

601 Receiver

Lets you reach previously inaccessible areas
Noise-Immune Radio Technology
Quick and Easy Installation
No FCC License Required

Installation and Instruction Manual

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Our Commitment

The Isaacs Technology Group is dedicated to giving you the most up-to-date and reliable industrial telemetry systems to replace wire. Our focus is on customers and their application needs. Products start with spread spectrum radio technology similar to that adopted by the US military for secure communications. Engineered into the design are quick, easy installation and minimum maintenance. We look forward to helping you solve problems with these products... give us a call at 1-800-237-2286.



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General

The **601 SmartReceiver** is a precision instrument using new and advanced radio technology for unsurpassed reliability. The system is designed for easy and quick installation, and requires little maintenance.

Optimum performance requires line-of-sight between transmitters and receivers, with respect to the ground or foliage. If there are ground or foliage obstructions between transmitter and receiver, placing receiver higher off ground enhances operational range. Therefore, always install the units as high as possible from the ground to minimize ground attenuation. There should be a **minimum of ten feet between the line of sight and the tallest obstruction.**

Signals in the frequency range can pass through concrete and wooden walls while reflecting off metal walls and structures. Therefore, metal structures between the transmitter and receiver can interfere with the line of sight, while non-metal structures generally can be transmitted through. In some cases, metal structures can increase range by providing reflecting surfaces around obstructions. In cases where a receiver cannot find the transmitter signal (usually due to extreme ranges or major obstacles), a radio repeater may have to be used. One repeater can repeat signals from any number of transmitters.

The transmitter is installed at the site to be monitored and only a dry contact input is provided to the transmitter. The receiver is installed at a site you want a relay output. When the two wires at the transmitter are closed, an output relay is turned on at the receiver. The receiver constantly monitors the transmitter for positive communication link and transmitter battery level and provides a "fault" relay output for fail-safe operation.

Specifications

Enclosure Size:	4.5" Dia. x 11" Length
Enclosure Material:	Polyvinylchloride with Dupont ® Imron ® finish
Operating Temperature:	0° C to 60° C, 32° F to 140° F
Humidity Range:	0-95% non-condensing
Operating Frequency:	902-928 MHz
Radio Type:	Narrow band spread spectrum
Power Requirement:	12 VDC, Transformer furnished
Initial Response time:	0 – 1.5 seconds
Control relay:	SPDT, 1A-120 VAC
Fault relay:	SPDT, 1A-120 VAC

Installation

Mount receiver in an upright position with one inch pipe fitting on the bottom. **The side of the tube that has the Isaacs label should be aimed at transmitter.** In a case where transmitter is moving with equipment, label side of receiver should be pointed in general or average direction of transmitter. The transmitter should remain within a 180 degree view of front of receiver. The receiver does have receiving capability from the back side, however not as strong as the front. If there are elevation changes or obstructions between transmitter and receiver, placing receiver higher off ground enhances operational range. **Receiver should be isolated from any vibrations from equipment by mounting to some solid structure or on a mast from the ground.**

Wiring 602 or 603 Transmitter

Warning: Be sure to lock out the main disconnect switch before performing any electrical service to the machine !

Do not apply power to the red and black wires from the transmitter.

Connect **black** and **red** wires to a dry contact closure operated by a circuit that is to control receiver relay output. The transmitter is provided with a 15' unshielded cable. If this needs to be extended, use Carol 6348 or Belden 8442 or equivalent. If your circuit or sensor does not provide a dry contact output, one can be provided by wiring the *coil* of an isolation relay to the circuit and the *common* and *normally open* or *normally closed* contacts to **black** and **red** wires.

Since a SPDT output is available at the receiver, NO or NC contacts can be hooked to the transmitter and still achieve desired operation at the receiver. However, consideration should be given to the priority of turning on or turning off equipment at the receiver. **The transmitter places a higher priority on contact change from open to closed, so more redundant transmissions are sent when the contact provided to the transmitter closes.**

Wiring Receiver

Apply only 12 Volts DC to red and black wires from the receiver.

120 VAC Power Supply

Install provided 120 volt plug-in power supply which will output 12 volts DC for receiver. Plug in or connect the 120 volts AC side of power supply.

Connect **red** wire to positive of power supply. Connect **black** wire to negative of power supply.

Power supply voltage must be present anytime the radio is expected to start or stop equipment, therefore, 120 volt supply must be on, even when equipment is off.

