# Chapter 10 Option Cards

The Micro Lynx has been designed to quickly and easily accommodate four option cards to expand the Micro Lynx synchronizer capabilities.

This chapter describes the following option cards:

- Video Sync Generator Card (VSG)
  The VSG Card is a small daughter card that plugs directly into the mother board and generates Video Sync in NTSC or PAL. The video signal is referenced to the Micro Lynx system speed reference.
- Third Machine Card (M3)
  The M3 Card, plugs into a Micro Lynx expansion slot, permitting control of a third machine. The M3 Card also has the special hardware required to operate the Sony VO-5800 and VO-5850.
- Digital Audio Clock Generator Card (ACG)
  The Digital Audio Clock Generator Card plugs into a Micro Lynx expansion slot and is used to generate digital audio sample rate clocks. The digital audio signals can be used to lock a digital audio workstation or digital tape transport to the Micro Lynx system.
- VITC Reader Card (VITC)
  The VITC Card is a state-of-the-art, microprocessor based Vertical Interval Time Code (VITC) reader that plays into a Micro Lynx expansion slot. The VITC Card integrates directly with the Micro Lynx machine controllers and provides VITC reading capability when the VTR or VCR is not equipped to supply serial time code to the synchronizer.

# Video Sync Generator (VSG) Card

The Video Sync Generator Card generates composite video sync in NTSC or PAL. The VSG Card is a small daughter card that plugs directly into the mother board and generates Video Sync in NTSC or PAL. The video signal is referenced to the Micro Lynx system speed reference.

## Installation Procedure

1. Turn off the power and place the Micro Lynx System Unit on a static safe workstation. Ground yourself and the workstation anti-static mat.
2. Remove the six phillips screws securing the top cover of the System Unit.
3. Position the System Unit so that the front panel faces you, and remove the cover.
4. Locate connector J1, the Video Sync Generator 20-pin plug, in the right front corner of the main board.
5. Hold the VSG Card component side up and position socket J1 so that it can be placed into the J1 plug on the main board. Align the two standoffs on the main board with the holes in the VSG Card.

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***Warning:***

**CAREFULLY** align the male and female connectors together. See Detail “B” in Figure 1. Insert all pins into the appropriate holes, failure to do so will **DESTROY** the VSG Card.

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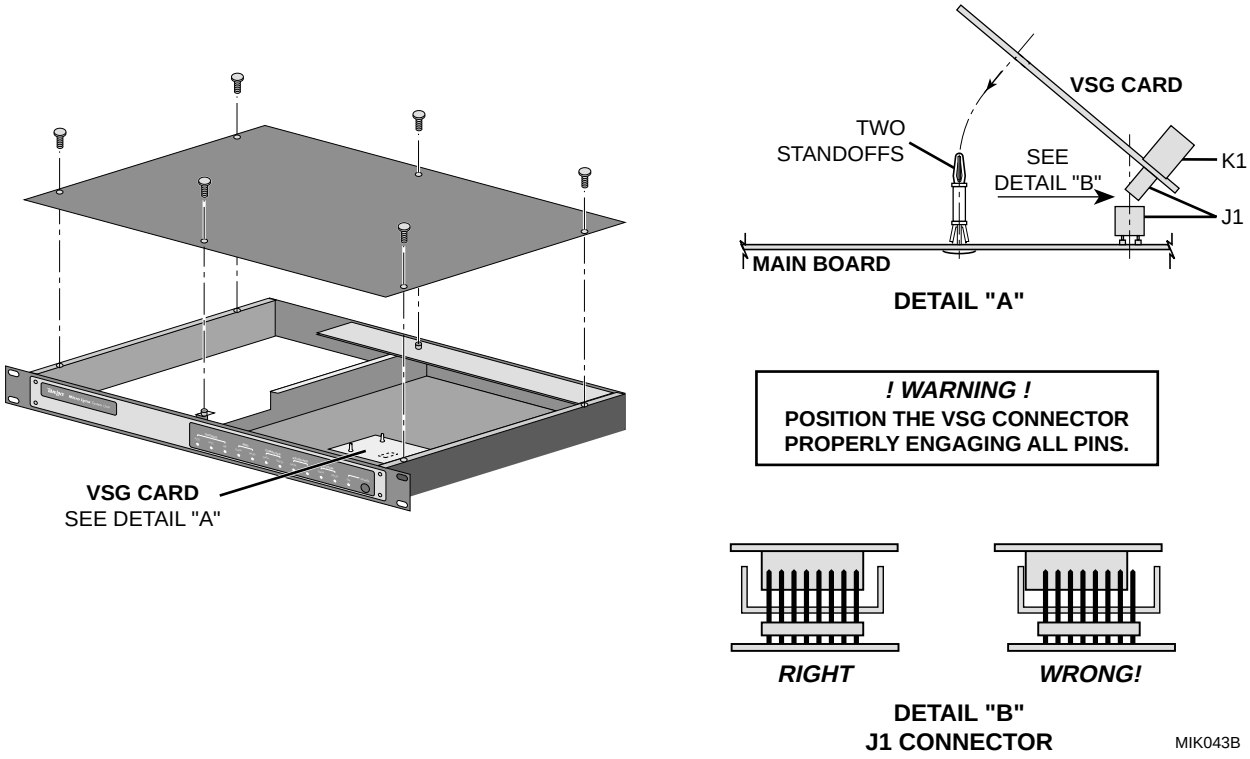


**Figure Chapter 10 -1. Video Sync Generator Card**

6. Press connector J1 and the standoffs into place.
7. Replace the top cover and the six phillips screws. Power up the unit. The Micro Lynx will recognize the VSG Card on power up. To turn the VSG on, press [SETUP], [TCG], [6], then [+]. Press [SETUP] again to return to the normal display.

# M3 Option Card

The Third Machine Card (M3) expands the standard two machine Micro Lynx to a three machine system, which permits more complex multiple transport control. The M3 Card supports the same transports as the two machine Micro Lynx main board machine controller.

The M3 Card also provides special hardware support for the Sony VO-5800 and the VO-5850. This is the ONLY port that may be used to connect a Sony VO-5850 to the Micro Lynx system.

Micro Lynx automatically detects the presence of the M3 Card, there are no user configuration changes to make. Plug in the card and select the transport type that you want to control.

On power up the Micro Lynx System Unit turns on the M3 LED in the option section of the front panel. This LED indicates that the M3 Card is installed and communicating correctly.

## Transport Options

Once the M3 Card is installed and initialized for a transport, there are several options that may be customized. Many of the default parameters listed below are automatically selected by the transport. However, by pressing [SETUP], [TRAN], then [TRAN] you may change the settings. A description of each item that may be selected follows the table. For operating information, please refer to the Micro Lynx Operating Manual, in particular the Keyboard Controller chapter.

**Table Chapter 10 -1. TRAN Setup Options**

| KEY | MENU | SUB-MENU | RANGE |
|---|---|---|---|
| TRAN | Machine Select Last/Next +/– TRAN | | |
| | | Transport Mfg. | |
| | | Machine Model | |
| | | 0 Capstan Mode | Wild, *Resolved* |
| | | 1 Capst Spd Trim | -128 to +127 *(0)* |
| | | 2 Lifter Defeat | Never, Normal, Not Stp/Play, Always |
| | | 3 Record In | Pulse Rec; P-Rec, Play |
| | | 4 Record Out | Pulse Play; P-Rec, Play; Pulse Stop; P-Rec, Stop; P-Play, Stop; Pulse Opto; Special Opto |
| | | 5 Rehearse In | Latch Reh; Pulse Reh; P-Reh, Play; P-Reh, Reclog; L-Reh, Reclog; Pulse Rec |
| | | 6 Rehearse Out | Unlatch Reh, Pulse Play, Save as Rec |
| | | 7 Approach Speed | 20-254 |
| | | 8 Bandwidth Limit | *Off*, On |
| | | 9 Reader Mode | LTC/SER TC; LTC/TT1; Serial TC; T.Timer 1 |
| | | 00 Mute Control | Normal, Until Rslved, Until Locked, Not Locked |
| | | NEXT Lock Threshold | 0-50 *(35)* |
| | | NEXT Lock Delay | 0-50 *(10)* |
| | | NEXT Park Window | 0-10 *(10)* |

**Capstan Mode**

**Resolved:** The Micro Lynx controls the speed of the machines capstan. It is used when synchronizing.

**Wild:** The machine capstan is set to its own internal reference and the Micro Lynx does not control its speed. Use it when striping time code or if the tape has no time code.

