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PROGRAMMING ESTEEM FEATURES

Listed in this chapter are the major ESTEem features and programming examples on how to use them. These features are individual building blocks to solve your application needs. Remember your particular application may require one or more of these features enabled.

DIGI-REPEATING

The Repeater feature allows an ESTEem to relay its respective transmission or packet through a maximum of three ESTEems to increase the operating range of the unit. Any ESTEem in your radio network can function as a repeater for any other ESTEem. This is independent of the fact that the ESTEem being used as a repeater is linked or connected to another node, therefore an ESTEem can function as a repeater, operational node, or both at the same time. The data that is digi-repeated through an ESTEem will not be output through the repeating ESTEem's RS-232C port.

To specify one or more ESTEems as repeaters, the CONNECT command has been expanded to accept up to three added addresses as follows:

```
CONN r1,r2,r3,da
```

r1 = Address (1 to 254) of first ESTEem repeater.
r2 = Address (1 to 254) of second ESTEem repeater.
r3 = Address (1 to 254) of third ESTEem repeater.
Da = Address (1 to 255) of destination ESTEem.

Note: *Address 255 is used for Global.*

When transmitting packets through other ESTEems, the source ESTEem will automatically adjust its FRACK time to allow additional time for the packet to reach its destination and for the returned acknowledgment. Frack time takes into account the packet size and the number of repeaters specified. The ACK still comes from the destination ESTEem, not the first or any repeater.

For testing purposes, you can loop back a connection to yourself by placing your source address in the destination address of the repeater string. Any data transmitted will repeat through the repeater address and display back on the screen.

Example:

```
CONN r1,Sa
```

r1 = Address (1 to 254) of first ESTEem repeater.
Sa = Address of local ESTEem.

Any ESTEem command in this manual that uses an address string can be configured to use the Digi-repeating feature.

Example:

```
SETC r1,r2,r3,da
```

GLOBAL BROADCAST

Global broadcast is the ability of one ESTEem to transmit its message to more than one ESTEem at one time. All ESTEems within radio range will receive the message whether or not they are connected to another ESTEem or in command or converse mode.

You can put your ESTEem in Global by connecting or programming the SETC to address 255. Address 255 is a non assignable unit address and is used by the ESTEem CPU to access this special mode. When an ESTEem is in Global, the standard ACK protocol from the receiving ESTEem is disabled, but the 32 bit CRC error checking on the received ESTEem is still operational. When you perform CONN 255 <cr> from the COMMAND MODE the ESTEem will immediately go to the CONVERSE MODE (* is displayed). All messages sent will be transmitted globally to all ESTEems in radio range.

In the ESTEem you have a GLOBAL (on/off) command. When GLOBAL = On, you can receive Global transmissions. If GLOBAL = Off you will not display Global transmissions from other ESTEems.

Note: *Factory default is ON.*

By using the repeater function you can transmit Global messages from another ESTEem using the Digi-repeating feature.

Example:

```
CONN 10,20,30,255<cr>  
SETC 10,20,30,255<cr>
```

By adjusting these commands you can route from unit 10 to 20, 20 to 30, and go Global at unit 30.

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You can enable global transmissions in more than one ESTeem in your network. This will allow global communications between all ESTeems within radio range.

AUTO TRANSMIT

The Auto Transmit feature of the ESTeem allows the user to transmit a data packet without filling up the PACKLEN (packet length) buffer or defining a special control character using the SENDPAC (send packet) variable. The Auto Transmit feature is a timer that is enabled in the ESTeem that monitors traffic in and out of the RS-232C port. If there are characters in the RS-232C buffer, the termination control timer starts from the time the last receive or transmitted character is updated in the buffer. If the termination time expires before another character is received or transmitted, the received characters are transmitted.

To enable this feature perform the following from the COMMAND MODE:

TERMC (on/off) = On. Enable termination control.

TERMT (10-255) = One unit number equals 1ms.

TERMC is the termination control command. TERMT is the termination time command. Factory default for TERMC = Off and TERMT = 10.

AUTO CONNECT

The Auto Connect feature allows the user to program the ESTeem to perform a CONNECT to another ESTeem when data is sent to the RS-232C communications port.

To enable this feature perform the following from the COMMAND MODE:

SETCON (1-255) = Address of destination ESTeem.

Remember, you can use the Repeater routing (r1,r2,r3,da) or put the ESTeem in Global (address 255). SETCON is the set connect command.

SA SAVE command. This will save the SETC variable to the non volatile memory so that it will not be lost when the ESTeem is RESET.

Bit 8 (on/off) = On. Bit 8 is located on the RS-232C SETUP SWITCH on the rear of the

ESTeem. The ESTeem must be RESET after the Bit has been changed to be read by the ESTeem CPU.

