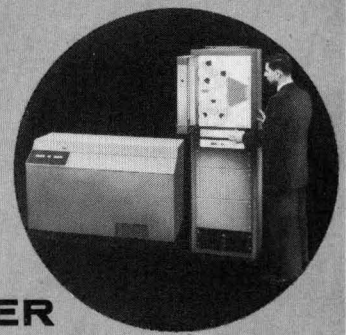


NEW *system...*
NEW *capabilities*

FOR COMPLETE ON-LINE DATA REDUCTION

Combining the RW-300 Digital Control Computer with its matched magnetic tape unit creates a powerful new system for on-line data reduction. For the first time, a single compact system can fulfill all data reduction requirements at the test site. The system will automatically scan measuring instruments, convert their readings to digital form, and store this data on magnetic tape at a maximum rate of 2,560 words per second. Generally, the RW-300 will also compute quick-look data and feedback control signals. Within minutes after a test is finished the system will automatically produce complete test data and results in meaningful form. For further information, call or write: Director of Marketing, The Thompson-Ramo-Wooldridge Products Company, 202 North Canon Drive, Beverly Hills, California, BRadshaw 2-8892.



The **RW-300 DIGITAL CONTROL COMPUTER**

with the

**NEW
MAGNETIC
TAPE
UNIT**

**EXPEDITES TESTING
REDUCES COSTS**

THE THOMPSON-RAMO-WOOLDRIDGE PRODUCTS COMPANY

a division of *Thompson Ramo Wooldridge Inc.*

THE RW-300 MAGNETIC TAPE UNIT

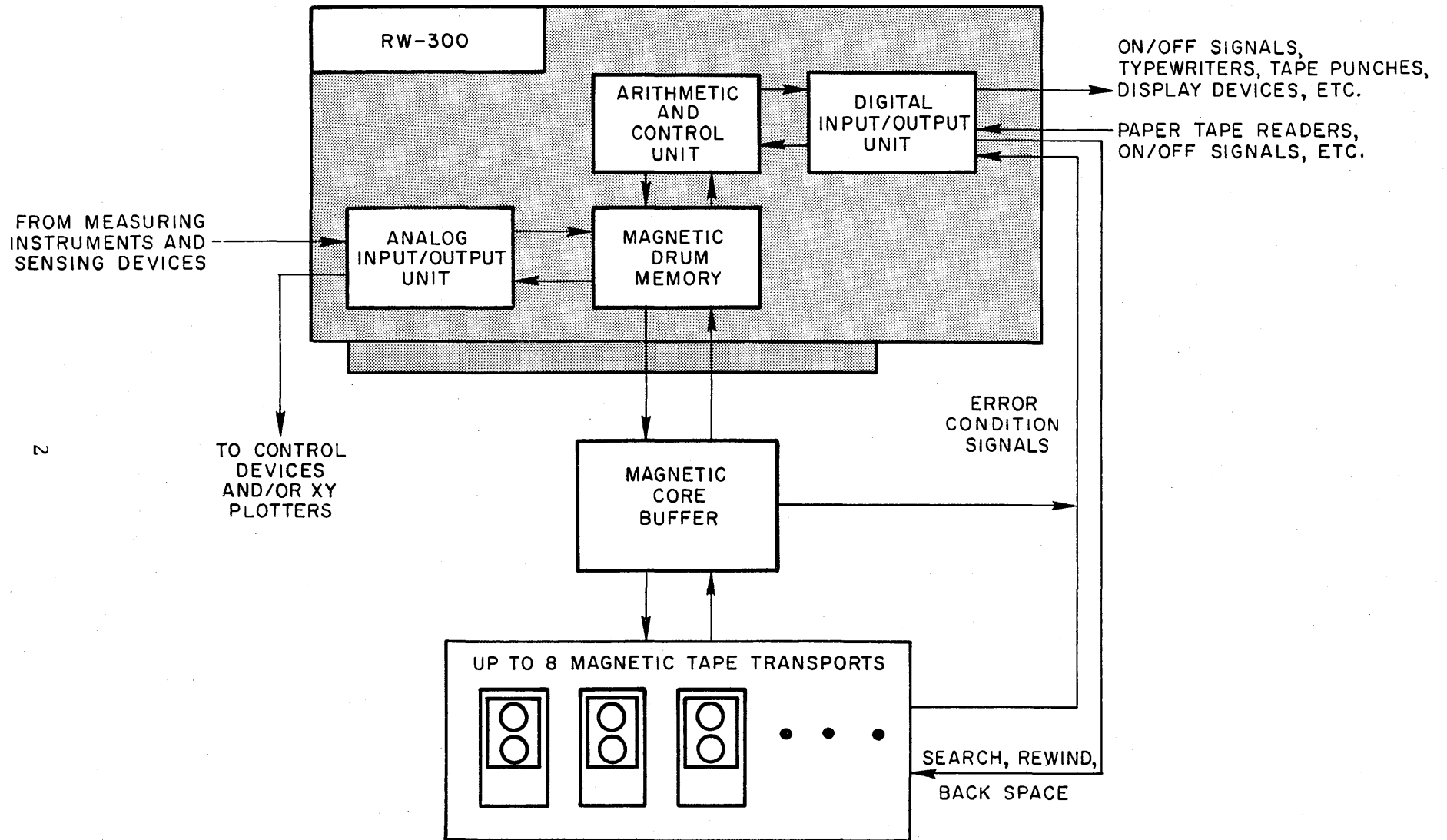
SYSTEM APPLICATIONS

The RW-300 Digital Control Computer and the RW-300 Magnetic Tape Unit form a system that is ideally suited for data reduction applications in many test facilities, including environmental laboratories, wind tunnels, test stands, nuclear installations, and pilot plants. This new system provides the advantages of complete on-line data reduction at the test site. Its performance is unequaled by arrays of more elaborate equipment used for data acquisition, conversion, translation, and processing.

In the RW-300 System, digital data flows to and from magnetic tape via a magnetic core buffer, as shown in the block diagram on page 2. The computer prepares and processes the data that is transferred to the tape. As many as 1,024 measuring instruments and sensing devices can be scanned by the RW-300's analog input/output unit, which converts the analog voltage signals to digital form and records these values on the magnetic memory drum. Data is transferred from the drum through the buffer to the tape. For interpretation, analysis, and presentation, raw data is transferred back to the computer via the buffer.

