

INTRODUCTION

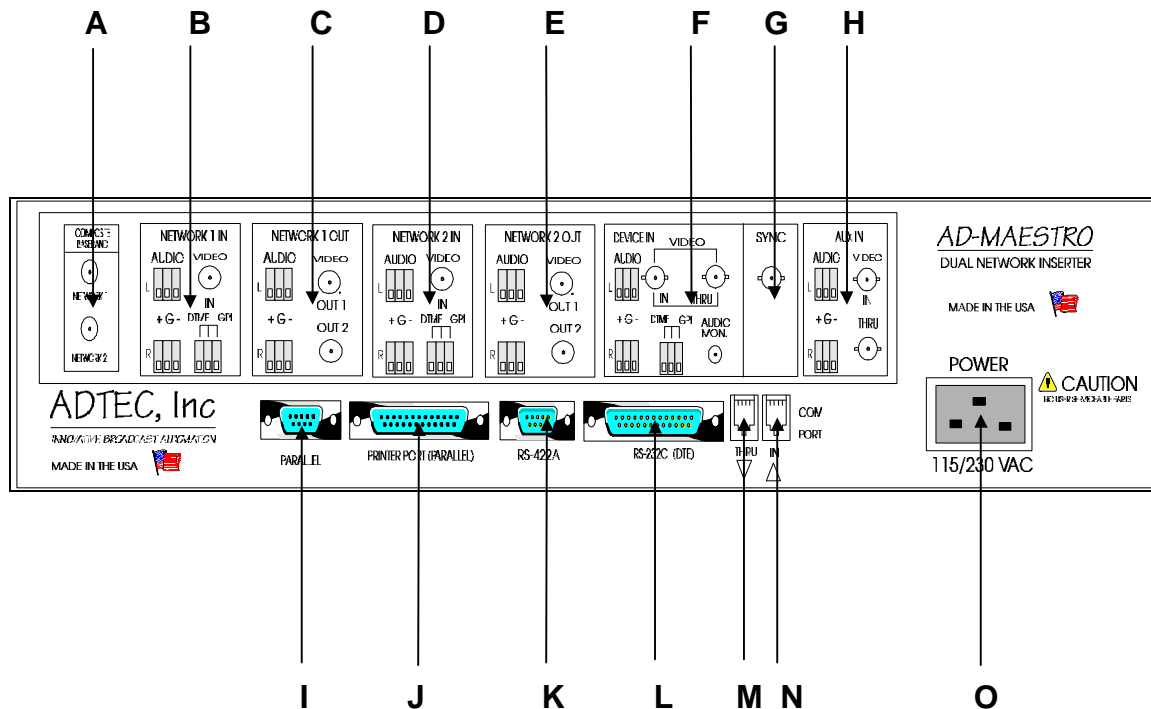
Congratulations on purchasing ADTEC's AD-MAESTRO. The AD-MAESTRO is a dual network program insertion device that contains a host of features that make it both powerful and easy to use. It's ideally suited to generate revenue by offering dependable operation you can count on, while not requiring too much time to operate. State of the art technology, high grade components and quality engineering are combined to give you broadcast quality and reliability with unprecedented flexibility and ease of use all for an economical price.

