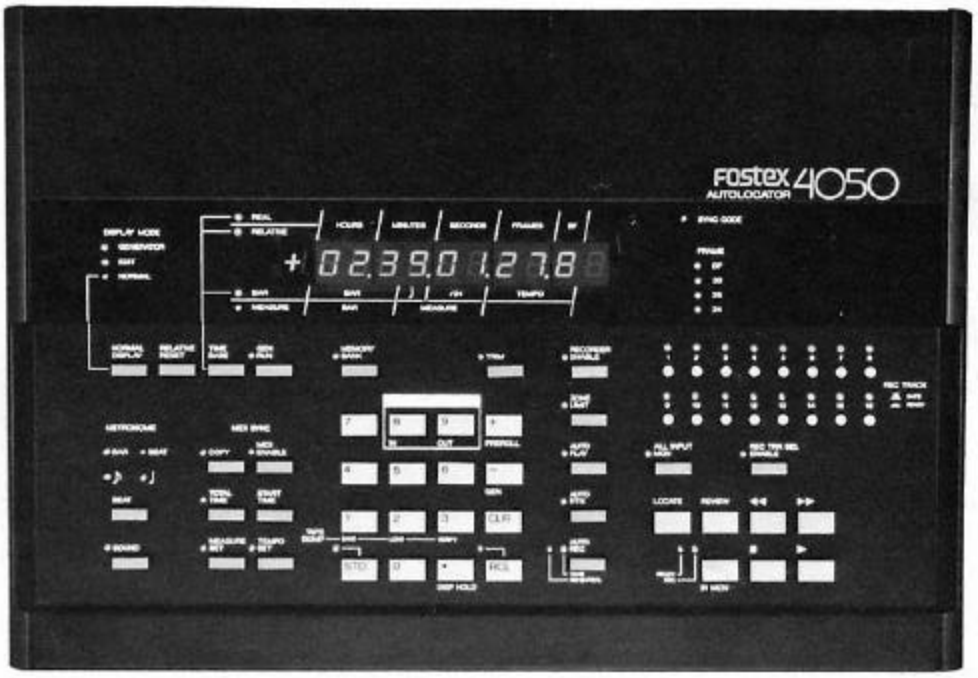
Owner's Manual

Model 4050

AUTOLOCATOR



FOSTEX®

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SAFETY INSTRUCTIONS

WARNING
"READ BEFORE OPERATING"

1. Read Instructions—All the safety and operating instructions should be read before the appliance is operated.
2. Retain Instructions—The safety and operating instructions should be retained for future reference.
3. Heed Warnings—All warnings on the appliance and in the operating instructions should be adhered to.
4. Follow Instructions—All operating and use instructions should be followed.
5. Water and Moisture—The appliance should not be used near water—for example, near a bathtub, washbowl, kitchen sink, laundry tub, in a wet basement, or near a swimming pool, etc.
6. Ventilation—The appliance should be situated so that its location or position does not interfere with its proper ventilation. For example, the appliance should not be situated on a bed, sofa, rug, or similar surface that may block the ventilation openings; or, placed in a built-in installation, such as a bookcase or cabinet that may impede the flow of air through the ventilation openings.
7. Heat—The appliance should be situated away from heat sources such as radiators, heat registers, stoves, or other appliances (including amplifiers) that produce heat.
8. Power Sources—The appliance should be connected to a power supply only of the type described in the operating instructions or as marked on the appliance.
9. Power-Cord Protection—Power-supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords at plugs, convenience receptacles, and the point where they exit from the appliance.
10. Cleaning—The appliance should be cleaned only as recommended by the manufacturer.
11. Nonuse Periods—The power cord of the appliance should be unplugged from the outlet when left unused for a long period of time.
12. Object and Liquid Entry—Care should be taken so that objects do not fall and liquids are not spilled into the enclosure through openings.
13. Damage Requiring Service—The appliance should be serviced by qualified service personnel when:
    A. The power-supply cord or the plug has been damaged; or
    B. Objects have fallen, or liquid has been spilled into the appliance; or
    C. The appliance has been exposed to rain; or
    D. The appliance does not appear to operate normally or exhibits a marked change in performance; or
    E. The appliance has been dropped, or the enclosure damaged.
14. Servicing—The user should not attempt to service the appliance beyond that described in the operating instructions. All other servicing should be referred to qualified service personnel.

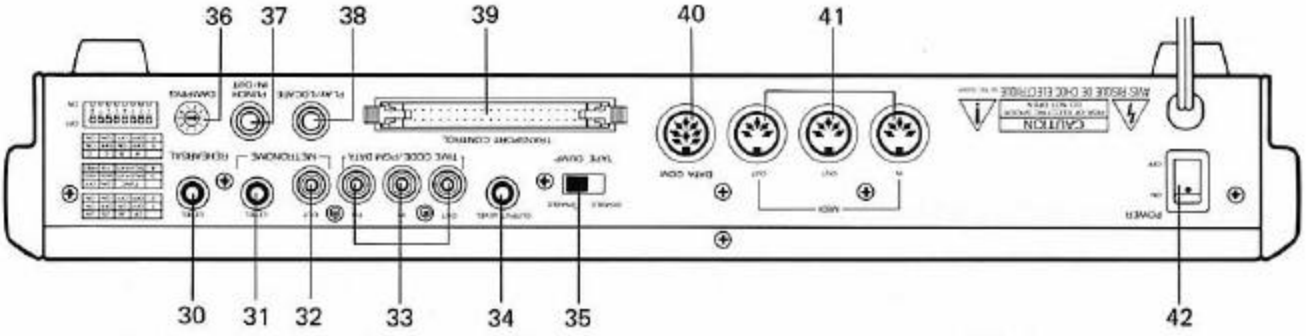
WARNING: To avoid possible electric shock hazard, do not expose this appliance to rain or moisture. There are no user serviceable parts inside. Refer servicing to qualified service personnel.

