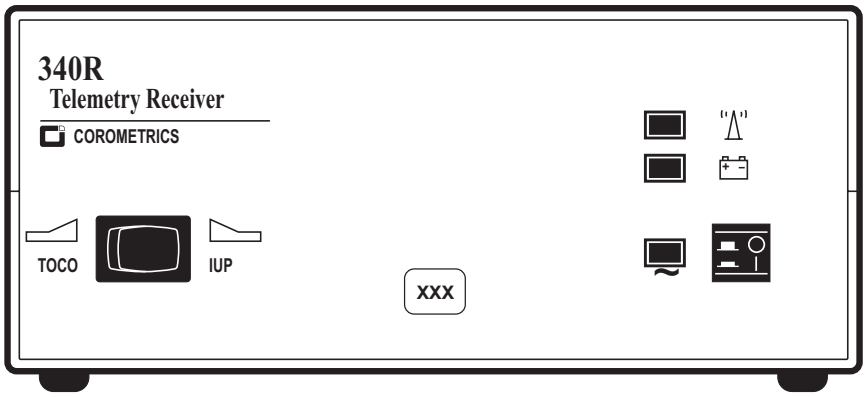
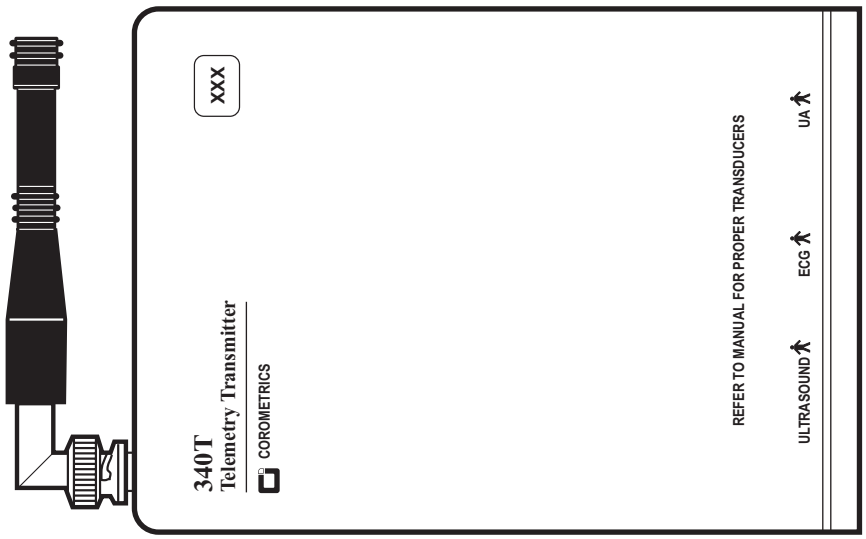
Corometrics® Model 340

OPERATOR'S MANUAL

MANUAL P/N 2003720-001 REV. B





GE Medical Systems
Information Technologies

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Corometrics® Model 340

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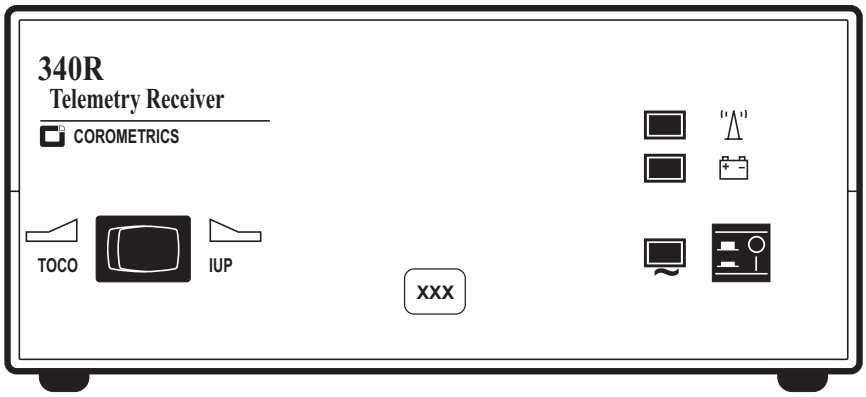

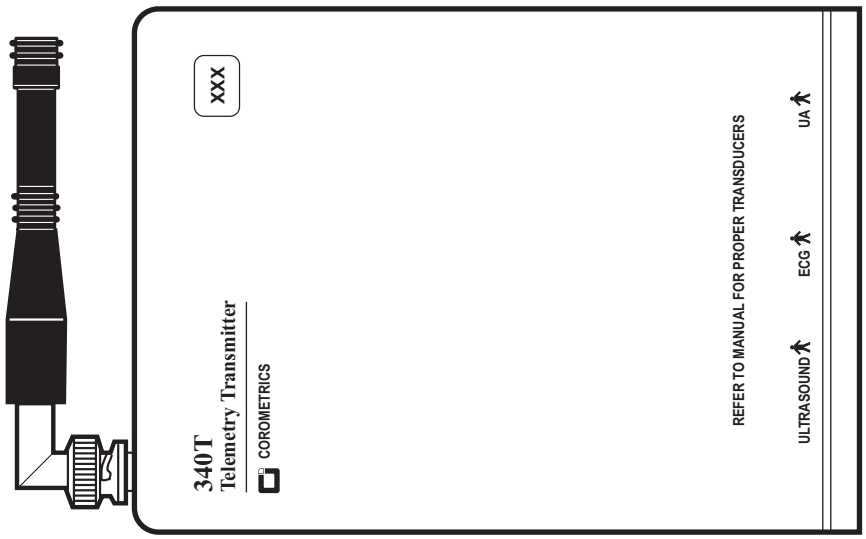

GE Medical Systems
Information Technologies

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GUARANTEE

All equipment sold by GE Medical Systems *Information Technologies* is fully guaranteed as to materials and workmanship for a period of 1 year. *Information Technologies* reserves the right to perform guarantee service operations in its own factory, at an authorized repair station, or in the customer's installation.

Our obligation under this guarantee is limited to repairing, or, at our option, replacing any defective parts of our equipment, except fuses or batteries, without charge, if such defects occur in normal service.

Claims for damage in shipment should be filed promptly with the transportation company. All correspondence covering the instrument should specify the model and serial numbers.

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Revision A: 5/00
Revision B: 11/00

GE Medical Systems *Information Technologies* will make available on request such circuit diagrams, component diagrams, component parts lists, descriptions, calibration instructions, or other information which will assist the users or appropriately qualified technical personnel to repair those parts of the equipment which are classified by *Information Technologies* as repairable. Refer to the service manual for further information.

⚠ **CAUTION:** In the United States of America, Federal Law restricts this device to sale by or on the order of a physician.

Contents

For your notes

Figures

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For your notes

Chapter 1

⚠ Safety

The information presented in this section is important for the safety of both the patient and operator and also serves to enhance equipment reliability. This chapter describes how the terms Danger, Warning, Caution, Important, and Note are used throughout the manual. In addition, standard equipment symbols are defined.

This section includes the following important information:

General Information

General Use

If any equipment is cold to the touch or below ambient temperature, allow it to stabilize before use.

To ensure patient safety, use only parts and accessories manufactured or recommended by GE Medical Systems *Information Technologies*. Parts and accessories used shall meet the requirements of IEC 601.1.1.

Disposable devices are intended for single use only. They should not be reused.

Periodically, and whenever the integrity of the equipment is in doubt, test all functions.

Refer to the "Maternal/Fetal Monitoring Operator's Manual" for information concerning the limitations of internal and external fetal heart rate monitoring techniques.

Responsibility of the Manufacturer

GE Medical Systems *Information Technologies* (hereinafter *Information Technologies*) is responsible for the effects on safety, reliability, and performance if:

- assembly operations, extensions, readjustments, modifications, or repairs are carried out by persons authorized by *Information Technologies*;
- the electrical installation of the relevant room complies with the requirements of appropriate regulations; and
- the equipment is used in accordance with the instructions for use.

Definitions of Terminology

Six types of special notices are used *throughout* this manual. They are: Danger, Warning, Caution, Contraindication, Important, and Note. The warnings and cautions in this safety section relate to the equipment in general and apply to all aspects of the equipment. Be sure to read the other chapters because there are additional warnings and cautions which relate to specific features of the equipment.

When grouped, warnings and cautions are listed alphabetically and do not imply any order of importance.

Table 1-1. Definitions of Terminology

Danger	A **DANGER** notice indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
Warning	A **WARNING** indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
Caution	A **CAUTION** indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. Cautions are also used to avoid damage to equipment.
Contraindication	A **CONTRAINDICATION** describes any special symptom or circumstance that renders the use of a remedy or the carrying out of a procedure inadvisable, usually because of a risk.
Important	An **IMPORTANT** notice indicates an emphasized note. It is something you should be particularly aware of; something not readily apparent.
Note	A **NOTE** indicates a particular point of information; something on which to focus your attention.

Equipment Safety Information

Warnings

WARNINGS

ACCIDENTAL SPILLS—In the event that fluids are accidentally spilled on the equipment, take the equipment out of operation and inspect for damage.

APPLICATION—This equipment is not designed for direct cardiac connection.

CONDUCTIVE CONNECTIONS—Avoid making any conductive connections to applied parts (patient connection) which are likely to degrade safety.

CONDUCTIVE PARTS—Ensure that the conductive parts of the lead electrodes and associated connectors do not contact other conductive parts including earth.

CONNECTIONS—The correct way to connect a patient to the transmitter is to plug the ***electrode leads*** into the ***patient cable*** which in turn connects to the ***transmitter***. The ***receiver*** is connected to the ***wall socket*** by the ***power cord***. Do ***not*** plug the electrode leads into the power cord, a wall socket, or an extension cord.

DEFIBRILLATION—This equipment is not designed for use with defibrillators.

ELECTRICAL SHOCK—To reduce the risk of electrical shock, do not remove equipment covers. Refer servicing to qualified personnel.

ELECTROMAGNETIC INTERFERENCE—Be aware that strong electromagnetic fields may interfere with equipment operation. Interference prevents the clear reception of signals by the device. If the hospital is close to a strong transmitter such as TV, AM or FM radio, police or fire stations, a HAM radio operator, an airport, or cellular phone, their signals could be picked up as signals by the equipment. If you feel interference is affecting the equipment, contact your Service Representative to check the equipment in your environment.

