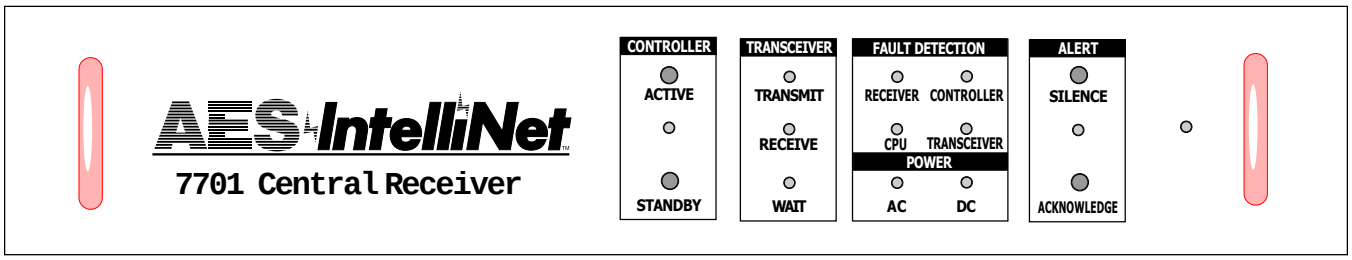
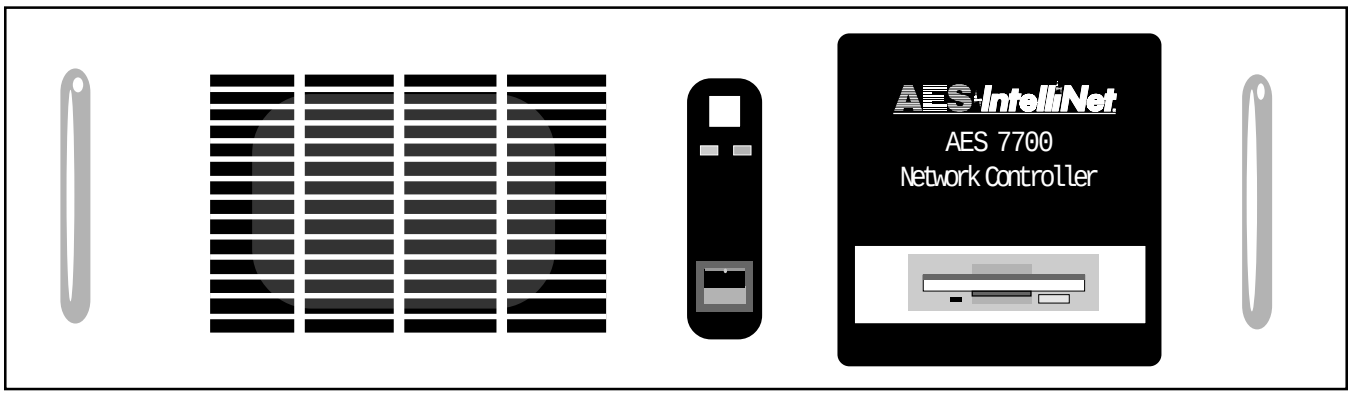
AES • 7700 CENTRAL STATION

INSTALLATION & OPERATION MANUAL
Including AES 7701 Central Receiver
7700 Network Controller
7730 Central Transceiver





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Document 40-0551u, 12/96, Rev A, Section 2

