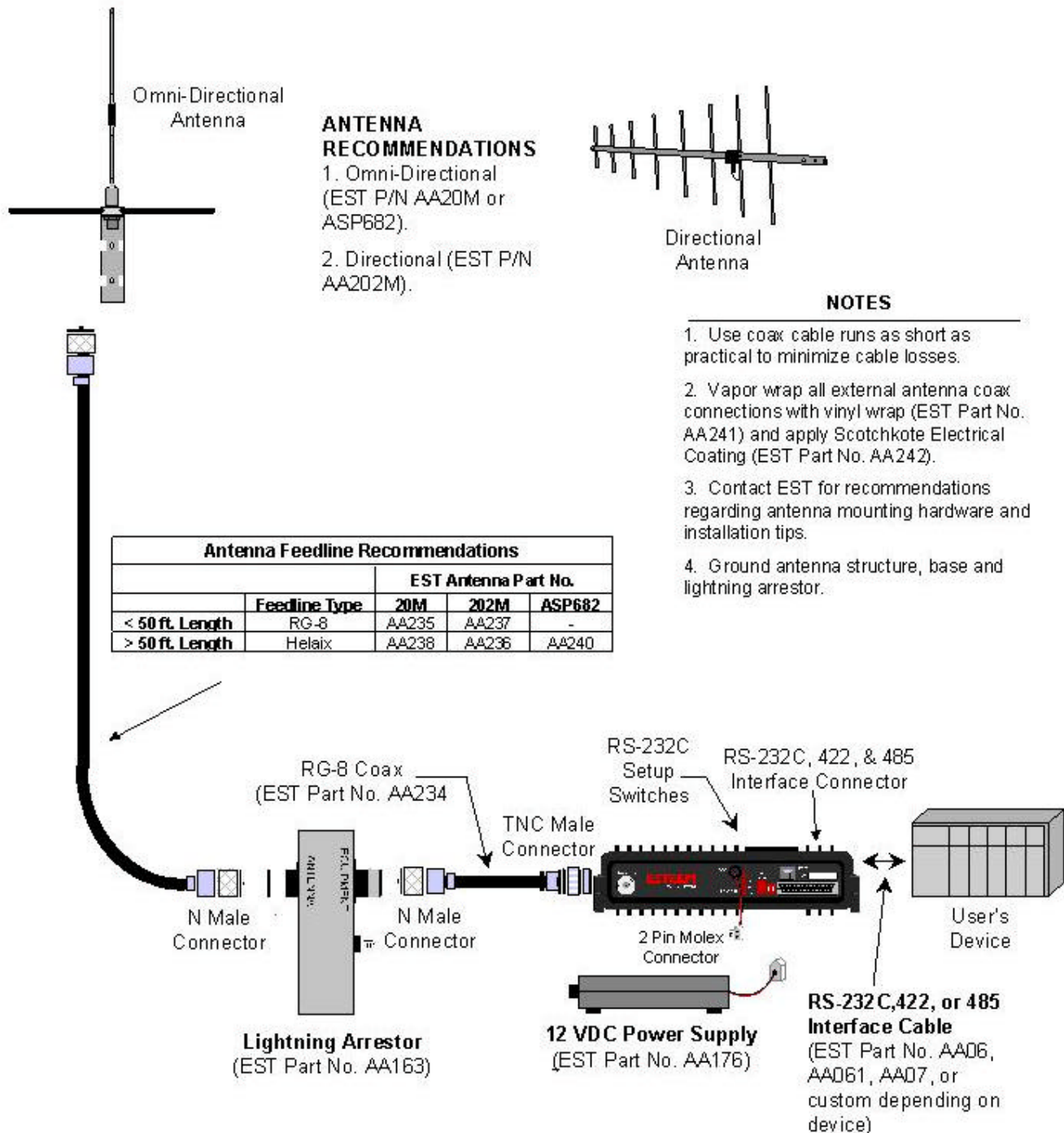
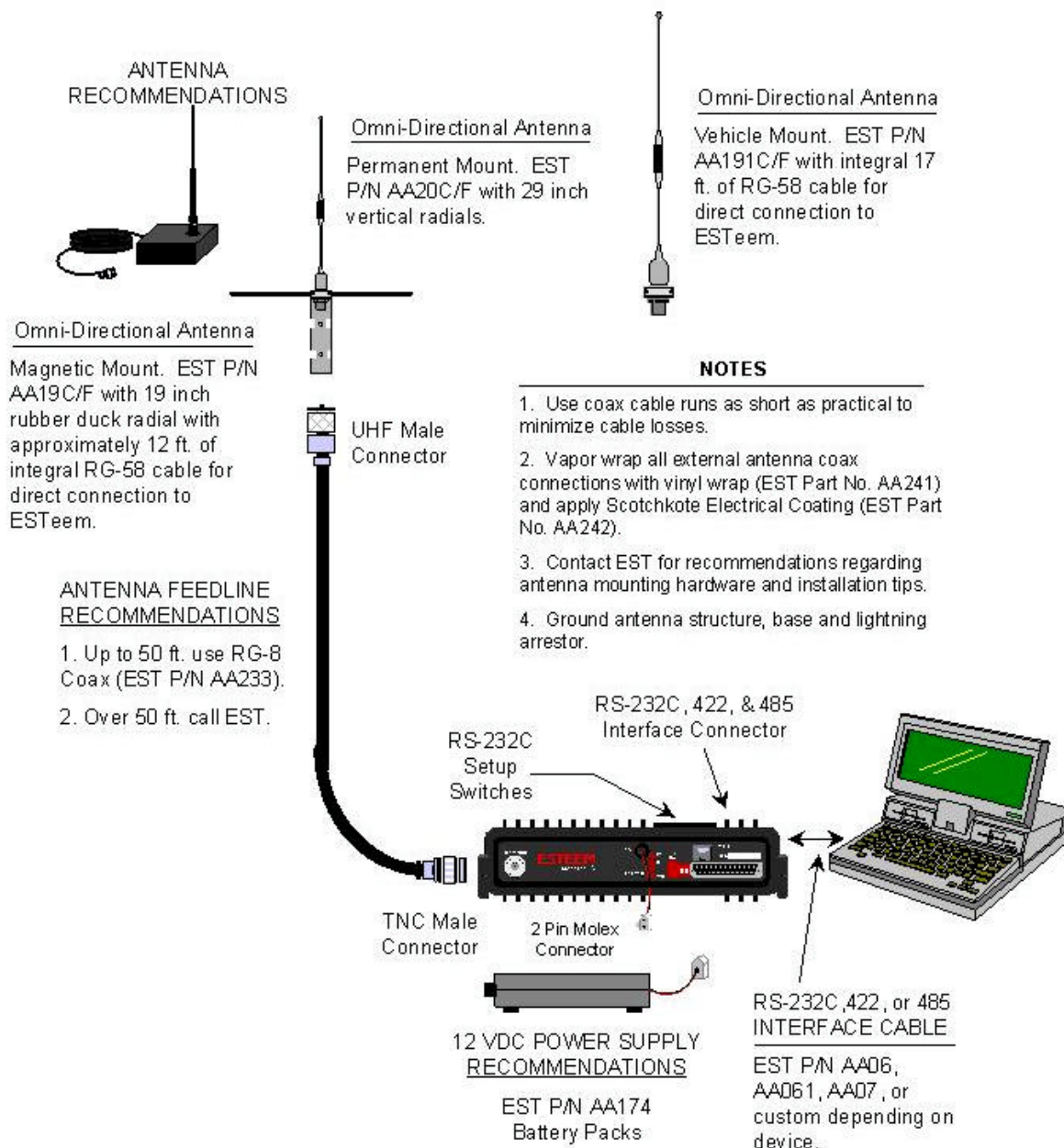


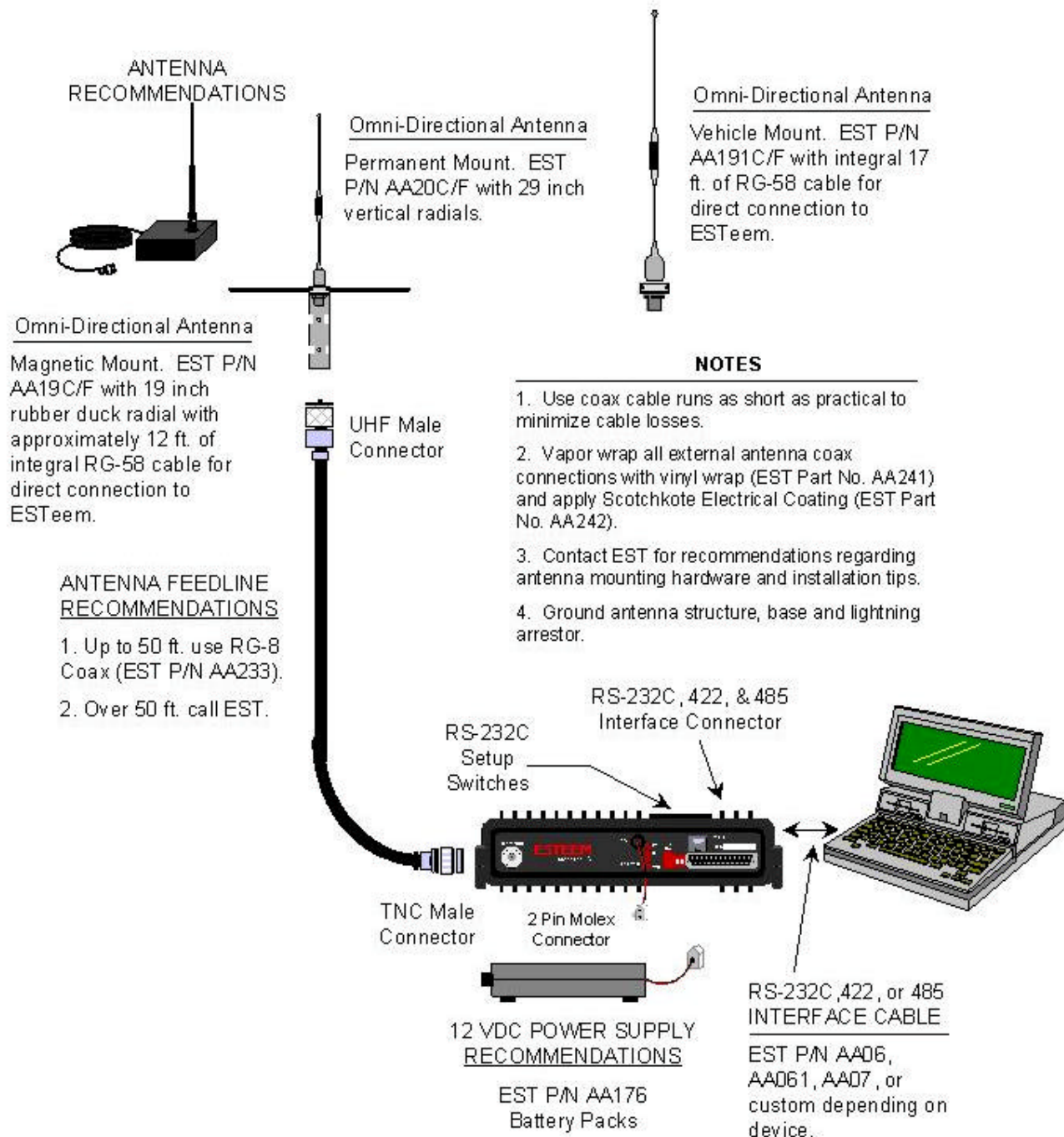
Model 192MHP Outdoor Fixed Base Hardware Diagram



