ATTI Company Profile
The corporation:
- Has designed, developed and manufactured ATE since 1987
- Has delivered and supported many test systems in both the commercial and military sectors
- Is an innovator in developing and implementing VXI technology solutions
- Has developed over one thousand test program sets, covering the test spectrum from simple to extremely complex

ATTI Worldwide Support
The corporation:
- Has developed Obsolescence Mitigation Replacement (OMR) technology which represents ATTI’s corporate commitment to customer use and TPS investment in our test systems
- Has delivered BRAT test systems worldwide
- Offers one of the most experienced service, training and support teams in the world
- Has worked with our customers solving diverse test challenges in digital, analog, and RF applications
- Is committed to total hardware and software support including service, spares, upgrades, documentation, training, and configuration control
- Has the financial efficacy to guarantee long-term commitments

ATTI Offices
Corporate Headquarters
110 Ricefield Lane, Hauppauge, NY 11788, phone: (631) 231-8777, 1-800-ATTI-VXI, fax: (631) 231-7174 www.attinet.com

Field Offices
Warner Robins, GA 127 Osigian Blvd., Warner Robins, GA 31088 phone: (478) 953-6356, fax: (478) 953-6494
Oklahoma City, OK 4600 SE 29th Street, Suite 530, Del City, OK 73115 phone: (405) 670-0384, fax: (405) 670-0388
Layton, UT 2965 N 935 E, Suite 1, Layton, UT 84041 phone: (801) 771-7259

Advanced Testing Technologies, Inc.
008 Rev A 10-6-14
514B1 Description

The 514B1 is a system developed to support HUD testing requirements for the A10. The system is configured with a generic analog/digital subsystem plus AC & DC power supplies. A PC based controller provides control of the A10 VXI configured chassis, AC & DC power supplies with configuration options as specified below.

State-of-the-Art-Technology
The BRATM features VXI instruments-on-a-card and modular technologies to provide complex testing capabilities in a compact workstation.

Multiple Programmable DC and AC Power Supplies
The power system is a reconfigurable precision power subsystem designed to meet the challenges of high tech ATE.

Operating Environment
The standard operating environment is Windows™. The software packages installed are determined by the user's test requirements.

Specifications
Computer
Intel-based PC (custom configurations available as options)

Test Languages
TEASCI™ Test Language (options available)

Static Digital Quad 8-Bit Latch
Four independently programmable 8-bit ports for GPIO handshake modes

Digital Multimeter
AC/DC Voltage: Range: 100 mV to 300 V
Resolution: 1 mV to 1 mV
Resistance (3-Wire): Range: 100 Ω to 100 MΩ
Resolution: 3 mΩ to 30 Ω
Frequency Range: 10 Hz to 30,000 Hz
Period: 0.1 to 3.33 ms
DC Common-Mode Rejection: 140 dB

Form C Switch
32 Channel
Nonlatching Relays (SPDT)

DC Power Supply
Eight programmable DC supplies
Resolution: 10 mV
Range: 9 V to 7 Vdc @ 15 A
9 V to 30 Vdc @ 10 A
0 V to 7 Vdc @ 6.25 A
0 V to 160 Vdc @ 1.25 A
0 V to 390 Vdc @ 0.65 A

AC Power Supply (Three-Phase) with PFC
Frequency Resolution: 0.01 Hz to 40 to 99.9 Hz
0.05 Hz 100 to 999.9 Hz
0.5 Hz 1000 to 5000 Hz
Range: 0 to 312 Vac
PFC: Allows for correction of input power better than 0.99

Switching
Maximum Current: 1 A
> 400 Universal Analog Test Points

When the 514B1 is integrated with a BRAT 100/200 Series System it provides all capabilities to test the A10 HUD.

Standalone units are also available.

VXI-4 Slot Mainframe
The VXI Video Generator is a programmable instrument generating accurate stroke (calligraphic) video to the A10 HUD for parametric evaluation. This generator is fully programmable providing for brightness, MTF, pin-cushion or barrel distortion, and positioning test patterns.

VXI Video Analyzer
This instrument can perform one-shot or continuous full frame video image capture on both analog and digital video in either synchronized or deflection driven format. For synchronized video, the video has an adaptive sync lock that locks on the input synchronization signal even if the signal is marginal.

