

Odyssey Plus

Specifications

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REVOLUTIONIZING *the Patient Care Environment*[®]

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1. General:

- 1.1. The contractor shall furnish all equipment, accessories, and material complete in strict accordance with specifications and applicable drawings as required for an electronic intercommunications system. System will meet or exceed required states health planning and development regulations, and State Fire Marshall Building Codes.
- 1.2. A catalog of designs and materials will be provided with the system. The operator instructions shall be resident in the system and shall prompt the user during operation.
- 1.3. All equipment shall be UL listed as under NBRZ Hospital Signaling and Nurse Call Equipment, conforming to UL 1069 standards. Submitting the UL listing cards describing the equipment by model number with the bid documents shall make proof of such listings.
- 1.4. All items of equipment including wire and cable shall be manufactured and assembled in the United States and designed by the manufacturer to operate as a complete system. Supplier shall submit manufacturer's complete service notes and drawings, detailing all interconnections. All systems must state "Made in America".
- 1.5. Alternate equipment will be considered only when the following have been submitted and approved in writing by the hospital ten (10) days prior to opening of bid: A list of such alternate equipment and materials, together with three (3) copies of working and shop drawings, and a list of six (6) installations of similar audio-visual nurse call systems, with radio page interface and patient information, which have been satisfactorily installed and maintained on user's premises over a minimum period of one (1) year.
- 1.6. Nursing staff of the hospital, as well as maintenance staff, shall be thoroughly instructed in the use of the system by authorized distributor personnel. Such in-service shall be provided in conjunction with the installation of the system equipment, and shall comply with section G of this specification.
- 1.7. Systems shall contain a five-year warranty for factory manufactured parts and one-year warranty for labor, after which time a maintenance contract shall be available from the factory authorized distributor. Free annual training for engineering and support staff shall be available to every facility in which this equipment is installed. This training shall be for the life of the system.
- 1.8. The successful bidder must have a four-hour response time for system failures, offering 24/7/365 emergency service.

2. Proposal Standards:

Alternate proposals are not acceptable. All proposals shall include:

- 2.1. Manufacturer's name, model numbers, and three copies of factory specification sheets of each equipment item to be supplied by the authorized distributor. All function variations of equipment shall be clearly indicated in written form, and pre-approved by the architect/owner 21 days prior to bid date.
- 2.2. Written confirmation on the type of speech reproduction of the system shall state the system offered includes Full Duplex Speech (uninterrupted two-way speech). Systems, which use "VOX", Voice-Operated Switching, or "Push-To-Talk" audio, are not acceptable.

3. System Description General:

- 3.1. The system shall be at minimum an IBM compatible 586 PC or approved equal and include the following:

Item:	Item:
15" Color LCD TOUCH SENSITIVE display with simultaneous support for a secondary pointing device (mouse, trackball, etc.).	Central processor control.
Audio handset, hands free mode will not be accepted.	Power supplies with battery back up.
Patient stations.	Accessory items as required to make a complete and operational system.
Patient remote control devices (Pillow Speakers).	User configurable.
Locator stations - Manual and/or Automatic.	Ability to interface with automatic locator systems.
Emergency call stations.	Management Report capabilities - Windows 2000 based.
Staff stations.	Interface to radio paging systems - with an unlimited number of pagers assignable per bed.
Duty stations.	ADT Interface for automatic patient information retrieval.
Dome lights.	Ability to interface with Roam Alert, Baby Theft, Telemetry, IV pumps, and various monitor alarms and identify at least 16 levels of call.

- 3.1.1. The system shall provide non-interrupted (Full Duplex) speech. No manual (Push-To-Talk) or voice activated (VOX) single amplifier, talk/listen system, shall be acceptable.
- 3.1.2. The system shall incorporate multiplex technology. All remote stations shall plug into system wiring for ease of installation, replacement, and/or maintenance.
- 3.1.3. All station functions shall be controlled through a central processor control cabinet. Computers located at the nurse's station shall be no larger than 10"(W) x 13"(L) x 3"(H) and mounted under a monitor or desk. Any larger computer is considered oversized and shall not be accepted.
- 3.1.4. All Patient stations shall be compatible with side rail bed communications and bed exit emergency alarms. Note: When the patient egresses from the bed with the bed exit system activated, a unique emergency tone shall sound and the screen shall flash "Bed EXIT." Bed interface connectors to be quoted separately.
- 3.1.5. All equipment must meet current UL 1069 for hospital usage, NBRZ category and be listed as a complete system.
- 3.1.6. The nurse call system must be "Made In America." Systems that do not comply with this requirement are not acceptable and shall be considered non-responsive to this specification.

4. System Feature Description:

4.1. General:

- 4.1.1. Two-way signaling and communications between nurse master station and patient rooms or staff areas.
- 4.1.2. Full Duplex (non-interrupted) Speech without having a "push-to-talk" button, or voice-activated switching circuitry. Each patient and staff station must have a microphone and separate speaker.
- 4.1.3. Ability to make a staff announcement in which the page is heard only where staff members are located. The screen shall indicate number of locations where staff members are present during page. This feature is not available with Automatic Locator Systems.
- 4.1.4. Ability to place up to three separate zone pages, plus one "all call" page, or four separate zone pages.
- 4.1.5. Ability to program any room to be paged in any or all zones.
- 4.1.6. Capability of up to 64 ASD (Auxiliary Signaling Device) zones activating an unlimited number of lights and/or duty stations on a system.
- 4.1.7. Ability to program any room to activate any of the 64 ASD zones (lights and/or duty stations) in any combination.
- 4.1.8. System shall incorporate built-in self-diagnostics and be capable of modem interfacing for system diagnosis from remote locations.
- 4.1.9. In the event of microprocessor failure, the system shall continue to provide visual nurse call functions.
- 4.1.10. The system shall be capable of interfacing to a radio paging system and must meet all requirements of radio paging section F of this specification.
- 4.1.11. Optional availability to have up to eight master stations on the system, connected via network. Each master station shall operate independently of each other. Patient calls may be routed to any station in the network.
- 4.1.12. Ability to interface with hospital ADT system and gather patient information automatically.
- 4.1.13. Ability to interface with Roam Alert, infant abduction alarms, IV pumps, telemetry, etc., and send emergency pages to appropriate levels of staff via radio pagers.
- 4.1.14. Ability to add a telephone modem for shop/factory troubleshooting, rebooting or reprogramming of system, and downloading future software upgrades.
- 4.1.15. Ability to have patients place calls for "Pain Med" directly to the RN assigned to that patient.
- 4.1.16. Ability to have patients place requests for "Bed Pan" by simply pressing a button on the pillow speaker.

