ARE YOU WIRING FOR A SMART HOME?

Advice for **homeowners** on the wiring requirements for telecommunications and other 'wired' services.

INTRODUCTION

Advances in technology mean it's more important than ever to make sure the wiring and connections in homes are capable of delivering modern telecommunications, entertainment and building services.

Whether you're building or renovating your home, having a high-speed 'Ethernet' wiring system is now essential to ensure you can access high-speed broadband services.

This pamphlet is provided as a helpful introduction to the things you'll need to consider to ensure your home is properly wired.

It is based on the 'Premises Wiring Code of Practice', approved by the Telecommunications Carriers' Forum (TCF) in February 2010. The latest version of this Code can be accessed on the TCF's website at: www.tcf.org.nz/premwiring

WIRING FOR THE FUTURE

Installing high-speed, Ethernet wiring when building or renovating can save you both time and money down the track because it can be done at the same time other services like electrical wiring and plumbing are going in and before wall linings restrict access. Installing wiring that doesn't comply with the TCF Premises Wiring Code of Practice may prove a costly choice if it isn't capable of delivering existing services and wall linings need to be removed.

At a *minimum*, we recommend installing what's known as Cat5e cable. Cat5e cabling needs to be 'star wired'. We recommend multiple telecommunications outlets or jackpoints for rooms such as your lounge, rumpus room, and study, as shown in the diagram on the following page. RF video distribution cables need to be a minimum specification of tri-Shield RG6 Coax.

For a more detailed summary of star wiring installation requirements, you can refer to the TCF's pamphlet "Are you wiring for a 'smart' home? Advice for cable installers." It is available on the TCF website at www.tcf.org.nz/premwiring.

BUILDING? WHAT YOU NEED TO KNOW

The builder, or the homeowner, will be responsible for arranging the following to the telecommunication network provider's requirements:

- Digging a trench for the underground 'lead-in pipe', and arranging for a trench inspection or co-ordinating aerial installations with the network provider;
- Installing the lead-in pipe;
- Feeding the pipe through the external wall of the home to the inside, and ensuring the wall remains weathertight;
- Providing a home distributor (star wiring box), a patch panel, and patch cords;
- Providing two AC power outlets for the equipment to be installed in the home distributor (NB. An Uninterrupted Power Supply (UPS) is also recommended for power back-up and mains power surge protection); and
- All internal communications wiring, installed in compliance with the TCF Premises Wiring Code of Practice.

WIRING TERMINOLOGY

Cat5e cable - A high quality copper cable designed to deliver Ethernet-standard services with performance to 100MHz to support 1Gbits/sec Ethernet networks over a distance of 100 metres.

Cat6 cable - A higher quality copper cable designed to deliver Ethernet-standard services with performance to 250MHz to support 1Gbits/sec Ethernet networks, with a maximum allowed length of 100 metres.

'Coax Cable' – is cable used for television and other radio frequency applications.

**'F' connector** – is a male or female connector on the end of a coax cable.

Optical Network Terminal (ONT) – is the point at which a fibre optic cable connection is integrated with your home's internal premises wiring network.

'Patch cord' – is a length of cable that with a connector on each end that is used to connect devices to each other or to network wall outlets.

'RJ45' – is a standard type of connector on the end of computer (Ethernet) network cables, such as Cat5e cables.

'Star Wired' – Wiring that's fed from a central point - a 'home distributor' or 'star wiring box' - with the cabling provided to most rooms of the house.

