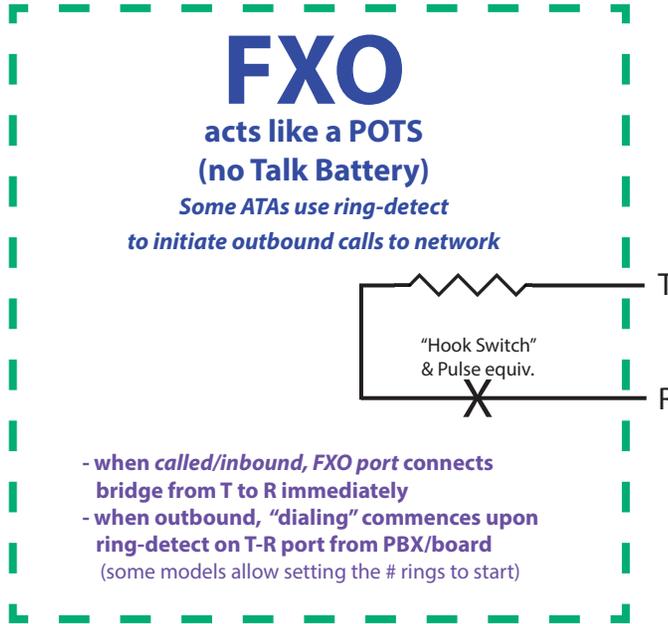


FXO & FXS Port Typical Environments

Abstracted High-Level Functional Diagram & Application Notes

SUMMARY: Specific information for using FXO & FXS ports in the environment of a PBX for collectors, museums, & hobbyists is sparse and often confusing. The diagrams herein attempt to demonstrate simple circuits for interfacing these ports to manual cord Switchboard PBXs and Dial PBXs. Depending on the brand and model of the ATA, some concepts may need adjusting or may not work. Below have worked with a W.E. 555 PBX and W.E. SxS Dial PBX switches.

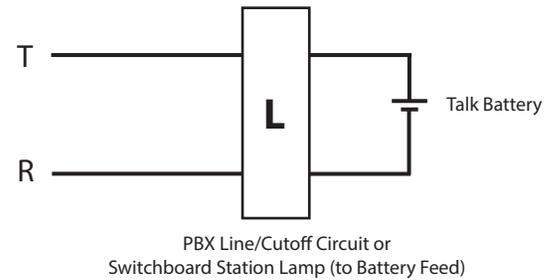
Important: in some ATA contexts, relative polarity matters: If problems, try reversing TR connection polarity



FXO ports connect to ...

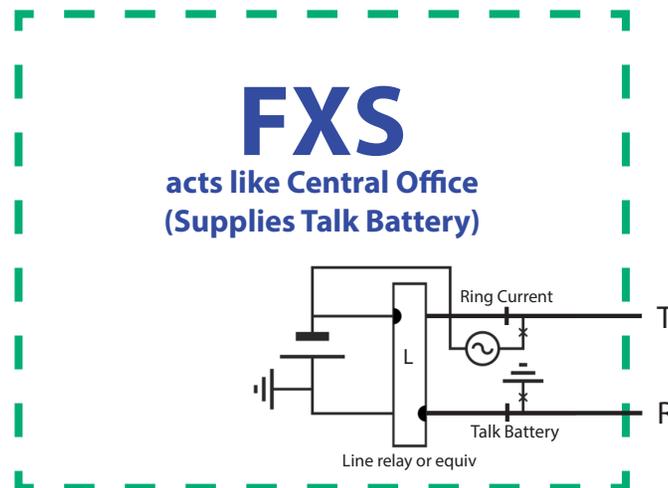
- **Dial PBX: Line ckts** or
- **PBX Switchboard: as a station line**

In either case, the PBX/board must provide talk battery



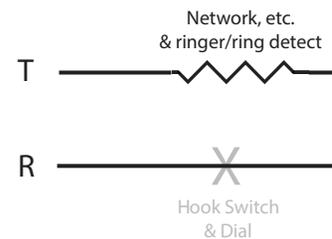
→ **INBOUND** from network

← **OUTBOUND** to network



FXS ports connect to ...