In most test facilities, data is generated at high rates for only short periods of time, and is then collected and analyzed by a combination of manual and semi-automatic methods requiring days or weeks. The RW-300 system can perform all data reduction functions and produce meaningful data and results within minutes after a test is finished. It can generally compute quick-look data and feedback control signals while the test is in progress. It can also provide logical sequencing and control of test equipment.

The power of the RW-300 system results from the balanced performance and advanced features of the individual units. The RW-300 Magnetic Tape Unit is the most powerful unit available for use with a medium-speed computer, because of its versatile operations. The RW-300 computer, with its integral analog-digital converter, incorporates the high reliability and special characteristics necessary for on-line control and data handling in industrial applications. Its flexible analog and digital input/output units



facilitate broad communication with physical phenomena and human operators. In addition, the RW-300 offers full general-purpose computing abilities.

EQUIPMENT DESCRIPTION

The RW-300 Magnetic Tape Unit consists of a magnetic core buffer and from one to eight magnetic tape transports. The buffer has a capacity of 128 computer words of 18 bits each, corresponding to one track on the drum and one block on the tape. Each transport holds one reel of tape with a capacity of approximately one million words. The unit transfers data at the maximum usable rate of either 1,920 or 2,560 words per second. (For additional information, refer to the specifications on pages 7 and 8.)

An eight-transport system can record data automatically at the maximum rate for nearly 70 minutes. Since the tape reels are easily replaced, the data-recording period may be extended indefinitely.

The transports are modified Ampex FR-400 Digital Tape Handlers operating at 75 inches per second in the write, search, and read modes and rewinding at 160 inches per second. Each transport accommodates 2400 feet of standard 1/2-inch magnetic tape wound on a 10-1/2-inch reel.