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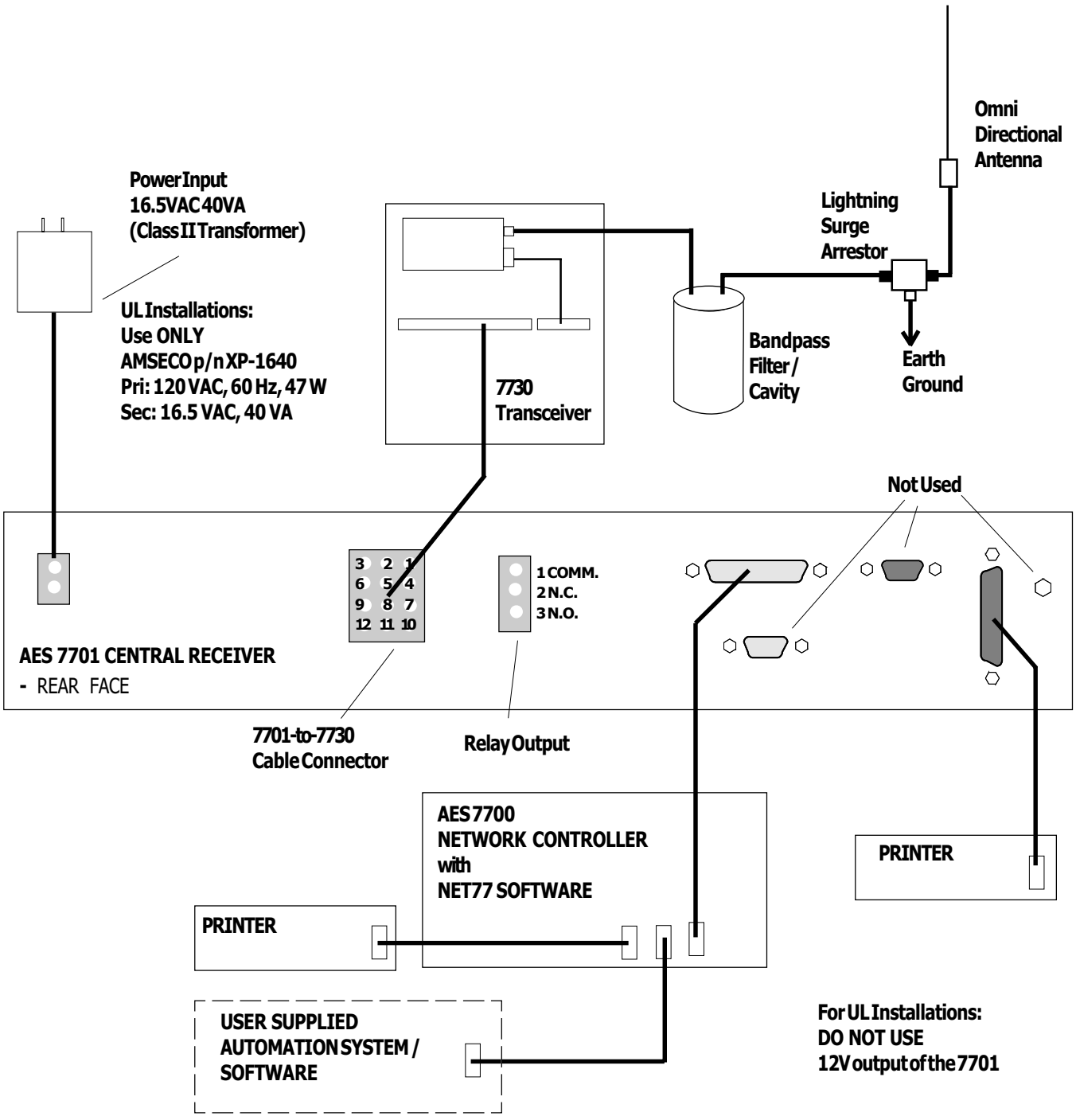
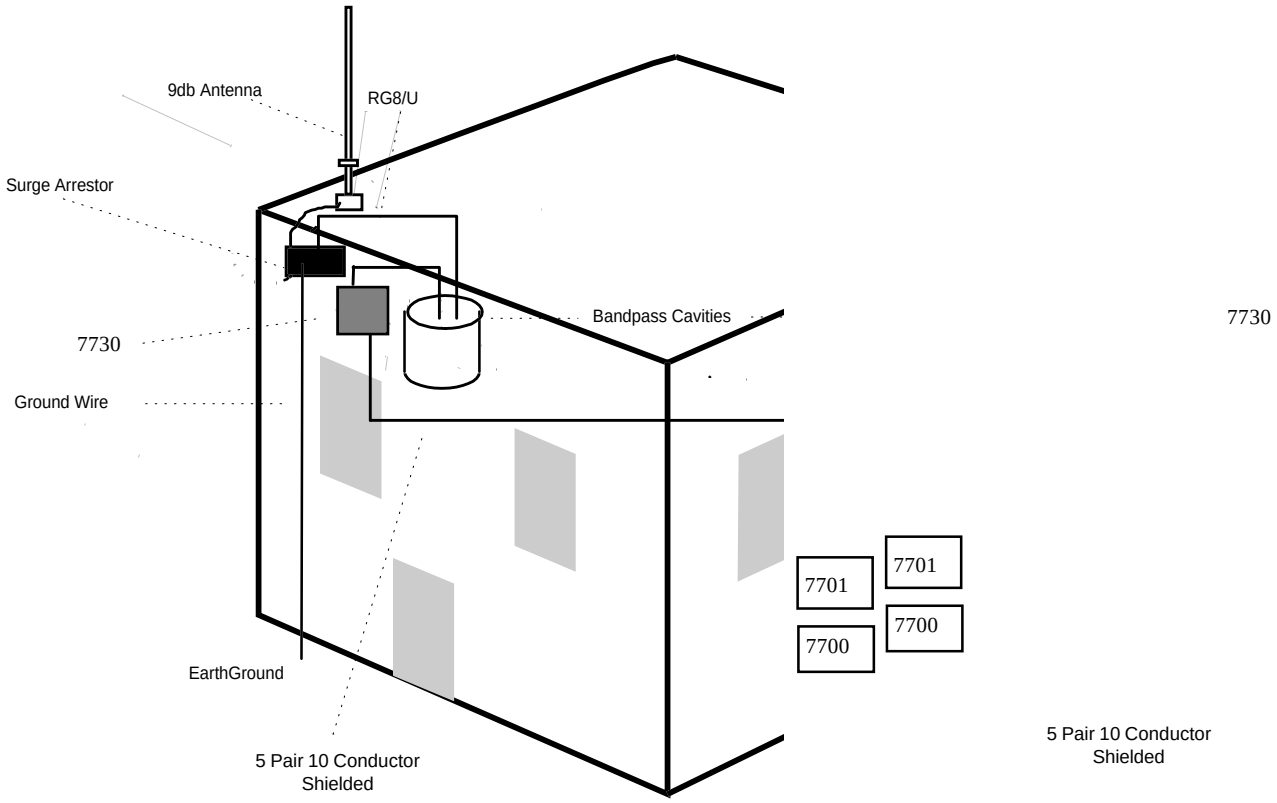
System Configuration Diagram



Single System Shown. Redundant and UL systems require a second equipment set to be installed. Secondary system must be set to STANDBY mode.

Key Component Locations



Shown: Typical Installation, with Redundant Back-Up System.
All wiring and installation must comply with relevant UL standards and local building codes.
Type RG8/U (or better) coaxial cable is required for UL and Commercial Fire system monitoring.

Typical Tool Requirements:

- SWR Meter
- Large Wire Cutters
- Soldering Iron
- RG8/U Coax Strippers
- AMP Service Tool II
- 11/16" Wrench
- 5/8" Wrench
- Wire Strippers 18-22 AWG
- Weatherproof Tape
- Silicone Sealant
- Silicone Grease

Installation must be completed by an AES authorized technician. Local installers can perform wire runs and equipment placement, but final connections, testing and acceptance must be completed by an AES authorized installer.

Installation

Installation of Antenna, Transceiver, Cables (See illustration on page 4.)

•. Install antenna(s) on top of building, at a minimum of 10 feet away from any electrical lines and/or metal objects. Install the antenna as high as possible for maximum range.

• Identify suitable grounding for lightning surge suppression in compliance with National Electric Code 810-20/57 and all applicable building codes.

NOTE: Avoid tight cable bends wherever possible - Do not bend cable less than a 3 inch radius. Make antenna cable runs as short as possible to minimize signal loss.

