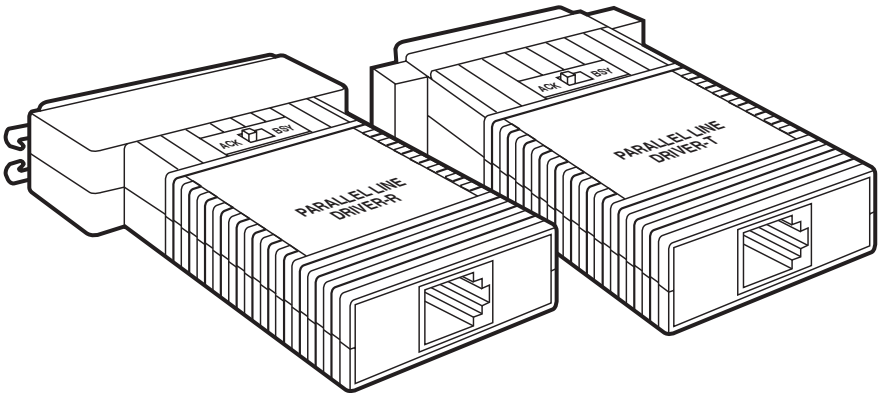




Parallel Line Driver—T Parallel Line Driver—R



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**FEDERAL COMMUNICATIONS COMMISSION
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RADIO FREQUENCY INTERFERENCE STATEMENTS**

This equipment generates, uses, and can radiate radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio communication. It has been tested and found to comply with the limits for a Class A computing device in accordance with the specifications in Subpart J of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference when the equipment is operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user at his own expense will be required to take whatever measures may be necessary to correct the interference.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This digital apparatus does not exceed the Class A limits for radio noise emission from digital apparatus set out in the Radio Interference Regulation of Industry Canada.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de classe A prescrites dans le Règlement sur le brouillage radioélectrique publié par Industrie Canada.

**NORMAS OFICIALES MEXICANAS (NOM)
ELECTRICAL SAFETY STATEMENT**

INSTRUCCIONES DE SEGURIDAD

1. Todas las instrucciones de seguridad y operación deberán ser leídas antes de que el aparato eléctrico sea operado.
2. Las instrucciones de seguridad y operación deberán ser guardadas para referencia futura.
3. Todas las advertencias en el aparato eléctrico y en sus instrucciones de operación deben ser respetadas.
4. Todas las instrucciones de operación y uso deben ser seguidas.
5. El aparato eléctrico no deberá ser usado cerca del agua—por ejemplo, cerca de la tina de baño, lavabo, sótano mojado o cerca de una alberca, etc..
6. El aparato eléctrico debe ser usado únicamente con carritos o pedestales que sean recomendados por el fabricante.
7. El aparato eléctrico debe ser montado a la pared o al techo sólo como sea recomendado por el fabricante.
8. Servicio—El usuario no debe intentar dar servicio al equipo eléctrico más allá a lo descrito en las instrucciones de operación. Todo otro servicio deberá ser referido a personal de servicio calificado.
9. El aparato eléctrico debe ser situado de tal manera que su posición no interfiera su uso. La colocación del aparato eléctrico sobre una cama, sofá, alfombra o superficie similar puede bloquea la ventilación, no se debe colocar en libreros o gabinetes que impidan el flujo de aire por los orificios de ventilación.
10. El equipo eléctrico deber ser situado fuera del alcance de fuentes de calor como radiadores, registros de calor, estufas u otros aparatos (incluyendo amplificadores) que producen calor.

11. El aparato eléctrico deberá ser conectado a una fuente de poder sólo del tipo descrito en el instructivo de operación, o como se indique en el aparato.
12. Precaución debe ser tomada de tal manera que la tierra física y la polarización del equipo no sea eliminada.
13. Los cables de la fuente de poder deben ser guiados de tal manera que no sean pisados ni pellizcados por objetos colocados sobre o contra ellos, poniendo particular atención a los contactos y receptáculos donde salen del aparato.
14. El equipo eléctrico debe ser limpiado únicamente de acuerdo a las recomendaciones del fabricante.
15. En caso de existir, una antena externa deberá ser localizada lejos de las líneas de energía.
16. El cable de corriente deberá ser desconectado del cuando el equipo no sea usado por un largo periodo de tiempo.
17. Cuidado debe ser tomado de tal manera que objetos líquidos no sean derramados sobre la cubierta u orificios de ventilación.
18. Servicio por personal calificado deberá ser provisto cuando:
 - A: El cable de poder o el contacto ha sido dañado; u
 - B: Objetos han caído o líquido ha sido derramado dentro del aparato; o
 - C: El aparato ha sido expuesto a la lluvia; o
 - D: El aparato parece no operar normalmente o muestra un cambio en su desempeño; o
 - E: El aparato ha sido tirado o su cubierta ha sido dañada.

