Setting up in the studio

SO-01-0690

System maintenance

Every New England Digital System has been designed to withstand the rigors of continual use, both on the road and in professional studio envionments. As with all sophisticated electronic equipment, however, proper care must be taken in the installation, shipping and handling of your system.

Maintenance and servicing

New England Digital holds periodic training programs for studio operators and technical personnel. However, before performing routine maintenance or undertaking any repair, all customers are strongly advised to contact an authorized New England Digital Support Services representative. A complete list of our worldwide sales, service and training offices is in the back of the manual.

Never attempt to open the system with the power on. Major operating problems may be created by careless disassembly and reassembly of the unit. New England Digital technicians are trained to troubleshoot system problems quickly and efficiently. If you experience a problem, call your nearest New England Digital Support Service.

When you request an NED service visit, be sure you back up all vital media prior to the arrival of the NED service personnel. When you sign the release form at each service visit, you release NED from any liability for any subsequent loss of data as a result of the service performed. If you wait until the service personnel arrive to begin backup, you will be billed for Time and Materials plus Waiting Time.

Shipping and handling

Always consult with the New England Digital Shipping Department (603/448-5870) before shipping any hardware. Proper care in packing is essential for all systems. Any unit supplied with a flight case must always be transported in the flight case. Studio units with doors should always be transported with the front (power on/off) side facing down. Units housed in wooden or ATS case enclosures should always be transported with the front (power on/off) side facing up. Units housed in wood must be properly wrapped in padding. Be sure that adequate personnel are available to pack and unpack the unit.

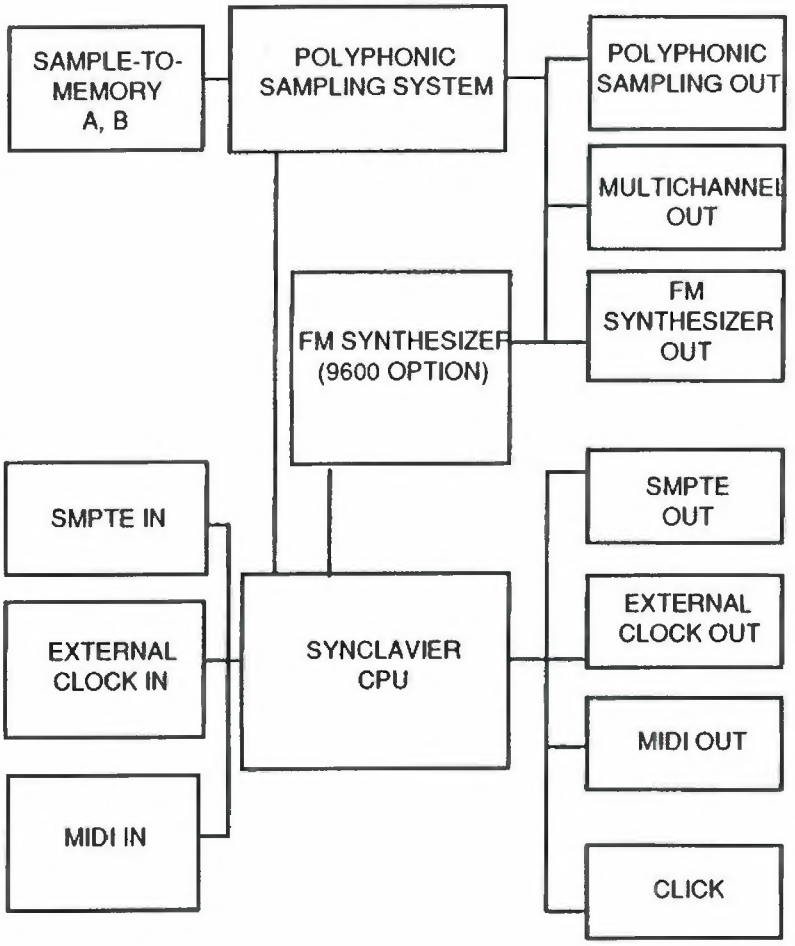
The unit must be shipped by air freight or "air ride" trucks equipped to handle precision electronics equipment. Never transport the unit via a commercial freight forwarder.