WHAT IS AN AD INSERTION DEVICE

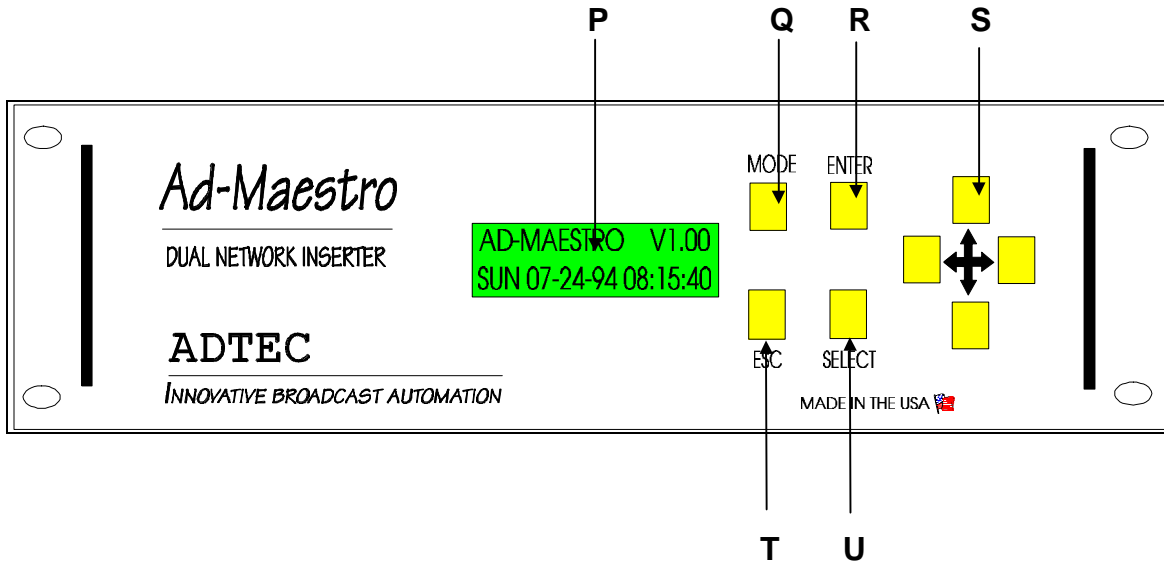
The AD-MAESTRO is an audio/video program insertion device. It can be used to insert local origination programs over an existing program. The existing program (the one you want to broadcast most of the time) is typically supplied by a broadcast network and is called the "Network Feed". The network feed usually arrives via satellite, but it can originate locally. Normally, the controller does nothing to interrupt the network feed. At specific times, however, the AD-MAESTRO inserts local origination programs, thereby overriding the network feed's programming. Typically, these locally originated programs are commercials or PSA's. The AD-MAESTRO can be programmed to offer a great deal of control about how and when it inserts.

Figure 1 Simplified diagram of AD-MAESTRO controller connections.

BACK OF AD-MAESTRO



FRONT OF AD-MAESTRO



CON.	DESCRIPTION
A	Composite Baseband Decoder Input from Satellite Receiver
B	Network 1 Video/ Audio and DTMF/GPI Input (DTMF/GPI not used if internal demodulators are used)
C	Network 1 Video/Audio Out (Video Out 2 for monitor, NO RELAY BYPASS)
D	Network 2 Video/ Audio and DTMF/GPI Input (DTMF/GPI not used if internal demodulators are used)
E	Network 2 Video/Audio Out (Video Out 2 for monitor, NO RELAY BYPASS)
F	Device Video/Audio and DTMF/GPI Input (Video through and Audio Mon. for monitor, Video Through must be terminated into 75Ω)
G	Sync Out to device
H	Auxiliary Video/Audio Input (Video through for monitor or loop, Video Through must be terminated into 75Ω)
I	Parallel Control (PSJ-03 Series or WUVR/IUVR Interfaces)
J	Parallel Printer Port
K	RS-422A Control Port (DTE Data Terminal Equipment)
L	RS-232C Control Port (DTE Data Terminal Equipment)
M	Communications Port Through
N	Communications Port In
O	115/230 VAC input
P	40 Character LCD Display
Q	Mode Key
R	Enter Key
S	Cursor Key(s) Clockwise UP, RIGHT, DOWN, LEFT
T	Escape Key
U	Select Key

WHAT IS ROS INSERTION

“ROS” is an acronym for “Run Of Schedule”. It describes how the AD-MAESTRO will be controlled. In ROS insertion, the insertion of local programs is controlled by the schedule of the network feed. In other words, the network feed “run of schedule” controls how and when the AD-MAESTRO will insert local programs over the network. For ROS insertion, the AD-MAESTRO is programmed to react to commands sent by the network. It monitors the network for specific control information such as a DTMF tone sequence or GPI. When it receives the control information, it performs preprogrammed tasks such as inserting a sequence of commercials or other programs. After the inserted program has finished, the AD-MAESTRO reverts back to the network. The tape is sequenced by DTMF tones placed on a single audio channel. A rewind DTMF tone at the end of the tape causes the tape to rewind and park on the first commercial.

