

#### RADIO SHACK LIMITED WARRANTY

This telephone product is warranted against manufacturing defects in material and workmanship for one (1) year from the date of purchase from Radio Shack company owned stores and authorized Radio Shack franchisees and dealers. Within this period Radio Shack will repair the telephone product without charge for parts and labor. Simply **bring your Radio Shack sales slip** as proof-of-purchase date to any Radio Shack store.

This warranty does not cover damage or failure caused by or attributable to Acts of God, abuse, misuse, improper or abnormal usage, faulty installation, improper maintenance, lightning or other incidence of excess voltage, or any repairs other than those provided by a Radio Shack Authorized Service Facility, or transportation costs.

**Radio Shack is not responsible or liable for indirect, special, or consequential damages arising out of or in connection with the use or performance of the product or other damages with respect to loss of property, loss of revenues or profit, or costs of removal, installation or reinstallation.**

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There will be charges rendered for repairs to the product made after the expiration of the aforesaid one (1) year warranty period.

This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

*We Service What We Sell*

3/87

## OWNER'S MANUAL

Please read before using this equipment

### SYSTEM 405 FOUR-LINE PHONE

RADIO SHACK  
A Division of Tandy Corporation  
Fort Worth, Texas 76102

DUOFONE®

## INTRODUCTION

Your **DUOFONE**® System 405 Four-line Telephone is an economical telephone system designed for both business and residential use. It can handle from one to four incoming lines and up to twelve stations.

The System 405 contains the basic features of a Key Telephone System without the need for a separate control box (KSU). Connections to and between the stations can be accomplished through standard telephone wiring.

This instruction manual is designed to give you all the information necessary for configuring and operating your new telephone. To assure proper installation, read this manual carefully. For the most part, the System 405 is user-installable, but if you are not comfortable doing wiring the installation should be done by a professional telephone installer.

This unit complies with Part 68 of the FCC Rules. The registration number as well as the *ringer equivalence number* (REN) appears on the bottom of the unit. You must, upon request, provide this information to your telephone company.

- Note:** Do not connect this equipment to —
- Coin-operated systems
  - Party-line systems
  - Electronic key telephone systems

**WARNING:** To Prevent fire or shock hazard, do not expose this appliance to rain or moisture

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## FEATURES

- **Call pickup from any station**—Any station can answer telephone calls.
- **Tone or pulse dialing**—The System 405 is compatible with both rotary (pulse) and touch-tone dialing.
- **Hold feature**—Place any call on hold with a push of a button.
- **Hearing aid compatible**—Can legally be used in all public areas.
- **AUXILIARY Jack**—This jack lets you connect accessories such as phone dialers, answering machines, and speakerphones directly to the System 405 station.

For your own protection, we urge you to record the serial number of this unit in the space provided. The serial number is located on the bottom of the unit.

Serial Number: \_\_\_\_\_

## INSTALLATION

Installation consists of these simple steps:

1. Ordering the necessary equipment (telephone lines from the telephone company, and so forth).
2. Installing the jacks, or having the phone company install them for you.
3. Connecting the System 405 to the installed jacks.
4. Configuring and adjusting the System 405 telephones.

### Ordering the Equipment

Before you contact the telephone company, you must answer a few questions about your system. Record your answers below so that you have a handy reference when speaking with telephone company service personnel.

— **How many telephone lines are currently installed?** Each telephone number corresponds to a separate telephone line.

— **How many telephone lines, if any, do you need to add?** The maximum number of lines you can connect to the System 405 is four.

— **Do you want pulse or touch-tone service?** The System 405 supports either touch-tone or pulse dialing. Although touch-tone dialing is faster and usually more convenient, pulse dialing is less expensive in many areas.

— **Do you want rollover?** Rollover is a service for multi-line telephone systems that automatically reroutes an incoming call from a busy line to a line which is not busy. You must request this service from the phone company, since rollover (known to the telephone company as "hunt") can only be activated at the telephone company's central office.

— **How many stations need to be installed?** Each System 405 key telephone is a station. You can install up to twelve stations. Station requirements vary depending on how many lines you plan to use. Refer to the following table to determine which jacks you need at each station.