1. INTRODUCTION

The Fostex 4050 is the most advanced autolocator yet available. In addition to autolocate function, it can write and read SMPTE time code, and synchronize MIDI products to SMPTE.

2. OUTSTANDING FEATURES

1) Complex music editing has become easier as the cue points of music information (bar numbers/beat numbers) synchronized with the multitrack recorder can be preset. This function lets you easily run edit decision lists (also known as "EDLs").
2) Synchronization between a tape recorder "striped" with SMPTE time code and an electronic musical instrument with MIDI interface is accomplished by using the 4050's internal synchronizer.
3) Positions on the tape can be accurately detected by the internal SMPTE time code generator/reader.
   Auto locate of a recorder is also possible by detecting the recorder TACH pulse and without recording the SMPTE time code.
4) It has a tempo sequencer function that can control timing changes in rhythm and tempo of a MIDI sequencer, as well as accurately preset the performance length of a tune.
5) Up to ten cue points and tempo sequences can be set in the internal memory by its program function and the memory can be battery backed up. These settings can be dumped on tape.
6) Auto locate is possible by either time information or bar information when the multitrack recorder and the internal MIDI synchronizer are in sync by the SMPTE time code.
7) The Model 4050 possesses all functions of tape remote control, record track select and input monitor contained in the Fostex Model B-16, 80 and 20 recorders.
8) It can communicate with a personal computer through the serial communication buss (option).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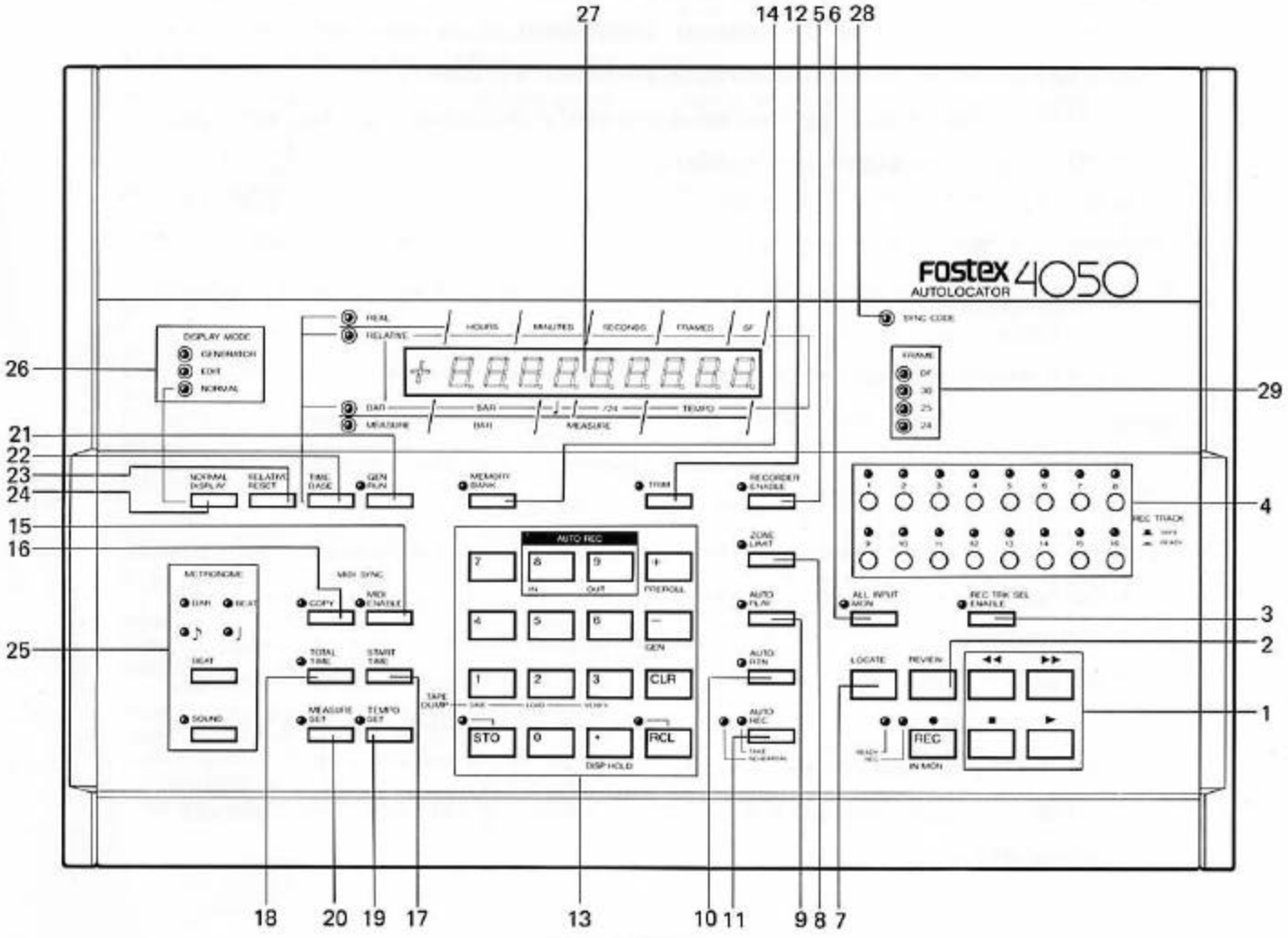
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3. THE CONTROLS AND THEIR FEATURES

1) Remote control buttons for controlling the recorder in PLAY, STOP, F.FWD, RWD and REC.

When the RECORDER ENABLE (5) is OFF, they will act as control switches in START/STOP etc. of the MIDI synchronizer.

