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## G-7903B AND G-7903C ANALOG MULTIPLEXERS INSTRUCTION INFORMATION

- **DIFFERENTIAL INPUTS (G-7903C ONLY)**
- **8 INPUTS PER G-7903 MODULE**
- **INDIVIDUAL INPUT SPAN SCALING**

### GENERAL DESCRIPTION

The G-7903 Analog Multiplexers are capable of multiplexing up to 8 analogs. The G-7903B is used with systems that can tolerate a common ground for all 8 inputs. The G-7903C provides 8 differential inputs for use with systems where each analog input allows remote referencing of ground potential. Functionally, the B and C versions are identical except for the input configuration.

The Sync pulse from the G-7803C causes the G-7903 to sequence through the number of analog inputs selected, up to 8 per module. As the analog signals are multiplexed, the 6-bit word on the address bus identifies the analog signal position in the multiplex scheme. Only those address lines necessary to address the number of analog signals need be connected to the G-7903. The remaining can be used for other status inputs. LED indicators on the front panel show which analog is being scanned.

Each analog input has its own amplifier and can provide individual scaling to a common scale. The scale is inserted in the analog-



to-digital converter on the G-7803C. Current loop shunt resistors are provided on each input for current to voltage conversion.

### SPECIFICATIONS

**Data Rates:** 30, 60, 120 and 240 bits per second and up to 19.2 KB/S for fiber optic modules G-2001 and G-2003.

**Inputs:** 8 high impedance inputs provided with current shunt positions. Each input can be scaled to the G-7803C's input scale. Single-ended inputs on the G-7903B, differential inputs on the G-7903C.

**Scan Coding:** Switches provided to select the number of inputs scanned.

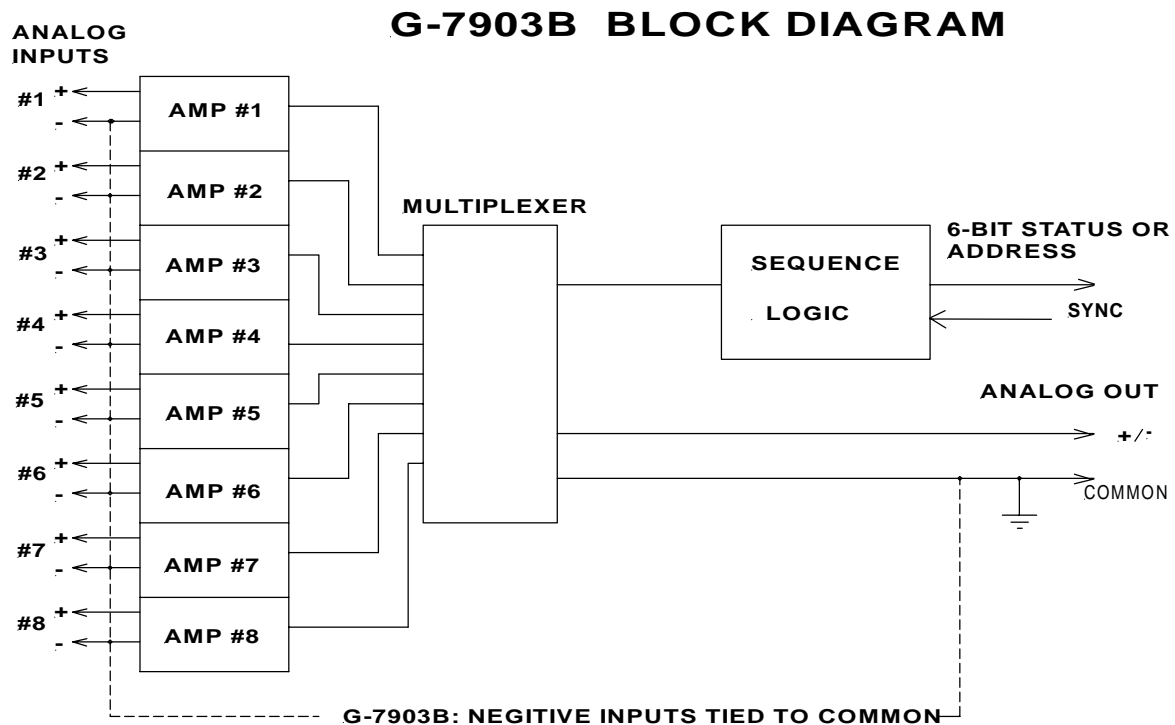
## THEORY OF OPERATION

The purpose of the G-7903B Analog Multiplexer is to apply up to 8 analog signals in sequence to the input of the G-7803C for transmission over a tone channel to a G-7804C. The G-7804C's digital output may be equipped with up to 8 D/A sections as found in two G-8404 Quad D/A Converters. Normally, unless the update time is important, all inputs are calibrated and marked as spares if not used.