12 VDC power supply

Connect **red** wire to positive of a constant source of 12 VDC power.

Connect **black** wire to negative of same 12 VDC circuit.

Control relays, (internal to 601 receiver)

Do not exceed 1 AMP or 120 Volts AC on internal relays!!!

The circuits are not internally protected. If you externally fuse these circuits, you may defeat the fail-safe design that ensures the equipment will go off upon any type of malfunction.

Relay wire colors:

Relay 1

Common-----brown

Normally open-----yellow

Normally closed----orange

Fault Relay (if used)

Common----- white/green

Normally open----- white/black

Normally closed---- white/red

Special Purpose Wires

Programming-----2) 2 conductor black

Ground-----black

+12VDC-----red



Determine which relay was provided with SmartSwitch™ 120 Volts AC or 12 Volts DC

12 VDC Interface Relay

red +12 VDC
black -12 VDC ground

- I. Connect **red** and **brown** wires to +12VDC power.
- II. Connect **black** wire to -12VDC ground.
- III. Connect one side of the 12 volt relay coil to -12VDC ground.
- IV. Connect either the **yellow** or **orange** wire to the other side of the 12 volt relay coil, depending on how you want the SmartSwitch to function.
 - A. The **yellow** wire will energize the 12 volt relay when the transmitter contacts are closed.
 - B. The **orange** wire will energize the 12 volt relay when the transmitter contacts are open.
- V. Cap off the unused wire.
- VI. Use the contacts of the 12 VDC relay to control your pump auto circuit.

120 VAC Interface Relay

red +12 VDC
black -12 VDC ground

- I. Connect **red** wire to +12VDC power.
- II. Connect **black** wire to -12VDC ground.
- III. Connect **brown** wire to one leg of 120 VAC power (L1).
- IV. Connect one side of the 120 volt relay coil to other leg of 120 VAC power (L2).
- V. Connect either the **yellow** or **orange** wire to the other side of the 120 volt relay coil, depending on how you want the SmartSwitch to function.
 - A. The **yellow** wire will energize the 12 volt relay when the transmitter contacts are closed.
 - B. The **orange** wire will energize the 12 volt relay when the transmitter contacts are open.
- VI. Cap off the unused wire.
- VII. Use the contacts of the 120 VAC relay to control your pump auto circuit.

See schematic examples on pages 7-11.

602T & 603T Transmitter Batteries

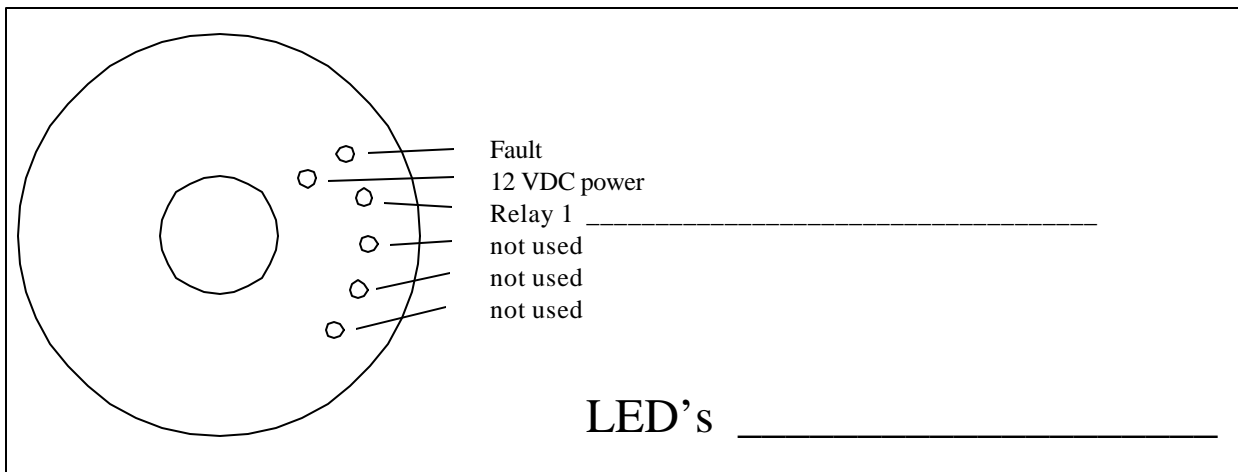
The transmitter battery is a three volt lithium (Duracell # DL123A or Panasonic CL123A) and should be available at any camera department. **Warning: Use the same battery. Equivalent replacements may cause damage to transmitter.** Battery is accessible from transmitter bottom by loosening set screw on side of base at least twelve turns and removing plastic cover plug. Board slides out to allow battery changing. Take care not to pull battery board too far out, to avoid stress to the wires. **With new battery installed, press reset button next to battery before reinstalling board and plug.** Be sure to re-tighten the set screw into the threaded hole in the cover plug. After the battery is changed, it will be necessary to power the receiver off and back on to reset the battery fault.