2) REVIEW button

The REVIEW mode can be entered from any mode. When the REVIEW button is depressed, the tape is rewound for a length of 5 seconds, then enters the play mode.

If the REVIEW button is depressed for longer than 5 seconds, the recorder will automatically enter the play mode as soon as the REVIEW button is released.

3) REC TRK SELECT ENABLE button

The switch for selecting whether REC TRK and ALL INPUT MON is to be controlled at the recorder or by the 4050. The control will be at the 4050 when the LED at left of this button is lit.

4) REC TRK button

Either SAFE or READY of the 80, 20 and B-16 RECORD TRACK (REC MODE) button can be selected by the 4050 when REC TRK SELECT ENABLE (3) is on.

5) RECORDER ENABLE button

To select whether or not the 4050 is to control the recorder. The LED will be lit at depressing RECORDER ENABLE to indicate that recorder control is at the 4050.

It is at disable status when this LED is not lit and the recorder cannot be controlled by the 4050 but as its internal phantom recorder will remain in synchroniztion with the MIDI real time information, this function is convenient in generating MIDI data.

6) ALL INPUT MON button

When this button is depressed with the RECORD TRACK SELECT ENABLE (3) button at ON, the outputs of 80, 20 and B-16 for all channels will switch to INPUT MONITOR.

7) LOCATE button

When this button is depressed, tape is automatically run in F.FWD or RWD to the previously designated position and stopped there.

8) ZONE LIMIT button

ZONE LIMIT is the function of specifying any length of a section on the tape and in the ZONE LIMIT on (LED lit) condition, tape will stop and LED blink when it reaches the preset position while tape is in either the play or fast wind modes.

Depressing the ZONE LIMIT button again will cancel this mode.

This function keeps the tape from running off the end of the reel when in rewind or fast forward modes, as well as protecting already recorded passages from further use.

9) AUTO PLAY button

When AUTO PLAY is on, the transport will automatically go to the PLAY mode after the LOCATE or AUTO RTN mode is completed and the tape comes to a momentary stop.

10) AUTO RETURN button

AUTO RETURN is the function, during the play or record mode, of automatically locating the first cue position upon reaching the end position of the two previously set cue memory positions.

Depressing the AUTO RETURN button again cancels this mode.

11) AUTO REC button

The section preset in CUE memory No. 8 and 9 will be automatically recorded by depressing AUTO REC.

Rehearsing of AUTO REC is also possible by entering the auto punch in/out preset section in the play mode.

12) TRIM key

When this key is depressed while in the EDIT mode (EDIT LED in DISPLAY MODE is lit), the up or down value for the unit indicated by the flashing dot in the display can be changed by the (+) or (-) key.

13) DATA entry key

The key for reading and writing CUE memory, measure set and tempo set during the EDIT mode.

14) MEMORY BANK button

Used to write and read various settings of the AUTO LOCATER and MIDI synchronizer.

15) MIDI ENABLE key

The key to select whether or not MIDI real time information and song position pointer are to be sent from the MIDI output jack. When only editing work is to be done at the recorder, switch off the MIDI ENABLE key.

16) COPY key

The mode key for copying measure set and tempo set data in bar units.

17) START TIME key

The key for entering START TIME so that MIDI real time information can start from any desired position on the tape recorded with SMPTE time code and the method of entering TIME is identical with that for CUE memory.

18) TOTAL TIME key

Performance time from the MIDI start point to the end point is calculated and if necessary, re-establish the performance time by using this key.

19) TEMPO SET key

The key for setting tempo of the tune.

20) MEASURE SET key

A NOTE(s) can be set against a bar number by this key.

21) GEN RUN key

SMPTE time code will be generated (output available from the TIME CODE OUT jack) when this key is depressed.

22) TIME BASE key

This key is for changing the display to REAL time, RELATIVE time, and BAR.

23) RELATIVE RESET key

The absolute position upon the tape corresponding to the content of the display as to REAL, RELATIVE or BAR, will be "0" o'clock of RELATIVE when this key is depressed.

24) NORMAL DISPLAY key

The recorder tape position will be shown on the display when this key is depressed.

25) METRONOME section

This section has the function of allowing tempo to be confirmed by a

clicking sound and flashing of the BAR and BEAT LEDs'.

1) The BAR LED flashes at the head of the bar, and the BEAT LED flashes at the timing set by the BEAT switch.
2) The clicking sound can be switched ON or OFF by the SOUND switch.

26) DISPLAY MODE LED

Displays the present mode of operation.

27) DISPLAY

Hours, minutes, seconds, frames and sub-frames (1/10 frame) at REAL and RELATIVE; BAR and NOTE at BAR are displayed here.

28) SYNC CODE LED

This LED is lit when the signal applied from the recorder to the 4050 is SMPTE time code.

It will not be lit if the time code at this input is other than the number of frames preset by the rear panel DIP switch.

29) FRAME display LED

When the time code with the number of frames preset by the rear panel DIP switch is input, the LED of that frame will be lit.

If the number of frames at this input is different from the preset number, the LED of the preset frame is lit and the input frame will go blinking.

30) REHEARSAL level pot

Whether the section preset for AUTO REC is correct or not can be by the beep sound at the start and end of the section.

This pot is for adjusting the beep sound level.

31) METRONOME level pot

The pot for adjusting the metronome sound volume.

32) METRONOME output jack

33) TIME CODE/PGM DATA jack

The IN/OUT jack for setting data of SMPTE time code, auto locater and MIDI synchronizer.

The FB (foldback) jack is paralleled with the INPUT jack.

34) OUTPUT pot

Signal output level adjusting pot of TIME CODE/PGM DATA.

