National Install
Standards and Guidelines

Version: 1.3
Release Date: January, 2005

Table of Contents

Introduction

This document describes some of the methods by which SFU customers are connected/activated for Bell ExpressVu™ service. This is a Standards and Guidelines document, it describes physical techniques/practices and materials associated with the installation job.

Purpose

The main purpose is to ensure **uniformity** with all installations and to ensure customer satisfaction.

IMPORTANT NOTE:

Not all houses are the same. Some of the following steps may not be necessary or some additional steps may be required based on individual house configuration. If you are not certain or require more information, please contact your designated ExpressVu technical RTM or ISM.

Section 1
SFU Technology Brief

Version: 1.3
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Table of Contents

1 Scope

This section provides an overview of how Digital Satellite signals arrive at receives sites all across Canada. Also provided is a brief description on the currently approved installation possibilities.

2 Digital Satellite Television Principles

MPEG is an acronym for Moving Picture Experts Group. This name was given to the International Standards Organization (ISO) group that defined a standard for compression and decompression technology for video, audio and data programming.

MPEG-2 is the result of MPEG-1. MPEG-2 was maximized for Digital TV broadcasting.

Bell ExpressVu's broadcast network architecture is based upon the Digital Video Broadcast Satellite (DVB-S) system developed by the European Unions' Digital Video Broadcasting Project.

DVB-S systems add the necessary transmission framework to the MPEG-2 compressed signals, to complete the broadcast link from the Uplink Facility to the Integrated Receiver Decoder (IRD).

Bell ExpressVu utilizes an MPEG-2 encoder for each television 'program' it broadcasts. The encoder accepts the 'source program', compresses it, and injects Conditional Access, Electronic Program Guide, Set top Box Software and other data. The output of the encoder is a digital bit stream, a fraction of the size before entering the encoding.

Multiple bit streams are then Radio Frequency (RF) modulated with inserted Forward Error Correction (FEC) and transmitted or 'up linked' to Nimiq, Bell ExpressVu Direct Broadcast Satellite (DBS), for national distribution.

Bell ExpressVu holds a license for the exclusive use of Echostar's DISH brand in Canada. Echostar technology is considered the best in the world. It complies with the MPEG-2 (video)/AC3 (audio) compression standard, which is the worldwide standard for digital technology; it is also compatible with DVD players, computers, and other digital audiovisual devices.

Use of this technology provides customers with CD-quality sound and images rivaling those of a DVD player.

Nimiq 1, 2, & 3 Overview

In 1999, Telesat Canada launched NIMIQ 1, the first Canadian direct broadcast satellite. Bell ExpressVu was the first DBS (direct broadcast satellite) broadcaster to use the satellite to transmit broadcasts.

NIMIQ 1 DBS (since July 1, 1999)

Launch Date	May 20, 1999
Orbit position	91° longitude – West
Number of transponders	32 Ku-band transponders
Approximate channel capacity	200 channels on 32 DBS transponders
Footprint	North America

In December, 2002, NIMIQ 2 was launched from the Baikonur launch site in Kazakhstan (a former republic of the Soviet Union).

Owned by Telesat Canada, it was built by Lockheed Martin, an American firm. Its launch was handled by ILS (International Launch Services) and it was operational as of the first quarter of 2003 (March/April).

With Nimiq 2, Bell ExpressVu can operate additional transponders, which allows an increase in programming services offered to customers. This second satellite activation also provides Bell ExpressVu with backup when dealing with any Nimiq 1 technical problems.

NIMIQ 2 DBS (December, 2002)

Launch date	December 29, 2002
Orbit position	82° longitude – West
Number of transponders	32 Ku-band transponders
Approximate channel capacity	
Footprint	North America

Nimiq 3 is the latest DBS satellite to join the Bell ExpressVu fleet. Co-located at 91 degrees with Nimiq 1, the satellite was put into service in early August of 2004.

NIMIQ 3 DBS (since August, 2004)

Launch Date	May 20, 1999
Orbit position	91° longitude – West Collocated with Nimiq 1
Number of transponders	8 Ku-band transponders
Approximate channel capacity	
Footprint	North America

Nimiq 1 and Nimiq 3 are configured for a combination of high power/medium power transponders making up the 32 transponders found from the 91 deg W orbital location.

Nimiq 3 offers 8 high powered transponders to the 91 degree location. This then allowed the technology group to re-configure Nimiq 1 to broadcast 8 of its transponders in high power as well. Therefore in total there are 16 transponders in high power mode, while the other 16 remain at normal power levels. This makes up the maximum 32 transponders allowed at this orbital location.

The impact of the addition of Nimiq 3 is extremely beneficial to our subscribers. The most important is that the 16 high powered transponders from Nimiq 1 and Nimiq 3 provide much higher signals strengths to our subscribers. This translates to half of our services at 91 degrees being less susceptible to rain fade!

Other modifications have allowed us to find extra bandwidth on these transponders allowing us to offer even more services from our main orbital position.

With less rain fade and more great products, Bell ExpressVu customers have even more reasons to be happy with their Way Better TV!

The Nimiq 1, 2, & 3 satellites presently give our customers access to over 400 video and music channels.

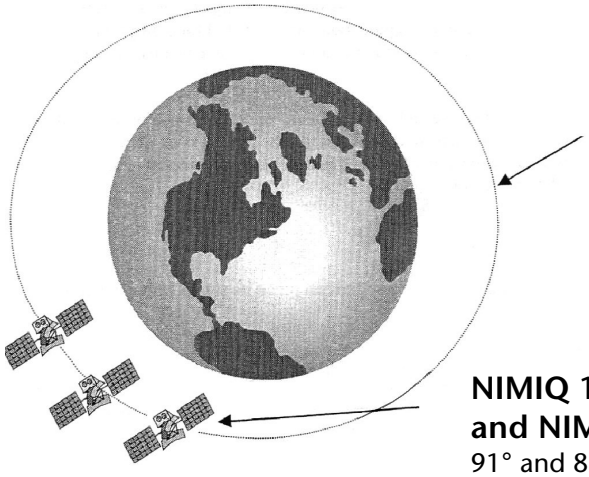
All Nimiq 1, 2, & 3 transponders provide national coverage. All Bell ExpressVu's customers thus have access to the same number of channels no matter where they are in Canada.

List of the Nimiq 1 & Nimiq 3 satellite's national transponders:

01, 02, 03, 04, 05, 06, 07, 08, 09, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32

Orbit position

The geostationary orbit positions of all three Nimiq satellites place them 37,000 km above the Equator. Since they are in a geostationary orbit, the three satellites travel at the same speed as the Earth turns, so that they remain vertical to a single fixed point (fixed in relation to us).



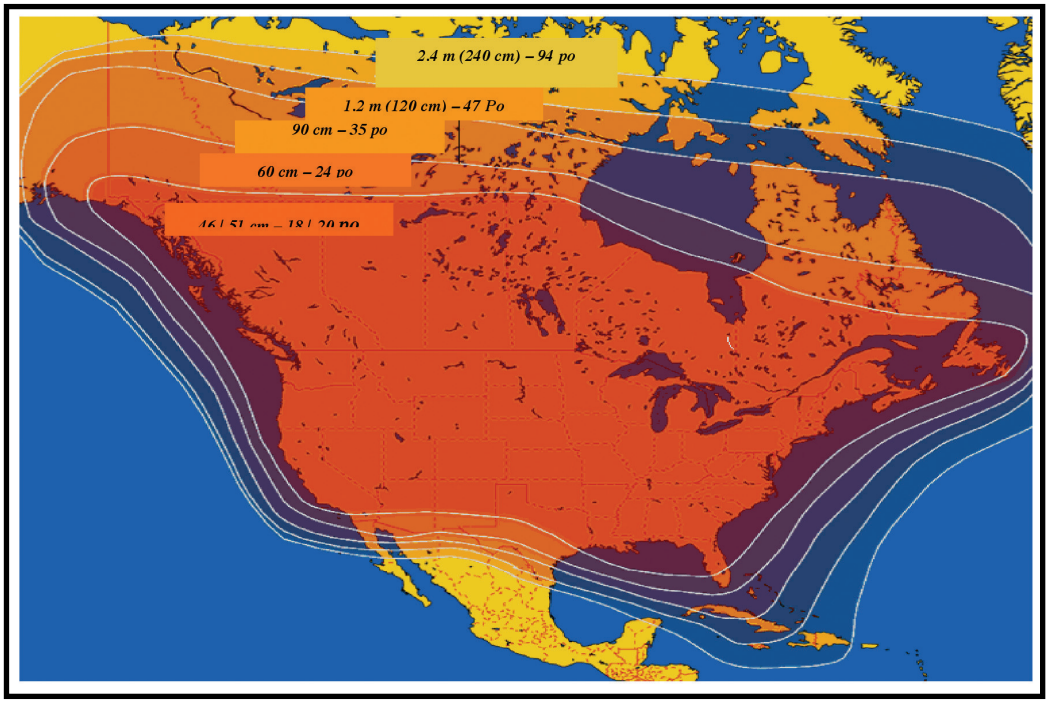
Geostationary orbit
(37,000 kilometres above the Earth)

NIMIQ 1 AND NIMIQ3 (Co-located), and NIMIQ 2.
91° and 82° longitude - West

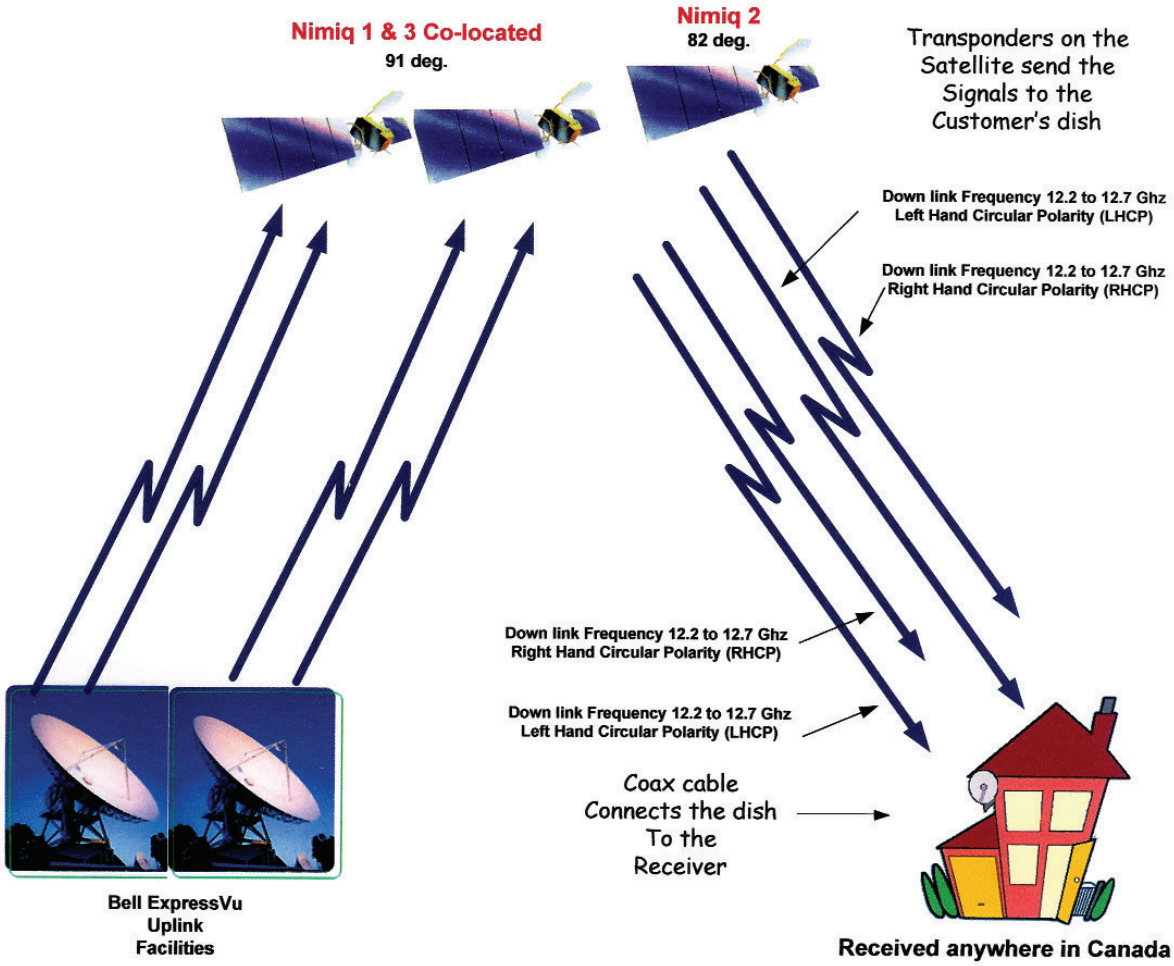
The footprints of the Nimiq 1, Nimiq 2, and Nimiq 3 satellites

The Nimiq 1, 2, and 3 satellites have a broadcast strength that allows coverage of all of North America along with part of the Caribbean. The antenna diameter increases as the distance from the Equator increases.

Note that a customer living outside the 18” to 20” dish satellite footprint will have to use two same-size antennas to capture the signals from both satellites.



Overview of a Direct Broadcast (DBS) Satellite Communication Link System



Notes: Each satellite has two polarities. Both polarities share the same down link frequency, but are Transmitted on different planes.
Total distance from the Space to the Equator: 36,600 KM

2 Types of Video Outputs:

Looking at the back of a satellite receiver, there are a number of different video and audio outputs can be used to connect to a television or sound system which are outlined below:

RF (Coaxial) Output:
Standard Coax output. Relays all elements of the satellite picture and sound. Allows for output to television on either channel 3 or channel 4.
Benefits: Basic F connector type which can be universally found on any television.

RF (Coaxial) Agile Modulated Output:
Available on models 3200 & 5200 only
Relays all elements of the satellite picture and sound but is changeable to include AIR: Channels 21 – 69 and CABLE: Channels 73-125
Also the agile output is 10 db higher than channel 3/4 for longer runs.

Composite (RCA-type) Output:
Isolates the video and audio parts of the signal and outputs them individually. The yellow jack outputs the video signal. (The white jack outputs the left channel audio signal and the red jack outputs the right channel audio signal for stereo sound)
Benefit: Picture is sharper by 10% using this output.

S Video:
The highest quality video available. This connection must be used in concert with the Phono (RCA) audio outputs.

DVI (Digital Video Interface)
Allows direct digital connection between television and receiver.

RGB Output:
Breaks video signal down into primary colours: red, green, and blue.
Found on HD TV's.
Benefit: Improved picture clarity and more vivid color. Used by model 6000 for HD output; no inherent performance advantage over component output (see above).

Y Pr Pb Output:
- Component" type output– This output is the HDTV equivalent of an S-video connection. The YPrPb module transmits image data (color and brightness) over three coaxial cables: brightness (Y), red (Pr) and blue (Pb).

Dolby Digital Optical Output:
Takes the data stream of a Dolby Digital soundtrack and relays it via fibre optic cable to a television or home theatre receiver for surround sound decoding.
Benefit: Dolby Digital offers the best sound for home theatre. The optical output is digital, therefore there is no signal lost between the satellite receiver and the amplifier.

Distribution Technology

3 Receive Site

For single satellite operation:

The Low Noise Block down Converter (LNBF) (Fig.1A) receives the Nimiq's broadcast and down converts the two polarities, the Right Hand Circular Polarization (RHCP), and Left Hand Circular Polarization (LHCP).

It is important to note that the RHCP and LHCP share the same L-band frequencies. (950Mhz – 1450 Mhz) (See Drawing 1 & 2 Appendix section)

Through software downloads, receivers inherently understand which polarity is required when seeking a specific television service. The Return Path Voltage (RPV), 13 or 18 VDC is sent up the coax cable from the receiver to the Low Noise Block down-converter with Feed (LNBF). This voltage will switch between polarities to acquire the correct polarity/transponder, which delivers the television service requested by the user.

Each Integrated Receiver Decoder (IRD) must have the ability to select the RHCP or the LHCP as required. Since each LNBF output can only transmit one polarity at a time, this works when one of the dish/LNBF output can be dedicated to a specific receiver. When utilizing a second receiver, an additional riser between the LNBF second output and the second receiver will be required. To overcome the two receivers per LNBF limitation, a multi switch will be required.

Note: Current LNBF model has two independent outputs.

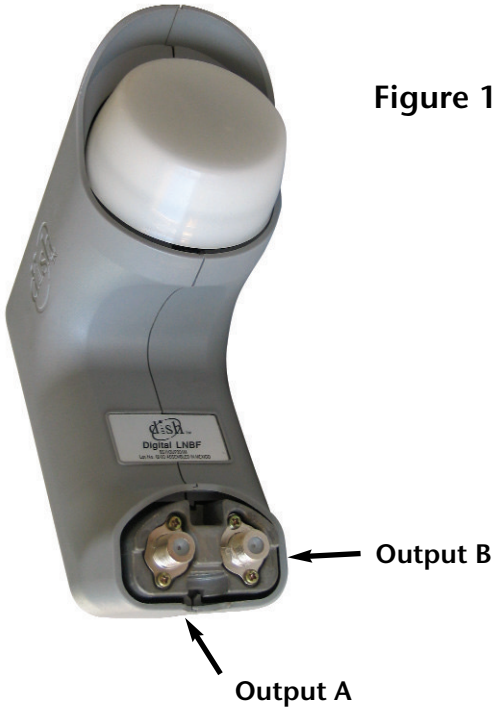


Figure 1A

3.1 Single Satellite Operation

The transponders on Nimiq 1, 2, and 3 are also distributed on the same polarities. Even-number transponders are located on the 18-volt polarity. Odd-number transponders are on the 13-volt polarity. **(Fig.1B)**

Circular polarity	Voltage and transponders
RHCP	13 volts – odd transponders
LHCP	18 volts – even transponders

Thus, when a customer tunes in a channel such as TSN, the receiver recognizes the transponder the channel is on, and sends the LNBF the voltage corresponding to the transponder via the coaxial cable. The LNBF then sends the selected signal to the receiver. Since the LNBF uses a voltage signal from your receiver to change polarity, the voltage will drop as the length of the cable gets longer. At some point the attenuation of the cable will drop the voltage from the receiver below 18 volts. The LNBF can't switch to the even polarity (even though the signal from the receiver is 18 volts), the LNBF is only able to use the 13 volt or odd polarity. (See Drawing #3 in the Appendix section)

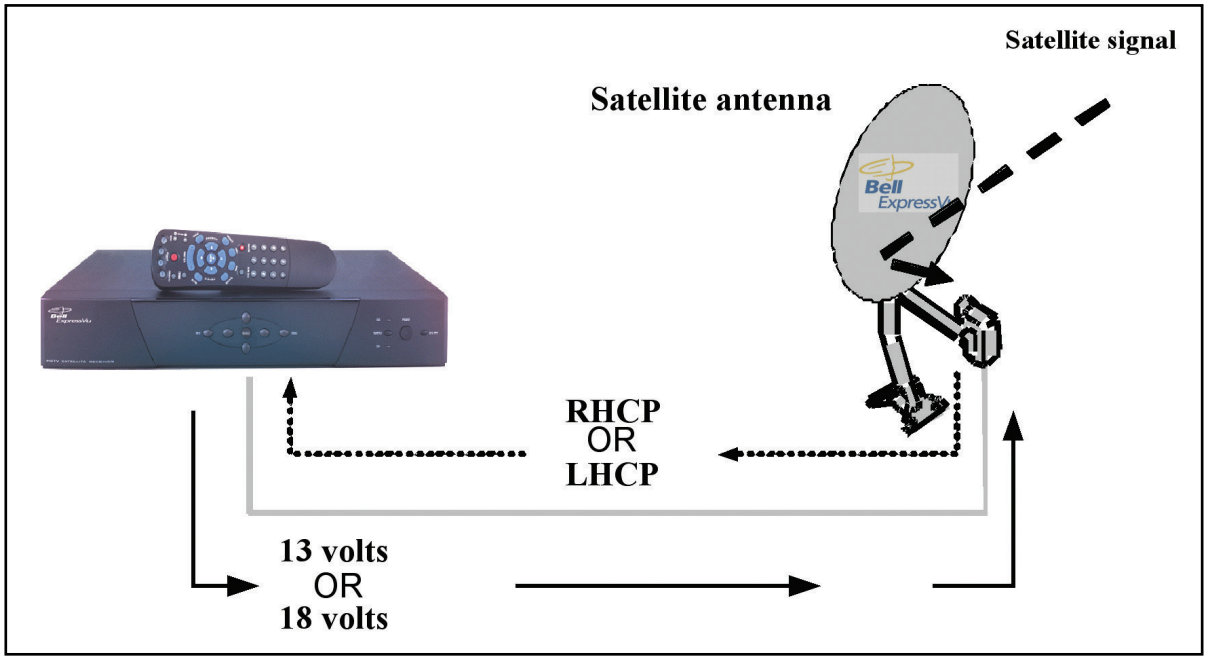


Figure 1B

3.2 Dual Satellite Operation.

Two LNB's are needed to receive all Nimiq 1, 2, and 3 signals/transponders. Since each satellite has two polarities, the receiver will now have to select the proper satellite polarity and then transponder for each requested channel. In order to do that, a dual satellite multi Switch is required.

The correct polarity selection is done by the receiver sending 13/18V and a date sequence put onto a tone **(Fig.1C)**. With this information the switch will be able to select the proper LNBF/Satellite and then choose the correct polarity. Each 2:1 (SW21) switch can feed one receiver. Since each LNBF has two outputs, a standard 51 cm with two dual output LNB's and two SW21, can feed up to two receivers. Once again, to overcome the two receiver limitation a SW44 or 4 inputs and 4 outputs multi Switch will be required **(Fig.1D)**.

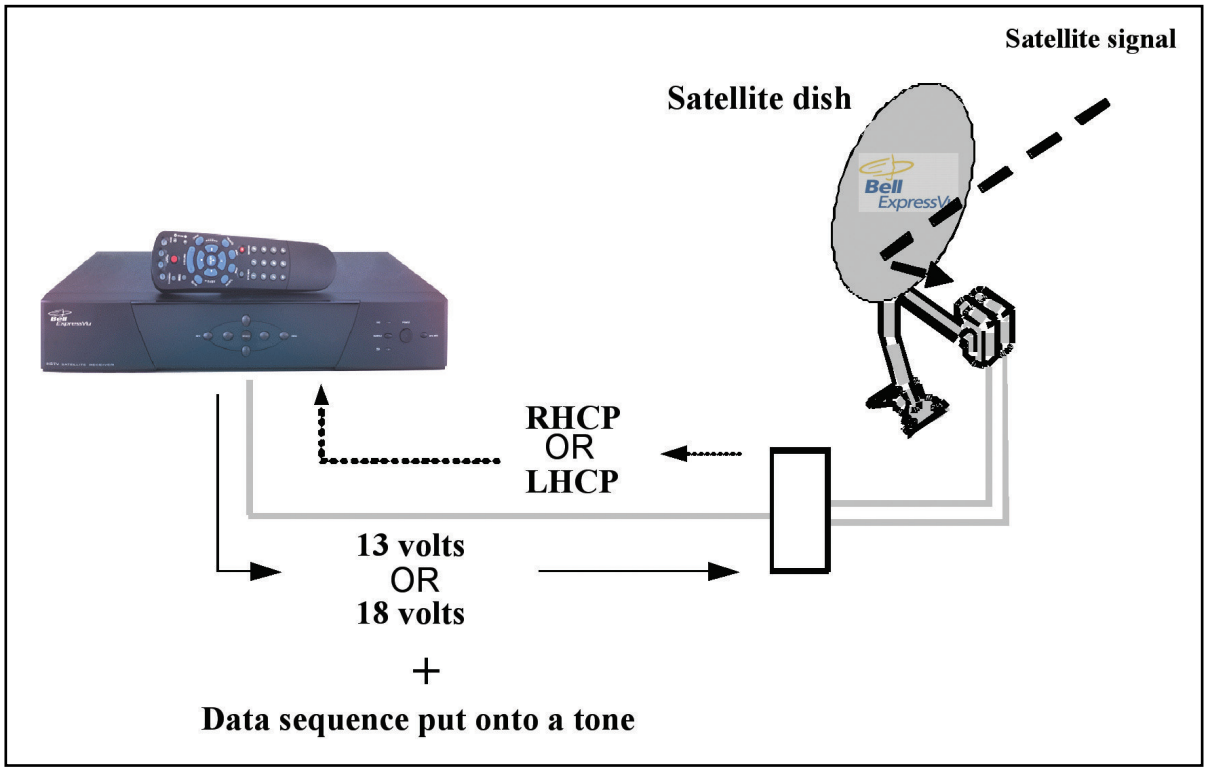


Figure 1C

3.3 Single Satellite Multi Switch

The single satellite multi switch is fed the RHCP and LHCP signals from one LNBF. It then emulates the switch inside the LNBF, delivering the individual polarity to each TUNER as requested. Each output can only support one TUNER. (See drawing #3 in the appendix section)

A single satellite multi switch is designed to support between 4 and 8 TUNER's, pass power to the LNBF, and diplex L-band and analog signals on the same output. Multi switches are to be installed indoors and can be located in a distribution closet or inside individual suites, depending on the wiring infrastructure.

3.4 Dual Satellite Multi Switch

The dual satellite multi switch **(Fig. 1D)** is fed RHCP and LHCP signals from two LNBF's for a total of 4 inputs. It then offers each TUNER the possibility to select any of the 4 available polarities **(Fig.1E)** (also see drawing #4 in the appendix section)

The Dual multi switch comes in two models 2:1 or 4:4. The 4:4 (SW44) comes with a separate power inserter **(Fig. 1D)**. ***The transformer, power inserter, and switch all must be installed indoors.*** The power inserter must always be connected to port #1.

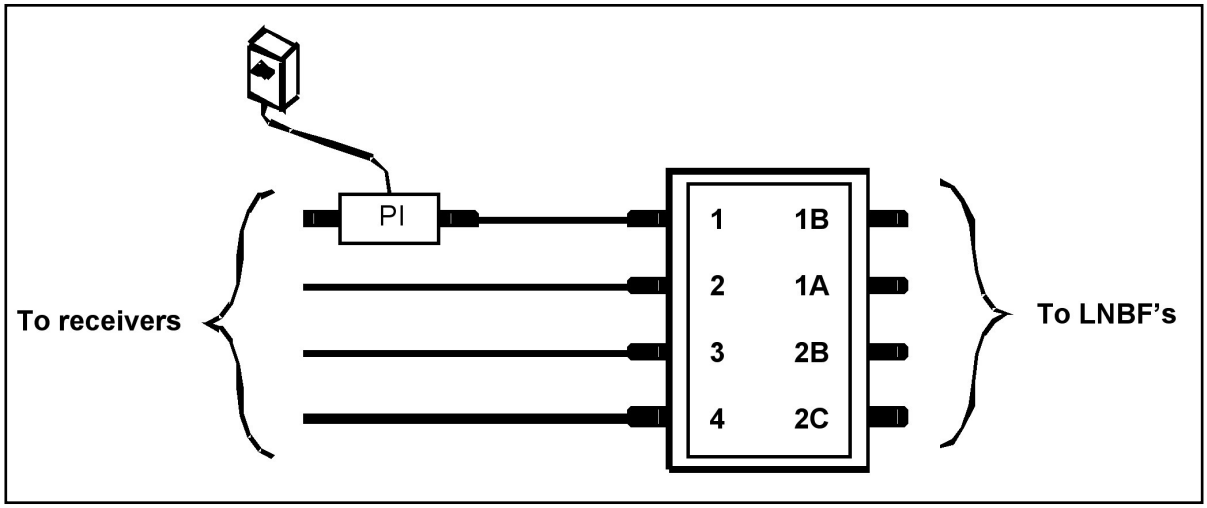


Figure 1D

Important Note: The SW44 may be used to take the place of a ground block. Please refer to section 5 for grounding procedures.