WARNINGS

ELECTROSURGERY—The equipment is not designed for use with high-frequency surgical devices. In addition, measurements may be affected in the presence of strong electromagnetic sources such as electrosurgery equipment.

EXPLOSION HAZARD—Do not use this equipment in the presence of flammable anesthetics or inside an oxygen tent.

GROUNDING—Do not defeat the three-wire grounding feature of the power cord by means of adaptors, plug modifications, or other methods. A dangerous shock hazard to both patient and operator may result.

INSTRUCTIONS—For continued and safe use of this equipment, it is necessary to follow all listed instructions. However, the instructions provided in this manual in no way supersede established medical procedures concerning patient care. The device does not replace observation and evaluation of the patient, at regular intervals, by a qualified care provider who will make diagnoses and decide on treatments and interventions.

INTERFACING OTHER EQUIPMENT—Monitoring equipment must be interfaced with other types of medical equipment by qualified biomedical engineering personnel. Be certain to consult manufacturers' specifications to maintain safe operation.

LEAKAGE CURRENT TEST—The interconnection of auxiliary equipment with this device may increase the total leakage current. When interfacing with other equipment, a test for leakage current must be performed by qualified biomedical engineering personnel before using with patients. Serious injury or death could result if the leakage current exceeds applicable standards. The use of accessory equipment not complying with the equivalent safety requirements of this equipment may lead to a reduced level of safety of the resulting system. Consideration relating to the choice shall include: use of the accessory in the patient vicinity; and evidence that the safety certification of the accessory has been performed in accordance with the appropriate IEC 601.1 and/or IEC 601.1.1 harmonized national standard.

WARNINGS

LINE ISOLATION MONITOR TRANSIENTS—Line isolation monitor transients may resemble actual cardiac waveforms, and thus cause incorrect heart rate determinations and alarm activation (or inhibition).

MRI USE—Do not use the equipment during MRI scanning; conducted current could potentially cause burns.

PATIENT CABLES AND LEADWIRES—Do not use patient cables and electrode leads that permit direct connection to electrical sources. Use only "safety" cables and leadwires. Use of non-safety patient cables and lead wires creates risk of inappropriate electrical connection which may cause patient shock or death.

PACEMAKER PATIENTS—Rate meters may continue to count the pacemaker rate during occurrences of cardiac arrest or some arrhythmias. Do not rely entirely upon rate meter alarms. Keep pacemaker patients under close surveillance. Refer to your monitor's operator's manual for disclosure of the pacemaker pulse rejection capability.

SIMULTANEOUS DEVICES—Do not simultaneously connect more than one device that uses electrodes to detect ECG and/or respiration to the same patient. Use of more than one device in this manner may cause improper operation of one or more of the devices.

STRANGULATION—Make sure all patient cables, leadwires, and tubing are positioned away from the patient's head to minimize the risk of accidental strangulation.

Cautions

CAUTIONS

ANNUAL SERVICING—For continued safety and performance of the equipment, it is recommended that the calibration, accuracy, and electrical safety of the equipment be verified on an annual basis by an *Information Technologies* Service Representative.

DAILY INSPECTION—It is essential that the equipment and accessories be inspected prior to every use.

ENVIRONMENT—The performance of the equipment has not been tested in certain areas, such as x-ray and imaging suites. The equipment is not recommended for use in these environments.

PERFORMANCE—Report all problems experienced with the equipment. If the equipment is not working properly, contact your Service Representative for service. The equipment should not be used if it is not working properly.

Equipment Symbols

The following is a list of symbols used on products manufactured by *Information Technologies*. Some symbols may not appear on your equipment.

Table 1-2. Equipment Symbols	
	ATTENTION: Consult accompanying documents.
	TYPE B EQUIPMENT. Type B equipment is suitable for intentional external and internal application to the patient, excluding direct cardiac application.
	TYPE BF EQUIPMENT. Type BF equipment is suitable for intentional external and internal application to the patient, excluding direct cardiac application. Type BF equipment has an F-type applied part.
	DEFIBRILLATOR-PROOF TYPE BF EQUIPMENT: Type BF equipment is suitable for intentional external and internal application to the patient, excluding direct cardiac application. Type BF equipment is type B equipment with an F-type isolated (floating) part. The paddles indicate the equipment is defibrillator proof.
	ALTERNATING CURRENT (AC).
IPX1	DRIP PROOF.
	EQUIPOTENTIALITY.
O	POWER OFF: disconnection from the mains.
I	POWER ON: connection to the mains.

FCC Information

FCC Rules Compliance

This equipment complies with Part 15 of FCC rules. Operation is subject to the condition that this device does not cause harmful interference.

FCC RF Exposure Compliance

IMPORTANT
RF EXPOSURE—To comply with FCC RF exposure compliance requirements, users should avoid grasping the antenna for any extended period of time while the device is in operation.

FCC Service Information

Servicing the radio frequency transmitter and receiver sections of the Model 340 Telemetry System requires an FCC General Radio Telephone License.

Any changes or modifications made to the Model 340 Telemetry System that are not expressly approved by *Information Technologies*, could void the user's authority to operate this equipment.

For your notes

Chapter 2

Introduction

This chapter contains the following information:

Product Summary

The Corometrics Model 340 Telemetry System (Model 340R Receiver and Model 340T Transmitter) provides a wireless means of transmitting heart rate and uterine activity signals from an ambulatory mother to a bedside fetal or maternal/fetal monitor. The system operates with the following Corometrics brand monitors; if your monitor is not listed, check with your saleperson or service representative for a more current list.

- Model 115
- Model 116
- Model 118
- 120 Series*
- Model 145
- Model 150
- Model 151
- Model 155
- 170 Series

NOTE: The Model 340 Telemetry System does ***not*** support fetal movement detection.

The system monitors ultrasound, ECG (FECG or MECG), and uterine activity (TOCO or IUPC) signals individually or in combination. Refer to your monitor's operator's manual as needed.

* *A 120 Series Monitor requires a Communications Board in order to interface to a Model 340 Telemetry System. If your monitor does not have this option, an upgrade kit is available as cat. no. (REF) 1559BAO. Contact your Service Representative for more information*.

Product Features

The following is a summary of product features:

- Battery operated transmitter provides up to 20 hours* of continuous transmission when operated with fresh batteries.
- A Low Battery indicator, accompanied by an audio indicator, signals an impending low-battery condition.
- A transmitter headset* allows the patient or staff to hear the ultrasonically detected heartbeats for reassurance as well as to verify proper transducer placement.
- A Signal Quality indicator verifies the strength of the radio transmission signal.
- Transducers are quickly and easily interchangeable amongst the Model 340 Telemetry System and most Corometrics brand monitors:
  - *Models 116, 118, 150, 151, 155, and 170 Series:* transducers are interchangeable.
  - *120 Series:* ECG rectangular connector cables are *not* compatible; round connector cables are compatible.
  - *Models 115 and 145:* cat. no. (REF) 5600 ultrasound transducers *cannot* be used with a Model 340. Use only cat. no. (REF) 5700 transducers when the using a Model 115 or 145 with a Model 340 Telemetry System.
- Provides simultaneous monitoring of two heart rates (twins or maternal/fetal) when used with a monitor supporting these parameters. Refer to Table 2-1 for a summary of monitor parameters.

IMPORTANT
INSTRUCTIONS—The operator should review and be familiar with the operator's manual for the fetal or maternal/fetal monitor as well as the "Maternal/Fetal Monitoring Operator's Manual".

Table 2-1. Summary of Monitor Parameters

	115	116	118	126	128	129	145	150	151	151D	155	171	172	173
TOCO	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
IUPC	✓	✓	✓	✓	✓	✓			✓	✓				✓
US	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
FECG	✓	✓	✓	✓	✓	✓			✓	✓				✓
MECG	✓	✓	✓			✓			✓	✓				

* *Use of the headset will deplete the batteries more rapidly.*

For your notes

Chapter 3

Controls, Indicators, and Connectors

This section describes all controls, indicators, and connectors on a Model 340 Telemetry System.

Model 340R Receiver

Model 340R Front Panel

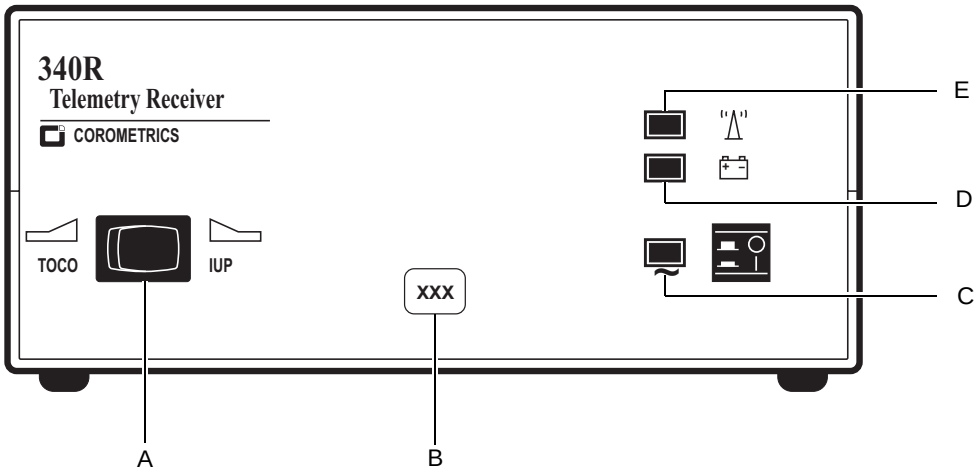
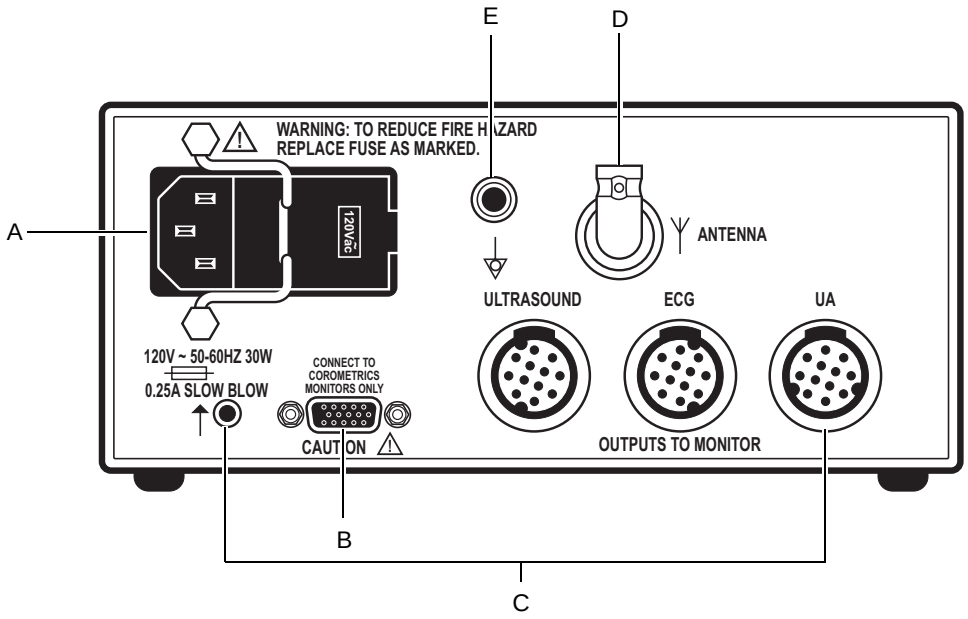


