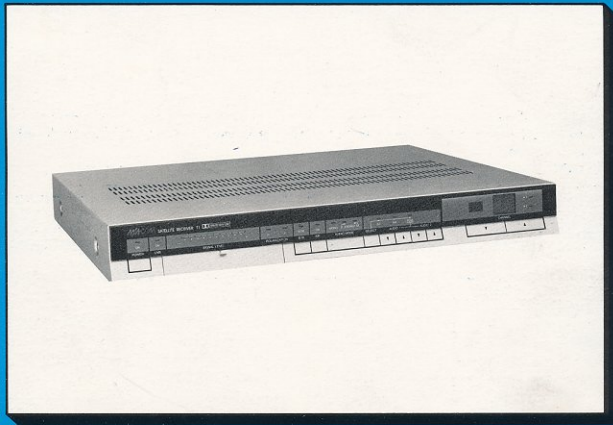


**MACOM**

# T1 Satellite Receiver Owner's Manual



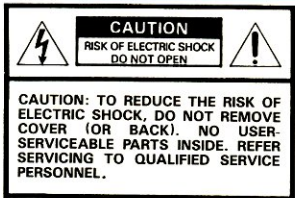
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Congratulations. You have just purchased the M/A-COM T1, one of the highest quality satellite receivers available today. This manual is designed to help you make the most of your purchase. We encourage you to read it carefully before installing or operating your new system. With proper care, your receiver will give you years of satellite television viewing pleasure.

**WARNING: TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.  
DO NOT OPEN THE CABINET. REFER SERVICING TO QUALIFIED PERSONNEL ONLY.**

**CAUTION:  
TO PREVENT ELECTRIC SHOCK, DO NOT USE THIS (POLARIZED) PLUG WITH AN EXTENSION CORD RECEPTACLE OR OTHER OUTLET UNLESS THE BLADES CAN BE FULLY INSERTED TO PREVENT BLADE EXPOSURE.**



The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

# Satellite Television

Welcome to the world of Satellite TV! With your new equipment, you will be able to enjoy a myriad of top-quality programming, with picture and sound quality unmatched by typical broadcast television.

## What is Satellite Television?

Satellite Television is a means of distributing TV programs from one originating site to a large number of receiving sites, scattered across the continent. The originating site transmits its live or taped program, at a designated microwave frequency, to a satellite orbiting 22,300 miles above the equator. The electronics in the satellite then "shift" the signal to a different frequency, and retransmit it back to earth, spreading the signal over a very wide area of the globe. Anyone within this signal area, or "footprint" of the satellite, may receive the signal with

a special set of equipment known as a television-receive-only earth station, or simply a TVRO.

A key feature of satellites used for television is that they orbit the earth at exactly the same rate that it rotates, thus appearing stationary from the ground (Figure 1). This eliminates the need for expensive and complex tracking equipment.

A dozen domestic satellites are now regularly used to distribute television programs. And each satellite can carry many programs simultaneously. Twenty-four hour movies, sports, news, and a multitude of other types of shows are distributed via satellite.

Increasingly, private educational and special interest groups are turning to satellite television as a dynamic, cost-effective means of distributing information. The high quality of the received signal, the advantage of having video as well as audio, and the relatively low cost of a TVRO, make it the ideal distribution method for these programs.

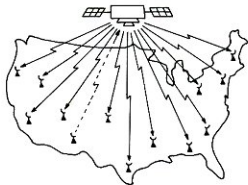


Figure 1. Satellite Television

## What is a TVRO?

A TVRO, or television-receive-only earth station is a special set of equipment used to receive signals relayed by satellites. The major components are an antenna (DISH), a low noise block converter (Outdoor Unit—ODU) mounted on the antenna and a receiver (Indoor Unit—IDU).

The antenna (1) is located outside, and must have a clear view of the southern sky. Most antennas are equipped with a polar mount, which must be carefully oriented on a North-South line to ensure correct alignment with each satellite as the mount is traversed from East to West across the satellite arc.

The ODU (2) is mounted at the focal point of the feed and is attached to the feed of the antenna. For complete program accessibility a polarizer is used. This polarizer can be either mechanically or electronically operated. The M/A-COM receiver is designed to operate with, and control either type of polarizer automatically.

A cable connects the ODU to the IDU (3) which is located inside your home, near the television set. This cable can usually be buried.