**Capstan Speed Trim**

This advanced feature should be used only by an experienced engineer or technician. It allows the "wild speed" of the machine to be adjusted by the operator, when a voltage controlled machine does not run at the right speed before synchronizing. It can also be used to adjust the wild speed of a tape that was recorded off pitch.

Capstan speed trim is separately retained in memory for each transport type. It is restored when the transport is selected. It is NOT erased when [CLR] + [TRAN] is pressed. It is only erased if a complete memory clear is performed ([CLR] + [SYS]).

**Reader Mode**

Selects the time code source for the machine; it is normally set to LTC.

**Lifter Defeat**

Selects the conditions when the Micro Lynx will defeat the machines lifters to read time code from the tape; it is usually set to Normal. In Normal, the Micro Lynx defeats the lifters only as the machine slows to park, to check that it has located correctly.

**Record In**

Selects the command method or logic to put the machine into

record.

**Record Out** Selects the command method or logic to drop the machine out of record.

**Rehearse In** Selects the command method or logic to put the machine into rehearse.

**Rehearse Out** Selects the command method or logic to drop the machine out of rehearse.

**Approach Speed** Sets the approach speed or deceleration point for a machine as it slows to park. Use it to adjust machine performance if the park point is consistently over shot or under shot. Increase the value to slow the transport later. Decrease the value to slow the transport earlier.

**Bandwidth Limit** Selects a time code reader input (RDR) filter circuit that bandwidth limits the input time code signal frequency range. It is used when time code sources are noisy and is most commonly applicable to video machines.

**Lock Threshold** The time code window or threshold in subframes (0-50 sfr), which the machine has to be within before the lock delay starts running. The lock window setting can be adjusted when time-to-lock may be more critical than lock accuracy. This can be used to fix problems with unstable machines, bad or misframed time code or to cause a Digital or Video tape transport to release with a looser lock tolerance. The setting is used in conjunction with the Lock Delay setting.

**Lock Delay** The time in frames (0-50 fr) that the machine has to be continuously in the lock window, before it is considered that the transport is locked, and the Micro Lynx will show lock status. It should be noted that very short lock delays could result in the machine locking in the wrong place.

**Park Window** The park window in frames (0-10 fr), for video and film transports only. This is used to accurately cue a video transport to a specific location. If the park window is set to zero, then the transport will respond to a ±1 frame locate. The video park window setting is set for all VTRs and is not reset when a different video machine is selected for that group (A-C).

## M3 Card Initialization Procedure

1. [SOLO], [C], [SETUP], [TRAN]

   *SETUP LED flashes*
   *TRAN LED turns on*
   *LAST LED turns on*
   *NEXT LED turns on*
   *+ LED turns on*
   *– LED turns on*
   *C LED*

   ```
   Setup:  AUTO Serial TRANSPORT
    Tran:
   ```

   You may access the Setup menus at any time. Go to the transport selection menu. If the Transport Option selection menu was accessed last, press [TRAN] again to access the Transport selection menu.

2. [NEXT]

   ```
   Setup:  Ampex ATR-100
    Tran:
   ```

   Using [NEXT] or [LAST] select the manufacturer of the machine connected to the 'C' (Transport 3) port. For this example select Ampex.

3. [+]

   ```
   Setup:  Ampex ATR-124
    Tran:
   ```

   Press [+] and [–] to select your machine type. Refer to the table of machines supported, in the Appendix.

4. [SETUP]

   ```
   SOLO:c .                  c→10:00:00:00
                          Err:           0.-
   ```

   Press [SETUP] to exit Setup mode. Alternatively select a different menu to modify.

**Table Chapter 10 -2. Troubleshooting the M3 Card**

| *Situation* | *Solution* | *Conditions* |
|---|---|---|
| SU M3 LED fails to turn on or is flashing | Check the Keyboard to SU cable connection.<br>Verify the card installation.<br>Check insertion and seating of the option card cable and connector. | If you have installed upgraded software, also check PROM installation on the main board. |
| When you try to SOLO C, it is "Not Available" or "does not exist" | Press [CLR] and [SYS], then [ENTR] to clear and reset the System Unit. | |
| No time code | Verify that the insertion and wiring of the time code cable from the SU to the machine is correct.<br>Verify that the machine cable is correctly inserted. | Time code must already be striped on the tape. |
| No machine control | Verify that the correct transport type is selected. | The different machine selections are listed in the Appendix of the Micro Lynx manual. |

## Installation Instructions

**Note:** If your Micro Lynx System Unit Serial Number is 1024 or higher, you have new metal work. The new metal work does not require the Option Card Bracket. Please turn to the instructions for new metalwork later in this section for instructions on installing the M3 Card.

1. Turn off the power and place the Micro Lynx System Unit on a static safe workstation. Ground yourself and the workstation anti-static mat.
2. On the back of the System Unit, remove the cover labeled THIRD MACHINE EXPANSION.
3. Remove the six phillips screws securing the top cover to the System Unit.
4. Position the System Unit so that the front panel faces you and remove the top cover.

### Install the Option Card Bracket

5. The Back Panel PCB is located at the top back of the chassis, horizontal to the back panel. Remove the "L" shaped bracket supporting the Back Panel PCB by removing the phillips screws; one on the left side of the board and the other on the back panel, to the right of the SYSTEM TALLY connector. The bracket is no longer needed, keep the phillips screws.

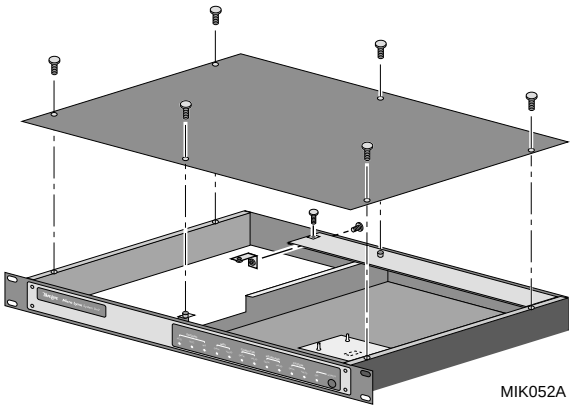


**Figure Chapter 10 -2. Remove the Support Bracket**

6. Hold the Option Card bracket so that the large cutout is face up. Set the front of the bracket in place on the threaded stud on the inside of the Front Panel. Set the bracket down and slide it under the left edge of the Back Panel PCB.

7. Insert and tighten the screws removed from the back panel, and from the Back Panel PCB. Place a nut on the threaded stud and secure the bracket to the front panel. (See Figure 10-3.)

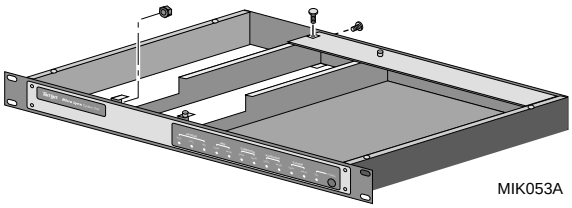


**Figure Chapter 10 -3. Install the Option Card Bracket**

## Install the M3 Card

8. The M3 Card is mounted on the left side of the System Unit, component side up.
9. If you have the ACG Card already installed, remove the card from the bracket before installing the M3 Card.
10. Tilt and slide the left side of the card into the groove along the bottom of the Micro Lynx Side Panel.
11. As the card slides into the groove, lie it flat in the chassis.