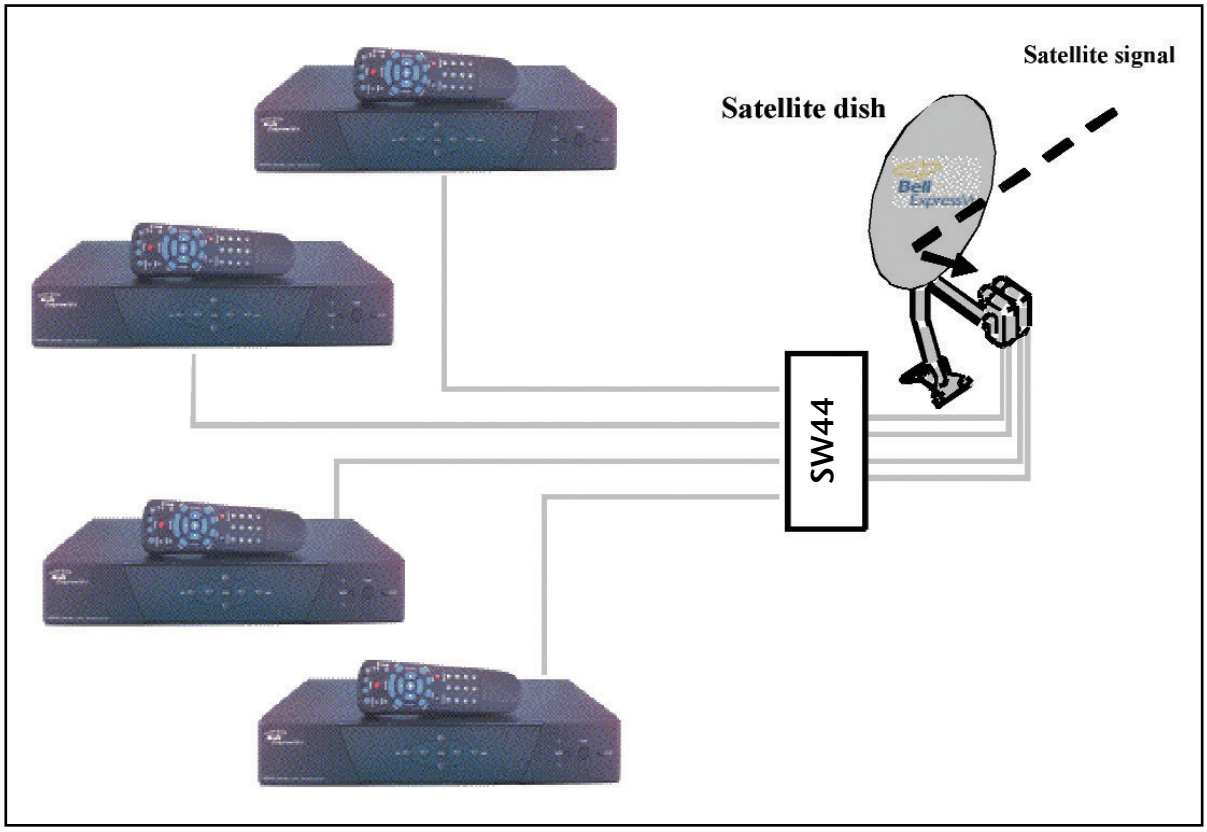


Figure 1E

3.5 Two Dual Satellite Multi Switch

Two SW44 are required to support more than 4 receivers **(Fig. 1F)**. This is done by splitting all 4 outputs coming from both LNBF's. The two way splitters need one DC pass each.

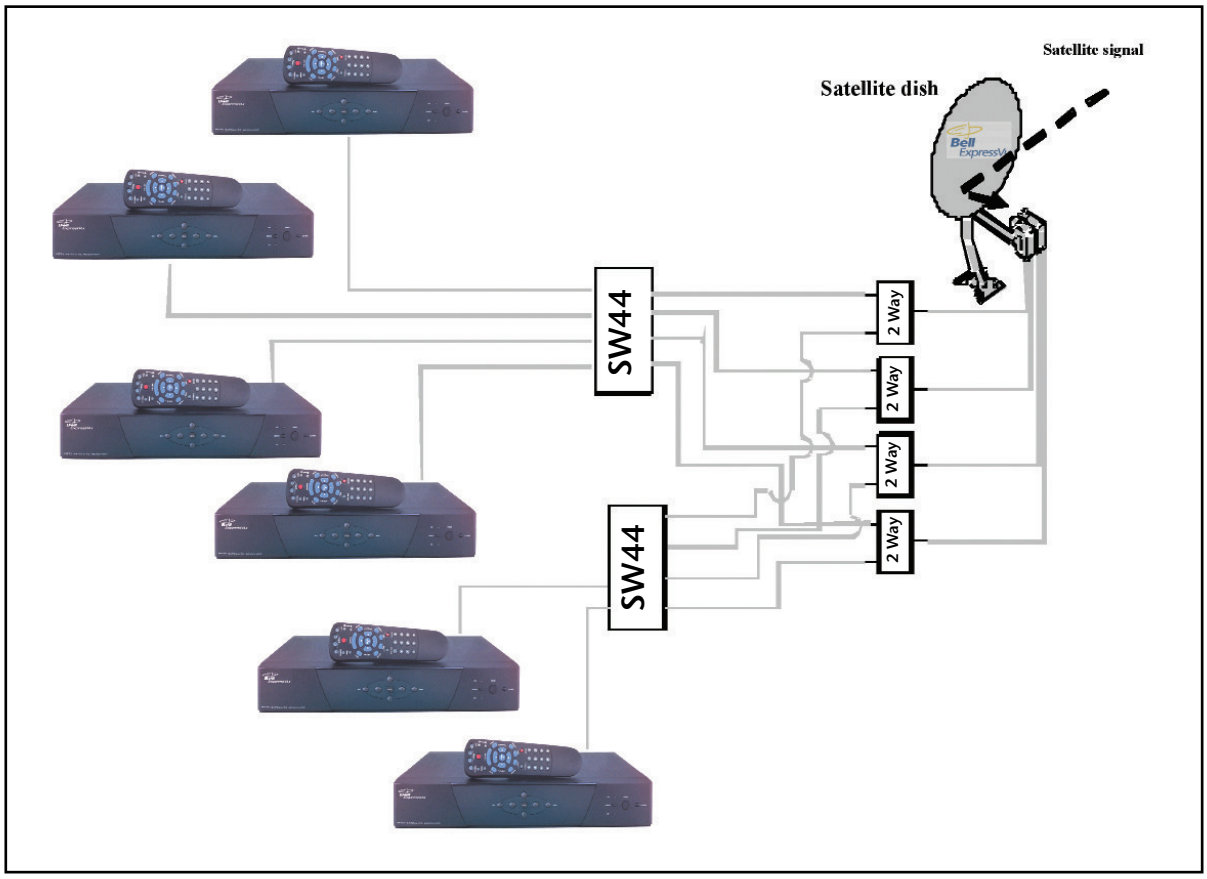
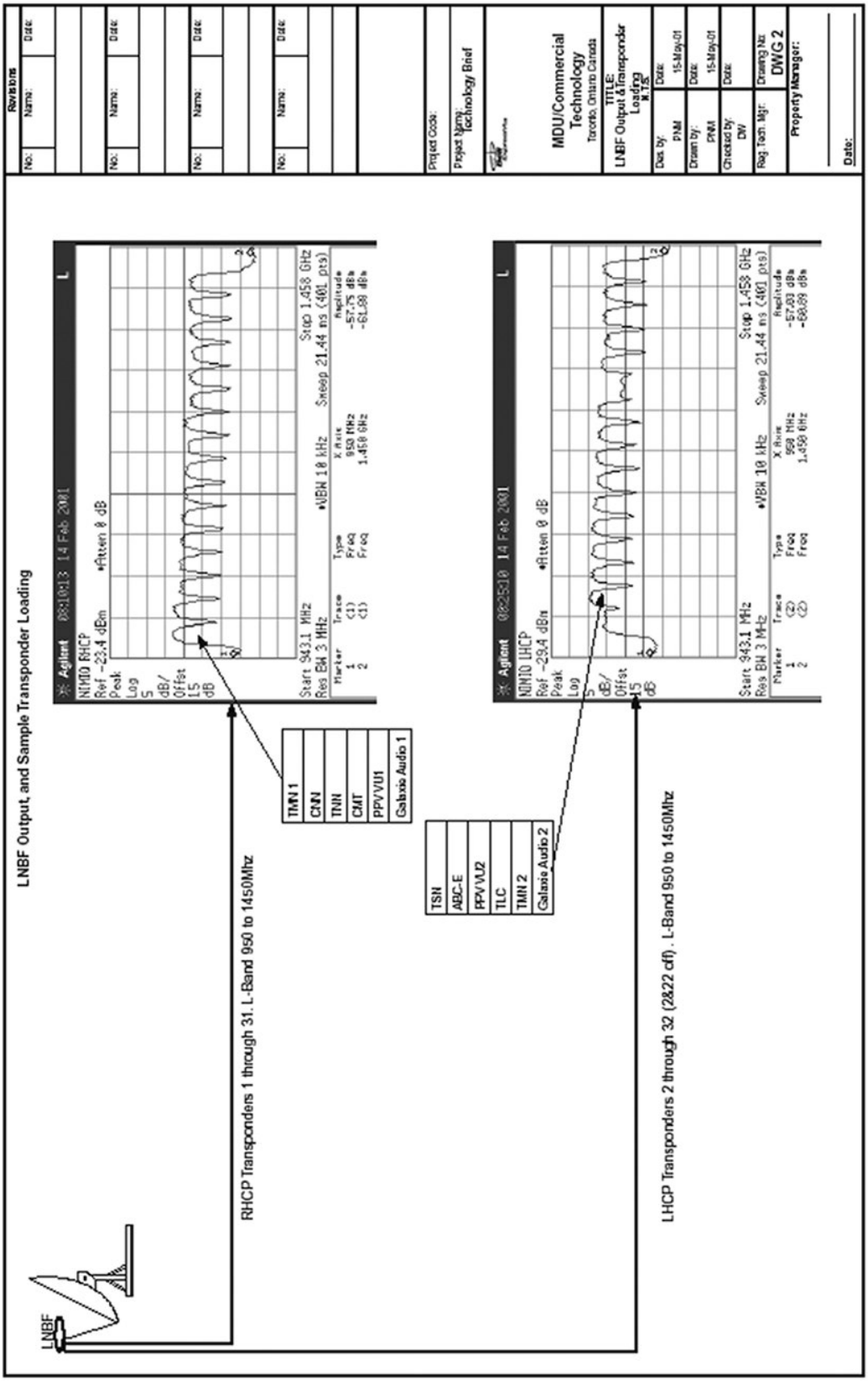


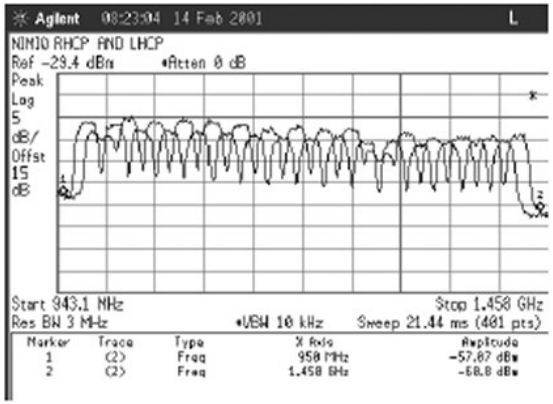
Figure 1F

Drawing 1 – LNBF Output and Transponder Loading



Drawing 2 – RHCP & LHCP Superimposed

RHCP and LHCP Superimposed



Other then a slight deviation in frequency, both RHCP and LHCP share the same frequencies.

Revisions		
No.:	Name:	Date:
No.:	Name:	Date:
No.:	Name:	Date:
No.:	Name:	Date:

Project Code:

Project Name: Technology Brief

MDU/Commercial Technology
Toronto, Ontario Canada

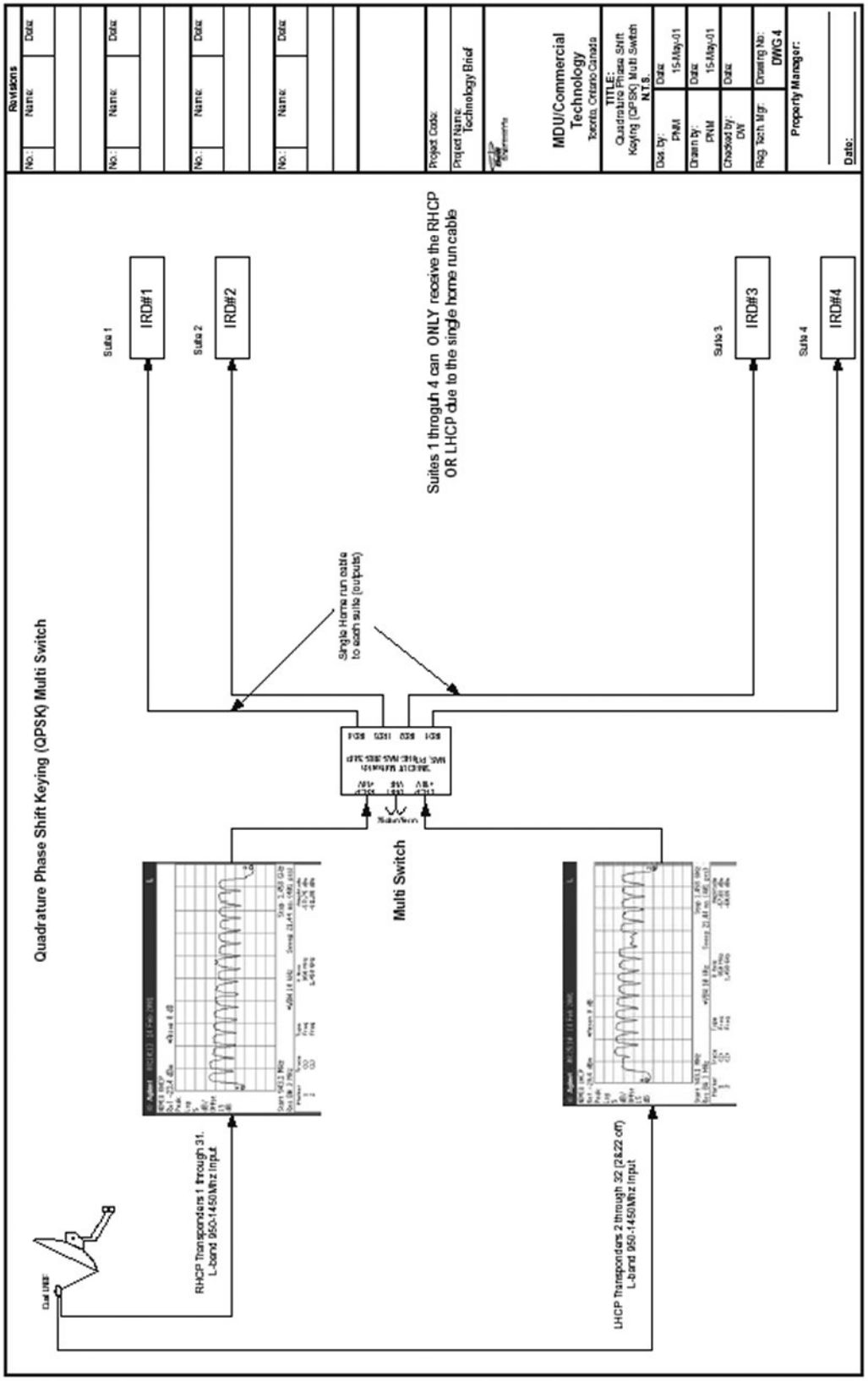
TITLE:
RHCP & LHCP Superimposed
N.T.S.

Des. by: PNM	Date: 15-May-01
Drawn by: PNM	Date: 15-May-01
Checked by: DW	Date:
Reg. Tech. Mgr:	Drawing No: DWG 3

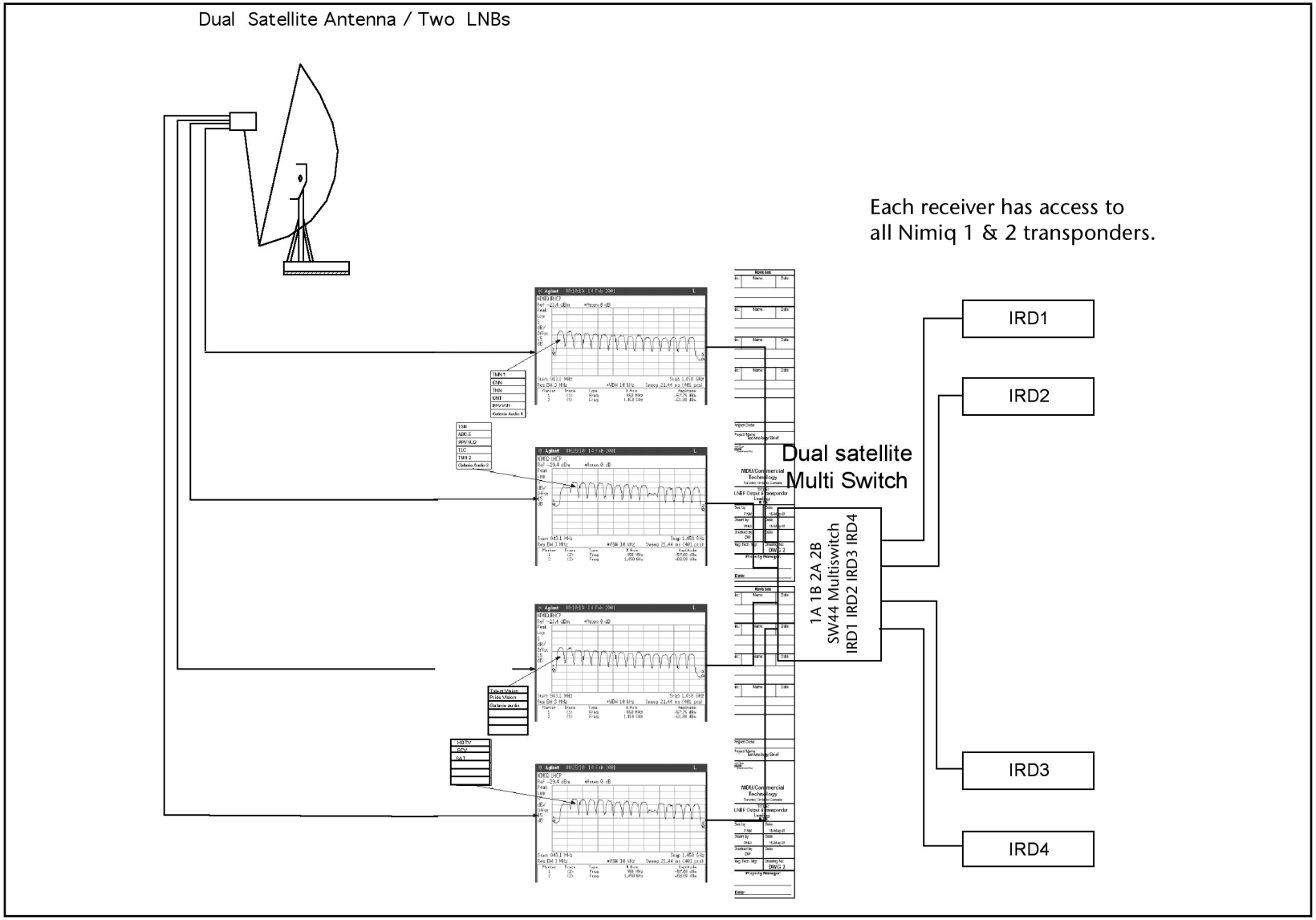
Property Manager:

Date:

Drawing 3 – Single Satellite Multi Switch



Drawing 4 – Dual Satellite multi Switch



Notes:

Section 2
Workplace Rules & Safety

Version: 1.3
Release Date: January, 2005

Table of Contents

Rules and Guidelines

As the leading Canadian satellite television provider, a successful installation is the single most important function we can provide. It is often the first and last face to face contact a customer may have with our organization. It is critical that all installers that work on behalf of Bell ExpressVu™ adhere to our basic workplace rules and guidelines. Below is an anatomy of an installation.

- Installer calls into SEFAS to review assigned work and dispatch first job.
- Previous to rolling the truck, the installer ensures they have the designated Bell ExpressVu receiver hardware and paperwork (BEA, Rental Agreement) for each installation order.
- Upon arrival at customer home, installer must validate the photo ID of the person on premise to ensure they are an adult.
- A site assessment should be conducted to confirm proper line of site can be obtained.
- With a new installation order, the installer must ensure the following conditions are met before proceeding:
  - The customer must sign two copies of the BEA, returning one to the installer
  - Under the Rental program, the installer should also have the customer or their designate sign two completed copies of the Bell ExpressVu Rental Agreement, returning one to the installer.
  - If the customer resides in a rental and condo property, a signed letter of permission must be obtained.
- Before the final installation is performed, the technician should obtain permission from the customer on the exact dish mounting location, cable routing and grounding, and any other specifics with regards to the installation. The technician must be aware of and adhere to any local or municipal building codes and/or regulations regarding Satellite antenna installation.
- If for any reason the installer is unable to complete the installation, the installer must contact the ExpressVu Dispatch Desk (EDD) to close the job.
  - If EDD is not available, installer should close the job in SEFAS using the appropriate reason code.
- After performing the installation as per the Bell ExpressVu standards and guidelines, and activating the account through IAS or 888 – SKYDISH, the installer must:
  - Complete the Bell ExpressVu Work Order and have the customer sign and return it to the installer.
  - Call SEFAS and report the installation product codes along with customer's account number to close the order.
- Forward all paperwork (BEA, Rental Agreement, Work Order) to the installation head office.

Survey

Upon arrival, the installer should conduct a site survey with the customer.
From a safety standpoint, the installer should be aware of several things.

- Are there children or animals present within the work area? The customer should be made aware of the potential danger of children or animals present in the work area.
- Identify anything at the site that could possibly be damaged during the install and ask for it to be temporarily relocated.
- Be sure to place your Fiberglass, or wooden ladder where the ground is even and dry when possible.
- If any digging is required, customer is responsible for providing the installer with all the appropriate '"locate documents" to ensure no gas lines, water lines, voltage wires and telephone wire are present in the area. A survey may be required in some instances.
- **Letter of Permission:** If you live in a condominium, townhouse, apartment or other multiple dwelling building ("MDU"), a signed letter of permission from the property management (landlord/condo board) must be provided to the installer before any installation can occur unless you live in a Bell ExpressVu wired building.
- As you work be aware of your surroundings. Take adequate precautions to avoid injury to yourself or others, and prevent damage to buildings, structures, or equipment.

Installation Safety

As an integral part of your initial site survey, you will want to take into consideration the following items when performing the installation;

- Assemble the satellite dish in a safe location before climbing up to the mounting location.
- Always use extreme caution when climbing and working at the mounting location.

- Use extreme caution when using ladders. To avoid the risk of electrical shock, use only an approved fibreglass or wooden ladder.
- Take care to secure the ladder in place. Stay clear of any overhead power lines, lights, or power circuits.
- Do not attempt to install the dish in high winds or stormy weather, particularly if there is a chance of lightening. If lightening is present, the installer should consider performing the interior portion of the installation until all possibility of being struck has passed.
- Take extreme care when climbing onto roofs, or extremely high locations. Be sure the surface is sound, dry, and allows for adequate traction. If the dish **must** be mounted on the roof and it is icy or snowing, and appears to be slippery, the installation should be re-scheduled.
- The roof should be considered a **last resort** when absolutely no other location provides for a clear line of sight. There are obvious inherent risks and liabilities associated with working on a customer's roof, and we do not recommend installing the dish on a roof.

Personal Protective Equipment

Eye protection

It is recommended that all technicians use necessary protective devices at all times while performing an installation. To provide adequate protection, all safety gear must meet or exceed the requirements of CSA, (Canadian Standards Association) or ANSI, (American National Standards Institute) standard.

There are 3 types of eye protection that are approved for use:

1. Safety Glasses

Typically, Safety glasses will provide regular frontal eye protection against flying or moving debris. Most glasses are fitted with impact resistant plain or corrective lenses.

Safety glasses should be worn at all times when;

- Working with or climbing a ladder.
- Performing any kind of overhead work.
- Using any kind of tool where there is a reasonable chance of incurring an eye injury.
- Drilling, coring into a structure.

- Cable prep, drilling/fastening.
- Flying dust and particles from drilling.
- Ultraviolet radiation from the sun.
- Ties and wires hanging down from ceilings.
- Flying wire clips or other material from snipping off cables or tie wraps.
- Sharp branches or trees when working around the home or running exterior cable.

2. Safety Goggles

Goggles will provide both frontal and peripheral protection against flying or moving debris. Certain types offer protection against irritating or hazardous liquids.

3. Full face shield

Provides full face protection against flying, or moving debris and liquids.

Safety Footwear

All technicians must wear adequate foot protection that complies with CSA or ANSI standard. It is recommended that footwear with a slip resistant lug sole and distinct heel be worn when performing the following tasks;

- Working with or climbing ladders; extension, step or other.
- Working on any kind of elevating device.
- Working in a confined space, rough terrain, or construction site.
- Working on a customers roof.

Technicians should always:

- Wear safety shoes or safety boots at all times.
- Ensure safety footwear sole is adequate to protect against injury to puncture.
- Ensure safety toe is adequate to protect against injury due to impact.

Hearing Protection Devices

It is recommended that any technician subjected to prolonged exposure to excessive sound levels, use a protective hearing protection device. Hearing Protection devices should be selected to reduce hazardous noise to an acceptable level, and must comply with CSA, or ANSI standards.

It is recommended that all technicians use necessary protective devices at all times while performing an installation. To provide adequate protection, all safety gear must meet or exceed the requirements of CSA, (Canadian Standards Association) or ANSI, (American National Standards Institute) Standard.

Safety-Hard Hats

Wearing a hard hat is the first line of defence against head injuries on the job.
Use your Head - Wear your Hard Hat!

- Wear your hard hat on ALL construction sites.
- Wear your hard hat whenever someone is working overhead.
- Wear your hard hat when working with tools overhead.
- Wear your hard hat in confined work areas.

Ensure your hard hat fits properly – provides most comfort and maximum protection.

Inspect your hard hat every day for cracks, gouges, and frays or breaks in the straps.