A properly installed TVRO is an unobtrusive, safe piece of equipment that will provide many years of reliable operation.

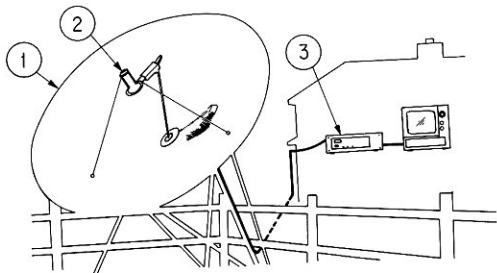


Figure 2. TVRO

## Antenna

Antennas for Satellite Television reception are dish-shaped reflectors provided generally with a motorized, or motorizable mount. Usually the mount is installed on a cement slab or a pipe anchored in concrete.

Several types of materials are used in the construction of antennas from wire mesh, aluminum, steel and compression molded fiberglass. M/A-COM uses compression molded fiberglass and recommends it for high quality performance, and outstanding durability.

The size of the antenna you need depends upon your location, and the strength of the available signals.

The most popular sizes have diameters of 8, 10, and 12 feet.

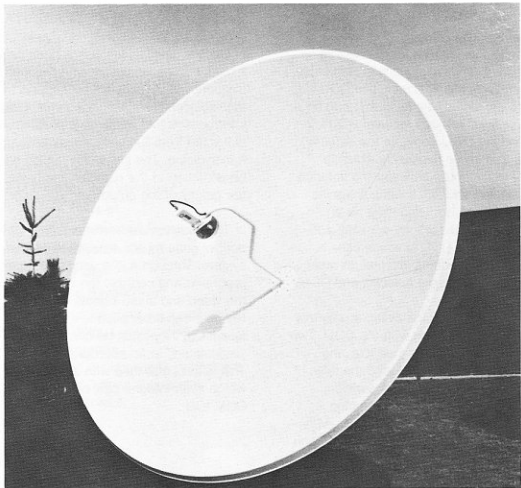


Figure 3. Antenna w/ODU

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## Low Noise Block Converter (ODU)

Due to the extreme distances they must travel, television signals from satellites are very low in power. The ODU boosts the signal to a level that can be used by your satellite receiver (IDU). In addition the ODU converts the satellite signal to a lower frequency which is easier to distribute between the antenna location and your IDU, without significant losses of level. You also may, as an option using this technique, install additional receivers (IDU's) which can operate independently from each other, while using the same antenna and ODU.

Frequently, a device called a polarizer is used in conjunction with the ODU. Two types of polarizers are available: the electro-mechanical type, and the fully electrical type. In satellite television, alternate channels have alternating polarities—horizontal and vertical. M/A-COM's polarizers allow selection of each polarity signal without moving the ODU.

## Receiver

Once a satellite signal has been collected, boosted in power, and reduced in frequency, it is ready for processing by the receiver. Here, the video and audio informations that make up a program are extracted from the complex satellite transmission. The better the design and construction of the receiver, the better the quality of the output.

The receiver also serves as the control point for the satellite television system. Through it, the user selects the programs and controls the output. Before the video and audio signals for the receiver can be applied to a standard television, they must be combined and "modulated" in an appropriate format. This is accomplished with a modulator which is an integral part of the M/A-COM IDU.

## System Integration

Successful operation of your TVRO will depend upon proper installation and interconnection of the individual components—antenna, ODU, polarizer, receiver, modulator, and whatever other options are selected. Understanding the function of these components, as described above, will help you operate your system properly.

M/A-COM, which manufactures all of the components of a TVRO, builds each to the highest quality standards for years of reliable enjoyment. And all are designed with total system operation in mind. When you think of *complete* satellite television capability think of M/A-COM!

# The T1

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The T1, with its ODU, is the heart of your satellite television system. It features state-of-the-art design for superb quality reception of satellite relayed programming.

Designed for high reliability and ease of operation, the T1 features 24 channel tuning and polarity selection capability for complete frequency coverage of domestic satellites. Separate audio frequency selection allows reception of program audio as well as auxiliary audio services, including stereo offered on some channels.