- 4.1.17. Password protected levels of system setup, allowing access to critical sections to authorized personnel.
- 4.1.18. Volume control adjustable on screen, with automatic volume adjustment at designated time of day (Quiet Mode). Quiet Mode shall also affect pager-beeping sequencing.

4.2. Display:

- 4.2.1. A touch screen LCD shall be used as the primary interface to Nurse Call functions. On-screen “buttons” shall be sized and spaced for easy use.
- 4.2.2. A toolbar shall be provided for immediate access to commonly used functions (i.e., Answer Call, Manual Call, Paging, etc.) when the user is not viewing the main menu tab.
- 4.2.3. An on-screen keyboard shall be provided for sites with limited space requirements and/or when a standard keyboard is absent.
- 4.2.4. The system shall be "user friendly," with help buttons displaying step-by-step procedural instructions on the screen.
- 4.2.5. Display of at least 10 incoming calls and visual indicators of more than 10 listed calls. Call types shall be indicated by separate tone and color (tones, colors and flash rates to be designated by hospital).
- 4.2.6. Provisions for registering and locating staff members by constant display in both a list and graphical format.
- 4.2.7. Simultaneous and constant display of patient requests and staff location available in both a list and graphical format. Two level locations shall be separate and will be designated by unique colors.
- 4.2.8. Incoming calls displayed by room number, bed number and status of call. Call status levels shall be differentiated by tone and color. Colors are to be determined by hospital and changeable by hospital staff if desired.
- 4.2.9. Map mode, allowing staff to view entire unit in a graphical format. Calls shall be displayed in each room with no limit on the number of simultaneously displayed calls. Patient requests, staff presence, and admitted patients shall be visually indicated on the map. A Control Panel must be available to view detailed information on a room-by-room basis by simply touching on the desired room. The information shall include: calls placed per bed; patient requests; staff presence; and patient name(s) per bed. The information is to be filtered such that only information for the selected room is displayed. The Control Panel must provide the ability to answer any call, in or out of order, place a manual call, and provide one-touch access to patient information.
- 4.2.10. Ability to monitor staff requests by viewing screen in both a list and graphical format.
- 4.2.11. Distinctive display of re-called service request not answered within an allotted time. An elapsed timer shall indicate the length of time the call is in the system. Hospital shall have the ability to set “recall” time limits for all call types individually, as well as for each task for all levels of staff. Display must show previous request with the ability to use same or add additional requests as required.
- 4.2.12. Ability to place current call on hold while answering a higher priority call. Any number of calls can be placed on hold but must indicate on the screen that they are on hold and the elapsed timer must continue to run.

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- 4.2.13. Ability to program patient calls at the Master station to be normal, priority, or emergency, depending on status of patient.
- 4.2.14. Hospital name and floor displayed on screen. Time of day and system status indicators shall be present and visible on the screen at all times.
- 4.2.15. Ability to differentiate between male or female patients by the color of the patient information screen, and color of bed icons on map display.
- 4.2.16. Ability to mute call tones for a pre-determined amount of time to allow staff to assist patients without ringing the call at the master.
- 4.2.17. System shall be user configurable, permitting on-site changing of room numbers, zone page, patient priority, zone lights and duty station assignments. Any combination of alpha/numeric room configuration shall be capable to a maximum of six digits.

4.3. Staffing:

- 4.3.1. Staff database shall include:

Item:	Item:
Staff member name.	Shift assignment(s). Staff members shall be allowed to work multiple shifts.
Assigned beds (using a grid to select beds).	Badge number.
Pager number, with the ability to disable routine pages per staff member.	Phone number. For cellular or wireless phone use.
Staff level.	Supervisor status.
Team membership.	Memo area for any useful information about staff member.

- 4.3.2. Unlimited number of staff levels definable at Master Station. Each level may have a unique color code as specified by hospital staff.
- 4.3.3. Unlimited numbers of Patient Requests (tasks) definable for each level of staff, with a unique recall time-out assignable for each task.
- 4.3.4. Ability to send a service request for any level of staff.
- 4.3.5. Staff assignments and settings assignable by shifts, with the ability to set up shift data prior to shift change, without affecting current shift settings. The new data must activate when the shift starts without user interaction.

4.4. Patient Information System:

4.4.1. The Patient Information Database shall include the following:

Item:	Item:
Patient name (first and last).	Religion.
Age (with years/months/weeks/days indication).	Language.
Gender.	Diagnosis (with ability to choose from a pre-defined list).
Smoking permissions.	Doctor and staff assignments.
Status.	Memo field for patient information purposes.
Memo field for staff information purposes.	

- 4.4.2. Ability to display all patients by level of priority on screen or optional printer.
- 4.4.3. Ability to transfer patient data to other rooms without re-entering patient information. Staff assignments must also be transferable in same step.
- 4.4.4. Ability to program unlimited levels of patient team member responses to each patient bed, i.e., RN, LVN, AIDE, Housekeeping, Engineering, and group call, etc.
- 4.4.5. Discharge function to delete patient information and staff assignments, with the ability to automatically send a pager message to housekeeping upon discharge.

4.5. Pagers:

- 4.5.1. Ability to store unlimited pre-set alphanumeric pager messages which may be sent to any combination of specific staff member(s), team(s), or individual pager numbers.
- 4.5.2. Timed Pages programmable to be sent to selected staff members, or teams, at a specified time and day(s) of week.
- 4.5.3. Auto Page feature allowing the assigned staff member(s) to be paged automatically when any patient call is placed. Page shall indicate where call was originated (room, bed) and the type of call placed (i.e., Normal, Bath, Pain Med, etc.).
- 4.5.4. Support Page feature allowing secondary staff level to be paged when the primary staff member is unable to respond to patients needs within a specified period of time.
- 4.5.5. Supervisor Page feature allowing staff members designated as supervisors to be automatically paged when a patient request cannot be completed by either the primary staff member, or support level within a specified period of time.
- 4.5.6. Paging system shall store last eight sent messages and recipients to allow easy re-paging when necessary.