Figure 3-1. Model 340R Receiver Front Panel

Table 3-1. Receiver Front Panel		
	Name	**Description**
A	UA Mode Selector Switch	This switch communicates the active uterine activity mode to the fetal or maternal/fetal monitor: ■ When monitoring with a tocotransducer, set the switch to the TOCO position. ■ When monitoring with an intrauterine pressure catheter, set the switch to the IUP position.
B	Channel Number	The channel number is the customer-designated receiving frequency of the Model 340R Receiver. For each telemetry system, the channel number of the receiver must be identical to the channel number of the transmitter. Also, if you have more than one telemetry system, or other RF devices, each system must have a unique channel number.
C	Power Switch and Indicator	The Power switch turns the receiver on (I) and off (O). When set to on, the green Power indicator illuminates.
D	Low Battery Indicator	The red Low Battery indicator *flashes* when you have approximately 10 minutes of Model 340T Transmitter battery power remaining. The Low Battery indicator stops flashing and *lights continuously* as soon as the battery is depleted.
E	Signal Indicator	The green Signal indicator *lights continuously* when the receiver is accepting radio frequency signals from the transmitter. The Signal indicator *flashes* if the signal strength is weak or marginal.

Model 340R Rear Panel



Note: Antenna shown removed.

Figure 3-2. Model 340R Receiver Rear Panel

Table 3-2. Receiver Rear Panel		
	Name	**Description**
A	AC Line Connector and Fuseholder Module	This module houses the AC-line input connector and the main fuses for the Model 340R Receiver: ■ 100–120 VAC: requires two, 1 A slow-blow fuses. ■ 220–240 VAC: requires two, 1 A time-lag fuses.
B	Auxiliary Output Connector	This connector is used with 120 and 170 Series Monitors only. Do not use this connection method for Models 115, 116, 118, 145, 150, 151, and 155 Monitors. This connector outputs the US, ECG, UA, and Mark signals, acquired by telemetry, to a 120 or 170 Series Monitor. See page 4-5 for complete interconnection details. **As soon as any telemetry mode is detected, the front panel of the 120 or 170 Series Monitor is disabled and all front panel inputs are ignored. In other words, telemetry and monitor modes cannot be "mixed and matched"; you must use telemetry only or direct monitoring only.** **For proper operation with a 170 Series Monitor, disconnect all transducers from the front panel of the monitor.**
C	US, ECG, UA, and Mark Connectors	These connectors are used with Models 115, 116, 118, 145, 150, 151, and 155 Monitors only. Do not use this connection method for 120 and 170 Series Monitors. Each connector outputs the respective signal, acquired by telemetry, to the fetal or maternal/fetal monitor: ■ US: light grey connector which outputs the ultrasound signal. ■ ECG: grey connector which outputs the FECG or MECG signal. ■ UA: white connector which outputs the TOCO or IUPC signal. ■ Mark: connector which outputs the Event Mark signal. See page 4-2 for complete interconnection details.
D	Antenna Connector	Twist-on connector for attaching the Model 340R Receiver antenna.
E	Equipotential Lug	Binding post terminal directly connected to the chassis for use as an equipotentiality connection.

Model 340T Transmitter

Model 340T Bottom Panel

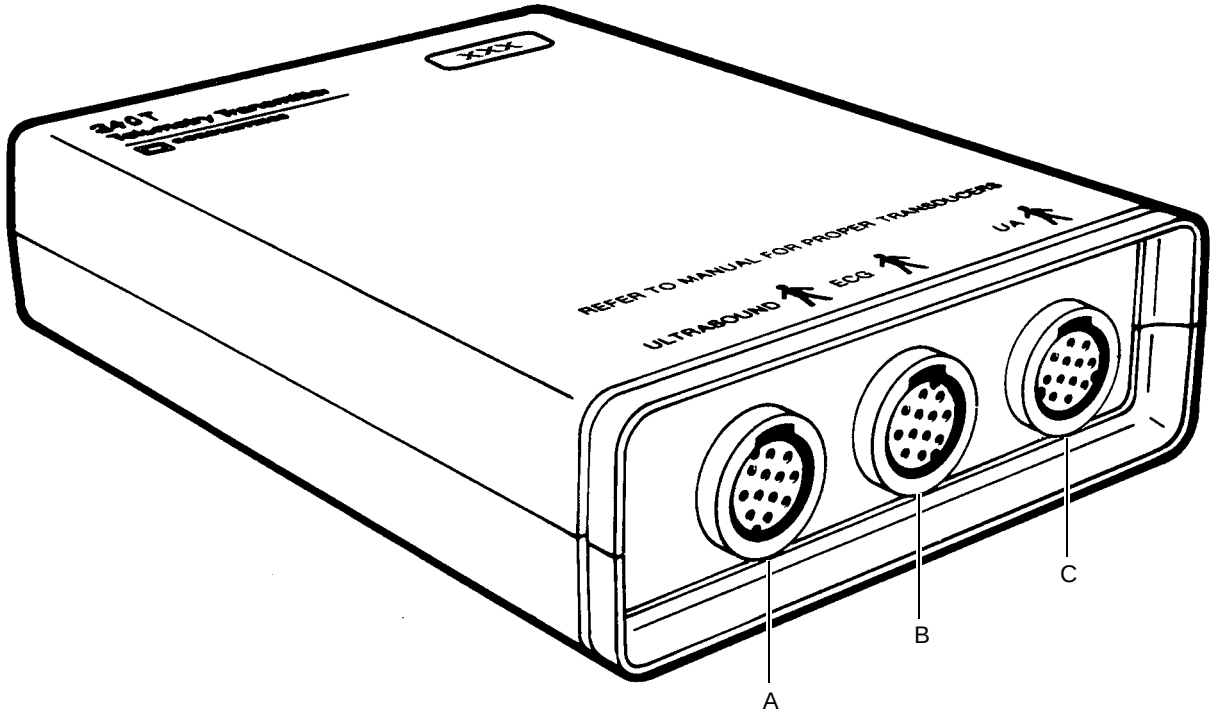
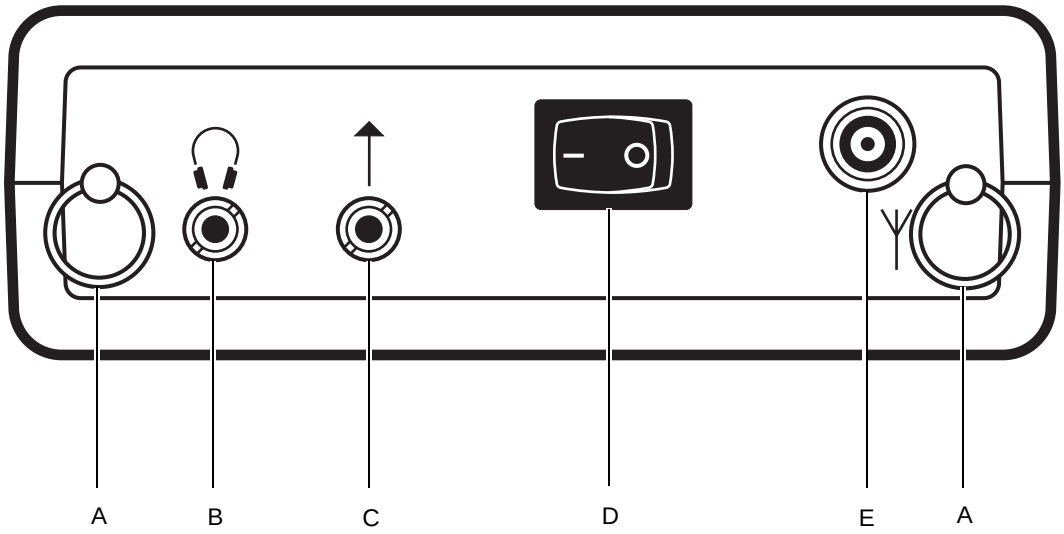


Figure 3-3. Model 340T Transmitter Bottom Panel

Table 3-3. Transmitter Bottom Panel		
	Name	**Description**
A	Ultrasound Input	Connect a Corometrics 5700 Series pulsed Doppler ultrasound transducer to this light gray receptacle. **Corometrics 5600 Series continuous-wave ultrasound transducers are not compatible with the Model 340 Telemetry System. The 5600 Series Transducer was designed for use with Models 115 and 145 Monitors and Models 320 and 330 Telemetry Systems.**
B	ECG Input	Connect an FECG cable/legplate or MECG cable plug to this grey receptacle. This connector is compatible with all *round*-connector FECG/MECG patient cables used with Corometrics-brand monitors.
C	UA Input	Connect a tocotransducer, IUPC, or strain gauge transducer plug to this white receptacle. Contact your Sales Representative about compatibility.

Model 340T Top Panel



Note: Antenna shown removed.

