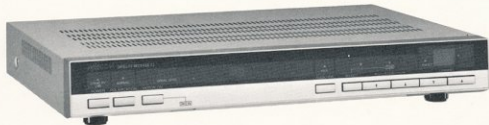




T2 Satellite Receiver Owner's Manual



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Congratulations. You have just purchased the M/A-COM T2, 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.

ATTENTION: POUR PREVENIR LES CHOCS ELECTRIQUES NE PAS UTILISER CETTE FICHE POLARISEE AVEC UN PROLONGATEUR UNE PRISE DE COURANT OU UNE AUTRE SORTIE DE COURANT, SAUF SI LES LAMES PEUVENT ETRE INSEREES A FOND SANS EN LAISSER AUCUNE PARTIE A DECOUVERT.



CAUTION

RISK OF ELECTRIC SHOCK
DO NOT OPEN



CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.



The lighting 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.

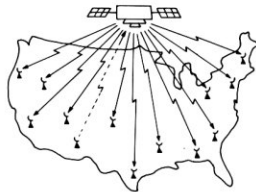


Figure 1. Satellite Television

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 (LNB) mounted on the antenna and a receiver.

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 LNB (2) is mounted at the focal point of the antenna and is attached to the feed. 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 LNB to the receiver (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.

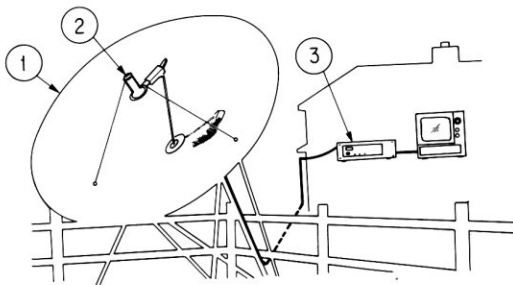


Figure 2. TVRO

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.

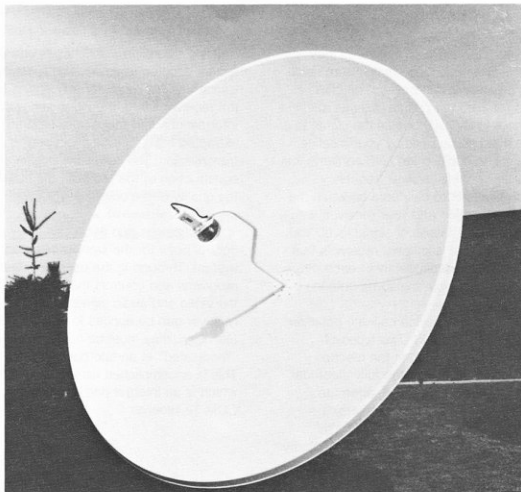


Figure 3. Antenna with LNB

Low Noise Block Converter (LNB)

Due to the extreme distances they must travel, television signals from satellites are very low in power. The LNB (also referred to in some texts as an Outdoor Unit-ODU) boosts the signal to a level that can be used by your satellite receiver. In addition the LNB converts the satellite signal to a lower frequency which is easier to distribute between the antenna location and your receiver, without significant losses of signal level. You may also install additional receivers that can operate independently of each other, when installed with the same antenna.

Frequently, a device called a polarizer is used with the LNB. 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 LNB.

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 T2 receiver.

System Integration

Successful operation of your TVRO will depend upon proper installation and interconnection of the individual components—antenna, LNB, polarizer, receiver and additional accessory items. 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 T2

The T2 Receiver is the center of your satellite system and features state-of-the-art microprocessor technology for improved performance and operation.

Designed for high reliability and ease of operation, the T2 features 24 channel tuning, automatic polarity selection using either motor driven or electronically operated polarizers, tuneable audio, remote control, and attractive styling.

FEATURES

- **"Soft-Touch" 24 Channel Tuning**
- **Separate Video and Audio Outputs**
- **Built in A-B Switch**
- **Infra-Red Remote Control**
- **LED Display of Functions**
- **VideoCipher Output for M/A-COM's VideoCipher 2**
- **Parental Supervision**
- **Auto-Polarization Control**
- **Programmable Tuneable Audio**
- **Adaptable to 12 GHz (DBS) Operation**

Installation

The T2 installation is not difficult, but correct connections are critical for proper T2 operation. Each T2 rear panel connector and switch is identified below. Refer to Figure 4 as necessary.

The installation procedure should be completed after making all outside cable and wiring connections. If the M/A-COM Multicable kit (part number: 0200-432) is supplied with the T2 receiver, refer to instructions packed within each kit for additional installation information. The T2 receiver **MUST BE UNPLUGGED** during installation.