35) TAPE DUMP switch

When this switch is ENABLED, the data of the auto locater and MIDI

synchronizer can be recorded on the track of the recorder to which TIME CODE/PGM DATA (33) is connected.

36) DAMPING switch

The switch for selecting the response of the recorder tape control.

37) PUNCH IN/OUT jack

Punch IN/OUT by a foot switch is possible by the Fostex Model 8051 Foot Switch plugged in here.

38) PLAY/LOCATE jack

Control from STOP mode to PLAY mode and the LOCATE mode from other than STOP mode is possible by plugging in the Fostex Model 8051 Foot Switch to this jack.

39) TRANSPORT CONTROL

The jack for connecting the 4050 to the recorder. The optional Model 8441 cable for connecting to the Fostex B-16 and the Model 8440 cable for Model 20 and 80, must be used.

40) DATA COM (Option)

Communication is possible through the serial communication buss of a personal computer.

41) MIDI

Synchronization with a recorder and electric music instrument is possible by connecting this port to a MIDI sequencer.

42) Power switch

4. SPECIFICATIONS

4.1 GENERATOR

Operating code	SMPTE 30 F.P.S.
	SMPTE DROP FRAME 29.97 F.P.S.
	EBU 25 F.P.S.
	FILM 24 F.P.S.
Start/stop	Can start/stop at any time.

4.2 MEMORY BANK

The 4050 contains 10 banks of memory in which locate informations, such as CUE, ZONE LIMIT, AUTO RTN; and MIDI informations such as MEASURE and TEMPO, can be set.

4.3 AUTO LOCATOR

No. of CUE points	10
Display	Can be switched to display Real, Relative and Bar.
Control keys	PLAY, STOP, REC, F.FWD, REWIND, LOCATE and REVIEW.
Other controls	Record track selectors and Input mon selector.

4.4 MIDI SYNCHRONIZER

Max. memory changeable points (in all 10 banks)	340 points

NOTE: One data memory will be required when the measure or tempo data is changed.

Maximum measures/bank	999 measures
Tempo data/bank	♩ = 20 ∿ 250
Start time	Can be set to any time.
Total time	Can be set within the tempo data handling range.

4.5 TAPE DUMP

Data in each bank can be saved, loaded and verified.

Baud rate	2400 baud

4.6 INPUTS/OUTPUTS

Time code/Program data input

Level	0.1V ∿ 3V p-p
Impedance	10KΩ unbalanced

Time code/Program data output	
Level	0.1V ∿ 1V p-p, adjustable
Load impedance	10KΩ or higher, unbalanced
Metronome output	
Level	0V ∿ 1V p-p, adjustable
Load impedance	10KΩ or higher, unbalanced
Communication buss (option)	RS-232C, DIN connector
4.7 POWER SUPPLY	120V AC, 60Hz, 20W
	220V AC, 50Hz, 20W
	240V AC, 50Hz, 20W
4.8 DIMENSIONS	400(w) x 65(H) x 275(D)mm
	[15-3/4(W) x 2-3/4(H) x 11(D) inches]
4.9 WEIGHT	4.3Kg (9-1/2 lbs.)

5. INSTALLATION

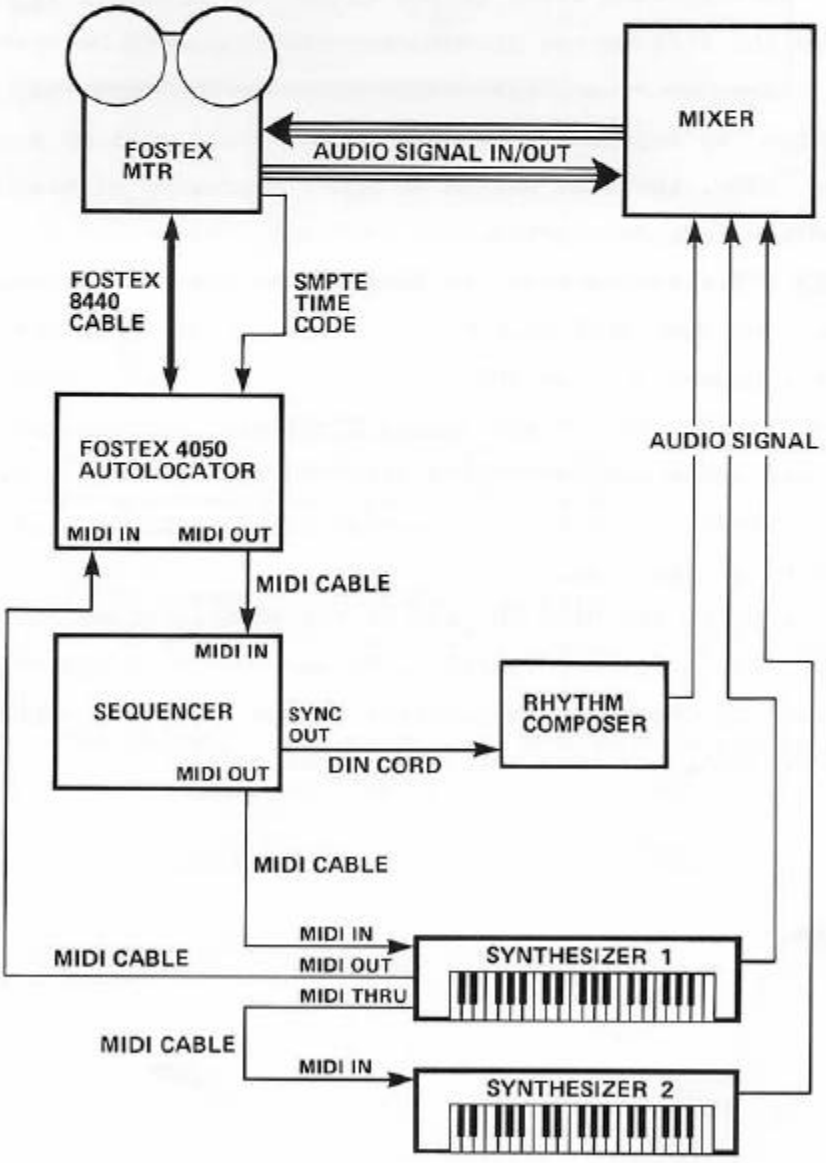
5.1 Unpacking

Unpack the unit, and, before making any electrical connections, inspect for any evidence of possible shipping damage. Save all packing materials at least until you have verified that the unit is working properly. If there is any evidence of damage due to rough handling, consult your FOSTEX dealer before connecting or operating the unit.