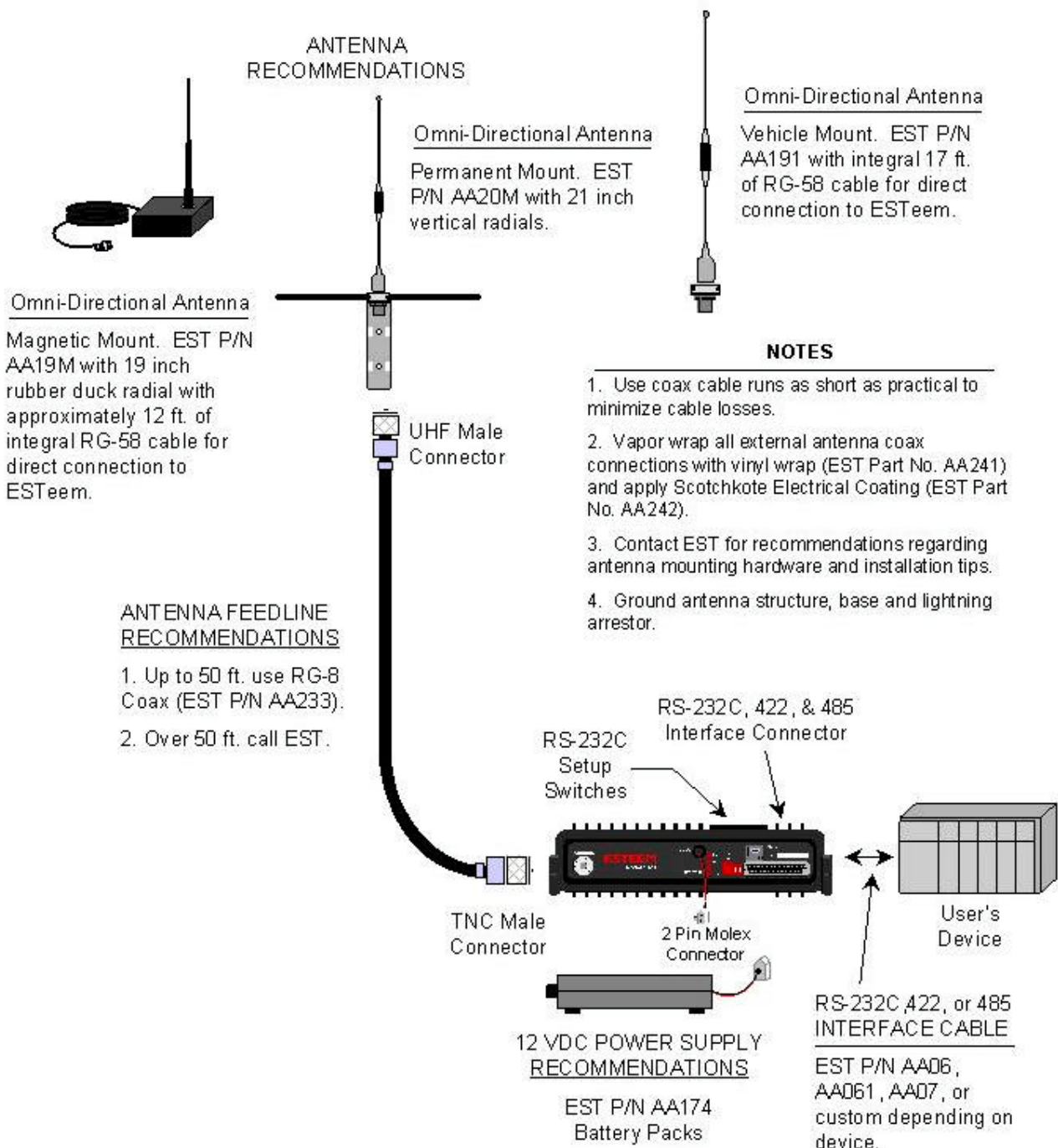
Models 192C/F Indoor and Mobile Hardware Diagram



Model 192CHP Mobile Hardware Diagram

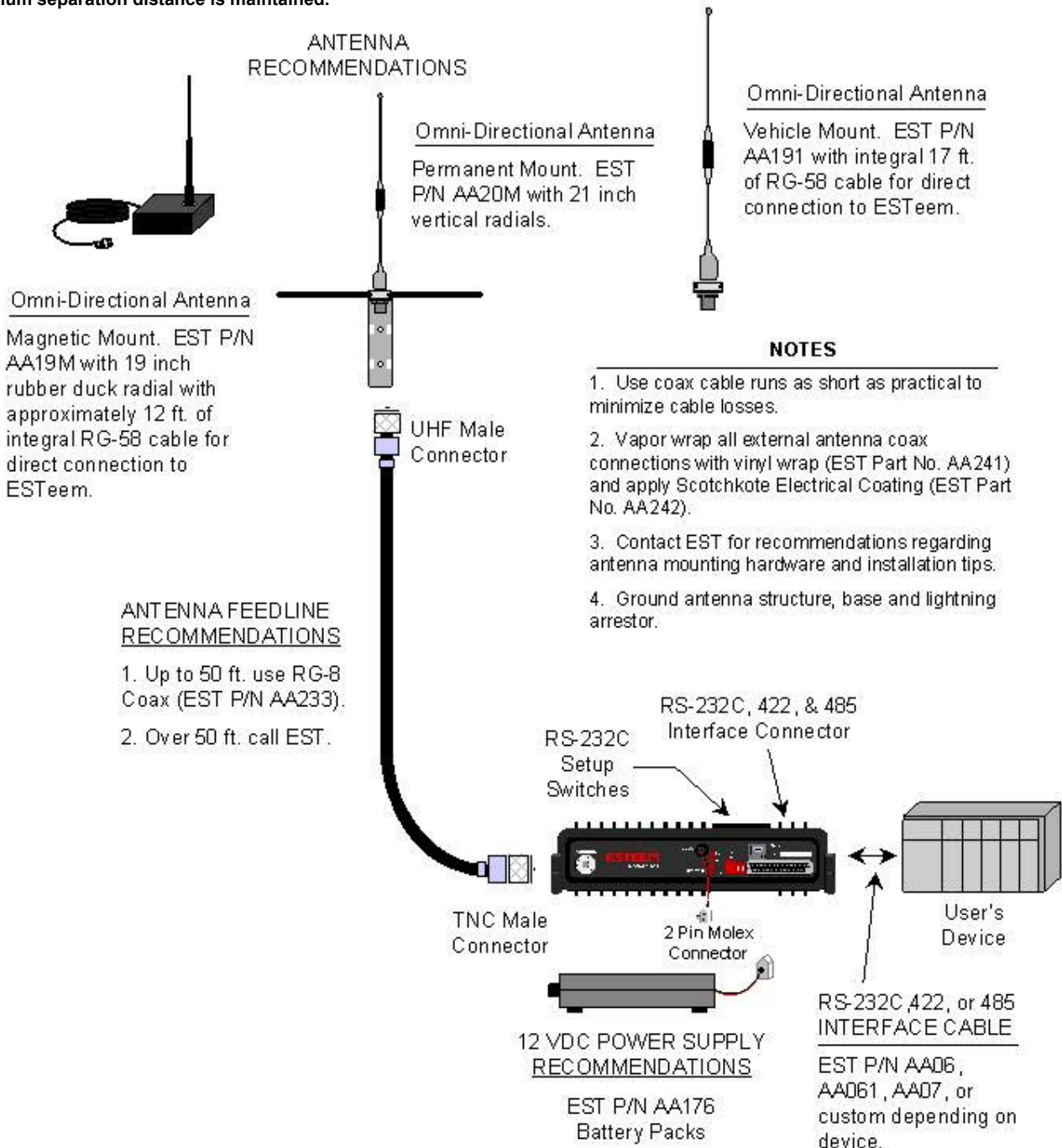


Model 192M Indoor and Mobile Hardware Diagram

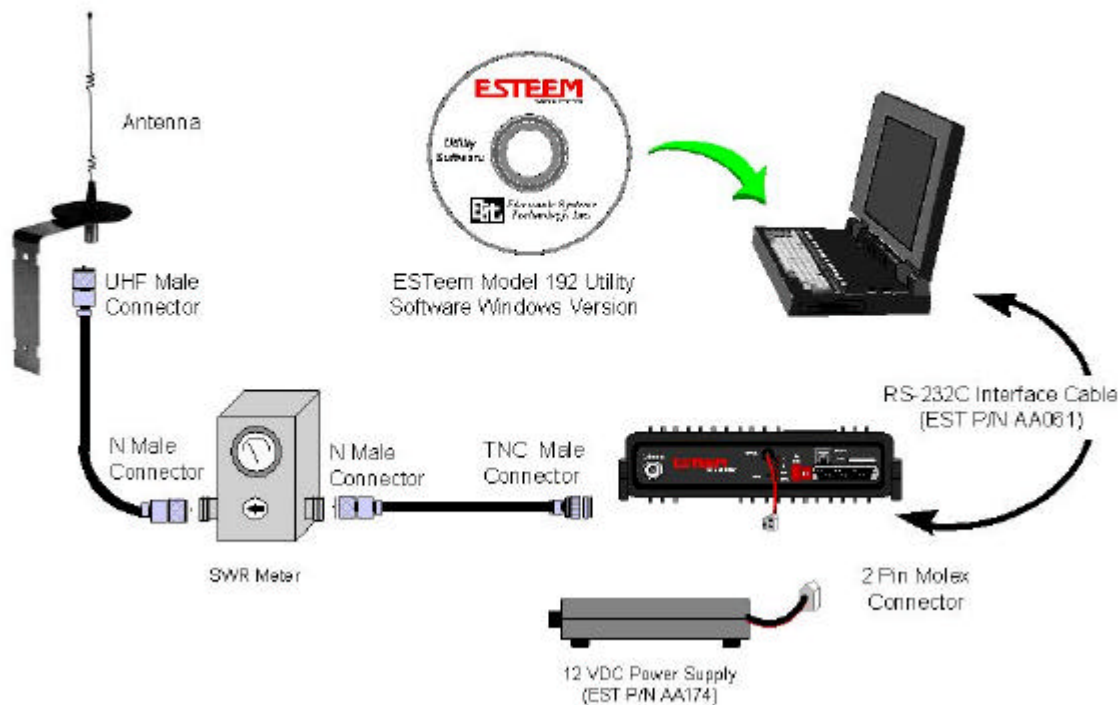


Model 192MHP Mobile Hardware Diagram

NOTE: For mobile applications the antenna must be mounted to maintain a minimum 50 cm. distance between the radiating element and any nearby person. When mounted on a vehicle it would be necessary to mount the antenna on the roof of the vehicle to ensure this minimum separation distance is maintained.