WHAT IS MROS INSERTION

“MROS” is an acronym for “Modified Run Of Schedule”. It is an advanced version of ROS that is unique to the AD-MAESTRO. Whereas ROS is completely controlled via network and video device DTMF tones. MROS is controlled by scheduled events in conjunction with DTMF tones. Commercials can be programmed to run during certain window avails only. For example, if commercials 10 through 20 on a spot reel are desired to run during 3 to 6 PM, the AD-MAESTRO will park to the 10th spot at 3 PM and cycle 10 through 20 from 3 to 6 PM. The park to the 10th spot is accomplished by playing (not fast forward searching) the tape until it hits the 10th park tone. If the tape is running ROS and is at any spot less than 10 (i.e. spots 1 - 9), when 3 PM arrives, it will simply play and park on the 10th spot. If the spot reel was past the 10th spot at 3 PM, a rewind command will be issued, then the deck will park to the 10th spot. This “play speed” park must be accounted for when estimating MROS schedules.

MORE ABOUT THE AD-MAESTRO

Before we dive into the particulars of programming and wiring connections, lets take a few minutes to explore the capabilities, features, bells and whistles of each component of the AD-MAESTRO. By gaining a thorough understanding of what the AD-MAESTRO controller can do, you can exploit its features more efficiently to apply it to your broadcasting needs. Some of the principal features of each of the controller's components is discussed below.

NETWORK FEEDS (Television Receive Only, TVRO)

1) *Two network feed capability* - The AD-MAESTRO controller can perform program insertion on up to 2 different network feeds. Each network feed is a signal on to which the AD-MAESTRO will insert local programming. Each feed is independent from the other and can maintain its own unique schedule of insertion. Although the controller can insert programming on each network feed independently, keep in mind that the sources of the inserted programming (1 video device and 1 auxiliary feed) are shared between both networks. Time conflicts can occur when one network requests a source and the source is busy serving the other network feed. Therefore, it is important to match networks that have differing avail times. If a dedicated device to network relationship is required, the AD-MAESTRO can be used as a single channel unit.

2) *Feed monitoring* - Each network feed can be monitored for control information utilizing either internal or external composite baseband demodulators. Both types of demodulators provide DTMF (dual tone multi frequency) tones from the network feed to the controller. The controller can be programmed to recognize several different sequences of DTMF tones and to perform different tasks for each specific tone sequence. In addition, GPI (General Purpose Interface) triggers can be used to control each network. The triggers must be generated by an external device and delivered to the controller in the form of a contact closure or open collector TTL circuit.

- 3) *Initiation of program insertion* - Program insertion may be initiated three different ways:
- By a program insertion command generated by the network feed (DTMF or GPI).
 - By a start time as determined by the controller's time clock.
 - By a program insertion command generated by some other external source (DTMF or GPI).
- 4) *Return to network after program insertion* - The return to network feed following a program insertion can be initiated three different ways:
- By a return to network command generated by the network feed (DTMF or GPI).
 - By the elapsed avail time as determined by the controller's time clock.
 - By a or b, whichever comes first.
- 5) *Loss of power bypass routing* - In the event of a power failure, the AD-MAESTRO will default each networks video and audio source to its respective output.
- 6) *Logging and Verification* - The AD-MAESTRO controller maintains a log of all activity for both networks, video device and auxiliary inputs. This log includes information regarding network DTMF tones, date and time of insert, and verification by DTMF ID tone sequences. In addition to providing a log and verification of inserts, the AD-MAESTRO logs all received DTMF tones (network 1 and 2), device PARK and REWIND information. This information is filtered out for the billing interface. It is, however, available for system maintenance and troubleshooting.
- 7) *Verification of video from system's video device* - The AD-MAESTRO controller monitors the video signal generated by the system's video device (VCR or Digital device) before and during the insert. If the system's video device cannot generate good video during the pre-roll, the controller will not insert. The log will state such a condition and the AD-MAESTRO will PARK on the next commercial. If the system's video device cannot detect good video during a insert (after the pre-roll and "on air"). Then the controller, at the users discretion, will either default back to the network feed, auxiliary source, or stay "on air" with the commercial. Video verification is not available for the auxiliary source input.
- 8) *Dynamic audio level control* - The audio level of each network out (1 and 2) can be controlled in two different ways. By controlling the network out, the gain or level of the network, device or auxiliary audio can be controlled.
- A constant gain adjustment (**COMPRESSOR OFF**) can be assigned at -6 dB, -4 dB, -2 dB, 0 dB, 2 dB, 4 dB, 6 dB or 8 dB. The gain adjustment will amplify or defeat the incoming audio level by whatever amount the gain adjustment is set for. For example, if the gain adjustment is set at 4 dB, then the corresponding network out would always be amplified by 4 dB.
 - Absolute gain adjustment (**COMPRESSOR ON**) to a specific level. The controller contains an audio compression/amplification circuit which will automatically adjust the network audio out level to reach a target level of -6 dB, -4 dB, -2 dB, 0 dB, 2 dB, 4 dB, 6 dB or 8 dB. To function properly, the incoming audio level must be within the range of -10 dB to 8 dB. The controller will automatically adjust the audio level up or down to reach the target absolute audio level you assigned for that network out.

