MASTER ANTENNA TELEVISION SYSTEM AND SATELLITE SYSTEM

01 General

The MATV/FTV and Satellite System shall receive and distribute all Free to Air Television Channels, for analogue and Digital TV's; including all FM radio stations to connection points in each residence.

The extent of work includes, but is not limited to the following principal items.

- ✓ Supply and installation of amplifiers
- ✓ Supply of head-end equipment
- ✓ Supply and installation of all cables, outlets and fittings as required for the installation
- ✓ Performance of signal strength tests
- ✓ Supply all test equipment
- ✓ Testing and commissioning of the complete system

Each complete system shall:

- ✓ Comply with AS 1367:2000 and AS1417 Part 1 and 2
- ✓ Be suitable for distribution of colour television for both analogue and digital
- ✓ Be suitable for UHF and VHF reception including pay TV digital decoders
- ✓ Be capable of distribution of up to 80 channels
- ✓ Provide a picture free of distortion, ghosting, flutter, background noise (snow), intermodulation of other interference
- ✓ Be installed and commissioned by a specialist MATV/Pay TV approved contractor

02 Performance Requirements

The installed and commissioned MATV-FTA and the Pay TV Cable or Satellite System will perform in accordance with the following parameters. Equipment installed shall conform to manufacturers briefs.

1) The signal level at each antenna outlet shall:

- ✓ Be not less than 1.0mV (peak vision carrier) in 75 ohms
- ✓ Be not more than 15mV (peak vision carrier) output voltage for each channel
- ✓ Not exceed 3dB difference in signal levels between channels for any given outlet
- ✓ Not exceed 6dB difference in signal levels between any outlet for any given channel.
- ✓ Have a vision to sound ratio on any channel within –1 to +3dB of radiated signal ratio
- ✓ The systems shall be able to receive and distribute VHF and or UHF channels with the bandwidth 40-860Mhz
- ✓ FTA single channel amplifiers or multiple processors shall be installed to minimise cross – modulation from unwanted carriers. Single channel filter equalizers may be installed in smaller systems followed by a wide band distribution amplifier
- ✓ Where required, the distribution amplifiers are to be installed to achieve the specified minimum signal level at all outlets
- ✓ Only crimp or compression F-type connectors should be used at the interface between passive devises and flexible cable
- ✓ RG6 and RG11 quad shield flexible coaxial cable must be used. The use of backboned hardline cables constructed sealed cell di-electric or equivalent that prevents moisture entry is permitted
- ✓ On completion of the installation, the installer is to provide a copy of the commissioning results as part of the AS installed manuals

03 Amplifiers

Head End Amplifier

The Head end amplifier shall comprise Clipsal Australia Pty Ltd approved type single channel amplifiers, broadband and decoders with all necessary diplexing and passive equipment.

Amplifiers shall incorporate adjustable gain and automatic gain control.

Head End Equipment (for off-air signal)

Each off air signal must have a single channel amplifier, to filter the channel frequency and to avoid signal ingress occurring from unfiltered frequencies.

Overall signal to noise ration at the output of the head end must be greater than 60dB.

All Head End modulators must be vestigial side band, capable of working in adjacent channel mode.

Minimum s/w ration (signal to noise) at 60dB or better.

Distribution Amplifiers

Distribution Amplifiers shall incorporate adjustable gain control in-built filters, diplexing and other passive devices (as necessary) and shall provide multiband amplification. Gains shall be separately adjustable for each band.

All distribution amplifiers shall be:

- ✓ Located as necessary and be remotely powered
- ✓ Fully transistorized wide band over the range of 2-2000Mhz with a response better than + 1dB over any one channel. The input and output V.S.W.R. shall be less than 1.5:1 and 2:1 respectively
- ✓ Sized such that its maximum output in conjunction with the antenna output is not less than 8dB in excess of the distribution system losses
- ✓ Free from discernable cross modulation/intercarrier interface at the amplifier output
- ✓ All amplifiers must be capable of high channel loading capacity. Minimum of 77 channels required.

04 Cabling

The cable to be used throughout the network must be quad shielded with at least 60-90% braid.