Number of Lines Used	Jacks Needed per Station
1	One RJ-11
2	One RJ-14
3	One RJ-14 (for first two lines) and one RJ-11 (for third line)
4	Two RJ-14 (one for first two lines, one for third and fourth line)

**Note:** Specify RJ-11W or RJ-14W for wall-mounted stations.

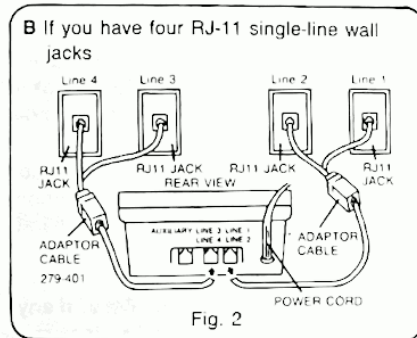
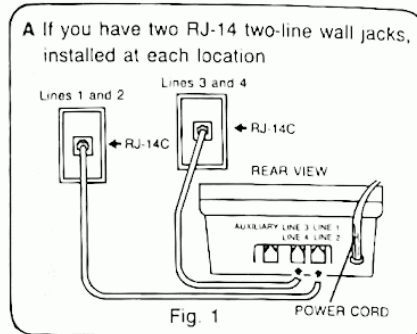
Call the telephone company and order the necessary lines and services. (Such as call forwarding, call waiting or other services that you may want your local phone co. offers)

### Installing the Jacks

You can wire the station jacks yourself. Complete instructions for doing so are beyond the scope of this manual. There are several books available at your local Radio Shack store that provide detailed information on running telephone cable and installing jacks. Refer to Figures 1 and 2 for basic wiring information.

We recommend that if you feel unqualified or unable to do the wiring, you have the jacks and lines installed by your telephone company or an experienced telephone installer. Note that the telephone company does charge for the installation of any jacks or lines.

We have provided the RS Cat. Nos. to assist you in obtaining the needed parts and accessories.



### Connections of Four Phones with Four Lines

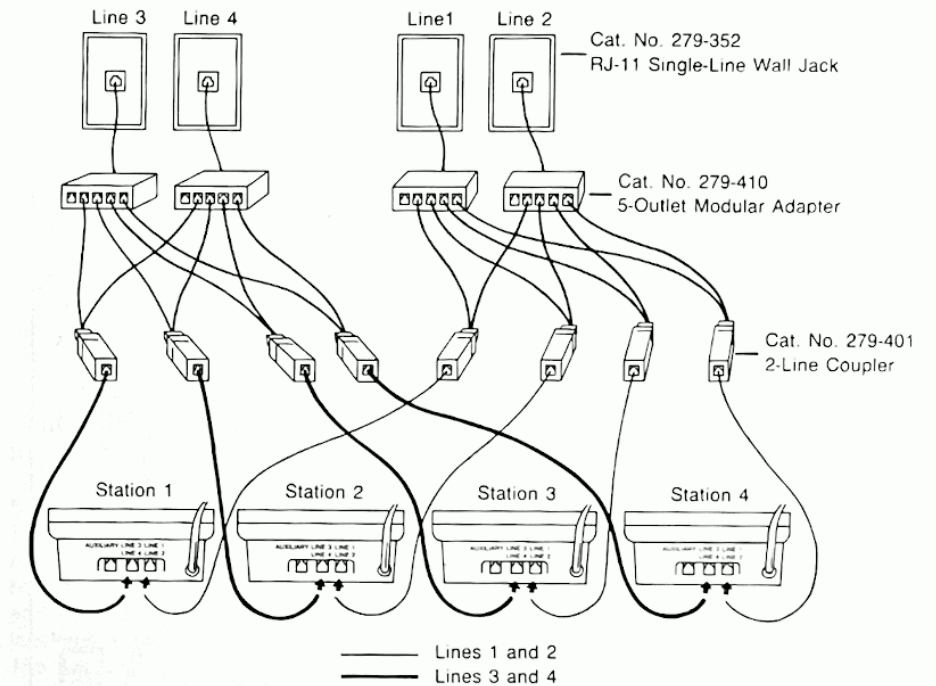


Fig. 3

## Connecting the System 405 Telephones

Packed with your System 405 are two telephone line cords. These cords are used to connect the telephone station to the