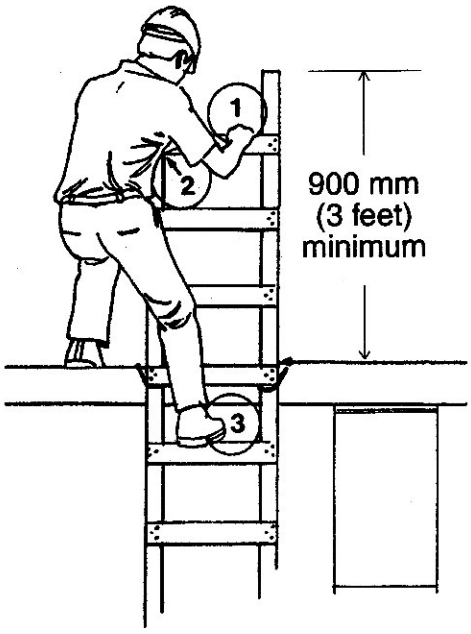
Ladder Safety

The importance of basic ladder safety cannot be overemphasized. The decisions you make with respect to ladder safety can be life or death. The following items should be considered when working with ladders;

1. Extension Ladders

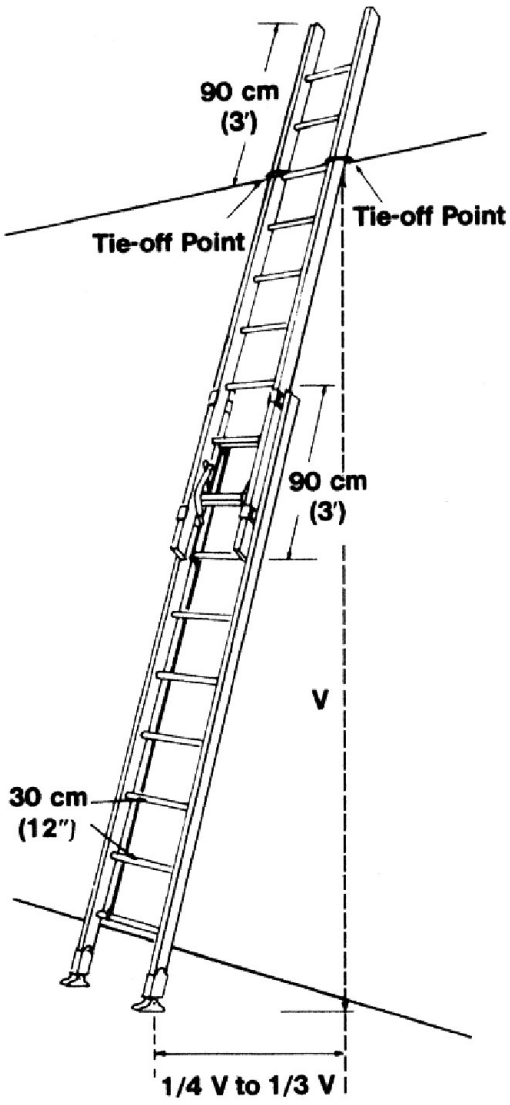
Only use a CSA approved fibreglass or wooden ladder. Aluminium ladders are not recommended, and do not meet code for Satellite Installation.

- The side rails of the ladder should always extend at least 36 inches, (3 feet) above the landing or support.
- The safe climbing angle for a ladder shall be out approximately 1\4 of the height needed.
- Ladders shall be secured to a landing or support on which it is resting, and must have non-skid bases.
- Ladders should never be placed in front of a door opening unless the door is open, locked or guarded.
- It is not recommended to climb above the 4th rung from the top of an extension ladder.
- Ladders should never be spliced together to extend the overall length.
- Only 1 technician should be working from a ladder at one time, to avoid overloading the ladder capacity.
- If a ladder is not secured, never lean beyond the point of your outside shoulder extending more than 12 inches beyond the side rail. A good rule to follow is never to move your breastbone beyond the side rail.
- Always face the ladder when ascending and descending.



Ensure your ladder is long enough to be set up at a safe angle and extends three feet above the top bearing point. These are some key safety items when using an extension ladder:

- Always inspect your ladder for damage and defects.
- Set the ladder on a firm level base.
- Set up ladder at proper angle – one foot out for every three or four feet up.
- Ensure there is at least 6 inches of clear space behind each ladder rung.
- When the ladder is fully extended, ensure ladder sections overlap at least 3 feet.
- Secure the top and bottom of the ladder.
- Keep areas at top and bottom clear of debris, scrap, material and other obstructions.
- Always face the ladder when climbing up or down and maintain three point contacts.
- Ensure ladder hoist rope is clear of foot path up ladder and is secured to ladder rung.
- Clean mud, snow and other slippery substances off your safety footwear before climbing.
- When working more than 10 feet (3 metres) wear a safety harness and tie off to a well-anchored lifeline or other support – NOT the ladder.



2. Safety-Step Ladders

Proper use of ladders is another important step in a positive approach to safety. Ladders are a key and versatile tool, and at times very hazardous.

Unfortunately there are enough accidents involving step ladders that we know people often don't know how to use them. Falls from step ladders are very common - your knowledge of safety rules and common sense will prevent ladder accidents from happening on your site.

There is no such thing as a good fall. Even a fall from a low height can result in a serious head injury or broken bones. Think about your safety plans before you set up your ladder.

Follow safe work procedures and you will reduce the risk of falls and other accidents.

When you are setting up your step ladder, review the following safety precautions and recommendations:

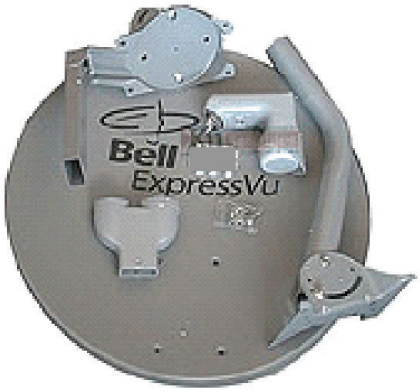
- Open the step ladder as far as it will go.
- The step ladder legs should always be fully spread and the spreading bars locked into place.
- Push the bracket shelf down into place.
- Make sure the ladder is placed on an even surface and within easy reach of your work.
- Don't stand a ladder on ice or snow.
- Don't use an unstable object - like a rock or a brick - to level the ladder's feet.
- If you are setting up in front of a closed door, open the door or lock it.
- Always inspect the ladder before using it. Look for:
  - Cracks, splits, twisted or jammed parts.
  - Loose screws, rivets or rungs.
- Make sure your ladder is at a safe angle and stabilized.
- Never use the top step of a step ladder.
- Step ladders should never be used as straight ladders.
- It is recommended when a technician is working on a step ladder over 10ft high; (except for platform ladder) the ladder should be held by another technician.
- Reach limitations are the same spec as extension ladders.
- Always climb and descend facing the ladder.
- Use both hands to hold onto the upper steps (not the side rails).
- Climb the ladder one step at a time.
- Do not stand on the top two rungs - if you need to get higher, get a longer ladder.
- Set tools or objects on the bracket shelf of the ladder - don't climb or descend with them in your hands.
- Don't work with anything heavy in one hand - such as a paint bucket. Set it on the bracket shelf.
- A good rule of thumb to maintain your balance: keep your belt buckle between the ladder's side rails - don't stretch or overextend yourself.

Section 3
Dish Assembly and Mounting

Version: 1.3
Release Date: January, 2005

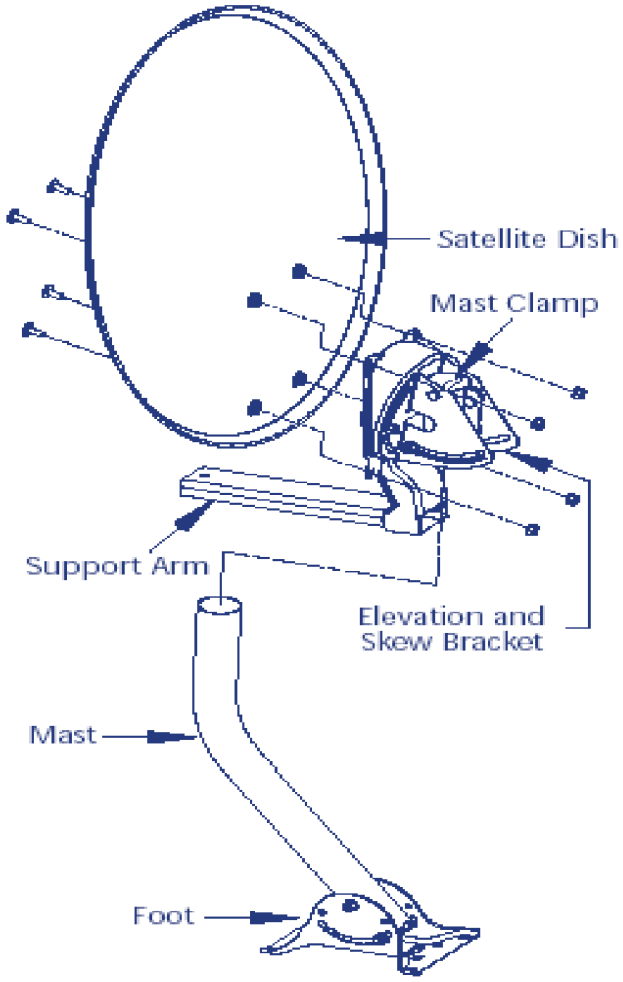
Table of Contents

Dish Assembly and Mounting



Assembly

- Pre assemble any parts on the ground as required. This would include the skew and elevation required for the geographical location where the installation will take place.
- It is **mandatory** for all 51 cm dishes to be set to the appropriate skew for all installations even if the services located on Nimiq 2 are not required as part of the original installation.
- ***Caution: Do not assemble the reflector to the mast / foot bracket as the combined pieces are too large to handle safely on the ladder/stepladder.***



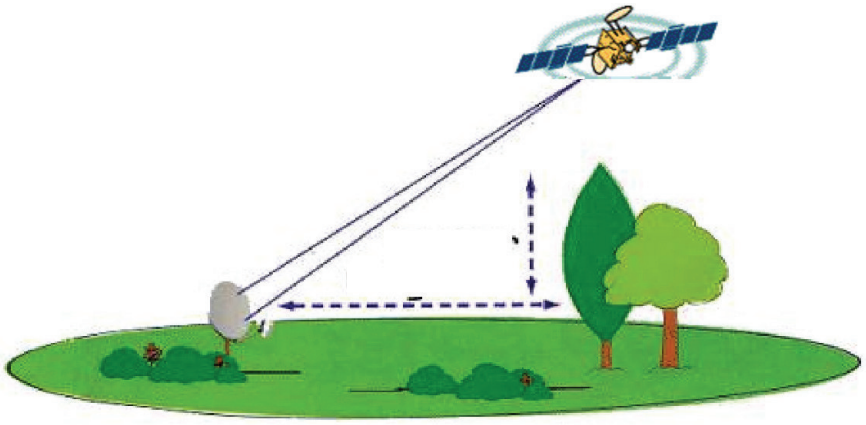
Mounting Location

Determine the best location for the dish with a clear line of sight to the satellite(s)

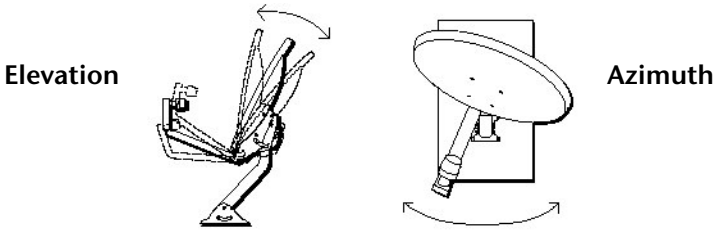
The dish must be situated in a location with a clear line of sight to the satellite(s) all year round. The location must also be free of interference from passing vehicles and passers-by.

In order to find the best location, the technician will first have to determine the general direction of the satellite – **South-West**. He will then have to ensure that the location allows a clear, unobstructed line of sight and that the dish may be mounted to a solid, sturdy surface.

« **Find a clear line of sight** » means finding a location where the signal reaches the dish and the orbiting satellite(s) is not blocked by trees, buildings, or any other obstacle. Therefore, the technician will have to ensure that young trees will not grow through the line of sight and that a location decided upon during the winter will not become obstructed by snow accumulation or foliage in the spring and summer!



A reference table listing the look angles for the satellite(s) – elevation angles (up and down) and azimuth (left and right) – can be found in the Appendix section of the manual.



The degree value of the angle of elevation for different regions throughout the country varies between 8° and 40°. The diagram that follows illustrates the possible effect of certain obstacles on the line of sight:

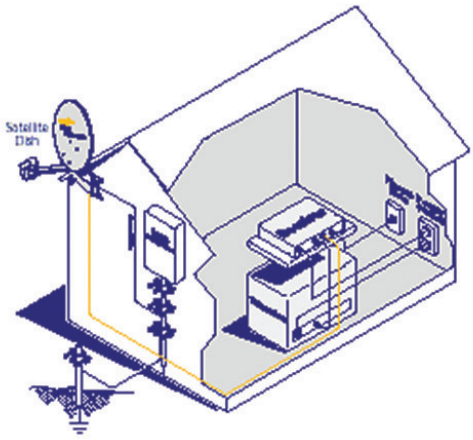
Other considerations come into play when deciding the location of a dish

- **Safety** – Can the dish be mounted safely in the position that you have chosen? Do not attempt to install the dish in high winds or stormy conditions, particularly if there is a chance of lightening. Stay clear of any overhead power lines, lights or power circuits.
- **Maintenance** – The dish location must be easily accessible in most weather conditions, as the customer may occasionally need to clean snow or debris off the satellite dish.
- **Rules & codes** - All installations should conform to local building and electrical codes. The installation must also comply with any and all local or municipal by laws specific to the installation of a dish (DBS antenna). For example some cities will not allow antennas in front of, or on a side wall facing the street. It is the installer responsibility to be aware of those by laws and to make sure they are applied/followed.
- **Routing & grounding** - Is routing of the coaxial wires and ground wire possible from the chosen location? All installations have to be properly grounded. Coax wire installed outside the house is not allowed to be attached to existing cable wires for routing purposes.
- **Location** - Is the location surface solid enough to ensure the dish does not move? Install the satellite dish on a solid surface or solid foundation material. A solid brick, cinder block, or structurally sound wood surface is considered an ideal mounting surface. Do not mount the antenna on aluminum or vinyl siding. These materials are structurally too weak to securely hold the antenna, even with building stud underneath. Stucco or imitation masonry, composite materials such as chip, fiber or particleboard, (unless fastened securely to a wall stud, rafter or other foundation material beneath surface, are **unacceptable** mounting surfaces. **The use of the Hydro mast pole is strictly forbidden**. In some cases the roof might be the ideal location, but always as a last resort, please refer to the sections on roof top installations.
- **Minimum Signal Strength** - For all Bell ExpressVu Satellite dishes there is a minimum required signal strength of 80% with no more than 3 transponders below 75%.

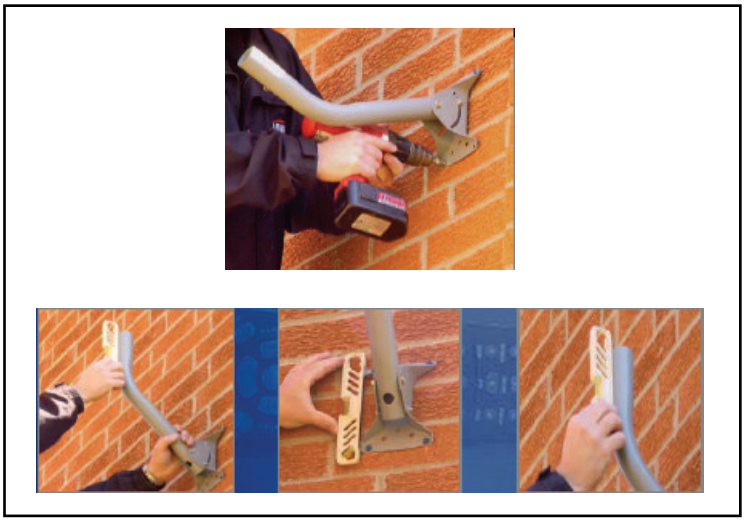
- **When peaking the satellite dish please use either transponder 1 or transponder 32.** These transponders are medium strength transponders and will allow for a much higher signal strength on all transponders on the dish.
- **Weather Conditions** - Please consult the home owner on locations where the weather may become a factor with snow and ice build-ups. Snow removal is the responsibility of the home owner so the location of the dish should also be easily accessible for snow removal.
- **Others/General** - Is the antenna location, external and internal wiring **aesthetic**, or will the customer complain. The cable color must be selected to match with the surface and ty-raps must be black in color and be UV protected.

In summary, the following must always be included in your site survey when looking for the proper antenna location. You should always be able to visualise the ENTIRE INSTALLATION BEFORE YOU START.

- Line of sight
- **Safety**
- Maintenance
- Building and electrical codes
- Municipal by-laws
- Cable runs External / Internal / Ground
- Grounding
- Solid surface
- Surface type
- Snow and Ice build-up areas
- Aesthetics
- Receiver(s) location
- Phone line connection

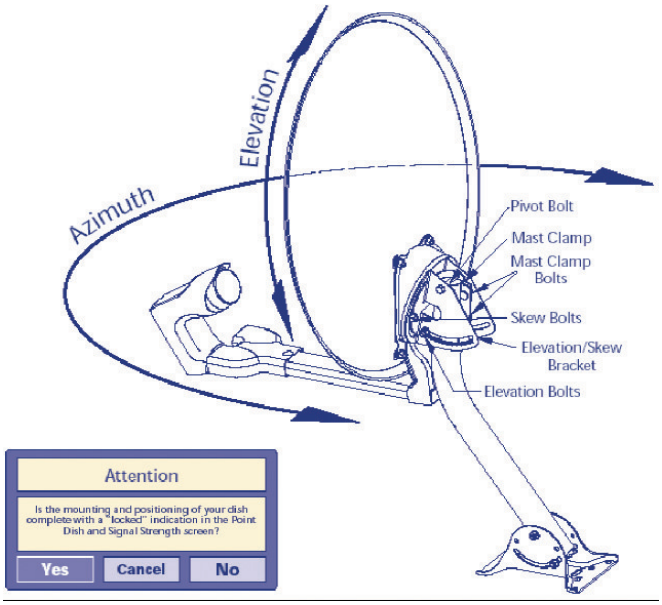


Wall Type Installation

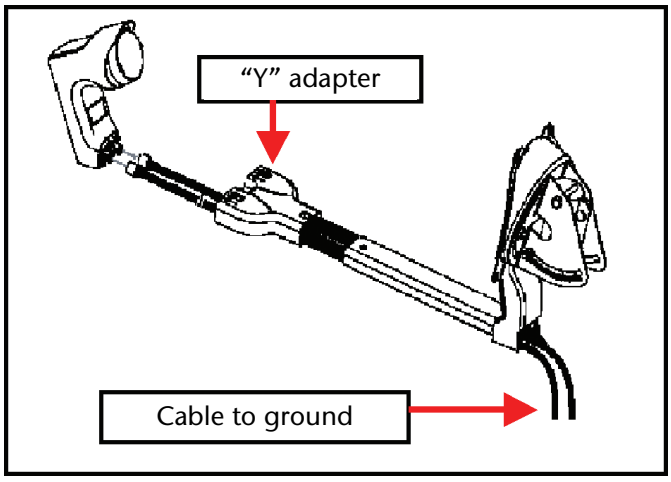


Step by step

- **It is most important that the surface is flat, solid and risk-free. For example, after a few years, mortar between bricks wears down; this is why you must never install the antenna mounting screws in the mortar.**
- On the ladder, always use the hand line to lift objects to your level.
- Use extreme caution when using ladders. To avoid the risk of electrical shock, use only those ladders approved by industry standards.
- Use the mounting base of the mounting bracket as a template. Mark the wall for either drilling or screwing.
- Lower the mounting bracket to the ground.
- Drill holes or pilot holes to receive anchors or lag screws.
- Ensuring the mounting bracket is **absolutely vertical**, tighten all bolts and screws. This is essential to acquire satellite signal quickly.
- Lift the preset parabolic dish and mount to the mounting bracket.



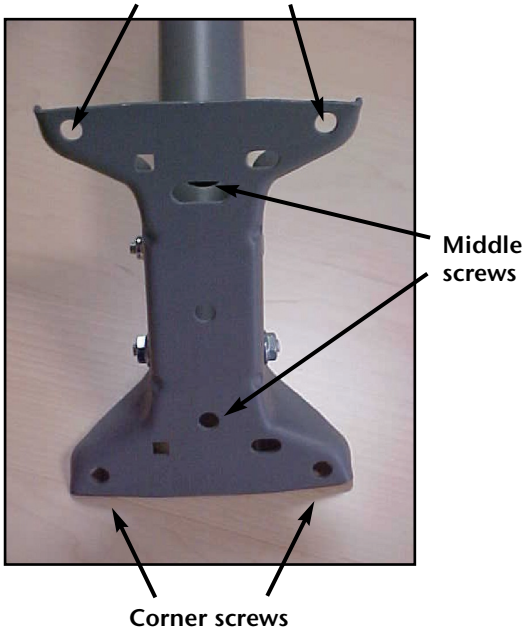
- Orient the parabolic dish with the satellite signal strength meter to receive optimum signal strength.
- Tighten all bolts while ensuring the dish does not move.

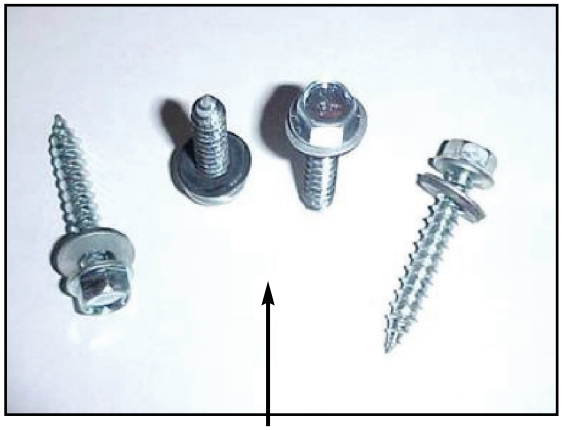


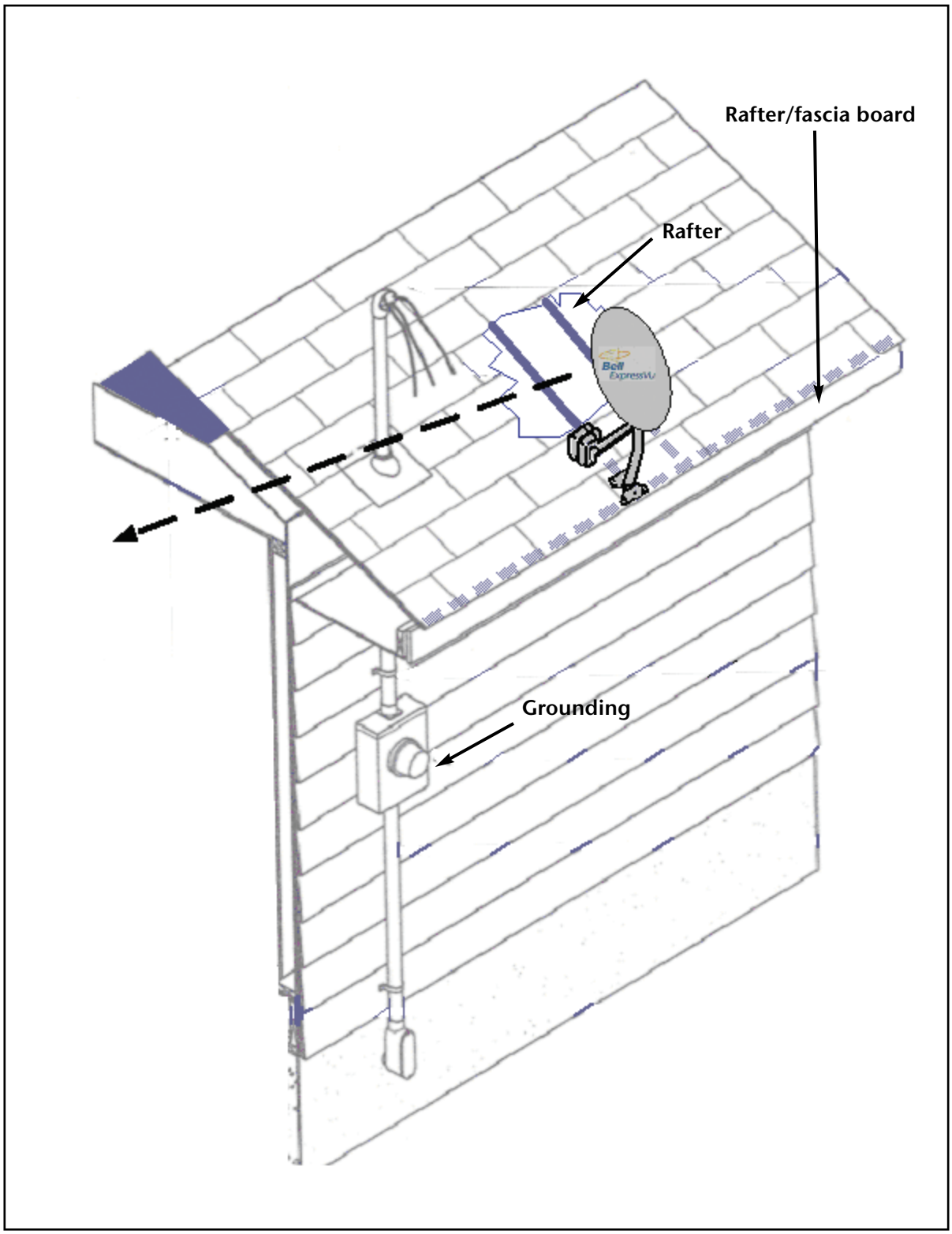
- For one LNBF only always use the "Y" adapter's 91° slot.
- For SW21, use appropriate supplied bracket.
- Proceed to run coaxial cable(s).
- The second LNBF and SW21's are necessary only if the customer wishes to subscribe to Nimiq 2 programming/service.
- All 51 cm dishes are to have the appropriate skew set before installation even if the services on Nimiq 2 are not required.