Figure 3-4. Model 340T Transmitter Top Panel

Table 3-4. Transmitter Top Panel		
	Name	**Description**
A	Loops	Loops for attaching the carrying strap.
B	Headset Connector	Connect the headset to this receptacle to listen to the fetal heart rate derived from ultrasound.
C	Remote Event Mark Connector	Connect a Corometrics Remote Event Marker to this receptacle. When the marker's button is pressed for at least one second, an event mark signal is transmitted and one of the following marks prints on the strip chart paper: ■ ↑: This annotation is commonly used to record an "event." This mark is available on all Corometrics-brand monitors. ■ FM↑: This annotation is commonly used as an indication that the mother has perceived fetal movement. (Refer to your monitor's operator's manual to learn if your monitor supports this feature. Refer to your monitor's service manual for information about enabling the option.)
D	Power Switch	Moving the switch to the *on* position (I) turns on the Model 340T Transmitter; moving the switch to the *off* position (O), turns off the transmitter.
E	Antenna Connector	Twist-on connector for attaching the Model 340T Transmitter antenna.

Model 340T Rear Panel Battery Compartment

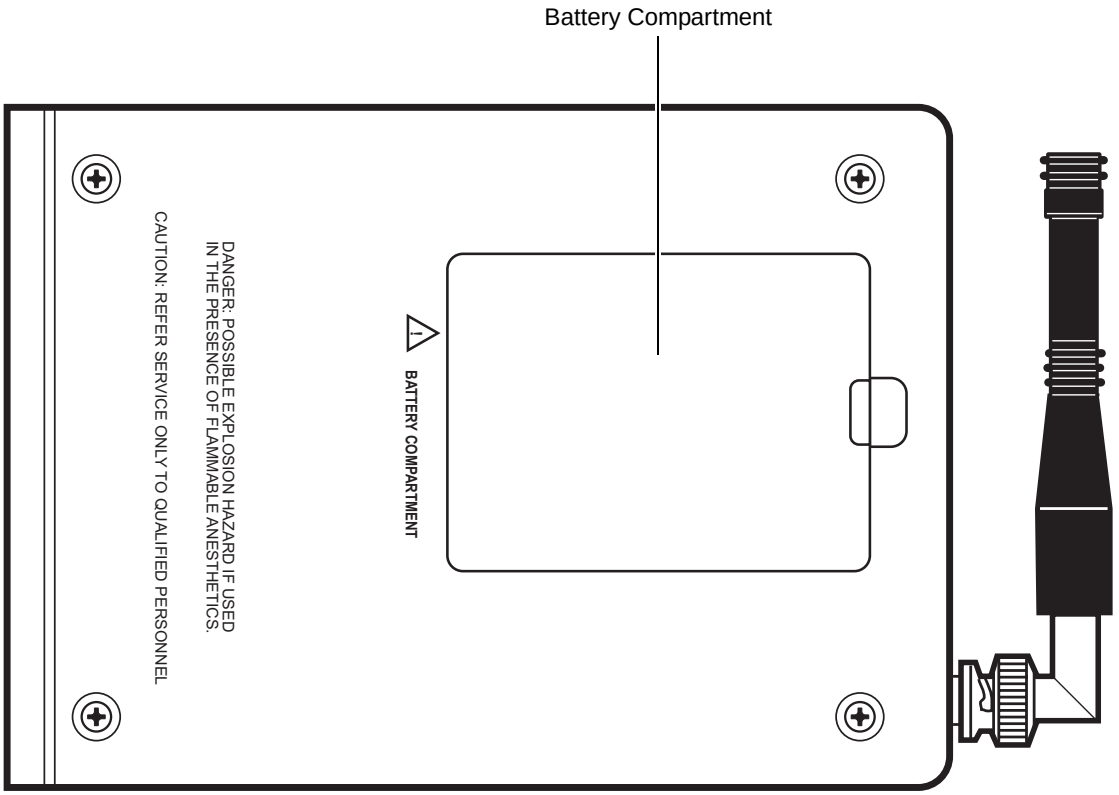


Figure 3-5. Model 340T Transmitter Rear Panel Battery Compartment

The battery compartment holds four “AA” alkaline batteries.

CAUTION

BATTERY STRENGTH—When the battery power is low, the transmitter emits a chirping sound every 4–5 seconds. This signals approximately 10 minutes of remaining battery power. The chirping continues until the battery power is completely depleted, at which time the Model 340T stops transmitting data.

Chapter 4

Setup Procedures

This section contains step-by-step instructions for connecting and testing your Model 340 Telemetry System.

IMPORTANT

CHANNEL NUMBERS—Ensure that the Model 340R Receiver and Model 340T Transmitter are operating on the same frequency; the channel numbers must be identical. The channel number label is located on the front of the Model 340R and on the side of the Model 340T.

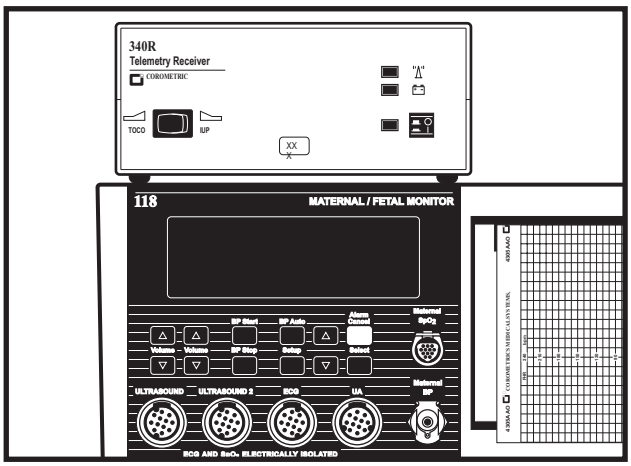
If you have more than one telemetry system, make sure that each transmitter/receiver pair operates on a unique frequency.

Connecting the Receiver and Monitor

There are two types of interconnection methods depending on the model of your fetal or maternal/fetal monitor. Check your monitor model number prior to making any connections.

Models 115, 116, 118, 145, 150, 151, and 155

1. Turn *off* both the monitor and the Model 340R Receiver.
2. Place the receiver on top of, or near, the monitor.



Note: Model 118 shown.

Figure 4-1. Positioning the Receiver

3. Insert the receiver antenna (longer of the two antennas) into the rear panel **Antenna** connector ᛉ; rotate the attachment collar in a clockwise direction until snug.

   NOTE: A Remote Antenna Bracket, cat. no. (REF) 1441AAO, is available for attaching the antenna when the receiver will be enclosed in a cart or cabinet. Refer to the Installation Instructions, part no. (REF) 14153AA, included with the bracket; or contact your Biomedical Engineering Department for assistance. To attach the antenna to the BNC connector on the bracket, rotate the antenna attachment collar in a clockwise direction until snug.

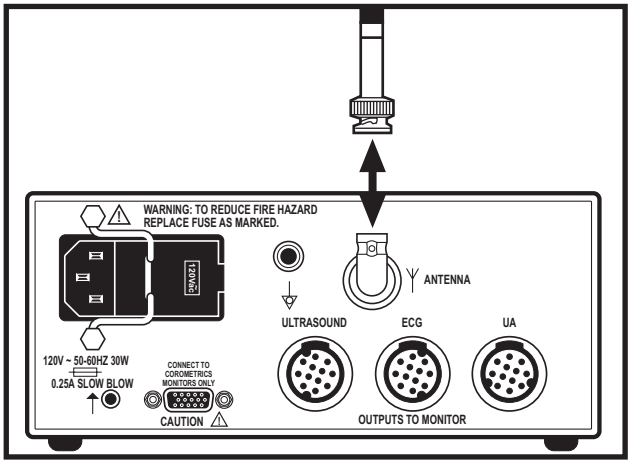


Figure 4-2. Attaching the Receiver Antenna

4. Connect the appropriate ultrasound, ECG, and uterine activity interconnect cables to the corresponding **Ultrasound**, **ECG**, and **UA** connectors on the receiver rear panel.

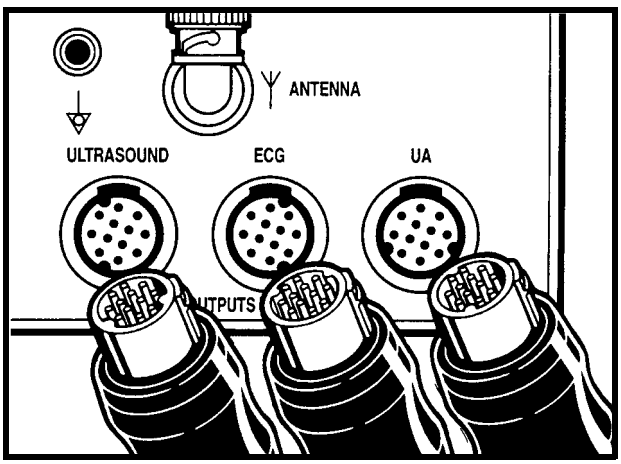
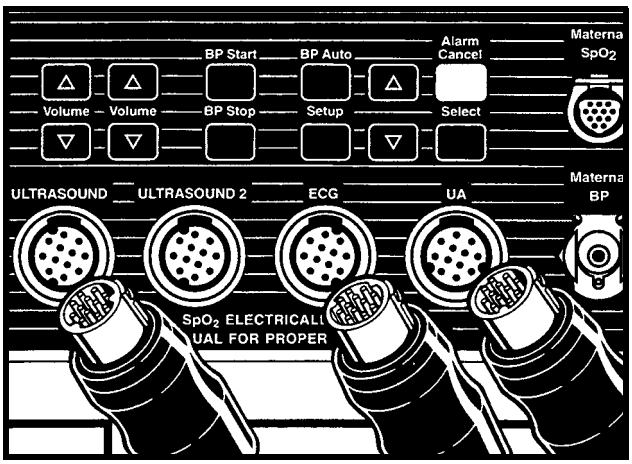


Figure 4-3. Attaching the Receiver Interconnect Cables

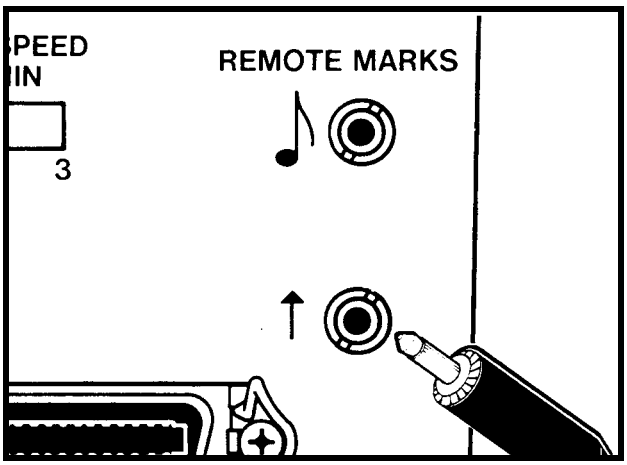
5. Connect the remaining ends of the cables to the color-coded **Ultrasound**, **ECG**, and **UA** input connectors on the front or side panel of the monitor.