• Install Surge Arrestor at entry point of Coax cable to structure. Connect ground lug of Surge Arrestor to ground using proper grounding strap or cable. If surge arrestor is located outside, it must be housed in a weathertight enclosure - select a box that allows minimal wire bends.

• Install Bandpass Cavity(s) as close to the 7730 unit(s) as possible.
NOTE: Bandpass Cavity(s) must be located in a climate controlled area, avoiding extremes of heat or cold.

• Install 7730 transceiver(s) to a suitable, strong surface, using proper fasteners. To minimize signal loss, mount 7730 as close to antenna as possible.
NOTE: 7730 transceiver(s) must be located in a climate controlled area, avoiding extremes of heat or cold.

Installation & Termination of Cables

NOTE: Cables, connectors and terminations are CRITICAL to the proper operation of this system. Read all instructions carefully.

• Run one length of RG8/U Cable from each Antenna to a 7730 unit. Do not make bends of less than 3" in radius. Leave 5 to 10 feet of extra cable at each end.
NOTE: MAXIMUM ANTENNA CABLE LENGTH IS 50 FEET. If cable length is greater than 50 feet, special low loss cable must be used. Contact AES for more information.

• Run one length of 10 conductor* (AES#13-0351) from each 7730 to the 7701 Central Receiver unit, leaving at least 5-10' of extra cable at each end.
NOTE: Maximum cable length must not exceed 100 feet.
*** Use *only* the special cable supplied by AES with this system.**

• **ALL CABLES MUST BE RUN IN ACCORDANCE WITH UL REQUIREMENTS, NATIONAL ELECTRIC CODES AND LOCAL BUILDING CODES.**

7730 Transceiver -to- 7701 Central Receiver Cable

At the 7730 Transceiver:

- Pull about one foot of 10-conductor cable through the watertight connector on the 7730 and strip off about 6" of insulating jacket. Remove plastic and foil coverings from the wire pairs and remove the inner filler.

- **NOTE:** Drain wires are uninsulated and are found in every shielded jacket.

- Strip all wires to expose 1/4" of conductor.

- Refer to next page for pin configuration. Tighten the cable clamp.

At the 7701 Central Receiver:

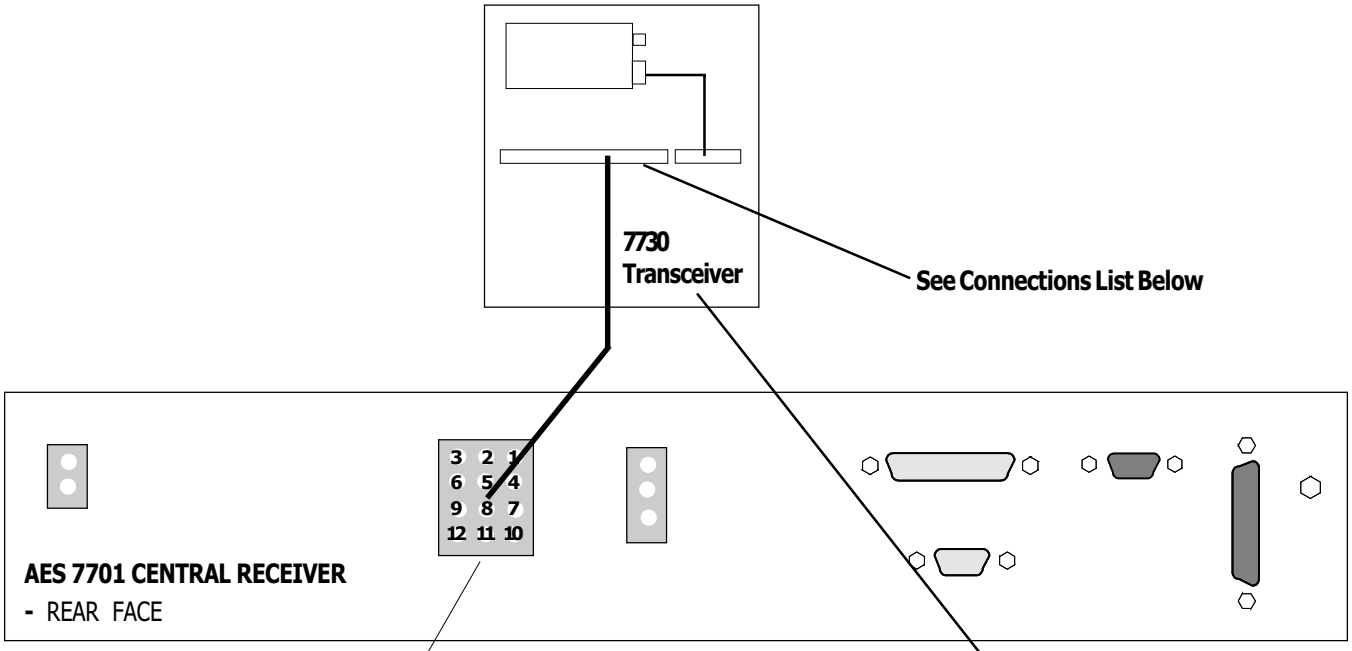
- Pull enough of the 10-conductor cable to reach the 7701 and still have adequate slack for servicing, usually 3 feet. Strip off about 6" of insulating jacket. Remove plastic and foil coverings from the wire pairs and remove the inner filler.

- Strip off about 1/8" from all wires. Using the AMP crimper, crimp both the green and drain wires in the female connector pins provided by AES. Do the same to the other wires. Insert pins into the 12-pin Molex connector as described in the table on the next page.

  FINAL CONNECTIONS AND TEST MUST BE PERFORMED BY AN AES AUTHORIZED TECHNICIAN.