Roof type installations
1 Pitched Roof Installation

- Technicians are not allowed to walk on residential roofs unless properly equipped with industry standard fall arrest equipment and associated training.
- Installation on the roof fascia board will be allowed only if the installation can be performed safely.
- Installation will be allowed on the roof overhangs only if there are no other options (last resort).
- The roof must be clean of all debris, ice, snow etc.
- You must first locate the rafter as well as the fascia board/rafter.
- Apply an auto adhesive resistant rubber type band (5” minimum width, made for roofs) on the roof shingles.
- Position the antenna mount so that 2 of the 4 corner screws are fixed in the fascia board (normally 2 x 6) and the two middle screws in the perpendicular rafter (normally 2 x 4). The two last corner screws can be fixed directly into the roof.
- All 51 cm dishes are to have the appropriate skew set before installation even if the services on Nimiq 2 are not required.
- **Roof type** screws **#14 - 1 _ *with*** a rubber gasket are a must.
- **Be sure to follow all regional electrical codes with regards to grounding of the mast if the dish is to be installed as the highest point on the building.**






Rafter/fascia board
Rafter
Grounding

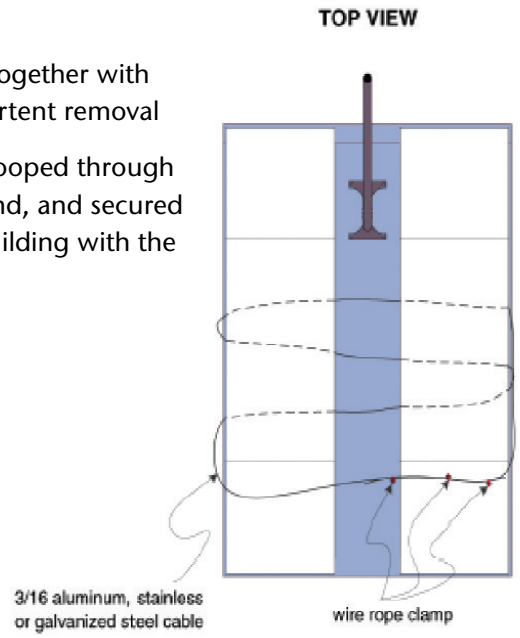
2 Flat Roof Installation

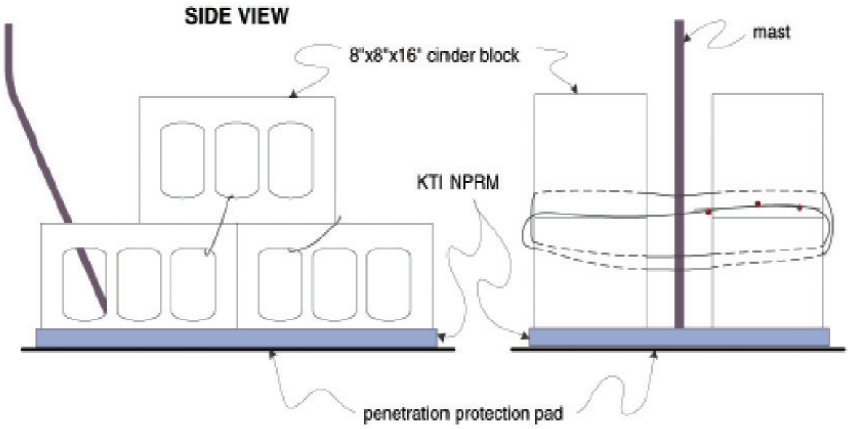
- For flat roof installations a non-penetrating roof mount (NPRM) must be used. The roof surface must be capable of supporting the combined weight of the antenna, mount, and ballast. (Channel Master 51 cm + single mount + 6 x 8" blocks = 250 lbs., 31 lbs./sq. ft.; For commercial applications Channel Master 90 cm + dual mount + 18 x 8" blocks = 650 lbs., 35 lbs./sq. ft.)
- It may be required for some NPRM installations to obtain engineering documentation before starting to ensure the roof will be able to handle the load.
- In all instances of the installation of a NPRM there is to be adequate penetration protection pad installed underneath the mount. Exterior grade rigid styrofoam insulation (minimum 1/2" thickness) or rubber mat (minimum 1/2" thickness) are suitable. **Standard white Styrofoam is not acceptable!**
- Rubber mat used must be anchored to the bottom of the NPRM sled without the heads of the bolts coming in contact with the roofing surface.
- NPRM must be tethered to an anchor point on the building. Existing anchor points for swing stage cannot be used.
- All blocks are to be banded together with 3/16 cable to avoid inadvertent removal.
- Please follow all safety regulations in your area concerning roof top fall arrest devices and associated training.
- The roof must be clean of all debris, ice, snow etc.
- You must first locate the rafters to locate an area that will better evenly distribute the weight.
- All 51 cm dishes are to have the appropriate skew set before installation even if the services on Nimiq 2 are not required.
- Home made flat roof mount kits are not acceptable.
- Be sure to follow all regional electrical codes with regards to grounding.

Non Penetrating Roof Mount Installation Detail

All blocks are to be banded together with 3/16 cable to prevent inadvertent removal

An additional cable is to be looped through the antenna mount at one end, and secured to an anchor point on the building with the other end. (not shown)





Balcony Type Installations

To be added at another time!

Dish Removal Instructions

Please note that *no* dish should be removed from *any* home unless requested by the home owner.

Some Things to Consider First:

- What is the location of the dish (Roof / Wall)?
- Can the dish be safely removed? Is it installed near power lines or any other obstacle that may be considered dangerous?
- Who owns the dish? Some Star Choice dishes are owned by Star Choice and not the customer.
- Refer to Dish Removal Waiver located in the appendix section.

Removal Instructions:

- For wall type removal please remove all pieces of the satellite dish and take adequate precautions to seal all holes to eliminate the chance of leaks.
- For all roof top removals please ensure that there has been a signed waiver before the start of any work. Remove all components of the dish and take adequate precautions to seal all holes to eliminate the chance of leaks.
- For the removal of any satellite dish that is not Bell ExpressVu issue a waiver will need to be signed by the home owner. If the ownership of the dish or the origination of the dish are in question a signed waiver is necessary before the work can start. Then follow the instructions as noted above depending on the type of removal that it is.

Please note that even with a signed waiver the removed equipment still remains the ownership of the customer and is their responsibility for proper disposal.

Prohibited Practices

It is strictly forbidden to install an antenna on the middle of the roof.

It is strictly forbidden to inadequately run cable over the roof

It is strictly forbidden to install an antenna on a Hydro mast or power/telephone pole.

It is strictly forbidden to install an antenna on a Pitched Roof using a NPRM (Non Penetrating Roof Mount) that is designed for flat roof installations.

It is strictly forbidden to attach Bell ExpressVu wires to the existing cable wires on the exterior of a building.

It is forbidden to use staples to attach Bell ExpressVu wires to any structure.

- **The utilization of any existing coaxial wires on Multi Dwelling buildings is strictly forbidden**

Appendix I

Look Angles for Bell ExpressVu Multi-Satellite Dish (82° & 91°)

Community	Compass Direction	Vertical Elevation	Skew
Alberta			
Athabasca	130.7	23.8	72.2
Banff	126.0	25.4	68.4
Brooks	132.3	27.8	70.3
Calgary	129.2	26.1	69.7
Cathrose	132.4	25.0	72.2
Drumheller	130.7	26.5	70.3
Edmonton	130.7	23.8	72.2
Fort McMurray	133.8	21.6	75.1
Fort Vermilion	125.2	19.3	73.1
Grande Prairie	121.4	20.8	69.6
Grimshaw	122.7	20.3	70.8
Hanna	132.4	26.9	70.9
Jasper	123.1	22.9	68.7
Lethbridge	130.6	27.4	69.6
Lloydminster	135.8	25.7	73.4
Meander River	123.4	18.1	73.2
Medicine Hat	134.0	28.1	71.0
Peace River	124.2	20.7	71.3
Red Deer	129.2	25.2	70.3
Slave Lake	127.4	22.2	71.7
British Columbia			
Campbell River	114.2	22.2	62.7
Chilliwack	117.8	24.4	63.4
Cranbrook	125.9	27.1	67.0
Dawson Creek	120.1	20.4	69.1
Dease Lake	108.1	13.2	68.9
Fort Nelson	115.2	16.1	70.5
Fort St. John	118.5	19.2	69.3
Kamloops	120.4	23.7	66.1
Kelowna	121.8	25.0	65.9
Kitimat	109.5	17.4	64.1
Nanaimo	115.3	23.4	62.3
Penticton	121.7	25.8	65.2
Port Alice	111.9	21.2	61.7
Prince George	116.4	20.0	66.8
Prince Rupert	108.3	16.9	63.7
Quesnel	117.7	21.2	66.6
Revelstoke	123.1	24.6	67.3
Valemount	121.7	22.5	68.2
Vancouver	116.6	23.9	62.7
Vernon	121.8	25.0	65.9
Victoria	116.5	24.6	62.1
Williams Lake	117.7	22.0	65.8
Manitoba			
Brandon	155.2	31.3	79.0
Churchill	172.9	22.7	85.6
Dauphin	153.3	30.0	78.6
Grand Rapids	158.2	28.3	80.8
Gypsumville	159.8	30.6	80.9
Hodgson	162.2	30.8	81.7
Lynn Lake	154.5	23.9	80.8
Portage La Prairie	159.6	31.7	80.6
The Pas	153.9	26.9	79.8
Thompson	161.3	25.4	82.4
Winnipeg	161.9	31.8	81.4

Community	Compass Direction	Vertical Elevation	Skew
New Brunswick			
Bath	225.2	33.7	107.7
Bathurst	227.0	31.4	107.4
Dalhousie	227.0	31.4	107.4
Edmundston	223.7	33.0	106.4
Fredericton	225.2	33.7	107.7
Grand Falls	184.2	36.0	89.5
Moncton	228.3	33.0	109.3
Oromocto	226.9	33.3	108.5
Saint John	226.8	34.3	109.2
Woodstock	226.9	33.3	108.5
Newfoundland			
Bonavista	243.1	26.1	116.2
Corner Brook	237.8	27.5	112.3
Gander	241.3	26.2	114.2
Grand Bank	240.0	28.3	115.1
Springdale	240.2	25.8	112.9
St. Anthony	240.4	25.0	112.2
St. John's	243.1	26.1	116.2
Northwest Territories			
Fort McPherson	101.6	7.6	73.0
Fort Simpson	118.6	15.7	75.0
Fort Smith	134.4	19.7	78.0
Hay River	127.3	18.1	76.0
Inuvik	101.9	7.3	75.0
Norman Wells	109.9	11.4	75.0
Yellowknife	128.5	16.8	78.0
Nova Scotia			
Cape Breton Island	234.0	31.4	112.4
Halifax	229.9	33.6	110.8
Port Hawkesbury	234.1	32.3	113.1
Springhill	229.8	32.6	110.0
Sydney	235.4	31.0	113.1
Trenton	203.9	38.6	98.6
Truro	231.3	33.2	111.6
Wedgeport	226.8	36.2	110.4
Yarmouth	226.8	35.3	109.8
Nunavut			
Arctic Bay	239.6	8.4	92.0
Baker Lake	174.9	17.3	87.5
Broughton Island	252.3	11.5	101.0
Cambridge Bay	144.8	11.8	85.0
Cape Dorset	223.9	17.0	97.0
Clyde River	253.6	9.5	97.5
Coppermine	122.5	11.7	80.5
Eureka	262.6	2.0	91.0
Gjoa Haven	181.8	12.9	88.0

Look Angles for Bell ExpressVu Multi-Satellite Dish (82° & 91°)

Community	Compass Direction	Vertical Elevation	Skew
Nunavut (cont'd)			
Grise Fiord	251.6	5.1	92.0
Hall Beach	231.5	12.5	94.0
Iqualuit	241.6	15.8	101.0
Lake Harbour	238.5	16.9	101.0
Pond Inlet	249.5	8.4	99.5
Rankin Inlet	186.4	19.0	89.5
Repulse Bay	212.2	15.1	92.0
Resolute Bay	217.8	6.8	89.0
Ontario			
Bancroft	204.1	37.5	98.3
Barrie	199.5	38.9	96.6
Belleville	206.1	38.4	99.6
Bradford	201.7	38.7	97.6
Brockville	208.4	37.1	100.3
Burlington	201.6	39.8	97.9
Cobalt	200.4	35.6	96.0
Collingwood	199.5	38.9	96.6
Cornwall	212.5	36.7	102.1
Elliot Lake	195.5	36.9	94.3
Fort Frances	170.7	33.4	84.4
Fort Severn	186.3	26.2	89.0
Geraldton	185.3	32.7	89.6
Goderich	195.0	39.1	94.6
Guelph	199.4	40.0	96.9
Haliburton	204.0	37.5	98.3
Hanover	197.3	39.0	95.6
Hearst	192.5	32.7	91.2
Huntsville	201.9	37.8	97.4
Kenora	168.7	32.2	83.8
Kingston	206.1	38.4	99.6
Kirkland Lake	200.6	34.5	95.8
Kitchener	199.4	40.0	96.9
London	197.0	40.1	95.8
Mattawa	204.4	36.4	98.1
Moosonee	199.8	31.4	94.4
Nipigon	182.6	33.8	88.7
North Bay	202.3	36.6	97.1
Ottawa	208.4	37.1	100.3
Owen Sound	197.6	37.8	95.4
Parry Sound	199.8	37.8	96.4
Pembroke	206.5	36.2	99.0
Perth	208.4	37.1	100.3
Sarnia	194.8	40.2	94.8
Peterborough	203.9	38.6	98.6
Sault St Marie	191.1	37.0	92.4
Sioux Lookout	173.4	32.6	85.4
Sudbury	198.1	35.7	95.1
Thunder Bay	179.8	34.8	87.8
Timmins	198.9	33.5	94.7
Tobermory	195.3	38.0	94.5
Toronto	199.8	37.8	96.4
Welland	201.6	39.8	97.9
Windsor	192.2	41.4	93.9

Community	Compass Direction	Vertical Elevation	Skew
Prince Edward Island			
Charlottetown	231.4	32.2	110.9
Summerside	231.4	32.2	110.9
Quebec			
Chibougamau	213.8	31.5	100.2
Chicoutimi	218.8	32.9	103.3
Drummondville	214.6	35.6	102.6
Gaspe	228.8	30.1	107.5
La Tuque	214.8	34.4	102.2
Mont-Laurier	208.8	35.0	99.6
Montreal	212.6	35.7	101.7
Quebec	218.5	33.9	103.9
Rimouski	222.2	32.3	105.0
Rouyn	202.8	34.4	96.7
Sept-Iles	225.9	29.8	105.5
Sherbrooke	216.4	36.2	104.0
Trois-Rivieres	214.6	35.4	102.6
Val d'Or	205.0	34.3	97.5
Saskatchewan			
Estevan	148.7	31.6	76.2
Hudson Bay	151.6	27.8	78.8
Kindersley	137.5	27.9	72.9
La Ronge	145.5	25.1	77.6
Moose Jaw	143.0	29.8	74.5
Moosomin	135.7	28.5	71.7
North Battleford	139.4	26.3	74.7
Prince Albert	143.3	26.8	76.0
Regina	145.1	29.1	75.7
Saskatoon	141.3	27.5	74.8
Stony Rapids	159.8	22.1	82.7
Swift Current	141.1	29.5	73.8
Uranium City	137.0	19.1	77.2
Yorkton	151.2	29.8	77.9
Yukon			
Carmacks	103.6	10.8	69.0
Dawson	100.6	8.5	70.0
Haines Junction	103.1	11.2	68.0
Ross River	106.8	12.2	70.0
Watson Lake	111.1	14.8	70.5
Whitehorse	105.1	12.2	68.5

Appendix II

Look Angles for Bell ExpressVu Single Satellite Dish (82° Only)

Community	Compass Direction	Vertical Elevation
Alberta		
Banff	121.8	23.6
Calgary	124.0	24.3
Drumheller	126.3	24.5
Edmonton	125.1	22.4
Fort McMurray	128.1	20.4
Grande Prairie	116.8	19.0
Grimshaw	118.4	18.7
Jasper	118.2	21.1
Lethbridge	125.9	25.9
Lloydminster	130.8	23.9
Medicine Hat	129.4	26.5
Peace River	118.8	18.8
Red Deer	141.9	23.4
Slave Lake	122.8	20.5
British Columbia		
Bella Coola	107.5	17.4
Campbell River	109.3	19.8
Cranbrook	121.4	24.8
Dease Lake	104.1	11.8
Fort Nelson	110.9	14.8
Kamloops	115.2	21.8
Kelowna	116.3	22.8
Kitimat	105.4	15.4
Nanaimo	110.8	21.0
Queen Charlotte Island	101.8	14.1
Port Alice	106.9	18.4
Prince George	111.9	18.2
Prince Rupert	103.7	14.6
Vancouver	111.8	21.4
Victoria	111.5	21.8
Williams Lake	112.9	19.8
Manitoba		
Brandon	149.7	30.4
Churchill	167.4	22.5
Dauphin	149.8	29.0
Grand Rapids	152.0	27.2
Lynn Lake	149.1	23.2
The Pas	148.0	26.1
Thompson	156.5	24.9
Winnipeg	155.7	31.1
New Brunswick		
Bathurst	221.9	33.0
Edmundston	217.5	34.0
Fredericton	220.0	35.0
Moncton	223.0	34.3
Saint John	221.0	35.5
Woodstock	218.6	35.0

Community	Compass Direction	Vertical Elevation
Newfoundland		
Cartwright	234.9	24.6
Corner Brook	232.7	29.3
Gander	236.5	28.0
Goose Bay	230.9	25.9
Grand Bank	235.1	30.1
Hopedale	232.2	23.8
Labrador City	221.9	27.9
Nain	230.8	23.2
Rigolet	208.2	24.6
Springdale	235.0	28.1
St. Anthony	235.8	26.2
St. Johns	238.4	28.4
Northwest Territories		
Fort Laird	109.5	13.4
Fort McPherson	95.0	4.9
Fort Reliance	131.1	15.7
Fort Resolution	144.9	15.9
Fort Simpson	111.6	13.1
Fort Smith	126.6	17.4
Hay River	119.3	15.6
Inuvik	95.4	4.8
Norman Wells	103.3	8.8
Prince Patrick Island	99.0	1.9
Tuktoyaktuk	95.1	4.3
Yellowknife	121.2	14.6
Nova Scotia		
Cape Breton Island	208.1	33.2
Halifax	224.8	35.4
Springhill	224.2	34.5
Sydney	229.7	32.7
Trenton	198.6	39.0
Yarmouth	220.7	37.0
Nunavut		
Arctic Bay	224.0	8.4
Baker Lake	165.5	16.5
Cambridge Bay	140.1	10.7
Cape Dorset	217.3	17.4
Chesterfield Inlet	179.7	18.4
Clyde	240.7	10.5
Coppermine	144.9	10.0
Eureka	262.2	1.0
Gjoa Haven	171.6	12.2
Igloolik Island	180.6	12.5
Iqaluit	229.3	17.2
Lake Harbour	226.1	18.3
Pangnirtung	235.9	14.5
Pond Inlet	236.7	8.7
Rankin Inlet	176.6	18.5
Repulse Bay	199.8	15.0
Resolute	201.5	6.4

Look Angles for Bell ExpressVu Single Satellite Dish (82° Only)

Community	Compass Direction	Vertical Elevation
Ontario		
Bancroft	198.3	38.0
Barrie	194.0	38.8
Brockville	202.8	38.3
Burlington	193.4	40.0
Cobalt	195.1	35.5
Collingwood	192.8	38.7
Fort Frances	163.9	33.1
Fort Severn	181.6	26.0
Geraldton	179.4	32.8
Goderich	189.1	39.6
Haliburton	197.8	38.0
Hearst	187.2	33.0
Huntsville	195.3	37.7
Kenora	161.9	31.7
Kingston	200.9	38.7
Kitchener	191.9	39.9
London	190.0	40.4
Moosonee	194.9	31.3
Nipigon	176.0	33.5
North Bay	195.1	36.7
Ottawa	202.9	37.4
Owen Sound	191.2	38.7
Parry Sound	193.5	37.8
Pembroke	200.1	37.1
Perth	201.6	38.0
Peterborough	197.0	38.8
Sault St Marie	184.1	36.5
Sioux Lookout	168.0	31.8
Sudbury	191.8	36.5
Thunder Bay	173.5	34.0
Timmins	191.9	34.3
Tobermory	189.8	37.9
Toronto	194.4	39.6
Welland	194.6	40.3
Windsor	210.4	36.6
PEI		
Charlottetown	225.6	33.7
Summerside	224.6	33.7
Quebec		
Chibougamau	207.2	32.4
Chicoutimi	213.0	33.4
Drummondville	209.5	36.4
Gaspe	224.0	31.5
La Tuque	209.4	34.8
Mont-Laurier	203.7	36.1
Montreal	207.3	37.0
Quebec	212.2	35.1
Rimouski	217.4	32.9

Community	Compass Direction	Vertical Elevation
Quebec (cont'd)		
Inukjuak	205.7	23.6
Kangiqsualujjuaq	198.6	22.0
Kangiqsujuaq	221.1	19.9
Kuujjuaq	223.3	22.8
Rouyn	197.0	34.5
Schefferville	222.7	26.0
Sept-Iles	221.5	30.6
Sherbrooke	210.6	36.8
Trois-Rivieres	209.6	35.9
Val d'Or	199.5	34.6
Waskaganish	199.2	31.0
Saskatchewan		
Estevan	143.3	30.1
Hudson Bay	145.3	26.7
Kindersley	132.1	25.9
La Ronge	139.7	23.8
Moose Jaw	138.5	28.1
Moosomin	132.0	27.1
North Battleford	133.7	25.0
Prince Albert	138.6	25.4
Regina	140.4	28.3
Saskatoon	136.7	26.1
Story Rapids		
Swift Current	134.4	27.4
Uranium City	132.7	18.7
Yorkton	144.8	28.3
Yukon		
Carmacks	96.3	7.3
Dawson	93.4	5.1
Mayo Landing	96.1	6.7
Old Crow	91.7	3.3
Ross River	99.6	8.9
Watson Lake	103.7	11.5
Whitehorse	97.8	8.6

Appendix III

Community	DBS Nimiq (@ 91W)		
	Compass Direction	Vertical Elevation	Skew
Alberta			
Athabasca	130.7	23.8	72.2
Banff	126.0	25.4	68.4
Brooks	132.3	27.8	70.3
Calgary	129.2	26.1	69.7
Camrose	132.4	25.0	72.2
Drumheller	130.7	26.5	70.3
Edmonton	130.7	23.8	72.2
Fort McMurray	133.8	21.6	75.1
Fort Vermillion	125.2	19.3	73.1
Grande Prairie	121.4	20.8	69.6
Grimshaw	122.7	20.3	70.8
Hana	132.4	26.9	70.9
Jasper	123.1	22.8	68.7
Lethbridge	130.6	27.4	69.6
Lloydminster	135.8	25.7	73.4
Meander River	123.4	18.1	73.2
Medicine Hat	134.0	28.1	71.0
Peace River	124.2	20.7	71.3
Red Deer	129.2	25.2	70.3
Slave Lake	127.4	22.2	71.7
British Columbia			
Campbell River	114.2	22.2	62.7
Chilliwack	117.8	24.4	63.4
Cranbrook	125.9	27.1	67.0
Dawson Creek	120.1	20.4	69.1
Dease Lake	108.1	13.2	68.9
Fort Nelson	115.2	16.1	70.5
Fort St.John	118.5	19.2	69.3
Kamloops	120.4	23.7	66.1
Kelowna	121.8	25.0	65.9
Kitimat	109.5	17.4	64.1
Nanaimo	115.3	23.4	62.3
Penticton	121.7	25.8	65.2
Port Alice	111.9	21.2	61.7
Price George	116.4	20.0	66.8
Prince Rupert	108.3	16.9	63.7
Quesnel	117.7	21.2	66.6
Revelstoke	123.1	24.6	67.3
Valemount	121.7	22.5	68.2
Vancouver	116.6	23.9	62.7
Vernon	121.8	25.0	65.9
Victoria	116.5	24.6	62.1
Williams Lake	117.7	22.0	65.8
Manitoba			
Brandon	155.2	31.3	79.0
Churchhill	172.9	22.7	85.6
Dauphin	153.3	30.0	78.6
Grand Rapids	158.2	28.3	80.8
Gypsumville	159.8	30.6	80.9
Hodgson	162.2	30.8	81.7
Lynn Lake	154.5	23.9	80.8
Portage La Prairie	159.6	31.7	80.6
The Pas	153.9	26.8	79.8
Thompson	161.3	25.4	82.4
Winnipeg	161.9	31.8	81.4

Community	DBS Nimiq (@ 91W)		
	Compass Direction	Vertical Elevation	Skew
New Brunswick			
Bath	225.2	33.7	107.7
Bathurst	227.0	31.4	107.4
Dalhousie	227.0	31.4	107.4
Edmundston	223.7	33.0	106.4
Fredericton	225.2	33.7	107.7
Grand Falls	184.2	36.0	89.5
Moncton	228.3	33.0	109.3
Oromocto	226.9	33.3	108.5
St. John	226.8	34.3	109.2
Woodstock	226.9	33.3	108.5
Newfoundland			
Bonavista	243.1	26.1	116.2
Corner Brook	237.8	27.5	112.3
Gander	241.3	26.2	114.2
Grand Bank	240.0	28.3	115.1
Springdale	240.2	25.8	112.9
St Anthony	240.4	25.0	112.2
St Johns	243.1	26.1	116.2
Northwest Territories			
Fort McPherson	101.6	7.6	73.0
Fort Simpson	118.6	15.7	75.0
Fort Smith	134.4	19.7	78.0
Hay River	127.3	18.1	76.0
Inuvik	101.9	7.3	75.0
Norman Wells	109.9	11.4	75.0
Yellowknife	128.5	16.8	78.0
Nova Scotia			
Cape Breton Isl	234.0	31.4	112.4
Halifax	229.9	33.6	110.8
Port Hawkesbury	234.1	32.3	113.1
Springhill	229.8	32.6	110.0
Sydney	235.4	31.0	113.1
Trenton	203.9	38.6	98.6
Truro	231.3	33.2	111.6
Wedgeport	226.8	36.2	110.4
Yarmouth	226.8	35.3	109.8
Nunavut			
Arctic Bay	239.6	8.4	92.0
Baker Lake	174.9	17.3	87.5
Broughton Island	252.3	11.5	101.0
Cambridge Bay	144.8	11.8	85.0
Cape Dorset	223.9	17.0	97.0
Clyde River	253.6	9.5	97.5
Coppermine	122.5	11.7	80.5
Eureka	262.6	2.02	91.0
Gjoa Haven	181.9	12.9	88.0

Community	DBS Nimiq (@ 91W)		
	Compass Direction	Vertical Elevation	Skew
Grise Fiord	251.6	5.11	92.0
Hall Beach	231.5	12.5	94.0
Iqualuit	241.6	15.8	101.0
Lake Harbour	238.5	16.9	101.0
Pond Inlet	249.5	8.4	99.5
Rankin Inlet	186.4	19.0	89.5
Repulse Bay	212.2	15.1	92.0
Resolute Bay	217.8	6.8	89.0
Ontario			
Bancroft	204.1	37.5	98.3
Barrie	199.5	38.9	96.6
Belleville	206.1	38.4	99.6
Bradford	201.7	38.7	97.6
Brockville	208.4	37.1	100.3
Burlington	201.6	39.8	97.9
Cobalt	200.4	35.6	96.0
Collingwood	199.5	38.9	96.6
Cornwall	212.5	36.7	102.1
Elliot Lake	195.5	36.9	94.3
Fort Frances	170.7	33.4	84.4
Fort Severn	186.3	26.2	89.0
Geraldton	185.3	32.7	89.6
Goderich	195.0	39.1	94.6
Guelph	198.4	40.0	96.9
Haliburton	204.0	37.5	98.3
Hanover	197.3	39.0	95.6
Hearst	192.5	32.7	91.2
Huntsville	201.9	37.8	97.4
Kenora	168.7	32.2	83.8
Kingston	206.1	38.4	99.6
Kirkland lake	200.6	34.5	95.8
Kitchener	199.4	40.0	96.9
London	197.0	40.1	95.8
Mattawa	204.4	36.4	98.1
Mocsonee	199.8	31.4	94.4
Nipigon	182.6	33.8	88.7
North Bay	202.3	36.6	97.1
Ottawa	208.4	37.1	100.3
Owen Sound	197.6	37.8	95.4
Parry Sound	199.8	37.8	96.4
Pembroke	206.5	36.2	99.0
Perth	208.4	37.1	100.3
Sarnia	194.8	40.2	94.8
Peterbrough	203.9	38.6	98.6
Sault St. Marie	191.1	37.0	92.4
Sioux Lookout	173.4	32.6	85.4
Sudbury	198.1	35.7	95.1
Thunderbay	179.8	34.8	87.8
Timmins	198.9	33.5	94.7
Tobermory	195.3	38.0	94.5
Toronto	199.8	37.8	96.4
Welland	201.6	39.8	97.9
Windsor	192.2	41.4	93.9

Community	DBS Nimiq (@ 91W)		
	Compass Direction	Vertical Elevation	Skew
Prince Edward Island			
Charlottetown	231.4	32.2	110.9
Summerside	231.4	32.2	110.9
Quebec			
Chibougamau	213.8	31.5	100.2
Chicoutimi	218.8	32.9	103.3
Drummondville	214.6	35.6	102.6
Gaspe	228.8	30.1	107.5
La Tuque	214.8	34.4	102.2
Mont-Laurier	208.8	35.0	99.6
Montreal	212.6	35.7	101.7
Quebec	218.5	33.9	103.9
Rimouski	222.2	32.3	105.0
Rouyn	202.8	34.4	96.7
Sept-Iles	225.9	29.8	105.5
Sherbrooke	216.4	36.2	104.0
Trois-Rivieres	214.6	35.4	102.6
Val d'Or	205.0	34.3	97.5
Saskatchewan			
Estevan	148.7	31.6	76.2
Hudson Bay	151.6	27.8	78.8
Kindersley	137.5	27.9	72.9
La Ronge	145.5	25.1	77.6
Moosejaw	143.0	29.9	74.5
Moosomin	135.7	28.5	71.7
North Battleford	139.4	26.3	74.7
Prince Albert	143.3	26.8	76.0
Regina	145.1	29.1	75.7
Saskatoon	141.3	27.5	74.8
Stony Rapids	159.8	22.1	82.7
Swift Current	141.1	29.5	73.8
Uranium City	137.0	19.1	77.2
Yorkton	151.2	29.8	77.9
Yukon			
Carmacks	103.6	10.9	69.0
Dawson	100.6	8.5	70.0
Haines Junction	103.1	11.2	68.0
Ross River	106.8	12.2	70.0
Watson Lake	111.1	14.9	70.5
Whitehorse	105.1	12.2	68.5

Appendix IV

DISH REMOVAL WAIVER

I am the owner of the premises located at the address set out below. I have asked Bell ExpressVu Limited Partnership ("Bell ExpressVu") to remove an existing satellite dish currently installed on the premises. I have been advised by the representative of Bell ExpressVu that there are risks associated with the removal of an installed satellite dish, including potential damage to the structure, and the possibility of leakage. I confirm my request for the removal of the satellite dish, not withstanding the risks of damage and I hereby release and forever discharge Bell ExpressVu and all partners, employees, representatives and agents of Bell ExpressVu from and against any and all actions, claims, costs or demands whatsoever resulting from or in any way related to the removal of the satellite dish from my premises, regardless of whether any such damage resulted from the negligence of Bell ExpressVu or any of its partners, employees, representatives or agents. I have read this waiver and I understand its terms.