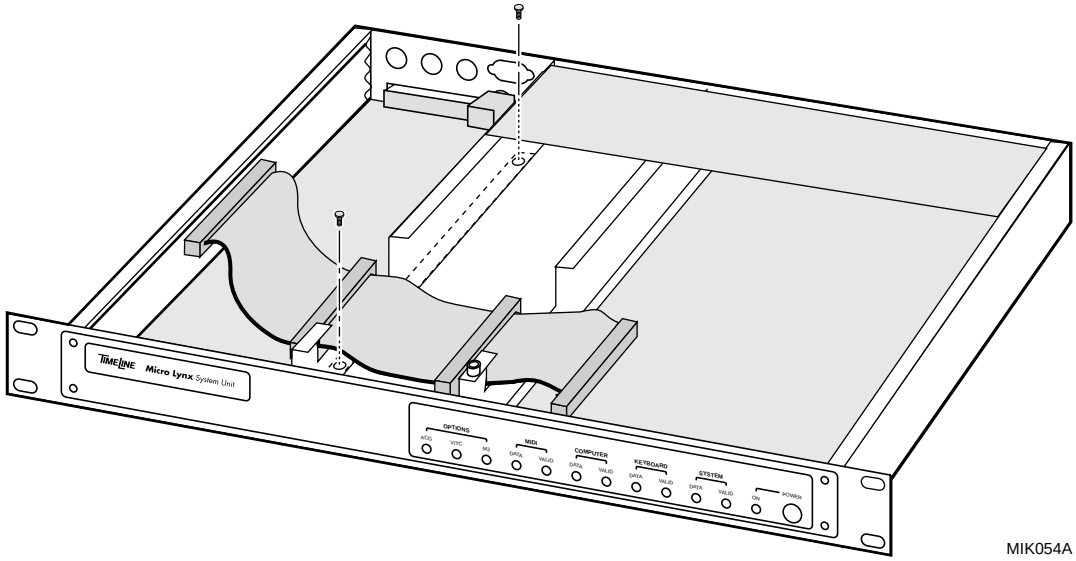


**Figure Chapter 10 -4. Installation of M3 Card**

12. Slide the M3 Card against the back panel so that the TRANSPORT connector and RDR jack are seated in the appropriate cutouts in the back panel.
13. Insert two phillips screws through the M3 Card, into the option card bracket standoffs and tighten.
14. If the ACG Card was removed, reinstall the card.

15. Insert the second connector of the Option Card Cable into J1 on the M3 Card and connect the other end of the cable into J3 on the Main Board. The unused connectors will lie in the open area in the System Unit, unless you have option cards installed.
16. Replace the top cover and the six phillips screws.
17. Connect the transport cable and reader cables between the Micro Lynx and third transport.
18. Power up the System Unit. The M3 LED on the System Unit OPTION Section should turn on.
19. Press [SETUP], [TRAN], [C], to select the type of transport to control.

### Install the M3 Option Card (New Metal Work)

1. Turn off the power and place the Micro Lynx System Unit on a static safe workstation. Ground yourself and the workstation anti-static mat.
2. On the back of the System Unit, remove the cover labeled THIRD MACHINE EXPANSION.
3. Remove the six phillips screws securing the top cover to the System Unit.
4. Position the System Unit so that the front panel faces you and remove the top cover.
5. The M3 Card is mounted on the left side of the System Unit, component side up. The M3 Card will lie flat in the chassis.
6. If you have the ACG Card already installed, remove the card from the bracket before installing the M3 Card.
7. Slide the M3 Card against the back panel so that the TRANSPORT connector and RDR jack are seated in the appropriate cutouts in the back panel.

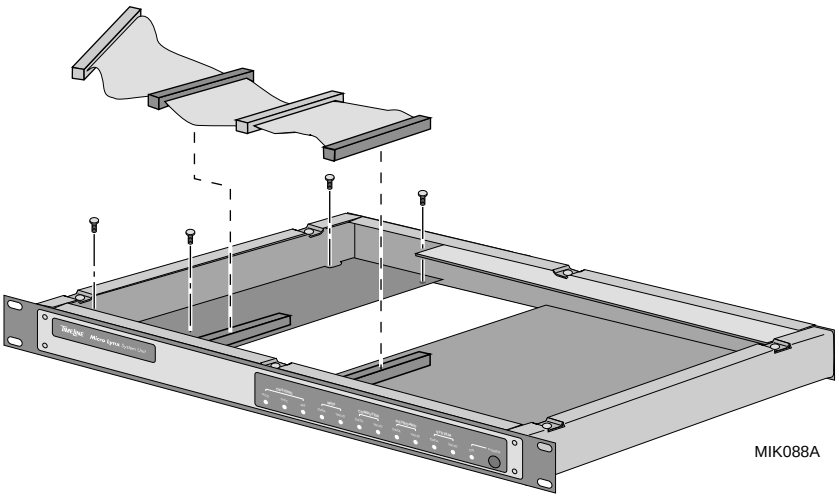


**Figure Chapter 10 -5. Installation of M3 Card**

8. Insert four phillips screws through the M3 Card, into the chassis, and tighten. (See Figure 10-5.)
9. If the ACG Card was removed, reinstall the card.
10. Insert the second connector of the Option Card Cable into J1 on the M3 Card and connect the other end of the cable into J3 on the Main Board. The unused connectors will lie in the open area in the System Unit, unless you have option cards installed.
11. Replace the top cover and the six phillips screws.
12. Connect the transport cable and reader cables between the Micro Lynx and third transport.
13. Power up the System Unit. The M3 LED on the System Unit OPTION Section will turn on.
14. Press [SETUP], [TRAN], [C], to select the type of transport to control.

# Digital Audio Clock Generator Card (ACG)

The Digital Audio Clock Generator (ACG) is the first synchronizer product developed, in a new class of interface products, which bridge the worlds of digital audio, time code, and machine control.

In a conventional machine environment, true synchronization of digital audio transports and workstations requires special reference clocks that are at a constant ratio to the system frame rate.

Even machines with internal time code readers and the ability to locate to specific time code locations require an exact sample rate or speed reference. Without this reference, the machines will slowly drift apart.

There are two ACG configurations:

- ACG-1 with Word Clock and
- Oversample Clock outputs

ACG-2 same as ACG-1 features and adds AES/EBU Silent Output and AES/EBU Clock Inputs, which can be used as the Micro Lynx system reference.

## Speed Reference

Speed reference is an essential component for synchronizing any system. For a Digital/Audio Workstation or digital tape machine to stay in sync with other time code based equipment, a “common” synchronizing speed reference is required. Normally a fixed rate reference like video sync or sample rate clock (word clock) is used.

Frequently a fixed rate speed reference is not available, not accepted by all of the equipment in the system, or may need to be varied to satisfy production requirements.

## The ACG Solution

The TimeLine ACG Card provides a solution to this problem by offering both fixed and variable digital audio speed reference generation that is always locked to the system frame rate.

There are two ACG Card configurations available for the Micro Lynx, both of which convert the synchronizer system into a powerful problem solver in the world of digital audio.

Applications for the ACG Card include:

- Transferring, recording or playing any piece of digital audio synchronously.
- Varispeeding a digital audio workstation or transport.
- Running a workstation at a non-standard sample rate.
- Locking two digital transports together at different rates.

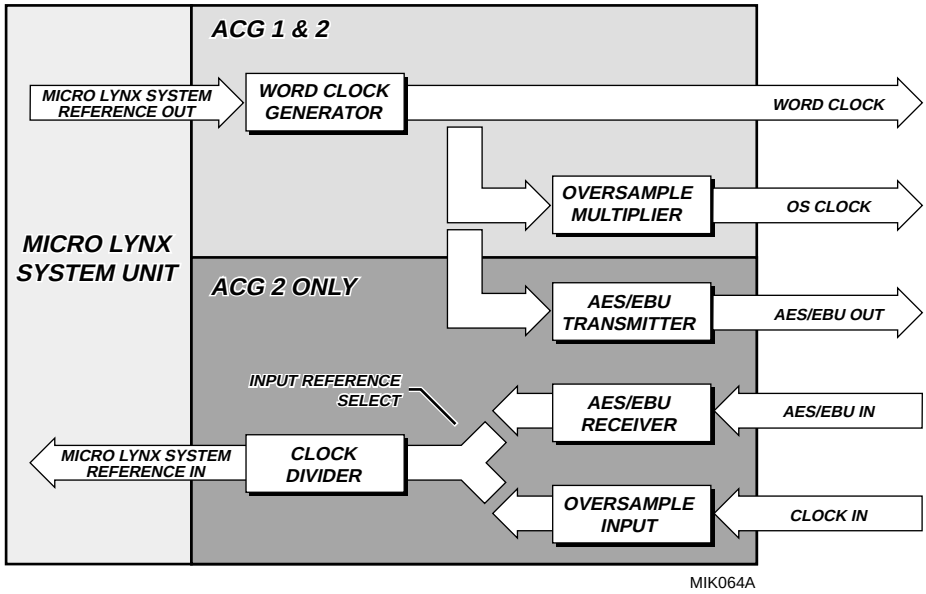


**Figure Chapter 10 -6. ACG Block Diagram**

## ACG-1 Features

- Generates stable word and oversample clock outputs that are phase locked to the Micro Lynx system reference.
- Clock outputs can be locked to the system reference at a number of fixed Sample Rate Ratios (SRR).
- Clock outputs can be varied from the nominal output sample rate (varispeed) in .01% steps.
- Four selectable standard oversample output clock multipliers.
- Clock output will track incoming varispeed time code with zero drift or error.