Note: Model 118 shown.

Figure 4-4. Attaching the Monitor Interconnect Cables

6. Connect one end of the Remote Event Mark interconnect cable to the ↑ connector on the receiver rear panel; connect the other end to the **Remote Marks** ↑ connector on the rear or side panel of the monitor.



Note: Model 118 shown.

Figure 4-5. Attaching the Remote Mark Interconnect Cable

120 and 170 Series

IMPORTANT
120 SERIES COMMUNICATIONS OPTION—A 120 Series Monitor requires a Communications Board in order to interface to a Model 340 Telemetry System. If your monitor does not have this option, an upgrade kit is available as cat. no. (REF) 1559BAO. Contact your Service Representative for more information.

1. Turn *off* both the monitor and the Model 340R Receiver.
2. Place the receiver on top of, or near, the monitor.
3. Insert the receiver antenna (longer of the two antennas) into the rear panel **Antenna** connector ᛉ; rotate the attachment collar in a clockwise direction until snug.

NOTE: A Remote Antenna Bracket, cat. no. (REF) 1441AAO, is available for attaching the antenna when the receiver will be enclosed in a cart or cabinet. Refer to the Installation Instructions, part no. (REF) 14153AA, included with the bracket; or contact your Biomedical Engineering Department for assistance. To attach the antenna to the BNC connector on the bracket, rotate the antenna attachment collar in a clockwise direction until snug.

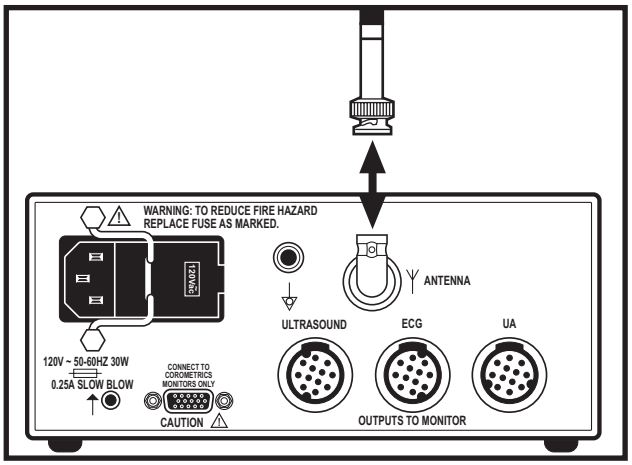


Figure 4-6. Attaching the Receiver Antenna

4. Plug one end of the interconnection cable into the Auxiliary Output connector (**Connect to Corometrics Monitor Only**) on the receiver rear panel.

5. Plug the other end into the respective telemetry connector on the real panel of the monitor:

   120 Series: Connect to **J101**.

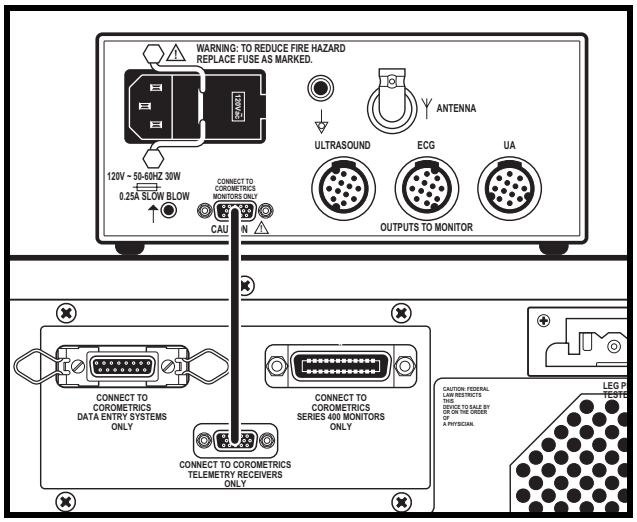


Figure 4-7. Attaching the Monitor Interconnect Cable to a 120 Series Monitor

170 Series: Connect to the receptacle labeled "⚠".

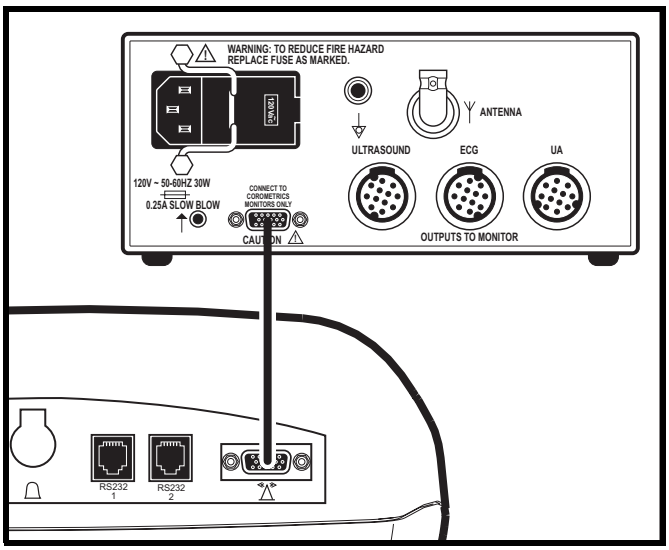


Figure 4-8. Attaching the Monitor Interconnect Cable to a 170 Series Monitor

Setting Up the Model 340T Transmitter

Installing Batteries

NOTE: If the Model 340T Transmitter will not be used for an extended period of time, remove the batteries to prevent damage due to battery leakage.

1. Turn *off* the Model 340T Transmitter.
2. Locate the battery compartment cover plate on the transmitter rear panel.
3. Remove the cover plate. Use your thumb to lift the raised end.

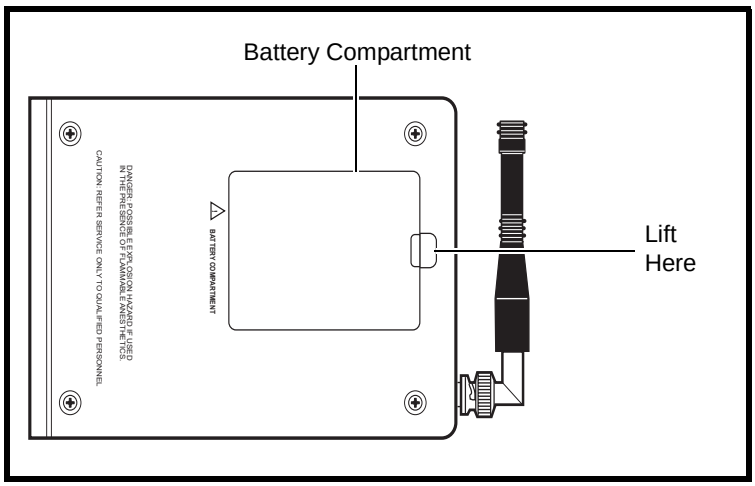
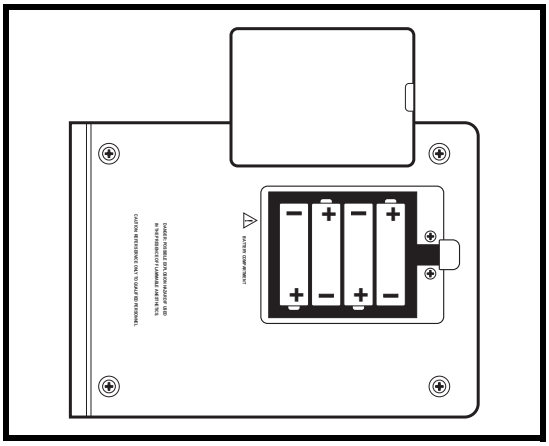


Figure 4-9. Accessing the Batteries

4. Remove the depleted batteries.

CAUTION
BATTERY DISPOSAL—Follow the battery manufacturer's recommendations or your hospital policy for the disposal of used batteries.

5. Insert four new “AA” alkaline batteries, observing the polarity markings in the battery compartment.



Note: Antenna shown removed

Figure 4-10. Transmitter Battery Orientation

6. Replace the battery compartment cover plate. Insert the lip of the cover in the lower portion of the compartment opening; swing the other end of the cover down and snap into place.

Attaching the Antenna

Insert the transmitter antenna (shorter of the two antennas) into the top panel **Antenna** connector; rotate the attachment collar in a clockwise direction until snug.

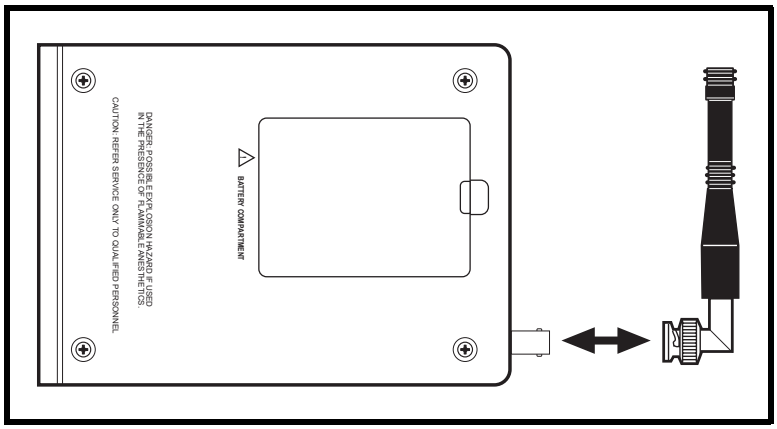


Figure 4-11. Attaching the Transmitter Antenna

Attaching the Carrying Strap

Secure the metal clips at each end of the carrying strap to the belt attachment loops on each side of the transmitter.