CIVIC ADDRESS: _____

CITY/ PROVINCE: _____

POSTAL CODE: _____

DATED: _____

_____ _____

WITNESS SIGNATURE OWNER SIGNATURE

_____ _____

WITNESS NAME (PRINT) OWNER NAME (PRINT)

Section 4
External Wiring

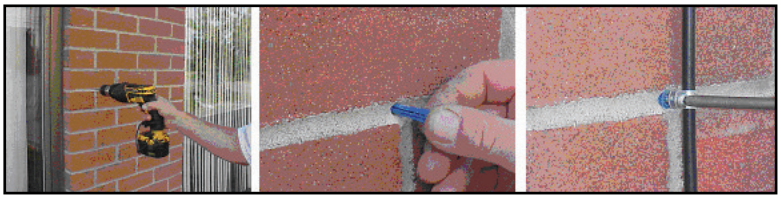
Version: 1.3
Release Date: January, 2005

Table of Contents

Installation of External Wiring

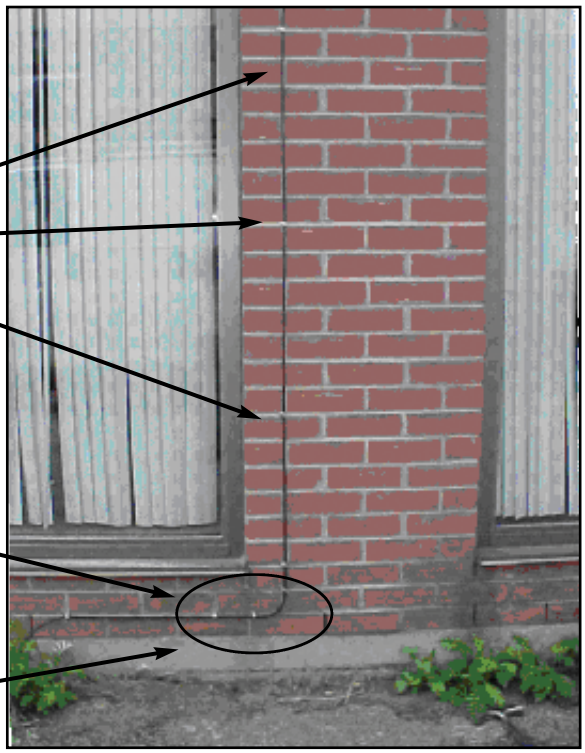
Make sure you properly plan before starting

- All cables must be Rg-6 or Rg-11.
- All existing connectors (outdoor and indoor) should be examined and changed if they are not approved (APL) or in poor condition.
- Before drilling any penetration holes into a building, make sure there are no wires, pipes or other obstructions in the area.
- Aesthetics is a very important aspect of the installation. It's very important to select the cable color appropriate to the surface on which it is installed. Each technician must carry at least two colors.
  ***At Least Black and White**
- SC-** (clip & screw) is the clip used to secure the cable on bricks, concrete, wood etc. (SC20 for RG-6 and SC21 for RG-11).

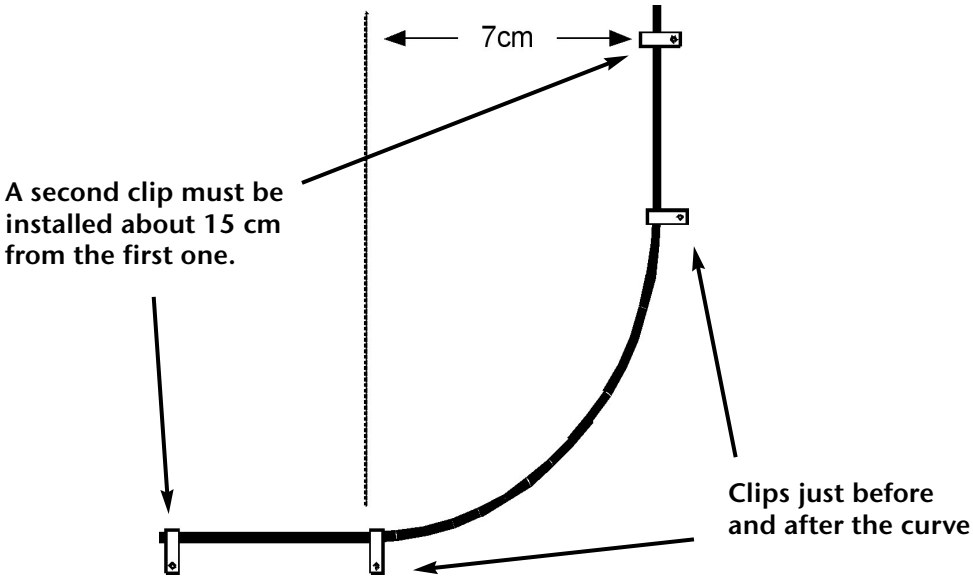


- As illustrated, SC-20 must be installed in the mortar using an anchor.
- On a run of cable the spacing between the clips is 50cm or approximately 7 or 8 conventional bricks.
- The cable run must be neat, clean and tidy.

Bending Radius & Drip Loop

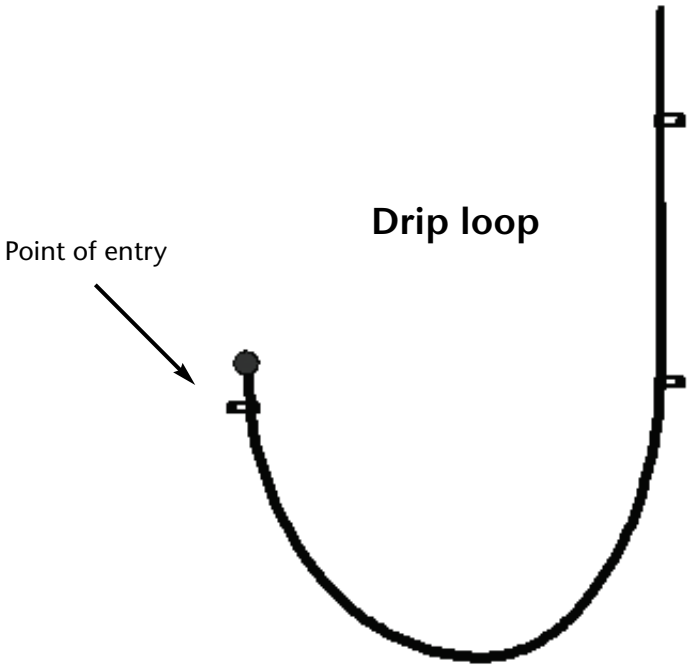


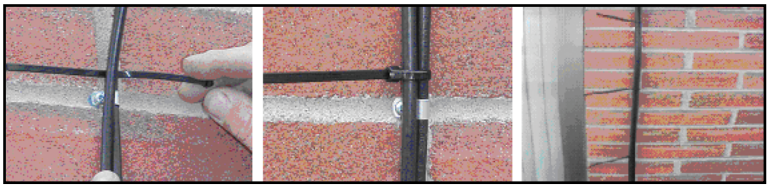
• Minimum **bending radius** for Rg-6 is 7cm



• A drip loop is required before attaching to any device and before the point of entry to allow moisture to drip from the cable and prevent any potential damage.
• Sealant must also be added to seal the hole at the point of entry.

Additional Cables

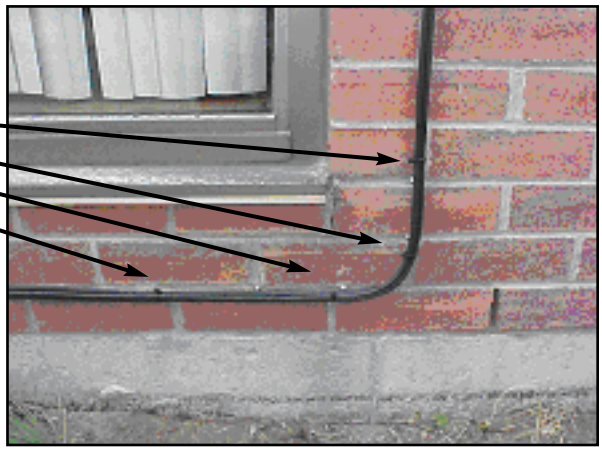




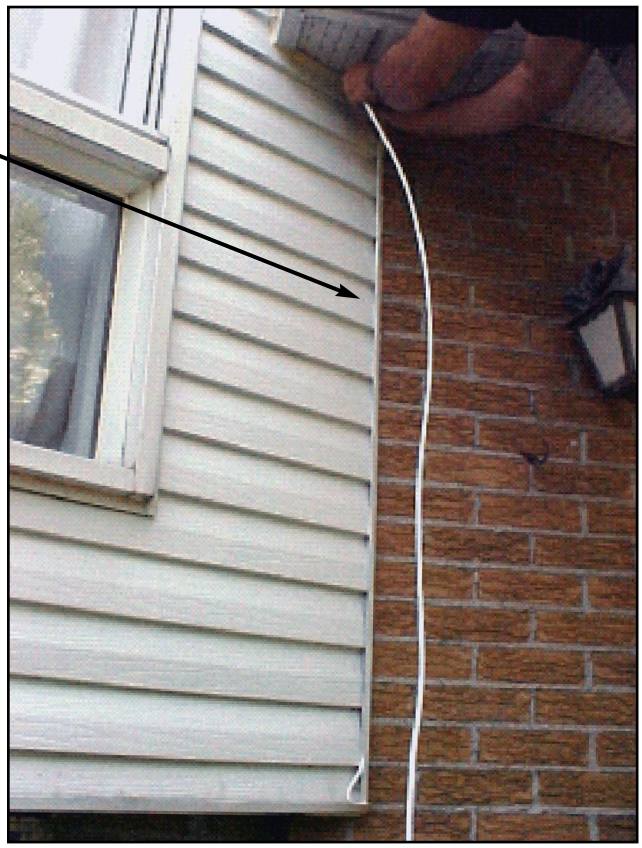
- If additional cables are required, they must be attached to the one already fixed with SC20 or SC21 clips.
- Up to 3 additional cables can be tie-raped for a total of 4.
- Bell ExpressVu Satellite wires cannot be attached to any non Bell ExpressVu wires previously installed on the exterior of the building.
- Ty-raps must be installed every 30 to 50 cm.
- All ty raps must be made of UV protected material and black in color. White ty raps are not allowed.
- All ty rap tails must be cut off.

Ty-rap

In the corner section the ty raps must installed at each clip.



Normally the cable can be tucked/hidden in the corner.

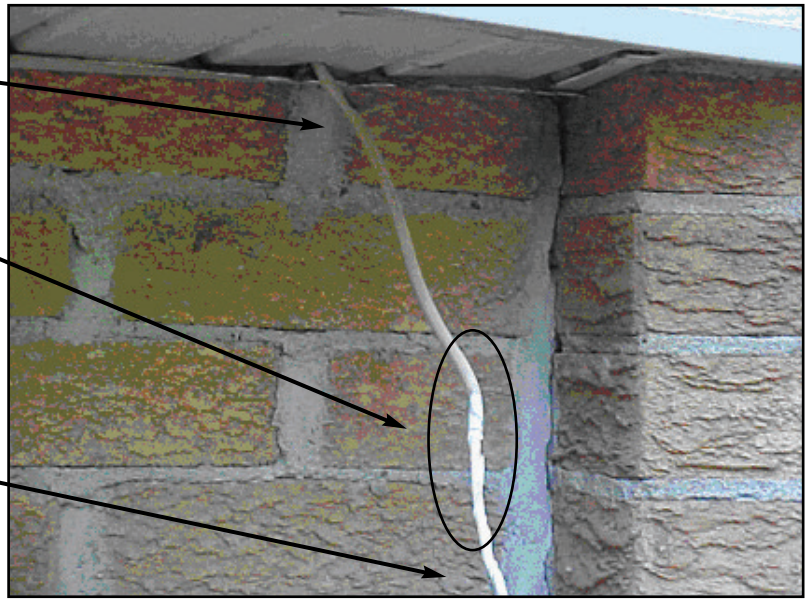


- If needed, plastic horizontal or vertical clips can be used to fix the cable on aluminium siding.

Old rg-59 cable

Pulling attachment between old and new cable to pull (fish) replacement cable.

New Cable



- **<u>Since RG-59 is not an adequate cable</u>**, whenever possible the Old existing Rg-59 can be used to pull (Fish) the new Rg-6 inside.

Things to Consider/ General Survey

Although the grounding transition can be properly executed in both examples (Fig A & B), and the Wire run will probably take less time in Fig. B, Fig. A is the correct and accepted method to carry out this installation.

Considering

- Line of sight
- Safety
- Customer
- Maintenance
- Regulations and codes
- Surface
- Aesthetics

Agreed to and practical antenna mounting location

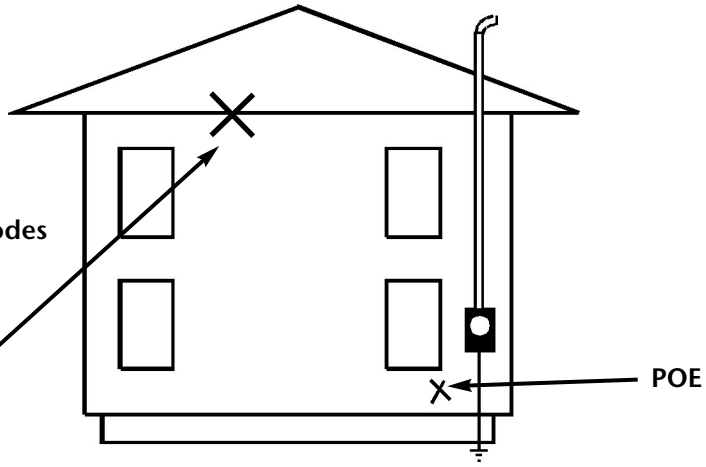
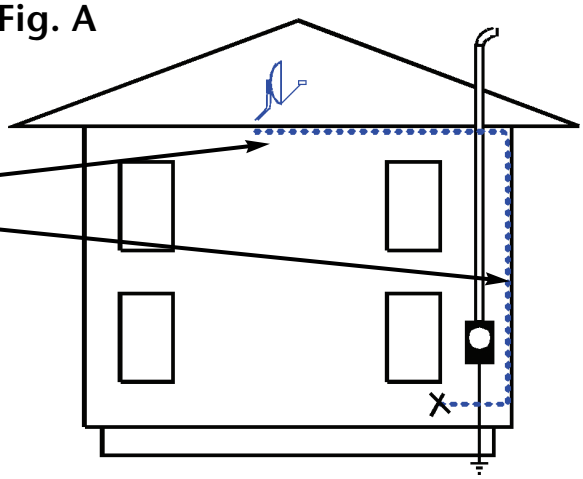


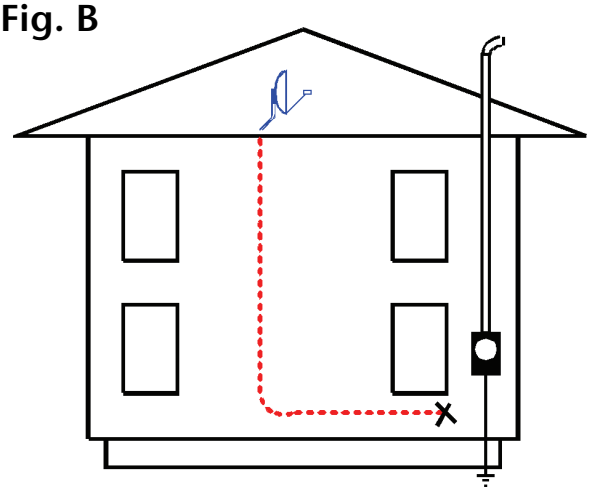
Fig. A

When possible and safe always follow the contours.



- Excellent Aesthetics
- Easier to hide if Aluminium/Vinyl siding
- Easier and more aesthetic grounding transition

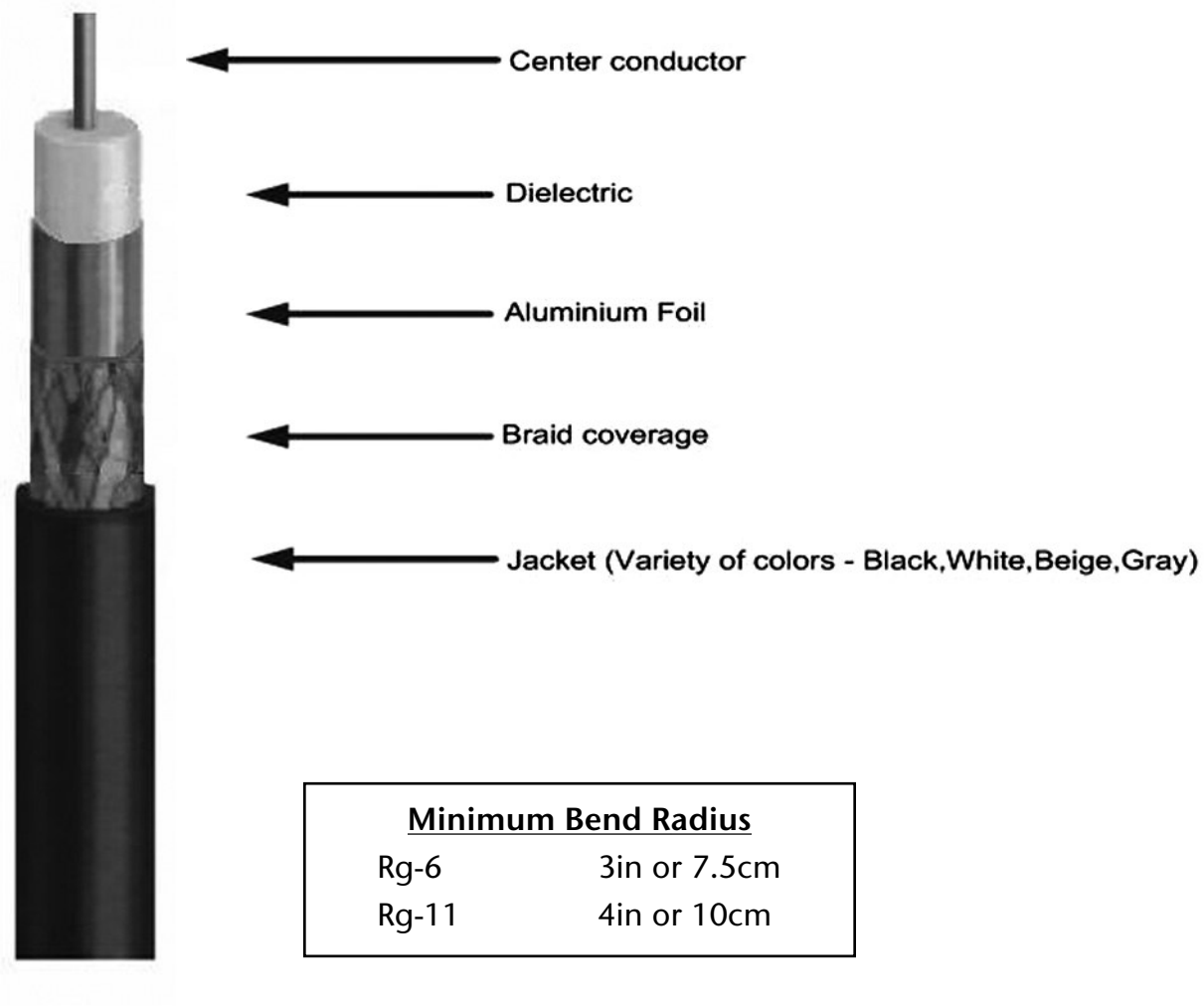
Fig. B



- Poor Aesthetics
- No possibilities to hide cable
- Average aesthetic grounding transition

Coaxial Cable

Construction and Specifications



Minimum Bend Radius	
Rg-6	3in or 7.5cm
Rg-11	4in or 10cm

Cable Attenuation

Frequency	RG-6 Lost dB/100ft	RG-11 Lost dB/100ft
950 Mhz	6.0	4.0
1450 Mhz	8.0	6.0
2250 Mhz	10.0	8.0

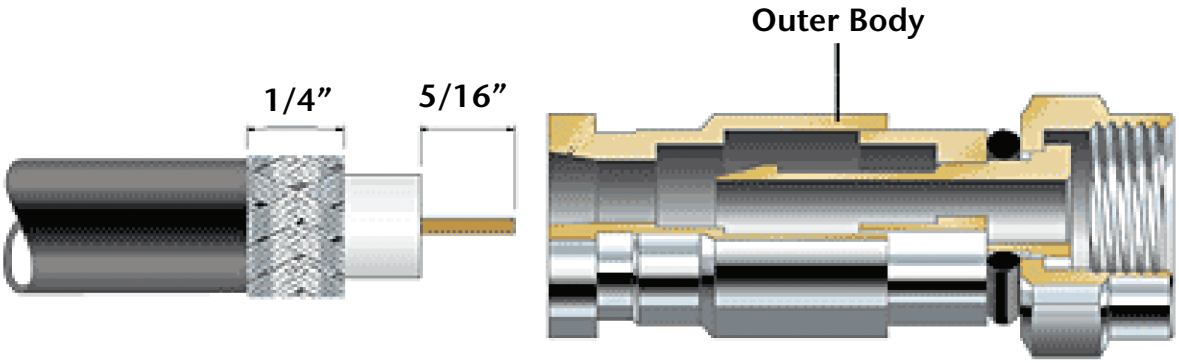
Note: RG-59 cabling is not considered adequate.

Coax Connectors

- Only compression style connectors are approved for use by Bell ExpressVu. To see a complete list of approved connectors please refer to the APL.

Cable Preparation

One step cable preparation of 1/4” (6.5 mm) Braid, 1/4” (6.5 mm) Dielectric and 5/16” (8.0 mm) center conductor. Refer to diagram below.



Installing Compression “F” Connectors

1. Strip the coax to the dimensions shown in the above diagram.
2. Cut the center conductor to the specified length as shown. If the centre conductor is any longer than 5/16” it will not allow for a proper crimp when the connector is compressed on the coax cable.
3. Push the connector on the coax cable so that the center conductor comes up through the sleeve in the middle. It is very important that the white dielectric foam around the center conductor is flush with the back plate of the connector. Failure to have the white foam dielectric flush with the bottom will result in a bad connection and the connector will be able to be pulled off.
4. Insert connector into the compression tool with the threaded end fitting over the slotted adapter in the compression tool. The center conductor of the coax will fit into the slotted adapter and the coax will slide into jaws at the top of the compression tool.
5. Squeeze the handles of the compression tool and compress the connector on the cable.

Underground Wiring

Installation of Underground Wiring

*****Make sure you properly plan before starting*****

- All cables must be Rg-6 or Rg-11 approved coax for use underground.
- Approved Cables for Direct Burial are found in the APL (Approved Parts List)
- There are three approved methods for direct burial of coax.

1. **Vibratory Plowing** - A plow with a special blade slices through the ground. The cable runs through a tube in the blade and is placed as the plow moves forward. Since no dirt is displaced, vibratory plowing is much less intrusive than trenching.
2. **Trenching** - involves digging or plowing a trench, placing the cable in it then burying the cable. Conduit can also be used with this method for short runs. Minimum trench depth of 6" required to ensure that the cable is buried at a depth that a lawn aerator cannot contact the wire.
3. **Boring** (directional and conventional) digs or punches a hole in the earth, usually from one trench to another. It is an excellent method for crossing areas that cannot be plowed (such as paved roads or railroad tracks) if they cannot be traversed aerially. Cable is then pulled through the hole.

Coax may also be pulled through existing or new underground conduit or ductwork. Careful attention must be paid to ensure the maximum pulling force or the minimum bend radius is not exceeded.

- A cable route survey should be completed before work begins and will dictate the cable placement scheme taking into account the man power available, the difficulty of the route and equipment necessary.
- Before starting any work with buried cable make sure to have the homeowner consult the local authorities to locate any possible buried power lines, gas lines, or sewer/septic field locations in the path of the cable route.
- Be sure to pick a path for the coax or conduit that does not interfere with the future enjoyment of property. Cable path should follow existing property lines or structure located on the property.

Trenching Method:

Example of digging a trench with a flat shovel.

Note the minimum 6'' depth of the trench.

Prohibited Practices

Wrong selection of cable color. White would be the choice.

Not neat and tight.

Was there a possibility to follow a contour instead of coming down the middle of the wall?

Point of Entry

- Always use the drill bit adapted to the material
- Never drill if you are not absolutely certain what is on the other side.
- Always drill with a slight downward inclination towards the exterior from inside.
- Use **acrylic latex** to seal the point of entry

Section 5
Grounding Procedures

Version: 1.3
Release Date: January, 2005

Table of Contents

Grounding Procedures

The following section details the grounding procedures to be followed during an ExpressVu™ installation.

It is mandatory that all installations be grounded.
This is an integral part of a professional installation.

