SYSTEM INDUSTRIAL TECHNOLOGY
TELECOMMUNICATIONS

Analog Set-Top Terminals
Baseband Addressable Terminal With On-Screen Display [CFT2000]

FEATURES

- **On-screen display**
- **Electronic program guide capability**
- **Unmatched baseband scrambling**
- **Fully downloadable**
- **Subscriber messaging**

The Motorola CFT-2000 is a 550 MHz impulse-capable baseband terminal with consumer-friendly on-screen display programming capability and the unmatched scrambling security of baseband technology.
SUBSCRIBER FEATURES The on-screen display feature is sophisticated, yet easy to use. Multi-colored, simple-format menus and help message screens walk subscribers through the steps required for even the more complicated terminal functions, such as VCR timer programming, sleep timers and parental codes. It also makes purchasing PPV events and services even more convenient. **Channel I.D.** When a subscriber changes channels, the on-screen display identifies the channel number and channel name, as well as whether the terminal is locked, parentally controlled, and if it is tuned to a favorite channel. **Volume Control Bar.** When a subscriber presses the volume up/down key, the volume control bar appears on the screen. The bar's movement visually indicates whether the volume has increased or decreased. The CFT- 2000 passes BTSC stereo signals, allowing subscribers with stereo televisions or VCRs to receive and enjoy stereo programming. The volume control bar also indicates the best stereo point for optimal stereo sound. **VCR Timers.** Subscribers can quickly program up to eight events over a 365-day period. The CFT-2000 makes it possible to program events on a one-time, daily, weekly, weekday and weekend basis. It is also easier to review and correct already-programmed events. The "A/B-Out" switch consists of a self-contained shielded switch in a four port configuration.

Parental Control. The on-screen menus make it easier to activate and deactivate parentally controlled channels. The lock and key symbols, as well as parental control barker messages, remove any doubt whether the parental control feature is in use.

Alarm Timers. This feature makes it possible for the subscriber to program the CFT-2000 to turn on or off at a specified time. This can be done once or on a daily basis. The sleep timer can be programmed to turn off the terminal anywhere from 30 minutes to three hours.

Subscriber Control Over Display Features. Research has shown that subscribers have different preferences for either a clear or solid menu background. The CFT-2000 allows the subscriber to change the menu background to clear screens, partial or solid, depending on personal preference. They can also adjust the centering of the menus on their televisions.

Remote Controls. The CFT-2000 offers a choice of three remote controls - the MRC-OSD, TVRC-OSD, and the universal remote control (XRC). The MRC is a full featured remote capable of operating all functions including OSD. The TVRC-OSD remote control allows the subscriber to turn the television on and off, and control the TV's volume, thus reducing the number of remotes the subscriber needs to use. The XRC is a universal remote which controls a TV, VCR, and Aux devices in addition to the set top.

OPERATOR FEATURES

The CFT-2000 provides multiple screens of message space that operators can use to notify customers of important information. These screens can be used to verify customer appointments, remind customers of service changes or disconnect dates, and explain service outages. Notifying subscribers of weather hazards in the area is another example of how the operator can use this feature. In addition, the message screens can serve as promotional tools, advertising upcoming pay-per-view events and services and limited free pay TV viewing, as well as important community events. They offer the potential for other creative revenue generating ideas, such as targeted local advertising. Using the CFT-2000, operators can send messages to specific subscribers, to a group of selected subscribers, or to the entire subscriber base, if so desired. Messages can be custom designed with Motorola's unique message editor, allowing operators to tailor their messaging ability to suit specific needs.

BARKERS

The CFT-2000 comes with two types of barkers terminal-activated and operator-activated allowing flexibility for operators who wish to guide subscriber viewing. All barker messages can be edited by the operator.

Terminal-Activated Barkers. In addition to providing video off-tuning, the operator can choose to display a character-generated message explaining why this channel is off limits and what steps are necessary to change this (unlock the box, order the PPV service, etc.) The CFT-2000 offers a total of six terminal-activated barkers: four standard barkers (parental control, impulse PPV, unauthorized pay and disconnect) and two optional barkers (turn-on that appears each time the subscriber turns on the terminal, and out-of-credit). These barkers are found in the channel map.

Operator-Activated Barkers. These only appear on scrambled channels that the subscriber is authorized to view. The operator can use these to verify purchase of PPV events and services or to provide movie/event specific information (movie running time or movie description). Operator-activated barkers can be programmed and sent on a specific scrambled channel to an individual subscriber, a group of subscribers or the entire subscriber base.

DOWNLOADABLE SYSTEM PARAMETERS

Downloadability gives the cable operator greater control and ease of operation. Using the AH-4E or ACC-4000 controller the operator can download such features as subscriber address, system site code, geographic code, output channel, barker channel, time-out period and custom channel assignment.

This downloading capability provides operator benefits such as centralized control over system functions, simplification of the installation process and reduction of inventory requirements. The software-selectable output channel capability enables the operator to easily switch between two different terminal output channels (3/4). This helps reduce inventory requirements by allowing interchange of terminals between systems. The 3/4 output channel allows for compatibility with subscriber VCRs so subscribers need not tune to one channel to watch TV and another to use the VCR.

IMPROVED SIGNAL SECURITY

Model CFT-2000 descrambles Motorola's modes of dynamic video inversion coupled with dynamic sync suppression. It also offers audio privacy. Motorola's baseband scrambling scheme offers the most secure signal in the cable industry today, protecting operator investments in expensive pay and special event programming.