## ACG-2 Features

ACG-2 includes the ACG-1 features and adds the following:

- Reads incoming word clock, oversample clock, or AES/EBU bit stream.
- Generates phase-locked silent AES/EBU bit stream.
- Incoming digital audio signal can be used as Micro Lynx system reference.
- Has independent input and output sample rate ratio selections. This can be used, for example, to lock a 44.1K tape in a system with a 48K tape.
- The input clock rate can be varied (in 0.01% steps) to allow offspeed devices or program material to be correctly synchronized.

### Sample Rate Ratio

A Sample Rate Ratio (SRR) is the number of digital audio samples-per-frame. Instead of the actual sample rate, which tends to be an unwieldy number, the Micro Lynx LEDs indicate the constant ratio or SRR and if applicable, the ratio modifier.

Sample rate / Frame rate = Sample rate ratio

For example, at a nominal sample rate of 48.000 KHz and a frame rate of 30 Hz, the SRR is 1600. At 25 Hz, the SRR is 1920. The Micro Lynx LED indicators show selected sample rate ratio.

If the system frame rate increases or decreases (speed, not code type) then the actual sample rate will increase or decrease to an unknown (not very useful) number. However, as both frame rate and sample rate change together, the SRR stays constant.

Table 10-2 shows the actual sample rate ratios generated by the ACG Card.

**Table Chapter 10 -3. ACG Card Sample Rate Ratios**

| Sample Rate | FRAME RATE (fps) | | | |
|---|---|---|---|---|
| (Ks/s) | 30 | 29.97 | 25 | 24 |
| 48.000 | 1600.00 | 1601.60 | 1920.00 | 2000.00 |
| 47.952 | 1598.40 | 1600.00 | 1918.08 | 1998.00 |
| 44.100 | 1470.00 | 1471.47 | 1764.00 | 1837.50 |
| 44.056 | 1468.53 | 1470.00 | 1762.23 | 1835.66 |
| 32.000 | 1066.66 | 1067.73 | 1280.00 | 1333.33 |

## Operation

The ACG Card once installed is active all the time. The ACG setup configuration can be adjusted during any Micro Lynx operation without affecting the current operation since the ACG Card processor operates independently from the other Micro Lynx functions. The Keyboard ACG LED will light to indicate that the ACG Card is installed.

Ratios on both ACG Cards can be configured by the operator using the Micro Lynx Setup menus. All of the known fixed ratios are supported and the Card will automatically generate the standard pull ups and pull downs.

For example if you are working with NTSC video at a frame rate of 29.97, the ACG Card can supply either 48,000 or 47,952 samples per second, dependent on the application.

Additionally the number of samples-per-frame can be set to any non-standard ratio to allow for those situations where it is necessary to run a digital system “off speed” for it to play back in sync.

Use the ACG variable ratio in and out to generate double pull up or pull downs if these are required to correct previous transfer errors.

### Off-Tape Time Code

The ACG Card is always locked to the Micro Lynx system (speed) reference. If the speed reference is set to VSO (variable speed, ±12.5%), then the ACG Card will lock to off tape code. The ACG Card will generate stabilized digital audio clocks with the selected SRR that are referenced to the incoming frame rate of the Master machine time code with 0.000% drift or error.

## Setup Options

Access to the Setup Options is available after the ACG Card is installed. Press [SETUP] then [ACG] to access the option menu. If the ACG menu is not displayed then verify the ACG Card installation.

**Table Chapter 10 -4. ACG Setup Options**

| KEY | MENU | SUB-MENU | RANGE |
|---|---|---|---|
| ACG | ACG Option | 0 Nom S/Rate Out | 32.000, 44.056, 44.100, 47.952, *48.000* Ks/s |
| | | 1 Var Ratio Out | *Off*, On |
| | | 2 Var Ratio Out % | 85% - 115% *(100.00%)* |
| | | 3 Oversample Out | 128, 192, *256*, 384 |
| | | 4 Nom S/Rate In | 32.000, 44.056, 44.100, 47.952, *48.000* Ks/s |
| | | 5 Var Ratio In | *Off*, On |
| | | 6 Var Ration In % | 87.5% - 112.5% *(100.00%)* |
| | | 7 Oversample In | 128, 192, *256*, 384, Off |
| | | 8 Reference In | *AES/EBU*, Clock In BNC |

**Nominal Sample Rate Out & In** Used to select the nominal sample rate output and input at the selected system frame rate. The output may be different from the input.

**Var Ratio Out & In** Used to select a variable output or input sample rate ratio. When set to off, the system uses the selected nominal sample rates.

**Var Ratio Out & In %** If variable ratio is selected, is used to vary the output or input sample rate with respect to the system reference frame rate (speed). The ACG Card gives a “not locked” error message if the cumulative system speed change exceeds the ACG output range. You can use the Micro Lynx Keyboard Jog Wheel or the [+] and [–] keys to adjust the ratio.

**Oversample Variable Out & In** Used to select the oversample output multiplier or input clock divider. Oversample In must be set to off if word clock is used as the input signal. Oversample ratios can be set to one of four standard ratios.

**Reference In** Used to select either the AES/EBU or TTL BNC clock input that will be used if the ACG is selected as the system speed reference source in the TCG Option menu. The Clock In BNC connector can be used for Word Clock or Oversample Clock. Use menu item ‘7’ to select Word Clock or the required Oversample modifier.

## Digital Audio Clock Generator LEDs

The Digital Audio Clock Generator LEDs located on the Micro Lynx Keyboard Controller indicate the ACG Card status. The LEDs directly reflect the parameters that have been set in the ACG options under the Setup menu. There are two rows of LEDs the upper row is for ACG inputs and the lower row is for ACG outputs.

**IN 1600/1920** This LED indicates that an ACG input sample rate ratio of either 1600 samples-per-frame at 30 Hz or 1920 samples-per-frame at 25 Hz has been set. This is a nominal sample rate of 48,000 Ks/s. This LED should be read in conjunction with the NON STD and +/– LEDs. If this LED flashes, it indicates that the ACG Card has not locked to the incoming signal.

**OUT 1600/1920** This LED indicates that an ACG output sample rate ratio of either 1600 samples-per-frame at 30 Hz or 1920 samples-per-frame at
25 Hz has been set. This is a nominal sample rate of 48,000 Ks/s. This LED should be read in conjunction with the NON STD and +/– LEDs. If this LED flashes, it indicates that the ACG output is not locked.

**IN 1470/1764** This LED indicates that an ACG input sample rate ratio of either 1470 samples-per-frame at 30 Hz or 1764 samples-per-frame at 25 Hz has been set. This is a nominal sample rate of 44,100 Ks/s. This LED should be read in conjunction with the NON STD and +/– LEDs. If this LED flashes, it indicates that the ACG Card has not locked to the incoming signal.

**OUT 1470/1764** This LED indicates that an ACG output sample rate ratio of either 1470 samples-per-frame at 30 Hz or 1764 samples-per-frame at
25 Hz has been set. This is a nominal sample rate of 44,100 Ks/s. This LED should be read in conjunction with the NON STD and +/– LEDs. If this LED flashes, it indicates that the ACG output is not locked.

**NON STD IN** If only this LED is on, it indicates that an ACG input sample rate ratio of either 1066 2/3 samples-per-frame at 30 Hz or 1280 samples-per-frame at 25 Hz has been set. This is a nominal sample rate of 32,000 Ks/s. If this LED flashes, it indicates that the ACG Card has not locked to the incoming signal. If the LED is on in combination with one of the previous two input LEDs, it indicates that the selected nominal sample rate ratio is being varied. There is no specific indication when a 32,000 Ks/s input is being varied.

**NON STD OUT** If only this LED is on it indicates that an ACG output sample rate ratio of either 1066 2/3 samples-per-frame at 30 Hz or 1280 samples-per-frame at 25 Hz has been set. This is a nominal sample rate of 32,000 Ks/s. If this LED flashes it indicates that the ACG output is not locked.

If the LED is on in combination with one of the previous two output LEDs, it indicates that the selected nominal sample rate ratio is being varied. There is no specific indication when a 32,000 Ks/s output is being varied.

