



LODGENET HOTEL INSTALLATION OVERVIEW

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LODGENET HOTEL INSTALLATION OVERVIEW

DISCLAIMER OF WARRANTIES

DISCLAIMER OF WARRANTIES: This document is intended for professional installers with MATV / CATV design experience. The information contained in this document is provided "AS IS." You and your construction advisors must independently determine the appropriateness of the information contained in this document. LodgeNet expressly disclaims all warranties of any kind with respect to this document and the information it contains, whether expressed or implied, including but not limited to the warranties of merchantability and fitness for a particular purpose.

If you have questions or require additional assistance, please contact LodgeNet's Professional Solutions Group at 1-888-LODGENET or at professionalsolutions@lodgenet.com.

DOCUMENT PURPOSE & DEFINITION

This document provides guidance for the design and installation of an MATV/CATV distribution network to support a LodgeNet system in a new hotel construction environment. A system properly designed and built during the construction period will not only serve your immediate needs, but will also provide for expandability, reliability, and serviceability in the future.

The LodgeNet system may be comprised of several solutions, including Guest Pay (GP) and Free-To-Guest (FTG) services. Each hotel may have any combination of these solutions installed. Each solution has a specific set of requirements for installation and operation.

This document is comprised of three sections.

- Section 1 - Provides specifications and guidance in the planning and installation of LodgeNet's Guest Pay platforms such as LodgeNet SD, LodgeNet HD, LodgeNet HD-Ready, and LodgeNet's Free-To-Guest (FTG) platforms (with a supplemental Off-air system, if required).
- Section 2 - Provides specifications and guidance in the planning and installation of a MATV/CATV distribution system.
- Section 3 - Provides examples and guidance for documenting the system design and performance. The required documentation will include As-Built diagrams, a TV Type matrix showing hardware combinations, and RF readings from the room.

Information found in this document can be freely duplicated and distributed to contractors and others involved in the planning and construction of new hotels. LodgeNet is committed to providing interactive products and services of the highest quality to the Lodging industry. If you have any questions about the specifications found in this document, feel free to call us at 1-888-LODGENET.

SECTION 1: LODGENET GUEST PAY AND FREE-TO-GUEST REQUIREMENTS

GUEST PAY (GP) HARDWARE COMPONENTS

LodgeNet's Guest Pay platforms provide a powerful, customizable, interactive and informative entertainment delivery system designed for guests. The hardware components within these platforms include:

- System Rack - Contains proprietary host computers, video file servers, and interactive TV enabling equipment. The system rack may also include game equipment (Nintendo® GameCube™) and Internet browser modules, depending on the requested or contracted services. Additionally, the rack contains television processing and networking components.
- LodgeNet Applications Wizard® Administrative Menu Console - Functions as an administrative terminal, allowing access to system management tools for system administration and diagnosis. The Applications Wizard includes a small footprint computer console, a flat panel monitor, a keyboard, a mouse, and two power supplies.
- Network Printer - Used in conjunction with the Applications Wizard console and allows users to print system information and reports.
- TV Signal Insertion Point - Comprised of required splitters, combiners, and television distribution amplifiers sufficient to introduce signals originating at the system racks with the existing TV cabling network.
- 1, 1.2 or 1.8 Meter Satellite Dish - The Ku band satellite dish is used to receive schedule updates and selected content downloads.
- Guest Room Terminal - Connects to the existing compatible TV receiver, enabling it to function as an interactive device.
- Nintendo GameCube Hardware (Optional) - Used only in sites contracted for the Nintendo service.
 - GameCube game controller - Controls GameCube game play on the TV through the guest room terminal.
- Guest Room Remote Control - Controls the functions of the television and/or guest room terminal.

FTG HARDWARE COMPONENTS

The Free-To-Guest (FTG) TV programming service may provide a predetermined number of basic cable, local, premium, DTV/HDTV local, and DTV/HDTV premium channels. The following hardware components are included in LodgeNet's Free-To-Guest TV programming service.

- FTG Receiver Rack(s) - Contains digital satellite receiving equipment, as well as commercial television processing and networking components.
- TV Signal Insertion Point - Comprised of splitters, combiners, and TV distribution amplifiers sufficient to introduce signals originating at the system racks with the existing TV cabling network.
- 1, 1.2 or 1.8 Meter Satellite Dish(es) –Ku and Ka band satellite dish(es) used to receive content.
- Off-Air Antennas - Used to receive (local analog and local DTV/HDTV) broadcast channels not available via satellite transmission.

RACK ROOM REQUIREMENTS

Security Requirements

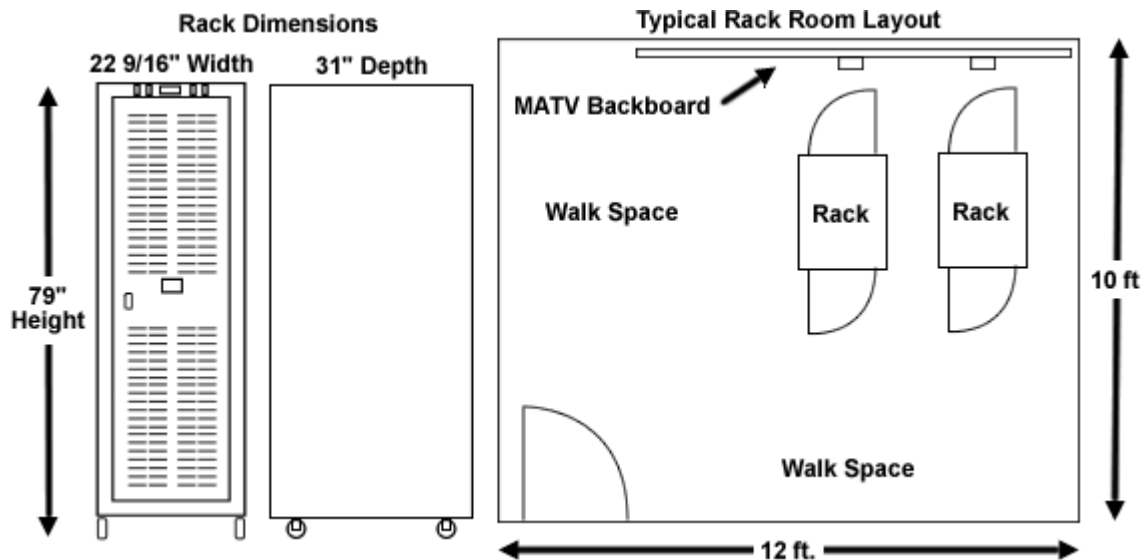
- The LodgeNet equipment room must be a secure, limited access area.
- Preferred equipment locations include environmentally controlled telephone or computer rooms.

Backboard Requirements

- A backboard of 3/4" plywood with a total area of 4' x 8' (split into two 4' x 4' boards is acceptable) must be installed on a wall near the system rack(s) for mounting the mix point devices, distribution amplifiers, and other related equipment.
- Backboards must meet local fire-rating codes.