The hard disk drives included in your system are extremely sensitive. Rough treatment can result in severe damage to the units, platters and heads as well as unrecoverable loss of your valuable data. Never remove a hard disk unit from the special protective case it is shipped in. We strongly advise that you back up all essential data to floppy or data cartridge before moving any hard disk.

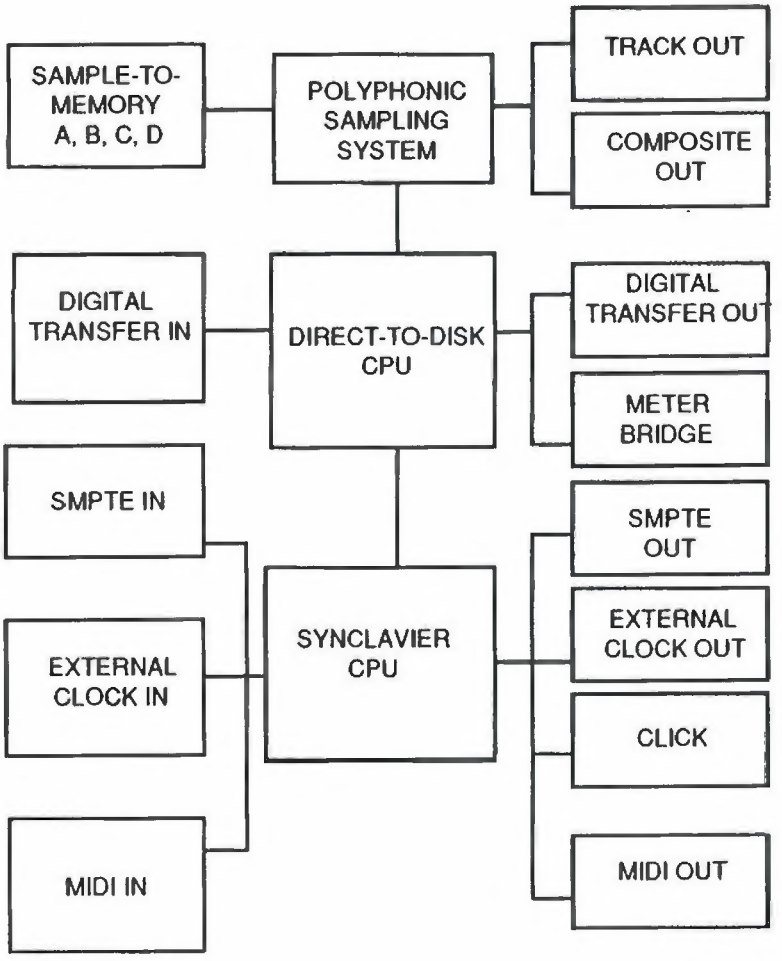
Signal flow charts

The following charts show the signal paths from input through signal processing to output.

Synclavier signals



Direct-to-Disk signals



Synclavier technical data

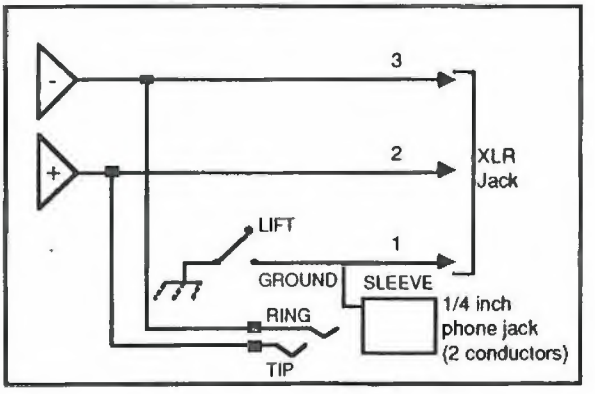
To maintain the highest quality signal, you should match your Synclavier carefully with the equipment in your studio.

