APPENDIX A
GLOSSARY

ABORT
A signal used to terminate the current process.

ACTIVE LIGHT
An LED indicator on most I/O modules, which indicates the module is communicating properly with the controller. Used as a maintenance aid.

ADDRESS
A numeric value used to identify a specific channel, module, I/O point, or communication port.

ADDRESS INDEX PIN
A mechanical device which screws into one of eight detents and establishes an address for a specific I/O housing slot.

ADDRESS SELECTOR
A switch on an I/O housing used to establish housing address.

ALGORITHM
A set of procedures designed to solve a problem. Typically a software formula.

ANALOG INPUT MODULE
Analog input modules accept signals from the user's field device (e.g. a 4-20 mA signal from a level transmitter), perform an analog to digital conversion, and transmit the digital result to the programmable controller.

ANALOG OUTPUT MODULE
Analog output modules accept digital information from the PC, perform a digital to analog conversion, and provide the result to the user's field device (e.g. a 4-20 mA signal to a valve actuator).

ANALOG SIGNAL
A continuously varying signal such as voltage or frequency.

AND FUNCTION
This function logically "ANDS" each bit in a source matrix with each bit in a second (destination) matrix. If both bits are a "1", the bit in the destination matrix will be set to a "1". If either or both bits are a "0", the bit in the destination matrix will be cleared to a "0".

ASCII
A 7-bit digital coding of standard alphanumeric characters as established by the American National Standards Institute. ASCII stands for the American Standard Code for Information Interchange.

ASYNCHRONOUS
Having a variable time interval between successive bits, characters, or events. In asynchronous data transmission, each word is individually synchronized using start and stop bits.

BAUD
The rate of speed digital data is transmitted or received. Derived from the name Baudot and equivalent to bits per second.

BCD (BINARY CODED DECIMAL)
A numerical system which uses four binary digits weighted 1, 2, 4, and 8 respectively, to represent the digits 0-9. Standard BCD industrial devices are available for inputs (e.g. thumbwheel switches) and outputs (e.g. LED displays).

BINARY
A numerical system wherein values are represented by only two digits; 0 and 1. This system is commonly used in digital equipment because circuits can be economically designed using semiconductor logic. A transistor switch can be biased off to represent a logical "0", or on to represent a logical "1".

BIT
An acronym for binary digit, the smallest unit of information in the binary number system. Represented by the digits 1 and 0. The smallest division of a PC word.

BIT MODIFY FUNCTION
This function alters a specific bit within a matrix. Bits may be set to a "1" or cleared to a "0".

BIT ROTATE FUNCTION
This function allows a series of bits to be rotated or shifted through a matrix.

BIT SENSE FUNCTION
This function determines the sense, "1" or "0", of a specific bit within a matrix.

BLOCK MOVE
This function copies, during one scan, the entire contents of any table to a table of outputs or holding registers.

BUS
An electrical conduit used to send or receive data.

BYTE
A sequence of binary digits usually operated upon as a unit. Typically = 8 bits.

CALCULATE FUNCTION
These functions are used to add, subtract, multiply, divide, or compare two numerical values.

CASCADE FUNCTION
Connecting two or more functions together to control one output. For example, timers and counters can be cascaded to produce results that cannot be achieved by one counter or one timer.

CATV
Rigid, well shielded coax cable with dB loss of 0.8 dB/1000 ft.

CD (CARRIER DETECT)
A signal indicating that the carrier is being received. (Pin 8 of an RS-232C connector).

CHANNEL
A group of I/O modules that are separately connected to the mainframe. A 584 channel of I/O can contain up to 128 input points and 128 output points.

CHARACTER
One of a set of elementary symbols, such as a letter of the alphabet or a decimal numeral. Characters may be expressed in many binary codes. For example, an ASCII character is a group of 7 bits.

CHECKSUM
An error detection code that sums all the one bits in a group of data storage locations. Summing is done without carries from one column to another. The known result is stored: any variance from this result indicates data has been altered. Checksums can be prepared for any portion of logic memory, coil storage, or register content.