TRADEMARKS

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Contents

Chapter	Page
1. Specifications	6
2. Introduction	7
2.1 Description	7
2.2 Features	7
3. Configuration.....	8
4. Installation	10
4.1 Connecting the Line Side.....	10
4.1.1 Terminal-Block Connection	10
4.1.2 RJ-11 Line Connection	16
4.2 Connecting to Parallel Hardware	17
4.3 Operating the Parallel Line Driver	17
Appendix A: Parallel Pin Configurations	18
Appendix B: Block Diagrams	20

1. Specifications

Parallel Interface —

ME190A: transmitter, DB25
male w/terminal block,
ME191A: receiver, Centronics
male w/terminal block,
ME192A: transmitter, DB25
male w/RJ-11,
ME193A: receiver, Centronics
male w/RJ-11

Range — 2000 feet (609.6 m)

Transmission — Half-duplex over
a single shielded or unshielded
twisted pair (19-26 AWG)

Line Interface — RJ-11, RJ-45, or
terminal block with strain relief

Data Rate — 5 Kilobytes per second
on parallel interface (40 Kbps
on serial line)

Interface Signals — Data bits 0-7,
ground, Busy or Acknowledge
(externally switch-selectable)

Power — Interface-powered, no
AC power or batteries needed

Size — 2.7"H x 2.1"W x 0.7"D
(6.8 x 5.3 x 1.8 cm)

Weight — 1 lb. (0.5 kg)

2. Introduction

2.1 Description

The Parallel Line Driver allows a PC and a parallel output device (printer, sharing switch, etc.) to communicate at distances to 2000 feet (609.6 m) over a single unconditioned twisted pair. Supporting parallel data rates to 5 kilobytes per second (serial rates to 40 kbps), the Parallel Line Driver derives all necessary operating power from the parallel interface—no AC power or batteries are required.

The Parallel Line Driver always works in pairs: A transmitter unit is plugged into the PC's parallel port, and a receiver unit is plugged into the output device's parallel port. The connection between them is serial, and functions at speeds high enough to allow real-time parallel communication between the two parallel devices.

The Parallel Line Driver has two unique features that allow it to operate in a wide variety of parallel applications: First, the Line Driver transmitter is able to send DC power down the line to the receiver in order to compensate for low power parallel printer interfaces. Second, the Parallel Line Driver can be configured for either BUSY or ACKNOWLEDGE flow-control methods.

The Line Driver receiver is available with Centronics® parallel interface. The Line Driver transmitter is available with a DB25 parallel interface. Line-connection options are RJ-11 or terminal block with strain relief.

2.2 Features

- Extends parallel communication to 2000 feet (609.6 m)
- Requires no AC power or batteries
- Operates over a single twisted pair
- Allows devices to communicate in “real time”
- Can be configured for BUSY or ACKNOWLEDGE flow-control methods
- Compatible with most printer-sharing devices
- Transmits DC power over the line to compensate for low-power parallel-printer interfaces
- DB25 or Centronics parallel connections
- RJ-11 or terminal-block line connections

3. Configuration

The Parallel Line Driver is designed to be easy to use. There are no internal jumpers or DIP switches to set, so there is no need to open the case to configure the unit (you may need to open the case for wire connection—refer to **Chapter 4**).

The only configuration necessary for operation is proper setting of the external BUSY/ACKNOWLEDGE switch. **Figure 3-1** shows the location of the BUSY/ACKNOWLEDGE switch on the PC board, as well as the location of the terminal block.

