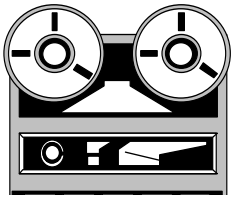
“TATTLE-TALE” TELEPHONE RECORDER KIT



Ramsey Electronics Model No. TT1C

Ever want to tape that annoying or obscene phone call? Want to find out who is making those long distance calls from your phone? Or how about taping that call just to remember what was said. The TT1C was designed with you in mind. Easy to construct and use - an ideal first kit !

- **Complete “hands off operation”! Turns on when you pick-up the phone, turns off when you hang-up.**
- **No line noise to alert callers of taping!**
- **Can be connected to any modular phone jack or directly to telephone line terminal block.**
- **Easily connected to any tape recorder with remote and mike jacks!**
- **Play back the tape to our TG2 “Tone Grabber” to read out what number was called!**
- **Superior performance!**
- **Very clean, low noise sound. Excellent audio quality.**
- **Unit runs on telephone line power-no need for batteries or external power supplies.**
- **Complete and informative instructions guide you to a kit that works the first time, every time - enhances resale value, too!**

RAMSEY TRANSMITTER KITS

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- **FM25B Synthesized Stereo Transmitter**
- **AM1, AM25 AM Transmitters**
- **TV6 Television Transmitter**

RAMSEY RECEIVER KITS

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- **SP1 Speakerphone**
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- **ECG1 Heart Monitor**
- **LC1 Inductance-Capacitance Meter**

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- **CW7 CW Keyer**
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- **VLF1 Low Bander**
- **QRP Power Amplifiers**

RAMSEY MINI-KITS

Many other kits are available for hobby, school, Scouts and just plain FUN. New kits are always under development. Write or call for our free Ramsey catalog.

TT1C TELEPHONE RECORDER KIT INSTRUCTION MANUAL
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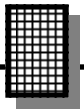

KIT ASSEMBLY
AND INSTRUCTION MANUAL FOR

TATTLE-TALE TELEPHONE RECORDER

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www.ramseykits.com

INTRODUCTION

Many times we wish to remember verbatim what was said during a phone call. Whether it's directions to grandma's house or repair instructions for some other manufacturers electronic kits, the TT1C will be your "silent secretary", recording calls for future playback.

The Ramsey TT1C "Tattle-tale" is a telephone recorder, which any person may build and use in accordance with the laws of one's state and local authorities. For U.S. residents, it is illegal to tape someones telephone conversation without informing all parties that the conversation is being taped. So remember, when you pick up the phone and say hello also inform the caller **the conversation is being recorded.** The TT1C's capabilities make it practical for many uses, but one should remember that this kit is definitely not a toy. You may need to consult local regulations to provide you with some information necessary to enjoy the TT1C's capabilities in accordance with the law.

Typical uses for the TT1C include:

- Recording directions to a particular location.
- Varifing calls made from or to your telephone.
- Taping annoying or obscene calls.
- Or how about those business calls you don't want to forget.

We think that you will be very pleased with the "Hands Off" operation, audio quality, and ease of assembly of this build-it-yourself telephone recorder. If you follow our assembly instructions carefully and use your TT1C in accordance with applicable laws you'll have a proud "reminder" for all those phone conversations to come.

TT1C CIRCUIT OPERATING DESCRIPTION

Take a look at the schematic diagram as we walk through the circuit. As you can see there is not much to the telephone recorder. For the purpose of making this as easy as possible we will assume the "Power" switch is "on" and the "Mode" switch is in the "record" position. We will discuss these switches later.

STAND-BY MODE

When the phone receiver is "on hook" (hung up), the voltage that is applied through the telephone line to J1 is about 48 volts. This voltage is supplied by a room full of huge batteries at your local telephone company.

That's why even when your local power goes out, your telephone still works. Surprising the things you can learn from these kit manuals.

Well, back to the circuit. To preface the next section it should be understood that a PNP transistor has an arrow on the emitter whch is pointing in, where as a NPN transistor has an arrow on it's emitter which is pointing out. Just as the arrows are reversed, the operation of these two different types of transistors is reversed. An NPN transistor is considered turned "on" when the voltage at it's base is more than .7 volts greater than the emitter voltage. PNP transistors are turned on when the emitter voltage is more than .7 volts greater than the base voltage.