VXI video generator
MTFaffle

Multiple Programmable parameters:
- Bus controller - Response time
- Multiple RT - Message rate
- Bus monitor - Programmable response time - Amplitude
- Dual slot width

514B1 System Instrumentation
(1) Transport
(2) Camera
(3) A10 BoreSight Bench
(4) A10 BoreSight Reference Tool
(5) Camera Controller
(6) VXI Mainframe
(7) VXI Generator
(8) MXG-0 Controller
(9) Video Monitor
(10) Analog/Digital/Power Supply System
(11) 153SB Bus Analyzer Simulator
(12) Video Analyzer

Transport
Transport provides a stable platform for the camera and servo positioning system.

Camera
The camera with its complementary Transport is an imaging micro-photometer providing for accurate measurements of HUD parameters such as line positioning to the accuracies of legacy theodolite systems. The camera's accuracy is traceable to NIST and with its optional Luminous Transfer Standard provides a complete HUD & Displays measurement tool.

A10 BoreSight Bench
The A10 BoreSight Bench (as a stable platform to mount the Transport/Camera and the A10 HUD or the BoreSight Reference Tool. It is supplied with an optical breadboard which provides positioning dowels to ensure that the HUD reference plane is accurately setup before measurements are made. These dowels represent the alignment pins required to ensure proper boresight is maintained.

BoreSight Reference Tool
This tool provides the BoreSight Reference Point for the Camera Positioning System. Ultimately Aircraft Datum Line for A10 is verified as the BoreSight Point and is then transferred accurately via gauge blocks, a surface plate, a theodolite and a rotatable leveler. This method allows for auto-mating the Test Program supporting the HUD and allows for extremely fast measurements with repeatable accuracies to be maintained.

Camera Controller
The Controller is a GPIB controlled device that provides the complete input-output interface to the Transport/Camera system. It provides a host of commands for positioning as well as providing the capability to measure various optical or visual parameters.

VXI 4 Slot Frame
This chassis supports the Host Computer PCI-MX2 interface and allows for the controlling of the VXI Video Generator. It also provides all of the power and interface backplane required by VXI instrumentation.

VXI Video Generator
The VXI Video Generator is a programmable instrument generating accurate stroke (calligraphic) video to the A10 HUD for parametric evaluation. This generator is fully programmable providing for brightness, MTF, pin-cushion or barrel distortion, and positioning test patterns.

VXI Video Analyzer
The RTCP performs one-shot or continuous full frame video image capture on both analog and digital video in either synchronized or deflection driven format. For synchronized video, the RTCP has an adaptive sync lock that locks on the input synchronization signal even if the signal is marginal.

VXI-5 Controller
This controller acts as an extension of the Host Computers PCI interface and allows for very high speed 1152b/second rates to be transmitted to and from the embedded VXI register based instruments. This technology is mandated via requirements to load extremely dense data patterns to the video generator without the overhead that would occur if slower bus structures (example GPIB) were utilized.

Video Monitor
This monitor provides a human interface to the closed loop video system. It interfaces with camera system on an RS-170 video interface. The operator can determine the systems operation and measurement or command set being executed at any point within the Test Program execution.

System Measurement Capability
The 514B1 provides for Modulation Transfer Function (MTF) Analysis, Peak Brightness, Line Center, Parallax, Line Width, Area Brightness and Area Brightness from 0.8 to 2.0 TV lines/field. The operator can determine the systems operation and measurement or command set being executed at any point within the Test Program execution.

What the System Actually Measures
The 514B1 can perform a variety of tests in each configuration, measuring:
- line width and resolution
- line center
- line sharpness (Modulation Transfer Factor—MTF)
- peak brightness
- area brightness
- parallax

Resolution
The 514B1 provides high quality resolution as it over-samples all areas of the image. It is not possible to take a good quality digital camera, look at a good quality display, and see the defects in the display without limiting that analysis by the defects that may be present in the camera. The Camera combines a high-quality, 100 percent tested and calibrated, photo-diode matrix array with precise angular motion and auto-focus.

Specifications
Recommended dash test specifications for multi-field capability Performance Characteristic Limit accuracy : (includes position, optical, & analytical errors)

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