Tektronix

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Subject: AM500 / AM5000 series Current Probe Amplifier Systems and Sub-Systems Memory Erasure Report (Tektronix Models – AM503, AM503A, AM503B, AM503S, AM5030, AM5030S)

This document provides information regarding the declassification of the Tektronix AM500 and AM5030 series Products.

PRODUCT:

AM503 AMPLIFIER; CURRENT PROBE,
Requires TM500 or TM5000 series power supply for operation.

Memory Parts List:
AM503 has no volatile or non-volatile memory parts.

Memory Erase Procedure:
None required.

AM503A AMPLIFIER; CURRENT PROBE,
Requires TM500 or TM5000 series power supply for operation.

Memory Parts List:
A1 U152 = 160-8824-01 IC, DIGITAL; 16K, EPROM, PRGM, 87C65A

A1 U251 = 156-3886-00 IC, MEMORY; CMOS, SRAMS, 256 X 8, I2C BUS, PCF8570, DIP08

A1 U250 = 156-4153-00 IC, MEMORY; CMOS, EEPROM;256 X 8, I2C BUS, PCF8582, DIP08.15

Memory Erase Procedure:
The non-volatile memory in this product contains user storable instrument settings only.
Remove Battery backup to clear non-volatile memory

Turn power off for a minimum of 20 seconds to clear all volatile memory.

AM503B AMPLIFIER; CURRENT PROBE,
Requires TM500 or TM5000 series power supply for operation.

Memory Parts List:
160-9569-02 IC, PROCESSOR; CMOS, MICROCOMPUTER;8-BIT, 16 MHZ, 32K X 8 OTP EPROM, 512 X 8 RAM, I2C, 80C51 FAMILY, PRGM 156-4389-00;P87C528EBPN, DIP40.6

156-3886-00 - IC, MEMORY; CMOS, SRAMS, 256 X 8, I2C BUS, PCF8570, DIP08

Memory Erase Procedure:
The non-volatile memory in this product contains user storable instrument settings only.
Remove Battery backup to clear non-volatile memory
Turn power off for a minimum of 20 seconds to clear all volatile memory.

AM5030 GPIB AMPLIFIER; CURRENT PROBE
Requires TM5000 series power supply for operation.

Memory Parts List:

160-9565-01 – IC,MEMORY; CMOS,EPROM;32K X 8,PRGM 156-3503-00,27C256,DIP28.6,GPIB ROM,200NS

160-9565-00 (replaced by 160-9565-01) – IC,MEMORY; CMOS,EPROM;32K X 8 PRGM 156-3052-00;27C256-250,DIP28.6

160-9569-02 – IC, PROCESSOR; CMOS, MICROCOMPUTER;8-BIT, 16 MHZ, 32K X 8 OTP EPROM, 512 X 8 RAM, I2C, 80C51 FAMILY, PRGM 156-4389-00;P87C528EBPN, DIP40.6

160-9569-01 (replaced by 160-9569-02) – IC,PROCESSOR; CMOS,MICROCOMPUTER;8-BIT,16 MHZ,32K X 8 OTP EPROM,512 X 8 RAM,I2C,80C51 FAMILY PRGM 156-4123-00;P87C528EBPN,DIP40.6

160-9569-00 (replaced by 160-9569-01) – IC,PROCESSOR; CMOS,MICROCOMPUTER;8-BIT,16MHZ,32K X 8 OTP EPROM,512 X 8 RAM,I2C,80C51 FAMILY,P87C528EBPN,DIP40.6

156-3886-00 – IC, MEMORY; CMOS, SRAMS, 256 X 8, I2C BUS, PCF8570, DIP08

156-2066-00 – IC, MEMORY; CMOS, SRAM;8K X 8, 120NS, DIP28.6, DUPLICATE OF 156-2274-00

156-4046-00 IC, PROCESSOR; CMOS, MICROCONTROLLER;8 BIT, 16MHZ, 256X8 RAM, ROMLESS, 80C51 FAMILY;P80C32-1, DIP40.6

Memory Erase Procedure:

The non-volatile memory in this product contains user storable instrument settings only. Remove Battery backup to clear non-volatile memory

Turn power off for a minimum of 20 seconds to clear all volatile memory.

AM503S CURRENT PROBE SYSTEM;
Includes: AM503B(A), TM502 MAINFRAME (TEGAM PN 118-9221-00) & A6302 CURRENT PROBE

Memory Parts List:

Has the same memory parts as the AM503B or AM503A depending which amplifier shipped with the instrument.

Memory Eraser Procedure:

Uses same memory erase procedures as the AM503B or AM503.

AM5030S GPIB AMPLIFIER; CURRENT PROBE SYSTEM,
Includes: AM5030 & TM5003 MAINFRAME (TEGAM 118-9270-00)

Memory Parts List:

Has the same memory parts as the AM503B or AM503A depending which amplifier shipped with the instrument.

Memory Eraser Procedure:

Uses same memory erase procedures as the AM503B or AM503.

See Appendix A for generic overview of operation for AM503A, 503B, and AM5030.

If you have any questions, contact the Tektronix Technical Support Center at http://www.tektronix.com/support.