The voltage at J1 is applied, through a 10:1 voltage divider (R3 and R4 or R5 and R4 depending on how the jack is hooked up) to the base of Q4 turning Q4 on. The diodes (D2,3,4 and 5) are arranged so that even if the jack is hooked up backward the unit will still work properly. When Q4 is turned on, the collector (leg without the arrow) is pulled down. This voltage is also at the base of Q2. This voltage is too low to turn Q2 on. So with Q2 turned off, it's collector is allowed to rise to the voltage coming in from the tape recorder remote jack at P1 and through power switch S1. Typically this voltage is in the range of 3 to 18 volts. This voltage is also applied to the base of Q1 turning it off. With Q1 turned off, no voltage passes through it to the base of Q3 leaving Q3 turned off (NPN remember?). To activate the tape recorder the remote line must be pulled low, this is the purpose of Q3. With Q3 turned off the line to the tape recorder remote jack is not affected and the tape recorder stays in stand-by mode. Therefore the second part of the circuit (the audio section) to P2 does nothing at this time. D1 is used to protect the TT1C circuitry from reverse voltage or possible voltage spikes from a tape recorder motor. We will go through the audio section when we discuss the next mode of operation (the "off-hook" or "active" mode).

ACTIVE MODE

When the phone receiver is "off-hook" (picked-up), either by an answering machine or by someone answering or making a call, this completes the telephone circuit. When the circuit is completed the voltage now at J1 is in the range of 3 to 8 volts. This reduction in line voltage is due to something called "line loss". This is when a circuit is completed and electrical current flows through the wires in the circuit, the wire tends to act like a resistor. The longer or smaller diameter the wire, the more the resistance. So now, with this smaller voltage at J1, let's run through the TT1C circuit. With 3 to 8 volts at J1, then going through the 10:1 voltage divider (R3+R4 or R5+R4) by the time this voltage gets to the base of Q4 the voltage is not enough to turn Q4 on. With Q4 turned off the collector of Q4 and also the base of Q2 rise to the voltage (through R1) to the voltage supplied by the tape recorder remote jack. This

voltage at the base of Q2 turns Q2 on. With Q2 turned on it's collector and also the base of Q1 are pulled low. With Q1's base pulled low, Q1 is turned on (remember PNP transistor). At this time Q1 passes the voltage from the remote jack to the base of Q3 turning Q3 on. Q3, being turned on, pulls it's collector (which is connected to the remote jack) low, activating the tape recorder. At this time the audio (which comes in on the same telephone lines) comes down to C1 and C2 in the audio section. C1 and C2 block the incoming DC voltage but pass the audio through. The audio then goes through a 100:1 divider, R6 and R7, and is applied to the tape recorder mike jack. Diodes D6 and D7 are used for protection and will never allow more than .7 volts of audio to reach the recorders "Mike" jack (you never know what noise can come over the line when you're on the phone).

There, now that we've got all that out of the way, there is just one more thing to discuss, the "Power" and "Mode" switches. The "Power" switch connects the TT1C to your tape recorders remote jack. When this switch is in the "Off" position the TT1C will have no effect on the tape recorders operation (i.e. the tape recorder is in manual operation).

When this switch is in the "On" position the power from the remote jack can be brought into the TT1C to be used to turn on and off the tape recorder remotely (i.e. remote operation).

The "Mode" switch is used when you wish to either be in the "Record" mode (with the tape recorders "Record" button pushed) or "Playback" mode (with the tape recorders "Play" button pushed) for listening to what has been recorded (remember to rewind the tape first).

Now, before we get building, check the parts that came in your kit with the parts list on the next page to make sure everything on the parts list accompanied the kit. Once you are satisfied with the parts,

LETS GET BUILDING!

TT1C PARTS LIST

RESISTORS

- ❒ 1 470 ohm [yellow-violet-brown] (R6)
- ❒ 2 47K ohm [yellow-violet-orange] (R2,7)
- ❒ 1 470K ohm [yellow-violet-yellow] (R4)
- ❒ 2 4.7M ohm [yellow-violet-green] (R3,5)
- ❒ 1 100K ohm [brown-black-yellow] (R1)

CAPACITORS

- ❒ 2 .01 uF disc capacitor [marked .01 or 103 or 10nF] (C1,2)