CAUTION: Always be sure power is applied only after all cable connections are made and pre-setting of the rear panel is completed.

5.2 Connections

A fundamental example of interconnections with other equipments.



NOTE 1: Please use the Fostex 8441 cable for inter-connection between the 4050 and Fostex B-16 or B-16D.

NOTE 2: Sequencers and the 4050

For representative sequencers, to be coupled with the 4050 to make a system, there are the Korg SQD-1, Roland MSQ-100, Yamaha QX-7, etc.

Sync is possible only from the start of the tune when the 4050 is coupled with Roland MSQ-700 and Yamaha QX-1. It will not sync from any other point in the tune.

NOTE 3: Operation procedures of Korg SQD-1 is different from other sequencers.

a) To perform from start of the tune, PLAY of SQD-1 is depressed, then the PLAY button of 4050 and the tune will be started.

b) To start from an intermediate point in the tune, the 4050 PLAY button is depressed. At this point, there will be a beep from the 4050, the PLAY button of SQD-1 depressed within one second and the tune is started.

c) With other sequencers, the tune can be started by simply depressing the 4050 PLAY button.

NOTE 4: Rhythm composer and the 4050

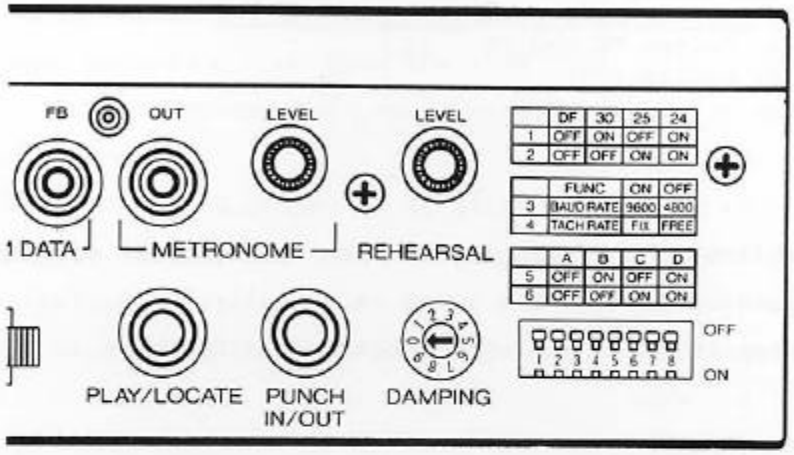
Roland TR-707, TR-709 and Yamaha RX-21 are representative rhythm composers which can be coupled with the 4050 to make a system.

Yamaha RX-11 and RX-15 will sync with the recorder only from the beginning of the tune.

NOTE 5: Data input to the MIDI IN jack of the 4050 is mixed only with the START, STOP, CONTINUE, TIMING CLOCK and SONG POSITION POINTER codes generated by the MIDI synchronizer in the 4050, and output from the MIDI OUT jack, and does not control the 4050.

5.3 Setting DIP switches

AC power to the 4050 must be switched on only after setting the DIP switches, as data thus set is read when power is switched on.



1) Switch 1, 2

These switches select the time codes to be output from the 4050 internal generator. Upper position is OFF and lower, ON. The relation between switch position and resulting time code, are as listed below.

SWITCH	DF	30	25	24
1	OFF	ON	OFF	ON
2	OFF	OFF	ON	ON

2) Switch 3

This selects the communication buss baud rate.

The switch upper position is 4800 baud, and down, 9600 baud.

3) Switch 4

The TACH pulse selector switch. This is set to down position when using Fostex recorders and upper position for other manufacturers recorders.

4) Switch 5, 6

These select the modes of each recorder.

SWITCH	A	B	C	D
5	OFF	ON	OFF	ON
6	OFF	OFF	ON	ON

A: Fostex 80 and 20
B: Fostex B-16

5) Switch 7

Not used.

6) Switch 8

This establishes the length of time from output of the song position pointer to when the sound is actually heard.
Down position is SLOW, and upper position is FAST.

5.4 Setting of damping

A Damping Selector is provided in the 4050 to compensate for each tape transport response time differences. Setting the proper damping figure will then allow smooth deceleration and accurate locating in the fast winding mode.

Ten levels of damping from 0 to 9 is possible. Please set to the figure which allows most smooth locating which is 3 ∿ 6 for B-16 and 1 or 2 for models 80 and 20.

CAUTION: Set the damping selector before switch ON of power as data thus set is read upon switch ON of power.

6. OPERATION

6.1 The following preparations are minimum requirements before using the 4050.

1) Record a time code on an edge track of a multitrack recorder (Refer to item 6.2).
2) Input start time data into the 4050. 00 Hour 01 Min. 00 Sec. is already stored as the initialize data. Start time is input as required (Refer to item 6.5, page 15).
3) Measure and tempo must be set. 4/4 beat, tempo ♩ = 100, and end data of 101 measure are already stored as initialize data (Refer to items

6.6, page 16, and 6.7, page 19, respectively).