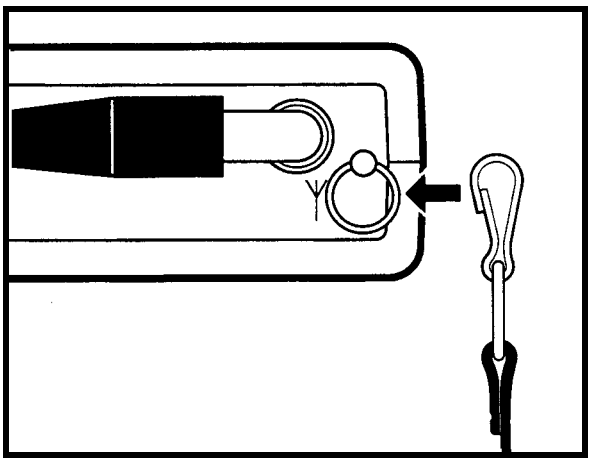


Figure 4-12. Attaching the Carrying Strap

Performing a Functional Checkout

Initial Conditions

Turn *on* the Model 340T Transmitter, the Model 340R Receiver, and the monitor attached to the receiver.

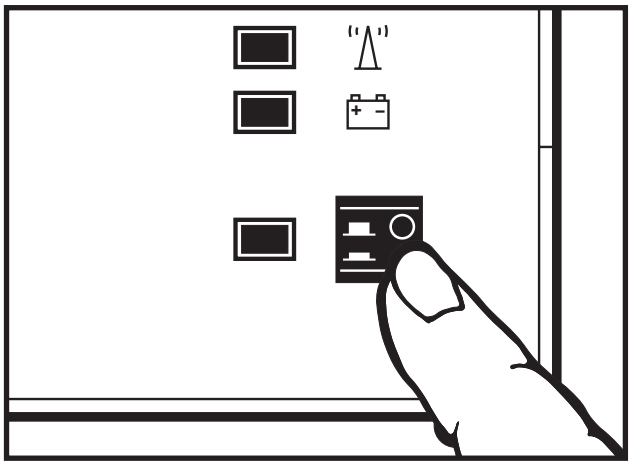


Figure 4-13. Applying Power

Testing the Radio Frequency

1. Check the status of the **Signal** indicator on the Model 340R Receiver:
   - *Continuous Green:* indicates the transmitter is active and the batteries have adequate capacity.
   - *Flashing Green:* indicates the signal strength is weak or marginal.

2. Check the status of the **Battery** indicator on the Model 340R Receiver:
   - *Off:* the transmitter batteries have power.
   - *Flashing Red:* the transmitter batteries are low and should be replaced before further patient use.
   - *Continuous Red:* the transmitter batteries are depleted.

Testing the Ultrasound Functions

IMPORTANT
TRANSDUCER TYPE—Use only Corometrics 5700 Series Ultrasound Transducers with the Model 340 Telemetry System.

1. Plug an ultrasound transducer into the **Ultrasound** connector on the transmitter.

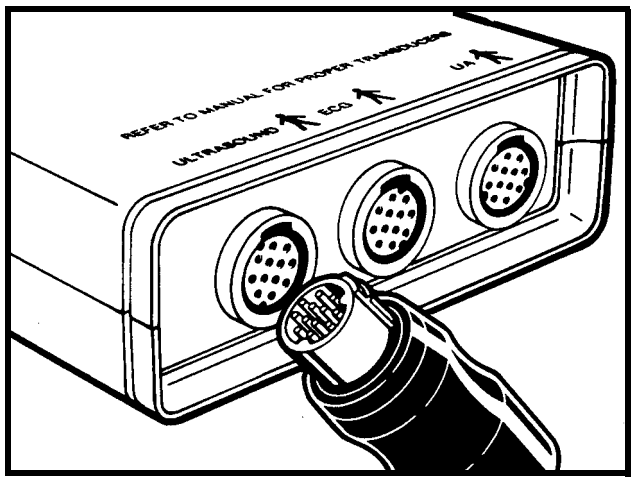


Figure 4-14. Connecting an Ultrasound Transducer

2. Verify the following:

   - *Models 115, 145:* The corresponding FHR display reads 0 BPM.
   - *Models 116, 118, 150, 151, 118, 155 and Series 120, 170:* The corresponding FHR display shows "– – –".

   If the display fails to illuminate, ensure that the corresponding interconnection cable is firmly attached to both the monitor and the receiver.

3. Use your finger to gently rub the ultrasound transducer face in a rhythmic manner. Try to maintain a steady rate and verify the following on the monitor:

   - the corresponding FHR display value responds to the rubbing;
   - the corresponding FHR heartbeat indicator ♥ responds to the input; and
   - the ultrasound audio tones are synchronous with the transducer stroking.

4. Plug the headset into the transmitter's headset connector 🎧.

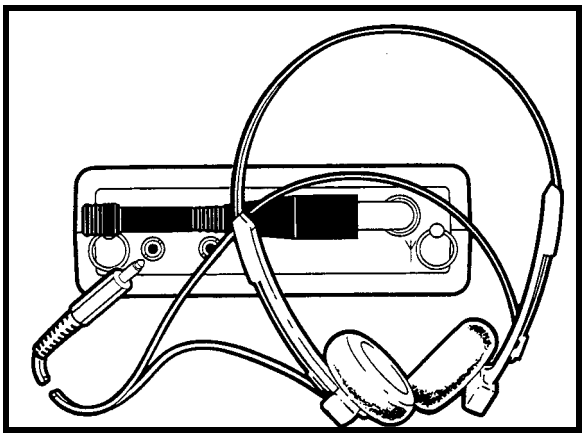


Figure 4-15. Connecting the Headset

5. Rub the face of the ultrasound transducer. Verify that you can hear ultrasound audio tones from both sides of the headset.

Testing the ECG Functions

NOTE: Not all monitors have a legplate tester. Refer to your monitor's operator's manual for complete information.

1. Slide the legplate into the monitor's **Legplate Tester** jack and hold firmly in place. (The legplate tester uses an internal ECG simulator circuit for testing cable/legplate assemblies. The tester simulates a signal of 120 BPM ± 1 BPM.)
2. Plug the other end into the **ECG** connector on the transmitter. Verify the following on the monitor:
   - the corresponding FHR value reads 120 BPM;
   - the corresponding FHR heartbeat indicator ♥ flashes at a rate of 120 times per minute; and
   - the ECG "beep" is heard from the speaker.

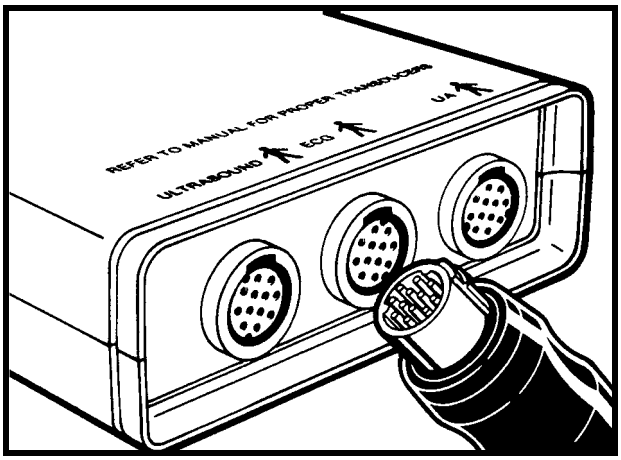


Figure 4-16. Connecting an FECG Cable/Legplate

Testing the UA Functions

1. Place the receiver's **UA Mode Selector** switch in the **TOCO** position.

IMPORTANT
TRIMLINE TOCOTRANSDUCERS—If the monitor is *on* when you connect or re-connect a Trimline Tocotransducer to the **UA** connector, you must wait at least 10 seconds before pressing the **UA Reference** button. If the monitor is *off*, you must wait at least 10 seconds from the time the monitor is powered on.

2. Plug a tocotransducer into the transmitter's **UA** connector. Verify the following on the monitor:

   - *If the monitor has a UA display:* the display reads an arbitrary pressure value.
   - *If the monitor does not have a UA display:* turn on the strip chart recorder and check that TOCO prints on the paper's mode annotation line.

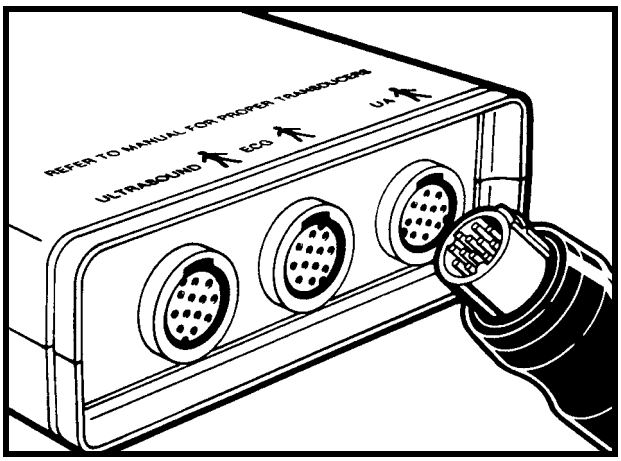


Figure 4-17. Connecting a Tocotransducer or IUPC Cable

IMPORTANT
DEFAULT REFERENCE VALUE—Most monitors have a default UA reference of 10 relative units. Take into consideration that newer model monitor's can be configured to store a custom default value.

3. Press the monitor's **UA Reference** button to set the UA value to 10 relative units. Verify the following on the monitor:

   - *If the monitor has a UA display:* the display reads 10 relative units.
   - *If the monitor does not have a UA display:* turn on the strip chart recorder and check that the UA REF message and TOCO mode annotation both print on the paper.

4. Apply gentle pressure to the tocotransducer pressure sensing button and verify that the monitor (display or uterine activity trace) responds to the pressure input. Increasing force should produce an increasing value and vice versa.

   If no pressure changes are recorded, ensure that the corresponding interconnection cable is firmly attached to both the monitor and the receiver.

5. *This step applies to monitors which support IUP monitoring.* Place the receiver's **UA Mode Selector** switch in the **IUP** position. Verify the following on the monitor:

   - *If the monitor has a mode indicator:* the IUP mode should be indicated.
   - *If the monitor does not have a mode indicator:* turn on the strip chart recorder and check that the IUP mode annotation prints on the paper.

   NOTE: Place the **UA Mode Selector** switch back in the **TOCO** position unless you plan to monitor with an IUPC.