- **Do Not connect power to 7701 at this time. Connect antenna first! Powering the transceiver with no antenna attached may result in permanent damage.**

Cable: 7730 Transceiver to 7701 Receiver



Function	7701	Wire Color	Wire Color	7730	Function
TX Audio	1	Brown	Brown	1	TX Audio
RX Audio	2	Red	Red	2	RX Audio
GND Ref	3	Drain	Drain	3	GND Ref
Sense –	4	Black	Black	4	Sense –
Sense +	8	White	White	8	Sense +
PTT\	5	Orange	Orange	5	PTT\
CD\	6	Blue	Blue	6	CD\
VDROP\	7	Purple	Purple	7	VDROP\
TAMPER IN	9	Grey	Grey	9	TAMPER IN
+Raw DC	10	Yellow	Yellow	10	+Raw DC
–Raw DC	11	Green	Green	11	–Raw DC
Shield	12	Drain	Drain	12	Shield

Drain
Drain
Drain

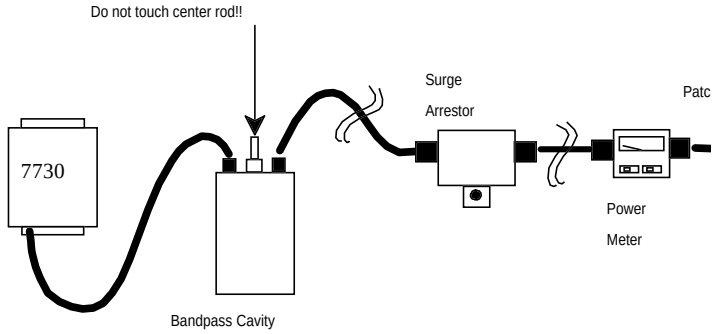
NOTE: All shields are isolated in cable. Use only cable supplied by AES Corporation.

COAX / RF Cable Installation and Test

FINAL CONNECTIONS AND TEST MUST BE PERFORMED BY AN AES AUTHORIZED TECHNICIAN.

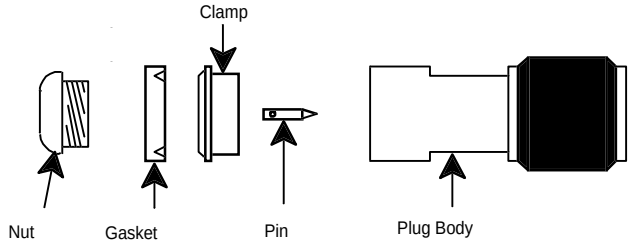
- Terminate the RG-8/U N-type connectors at the COAX end that connects to the Antenna, the Bandpass Cavity, the Surge Arrestor (make sure it faces the correct direction) and from the Bandpass Cavity to the 7730.
- Run ground cable from Surge Arrestor to suitable earth ground in accordance with local building codes.
- After terminating the Coax, make a small patch cable (1-2') from the RG8/U with a N-type connector on both ends.
- To Test Cables and Connectors, connect power to the 7701 Central Receiver, which provides power for the 7730 Transceiver.
- Connect the patch cable to the Antenna. Connect the power meter to the RG8/U coax, making sure that the orientation of the power meter is correct. Connect cables to the Bandpass Cavities and the 7730 cases.
- With a Power Meter set on "Power", activate the transmitter by connecting test clip leads across terminals 3 and 5 on the 7730. ***WARNING:*** DO NOT transmit longer than 10 seconds.
- On the Power Meter watch for a reading of 2 watts of power.
- If Power is too low: check that power input is at 13.8VDC; check all cable terminations.
- Change the Power Meter setting to "Reflected Power" and watch for a reading of 0 - .3 watts of reflected power.
- If Reflected Power is too high: check the connectors and re-terminate if necessary.
- Disconnect jumper, power and meter, and reconnect Antenna.
- Using weatherproof tape, tape all coax connectors tightly and apply silicone sealant on all "N" type threads to prevent water damage.
- Repeat steps for second antenna in redundant / backup system.
- NOTE: A redundant system is required for U.L. and Commercial Fire System Monitoring.

COAX Cable Run Diagram

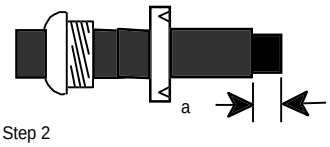


Installation of N-type Connectors

"N" Type assembly instructions (Clamp Type)

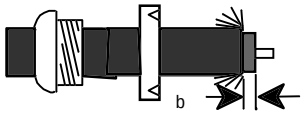


Step 1



Step 1) Place nut and gasket, with "V" groc
toward clamp, over cable and cut c

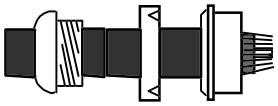
Step 2



Step 2) Comb out braid and fold back. Cu
dimension b.

Step 3) Pull braid wires forward and taper
Place clamp over braid and push b

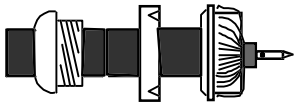
Step 3



Step 4) Fold back braid wires as shown, tri
and form over clamp as shown. So

Use adequate heat to flow solder. Defects in solder will adversely affect performance. Make sure no braid or loose pieces of braid are shorted to the center pin.

Step 4



Step 5) Insert cable and parts into connect
edge of clamp seats properly in ga

Step 5

Connect 7701 Central Receiver, 7700 Network Controller & Accessories

- Identify locations for:
  - 7701 Central Receiver, rack mount
  - 7700 Network Controller, Monitor and Keyboard
  - (2) Printers: one for 7701 Receiver and one for 7700 Controller

- Use cables provided to connect the AES central receiver, network controller and printers as shown on the illustration on next page.

  All equipment must be installed in accordance with National Electric Code, applicable UL Standards and local building codes.

  A UL Listed Uninterruptable Power backup must be provided for all elements of the system, capable of operating this system in accordance with applicable UL standards.

Alarm Output

Description: RS-232 serial link from COM1 of the 7700 (operating with Net77 software) that links to the alarm automation system / software. (See separate section on data format)

Location: 9 pin male connector on rear of 7700

NOTE: Custom cable may be required for Alarm Automation. Consult with AES Corporation and alarm software company for further details.

