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AN APPLICATIONS GUIDE FOR INMAC T-SWITCHES

P/N #23979 REV-A

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INTRODUCTION

1

Congratulations on purchasing a T-Switch from Inmac—you have just brought a new level of convenience and economy to your computer installation.

Inmac's T-Switches require no power. Data format is transparent on all lines, and baud rates up to the maximum are possible. Contact resistance is 0.015 ohms, maximum, and the current capacity is 2 amps.

Your Inmac T-Switch is guaranteed for a full year. If the device fails at any point during that period, return it for a replacement.

Note: Inmac sells several kinds of T-Switches. This manual covers all of them.

Unpacking Information

The T-Switch package should contain the device as well as this manual and a warranty card. If anything is missing or appears damaged, please contact the Inmac Sales Office from which you bought the unit.

2 VARIETY OF T-SWITCHES

Inmac makes three kinds of T-Switches.

1. One type links a single "Common" device with two, four or six devices. (These are usually labelled "A", "B", etc.) With a two-device T-Switch, a computer might be linked to a printer in outlet "A" and a modem in outlet "B". The T-Switch would then be used to direct data from the computer to either "A" or "B".

2. The second type is called a "X-Switch" and has two devices on each side. With an "X-Switch", two computers could be hooked up to two other peripherals. With the switch in the NORMAL position, the first computer would be connected to the printer and the second to the modem. When the switch is turned to the CROSS-OVER setting, the positions would be reversed, with the first computer now being hooked with the modem and the second with the printer.

3. The third is our Rack-Mount T-Switches. The T-Switches are made with 7 different connector types (EIA 25-, 15-, 9-Pin, Coax, Twinax, Wang Coax & RJ-11/45). This type was designed to fit the Inmac Standard 19" Electronics Rack (P/N 011090) which holds up to sixteen Rack-Mount T-Switches.

Note that computers and computer equipment use a wide variety of different connections. Each of these connections represent a completely different way of sending data. As a result, a T-Switch can only be used with equipment having the same kind of connectors.

For example, the same T-Switch cannot link a computer to both a 25 pin RS-232 serial modem and a 36 pin Centronics parallel printer. Make sure that your T-Switch is appropriate for your equipment.

Shown on the following page is a list of connectors which are available on Inmac T-Switches. If you are unsure of the type of T-Switch you need, consult your Inmac sales representative.

CONNECTOR TYPES

3

Connector Types Offered on Inmac Standard T-Switches

A. 25-Pin (DB-25) EIA RS-232 type connector. Primarily on devices like modems, printers and computers which have or use an RS-232 serial data port. However some personal computer manufacturers like IBM and Compaq are using this connector type for the parallel printer port also.

B. 9-Pin EIA RS-232 connector.

C. 15-Pin X.25 equipment and Ethernet type connector.

D. 37-Pin EIA RS-449 type.

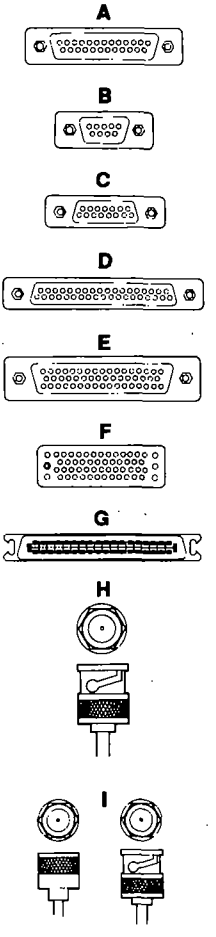
E. 50-Pin EIA type.

F. 50-Pin MRAC (Winchester) type connector used on Data Products printers.

G. 36-Pin Centronics type connector. Mostly used as parallel ports on printers and personal computers.

H. BNC connector type for coax cable.

I. TNC/BNC connectors (Wang version).



4 T-SWITCH CHART

The following chart shows product numbers of the T-Switches made by Inmac, along with the type of connections they come with.