Model 192C/CHP/F/M/MHP SWR Measurement Block Diagram



Programming The ESTEem Model 192 For SWR Measurements

1. Configure the hardware as per the above diagram.
2. Turn Switch 2 on the RS-232 Setup Switch (located on the rear of the ESTEem) to the OFF position.
3. Reset the ESTEem (front panel push button).
4. Install the ESTEem Utility on the PC hard drive as per instructions with the software.
5. From Utility Main Menu (Figure 1) select the Terminal Emulation Mode.
6. In the Terminal Emulation Mode type the following commands followed by a RETURN.

FA Return	This returns the unit to factory default parameters.
RAD ON	Return Enable the RADIO ON command. The transmitter will alternate ON for 10 seconds (5 seconds for 192CHP) and OFF for 3 seconds .

7. When the testing is completed, type the following:

RAD OFF Return This disables the RADIO ON command



Figure 1: ESTEem Utility Main Menu

INTRODUCTION

ESTeem wireless modem products provide a "Wireless Solution" by eliminating conventional hardwiring of leased phone lines.

All of the ESTeem models come with the industry standard RS-232C, RS-422, and RS-485 asynchronous communications ports to give the user a new dimension to "Local Area Networking".

Our packet burst, frequency agile communications products allow the user to create a "Radio Area Network" of up to 255 users on a single frequency. The packet burst communications technique was chosen to give the system very high data integrity in high noise industrial environments. The ESTeem incorporates a method of error checking that provides received data accuracy of greater than one part in 100 million.

Internal Digi-Repeater features allow the user to increase operating range by relaying transmission through a maximum of three ESTeems to reach the destination ESTeem. An ESTeem can operate as an operating node, a repeater node, or both simultaneously for added flexibility.

"Private Data Communications" is provided by the use of an interleaving technique of the modulated data, user definable commands for unit addressing, network addressing, and security lock-out of software programming. If higher security is required, the ESTeem is compatible with asynchronous Data Encryption Standard (DES) encryption devices.

The ESTeem has programmable software commands to allow the user to easily configure the unit for any application or mission. The ESTeem setup parameters are saved in non-volatile memory.

When you buy ESTeem products you are getting equipment designed by the company that holds the United States and Canadian patent for the wireless modem. We are proud to say that we design, develop and manufacture our products in the United States. Each ESTeem is subjected to a rigorous quality control bench test before shipping to insure our customers have out-of-the-package reliability. We also have a dedicated Customer Support Staff, Field Engineering Services and Factory Training classes to make sure that your application problems are solved.

HOW IT WORKS

Now, as you can probably guess, the ESTeem is a sophisticated piece of technology, however the concept is easy to comprehend if you understand packet radio.

All packet systems, whether hardwired or radio, share the same principle of operation; data is taken from your standard RS-232C, RS-422, or RS-485 asynchronous port and is transmitted in "Blocks". Think of this block as an "Electronic Envelope" that we call a packet. The size of the packet can be defined by the user from 1 to 2000 bytes of information. Reducing the size of the packet allows the ESTeem to operate better in high EMF noise environments, because by reducing the packet size you reduce transmission exposure time on the radio waves thereby increasing your probability of a successful transmission.

Once this packet of data is formed, it's transmitted in a "burst," one ESTeem to another, hence the term "packet burst communications". Now, if more than one packet is required to send the data then the ESTeem goes into full automatic mode and transmits additional packets.

Before an ESTeem transmits its packet it listens to ensure that the air waves are clear before transmitting. This listen before transmit scheme is called "carrier sensed multiple access," or CSMA.

When a "packet" has been transmitted, every modem in radio range on the same frequency hears it. To design a modem to communicate with a network of modems it has to be "address specific" so only the modem you want to talk to accepts your information. It's like yelling into a crowd of 255 people but you want only the person's name you called to acknowledge (ACK).

Well, very simply, that's how the ESTeem works. Once the address you're calling receives your packet, it's checked for accuracy.

Accuracy is probably the single most important part of any communication device. The ESTeem uses Forward Error Correction (FEC) and a 32 bit Cyclic Redundancy Check (CRC) which is a very sophisticated method of checking the data integrity of the packet once its been received. The CRC insures data integrity greater than one part in one hundred million. Once the CRC is completed on the received packet, the data is outputted to the user and a positive acknowledgment (ACK) is transmitted back to the sender.

It's safe to assume that the data you receive is good data or you get nothing at all using the CRC technique. If no ACK is returned after a given delay, the sender assumes the packet was not received and "retries" the transmission. The number of retries are user definable from 1 to 255, allowing the unit to automatically retry sending the packet.

SPECTRUM UTILIZATION

The ESTeem uses a "listen before transmit" or Carrier Sensed Multiple Access (CSMA) scheme. This means only one unit in a network is allowed to transmit at a time. By fixing each user's communication window and allowing the computer in the ESTeem to be the Air Traffic Controller, many individual users can share one frequency. The ESTeem firmware can support up to 255 ESTeems on a single channel or frequency. For example in the United States there are 1600 frequencies (12.5 kHz channel spacing) in UHF, giving a network density of greater than 408,000 users in a given cell or geographical area. Once you are out of radio range, you can construct another cell of users.

The CSMA technique is a very efficient way to manage your network of ESTeems and prevent communication bottlenecks. In addition, an anti-collision software scheme is used to recover data if two or more units transmit at exactly the same time. When this feature is added the technical term for this technique is now called CSMA-CD (collision detection).

By using this communications technique only one frequency channel is needed with a very narrow bandwidth (this is called narrow band FM modulation) thereby saving valuable radio spectrum space.

PACKET PROTOCOLS

By using CSMA no polling station or token is required in the ESTeem network. When an ESTeem has information to send it will check to see if the channel is clear before transmitting its packet and await an (ACK). The ESTeem is a Master/Master system, meaning any ESTeem can communicate with any other ESTeem.

FLOW CONTROL

The ESTeem supports hardware and software flow control, which allow different devices on the network to communicate at different baud rates. In addition to flow control the ESTeem also has a 4000 byte data buffer on both the receive and transmit buffers in the unit.

DATA PRIVACY

Data privacy in the ESTeem is provided by three levels of data encoding in the firmware and by the user being able to define over four security and communications parameters (Unit Address, Network ID, and Operating Frequency) that allow communications access to the modem giving over 100 million combinations. If higher security is required, the units are compatible with asynchronous Data Encryption Standard (DES) encryption peripherals.

EFFECTIVE BAUD RATE

The maximum input baud rate to the modem is 19,200 baud, asynchronous, full duplex, but this is misleading since the ESTeems actually communicate to each simplex over the RF link, at 19,200 bps (25 kHz channel spacing - Model 192C/F) or 9,600 bps (12.5 kHz channel spacing - Model 192C/F). The effective baud rate is a function of the above plus the packet length variable in the ESTeem (definable from 1 to 2000 bytes). If the packlength variable is set to 2000 bytes the effective baud rate is approximately 18,000 baud (25 kHz channel spacing) or 9,000 baud (12.5 kHz channel spacing) the effective baud rate will degrade as the packlength variable is reduced.

Another item that must be understood is transmission turn around time. Remember that the ESTeem sends a data packet and waits for an (ACK) from the destination modem before another packet is transmitted. All radio transmitters have a fixed delay time, this is the amount of time it takes the transmitter to stabilize once it is energized before it can send data. In the ESTeem the delay is approximately 15 milliseconds *one way* which includes transmitter turn-on time and packet frame overhead or a total turn around time accounting for the (ACK) of 30 milliseconds. Therefore total time to send a data packet is 30 milliseconds plus the time required to send the data (i.e. number of bits sent/19,200 b/s).

INFORMATION TO USERS

WARNING: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generated, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

To insure compliance to FCC non-interference regulations, peripherals attached to this modem require shielded I/O cables.

If this equipment does cause interference to radio or television, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

1. Re-orient the radio/TV-receiving antenna.
2. Re-orient the modem antenna.
3. Relocate the modem with respect to the radio/TV-receiving antenna.
4. Plug the power supply for the modem into a different outlet so that the modem and radio/TV receiver are on different branch circuits.
5. Verify that the modem chassis is connected to an earth ground.
6. Attach a split bead (FAIR-RITE PN 2643164251) to the RS-232 cable.

If necessary, the user should consult the dealer or an experienced radio/TV technician for additional suggestions. The user may find the following booklet prepared by the FCC helpful.

"How to Identify and Resolve Radio-TV Interference Problems"

This booklet is available from the U.S. Government Printing Office, Washington, D.C. 20402 - Stock No. 004-000-00245-4. Application forms for the license are available from the nearest office of the FCC.

Electronic Systems Technology maintains a list of consultants that provide professional services at a reasonable cost to assist the users in licensing.