SEMICONDUCTORS

- ❒ 3 NPN transistors [marked 3904] (Q2,3,4)
- ❒ 1 PNP transistor [marked 221 334] (Q1)
- ❒ 7 Diodes [marked 1N4148] (D1,2,3,4,5,6,7)

MISCELLANEOUS PARTS AND HARDWARE

- ❒ 1 3.5mm Cable,Mike plug(P2)
- ❒ 1 2.5mm Cable,Remote plug (P1)
- ❒ 1 Telephone modular jack (J1)
- ❒ 2 Switch,DPST,pushbutton (S1,2)
- ❒ 1 TT1C printed circuit board

RAMSEY Learn-As-You-Build KIT ASSEMBLY

There are numerous solder connections on the TT1C printed circuit board. Therefore, PLEASE take us seriously when we say that good soldering is essential to the proper operation of your kit!

- Use a 25-watt soldering pencil with a clean, sharp tip.
- Use only rosin-core solder intended for electronics use.
- Use bright lighting, a magnifying lamp or bench-style magnifier may be helpful.
- Do your work in stages, taking breaks to check your work. Carefully brush away wire cuttings so they don't lodge between solder connections.

We have a two-fold "strategy" for the order of the following kit assembly steps. First, we install parts in physical relationship to each other, so there's minimal chance of inserting wires into wrong holes. Second, whenever possible, we install in an order that fits our "Learn-As-You Build" Kit building philosophy. We have described the circuit that you are building, instead of just blindly having you install components. We hope that this will not only make assembly of our kits easier, but help you to understand the circuit you're constructing.

For each part, our word "Install" always means these steps:

1. Pick the correct part value to start with.

2. Insert it into the correct PC board location.

3. Orient it correctly, follow the PC board drawing and the written directions for all parts - especially when there's a right way and a wrong way to solder it in. (Diode bands, transistor shapes, dotted or notched ends of ICs, and so forth.)

4. Solder all connections unless directed otherwise. Use enough heat and solder flow for clean, shiny, completed connections.

Now, let's get building!

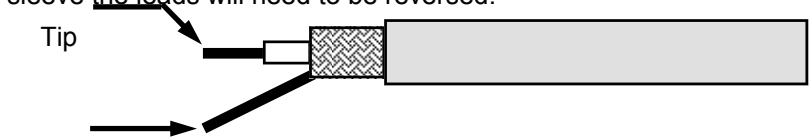
Since you may appreciate some “warm-up” soldering practice as well as a chance to put some “landmarks” on the PC board, we’ll first install some “hardware” components. This will also help us to get acquainted with the up - down, left - right orientation of the circuit board. Remember that the components will be mounted on the “component” side of the circuit board and soldered on the “solder” side of the circuit board.

- ❒ 1. Identify and install DPDT switch S1. Be sure to push the switch flat to the circuit board. Solder all six connections.
- ❒ 2. Install switch S2, same as in step 1.
- ❒ 3. Install the modular phone jack J1.

We’ll now begin by constructing the tape recorder control section of the TT1C.

- ❒ 4. Install R3, 4.7M ohm[yellow-violet-green].
- ❒ 5. Install R5, 4.7M ohm[yellow-violet-green].
- ❒ 6. Install D2, 1N4148 type small signal diode (glass body with black band). Install it with the cathode band as shown as these diodes are polarity sensitive and must be installed in the correct direction.
- ❒ 7. Install D3, 1N4148 same as in step 6.
- ❒ 8. Install D4, 1N4148 same as in step 6.
- ❒ 9. Install D5, 1N4148 same as in step 6.
- ❒ 10. Install R4, 470K ohm [yellow-violet-yellow].
- ❒ 12. Install Q4 a 2N3904 NPN transistor. When installing Q4, observe correct placement of the flat side. Press the transistor snugly into the PC board so that only a minimum amount of wire lead is exposed above the board. In soldering, do not be afraid of using enough heat to make a good solid connection.
- ❒ 13. Install Q2, 2N3904 same as in step 12.
- ❒ 14. Install Q3, 2N3904 same as in step 12.
- ❒ 15. Install R1, 100K ohm [brown-black-yellow].
- ❒ 16. Install R2, 47K ohm [yellow-violet-orange].
- ❒ 17. Install Q1, 221334 PNP transistor. Orient the part using the larger flat side with no writing on it.
- ❒ 18. Install D1, 1N4148 diode [reviewing step 6].