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4.6. Reports:

4.6.1. Built-in Staffing Reports function shall include:

Item:	Item:
Staff name	Bed/Patient assignments
Level	Pager number
Shift(s)	Phone number
Team(s)	Supervisor status

4.6.2. Built-in Patient Information Reports shall include:

Item:	Item:
Patient name	Diagnosis
Status	Gender
Age	Doctor assignments
Admit date	Staff assignments

4.6.3. Reports may be sorted by any of the preceding fields.

4.6.4. Productivity Reports shall include:

Calls placed and response times for any bed. (Available as option.)

Activities of a specified staff member; calls, response times, etc. (Available as option with the automatic locator feature.)

History report showing all activity of master for specified day. (Standard feature.)

5. Equipment:

5.1. Nurse Call Master Station:

5.1.1. Function:

The Master Station shall come complete with a 15" touch screen flat panel display, a Pentium computer or faster, keyboard, mouse, and a phone. It shall include an interactive touch screen interface with a floor map displaying all rooms assigned to the nursing unit. Large descriptive buttons with colorful animated graphics making finding and using functions simple must be included. Help buttons located throughout the nurse call software shall allow the user to receive answers to operational questions on demand. Full duplex voice communication must be available from the master station to patient stations, staff stations, duty stations, and other master stations. Other functions that must be included are fully integrated radio paging, staffing reports, staff assignment, and patient information, and all shall be customizable to meet the nursing unit's needs. Patient rooms must be able to be swung independently or in a group to any other master station connected to the nurse call system. A UPS (Uninterrupted power supply) option must be available.

5.1.2. General Description:

The Nurse Call Master Station shall contain:

- A means by which to annunciate all routine, priority, and emergency calls throughout the nurse call system.
- 15” Touch-screen LCD with simultaneous support for a backup input device, such as a mouse.
- Unlimited call tones, with adjustable volume level and repeat interval for each call type.
- Handset with full-duplex audio and adjustable volume level.
- A location of staff by level (i.e., RN, LVN, Aide).
- Automatic notepad for monitoring services requested by patients. This notepad must be configurable by the hospital.
- Automatic recall of patient calls to which staff has not yet responded (within a hospital selected pre-set period of time).
- Ability to be wall or desk mounted.
- An "all page" to all areas in which staff are located without disturbing the entire floor or nurse call area.
- Number of locations paged must be indicated on master during page.
- The capability of determining area of system malfunction through a resident self-diagnostics program.
- Ability to interface with the hospitals ADT information system.
- Ability to send full alphanumeric pages from any Nurse-Call Master Station to specific pagers programmed to the radio paging system that is interfaced with the nurse call system.

5.1.3. Technical Description:

5.1.3.1. Monitor:

Item:	Technical Specification:
Display Type	Active Matrix TFT LCD
Display Size	15” Diagonal
Useful Screen Area	Horizontal: 11.9” Vertical: 8.9”
Monitor Dimensions	Width: 15.4” Height (Inc. Base): 15.4” Depth (Inc Base): 8.2”
Optimal Resolution	1024 x 768 at 60, 70 or 74 Hz
Colors	16.7 Million
Brightness LCD Panel	285 cd/m ² typical
Viewing Angle (from center)	Horizontal: ±75° or 150° total Vertical: 10/60° or 130° total
Contrast Ratio	450:1
Input Video Format	VGA/SVGA/XGA analog video
Input Video Signal Connector	Mini D-Sub 15_Pin (female)
Scanning Frequency	Horizontal: 31.5-60 kHz Vertical: 56-75 Hz
Video Bandwidth	80 MHz
Power Supply	Internal DC power supply; external AC input 100-240 VAC, 50-60 Hz
Power Dissipation	30 Watts Max.
Temperature, Operating	10°C to 40°
Temperature, Storage	-30°C to 60°C
Humidity, Operating	20%-80%
Humidity, Storage	5%-90% non-condensing
Weight (approx)	Actual: 15.2 lb (6.9 kg) Shipping: 21.6 lb (9.8 kg)

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5.1.3.2. Computer:

Item:	Technical Specification:
Microprocessor Type	3.2 GHz Intel processor, 128K Cache
Memory	128 MB SDRAM
Video Card	Integrated. Intel Media Accelerator 900
Hard Drive	40GB, 7200 RPM Serial ATA
CD-ROM Drive	Removable CD-ROM/DVD-ROM Combo
Floppy Disk Drive	Optional
Connectivity	One 9-Pin D-Sub Serial Port, One 25-Pin D-Sub Parallel Port, One RJ-45 Network Connector, PS/2 Mouse & Keyboard Port, 15-Pin VGA Port, 5 USB on back 2 USB on front
Power Supply	External DC Power Adapter
Wattage	150 Watts
Heat Dissipation	455 BTU/hr (average)
Voltage	90-135 V at 60 Hz; 180-265 V at 50 Hz
Backup Battery	3-V CR2032 lithium coin cell
Vertical Orientation	3.4" W x 9.7" D x 9.9" H
Horizontal Orientation	9.9" W x 9.7" D x 3.4" H
Weight	10.5lbs.
Temperature, Operating	10° to 35° C (50° to 95° F)
Temperature, Storage	-40° to 65° C (-40° to 149° F)

5.1.3.3. Other:

Item:	Technical Specification:
Phone	DC 12V
Keyboard	84 Keys
Cabling	Category 5 Cable From Master Computer To HUB. West-Call® Special Black Cable From Master Phone to Central.

5.2. Central Control Terminal:

5.2.1. Function:

The Central Control Terminal shall be the control center for data, audio and configuration files for up to eight master station and 256 ID points. Each central shall come standard with 16 audio paths, support for 4 master and 64 ID's. Up to eight centrals can be connected together for a total of 64 master stations and 2048 ID points. IPX protocol must be used for communication through a 10baseT network. A service LCD panel option must be available and attached for onsite, local diagnostics of the central.

5.2.2. General Description:

The Central Control Terminal shall also contain:

- Battery back up
- Audio amplifiers
- UL-1069 Listed components.
- ISO-9001 certified embedded controller.
- 10-Base-T Ethernet connection for communication with 8 masters, and up to 7 more centrals.
- Up to 16 Room audio paths.
- Capable of up to 8 Master audio paths.
- Capable of up to 8 External audio inputs.
- 16 x 16 cross-point audio switch allowing any master or external device to connect to any room audio channel.
- 256 ID points per Central.
- Isolated data lines on each home run.
- Adjustable talk volume level for each home run.
- Ability to extend data lines up to 4000 feet from Central.
- All programming information must be stored in non-volatile memory. Hard disk, and floppy drives are not acceptable; data must be stored in non-mechanical flash memory
- LCD service panel with keyboard for diagnostics.
- Include Voltage Test Points
- All PC boards shall - without exception - be equipped with plug-in connections.