## FEATURES

- **“Soft-Touch” 24 Channel Tuning**
- **Stereo-Direct and Matrix**
- **Scan Feature For Satellite Locating**
- **Separate Video and Audio Outputs**
- **Built in A-B Switch**
- **Infra-Red Remote Control**
- **External Audio and Video Input**
- **LED Display of Functions**
- **Baseband Output**
- **Parental Supervision Control**
- **Auto-Polarization Control**
- **Attractively Styled**
- **Dolby Noise Reduction®**

Noise Reduction manufactured under license from Dolby Laboratories Licensing Corporation.

“Dolby” and the double-D symbol are trade marks of Dolby Laboratories Licensing Corporation.

## OPTIONS

- **Additional IDU for simultaneous independent reception**

# Installation

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The T1 installation is not difficult, but a few minutes required to read this section will improve reliability and prevent damage.

Installation of the antenna is the most critical part of your system installation. While not covered in this manual, be sure to address the following issues when installing your antenna:

- Appropriate Location
- Distance from House
- Means of bringing cable into building
- Accurate North South positioning for Polar Mounts
- Conformance to local building and electrical codes
- Antenna Grounding

## 1. Install ODU (LNB):

The ODU is installed outside on the antenna feed. Follow the instructions for the particular antenna and feed being used. Be sure to install rubber gasket between flanges on the ODU and the feed to prevent moisture from entering the waveguide section of the ODU.

## 2. Antenna (outside) Connections: **Receiver must be unplugged when attaching the cable to the ODU.**

There are many possible cable kit combinations used to connect the ODU and Optional Polarizers and antenna controllers to the (IDU) Receiver. It is beyond the scope of these instructions to address all of these possibilities, so we recommend that you refer to any applicable instructions provided with the cable kit you are using, and we will concern ourselves here with the basics.

(a) One coaxial cable is used to connect the ODU with the IDU. This cable will have F connectors on each end. Attach one end of this cable to the F connector on the ODU. Handtighten and then tighten an additional 1/4 turn to seal the connector. It is a recommended practice to weatherproof this connector with shrink tubing or the application of a Dow Corning Silica Gel compound, similar to that used on automobile battery terminals to prevent corrosion and moisture ingress.

(b) If polarizer is used, follow Polarizer installation instructions.

(c) If motorized antenna is used, follow installation instructions provided.

## 3. Receiver (IDU) Connections: Refer to figures 4 on page 8.

(a) Connect the F connector on the indoor end of the coaxial cable connected to the ODU in step 2 (a) to the "IF" input on the rear panel of the receiver.

(b) Connect a short piece of RG 59 or RG 6 fitted with F connectors between the RF output connector on the receiver and the input connector to your TV set. Note: If your TV set is not provided with a 75 ohm coaxial input, then install a 75 ohm to 300 ohm transformer between the end of the co-ax and the input terminals of your receiver.



(c) If you are using a VHF off-air antenna, or a Cable input to your TV set, this input can be routed through the automatic A-B switch in the receiver by connection to the VHF "F" connector input on the rear of the receiver.

(d) You may select either channel 3 or 4 output by positioning the VHF channel select switch on the rear of the receiver.

(e) Separate audio RCA phono connectors are available on the rear of the receiver to connect the mono or stereo outputs from the receiver to a stereo amplifier.

(f) If a polarizer of either the electro-mechanical type or the electronic type is used, connect the applicable wires to the designated terminals on the receiver.

⊥	: Motor Power (+5V)	} Mechanical Polarizer
⏏	: Pulse Output to Motor	
⊥	: Ground	} Electrical Polarizer
H	: to Electrical Polarizer "H"	
V	: to Electrical Polarizer "V"	

(g) Plug the AC cord into a polarized AC receptacle and turn the power switch on, and allow receiver to warm up for at least 1/2 hour.

#### NOTE

Power is supplied to the ODU from the receiver whenever the receiver is connected to an AC source, even when the power switch is OFF. This is indicated by the LNB "ON" indicator on the left side of the front panel.

(h) Follow the operating instructions outlined in the Operation Section of this manual.

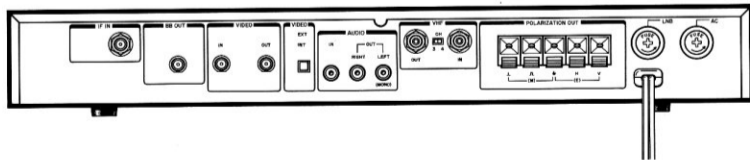


Figure 4. Rear Panel View

# Operation

## Operation

The T1 Receiver employs a full-logic operating system, using an easy to operate micro-computer. Most of the functions can be controlled with the Infrared Remote Control Unit (RCU-T1). The remaining pre-set function controls are located on the front and back panel of the Receiver. Please read all instructions before operating the T1 Receiver.

