

MkIIIC and Turbo Installation

Note: Installation of the Meta-Speed[□] digital servo modification kit should be undertaken only after confirming that the present analog servo, scan, and zoom systems are working properly and are aligned correctly.

Inserting and Removing Circuit Boards

ALWAYS TURN OFF THE POWER before inserting or removing Meta-Speed[□] circuit boards. These boards contain CMOS chips that could be damaged or erased if this procedure is not observed. Additionally, when working on the spooling motors, be sure to unplug the Supervisor board from the rack to avoid damaging the software.

Servo Identification

Before starting installation of Meta-Speed[□], please confirm that the servo rack is either a MkIIIC or Turbo 2 version. This servo rack can be identified by:

- a) Motherboard type (100734), (100799), (101035), or (102328).
- b) The Speedbus is present on the motherboard.
- c) The Write/Freeze signal passes through the servo rack before going to the Digiscan.
- d) A Servo Logic 8 board (100729), (100798), or (101037) is used.
- e) A Servo Logic 11 board (100738) is used.

Note: For the purposes of this manual, **any** telecine with a Servo Rack **Motherboard 100558** is considered to be a **MkIIIB**, even if other modifications, such as Unimedia Turbo, have been applied to the telecine.

Remove Servo Rack

1. Disconnect all cables to the Servo Rack after checking that they are properly marked.
2. Remove the Servo Rack from the telecine and place it on a stable work surface.

Remove Servo Rack Boards

1. Remove the Cintel boards from the Servo Rack indicated in .

Cintel Board Name	Cintel Board #
Servo Logic 8	100729, 100798 or 101037
Framing Board	100472 or 100829
Capstan Servo Control 1/3	100731, 101000, or 101036
Capstan Servo Control 2	100746 or 100828
Velocity Servo	100745, 100898, or 101038
Phase Servo	100735 or 100899
Gate & System Coding	100744 or 100794

Table 8 - MkIIIC Servo Rack Boards to Remove

Install Servo Rack Connector Panel 2 (23016)

The Servo Rack Connector Panel 2 (SRCP2) will be mounted on the rear rails of the Servo Rack, approximately 1 inch to the right of McMurdo connectors **ASK4**, **ASK5**, and **APL6**. Perform the following modifications:

1. If a TLC Connector Panel is installed on the back of the Servo Rack, relocate it to the back of the PEC Rack.
2. Install the SRCP2 Power Cable (19001). Solder the cable to the pins of **PL1** of the Servo Logic 10 board (100733) on the backside of the Servo Rack motherboard as shown in Table 9 (next page). Secure this cable to the main wiring bundle at the bottom of the Servo Rack.

Note: *The choice of the Servo Logic 10 board (100733) is merely a suggestion, since all that is required is to provide the needed voltages to the SRCP2.*

Install Servo Rack Connector Panel 2 (23016) (cont.)

DE9S Pin	Wire Color	100733 pin	Signal
1	violet	PL1-17	GND
4	red	PL1-2	+5V
6	yellow	PL1-4	+12V
8	white	PL1-29	-12V

Table 9 - SRCP2 Power Cable (19001)

3. Position the SRCP2 next to the rear of the Servo Rack to use as a reference for connector locations. Do not attach it to the Servo Rack at this time. Refer to Table 10 for SRCP2 cable definitions
4. Route cable (19016) from the Phase Servo slot (100735 or 100899) near the edge connector, around the right end of the motherboard and connect to **P15** of the SRCP2.
5. Connect 10-conductor 'twist-n-flat' ribbon cable (19004) to SRCP2 **P16**. Make sure pin 1 (brown wire) is to the top of the ribbon cable. Route this cable between the slots for the Velocity Servo (745, 898, or 1038) and the Phase Servo (735 or 899). This cable goes above the motherboard and between the edge connectors, but under the metal crossbar if possible. It will be connected to the front of the Velocity DSP (23004) in a later step.

Cable	Conductors	SRCP	To Connector and Board
19003	26	P13	P5 of Supervisor (23021)
19004	10 (5 pairs)	P16	P4 of Velocity DSP (23004)
19016	26	P15	P3 of Phase Adapter 4 (23019)

Table 10 - SRCP2 Cables

Install Servo Rack Connector Panel 2 (23016) (cont.)

- Route cable (19003) as shown in Figure 4. Starting at **P13** of the SRCP2, this cable goes outside the top of the Servo Rack and re-enters the rack just to the right of the Servo Control 2 (100828) slot. This routing is to ensure that the Supervisor board in the Framing board (100829) slot can be withdrawn from the Servo Rack without disconnecting or entangling its associated cables.