5.2.3. Technical Description:

Item:	Technical Description:
Operating Voltage	120 VAC and 28 VDC +/-10%
Power Consumption	80 watts
Size	32"H x 20"W x 3.5"D
Mounting Cabinet	36"H x 24"W x 6"D, electrical enclosure or equivalent. Flush or surface mount available.
Termination	Room identity lines terminate to mass termination connectors on room interface cards. Common data lines terminate on electrically isolated interface cards. Mating connectors are Panduit CD100F22-8 connectors.
Audio Amplifier	True duplex (2 channel) amplifier with 30db minimum gain and power output of 2 watts. One amplifier per audio channel, up to 16.
Processor	PC-104 Embedded Controller operating at 40MHz
Storage	8MB Solid-State Disk (no moving parts) for operating system and configuration files.
Interface	May also be used with existing West-Call® 1000 and 8000 field devices and wiring.

5.3. Power Supply Module:

5.3.1. Function:

The Power Supply Modules provide low voltage power to all signaling field units for the nurse call system. Each assembly provides independent replaceable power supplies and a 120VAC power outlet to facilitate plug-in type power connections. All Power Supply Modules include high frequency switching, solid-state circuitry, electronic circuit breaker overload protection and a power LED. A UPS must be added to protect against power fluctuations and power outages. **Must be connected to the hospitals critical branch of emergency power.** Operating Voltage: 120 VAC, 60HZ.

5.3.2. General Description:

Operating Voltage shall be 117VAC, 60HZ.

Power consumption shall be 100 watts per supply.

Size shall be 17"H x 20-1/8"W x 4"D.

Mounting shall be 22"H x 18"W x 6"D electrical enclosure.

Termination shall be to CCT or CTE via screw-down barrier strips. Mating lugs - Waldom T2014 or equivalent.

Regulation shall be high frequency switching regulator circuitry with fold-back current limiting (3.2 amperes) and self restart.

5.3.3. Technical Description:

Item:	Technical Specification:
Power Consumption	120 watts per supply
Size	17" H x 20-1/8"W x 4"D
Mounting Cabinet	22"H x 18"W x 6"D, Electrical enclosure or equivalent. Flush or surface mount available
Regulation	Fold-back current limiting with restart.
Cable Requirement	2 conductor #18AWG per power supply to associated central control terminal.
UPS Power	120VAC, 60HZ

5.4. Nurse Call Single Patient Stations:

5.4.1. Function:

The single patient stations are located in the patients' rooms, providing a patient with a convenient means of originating calls to the nurses' station. When used with a paging system, calls can be routed directly to a patient's caregiver. The voice communication from the patient's room to the nurses' station is hands-free and two-way (duplex). Patient stations are capable of placing 4 types of call, including routine call, emergency call, code call, and two level locators. Remote devices can be connected to the patient station for additional call levels including the following:

Item:	Item:
Pillow Speakers	Dome Light
Toilet Assist Stations	Staff Locators
Mark II Intercom	Code Blue Stations
Bed Side Communications	Code Pink Stations
Emergency Call Stations	IVAC Alarm
Heart Monitors	TV Theft Alarms
Bed Exit Alarms	Room Smoke Detector

5.4.2. General Description:

Inlaid membrane switch with call and monitor indicator LED and call buttons.
 Full Duplex speech for uninterrupted communication between patient and nurse.
 Manual call origination via either a call button or corresponding cordset; automatic "cord out" call origination occurs when cordset is unplugged from its receptacle.
 Single 10 pin modular cordset receptacles conveniently located on station.
 Red nurse monitor/privacy LED. Solid-state circuitry throughout for long life and reliability.
 Quick connect/disconnect pre-wired edge connector for simplified installation and service.
 2-3/4" Mylar cone speaker with a separate electret condenser microphone for full duplex communication.
 Standard four-gang hospital grade ABS plastic faceplate. (Three-gang box adapter ring is also available.) Stations are fully compatible with all bedside "In-Rail" communications systems.

5.4.3. Technical Description:

Item:	Technical Description:
Operating Voltage	27.5VDC +/-10%.
Power Consumption	4 watts
Size	4-1/2"H x 8-1/4"W x 3-1/2 "D
Mounting	Four-gang backbox Raco #698 (box must be level). Normal mounting is Horizontal. BOX MUST BE LEVEL.
Faceplate	Hospital grade ABS UL94V-0 molded thermoplastic with inlaid membrane
Faceplate Color	Standard Warm Grey (Pantone 1C). Special colors supplied on individual basis.
Membrane	.010 Lexan with hardcoat finish
Membrane Color	Background color, Pantone 4C Warm Grey, copy color Grey (Pantone 1C and 11C).
Termination	Plug-on connectors allowing rapid mass termination mating connectors - Panduit needed are three (3) CE156F22-15 and one (1) CE156F22-5.
Microphone	Cardiod Electret, sensitivity is -64db @ 1 microbar @ 1KHz
Speaker	2 3/4" Mylar cone with .5-ounce magnet. Minimum sensitivity is 90db SPL @ .25 watts @ 1ft.
Cable Requirements	West-Com WW-1 pair #20AWG (Power); 8 Conductor #22AWG (Data); 2-shielded pairs #22AWG (Audio) and 1 conductor #22AWG home to central terminal for I.D. wire.

5.5. Nurse Call Dual Patient Stations:

5.5.1. Function:

The dual patient stations are located in the patients' rooms, providing two patients with a convenient means of originating calls to the nurses' station. When used with a paging system, calls can be routed directly to a patient's caregiver. The voice communication from the patient's room to the nurses' station is hands-free and two-way (duplex). Patient stations are capable of placing 4 types of call, including routine call, emergency call, code call, and two level locators. Remote devices can be connected to the patient station for additional call levels including the following:

Item:	Item:
Pillow Speakers	Dome Light
Toilet Assist Stations	Staff Locators
Mark II Intercom	Code Blue Stations
Bed Side Communications	Code Pink Stations
Emergency Call Stations	IVAC Alarm
Heart Monitors	TV Theft Alarms
Bed Exit Alarms	Room Smoke Detector

5.5.2. General Description:

Inlaid membrane switch with call and monitor indicator LED and call buttons.
 Full Duplex speech for uninterrupted communication between patient and nurse.
 Manual call origination via either a call button or corresponding cordset; automatic "cord out" call origination occurs when cordset is unplugged from its receptacle.
 Dual 10 pin modular cordset receptacles conveniently located on station.
 Red nurse monitor/privacy LED. Solid-state circuitry throughout for long life and reliability.
 Quick connect/disconnect pre-wired edge connector for simplified installation and service.
 2 3/4" Mylar cone speaker with a separate electret condenser microphone for full duplex communication.
 Standard four-gang hospital grade ABS plastic faceplate. (Three-gang box adapter ring is also available.) Stations are fully compatible with all bedside "In-Rail" communications systems.