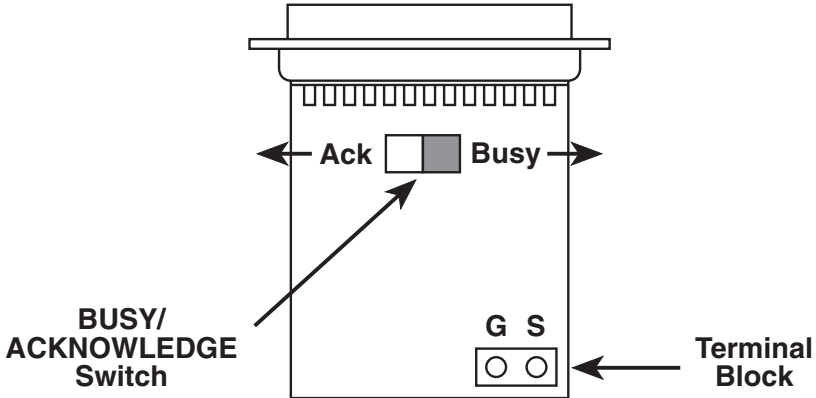


Figure 3-1. Location of the BUSY/ACKNOWLEDGE Switch.

Setting the Busy/Acknowledge Switch

There are three things to keep in mind when you set the BUSY/ACKNOWLEDGE switch (see **Figure 3-2**):



Figure 3-2. BUSY/ACKNOWLEDGE Switch.

1. The switch must be set the same way on both transmitter and receiver.
2. Set the switch to Acknowledge on both the transmitter and receiver. This should achieve good results in most applications.
3. If you experience loss of information or other problems with both switches set to Acknowledge, set both switches to Busy.

4. Installation

Once you have configured the Parallel Line Driver transmitter and receiver, you must connect the system. This section will tell you how to connect the transmitter and receiver via twisted-pair wire and how to connect the two devices to your system hardware.

4.1 Connecting the Line Side

Depending upon the type of units you have ordered, you can connect twisted-pair wire to the Parallel Line Driver using internal terminal blocks (with strain relief) or modular jacks. The following pages describe both kinds of twisted-pair connection.

4.1.1 TERMINAL-BLOCK CONNECTION

Terminal blocks are used to connect a single pair of bare wires to the Parallel Line Driver. The following instructions will tell you how to open the case, connect the bare wires, and fasten the strain-relief collar in place.

1. Open the unit by gently inserting a screwdriver between the DB25 connector and the lip of the plastic case (see below). You don't have to worry about breaking the plastic, but be careful not to bend the D-sub connector.

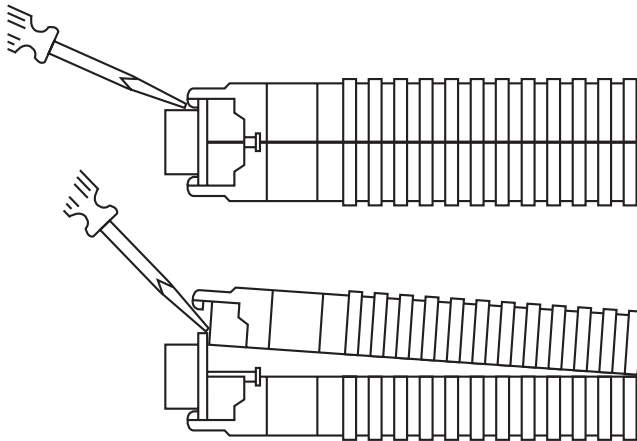


Figure 4-1. Opening the Parallel Line Driver.

After you have opened the unit's case, you will find the terminal block mounted at the rear of the PC board. The terminals are labeled "S" for signal and "G" for ground.

2. Strip the outer insulation from the twisted pairs about one inch from the end.



Figure 4-2. Stripping the Outer Insulation.

3. Strip back the insulation on each of the 2 wires about $\frac{1}{4}$ inch.

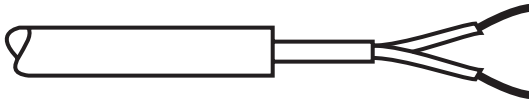


Figure 4-3. Stripping the Insulation on the Wires.