CIRCUIT CARD
A printed circuit board containing electronic components.

CLEAR
To return a memory to a nonprogrammed state (all zeros).

CLOCK
Pulse generator that synchronizes the timing of various logic circuits and memory in the processor.

CLOCK RATE
The speed (frequency) at which the processor operates, as determined by the rate at which words or bits are transferred through internal logic sequences.

CMOS
Complementary metal oxide semiconductor. An integrated circuit family with low power consumption and high noise immunity.

CPU (CENTRAL PROCESSING UNIT)
The "brain" of the controller system, wherein the customer's logic and executive is stored; all logic solving and decision making is performed by the CPU. Also called the processor or mainframe.

COIL
1. A discrete element which can be on or off based on the result of power flow within the user's ladder logic program. A coil is used to activate logic within the user's program, or to control an output.
2. The electromagnet in a relay.

COMMUNICATION NETWORK
A serial data link which provides communication among multiple stations which may be separate PC's, computers, or data terminals.

COMPARE FUNCTION
This function compares the bit pattern of one matrix against the bit pattern of a second matrix for discrepancies.

COMPLEMENT FUNCTION
This function copies the complement of inverted bit pattern (all "1's" are replaced by "0's", all "0's" are replaced by "1's") of one matrix into a second matrix.

COMPUTER
A device incorporating a CPU, memory, I/O facilities, power supply, and cabinet that accepts information, processes it in a prescribed manner, and supplies the results of these processes.

COMPUTER INTERFACE
A device designed for data communication between a computer and another unit such as a printer.

CONFIGURATION
The procedure which defines the 584's database. Includes setting system size, communication parameters, memory allocation, and addressing.

COUNTER
An electromechanical device which can count the transitions of an input. Typically has an relay contacts which change state when a preset number of counts is reached.

COUNTER FUNCTIONS
The 584 has both up counter (UCTR) and down counter (DCTR) functions which count the control input transitions from on to off. The up counter (UCTR) counts up from zero to a preset number, and the down counter (DCTR) counts down from the preset to zero.

CRT
An acronym for cathode ray tube; the video display device used in programming panels (e.g. the P190), televisions, oscilloscopes, etc.

CTS (CLEAR TO SEND)
A signal that tells the transmitting device that it may now place data on the transmit data line (pin 5 of an RS-232C connector).

CURSOR
A visual movable pointer used on a CRT to locate where instructions will be added or edited.

DATA TRANSFER FUNCTION
The technique of moving and manipulating data within the controller.

DELIMITER
A special ASCII character that terminates or ends an ASCII communication; normally a carriage return.

DIAGNOSTIC PROGRAM
A test program to help isolate hardware malfunctions in programmable controllers.

DIGITAL
Having discrete states. Typically two states: ON and OFF.

DISABLE
The capability of removing a logic coil or a discrete input from program control. A disabled coil or input may then be "forced" ON or OFF manually by the user.

DISCRETE REFERENCE
A reference that can be either ON or OFF. A discrete reference can be an input, output, or internal logic element.

DISTRIBUTED SYSTEM
Any combination of PC's, computers, and data terminals communicating via a network.

DOUBLE PRECISION FUNCTION
The technique of storing a single numerical value in two consecutive registers. Since each register can store up to four digits (maximum value 9,999), double precision allows a value of 99,999,999 to be stored.

DSR (DATA SET READY)
A signal indicating that the modem is connected, powered up, and ready (pin 6 of an RS- 232C connector).

DTR (DATA TERMINAL READY)
A signal indication that the transmitting device is connected, powered up, and ready (pin 20 of an RS-232C connector).

DUMP
Recording the entire or partial contents of user memory onto a storage medium (e.g., magnetic tape, floppy disc, etc.).

DUPLEX
A means of two way communication (see full duplex and half duplex).

DX
The abbreviation for data transfer.