Rear Panel Connections and Features

FROM SATELLITE ANT. (DC MAX 21V/ 250mA)—Cable connection from the antenna's LNB. The cable should be an appropriate coaxial cable and fitted with type-F connectors from the antenna's LNB. The outside LNB connector must be properly sealed and weather proofed.

VIDEOCIPHER OUTPUT—Connector provided for future use with M/A-COM's VideoCipher 2. Requires a RCA phono connector.

MONITOR OUTPUT (VIDEO)—Connector provided for connection to a VCR or Monitor for video information. RCA phono connector required.

MONITOR OUTPUT (AUDIO)—Connector provided for connection to a home audio system or to a VCR. RCA phono connector required.

VHF (TO TV)—Connector provided to connect output of T2 to TV set, Type F connector required.

VHF (CHANNEL 3/4)—Allows the selection of a VHF output channel from the T2, on channel 3 or 4. Select the channel that produces the best reception in your area.

VHF (FROM TV ANT/CABLE)—Connector provided for connection of a VHF signal from either an antenna or local cable service to the built-in A/B switch in the T2. When the T2 receiver is on, the selected satellite channel is connected to the TV set. When the T2 is turned off, the VHF local service is automatically routed to the TV set.

POLARIZATION OUTPUT—Terminals are provided for connection and control of either mechanical or electronic polarizers.

- ⏏ : Motor Power (+5V). For use with a mechanical polarizer.
- ⏏ : Pulse Output to the polarizer's motor. For use with a mechanical polarizer.
- ⏏ : Ground. For use with the mechanical or electronic polarizers.
- H : To the electronic polarizer "H" signal.
- V : To the electronic polarizer "V" signal.

Video Invert Switch—This control is used to invert the video outputs of the T2 during reception of 12GHz satellite transmissions. Set in normal position for 4GHz and in inverted position for 12GHz.

RECEIVE MODE (PRESET UNSCRAMBLED-PRESET SCRAMBLED-NORMAL)
—This control is used to enable presetting or setting up channel assignment for non-standard transmissions. For normal operations—set in normal position.

POLARIZATION (90° ADJUST)—This control for adjusting polarization 90° setting during installation.

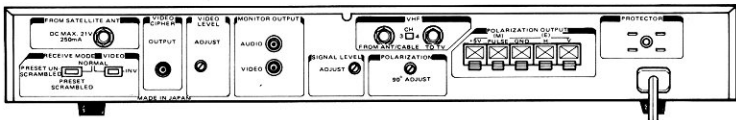


Figure 4. Rear Panel View

T2-FRONT PANEL

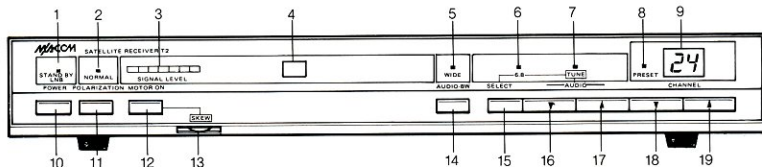


Figure 5. Front Panel View

ITEM	CONTROL/INDICATOR	FUNCTION	REMARKS
1	Orange LED	Indicates Power for LNB.	Always On When AC Power Connected
2	Green LED	Indicates Polarization Sensing.	Normal Position—RCA Satellites.
3	7 Segment Red LED	Indicates Received Signal Level.	Adjusted During Installation So 6 Segments On.
4	IR Sensor	Receive IR Signal From Remote Control.	
5	Orange LED	Indicates Audio Bandwidth.	On When Wide BW Select.
6	Green LED	Indicates Preset 6.8 Audio Selected.	Most Program Audio Is Carried On 6.8MHz.
7	Green LED	Indicates Audio In Tune Mode.	When In This Position—Using Controls 16 and 17 The Audio Can Be Tuned From 5.0 to 8.5MHz System Remember Last Setting For Each Channel.
8	Red LED	Indicates Receiver In Preset Mode.	When In This Mode and By Using Controls 18 and 19 An Individual Channel Can Be Set To Any Desired Frequency In the 950 to 1450MHz Range.