Space Requirements

- Rack room entrance or door must be at least 32" (w) and 80" (h).
- LodgeNet System Rack Dimensions: 79" (h), 22 9/16" (w), and 31" (d).
- LodgeNet System Racks require a minimum of 5' (w) x 8' (d) of unobstructed floor space, with 8' of head room for the first rack (includes "walk around").
- An additional 2' (w) x 8' (d) of unobstructed floor space is required for each additional rack.
- **Depending on the services being installed, you will need at least one GP rack and up to 3 FTG racks. To determine the number of racks required, please contact your LodgeNet Installations Project Coordinator.**



- Applications Wizard Dimensions (Can be located outside the rack room):
 - Computer Console: 2.5" (h), 11.5" (w), 11" (d).
 - Flat Panel Monitor: 15.5" (h), 16.5" (w), 6.5" (d).
 - Keyboard: 1" (h), 15.7" (w), 9.25" (d).
- Network Printer Dimensions (Can be located outside the rack room):
 - 10.9" (h), 14.1" (w), 17.8" (d).

Electrical Circuit Requirements

- **Guest Pay:**
 - Hotels containing 630 rooms or less will require one 30A-110VAC circuit.
 - Hotels containing more than 630 rooms must contact LodgeNet for specific electrical requirements.
 - Applications Wizard - Two outlets. (One 15 amp circuit / may be behind the front desk.)
 - Printer - One outlet. (One 15 amp circuit may be behind the front desk.)
- **Free-To-Guest:**
 - Each FTG Rack - One 15A circuit with two standard 15A outlets.
- **General:**
 - Insertion Point Launch Amp - One outlet (typical).

Conduit Requirements

- **Guest Pay:**
 - One 3” diameter conduit for LodgeNet’s exclusive use must be provided from the GP rack location to the satellite dish location. (400-foot maximum distance.)
 - At the dish location, conduits must terminate into a 12” x 12” x 6” weatherproof box.
- **Free-To-Guest:**
 - One 3” diameter conduit for LodgeNet’s exclusive use must be provided from the FTG rack location to the satellite dish location. (250-foot maximum distance.)
 - One 3” diameter conduit for LodgeNet’s exclusive use must be provided from the FTG rack location to the antenna location on the roof (if signals are received via antenna).
- **General:**
 - One 2” diameter conduit for LodgeNet’s exclusive use must be provided from each of the rack locations to the hotel’s main distribution point location (if GP, FTG, and the main distribution point are not located in the same room).
 - One 2” diameter conduit for LodgeNet’s exclusive use must be provided from the headend rack location to the front desk area. (Distance limitations may apply.)
 - One 2” diameter conduit for LodgeNet’s exclusive use must be provided from the headend rack location to the hotel’s Property Management System (PMS) location. (Distance limitations may apply.)
 - One 2” diameter conduit for LodgeNet’s exclusive use must be provided from the headend rack location to each additional remote system interface (Applications Wizard) location. (Distance limitations may apply.)

HVAC Requirements

- **General:**
 - The LodgeNet rack temperature must be maintained between 50°F–75°F.
- **Guest Pay:**
 - Refer to the table below to determine the heat loading by the number of rooms.

SYSTEM HVAC REQUIREMENTS						
Room Count	50 - 150	151 - 270	271 - 390	391 - 510	511 - 630	Over 630
Rack Count	1	1	1	1	1	Contact LodgeNet
Power (Watts)	665	1246	1272	1307	1336	
Heat (BTU)*	2270	4250	4340	4460	4560	

*Note: To calculate the total amount of heat generated, the heat generated by the Free-To-Guest equipment installed in the same location as the Guest Pay equipment must be added to the heat figures in the table above.

- **Free-To-Guest:**
 - Refer to the table below to determine the heat loading by type of FTG channel.

FTG HVAC REQUIREMENTS		
Type and # of Channels	BTUs	For More Channels
Up to 40 DirecTV SD (Analog) Satellite Channels	4843	Contact LodgeNet
Up to 12 DirecTV HD Satellite Channels	5064	
Up to 12 Digital HD Off-Air (Local) Channels	1284	

Note: To calculate the total amount of heat generated in the rack room, the heat generated by the Guest Pay equipment installed in the same location as the Free-To-Guest equipment must be added to the total heat figures in the table above.

RACK ROOM CABLING REQUIREMENTS

The following guidelines and diagrams detail the cable run specifications from the system rack location.

CAT5 Cabling Requirements

- One CAT5 cable required for the Applications Wizard.
- One CAT5 cable required for the network printer.
- One CAT5 cable required as a spare for the front office equipment.
- One CAT5 cable required for the broadband Internet connection.
- One CAT5 cable required for Networked PC Access (if applicable).
- If FTG is installed, an additional CAT5 cable must be installed between the GP and FTG racks.
- CAT5 cable runs greater than 328 feet will require the use of an Ethernet hub or a pair of Ethernet extenders between the system rack and the connected device. Note: AC power is required at the hub or Ethernet extender location.

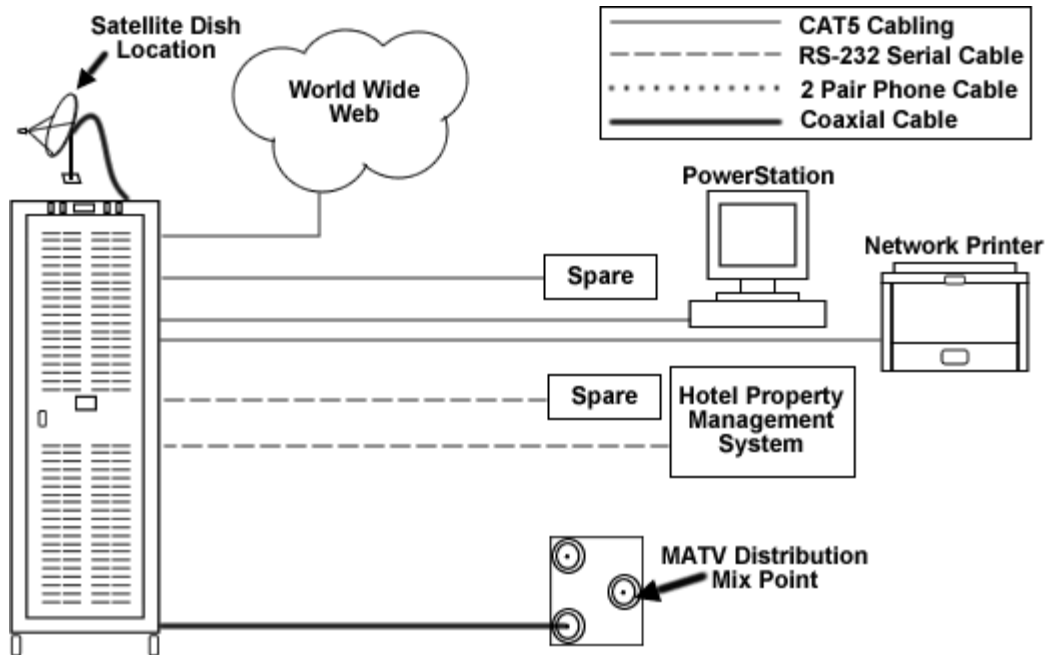
RS-232 Cabling Requirements

- One RS-232 cable required for the connection to the hotel's Property Management System.
- One RS-232 cable required as a spare for the hotel's Property Management System.
- If FTG is installed, a data cable is required between the GP and FTG racks.
 - CAT5 cable may be used if the GP and FTG racks are in separate locations.