**+ / – IN** This LED operates in combination with the previous input LEDs and indicates that the selected input sample rate ratio has been automatically pulled up or down by 0.1%; for example, from 48,000 to 47,952 or from 44.100 to 44,056.

When the nominal sample rate is selected, the ACG Card will automatically adjust the sample rate ratio by +0.1% if the sample rate requested requires a pull up because the system frame rate is running at 29.97 Hz instead of 30/25/24 Hz. Or, it will automatically adjust the sample rate ratio by -0.1% if the sample rate requires a pull down because the system frame rate is running at 30/25/24 Hz instead of 29.97 Hz.

**+ / – OUT** This LED operates in combination with the previous output LEDs. It indicates that the selected output sample rate ratio has been automatically pulled up or down by 0.1%; for example from 48,000 to 47,952 or from 44.100 to 44,056.

When the nominal sample rate is selected, the ACG Card will automatically adjust the sample rate ratio by +0.1% if the sample rate requested requires a pull up because the system frame rate is running at 29.97 Hz instead of 30/25/24 Hz. Or it will automatically adjust the sample rate ratio by -0.1% if the sample rate requires a pull down because the system frame rate is running at 30/25/24 Hz instead of 29.97 Hz.

## Audio Clock Generator Outputs

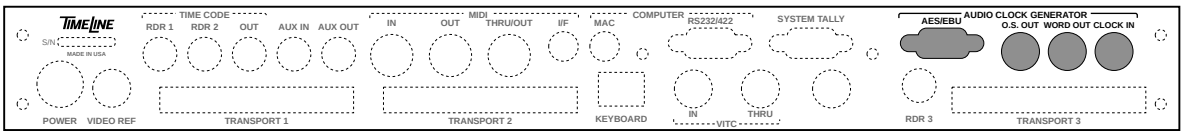


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**Figure Chapter 10 -7. Audio Clock Generator Inputs/Outputs**

### ACG-1 Outputs

The ACG-1 Card uses the WORD OUT and O.S. OUT jacks on the back of the System Unit. The other ports and jacks in the Audio Clock Generator section are not installed.

**O.S. OUT.** BNC, +5V TTL level output. The Oversample Clock Output is locked to the system reference with a frequency determined by the word clock rate and the oversample output multiplier.

**WORD OUT.** BNC, +5V TTL level output. The Word Clock Out is locked to the system reference with either a fixed or variable ratio to the nominal sample rate.

### ACG-2 Outputs/Inputs

All connectors and jacks in the Audio Clock Generator section on the back of the System Unit are installed.

**AES/EBU.** 9-pin 'D' socket, transformer coupled, digital input and output connector. It will output a silent AES/EBU bit stream locked to the system reference with either a fixed or variable ratio to the nominal sample rate. It will also accept an AES/EBU input that can be used as a system reference.

**Table Chapter 10 -5. AES/EBU Connector Pin Description**

| Pin | Description |
|---|---|
| 1 | Ground |
| 2 | AES/EBU In- |
| 3 | Ground |
| 4 | AES/EBU Out- |
| 5 | Ground |
| 6 | AES/EBU In+ |
| 7 | Ground |
| 8 | Ground |
| 9 | AES/EBU Out+ |

**O.S. OUT.** BNC, +5V TTL level output. The Oversample Clock Output is locked to the system reference with a frequency determined by the word clock rate and the oversample output multiplier.

**WORD OUT.** BNC, +5V TTL level output. The Word Clock Out is locked to the system reference with either a fixed or variable ratio to the nominal sample rate.

**CLOCK IN.** BNC, +5V TTL level input. The Digital Audio Word Clock or Oversample Clock input is used with the oversample input divider to provide a system speed reference. This connector is also used to input word clock. If word clock is used as the system reference, then the Oversample divider should be set to off.

## ACG Card Setup

### Procedure

```
Hold the "GRP" key, and add
groups in order of priority
```

Power on the SU and KBD.

1. [SETUP], [ACG]

   *SETUP LED flashes*
   *ACG LED turns on*
   *LAST LED turns on*
   *NEXT LED turns on*
   *+ LED turns on*
   *– LED turns on*

```
   Setup:  ACG Options
Selection:  Nom S/Rate Out: 48.00 Ks/s
```

   You may access the Setup menu at any time.

2. [+]

```
   Setup:  ACG Options
Selection:  Nom S/Rate Out: 47.592 Ks/s
```

   Press the [+] and [–] keys to select the options in each menu selection. Use [NEXT] and [LAST] to step through menu items.

**Table Chapter 10 -6. Troubleshooting the ACG Card**

| *Situation* | *Solution* | *Conditions* |
|---|---|---|
| SU ACG LED fails to turn on or it is flashing | Verify the card installation.<br>Check insertion and seating of the option card cable and connector. | If you have installed upgraded software, also check PROM installation on the main board. |
| ACG not available when selected | Use [CLR] + [SYS] to reset the SU | Check the new PROM installation on the Main board. |

## Error Conditions

**Warning** If any of the following LEDs are flashing it indicates that the ACG output is not locked to the respective Micro Lynx system reference or input.

IN 1600/1920
OUT 1600/1920
IN 1470/1764
OUT 1470/1764
NON STD

**System Error** When the display reads:

```
ACG Input lost lock
```

it indicates that the ACG Card has not locked to the incoming signal because the signal is out of range, can't lock, or no signal is present.

When the display reads:

```
ACG Output lost lock
```

it indicates that the ACG Card has not locked to the signal because it is out of range, can't lock, or no signal is present.

## Installation Instructions

**Note:** If your Micro Lynx System Unit Serial Number is 1024 or higher, you have new metal work. Please turn to instructions with new metalwork later in this section for instructions on installing the ACG Card.

1. Turn off the power and place the Micro Lynx System Unit on a static safe workstation. Ground yourself and the workstation anti-static mat.
2. On the back of the System Unit, remove the cover labeled AUDIO CLOCK GENERATOR.
3. Remove the six phillips screws securing the top cover to the System Unit.
4. Position the System Unit so that the front panel faces you, and remove the top cover.

### Install the Option Card Bracket

5. The Back Panel PCB is located at the top back of the chassis, horizontal to the back panel. Remove the "L" shaped bracket supporting the Back Panel PCB by removing the phillips screws; one on the left side of the board and the other on the back panel, to the right of the SYSTEM TALLY connector. The bracket is no longer needed, keep the phillips screws.

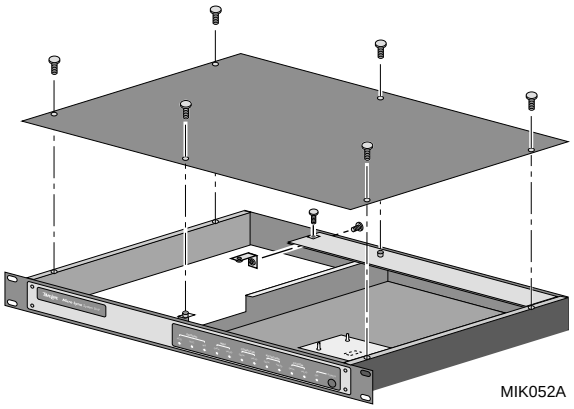


**Figure Chapter 10 -8. Remove Support Bracket**

6. Hold the Option Card bracket so that the large cutout is face up. Set the front of the bracket in place on the threaded stud on the inside of the front panel. Set the bracket down and slide it under the left edge of the Back Panel PCB.
7. Insert and tighten the screws removed from the back panel, and from the Back Panel PCB. Place a nut on the threaded stud and secure the bracket to the front panel. (See Figure 10-9.)

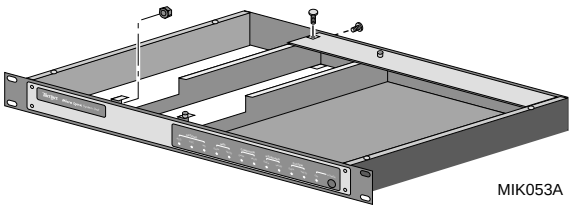


**Figure Chapter 10 -9. Install the Option Card Bracket**

### Install the ACG Option Card

8. Locate and remove the black rubber bumper on the corner of the ACG Card. (See Figure 10-10.)
9. The ACG Card is mounted on the left side of the System Unit.
10. If you have the M3 Card or VITC Card already installed in the Micro Lynx, remove the Option Card cable before installing the ACG Card.