9	Green-Two Digit	Displays Selected Satellite Channel Or Audio Subcarrier.	Normally Shows Selected Satellite Channel. When Receiver Is In Audio Tune Mode And Control 16 or 17 Is Used Then Audio Channel Is Displayed.
10	Push/Push Switch	Turns T2 Receiver On Or Off.	Receiver On Indicated By LED's And CH Indicator Being On.
11	Push/Push Switch	Selects Normal Or Inverted Polarization Format.	In Normal Mode; Vertical—Odd, Horizontal—Even (RCA).
12	Push On Switch	Provides Power To Polaroter Motor.	This Switch Used In Conjunction With Skew Adjust (13).
13	Edge Type Rotating Control	Adjust Skew Of Polaroter.	When Switch 12 Is Depressed This Control Is Used To Adjust Polaroter For Best Picture, Satellite By Satellite.
14	Push/Push Switch	Selects Wide Or Narrow Audio Bandwidth.	When In Wide Mode Then Associated LED Is on (5).
15	Push/Push Switch	Selects 6.8MHz Or Audio Tune Mode.	In 6.8 Mode, Preset Audio Frequency Selected. In Tune Mode Any Audio Frequency Between 5.0 to 8.5 Can Be Select Using Controls 16 and 17.
16	Push Switch	Tune Audio Down In Frequency.	Operates Audio Tune Down When In Tune Mode.
17	Push Switch	Tune Audio Up In Frequency.	Operates Audio Tune Up When In Tune Mode.
18	Push Switch	Tune Satellite Channel Down.	Used To Select Desired Satellite Channel By Scanning Down When Pressed. Also Used During Preset Mode To Set A Desired Satellite Signal On A Particular Channel.
19	Push Switch	Tune Satellite Channel Up.	Used To Select Desired Satellite Channel By Scanning Up When Pressed, Also Used During Preset Mode To Set A Desired Satellite Signal On A Particular Channel.

T2 - REAR PANEL

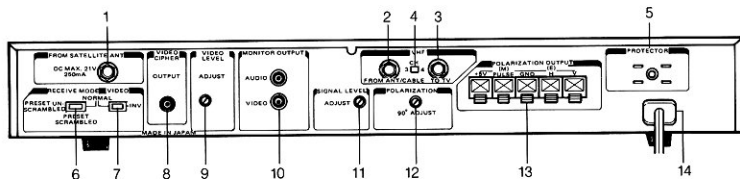


Figure 6. Rear Panel View

ITEM	CONTROL/CONNECTION	FUNCTION	REMARKS
1	"F" Type Female Connector	Connects Receiver To LNB.	Provides Signal Input To Receiver And DC Power To LNB.
2	"F" Type Female Connector	Connects VHF Signal From VHF Ant Or Cable.	Provides VHF Input To Receiver A/B Switch.
3	"F" Type Female Connector	Connects Output Of Modulator To TV.	Provides Channel 3 or 4 to TV.
4	Two Position Slide Switch	Select Modulator Output TV Channel 3 or 4.	Select Best Channel For Viewing Area.
5	Circuit Protector	Resettable Circuit Breaker.	Protects Receiver From Electrical Overloads.
6	Three Position Slide Switch	Selects Normal—Preset Scrambled And Preset Unscrambled.	This Switch Set In Normal Position For Standard Use. When Setting Satellite Channels For Non-Standard Operation Or 12GHz Operation Set Switch In Scrambled Or Unscrambled Position As Applicable.
7	Two Position Slide Switch	Selects Normal and Invert.	Used In Normal Position At 4GHz And In Inverted Position For 12GHz (DBS).
8	RCA—Phono Jack	Provide Unclamped De-Emphasis Broadband Video Output.	This Output Used To Connect To Descrambling Equipment.
9	Screw Drive Adjust	Adjust Video And Videocipher Output Levels.	Normal Set For 1 Volt Peak To Peak Level.
10	RCA Phono Jacks	Provide Video And Audio Outputs.	Used For Connecting To VCR/Video Monitor Or Audio Amp.
11	Screw Driver Adjust	Adjust Signal Level Indicator.	Adjusted During Installation So That 6 LED's Are On (Item 3 Front Panel).
12	Screw Driver Adjust	Adjust Polaroter 90° Angle.	Adjusted During Installation To Calibrate 90° Angle Of Polaroter.
13	5 Push In Quick Connect Terminals	Provide Connections For Motor Or Electronic Driven Polarizers.	Connect As Necessary To Type Of Polarizer Used.
14	AC Cord	Connects Receiver To AC Line.	Connector Is Polarized.

Operation

The T2 satellite receiver features a full logic operating system using state-of-the-art microprocessor technology. Most functions of the T2 can be controlled by the remote control unit (RCU).

This section describes the function and operation of the front panel controls, the rear panel controls and connections as well as the operation of the RCU.

NOTE: When the T2 is initially installed and as long as it is connected to the AC line, some portions of the unit are always energized. This is to ensure that power is continuously supplied to the LNB, and is indicated by a RED LED labelled "STANDBY LNB."