## Power On / Off

Turn the receiver power on/off by pressing the power button on the front panel or on the RCU-T1 (remote control unit).

**Note:** Power for the ODU is constantly supplied (LNB Indicator displays) whenever the receiver is connected to the AC power source, even when the power switch is off.

## Channel Pre-Set

**Note:** Channel pre-set is factory adjusted for standard channel frequency and polarization prior to shipping and seldom requires re-adjustment. If your unit requires re-adjustment (ex. receiving a non-standard channel, or erasing the pre-set button) proceed as follows:

## Standard Setting

Ch. No.	Frequency (MHz)	Polarization
1	3720	V
2	3740	H
3	3760	V
4	3780	H
5	3800	V
6	3820	H
7	3840	V
8	3860	H
9	3880	V
10	3900	H
11	3920	V
12	3940	H
13	3960	V
14	3980	H
15	4000	V
16	4020	H
17	4040	V
18	4060	H
19	4080	V
20	4100	H
21	4120	V
22	4140	H
23	4160	V
24	4180	H

1. Set the Pre-set/Receive button to the pre-set position using the accessory screwdriver provided (Inward).
2. Set the H/V mode by operating the Polarization button (POL.) to the desired channel (H/V indicator indicates the polarization).
3. Scan the frequency by operating the CH. Up or CH. Down key on the RCU until the desired channel signal is received.

**Note:** By pressing the CH. Up or CH. Down key, the receiver starts to search for the signal upward or downward, and stops searching when a signal is received. If the stop channel is not the desired channel, continue channel search.

4. Select the channel number by using the appropriate keys on the RCU. Refer to the channel indicator.

**Example:** When pre-setting to channel 3, press the "0" and "3" buttons.

**Note:** Consult program directories for proper channel setting.

5. Press the Pre-set/Receive button to the receive position to program the channel data. If you want to pre-set two channels, repeat steps 2 through 4 before proceeding to step 5.

### Video Scan

1. Depress the video scan button.  
Receiver will begin scanning the channels upward.
2. Begin tracking antenna through satellite arc. Receiver scanning stops when the T1 receives a satellite signal.
3. Stop antenna movement. Record position of satellite. (If actuator controller is used, program actuator controller to corresponding satellite coordinates.)
4. Press the video scan key to reactivate video scan mode. (Video scan automatically restarts as the antenna moves to the next satellite.)

**Note:** In the Video Scan mode, the polarization change operates only when receiving channel reset from 24 to 1.

5. Press the "W" (polarization W) or "N" (polarization N) key inside the front door to allow polarization adjustment during video scan operation.

**Caution:** To avoid motor damage, polarization adjustments should be limited to 15 second intervals following depression of "N" or "W" key.

### Video Level

Rotate this control for optimum video contrast by using the accessory screwdriver provided.

### Signal Level

The signal level indicator displays the signal strength received. The display level can be adjusted by the signal level control located inside the front panel door. Optimum setting is 80% efficiency on your strongest channel. Adjustments may be made with the accessory screwdriver provided.

### B/W Switch

When receiving narrow audio deviation program, press the B/W key to set the receiver to narrow mode. The function changes cyclically by pressing the button. (The initial setting is for wide band audio.)

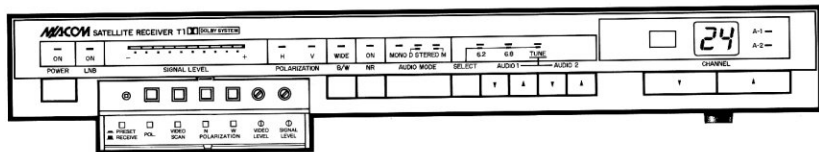


Figure 5. Front Panel View

### **NR ON Switch**

The initial setting mode is "on" to the Dolby noise reduction system. To release the noise reduction, press the "NR ON" key. The key function changes cyclically.

### **Audio Mode**

Select the audio mode desired by pressing appropriate audio mode key: "Monoral" (MONO), "Stereo Direct" (D), or "Stereo Matrix" (M). These functions change cyclically by pressing the Audio Mode button on the front panel or on the RCU.