- **POTS phone - or a circuit that "acts" like one:**
 - o via a Dial PBX outgoing trunk, or
 - o via PBX Switchboard Trunk Circuit

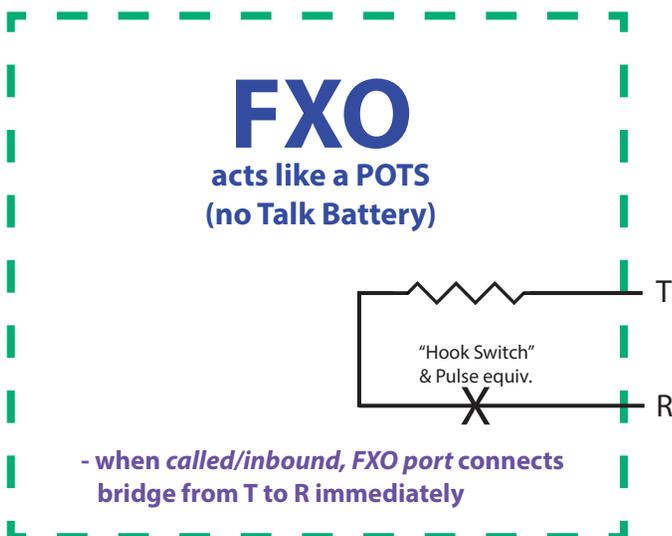


BTL documents refer to at least 11 different outgoing repeaters and 4 different incoming repeaters

FXO InBound Applications

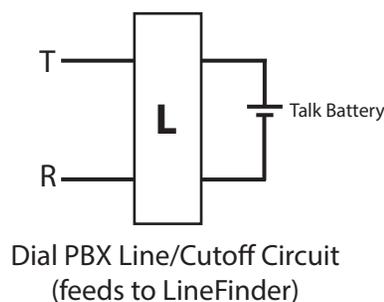
Abstracted High-Level Functional Diagram

→ INBOUND from network



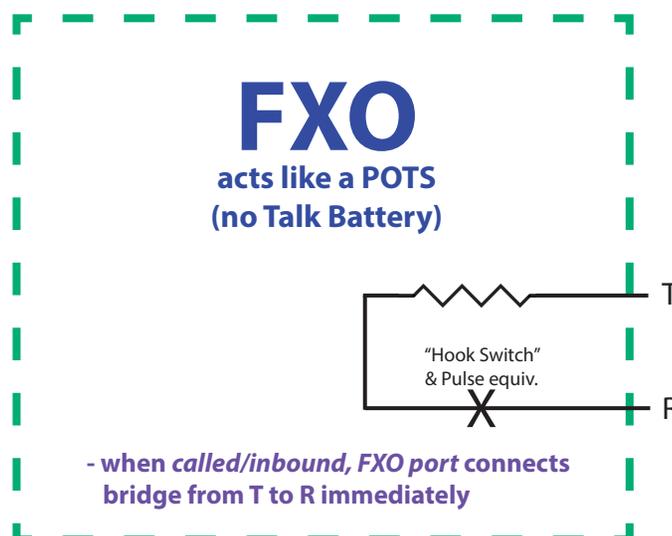
**FXO ports connect to ... line ckts in a:
Dial PBX:**

- The Line Relay provides talk battery



The FXO port acts like a POTS phone is off-hook and seizes a LineFinder and 1st Selector

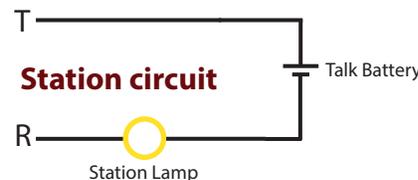
→ INBOUND from network



FXO ports connect to a ...

PBX Switchboard (555 or similar):

- The Switchboard provides talk battery

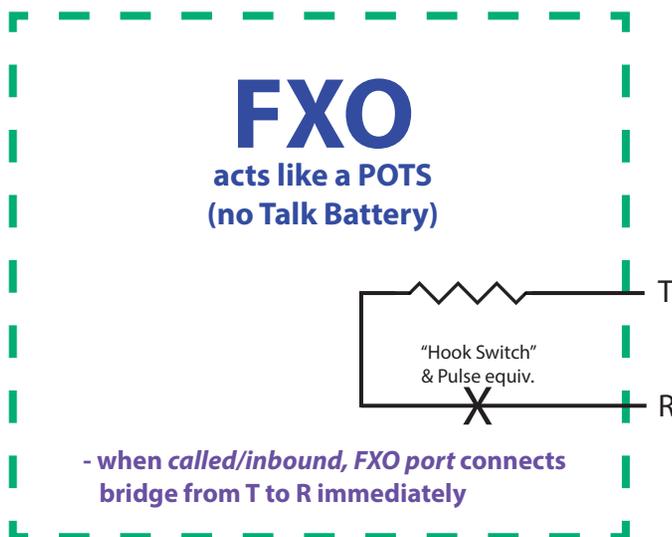


The FXO port acts like a POTS phone is off-hook and closes the circuit for the station lamp. The attendant plugs in a cord circuit (not shown) to continue talk battery and subsequent connection