Other Information

Model 192C

25 KHz Channel Spacing, 19,200 bps
FCC Type Acceptance No: ENPESTEEM192
Emissions Designator: 17K6F1D

12.5 KHz Channel Spacing, 9,600 bps
FCC Type Acceptance No: ENPESTEEM192A
Emissions Designator: 10K8F1D

12.5 KHz Channel Spacing, 19,200 bps
Industry Canada Type Acceptance No: 2163 195 214A
Emissions Designator: 10K0F1D

Model 192CHP

25 KHz Channel Spacing, 19,200 bps
FCC Type Acceptance No: ENPESTEEM192CHP
Emission Designator: 16K6F2D

12.5 KHz Channel Spacing, 9,600 bps
FCC Type Acceptance No: ENPESTEEM192CHP
Emission Designator: 9K8F2D

12.5 KHz Channel Spacing, 19,200 bps
Industry Canada Type Acceptance: 2163192CHP
Emission Designator: 9K8F2D

Model 192F

25 KHz Channel Spacing, 19,200 bps
Industry Canada Type Acceptance No: 2163 195 214A
Emissions Designator: 17K6F1D

12.5 KHz Channel Spacing, 9,600 bps
Industry Canada Type Acceptance No: 2163 195 214A
Emissions Designator: 10K8F1D

25 KHz Channel Spacing, 19,200 bps
Malaysia Telecom No: RADL 60A 1097 S
Emissions Designator: 17K6F1D

Model 192M

25 KHz Channel Spacing, 19,200 bps
U.S.A. Type Acceptance: ENPESTEEM192M
Emission Designator: 17K6F1D

12.5 KHz Channel Spacing, 9,600 bps
U.S.A. Type Acceptance: ENPESTEEM192M
Emission Designator: 10K8F1D

25 KHz Channel Spacing, 19,200 bps
Canada: 2163195385A
Emission Designator: 17K6F1D

12.5 KHz Channel Spacing, 9,600 bps
Canada: 2163195385A
Emission Designator: 10K8F1D

Model 192MHP

25 KHz Channel Spacing, 19,200 bps
U.S.A. Type Acceptance: ENPESTEEM192MHP
Emission Designator: 16K6F2D

12.5 KHz Channel Spacing, 9,600 bps
U.S.A. Type Acceptance: ENPESTEEM192MHP
Emission Designator: 9K8F2D

25 KHz Channel Spacing, 19,200 bps
Canada: TBD
Emission Designator: 16K6F2D

12.5 KHz Channel Spacing, 9,600 bps
Canada: TBD
Emission Designator: 9K8F2D



APPENDIX A FCC INFORMATION

FEDERAL COMMUNICATIONS COMMISSION FIELD OFFICES

ALASKA

1011 E. Tudor Rd.
Rm 240 Box 2955
Anchorage, AK 99510

CALIFORNIA

7840 El Cajon Blvd
Suite 405
La Mesa, CA 92041

3711 Long Beach Blvd
Suite 501
Long Beach, CA 90807

323A Battery St
San Francisco, CA 94111

COLORADO

Executive Tower
1405 Curtis St
Suite 2925
Denver, CO 80202

FLORIDA

919 Federal Bldg
51 SE First Ave.
Miami, FL 33130

1211 N. Westshore
Suite 601
A.D. P. Building
Tampa, FL 33607

GEORGIA

Massell Bldg. 440
1365 Peachtree NE
Atlanta, GA 30309

HAWAII

7304 Prince Kuhi
Federal Building
Honolulu, HI

HAWAII

300 Almoana Blvd.
P.O. Box 50023
Honolulu, HI

ILLINOIS

3935 Federal Bldg
230 S. Dearborn
Chicago, IL 60604

LOUISIANA

1009 Edw Hebert Bldg.
600 South Street
New Orleans, LA 70130

MARYLAND

1017 Geo. Fallon
Building 31
Hopkins Plaza
Baltimore, MD

MASSACHUSETTS

1600 Customhouse
165 State Street
Boston, MA 02109

MICHIGAN

1054 Federal Building
231 W LaFayette
Detroit, MI 48225

MINNESOTA

691 Federal Building
316 N Robert St.
St. Paul, MN

MISSOURI

Brywood Office Tower
6800 E. 63rd Street
Kansas City, MO

NEW YORK

1307 Federal Building
111 W. Huron
Buffalo, NY 14202

201 Varick Street
New York, NY 10014

OREGON

1782 Federal Building
1220 SW 3rd Avenue
Portland, OR 97204

PENNSYLVANIA

Room 404
2300 E. Lincoln H
Langhorne, PA

PUERTO RICO

747 Federal Building
Carlo Chardon Ave.
Hato Rey, PR 00918

TEXAS

Cabeli Building
1100 Commerce
Dallas, TX 75242

5636 Federal Building
515 Rusk Avenue
Houston, TX 77002

VIRGINIA

Military Circle
870 N. Military Hwy.
Norfolk, VA 23502

WASHINGTON

3256 Federal Building
915 Second Avenue
Seattle, WA 9817

Model 192C/CHP/F/M Overall Specifications

SWITCHES:

- CPU Reset
- RS-232C/422/485 Setup

LED INDICATORS:

- Power On
- Receiver Carrier Detect
- Transmitter Enable
- Link Connect/Disconnect
- Auto Connect Enabled
- RS-232C/422/485 Framing Error

I/O - CONNECTORS:

- Asynchronous Full Duplex, RS-232C, RS-422 and RS 485 with 25 Pin Sub D Connector.
- Antenna Output - TNC connector
- Input Power - 2 pin molex

ADDRESSING RANGE:

- 1 to 255

DATA INPUTS:

- Selectable 600 to 19,200 baud
- 7 to 8 data bits
- Even, odd, or no parity
- One or two stop bits

DATA BUFFERS:

- Transmit 4000 bytes
- Receive 4000 bytes

FLOW CONTROL:

- Hardware or Software

DATA TRANSMISSION PROTOCOL:

- Carrier Sensed Multiple Access with Collision Detection (CSMA-CD)

ERROR CHECKING:

Forward error correction and 32 Bit Cyclic Redundancy Check (CRC) with packet acknowledge and retry

MINIMUM RADIO TURN AROUND TIME:

- < 15 ms + Data (W/O ACK)
- < 30 ms + Data (W/ACK)

POWER REQUIREMENTS:

Models 192C & 192F

- 11 to 15 VDC @ 400 ma Rx
2 W RF 1.5 A Tx
4 W RF 2.0 A Tx

Models 192CHP & 192MHP

- 11 to 15 VDC @ 400 ma Rx
10 W RF 4.0 A Tx
20 W RF 5.5 A Tx
30 W RF 8.5 A Tx

Model 192M

- 11 to 15 VDC @ 400 ma Rx
2 W RF 1.5 A Tx
4 W RF 2.0 A Tx

SIZE:

- 2.45 in. Height
- 9.37 in. Width
- 8.16 in. Length

WEIGHT:

- 5 lbs.

ENVIRONMENT:

- -30 TO 50 ° C.
- 95% non-condensing

WARRANTY:

- 1 Year

Model 192C/CHP/F/M/MHP Overall Specifications

ESTeem Model 192C

Frequency Range	450 to 470 MHz
Frequency Selection	Digitally Synthesized - Software Selectable
Frequency Stability	+/- 1 ppm
Frequency Selectability	6.25KHz
RF Data Rate	19,200 bps @ 25 KHz Channel Spacing U.S.A. Type Acceptance: ENPESTEEM192A Emission Designator: 17K6F1D 9,600 bps @ 12.5 KHz Channel Spacing U.S.A. Type Acceptance: ENPESTEEM192A Emission Designator: 10K8F1D 19,200 bps @ 12.5 KHz Channel Spacing Canada: 2163 195 214A Emission Designator: 10K0F2D
Transmitter Modulation	DC to 4800 Hz @ 19,200 bps DC to 2400 Hz @ 9,600 bps
Transmitter Deviation	4 KHz @ 19,200 bps 3 KHz @ 9,600 bps
Transmitter RF Power Output	2 Watts (4 Watts optional)
Transmitter Duty Cycle	100%
Transmitter Spurious & Harmonics	> 55 dB down from carrier
Transmitter Rise Time	1 msec
Receiver Sensitivity:	-101 dBm @ 12 dB Sinad
Receiver Spurious & Image Rejection	> 50 dB
Receiver Squelch Sensitivity	Software Adjustable
Receiver Adjacent Channel Rejection	> 70 dB
Receiver Modulation Acceptance:	25 KHz @ 19,200 bps 12.5 KHz @ 9,600 bps
Receiver Base Bandwidth:	4.8 KHz @ 19,200 bps 2.4 KHz @ 9,600 bps
Transmit/Receive Switch	Integral to Unit
RF Output Impedance	50 Ohms
RF Input/Output Connector	TNC Female
Power Supply Voltage	10.8 to 16 VDC
Power Supply Current @ 12 VDC	400 ma Receive 1.5 A Transmit @ 2 W RF Output 2.0 A Transmit @ 4 W RF Output
Input Power Connector	2 Pin Molex (male)
Temperature Range	-30 to + 50 ° C.
Size	2.45 in. H x 9.37 in. W x 8.16 in. L.
Weight	5 lbs.

ESTeem Model 192CHP

Frequency Range	450 to 470 MHz
Frequency Selection	Digitally Synthesized - Software Selectable
Frequency Stability	+/- 2.5 ppm
Frequency Selectability	6.25KHz
RF Data Rate	19,200 bps @ 25 KHz Channel Spacing F.C.C.: ENPESTEEM192CHP Canada: 2163192CHP Emission Designator: 16K6F2D 9,600 bps @ 12.5 KHz Channel Spacing F.C.C.: ENPESTEEM192CHP Canada: 2163A-EST192CHP Emission Designator: 9K80F2D/16K6F2D
Transmitter Modulation	DC to 4800 Hz @ 19,200 bps DC to 2400 Hz @ 9,600 bps
Transmitter Deviation	3.5 KHz @ 19,200 bps 2.5 KHz @ 9,600 bps
Transmitter RF Power Output	10, 20, 30 or 30 watts (Software Selectable)
Transmitter Duty Cycle	100%
Transmitter Spurious & Harmonics	> 55 dB down from carrier
Transmitter Rise Time	1 msec
Receiver Sensitivity:	-110 dBm @ 12 dB Sinad
Receiver Spurious & Image Rejection	> 50 dB
Receiver Squelch Sensitivity	Software Adjustable
Receiver Adjacent Channel Rejection	> 70 dB
Receiver Modulation Acceptance:	25 KHz @ 19,200 bps 12.5 KHz @ 9,600 bps
Receiver Base Bandwidth:	4.8 KHz @ 19,200 bps 2.4 KHz @ 9,600 bps
Transmit/Receive Switch	Integral to Unit
RF Output Impedance	50 Ohms
RF Input/Output Connector	TNC Female
Power Supply Voltage	10.8 to 16 VDC
Power Supply Current @ 12 VDC	400 ma Receive 4.0 A @ 10 W RF Output 5.5 A @ 20 W RF Output 8.5 A @ 30 W RF Output
Input Power Connector	2 Pin Molex (male)
Temperature Range	-30 to + 50 ° C.
Size	2.45 in. H x 9.37 in. W x 8.16 in. L.
Weight	5 lbs.