6.2 Recording of time code (GENERATOR)

Output level

1) When it is put in the RUN mode by depressing the GEN RUN key, the SMPTE TIME code is output from the TIME CODE jack. Adjust OUTPUT pot (34) so that the 80 and B-16 meter reading is in the range from -3dB to 0dB.
2) The GEN RUN key functions as an alternate switch and at the HOLD condition at which the LED of this switch is not lit, the HOLD time will be held.
   It will start from the HOLD time when the GEN RUN key is depressed again.

Time setting

1) TIME code frame to be recorded is selected by the rear panel DIP switch. (Refer to item 5.3 Setting DIP switches)
2) Depress GEN RUN key to set it in the HOLD condition at which GEN RUN LED is extinguished. Then, set TIME BASE to REAL.
3) Depress the CLR key, then set the generator start time by the key-pad. (Refer to item 4.5 START TIME)
4) Store the generator start time in memory by depressing STO and [-] (GEN) keys. The display will return to the NORMAL mode.

Time display

1) GEN LED of the DISPLAY MODE will be lit and the display panel show the generator time when the RCL and [-](GEN) keys are depressed.
2) It will go to the NORMAL mode when the NORMAL DISPLAY key is depressed. It will go to the EDIT mode when the CLR key is depressed or the RCL and "n" key are operated.

6.3 Playback of time code (READER)

The Reader will correctly operate when it reads the SMPTE TIME codes which are identical with the number of frames set by the rear panel DIP switch.

1) Setting the number of frames

Set the rear panel DIP switch to number of frames identical with the SMPTE TIME code to be read.

Either one of the FRAME indicating LED (29) will be lit in accordance to the number of frames set.

2) The SYNC CODE (28) LED will be lit, when frames identical with the number of frames set by the DIP switch, is input to the 4050 from the recorder.

3) Should SMPTE TIME codes different to what is set by the DIP switch is input, the input TIME code frame number will be shown in blinking by the FRAME indicating LED (29).

Example

FRAME No. set by DIP switch	FRAME Nos. at input	FRAME LED				DISPLAY
30	30	24	25	30	DF	NORMAL
		O	O	●	O	
DF	30	24	25	30	DF	ERROR
		O	O	*	●	

● Lighting * Blinking O Extinguished

4) For tapes with excess drop out

When SMPTE TIME codes with excess drop out is input to the 4050, missing codes can be filled in to a certain extent. In such a condition, the SYNC CODE LED will not be lit.

6.4 MIDI SYNCHRONIZER

The MIDI synchronizer generates from the TIME CODE, MIDI real time information (START, STOP, CONTINUE, TIMING CLOCK) which is synchronized with the recorder, and song position pointers.

The MIDI synchronizer normally operates with the recorder as its master. In other words, it synchronizes with the recorder time code but if the RECORDER ENABLE button (5) is switched OFF (DISABLED), MIDI real time information synchronized with the 4050 time code generator (phantom recorder) is generated.

6.5 START TIME

START TIME is established to start MIDI from any point on the tape. The method of establishing and the indications are the same as for CUE memory (refer to item 6.11 DATA INPUT).

However, TIME BASE cannot be entered by BAR and will create an error if this is attempted. In such a case, the display will indicate an "error", emit an error beep, and about 2 seconds later return to the display shown prior to depressing the STO key.

6.6 MEASURE SET

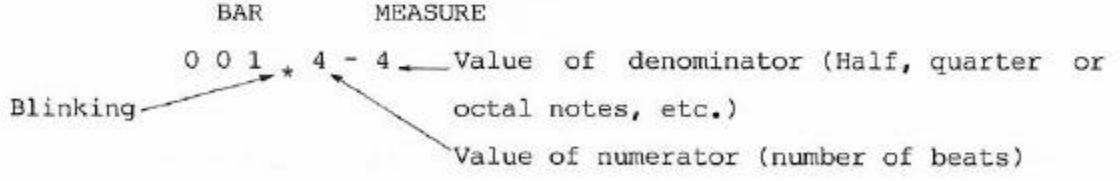
MEASURE is set for BAR display and tempo sequences. In a tune with no change in rhythm, it is only necessary to enter rhythm data of the first bar and the end data. For a tune in which there are changes in rhythm, it is necessary to enter data of the changing points.

a) The MEASURE SET switch functions as an alternate switch and when MEASURE SET is switched ON, the switch LED is lit, DISPLAY mode will be EDIT, DISPLAY will change to MEASURE, and the changing point nearest beforehand of the present position is displayed.

NOTE 1: MEASURE SET will not go ON during operation of the recorder or MIDI.

NOTE 2: MEASURE SET automatically goes OFF when NORMAL DISPLAY is induced, and LOCATE or other transport control modes are carried out.

b) MEASURE SET will be entered as a default value of 4/4 rhythm for rhythm data in the first bar.



c) The changing point one step ahead when the (+) key is depressed, or that one step beforehand when the (-) key is depressed, will be displayed.

d) Changes, additions or deleting of measure shifting points
A change is made, while the measure shifting point data is shown on the display, and by rewriting with the numerical keys and the

period (.) key, then depressing the STO key, in the same way as rewriting the CUE point.

An addition is made by depressing the CLR key to put the measure shifting point display to data input standby, enter new data, then depressing the STO key.

Delete is made by depressing the CLR key after showing the measure shifting point on the display, then depressing the STO key.

e) Following are examples in how the display changes in accordance to change, addition and delete operations.

CAUTION: Measure only can be changed in the data for the first measure. For the end measure, measure number only can be changed.

Example 1

Changing the setting of 3/4 beat from the 12th bar to 4/4 beat from the from the 13th bar.

This measure shifting point is displayed using the (+) or (-) keys.