NOTE: Using the audio compression/amplification (**COMPRESSOR ON**) feature will limit the dynamic range (natural variations in volume level) of the network out audio signal. Audio on the network out will tend to occur at the same level whether it's a whisper or a shout. In particular, it is not recommended for music since music naturally contains audio with a very wide dynamic range.

9) *Sync Routing* - The AD-MAESTRO is capable of striping the sync component of either network feeds video signal and routing it to the video device. During the pre-roll, the AD-MAESTRO routes the sync signal from the corresponding network to the video device. This allows the video device to synchronize (or genlock) its video to that of the network.

10) *Vertical interval switching* - When the AD-MAESTRO inserts a program and switches the network feed to or from the system's video device, the actual switch occurs during the vertical interval of the outgoing signal. This makes for perfectly seamless insertion when the two signals are synchronized. In order to take advantage of this feature, the system's video device (VCR, Digital device) must have a sync signal input. Vertical intervals of both the network feed and the video device must be synchronized (genlocked) in order to insure seamless switching.

VIDEO DEVICES FOR INSERTION

The AD-MAESTRO can insert video onto its network feeds from two different sources; a controllable video device (VCR, Video Disk, or Digital device) and an auxiliary source.

DEVICE CONTROL- The system's controllable video device can be a VCR, video disc player, digital video device, etc. The main requirement is that the controller be able to control it. The controller has three different connections for video device control: a parallel port, RS-422 port, and RS-232 port. Between these ports, control of almost any device is possible. Contact your friendly ADTEC representative for specific applications. Two way (full duplex) control between the video device and the controller is very highly recommended for true automatic insertion. The full duplex control provides the AD-MAESTRO with information from the tape deck such as tape status. This information is standard with RS-232 and RS-422 control. It can be achieved with parallel interfaces such as Sony's 33 pin, Panasonic's 34 pin and JVC's 45 pin interface. Adtec offers the PSJ-0333 for Sony, the PSJ-0334 for Panasonic and the PSJ-0345 for JVC. If devices with one way control (half duplex) are to be controlled by the AD-MAESTRO, then the tape sense function is not automatic and operator intervention will be required when tapes are changed. Once the PARK command has been manually issued, the AD-MAESTRO will operate fully automatic until a tape change is made. Adtec offers the WUVR-01, WUVR-02 and IUVR-01 interfaces for devices with one way control. Consult your sales representative for the model that fits your video device.

TAPE CUEING - The ROS and MROS version of the AD-MAESTRO is capable of controlling video devices via DTMF tone sequences contained on one of the device's audio tracks. The Ad-Maestro provides for four unique device DTMF tone sequences; these include a PARK, a SWITCH, a REWIND and a ID DTMF tone or sequence of DTMF tones. They are defined by the user and make it possible for the Ad-Maestro to use tapes produced for other manufacturers inserters (DTMF versions only). Below we will describe in more detail the preparation of tapes and options that can make tape preparation simple.

TAPE PREPARATION FOR THE AD-MAESTRO

If you have experience in using commercial insertion hardware that uses DTMF tones, you can set up the Ad-Maestro to use those tapes with out changing a thing on the tape. If commercial insertion is new to you, then carefully read this section and apply the techniques described to produce tapes for the Ad-Maestro. We will begin by defining terms used to produce tapes for the Ad-Maestro.

DTMF tone generator: If you are starting from scratch, you will need a DTMF tone generator to generate the DTMF tones. There are two options that ADTEC offers, the first is a advanced DTMF tone generator that includes the A, B, C, D tones along with the numeric and *, # tones.

This DTMF generator also has a GPI input to allow edit controllers to GPI the generator to generate the DTMF tone stored in memory location 1. This is extremely useful in that it will speed up the production process and make your audio inserts more accurate and in effect make your on air look more professional. ADTEC's part number **DTMFGEN1** can be ordered for \$ 450.00. The second type of DTMF generator is a modified pocket dialer. This unit only provides the numeric and *,# keys. It does not have the GPI option, this means you will have to press the key to generate the DTMF tone desired to insert onto the audio channel. ADTEC's part number **DTMFGEN2** can be ordered for \$50.00. (Note: the DTMFGEN2 is a modified radio shack pocket dialer (43-146), the modification simply adds a line out that is paralled with the speaker.)