Power requirements

	Synclavier 9600	Synclavier 3200 Synclavier 6400
Circuit	120-volt, single-phase, 60-Hz, independent isolated ground branch circuit fused at 30 amps	120-volt, single-phase, 60-Hz, independent isolated ground branch circuit fused at 15 amps
Plug	30-amp, 120-volt twist lock of the National Electrical Manufacturer's Association L5-30 code male style	15- amp, 120-volt twist lock of the National Electrical Manufacturer's Association L5-30 code male style
Power consumption	2160 watts	785 watts
BTU output	13K BTU/hr	5K BTU/hr

Ground lift switch wiring

XLR Pin 1 connected to chassis ground when switch is up. Pin 1 of interconnecting audio cables not connected to connector housing.



Cooling and ventilation

To assure proper working of the cooling system, the front vents must be unobstructed so that air can freely enter the unit through the front. The air exhaust fans on the rear of the unit must be clear and at least six inches from the wall. Exhaust air should be vented away from the unit and not be allowed to recycle through the front vents.

Operating temperature	42–75° F
Storage temperature	32–110° F
Operating humidity	20–80%, non-condensing
Storage humidity	8–80%, non-condensing

Synclavier technical data (con't)

Audio input specifications

	Synclavier 6400, 9600	Synclavier 3200
A/Ds	16 bits/channel, linear quantization	16 bits/channel, linear quantization
Impedance	200 kΩ balanced 100 kΩ unbalanced 20 Hz to 20 kHz	200 kΩ balanced 100 kΩ unbalanced 20 Hz to 20 kHz
Gain	Programmable, -3 to +28 dB in 1 dB steps ± -0.05 dB accuracy @ 1 kHz	Programmable, -3 to +28 dB in 1 dB steps ± -0.05 dB accuracy @ 1 kHz
Sampling rate	Programmable, 1 to 100 kHz in 0.1 kHz steps	Programmable, 1 to 100 kHz in 0.1 kHz steps
Frequency response	+0.5 dB, -1.0 dB, 20 Hz to 20 kHz	+0.5 dB, -1.0 dB, 20 Hz to 20 kHz
THD	< 0.02% at +4 dBm, 20 to 20 Khz @ 50 kHz	< 0.02% at +4 dBm, 20 to 20 Khz @ 50 kHz
IMD	not specified	not specified
S/N ratio	94 dB minimum, gain =0 dB, 20 Hz to 20 kHz	94 dB minimum, gain =0 dB, 20 Hz to 20 kHz
Crosstalk	< -90 dB minimum, channel to channel	< -90 dB minimum, channel to channel

Audio output specifications

	Synclavier	**Multichannel Distributor**
D/As	Electronically balanced stereo XLR or 3-conductor 1/4" phone (6400, 9600) Electronically balanced master XLR or 3-conductor 1/4" phone (3200)	Electronically balanced XLR
Impedance, D/As	100 Ω balanced 50 Ω unbalanced 20 Hz to 20 kHz	100 Ω balanced 50 Ω unbalanced 20 Hz to 20 kHz
Impedance, FM (9600)	660Ω balanced 330Ω unbalanced 20 Hz to 20 kHz	n/a
Level, balanced	+4 dBm nominal +19 dBm maximum	-9.5 dBm nominal, 600Ω -16 dBm balanced, no load -15.5 dBm unbalanced, 600Ω -19 dBm unbalanced, no load
Frequency response	+0.5 dB, -1.0 dB, 20 Hz to 20 kHz	
Gain	-1 dB for 1 voice peak amplitude +3 dB per every doubling of voices	-26.5 dB

Synclavier technical data (con't)