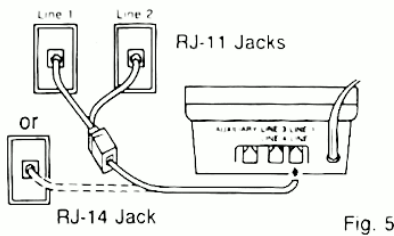
installed telephone line(s). The coiled cord connects the handset to the base unit.

1. Assemble the System 405 station by plugging the handset cord into the bottom of the handset and then into the jack on the side of the base unit.



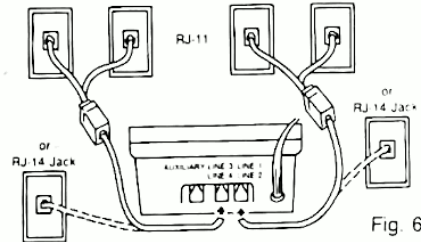
2. Now connect the base unit to the installed jacks.

- a. If you have one or two lines installed, use only one line cord. Connect one end of the cord to the Line 1/2 jack on the telephone. Then, plug the other end into the installed jack.

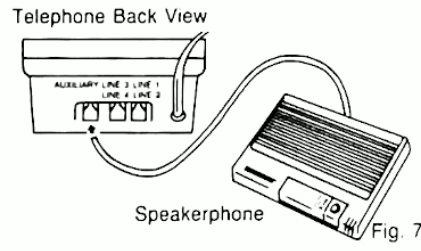


- b. If you have three or four lines installed, use both line cords to connect the installed jacks to the line jacks on the phone (labeled Line 1/2 and Line 3/4).

**Note:** If you have three lines, remember not to mix up the connections. The two installed jacks carry different lines.

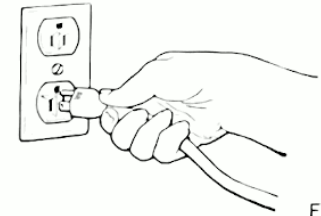


3. If you wish to connect an auto-dialer, speakerphone, or other accessory telephone device to the installed station, simply plug the device into the AUXILIARY jack on the back of the telephone. The accessory is automatically connected to the telephone line whenever a line button is pressed.



4. Plug the AC power cord into a standard AC outlet.

**Note:** The AC outlet must be properly grounded for proper and safe operation. Check each outlet with an AC Outlet Tester (Radio Shack Catalog Number 22-101) prior to plugging in the telephone.



### Wall Mounting

The System 405 requires a special metal bracket (available by special order) which enables you to wall mount the telephone. Instructions for doing so are included with the bracket.

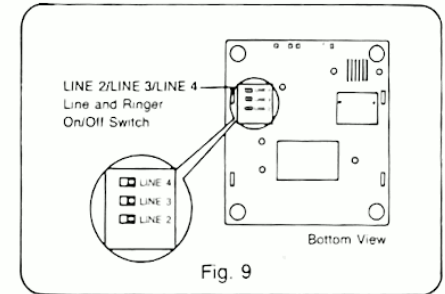
### Configuring and Adjusting the System 405 Telephones

#### Setting the LINE Ringer On/Off Switches

There are three switches on the bottom of the System 405 telephone that determine how the telephone operates with Lines 2, 3 and 4. Each switch has three positions, labeled A, B, and C. (Fig. 9)

The switches function as follows.

- A The line is active and rings with incoming calls. This is the normal position for connected lines.
- B The line is not active, and you cannot make or receive calls on that line. Use this position for lines that are not connected or for lines that you do not want to be active at a particular station.
- C The line does not ring with incoming calls but can still be used to make and receive calls. Use this position when you want the station to be able to use the line but not to ring for that line. The line indicator still lights with incoming calls and when the line is active.