RESET ESTeem RESET is located on the front panel OFF/ON switch. The T/E light on the front panel of the ESTeem should now flash at a two times per second rate.

MULTI-CONNECT

The actual polling of the ESTeem must originate from the host device connected to the ESTeem using the CONNECT command to originate the initial connect and the COMMAND character to return from the CONVERSE mode to the COMMAND mode. The first time around the pole a CONNECT data packet (rf transmission) will be initiated. When a link is established, it is held internally in the ESTeem connect table. The next time around the pole to the same address, the link status will be checked in the ESTeem table. If the address indicates a link has already been established, then only data and its corresponding ACK will be transmitted to that node. This greatly increases polling time by eliminating the usual CONNECT/DISCONNECT sequence each time except when communication is first established.

The MULTID command allows the user to send data to a specific ESTeem address from the CONVERSE Mode by specifying the ESTeem address routing before the data packet. This feature will also display the address of the sending ESTeem on any received data.

Example Of Transmitted Data:

[001]DATA Routes data to an ESTeem addressed 1.

[100,200,250,1]DATA Routes data to an ESTeem addressed 1 via ESTeems addressed 100, 200, and 250.

The above example replaces the CONNECT command from the COMMAND Mode.

Received data packets will have the address of the ESTeem that sent the data at the beginning of the data packet.

Example Of Received Data:

[004]RECEIVED DATA Data received from an ESTeem addressed 4.

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[030,100,244,004] Data received from an ESTeem addressed 4 via ESTeems addressed 30, 100, and 244.

MULTID (on/off) = On Enables this feature. Factory default = OFF.

REMOTE PROGRAMMING

The Remote Programming feature allows the user to remotely program ESTeems in his network. When a connection has been made with the remote ESTeem the RPG: prompt will be displayed showing that you are now in the COMMAND mode of that remote ESTeem.

To enable this feature perform the following from the COMMAND MODE:

PROG (1-254) Address of destination ESTeem.

Note: *You can also use the Repeater routing (r1,r2,r3,da) to reach the destination ESTeem. (r1 = address of first repeater, r2 = address of second repeater, etc. da = destination address).*

To end a remote programming session, type DISC (Disconnect) and you will return to the COMMAND prompt of your ESTeem. There is a Watch Dog Timer that will automatically disconnect you from remote programming if there is no activity for thirty seconds.

The REMPROG (on/off) feature is used to defeat the ability of your ESTeem from being remotely programmed. If REMPROG = OFF another ESTeem cannot remotely program your unit. Factory default = ON.

SECURITY

The Security feature allows the user to lock out programming of the ESTeem. REMEMBER TO STORE YOUR CODE NUMBER IN A SAFE PLACE. To enable this feature perform the following from the COMMAND MODE:

SECURITY (1 to 100,000) Entering a security number enables the security feature.

SAVE To enter the security code permanently into the ESTeem memory.

Note: *When enabled, the ESTeem will output a "Security On" message.*

To disable the security feature perform the following from the COMMAND mode.

SECURITY (1 to 100,000) Entering your security number disables the security feature.

SAVE To remove the security code permanently from the ESTeem memory.

Note: *When disabled, the ESTeem will output a "Security Off" message.*

HARDWARE RING LINE

When the ESTeem establishes a CONNECT or link with another ESTeem (T/E Light on solid), pin 22 at the ESTeem RS-232C will change from a -15 vdc voltage state to a +15 vdc voltage state. The RING software command allows the user to change the output from a latched state to a pulsed state. To change the state of this line program the following from the COMMAND mode. Factory default = LATCH.

RING = Latch. Pin 22 is high when the ESTeem T/E light is on solid.

RING = Pulse. Pin 22 is pulsed (positive 250 ms.) when the ESTeem T/E light is on solid.

PACKET MONITOR

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The PACKM [ON/OFF] command places the ESTeem in a special packet monitor mode. When this feature is enabled the ESTeem is placed in a receive only mode and will not function as a normal ESTeem. The ESTeem will monitor and report the status of all message traffic within the network in the following format, the actual packet message will not be outputted.

SA-xxx, DA-xxx, Type Code, R1-Repeater Status, R2-Repeater Status, R3-Repeater Status, Data Bytes Sent

xxx = ESTeem Address
DA = Destination ESTeem
SA = Source ESTeem
R1 = Address of first ESTeem repeater.
R2 = Address of second ESTeem repeater.
R3 = Address of third ESTeem repeater.