Receiver Indicator Lights

The red LED closest to center should be illuminated when there is 12VDC power to the receiver and indicates power supply is functioning properly.

Next to the power LED is the yellow fault LED which indicates if the transmitter is **1)** not functioning properly, **2)** out of range or communication link is blocked, or **3)** has a low battery.

The green LED next to the yellow fault LED is illuminated when the receiver has received and decoded a signal to energize the internal output relay. The other three LED's are not used.



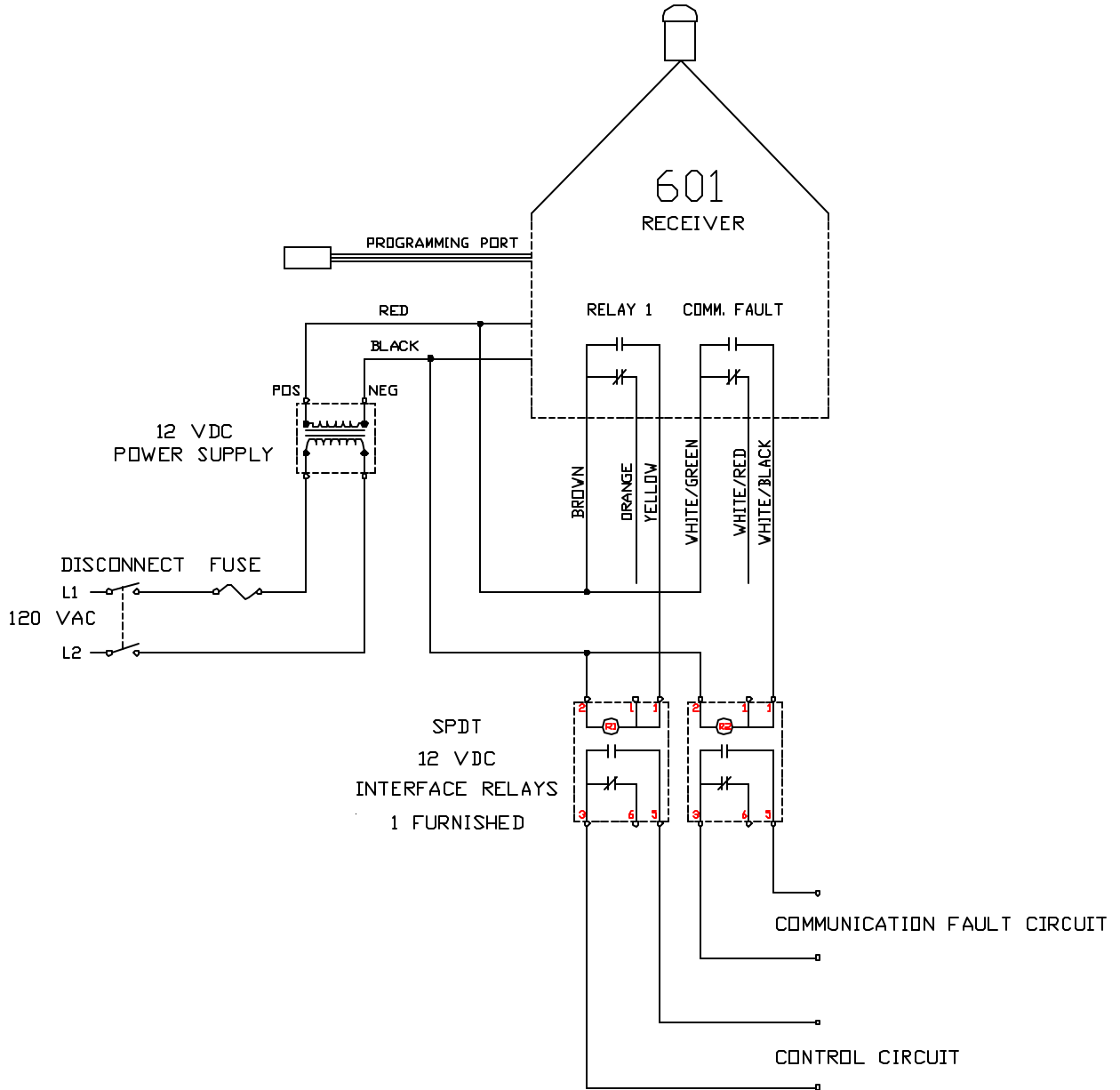
Programming Cables

The receiver now has two additional cables out the bottom. The programming cables are intended to provide access only to factory trained service technicians. At the time of installation, they should be left in place and put in the conduit or junction box with the other conductors, so it is in a waterproof environment. **Warning: Do not plug either cable into a transmitter or any other device. Damage will result if used improperly.**