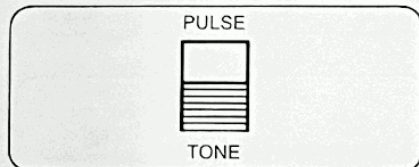


Line 1 is always active and rings at all stations. You can select what telephone line appears on Line 1 by the way the telephone jacks are wired.

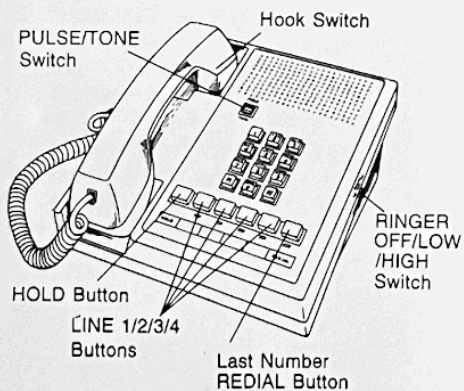
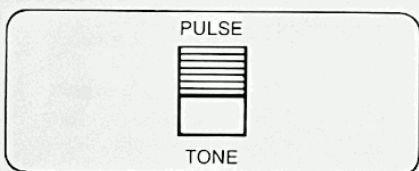
### Selecting Pulse or Tone Dialing

Set the Tone/Pulse switch on the top of the phone to the type of dialing you ordered from the telephone company. If you are unsure of the type, follow this simple procedure.

1. Place the switch in the TONE position.



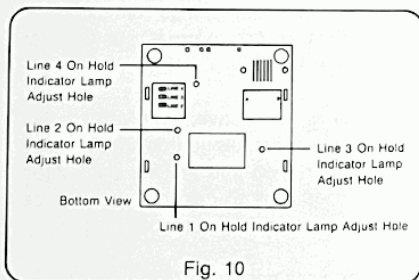
2. Lift the handset and press a connected line button.
3. Press any number key on the keypad.
4. If the dial tone stops, you have touch-tone dialing; leave the switch in the tone position. If the dial tone continues, you have rotary dialing; place the switch in the PULSE position, then press hook switch to activate PULSE function.



### Adjusting the On-hold Indicators

The system 405 determines the status of a line (in use, on hold, etc.) by sensing the change in voltage flowing in the phone line. The voltage available will vary depending on the type of system and the distance between the telephone company central office and your location. Therefore, they might require an initial adjustment for best operation.

1. Using Line 1, dial the Line 2 telephone number
2. When Line 2 begins to ring, place Line 1 on hold. The Line 1 lamp should blink continuously at every station with no interference from the ringing line.
3. If the indicator does not blink steadily when another line rings, adjust the Line 1 On-hold Indicator as follows, using the key packaged with the unit.
  - a. Carefully insert the metal key into the hole and turn clockwise until the Line 1 lamp blinks without interference. If clockwise adjustment does not cause the lamp to blink properly, turn the key counter-clockwise to adjust. (Fig. 10)



- b. To ensure a constant on-hold indication, turn the key a fraction of a turn more than necessary in the same direction.
4. Repeat the above procedure for the other connected lines.

## OPERATION

Your System 405 telephone system is simple to operate. Most functions operate as on any standard telephone. Refer to this section whenever you need detail on a specific feature of the telephone.

### Placing a Call

Lift the handset, select a line not being used, and dial.

**Note:** Any telephone station can pick up any line, even if a conversation is already in progress on that line. Always be sure that the line indicator is not on before you press the line button.

### Answering a Call

Press the button above the flickering line indicator, lift the handset, and talk.

### Placing a Call on Hold

You can place any call on hold by pressing the [HOLD] button. The line indicator changes from a steady to a slowly flashing light.

You can now use any available line or return the handset to the cradle without disconnecting the call that is on hold.

To return to the call on hold, lift the handset and press the button above the slowly flashing line indicator.

**Note:** You can place more than one line on hold at the same time.

### Redialing the Last Number Dialed

To quickly redial the last dialed number, in case of a busy signal or no answer, either momentarily hang-up or select another line then press [REDIAL].

### Using the AUXILIARY Jack

If you want to have an answering machine, speakerphone, or other telephone device connected to your telephone system, connect it to the AUXILIARY jack as described earlier in this manual. The device is automatically connected to whatever line is currently selected.