EDIT
To deliberately modify the user program.

EIA
Electronic Industries Association. This organization establishes data communication standards.

ELEMENT
The basic building block of the PC ladder logic. An element can be a relay contact, horizontal short, vertical short, coil, or function block. Sometimes referred to as a logic element.

ENABLE
To reactivate a logic coil or discrete input after it has been disabled.

EXCLUSIVE OR (XOR) FUNCTION
This function logically "XORS" each bit in a source matrix within its corresponding bit in a second (destination) matrix. If either bit is a "1", the bit in the destination matrix will be set to a "1". If both bits are a "1" or a "0", the bit in the destination matrix will be cleared to a "0".

EXECUTIVE
An operating system that processes the user logic program.

EXTENDED MEMORY
Additional memory, up to 96K max, available in the 584L only. BCD, 16 bit binary, hex, and ASCII data may be stored using the extended memory write function (XMWT), or retrieved using the extended memory read function (XMRD).

FIRST IN (FIN)/FIRST OUT (FOUT) FUNCTIONS
These two functions are normally used together to create a FIFO (First In/First Out) stack. A FIFO stack is a table that maintains the order data was entered.

FORCE
Manually controlling a disabled input or output via a programming panel or the rap.

FULL DUPLEX (FDX)
A mode of communication in which data is transmitted in two directions at the same time.

HALF DUPLEX (HDX)
A mode of data transmission capable of communication in two directions, but only one direction at a time.

HARD COPY
Any form of printed document such as ladder diagram program listing.

HARDWARE
Physical equipment (e.g., mechanical, electrical, and electronic devices).

HEXADECIMAL
The numbering system that represents all possible ON/OFF combinations of four bits with sixteen unique digits (0-9 then A-F).

HOST COMPUTER
A computer that monitors and controls other computers and peripherial devices.

HOUSING
Device which I/O modules plug into.

IMAGE TABLE
A table in a PC memory that contains the status of all inputs, coils, and registers. Also termed the "State RAM".

INPUT
A signal that provides information to the controller; can be discrete (e.g. pushbutton switches, relay contacts, etc.), BCD (e.g. thumbwheel switches), or binary (analog transmitter).

INPUT DEVICES
Devices such as limit switches, pressure switches, pushbuttons, etc., that supply data to a programmable controller.

INPUT MODULE
Accept signals from the user's machine or process, such as limit switches, thumbwheel switches, or transducers, and convert the incoming voltages to signal levels compatible with the processor.

INSTRUCTION
A command or order that will cause a PC to perform one certain operation.

INTERFACING
Interconnecting a PC with its application devices, and data terminals through various modules and cables.

I/O
Input/Output, the controller's connection to the "real world".

I/O MODULE
The modular component which mounts in a housing and provides the electrical connections between the PC and the field.

I/O RACK
A housing which contains I/O modules.

K
Abbreviation for kilo. Equals one thousand. Common usage in the computer industry has 1K = 1024, therefore, a 4K memory actually has 4096 memory locations.

KB
Kilobytes. Thousand bytes per second.

LADDER DIAGRAM
Industry standard symbology used to document relay logic control systems. Logic lines are drawn horizontally, similar to rungs of a ladder.

LADDER LISTING
A hard copy listing of the users logic program.

LATCHED COIL
A type of coil that will power-up in the state (ON or OFF) it was in when power was lost. This state will be retained for one scan.

LCD
Acronym for liquid crystal display. Its segments are displayed only by reflected light. Has extremely low power consumption compared with an LED which emits light.

LED
Acronym for light emitting diode.

LINE
In communications, describes cables, telephone lines, etc., over which data is transmitted to and received from the terminal.

LINE PRINTER
A high speed printing device that prints an entire line at one time.

LOCATION
A storage position in memory.

LOGIC
Problem solution via an orderly thought or computational process.

LOGIC DIAGRAM
A graphic description of logic functions and conditions.