	BAR	MEASURE
	0 1 2 * 3 -	4
		Blinking
1	_ _ 1 * 3 -	4
3	_ 1 3 * 3 -	4
.	0 1 3 . 3 * -	4
4	0 1 3 . 4 * -	4
STO	Next shifting point or data input standby.	

Example 2

New setting (addition) to 6/8 beat from the 33rd bar.

		BAR			MEASURE
Set to data input standby by depressing CLR		_ _	_ * _	-	_
3		_ _	3 * _	-	_
3		_ 3	3 * _	-	_
.		0 3	3 . _ *	-	_
6		0 3	3 . 6 *	-	_
.		0 3	3 . 6	-	_ *
8		0 3	3 . 6	-	8 *
	STO	Next shifting point or data input standby.			

f) It is necessary to change an ending data to stop MIDI at end of the tune. If the tune ends at the 160th measure, the ending data 0/0 is entered at the 161st measure. Default value of the tune end is 100th measure and ending data 0/0 is in the 101th measure.

Change to data input standby
by using the (+) key.

	BAR	MEASURE
	1 0 1 * 0 -	0
	Blinking	
1	_ _ 1 * 0 -	0
6	_ 1 6 * 0 -	0
1	1 6 1 * 0 -	0
STO	Next shifting point or data input standby.	

6.7 TEMPO SET

TEMPO is set to establish tempo of the tune, and to operate MIDI and the metronome.

a) The TEMPO SET switch functions as an alternate switch and when TEMPO SET is set to ON, the switch LED is lit, display mode will be for EDIT, TIME BASE for BAR, and the shifting point beforehand the nearest current position will be displayed. However, if the current position is before the first step, this first step will be displayed.

NOTE: TEMPO SET cannot be set to ON whenever the recorder or MIDI is operating.

When TEMPO SET is ON, the metronome will operate at the beat which is on display and a timing clock will be output from MIDI OUT.

b) TEMPO SET is established as a default value of ♩ =100 for the tempo data at the start (first note of the tune) of the first beat in the first measure.
In this case, when TEMPO SET is set to ON, the established starting point of the tune will be displayed as below.

BAR ♩ /24	TEMPO
0 0 1 * 1 . 0 0 . 1	0 0
Blinking	

c) When the (+) key is depressed, in the same way as for MEASURE SET, the shifting point one step ahead, and when the (-) key is depressed, the same one step beforehand will be displayed.

d) Changes, additions and deletion of the measure shifting point

These, in the same way as for MEASURE SET, are changed by the same process as for rewriting the CUE POINT, by first displaying the shifting point data to be changed, then rewriting with the numerical keypad and period (.) key, and finally depressing the STO key, in the same way as for rewriting the CUE point.

Additions are made by either depressing the CLR key to put the shifting point display into the data input standby mode or manipulate the controls so that data after the final step can be displayed by the (+) key, then putting it into the data input standby mode, and finally entering the new data and depressing the STO key.

For deletion, the shifting point to be deleted is put on display, the CLR key, then the STO key are successively depressed.

e) Examples in each manipulation and changes in display for the above changes, additions and deletion are presented below.

Example 1

Changing the ♩ =120 setting for the downbeat of the 2nd beat in the 12th measure to ♩ =140 from the 1st beat in the 13th measure.

This shifting point is displayed using the (+) or (-) key.

	BAR	♩	/24	TEMPO
	0 1 2 * 2 . 1		2 . 1	2 0
Blinking →				
1	_ _ 1 * 2 . 1		2 . 1	2 0
3	_ 1 3 * 2 . 1		2 . 1	2 0
.	0 1 3 . 2 * 1		2 . 1	2 0
1	0 1 3 . 1 * 1		2 . 1	2 0
.	0 1 3 . 1 . 1		2 * 1	2 0
0	0 1 3 . 1 . _		0 * 1	2 0
.	0 1 3 . 1 . 0		0 . 1	2 0 *
1	0 1 3 . 1 . 0		0 . _	_ 1 *
4	0 1 3 . 1 . 0		0 . _	1 4 *
0	0 1 3 . 1 . 0		0 . 1	4 0 *
STO	Next shifting point or data input standby.			

Example 2

New setting (addition) to ♩ =90 from the 3rd beat of the 33rd measure.

Set to data input standby using CLR key or (+) key.

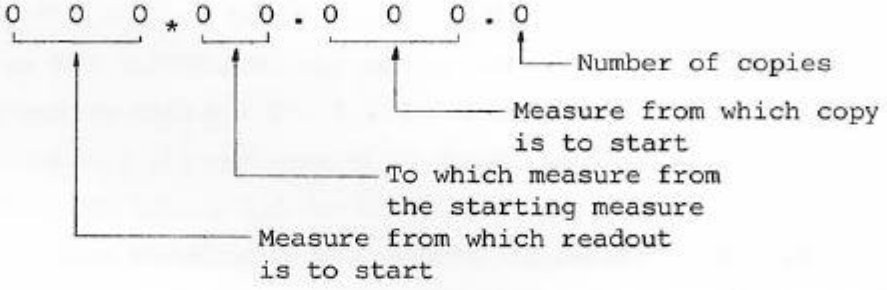
	BAR	♩	/24	TEMPO
	_ _ _ * _ . _		_ . _	_ _
3	_ _ 3 * _ . _		_ . _	_ _
3	_ 3 3 * _ . _		_ . _	_ _
.	0 3 3 . _ * _		_ . _	_ _
3	0 3 3 . 3 * _		_ . _	_ _
.	0 3 3 . 3 . _		_ * _	_ _
0	0 3 3 . 3 . _		0 * _	_ _
.	0 3 3 . 0 0 .		_ * _	_ _ *
9	0 3 3 . 3 . 0		0 . _	_ 9 *
0	0 3 3 . 3 . 0		0 . _	9 0 *
STO	Next shifting point or data input standby.			