Model 192C/CHP/F/M/MHP Overall Specifications

ESTeem Model 192F

Frequency Range	400 to 420 MHz
Frequency Selection	Digitally Synthesized - Software Selectable
Frequency Stability	+/- 1 ppm
Frequency Selectability	6.25KHz
RF Data Rate	19,200 bps @ 25 KHz Channel Spacing Canada: 2163 195 214A Emission Designator: 17K6F1D 9,600 bps @ 12.5 KHz Channel Spacing Canada: 2163 195 214A Emission Designator: 10K8F2D
Transmitter Modulation	DC to 4800 Hz @ 19,200 bps DC to 2400 Hz @ 9,600 bps
Transmitter Deviation	4 KHz @ 19,200 bps 3 KHz @ 9,600 bps
Transmitter RF Power Output	4 Watts (2 Watts optional)
Transmitter Duty Cycle	100%
Transmitter Spurious & Harmonics	> 55 dB down from carrier
Transmitter Rise Time	1 msec
Receiver Sensitivity:	-101 dBm @ 12 dB Sinad
Receiver Spurious & Image Rejection	> 50 dB
Receiver Squelch Sensitivity	Software Adjustable
Receiver Adjacent Channel Rejection	> 70 dB
Receiver Modulation Acceptance:	25 KHz @ 19,200 bps 12.5 KHz @ 9,600 bps
Receiver Base Bandwidth:	4.8 KHz @ 19,200 bps 2.4 KHz @ 9,600 bps
Transmit/Receive Switch	Integral to Unit
RF Output Impedance	50 Ohms
RF Input/Output Connector	TNC Female
Power Supply Voltage	10.8 to 16 VDC
Power Supply Current @ 12 VDC	400 ma Receive 1.5 A Transmit @ 2 W RF Output 2.0 A Transmit @ 4 W RF Output
Input Power Connector	2 Pin Molex (male)
Temperature Range	-30 to + 50 ° C.
Size	2.45 in. H x 9.37 in. W x 8.16 in. L.
Weight	5 lbs.

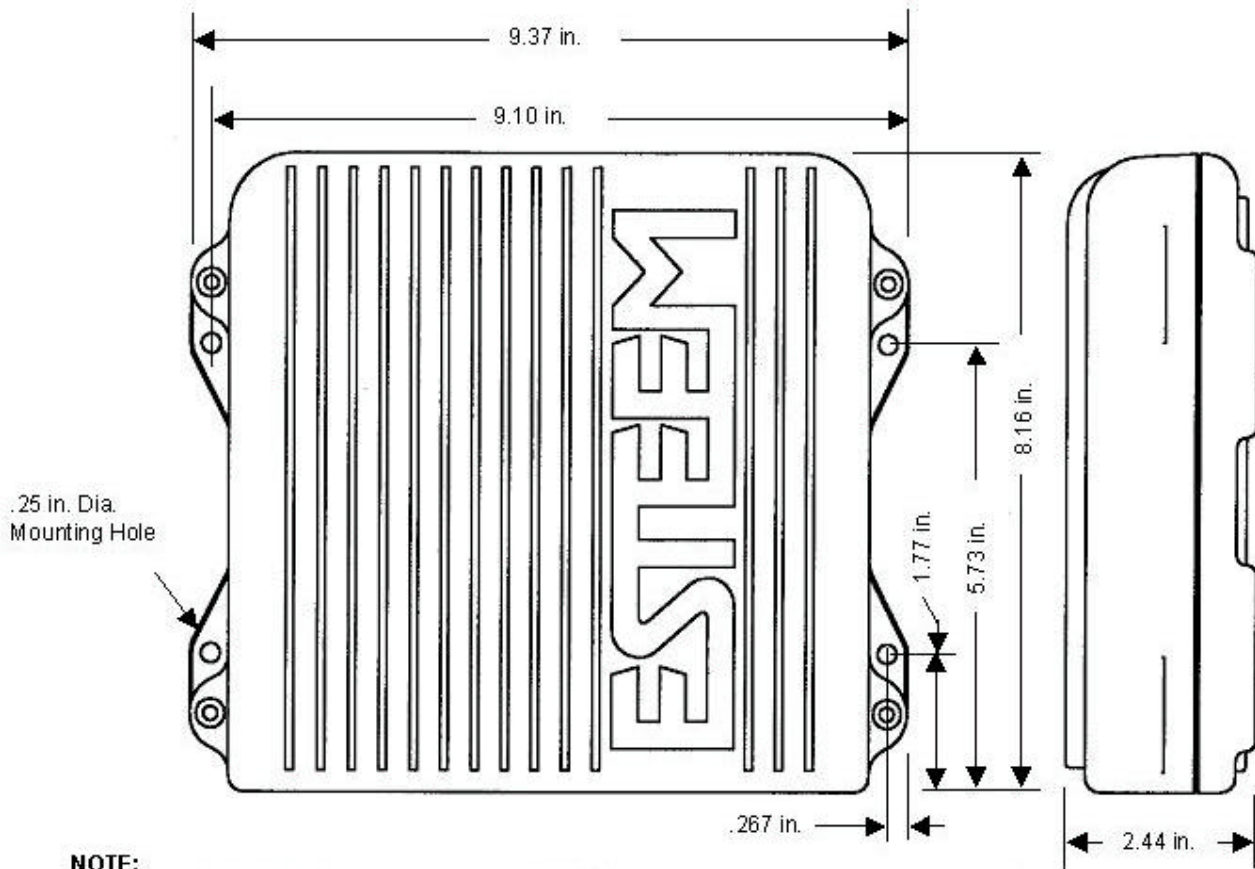
Model 192C/CHP/F/M/MHP Overall Specifications

ESTEem Model 192M

ESTEem Model 192MHP

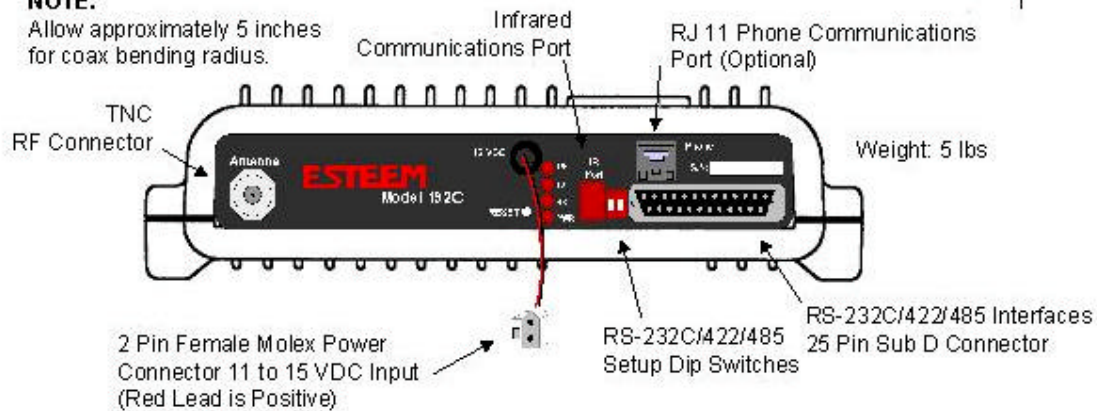
Frequency Range	150 to 174 MHz	150 to 174 MHz
Frequency Selection	Digitally Synthesized - Software Selectable	Digitally Synthesized - Software Selectable
Frequency Stability	+/- 2.5 ppm	+/- 2.5 ppm
Frequency Selectability	6.25KHz	6.25KHz
RF Data Rate	19,200 bps @ 25 KHz Channel Spacing U.S.A. Type Acceptance: ENPESTEEM192M Emission Designator: 17K6F2D 9,600 bps @ 12.5 KHz Channel Spacing U.S.A. Type Acceptance: ENPESTEEM192M Emission Designator: 10K8F2D 19,200 bps @ 25 KHz Channel Spacing Canada: 2163 195 385A Emission Designator: 17K6F2D 9,600 bps @ 12.5 KHz Channel Spacing Canada: 2163 195 385A Emission Designator: 10K8F2D	19,200 bps @ 25 KHz Channel Spacing F.C.C.: ENPESTEEM192MHP Canada: TBD Emission Designator: 16K6F2D 9,600 bps @ 12.5 KHz Channel Spacing F.C.C.: TBD Canada: TBD Emission Designator: 9K8F2D
Transmitter Modulation	DC to 4800 Hz @ 19,200 bps	DC to 4800 Hz @ 19,200 bps
	DC to 2400 Hz @ 9,600 bps	DC to 2400 Hz @ 9,600 bps
Transmitter Deviation	4 KHz @ 19,200 bps	3.5 KHz @ 19,200 bps
	3 KHz @ 9,600 bps	2.5 KHz @ 9,600 bps
Transmitter RF Power Output	2 Watts (4 Watts optional)	10,20 or 30 watts (Software Selectable)
Transmitter Duty Cycle	100%	100%
Transmitter Spurious & Harmonics	> 55 dB down from carrier	> 55 dB down from carrier
Transmitter Rise Time	1 msec	1 msec
Receiver Sensitivity:	-101 dBm @ 12 dB Sinad	-110 dBm @ 12 dB Sinad
Receiver Spurious & Image Rejection	> 50 dB	> 50 dB
Receiver Squelch Sensitivity	Software Adjustable	Software Adjustable
Receiver Adjacent Channel Rejection	> 70 dB	> 70 dB
Receiver Modulation Acceptance:	25 KHz @ 19,200 bps 12.5 KHz @ 9,600 bps	25 KHz @ 19,200 bps 12.5 KHz @ 9,600 bps
Receiver Base Bandwidth:	4.8 KHz @ 19,200 bps 2.4 KHz @ 9,600 bps	4.8 KHz @ 19,200 bps 2.4 KHz @ 9,600 bps
Transmit/Receive Switch	Integral to Unit	Integral to Unit
RF Output Impedance	50 Ohms	50 Ohms
RF Input/Output Connector	TNC Female	TNC Female
Power Supply Voltage	10.8 to 16 VDC	10.8 to 16 VDC
Power Supply Current @ 12 VDC	400 ma Receive 1.5 A Transmit @ 2 W RF Output 2.0 A Transmit @ 4 W RF Output	400 ma Receive 4.0 A @ 10 W RF Output 6.5 A @ 20 W RF Output 8.5 A @ 30 W RF Output
Input Power Connector	2 Pin Molex (male)	2 Pin Molex (male)
Temperature Range	-30 to + 50 ° C.	-30 to + 50 ° C.
Size	2.45 in. H x 9.37 in. W x 8.16 in. L.	2.45 in. H x 9.37 in. W x 8.16 in. L.
Weight	5 lbs.	5 lbs.