PARALLEL LINE DRIVER

4. Insert the two-wire data line to the center (signal) and shield (ground) terminal posts, then tighten the screws.

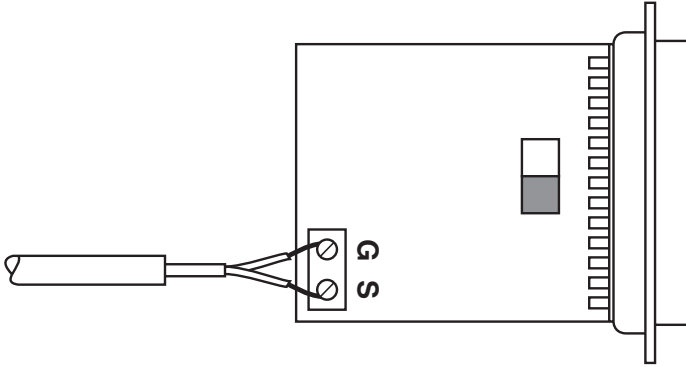


Figure 4-4. Inserting the Two-Wire Data Line.

NOTE

Make sure the twisted pair cable between the transmitter and receiver is wired straight through as shown in Figure 4-5.

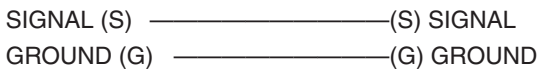


Figure 4-5. Straight-Through Wiring.

5. Place the two halves of the strain-relief assembly on either side of the telephone wire and press together very lightly. Slide the assembly so that it is about two inches from the terminal posts and press together firmly.

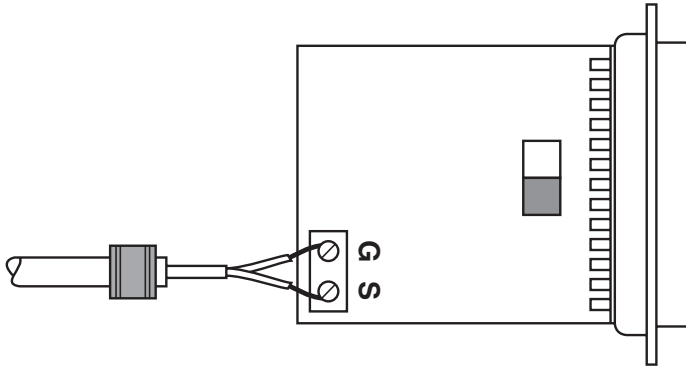


Figure 4-6. Putting the Strain-Relief Assembly Together.

PARALLEL LINE DRIVER

6. Insert the strain-relief assembly and the wire into the slot in the bottom half of the modem case. Set it into the recess in the case. If the telephone wire does not fit into the strain-relief assembly, call for technical support. We can supply you with strain-relief collars to fit a wide variety of cable diameters.

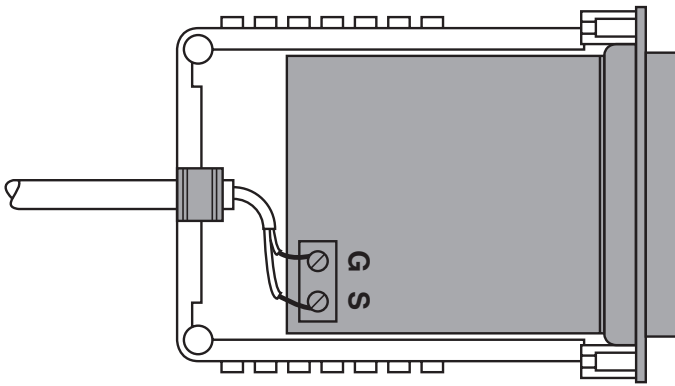


Figure 4-7. Setting the Strain-Relief Assembly.

7. Bend the top half of the case as necessary to place it over the strain-relief assembly. Do not snap the case together yet.

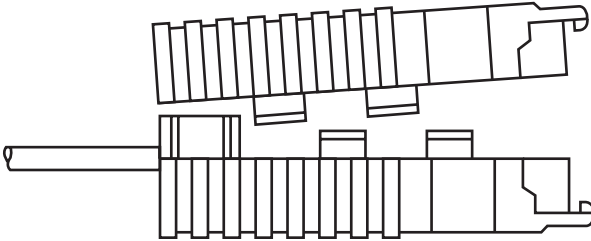


Figure 4-8. Placing the Case over the Strain-Relief Assembly.

8. Insert one captive screw through a saddle washer and then insert the entire piece through the hole in the DB25 end of the case. Snap that side of the case closed. Repeat the process for the other side. This completes the installation.