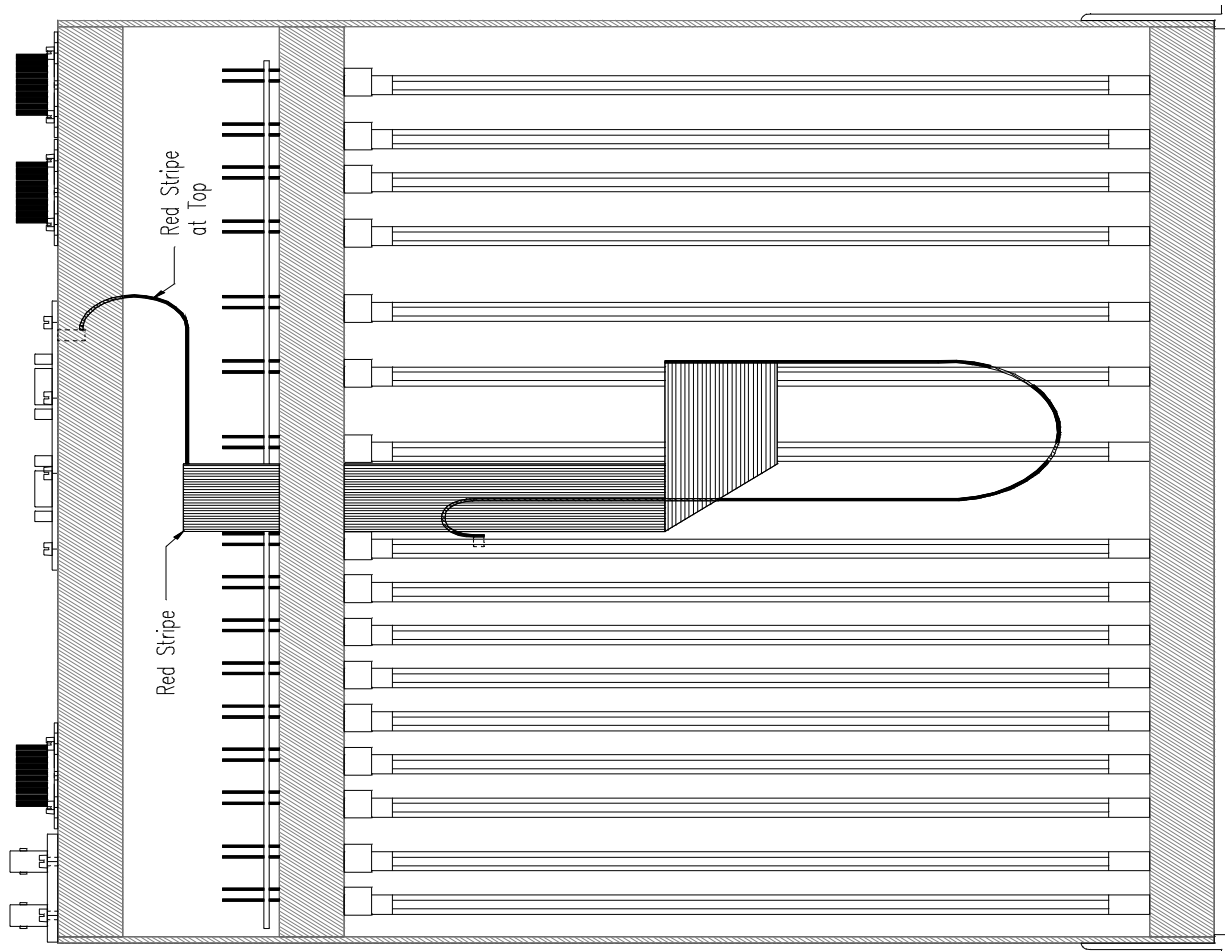


Figure 4 - 19003 Cable Routing (Top View)


- Connect cable (19001) (installed in step 2 above) to **P10** on the SRCP2. Note that pin 3 is a coding pin.
- Using the screws and washers provided, mount the SRCP2 on the rear rails of the Servo Rack, approximately 1 inch to the right of McMurdo connectors **ASK4**, **ASK5**, and **APL6**. It may be necessary to loosen the screws attaching the other connector panels to the rear rails of the Servo Rack. This will allow the nut bars to slide sideways, so that the holes will line up with the SRCP2.

Install Meta-Speed[□] Boards

1. Set the jumpers on the Meta-Speed[□] Servo Rack boards as shown in Table 11. For more detailed information, refer to the Jumper Setting Charts in the Detailed Board Descriptions section, starting on page 83.