The buffer is a specially designed assembly, which in addition to the core storage includes control, parity generation and checking, error sensing, timing, and power circuitry.

The entire magnetic tape unit is designed and constructed to ensure dependable operation. Parity checking and error surveillance are provided to prevent loss and inaccuracies in data during transfers to and from magnetic tape. Carefully selected components are employed in the conservative, derated electronic circuits in order to achieve reliability of the same order as that of the RW-300 computer.

EQUIPMENT OPERATION

The computer program controls the normal, automatic operation of the magnetic tape unit. The unit furnishes error condition signals to aid in this

control, and has manual controls and indications for non-automatic operations.

A single computer command with a number of variations determines the mode of operation of the magnetic tape unit. This command causes the unit to transfer data, search, rewind, or back space. Data is transferred within the system in one of five different steps: (1) from computer to buffer, (2) from buffer to tape, (3) from computer to tape, (4) from tape to buffer, and (5) from buffer to computer. To locate data recorded on tape, the computer searches the tape while it is traveling forward or reverse until a specified block number (first word of the block) is found. To prepare to write over data on tape, the selected transport back spaces one block and stops.

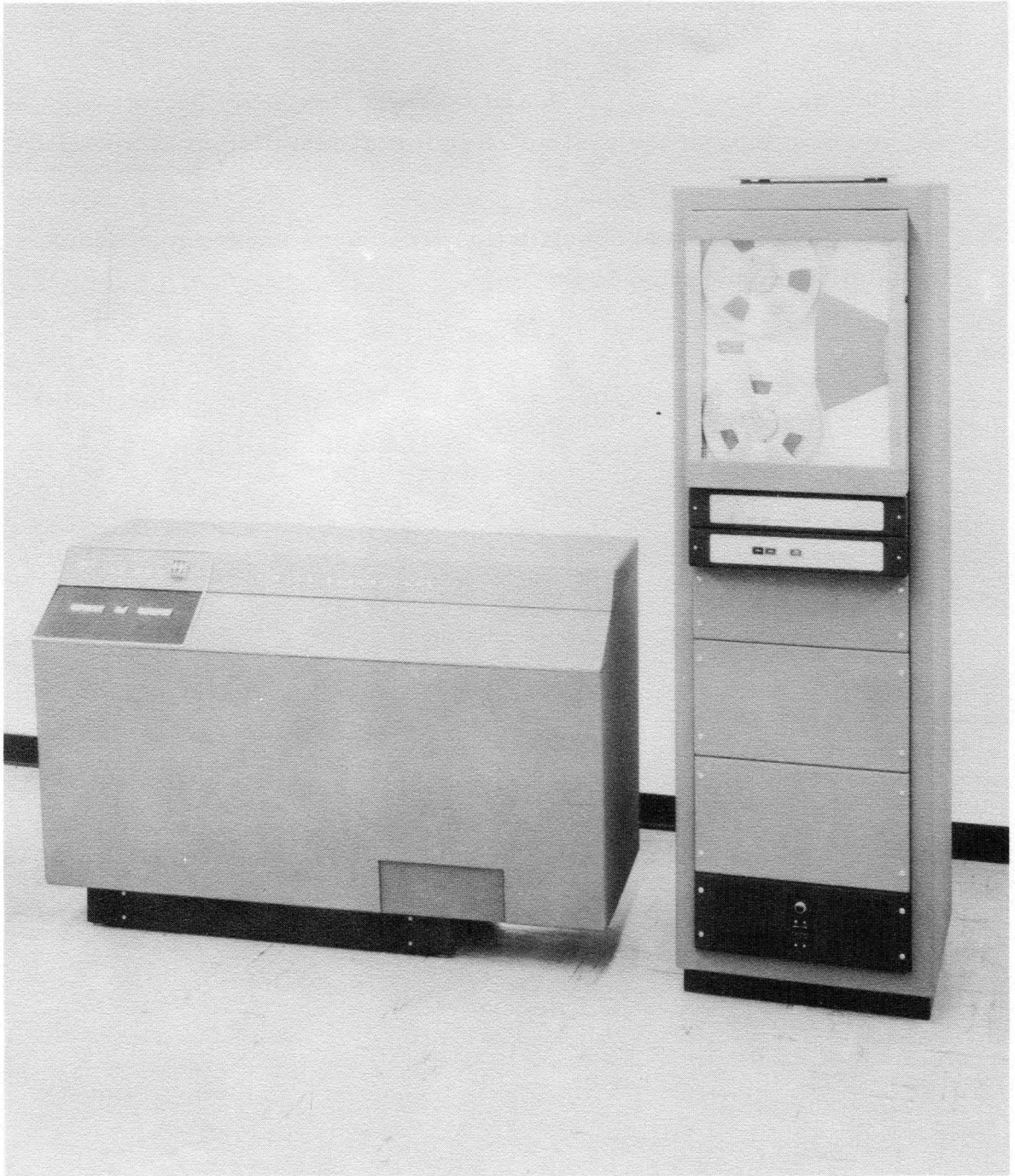
The tape unit provides the computer with indications of six conditions that interfere with the transfer of data. These conditions are (1) buffer power supplies inoperative, (2) buffer in use, (3) tape error (parity violation), (4) transport inoperative, (5) end of reel, and (6) "write" amplifiers disabled. During the last three conditions, the unit causes the computer to stop if it attempts to transfer data.

