

SATELLITE MASTER ANTENNA TELEVISION SYSTEM (SMATV) – IF DISTRIBUTION

The Contractor shall supply, install and commission an IF Satellite Receiving System of an approved manufacturer and design, capable of receiving and distributing present transmission in the intermediate (IF) frequency from the satellites as listed, with sufficient allowance made to include any future transmissions within the foreseeable future without degradation of the system parameters.

The contractor shall submit a complete proposal with schematic drawings, list of materials and original detailed catalogues of the equipment for consultant/client approval before starting the work.

1. System Parameters

- 1.1** In accordance with **CENELEC SPECS. TC 209**
- 1.2** All parts of the system (Multiswitchers, Amplifiers, tap offs, distribution boxes, sockets) shall be **CE certified and tested** and **CE** Marking shall appear on the packaging and/or included in the operating instructions.
- 1.3** For compliance with the legal **EMC** (Electromagnetic Compatibility) requirements and to prevent interference between TV cable networks and radio services, components with shielding rate defined in European standard EN 50083-2 shall be used for distribution items including connecting cables for terminal equipment. **The components shall bear the Class A label.**
- 1.4** Conform to an overall minimum total signal cross-modulation ratio of 57dB with the maximum output for all present and future programs set with an allowance of at least 3dB output under all known conditions.
- 1.5** A pre-planning site survey will take into account the following factors, which must be satisfactory as agreed by a representative of the authority:
 - a) Adequate signal levels (not less than 55 for IF signal) at all outlets to provide the specified signal/noise ratio or an agreed satisfactory subjective result.
 - b) Clean signals free from reflections and co-channel interference effects.
 - c) Regard to be paid to any very high level local field strengths leading to possible immunity and pre-image problems.

- d) Possibility of interference from any source that may interfere with the system performance.

2 Selected Channels for the System

2.1 The system shall facilitate the reception of all free available programs from a total of 8 polarities from the following satellites:

- 2.1.01** Arabsat 3A (Ku band)
- 2.1.02** Nilesat (Ku band)
- 2.1.03** Hotbird (Ku band)

The system shall be designed to function on field strength levels of local transmissions.

A 13 Amp. Fusible Test power socket shall be installed in the cabinet for a future connection of signal test equipment to aid the service requirement.

Spurious variation shall be within the limit ref. DIN V VDE 0855 part 10 and 12:

For active components:

0.01	MHz	.....	470	MHz	Shielding rate > 75 dB.
470	MHz	.....	950	MHz	Shielding rate > 70 dB.
950	MHz	.....	1750	MHz	Shielding rate > 55 dB.

For coaxial cables:

0.01	MHz	.....	30	MHz	Shielding rate > 75 dB.
47	MHz	.....	108	MHz	Shielding rate > 70 dB.
108	MHz	.....	470	MHz	Shielding rate > 75 dB.
950	MHz	.....	1750	MHz	Shielding rate > 65 dB.

3. SYSTEM'S SPECIFICATIONS:

All radio frequency levels in this sub-division are to be construed and referred to microvolt across 75-Ohm (dBµV).

- 3.1.** One standard radio frequency distribution impedance of 75-Ohm shall be used within the system.
- 3.2.** Return loss shall not be less than 14dB at any point of the system.

- 3.3. Isolation between any two outlets shall be at least 22dB.
- 3.4. The system shall be such that the short or open circuit at any outlet socket will not significantly affect signals at other outlets (tap-off system).
- 3.5. The system shall be capable of continuous operation in an ambient temperature up to + 50⁰ C.

4. **EQUIPMENT'S SPECIFICATIONS:**

4.1. **General:**

The system shall include, but not necessarily be limited to the following:

- 4.1.01- 3 Nos. 1.2 m solid aluminium dishes for Arabsat 3A, Hotbird and Nilesat satellites.
- 4.1.02- 9 Cable Cascadable Multiswitchers with provision for 4 or 8 individual subscriber connections.
- 4.1.03- Cables, cables connectors, ancillary equipment and fixing devices.

4.2 **Dish Antenna:**

Following shall be the minimum requirement for the Satellite dishes for Arabsat 3A, Hotbird and Nilesat signal reception. Separate dishes shall be installed for each of the satellite signal reception.