Coaxial Cable

- RG-11 coaxial cable is required for the satellite dish.
- RG-11 coaxial cable is required to the MATV distribution point.
 - Swept from 5 MHz–1 GHz.

Guest Pay System Cabling Diagram



SATELLITE DISH REQUIREMENTS

Satellite Dishes

- **Guest Pay:**

- One 1-meter satellite dish is required for the LodgeNet system. Note: A 1.2 or 1.8 meter satellite dish may be needed in select areas.
 - If HD VOD is being installed with an On Command headend system, an additional 1-meter satellite dish is required. (A 1.2 meter satellite dish may be needed in select areas.)
- The satellite dish location requires an unobstructed view of the sky facing 103 degrees west.
- It is important that the satellite dish location be no more than 400 feet from the LodgeNet system racks. (Because of this limitation, a roof location may not always be acceptable.)

- **Free-To-Guest:**

- Up to 6 satellite dishes (1 or 1.2 meter depending on location) may be required for digital satellite programming services.
- The satellite dish location requires an unobstructed view of the sky from 72.5 degrees west to 119 degrees west.
- It is important that the satellite dish location be no more than 250 feet from the LodgeNet system racks. (Because of this limitation, a roof location may not always be acceptable.)

- **General:**

- Pre-installed 4' antenna mast(s) (3" OD capped) that are properly secured to the building during construction will reduce costs (one required per dish).
- All masts must be properly grounded. (Refer to NEC code, Article 810, Section 810-21.)
- If the satellite dish will be installed on the roof without a permanent mast, a non-penetrating ballasted roof mount must be used. Therefore, the roof must be able to withstand continuous roof loading of 45 lbs. per sq. ft.
- Satellite dishes must be in an accessible location for service.

Antennas

- Off-air antennas must be on the exterior roof of the building and in a location that provides a clear line of sight to the surrounding area.
- Three 6' antenna masts spaced 5' apart and properly secured during construction may reduce cost.

Space Requirements

- 1 meter satellite dish mount: Baird B3 34" x 40" Mount
 - Typical mast dimensions: 30" (h) x 35" (w) x 40" (d)
- 1.2 meter satellite dish mount: Baird B4 6' x 6' Mount
 - Typical mast dimensions: 36" (h) x 75" (w) x 72" (d)
- 1.8 meter satellite dish mount: Baird B6-11 11' x 11' Mount
 - Typical mast dimensions: 36" (h) x 130.75" (w) x 130.75" (d)

Ballast

- In applications where a non-penetrating roof mount is deployed, ballast in the form of sandbags or concrete blocks must be used.
- The amount of ballast required will vary, based on local conditions such as the surface area of the dish, height of the building, and the typical area wind speeds.

Cables

- All weather-exposed cables must be placed in conduit and terminated with a weather head.
 - Exposed cable for service loops should be limited to no more than 5 feet and should be adequately dressed (not laying on roof).
- Connectors should be of the weatherproof type or sealed with weatherproof compound.

Electrical Outlet Requirements

- Power is provided from the system rack via RG-11 coaxial cable. No additional electrical outlets are required at the satellite dish location.

CIRCUIT/TELECOM REQUIREMENTS

The LodgeNet system must have a dedicated Internet circuit or be on a shared circuit with bandwidth management allowing a portion of the circuit to be dedicated to LodgeNet services. Please reference your specific agreement for details.

Supported Interfaces

- Supported interface types: 10Base-T (Ethernet), or 100Base-T (Fast-Ethernet).

Public Routable IP Address

- IP addresses must be assigned from the Internet Service Provider (ISP) before the system is installed. This IP address may also be referred to as the "host IP" or "customer IP."
- The LodgeNet system requires (1) public routable IP address. This may also be referred to as a "static IP address."
- The address must be static - It must not be Dynamic Host Configuration Protocol (DHCP) assigned or be a DHCP "sticky" IP address.
- The IP address must not be Network Address Translated (NAT), must not be shared with another system, and must not be firewalled or filtered.

- The IP address must not be an RFC-1918 private, unroutable IP address that is masqueraded, spoofed, or translated. The following IP addresses are not supported (RFC-1918):
 - Addresses that begin with 10
 - Addresses that begin with 192.168
 - Addresses that begin with 172.16-31

Subnet Mask

- The subnet mask is assigned from the ISP in conjunction with the host IP address.

Examples: IP: 12.100.100.100 **subnet mask: 255.255.255.248**

IP: 12.100.100.100/29 (The “/29” is the subnet mask)

Gateway IP Address

- The Gateway IP address is also assigned from the ISP in conjunction with the host IP address. This will be denoted as “Gateway Address,” “Gateway IP,” or “Default Gateway.”

GUEST ROOM REQUIREMENTS

Guest Room Hardware Components

- In-Room Terminal.
- Remote Control.
- GameCube Hardware (Optional) - Used only in systems with Nintendo games.
 - GameCube Game Controller - 2” (h) x 5.5” (w) x 4” (d).
 - The controller must be placed near the television.
- LodgeNet LaunchPad (Optional) - Allows your guests to connect a wide variety of portable devices with the guest room television.
- LodgeNet RoomDock™ Premier (Optional) - A stylish desktop solution that allows guests to easily and conveniently connect their iPod® or other portable device to a high-definition TV display.

Electrical Outlet Requirements

- Non-integrated terminals Only - The existing TV power cord must plug into the convenience outlet provided on the power supply. The guest room terminal power supply plugs into a vacated non-switched outlet. No additional outlet is required.

Security Requirements

- Metallic, tamper-resistant sleeves for coaxial cable ends (provided).

Television Receivers

- The LodgeNet system is designed to work with a wide variety of TV models.
- Please consult your LodgeNet representative to ensure compatibility of TVs before purchasing new ones.

SECTION 2: CATV/MATV DISTRIBUTION REQUIREMENTS

SIGNAL SPECIFICATIONS

- The recommended MATV/CATV distribution system's forward frequency response must be at 49 MHz–860 MHz with +3 to +10 dBmV on every channel at each TV outlet. The return response must be 5 MHz–35 MHz.
- The system must be able to deliver 6 to 10 dBmV return level at 5 MHz–35 MHz to the headend, with a 36 dBmV reference from a typical room location.
- The system must maintain a room-to-room isolation of 23 dB or greater.

DISTRIBUTION CLOSET REQUIREMENTS

- Must be a secure, limited access area.
- A backboard of 3/4" plywood with a total area of 4' x 4' must be installed on the wall in each distribution closet. Each backboard must meet local fire-rating codes.
- If the distribution closets require amplifiers, a non-switched 10A 120VAC circuit must be provided at the backboard.
- A 2" conduit must be provided from each distribution closet to the headend.

AMPLIFIER REQUIREMENTS

- Amplifiers must be bi-directional with a forward frequency pass range of at least 49 MHz to 860 MHz. The return rating should be between 5 MHz and 35 MHz.
- The amplifier's output must not exceed 42 dBmV at 860 MHz. Frequencies between 225 MHz and 400 MHz should not exceed 38.75 dBmV.
- Amplifiers must be mounted on spacers that are a minimum of 1/2" from the plywood backboard to allow for adequate cooling.
- Amplifiers should be located in, or as close to the distribution closets as possible.
- The following amplifier input specifications denote levels after all internal pads and equalizers are installed.