Model 192C/CHP/F/M/MHP Case Diagram



NOTE:

Allow approximately 5 inches for coax bending radius.



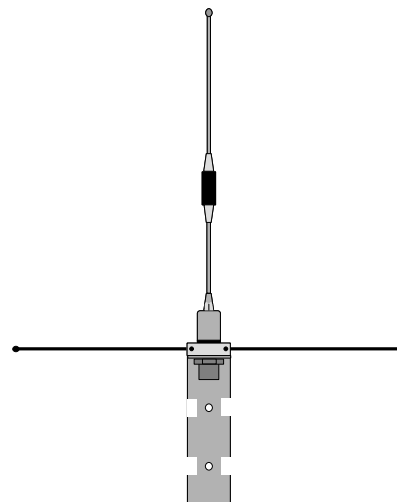
Model 192C/CHP/F Antenna Specifications

Model No:	AA19C & AA19F
Antenna Type:	Omni-Directional, ½ Wave
Applications:	Mobile Mount.
Frequency:	450 to 470 MHz - AA19C 400 to 420 MHz - AA19F
Polarization:	Vertical
Impedance:	50 ohms
Gain:	2 db.
VSWR:	< 2 to 1
Front To Back Ratio:	n/a
Horizontal Beamwidth:	n/a
Vertical Beamwidth:	60 degrees
Antenna Material:	Rubber duck whip.
Mounting Hardware:	Magnetic base.
Antenna Connector:	TNC with 12 feet integral RG-58 cable.
Antenna Envelope:	16 in. length. Magnetic base 3.5 in. by 3 in by 1 in.
Weight:	1 lb. 5 oz.



Model AA19C/F

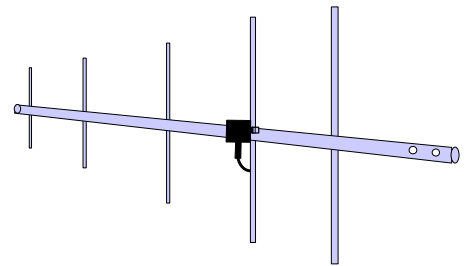
Model No:	AA20C & AA20F
Antenna Type:	Omni-Directional, DC grounded, Collinear 5/8 wave over 1/2 wave.
Applications:	Fixed base or mobile mounting. L shaped mounting bracket may be removed for panel mounting. Ground plane radials may be removed depending on application.
Frequency:	450 to 470 MHz - AA20C 400 to 420 MHz - AA20F
Polarization:	Vertical
Impedance:	50 ohms
Gain:	4.5 dB.
VSWR:	< 1.5
Front To Back Ratio:	n/a
Horizontal Beamwidth:	n/a
Vertical Beamwidth:	30 degrees
Antenna Material:	Stainless steel whip and ground plane radials. All other hardware anodized metal.
Mounting Hardware:	Stainless steel clamps for mounting to ¾ in. to 1 ½ in. pipe with right angle mount or direct mount.
Antenna Connector:	UHF Female (S-239)
Antenna Envelope:	37 ½ in. length by 16 in width with ground plane radials.
Weight:	2 lbs.



Model AA20C/F

Model 192C/CHP/F Antenna Specifications

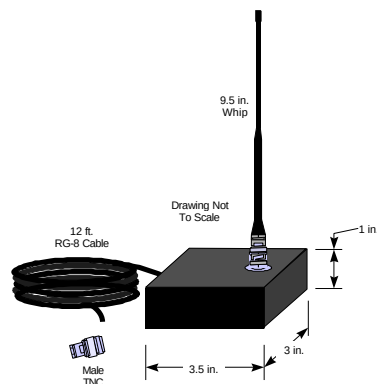
Model No:	AA202C & AA202F
Antenna Type:	Directional, DC grounded, 5 element yagi.
Applications:	Fixed base.
Frequency:	450 to 470 MHz - AA202C 400 to 420 MHz - AA202F
Polarization:	Vertical or Horizontal
Impedance:	50 ohms
Gain:	10 dB
VSWR:	< 1.5
Front To Back Ratio:	20 dB
Horizontal Beamwidth:	59 degrees
Vertical Beamwidth:	53 degrees
Antenna Material:	High strength aluminum with gold chromate finish.
Mounting Hardware:	Heavy duty U bolts for mounting up to 2 1/8 in. pipe with right angle mount or direct panel mount.
Antenna Connector:	UHF Female (SO-239)
Maximum Power Input:	300 Watts
Antenna Envelope:	34.5 in. length by 13.25 in. width
Windload (RWV):	100 mph
Weight:	1.68 lbs.



Model AA202C/F

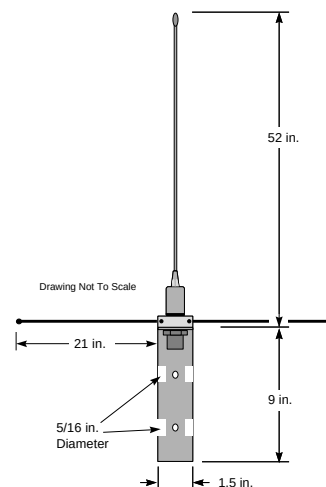
Model 192M/MHP Antenna Specifications

Model No:	AA19M
Antenna Type:	Omni-Directional, $\frac{1}{2}$ Wave over $\frac{1}{4}$ Wave.
Applications:	Mobile Mount.
Frequency:	150 to 174 MHz
Polarization:	Vertical
Impedance:	50 ohms
Gain:	Unity
VSWR:	< 1.5 to 1
Front To Back Ratio:	n/a
Horizontal Beamwidth:	n/a
Vertical Beamwidth:	60 degrees
Antenna Material:	Rubber duck whip.
Mounting Hardware:	Magnetic base.
Antenna Connector:	TNC with 12 feet integral RG-58 cable.
Antenna Envelope:	11 in. length. Magnetic base 3.5 in. by 3 in. by 1 in.
Weight:	1 lb. 5 oz.



Model AA19M

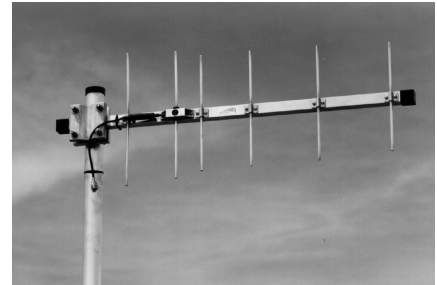
Model No:	AA20M
Antenna Type:	Omni-Directional, DC Grounded, $\frac{5}{8}$ Wave.
Applications:	Fixed base or mobile mounting. L shaped mounting bracket may be removed for panel mounting. Ground plane radials may be removed depending on application.
Frequency:	150 to 175 MHz
Polarization:	Vertical
Impedance:	50 ohms
Gain:	3.0 dB with ground plane radials
VSWR:	< 1.5
Front To Back Ratio:	n/a
Horizontal Beamwidth:	n/a
Vertical Beamwidth:	60 degrees
Antenna Material:	Stainless steel whip and ground plane radials. All other hardware anodized metal.
Mounting Hardware:	Stainless steel clamps for mounting to .75 in. to 1.5 in. pipe with right angle mount or direct panel mount.
Antenna Connector:	UHF Female (SO-239)
Antenna Envelope:	61 in. length by 43.5 in. width with ground plane radials
Power:	200 watts
Weight:	2 lbs.



Model AA20M

Model 192M/MHP Antenna Specifications

Model:	AA202M
Antenna Type:	Directional, 3 Element Yagi, DC Ground
Applications:	Fixed base mounting.
Frequency:	150 to 174 MHz
Polarization:	Vertical or Horizontal
Impedance:	50 ohms
Gain:	7.1 dB
VSWR:	< 1.5
Front To Back Ratio:	17 dB
Horizontal Beamwidth:	72 degrees
Vertical Beamwidth:	57 degrees
Antenna Material:	6061-T6 Aluminum
Boom Diameter:	7/8 in. 6061-T6 Aluminum, double wall construction
Mounting Hardware:	Stainless steel U bolts for mounting to 1 5/8 in. diameter pipe.
Antenna Connector:	UHF Female (SO-239)
Maximum Power Input:	500 Watts
Antenna Envelope:	42 in. length by 39 in. width
Windload (RWV):	100 mph
Wind Load, Flat Plate (Ft²):	.36 sq. ft.
Lateral Thrust @ RWV:	14.6 lbs.
Bending Moment @ RWV:	25.3 ft. lbs.
Weight:	3 lbs.



Model AA202M

ESTeem Command Error Messages

Listed below are the ESTeem Command Error Messages and their definitions. To receive these messages, TYPESYSTEM must be ON (See Appendix D, Definitions). All System Status Message have a bell (O7H or CTRL G) preceding the message except when Messform is ON. If MESSFORM = OFF Line A will be displayed. If MESSFORM = ON Line B will be displayed.

1. A "TOO MANY CHARACTERS FOR COMMAND"
B EMO1

This message will be displayed if more than the allocated number of characters are typed for a command. This is because some commands are truncated at a length of 8 characters.

2. A "AMBIGUOUS COMMAND"
B EMO2

This is the case of not enough characters being entered to uniquely identify a command.

3. A "INVALID ARGUMENT"
B EM03

This is displayed when a non valid value is given to a Command. Example; a value of O cannot be given to FRACK because the only valid values are 1-255.

