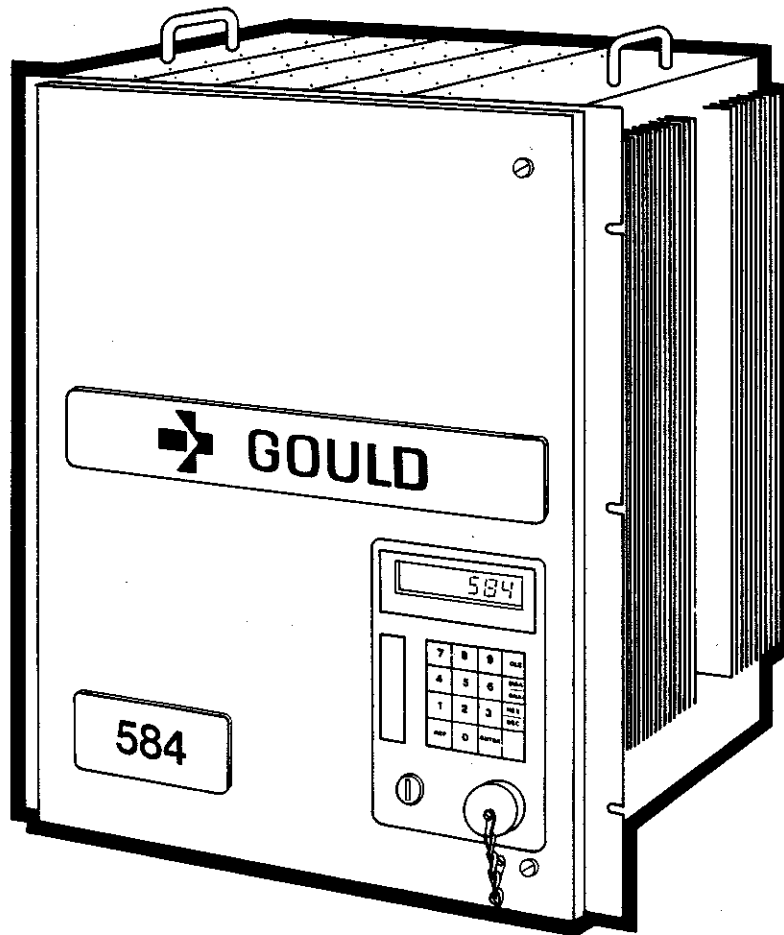


# GoULD 584 PC System Reference Manual



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# COMPUTER INDUSTRY BASICS

## Bit

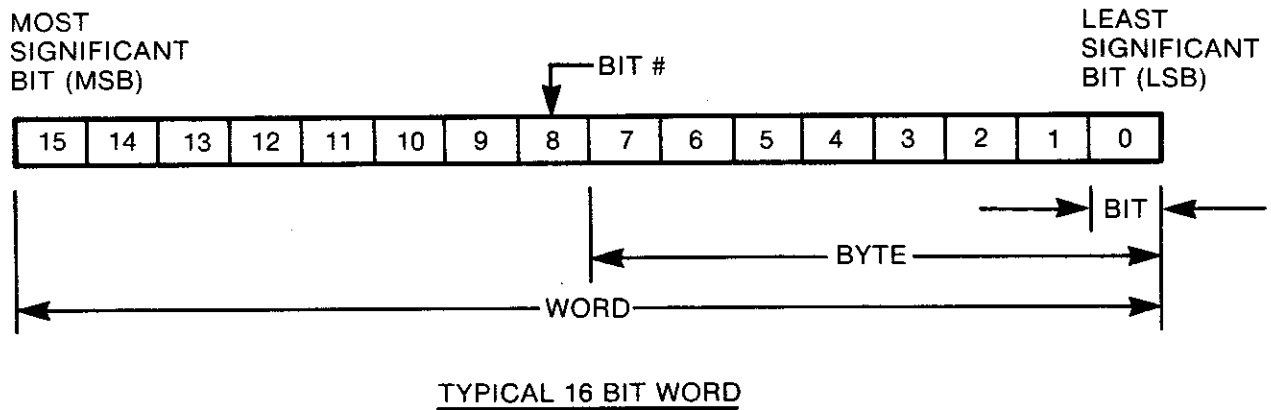
An acronym for Binary digit, the smallest unit of information in the binary number system. Represented by the digits 1 and 0.