Make	Model	Max Input	Min Input	Max Output @ Max Input
BT	BIDA 75A-30P	14	8	44
BT	BIDA 75A-43P	5	2	44
BT	BIDA 86A-30P	14	8	44
BT	BIDA 86A-43P	5	2	44
Drake	DA7533-750P-33	14	8	44
Drake	DA7543-750P-43	5	2	44
Drake	DA8632-860P-32	14	8	44
Drake	DA8642-860P-42	5	2	44

- Amplifier cascading (multiple amplifiers in the same signal path) should be kept to a minimum.
- Cascading high gain amps (over 35 dBmV gain) is not recommended.
- Every time amplifiers are cascaded, the inputs and max outputs must be systematically reduced as listed below.

DE-RATED AMPLIFIER INPUT/OUTPUT SPECIFICATIONS

Refer to the tables below for the input and output specifications for 30 dBmV and 43 dBmV cascaded amplifiers.

30 dBmV Gain Cascaded Amplifier Input/Output Specifications

Cascade Number	44 dBmV		43 dBmV		42 dBmV		41 dBmV	
	Max Input	Max Output	Max Input	Max Output	Max Input	Max Output	Max Input	Max Output
1	14	44	14	43	14	42	14	41
2	11	41	11	41	11	41	11	39
3	9	39	9	39	9	39	9	37
4	8	38	8	38	8	38	8	36

High Gain (43 dBmV) Cascaded Amplifier Input/Output Specifications

Cascade Number	44 dBmV		43 dBmV		42 dBmV		41 dBmV	
	Max Input	Max Output	Max Input	Max Output	Max Input	Max Output	Max Input	Max Output
1	5	44	5	43	5	42	5	41
2	4	41	4	41	4	41	4	41
3	3	39	3	39	3	39	3	39
4	2	38	2	38	2	38	2	38

PASSIVE DEVICE REQUIREMENTS

- Passive devices (taps, splitters, etc.) must have a frequency rating of 5 MHz–1 GHz and a shielding rating of –100dB RFI or greater.
- All passive devices must be located in an accessible location. Passive devices installed in ceilings or walls must have access panels provided.
- Devices must have a minimum port-to-port isolation of 23 dB or greater.

CABLE REQUIREMENTS

- Main trunk cables should be CATVR rated RG-11 cable, swept from 5 MHz–1 GHz. (See the Cable Specification Chart for minimum cable requirements and the Maximum Cable Attenuation Chart for sweep specifications.) Hardline cable .500 or larger is also acceptable.
- Underground cable runs that connect separate buildings must use flooded type cable and be in conduit. RG-11 or hardline cable should be used for runs up to 500 feet.
- Hardline cable or fiber cable should be considered for runs of 500 or more. Hardline attenuation losses must be considered when hardline is used.
- Riser cabling should be CATVR cable, swept from 5 MHz–1 GHz.
- Cable runs should not contain splices.
- Always use plenum-grade CATVP cable where required by local code or when installing cable in plenum ceilings without conduit.
- RG-59 type cable is not recommended.
- Compression or radial type fittings should be used for RG-6 coaxial cable connectors. RG-11 coaxial cable can use compression-type or hex-crimp connectors with a crimped center conductor pin.
- All cable pulls prior to termination must leave a 3-foot service loop.
- Coaxial cable type and installation must meet NEC codes for fire safety.
- All weather-exposed cables must be the flooded type.

Cable Specification Chart

Cable Type	Conductor Size, Construction and Diameter	Dielectric Type and Diameter	Shielding Type and Coverage (Minimum)	Jacket Type and Thickness	Overall Diameter
Riser Rated RG-6	18 AWG Copper-Clad Steel. Nom. 0.0403"	Foam Polyethylene. Nom. OD 0.180"	Foil: Aluminum/Poly tap 100% coverage Braid: 34 AWG Aluminum 60% coverage	Flame Retardant PVC. Nom. 0.030"	Nom. 0.272" (+/- 0.004")
Plenum Rated RG-6	18 AWG Copper-Clad Steel. Nom 0.0403"	Foam FEP Nom. OD 0.170"	Foil: Aluminum/Poly tap 100% coverage Braid: 34 AWG Aluminum 60% coverage	Plenum PVC or Kynar (PVDF) Nom. 0.015"	Nom. 0.239" (+/- 0.006")
Riser Rated RG-11	14 AWG Copper-Clad Steel. Nom. 0.0641"	Foam Polyethylene. Nom. OD 0.280"	Foil: Aluminum/Poly tap 100% coverage Braid: 34 AWG Aluminum 60% coverage	Flame Retardant PVC. Nom. 0.045"	Nom. 0.405" (+/- 0.010")
Plenum Rated RG-11	14 AWG Copper-Clad Steel. Nom. 0.0641"	Foam FEP Nom. OD 0.280"	Foil: Aluminum/Poly tap 100% coverage Braid: 34 AWG Aluminum 60% coverage	Plenum PVC or Kynar (PVDF) Nom. 0.020"	Nom. 0.351" (+/- 0.006")

Maximum Cable Attenuation Chart (dB/100 ft.)

Cable Type	1 MHz	10 MHz	50 MHz	100 MHz	200 MHz	400 MHz	700 MHz	900 MHz	1000 MHz
Riser Rated RG-6	0.37 dB	0.66 dB	1.41 dB	1.92 dB	2.64 dB	3.73 dB	5.05 dB	5.79 dB	6.11 dB
Plenum Rated RG-6	0.38 dB	0.70 dB	1.48 dB	2.01 dB	2.86 dB	4.23 dB	5.96 dB	6.96 dB	7.45 dB
Riser Rated RG-11	0.17 dB	0.45 dB	0.89 dB	1.21 dB	1.68 dB	2.37 dB	3.27 dB	3.77 dB	3.95 dB
Plenum Rated RG-11	0.15 dB	0.45 dB	0.90 dB	1.28 dB	1.85 dB	2.75 dB	3.92 dB	4.72 dB	5.04 dB

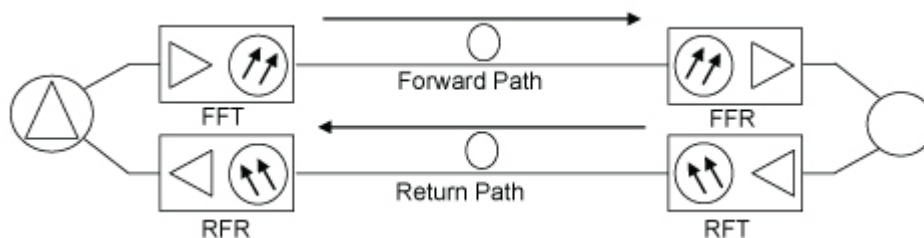
Maximum Cable Attenuation Chart (dB/100 ft.)