11. The Option Card Cable is a ribbon cable with four connectors attached. On one end of the cable, the second connector is about 3.5” from the end. Insert this end into connector J1 on the component side of the ACG Card. The connector should be attached so that the cable falls away from the ACG Card as illustrated in Figure 10-10.

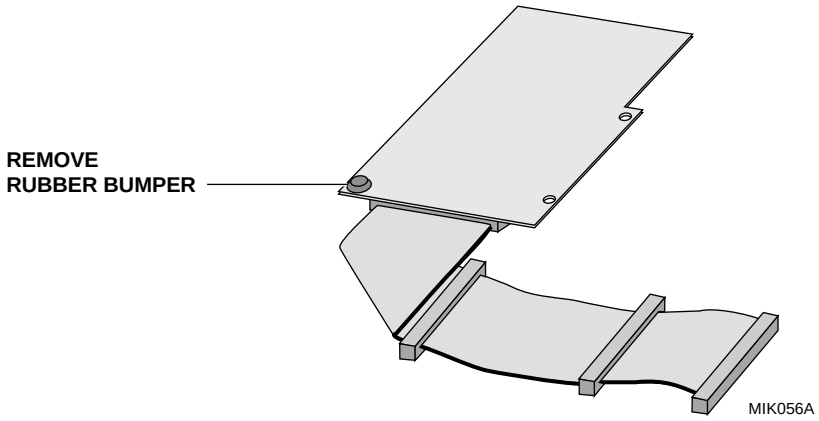


**Figure Chapter 10 -10. Option Cable Installation**

12. Position the ACG Card component side down with connector J1 toward the front of the System Unit. Approximately 1.25” from the J1 connector, bend the Option Card cable under, so that it makes a right-angle turn (the unused connectors on the cable will face the chassis bottom), as shown in Figure 10-10.
13. Hold the folded Option Card cable over the cutout in the Option Card bracket, tilt and slide the left side of the card into the groove, along the top of the Micro Lynx Side Panel.
14. As the card slides into the groove, lie it flat on the Option Card bracket.
15. Slide the ACG Card against the back panel, so that the AES/EBU connector and the O.S. OUT, WORD OUT and CLOCK IN jacks are seated in the appropriate cutouts in the back panel. Insert the washers and nuts onto the BNC connectors.
16. Insert two phillips screws through the ACG Card into the Option Card bracket standoffs and tighten.
17. If the M3 Card is fitted, insert the Option Card cable connector into J1 on the M3 Card. If the VITC Card is fitted, insert the Option Card cable connector into J1 on the VITC Card.

18. Connect the other end of the cable into J3 on the Main Board. The unused connectors will lie in the open area in the middle of the System Unit, unless you have option cards installed.

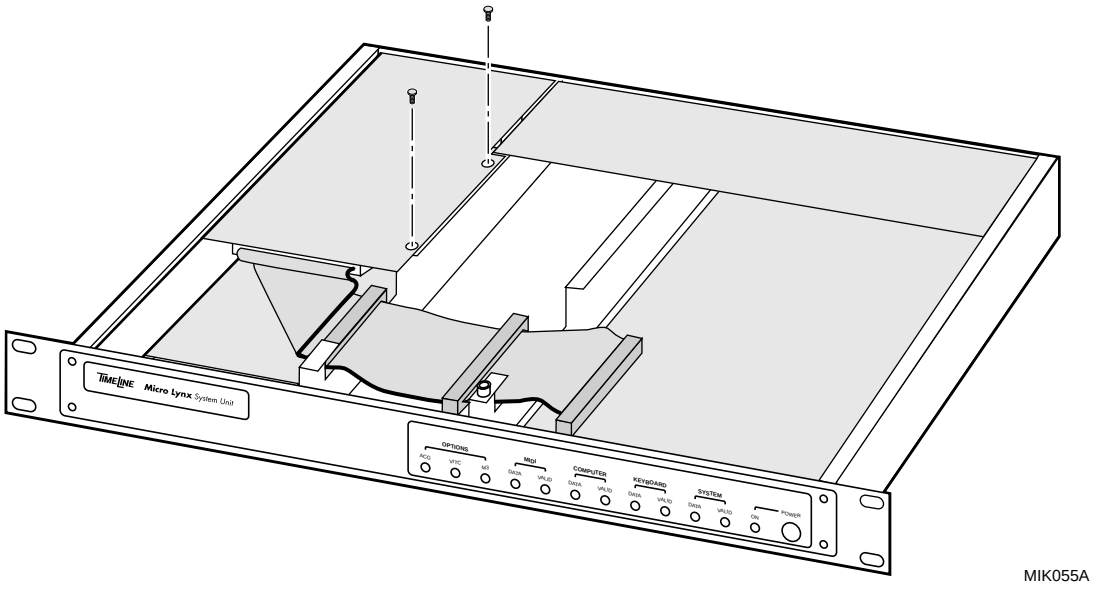


**Figure Chapter 10 -11. Installation of the ACG Card**

19. Replace the top cover and the six phillips screws.
20. Power up the System Unit. The Micro Lynx will recognize the ACG Card on power up and the ACG LED on the System Unit OPTION Section will turn on. Press [SETUP], [ACG], to configure the card functions.

### Install the ACG Option Card Bracket (With New Metal Work)

1. Turn off the power and place the Micro Lynx System Unit on a static safe workstation. Ground yourself and the workstation anti-static mat.
2. On the back of the System Unit, remove the cover labeled AUDIO CLOCK GENERATOR.
3. Remove the six phillips screws securing the top cover to the System Unit.
4. Position the System Unit so that the front panel faces you, and remove the top cover.

5. Remove the “L” shaped bracket supporting the Back Panel PCB. Relocate this bracket to the left side of the chassis as shown in Detail A and secure using the phillips screw supplied in the ACG Option Installation Kit. (See Figure 10-12.)

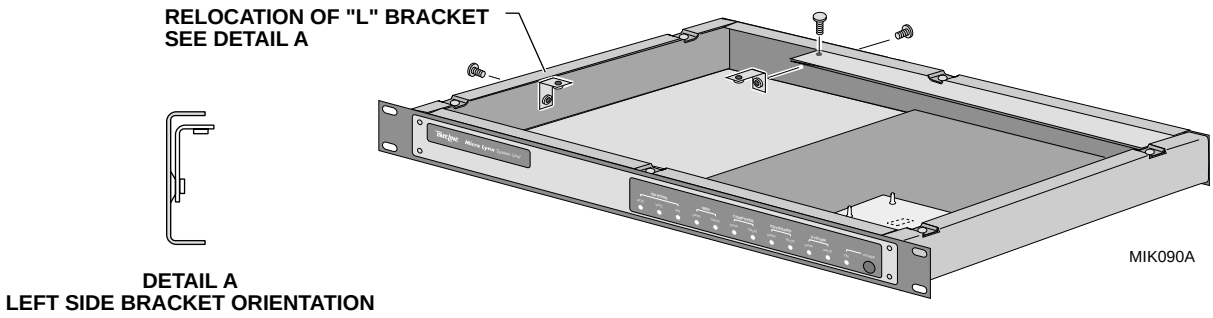


**Figure Chapter 10 -12. Relocation of “L” Bracket**

6. Remove the M3 Card, if installed. Remove the nut on the left threaded stud securing the front panel to the chassis.
7. Hold the ACG Option Card bracket diagonally across the chassis with the cable opening to the front. Set the front of the bracket in place on the threaded stud, inside the chassis. Slide the bracket under the left edge of the Back Panel PCB and the VITC Card (if installed).
8. Insert and tighten the screw removed from the back panel, and from the Back Panel PCB. Replace the nut on the front panel threaded stud to secure the bracket. (See Figure 10-13.)