❒ 19. Install P1, 2.5mm tape recorder “REMOTE” plug cable (see figure on page 11). In most cases the P1 hook-up in the schematic will be correct but, as we all know some manufacturers just like to be different. Though unlikely, the manufacturer of your tape recorder may have reversed the positive and ground outputs on the remote jack. This is not a problem as the TT1C is made to withstand reverse voltages. Remember this point when it comes to testing the assembled unit. If your tape recorder does not activate use a volt meter to measure from remote jack-sleeve to remote jack-tip on your board. If the positive voltage is not on the sleeve the leads will need to be reversed.



“Remote” and “Mike” Jack Cables

Whew ! Now that wasn’t so bad now was it? You have just completed the tape recorder control section of the TT1C. Take a moment now to recheck you work for clean, shiny solder connections. Resolder any connections that are less than perfect.

We’ll get back to building now, starting at the audio input at J1 and working through the audio circuitry.

❒ 20. Install C1, .01uF disk capacitor [marked .01 or 103 or 10nF]. This capacitor is not polarized so polarity is not important.

❒ 21. Install C2, .01uF disk capacitor [marked .01 or 103 or 10nF] same as in step 20.

❒ 22. Install R7, 47K ohm [yellow-violet-orange].

❒ 23. Install R6, 470 ohm [yellow-violet-brown].

❒ 24. Install D7, 1N4148 signal diode(remember cathode orientation).

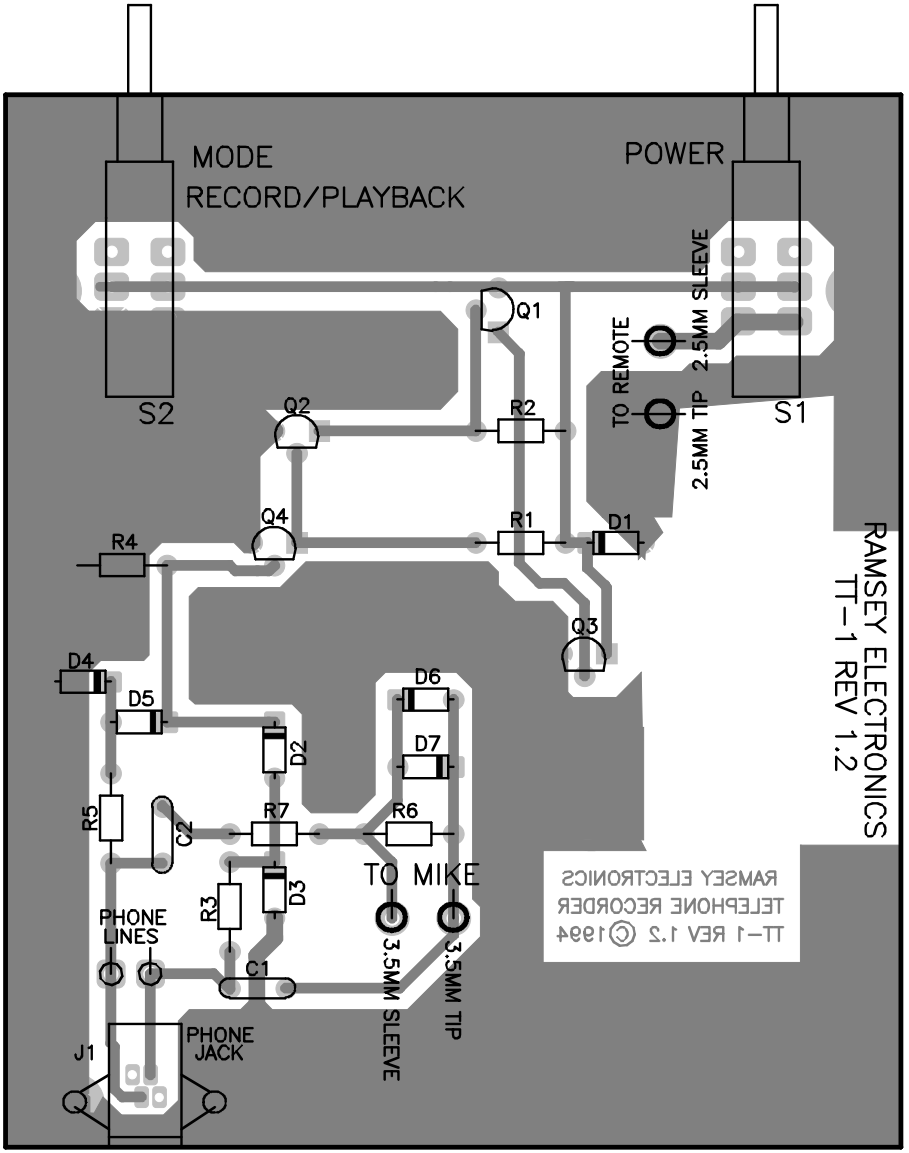
❒ 25. Install D6, 1N4148 signal diode(remember cathode orientation).