Pin # 7700	Signal	I/O	at 9-pin
2	Transmit Data	O	2
3	Receive Data	I	3
4	Data Term Ready	I	4
5	Signal Ground	-	5
6	Data Set Ready	O	6

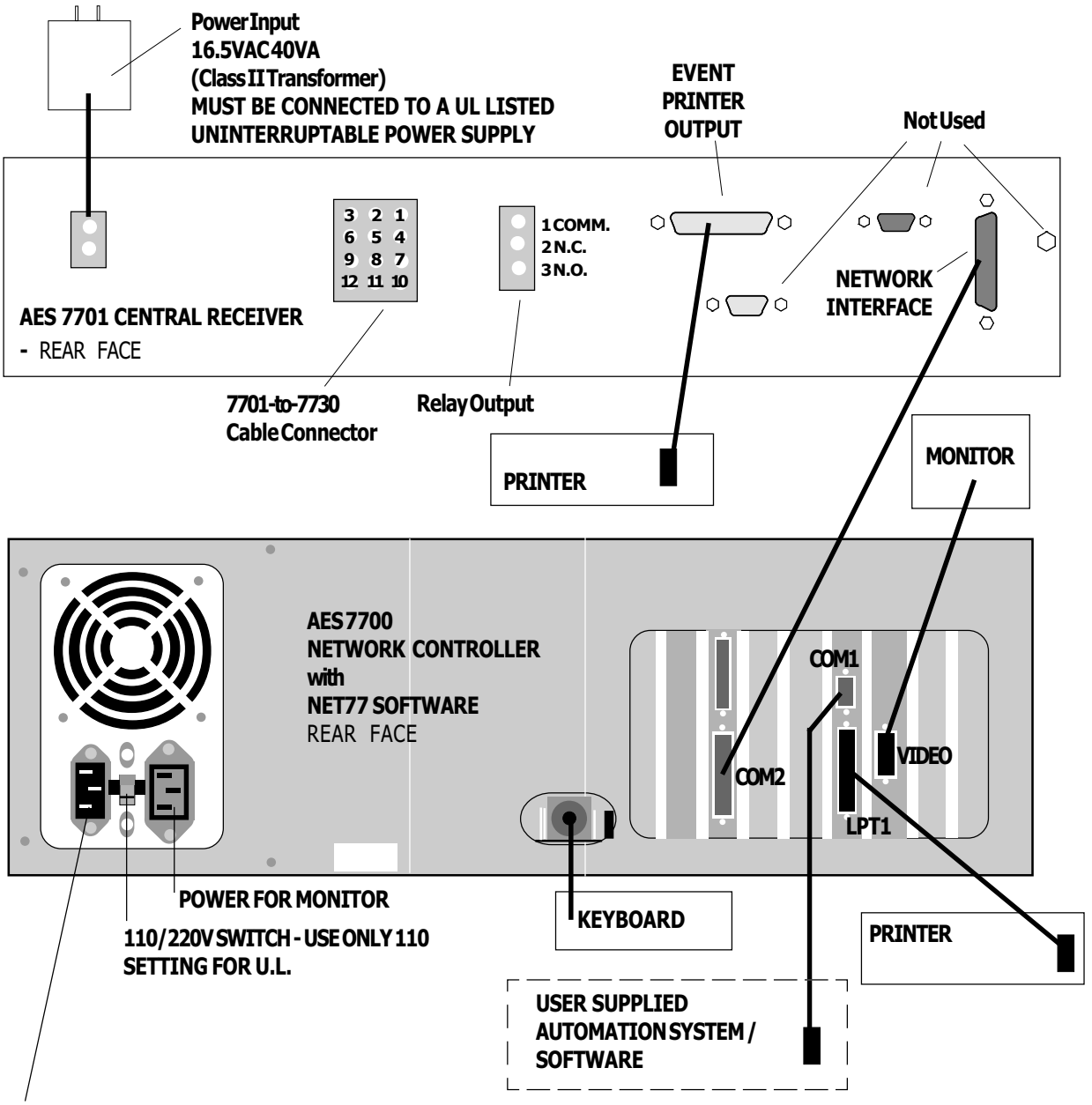
Network Interface

Function: RS-232 serial link between the COM2 port of the 7700 (operating the Net77 software) and the 7701 Central Receiver. (See separate section on data format)

Pin # 7701	Signal	I/O	at 25-pin
2	Receive Data	I	2
3	Transmit Data	O	3
6	Data Set Ready	O	6
7	Signal Ground	-	7
20	Data Term Ready	I	20

Connect 7701 Central Receiver, 7700 Network Controller & Accessories

Rear View



CONNECT TO MAIN AC POWER SOURCE; MUST BE CONNECTED TO:
1. THE U.L. LISTED TRIPP-LITE MODEL ISOBAR 8 ULTRA SURGE SUPPRESSOR.
2. A U.L. LISTED UNINTERRUPTIBLE POWER SUPPLY.

IF SO DESIRED, A MODEM CARD MAY BE USED WITH THE 7700 CENTRAL CONTROLLER. THE MODEM CARD MUST BE U.L. LISTED TO THE REQUIREMENTS OF UL STANDARD 1459, TELEPHONE EQUIPMENT.

Set Cypher (Dealer) Code

The Cypher code is a four digit hex number that is unique to your wireless data network. The central receiver and all subscriber units must have matching cypher codes in order to communicate with each other. Signals received from any source with a non-matching cypher code is ignored by the subscriber unit and the central station. The cypher provides protection from unwanted signals and attempts to "fool" the system.

The Cypher code must be programmed into the 7701 firmware. **Most customers prefer this code to be set at the factory.** If this is the case, move on to the next section. Otherwise, choose and set the cypher code now before installing subscriber units.

• From the 7700, Run Net77 software. Start by typing NET77 (see Net77 manual for full operating details).