PARK TONE: This is the DTMF tone (or sequence of up to four DTMF tones) used to park the tape. Parking the tape is another term for playing the tape until the park tone is heard and stopping the tape at that instant. It is recommended to use a single DTMF tone for the park tone.

SWITCH TONE: This is the DTMF tone that initiates a switch from network to the tape. This DTMF tone is infrequently used as the Park Frames is a simpler and just as effective way to initiate the switch. Some older ROS type inserters required a switch tone, therefore the Ad-Maestro has this option to facilitate use of those tapes. If you are producing tapes a new, it is not recommended to use a switch tone.

REWIND TONE: This is the DTMF tone used to initiate a rewind. It is placed either at the point where a park tone would be placed at the end of the last spot on the tape, or at some point after the last spot on the tape. Make sure the rewind tone is not more than 1 minute past the last spot on the tape. The Ad-Maestro supports Modified Run of Schedule insertion using DTMF tones. By defining the ENDING SPOT (see KEYSCHEDULE-6) the Ad-Maestro will initiate a rewind after the Ending Spot number entered in VTR settings. ADTEC recommends that a rewind DTMF tone be placed on the tape as a safe guard in the event that the ending spot number is entered incorrectly or not at all.

ID TONE: This is a sequence of DTMF tones used to Identify the spot. It can be up to 15 DTMF tones long (typical lengths are 6 to 8). Be sure not to use a PARK, SWITCH or REWIND tone in the ID. The ID tone is typically placed in the middle of a spot. Examples of ID tones would be 000301, 008706 etc. Most billing packages use the first four DTMF tones to identify the client and the second two to four DTMF tones to identify the spot number.

The DTMF tone 000301 would identify client 0003 (Three) and spot 01 (one).

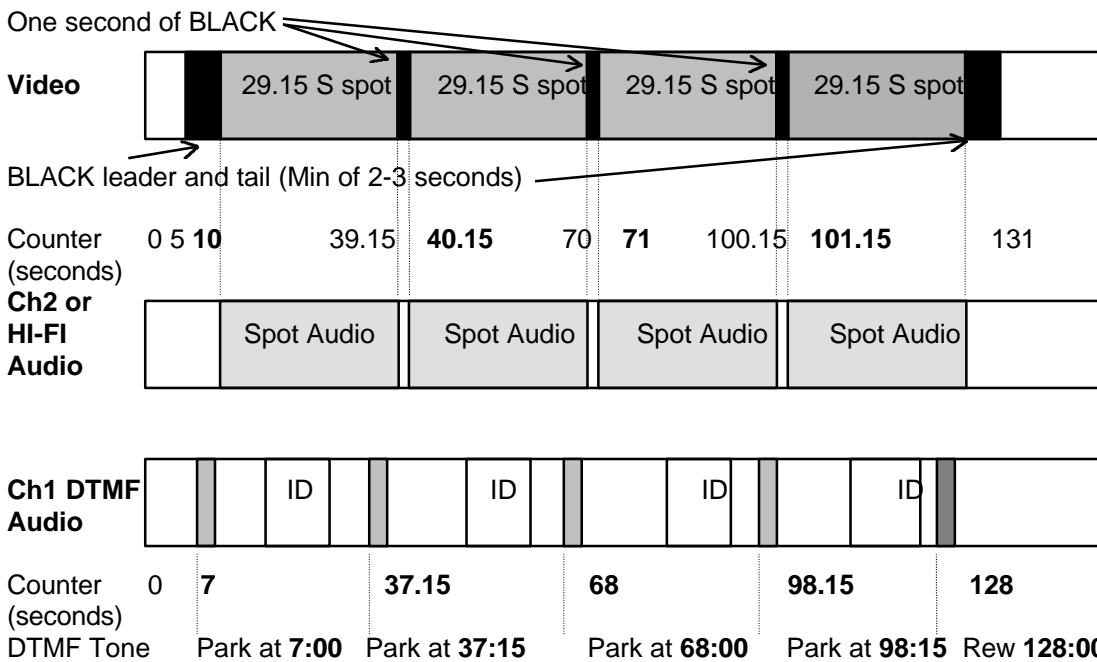
SPOT: A single commercial, typical length is thirty seconds (or just under 29.15). A spot can be any length, it however must be in and incremental time that allows multiple spots plus black between spots to fill the network avail. Each spot has a park tone.