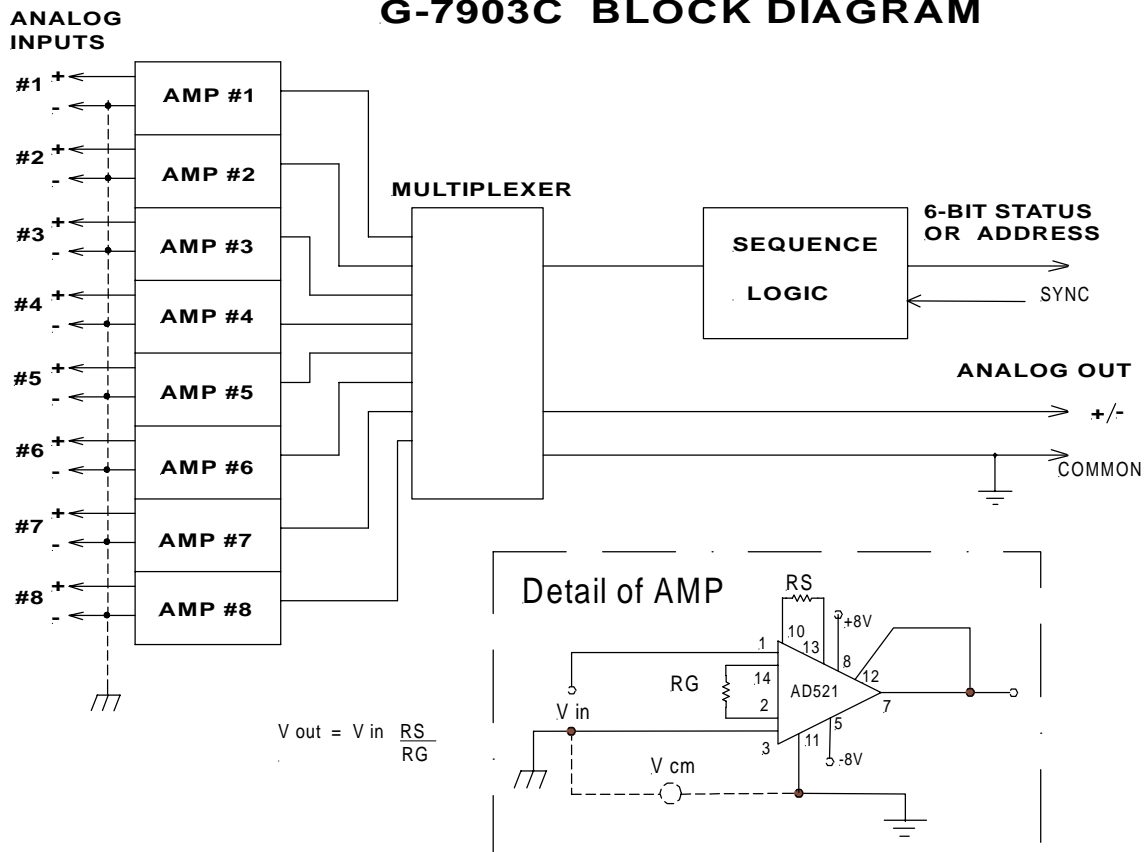
The G-7903B consists of eight inputs and eight amplifiers to scale their outputs to 5.0 or +/-5.0Vdc.

Sequencing circuitry operated by the sync pulse from the G-7803C card connects the voltage output of each amplifier to a scaled voltage ampli-

fier input on the G-7803C for digital to FSK transmission. Double scan or single scan can be selected. Double scan provides greater security against line noise in transmission and increases the update time. Manual scan is provided for test purposes. A binary code is sent over the status lines that ensures the inputs are correctly received by the proper D/A section in the G-8404. Two G-7903 modules maybe used per system. Multiplexing up to 15 meter positions, this would require 2 to the 4th power or 4 status lines for multiplexing purposes. Any more than 15 positions would not be recommended due to the long update time and possibility of losing more than 15 meters due to an electronic failure. For the eight inputs of one G-7903B the code requires  $2^3$  or 3 status lines. This leaves 3 status lines for other uses.



## G-7903C BLOCK DIAGRAM



AD521 is a Precision Instrumentation Amplifier. An instrumentation amplifier is a differential voltage gain device and is intended to be used wherever acquisition of a useful signal is difficult.

Detail of AMP shows ground loop elimination. The reference input, Pin 1, allows remote referencing of ground potential. Differences in ground potentials are attenuated by the high common mode rejection ratio CMRR of the AD521.

CMRR is the ratio of common mode voltage to the resulting common mode error voltage. Common mode voltage is any voltage (above or below ground) that could be observed at both inputs ( $V_{CM}$ ) and produces no output, that is; when both inputs are at the same potential. With the  $\pm 8V$  power source,  $V_{CM}$  is limited to  $\pm 5V$  less signal.

*\*Equipment and/or components purchased through Da-Tel but manufactured by other companies are covered under the warranties of those manufacturers.*

### NOTICE

As of the date of this printing, the specifications for the G-7903 in this Instruction Information sheet apply to all G-7903, except as indicated. Because all Da-Tel products are continually being refined and improved, these specifications are subject to change without notice.