	Configuration				
Connector	**Two Device**	**Four Device**	**Six Device**	**X-Switch**	**Rack-Mount**
25-Pin RS-232 Switches all 25 lines.	1901 127	1902 1851	1904	1903	011010
9-Pin EIA RS-232 Switches all 9 lines.	1906	1907			011015
15-Pin EIA Switches all 15 lines.	1909	1910			011020
37-Pin RS-499 Switches lines 2–37 Line 1 is common to all connectors.	1931				
50-Pin EIA Switches lines 1–40 and lines 43–50. Lines 41 and 42 are common to all connectors.	1933				

T-SWITCH CHART (CONTINUED)

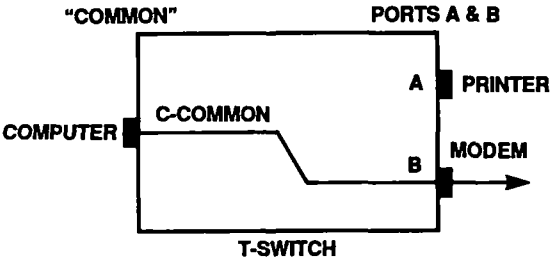
4

Connector	Configuration: Two Device	Four Device	Six Device	X-Switch	Rack-Mount
36-Pin Centronics (Parallel) Switches all 36 lines.	1943 126	1944 1852		1945	
50-Pin MRAC (Data Products) Switches 48 lines. Lines F and DD are not connected.	1948				
BNC (Regular coaxial) Switches center conductor.	1951	1952			011025
TNC Twinax	1954	1955			011030
TNC/BNC (Wang coaxial) Switches center conductor and shield of both TNC and BNC connectors. Idle connectors are terminated to 75 ohms.	1985				011035
RJ-11/45 4-, 6-, 8-conductor	1991	1992		1993	011040

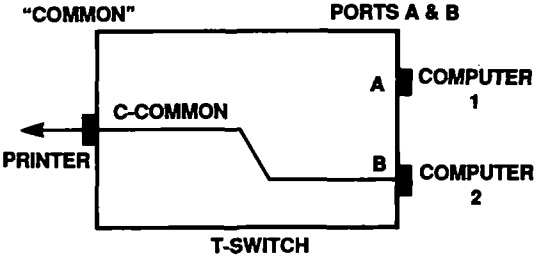
5 A NOTE ON PASSIVITY

Many people think of T-Switches only as a way to route data from a single output source, such as a computer, to one of several peripheral devices, such as printers. T-Switches perform that function, of course, but are not limited to that role. The T-Switch is a completely "passive" device, and will work no matter which direction information is being sent in. Either side of the T-Switch can be the "input" or "output" side.

With a two-device switch, for example, a computer can be hooked into the "Common" port, with a printer and a modem in Ports A and B. In that case, the "Common" side would be the "input" side, and the flow of data might look like this:



But two computers can also be hooked up to Ports A and B, sharing a printer that is attached to the "Common" side. In that case, the "input" and "output" sides are reversed from the above example, with the flow looking like this:



USING YOUR T-SWITCH

6

You should put your T-Switch where it will be central to the devices you will be hooking up, as well as convenient to the people who will be using it. Be sure you turn off all your equipment before hooking up your T-Switch.

Two-, Four, and Six-Device T-Switches

If you have a two-, four- or six-device T-Switch, the plugs on the back of it will be labelled "Common" and "A", "B", etc. Connect the device you wish to share into the "Common" socket, and the devices you wish to share it with into the lettered sockets. With that done, turning the switch in the front of the T-Switch will control the routing of the data from the "Common" socket to the designated port.

A two-device switch can be used to connect a computer terminal at a word-processing station to two printers—one of them dot matrix, the other letter-quality. In the process of preparing a document, output can be directed to the dot matrix printer for a quick print-out. When the document is finished, it can be printed on the letter-quality device. See other applications on page 12.

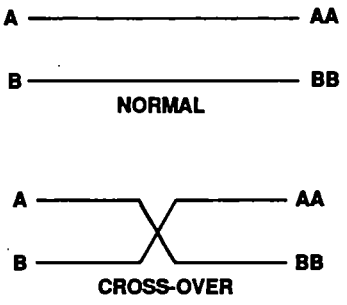
In an office where a printer is not used very frequently, a four-device T-Switch can connect four personal computers to a single printer. Individual users can connect their computer to the printer only when they actually need it. See other applications on page 13.

A six-device T-Switch could be used to connect six terminals to a single port on a larger mainframe computer. Access to the main computer can then be governed simply by changing the setting on the T-Switch. See other applications on page 15.