ESTeem System Status Messages

Listed below are the ESTeem System Status Messages and their definitions. To receive these messages, TYPESYSTEM must be ON (See APPENDIX D, DEFINITIONS). All System Status Messages have a bell (O7H or CTRL G) preceding the message except when Messform is ON. If Messform = OFF Line A will be displayed. If Messform = ON Line B will be displayed.

1. A "CONNECTED TO XX"
B SSO1-xx

This message is caused by either receiving a reply from a Log On Packet, receiving a Log On Packet, or by typing LINK when connected and in the COMMAND MODE. XX is the address of the modem connected to.

2. A "DISCONNECTED FROM XX"
B SSO2-xx

Tells that you have been disconnected from the device you were originally connected to (xx is unit address).

3. A "LINK DOWN"
B SSO3

This message occurs after sending the last retry data packet and receiving no response from the destination node. This message usually indicates a hard failure -i.e. destination node not energized, wrong baud rate, (not compatible between units) improper transmit/receive frequency between nodes, etc.

4. A "CURRENTLY NOT CONNECTED!"
B SSO4

The Disconnect was issued while the modem was not connected to another modem or when LINK is typed in the COMMAND MODE when you are not connected. This message is displayed when the modem is configured in the monitor mode.

5. A "FAILED TO CONNECT!"
B SS05

This message occurs if the modem fails to connect.

6. A "FAILED TO DISCONNECT!"
B SS06

This message occurs if the modems are connected and are unable to disconnect.

7. A "USING FACTORY DEFAULTS"
B SS07

This command states when factory defaults have been enabled.

8. A "REMOTE PROGRAMMING"
B SS08

This message is displayed when the ESTeem has been placed in the remote programming mode.

9. A "PHONE MODEM CONNECTED. INFRARED PORT DISABLED"
B SS09

This message is displayed when the ESTeem phone port has received an in-coming call.

10. A "PHONE MODEM DISCONNECTED. INFRARED PORT ENABLED"
B SS10

This message is displayed when the ESTeem port has been disconnected.

ESTeem System Error Messages

Listed below are the ESTeem System Error Messages and their definitions. To receive these messages, TYPESYSTEM must be ON (See APPENDIX D, DEFINITIONS). All System Status Messages have a bell (O7H or CTRL G) preceding the message except when Messform is ON. If Messform = OFF Line A will be displayed. If Messform = ON Line B will be displayed.

1. A "NOVRAM FAILED"
B SEO1

If this response is received after a save, there is a hardware problem with the ESTeem's NOVRAM Circuitry.

2. A "ROM FAILED"
B SEO2

If this response is received after a save, there is a hardware problem with the ESTeem's ROM Circuitry.

Listed below are the software commands and their factory default setting.

HELP CONTROL

APPENDRU = 255
CONNECT
CONVERS
DISCONNE
FACTORY
FLASH
HELP
MULTID = OFF
PACKMON = OFF
RADIO = OFF
RESET
ROUTE = 0
RESTORE = 0
SAVE
TRANSPAR = OFF

HELP SETUP

ADDRESS = 1
COMMAND = 3
EDIT = ON
MESSFORM = OFF
NETWORK = 37
PACKLENG = 2000
PROMPT = ON
RETRY = 6
SENDPAC = 13
SETCON = 2
TERMCONT = OFF
TERMTIME = 50
TYPERROR = OFF
TYPSTYPE = ON

HELP PLC

A_BCTRL = OFF
CUTLER = OFF
DNP = OFF
GE_CTRL = OFF
MODCTRL = OFF
OPTO = OFF
PLC_MAST = OFF
SCASERVE = OFF
SQDADD = 0
SQDCTRL = OFF

HELP RS-232

AUTOLF = ON
BLOCK = OFF
COMRATE
DTR_ENAB = OFF
ECHO = ON
MODECONT = OFF
XHFLOW = OFF
XSFLOW = ON

HELP SYSTEM

COPRIGHT
DISACK = OFF
HOUR
MODEL = 19C
OPTION
POLL = OFF
PROGRAM = 0
SENDDEL = 0
REMPROG = ON
SECURITY = OFF
SENDDEL = 0
S/N = 0
TXSTAT
VERSION = 1.51

HELP RADIO

ASQUELCH = 0
DATARATE = 64
CARBSY = 1
DQ = OFF
FRACK = 50
LAT
MODULATE = ON
RANDOM = OFF
RFWAIT = 2
RFCYCLES = 10
RXDATA = 1
RXEND = 1
RXSIGNAL = OFF
SEL/A1 = 0
SEL/N1 = 0
SEL/N2 = 0
SQUELCH = 0
TXFLAG = 0
TXEND = 0

Listed below in alphabetical order are the definitions of the ESTeem software commands.

A_BCTRL

This function enables the Allen Bradley controller protocol. For further details reference the EST Engineering Report on Allen Bradley controller interfacing.

ON: Enabled.
OFF: Disabled.

Factory default = OFF.

ADDRESS (1-255)

The command defines the ESTeem source address. The default value is whatever address has been stored in nonvolatile memory. Addresses 1 to 254 are usable for unit addressing. Address 255 is used for GLOBAL.

APPENDRU (l#,r#,a1,a2,g)

The APPENDRU command appends routes to a connect address that are defined by the ROUTE command.

l # = Location of route number in memory. Address locations 1 to 16.
r # = Appended route number. Route numbers 1 to 16.
a1 = Address of first destination node. Address numbers from 1 to 254.
a2 = Address of last destination node. . Address numbers from 1 to 254.
g = Group feature is enabled by inserting a 1 in this field.

Factory default = 0. APPENDRU 0 disables this feature.

Note: *This command is used in conjunction with the ROUTE Command.*

ASQUELCH (0, 255)

This command defines the squelch threshold of the receiver. This command is only used on the Model 192CHP. The ESTeem will auto adjust this setting.

AUTOLF (on/off)

This command enables the auto line feed sent to the terminal after each carriage return.

ON: Enabled.
OFF: Disabled.

Factory default = ON.

BLOCK (on/off)

The BLOCK command, when enabled, disables the RS-232C/422/485 communications port from receiving or outputting data.

ON: Enabled.
OFF: Disabled.

Factory default = OFF.

CARBsy (0-255)

This command defines the carrier busy delay in milliseconds. A value of 0 will disable the carrier busy delay. Factory default = 1.

COMMand (0-255)

This command specifies the value (in decimal) of an ASCII character used to return the ESTeem to COMMAND MODE. If the COMMAND character is read by the ESTeem when in the CONVERSE MODE, the modem will exit to the COMMAND MODE. A value of 0 in this command will disable the function. Factory default = \$O3 (Hex) or CTRL-C.

COMRate (0-255)

This command defines the RS-232/422/485 configuration when Switch 1 on the RS-232 Setup Switches is engaged. See Chapter 5 for table.

CONNect (r1,r2,r3,da)

This command performs the CONNECT to a destination ESTeem. This function supports a direct connect or a connect through a maximum of three repeater nodes. The default value is whatever address has been stored by the SETCon COMMAND.

r1 = ESTeem address (1 to 254) of repeater 1.

r2 = ESTeem address (1 to 254) of repeater 2.

r3 = ESTeem address (1 to 254) of repeater 3.

da = Destination address (1 to 254).

CONVers

The execution of this command causes an immediate exit from COMMAND MODE into CONVERSE MODE.

COPright

The execution of this command causes the copyright information to be printed.

CUTler (On/Off)

This command enables the Cutler Hammer controller protocol. For further information reference Engineering Report 01-003. Factory default = Off.

On: Enabled

Off: Disabled

DARate (0 or 64)

This command sets the RF data rate on the Model 192C/CHP/F/M products. This value is set at the factory and should not be changed. Factory default = 0.

0 = 19,200 bps

64 = 9,600 bps

DISACK (on/off)

This command when enabled instructs the modem to disable the acknowledgment request on the information packet. This is used when the designation device will respond with its own acknowledgment. Factory default = OFF.

On: Enabled

Off: Disabled

DISCONnect (1-254)

The disconnect command. The execution of this command immediately initiates a disconnect request with the currently connected node or in a multi-connect environment only a specific node may be addressed.

DNP (On/Off)

This command enables the DNP protocol. For further information reference Engineering Report 21-004. Factory default = Off.

On: Enabled
Off: Disabled

DTR_enab (on/off)

The DTR enable command. This command, when enabled, allows the ESTeem modem to monitor pin 20 of the RS-232C connector in regards to the status of an external device connected to it.

ON: Enables monitoring the DTR signal on pin 20 of the RS-232C connector. If DTR is at a space condition, then the modem is enabled. If DTR is at a mark condition, then the ESTeem modem will be disabled. The normal operation of this line is for the ESTeem modem to have status on the external device, out-putting to pin 20. This line can act as a status to the ESTeem when the external device is ready to transmit or receive data.

OFF: Disabled

Factory default = OFF.

Note: *If the DTR command is enabled and the line is disabled then the ESTeem will perform a "Disconnect" if connected. The DTR Command will also activate the Data Carrier Detect (DCD) Line (Pin 8) to toggle High when connected and Low when disconnected.*

ECHO (on/off)

This command enables the ESTeem to echo characters received from the input device back to the input device.

ON: Enabled.
OFF: Disabled.

Factory default = ON.

EDit (on/off)

This command enables the EDIT functions from the CONVERSE Mode.

Factory default = ON.

Faactory

The factory default command. The execution of this command causes the ESTeem to restore the command table values from factory values that are stored permanently in memory. This will allow the user the ability to restore the ESTeem to factory conditions during testing or set-up.

FLASH

This command places the ESTeem in Flash mode for reprogramming of the operation system.

FRack (1-255)

This command programs the frame acknowledge delay in milliseconds. This value is used as a minimum time before decrementing the retry count and retransmitting a packet if the retry count is not zero.

Factory default = 50.

GE_CTRL

This command enables the General Electric controller protocol. For further information please reference the EST Engineering Report on General Electric controller interfacing.

ON: Enabled.
OFF: Disabled.

Factory default = OFF.

HElp

HELP switches are:

HELP	Displays this Help menu.
HELP ALL	Displays All commands switches and arguments.
HELP CHANGE	Displays only the commands that are changed from factory default.
HELP CONTROL	Displays Control commands switches and arguments.
HELP PLC	Displays PLC commands switches and arguments.
HELP RADIO	Displays Radio commands switches and arguments.
HELP RS-232	Displays RS232 commands switches and arguments.
HELP SETUP	Displays Setup commands switches and arguments.
HELP SYSTEM	Displays System commands switches and arguments.