**Note:** In 6.2 or 6.8MHz selection, Audio Mode is only in "Mono" position. If you like to select audio mono rather than 6.2 or 6.8MHz, select the audio to "TUNE" and Mode to "MONO". Then you can select the audio by A-1 channel.

### **Audio Tuning**

The initial setting of audio tuning is 6.8MHz. By pressing the Audio Select (SELECT) button, the tune mode changes cyclically. To tune to other than 6.8MHz or 6.2MHz, press the Audio 1/Audio 2 Up/Down keys. When these keys are pressed, the audio tuning scan starts and tunes the audio. Frequency is dis-

played on the channel indicator, and the A-1 or A-2 indicator lights, depending on the audio channel tuned. When an audio signal is received, the scanning stops and the A-1 or A-2 indicator fades out and the channel indicator displays the channel number. The Audio Select, Audio 1 Up/Down, Audio 2 Up/Down keys are also provided on the RCU.

**Note:** When tuning the audio subcarrier demodulators in the tune mode, you may experience on some transponders such as Transponder 3 on SATCOM F3R, a tendency for the demodulator to lock up on a strong carrier, and require an additional operation of the tune control. This is normal when subcarriers are close together and the AFC will select the previously received carrier.

If you experience this problem, select the narrow filter position and re-push in short intervals the Tune up or Tune down key as applicable.

### **Channel Selection**

By pressing the channel Up/Down keys on the front panel or on the RCU, the channel number moves up or down. When continuously pressing the button, the channel continuously moves. The channel can be directly changed by the ten keys on the RCU. When changing to a one digit channel number (Ex.: Channel 3), only one action pressing (Ex.: Channel 3) is required. In this one action, the channel changes 2 seconds after. If you desire faster channel selection, press two digit number (Ex.: Channel 0 and 3).

The motor power for the mechanical polarization control is supplied for about 4 seconds each time the channel is changed.

### **Video Internal/External Change**

When using the external video and audio signal, set the Video Internal/External switch on the rear panel to the external position.

### **VHF Modulation Channel Change**

Set the internal RF modulator switch to channel 3 or channel 4 for your convenience.

# Maintenance

The T1 is easy to care for. Dust as needed with a soft damp cloth. Care should be taken to prevent excess moisture from getting inside the receiver. No objects should be inserted through the vents on the receiver, as this could damage the receiver and also result in a safety hazard due to shock. No internal cleaning or service is recommended, except by a qualified technician. The receiver or ODU contains no user serviceable parts. Opening or tampering with unit will void the warranty.

## Troubleshooting

The T1 is designed to give years of troublefree service. However, if a problem should develop, please check the following table for correctable conditions before calling your dealer.

### Troubleshooting Guide

Problem	Check
No Picture No Sound	Power Switch OFF—Unit disconnected Television Set not set to correct channel 3 or 4 Fuse Blown—Rear Panel No—ODU Power Indication—Check Fuse Polarity not correct for channel selected Antenna misaligned Cables not connected or faulty
Remote Control Not Operating	Replace Batteries
No Audio (Video Only)	Audio Channel not tuned
Noisy Video and Audio	Antenna not Peaked Terrestrial Interference (Contact Dealer) Cables poorly connected or faulty ODU Malfunction
No Stereo Reception	Check Program guide for types of service and timing Cables to Stereo amp-faulty or misconnected Fault with Stereo Amp

# Specifications

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## GENERAL

- Dual heterodyne downconversion with Low Noise Block-converter (ODU)
- Voltage Synthesizer tuning system capable of receiving any of 24 channels (3.7 to 4.2GHz Satellite TV Band)
- Dual Frequency Synthesizer tuning system for Sound IF selection and DOLBY/Matrix circuit capable of receiving Hi-Fi stereo program
- Electrical/Mechanical dual Antenna Polarization control outputs
- Full-function remote controllable with infrared control unit (RCU)

## INPUT SECTION (Input from ODU)

- Frequency 950 to 1450MHz
- Input Impedance 75 ohm, Type F
- Input Signal Level -50 to -20dBm/ch
- Signal Format Upperside heterodyned

## 2ND IF SECTION

- Frequency output 140MHz  
(Upperside heterodyned)
- Bandwidth over 27MHz
- Noise Figure 15dB nominal
- Gain Control A.G.C.
- Tuning Control A.F.C.