APPENDIX A
AM503A, AM503B, AM5030 Operation Overview

The AM503A, AM503B and AM5030 microcontroller circuit translates front panel commands into corresponding circuit responses, reports circuit status information to the front panel indicators and manages overall instrument operation.

The DC signal path originates in the Hall device and flows through the Hall device preamplifier, power amplifier, probe coil, attenuator, and finally through the output amplifier. The AC signal path originates in the probe coil and flows through the attenuator and output amplifier. The overall system gain is determined by the attenuator and gain settings of the output amplifier. These circuits are controlled by the microcontroller and its associated interface circuitry.

The microcontroller processes user-initiated switch closures from the front panel and sends corresponding control signals to the appropriate circuits. Analog control signals are generated by the digital-to-analog converter (DAC). The control signals typically include gain settings and offset voltages.

Digital status signals from various AM503X circuits are input directly to the microcontroller. Analog status signals are converted by the analog-to-digital converter (ADC) into digital signal that the microcontroller can process. Typical signals include offset voltages and probe identification.

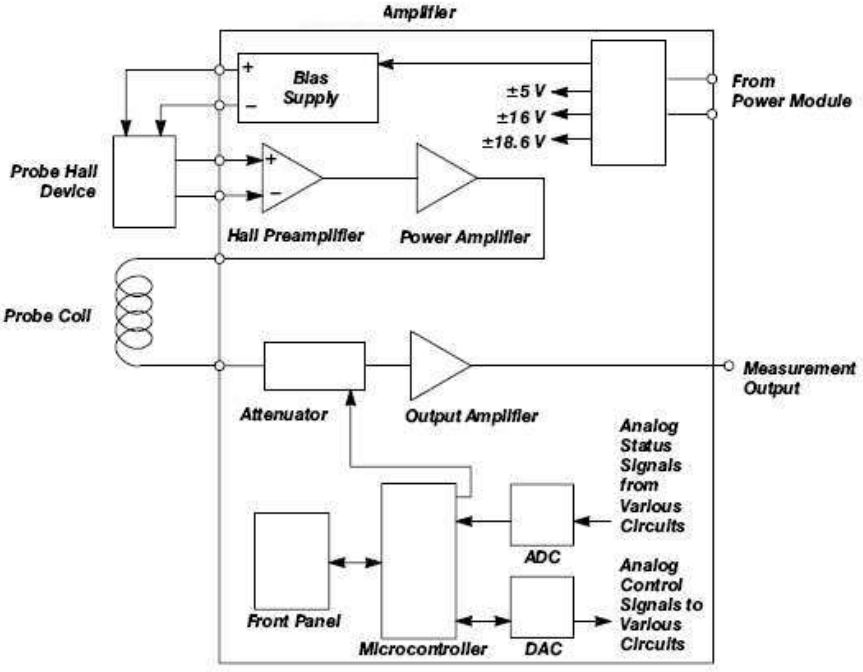

Figure 3-9: Simplified Block Diagram

The digital-to-analog converter (DAC) provides an interface from the microcontroller to the AM503X circuits. The DAC supplies various control voltages that are used by the AM503X.

The DAC is made up of eight individual eight-bit D/A converters. It is programmed using a 3 wire serial interface by the AM503X microcontroller.

Serial data from the microcontroller appears on the SERIAL_DATA line and is clocked into the DAC with the rising edge of VCS_CLK. The serial data contains the desired DAC register address followed by the data to be loaded into the register. When the microcontroller strobes VCS_Load low, the selected register is updated.

The analog-to-digital converter (ADC) provides an analog interface from the AM503X circuits to the microcontroller. The ADC converts various analog signals into serial data words that the microcontroller can read.

The microcontroller programs the mode configuration of the ADC with an eight-bit serial word on the DATA_IN line. The data word addresses the desired conversion channel, configures the mode of operation, and specifies the format of the conversion data.

The microcontroller circuit translates front panel commands into corresponding circuit responses, reports circuit status information to the front panel indicators, and manages overall instrument operation.

The microcontroller has four parallel interface buses. Each bus is eight bits wide. The address latch enable is used for analog-to-digital conversion timing. A 12MHz ceramic resonator sets the internal clock frequency. Because internal ROM is used, the external access line is set to +5V. The program store enable pin is not used.

The microcontroller uses the Signetics Inter-IC bus (IIC or I2C), a two way serial communication bus, to communicate with several components including an EEPROM (electrically-erasable programmable read-only memory), RAM (volatile random access memory), an I2C I/O port expander and the front panel controller.

An electrically-eraseable programmable read-only memory is used to store probe ID data. To use the data, the microcontroller first reads the probe ID code obtained from the ADC. The microcontroller then reads the EEPROM data corresponding to that code. The EEPROM data includes the probe type, minimum and maximum current ratings, bandwidth limit, and attenuation factor of the probe.

Volatile random-access memory (RAM) stores the front panel settings and calibration data that is generated during the probe degauss/auto-balance routine. An NVRAM is formed by using a battery in conjunction with the RAM to maintain the data when the AM503X is powered off. When power is restored, the microprocessor reads the NVRAM data to restore the previous settings.

An I2C I/O port expander converts the I2C serial data into corresponding settings for step gain, bandwidth, and degauss enable.

For additional information see specific product manuals.