• When running, press **Control-D**

• Enter Password **P E A B O D Y** in capital letters

• Enter 4 digit cypher code in hex (012345467890ABCDEF). Example: FD99

• Record the cypher code for later reference. Treat this code as you would any other sensitive, proprietary information. It is literally a key to your AES•IntelliNet system.

Final Connections

- Connect 7701 -to- 7730 cable using the AMP plug provided.

- At the 7730 transceiver(s), apply silicone sealant to the watertight connectors and put the covers back on the 7730 case(s).

Operation of AES 7701 Central Receiver

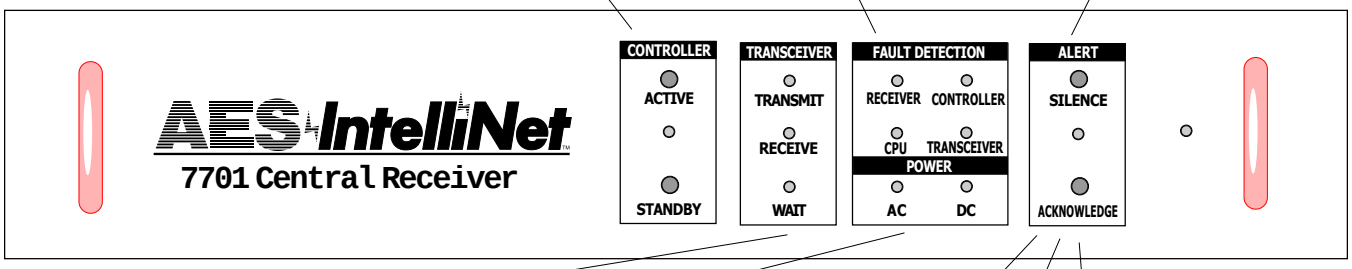
Front Panel and Function Identification

FAULT DETECTION INDICATORS
Lights ON indicates a problem:
- **RECEIVER (formerly Controller): printer problem or internal problem with 7701;**
- **CONTROLLER (formerly Computer): 7700 is off or disconnected; Net77 software is not running**
- **CPU: CPU has reset; indicates firmware problem during power up**
- **TRANSCEIVER: Tamper in Transceiver; 7730 power problem; cable or connector problem.**

SILENCE SWITCH
Silences buzzer when alert LED is steady (buzzer silences only when LED is steady). Also acknowledge CPU faults.

ACKNOWLEDGE SWITCH
Manually acknowledges messages when Alert LED is flashing; switch push is recorded on printer.

CONTROLLER SWITCH
- **ACTIVE: Unit is "live"**
- **STANDBY: Unit is "off-line"; transmitter is disabled**



TRANSCEIVER INDICATIONS
- **TRANSMIT: Transmitting**
- **RECEIVE: Signal Detected on Receiver Frequency**
- **WAIT: Waiting for Acknowledgment of last transmission**

POWER
- **ON=AC Power input OK**
- **DC - not used for 7701 / UL installations,** (option for battery backed systems)

UL systems:
- **Must use external backup power source.**
- **DO NOT use DC connections**

ALERT LIGHT

LIGHT ON / STEADY:
Indicates one or more of the following: Central Receiver CPU has reset; Internal Hardware Fault; External Hardware Fault - loss of link to Net77 software or transceiver problem. Check Print Out for report of specific event.

LIGHT ON / FLASHING: Indicates condition of non-response from Net77. Central Receiver now goes to manual mode for acknowledgment for all alarm events. Under this condition, operator must press the acknowledge button for *every* alarm event received. Press the silence button after all alarms acknowledged to silence buzzer.

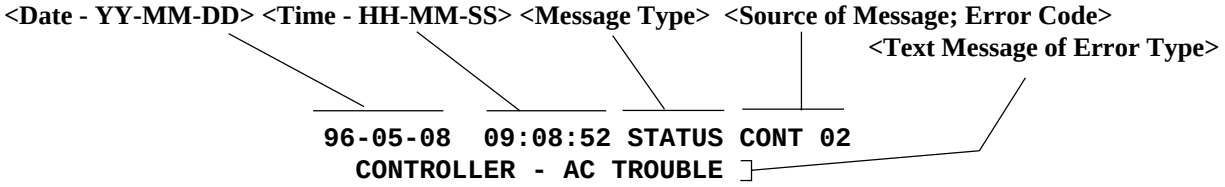
Operation of AES 7701 Central Receiver, continued

Faults that require operator attention:

Event Type	Indicator	Action/Remedy
7701 Receiver Internal Problem	Receiver LED	Reset main board in 7701 using internal reset button, or momentarily remove power
Loss of contact With Net77	Controller LED; Beep	Check Cables Check that Net77 is running
CPU Fault	CPU LED; Beep	Reset main board in 7701 using internal reset button. If power up OK, acknowledge signal, otherwise check event printer for possible problems
Transceiver Tamper/ Fault	Transceiver LED; Beep	Check cable to transceiver; Check transceiver for tamper
Un-Acknowledged Radio Packet	Flashing Alert LED	Check Interface to 7700 and that Net77 is running; Acknowledge packet (message) manually by pressing Acknowledge button.