## BASEBAND DEMODULATION / OUTPUT SECTION

- Baseband Frequency Range 30Hz to 8.5MHz AC coupled
- Baseband Output Level 1V p-p  
Negative Sync.
- Baseband Output Impedance 75 ohm, Type F
- Deviation 21.5MHz p-p
- De-emphasis CCIR Rec. 405-1

## VIDEO SECTION

- Output Signal Format NTSC,  
Negative Sync.
- Frequency Range 60Hz to  
4.2MHz AC coupled
- Output Impedance 75 ohm, Type F
- Output Level 1V p-p Adjustable
- External Video Input NTSC, 1V p-p,  
Negative Sync.
- External Input Impedance 75 ohm, Type F
- External/Internal Selection Rear Panel Switch

## AUDIO SECTION

- Tuneable Subcarrier 5.0 to 8.5 MHz
- Tuning System Dual F.S. System
- Sound IF frequency Dual 10.7 MHz
- Bandwidth 330kHz/150kHz changeable
- Noise Reduction DOLBY B ON/OFF
- Stereo Mode Direct/Matrix changeable
- Audio Output Level Dual 0dBm at 75kHz dev.
- Output Frequency Response 30Hz to 15kHz
- Output Impedance/Connector 600 ohm unbalanced, RCA Type Connector
- External Audio Input Monaural, RCA Type Connector
- External/Internal Selection Changed with Video simultaneously

## RF MODULATOR SECTION

- Output VHF 3 or 4 ch changeable
- VHF Antenna Input through when set off
- Output Level 66dB $\mu$ V Typ
- Input/Output Impedance 75 ohm, Type F

## OTHER FEATURES / SPEC.

- Electrical Polarizer Output 3 wire terminal
- Mechanical Polarizer Output 3 wire terminal
- Power Supply to ODU 17-21 V DC through Coaxial Cable
- Signal Level Indicator bar-graph LED
- Channel Indicator 7 Segment LEDs
- Audio Tuning Frequency Indicator 7 Segment LEDs
- Remote Control Infrared Keypad

## PRIMARY POWER

- Source 105 to 125V/47 to 63Hz (nominal 117V/60Hz)
- Fuse 1.0A AC 125V
- Power Consumption 39 watts

## MECHANICAL

- Size 16-1/2" (W)  $\times$  11-3/4" (D)  $\times$  20" (H)
- Weight less than 12 lbs.

All specifications are subject to change without notice.

If there is a problem with your equipment, first check the possible causes, as explained in this manual. If a service call is required, contact the selling dealer, or call M/A-COM Home TVRO Division at 704-324-2200 and request to be connected to Customer Service Department.

## WARNING

*HIGH VOLTAGES ARE USED IN THIS RECEIVER. EVERY EFFORT HAS BEEN MADE TO INSURE SAFETY AND RELIABILITY. IF A PROBLEM SHOULD OCCUR, DO NOT ATTEMPT TO REPAIR THE UNIT. THERE ARE NO USER SERVICEABLE PARTS IN THE IDU OR ODU.*

# A Note About Programming

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Satellite signals originate from a variety of sources and programmers. Some of these signals may be proprietary and intended for reception only by approved subscribers or subscription services. The manufacturer assumes no responsibility for the use of home TVRO systems by the purchaser, and regulations regarding their applications remain vague. However, the Federal Communications Commission has suggested that TVRO manufacturers communicate to their customers the following policy statement:

*"Use of this device may violate Section 605 of the Communications Act of 1934, as amended, through the unauthorized interception and divulgence of radio communications: or, the use of radio communications for one's own benefit where there is no entitlement to its receipt."*

Programming restrictions also apply to the use of video cassette recorders (VCR's). Compatibility between VCR and Home TVRO products does not imply consent or approval by the Home TVRO manufacturer for use where restrictions may apply.

Resale of video signals received from satellite is explicitly regulated. Home Receiver systems are generally not intended for such applications. In any use or application involving resale or distribution, the user should verify complicity with current laws, regulations, and approved procedures for use. Where required, local and federal licensing or franchise authorization is the sole responsibility of the user.



# Glossary of Terms

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**A/B Switch**—Switch that selects between A and B inputs and provides a single output.