12VDC INTERFACE RELAY

Close transmitter contacts to run equipment

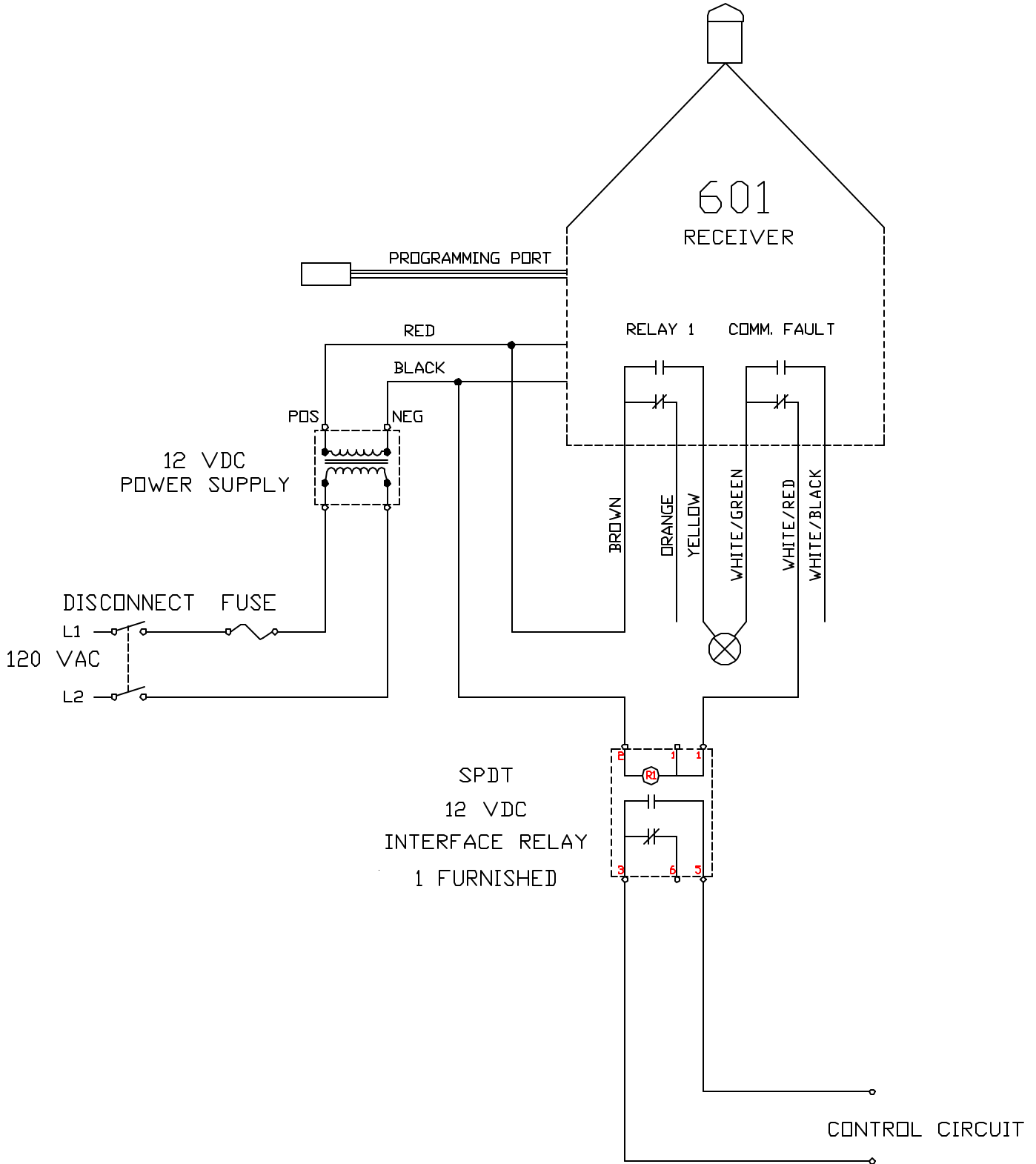
Typical Receiver Installation