If, for example, one of the telephone stations had an answering machine plugged into the AUXILIARY jack, you could have it answer Line 1 by turning on the answering machine and pressing the Line 1 button on that station.

### Using the RINGER Switch

Set to HIGH for about same level of ringer as regular telephone. Use the LOW position for a quieter ringer. If you do not want the phone to ring, set it to the OFF position, like when you do not wish to be disturbed. You can still answer or place calls when this switch is set to OFF.

### If you Have Problems...

If your System 405 is not operating properly, going through this checklist might keep you from spending unnecessary time and money.

1. Is the unit properly connected?
2. Is the PULSE/TONE switch set correctly?  
Are all the line PULSE or TONE or a combination?
3. Are other phones on the same line being used? If your System 405's volume level drops or if it begins to make strange sounds, check to see if other phones have been picked up on the same line. In areas of low telephone voltage, the unit might not function when other extensions are active on the same line. Hanging up the other phones should correct the problem.
4. Do the status indicators work? In the event of a power failure, the System 405 continues to operate as a telephone with all lines functioning, because the telephone is powered by the telephone line.

The light status indicators are powered by AC power, and are inoperable in the event of a power failure.

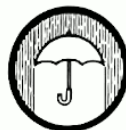
5. Can you hear other conversations during your call? If this happens only occasionally, this is normal on some telephone networks. If the problem is frequent, ensure that the telephone jacks were wired correctly, using twisted-pair telephone cable per the industry-standard color code. If flat, modular telephone cable is used for an extension over 25 feet, this "crosstalk" occurs. Wiring the jacks correctly, using the recommended type telephone cable, should correct the problem.

If you still have problems, disconnect the unit immediately! If other phones on the same line function properly, then the problem is in the unit or its installation. If you are unable to locate the problem, bring the unit to your local Radio Shack store for assistance.

### The FCC Wants You to Know

It is very unlikely, but...if your System 405 causes problems on the phone line, the telephone company has the right to discontinue your service temporarily. If this happens, the telephone company will notify you and give you a chance to have the problem corrected. Also, the telephone company has the right to change its lines and/or equipment. If these changes affect your System 405 or require changes in its connection, the telephone company will notify you in writing so that you can take the steps necessary to ensure uninterrupted telephone service.

## CARE AND MAINTENANCE SPECIFICATIONS



Keep the telephone dry. If water should get on it, wipe it off immediately. Water contains minerals that can corrode electronic circuits.



Do not store the telephone in hot areas. High temperatures can shorten the life of electronic devices and can distort or even melt some plastics.



Do not drop your phone. Circuit boards can crack and cases might not survive the impact. Handling your phone roughly shortens its useful life.



Do not use or store the telephone in dirty or dusty areas. This causes premature wear of any moving parts.



Do not use harsh chemicals, cleaning solvents, or strong detergents to clean your phone. Wipe it only with a damp cloth.

Redial Capacity:	Up to 31 digits
Power Requirements:	Phone line and AC power 120V
Connector:	U.S.O.C Type RJ11 or RJ14
Dialing Rate: (Pulse Mode)	10 pulses-per-second
Make/Break Ratio:	39% / 61%
Inter-digit Period:	800 msec
Touch Tone dialing:	Standard DTMF

### Operating Parameters

This information is supplied to assist answering possible technical questions from your phone company.

Interface: Loop start.

Ringer: Standard bridged ringer 20-28 Hz sine or square wave 40-105 volts ring signal.

Current: 6-20 VDC (Off hook) 20-80 mA.

Resistance: 300 ohm (Off hook)/10M ohm (On hook)

### Lightning

Your DUOFONE® System 405 has a built-in protection circuit, which meets or exceeds FCC requirements, to reduce the risk of damage from surges in the telephone and AC line current. However, a lightning strike near, or directly to, these lines might cause an excessive surge of voltage which could damage the telephone.

Lightning damage is uncommon, but it can occur. If you are concerned about it or live in an area with frequent and/or severe electrical storms, we suggest that you unplug your electronic products during the storms.