## Byte

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

## 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.



# COMPUTER INDUSTRY BASICS

## RS-232C

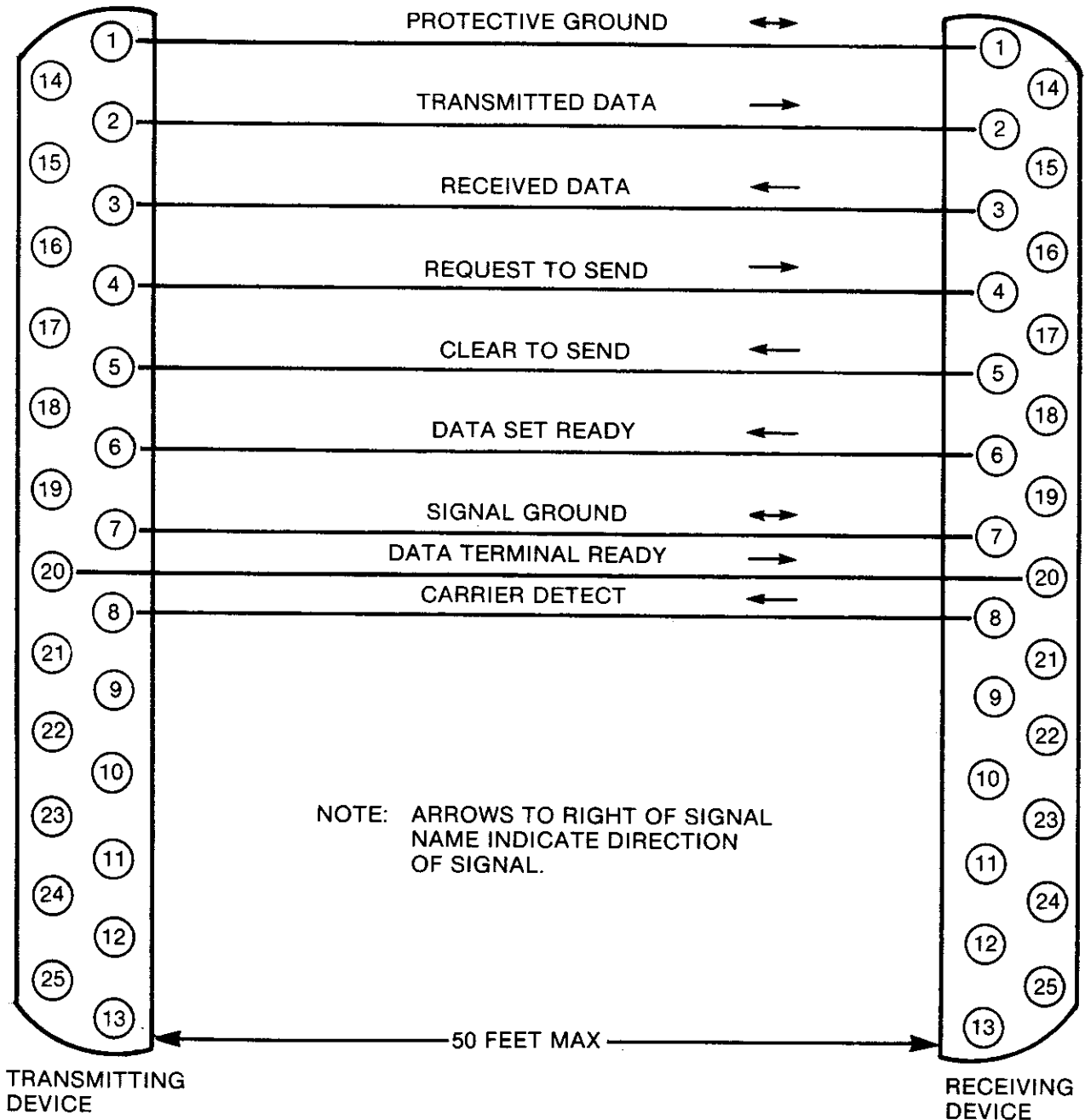
"Electronics Industries of America" (EIA) established the RS-232C standard to provide the computer industry with a common communication technique which would allow one digital device to "talk" with another. RS-232C specifies:

Voltage levels (greater than 3 volts = 0, less than 3 volts = 1)

A 25 pin "D" connector (amphenol part #DB-25-P = male, #DB-25-S = female)

Pin-out definition (see below)

Various electronic parameters (impedance, etc.)



## COMPUTER INDUSTRY BASICS

### Baud

The rate of speed digital data is transmitted or received is termed the "baud rate". It is derived from the name Baudot and is equivalent to bits per second. Digital devices must communicate with one another at the same baud rate. Typical rates are 110, 300, 600, 1200, 2400, 4800, 9600, and 19,200.

