FXO & FXS Typical Environments

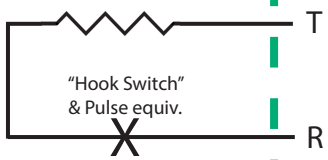
Abstracted High-Level Functional Diagram

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

FXO

acts like a POTS
(no Talk Battery)

Some ATAs use ring-detect
to initiate outbound calls to network

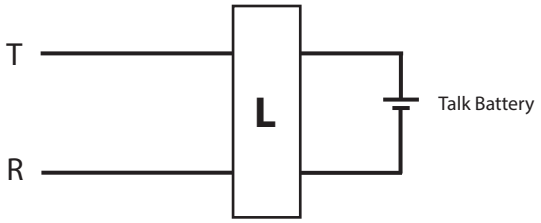


- **when *called/inbound, FXO port* connects bridge from T to R immediately**
- **when outbound, "dialing" commences upon ring-detect on T-R port from PBX/board**
  (some models allow setting the # rings to start)

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



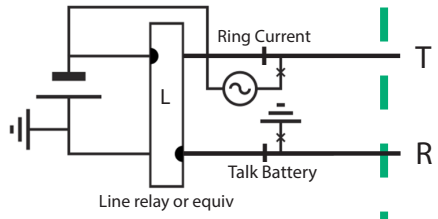
PBX Line/Cutoff Circuit or
Switchboard Station Lamp (to Battery Feed)

→ **INBOUND from network**

← **OUTBOUND to network**

FXS

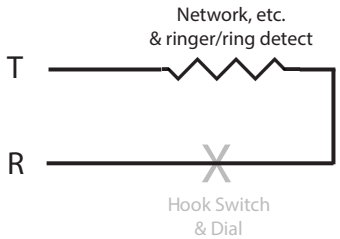
acts like Central Office
(Supplies Talk Battery)



Line relay or equiv

FXS ports connect to ...

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



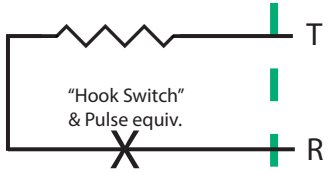
BTL documents refer to at least
11 different outgoing repeaters and
4 different incoming repeaters

FXO InBound Applications

Abstracted High-Level Functional Diagram

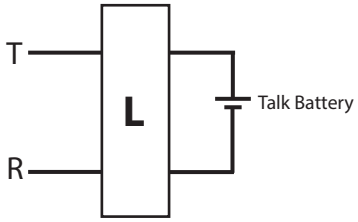
→ INBOUND from network

FXO
acts like a POTS
(no Talk Battery)



- when *called/inbound, FXO port* connects bridge from T to R immediately

FXO ports connect to ... line ckts in a:
Dial PBX:
- The Line Relay provides talk battery

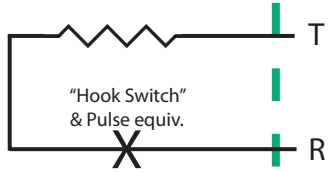


Dial PBX Line/Cutoff Circuit
(feeds to LineFinder)

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

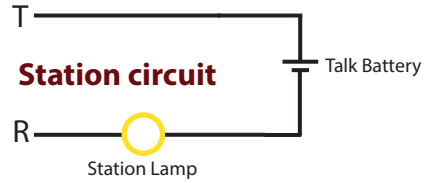
→ INBOUND from network

FXO
acts like a POTS
(no Talk Battery)



- when *called/inbound, FXO port* connects bridge from T to R immediately

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

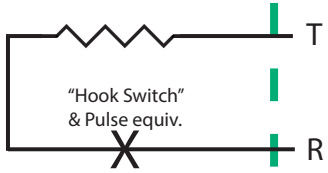
FXO OutBound Applications

Abstracted High-Level Functional Diagram

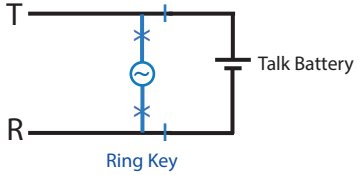
← **OUTBOUND to network**

FXO

acts like a POTS
(no Talk Battery)



- when *called/inbound, FXO port* connects bridge from T to R immediately



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.

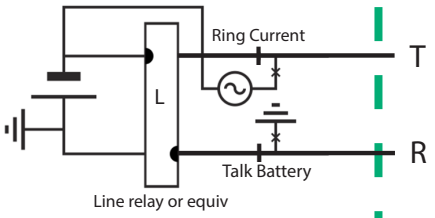
FXS InBound Applications

Abstracted High-Level Functional Diagram

→ **INBOUND from network**

FXS

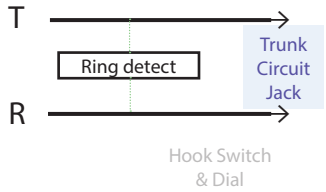
acts like Central Office
(Supplies Talk Battery)



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.

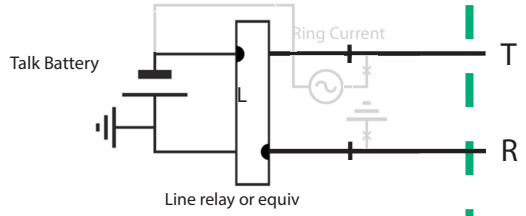
Note: Not easily used for incoming to a Dial PBX because there is no supervision for when the caller (from the network) hangs up.

FXS OutBound Applications

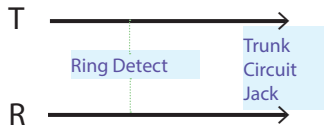
Abstracted High-Level Functional Diagram

← **OUTBOUND to network**

FXS
acts like Central Office
(Supplies Talk Battery)



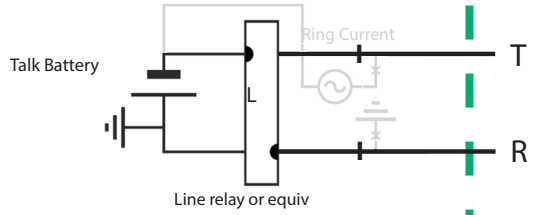
FXS ports connect from a ...
PBX Switchboard Trunk Circuit



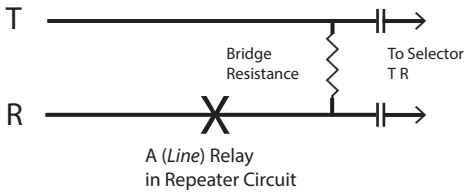
The Trunk Circuit provides a resistance bridge to hold open the FXS port until the plug is removed from the jack.
The Trunk Circuit isolates the FXS talk battery from the Switchboard's station talk battery via capacitors.

← **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