12VDC INTERFACE RELAY

Communication fault will Open interface relay

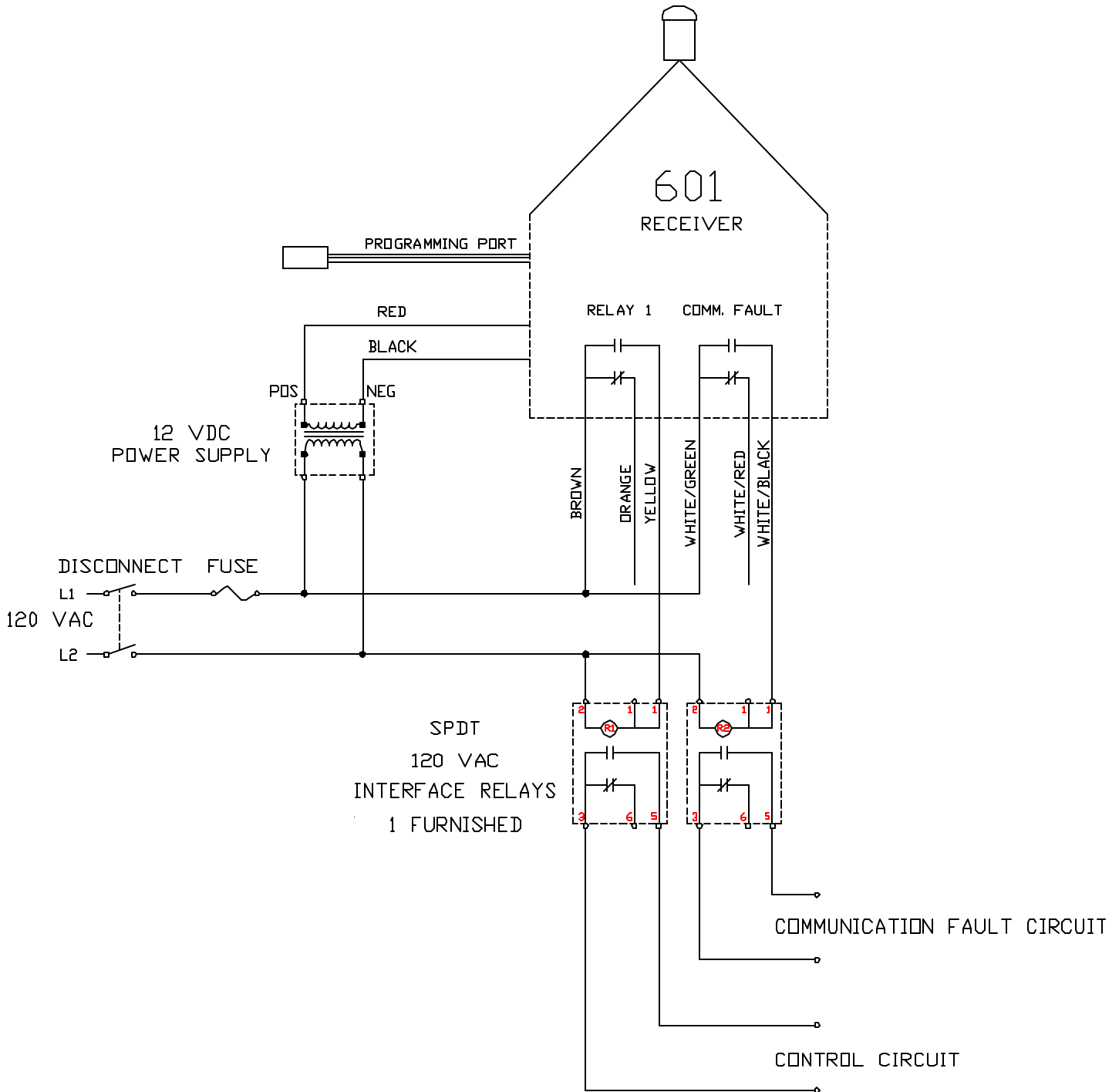
