

SKY NETWORK TELEVISION AND MOVIELINK MATV REQUIREMENTS

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General Overview

This document is to provide only the information relating to SKY TV and MovieLink MATV requirements. System design and installation is expected to be in accordance with AS/NZS1367:2007.

AS/NZS1367:2007 refers to two "grades" of equipment "Basic-grade" and "High-grade". Please use the "High-grade" reference when installing for SKY TV/MovieLink.

Possible installation scenarios for SKY TV in -

- Apartments (as part of an MDU)
- A Hotel as part of an MDU
- A Hotel with MovieLink installed

In a hotel situation you may have a requirement to install a MATV system capable of reticulating all the Free-to-air channels (VHF and UHF analogue and digital - headend), MovieLink and LBand for SKY TV.

SKY TV may be decoded at the headend and reticulated as individual analogue channels or as the original QPSK carriers in the LBand.

The decoding of SKY TV and then re-encoding into an IP stream is not an approved method. Please contact SKY TV if you wish to use IP to reticulate SKY TV.

These are the SKY TV/MovieLink requirements, not a "how to design" a suitable MATV system. You will need to refer to AS/NZS1367:2007 for required installation standards. If you have any queries, please do not hesitate to contact SKY TV or MovieLink NZ.

If MovieLink is to be installed, please contact MovieLink.

It is important to note the number of individual business units that may potentially exist within the building and or MATV system (e.g. retail, apartments, hotel etc). If not cabled correctly this will limit the number of services that the building owner/body corporate can offer to the occupants.

- MDU - Apartments only:

47 to 2150 MHz MATV a minimum of two RG-11 backbone feeds in the riser and two RG-6 lateral droppers from the riser to each and every outlet plate. Refer to sections 4, 5 and 6 for levels, etc.

The RF output of the MYSKY decoder and/or HDi decoder (via a modulator) MUST not be fed back into the MATV system.

- MDU/HOTEL Mix:

Same as above but may require a separate system for MovieLink (MovieLink signals are not permitted to be present in **non** Hotel outlets). But the Hotel outlet will require the full 5 to 2150 MHz as the suite rooms in the Hotel may have HDi and or MYSKY decoders installed. Refer to sections 6, 7 and 8 for signal levels and wall plate requirements.

- Hotel

As per MDU/Hotel

SKY TV

All SKY TV (and Free view) transponders are now located on Optus D1 (Orbital location 160 degrees East) and use the Horizontal polarity. However, there is also a future requirement to access the yet to be launched Optus D3 satellite (Orbital location 156 degrees East). SKY TV will utilise the horizontal polarity (only) on this satellite also.

Note: Unlike the older B1 satellite, the D1 satellite is capable of covering New Zealand on both polarities. It is therefore imperative that the LNB skew is accurately aligned for minimum cross pole interference.

In preparation for eventual access to the new D3 satellite, (as a means of future proofing), SKY TV now requires that all future installations be pre-cabled to allow for this.

This means two RG-11 backbone feeds in the riser and two RG-6 lateral droppers from the riser to each and every outlet plate with appropriate labelling on each end.

For VHF/UHF distribution, a third backbone and extra dropper to every outlet may also be required.

Depending on the size/design of the system, it may be possible to diplex the VHF/UHF signals with one of the satellite backbones, but particular attention must be paid to the levels and balancing of all signals if this method is employed.

In the future, this may also require appropriate switching devices. Therefore, all currently unused cable ends should be accessible and of adequate lengths for future installation of multi-switches, repeater amplifiers, test ports etc.

These devices will be required to be adequately earthed, and will be located as close as possible to the nearest Communications Earth Terminal (CET). Refer to AS/NZS 1367:2007.

All currently unused cables should be terminated, pretested and marked as such on the 'as built' drawing, according to their respective labelling.

Provision may need to be made for a second dish (for D3) to be installed in the immediate vicinity to the original D1 dish. See "Satellite Dish/Mounting Hardware" on Page 8.

All aspects of the installation (including all equipment used) must meet the requirements of AS/NZS 1367:2007.

1. *Headend (for on-air signals)*

The system must support the following frequencies:

- Forward (TV and Data signals) 47 – 2150 MHz
- Reverse (Data only) 5 – 30 MHz (If MovieLink is to be installed)
- MATV system should be designed to support at least 55 analogue channels (45 to 860 MHz)

To get a channel loading of at least 55 channels (45 to 860 MHz), all modulators and/or channel processors must be VSB, capable of working in adjacent channel mode. Each “on-air” signal should be channel shifted to avoid potential interference from the original signal.