Capstan Servo Control 2 Adapter (23006)		
J1-J6	in	Speedbus present

Capstan Servo Control 1/3 Adapter (23008)		
J1	in	Shuttle present
J2	out	No TLC
	1-2 (up)	FSOSlow* on Phase Servo PL1-25
	2-3 (down)	FSOSlow* on Phase Servo PL1-27
Note: J2 depends on the pins used by TLC		

Velocity DSP (23004)		
J1	out	WVD Hi-Z input
J2		Standard Interrupts
J3	out	WHD Hi-Z input
J4	2-3 (down)	FP negative pulse
J5	2-3 (down)	WHD negative pulse
J6	out	WDT disabled
J7	out	SCLK Master
J8	in	SFRAME Master
J9	2-3 (right)	PLL Ref is WHD
J10	out	MkIII Gate Codes

Phase Adapter 4 (23019)		
J1-J8	in	MkIIIC
J9- J12	1-2 (up)	MkIIIC
J13	1-2 (up)	FP positive pulse
J14	1-2 (up)	FP positive pulse
J15-J16	1-2 (up)	MkIIIC
J17-J18	1-2 (up)	MkIIIC

Table 11 – Typical MkIIIC Servo Boards Jumper Settings

Install Meta-Speed[□] Boards (cont.)

2. Connect ribbon cables to the Supervisor board and the two associated adapter boards. These adapter boards are **NOT INTERCHANGEABLE** and must be assembled as follows:
 - a) Connect the long end of 50-conductor ribbon cable (19011) to **P2** of the Supervisor board (23021).
 - b) Connect the center connector of 50-conductor ribbon cable (19011) to **P2** of the Capstan Control 1/3 Adapter (23008).
 - c) Connect the short end of 50-conductor ribbon cable (19011) to **P2** of the Capstan Control 2 Adapter (23006).
 - d) Connect one end of 40-conductor ribbon cable (19012) to **P3** of the Supervisor board (23021). The other end will be connected in a later step.
3. Install this Supervisor assembly (all 3 boards) in the Servo Rack as follows: (Refer to Table 12 for board arrangement).
 - a) Install the Capstan Control 2 Adapter (23006) in the Capstan Servo Control 2 slot (746 or 828).
 - b) Install the Capstan Control 1/3 Adapter (23008) in the Capstan Servo Control 3 slot (731, 1000, or 1036).
 - c) Connect the free end of the 26-conductor ribbon cable (19003) installed earlier to **P5** of the Supervisor board (23021).
 - d) Install the Supervisor board (23021) in the Framing slot (472 or 829).

Supervisor 2 (23021) Left-most	Capstan Servo Ctrl 1/3 (23008) Middle	Capstan Servo Control 2 (23006) Right-most
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Table 12 – Supervisor 2 Group

4. Install ribbon cables (19014 & 19018) to the Velocity DSP board (23004) and the two associated adapter boards. These adapter boards are **NOT INTERCHANGEABLE** and must be assembled as follows:
 - a) Connect one end of 50-conductor ribbon cable (19014) to **P2** of the Velocity DSP board (23004).
 - b) Connect the other end of 50-conductor ribbon cable (19014) to **P2** of the Phase Adapter 4 (23019). Note that this connector is on the solder side of the Phase Adapter 4 (23019).
 - c) Connect one end of 50-conductor ribbon cable (19018) to **P4** of the Phase Adapter 4 (23019).

Install Meta-Speed[□] Boards (cont.)

- d) Connect the other end of 50-conductor ribbon cable (19018) to **P2** of the Gate/Sys Adapter (23005).
5. Install this Velocity DSP assembly (all 3 boards) in the Servo Rack as follows: (Refer to Table 13 for board arrangement).

- a) Install the Gate/Sys Adapter (23005) in the Gate & System Coding/Shrinkage 1 slot (744 or 794).
- b) Connect the free end of the 26-conductor ribbon cable (19016) installed earlier to **P3** of the Phase Adapter 4 (23019).
- c) Install the Phase Adapter 4 (23019) in the Phase Servo slot (735 or 899).
- d) Connect the free end of the 10-conductor ‘twist-n-flat’ ribbon cable (19004) installed earlier to **P4** of the Velocity DSP board (23004). Make sure pin 1 (brown wire) is to the left.
- e) Install the VDSP board (23004) in the Velocity Servo slot (745, 898 or 1038).
- f) Connect the free end of the 40-conductor ribbon cable (19012) installed earlier to **P3** of the Velocity DSP board (23004). Note that this connector is on the solder side of the Velocity DSP board (23004).