Synchronization specifications

	SMPTE In	External Clock In
Type	Balanced transformer coupled	TTL
Impedance	10 kΩ	4 kΩ
Level	-32 dBm minimum -10 dBm nominal	3 volt minimum for ON state

	SMPTE Out	External Clock Out	Click out
Type	TTL	TTL	Balanced 10 ms pulse
Impedance	1 kΩ	1 kΩ	100 Ω balanced 50 Ω unbalanced
Level	0–5 v	0–5 v	pin 2 to ground: 0–3.5 v pin 3 to ground: 0–7.5 v pin 2 to pin 3: 0–7.25 v

Keyboard back panel output specifications

	Gate	Trigger	CV
Level	+10 v	+10 v, 10 ms pulse	+1 to 5 v, 1 v/octave
Impedance	100 Ω	100 Ω	100 Ω

	Ribbon	Headphone, Front panel	Headphone, Back panel
Level	0 to 4.6 vDC	+3.5 dBm	+3.5 dBm
Impedance	800 Ω pressed 10 kΩ unpressed	250Ω	250Ω

	Pedal1, Pedal2
Controller range	0Ω–1 MΩ = 0–100%

Synclavier technical data (con't)

Note: All connectors are on the back panel of all Synclavier control units.

Connectors

Audio input	SAMPLE-TO-MEMORY A,B	Input channels for recording audio signals
Audio output	FM SYNTHESIZER OUT (9600)	Composite output for all polyphonic sampling voices
	POLYPHONIC SAMPLING OUT	Composite output for all polyphonic sampling voices
	HEADPHONE OUT (9600)	Composite FM and sampling output for headphone
	MULTICHANNEL 1–16 (6400 and 9600)	Outputs for right and left channels of individual sequencer tracks

Connectors (con't)

Timing	EXTERNAL CLOCK IN	Input for audio sync signals
	EXTERNAL CLOCK OUT	Output for audio sync signals; on 9600, SMPTE time code generator
	SMPTE IN	Input for SMPTE time code
	SMPTE OUT (3200 and 6400)	SMPTE time code generator
	CLICK	Output for digital metronome
MIDI	MIDI IN	Input for MIDI events
	MIDI OUT	Output for MIDI events
	MIDI THRU	Output for MIDI events for module in MIDI chain.
	MIDI AUX	Input for MIDI sync signals
Peripherals	TERMINAL	Mac II connector
	PRINTER	Printer connector
	MODEM	Modem connector
	RS422	Connectors for RS422 board, MIDInet and/or DESC

Peripherals

Keyboard footswitches

Footswitches can be purchased from local music stores. They should provide both Normally Open and Normally Closed momentary contacts. For correct operation, connect the Normally Open contacts to any of the 7 footswtich inputs on the back panel of the Synclavier keyboard.

Hold
Repeat
Portamento
Punch In/Out
Sustain
Arpeggiate
Phrase
(**Mute** is not currently used)

All footswtiches are normally open; close to activate.

Peripherals (con't)

Real-time effects controllers

A battery powered (9-volt) Morley SLVO footpedal is shipped with all Synclavier 9600 units. It is connected from the 1/4-inch phone jack labeled "Instrument" to either the **Pedal1** or **Pedal2** input on the back panel of the Synclavier keyboard.

The footpedal "Volume" know sets the volume level for the lowest (heel down) pedal position. The "Travel" knob adjusts how much pedal travel is required to reach maximum volume.

The controller range for both pedal inputs is 0Ω–1 MΩ = 0–100%.

A Yamaha BC-1 or its electrical equivalent can be connected to the **Breath Controller** input on the back panel of the Synclavier keyboard.