Front Panel Controls and Indicators

Refer to Figure 5.

POWER ON—Turns T2 ON or OFF. When T2 is on, all LEDs, including channel indicators are lit. When T2-OFF only standby LNB indicator is ON.

POLARIZATION SELECT—This control select, either "normal" or inverted polarization sensing for the auto select circuits in the receiver. The normal mode is indicated by a green LED (2) and is referenced to the RCA satellite format where the ODD channels are

vertically polarized and the EVEN channels are horizontally polarized.

MOTOR ON—This switch is used in conjunction with the SKEW adjust control (13) to properly align the polarizer with the Satellite being viewed, and with 90° adjust control located on rear panel (Fig. 6-12).

1. During initial installation, once proper mechanical alignment of the polarizer has been completely processed as follows:
 - a. Set Polarizer Select (11) in normal mode.
 - b. Select ODD channel on Satellite.
 - c. Depress Motor ON (12) and adjust SKEW control (13) for best picture.
 - d. Select even channel.
 - e. Depress Motor ON (12) and with screw driver adjust 90° adjust control on rear panel (Fig. 6-12) for best picture.

NOTE: Step (e) is initial installation adjustment only, and once set should not require readjustment.

2. Once step one has been completed for initial adjustment, then only the front panel controls, items (12) and (13) are required to adjust SKEW as you move from Satellite to Satellite.

Remember, when adjusting skew control you must simultaneously press motor on as you adjust skew control, for best quality picture.

SIGNAL LEVEL INDICATOR

This display indicates the relative signal strength of the received signal. During initial installation this level should be set so that 6 of the 7 LED segments are lit. An adjust is located on the rear panel for setting this level, and once set for a particular installation should not require further adjustment.

AUDIO BANDWIDTH SELECT (14)

This control selects either wide or narrow audio bandwidth and the wide LED (5) indicates that wide bandwidth is selected when on.

The narrow bandwidth improves the sensitivity of the audio reception for low level audio transmissions. Select the mode for best audio quality.

AUDIO SELECT (15)

Most satellite transponders transmit their program audio at 6.8MHz, but a few use other subcarrier frequency for program audio, as well as provide auxiliary audio service on additional sub-carriers.

The T2 has two audio modes—6.8MHz and tune. In the 6.8 mode a green LED (6) indicates this function is selected and no other adjustments are necessary.

In the tune mode as indicated by the green LED (7), the T2 audio circuits can be tuned either up or down from 5.0 to 8.5MHz using the audio tune controls (16) Down and (17) Up.

The tuned audio frequency is displayed on the channel indicator (9) during this operation.

To select a particular audio frequency, proceed as follows:

- a. Select tune mode.
- b. Depress either Audio Down (16) or Audio Up (17).
- c. Channel selector will display two digit display of frequency.
- d. Hold or depress twice audio tune up or down and frequency display will change.
- e. As soon as audio circuits detect an audio signal they will stop. If you are holding tune control and if this is the desired signal, release control. If this is not the desired signal, repeat (d) and (e) until desired signal is received.

NOTE:

1. When you are setting audio tune, if you continue to depress control audio circuits will scan, stop at a detected signal, then begin to scan if you continue to depress control. A little practice with this function will assist in familiarizing yourself with the audio tune features.
2. Once a particular audio channel has been set in the tune mode, that channel will remain in the microprocessor memory for that satellite channel, until reset by the user. This feature allows you to program one audio channel for each satellite channel. These programmed audio settings are immediately available simply by selecting "Tune Mode".

Channel Select (18) (19)

The T2 is capable of tuning through 24 Satellite channels. To change channels either push (18) down or (19) up and the T2 will step up or down through the channels as long as these controls are depressed.

Rear Panel Controls and Connectors

Refer to Figure 6.

Most of these connections and/or controls are identified and explained in the Chart.

RECEIVER MODE (6) (7)

The T2 receiver is an extremely versatile unit and has been designed to be adaptable for use in either 4GHz or 12GHz applications when connected to an appropriate ODU. When the T2 is delivered, all channels 1 through 24 are factory preset for standard 4GHz operation.

However, should you desire to re-program particular channels, or use your unit for 12GHz operation, proceed as follows:

- a. If presetting for 4GHz operation, set normal-INV switch (7) to normal.
- b. Set channel selector on front panel to desired channel 1 through 24.
- c. Determine if signal to be viewed is scrambled or unscrambled. If scrambled set switch (6) in preset scrambled position. If unscrambled, set preset in unscrambled position.