7701 Event Printer Messages

Message Structure:



Messages Regarding Central Station Equipment Status

Printed Message	Explanation
CONTROLLER - AC TROUBLE	AC Power Fault - Serious Problem - system relies on Uninterruptable AC source (user supplied)
CONTROLLER - AC RESTORE	End of AC Power Fault
CONTROLLER - NET7000 OFFLINE	Connection lost between 7701 and 7700 / Net77; check cable, check that 7700 and Net77 program are running
CONTROLLER - NET7000 ONLINE	Connection initiated / restored between 7701 and Net77
CONTROLLER - COMM TIMEOUT STATUS MESSAGE NOT ACKNOWLEDGED BY COMPUTER	Comm link lost between 7701 and Net77 software; Check that Net77 software is running; Check that proper Net77 version is running;
CONTROLLER - MANUAL ACKNOWLEDGE RECEIVED	Operator pushed Silence / Acknowledge buttons Time Stamp of Acknowledgment and Event Data Printed
CONTROLLER - ACTIVE MODE	7701 is "Active", i.e. NOT in Standby
CONTROLLER - STANDBY MODE	7701 is in "Standby", i.e. NOT Active

7701 Event Printer Messages, *continued*

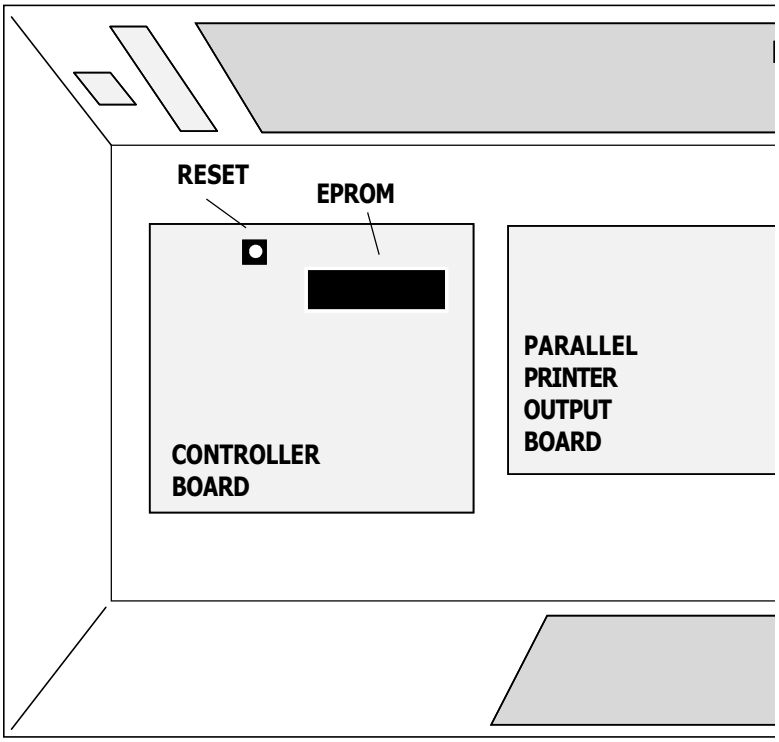
Messages Regarding Subscriber Units

Printed Message	Explanation
SUPVIS nnnn 00	Subscriber Unit #nnnn Check-In, No Faults
<date><time> SUPVIS nnnn 01	Subscriber Unit check-in after reset switch is pushed
STATUS - UNIT RESET	Subscriber Unit Reset
<date><time> SUPVIS nnnn 02 STATUS - POWER-ON RESET	Subscriber Unit check-in after power restoral
<date><time> FAULT nnnn 00 FAULT - NONE	Reply by Subscriber to Status Request by Operator - All is OK
FAULT - LOW BATTERY	Low Battery Detected at Subscriber Unit
FAULT - MODEM LOOPBACK	Problem with modem chip, power down & power up, or push RESET switch.
FAULT - RAM DATA	Failed RAM Check in Subscriber
FAULT - RAM BATTERY	Failed RAM Battery Check by Subscriber