Direct-to-Disk technical data

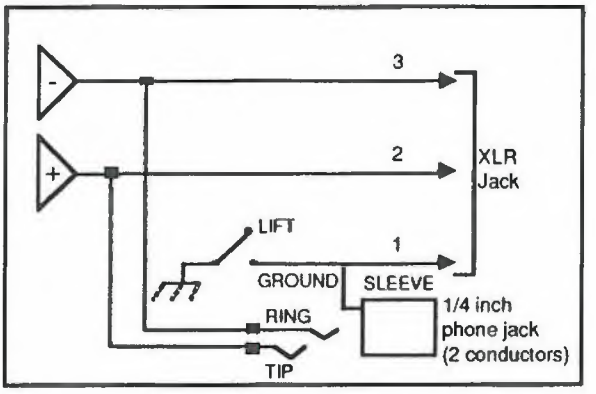
To maintain the highest quality signal, you should match your Direct-to-Disk carefully with the equipment in your studio.

Power requirements

	Direct-to-Disk, PostPro	PostPro SD
Circuit	120-volt, single-phase, 60-Hz independent isolated ground branch circuit fused at 20 amps	120-volt single-phase 60-Hz independent isolated ground branch circuit fused at 15 amps.
Plug	15-amp, 125-volt twist lock of the National Electrical Manufacturer's Association 5-15 code male style	15-amp, 125-volt twist lock of the National Electrical Manufacturer's Association 5-15 code male style
Power consumption	1380 watts	1020 watts
BTU output	6.5 K BTU/hr	6.5 K BTU/hr

Ground lift switch wiring

XLR Pin 1 connected to chassis ground when switch is up. Pin 1 of interconnecting audio cables not connected to connector housing.



Cooling and ventilation

To assure proper working of the cooling system, the front vents must be unobstructed so that air can freely enter the unit through the front. The air exhaust fans on the rear of the unit must be clear and at least six inches from the wall. Exhaust air should be vented away from the unit and not be allowed to recycle through the front vents.

Operating temperature	42–75° F
Storage temperature	32–110° F
Operating humidity	20–80%, non-condensing
Storage humidity	8–80%, non-condensing

Direct-to-Disk technical data (con't)

Audio input specifications

	Direct-to-Disk PostPro	PostPro SD
A/Ds	16 bits/channel, linear quantization	16 bits/channel, linear quantization
Impedance	200 kΩ balanced 100 kΩ unbalanced 20 Hz to 20 kHz	200 kΩ balanced 100 kΩ unbalanced 20 Hz to 20 kHz
Gain	Programmable, -3 to +28 dB in 1 dB steps ± -0.05 dB accuracy at 1 kHz	Programmable, -3 to +28 dB in 1 dB steps ± -0.05 dB accuracy at 1 kHz
Sampling rate	Programmable, 1 to 100 kHz in 0.1 kHz steps	Programmable, 1 to 100 kHz in 0.1 kHz steps
Frequency response	+0.5 dB, -1.0 dB, 20 Hz to 20 kHz	+0.5 dB, -1.0 dB, 20 Hz to 20 kHz
THD	< 0.02% at +4 dBm, 20 to 20 Khz @ 50 kHz	< 0.02% at +4 dBm, 20 to 20 Khz @ 50 kHz
IMD	not specificd	not specified
S/N ratio	94 dB below full scale level of +19 dBm, 20 Hz to 20 kHz	94 dB below full scale level of +19 dBm, 20 Hz to 20 kHz
Crosstalk	< -80 dB minimum, 20 Hz to 20 kHz	< -80 dB minimum, 20 Hz to 20 kHz