NOTE: Preset LED on front panel (8) will be on.

- d. Depress either switch (18) or (19) on front panel to increase or decrease frequency. T2 will scan until a signal is detected and will then lock up. If the signal is detected, proceed to (e), if not repeat (d) until desired signal obtained.
- e. When desired signal is obtained, position switch (6) in normal position. Preset LED on panel will extinguish, channel is now set and will remain programmed until changed.

If 12GHz channel setting is desired, change step (a) to set switch (7) in INV position and perform all steps (a) through (e).

Remote Control Unit (RCU) Operation

W-ANT-E—Antenna east and west controls designed to interface with the T2 Antenna Controller.

AUDIO BW—Wide/Narrow. See front panel control Audio BW.

POWER—Turns T2 On and Off.

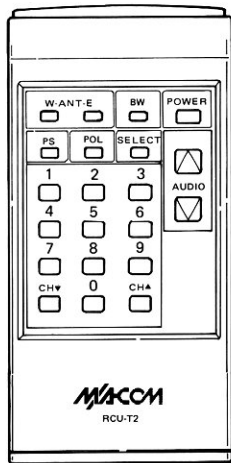
PS (Parental Supervision)—enables parental supervision of selected channels. Operation instructions follow:

1. Tune to the channel to be supervised by depressing the T2's Up/Down keys or by direct tuning with the RCU.
2. Press the PS key on the RCU. (Supervised channel is now inaccessible by direct tuning with the T2 front panel up/down channel keys.)
The RCU must be secured to provide complete parental supervision.
3. Release the parental supervision by direct tuning of the supervised channel with the RCU.

SELECT—Allows the remote operation of the T2's audio select feature. (See front panel controls—SELECT.)

AUDIO TUNE—Allows the remote tuning of audio frequencies between 5.0—8.5 MHz. (See front panel controls—TUNE.)

CHANNEL SELECTION—The RCU provides two types of channel selection; direct entering of the channel number or channel scanning by pressing the Channel Up/Down keys. (Ch ▲ / ▼).



Maintenance

The T2 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 LNB contains no user serviceable parts. Opening or tampering with unit will void the warranty.

Troubleshooting

The T2 is designed to give years of troublefree service. However, if a problem should occur, 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) Circuit Breaker tripped No LNB Power indication 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 LNB Malfunction

Specifications

GENERAL

- Dual heterodyne downconversion with Low Noise Block Converter (LNB)
- Voltage Synthesizer tuning system capable of receiving any of 24 channels (3.7 to 4.2GHz Satellite TV Band)
- Electrical/Mechanical dual Antenna Polarization control outputs
- Full-function remote controllable with infrared control unit (RCU)

INPUT SECTION (Input from LNB)

- 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 27 MHz
- Noise Figure 15dB nominal
- Gain Control A.G.C.
- Tuning Control A.F.C.

VIDEOCIPHER OUTPUT SECTION / BASEBAND DEMODULATION

- Baseband Frequency Range 30Hz to 8.5MHz AC coupled
- Baseband Output Level 1V p-p
Negative Sync.
- Baseband Output Impedance 75 ohm
- 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
- Output Level 1V p-p Adjustable

AUDIO SECTION

- Tuneable Subcarrier 5.0 to 8.5 MHz
- Tuning System F.S. System
- Sound IF frequency 10.7 MHz
- Bandwidth 330 kHz/150 kHz changeable
- Audio Output Level 0 dBs at 75 kHz dev.
- Output Frequency Response 30 Hz to 15 kHz
- Output Impedance/Connector Less than 2 kohm RCA Type Connector

RF MODULATOR SECTION

- Output VHF 3 or 4 ch changeable
- VHF Antenna Input through when set stand-by
- Output Level 66 dB μ V Typ
- Input/Output Impedance 75 ohm, Type F
- Antenna Terminal Leak 9.53 dB μ V max.
(FCC TV interference regulation specifications)

OTHER FEATURES / SPEC.

- Electrical Polarizer Output 3 wire terminal
- Mechanical Polarizer Output 3 wire terminal
- Power Supply to LNB 17-21 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 125 V/47 to 63 Hz (nominal 117 V/60 Hz)
- Power Consumption 42 watts max.

MECHANICAL

- Size 16-1/2" (W) \times 10-4/5" (D) \times 2-1/2" (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 your M/A-COM dealer or call the M/A-COM Cable Home Group's Customer Service Department at 704/324-2200.

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 RECEIVER OR LNB.

A Note About Programming

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

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 4.5MHz 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.

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.

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).

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.

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