PARALLEL LINE DRIVER

4.1.2 RJ-11 LINE CONNECTION

When using the RJ-11 modular jacks, install straight-through cabling between the transmitter and receiver, as shown below:

Table 4-1. RJ-11 Jacks.

Signal	Pin #	Color	Color	Pin #	Signal
DATA	3	Green ¹	—Green	3	DATA
GND	4	Red	—Red	4	GND

¹Standard AT&T® color codes—yours may be different.

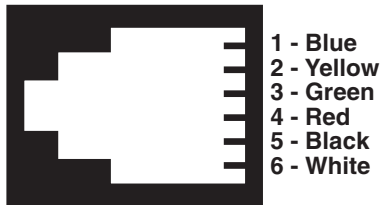


Figure 4-9. Pinout for Straight-Through Cabling.

4.2 Connecting to Parallel Hardware

After connecting the twisted-pair line to the Parallel Line Driver transmitter and receiver, you are ready to connect the units to your parallel hardware. The following steps explain this process:

1. Plug the DB25 male connector on the Parallel Line Driver transmitter directly into the parallel port of the sending device (which is normally a PC, terminal, host, or similar DTE).

NOTE

If you cannot plug the transmitter directly into the parallel port, use a straight-through DB25 parallel cable of the shortest possible length. We recommend 6 feet (1.8 m) or less.

2. The Parallel Line Driver receiver is available with a 36-pin Centronics male connector, designed for direct connection to the Centronics port of a parallel printer.

NOTE

If you cannot plug the receiver directly into the port, use a straight through cable of the shortest possible length. We recommend 6 feet (1.8 m) or less.

4.3 Operating the Parallel Line Driver

Once the transmitter and receiver have been connected to each other and to their corresponding parallel input and output devices, you are ready to operate the units. Make sure that the BUSY/ACK switches on both units are set the same way. Otherwise, the units should function transparently, just like a cable. There is no ON/OFF switch.

If your Parallel Line Drivers are not operating properly, double-check all of your connections and try again. If you still experience problems, change the Busy/Acknowledge setting on both units and try again. If you still do not obtain satisfactory results, call technical support.

Appendix A: Parallel Pin Configurations

SOURCE	TRANSMITTER (DB25)		SOURCE
Common	Return / Ground - 25	13 - Select (Active HIGH)	Printer
Common	Return / Ground - 24	12 - Paper End (Active HIGH)	Printer
Common	Return / Ground - 23	11 - Busy (Active HIGH)	Printer
Common	Return / Ground - 22	10 - Acknowledge (Active LOW)	Printer
Common	Return / Ground - 21	9 - Data Bit 8 (MSB)	Computer
Common	Return / Ground - 20	8 - Data Bit 7	Computer
Common	Return / Ground - 19	7 - Data Bit 6	Computer
Common	Return / Ground - 18	6 - Data Bit 5	Computer
		5 - Data Bit 4	Computer
		4 - Data Bit 3	Computer
		3 - Data Bit 2	Computer
Printer	Error (Fault - Active LOW)	2 - Data Bit 1 (LSB)	Computer
		1 - Data Strobe (Active LOW)	Computer

Figure A-1. Parallel Pin Configuration (DB25 Transmitter).

APPENDIX A: Parallel Pin Configuration

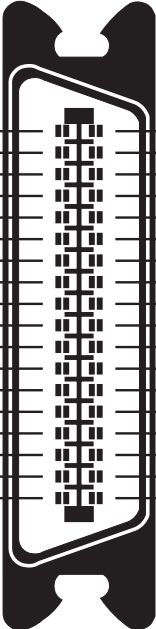
DIRECTION	RECEIVER (CENTRONICS)	DIRECTION
Printer	<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: right;"> <p>Fault (Active LOW) - 32</p> <p>- 36</p> <p>- 35</p> <p>- 34</p> <p>- 33</p> <p>- 31</p> <p>- 30</p> <p>- 29</p> <p>- 28</p> <p>- 27</p> <p>- 26</p> <p>- 25</p> <p>- 24</p> <p>- 23</p> <p>- 22</p> <p>- 21</p> <p>- 20</p> <p>- 19</p> </div> <div style="text-align: center;">  </div> <div style="text-align: left;"> <p>18 - (+) 5 Volts</p> <p>17 - Chassis Ground</p> <p>16 - Logic Ground</p> <p>15 -</p> <p>14 -</p> <p>13 - Select (Active HIGH)</p> <p>12 - Paper End (Active HIGH)</p> <p>11 - Busy (Active HIGH)</p> <p>10 - Acknowledge (Active HIGH)</p> <p>9 - Data Bit 8 (MSB)</p> <p>8 - Data Bit 7</p> <p>7 - Data Bit 6</p> <p>6 - Data Bit 5</p> <p>5 - Data Bit 4</p> <p>4 - Data Bit 3</p> <p>3 - Data Bit 2</p> <p>2 - Data Bit 1 (LSB)</p> <p>1 - Data Strobe (Active LOW)</p> </div> </div>	<p>Printer Common Common</p> <p>Printer Printer Printer Printer Computer Computer Computer Computer Computer Computer Computer Computer</p>