Cable Type	5 MHz	55 MHz	250 MHz	350 MHz	450 MHz	550 MHz	750 MHz	865 MHz	1000 MHz
.500 Hardline	0.16 dB	0.54 dB	1.2 dB	1.43 dB	1.63 dB	1.82 dB	2.16 dB	2.34 dB	2.52 dB
.750 Hardline	.11 dB	0.37 dB	0.81 dB	0.97 dB	1.12 dB	1.24 dB	1.48 dB	1.61 dB	1.74 dB

FIBER OPTIC CABLES

- Fiber optic cables are acceptable for trunk line runs and should be considered for runs over 1000 feet.
- If fiber is being used for runs from dish locations to the headend or in conjunction with On Command head end equipment, please contact LodgeNet for assistance.
- All fiber optic cables must be single mode 9/125 μ m.
- If non-armored cable is used, conduit should be considered (reference local codes for requirements).
- LodgeNet recommends a minimum of two fiber strands to all locations.
 - Additional spares are recommended if forward and return signals are to be run on separate cables.
 - If fiber is being used for runs from dish locations, please contact LodgeNet for assistance.
- All cable splices must be fusion splices. Mechanical splices are not acceptable.
- Minimum cable bend ratio should not be less than 10x the diameter of the cable (~ 2" minimum).
- All fiber optic cable runs must be terminated and tested by the fiber installation contractor.
- Cables should be terminated with SC/ACP (SC style connector / Angle Physical Contact).
- The hotel must provide and install fiber optical link equipment for both forward and return signals (transmitters and receivers).
- The forward path FFT (Forward Fiber Transmitter) and FFR (Forward Fiber Receiver) must support 49 MHz to 860 MHz.
- The return path RFR (Return Fiber Receiver) and RFT (Return Fiber Transmitter) must support 5 MHz – 35 MHz.
- The optical transmitters should be sized so that the signal reaches the receiver at -1 dBm (+/- 3dB).
- LodgeNet does not currently support fiber to the room.

Typical Bi-Directional Trunk

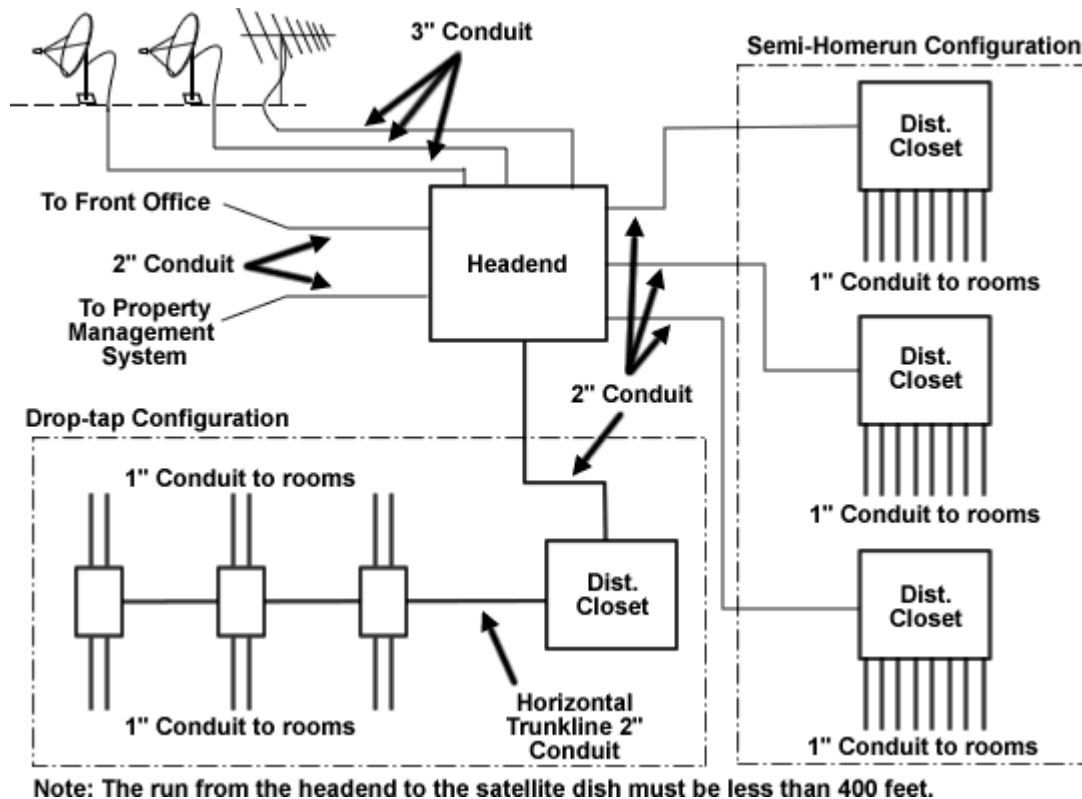


CONDUIT REQUIREMENTS

- The use of conduit for all MATV/CATV wiring, including room drops, is highly recommended.
- Underground cable runs that connect separate buildings must use flooded type cable and be in conduit. RG-11 or hardline cable should be used for runs up to 500 feet. Hardline cable is required for runs of 500 or more.
- All conduits must contain a pull string.

CONDUIT DIAGRAM

The following diagram indicates the type(s) of conduit to be used according to the aforementioned guidelines within this document. Therefore, this diagram should only be used as a reference or aid in conjunction with those guidelines.



MATV CABLING OVERVIEW

A properly designed and maintained MATV distribution system is critical to the delivery of quality television entertainment and information services. Two methods are recommended for the design and layout of MATV/CATV distribution systems.

Method #1: RG-6 homeruns to each room from distribution closets or the system rack.

Method #2: Horizontal RG-11 trunks feeding 4-port and 2-port drop taps. Drop tap legs feed individual rooms with RG-6.

- Meeting rooms and public area wiring must be on a separate trunk or riser from the guest rooms.
- Loop-through riser configurations are not recommended.
- For best results, Method #1 should always be employed in new construction.

Method #1: Homerun Installation Guidelines

- All rooms terminate with pass-through F-81 connectors at the wall plate.
- Use RG-11 or .500 hardline for all trunk lines from the system rack to the distribution closets.
- Values of splitters or directional couplers should be chosen to allow more signal to be fed to distant rooms. This helps compensate for increased signal loss over long distances.
- Splitters and directional couplers are used in the system rack room or distribution closets to distribute signals to the rooms.