LOGIC ELEMENT
Any one of the elements that can be used in a ladder logic diagram, including relays, coils, shunts, timers, counters, arithmetic, and function blocks.

LOGIC LINE
A line of user logic used to construct unique logic for an application.

MAINFRAME
The "brain" of the controller system, wherein the user's logic and executive is stored; all the logic solving and decision making is performed by the mainframe. Also called the CPU or processor.

MATRIX FUNCTION
Data transfer functions which operate on a sequence of data bits formed by consecutive 16 bit words derived from tables. Functions include: complement, and, or, exclusive or, compare, bit modify, bit sense, and bit rotate.

MEMORY
Storage area for binary data.

MEMORY ADDRESS
A specific location in memory.

MEMORY PROTECT LOCK
A keyswitch used to prevent the unauthorized alteration of a user's program.

MICROPROCESSOR
The control and processing portion of a small computer with large scale integration (LSI) circuitry, usually on a single chip.

MICROSECOND
One millionth of a second (0.000001).

MINI-COMPUTER
A complete computing system, including CPU, memory, I/O interfaces, and power supply.

MODBUS
A communication system that links Gould PC's with intelligent terminals and computers over common carrier or dedicated, locally installed lines.

MODEM
Acronym for modulator/demodulator. It modulates digital signals to analog signals for transmission over telephone lines, coaxial cable, or other transmission media. It demodulates incoming analog signals and converts them to digital signals.

MODULE
Hardware subassembly that can be easily replaced for maintenance purposes.

MOVE FUNCTION
Data transfer functions which copy data (16 bit words) from one memory area to another.

MULTIPLEXING
The time-shared scanning of a number of data lines into a single channel. Only one data line is enabled at any instant.

NANOSECOND
A billionth of a second. A time measurement used to measure the operating speed of a computer.

NETWORK
A group of logic elements that are connected together to perform a specific function (e.g., a motor starter control circuit).

NODE
A point on a ladder diagram that can receive power from the left or provides power flow to the right. This can be an input to a logic element (left side) or an output from a logic element (right side). It is the smallest possible programming increment in a ladder logic diagram.

NOISE
Extraneous signals; any disturbance which causes interference with the desired signal.

NON-VOLATILE MEMORY
A memory which does not lose its information when its power supply is turned off.

OFF-LINE OPERATION
Describes equipment or devices that are not connected to the communications line. Typically software devices which may be programmed "off-line".

ON-LINE OPERATION
Operations where the programmable controller is directly controlling the machine or process.

ONE SHOT
A discrete reference, typically a logic coil, that is energized for one scan of the controller's logic.

OPTICAL COUPLER
A device which couples field inputs to the PC, or outputs from the PC to the field. The input to this device illuminates an LED which in turn causes a phototransistor to gate on. This provides electrical isolation between the PC's circuitry and field devices.

OR FUNCTION
This function logically "ors" each bit in a source matrix with its corresponding bit in a second (destination) matrix. If either or both bits are a "1", the bit in the destination matrix will set to a "1". If both bits are a "0", the bit in the destination matrix will be cleared to a "0".

OUTPUT
A signal provided from the controller to the "real world"; can be either discrete output (solenoid value, relay, motor starter, indicator lamp, etc.) or numerical output (e.g., display of values within the controller).

OUTPUT DEVICES
Devices such as solenoids, motor starters, relays, indicator lamps, etc., that are controlled by the PC.

OUTPUT MODULE
Convert digital signals from the PC to signal levels compatible with the user's machine or process control devices such as indicators, motor starters, and valve actuators.

PARALLEL OUTPUT
Simultaneous availability of two or more bits, channels, or digits.

PARITY
A method of verifying the accuracy of transmitted data.

PARITY BIT
An additional bit added to memory word to make the sum of the number of "1's" in a word always even (even parity) or odd (odd parity).

PARITY CHECK
A check that tests whether the number of "1's" in an array of binary digits is even or odd.

PC
Programmable controller.