7701 Internal Parts Location

7701
CENTRAL RECEIVER
Inside View,
Top Cover removed

FUSE: 5 amp
5mm type

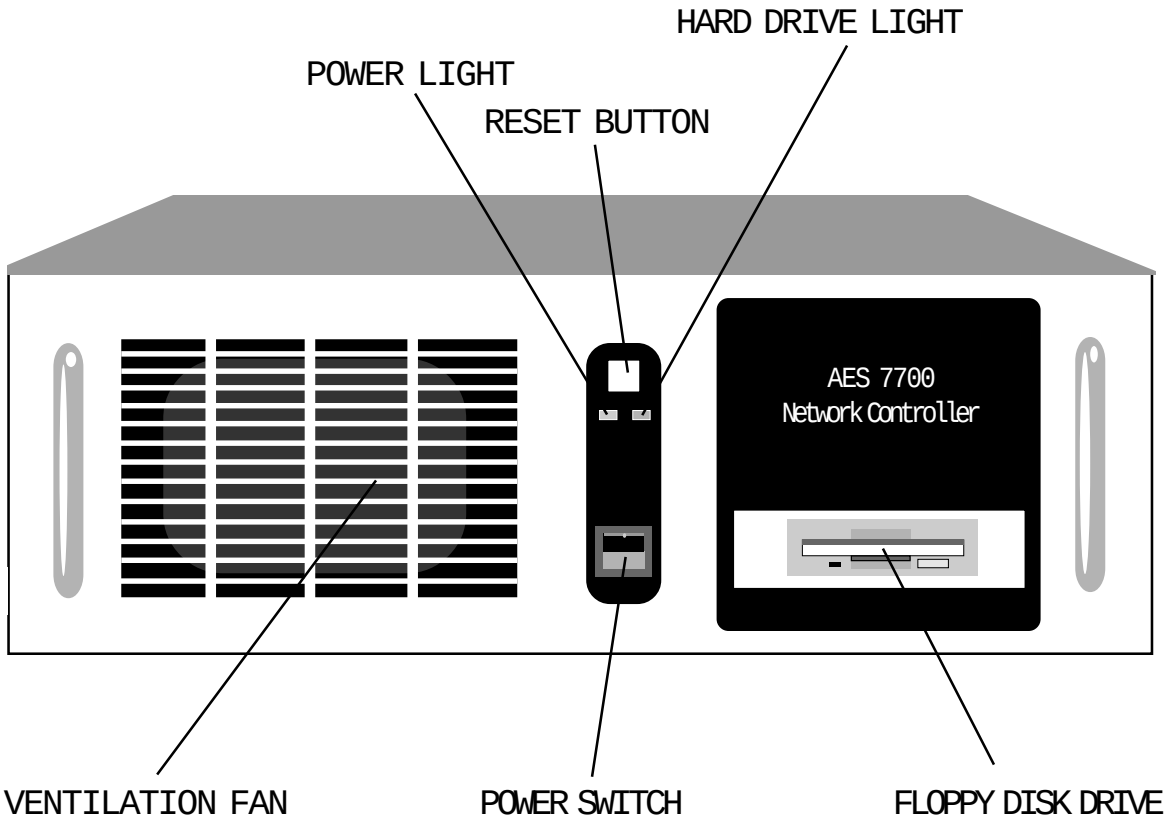


THE AES 7700 NETWORK CONTROLLER

PARTS LIST

- AES 7700 Network Computer
- Monitor
- Keyboard
- Keyboard Extension Cable
- Monitor Extension Cable
- Computer Manual Package
- Includes disks for DOS, assorted drivers, and manuals for all computer boards
- AES IntelliNet Manual Package

NOTE: Due to occasional improvements in manufacturing procedure, board location within your AES 7700 may vary. Please read all instructions concerning the AES• IntelliNet system carefully before installing and operating the AES•IntelliNet and the AES 7700.



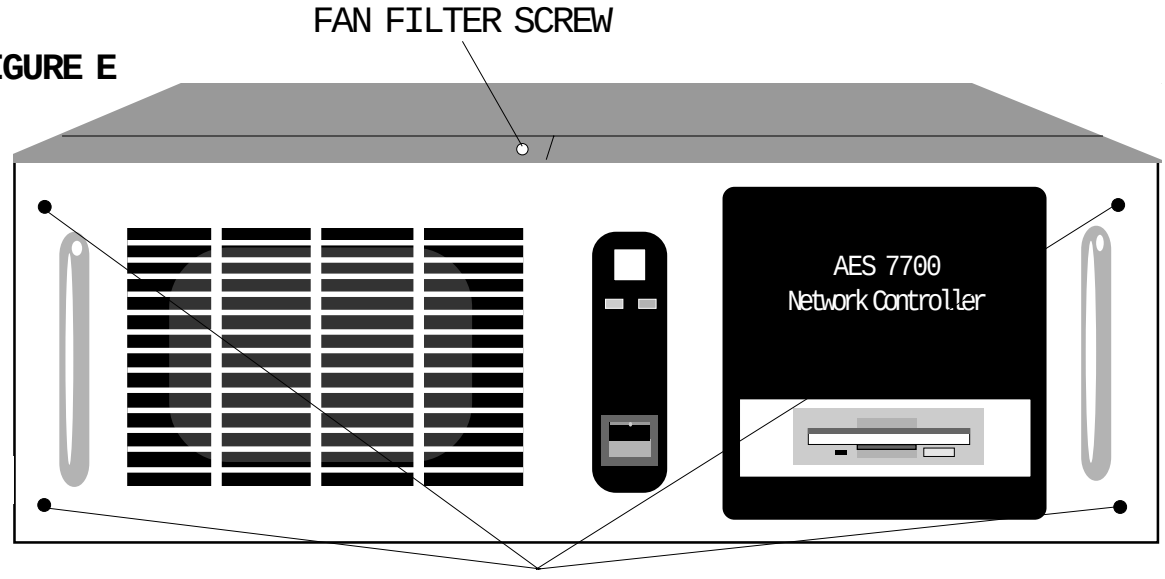
Maintaining the AES 7700

CLEANING THE FAN FILTER

The AES 7700 fan filter must be cleared of accumulated debris on a regular basis. Frequency of cleaning will vary according to the amount of dust in the environment. Begin by cleaning the fan filter once every month. If collected debris appears excessive, clear the filter more often.

1. Unfasten the four screws that hold the 7700 in its cabinet.
2. Pull the 7700 approximately two inches out of its cabinet. It is not necessary to turn the 7700 off for this procedure. Be careful not to pull out any of the cables connected to the rear panel of the 7700.
3. Unscrew the filter fan screw located on the top of the 7700 case. Please refer to Figure E, below.
4. Lift the fan filter holder out of the 7700 case and remove the filter. Note that the 7700 can run for short periods of time without the filter in place. Do not, however, allow the 7700 to run for long periods of time without the filter in place.
5. Clean the filter of accumulated debris and replace in filter holder.
6. Fasten filter holder down, replace the 7700 in cabinet and fasten, once again, with screws.

FIGURE E



AES ONE YEAR OWNER WARRANTY

We warrant AES products to be free from defects in material and workmanship for one (1) full year from date of purchase.

At no cost to the original purchaser for parts or labor, AES will repair or replace any part or parts which are judged defective under the terms of this Warranty.

Defective products must be returned to AES directly, provided they are properly packed, postage prepaid. Or exchange may be made through any authorized direct factory representative for any products which are judged defective under the terms of this Warranty.

This Warranty is in lieu of all other Warranties expressed or implied and of all other obligations or liabilities on the part of AES. This Warranty does not apply to any product or any part thereof which has been repaired or altered outside our factory in any way to affect its stability or reliability, or which has been subjected to misuse, negligence or accident, or which has had the serial number effaced or removed. Neither shall this Warranty apply to any product which has not been installed, applied or used in strict accordance with our instructions.

AES Corporation cannot be aware of, or responsible, for the differing values of property to be protected by its alarm reporting systems. The above Warranty is given in lieu of all other Warranties, either expressed or implied, including a Warranty of fitness for a particular purpose, and manufacturer shall not be liable for any defect, incidental or consequential, loss or damage arising out of the failure of the product to operate.

Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

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

AES IntelliNet®

SERVICE PROCEDURE: Contact AES Corporation at 508-535-7310 (fax 508-535-7313) to receive a Return Authorization Number. Have the AES part number and serial number ready. Items should be shipped freight prepaid c/o Repair Services, AES Corp, 285 Newbury Street, Peabody, Massachusetts 01960 USA. Authorized repair service is furnished only by AES Corporation.