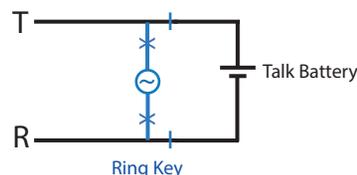
FXO OutBound Applications

Abstracted High-Level Functional Diagram

← **OUTBOUND to network**



FXO ports connect to ... station ckts in a PBX Switchboard which supply talk battery



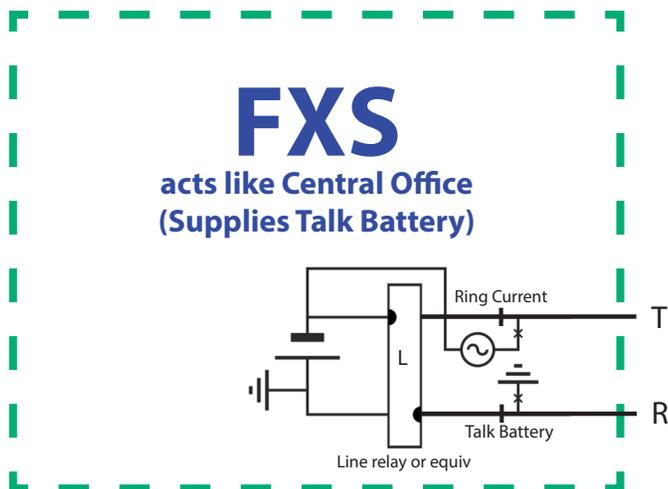
Some FXO devices will respond to a Switchboard-generated ring voltage and then initiate an outgoing PLAR call

Note: When used with a Dial PBX connector, some FXO devices will respond to the ringing voltage and provide bridge resistance to hold the line open.

FXS InBound Applications

Abstracted High-Level Functional Diagram

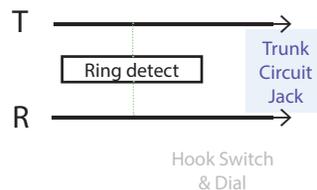
→ **INBOUND** from network



FXS ports connect to ...

POTS phone - or a circuit that "acts" like one:

- **to a PBX Switchboard Trunk Circuit**



The Switchboard Trunk Circuit detects the ring voltage and lights the lamp for the incoming call. The call is answered by plugging in to the Trunk jack. The Attendant detects when the station is on-hook and pulls down the call to release the FXS port.

Note: Not easily used for incoming to a Dial PBX because there is no supervision for when the caller (from the network) hangs up.

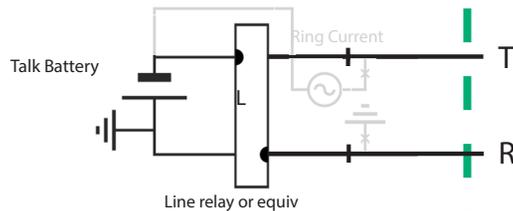
FXS OutBound Applications

Abstracted High-Level Functional Diagram

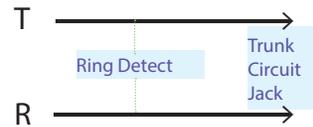
← **OUTBOUND to network**

FXS

acts like Central Office
(Supplies Talk Battery)



**FXS ports connect from a ...
PBX Switchboard Trunk Circuit**

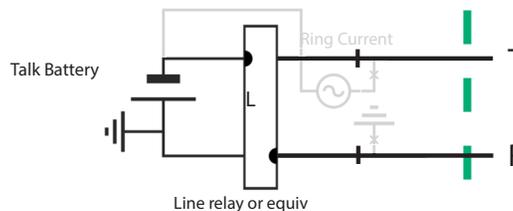


The Trunk Circuit provides a resistance bridge to hold open the FXS port until the plug is removed from the jack. The Trunk Circuit isolates the FXS talk battery from the Switchboard's station talk battery via capacitors.

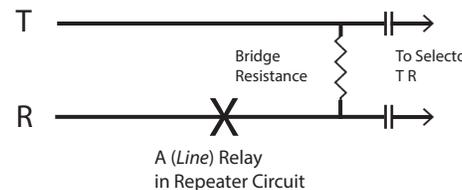
← **OUTBOUND to network**

FXS

acts like Central Office
(Supplies Talk Battery)



**FXS ports connect from a ...
Outgoing Trunk in a Dial PBX (*)**



DialPBX Repeater Circuit
(Typically from Selector)

The Outgoing Trunk circuit connects the TR from a Selector to the FXS port thru capacitors, and any pulses from the caller are repeated via the A relay.

(*) Outgoing Trunk Circuit for Selector... see examples:
www.sherwoodphoto.com/strowger/SXS-WE/outgoing_trunk_repeater_circuit_SELECTOR_version_WS2022.pdf
www.sherwoodphoto.com/strowger/SXS-WE/SD-31779-01-Iss24_28_trunk_repeater.pdf