Diagram A: Method #1 Homerun Installation

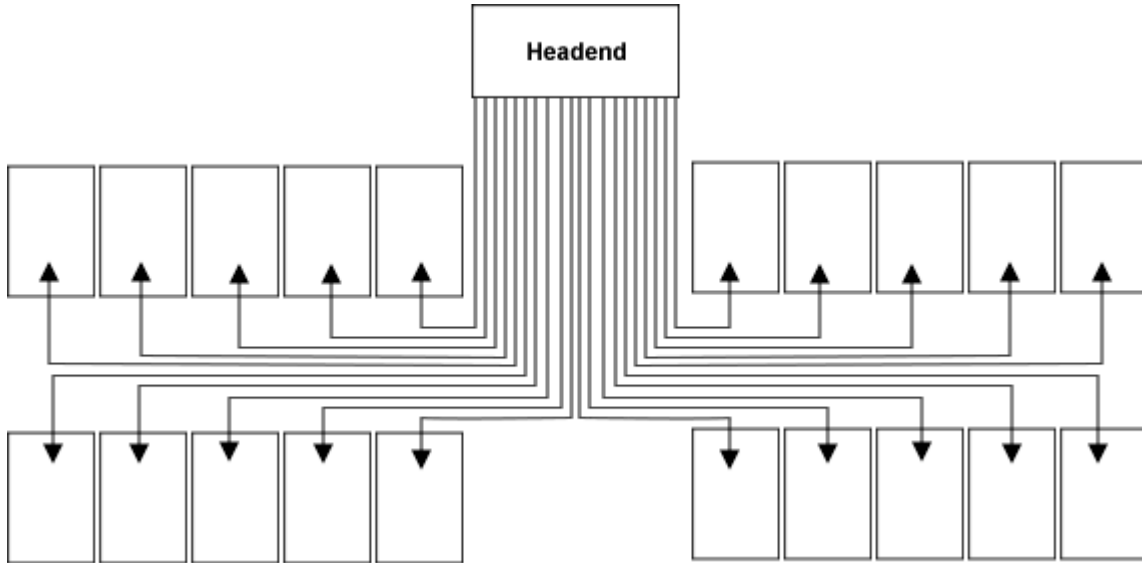
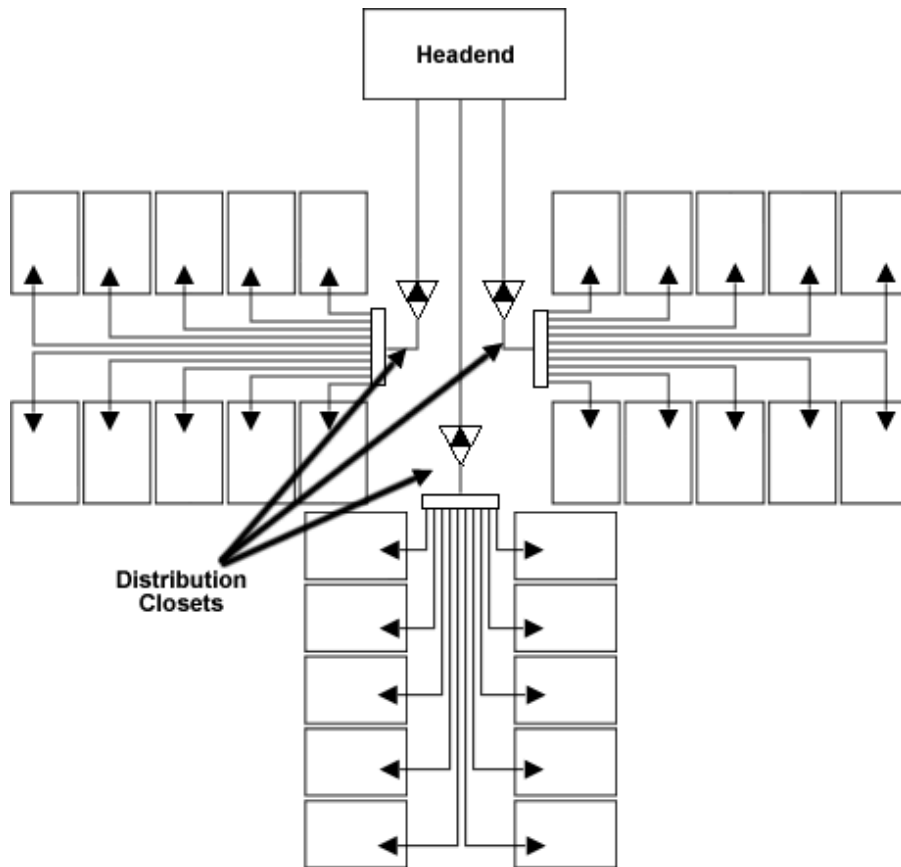


Diagram B: Method #1 Homerun Installation



Method #2: Semi-Homerun Installation Guidelines

- Trunks must be designed to ensure that drop taps decrease in value the further from the beginning of the trunk to provide signal levels from +3 dBmV to +10 dBmV to each outlet.
- 2-port drop taps can be used whenever less than 3 rooms need to be fed. Note: Feeding end rooms from the tap throughput is not acceptable.
- Trunk lines can be home run from the system rack or fed from distribution closets.

Diagram C: Method #2 4-Way Drops

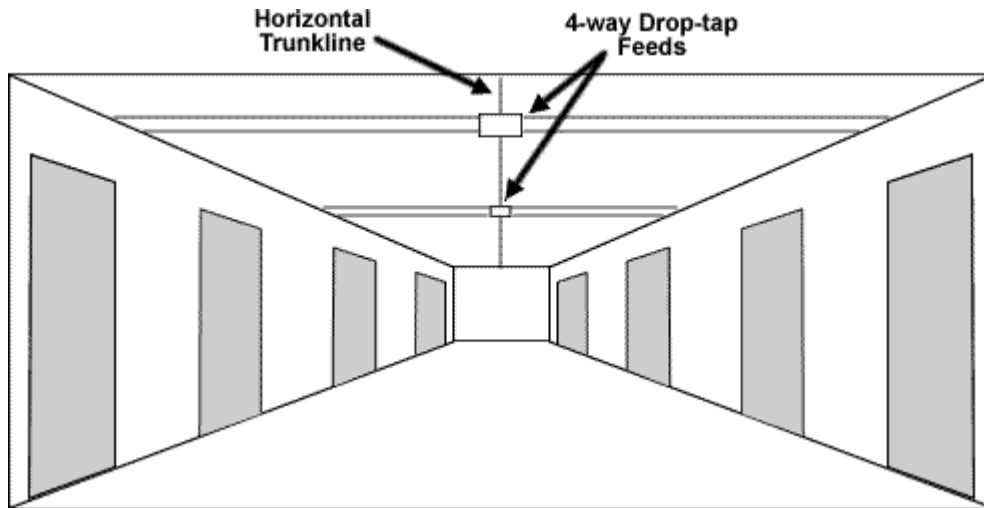
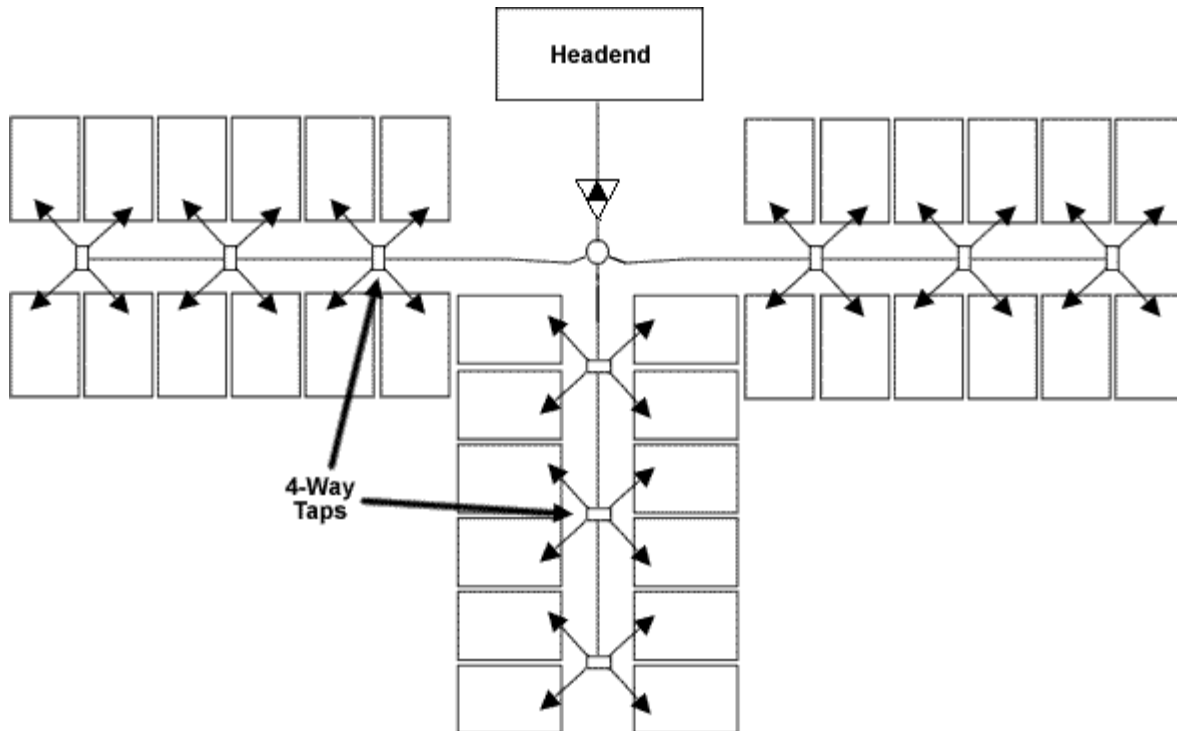