Figure A-2. Parallel Pin Configuration: Centronics.

Appendix B: Block Diagrams

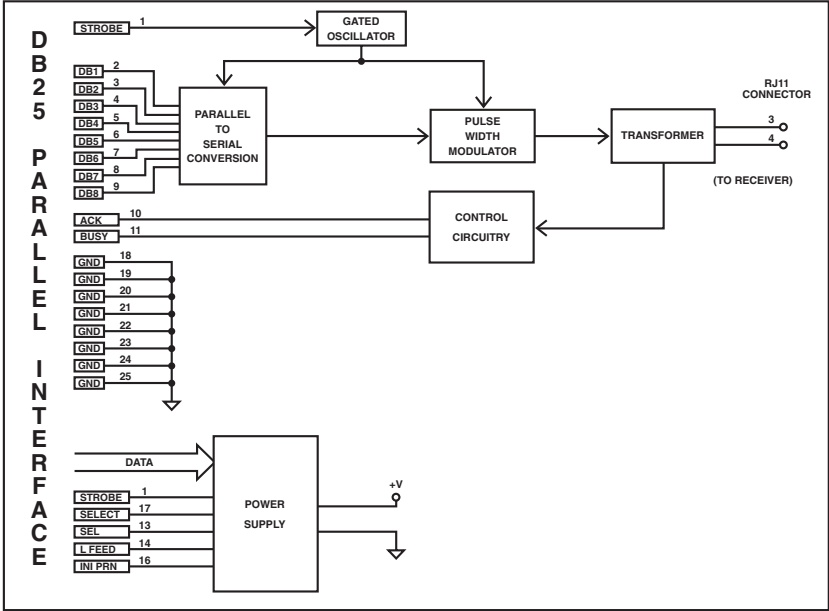


Figure B-1. Block Diagram (Transmitter).

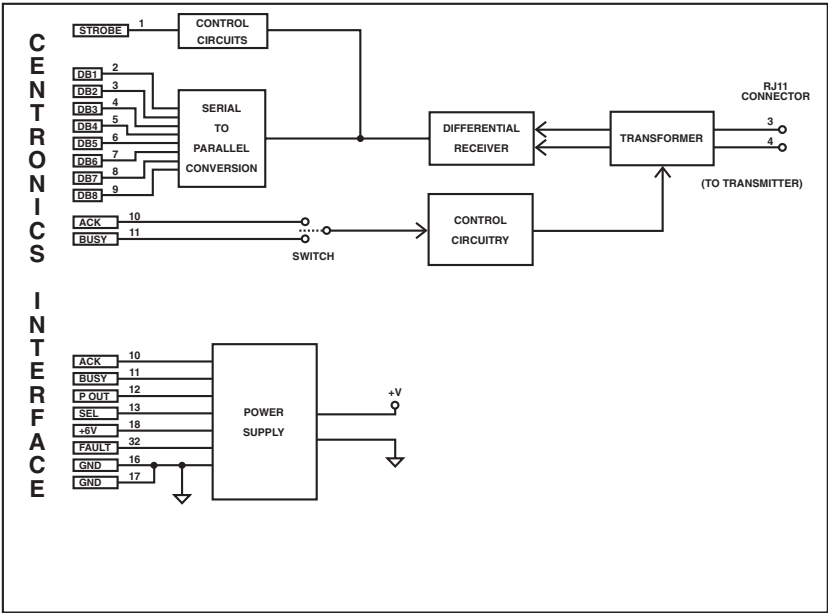


Figure B-2. Block Diagram (Centronics Receiver).



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