GENERIC CABLING SYSTEM COMPONENTS
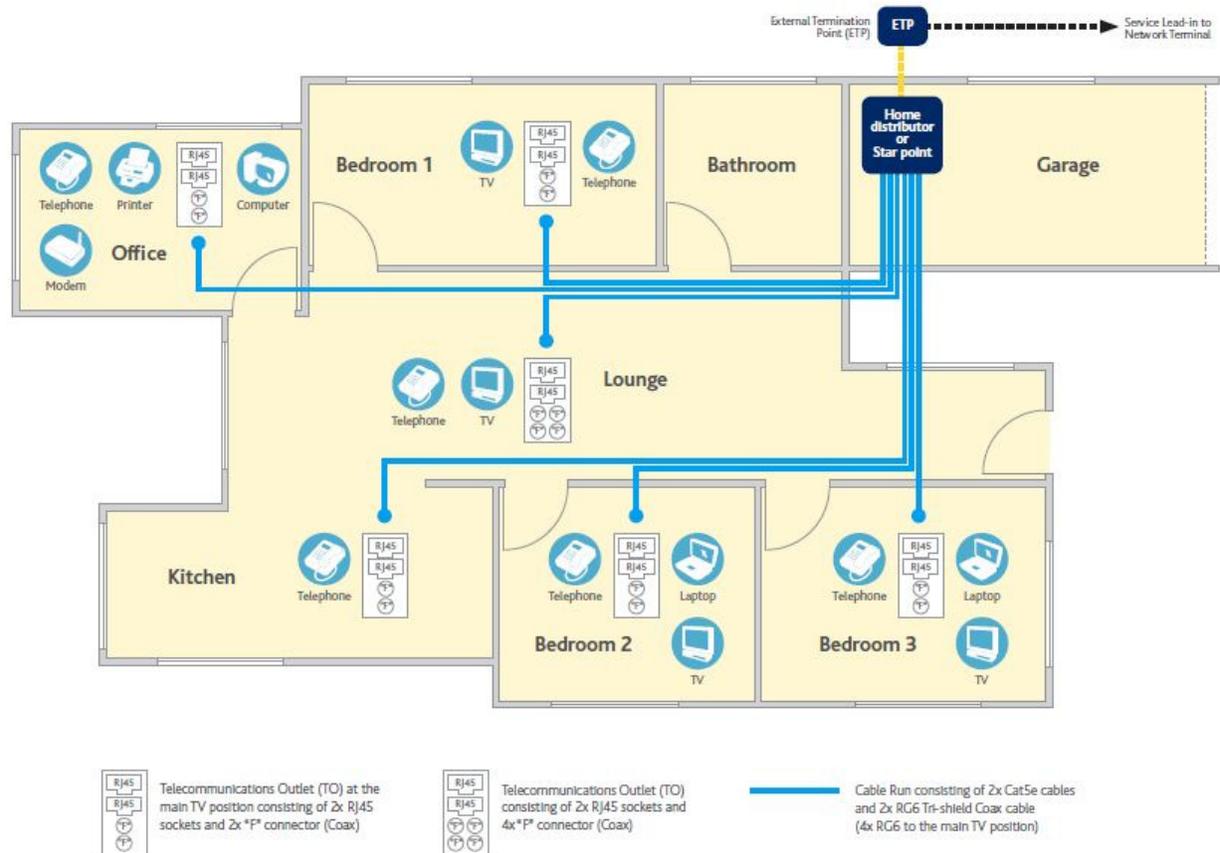
FOR YOUR PEACE OF MIND: QUALITY COMPONENTS, TESTING AND VERIFICATION

Low quality components will inevitably affect the performance of your phone or broadband services. We strongly recommend that you only install good quality patch cords and connectors that have been independently certified - e.g. those that are Underwriters Laboratories 'UL' certified.   Your services' performance can also be compromised where:

- Too much cable insulation is removed, or there is excessive untwisting of copper cable pairs, at termination points;
- The wiring is incorrectly terminated;
- The communications cabling is too close to electrical cabling, lighting, or appliances that can cause interference;
- The minimum 'bend radius' is exceeded; and
- Low quality components have been used.

For your peace of mind, we strongly recommend that you ask your cabling installer to provide a qualified test report confirming that the wiring has been installed correctly and that it will operate at its rated speed for the services you are anticipating enjoying at home.