Diagram D: Method #2 Descending 4-Way Drop Tap Installation



ADDITIONAL MATV INFORMATION

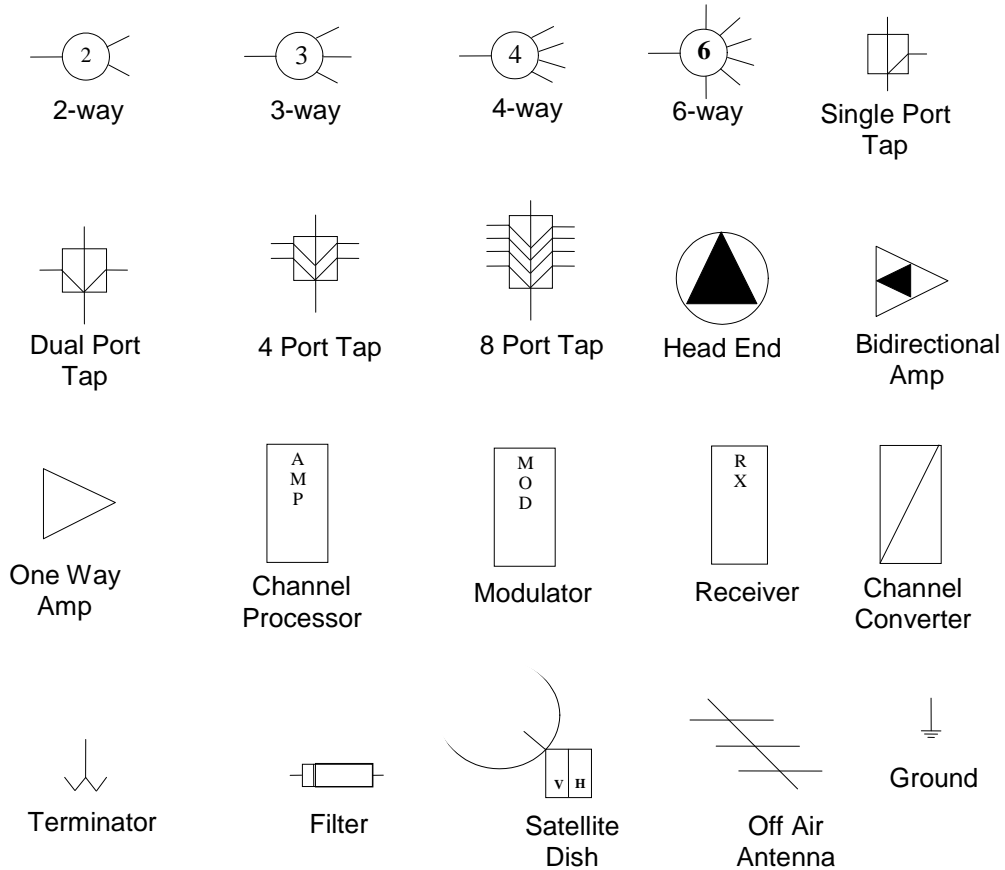
For additional MATV information, questions, or MATV design, please contact LodgeNet's Professional Solutions Group at 1-888-LODGENET or at professionalsolutions@lodgenet.com.

SECTION 3: DOCUMENTATION OF SYSTEM DESIGN AND PERFORMANCE

AS BUILT DIAGRAMS

The layout or design of the system must be thoroughly documented in an As Built diagram. Refer to the following examples of acceptable As Built symbols and the sample As Built diagram below.