**Analog**—Describes a system in which signals constantly fluctuate in a wavelike pattern, rather than in discrete steps. "See Digital."

**Antenna**—Intercepts and focuses electromagnetic energy (radio waves). Satellite antennas are usually parabolic, spherical or horn shaped.

**Attenuation**—Decrease or weakening of signal strength.

**AFC**—Automatic Frequency Control. A circuit which locks a Receiver to the desired channel frequency.

**AGC**—Automatic Gain Control. A circuit which uses feedback to keep Receiver output at a constant level.

**Azimuth (AZ)**—The antenna pointing angle measured in compass degrees clockwise from true north.

**Azimuth—Elevation Mount—(AZ-EL)**. Earth Station antenna mount having two separate adjustments; azimuth (bearing) and elevation of the satellite.

**Baseband Signal**—Complete set of signals (i.e., video, audio, energy dispersal waveform) transmitted on the carrier frequency.

**Bird**—(slang) A satellite.

**Carrier**—A modulated high frequency radio signal on which information is carried.

**Carrier-to-Noise Ratio—(C/N)** The noise ratio of received carrier power to noise power in a given bandwidth.

**Channel**—An assigned frequency band used as a signal path.

**Clamper**—A circuit which removes the energy dispersal waveform from the signal to make a "clean" video signal.

**Coaxial Cable—(Coax)** A cable consisting of an inner conductor surrounded by an insulating material (the dielectric) which is in turn surrounded by a conductive shield.

**Commercial TVRO**—A professional quality station that receives satellite transmissions and sells the programming to subcarriers.

**Composite Video**—Baseband video plus 4.5 MHz program audio subcarrier.

**Decibel—(dB)** The standard unit used for expressing transmission gain or loss as a power ratio.

**Demodulator**—A circuit which recovers modulated information from a carrier.

**Digital**—Describes a system or device in which signals change in discrete steps rather than continuously. See Analog.

**Dish**—Jargon for a microwave antenna; derived from the shape of the reflecting surface.

**Downconverter**—A circuit which converts a microwave signal (i.e., satellite) to one of lower frequency.

**Downlink**—The microwave signal transmitted from the satellite to the ground.

**Dual Polarization**—A system that operates in two perpendicular planes of polarization, normally termed horizontal and vertical.

**Earth Station**—Complete system of antenna and electronics used for transmit (uplink) and receive (downlink).

**Elevation**—The angle between the horizon and the satellite.

**Energy Dispersal**—The practice of frequency modulating the carrier to spread carrier energy over a wider bandwidth, thereby limiting peak energy. The clamper circuit in satellite Receivers removes this waveform.

**Feed**—Located at the antenna focus, the feed directs selected polarizations of the received energy into a waveguide or LNA.

**Footprint**—The pattern made by satellite signals projects on the earth's surface. The signal is strongest at the center of the pattern, and becomes weaker near the edges.

**Format**—The transponder frequency plan used by satellites. Satellites have either a 12 or 24 channel format.

**Frequency Coordination**—A service offered by companies with a large database of information about terrestrial microwave sites. For a fee, they will determine whether a potential TVRO site will encounter interference from terrestrial microwave links.

**Frequency Reuse**—The practice of overlapping channel frequencies in a 24 channel format by alternating polarity on adjacent channels.

**Gain-to-Noise Temperature Ratio**—(G/T)  
A figure representing the merit of a TVRO system based on evaluations of antenna size, LNA temperature and antenna pointing angles.

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**Geostationary**—A satellite orbiting the earth about 22,300 miles above the equator, and completing one orbit per day. Since it remains in the same position relative to any given location on earth, the satellite appears to be “fixed” in space.

**Gigahertz**—(GHz) One billion hertz or 1,000,000,000 cycles per second.

**High Power Amplifier**—(HPA) A device which increases the strength of a signal transmitted to a satellite (uplink).

**HTVRO**—Home Television-Receive only. Private Satellite Terminal.

**IDU**—Indoor Unit. Generally the receiver of an HTVRO.

**Interference**—Distortion of sound and/or picture caused by reception of an unwanted or stray signal.

**Intermediate Frequency**—(IF) An internal Receiver frequency to which all incoming signals are converted for the purposes of processing and filtering.

**°Kelvin**—(°K) A celsius temperature scale based on absolute zero, used to measure small amounts of noise in satellite equipment.