Grounding Rationale

- The Canadian Electrical Code (CEC) stipulates that all dish antenna installations must be grounded with the two following procedures.
    1. Proper grounding of the incoming coaxial lead from the satellite dish
    2. Proper grounding of the parabolic dish or mounting bracket.
- Rule 54-200 of the Canadian Electrical Code – 2002 (CEC) clearly states that where the coaxial cable is exposed to lightning or accidental contact with the power conductors the metal shield of the cable shall be grounded at the building as close to the point of entry as possible. This is achieved by use of a coaxial grounding block.
- Rule 54-300 of the CEC dictates the size of the grounding conductor as #14 AWG copper wire as minimum. (# 10 is the preferred)
- Bell ExpressVu has made it mandatory to use minimum #14 AWG copper wire for both the grounding of the coax as well as the ground of the mast when grounding the mast is required.
  (Please refer to: Antenna/Mast grounding – page 4)

Coaxial Cable Grounding

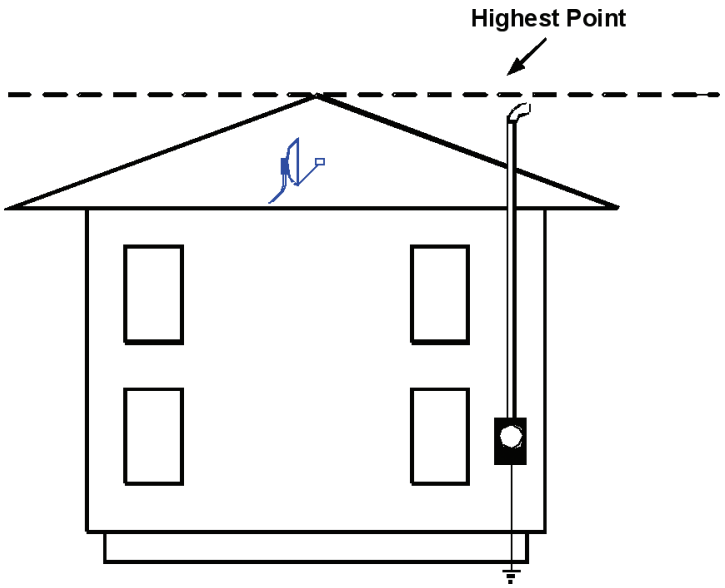
Please follow the following steps to complete grounding of the incoming coaxial lead(s).

- Install and mount grounding block inside the building (or outside if required) as close to cable entry point as possible. Make sure that the mount is solid using the appropriate sized screws.
- Cut incoming coaxial cable to length, connect with approved outdoor connector (if located outside) and attach to one side of grounding block. Repeat for all coaxial cables coming from the LNBF's.
- With the coaxial cable going to the receiver, cut to length, connect with approved outdoor connector (if located outside) and attach to one side of grounding block. Repeat if 2 coaxial cables or more are required. (Always include service loops at the input and output of the grounding block)
- Run insulated #10 AWG solid copper (or bigger) from grounding block to the appropriate power grounding system of the house.

Antenna/Mast Grounding

The Antenna /Mast **must** be grounded when it's the highest point on the house/building or installed away from the house. eg: Pole mount installed away from the main structure.

As stated in Section 3 - Dish Assembly and Mounting, BXVU does not allow roof installations outside the roof overhang , consequently cases with antennas as the highest point are infrequent.



Please follow the following steps to complete grounding of the parabolic dish.

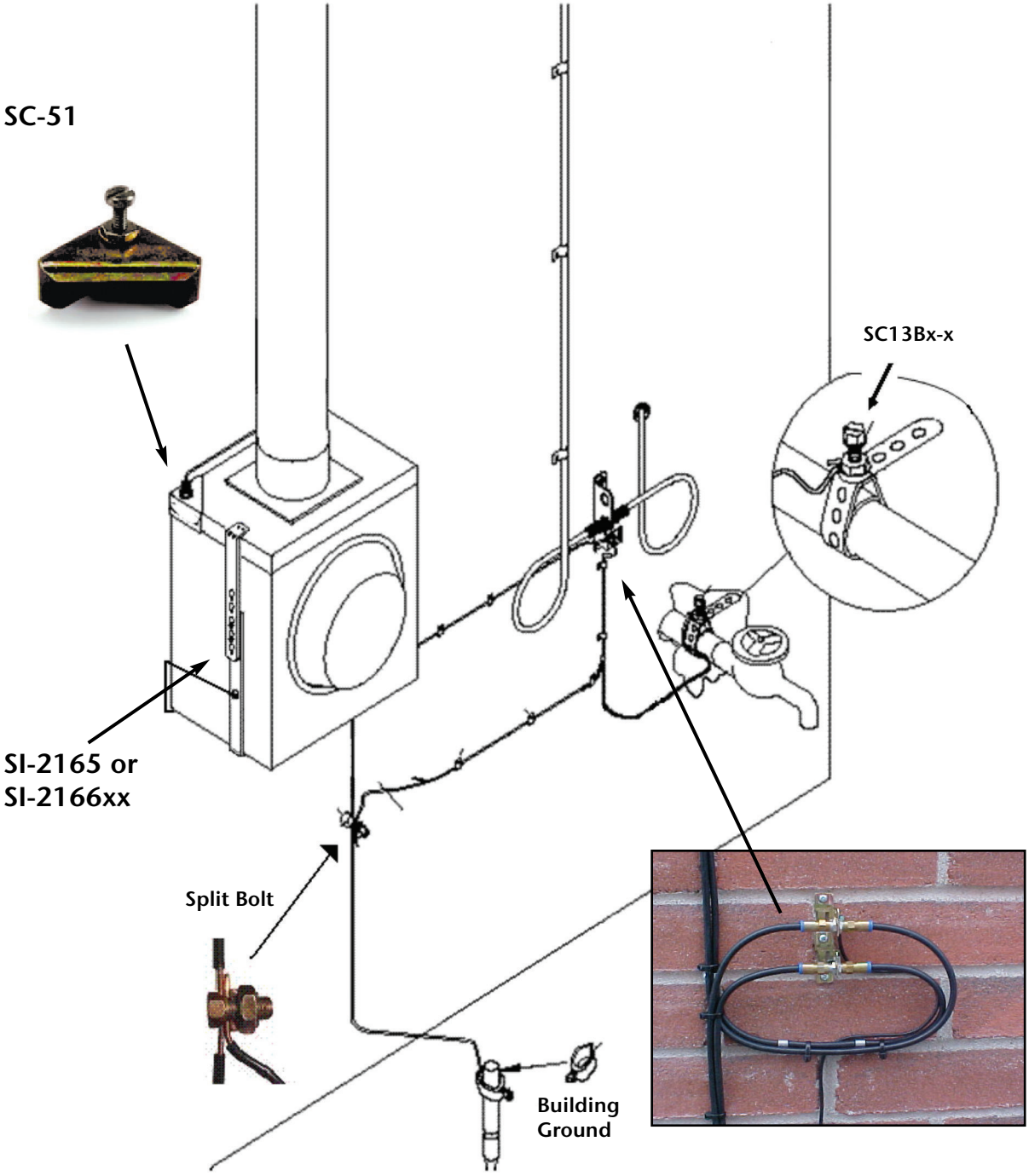
- Drill mounting bracket using a 9/32" steel bit in prescribed location to accept "Ground Lug L70".

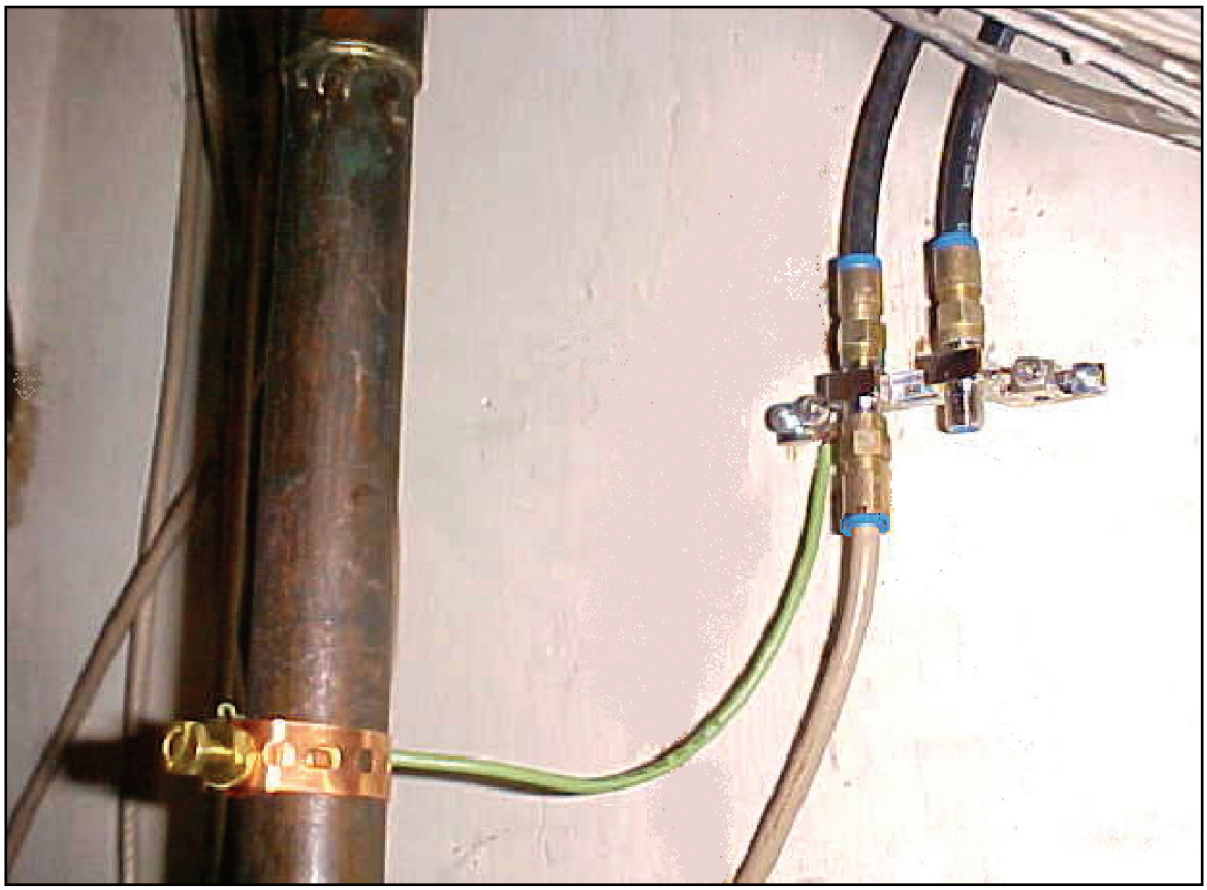
- Mount "Ground Lug L70 "to dish mounting bracket using the appropriate bolts, washer and nuts.
- Remove a small portion of PVC from #10 and insert and secure into "Ground Lug L70".
- Bring the #10 copper grounding wires to appropriate grounding system of the house.

Grounding Locations

Here are the potential grounding locations and preferred methods.

- AC panel board inside dwelling
- Hydro meter box
- Cold water pipe





Section 6
Inside Wiring & Connections

Version: 1.3
Release Date: January, 2005

Table of Contents

Installation of the Inside Wiring

The objective of the indoor wiring is to deliver an activated outlet, at a location of the customer's choice, using the shortest length of cable possible and with the neatest possible installation.

The work you perform inside the home will have the greatest positive impact on the customer. This is where you add value to the customer experience by delivering a high quality, professional installation.

1.0 Before Activation

- Identify cable routing and locate/install closest phone jack.
- Obtain customer permission for cable route provisioning.
- Identify anything at the site that could possibly be damaged during the install and ask for it to be temporarily relocated.
- Verify cable integrity from Point of Entry (POE) to outlet(s) location.
- Perform in-suite wiring as approved by the customer.
- All cables must be Rg-6 and must meet or exceed APL.
- All existing connectors should be examined and changed if they are not approved (APL) or in poor condition.
- All F-81 (wall plate) must be changed for the 2Ghz type (APL).
- Remove splitter from behind wall-plate (where necessary).
- No stapling across doorways.
- Use step-guard on flooring when necessary.
- Aesthetics is again a very important aspect of the inside wiring installation. It's very important to select the cable color appropriate to the surface on which it is installed. Each technician must carry at least two colors. (At least Black and White)
- All existing cables must be inspected to make sure they meet BXVU criteria
- Once the initial installation is complete, the installer is required to install the STB at the specified location, wire and configure the STB.
- In order to avoid unnecessary service calls, receivers must be connected with all available connection types for example both the RCA and RF connections.

1.1 Quick Survey and Planning

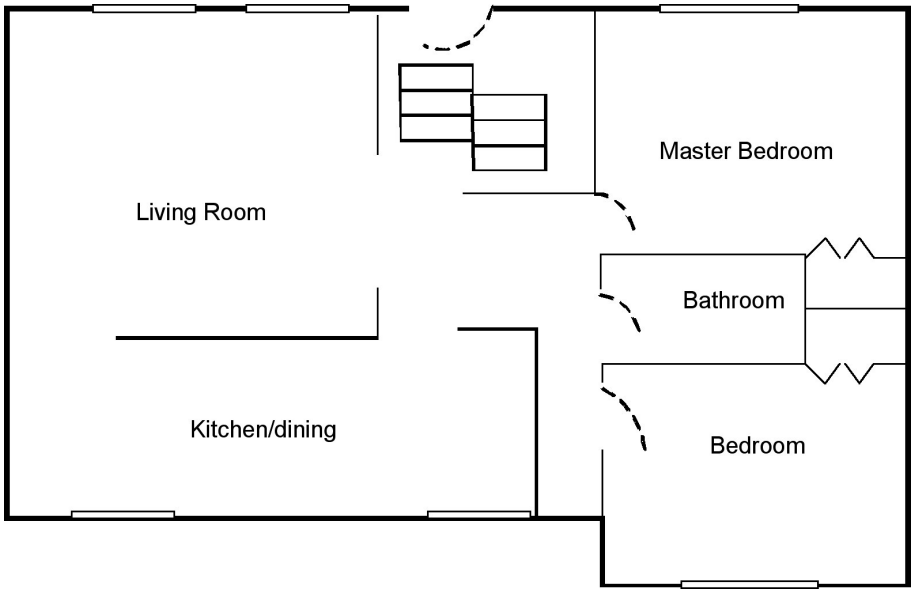
As with the external work you have to be able to visualise and plan the inside wiring run(s).

Planning for:

- Receiver(s) location
- Phone Jack location
- Safety
- Aesthetics

Did you consider?

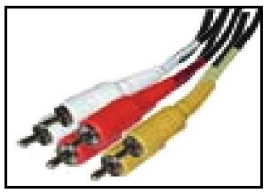
- Basement?
- Attic?
- Closets?



1.2 Other Practices and Considerations

- Confirm operation of STB to obtain minimum 80% signal strength on most transponders, not going below 74% signal strength on any three transponders.
- Connect every STB to phone jack with the supplied phone wire.
- If the customer has more than two TV sets and wishes to view different programs on each one, he must acquire a multiplexer/switch.
- An external off-air antenna (rabbit ears) can be connected to all our receiver models except the 6000 model (on that model, the antenna must be connected directly to the TV set's coax input).
- The off-air antenna can be used to view local channels off-air that are not broadcast by Bell ExpressVu. Viewers may switch from the satellite dish to the external antenna by pressing the "TV/Video" button on the remote control.

2.0 Types of cables (other then the coaxial) used for receiver connections

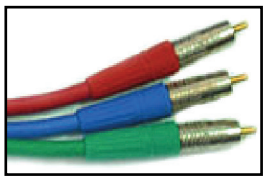


RCA – This type of cable consists of separate wires for audio and the video signals. It includes three connectors (yellow, red and white) at each end.

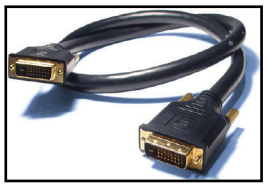
The yellow connector carries the video signal.
The red connector carries the signals for the right audio channel.
The white connector carries the signals for the left audio channel.

S-Video – This type of cable can only carry video signals. You must connect separate RCA cables for the left and right audio channels.

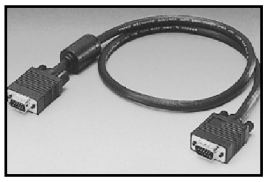
The following 3 video cables are used exclusively with the HD model receivers (6000 & 6100). These cables need to be used with RCA audio cables (red and white).



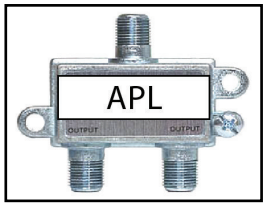
"Component" type cable (Y Pr Pb) – This device is the HDTV equivalent of an S-video connection. The YPrPb module transmits image data (color and brightness) over three coaxial cables: brightness (Y), red (Pr) and blue (Pb).



"VGA / RGB" type cable – This abbreviation stands for "Red-Green-Blue". Colors and pictures on TV screens and computer monitors are achieved using the RGB strategy. This type of cable uses separate conductors for red, green and blue.



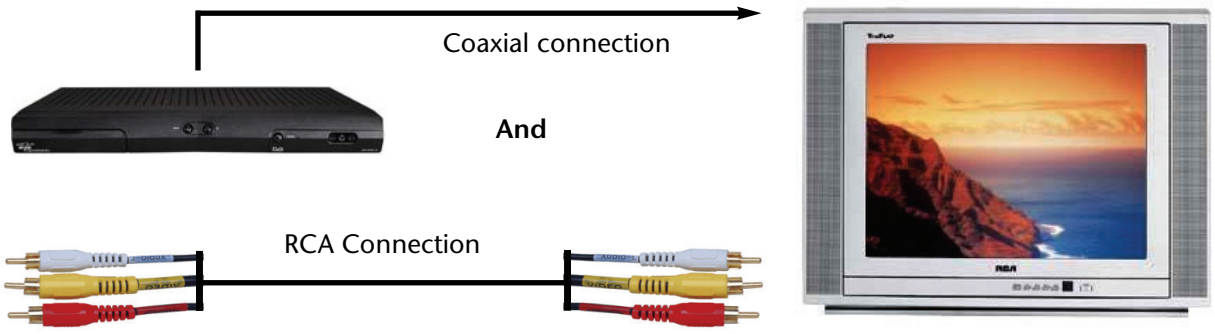
"DVI" type cable – This abbreviation stands for "Digital Video Interface". This cable used on the model 6100 allows for direct digital connection to today's new LCD and Plasma Screen Televisions.



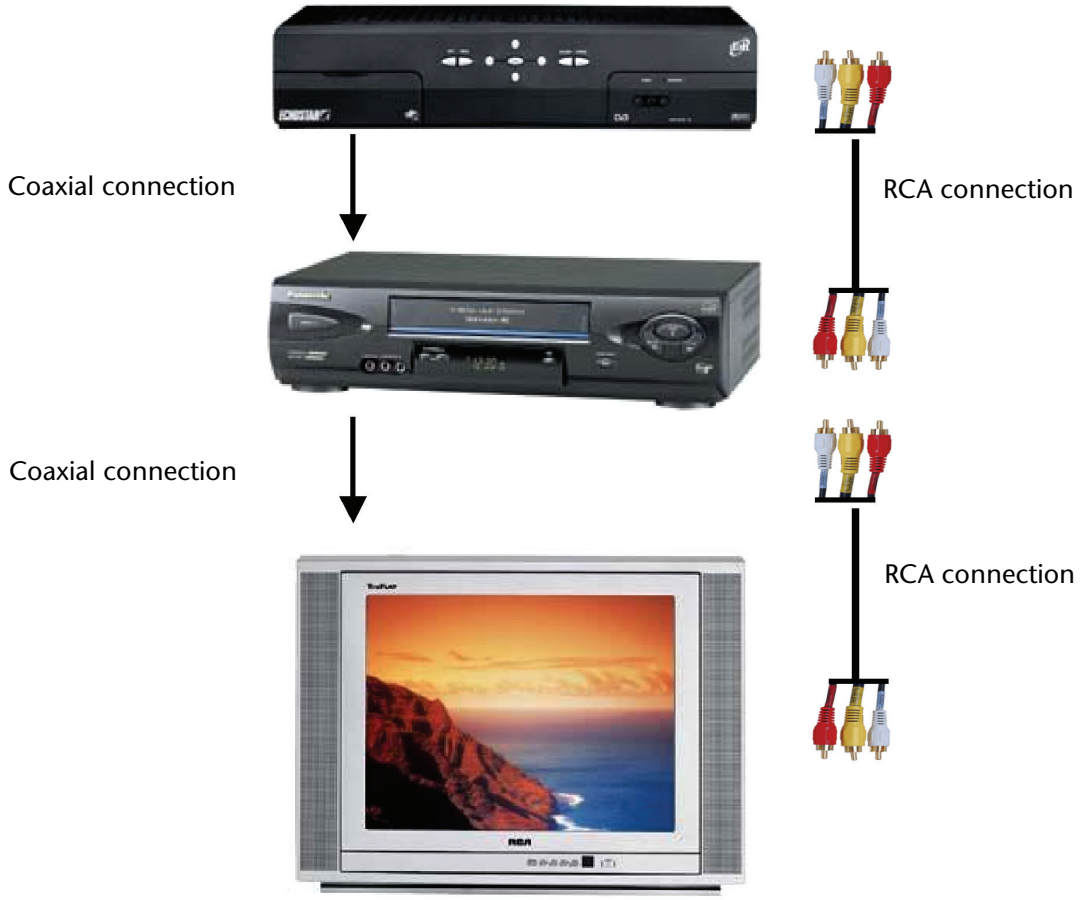
Splitter – An accessory that splits the signal coming from a receiver. This can only be used from the "OUTPUT" F-connector of the IRD. This device cannot be placed between the dish and the IRD.