ELECTRONIC PROGRAMMING GUIDE (EPG)

The operator can use the CFT-2000's in-band and out-of-band messaging capability to provide program guide information to subscribers. The ways of presenting this type of information - as well as the type of information presented - are numerous. Examples of EPG information include movie and/or program specific descriptions of current and/or future programs or movies. Schedule information is another possibility. Events/programs in a specific time period could be organized by subject matter.

TWO-WAY UPGRADABILITY

The CFT-2000 is upgradable to two-way operation using Motorola's STARFONE® and STARVUE® internal modules. The CFT-2000 lets operators offer push-button impulse pay-per-view programming to subscribers without expensive rework.

ZENITH AND TOCOM COMPATIBLE

The CFT-2000 can be factory-ordered to be Zenith- or Tocom-compatible. A CFT-2000/Z (Zenith) or CFT- 2000/T (Tocom) consists of standard set-top (CFT 2000) equipped with special Zenith "Z-Tac" descrambling circuitry or Tocom descrambling circuitry. The MVP-II/Z or MVP-II/T is used to insert Motorola formatted data on clear video. This is then fed to the Zenith or Tocom encoder for scrambling and communications. The MVP-II/Z supports Zenith sync suppression and video inversion scrambling modes. The MPV-II/T supports all Tocom scrambling modes. The video output of the Zenith- or Tocom-compatible MVP-II provides the video source for their respective encoders. Hardware modification of the Zenith or Tocom encoder is not required, nor is there any change in the operation of either system. The only change consists of installing a MVP-II/Z or MVP-II/T in every channel to be descrambled by a Zenith- or Tocom-compatible Motorola terminal. The MVP-II/Z and MVP-II/T are fieldupgradable to standard Motorola MVP-IIs.

Specifications
Analog Set-Top Terminals Baseband Addressable Terminal With On-Screen Display[CFT-2000]

MODEL	CFT 20*# (* = 1 way/2 way; # = output channel 3/4)
Input Frequency	54-550 MHz (excluding data carrier frequency)
HRC/IRC Frequency Assignments	Downloaded
Number of Channels	80 channels per cable; one or two cables (less 2 channels; one for data frequency and one for OSC.
Dual A/B Cable Switching	Optional A/B switch (field upgradable)
A/B Cable Indicator	LED in front display
Input Video Level	0 dBmV to +15 dBmV
Input Sound Level	-13 to 17 dBc
Data Carrier	FSK Modulated FM Carrier
Frequency	106.5 or 108.5 MHz
Bandwidth	±200 kHz standard FM
Level	-15 dBmV
Video S/N	48 dB @ 0 dBmV input level
Fine Tuning	Automatic
AFT Capture Range	±300 kHz @ input level of 0 dBmV to +15 dBmV
Output Frequency Accuracy	±150 kHz
Return Loss:	
Input	5 dB Min.
Output	8 dB Min.
Spurious:	
Output	-57 dBc Max., in band
Cross Modulation Distortion	-56 dB (82 channels, each @ +15 dBmV)
Composite Second Order Distortion	-56 dB (82 channels, each @ +15 dBmV)
Second Order Distortion	-60 dB (@ +15 dBmV input level)
Composite Triple Beat Distortion	-56 dB (82 channels, each @ +15 dBmV)
Converted Input Beats (With all Input Signals)	-25 dB (82 channels, each @ +15 dBmV)
Output Level	10 to 15 dBmV
Isolation (Input/Output)	70 dB Min.
Differential Gain	10% (Max.)
Differential Phase	10° (Max.)

Scrambling Method	Gated Sync Suppression or Dynamic Gated Sync Suppression, Video Inversion, Audio Privacy, Hamlin Compatibility
On-Screen Display	Character Size : 12x18 pixes Screen Size: 12 rows x 24 columns Message/Barker Capacity: 14 pages Channel Descriptors: 4 Characters, Maximum
Parental Control by Channel	100% user-controlled offering channel-by-channel selections
Mechanical Security	Std.: Security screws; security pin; uni-chassis construction
Downloadable Parameters	Output Channel Terminal Configuration Authorization Information Barker Channel(s) Consumer Feature Enable/Disable Subscriber Messaging Channel Descriptors Channel Cross Reference Map
Two-way System Compatibility	Upgrade in field by addition of STARVUE® OR STARFONE® internal module
Operating Temperature Range	59°F to 104°F (15°C to 40°C)
Operating Humidity Range	5% to 95% (non-condensing)
AC Voltage	105 Vac to 125 Vac, 60 Hz
Power Dissipation	16 Watts at 120 Vac
Surge Protection	Surge protection provided on power supply and RF ports
Size	10.25" x 8.25" x 2.7" (LxWxH) (260.4 mm x 209.6 mm x 68.6 mm)
Weight	5.5 lbs

Motorola's Impulse Model CFT-2000 Handheld Remote Controls

MRC-OSD Transmission Range	Up to 25 feet in a direct line from the receiver/terminal or up to 22 feet at an angle of ±20 degrees from receiver centerline	Power Requirements Weight Batteries	Two 1.5 V AAA Batteries 3 Ounces (with battery) Included as standard
TVRC-OSD/D Transmission Range	Up to 25 feet in a direct line from the receiver/terminal or up to 22 feet at an angle of ±20 degrees from receiver centerline	Power Requirements Weight Batteries	Four 1.5 V AAA Batteries 10 Ounces (with battery) Included as standard
	Receiver centerline		
XRC Transmission Range	Up to 35 feet in a direct line from the receiver/terminal at 0 degrees and 35 feet at any angle of up to ±30 degrees axial	Power Requirements Weight Batteries	6 V 6.5 Ounces (with battery) Included as standard, Two 1.5 V AA