PERIPHERAL EQUIPMENT
Units that may communicate with the programmable controller, but not part of the programmable controller (e.g., teletype, cassette recorder, CRT terminal, tape reader, programming panel, etc.).

PG (PROTECTIVE GROUND)
The safety or power line ground for equipment (pin 1 of an RS-232C connector).

PID (PROPORTIONAL-INTEGRAL-DERIVATIVE) FUNCTION
This function provides the ability to control analog loops such as flow, pressure, and temperature.

PORT
An I/O connection on a processor or peripheral device.

PRESET
The upper limit specified for a counter or timer function. When the specified preset value is reached, an output is energized indicating the status of a counter or timer.

PRINTED CIRCUIT BOARD
A board on which a predetermined pattern of printed connections have been formed.

PROCESSOR
The "brain" of the controller system, wherein the customer's logic and executive is stored; all the logic solving and decision making is performed by the processor. Also called the CPU or mainframe.

PROGRAM
A sequence of instructions to be executed by the PC processor to control a machine or process.

PROGRAMMABLE CONTROLLER
An electronic digital device designed to receive instructions for the monitoring and control of industrial processes.

PROGRAMMING PANEL
Device for inserting, monitoring, and editing a PC's program. The 584 is programmed by a P190 programming panel.

PROGRAM SCAN
The time required for the PC processor to execute all instructions in the program once. The program scan repeats continuously.

PROM (PROGRAMMABLE READ ONLY MEMORY)
A retentive memory used to store data. This memory can only be erased using ultraviolet light, and is reprogrammed with special electronics; thus, it is not readily alterable in the field, but programmed in the factory.

PROTOCOL
A means of establishing criteria for receiving and transmitting data through communications channels.

RAP (REGISTER ACCESS PANEL)
The RAP is located on the front of the 584 PC and contains a six digit numerical display, a numerical keypad, three LED's (battery OK, power, and run), a keylock and a communications port.

RAM (RANDOM ACCESS MEMORY)
A memory where information may be written and/or read as many times as desired. This type of memory is volatile. (Memory is lost when power is turned off, unless battery back-up is used.)

RD (RECEIVED DATA)
The data line which data is received (pin 3 of an RS-232C connector).

READ
To sense the presence of information in some type of storage, such as RAM and ROM.

REAL TIME
The actual time during which physical events take place.

REAL WORLD
The actual world within which special events take place.

REDUNDANCY
The use of two 584L's, one on-line and the other a hot stand-by, to control a single remote I/O system.

REFERENCE NUMBERS
Five digit numbers used in the 584 to identify inputs, outputs, contacts, coils, and registers.

REGISTERS
A memory location where 16 bits of data can be stored.

REGISTER MODULE
A device used to select, convert, and condition binary coded decimal (BCD) signals that pass between a user's device being controlled at the PC.

REGISTER TO TABLE FUNCTION
Copies the bit pattern of any register or 16 discretes to a specific register located within a table.

RELAY
An electronic device operated by a variation in conditions of an electric circuit. When so operated, it operates other devices such as switches.

RELAY ELEMENT
A logic symbol used to simulate the effect of relays. Contacts can be normally open, normally closed, or transitional.

REMOTE I/O
The portion of the controller's I/O that is installed at a location away from the controller. Communication between the remote I/O and the controller is typically via co-axial cable.

REMOTE PRESET
The capability for placing the preset for a timer or counter line into the register and referring to that register in the upper element of the logic. The preset is no longer fixed since the contents of the register (and thus the preset) can be altered at any time.

ROM (READ-ONLY-MEMORY)
A ROM is a digital storage device specified for a single function. Data is loaded permanently into the ROM when it is manufactured. Data is available whenever the address lines are scanned.

RS-232C
Electronic Institute of America (EIA) standard for data communications, type RS-232C. Data is provided at various rates, eight data bits per character.

RTS (REQUEST TO SEND)
Signal indicating that data is ready to be transmitted (pin 4 on an RS-232C connector).