### Parity

Transmission errors resulting in missing or redundant characters may be detected by the addition of a "parity bit". This feature is optional. If parity is enabled, a choice between odd or even parity must be made.

This bit is located after the last data bit (ASCII = 7, RTU = 8), and will be set ("1") or cleared ("0") to cause the total number of active data bits (1'S) to be either even (even parity) or odd (odd parity).

For example, the ASCII character "C" (1000011) has an odd number of active data bits, three. If this character were transmitted by a computer set for even parity, the resultant word (11000011) would have the parity bit set. If a printer set for even parity were to receive an odd number of bits for this character, it would know that a communications error had occurred, and request another transmission or generate an error message.

### Asynchronous

Asynchronous data transmission is accomplished by prefixing each word with a "start bit" and ending each word with one or two "stop bit(s)". No clocking signals are required as in synchronous transmissions.

### ASCII

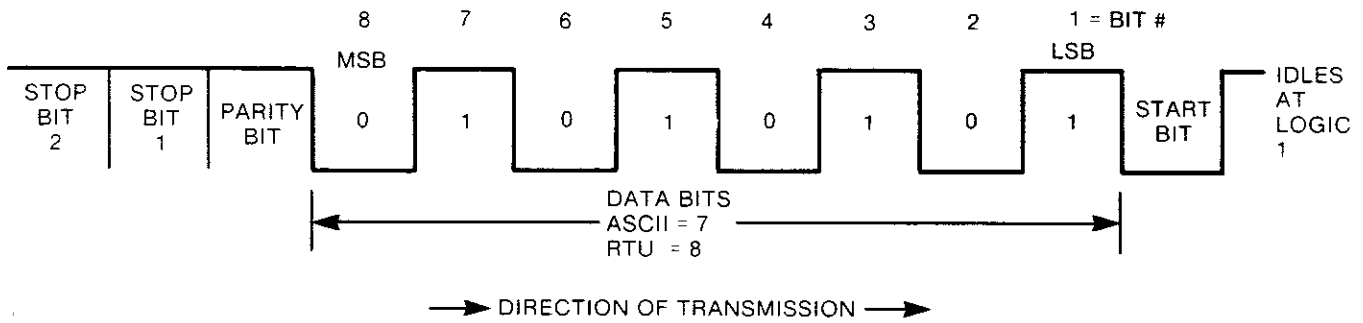
The RS-232C standard defines electronic and hardware specifications necessary to allow communication between two digital devices, but it does not define the coding of the data to be transmitted. This is accomplished by ASCII (pronounced ASK E), an acronym for American Standard Code for Information Interchange, which defines 128 unique alphanumeric and control characters (see page 18-35 for list of characters).

### RTU

RTU is an abbreviation for Remote Terminal Unit, which is an eight bit communication code. The P190 is an RTU device.

# COMPUTER INDUSTRY BASICS

## Digital Word Format



LSB = LEAST SIGNIFICANT BIT  
MSB = MOST SIGNIFICANT BIT

# NUMBER SYSTEMS

## 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".

## BCD (Binary Coded Decimal)

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

## Hexadecimal

A numerical system wherein all possible on/off combinations of four bits are represented by 16 unique digits: 0-9, then A-F.

16 BIT WORD DISPLAYED IN BINARY

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	= POWERS OF 2 = LSD
2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
32K	16K	8K	4K	2K	1K	512	256	128	64	32	16	8	4	2	1	= DECIMAL WEIGHT
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	= GOULD BIT #

NOTE: The suffix "K" (Kilo) is used to indicate a value of approximately 1000. Examples follow:

- 1K = 1024
- 2K = 2048
- 4K = 4096
- 8K = 8192
- 16K = 16384
- 32K = 32768

16 BIT WORD DISPLAYED IN HEXADECIMAL

8K	4K	2K	1K	800	400	200	100	80	40	20	10	8	4	2	1	= HEX WEIGHT
----	----	----	----	-----	-----	-----	-----	----	----	----	----	---	---	---	---	--------------

Decimal	Binary	BCD 8421	Hexadecimal
0	0	0000	0
1	1	0001	1
2	10	0010	2
3	11	0011	3
4	100	0100	4
5	101	0101	5
6	110	0110	6
7	111	0111	7
8	1000	1000	8
9	1001	1001	9
10	1010		A
11	1011	0001 0000	B
12	1100	0001 0001	C
13	1101	0001 0010	D
14	1110	0001 0011	E
15	1111	0001 0100	F