6 USING YOUR T-SWITCH
(CONTINUED)

X-Switch

If you have an X-Switch, there will be four plugs mounted on the back panel labelled "A", "B", "AA" and "BB". The "A" and "B" plugs are for two "output" devices, like computers or terminals, and the "AA" and "BB" plugs are for two "input" devices like modems or printers. When the switch is in the "NORMAL" position, the device at "A" is connected to the device at "AA", and simultaneously the device at "B" is connected to the device at "BB". When the switch is turned to the "CROSSOVER" position, the connections reverse, attaching "A" to "BB" and "B" to "AA".



You could use the X-Switch to allow two personal computers to alternately share two printers, one dot matrix and one letter quality. Some other applications are shown on page 16.

Helpful Hints

Making the Connection—When attaching your cables, insure you correctly mount the cable connector to the T-Switch by using the mounting hardware. If there are screws on the cable connector, make sure you fully tighten them. A loose cable connection could cause errors in the data flowing through the T-Switch.

Prior to attaching any cables to your T-Switch, ensure the peripheral you're sharing works with each of the devices you're switching by attaching the cable from the peripheral to the device (computer, terminal, etc.) directly.

USING YOUR T-SWITCH
(CONTINUED)

6

Once you've determined the peripheral cable works with each device, keep the cable in between the peripheral and the T-Switch, and use cables wired straight through (pin-to-pin) for connection from any other devices to the T-Switch. This way, any crossing of lines in the cable necessary to operate the peripheral correctly will be common to all other devices.

Personal Computer Software—When using a T-Switch to share two printers with your personal computer, be sure to be aware of any printer configurations you need to change when you switch from one printer to another. This is normally done through the software you're running on the computer, like word processing or spreadsheet programs. If you find one of the printers does not function, plug the cable directly into the printer port, bypassing the T-Switch. Try printing again, if it still fails, refer to your software manual to ensure the program is correctly configured for the printer you have attached.

Cable Length—How Long Is Too Long?—The maximum length the cable can be depends on the equipment you're using, whether it's parallel or serial, and the speed you're sending data at. The recommended maximum distance, to ensure no errors occur in the transmission for EIA RS-232 serial cables, is 50 feet. However, you should be able to use cables up to 100 feet and experience no problems in communications. When using parallel cables, the recommended maximum distance is 10 feet, but distances of 20 to 50 feet are possible. Using a T-Switch will add approximately 1 foot of cable length to the overall cable connection.

6 USING YOUR T-SWITCH
(CONTINUED)

Crosstalk—Crosstalk is the phenomenon which occurs when signals travelling through the wires in a cable, interfere with each other. This normally causes errors in the data transmission—your computer may send the word "COMMUNICATIONS" and it prints out "CX†MUQ CAT©ZNS" when it reaches the printer. If you suspect crosstalk is a problem, try shortening the cable length. If you're using parallel data transmission, try using flat ribbon cable. A flat ribbon cable has the wires laying side-by-side, so there's less chance of crosstalk occurring.

Noise—Noise is stray electrical signals from devices like: heavy duty electrical motors, generators, radio transmitters and fluorescent lighting. If you believe noisy conditions are causing problems with your communications link, try using one of Inmac's shielded cables, some are listed on page 11. If you are already using shielded cables, you may want to relocate the cable or use a shorter cable.

Help! What To Do If You Have Trouble—If you experience trouble using your new Inmac T-Switch, we're here to help, just give us a call on our toll-free technical hotline. Telephone numbers are:

Inside California: 1-800-527-8522
Outside California: 1-800-527-8523

USING YOUR T-SWITCH
(CONTINUED)

6

Inmac Cables

Below is a list of the most popular cables used with Inmac T-Switches. To order these cables contact your local Inmac branch. Telephone numbers are listed on the back cover.