Note: To achieve the above channel loading, there should be no more than 100 dB μ V at the off-air head end **launch point** and down line anywhere in the system.

2. *Distribution Amplifiers*

All distribution amplifiers after the final combining must be bi-directional capable, supporting 47 to 860 – 2150 MHz forward and 5 – 30 MHz reverse (min 20 db gain return path – adjustable).

All amplifiers must be capable of high channel loading capacity. Minimum 55 channels.

Cascading of Amplifiers: Refer to AS/NZS 1367:2007 regarding derating for channel loading and cascading.

Note: If MovieLink is installed, there is a launch amp in the MovieLink headend. Please take this into consideration.

Amplifiers and any other mains powered devices will be required to be adequately earthed to the nearest Communications Earth Terminal (CET). Refer to AS/NZS 1367:2007.

3. *Passive Components*

Couplers – (tap off units) must be bi-directional capable supporting frequencies from 5 to 2150 MHz. Should be “F” type.

Splitters – same as Couplers.

F to F Joiners – capable of supporting frequencies from 5 to 2150 MHz.

All above should be “High-grade” as per AS/NZS 1367:2007.

All passive and active components will be installed at an easily accessible location and in accordance with AS/NZS 1367:2007 regarding proximity to other non MATV related equipment and earthing etc.

Signal Requirements to Input Connector of Set Top Box

4. *LBand*

The IF/L-Band frequencies currently used (and to be used in future) by SKY TV, are as follows and quoted in Megahertz (Two figures given, for 11300/10750 LNB'S).

Note: D3 will use the same transponder layout.

NZ9L	968 / 1,518	NZ12L	1,156 / 1,706	NZ15L	1,344 / 1,894
NZ9U	995 / 1,545	NZ12U	1,183 / 1,733	NZ15U	1,371 / 1,921
NZ10L	1,031 / 1,581	NZ13L	1,219 / 1,769	NZ16L	1,407 / 1,957
NZ10U	1,058 / 1,608	NZ13U	1,246 / 1,796	NZ16U	1,434 / 1,984
NZ11L	1,094 / 1,644	NZ14L	1,281 / 1,831		
NZ11U	1,121 / 1,671	NZ14U	1,308 / 1,858		

- Bit Error Rate (pre Viterbi – also known as Channel BER):

1 x 10e - 4 or better. This is expected on each and every SKY Stream.

Note: BER may be difficult to measure accurately on NZ10L+U due to the use of DVBS- 2/8 PSK modulation techniques.

- Signal Level:

No less than 60 db μ V and not to exceed 77 db μ V, with no more than 2 dB of slope or ripple across any one transponder.

- Carrier/Noise Ratio:

15 db or better on each Carrier.

The above requirements are based on clear SKY TV conditions and apply to all SKY TV satellite carriers and for all outlets.

If these signal requirements are not met (at time of decoder installation), the installer will cancel the SKY TV installation. The building manager or representative will be advised that the signal levels do not meet specification, and the building manager or representative will need to contact their appropriate commercial installer for repair before the installation can proceed.

5. *VHF/UHF*

FM Radio: 45 db μ V \pm 3 db μ V

VHF: 70 db μ V \pm 3db Refer to AS/NZS 1367:2007 for slope and intermod etc

S Band and Hyper Band: 70 db μ V \pm 3db Refer to AS/NZS 1367:2007 for slope and intermod etc

UHF: 70 db μ V \pm 4db Refer to AS/NZS 1367:2007 for slope and intermod etc

Digital Terrestrial: Refer to AS/NZS 1367:2007

6. *Wall Plates*

- Satellite Outlet x 2

Must be "F" type and be appropriately labelled (D1H and D3H).

- TV Outlet - (VHF/UHF)

Must be "F" type and be appropriately labelled. If the VHF/UHF signals are present in one of the SAT feeds (D1 and/or D3) it must be diplexed out on the system side of the wall plate, not the customer side.

- Telephone Outlet

Must be no greater than 2 metres from designated set top box position. Refer to Telecom PTC106 for more detail on outlet types.

- Broadband Outlet (for future use)

RJ45 socket, cabled with Cat 5 or better, preferably connected back to a standard 10/100 Ethernet router/switch.

As a minimum, all outlets should be cabled back to a common area patch bay and labelled accordingly.

Ideally, all outlets above will be located on the same wall plate.

(3 x "F" type connectors (D1 and D3) and VHF/UHF, 1 x BT or RJ45 (Telephone) and 1 x RJ45 (for Ethernet).