5.5.3. Technical Description:

Item:	Technical Description:
Operating Voltage	27.5VDC +/-10%.
Power Consumption	4 watts
Size	4-1/2"H x 8-1/4"W x 3-1/2"D
Mounting	Four-gang backbox Raco #698 (box must be level). Normal mounting is Horizontal. BOX MUST BE LEVEL.
Faceplate	Hospital grade ABS UL94V-0 molded thermoplastic with inlaid membrane
Faceplate Color	Standard Warm Grey (Pantone 1C). Special colors supplied on individual basis.
Membrane	.010 Lexan with hardcoat finish
Membrane Color	Background color, Pantone 4C Warm Grey, copy color Grey (Pantone 1C and 11C).
Termination	Plug-on connectors allowing rapid mass termination mating connectors - Panduit needed are three (3) CE156F22-15 and one (1) CE156F22-5.
Microphone	Cardiod Electret, sensitivity is -64db @ 1 microbar @ 1KHz
Speaker	2 3/4" Mylar cone with .5-ounce magnet. Minimum sensitivity is 90db SPL @ .25 watts @ 1ft.
Cable Requirements	West-Com WW-1 pair #20AWG (Power); 8 Conductor #22AWG (Data); 2-shielded pairs #22AWG (Audio) and 1 conductor #22AWG home to central terminal for I.D. wire.

5.6. Locator Station:

5.6.1. Function:

The Nurse Call Single Locator Station shall contain two locator switch/lights. This switch/light shall allow for staff location, staff paging and management reports. Activation of the switch shall also cancel service requested and patient calls.

5.6.2. General Description:

Highly visible call LED to assure the call has been placed; 5000,000 hour life expectancy.
 Easily operated push color-coded area.
 Fire retardant high impact molded thermoplastic.
 Solid-state circuitry.
 Plug-in connectors for easy system connection/service.
 Designed to work with all West-Call® Nurse Call Systems.
 Custom colors and text available.

5.6.3. Technical Description:

Item:	Technical Specification:
Operating Voltage	12-30VDC, 12-24VAC
Power Consumption	1 watt maximum
Size	4-1/2"H x 2-3/4"W x 1-1/4"D
Mounting	4" square backbox with 1 gang plaster ring, Raco 190 with 768 or equivalent. 2-1/8" minimum depth required. Normal mounting is <u>Vertical</u>
Faceplate	Hospital grade ABS UL94V-0 molded thermoplastic with inlaid membrane
Faceplate Color	Warm Grey (Pantone 1C)
Membrane	.010 Lexan with hardcoat finish
Membrane Color	.010 Lexan with hardcoat finish background color Grey (Pantone 4C). Copy color Warm Grey (Pantone 1C and 11C).
Termination	Plug on connector allows rapid mass termination. Mating connector - Panduit CE156F22-10
Cable Requirements	6 conductor #22AWG cable to associated station or panel

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5.7. Staff Call Station:

5.7.1. Function:

Staff Stations are used where voice communication is needed between the nurse station and other non-patient occupied areas. Nurse lounge, waiting rooms, locker rooms and break rooms are all examples of where staff stations are used. Staff stations are also available with a duty alert option.

5.7.2. General Description:

Inlaid membrane switch with call and monitor indicator LED and call buttons.
Duplex speech for uninterrupted communication between patient and nurse.
Manual call origination via either a call button or corresponding cordset; automatic "cord out" call origination occurs when cordset is unplugged from its receptacle.
Red nurse monitor/privacy LED.
Solid-state circuitry throughout for long life and reliability.
Quick connect/disconnect pre-wired edge connector for simplified installation and service.
2 3/4" Mylar cone speaker with a separate electret condenser microphone for full duplex communication.
Standard four-gang hospital grade ABS plastic faceplate. (Three-gang box adapter ring is also available)
Stations are fully compatible with all bedside "In-Rail" communications systems.

5.7.3. Technical Description:

Item:	Technical Specification:
Operating Voltage	27.5VDC +/-10%.
Power Consumption	4 watts
Size	4-1/2"H x 8-1/4"W x 3-1/2"D
Mounting	Four-gang backbox Raco #698 (box must be level). Normal mounting is Horizontal. BOX MUST BE LEVEL.
Faceplate	Hospital grade ABS UL94V-0 molded thermoplastic with inlaid membrane
Faceplate Color	Standard Warm Grey (Pantone 1C). Special colors supplied on individual basis.
Membrane	.010 Lexan with hardcoat finish
Membrane Color	Background color, Pantone 4C Warm Grey, copy color Grey (Pantone 1C and 11C).
Termination	Plug-on connectors allowing rapid mass termination mating connectors - Panduit needed are three (3) CE156F22-15 and one (1) CE156F22-5.
Microphone	Cardiod Electret, sensitivity is -64db @ 1 microbar @ 1KHz
Speaker	2 3/4" Mylar cone with .5-ounce magnet. Minimum sensitivity is 90db SPL @ .25 watts @ 1ft.
Cable Requirements	West-Com WW-1 pair #20AWG (Power); 8 Conductor #22AWG (Data); 2-shielded pairs #22AWG (Audio) and 1 conductor #22AWG home to central terminal for I.D. wire.

5.8. Duty Alarm Station:

5.8.1. Function:

The Nurse Call Duty Station shall provide remote annunciation of the nurse call system status in staff areas. Staff personnel can, therefore, monitor patient calls continuously in non-master station areas. The zone and call mode of this station can be programmed at the master station.

5.8.2. General Description:

Reports all levels of calls with audible buzzer.
 Fire retardant painted cold-rolled steel.
 Solid-state circuitry.
 Plug-in connection to system wiring.
 Color is a warm gray (Pantone 1C).
 Easy programming to any zone or mode.