	Gender	Length	Product Number
EIA SHIELDED	M-F	10'	406-1
25-LINE EXTENSION	M-M	10'	406-2
(25-PIN CONNECTORS)	F-F	10'	406-3
	M-F	25'	407-1
	M-M	25'	407-2
	F-F	25'	407-3
EIA	M-F	10'	365-1
37-LINE EXTENSION	M-M	10'	365-2
(37-PIN CONNECTORS)	M-F	20'	365-5
	M-M	20'	365-4
EIA	M-F	10'	380-1
50-LINE EXTENSION	M-M	10'	381-1
(50-PIN CONNECTORS)	M-F	20'	380-2
	M-M	20'	381-2
CENTRONICS SHIELDED	M-F	10'	324-1
36-LINE EXTENSION	M-M	10'	323-1
(36-PIN CONNECTORS)	M-F	20'	324-2
	M-M	20'	323-2
EIA—NULL-MODEM	M-F	1'	277
(25-PIN CONNECTORS)	F-F	1'	276
PIN CONFIGURATION			
(1–1, 2–3, 3–2, 5, 6 & 8–20, 20–5, 6 & 8, 7–7			

For other cables not listed here, please refer to your Inmac catalog or call your local branch.

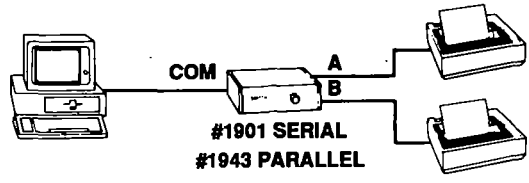
7 APPLICATIONS

Applications for 2-Device T-Switches

PC Sharing Two Printers

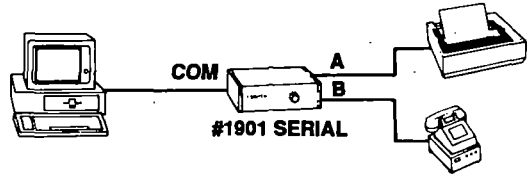
In this application, two printers are shared with a personal computer. The PC could be a CPU port on your mainframe computer or a terminal which has a printer port.

The printers in this diagram are shown as serial devices, however you could use the parallel output of your computer to control parallel printers with a #1943 T-Switch.



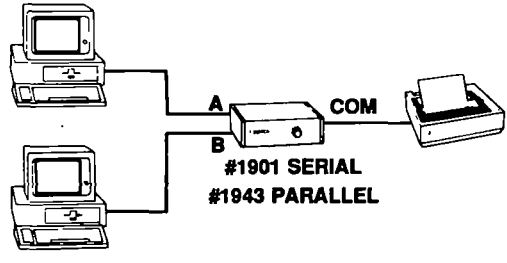
PC Sharing Printer and Modem

This application uses the #1901 serial T-Switch to share a modem and a serial printer with a PC. Again the PC could be a CPU port or any device which uses EIA RS-232 data protocol.



Two PC's Sharing Printer

Here two PC's are sharing a common serial printer. You could use the parallel 2-Device T-Switch (#1943) to share a parallel printer with two PC's using parallel ports.

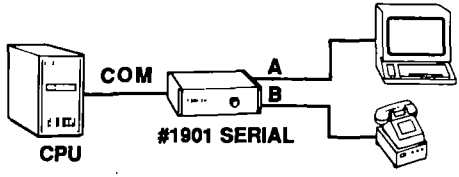


APPLICATIONS (CONTINUED)

7

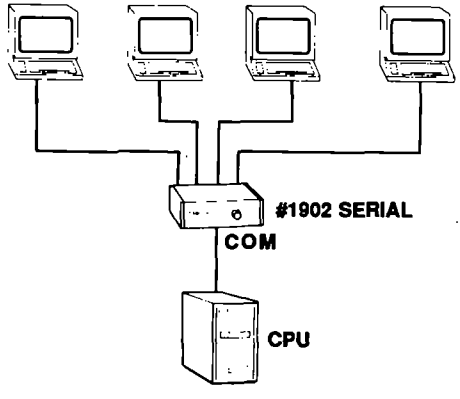
CPU Port Sharing Terminal and Modem

In this example, a terminal can be connected to a CPU port or a modem.



Four Terminals Sharing a CPU

Here a 4-Device T-Switch is used to allow any one terminal to be connected to a CPU port.