POD: A group of spots recorded back to back with a single park tone. A pod must match the network avail time. Each spot within the pod does not have a park tone.

SPOT insertion verses **POD** insertion: With spot insertion, you can fill dynamic avail times. In other words if a network provides both 60 and 120 second avails, a spot based tape can roll through two spots for the 60 and four spots for 120 avail. In addition spot based tapes used with the Ad-Maestro allow Modified Run Of Schedule (MROS), this allows a time window to be set up and you can start the insert on any spot on the tape (see INTRODUCTION-3). With pod based tapes, you will always play the pod (same group) of spots during a network avail. Pod based tapes do not support different network avails, in the example above you would only be able to fill 60 seconds of the 120 second avail. If a 120 second pod is used then the 60 second avail would clip the pod at 60 seconds. ADTEC recommends producing spot based tapes, however if you are using tapes that are produced for a pod based inserter, the Ad-Maestro can run those tapes.

The recommended tape production procedure is as follows:

1. Compile the thirty (or just under 29.15) second spots on to a master reel with one second of black between spots. When two 29.15 second spots plus 1.00 second of black is recorded back to back, the sum is equal to 60.00 seconds. This will fill the typical cable network avail time.
2. Record spot audio onto one audio channel, typically channel two. If your master spots have two channel (stereo) audio, mix them onto channel two. If you have a VTR that supports HI-FI and NORMAL (Longitudinal) audio and you wish to retain full stereo spot audio, record the spot audio to the HI-FI tracks.
3. Once the tape has the video and spot audio recorded, go back and perform audio inserts to record the DTMF tones onto channel one. (If you have HI-FI capabilities, you can use either of the normal audio tracks to insert the DTMF tones)



In the illustration above, the following settings would need to be entered into the Ad-Maestro VTR settings

Park Frames: 3.00 (3 seconds and 00 frames). This is where the park tone is recorded relative to the inset of video for each spot!. The video for the first spot starts at 10 seconds, therefore the park tone is recorded at 7 seconds. The video for the second spot starts at 40.15 seconds, therefore the park tone is recorded at 37.15 seconds. The third and fourth are also recorded at video in minus 3.00. The Park Frames is user definable, make sure it is set to match the exact difference between the inset of video and park tone location preceding each spot. (see KEYSCHEDULE-8 Park Frames)

Park Tone: The Park Tone is user definable as well, only one Park Tone may be defined (in other words use the same park tone through out the tape). The tone you use is a function of which DTMF tone generator you have. If the advanced DTMF generator (or equivalent) is used, ADTEC recommends using the **“A”** DTMF tone as the Park Tone. If the modified pocket dialer is used, ADTEC recommends using the **“*” (star)** DTMF tone as the Park Tone.

Switch Tone: Not used in our illustration. If tapes produced for another manufacturers inserter is used and it uses a Switch Tone, the following happens;

1. You must define both the Switch Tone and Park Frames.
2. The actual switch to air will occur on a first come basis, either the time out of the Park Frames or hearing the Switch Tone.

Rewind Tone: The Rewind Tone is user definable as well. The tone you use is a function of which DTMF tone generator you have. If the advanced DTMF generator (or equivalent) is used, ADTEC recommends using the **“C”** DTMF tone as the Rewind Tone. If the modified pocket dialer is used, ADTEC recommends using the **“#” (pound)** DTMF tone as the Rewind Tone. The rewind tone should be recorded exactly where a Park Tone would be recorded in the last spot on the tape.

ID TONE: This is a sequence of DTMF tones used to Identify the spot. It can be up to 15 DTMF tones long (typical lengths are 6 to 8). Be sure not to use a PARK, SWITCH or REWIND tone in the ID. The ID tone is typically placed in the middle of a spot. Examples of ID tones would be 000301, 008706 etc. Most billing packages use the first four DTMF tones to identify the client and the second two to four DTMF tones to identify the spot number.

The DTMF tone 000301 would identify client 0003 (Three) and spot 01 (one).