❒ 26.Install P2, 3.5mm tape recorder “MIKE” plug cable (see figure above).

Congratulations! You have now completed assembly of your Ramsey TT1C “Tattle-tale” telephone recorder printed circuit board.

At this time lets take a short break to clean up the work area, get a bowl of Rocky Road ice cream, sit back and look over the work you just did. Check for cold solder joints, solder bridges, missing components or any other problems. Once you are satisfied with your assembly work, it’s time to

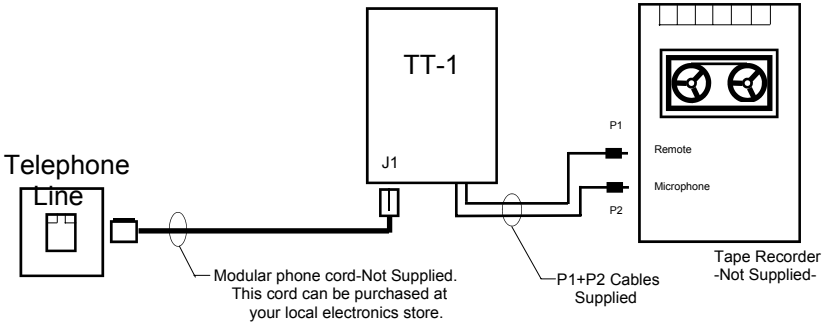
TT1C PARTS LAYOUT DIAGRAM



test your new Ramsey TT1C “Tattle-tale” telephone recorder.

INITIAL TESTING

Hook-up your TT1C telephone recorder as in the figure below:



Once your TT1C is hooked-up per drawing push “Power” button on TT1C to “On” position. Push “Mode” button to “Record” position. Push “Record” button on tape recorder. The tape recorder is now in stand-by. Pick up any phone on the same phone line. The tape recorder should start taping. Talk into the phone for a few seconds. Now hang-up. The tape recorder should stop running.

To listen to what was taped, push the “Stop “button on tape recorder. Push the “Mode” button on your TT1C to “Playback”. Rewind your tape. Push the “Play button on your tape recorder. You will now be hearing what was taped. Yes, it’s that easy.

TROUBLESHOOTING INSTRUCTIONS

While we had hoped that it wouldn’t come to this, if you are having trouble with your “Tattle-tale” Telephone Recorder, here are a few suggestions.

By far the most common source of problems is due to misplaced parts or poor solder connections. It’s always best to take a break before searching for bad connections. Around here it’s referred to as the “Irwin Time Test” which states that “anything left alone long enough seems to repair itself !” This also gives you a chance to clear your head. A good way of checking component placement is to double check the assembly steps going backwards from the last steps to the first. Bright lighting and a magnifying aid can be helpful in identifying soldering problems.

Use a methodical, logical troubleshooting technique. Most problems can be solved using common sense. A volt-ohm meter and a clear head are

usually all that are needed to correct any problem. A full circuit operating description is located starting on page 4 of this book. If you walk through this description carefully with your meter, this should lead you to the root of the problem.

If your TT1C still doesn't work properly, please understand that we do have a talented repair staff on hand but, it is nearly impossible for us to "troubleshoot" by phone. Any specific questions should be documented and sent to us by email or snail mail.

CONCLUSION

We sincerely hope that you have enjoyed the construction and use of this Ramsey Kit. As always, we have tried to compose our manual in the easiest, most "user friendly" format that is possible. As our customers, we value your opinions, comments, and additions that you would like to see in future publications. Please submit comments or ideas to:

Ramsey Electronics Inc.
Attn. Hobby Kit Department
590 Fishers Station Drive
Victor, NY 14564

And once again, thanks from the folks at Ramsey!

The Ramsey Kit Warranty

Please read carefully BEFORE calling or writing in about your kit. Most problems can be solved without contacting the factory.