If the distance between the head end and the building is more than 200 meters, then the main truck shall be at least ½ inch cable, otherwise the main trunk shall be at least ¼ inch cable.

For shorter distances RG11 quadshield cables can be used. The main trunks should be double shielded with 90% braid.

For each Unit the floor distribution cables shall be RG6 Quadshield. In star configuration to the multi switch; splitters etc.

For long distances between rooms RG11 cables shall be used and for room drops RG6 cables shall be used.

All cabling shall be of a Foxtel or Austar approved type and under no circumstances should any cable be left unterminated.

05 Outlets

The system outlets shall utilize female F-type connectors for all services and shall comply with IEC 60169-1 and ICE 60169-24. The maximum diameter of the male contacts used with these connectors must not exceed 1.762mm.

The return loss of any system outlet shall be greater or equal to 14dB – 1.5dB/octave, in the range 40 Mhz to a minimum of 10dB.

The screening effectiveness of the system outlet shall be greater or equal to 75dB in the range of 30Mhz to 1000Mhz and greater or equal to 65dB in the rnage between 1000Mhz and 1750Mhz.

The system outlets shall incorporate isolating components in series with both inner and outer conductors of the coaxial connectors. The isolating components may be either high voltage capacitors or double wound transformers.

Outlets shall be as manufactured by Clipsal Australia Pty Ltd, ISO type or equivalent.

Face plate shall match other electrical accessories.

06 Accessories

All passive components and other connections in the system shall:

- ✓ Be fully screened to avoid induction and radiation and be characteristically matched to prevent generation of standing waves. V.S.W.R. into 75 ohms not to exceed 1:5:1.
- ✓ Be fitted with F-Type terminals for cable connection.
- ✓ Not be resistive type units
- ✓ Be suitable for frequencies up to 2 Ghz

07 Testing

The Sub-Contractor shall:

- ✓ Make all necessary adjustments and test that the signal levels throughout the complete system are within the limits specified
- ✓ Provide tabulated test results for the following:
  i. Signal levels for a set of frequencies spread over the bandwidth of the system
  ii. Frequency response of system
  iii. System noise levels
  iv. Intermodulation and beats
  v. Hum and low frequency modulations
  vi. Outlet isolation
  vii. System radiation measurements
- ✓ Provide a colour television receiver of normal design and monitor the sound and picture in the presence of the Proprietor to ensure the signals on all available channels are free from distortion, ghost pre-imaging, cross modulation, impedance mismatch, background noise, and other interference.
- ✓ Submit all test results for approval. Test results may be require to be substantiated in the presence of the Proprietor

PAY TV companies will only activate services from the successful completion and subsequent approval of a contractors commissioning report. Within two working days of receiving a commissioning report PAY TV companies will either accept or reject the report and will notify the contractor of any reason for rejection. The commissioning process is a critical stage in the installation process.
The following tests need to be performed at the headend to ensure compliance with the technical specifications of PAY TV.

- Local oscillator (I.F.) signal levels measured at T10 and T20 on both ports. L.N.B.I.F. output levels should be stated in the As Built drawing, not the commission report.
- Local oscillator (I.F.) Carrier to Noise ration at T10 and/or T20 on both L.N.B. ports.
- Local oscillator (I.F.) L.N.B. cross polarity on both ports T20
- Local oscillator (I.F.) minimum and maximum launch levels on both launch amplifiers and line extension amplifiers if applicable.
- Local oscillator (I.F.) output Carrier to Noise ration on both vertical and horizontal I.F launch amplifiers if applicable
- Minimum and Maximum channel launch levels for analogue free to air services
- Minimum and Maximum channel launch levels for digital free to air services

08 Installation Manual

The ‘s Installed’ drawings and manuals shall incorporate the following details in respect to the MATV/Satellite system:

- ✓ Full technical details of all splitters, tee offs, baluns, antennae, amplifiers and outlets as used in the system
- ✓ Plain layouts of the installation showing the locations of equipment and cable routers.
- ✓ A line diagram of the complete system showing the catalogue numbers of each item of equipment and the losses and/or signal levels of all cables and components
- ✓ Length of all cables.