3.0 Inside Cabling Single Tuner Receivers

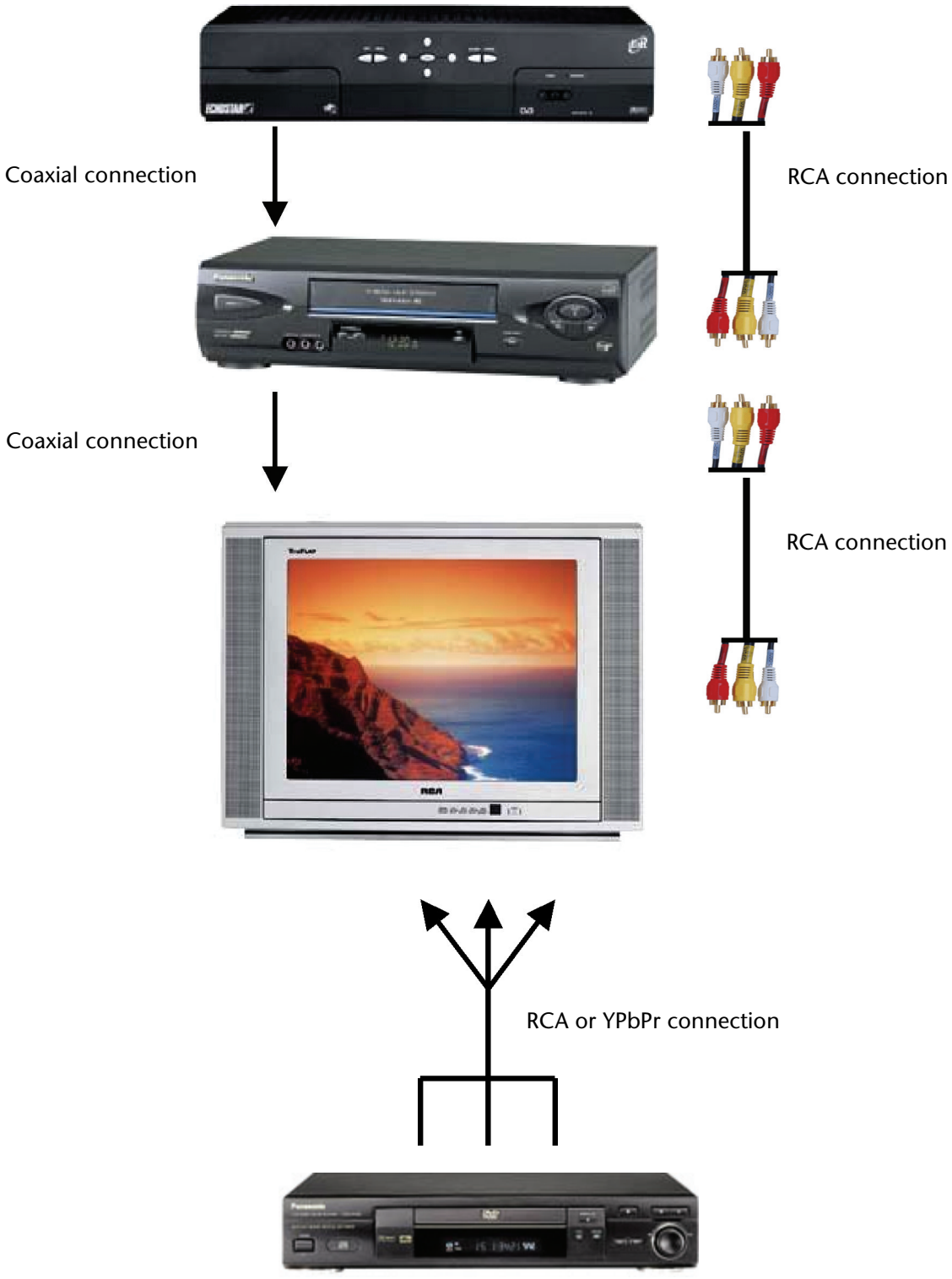
3.1 Single Tuner Receiver and TV set



3.2 Single Tuner Receiver, TV set and VCR

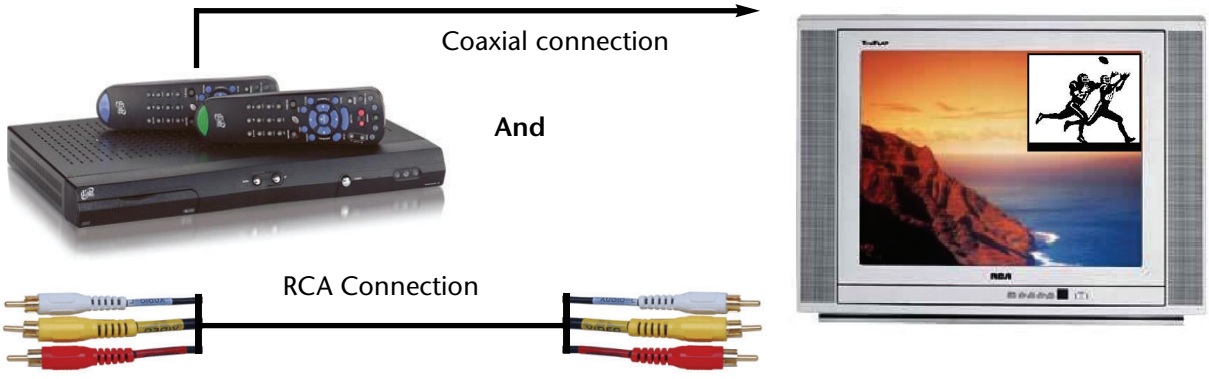


3.3 Single Tuner Receiver, TV Set, VCR and DVD Player

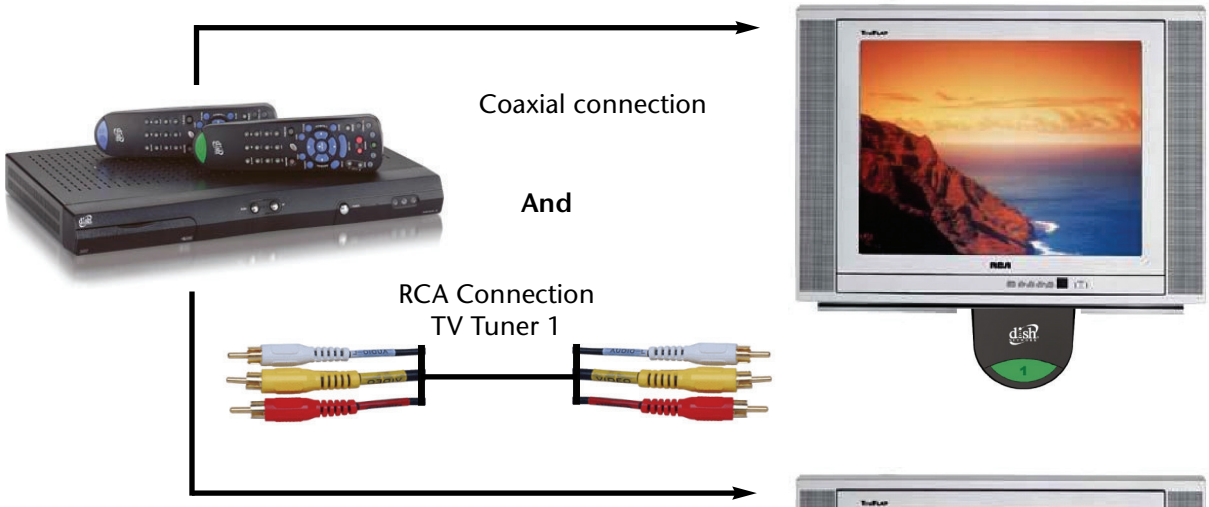


4.0 Inside Cabling Dual Tuner Receivers

4.1 Dual Tuner Receiver with 1 TV Set (Picture in Picture)

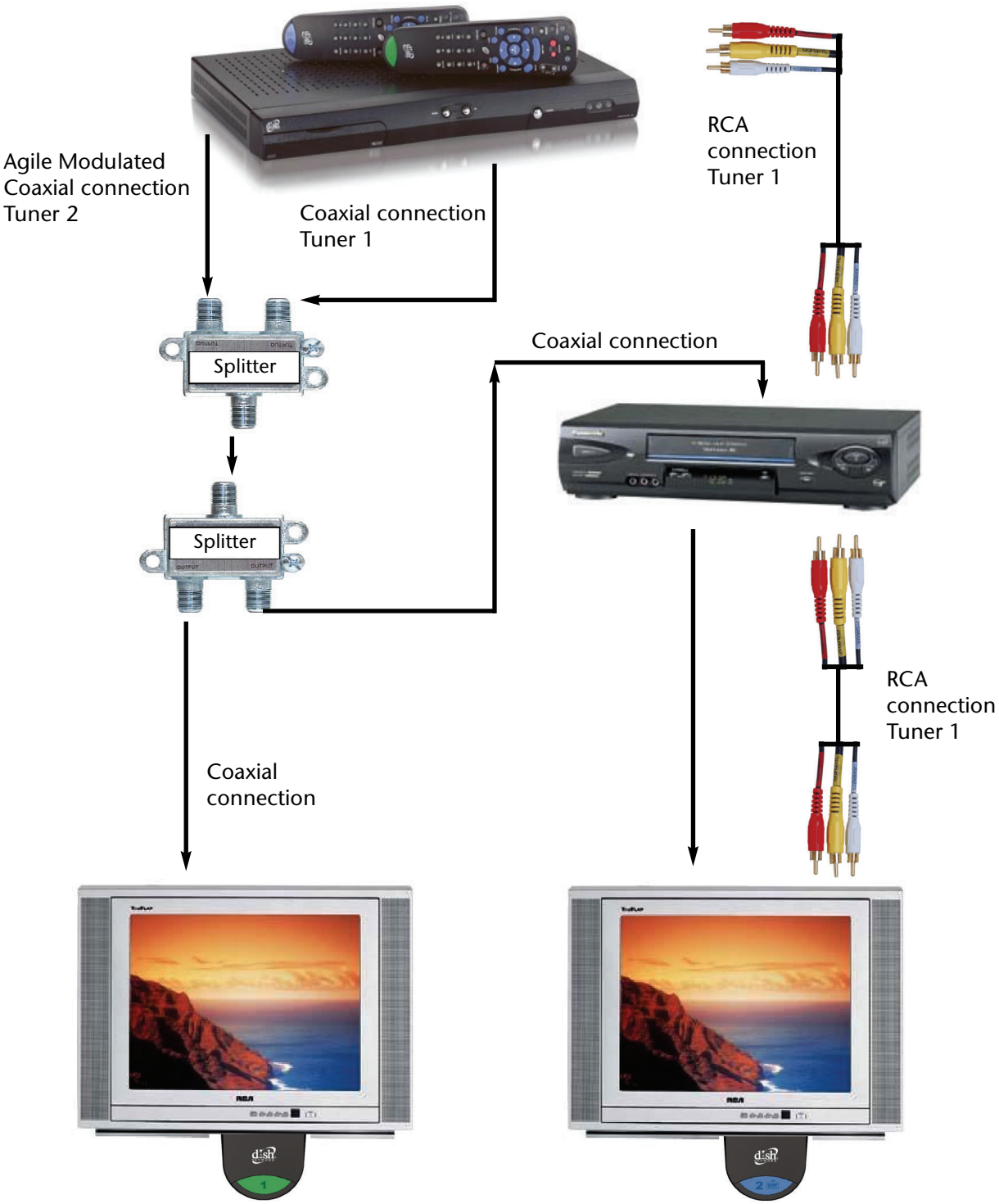


4.2 Dual Tuner Receiver and 2 TV Sets

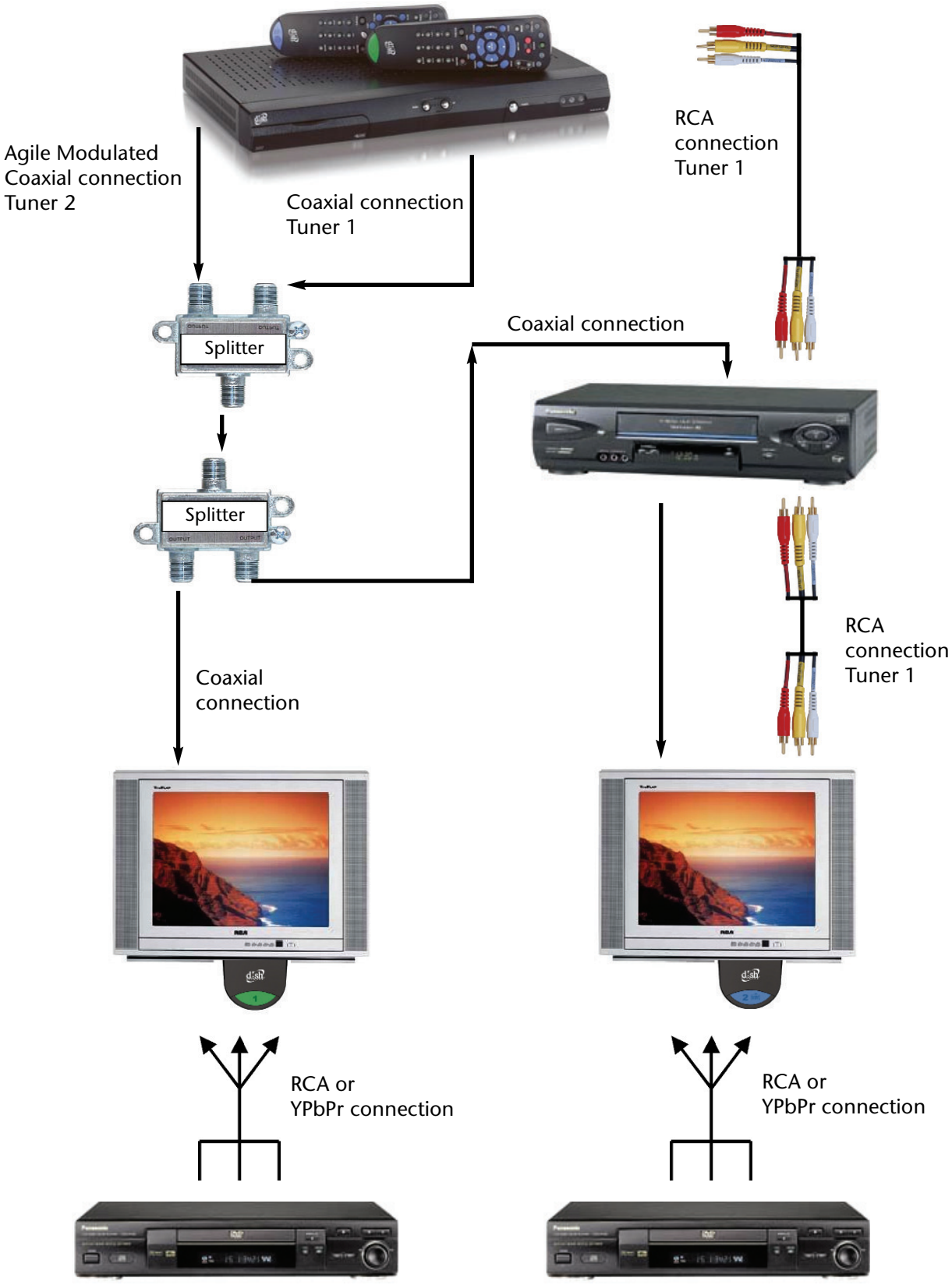


Agile Modulated
Coaxial connection
TV Tuner 2
channels 21-69 (Off-air)
or
channels 73-125 (Cable)
10 db gain output for extended cable runs

4.3 Dual Tuner Receiver, 2 TV's and 1 VCR



4.4 Dual Tuner Receiver, 2 TV Sets, 1 VCR and 2 DVD Player's



5.0 Phone Line Connections

- All set-top boxes must be connected to a phone line. This permits Pay-Per-View purchases, as well as interactive services and is added security measure for Bell ExpressVu. This policy must be enforced during activation and on every phone call.

5.1 How to Explain the Phone Connection to Customers

- Smart card upgrades.
- Plugging into the phone line allows us to communicate with all receivers, and verify that they are being used in the same household.
- The receivers are programmed to “call home” randomly throughout the month to verify their location.
- A phone and receiver can be plugged in at the same time by installing a “Y” adapter (must be supplied by installer).
- For special cases the customer may opted to purchase a “Wireless telephone jack” connection (described in the following section). This option must be explained by the technician.

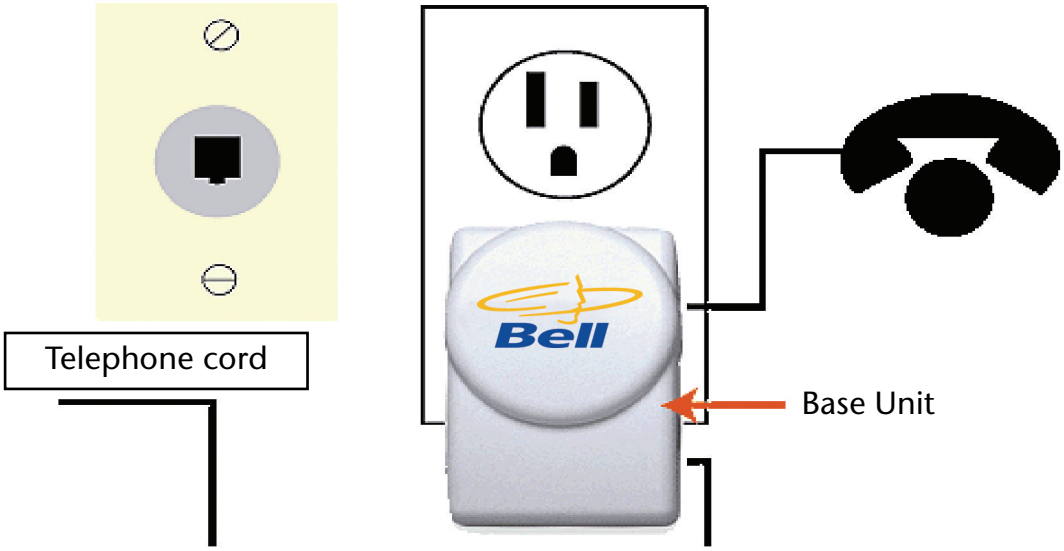
5.2 Wireless Telephone Jack

Wireless Telephone Jack

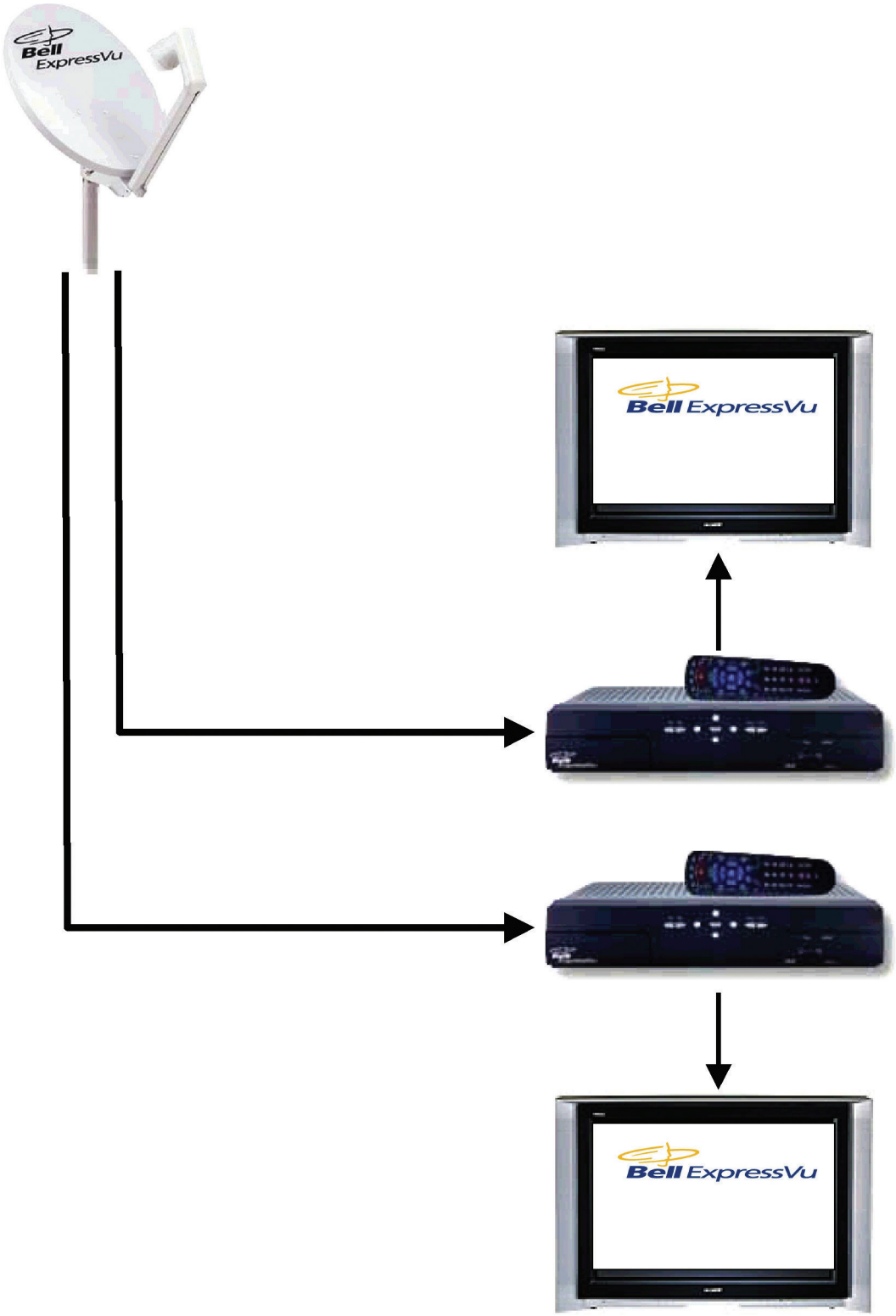
This device is used to convert an electrical outlet into a telephone jack.

The base of the device is plugged into the electrical outlet, and the extension cord into the telephone jack on the wall. **The secondary unit** is also plugged into the electrical outlet, but the telephone extension cord is connected to the receiver.

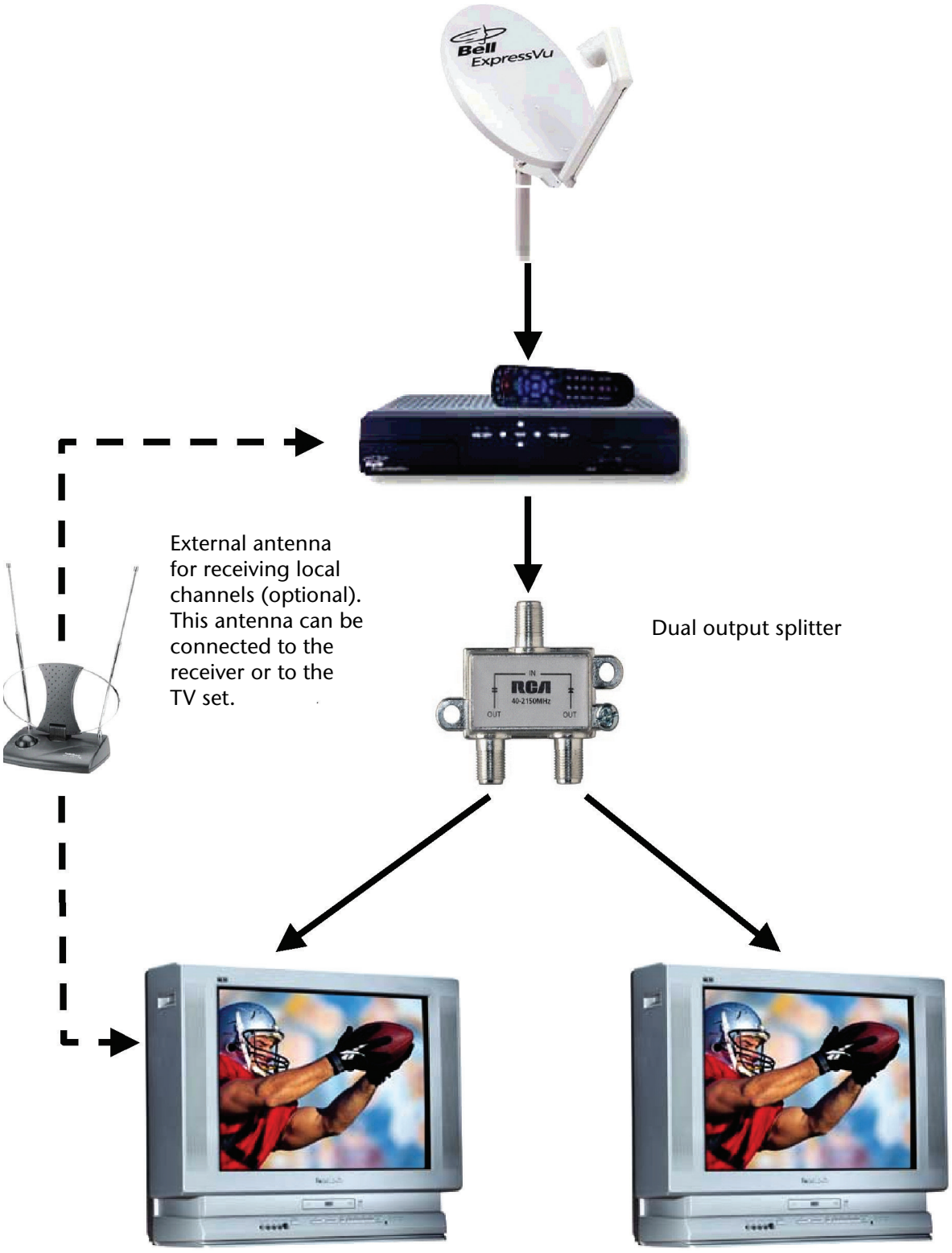
This system is compatible with all models of telephones, answering machines, call forwarding, etc.



6.0 Basic Installation with 2 IRDs

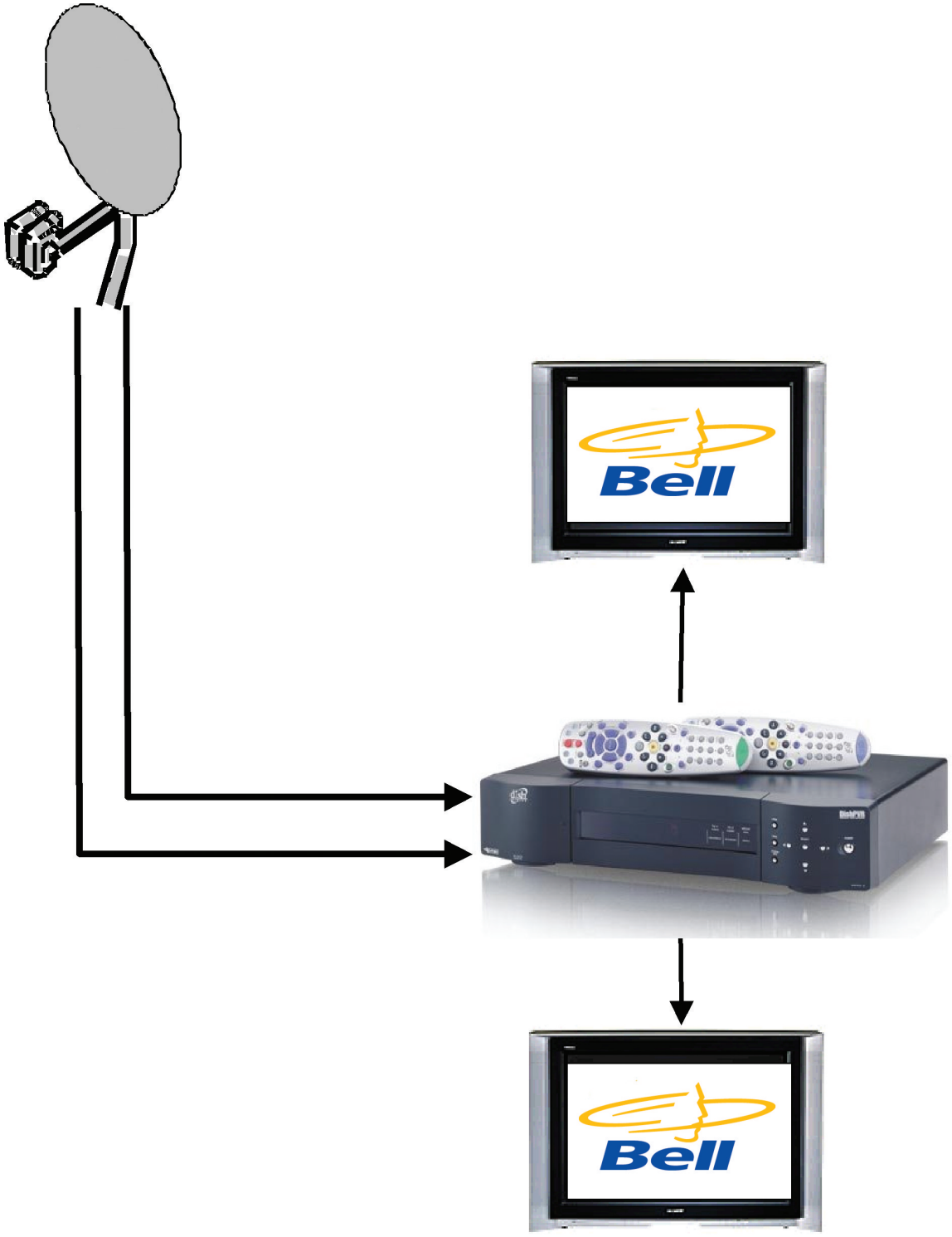


6.1 Splitter and Installation Diagram

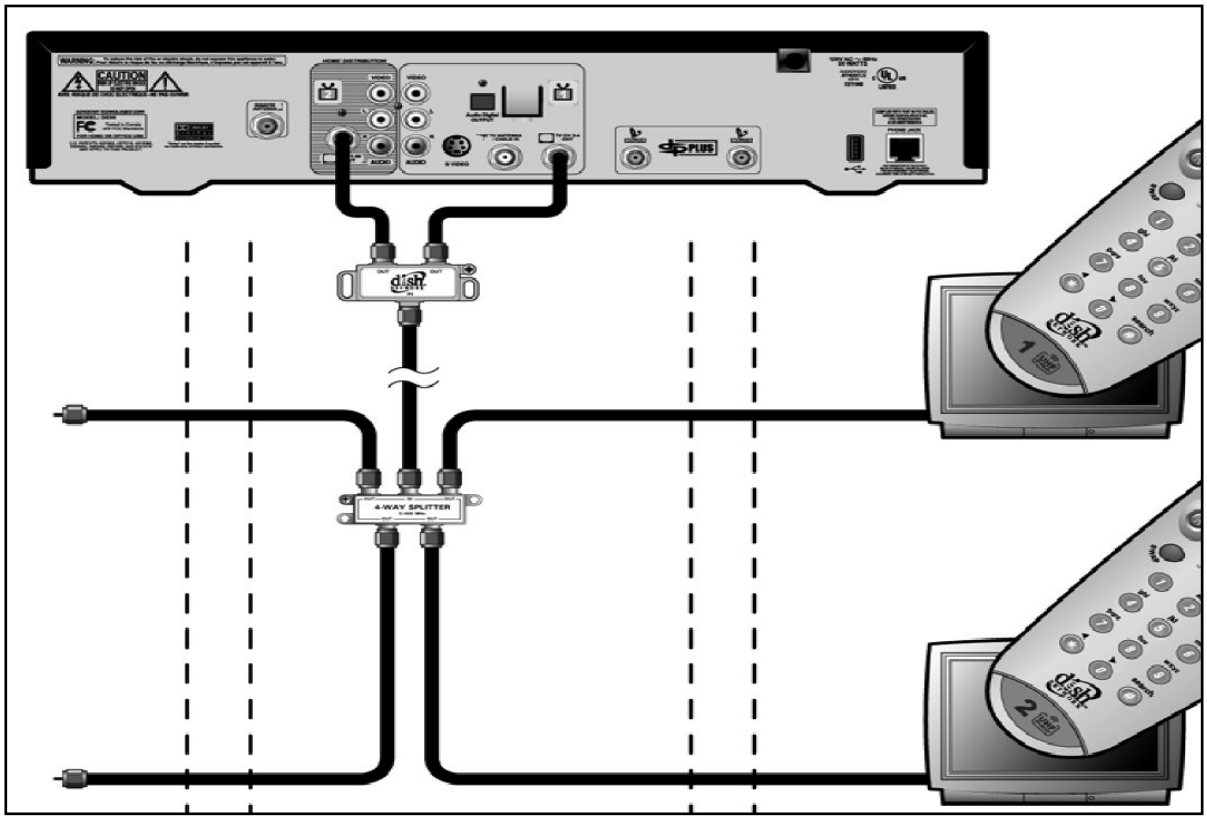


6.2 Basic Installation with Dual Tuner IRD's

Notes: All Dual Tuner Receivers must be connected with 2 independent lines directly to the Satellite dish or to a multi-switch.
All Dual Tuner Receivers must be connected to an active telephone line in order to complete the installation/activation process.