JOHNctrl (on/off)

This function enables the Johnson controller protocol. For further detail Reference the EST Engineering Report on Johnson controller interfacing.

ON: Enabled.
OFF: Disabled.

Factory default = OFF.

LAT

Latches the selection of the desired serial frequency synthesizer on the Tx/Rx card

MESSform (on/off)

When enabled all of the system status and error messages will be in a formatted form.

"xx" indicates what error or message (See Error Messages and System Status Messages).

EMxx <CR> [ESTeem Error Messages]
SExx <CR> [System Error Messages]
SSxx <CR> [System Status Messages]
SSxx-xxxx <CR> [System Status Message W/Returned Value]
ON: Enabled.
OFF: Disabled.

Factory default = OFF.

MModecontr (on/off)

ON: The mode of the ESTeem modem is controlled by pin 19 of the RS-232C connector. A low (0) directs the ESTeem into the COMMAND mode. A high (1) directs the ESTeem into CONVERSE/TRANSPARENT mode.
OFF: The mode of the ESTeem modem is controlled by ASCII character.

Factory default = OFF

MODEL (xx)

Displays the product model of default firmware that is installed. Model should be the same as product being used. Listed below are the model codes

19C = ESTeem Model 192C
19F = ESTeem Model 192F
19V = ESTeem Model 192V

MODCTRL

This command enables the Modicon controller protocol. For further detail Reference the EST Engineering Report on Modicon controller interfacing.

OFF: Disabled.

Factory default = OFF.

MODulate (on/off)

The radio modulate command. When enabled will transmit a modulated test signal when the RADIO ON command is enabled.

ON: Enabled.
OFF: Disabled.

Factory default = OFF.

MOORE (on/off)

This function enables the Moore products using Hart protocol. For further details reference the EST Engineering Report on Moore Products interfacing.

ON: Enabled.
OFF: Disabled.

Factory default = OFF.

MULTID (on/off)

This command when enabled allows the ESTeem User to send data to another ESTeem from the CONVERSE MODE by specifying the routing address before the data.

ON: Enabled.
OFF: Disabled.

Factory default = OFF.

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.

This replaces using 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.

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

NETwork (0-255)

Network identification code. This is used to program a common code for all modems in the customers network so that another facility on your frequency using the same addresses will not interfere with your equipment. Factory default = 37.

OPTO (on/off)

This function enables the Opto 22 protocol. For further details reference the EST Engineering Report on Opto 22 interfacing.

ON: Enabled.
OFF: Disabled.

Factory default = OFF.

PACKleng (1-2000)

This command defines the length of the data packet in bytes. Factory default = 2000.

PACKMon (on/off)

Places the ESTeem in the packet monitor mode. Factory default = OFF.

PHone (on/off)

Phone port enable command. The ESTeem will answer an incoming call when enabled.

ON: Enabled.
OFF: Disabled.

Factory default = OFF.

PLC_MAST (on/off)

The programmable logic controller (PLC) command.

- ON: When enabled, the ESTeem modem will identify the desired route from the master PLC message. The ESTeem modem will only identify the PLC master route if the master command is enabled in the PLC.
- OFF: The ESTeem modem will be configured as to interface to a slave PLC.

Factory default = OFF.

POLLed (on/off)

When enabled the ESTeem will only transmit the contents of its internal transmit buffer when it receives an ENQ (hex 5) from a polling ESTeem. During non polled times the ESTeem transmit buffer will be continuously updated from data being received by the

RS-232C/422 port. This software feature was developed for interfacing the ESTeem to output devices without flow control that are to be polled from a master device.

- ON: Enabled will transmit the contents of its transmit buffer when a ENQ (hex 5) is received.
- OFF: Disabled.

Factory default = OFF.

PROGram (1-254,1-254,1-254,1-254)

This command is used to remote program another ESTeem unit. Example PROG 10 (Unit 10 is the address of the remote unit). When a connection has been made with the remote ESTeem the RPG: prompt will appear. The RPG: prompt is the command prompt of the remote modem.

Note: See *REMPROG Command*.

PROMpt (on/off)

The prompt enable command.

- ON: The prompt responses are enabled. These are the prompts for Converse or Trans Mode that are normally output from the RS-232C serial port by the ESTeem.
- OFF: Disabled.
- Factory default = ON.

RADio (on/off)

The radio transmitter enable command. The ESTeem radio transmitter will cycle on and off when enabled for tuning and antenna testing procedures.

- ON: Enabled.
- OFF: Disabled.

Factory default = OFF.

RANDom (on/off)

The RANDOM command when enabled will generate a simulated random data output when the RADIO ON command is enabled

- ON: Enabled.
- OFF: Disabled.

Factory default = OFF.

REMprog (on/off)

This command will disable the ESTeem from being remotely programmed by any another ESTeem.

ON: Enabled.
OFF: Disabled.

Factory default = ON.

RESet

The software reset command for the ESTeem. The execution of this command resets the internal electronics in the ESTeem.

REStore

The restore command. The execution of this command restores the ESTeem command variables and switches configurations stored in nonvolatile memory.

RETry (1-255)

The retry command number. This is the number specifying the number of retries, retransmission of frames, that are not acknowledged. Frames are retransmitted RETRY times before operation is aborted. Factory default = 6.

RFcycles

This command defines the number of cycles the ESTeem will transmit when programmed with the RADIO COMMAND.

Factory default = 10.

RFWait (1-255)

This command defines the time in milliseconds the receiver waits after a carrier detect before starting the acquire sequence. This value is optimized at the factory for the specific product and should not be changed.

ROUTE (l#,r1,r2,r3,)

The ROUTE sets up the route table in the ESTeem.

l # = User defined route number. Route numbers 1 to 16 may be used.
r1 = Address of first repeater. Address numbers from 1 to 254 may be used.
r2 = Address of second repeater. Address numbers from 1 to 254 may be used.
r3 = Address of third repeater. Address numbers from 1 to 254 may be used.

Note: See APPENDRU Command.

Factory default = 0.

RXData (1-255)

This command defines the time (milliseconds) the receiver waits after a carrier detect before starting the receive sequence. This value is optimized at the factory and should not be changed.

Factory default = 1.

RXEnd (1-255)

This command defines the time (milliseconds) to wait after the last character is received before reinitializing the receiver.
Factory default = 1.

RXSIGNAL (on/off)

This command enables the signal to noise ratio meter output. Output level varies from 0 to 248 (248 being the highest reading).

ON: Enabled.

OFF: Disabled.

Factory default = OFF.

SAve

The save command. The execution of this command stores the current command values and switches.

Note: Please wait approximately two seconds *after* executing the SAVE command before turning off power to the ESTeem.

SECURITY (off or 1- 100000)

The security command disables programming the ESTeem.

1 to 100000 This feature is enabled when you enter a number from 1 to 100000. When enabled the ESTeem will return a Security ON message. To disable security enter SECURITY xxxxxx.

xxxxxx = your predefined security number. When disabled the ESTeem will return a Security Off message.
OFF Security disabled.

Factory default = OFF.

SENDDel (0 to 65535)

This command sets the time to wait before sending back the contents of the transmit buffer when a global ENQ is received and POLL Mode is enabled. This allows for several polled ESTeems to respond back at different times keeping the transmissions from colliding. Reference Polled Command.

SENDPACK (0-255)

Send packet (SENDPACK) command. The value specifies an ASCII character used to signal when to send the packet. If set to a value of 255 the command is disabled. The factory default value is 13 (Return).

SEL/A1 (1-255)

The SEL/A1 command sets the transceiver for a specific frequency.

SEL/N1 (1-56635)

The SEL/A1 command sets the transceiver for a specific frequency.

SEL/N2 (1-999)

The SEL/N2 command sets the transceiver for a specific frequency.

SETCon (r1,r2,r3,da)

This command defines the destination address for the ESTeem to perform a connect using the Auto Connect feature. This function supports a direct connect or a connect through a maximum of three repeaters.

r1 = ESTeem address (1 to 254) of repeater 1.

r2 = ESTeem address (1 to 254) of repeater 2.

r3 = ESTeem address (1 to 254) of repeater 3.

da = Destination address (1 to 254).

S/N

Serial Number command. When executed from the Command Model will output the ESTeem serial number of the unit that is defined at the time of manufacturer.

SQDCTRL (on/off)

This function enables the Square D controller protocol. For further detail Reference the EST Engineering Report on Square D controller interfacing.

Factory default = OFF.

SQDADD (1-254)

This function is used with the SQDCTRL command to control the address fence when using SQ-D Network Interface Modules. For further details reference the EST Engineering Report on the SQ-D controller.

Factory default = 0.

SQUELCH (0-3)

This command defines the squelch threshold of the receiver. Listed below are the settings:

0	=	-101 dBm	2 μ V
1	=	- 93 dBm	5 μ V
2	=	- 87 dBm	10 μ V
3	=	- 70 dBm	70 μ V

Factory default = 0.

TERMCont (on/off)

The RS-232C/422/485 receive termination timer.

ON: If there are characters in the RS-232 buffer and the modem is in Converse Mode, the termination timer starts from the time the last receive character is updated in the buffer. If the termination time expires before another character is received, the characters are transmitted.

OFF: Disabled

Factory default = OFF.

TERMTime (10-65535)

The RS-232C/422/485 receive termination timer value. This value can be 10 to 65535 milliseconds. This value is enabled by TERMCONT. Factory default = 50.

TRANSPAR (on/off)

The transparent mode command. This mode allows the ESTeem link to be completely transparent to the communicating RS-232/422/485 devices. Reference Chapter 2.

ON: Enabled.

OFF: Disabled.

Factory default = OFF.

TXSTAT

This command outputs the total number of rf transmissions vs. the total number of retries. After output is completed, the counter is zeroed.

TYPerr (on/off)

This command enables the Communication Error Messages.

ON: Enabled.
OFF: Disabled.

Factory default = OFF.

TYPSyste (on/off)

This command enables the System and Error Message Commands.

ON: Enabled.
OFF: Disabled.

Factory default = ON.

VERSION

This command will display the current software version being used by the ESTeem.

XHflow (on/off)

This command enables hardware flow control.

ON: Enabled.
OFF: Disabled.

Factory default = OFF.

XSflow (on/off)

This command enables software flow control.

ON: Enabled.
OFF: Disabled.

Factory default = ON.