Testing the Remote Event Marker Function

1. Plug the Remote Event Marker into the transmitter's **Remote Marks** connector.
2. Turn on the monitor's strip chart recorder.
3. Press the Remote Event Marker's pushbutton for at least one second. Verify that an appropriate mark is printed on the paper:

   - ↑: This annotation is commonly used to record an "event." This mark is available on all Corometrics-brand monitors.
   - FM↑: This annotation is commonly used as an indication that the mother has perceived fetal movement. (Refer to your monitor's operator's manual to learn if your monitor supports this feature. Refer to your monitor's service manual for information about enabling the option.)

Testing the Environment

Decide on which areas of your facility will be used for ambulatory monitoring. Test each location separately to rule out rooms that are restricted due to metal structures blocking signal transmission.

Chapter 5

Monitoring via Telemetry

This section provides a brief overview of telemetry monitoring procedures. Refer to the "Maternal/Fetal Monitoring Operator's Manual" for patient application information. Also refer to your monitor's operator's manual.

Suggestions for Ambulatory Monitoring

IMPORTANT
DESIGNATED AREAS—Show the patient the areas that are within signal range and where signal reception is clear.

1. Instruct the patient to wear the Model 340T Transmitter with the antenna pointed *towards* the Model 340R Receiver when possible.
2. Adjust the carrying strap to a comfortable length.
3. Encourage the patient to walk in a smooth, gliding motion. It is preferable to slide feet rather than moving quickly which may cause bouncing and artifact.
4. Instruct the patient, following each fetal movement, to listen via the headset, for continued fetal heart rate tones.
5. Make sure the transducer cables are not dragging on the floor. If the patient is in danger of tripping over the cables, drape them over the patient's arm; or shorten the length by taping a loop.

NOTE: Transducers with short cables are available. Contact your *Information Technologies* Sales Representative.

Monitoring Reminders

General

- Use the correct interconnection method according to your monitor model. See page 4-2 and page 4-5.
- Remember to apply power to all three devices: monitor, receiver, and transmitter.
- Check that each interconnection cable is firmly attached to both the receiver and the monitor.
- As soon as any telemetry mode is detected, the front panel of the 120 or 170 Series Monitor is disabled and all front panel inputs are ignored. In other words, telemetry and monitor modes cannot be "mixed and matched"; you must use telemetry only or direct monitoring only.

IMPORTANT
170 SERIES—For proper operation with a 170 Series Monitor, disconnect all transducers from the front panel of the monitor.

Ultrasound

- Use only Corometrics 5700 Series ultrasound transducers with a Model 340 Telemetry System.
- Remind the patient to use the headset to check for continual pickup of the fetal heart rate signal following each fetal movement.

FECG

- You may need to tape the transducer cable to the patient to prevent excessive tension on the legplate or attachment pad.
- The recommended position for the legplate is on top of the upper thigh instead of the inner thigh. This facilitates walking and minimizes fluid contacting the legplate.

Tocotransducer

- Remember to place the receiver's **UA Mode Selector** switch in the **TOCO** position.
- When connecting or re-connecting a Corometrics Trimline Tocotransducer to the transmitter's **UA** connector, you must wait at least 10 seconds before pressing the monitor's **UA Reference** button. If any device (monitor, receiver, transmitter is off), you must wait at least ten seconds from the time the last device is powered on.

IUP

- Remember to place the receiver's **UA Mode Selector** switch in the **IUP** position.

Chapter 6

Maintenance

All equipment, no matter how reliable, needs to be maintained on a regular basis. This section describes general care and cleaning instructions for the Model 340 Telemetry System.

General Cleaning Precautions

NOTE: Refer to your monitor's operator's manual for cleaning instructions for the monitor and transducers.

CAUTION

SHOCK—Unplug the fetal or maternal/fetal monitor and the Model 340R Receiver from the AC power source and detach all accessories. Do not immerse accessories in any liquid. Do not use abrasive cloth or cleaners on the monitor, the Model 340R Receiver, the Model 340T Transmitter, or any accessories.

Cleaning the Transmitter and Receiver

1. Wipe any fluids from the surface of each unit.
2. Dampen a soft cloth with isopropyl alcohol and gently rub soiled area until clean.
3. Dry with a soft, dry cloth.

For your notes

Chapter 7

Troubleshooting

This section of the manual provides a troubleshooting guide for the most basic Model 340 operational problems. If the response to a specific question is not found, contact the Service Department at one of the following telephone numbers:

Inside the United States: Call 1-800-558-5120.

Outside the United States: Call 414-355-3790;
or contact your local distributor.

Problem Chart

Table 7-1. Troubleshooting

Problem		Probable Cause	Solution
Receiver **Power** indicator does not light when the receiver is turned on.		■ Receiver not connected to AC receptacle. ■ Defective AC power cord. ■ Defective AC outlet.	■ Connect to AC receptacle. ■ Replace AC power cord. ■ Use a different AC outlet.
	**Signal** indicator flashes with transmitter turned on.	■ Transmitter batteries completely discharged. ■ Mismatched transmitter and receiver channels.	■ Replace batteries. Dispose of used batteries according to the manufacturer's directions. ■ Ensure transmitter and receiver are labeled with identical channel numbers.
	**Signal** indicator flashes intermittently as patient ambulates.	■ Patient outside signal transmission range. ■ Metal in walls, doors, or other structures between transmitter and receiver.	■ Instruct patient to stay within signal range and designated areas where reception is clear. ■ Install optional ceiling antenna system. ■ Contact your *Information Technologies* Service Representative.
 	**Signal** and **Low Battery** indicators light with transmitter turned off.	■ External source of radio frequency interference is present. ■ Another transmitter with the same frequency is use within the same facility. ■ Service required.	■ Contact your *Information Technologies* Service Representative. ■ Discontinue use of one of the transmitters. ■ Contact your *Information Technologies* Service Representative.
	**Low Battery** indicator flashes with transducers plugged into transmitter.	Transmitter batteries have less than 10 minutes of energy left.	Replace the batteries. Dispose of used batteries according to the manufacturer's instructions.
	**Low Battery** indicator lights continuously with no transducers plugged into transmitter.	Transmitter batteries are depleted.	Replace the batteries. Dispose of used batteries according to the manufacturer's instructions.

Table 7-1. Troubleshooting (Continued)		
Problem	**Probable Cause**	**Solution**
Erratic FHR/UA recording.	■ Transducer not properly placed. ■ Transducer not properly connected to transmitter. ■ Receiver interconnection cable(s) not properly attached. ■ Receiver interconnection cable(s) defective. ■ Wrong interconnection cable(s) in use. ■ Radio frequency interference. ■ Exceeding transmission range. ■ Shielding effect of hospital structure.	■ Reposition transducer. ■ Ensure the transducer is securely attached to the transmitter. ■ Ensure interconnection cable(s) firmly attached to both monitor and receiver. ■ Replace interconnection cable(s). ■ Verify interconnection method. ■ Instruct patient to stay within signal range and designated areas where reception is clear. ■ Install optional ceiling antenna system. ■ Contact your *Information Technologies* Service Representative.
Monitor FHR and UA displays do not light when transducers are plugged into transmitter.	■ Monitor, transmitter, and/or receiver off. ■ Receiver interconnection cable(s) not properly attached. ■ Receiver interconnection cable(s) defective. ■ Wrong interconnection cable(s) in use.	■ Ensure all three devices are turned on. ■ Ensure interconnection cable(s) firmly attached to both monitor and receiver. ■ Replace interconnection cable(s). ■ Verify interconnection method.
Transmitter “chirps” every 4–5 seconds.	Transmitter batteries have less than 10 minutes of energy left.	Replace the batteries. Dispose of used batteries according to the manufacturer’s instructions.

For your notes

Chapter 8

Supplies and Accessories

This section provides an overall listing of supplies and accessories for use with a Corometrics Model 340 Telemetry System and with Corometrics Fetal or Maternal/Fetal Monitors. To order any of the supplies and accessories listed in this manual:

Inside the United States: Call 1-800-558-5120.

Outside the United States: Call 414-355-3790;
or contact your local distributor.

This chapter contains the following information:

General

Table 8-1. General Supplies	
Item	**Catalog Number (REF)**
Detachable IEC AC Power Cord, United States Plug	1392AAA
Remote Event Marker, 8-foot Cord	3919BAO
Remote Event Marker, 5-foot Cord	3919CAO
Headset for Model 340 Telemetry System	3316AAO
Ultrasound Interconnect Cable (Models 115, 145 only)	1399AAO
Ultrasound Interconnect Cable (Models 116, 118, 150, 151, 155 only)	1399BAO
ECG Interconnect Cable (Models 115, 116, 118, 145, 150, 151, 155 only)	1375BAO
UA Interconnect Cable (Models 115, 116, 118, 145, 150, 151, 155 only)	1400AAO
Mark Interconnect Cable (Models 115, 116, 118, 145, 150, 151, 155 only)	1397AAO
System Interconnect Cable (Series 120, 170 only)	1563AAO
Remote Antenna Bracket with Extension Cable for Cart Use	1441AAO
Model 2116B Clinical-Notes/Data-Entry System	2116BAX
Model 3116 LDR/LDRP Bedroom Style Mobile Cart—Finished	3116AAO
Model 3116 LDR/LDRP Bedroom Style Mobile Cart—Unfinished	3116BAO
Model 146 Fetal Acoustic Stimulator	0146AAY

Paper

Table 8-2. Paper Supplies	
Item	**Catalog Number (REF)**
Z-Fold Chart Paper Pack, 30–240 BPM Heart Rate Scale (40/carton)	4305CAO
Z-Fold Chart Paper Pack, 50–210 BPM Heart Rate Scale (40/carton)	4305DAO
Chart Guard Label Packet	4914BAO