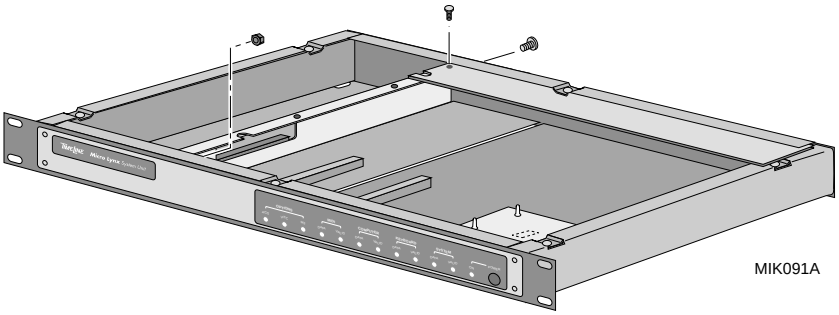


**Figure Chapter 10 -13. Install the ACG Option Card Bracket**

### Install the ACG Option Card (With New Metal Work)

9. Reinstall the M3 Card, if it was removed. The ACG Card is mounted on the left side of the System Unit, above the M3 Card.
10. Remove the mounting standoffs from the 9-pin connector on the ACG Card.

11. The Option Card cable is a ribbon cable with four connectors attached. On one end of the cable, the second connector is about 3.5" from the end. Insert this end into connector J1 on the component side of the ACG Card. The connector should be attached so that the cable falls away from the ACG Card, as illustrated in Figure 10-10.
12. Position the ACG Card component side down with connector J1 toward the front of the System Unit. Approximately 1.25" from the J1 connector, bend the Option Card cable under, so that it makes a right-angle turn (the unused connectors on the cable will face the chassis bottom).
13. Insert the folded Option Card cable through the opening in the Option Card bracket.
14. Lie the ACG Card flat on the Option Card bracket. Slide the ACG Card against the back panel, so that the AES/EBU connector and the O.S. OUT, WORD OUT and CLOCK IN jacks are seated in the appropriate cutouts in the back panel. Insert the washers and nuts onto the BNC connectors. Replace the mounting standoffs on the 9-pin connector.
15. The corner of the ACG Card, with the black rubber bumper, will rest on the "L" bracket installed on the side of the chassis in Step 5. Insert two phillips screws through the ACG Card into the Option Card bracket and tighten. (See Figure 10-14.)

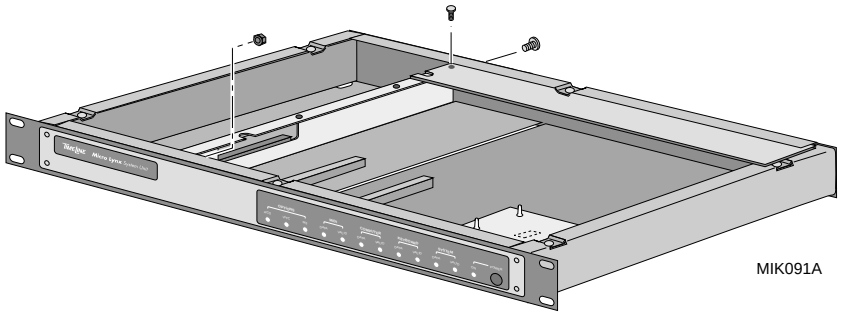


**Figure Chapter 10 -14. Install the ACG Card**

16. If the M3 Card is fitted, insert the Option Card cable connector into J1 on the M3 Card. If the VITC Card is fitted, insert the Option Card cable connector into J1 on the VITC Card.
17. Connect the other end of the cable into J3 on the Main Board. The unused connectors will lie in the open area in the middle of the System Unit, unless you have option cards installed.
18. Replace the top cover and the six phillips screws.
19. Power up the System Unit. The Micro Lynx will recognize the ACG Card on power up and the ACG LED on the System Unit OPTION Section will turn on. Press [SETUP], [ACG], to the configure the card functions.

# VITC Reader Card

## Features

- Automatic or manual line selections modes.
- Automatic switch between LTC and VITC at 1/3rd play speed.
- Allocation to any of the three Micro Lynx machines.
- Valid VITC code, type and line status display.

## Introduction

The Micro Lynx VITC Reader Card is a state-of-the-art, microprocessor based Vertical Interval Time Code (VITC) reader that installs inside the Micro Lynx system unit. The VITC Card integrates directly with any Micro Lynx machine controller, and eliminates the need for an external VITC to LTC translator.

The VITC Reader Card is used in audio-for-video post-production applications, when a VITC reading capability is required, and the VTR or VCR is not equipped to supply serial time code to the synchronizer.

Since VITC can be read in still mode and at very slow speeds, it can be used for accurately determining video tape position. The Micro Lynx seamlessly switches at 1/3rd play speed; between Longitudinal Time Code (LTC) and VITC, ensuring smooth operation and accurate time code values for use in dialog replacement, sound effects spotting and foley applications. A Micro Lynx keyboard status LED indicates when VITC is present and the LCD displays when the Micro Lynx is using VITC to update the machine reader position.

VITC is a form of time code that is only used with video. It is recorded as part of the video signal in the vertical blanking interval. VITC uses a 90-bit time code data word that is recorded on two non-consecutive video lines, at the beginning of each video field.

The Micro Lynx keyboard provides a comprehensive use interface for selecting VITC parameters. A function key accesses the VITC menu setup options. The menu structure is used to freely allocate the VITC Card to any video transport, and to set the line scan mode. The scan mode can be automatic or fixed. In automatic, the Micro Lynx scans all video lines and will select the first available line pair with matching time codes. In fixed scan, the user specifies the lines for reading. The Keyboard shows a clear display of all lines present and lines selected to assist VITC reader configuration.

The VITC Option Card also updates the output of the time code and MIDI time code generators, in Jog, Shuttle and Still modes. This is particularly useful when using digital audio workstations that can read time code or MTC in still and slow motion modes. Specific applications include spotting sound effects and capturing frame accurate video positions.

The VITC Card is an essential addition to the Micro Lynx system for audio and video applications.

## Installation Instructions

**Note:** If your Micro Lynx System Unit Serial Number is 1024 or higher, you have new metal work. The new metal work does not require the Option Card Bracket. Please turn to the instructions for new metalwork later in this section for instruction on installing the VITC Card.

1. Turn off the power and place the Micro Lynx System Unit on a static safe workstation. Ground yourself and the workstation anti-static mat.
2. On the back of the System Unit, remove cover labeled VITC READER.
3. Remove the six phillips screws securing the top cover to the System Unit.
4. Position the System Unit so that the front panel faces you, and remove the top cover.

### Install the Option Card Bracket

5. The Back Panel PCB is located at the top back of the chassis, horizontal to the back panel. Remove the “L” shaped bracket supporting the Back Panel PCB by removing the phillips screws; one on the left side of the board and the other on the back panel, to the right of the SYSTEM TALLY connector. The bracket is no longer needed, keep the phillips screws.

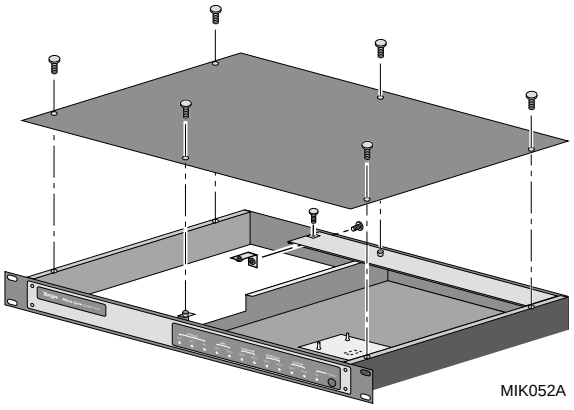


**Figure Chapter 10 -15. Remove the Support Bracket**

6. Hold the Option Card bracket so that the large cutout is face up. Set the front of the bracket in place on the threaded stud on the inside of the front panel. Set the bracket down and slide it under the left edge of the Back Panel PCB.
7. Insert and tighten the screws removed from the back panel, and from the Back Panel PCB. Place a nut on the threaded stud and secure the bracket to the front panel. (See Figure 10-16)

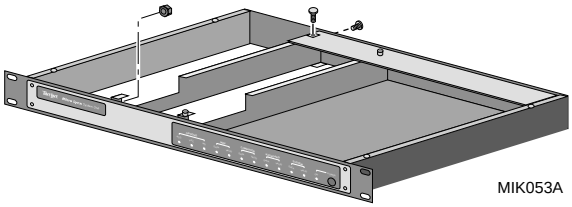


**Figure Chapter 10 -16. Install the Option Card Bracket**

## Install the VITC Option Card

8. The VITC Card is mounted to the right of the Option Card bracket, component side up.
9. If you have the M3 or ACG Card already installed in the Micro Lynx, remove the Option Card cable from J3 on the Main Board before installing the VITC Card.
10. Place the VITC Card under the lip on the mounting bracket and slide against the back panel so that the VITC IN and VITC THRU jacks are seated in the appropriate cutouts in the back panel. Insert the washers and nuts onto the BNC connectors.
11. Insert the three phillips screws through the VITC Card into the Option Card bracket, as show in Figure 10-17, and tighten.