Typical Receiver Installation



120VAC INTERFACE RELAY

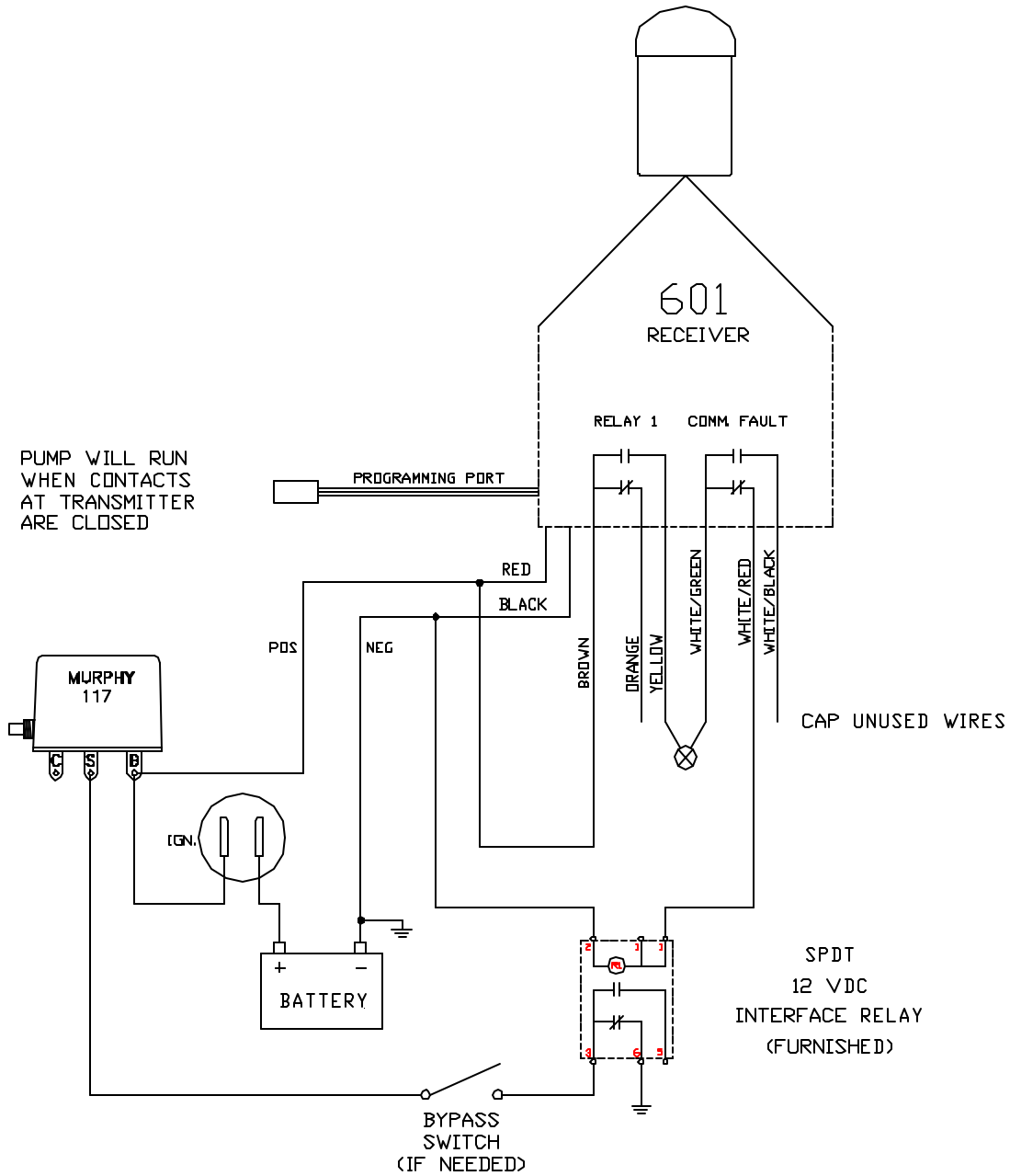
Close transmitter contacts to run equipment