For a description and specification of the computer, refer to the RW-300 Digital Control Computer brochure.

SYSTEM ADVANTAGES

The advantages of the RW-300 computer and magnetic tape system are the following:

1. It compresses the elapsed time between the completion of a test and the availability of meaningful results.
2. It sharply decreases the manpower required to gather data, process it, and calculate results.
3. It is less expensive than the array of conventional equipments required to accomplish similar functions.
4. It provides closed-loop control and logical sequencing capabilities.



RW-300 DIGITAL CONTROL COMPUTER WITH MAGNETIC TAPE UNIT

5. It makes available full general-purpose computing abilities at the test site.
6. Its "building block" approach and inherent flexibility permit expanding the functions of the system after initial installation at moderate or no additional cost.
7. Its design criteria and construction techniques ensure maximum reliability of operation in the field.

SPECIFICATIONS OF THE RW-300 MAGNETIC TAPE UNIT

GENERAL

Number of buffers: one.

Number of transports: one to eight.

Power consumption: 850 watts, 120 volts, 60 cps.

BUFFER

Type: magnetic core.

Physical characteristics: mounted in one tape transport.

Capacity: 128 words of 18 bits each (one block).

TAPE TRANSPORT

Type: modified Ampex FR-400 Digital Tape Handler.

Dimensions of transport: 72 in. high, 23 in. wide, and 24 in. deep.

	<u>150 lines per inch</u>	<u>240 lines per inch</u>
Tape width	1/2 in.	1/2 in.
Tape length	2400 feet	2400 feet
Tape reel	10-1/2 in.	10-1/2 in.
Tape speed forward or reverse	75 in./sec., with- in 1%	75 in./sec., within 1%
Tape rewind speed	160 in./sec.	160 in./sec.
Maximum bit rate	11.25 kps	18.0 kps
Minimum bit time	89 us.	55.5 us.
Block length (128 words)	2.58 in.	1.61 in.
Blocks per 2400-foot tape	7,630	10,250

TAPE TRANSPORT (Continued)

	<u>150 lines per inch</u>	<u>240 lines per inch</u>
Allowable block numbers	2 ¹⁸	2 ¹⁸
Block time	34.4 ms.	21.5 ms.
Maximum usable data transfer rate	1,920 words/sec.	2,560 words/sec.
Number of heads	8 read; 8 write	8 read; 8 write
Number of data bits	6	6
Number of timing bits	1	1
Number of parity bits	1	1

The RW-300 Magnetic Tape Unit was designed and is manufactured by Ramo-Wooldridge, a division of Thompson Ramo Wooldridge Inc. Systems engineering, installation, maintenance, and marketing of RW-300 systems are performed by The Thompson-Ramo-Wooldridge Products Company, a separate division.