Velocity DSP	Phase Adapter 4	Gate/System Adapter
(23004)	(23019)	(23005)
Left-most	Middle	Right-most

Table 13 – Velocity DSP Group

- 6. Install the Servo Logic 8M (23009) in the Servo Logic 8 slot (729, 798, or 1037).

Modify the Varispeed Board (100797)

1. Remove the Varispeed board (100797), usually located in the Audio Rack. Perform the following modification:
 - a) Remove the IC's listed in Table 14 from the Varispeed board (100797):

IC13	74LS374
IC14	74LS373
IC15	74LS374
IC16	26LS32
IC17	26LS32

Table 14 – IC's To Be Removed

- b) Insert the supplied 20-pin header into socket **IC14**. The effect of this modification is to wire the Speedbus data "straight-through". (The 20-pin header is wired as follows: 2 to 3, 4 to 5, 6 to 7, 8 to 9, 12 to 13, and 14 to 15.)
2. Install the modified Varispeed board (100797) back into its original slot.

Frame Counter Modifications for MkIIIC and Turbo

Description

This procedure describes the modifications required for the Meta-Speed[□] to drive the telecine Frame Counter and associated devices (color correctors, TLC, etc.). The advantages of this approach include:

- Selectable perfs-per-frame on a particular gate (such as 3-perf 35mm on a 4-perf gate) with correct frame count to color corrector and other external devices
- Adjustable timing of the count pulses
- More consistent editing with TLC and other edit controllers

Discussion

In Cintel telecines, the Frame Counter is derived from the slots on the sprocket encoder cylinder on the rear of the film gate. The slots are arranged in a pattern that generates a biphasic pair of signals, when sensed with phototransistors and LEDs. These signals indicate the position of the film and are referred to as **2ØA** and **2ØB**. The analog phototransistor signals go first to the Counter Board (100853), where they are level-shifted to TTL. They are then conditioned by Gate Code information to maintain consistent count direction for different gate types, and decoded to drive the local counter display. The TTL versions of the signals then go to the Sep Mag & Counter board (100585), where they are buffered by transistors, and sent out to external devices, such as Color Correctors.

This modification replaces the signals generated by the encoder cylinder **slots** with servo signals derived from the encoder cylinder **castellations**. After performing this modification procedure, the source of 2ØA and 2ØB will be the Meta-Speed[□] Servo System.

MkIIIC and Turbo Procedure

In telecines including MkIII and Turbo, a pair of wires must be added from the Servo Rack to the PEC Rack. The Sep Mag & Counter board (100585) requires no modification.

Power down the telecine before removing any boards!

Disable Frame Counter TTL outputs.

Note: Some machines may have a 100594 board rather than a 100853.

On the Frame Counter board (100594), remove **IC33** and **IC34**.

On the Frame Counter board (100853), remove **IC7** and **IC8**.

Add 2ØA and 2ØB Signals to Servo Rack

Add a cable between the PEC Rack and the Servo Rack as detailed in Figure 5. This cable must have a disconnect to allow removal of the racks. Suggested connectors are XLR 3-pin. Suggested cable is Belden 9451 or equivalent shielded 1-pair “audio” cable. Note that there will be wires already present on some of the pins indicated. The new wires should be added to the existing wires, leaving the old signal paths intact.