Notice that this is not a "fine print" warranty. We want you to understand your rights and ours too! All Ramsey kits will work if assembled properly. The very fact that your kit includes this new manual is your assurance that a team of knowledgeable people have field-tested several "copies" of this kit straight from the Ramsey Inventory. If you need help, please read through your manual carefully, all information required to properly build and test your kit is contained within the pages!

1. DEFECTIVE PARTS: It's always easy to blame a part for a problem in your kit, Before you conclude that a part may be bad, thoroughly check your work. Today's semiconductors and passive components have reached incredibly high reliability levels, and its sad to say that our human construction skills have not! But on rare occasion a sour component can slip through. All our kit parts carry the Ramsey Electronics Warranty that they are free from defects for a full ninety (90) days from the date of purchase. Defective parts will be replaced promptly at our expense. If you suspect any part to be defective, please mail it to our factory for testing and replacement. Please send only the defective part (s), not the entire kit. The part(s) MUST be returned to us in suitable condition for testing. Please be aware that testing can usually determine if the part was truly defective or damaged by assembly or usage. Don't be afraid of telling us that you 'blew-it', we're all human and in most cases, replacement parts are very reasonably priced.

2. MISSING PARTS: Before assuming a part value is incorrect, check the parts listing carefully to see if it is a critical value such as a specific coil or IC, or whether a RANGE of values is suitable (such as "100 to 500 uF"). Often times, common sense will solve a mysterious missing part problem. If you're missing five 10K ohm resistors and received five extra 1K resistors, you can pretty much be assured that the '1K ohm' resistors are actually the 'missing' 10 K parts ("Hum-m-m, I guess the 'red' band really does look orange!") Ramsey Electronics project kits are packed with pride in the USA. If you believe we packed an incorrect part or omitted a part clearly indicated in your assembly manual as supplied with the basic kit by Ramsey, please write or call us with information on the part you need and proof of kit purchase.

3. FACTORY REPAIR OF ASSEMBLED KITS:
To qualify for Ramsey Electronics factory repair, kits MUST:
1. NOT be assembled with acid core solder or flux.
2. NOT be modified in any manner.
3. BE returned in fully-assembled form, not partially assembled.
4. BE accompanied by the proper repair fee. No repair will be undertaken until we have received the MINIMUM repair fee (1/2 hour labor) of $25.00, or authorization to charge it to your credit card account.
5. INCLUDE a description of the problem and legible return address. DO NOT send a separate letter; include all correspondence with the unit. Please do not include your own hardware such as non-Ramsey cabinets, knobs, cables, external battery packs and the like. Ramsey Electronics, Inc., reserves the right to refuse repair on ANY item in which we find excessive problems or damage due to construction methods. To assist customers in such situations, Ramsey Electronics, Inc., reserves the right to solve their needs on a case-by-case basis.The repair is $50.00 per hour, regardless of the cost of the kit. Please understand that our technicians are not volunteers and that set-up, testing, diagnosis, repair and repacking and paperwork can take nearly an hour of paid employee time on even a simple kit. Of course, if we find that a part was defective in manufacture, there will be no charge to repair your kit (But please realize that our technicians know the difference between a defective part and parts burned out or damaged through improper use or assembly).
6. REFUNDS: You are given ten (10) days to examine our products. If you are not satisfied, you may return your unassembled kit with all the parts and instructions and proof of purchase to the factory for a full refund. The return package should be packed securely. Insurance is recommended. Please do not cause needless delays, read all information carefully.

TT1C "Tattle-tale Telephone Recorder
Quick Reference Page Guide

REQUIRED TOOLS

- Soldering Iron (WLC100)
- Thin Rosin Core Solder (RTS12)
- Needle Nose Pliers (PTS401)
- Small Diagonal Cutters (PTS400)

TOTAL SOLDER POINTS
58
ESTIMATED ASSEMBLY TIME
Beginner .....1.8 hrs
Intermediate .....1 hr
Advanced 0.8hrs

ADDITIONAL SUGGESTED ITEMS

- Helping Hands Holder for PC Board/Parts (HH3)
- Desoldering Braid (RTS08)

Price: $5.00
Ramsey Publication No. MTT1C
Assembly and Instruction manual for:
RAMSEY MODEL NO. TT1C "Tattle-tale"
Telephone Recorder Kit

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