Applications for 2-Device T-Switches
(Continued)

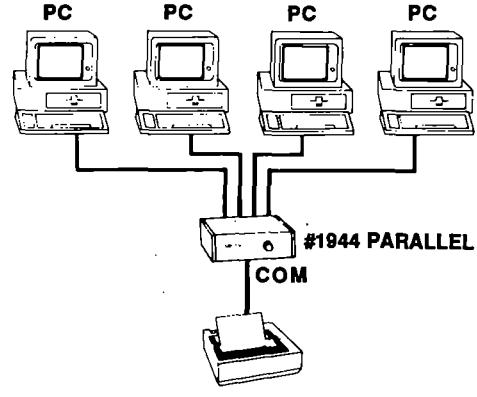
Applications for 4-Device T-Switches

APPLICATIONS (CONTINUED)

Applications for 4-Device T-Switches
(Continued)

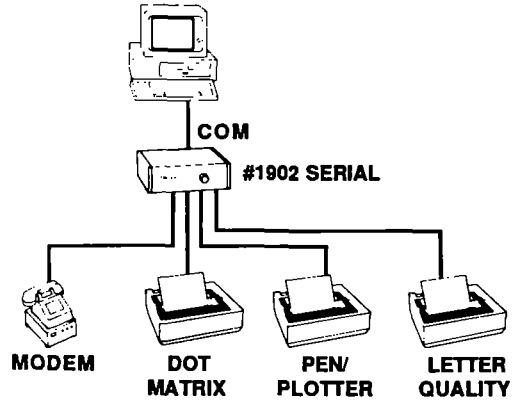
Four PC's Sharing Printer

A 4-Device parallel T-Switch (#1944) can be used to allow any one PC to be connected to the parallel printer.



One PC Sharing Four Serial Devices

Here a serial 4-Device T-Switch (#1902) is used to either connect a dot matrix printer, a letter quality printer, a modem or a plotter to a PC. The PC could be a CPU port on a mainframe or any EIA RS-232 compatible port.



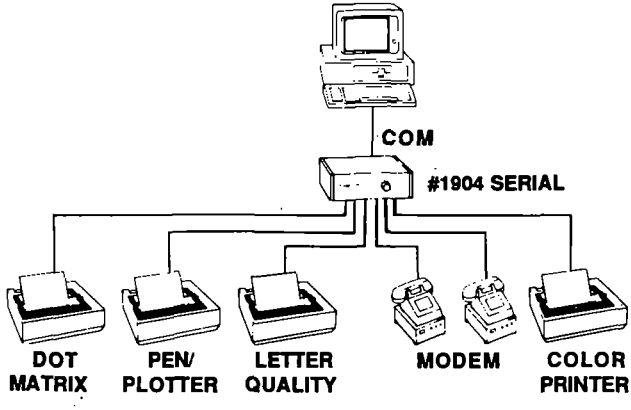
APPLICATIONS (CONTINUED)

7

Applications for 6-Device T-Switches

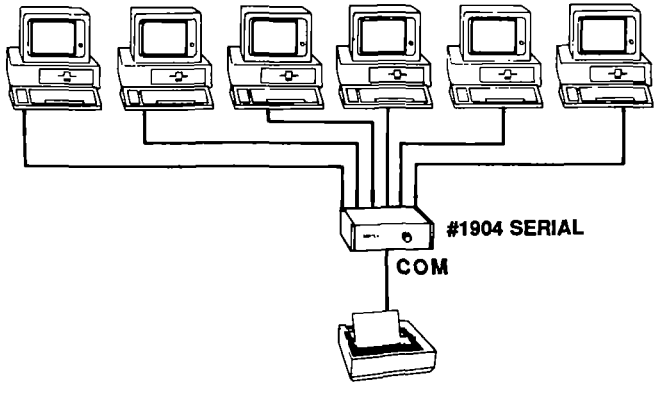
One PC Sharing Six Devices

The six-device serial T-Switch could be used to share a multitude of serial devices with a PC or terminal...



Six PC's Sharing Printer

or a number of PC's to share a printer. You could also put six terminals to share one CPU port or a printer.