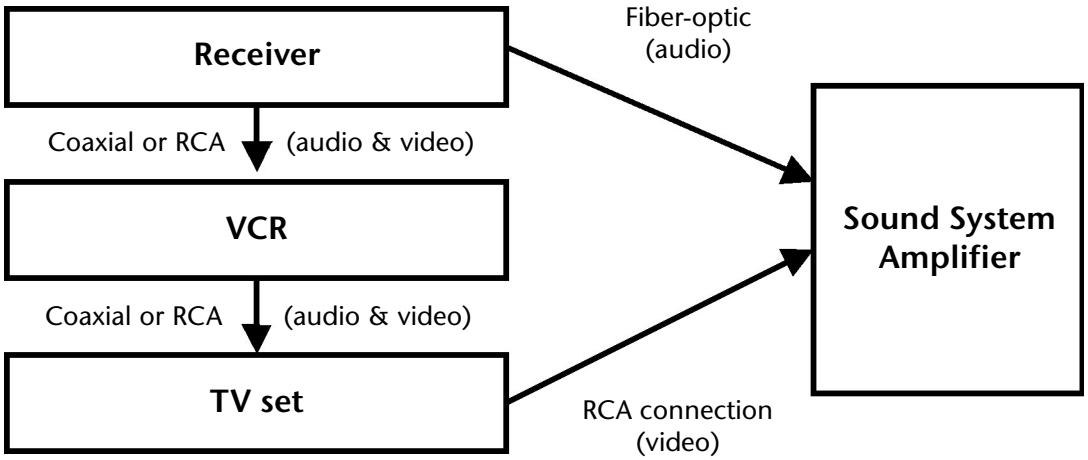
6.3 Dual Tuner Installation Backfeeding



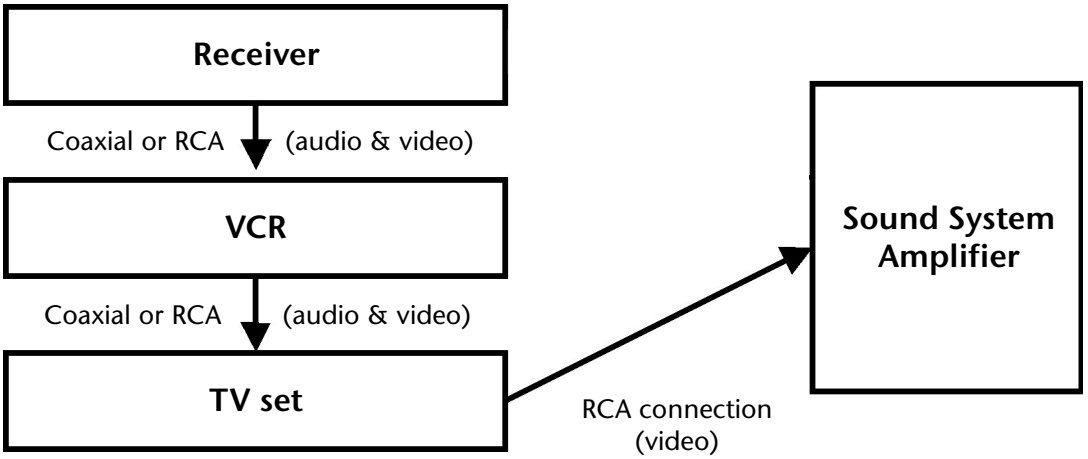
7.0 Audio Technology

RG-6 cable is used to connect the dish to the receiver. Beyond that point, RG-6 or/and RCA cable are used to carry the signal from the receiver to the VCR, then to the TV set.

If the customer has model 4500, 4700, 5000 series or 6000, and his sound system is compatible with a Dolby digital signal, he can set up a direct audio feed using a fibre-optic cable.



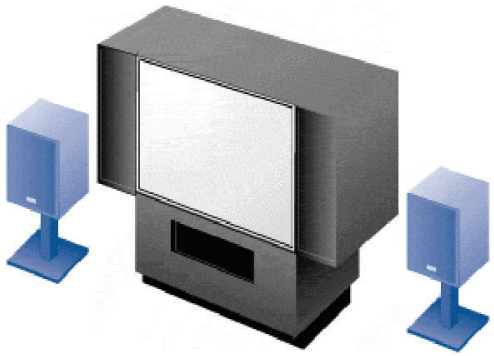
If the receiver is not Dolby digital, the customer can connect his TV set directly to his sound system; that way, the audio signals from all three components (IRD, VCR and TV) will be carried to the amplifier.



7.1 Stereophonic sound (2.0)

- A soundtrack with two channels (left and right), which feed the left and right loudspeakers (respectively) of a stereo TV set or sound system.
- The stereo sound can be carried to the TV set by means of a coaxial cable. RCA cables can also be used to connect the left and right output terminals of the IRD to the input terminals of a stereo amplifier or audio video receiver.

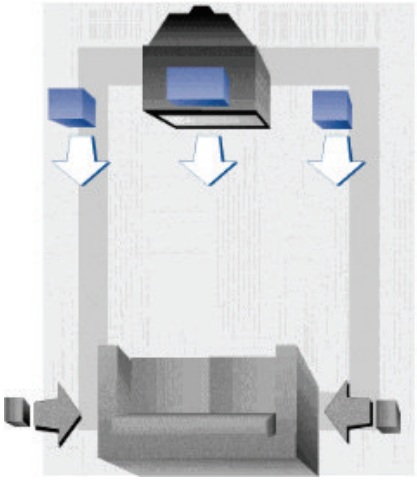
All Bell ExpressVu programs have a stereo soundtrack.



7.2 Dolby Pro-Logic (4.0)

- The Dolby Pro-Logic encoding system provides four audio channels: a left and a right channel for music and sound effects, a middle front channel for dialogue and an ambient sound channel.
- To obtain Dolby Pro-Logic surround sound, the left and right output terminals of the IRD must be connected to the input terminals of a Dolby Pro-Logic audio-video receiver for home theatre.

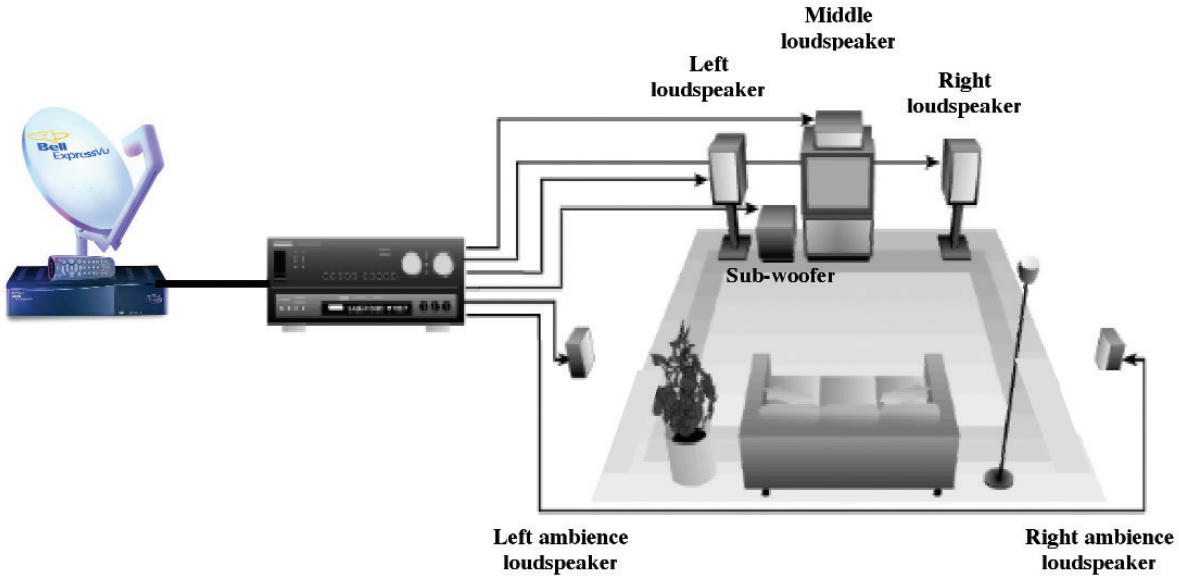
All Bell ExpressVu programs have a Dolby Pro-Logic soundtrack which must be decoded using a Dolby Pro-Logic audio-video receiver for home theatre.



7.3 Dolby AC-3 (5.1)

- The Dolby AC-3 encoding system (or Dolby digital) provides six channels of surround sound of crystalline purity. Three front channels (left, right and centre) are used to position the dialogue precisely. Two other side channels (left and right) carry ambient sound and sound effects and surround the viewer in the atmosphere of the movie. A sixth channel, for sub-woofer, carries the low-frequency sounds and gives greater impact to action scenes and special effects.
- To enjoy Dolby AC-3 sound, you must connect an optical cable between the receiver's AC-3 optical jack (available on the AC-3 optical adapter of receiver models 4500, 4700, 5000 series and 6000) and the optical input terminal of a Dolby AC-3 receiver for home theatre.

Only some of the programs and movies broadcast by Bell ExpressVu have Dolby AC-3 sound.



Section 7
Customer Care

Version: 1.3
Release Date: January, 2005

Table of Contents

Subscriber Orientation

As part of a successful installation, the installer must ensure the customer/subscriber is fully educated on the usage and policies of Bell ExpressVu™ equipment. The importance of this orientation cannot be overemphasized. A customer educated in the basic operation, and functions of our system can help to ensure ease of operation, reliability and an enhanced customer experience.

Once a customer service representative has successfully obtained the relevant information and activated the STB for programming, customer orientation or education regarding the operation and features of the STB should be communicated.

The basic operation of the STB and remote control should be explained in detail, as well as its integration into an existing system. The description of the functional features of the STB and remote control should include:

- The basic navigational functions of the STB including the on-screen program guide.
- Explanation and demonstration of the channel up and down, individual channel selection, and channel browse functions.
- Explanation and demonstration of the themes, favourite channel lists, menu functions, info feature, and the various channel locks and ratings thresholds.
- Programming options and minimum programming requirements should be explained, including pay per view. Explain requirements for ordering PPV ensuring continued service, up to date billing and legitimacy.
- Review with customer/subscriber collateral material and Call Centre direct-dial number for inquiries or customer service.
- A professional installer should have an innate understanding of the diversity and complexity of advanced installations and how the satellite receiver can best be integrated into these systems. With the advanced STB, (PVR or model 6000HD) additional features may need to be explained, including:
    1. High Definition compatibility, connection and set up;
    2. PVR features and recording capabilities;
    3. Dolby Digital Audio compatibility;
    4. UHF universal remote;
    5. Various timers (if applicable).
    6. Dual tuner functionality / installation requirements.

Inspection Program

Version: 1.3
Release Date: January, 2005

Table of Contents

Inspections

1.0 Objective

The objective of audit inspections is to ensure the practise of Bell ExpressVu™ standards is upheld and to provide technicians with feed back to clarify any misconceptions.

2.0 Inspection Overview

A percentage of new installs, moves, and service calls will be inspected. Most inspections will be performed by independent contracted inspectors. All other inspections will be performed by the National Installation Field Services Team and the vendors. The vendors according to their agreement with Bell ExpressVu are also required to perform self inspections using the below system.

All the areas to be inspected will be totalled and divided by the total possible correct to produce a percentage score. If there is a major infraction (these areas are highlighted in grey) of our standards, the vendor will be required to go back and re-do the installation to bring the work up to standard and then provide digital photos of the correction. All the inspection forms are attached to this document. At the end of the document under “Inspection Notes” is a list of inspection questions and what we are looking for to be considered up to standard.

Installation Inspection Checklist

Date of Inspection: _____ Name of Inspector: _____

OMC Number: _____ Customer Name: _____

Type of Inspection (New Install or Move): _____

Address of Inspection: _____

Physical Installation Outside **Circle the correct score for each line**	**Pass**	**Fail**	**N/A**
Is the dish mounted to the home according to Express Vu standards? Notes:	5	0	5
Is the dish assembly adjusted for the skew? Notes	1	0	1
Are all entry holes sealed? Notes	5	0	5
Is the appropriate color of cable used? Notes:	1	0	1
Are clips used to secure the cable – no staples and no white cable ties? Notes:	1	0	1
Is the dish cable secured on its own not tied to any existing cables? (example other TV cables) Notes:	1	0	1
Are RG6 or better cables used? (not RG59) Notes:	5	0	5
Is there a drip loop at all cable penetrations? Notes:	2	0	2
Were APL compression connectors used? Notes:	3	0	3
Were all the connectors wrench tightened? Notes:	1	0	1
Are the cables run neatly and have proper bend radius? (clipped down - no cables hanging freely and no cables are kinked) Notes:	3	0	3
Is the area where the installation took place clean? (no cut off excess cables lying around or materials from the install) Notes:	1	0	1
Is a cable grounding block installed and can the dish be grounded? If no check N/A. If yes was the ground block grounded using 10AWG wire dish grounded? Notes:	5	0	5

Physical Installation Inside **Circle the correct score for each line**	**Pass**	**Fail**	**N/A**
Could the receiver be plugged into phone line? If no check N/A. If yes was the receiver plugged into the phone line? Notes:	3	0	3
Is the appropriate color of cable used? Notes:	2	0	2
Are all RF and Audio Video cables that can be plugged in from the receiver to the TV connected? Notes:	1	0	1
Customer Questions **Circle the correct score for each line**	**Pass**	**Fail**	**N/A**
Did the technician explain the installation charges/billing? Notes:	1	0	1
Did the technician give a basic system orientation including showing or explaining channel 191 and the on screen features? Notes:	1	0	1
Did the technician explain how to use the remote control? Notes:	1	0	1
Did the technician explain the customers programming packages? Notes:	1	0	1
Did the technician explain how to use the channel lockout feature? Notes:	1	0	1
Did the technician explain how to clean snow off the dish in case of poor reception? Notes:	1	0	1
Did the technician discuss the dish mounting location and cable routing work plan before the installation? Notes:	2	0	2
Did the customer approve the work plan? Notes:	2	0	2
Did the technician meet the specified installation time and date? Notes:	1	0	1
Was the technician's appearance and professionalism to your satisfaction? If no why. Notes:	1	0	1
Did the technician complete the job on the installation day? Notes:	1	0	1
(Add all the column totals) **Totals**			
Subtract 53 by the total of N/A column to get Inspected Total			
Divide the Pass Total by the Inspected Total for the **Inspection Percentage**			

IRD Readings

Signal IRD at Rx	1	2	3	15	16	17	30	31	32
Nimiq 1									
Nimiq 2	1	2	3	15	16	17	30	31	32

Pictures

1. Take a picture of the dish installation. The dish should fill approximately 80% of the frame and the foot of the dish should be in the frame.
2. Take an overview picture showing the dish and mounting location. The dish must be in the picture but try and show as much of the area around the dish as possible.
3. Take a picture of the cable penetration point. The cable penetration point should fill approximately 60% of the frame.
4. Take an overview picture of the cable penetration point. The cable penetration point must be in the picture but try and show as much of the area around the point as possible.
5. Take a picture of where the dish is grounded. The ground should fill approximately 60% of the frame.
6. Take an overview picture of where the dish is grounded. The ground point must be in the picture but try and show as much of the area around the ground point as possible.
7. Any anomalies that don't meet our standards.

Attach Pictures

Dish Picture	Dish Foot	Dish Overview
Ground	Ground Overview	Point of Entry
Point of Entry Overview	Anomalies (If Required)	Anomalies (If Required)

Service Call Inspection Checklist

Date of Inspection: _____ Name of Inspector: _____

OMC Number: _____ Customer Name: _____

Address of Inspection: _____

Customer Background Questions	Answers
Where did you purchase your system? (Retailer – Bell Internet – Calling Bell – Other)	
When did the original install take place?	
Who did the original install? (Self Install – Contractor – Bell Contractor)	
What was the problem that occurred resulting in the customer requesting a service call?	

Customer Questions **Circle the correct score for each line**	Pass	Fail	N/A
Did the technician meet the specified service time and date? Notes:	1	0	1
Did the technician explain the problem and the solution at the end of the job? Notes:	1	0	1
Was the technician able to solve the problem that day? Notes:	1	0	1
If the technician was not able to solve the problem that day, did the tech keep the customer informed of what was happening and follow up with the customer, until completion? Notes:	1	0	1
Was the technician's appearance and professionalism to your satisfaction? If no why? Notes:	1	0	1
(Add all the column totals) **Totals**			
Subtract 5 by the total of N/A column to get Inspected Total			
Divide the Pass Total by the Inspected Total for the **Inspection Percentage**			

Physical Installation Outside **Circle the correct score for each line**	**Yes**	**No**	**N/A**
Is the dish mounted to the home according to Express Vu standards? Notes:			
Is the dish assembly adjusted for the skew? Notes			
Are all entry holes sealed? Notes			
Is the appropriate color of cable used? Notes:			
Are clips used to secure the cable – no staples and no white cable ties? Notes:			
Is the dish cable secured on its own not tied to any existing cables? (example other TV cables) Notes:			
Are RG6 or better cables used? (not RG59) Notes:			
Are there drip loops at all cable penetrations? Notes:			
Were APL compression connectors used? Notes:			
Were all the connectors wrench tightened? Notes:			
Are the cables run neatly and have proper bend radius? (clipped down - no cables hanging freely and no cables are kinked) Notes:			
Is the area where the installation took place clean? (no cut off excess cables lying around or materials from the install) Notes:			
Is a cable grounding block installed and was the ground block grounded using 10AWG wire? Notes:			

Pictures

1. Take a picture of the dish installation. The dish should fill approximately 80% of the frame and the foot of the dish should be in the frame.
2. Take an overview picture showing the dish and mounting location. The dish must be in the picture but try and show as much of the area around the dish as possible.
3. Take a picture of the cable penetration point. The cable penetration point should fill approximately 60% of the frame.
4. Take an overview picture of the cable penetration point. The cable penetration point must be in the picture but try and show as much of the area around the point as possible.
5. Take a picture of where the dish is grounded. The ground should fill approximately 60% of the frame.
6. Take an overview picture of where the dish is grounded. The ground point must be in the picture but try and show as much of the area around the ground point as possible.
7. Any anomalies that don't meet our standards.

Attach Pictures

Dish Picture	Dish Foot	Dish Overview
Ground	Ground Overview	Point of Entry
Point of Entry Overview	Anomalies (If Required)	Anomalies (If Required)

Inspection Notes

Installation Inspection Notes

Physical Installation Outside

Subject: Is the dish mounted to the home according to standards?

What we are looking for:

Is the location surface solid enough to ensure the dish will not move? The dish location must be easily accessible in most weather conditions, as the customer may occasionally need to clean snow or debris off the satellite dish. The dish must be installed on a solid surface or solid foundation material. Solid brick, cinder block, or structurally sound wood surface is considered an ideal mounting surface. If the dish is mounted on cinder block, the dish mounting screws must not be screwed into the mortar between bricks. Over time mortar between bricks wears down and will cause the mount screws to work loose. The dish **can not** be mounted on aluminum or vinyl siding. These materials are structurally too weak to securely hold the antenna, even with building stud underneath. Stucco or imitation masonry, composite materials such as chip, fibre or particleboard, (unless fastened securely to a wall stud, rafter or other foundation material beneath surface), are **unacceptable** mounting surfaces. **The use of the Hydro mast pole is strictly forbidden.** In some cases the roof might be the ideal location, **but always as a last resort**. If the dish must be mounted on the roof it must be mounted on the roof over hang to avoid roof leaks into attics. **The installation must also comply with any and all local or municipal by laws specific to the installation of a dish (DBS antenna)**. For example, some cities will **not** allow antennas in front of, or on a side wall facing the street. It is the installer's responsibility to be aware of those by laws and to make sure they are applied / followed.

Subject: Is the dish assembly adjusted with the skew?

What we are looking for:

All dishes installed should be installed for the NIMIQ 2 upgrade.
The simple way to tell if the dish is mounted properly is that the "Bell ExpressVu" physically printed on the dish should not be horizontal but on an angle.

Subject: Are all entry holes sealed?

What we are looking for:

Every cable entry point has to be sealed with **Acrylic Latex** so water can not enter the customer's home through the entry point.

Subject: Is the appropriate color of cable used? (Inside and Outside)

What we are looking for:

Is the external and internal wiring **aesthetic**, or will the customer complain? The cable color must be selected to match with the surface and tie-raps must be black in color. It's very important to select the cable color appropriate to the surface on which it is installed. Each technician carries at least two colors black and white to achieve this goal.

Subject: Are clips used to secure the cable – no staples and no white tie straps?

What we are looking for:

Staples can puncture cables, the proper way to install cabling is to screw clips into the wall and secure the cable to a clip using a tie strap. Black tie straps are UV treated and will not fade in color over time. The only acceptable white tie straps must be UV coated.

Subject: Is the dish cable secured on its own - not tied to any existing cables?

What we are looking for:

All dish cables must be secured on their own using clips; securing the dish cables by attaching them to other cables is strictly prohibited. Attaching cables to evestroughs is also not recommended, however on a balcony mount where the cable clips can not be used, attaching the cable to the balcony railing is permitted.

Subject: Are RG6 or better cables used? (Not RG59)

What we are looking for:

RG6 refers to the diameter of the cable used and how the cable is shielded. The cable should have RG6 stamped on the cable. RG59 type of cable is not allowed. If you can not determine what kind of cable is used then check NA on the audit.

Subject: Are there drip loops at all cable penetrations?

What we are looking for:

A drip loop is required before the dish cable point or points of entry. This allows moisture to drip down the cable past the point of entry point preventing any potential damage.

Subject: Were APL compression connectors used?

What we are looking for:

APL stands for approved parts list. This is a list of parts that Bell ExpressVu has approved for technicians to use for installations. Technicians must not use any parts other than what is on the parts list. Compression connectors pull in a sleeve running parallel to the cable; any connectors that are a squeeze fit are (the connector is squeezed on to the cable and the squeeze is horizontal on the cable) not to be used.

Subject: Were all the connectors wrench tightened?

What we are looking for:

All connectors must be wrench tightened to prevent accidental removal and leakage; you should not be able to unscrew any cable connector outside with your fingers.

Subject: Are the cables run neatly and have proper bends radius? (Clipped down - no cables hanging freely and no cables are kinked) (Inside and outside)

What we are looking for:

Cables need to be secured and not hanging freely. Cables may be kinked by too sharp of a bend. The **minimum bending radius** for RG-6 cable is 7cm. If possible, the cables route should always follow the main contours of the home.

Subject: Is the area where the installation took place clean? (No cut off excess cables lying around or materials from the install)

What we are looking for:

The area around the dish and the cabling needs to be clean and free of any garbage material from the installation.

Subject: Is a cable grounding block installed and was the ground block grounded using 10AWG cable?

What we are looking for:

The Canadian Electrical Code (CEC) stipulates that all dish antenna installations must be grounded with the two following procedures; proper grounding of the incoming coaxial lead from the satellite dish and if the dish is the highest point of the house (which is very rare) or on a pole, proper grounding of the parabolic dish or mounting bracket. Bell ExpressVu has made it mandatory to use minimum #10 AWG copper wires for both the grounding of the coax as well as the ground of the mast. The coax grounding block can be installed inside or outside the building as close to cable entry point as possible. The mount must be solid using the appropriate sized screws. There should always be service loops at the input and output of the grounding block. Insulated #10 AWG solid copper wire (or bigger) has to be run from grounding block to the appropriate power grounding system of the house.

Physical Installation Inside

Subject: Could receiver be plugged into phone line? If no check N/A. If yes, was the receiver plugged into the phone line?

What we are looking for:

The receiver uses the phone line for ordering pay per view. If the receiver is not plugged into the customer's phone line then the customer can not use the receiver to order pay per view.

Subject: Are all RF and Video cables that can be plugged in from the receiver to the TV connected

What we are looking for:

Video cables that are supplied with the receivers send a clearer picture than RF cables, so when possible we expect all cable to be installed giving the customer a choice of picture clarity.

Customer Questions

Subject: Did the technician explain the installation charges/billing?

What we are looking for:

We expect the technician to explain the customer's first bill with any installation charges that will occur as well as what the customer can expect for monthly subscription fees.

Subject: Did the technician give a basic system orientation including showing or explaining channel 191 and the on screen features?

What we are looking for:

We expect the technician to give a brief explanation of how the system works, how to order pay per view and show the customer channel 191. Channel 191 is a continuous repeating documentary of how Bell ExpressVu satellite systems function and how to use the system.

Subject: Did the technician explain how to use the remote control?

What we are looking for:

We expect the technician to show the customer how to turn on and off the system, how to change channels and use the channel menu system.

Subject: Did the technician explain the customers programming packages?

What we are looking for:

We expect the technician to explain to the customer all the channels that they will be able to watch. If the customer asks you for more information, please refer the customer to 1-888-SKY-DISH for any questions that they may have.

Subject: Did the technician explain how to use the channel lockout feature?

What we are looking for:

We expect the technician to show the customer how to use the channel lockout feature which prevents children from accessing certain channels.

Subject: Did the technician explain how to clean snow off the dish in case of poor reception?

What we are looking for:

We expect the technician to review how snow can cause poor reception and explain to the customer that clearing off the snow can return the reception back to normal.

Subject: Did the technician discuss the dish mounting location and cable routing work plan before the installation?

What we are looking for:

We expect the technician to review where the dish will be mounted and how the cables will be run before doing any work.

Subject: Did the customer approve the work plan?

What we are looking for:

We expect the technician to have the customer agree to all work and sign off before the technician starts the installation.

Subject: Did the technician meet the specified installation time and date?

What we are looking for:

We book appointments in the AM, PM afternoon and PM evening.
We expect the technician to be at the customer's location in the booked window.

Subject: Was the technician's appearance and professionalism to your satisfaction? If no why.

What we are looking for:

We expect all technicians to look professional in their appearance and treat all customers and their property with respect.

Subject: Did the technician complete the job on the installation day?

What we are looking for:

We expect all technicians to have everything that they need to complete the job that day.

Service Call Inspection Notes

Customer Background Questions

Subject: Where did you purchase your system?

What we are looking for:

If the customer can remember, we would like to know where the purchase occurred - retailer (if they can tell you which retailer that would be great), Bell direct (internet, or over the phone with Bell) or other.

Subject: When did the original installation take place?

What we are looking for:

If the customer can remember when the system was installed, an approximate time would be great -- 6 months ago, 2 years ago, 5 years ago etc.

Subject: Who did the original install?

What we are looking for:

If the customer can remember, we are looking to find out who did the original installation. Some answers would be: contractor, retail installer, self install, friend, called Bell for installer.

Subject: What was the problem that occurred resulting in the customer requesting a service call?

What we are looking for:

Why did the customer call? What was the problem?Was there no picture, no signal, missing some channels, needed extra cable run for additional receiver, remote not working? These are all examples of what drives a service call.

Customer Questions

Subject: Did the technician meet the specified service time and date?

What we are looking for:

We book calls for AM, PM afternoon and PM evening. Did the technician show up on the booked day at the scheduled time.

Subject: Did the technician explain the problem and the solution at the end of the job?

What we are looking for:

We expect the technician to solve the problem and then explain to the customer what happened and what the solution was.

Subject: Was the technician able to solve the problem that day?

What we are looking for:

We expect the technician to solve all problems that day with the exception of the requirement t repace a faulty receiver.

Subject: If the technician was not able to solve the problem that day, did the technician keep the customer informed of what was happening and follow up with the customer until completion?

What we are looking for:

On the rare occasion in which the technician can not fix the problem that day we expect the technician to keep the customer in the loop as to the status of the repair until the repair is complete.

Subject: Was the technician's appearance and professionalism to your satisfaction? If no why.

What we are looking for:

We expect all technicians to look professional in their appearance and treat all customers and their property with respect.

Physical Installation Outside – Service Call

Subject: We are just looking for information about the original installation during the service call inspection.

What we are looking for:

Use the "Installation Inspection Notes – Physical Installation Outside."

Technician Notes:

Please Type Here

Please Type Here

Please Type Here