Typical Receiver Installation



MURPHY 117 SWITCH with 12VDC Interface Relay

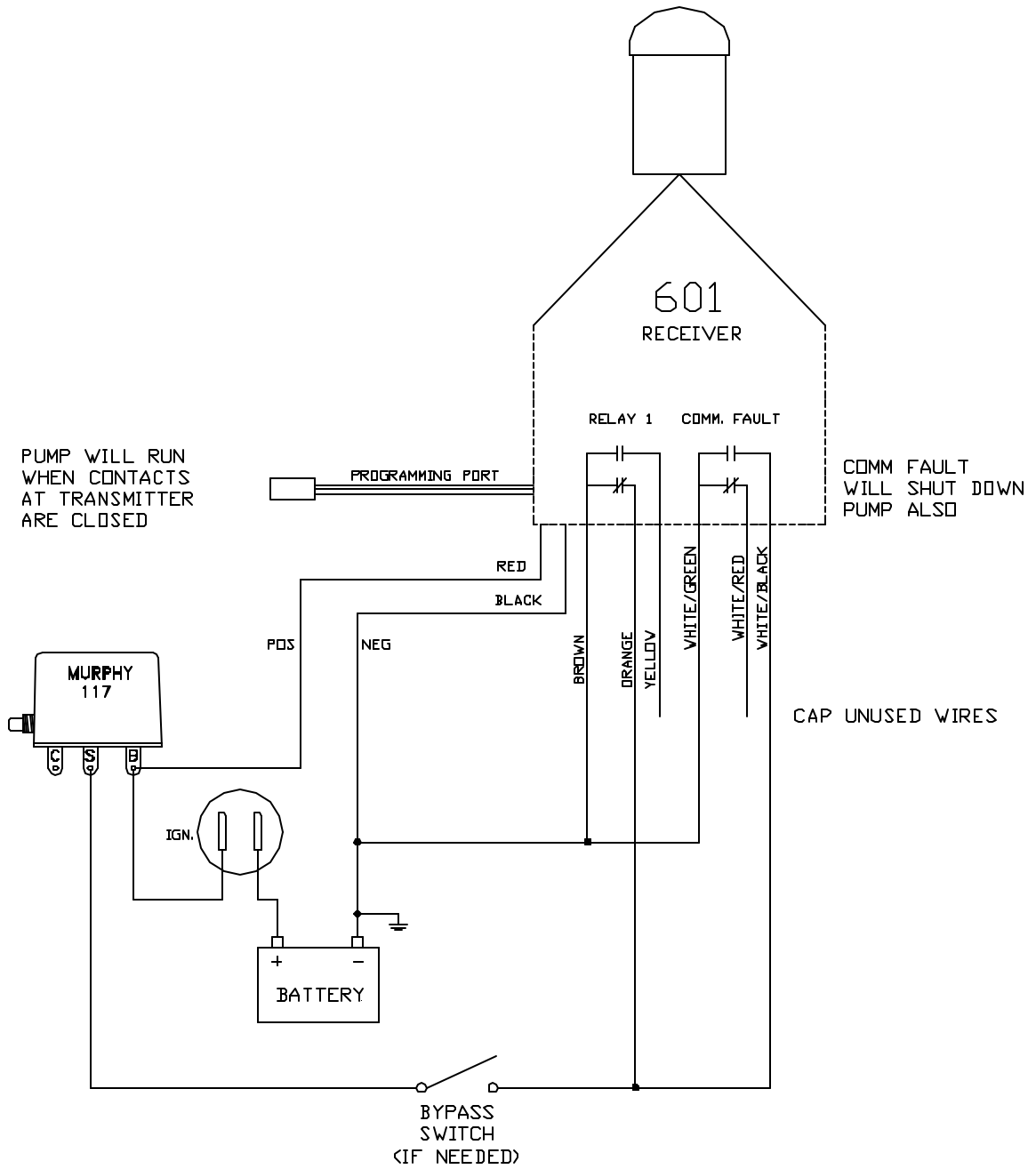
Close transmitter contacts to run pump TYPICAL ENGINE DRIVEN PUMP INSTALLATION



MURPHY 117 SWITCH, no relay

Close transmitter contacts to run pump

TYPICAL ENGINE DRIVEN PUMP INSTALLATION



Warranty & Disclaimer

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