5.8.3. Technical Description:

Item:	Technical Specification:
Operating Voltage	12-30 VDC; 12-24 VAC
Power Consumption	1 watt maximum
Dimensions	4 1/2"H x 2 3/4"W x 1 1/2"D
Mounting	4-inch square backbox with 1 gang plaster ring, Raco 190 with 768 one-gang adapter or equivalent. Minimum 2 1/8" depth required. Normal mounting is vertical. For remodel areas, use Raco #500 or 503 with #977 Grip-Lok's or equivalent. Minimum 2 1/2" depth required.
Faceplate	Painted cold rolled steel
Faceplate Color	Standard color is Pantone 1C Warm Grey
Cable Requirement	Use 10-conductor #22AWG cable.
Termination Requirement	Plug-on connector allows rapid mass termination. Mating connector is a Panduit CE156F22-10.

5.9. Pillow Speakers:

5.9.1. Function:

The Pillow Speaker shall be a compact unit, easily cleaned and sterilized. It shall also have a high fidelity Mylar speaker for private listening and a wide variety of controls governing patient entertainment systems (i.e., radio, television) and for patient convenience in contacting hospital personnel. Pillow Speaker shall have two assignable buttons for automatic dispatch of staff for (bed pan and pain med) requests.

5.9.2. Optional Features:

Room light control
 Room drapery control

5.9.3. General Description:

The Pillow Speaker shall contain:
 A nurse call button. A TV (on/off/channel-change) button.
 A volume control for incoming audio.
 A Mylar coned speaker.

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An eight-foot cord with a 10-pin modular plug.

5.10. Emergency Pull Cord:

5.10.1. Function:

Emergency Pull Cord Stations alert staff members of the location where prompt emergency help is required. Pulling on a cord that goes from the station to the ground places an emergency call. This allows patients who may have fallen to place a call while lying on the floor.

5.10.2. General Description:

Large color-coded emergency label for placement of calls.
Highly visible call LED to assure that a call has been placed.
Large color-coded "CANCEL" or "CANCEL AT TOILET" label for cancellation of calls.
Fire-retardant high-impact hospital-grade molded thermoplastic with inlaid membrane.
Attractive Lexan membrane (Pantone 1C Warm Grey).
Solid-state circuitry.
Easy plug-in connection into the system wiring.
Eight-foot pull cord with a tassel on the end for ease of gripping.
All emergency stations shall be capable of complete operation with any type of nurse call system.

5.10.3. Technical Specifications:

Item:	Technical Specification:
Operating Voltage	12-30 VDC; 12-18 VAC
Power Consumption	1 watt maximum
Dimensions	4-1/2"H x 2-3/4"W x 1-1/2"D
Mounting	4-inch square backbox with one-gang plaster ring, Raco 190 with 768 one-gang adapter or equivalent. Minimum 2-1/8" depth required. Normal mounting is vertical. For remodel areas, use Raco #500 or 503 with #977 Grip-Lok's or equivalent. Minimum 2-1/2" depth required.
Faceplate	Hospital grade UL94V-0 ABS molded thermoplastic with inlaid membrane
Faceplate Color	Standard color is Pantone 1C Warm Grey
Membrane	.010 Lexan with hardcoat finish background color Pantone 4C Warm Grey. Cancel color Pantone 1C and 11C Warm Grey.
Lamp Life	500,000 hour minimum
Switch Life	100,000 cycles minimum
Cable Requirement	Use 4-conductor #22AWG cable to associated patient station.
Termination Requirement	Plug-in connector allows rapid mass termination. Mating connector is a Panduit CE156F22-10.

5.11. Staff Emergency Station:

5.11.1. Function:

The Staff Emergency station is intended for use in toilets, bath, tub rooms and other areas where priority calls require immediate attention. The Emergency Station shall consist of a red push button area and red LED indicator lamp for medical use in applications requiring Staff Emergency for medical personnel.

5.11.2. General Description:

Large color-coded call type label for placement of calls.
 Highly visible call LED to assure that a call has been placed.
 Large color-coded "CANCEL" label for cancellation of calls.
 Fire-retardant high-impact hospital-grade molded thermoplastic with inlaid membrane.
 Attractive Lexan membrane (Pantone 1C Warm Grey).
 Solid-state circuitry.
 Easy plug-in connection into the system wiring
 All emergency stations shall be capable of complete cooperation with any type of nurse call system.

5.11.3. Technical Specifications:

Item:	Technical Specification:
Operating Voltage	12-30 VDC; 12-18 VAC
Power Consumption	1 watt maximum
Dimensions	4-1/2"H x 2-3/4"W x 1-1/2"D
Mounting	4-inch square backbox with one-gang plaster ring, Raco 190 with 768 one-gang adapter or equivalent. Minimum 2-1/8" depth required. Normal mounting is vertical. For remodel areas, use Raco #500 or 503 with #977 Grip-Lok's or equivalent. Minimum 2-1/2" depth required.
Faceplate	Hospital grade UL94V-0 ABS molded thermoplastic with inlaid membrane
Faceplate Color	Standard color is Pantone 1C Warm Grey
Membrane	.010 Lexan with hardcoat finish background color Pantone 4C Warm Grey. Cancel color Pantone 1C and 11C Warm Grey.
Lamp Life	500,000 hour minimum
Switch Life	100,000 cycles minimum
Cable Requirement	Use 4-conductor #22AWG cable to associated patient station or smart dome lights. Use 6-conductor #22AWG cable to associated other modules.
Termination Requirement	Plug-on connector allows rapid mass termination. Mating connector is a Panduit CE156F22-10.

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5.12. Push for Help Station:

5.12.1. Function:

The Push For Help station is intended for use in toilets, bath, tub rooms and other areas where priority calls require immediate attention. The Push For Help station shall consist of a red push button area and red LED indicator lamp and is designed for use in patient areas.

5.12.2. General Description:

Large color-coded call type label for placement of calls.
Highly visible call LED to assure that a call has been placed.
Large color-coded "CANCEL" label for cancellation of calls.
Fire-retardant high-impact hospital-grade molded thermoplastic with inlaid membrane.
Attractive Lexan membrane (Pantone 1C Warm Grey).
Solid-state circuitry.
Easy plug-in connection into the system wiring
All emergency stations shall be capable of complete cooperation with any type of nurse call system.