Type Codes

I = Information
DISC = Disconnected
RR = Receive Ready
UA = Unnumbered Acknowledge
RNR = Receive Not Ready
FRMR = Frame Reject
REJ = Reject
DM = Disconnected Mode
UI = Unnumbered Information
SABM = Set Async. Balance Mode

Repeater Status

P = Pending
D = Done

USING THE INFRARED COMMUNICATIONS PORT

The infrared (IR) communications port will allow you to program and interrogate the ESTeem without disconnecting the serial cable from the back of the modem. The IR port is located on the front panel of the ESTeem, above the T/E light.

To communicate from a computer to the ESTeem through the IR port you will need a copy of the ESTeem Utility Program and an ESTeem IR Communication Dongle (ESTeem P/N AA300).

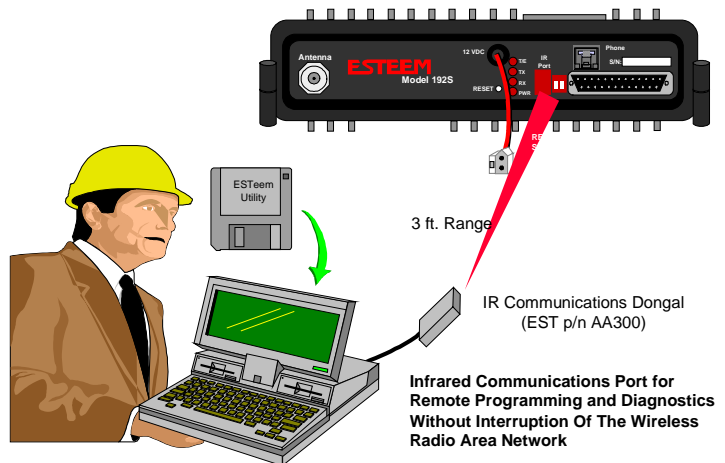


Figure 1: Using The IR Port

Connect the dongle directly to the serial port of the computer. The dongle requires initialization from the ESTeem Utilities. This initialization is done in the Terminal Emulation on the menu select ESTeem Setup Initialize IR Dongle. If the modem is not in the COMMAND mode, press CTRL-C to display the CMD: prompt.

Note: *With Switch 8 (RS-232 Setup) in the On position the ESTeem defaults the IR port to the command mode.*

The IR dongle has a range of approximately three feet, directly in front of the port. The dongle is powered by the serial port and requires no additional power sources.

Note: *Only one of the four communications ports (RS-232/422/485 connector, IR port, Phone Modem Port, or Remote Programming) can be in the Command mode at a time. When either the IR or the Phone port switch to converse mode, the RS-232/422/485 port is blocked from receiving any data.*

USING THE PHONE COMMUNICATIONS PORT

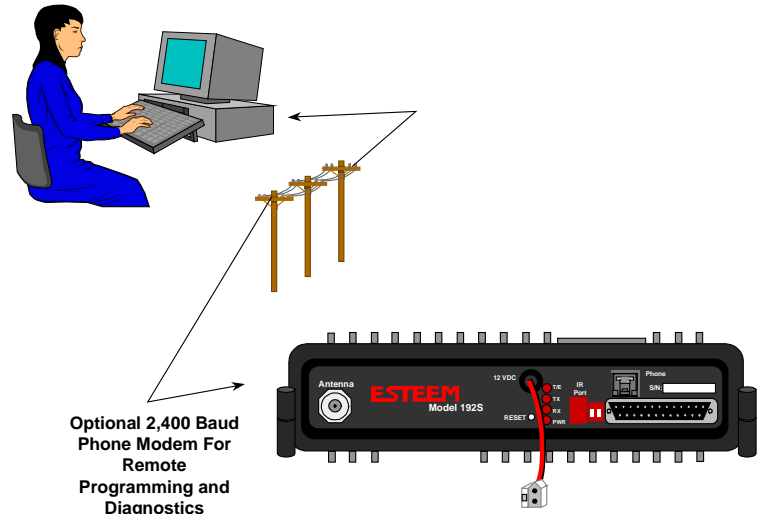
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If your ESTeem modem has the optional phone port installed, you have the ability to gain access to the ESTeem from anywhere in the world through a standard phone modem.

Connect a standard phone company line to the ESTeem's phone connector and dial the number with a phone modem using the ESTeem Utility Program's terminal emulator. Select your phone modem manufacturer, on the menu select Terminal Setup Modems. Select your modems manufacturer and Model from the list and CommPort and select ok. The program will auto configure your modem. Set the terminal to connect at 2400 bps. The ESTeem will answer on the first ring. Type a CTRL-C on the communications terminal and a CMD: prompt should appear.

Note: *When the phone port is active, the IR port will be disabled.*



ESTeem Rear View

Figure 2: Using The Phone Port