WANGCO

SUMMARY OF TEST FUNCTIONS

FOR WANG COMPUTER PRODUCTS MAGNETIC TAPE SYSTEMS

Each Wang Computer Products magnetic tape system is computer-tested before shipment. A printout of the test results accompanies each machine when it leaves our plant. Interpretation of the test results will be made easier through the use of this summary.

At the beginning of the final test procedure, the machine type is keyed into the system, with the machine serial number. Then the computer aides the test engineer in putting into the system the data necessary to perform the tests. This is in the form of a question and answer dialogue, as follows:

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MTT MODEL - ? - M/7  7/9?-9  IPS ?-012.5  RUN/STOP?-N
FWD/STOP?-Y  DUAL STACK?-Y  F/P LO TRUE?-Y  VPG?-N
VPC?-N  CRCG?-N  LPG?-N  LPC?-N
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The first item is self-explanatory. In this example, the Magnetic Tape Transport is a Mod 7. The computer asked if it were a 7- or 9-channel machine, and the answer was 9. Tape speed was entered as 12.5 inches per second, and the Run/Stop control mode was denied. Instead, the system was told that the handler would respond to motion commands on the basis of Forward/Stop and Reverse/Stop. The computer was given a "Yes" response to the dual stack query, indicating that the machine is capable of read after write. F/P LO TRUE indicates that there is no file protect ring on the tape reel.

VPG and VPC are vertical parity generate and check, respectively, and the system has been told that it needn't check the tape handler for these functions. The same is true of CRCG, which stands for cyclic redundancy check generation. LPG and LPC represent longitudinal parity generate and check; the response to the system indicates that these functions are not in the tape handler being tested.

In the ensuing test procedure, several types of tests are run, with the following designations and printout characteristics:

RTI - Read-head Track Identification. In this test, the system responds by going through the tracks in turn, showing which track was addressed by the system and which track responded.

SPEED - The tape speeds in forward, reverse and rewind are checked to two decimal places, and the results are shown in the printout.

WTI - Write head Track Identification. This is similar to the read head test, and again the system addresses the tracks in turn, checking the results for proper response from the tape system.

IRG - Inter-record Gap. This test checks the length of the inter-record gap written by the system to be sure it does not exceed specified limits, nor fall short of the minimum permitted by computer industry standards. The result of this test is printed out in mils, or thousandths of an inch.

HPT - Head Phasing Test. Polarity of write heads is checked in this test to be certain that the heads are all polarized in the same direction. If there is an error of head phasing, the system will print out an error indication in the appropriate channel.

SLT - Servo Loop Test. In this test, the ability of the servo systems to respond to all programming conditions is checked through varied command rates. The test starts with a 1 msec forward command, followed by a 1 msec reverse command. In the next sequence, the command in each direction is of 2 msec duration. When the system has successfully performed at all rates up to one second in each direction, the test is terminated. If the system fails, the test terminates and appropriate entry is made in the printout.

SCW - Servo Check Write. Incorrect capstan operation is checked in this test, in which a variable number of characters is written in each record and then the system checks the numbers. If the number is incorrect when checked, the system prints out WRITE ERR.

SCR - Servo Check Read.
This test is similar to SCW but it is performed with a pre-recorded tape. If the character count is incorrect a READ ERR printout is recorded.

IBT - Isolated Bit Test.
Data electronics in the tape system are checked in this test. A data pattern having only one flux change in each character is written on the tape and read as it's written.

Setting up this test introduces other characteristics, as may be seen on the printout:

MODE?-RAW	Read after write.
BPI?-0800	800 bits per inch; or 200, 556, or 1600 bits per inch.
CHAR/BLK?-1024	1024 characters per block.
# BLKS?-200	200 blocks in test.
INTER?-1	One iteration of the test is indicated; more iterations may be requested by the test engineer.
STROBED?-N	Data is sensed as a transition on a data line at any time. If a Y (yes) input is given data is sensed and stored only at the read clock time.
ERR REPORT?-Y	Operator requests error report after each record.
CYC ON?-N	Operator declines cycle on any record found in error. If he inserts Y, the system will repeat the block in which the error was found until the operator intervenes.
STOP X?-Y	Operator instructs the system to stop the test after finding X number of errors.

ERRS?-255 — Operator specifies the number of errors after which the test should be stopped. This can be from 1 to 254. If he specifies 255, the test will continue. The number of errors is reported at the end of the test.

RFW - After MODE?, RFW indicates Read Forward.

RRV - After MODE?, RRV indicates Read Reverse.

CCT - After TEST TYPE, CCT indicates the Chop-Chop Test, which tests both the servos and data electronics with varying block lengths. Blocks are written and read, starting with an eight-character block, in Read-after-Write mode. This is followed by a read reverse and a read forward. As the test proceeds, the block length is increased in 8-character increments to 1024 characters, then reduced by the same increments to 8 characters again. In addition the operator may select up to 5000 iterations of the test.

CTT - Cross Talk Test.
For proper tape system operation, it is vital that data written in one channel not be read in adjacent channels, either in Read mode or Read after Write mode. An effective method, as used in CTT, is to shift an isolated zero through all channels and check parity for each character. The operator may also vary the number of characters in each block from 1 to 1024, and the number of blocks per tests from 1 to 5000. The test may also be repeated up to 5000 times.

RDT - Random Data Test.
This test simulates normal tape system operation through the writing of psuedo-random data with random record lengths. Each block has a different pattern, and the system checks all characters.

These tests are supplemented with additional operations to establish the margins of reliability provided in the equipment. These operations involve changes to adjustments in the tape systems, while using the computer-controlled modes of operation described in this summary.

When options such as VPG, VPC, LPG, LPC, and CRCG are included, the tests are expanded to include checking of those functions also.