RTU (REMOTE TERMINAL UNIT)
An eight bit communication code used by the 584 and P190.

RUN LIGHT
A LED indicator on the processor that, when lit, indicates that logic is being solved.

MISSING
Copy is missing at the top of the page. It ends with specifications, and variables of layout.

SCAN
The technique of examining or solving logic networks one at a time in numerical order. After the last network is solved, the next scan begins at network number one again. Logic is always solved in this fixed cyclical process.

SCAN TIME
The time it takes to completely execute the entire PC program one at a time.

SCRATCH PAD MEMORY
A high speed memory used to temporarily store a small amount of data so that the data can be retrieved quickly when needed. Interim calculations usually are stored in a scratch-pad memory.

SEARCH FUNCTION
This function searches a table of registers for a specific bit pattern.

SEGMENT
A section of logic program that contains one or more networks.

SELF-DIAGNOSTIC
The hardware and firmware within a controller which allows it to continuously monitor its own status and indicate any fault which may occur within it.

SG (SIGNAL GROUND)
The common ground reference for all signal lines (pin 7 of an RS-232C interface).

SIMPLEX
One transmitter can transmit to only one receiving station. The information can travel in only one direction.

SKIP FUNCTION
This function allows networks to be bypassed and not solved. It can be used to reduce scan time by not solving seldom used program sequences (e.g., emergency stop), or to create subroutines.

SOFTWARE
Application and internal programs used to support the performance of the controller.

SOLID-STATE
Circuitry designed using only integrated circuits, transistors, diodes, etc.; no electro-mechanical or vacuum tubes are used. High reliability is obtained with solid state logic, which would be degraded by depending on electromechanical devices.

SWEEP FUNCTIONS
These functions allow the user's program to be scanned at a fixed interval.

STAT BLOCK
This function loads a table of holding registers with up to 75 words of system status information.

SYNCHRONOUS
Data is transmitted continuously against a time base that is shared by transmitting and receiving terminals. If no legitimate data is available to be sent at a given time, "synch" or "idle" characters are sent to keep the transmitter and receiver in synchronization.

SYSTEM
A collection of units combined to work as a larger integrated unit having the capabilities of all the separate units.

TABLE
A group of consecutive 16 bit words, e.g., registers 40001 through 40005 form a table of holding registers 5 long.

TABLE TO REGISTER FUNCTION
This function copies the bit pattern of any register or 16 discretes located within a table to a specific holding register.

TABLE TO TABLE FUNCTION
This function copies the bit pattern of any register or 16 discretes from a position within one table to the same position in a second table.

TD (TRANSMITTED DATA)
The data line over which data is transmitted (pin 2 of an RS-232C connector).

TRAFFIC COP
A portion of the PC executive that controls how input and output data is interpreted relative to its channel number and address index.

TRANSDUCER
A device to convert physical parameters such as temperature, pressure, flow, etc. into an electrical signal.

TRANSITIONAL CONTACT
Contacts which pass power for only the one scan in which their controlling coil or input changes state.

TTL (TRANSISTOR TO TRANSISTOR LOGIC)
A family of integrated circuit logic. Usually with 5 volts representing a high or "1" state, and 0 volts representing a low or "0" state.

UNIT OF LOAD
The internal dc current required to drive an I/O module. Units of load for 200, 500, and 800 series I/O modules follow:

200 = 300 MA
500 = 18 MA for inputs and 69 MA for outputs

VOLATILE MEMORY
A memory that loses its contents when power is removed.

WATCHDOG TIMER (WDT)

A circuit on the CPU board with an R/C network set up to time a fixed value. The CPU, when correctly operating, continuously resets the timer via a combination hardware/ software command. In the event the CPU fails to reset the timer within the set limit, the timer "times out" and the system will shut down.

WORD

A grouping of bits in a sequence that is operated on as a unit and is stored in one memory location. One 584 word = 16 bits.

WRITE

The process of loading information into memory.