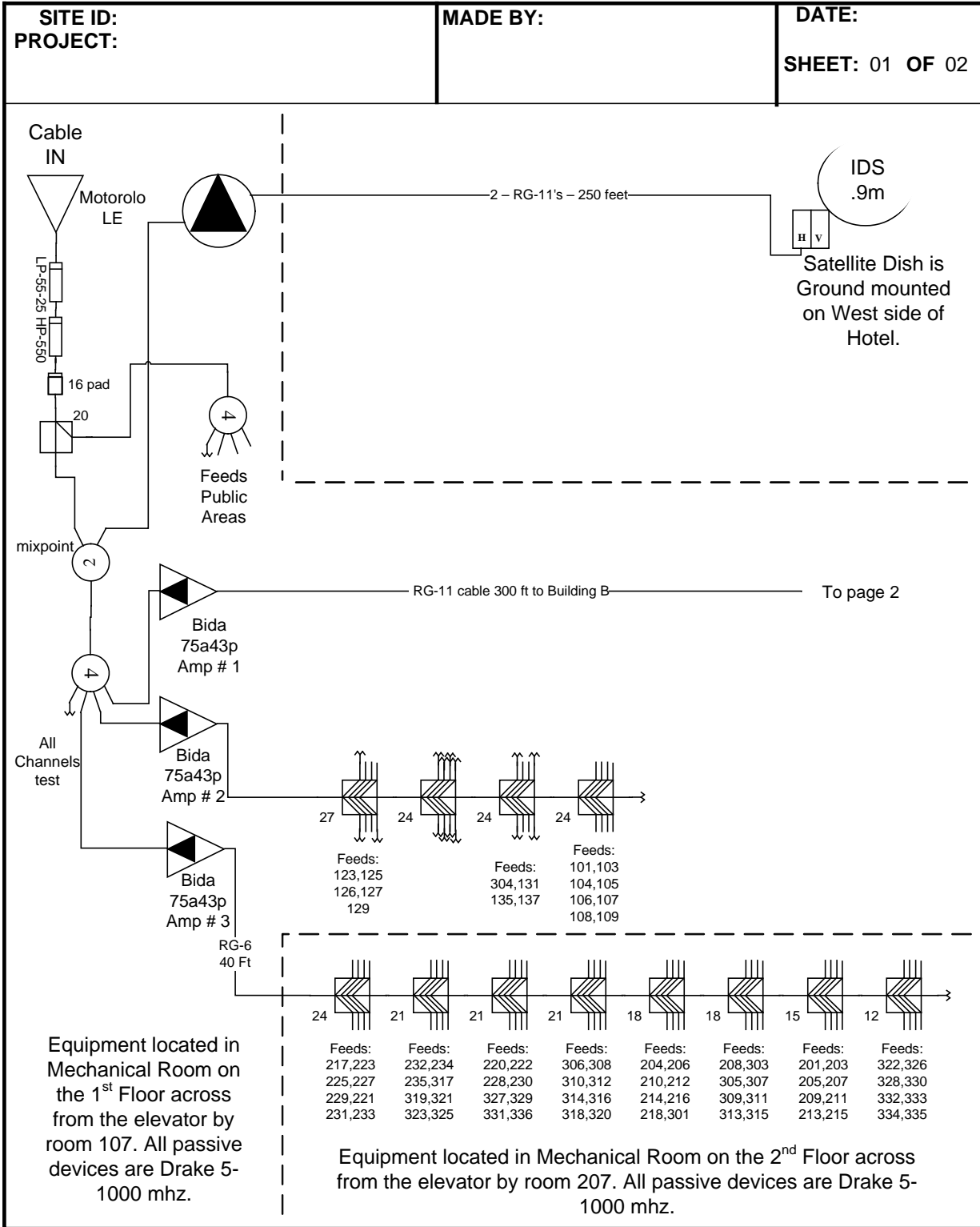
As Built Diagram Symbols



As Built Diagram Example



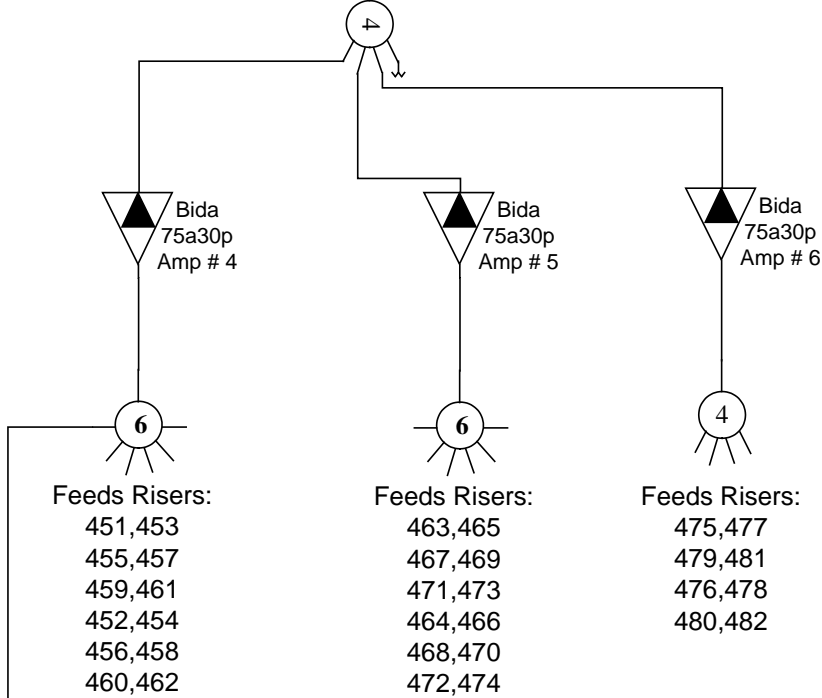
INSTALLATIONS DEPARTMENT AS-BUILT DIAGRAM



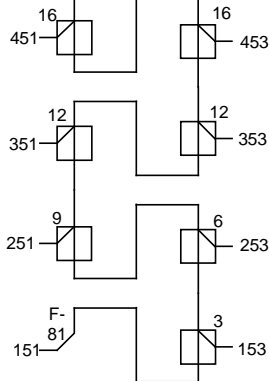
SITE ID: PROJECT:	MADE BY:	DATE:
		SHEET: 02 OF 02

From Building A
MATV room

Rg-11 300ft



Typical Riser



Equipment located in Mechanical Room on the 4th Floor across from the elevator by room 461. All passive devices are Drake 5-1000 mhz.

IN ROOM DOCUMENTATION AND READINGS

Documenting TV Types

To ensure that the LodgeNet or On Command system can be properly installed and or configured, all of the different TV hardware combinations must be documented. Refer to the sample TV Type Legend below.

TV Type Legend				
Type #	Make	Model #	Terminal / Commander	Remote Control
1				
2				
3				
4				

- Additional TV types “Type #” rows can be added if needed to document all of the different hardware combinations being installed.
- TVs should be listed by make (manufacturer) and by model number.
- If a LodgeNet terminal or Commander is installed with the TV, the terminal or Commander model number should be documented in the matrix.
- If a LodgeNet or On Command remote control is installed with the TV, the remote control model number should be documented in the matrix.

Documenting RF Room Readings

RF readings must be taken at each TV location to ensure the MATV system has been installed correctly and will adequately support a LodgeNet Guest Pay or Free-To-Guest system. Refer to the sample Room Reading matrix below.

Room #	TV Type	Notes	Tap Value	50.5	Highest Rack Ch.#	Inserted Channel #	Return
					Highest Ch. =	Ch. 78 (550 MHz) / Ch. 116 (750 MHz) / Ch. 135 (860 MHz)	

- The Room # column should be used to document the room that the readings were taken from.
- If more than one TV will be installed in a room or suite, readings should be taken at each TV location. The room number should then include some designation to identify the location within the room. Example = 100LR for room 100 Living Room or 100BR for room 100 Bed Room.
- The TV Type column should be used to document the TV configuration installed at each TV location. The TV Types should correspond to the TV types documented in the TV Type matrix.
- The Notes column should be used to document anything of special interest at that particular TV location.
- The Tap Value column should be used to document the wall tap value at each TV location. If a particular TV location is a home run, document it as a home run.

- The 50.5 column should be used to document the RF readings taken at 50.5 MHz for each of the TV locations. Please note that a modulator will need to be inserted and balanced at this frequency to take the readings.
- At the top of the Highest Rack Channel column, the person taking the readings should indicate the highest channel that will be used on the MATV system at the time of installation. If this information is not known, it can be obtained by contacting the LodgeNet Installations Project Coordinator. This column will then be used to document the RF readings taken at the Highest Rack Channel for each of the TV locations. Please note that a modulator will need to be inserted and balanced at this frequency to take the readings.
- At the top of the Inserted Channel # column, the person taking the RF readings should indicate the highest channel supported by the MATV system (this can be indicated by circle the highest channel). This column will then be used to document the RF readings taken at the Inserted Channel # for each of the TV locations. Please note that a modulator will need to be inserted and balanced at this frequency to take the readings.
- The Return column should be used to document the RF level of the return signals from the TV location back to the headend location. The return signals should be 5 MHz–35 MHz at 36 dBmV reference. These readings only need to be documented from a few rooms fed from each distribution amplifier (middle room / middle riser).
- All room readings must meet the requirements outlined in the Signal Specifications section of this document.

ADDITIONAL INFORMATION

For additional MATV information, questions, or MATV design, please contact the LodgeNet Professional Solutions Group at 1-888-LODGENET or at professionalsolutions@lodgenet.com.