Audio output specifications

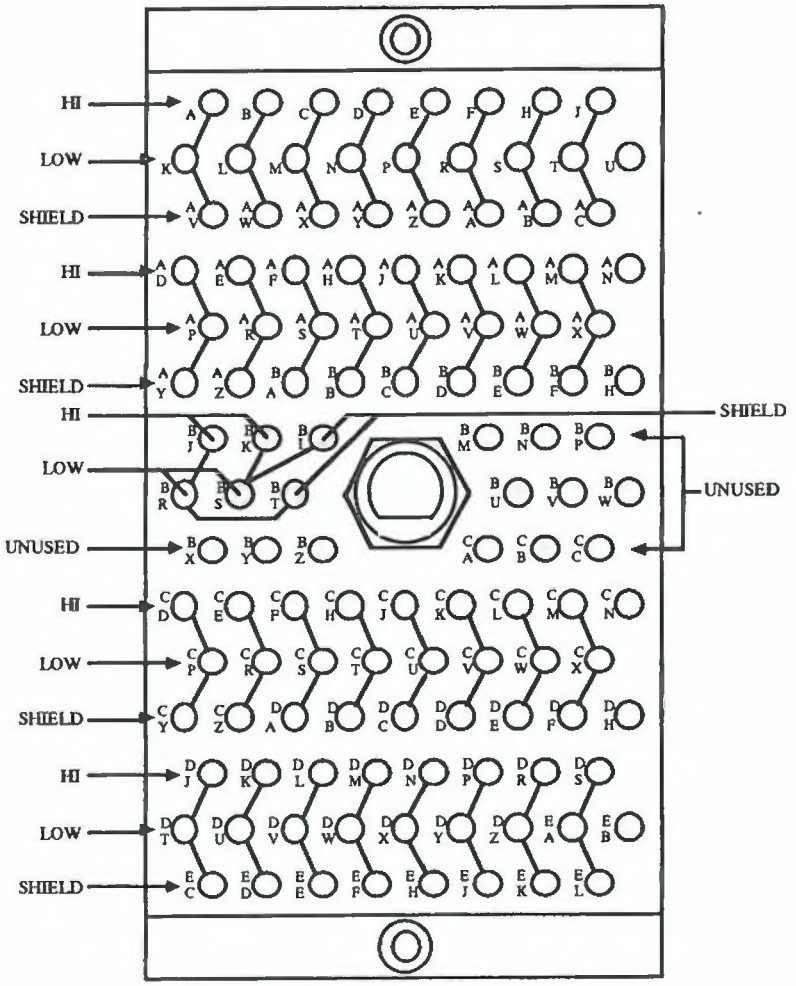
	PostPro and PostPro SD track outputs	**PostPro SD multichannel outputs**
D/As	Electronically balanced stereo composite ELCO, XLR or 3-conductor, 1/4" phone	Electronically balanced channels, XLR
Impedance	100 Ω balanced 50 Ω unbalanced 20 Hz to 20 kHz	100 Ω balanced 50 Ω unbalanced 20 Hz to 20 kHz
Level, balanced	+4 dBm nominal +19 dBm maximum	-9.5 dBm nominal, 600Ω -16 dBm balanced, no load -15.5 dBm unbalanced, 600Ω -19 dBm unbalanced, no load
Frequency response	+0.5 dB, -1.0 dB, 20 Hz to 20 kHz	+0.5 dB, -1.0 dB, 20 Hz to 20 kHz -30 dB, 13 kHz
Gain	0 dB	-26.5 dB

Direct-to-Disk technical data (con't)

ELCO 8016 120-pin connector

	Left			Right		
Output	High	Low	Shield	High	Low	Shield
Track 1	A	K	V	CD	CP	CY
Track 2	B	L	W	CE	CR	CZ
Track 3	C	M	X	CF	CS	DA
Track 4	D	N	Y	CH	CT	DB
Track 5	E	P	Z	CJ	CU	DC
Track 6	F	R	AA	C	CV	DD
Track 7	H	S	AB	CL	CW	DE
Track 8	J	T	AC	CM	CX	DF
Track 9	AD	AP	AY	DJ	DT	EC
Track 10	AE	AR	AZ	DK	DU	ED
Track 11	AF	AS	BA	DL	DV	EE
Track 12	AH	AT	BB	DM	DW	EF
Track 13	AJ	AU	BC	DN	DX	EH
Track 14	AK	AV	BD	DP	DY	EJ
Track 15	AL	AW	BE	DR	DZ	EK
Track 16	AM	AX	BF	DS	EA	EL
Composite	BJ	BR	BT	BK	BS	BL