5.12.3. Technical Specifications:

Item:	Technical Specification:
Operating Voltage	12-30 VDC; 12-18 VAC
Power Consumption	1 watt maximum
Dimensions	4-1/2"H x 2-3/4"W x 1-1/2"D
Mounting	4-inch square backbox with one-gang plaster ring, Raco 190 with 768 one-gang adapter or equivalent. Minimum 2-1/8" depth required. Normal mounting is vertical. For remodel areas, use Raco #500 or 503 with #977 Grip-Lok's or equivalent. Minimum 2-1/2" depth required.
Faceplate	Hospital grade UL94V-0 ABS molded thermoplastic with inlaid membrane
Faceplate Color	Standard color is Pantone 1C Warm Grey
Membrane	.010 Lexan with hardcoat finish background color Pantone 4C Warm Grey. Cancel color Pantone 1C and 11C Warm Grey.
Lamp Life	500,000 hour minimum
Switch Life	100,000 cycles minimum
Cable Requirement	Use 4-conductor #22AWG cable to associated patient station or smart dome lights. Use 6-conductor #22AWG cable to associated other modules.
Termination Requirement	Plug-on connector allows rapid mass termination. Mating connector is a Panduit CE156F22-10.

5.13. Code Blue Station:

5.13.1. Function:

The Code Blue station is intended for use in Recovery, ICU, CCU and other areas where priority code calls require immediate attention. The Code Blue station shall consist of a blue push button area and red indicator lamp for medical use in applications requiring Staff Emergency for medical personnel. All "Code Blue" calls shall annunciate locally at nurses station, pagers, and at PBX.

5.13.2. General Description:

Highly visible call LED to assure that a call has been placed.
 Large color-coded call type label for placement of calls.
 Large color-coded "CANCEL" label for cancellation of calls.
 Fire-retardant high-impact hospital-grade molded thermoplastic with inlaid membrane.
 Attractive Lexan membrane (Pantone 1C Warm Grey).
 Solid-state circuitry.
 Easy plug-in connection into the system wiring
 All emergency stations shall be capable of complete cooperation with any type of nurse call system.

5.13.3. Technical Specifications:

Item:	Technical Specification:
Operating Voltage	12-30 VDC; 12-18 VAC
Power Consumption	1 watt maximum
Dimensions	4 1/2"H x 2 3/4"W x 1 1/2"D
Mounting	4-inch square backbox with one-gang plaster ring, Raco 190 with 768 one-gang adapter or equivalent. Minimum 2 1/8" depth required. Normal mounting is vertical. For remodel areas, use Raco #500 or 503 with #977 Grip-Lok's or equivalent. Minimum 2 1/2" depth required.
Faceplate	Hospital grade UL94V-0 ABS molded thermoplastic with inlaid membrane
Faceplate Color	Standard color is Pantone 1C Warm Grey
Membrane	.010 Lexan with hardcoat finish background color Pantone 4C Warm Grey. Cancel color Pantone 1C and 11C Warm Grey.
Lamp Life	500,000 hour minimum
Switch Life	100,000 cycles minimum
Cable Requirement	Use 4-conductor #22AWG cable to associated patient station or smart dome lights. Use 6-conductor #22AWG cable to associated other modules.
Termination Requirement	Plug-on connector allows rapid mass termination. Mating connector is a Panduit CE156F22-10.

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5.14. Dome Light:

5.14.1. Function:

The dome light provides the required visual signal to notify staff members of a room's status. The dome light can be equipped with up to four sections with one lamp per section, offering a wide variety of signals. High intensity five-watt incandescent lamps are easily visible from any reasonable angle. Dome lights can be mounted on the wall or ceiling, and the lamps are available in various colors. Typical applications include corridor indication of patient calls, patient waiting, staff calls, emergency, code blue, and code pink indications, as well as zone light applications.

5.14.2. General Description:

Translucent wedge-shaped dome lens for maximum visibility in all directions, even at great distances and under high ambient lighting conditions.
Front-replaceable lamp(s) for simplified service.
Oversized two-gang faceplate, hospital-grade ABS plastic. Color is Pantone 1C Warm Grey.
Lens is made from unbreakable polystyrene UL94V0 plastic.
Normal and emergency calls distinguished by different visual signals for positive identification of call priority.

5.14.3. Technical Specifications:

Item:	Technical Specification:
Operating Voltage	24VDC
Power Consumption	5 watts per lamp
Size	5 1/4"H x 5 1/4"W x 3 3/4"D.
Mounting	4 11/16" square backbox with two-gang plaster ring. Raco 257 with 818 or equivalent.
Faceplate	Hospital grade ABS plastic back plate with attractive finish. Pantone 1C Warm Grey.
Termination	Dome lights have 6" wired pigtails; smart dome lights and Area zone lights have plug-on connectors allow rapid mass terminations. Mating connectors are Panduit CE100F22-7, 10,12.
Luminarie	Molded white Polystyrene plastic, replaceable
Lamp colors	White, Green, Amber, Red, and Blue. Note: Blue is not recommended due to poor visibility at distances of more than 10 feet, or where fluorescent lamps are within 10 feet.

5.15. Wiring:

All nurse call system wiring shall be in accordance with the equipment manufacturer's recommendations. All components shall be provided with plug-in connections to system wiring.

6. System Interfaces:

6.1. Radio Page Interface:

The nurse call system shall have the ability to interface paging systems and must have the following system features:

- 6.1.1. Ability to assign **any** bed to **any** pager, or pager group.
- 6.1.2. Ability to assign an unlimited amount of pagers to any patient bed.
- 6.1.3. Ability to send an unlimited number of hospital selected messages to each of the pagers assigned to any bed.
- 6.1.4. Ability to send detailed, 32-character (minimum) special messages to any pager in the system from any nurse call master in the system.
- 6.1.5. Ability to send detailed, 32-character (minimum) special messages to any pager in the system from any in-house PC equipped with i-page software.
- 6.1.6. Ability to send staff emergency calls to all staff members by patient care group, automatically by simply pressing one button. Staff emergency calls shall be indicated by an emergency tone and the pager shall indicate the room number of the call and state "Staff" in plain English format on pagers.
- 6.1.7. Ability to send all code blue calls to staff members automatically by simply pressing one button. Pager shall give a separate and distinct code blue tone and indicate room number of code call, and state "Code Blue" in plain English format on pagers.
- 6.1.8. Ability to have patient calls go directly to the R.N. assigned to that patient. The nurse call system must continue to indicate call until the R.N. assigned enters the room or the patient call is answered at the nurse call master. Pager shall give routine call indication and indicate room and bed number of call, as well as "patient need" in plain English format on pagers. When interfaced with the room-to-room communication feature, calls can be canceled from any intercom throughout the facility. Patient direct calls shall indicate a pain med request, a bedpan request or a normal request.
- 6.1.9. If the radio page feature is placed in the general call mode, all levels of call shall go directly to the pager/pagers assigned to the bed placing the call. Note: Hospital must have the ability to determine which level or levels of calls go to any or all of the pagers assigned to the bed.
- 6.1.10. When a patient service request is re-called from the service mode, a second page shall be sent to the pager assigned to that specific bed. The pager shall give a general call tone and re-indicate room and bed number of call.
- 6.1.11. Pager assignments shall be easily made and/or displayed from any nurse call master in the system. Hospital shall have the ability to assign levels of call to individual pagers.
- 6.1.12. Ability to have bathroom emergency calls go directly to the R.N. assigned to that room by simply pulling the bathroom emergency call cord. Pager shall sound an emergency call and indicate room number of emergency call, and shall state "Bathroom Emergency" in plain English format on pagers.
- 6.1.13. Ability to have bed exit emergency calls go directly to the R.N. assigned to that bed when a patient egresses from the bed and the bed exit feature is turned on. The pager shall give an emergency tone and indicated room and bed number of the bed exit alarm, and state "BedX" in plain English format on the pagers.

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- 6.1.14. Ability to send a stat call to the R.N. assigned to a bed by simply pressing one button on the master while talking to the room. All pagers on the floor shall give an emergency tone and indicate the room and bed number of the stat call.
- 6.1.15. System shall be capable of placing unlimited auto pages, programmed as needed at the nurses' station. These pages shall automatically be sent at specified times and days.
- 6.1.16. In the event that a patient call is re-called in excess of two times (number of re-calls to be programmable by hospital) without the proper level of staff entering the room, a page will automatically be sent to the Supervisor's pager. An emergency tone on the pager shall alert the Supervisor of a problem, and the pager will display the room and bed number of the patient needing assistance.

6.2. Automatic Tracking Systems:

Automatic tracking system shall consist of a small, lightweight badge that emits invisible, digitized infrared light with a unique identification code. The code is received by sensors and relayed to the nurse call system master station where the badge's location is displayed. When a staff member wearing an IR badge enters a patient's room, the dome light indicates his or her presence by turning on the appropriate lamp. Routine patient calls are also automatically canceled when the correct staff member enters a patient's room. The nurse call master station must have automatic location features such as low battery indication and badge log file. Instant voice communication to staff members using a location badge is also possible. Staff location information can be stored in the reporting database to produce productivity reports that includes staff members names, locations, and their response times on all patient calls.

6.3. ADT Systems:

- 6.3.1. The nurse call system shall receive information from the hospital's Admit-Discharge-Transfer system in real time.
- 6.3.2. The nurse call system shall be capable of receiving the information in a variety of formats including HL7.
- 6.3.3. The nurse call shall receive the information through a serial or TCP/IP connection.
- 6.3.4. Information shall be automatically placed in the appropriate patient information file in the nurse call system if required. The following is a list of fields that can be uploaded:

FIELD
BED ID*
NAME, LAST*
NAME, FIRST*
ADMIT DATE
DIAGNOSIS
RELIGION
MEMO (Personal data)
MEMO (staff data)
AGE
AGE YMD
GENDER
SMOKER
ACCOUNT#
DOCTOR (s)
NURSE (s)

7. Management Reports:

The nurse call system shall be capable of collecting data and storing it in an SQL database so a variety of reports may be produced. This data shall include a recap of all events associated with a bed, patient, staff member, patient requests and response time.

If a hospital has multiple floors or wings with independent Central Terminals, the system shall be configured to use a common database. A report can be generated for one or multiple centrals terminals.

Summary information included in the report includes but is not limited to:

- Total number of calls in report.
- What percentage of all calls this type was answered on time.
- Total number of recalls.
- Percentage of calls that recalled.
- Total number of calls for all types.
- Total number of recalls for all types.
- Overall percentage of calls that recalled.
- Percentage of calls answered per staff member.

The statistics table displays for **each** call type; the average (AVG), highest (HIGH), and lowest (LOW) times in the report for:

Desk Response: The length of time for a call to be answered at the Master.

Room Response: The length of time for a staff member to arrive in the room, either by a call answered at the Master, or a direct response.

Total Response: The cumulative time before a patient has been serviced. (Desk Response + Room Response)

Stay in room: The length of time the staff member(s) stayed in the room.

8. Network/Centralization:

- 8.1. All nurse call centrals must have the ability to be networked and centralized, if desired.
- 8.2. All calls placed in the nurse call system must be able to be answered from any nurses' station on the network or at a centrally located master station.
- 8.3. All nurse call centrals must be able to run networked, or independently from the network.

9. Training:

9.1. In-Service Training:

- 9.1.1. All in-service shall include user manuals. Vendor to supply one in-service per year, minimum, at no additional charge to the hospital to be scheduled a minimum of one month in advance.
- 9.1.2. The in-service schedule shall be coordinated with the nursing education department of the hospital and signed off by nursing administration before installation of the system can begin. The pre-agreed upon in-service schedule shall become a part of the contract.

9.2. Factory Training:

A factory technical training seminar shall be supplied at no additional cost to the facility. This training seminar shall be held at the factory on an annual basis and shall offer a minimum of three days hands-on training to all hospital engineering and Bio-medical staff. Hospital personnel shall have access to this school for the life of the system.

10. Conditions:

10.1. Equipment:

- 10.1.1. All equipment listed above must be supplied by a US manufacturer and must meet all of the above specifications.
- 10.1.2. All equipment shall be listed for "UL 1069" Standards for Hospital Usage.
- 10.1.3. Part numbers designated may change according to the manufacturer's new product releases; however, the equipment specified shall meet or exceed the specifications as outlined.
- 10.1.4. No deviation from the specified equipment shall be acceptable.

10.2. History:

The successful bidder must have at least six (6) local installations of comparable systems and supply a complete list of references with their bid.

10.3. Service:

All service shall be performed by an authorized factory servicing company (subcontractors are not acceptable).

10.4. Installation:

Company employees of the company selling the above listed system shall perform all installation. Use of sub-contractors or hospital personnel to perform installation is not acceptable.

10.5. Warranty:

Full five-year warranty on all equipment and one year on labor. Pillow speakers are warranted for two years. Light bulbs shall be guaranteed for 90 days.