**Line Amplifier**—A device which boosts the satellite signal from antenna to Receiver along lengths of coaxial cable.

**Local Oscillator**—(LO) A device which generates a very stable signal that mixes with the desired received signal to produce an IF.

**Look Angle**—Refers to proper antenna adjustments for pointing to a given satellite. The antenna must be able to “see” the satellite without obstruction for clear reception.

**Low Noise Amplifier**—(LNA) A critical earth station component which amplifies the extremely weak signal collected by the antenna. A high quality LNA will generate a minimum of amplifier noise while amplifying the satellite signal.

**LNC**—Low Noise Converter Outdoor Unit comprised of LNA and Voltage controlled converter which converts selected transponder to 70MHz to feed receiver.

**LNB**—Integrated LNA and Block Down Converter converts 500MHz Satellite Band to intermediate frequency.

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Megahertz—(MHz) One million hertz or 1,000,000 cycles per second.

Modulator—A device that slightly alters a pure carrier to impress information.

Mount—Supporting structure for an earth station antenna.

Noise—Any unwanted signal which interferes with reception and impairs the quality of sound or picture.

Noise Figure—Compares the actual noise generated at amplifier input to the noise which would be generated under conditions of "ideal" resistance. This figure is expressed as a ratio; the lower the figure, the better the amplifier.

Noise Temperature—Refers to the amount of thermal noise generated by a device. The lower the noise temperature, the better the picture quality for a fixed amount of gain.

Orthomode Transducer—(OMT) A waveguide adapter that separates the vertical and horizontal polarization for a dual LNA system.

ODU—Outdoor Unit usually consists of an integrated LNA and down converter.

Pad—An artificial surface or platform, usually concrete, which serves as the foundation for an antenna or its supports.

Path Loss—Weakening of the signal (attenuation) as it travels between two points.

Polar Mount—Also called hour angle mount. Once properly installed, a single adjustment causes the antenna to sweep along the satellite arc. "See Az-El Mount."

Polarization—The orientation of the electric and magnetic fields determine a radio waves polarization. Common polarizations used in satellite communications are linear (horizontal and vertical).

Prime Focus—The technique of locating the feed directly at the focus of the antenna.

Radio Frequency—(RF) A frequency which can be transmitted without the use of wires.

Reflector—A large surface, usually parabolic, which is shaped to concentrate radio waves at a single point (focus).

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RCU—Remote Control Unit.

RX—Receive.

Sidelobe—Any off-axis antenna response.

Signal-to-Noise Ratio—(S/N) The ratio of the demodulated signal to the noise power at the output of the Receiver.

Slant Range—Length of the signal path from satellite to the receiving antenna.

Solar Outage—A loss of reception which occurs when the sun moves directly behind the satellite being received. An outage typically lasts only a few minutes and can occur at the same time of day for a week. This event happens twice a year and can be verified by seeing that the antenna feed casts a shadow directly in the center of the dish.

Sparkles—Dot or streak interference caused by a noisy signal.

Subcarrier—A portion of the receive baseband signal that contains the audio information.

Threshold Extension Demodulator—(TED) Reduces a Receiver's sensitivity to the noise accompanying all satellite transmissions. This allows the use of smaller antennas or noisier LNA's.

Transponder—The part of a satellite that receives a band of signals transmitted from earth, amplifies them and retransmits them at a new frequency. A satellite may contain 12 or 24 transponders (channels).

TVRO—Television receive only satellite earth station. The complete system that receives primarily television signals.

TX—Transmit.

Upconverter—Increases a transmitted signal's frequency, usually from intermediate frequency (IF) to radio frequency (RF).

Uplink—Refers to the transmitting earth station and the signal path from the ground to the satellite.

Video Signal—A portion of the receive baseband signal that contains only picture information.

Waveguide—A microwave conductor which minimizes signal loss.

# Warranty

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Equipment manufactured by M/A-COM is warranted to meet all published specifications and to be free from defects in material and workmanship for a period of one (1) year after delivery to the end user or for a period of 15 months from date of delivery to Distributor, whichever occurs first. The company's liability under this warranty is limited to servicing or adjusting equipment returned to M/A-COM's Authorized Service Center, freight prepaid. Equipment showing alteration, damage by misuse, abnormal conditions of operation or attempts to repair by others than authorized service personnel shall be excluded from this warranty.

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