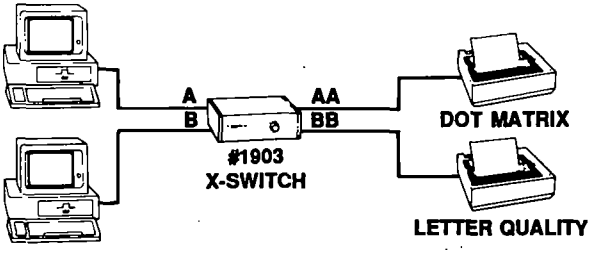


7 APPLICATIONS (CONTINUED)

Applications for the X-Switch

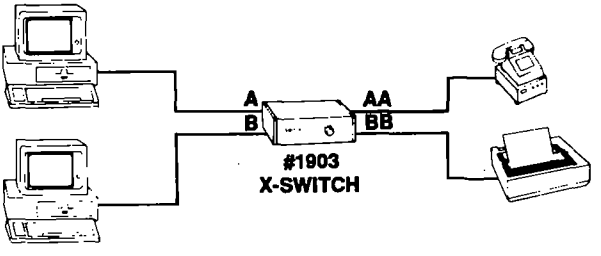
Two PC's Sharing Two Printers

With the X-Switch, two computers can alternately use two peripherals at the same time. In this example two PC's are sharing two printers. When the switch is in the "NORMAL" position the device at port-A is connected to the device at port-AA and simultaneously the device at port-B is connected to port-BB. When the switch is in the "Cross-Over" position port-A becomes connected to port-BB and simultaneously port-B becomes connected to port-AA. All can be operated at the same time. No waiting.



Two PC's Sharing Printer and Modem

In this example two PC's can alternately share a printer and modem.



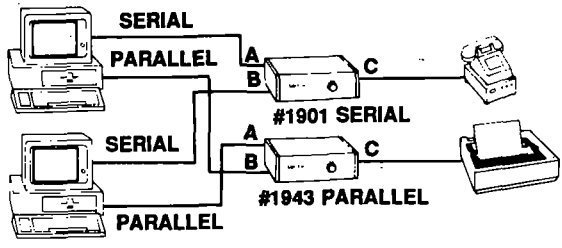
APPLICATIONS (CONTINUED)

7

Applications Using Multiple T-Switches
(Continued)

Two PC's Sharing Printer and Modem

In the example below, two separate T-Switches are used in combination allowing 2 PC's to share a common modem and printer. The serial outputs of the computers are routed through a serial T-Switch to share the modem, and the parallel outputs are routed through a parallel T-Switch to share a parallel printer.



8 WARRANTY AND OTHER INFORMATION

More Questions?

If you have questions about your T-Switch we haven't answered here, please call us on our toll-free technical assistance hotline. The numbers are:

Inside California: 1-800-527-8522
Outside California: 1-800-527-8523

Please use these numbers only for technical assistance on Inmac's Data Communication products. Consult your Inmac catalog for the telephone numbers to use for ordering or other matters.

Persons outside the U.S. can obtain technical help from their nearest Inmac Sales and Distribution Center.

Warranty

Inmac warrants to the buyer that this product is free from defects in material and workmanship under normal use. The guarantee period is for one year. If this product should fail during the warranty period, Inmac will repair or replace it. Inmac will not be liable for any consequential damages or personal injury or losses, damages or expenses directly or indirectly resulting from the use of this product.

INMAC SALES AND DISTRIBUTION CENTERS

Region Served	Address	Telephone
West	470 Mercury Drive Sunnyvale, CA 94086	(408) 737-7777
Southwest	3120 Airway Ave. Costa Mesa, CA 92626	(714) 641-3100 (213) 852-0973
	2575 W. Eric Dr. Tempe, AZ 85282	(602) 438-0500
	2801-A Broadbent Parkway NE Albuquerque, NM 87107	(505) 344-9500
Pacific NW	20422 84th Ave. S Kent, WA 98032	(206) 395-8060
Rockies	12742 E. Caley Ave., Unit E Englewood, CO 80111	(303) 799-4324
South Central	1111 North West Carrier #200 Grand Prairie, TX 75050	(214) 641-0024
Midwest	860 E. State Parkway Schaumburg, IL 60173	(312) 885-8383
	530 Lakeview Plaza Blvd., Ste. D Worthington, OH 43085	(614) 848-5868
South	5600 Oakbrook Pkwy., #290 Norcross, GA 30093	(404) 441-3041
Florida and Puerto Rico	6301 Hazeltine National Dr. Orlando, FL 32809	(305) 855-0414
Mid-Atlantic	4390 Parliament Place Lanham, MD 20706	(301) 731-5980
	275 Great Valley Parkway Malvern, PA 19355	(215) 251-0190
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