THE HOME DISTRIBUTOR OR STAR WIRING BOX

It is the homeowner or builder's responsibility to supply the home distributor or star wiring box. This must be installed inside the home, typically on a garage or utility room wall. It should be easily accessible - at about eye level.

The home distributor requires mains power supply. It needs to be large enough to contain each of the following:

- A Residential Gateway: where installed, this replaces existing modems or routers and controls your fibre optic cable services;
- An Optical Network Terminal: the point at which a fibre optic cable connection is integrated with your home's internal premises wiring network; and
- A back-up power device: either now or in the future, the equipment that delivers your voice and data services may need power to function. You may decide to install a back-up power device to maintain your voice and data services in the event of a power cut.
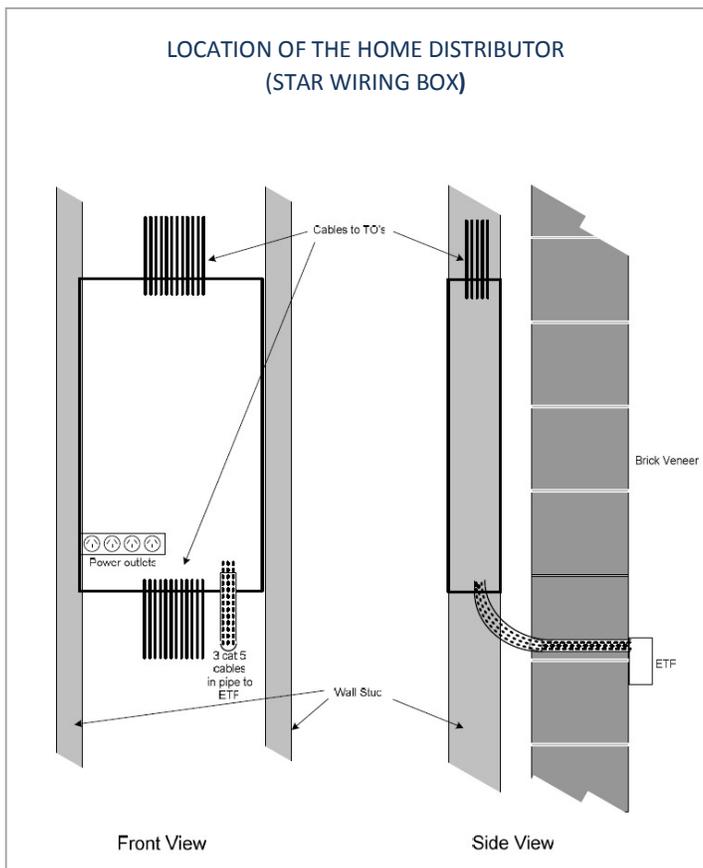
DUCTING – FUTURE-PROOFING YOUR HOME

Although Cat5e standard wiring is sufficient for meeting the bandwidth demands of existing telecommunications services, it is a good idea to prepare ahead for future upgrades and services. Installing ducting when you are building or renovating your home can be a good way of preparing a property for future options such as Cat6 (10Gbits/sec) cable or fibre optic cabling.

Once the ducting has been installed, completing an upgrade can be as simple as feeding a new cable along it. Ducting itself is relatively inexpensive and is covered in the Premises Wiring Code of Practice. We recommend you consult your cable installer for recommendations on ducting sizes.

LOCATION OF THE HOME DISTRIBUTOR
(STAR WIRING BOX)

Cables to TO's

Brick Veneer

Power outlets

3 cat 5 cables in pipe to ETF

Wall Stud

ETF

Front View   Side View

CHECKLIST FOR WIRING A SMART HOME

- ✓ Use a cable installer that complies with the TCF Code.

- ✓ Use Cat5e cabling or better.

- ✓ Ensure the home distributor is large enough.

- ✓ Put the home distributor somewhere easily accessible.

- ✓ Check that multiple outlets are installed in key living areas.

FOR MORE INFORMATION

Visit the Premises Wiring page on the TCF website:

http://www.tcf.org.nz/premwiring