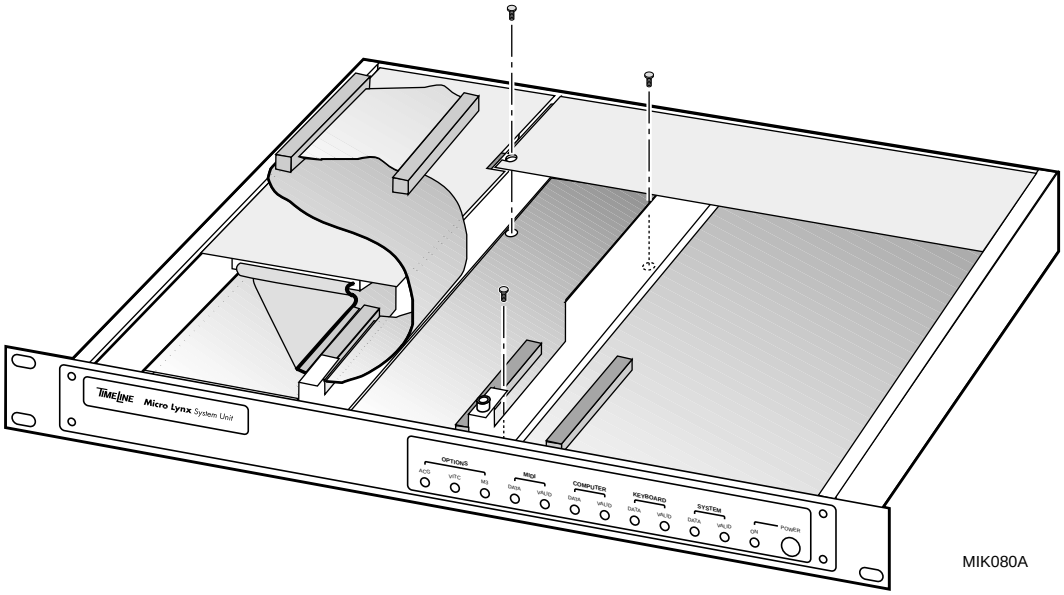


**Figure Chapter 10 -17. Securing the VITC Card**

12. Insert the Option Card cable connector into J1 on the VITC board.
13. Connect the end of the cable into J3 on the Main Board. The unused connectors on the left of the cable will lie in the open area, unless you have option cards installed.
14. Replace the top cover and the six phillips screws.
15. Power up the System Unit. The Micro Lynx will recognize the VITC Card on power up and the VITC LED on the System Unit OPTION Section will turn on.

### Install the VITC Option Card (New Metal Work)

1. Turn off the power and place the Micro Lynx System Unit on a static safe workstation. Ground yourself and the workstation anti-static mat.
2. On the back of the System Unit, remove cover labeled VITC READER.
3. Remove the six phillips screws securing the top cover to the System Unit.
4. Position the System Unit so that the front panel faces you, and remove the top cover.
5. Locate and remove the black rubber bumper on the corner of the VITC Card.
6. The VITC Card is mounted to the left of the Main Board, component side up. The VITC Card will lie flat in the chassis.
7. If you have the M3 or ACG Card already installed in the Micro Lynx, remove the Option Card cable from J3 on the Main Board before installing the VITC Card.
8. Slide the VITC Card against the back panel so that the VITC IN and VITC THRU jacks are seated in the appropriate cutouts in the back panel. Insert the washers and nuts onto the BNC connectors.
9. Insert the four phillips screws through the VITC Card into the chassis and tighten. (See Figure 10-18.)

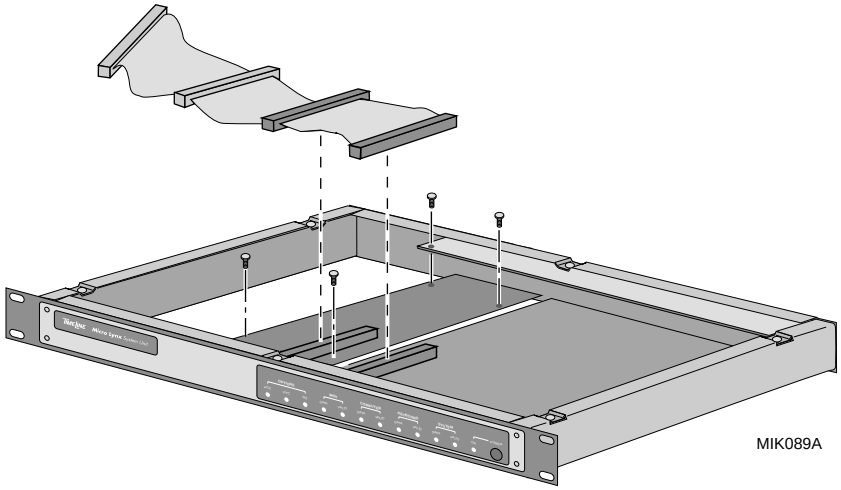


**Figure Chapter 10 -18. Securing the VITC Card**

10. Insert the Option Card cable connector into J1 on the VITC Card.
11. Connect the end of the cable into J3 on the Main Board. The unused connectors on the left of the cable will lie in the open area, unless you have option cards installed.
12. Replace the top cover and the six phillips screws.
13. Power up the System Unit. The Micro Lynx will recognize the VITC Card on power up and the VITC LED on the System Unit OPTION Section will turn on,

## Operation Instructions

Operation of the VITC Reader Card is extremely simple, and once configured operates transparently to the user. When a VITC Option Card is installed in the Micro Lynx SU the card is automatically detected by the system. The VITC LED on the front panel of the system unit and the F3 LED on the Keyboard will come on to indicate that the VITC Option Card is present and correctly communicating.

To configure the VITC Card, the line scan mode and group assignment need to be selected. Use Setup VITC to specify the correct settings for your system. Enter setup mode by pressing the [SETUP] key followed by [F3] to select the VITC setup options menu. Use the [NEXT]/[LAST] and [+]/[–] keys to set the correct options from the menu.

## [F3] VITC Options

**Table Chapter 10 -7. F3 Setup Options**

| KEY | MENU | SUB-MENU | RANGE |
|---|---|---|---|
| F3 | VITC Options | 0 Group Select | *Off*, A, B, C |
| | | 1 Reader Mode | *Auto*, Fixed |

**Group Select** Use the group select option to allocate the VITC reader to a specific Micro Lynx machine. This should be set to the same machine (A-C) that the video transport is connected to. Make sure that a BNC to BNC cable is connected between the video out jack on the video transport and the video in jack on the Micro Lynx VITC Card.

**Reader Mode** **Auto.** Automatic mode will always find and select the lowest pair of matching lines. If this pair of lines is lost for any reason then the VITC Card will scan for the next matching pair of lines on the tape. If the VITC board finds another pair of lines then it will automatically switch to the new lines and display the warning message "VITC Lines changed". This mode of operation is extremely effective when there is only one pair of continuous lines on the tape. If the VITC on tape is discontinuous or because of the video editing process there are several pairs of discontinuous VITC lines on tape then fixed reader mode should be used.

**Fixed.** In fixed mode, a single pair of VITC lines can be selected. When a pair of lines is selected, the VITC reader will only read these lines.

**Selecting VITC lines.** To display or select specific VITC lines, press the F3 key, the display will show the numbers of the lines that the VITC reader has found on the video tape. The lines selected by the automatic line select mode are indicated by A's in the display and the fixed lines indicated by f's. To select lines in fixed mode use the [LAST]/[NEXT] keys to choose line 1 or line 2 and then the [+]/[–] keys or the Jog/Shuttle wheel to pick a specific line. The number of lines displayed is automatically adjusted for NTSC or PAL operation so only correct lines are available for selection.

## VITC Display and Status

The keyboard VITC LED status indicator will come on when any matching pair of VITC lines is detected on tape whether the lines are selected not.

A lower case "v" is placed in the display next to the machine letter when the displayed machine or group time code is being updated by the VITC reader board. The time code display is normally LTC

and will automatically switch to VITC when the video tape machine is in still mode or moving at less than 1/3rd play speed.