ELCO 8016 120-pin connector (con't)



Direct-to-Disk technical data (con't)

Synchronization specifications

	SMPTE In	External Clock In
Type	Balanced transformer coupled	TTL
Impedance	10 kΩ	4 kΩ
Level	-32 dBm minimum -10 dBm nominal	3 volt minimum for ON state

	SMPTE Out	External Clock Out	Click out
Type	TTL	TTL	Balanced 10 ms pulse
Impedance	1 kΩ	1 kΩ	100 Ω balanced 50 Ω unbalanced
Level	0–5 v	0–5 v	pin 2 to ground: 0–3.5 v pin 3 to ground: 0–7.5 v pin 2 to pin 3: 0–7.25 v

Connectors

Audio Input	SAMPLE-TO-MEMORY A,B,C,D	Input channels for recording audio signals
	STM IN	Input for recording audio signals from the Synclavier STM module
	STM OUT	Output for audio signals recorded into Synclavier STM module
Audio output	TRACK OUT	Direct output of all DTD tracks
	COMPOSITE OUT	Composite output of all DTD tracks
	MULTICHANNEL 1–16	Outputs for right and left channels of sequencer tracks (not currently in use)
UDIO	COMPOSITE SYNC IN	Input for NTSC or PAL/SECAM sync signal
	PRODIGI IN/OUT	Input and output for ProDigi formats and SDIF multitrack format
	SDIF2 IN/OUT	Input and output for SDIF two-track format
	AES/EBU S/PDIF IN/OUT	Input and output for AES, EBU or S/PDIF formats

Note: All connectors are on the back panels of the Direct-to-Disk, the PostPro and the PostPro SD units.

Direct-to-Disk technical data (con't)

Connectors (con't)

Any Direct-to-Disk can have up to four STM input modules installed with the input channels numbered as follows:

STM module	Input channels			
	1	2	3	4
1	1A	1B	1C	1D
2	2A	2B	2C	2D
3	3A	3B	3C	3D
4	4A	4B	4C	4D

Connectors (con't)

Timing	EXTERNAL CLOCK IN	Input for audio sync signals
	EXTERNAL CLOCK OUT	Output for audio sync signals
	SMPTE IN	Input for SMPTE time code
	SMPTE OUT	SMPTE time code generator
MIDI	MIDI IN	Input for MIDI events
	MIDI OUT	Output for MIDI events
	MIDI THRU	Output for MIDI events for module in MIDI chain
	MIDI AUX	Input for MIDI sync signals
Peripherals	TERMINAL	Mac II connector
	PRINTER	Printer connector
	MODEM	Modem connector
	RS422	Connectors for RS422 board, MIDInet and/or DESC
	DISPLAY	Connector for meter bridge

Direct-to-Disk technical data (con't)

Connectors (con't)

Time Expansion	1	Connects additional drive to tracks 1–2 (tracks 1–4 if running with track expansion) to double recording time.
	2	Connects additional drive to tracks 3–4 (tracks 5–8 if running with track expansion) to double recording time.
	3	Connects additional drive to tracks 5–6 (tracks 9–12 if running with track expansion) to double recording time.
	4	Connects additional drive to tracks 7–8 (tracks 13–16 if running with track expansion) to double recording time.
SCSI	IN	Input for external SCSI drive
	OUT	Output for external SCSI drive
	Dignostic	Connector for diagnostic terminal

Peripherals

Meter bridge

The meter bridge has individual LED viewmeters for each Direct-to-Disk track. Below each view meter, the track number lights whenever the track is available. The following colors indicate track status.

color	track status
green	input mode
yellow	repro mode
red	record mode

When the track is in Auto mode, the track number switches from green (when stopped) to yellow (when playing back).

Color-coded words add track status information.

color	word	track status
green	INPUT	input assigned
yellow	READY	track set to ready
red	RECORD	track set to record