4.2.01 Satellite Dish Ku band

- Frequency	:	10.7 - 12.75 GHz
- Gain @ 10.95GHz	:	41.5 dB
- Noise temp @ 30° elevation	:	36° K
- Wind Load	:	1270 N
- Diameter	:	1.2 meter
- Reflector Material	:	Aluminum

4.2.02 Feed Horn & L.N.B Output

- Output Frequency 950 MHz - 2150 MHz.
- Polarization Linear, 4 outputs
- Noise Figure 25° K

5. IF Satellite Distribution System:

5.1. General:

- 5.1.a-** The IF signals from the dish antennas respectively shall be fed into the IF distribution network described hereafter.
- 5.1.b-** The system shall utilize distributing all available IF signals in Arabsat 3A, Hotbird and Nilesat dishes to all the outlets of the building.
- 5.1.c-** The switching between different polarization planes from the LNB's shall be done from the domestic receiver at the outlet sockets. Domestic receivers shall be provided by tenants.
- 5.1.d-** Outlets shall be connected separately (radial) to switcher, loop connection is not permitted.
- 5.1.e-** All equipment shall be double shielded and in conformity with VDE or similar standard.
- 5.1.f-** The system shall have 100% connectivity for digital signal reception.

5.2. 9 Cable Cascadable Multi-Switcher:

- 5.2.a-** Multiswitchers shall have 9 cable system, where 8 cables are used for the IF frequency and 1 cable for RF frequency.
- 5.2.b-** The Multiswitcher shall be cascadable with provision for 4 or 8 subscribers per switcher.
- 5.2.c-** Switcher shall have the total frequency range from 47 MHz to 2150MHz.
- 5.2.d-** Switching possibilities for 8 polarization planes.

- 5.2.e-** Switcher shall have min. 6 dB through pass attenuation for IF frequency (950-2400MHz).

5.3 Cascadable Post Amplifiers:

- 5.3.a-** Cascadable Post Amplifiers shall be used as necessary along the line to compensate for the signal loss on the co-axial cable. Specifications are as follows:

- Broad - band range : 47 – 2400 MHz.
- Maximum gain : 15/19 dB
- Maximum output level : 108 dB μ V
- Ambient operating temp. : -20°C to + 50°C
- DiSEqC 2.0, suitable for return path.

- 5.3.b-** The number of amplifiers shall be made as required for the final wiring layout.

- 5.3.c-** Proper arrangements shall be made to dissipate the heat generated during normal working of the amplifier.

5.4. Cables:

- 5.4.a-** Cables used within the system shall have polyethylene dielectric.

- 5.4.b-** Cables used for wiring the aerials and dish antennas shall be ultra violet resistant.

- 5.4.c-** All the cables shall be with the following minimum shielding rates:

- 470 - 1000 MHz > 75 dB
- 1000 - 2050 MHz > 65 dB.

- 5.4.d-** Maximum loss of the coax-cables shall be as listed:

- For risers & long run 12 dB/100m at 800 MHz.
- For internal sockets wiring 18 dB/100m at 800 MHz.
- For dish antennas wiring 29 dB/100m at 2150 MHz.

- 5.4.e-** Joints and cable termination shall be adequately sealed against ingress of moisture and migration along the cable.

5.5. SAT/TV/FM sockets:

5.5.a- Sockets shall be of broadband type with operating frequency range from 4 MHz up to 2400 MHz.

5.5.b- Sockets shall have Sat/TV/FM triple outlet in rigid metallic structure with cover similar to the wiring accessories.

5.5.c- Sockets shall be of terminal type.

6. MAINTENANCE:

The system shall be warranted for a period of 12 months after final approval. To maintain the system in a proper working condition a maintenance contract is strongly recommended.

Bill of materials:

No.	Description	Unit	Qty	Rate	Total
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<u>Satellite Master Antenna Television System :</u>					
	Supply and installation of S.M.A.TV. system for the building as per the enclosed specifications :				
1.	1.2 m Solid Aluminum Dish Antenna as specified, with Quattro Ku-band LNB (for Arabsat 3A, Hotbird and Nilesat), complete with stand.	Nos	03		
2.	9 Cable feed in switch.	No.	01		
3.	9 Cable Cascadable Multiswitcher with 4 or 8 Individual subscriber connections as per specifications.	Nos			
4.	9 Cable Cascadable post amplifier to compensate the signal loss.	Nos			
5.	PVC junction boxes in the electrical room of each floor of the building.	Lot	LS		
6.	S.M.A.TV. System network as per enclosed specifications complete with the distribution boxes, coaxial cables and cable fittings.	Lot	LS		
7.	Extended high frequency TV triple outlet sockets with plastic cover plate.	Nos			
8.	All necessary concrete bases, PVC pipes, trunking and all accessories with installation.	Lot	LS		