



## *Installation and Operation Manual*



### **TT-1 Rev. E PCB** ***Telephone Line Powered Auto-Answer Hybrid/Coupler***

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## INTRODUCTION

Thank you for your purchase of the tiny TOOLS™ TT-1, Telephone Line Powered Auto-Answer/Auto-disconnect Hybrid/Coupler, which we will refer to throughout the manual as the TT-1. We're confident this product will give you many years of dependable service. This manual is intended to give you all the information needed to install and operate the product.

## SAFETY INFORMATION

Only qualified personnel should install Broadcast Tools® products. Incorrect or inappropriate use and/or installation could result in a hazardous condition.

## WHO TO CONTACT FOR HELP

If you have any questions regarding your product or you need assistance, please contact your distributor from whom you purchased this equipment.

If you would like more information about Broadcast Tools® products, you may reach us at:

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**CAUTION!**

**Broadcast Tools®** Products, as with any electronic device, can fail without warning. Do not use this product in applications where a life threatening condition could result due to failure.



**NOTE:**

This manual should be read thoroughly before installation and operation.

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## PRODUCT DESCRIPTION

The tiny TOOLS TT-1 is more than just an ordinary telephone line coupler. The TT-1 is a rack-able compact telephone line powered auto-answer and auto-disconnect hybrid/coupler. The TT-1 utilizes dual-hybrid transformers providing full duplex audio at a plain old coupler price. We provide a rear panel multi-turn hybrid NULL trimmer to allow the user to achieve approximately 20db separation figures. Additional TT-1 features: front panel line seize button, call drop button, auto-answer/monitor-TAP switch, audio mute switch, and off-hook and ring indicators. A rear panel RJ-11 is provide for connection to a POTS line along with a second RJ-11 loop-thru jack that may be configured to disconnect attached devices when the TT-1 goes off-hook. Plug-in euroblock screw terminals along with 3.5mm jacks are provided for balanced send and caller audio. Plug-in euroblock screw terminals are provided for remote seize and drop inputs and the SPDT off-hook dry relay contacts. The TT-1 may be set on a desktop, mounted on a wall or up to four units mounted on the RA-1, Rack-Able mounting shelf.

## INSTALLATION

Please examine your TT-1 carefully for any damage that may have been sustained during shipping. If any is noted, please notify the shipper immediately and retain the packaging for inspection by the shipper. The package contains the TT-1, modular cable and this manual.

Installation of the TT-1 in **high RF environments** should be performed with care. Shielded cable is suggested for all audio connections. All shields should be tied to the “C-GND” Chassis GrouND terminals. The station ground should be connected to the chassis ground screw located on the far right side of the TT-1 as viewed from the rear. It is recommended that all cables connected to the TT-1 be looped through ferrite cores to suppress RF.

**Telco line jack:** Connect your telephone line to this modular RJ-11 jack labeled “ L I N E ” .

To have the TT-1 automatically disconnect when a caller hangs up, verify that the telephone company has enabled the “CPC” calling party disconnect (**wink**) feature.

**TIP: If you have trouble seizing the telephone line, try reversing the tip and ring.**

**Loop-thru line jack:** Connect your telephone set or other telephone type equipment to the jack labeled “LOOP”. When the internal “BYPASS” jumper JP1 is removed, the device connected to this jack will be disconnected when the TT-1 answers the line. To bypass this feature, place a jumper over JP1 (factory default).

**Send Input:** Low Z, transformer balanced. Connect your (send to telephone line) equipment’s output to the **SEND + and SEND -** rear panel plug-in euroblock screw terminals or the 3.5 stereo jack labeled ”SEND”. The level should be limited to -9dBu.



### NOTE:

*Some features may require the removing of the chassis cover. Caution should be observed, as hazardous voltages may be present on the printed circuit board. Be sure to reinstall the cover before using the TT-1.*

**Caller Output:** Low Z, transformer balanced. Connect your (caller audio from telephone line) equipment's input to the **CALLER + and CALLER -** plug-in euroblock screw terminals or the 3.5 stereo jack labeled "**CALLER**" rear panel screws. The caller audio level may vary from  $-9\text{dBu}$  to  $-20\text{dBu}$ . **Note:** **Additional external amplification may be required.**

**Relay connections:** The "**OFF-HOOK**" relay may be connected to either the **K1-CM** (wiper) and **K1-NO** (normally open) terminals or the **K1-NC** (normally closed) terminal. When the line is answered (seized), the normally open contacts will close and the front panel "**HOOK**" LED will light.