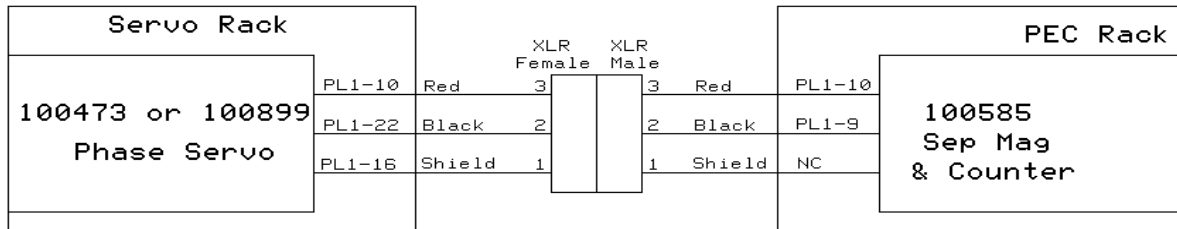


Figure 5 - Servo Rack to PEC Rack Interconnect

1. Power down the telecine.
2. Solder a shielded 1 pair cable to the Phase Servo socket as follows:
 - Shield to Phase PL1-16
 - Black to Phase PL1-22 (2ØA signal)
 - Red to Phase PL1-10 (2ØB signal)
3. Cut the cable to an appropriate length for the layout of your telecine and terminate it with a female 3-pin XLR connector as follows:
 - Shield to pin 1
 - Black to pin 2 (2ØA Signal)
 - Red to pin 3 (2ØB Signal)
4. Re-install the Servo Rack and reconnect all cables.
5. Disconnect and remove the PEC rack.
6. Solder a shielded 1-pair cable to the Sep Mag & Counter (100585) socket as follows:
 - Shield – no connection. This is to avoid ground loops.
 - Black to PL1-9 (2ØA Signal)
 - Red to PL1-10 (2ØB Signal)
7. Cut the cable to an appropriate length for the layout of your telecine and terminate it with a male 3-pin XLR connector as follows:
 - Shield to pin 1
 - Black to pin 2 (2ØA Signal)
 - Red to pin 3 (2ØB Signal)
8. Re-install and re-connect the PEC Rack. Connect the two XLR connectors.

Enable and Adjust Meta-Speed 2ØA and 2ØB Drivers

1. On the Phase Adapter 4 (23019), set bit 4 of **SW2** to **On**. This enables the 2ØA and 2ØB drivers.
2. On the Phase Adapter 4 (23019), bits 1 and 2 adjust the timing of the 2ØA and 2ØB signals, in 1/4 frame increments. Usually, it is best if the Color Corrector frame count changes when the frame line passes the center of the picture monitor.

Miscellaneous

Digiscan 4:2:2 has excessive droop and low levels on its Write Vertical Drive (WVD) signal. To reduce the droop rate and increase the signal level, perform the following modification to the Store Control 2 board (101133) (See page 1 of the Cintel schematic):

1. Change capacitor **C62** from **0.1uF** to a **2.2uF** tantalum, **16** volts or higher. Orient this capacitor with the **positive** side towards the **lower** edge of the circuit board. On page one of the Cintel Store Control 2 (101133) schematic, the positive side of the capacitor is to the left (towards **IC24** pin 10).
2. Add a **10K8** resistor from **IC24 pin 16** to **IC24 pin 10**. This will increase the voltage swing of the WVD signal.

SlowScan Disable GPI Input

Some users (especially those with Kinesis units) have requested a GPI input to disable SlowScan. This is available at PL1-6 of the Meta-Speed[□] Gate/System Adapter (23005). If this line is pulled low, SlowScan will be turned Off. This input overrides any selection made at the VT100 terminal or CTM control panel.

Time Logic Controller

Meta-Speed[®] software versions 1.98 and above require TLC **RK3.44** or later software.

To use the Time Logic Controller with Meta-Speed[□], the TLC Buffer Electronics Assembly must be modified and J2 on the Capstan Control 1/3 Adapter (23008) must be set to select the Film Speed Override (FSO*) signal.

1. Remove **U6** and **U7** (both are chip type HI-5043) from the TLC Buffer Assembly.
2. Replace **U6** with the supplied header marked **U6** (this header connects pin 1 to pin 10).
3. Replace **U7** with the header marked **U7** (this header connects pin 1 to pin 15).
4. Set **J2** on the Capstan Control 1/3 Adapter (23008) to select the pin on **PL1** which is the source of the FSO (Film Speed Override) signal from the TLC Buffer Electronics Assembly. See Table 15 (overleaf) for typical settings.

Time Logic Controller (cont.)

J2	FSO signal	Telecine
1 to 2	PL1-25	MkIIIB, Turbo 2, most URSAs
2 to 3	PL1-27	MkIIIC, some URSAs

Table 15 – TLC Film Speed Override

5. After installation is complete TLC will need to be enabled at the software **Setup Menu**, under **Film Speed Override Type**.

Frame Timebase or Digital Deflection System (DDS)

Depending on the telecine configuration, the next step is to either install the Frame Timebase board (page 49) or complete the necessary connections to interface to a DAV DDS (page 51).

Removal of Meta-Speed[□] from MkIIIC and Turbo

Should it be necessary to remove the Meta-Speed[□] system from the telecine, the ribbon cables and connector panels can be left installed, but disconnected. The old boards can be re-installed without modifications, other than replacing the chips that were removed from the Varispeed, Zoom and TLC boards, if applicable.

The following steps summarize the removal procedure:

1. Power down the telecine.
2. Replace the Meta-Speed[□] boards with the original Cintel boards.
3. Replace the chips removed from the Varispeed board (797), if applicable.
4. Replace the chips removed from the (761) or Kinesis Zoom board, if applicable.
5. Replace the chips on the TLC Buffer Electronics Assembly, if applicable.
6. Replace the chips on the Frame Counter boards, and disconnect the XLR connectors used for the Frame Counter modification.
7. Reapply power.