Ultrasound

Table 8-3. Ultrasound Supplies

Item	Catalog Number (REF)
Loop-Style Ultrasound Transducer, 5-foot Cord	5700EAX
Loop-Style Ultrasound Transducer, 8-foot Cord	5700AAX
Loop-Style Ultrasound Transducer, 10-foot Cord	5700CAX
Button-Style Ultrasound Transducer, 5-foot Cord	5700FAX
Button-Style Ultrasound Transducer, 8-foot Cord	5700BAX
Loop-Style Ultrasound Transducer (Nautilus), 5-foot Cord	5700KAX
Loop-Style Ultrasound Transducer (Nautilus, 8-foot Cord	5700LAX
Loop-Style Ultrasound Transducer (Nautilus), 10-foot Cord	5700MAX
Button-Style Ultrasound Transducer (Nautilus), 5-foot Cord	5700GAX
Button-Style Ultrasound Transducer (Nautilus), 8-foot Cord	5700HAX
Loop-Style Ultrasound Transducer (Nautilus), 5-foot Cord	5700JAX
Ultrasound Coupling Gel Bottle, 250 ml (12/carton)	2434AAO
Ultrasound Coupling Gel Bottle, 5 liter	2475AAO
Reusable Belt for Loop-Style Transducer, Mesh Style (10/carton)	4425AAO
Reusable Belt for Loop-Style Transducer, Velcro Style (10/carton)	4425CAO
Reusable Belt for Button-Style Transducer, Elastic Style (10/carton)	4425EAO
Semi-Reusable Belt for Loop-Style Transducer, Velcro Style (2/pack; 50 packs/carton)	4425FAO
Single-Patient Use Belt for Loop-Style Transducer, Foam Style with Velcro Closure	8024AAO

IMPORTANT

TRANSDUCER TYPE—Use only Corometrics 5700 Series Ultrasound Transducers. Do not use a Corometrics 5600 Series Transducer. The 5600 Series Transducers are only for direct connection to a Model 115 or Model 145 Fetal Monitor or for use with a Model 320 or Model 330 Telemetry System.

FECG

Table 8-4. FECG Supplies	
Item	**Catalog Number (REF)**
Qwik Connect *Plus* Spiral Electrode (50/carton)	7000AAO
Legplate for Qwik Connect *Plus* Spiral Electrode, 8-foot Cord	1590AAO
Button-Style Legplate for Qwik Connect *Plus* Spiral Electrode, 8-foot Cord	1590CAO
Strap Adaptor for Qwik Connect *Plus* Spiral Electrode Legplates	1594AAO
ECG Conductive Cream Bottle, 118 ml (12/carton)	4514AAO
Reusable Legplate Strap with Velcro Closure (24/carton)	2023AAO
Single-Patient Use Legplate Strap	8036AAO

Tocotransducer

Table 8-5. Tocotransducer Supplies	
Item	**Catalog Number (REF)**
Loop-Style Tocotransducer (Nautilus), 5-foot Cord	2264KAX
Loop-Style Tocotransducer (Nautilus), 8-foot Cord	2264LAX
Loop-Style Tocotransducer (Nautilus), 10-foot Cord	2264MAX
Button-Style Tocotransducer (Nautilus), 5-foot Cord	2264GAX
Button-Style Tocotransducer (Nautilus), 8-foot Cord	2264HAX
Button-Style Tocotransducer (Nautilus), 10-foot Cord	2264JAX
Reusable Belt for Loop-Style Transducer, Mesh Style (10/carton)	4425AAO
Reusable Belt for Loop-Style Transducer, Velcro Style (10/carton)	4425CAO
Reusable Belt for Button-Style Transducer, Elastic Style (10/carton)	4425EAO
Semi-Reusable Belt for Loop-Style Transducer, Velcro Style (2/pack; 50 packs/carton)	4425FAO
Single-Patient Use Belt for Loop-Style Transducer, Foam Style with Velcro Closure	8024AAO

IUPC

Table 8-6. IUPC Supplies	
Item	**Catalog Number (REF)**
Corometrics Softrans IUPC with Amnio Infusion/Sampling Capabilities (10/carton)	2076AAO
Corometrics Softrans Intermediate Cable	1336AAO
Reusable Strain Gauge Pressure Transducer, 10-foot Cord (with Holder)	4007BAX
Reusable Strain Gauge Pressure Transducer, 10-foot Cord (without Holder)	4007LAX
Holder for Reusable Pressure Transducer	4516BAO
IUP Kit with Syringe for Reusable Pressure Transducer (50/carton)	2069AAO
Single-Patient Use Sterile Dome (10/carton)	5512AAO
Single-Patient Use Sterile Dome (120/carton)	5512BAO
Reusable Dome (5/carton)	5507AAO
Pressure Relief Valve for Pressure Transducer Dome (5/carton)	8070AAO
Disposable Strain Gauge Pressure Transducer (10/carton)	4009AAX
Holder for Disposable Pressure Transducer	4519AAO
Holder Assembly for Disposable Pressure Transducer	4518BAO

MECG

Table 8-7. MECG Supplies	
Item	**Catalog Number (REF)**
MECG Cable (round connector) for use with detachable leadwires, USA/AHA	1554AAO
MECG Cable (round connector) for use with detachable leadwires, Intl./IEC	1554BAO
Multi-Link Snap Leadwires, Set of 3, Grouped Detachable, 31 inches	411203-001
Multi-Link Snap Leadwires, Set of 5, Individually Detachable, 31 inches	411200-001
Multi-Link Grabber Leadwires, Set of 3, Grouped Detachable, 31 inches	412682-001
Multi-Link Grabber Leadwires, Set of 5, Individually Detachable, 31 inches	414556-001
Leadwire Adapter, 3-Lead Multi-Link to 3-Lead DIN	414371-001
Electrodes, Round, Foam, Pouches of 30, Case of 300	9431-004

Chapter 9

Technical Specifications

NOTE: Specifications are subject to change without notice.

This section contains a detailed list of the technical specifications for the Model 340 Telemetry System.

This chapter lists specifications for the following:

Model 340T Transmitter

Table 9-1. Model 340T Transmitter		
Category	**Technical Specifications**	
Physical Characteristics		
Height:	1.8 in (4.5 cm)	
Width:	5.4 in (13.8 cm)	
Depth:	7.5 in (19.0 cm)	
Weight:	1.75 lbs (0.8 kg)	
Environmental Conditions	**Operating**	**Storage**
Ambient Temperature:	50°F to 104°F (10°C to 40°C)	14°F to 131°F (–10°C to 55°C)
Relative Humidity:	5% to 95%, non-condensing	5% to 95%, non-condensing
Atmospheric Pressure:	700–1060 mbar (525–795 mmHg)	700–1060 mbar (525–795 mmHg)
Certification and Compliance		
UL:	UL-544 Listed	
FCC:	Complies with FCC Part 90	
Industry Canada:	Complies with RSS-119	
Monitoring Modes		
Fetal Heart Rate:	Ultrasound (US) and Fetal ECG (FECG)	
Uterine Activity:	External Tocotransducer (TOCO) or Internal Intrauterine Pressure Catheter (IUPC)	
Maternal Heart Rate:	Maternal ECG (MECG)	
Ultrasound Mode		
System:	Pulse Doppler	
Transmitter Frequency:	1.151 MHz	
Intensity (I_{sata}):	<5 mW/cm^2	
ECG Mode		
Input Impedance:	>1 GΩ	
dc Tolerance:	±1 V	
Common Mode Rejection Ratio:	>90 dB	
FECG Sensitivity:	20 µV to 1 mV	
MECG Sensitivity:	0.5 mV to 5 mV	
TOCO Mode		
Type:	Tocotransducer	
Sensitivity:	20 µV/relative unit	
Range:	–50 to +250 relative units	
IUPC Mode		
Type:	dc Strain Gauge	
Sensitivity:	20 µV/mmHg	
Range:	–50 to +250 mmHg	
RF Section		
Output Power:	10 mW	
Available Frequencies:	430–470 MHz	
Channel Bandwidth:	25 kHz	
Transmission Range:	1640 ft (500 m), line of sight	
Antenna Type:	Flexible, detachable, BNC interconnect	

Table 9-1. Model 340T Transmitter	
Category	**Technical Specifications**
Batteries Type: Life:	 Four “AA” Alkaline Cells, 6.0 Vdc at 2450 mAh 20 h, approximately[a]
Control:	On/Off Switch
Audio Indicator:	Low Battery
Connectors:	Remote Event Marker Input, Headset Output

[a] *Use of the headset will deplete the batteries more rapidly*.

Model 340R Receiver

Table 9-1. Model 340R Receiver		
Category	**Technical Specifications**	
Power Requirements		
Nominal Line Voltage:	100–120 VAC	220–240 VAC
Line Frequency:	50/60 Hz	50/60 Hz
Power Consumption (maximum):	30 W	30 W
Chassis Leakage:	<50 µA	
Physical Characteristics		
Height:	3.2 in (8.1 cm)	
Width:	7.4 in (18.8 cm)	
Depth:	11.4 in (29.0 cm)	
Weight:	7.0 lbs (3.2 kg)	
Environmental Conditions	**Operating**	**Storage**
Ambient Temperature:	50°F to 104°F (10°C to 40°C)	14°F to 131°F (–10°C to 55°C)
Relative Humidity:	5% to 95%, non-condensing	5% to 95%, non-condensing
Atmospheric Pressure:	700–1060 mbar (525–795 mmHg)	700–1060 mbar (525–795 mmHg)
Certification and Compliance		
UL:	UL-544 Listed	
FCC:	Complies with FCC Part 15	
Industry Canada:	Complies with RSS-119	
Output Signals:	US, ECG, UA, and Mark	
RF Section		
Input Impedance:	50 Ω	
Input Sensitivity:	<0.4 µV for 12 dB SINAD	
Antenna Type:	Flexible, detachable, BNC interconnect (Other factory-approved external antennas or antenna systems may be used. Contact your *Information Technologies* Service Representative for more information.)	
Controls:	On/Off Switch, UA Mode Switch	
Visual Indicators:		
Power:	Green LED	
Signal Strength:	Green LED	
Transmitter Low/Depleted Battery:	Red LED	
Connectors		
AC Line Input:	3-Prong, IEC-Style	
Mark Output:	Use only with Models 115, 116, 118, 145, 150, 151, and 155 Monitors.	
Ultrasound Output:	Use only with Models 115, 116, 118, 145, 150, 151, and 155 Monitors.	
ECG Output:	Use only with Models 115, 116, 118, 145, 150, 151, and 155 Monitors.	
UA Output:	Use only with Models 115, 116, 118, 145, 150, 151, and 155 Monitors.	
Auxiliary Output:	Use only with Series 120 and 170 Monitors.	

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