**Remote Seize:** Connect a positive voltage (no greater than 6 vdc) to the **Seize +** terminal and ground to the **Seize -** terminal to seize (answer) the (call) line.

**Remote Drop:** Connect a positive voltage (no greater than 6 vdc) to the **Drop +** terminal and ground to the **Drop -** terminal to drop (disconnect) the (call) line.

**Ring LED:** Front panel LED will light when the coupler is called. The TT-1 will go off-hook during or after the first ring.

**Hook LED:** Lights when the TT-1 has seized the telephone line.

**Mute Switch:** Used to disconnect the **SEND & CALLER** audio from the hybrid with the switch **IN**. This feature may be disabled on the **CALLER** side by installing JP2 & JP3 (factory default).

**Monitor (TAP) Switch:** Used to select between the auto-answer mode and the TAP mode. When this switch is **IN**, the TT-1 will **TAP (monitor)** a telephone line without seizing the line. When the switch is **OUT**, the TT-1 will auto-answer any call on the first ring.

**Null adjustment pot:** Used to adjust the null between the send and caller audio. To adjust the TT-1 null, follow the steps:

- 1 - Connect a telephone line to the RJ-11 line jack.
- 2 - Connect an audio source to the **SEND +/-** terminals. Use a 700 hz tone at  $-9\text{dBm}$ .
- 3 - Connect a dB meter to the **CALLER +/-** terminals. Be sure to terminate with 600 ohms.
- 4 - Make a call to the TT-1. After the TT-1 answers, adjust the **NULL** trimmer for minimum (**NULL**) level on the (**CALLER**) dB meter.

The TT-1 is now ready for normal operation.

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The screenshot shows a web browser window with the address <http://www.broadcasttools.com/>. The page features a circuit diagram at the top with components labeled SW9, SW10, SW11, SW12, SW13, SW14, C18, C17, R24, R23, R22, R21, R20, R19, R18, R17, R16, R15, R14, R13, R12, R11, R10, R9, R8, R7, R6, R5, R4, R3, R2, R1. Below the diagram is a navigation menu with links for Home, Products, and About Us. The main content area is titled "BROADCAST TOOLS Innovative Problem" and includes sections for "Product Listings", "Hot New Products" (listing AVR-8 Alarm Voice Response, CDR Connected Of Pad, CDA-10 Connected Of Adapter, and CDA-27 Connected Of Adapter), "Important Updates" (Staticcode Will Revoke, Program, Provider, and Service Codes), and "Updated Manual for AVR-8". A "News & Reviews" section offers to download a Short Form Catalog. A welcome message from Broadcast Tools, Inc. (BTI) describes their specialization in affordable and custom problem-solving tools for radio and broadcast industries, highlighting their products such as quality audio switches and routers, relay-coupled remote controls, and satellite receiver control lines and intercom systems. The footer mentions the company was founded in 1987 and is located in Sedro-Walugton, Washington, emphasizing their commitment to durability and reliability.

### INSTALLATION

## SPECIFICATIONS

Input Level	-9dBu.
Input Impedance	600 ohms, transformer balanced.
Output Level	-9dBu to -20dBu.
Output Impedance	600 ohms, transformer balanced.
Relay	SPDT, 30Vdc / 1 amp.
<b>NOTE:</b>	For safety, never connect 120 Vac circuits to these relays!
Remote seize/drop input voltage:	5 to 6 Vdc@30ma.
FCC information:	Complies with FCC parts 15 & 68
Ringer equivalence:	0.4B
Connectors:	Telco: 2 x modular RJ-11
Audio:	Plugin euroblock screw terminals and 3.5mm stereo jacks
Remote:	Plugin euroblock screw terminals
Size:	1/4" rack space, 4.20" x 6.00" x 1.55", painted chassis w/ 4 - mounting holes.
Weight:	2.0 lb.
Options:	RA-1, Rack Shelf. 1 RU.

## LIMITED WARRANTY

The term “Buyer” as used in this document refers to and includes both (but only) (a) any person or entity who acquires such an item for the purpose of resale to others (i.e., a dealer or distributor of an item), and (b) the first person or entity who acquires such an item for such person’s or entity’s own use.

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APPENDIX A