7. *Satellite Dish/Mounting Hardware*

Master receive dish to be 1 metre in size and is available as a stock item from SKY TV Auckland. Mounting Hardware must be approved by SKY TV for use with this dish size and is readily available in various configurations from several antenna hardware suppliers.

D3 will require the same size dish or a suitable mounting bracket for the second LNB to enable the one dish to provide both services (D1 and D3). This will not be required to be installed at this time.

8. Cables

The cable used in the network plays a vital role in the overall performance of the system. Quad shield should be used if the MATV system has a high channel loading e.g. if MovieLink is installed in an MDU, possibility of local interference or where the MATV system is in a highly populated area.

SKY TV currently recommends the use of the following cables for L-Band and VHF/UHF reticulation.

- TFC

T10 series RG-6 (No 32360) and RG-11 (No 32362)
T660SIAM-LTVB-DBS BK
T660SIAM-LTVB-DBS BWH

- Belden

RG-6 (No 1829AC) and RG-11 (No 1525A)
B1829AC-Dual YR53172 010 (Black)
B1829AC-Dual YR53172 009 (White)

- Commscope

SAT2-660BV-S-B (Black)
SAT2-660BV-S-W (White)

- Digimatch

RG-6 - Quad shield single - 06MM-E6Q
RG-6 - Quad shield dual (Siamese) - 06MM-E6QS
RG-11 - Quad shield - 06MM-E11Q

Installation of cable should be within the manufacturers' guidelines for the purpose. Also refer to AS/NZS 1367:2007 for more information.

9. *Additional Specifications Required For MovieLink (RF Analogue Distribution)*

If MovieLink is going to be installed, please consult with MovieLink NZ regarding the design. For an Ethernet (over Cat 5e) delivered system please contact MovieLink.

MovieLink has a number of methods to reticulate its services, this means that the following area in the MATV channel spectrum needs to be free.

Analogue distribution

- 5 to 30 MHz (Return Data path)
- 45 to 68 MHz (CH1 to CH3) (Forward Data path)
- 111 to 174 MHz (S2 to S10)
- 230 to 466.50 MHz (S11 to S44)
- And in some cases 862 to 950 MHz

Room Outlet Levels

Refer to "Signal requirements to input connector of set top box - VHF/UHF" on page 5.

MovieLink Data Levels and Frequencies

Head End

Forward Data	52 MHz	70 dB μ V \pm 3 dB μ V at Outlet
Reverse Data	16 MHz	70 dB μ V \pm 3 dB μ V at Headend

Terminal box

Reverse Data Output Level 95 dB μ V.

- Area for Headend

Set aside a clean and air conditioned area, close to the existing headend in which to accommodate two cabinets, each 1970 mm height x 871 mm depth x 610 mm width. Although the cabinets are on castors, there must be sufficient space to walk around each cabinet for maintenance purposes.

Note: The MovieLink headend will generate approximately 4100 BTU'S. Room temperature should be 17 - 22 degrees Celsius.

- Separate power points, one for each cabinet
- Direct dial in telephone line for modem
- A telephone line close by for communication purposes
- MovieLink headend should be located no more than 50 metres (cable run) from MATV Headend. Inter Connect RF Cable to be RG11.
- Guest Net will require additional Phone/Data Line. T.B.A

- **Back of House/Reception**

Computer (desktop)	430 mm x 160 mm x 360 mm
Keyboard	470 mm x 170 mm x 30 mm
LCD Monitor	Standard Monitor
Printer	Small form factor Laser

- **Guest Room**

A separate power point in each guest room close to the TV for the MovieLink terminal box. Must be constant power (24 hour) and not energy managed.

- **In-Room Equipment**

Room terminal*	265 mm x 180 mm x 48 mm
External power supply*	57 mm x 85 mm x 50 mm
Remote control	170 mm x 40 mm x 15 mm
Infra Red Sensor (depending on TV)	25 mm x 20 mm x 15 mm

* These items are hidden from guest view.

Data Cable

1	x	Four pair Cat 5 from MovieLink headend to Hotel music source.
1	x	Four pair Cat 5 from MovieLink headend to Hotel PMS. See Note.
1	x	Four pair Cat 5 from MovieLink headend to back of Reception (for terminal).

Note: This is RS232 so should conform to normal cable lengths. Installation of cable should be within the manufacturer's guidelines for the purpose.

Disclaimer:

SKY NETWORK TELEVISION reserves the right to change part or all of this specification without notice.