VERIFICATION - The ROS and MROS version of the AD-MAESTRO is capable of recognizing DTMF tone sequences to identify the inserted commercial. Each spot may have its own unique DTMF tone sequence (up to 15 tones but typically 6 to 8). ID tone sequences must not contain any tone sequences that are defined as either a PARK, SWITCH, or REWIND tone for tape cueing purposes. For example, if the DTMF tone “A” is used for PARK and “C” is used for REWIND (no switch tone in this example) then a valid ID must not contain “A” or “C”. If either the PARK, SWITCH or REWIND tones are used in the ID, the corresponding command will be executed upon receipt of the tone.

Valid ID tone for the example: **0D0301 or 000301 etc.**

Non Valid ID tone for the example: **00A301 or 00C301 etc.**

SPOOL FRAMES (THREADING) - The AD-MAESTRO controller has an adjustable tape SPOOL FRAMES time to allow for different video device response times. This is the time (in seconds and frames) which elapses after the play command has been issued until the video device actually begins to advance through the tape or video disc. Typical SPOOL FRAMES for U-Matic (3/4”) decks is 4 seconds and 15 frames while SVHS decks only require 1 second and 15 frames. The SPOOL FRAMES for a digital video device would be zero.

PARK FRAMES (DEVICE PRE-ROLL) - The AD-MAESTRO controller has an adjustable tape park frames time to allow for different placement of the PARK tone. The PARK FRAMES is the time in seconds and frames that the PARK tone is placed before the video “in” or “to air” point. If a SWITCH TONE is used, then the PARK FRAMES or SWITCH TONE, first to hit, will cause the switch to air.

PRE-ROLL (NETWORK) - The AD-MAESTRO controller has an adjustable PRE-ROLL for network insert switches. Unique PRE-Roll's can be set for different networks and DTMF tone sequences. This provides a simple way of handling both edited and non-edited network feeds. The PRE-ROLL is used to calculate the switch time after the network DTMF tone is detected. If the sum of the SPOOL FRAMES and PARK FRAMES is equal to the PRE-ROLL, the tape deck will start immediately upon the detected network DTMF tones. Use the formula below to determine how the AD-MAESTRO will handle differing SPOOL FRAMES, PARK FRAMES and PRE-Roll's.

Example 1.

SPOOL FRAMES + PARK FRAMES = PRE-ROLL

If the spool plus the park is equal to the pre-roll, then the deck will start immediately after the network DTMF tone has been detected.

Spool = 4:15, Park = 3:15, Pre-Roll = 8:00

$$4:15 + 3:15 = 8$$

$$8=8$$

Example 2.

SPOOL FRAMES + PARK FRAMES < PRE-ROLL

If the spool plus the park is less than the pre-roll, the tape deck will be delayed the difference.

Spool = 1:15, Park = 3:15, Pre-Roll = 8:00

$$1:15 + 3:15 = 8$$

$$5=8$$

3 second delay

The tape deck will not receive the play command for three seconds after the network DTMF tone has been detected. This automatic calculation compensates for different tape formats under one tape production model.

Example 3.

SPOOL FRAMES + PARK FRAMES > PRE-ROLL

If the spool plus the park is greater than the pre-roll, the tape deck will be forwarded (in seconds and frames) the difference until the spool plus park equal the pre-roll.

Spool = 4:15, Park = 4:15, Pre-Roll = 8:00

$$4:15 + 4:15 = 8$$

$$9=8$$

1 second advance of tape from PARK TONE

The tape deck will be forwarded one second during the PARK process. In other words the AD-MAESTRO will forward the tape to the point where the PARK tone should of been placed for an immediate start of the deck after the network DTMF tone is detected.

Warning: If you are using a dual network AD-MAESTRO under these circumstances, there may be a Park error if they have different Pre-Rolls. Avoid this by only using networks with similar Pre-Rolls.

POST-ROLL (NETWORK) - The AD-MAESTRO controller has an adjustable POST-ROLL for network return switches. Unique POST-Roll's can be set for different networks and DTMF tone sequences. The POST-ROLL is the time (seconds and frames) after a return DTMF tone or GPI has been received until the return to network switch is performed.

AUXILIARY INPUT - The AD-MAESTRO controller has an auxiliary audio and video input which may be inserted onto either network feed just like the signals from the controller's video device. It has many of the same features available to the video device including dynamic audio level control. The auxiliary input does not have any provisions for video sensing or synchronizing. For this reason, video from the auxiliary source may be inserted on a network regardless of it's quality or timing.

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