6.8 COPY

MEASURE SET and TEMPO SET data can be copied in measure units.

Following is an example of copying tempo data from the 6th measure to the 8th measure 3 times from the 9th measure and thereafter.

1) When the COPY key is depressed, the COPY key LED is lit, display mode will be EDIT, and be in standby for the copy destination as shown below:



	0 0 0 * 0 0 . 0 0 0 . 0	
5	0 0 5 * 0 0 . 0 0 0 . 0	
.	0 0 5 . 0 0 * 0 0 0 . 0	
3	0 0 5 . 0 3 * 0 0 0 . 0	
(5th measure to the 3rd measure, namely 8 measures)		
.	0 0 5 . 0 3 . 0 0 0 * 0	
9	0 0 5 . 0 3 . 0 0 9 * 0	
.	0 0 5 . 0 3 . 0 0 9 . 0 *	
3	0 0 5 . 0 3 . 0 0 9 . 3	
STO	COPY LED is extinguished and go to NORMAL mode.	

6.9 TOTAL TIME

Length of time from MIDI starting point to ending point (ending position) can be calculated. On the other hand, length of time from starting point to ending point can be specified.

a) The TOTAL TIME switch functions as an alternate switch and when TOTAL TIME is switched ON, the switch LED is lit, DISPLAY mode will be EDIT, TIME BASE will be REAL, and the length of time from the starting point set by the MIDI START TIME up to the ending point set by MEASURE SET will be displayed as below.

```
        H      M      S      F   SF
  0  0 * 0  5 . 1  2 . 1  2 . 3
       ↖
      Blinking
```

NOTE 1: TOTAL TIME will not go ON when the recorder or MIDI is operating.

NOTE 2: TOTAL TIME is automatically turned off except when the NORMAL DISPLAY mode is entered, or if other transport operations such as LOCATE, etc, is activated.

NOTE 3: If the ending data have not been entered by MEASURE SET, turning ON the TOTAL TIME will show an "ERROR" on the display, an error beep sound will be emitted, TOTAL TIME will go OFF and return to NORMAL mode.

b) Should it be necessary to specify the time and automatically correct TEMPO, either the time is rewritten by the same procedure as for correcting the CUE point or depress the CLR key, enter the time by the numerical keypad and depressing the STO key, in the same way as when entering the CUE point using the numerical keypad.
Blinking of the DISPLAY dot will then stop, and with the specified time showing on the display, and the corrected figure for TEMPO will be calculated.

c) After completing calculation of the corrected figure for TEMPO and TEMPO is automatically corrected, the TOTAL TIME LED will change to constant lighting and the display HOUR unit dot will start blinking in the same way as when TOTAL TIME is turned ON.

NOTE: If a time which must be corrected beyond the range of =20 ∿ 250 for

TEMPO is entered and then STO key is depressed, an "ERROR" will be shown on the display, an error beep will sound and after about 2 seconds, the display will return to what was shown prior to depressing the STO key.

6.10 METRONOME

This METRONOME features two separate blinking LED's for BAR and BEAT, and a clicking sound to confirm the TEMPO.

a) METRONOME operates within the section starting from two measures beforehand of the start point established by MIDI START TIME during the PLAY or REC PLAY modes, up to the end point established by the MEASURE SET ending data.

NOTE: METRONOME operates without regard to ENABLE or DISABLE of MIDI.

b) The METRONOME BAR LED is lit at the first note of a measure, and the BEAT LED is lit at the timing of the note selected by the BEAT switch.

c) The click sound of the METRONOME is output at the timing of the note selected by the BEAT switch, and the first note of each measure is a loud sound.

The click sound can be switched on or off by the SOUND switch, and the sound volume controlled by the rear panel METRONOME VOL.

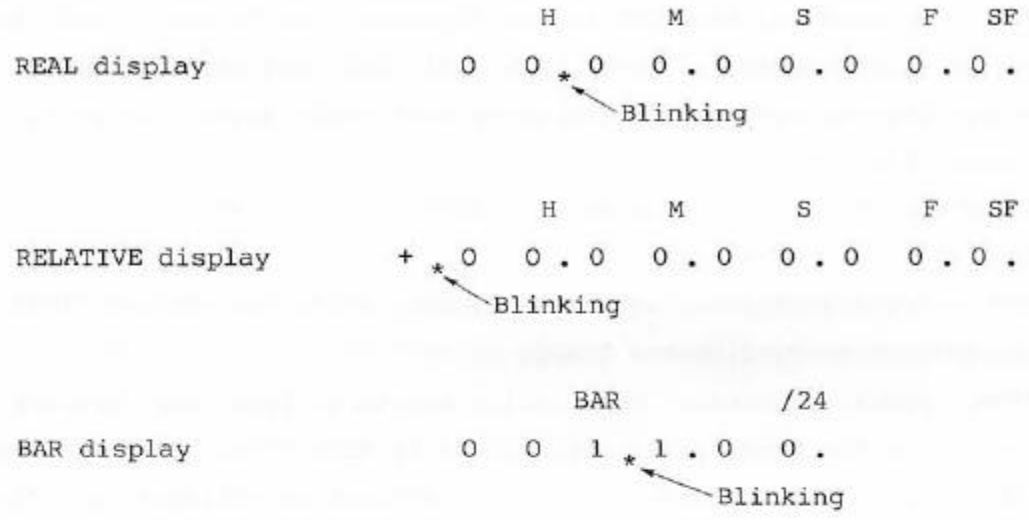
If this click is being monitored from METRONOME OUT. the click will not be heard from the 4050 internal speaker.

6.11 DATA INPUT

6.11.1 Input by the keypad

1) Depress the CLR key. The 4050 will change to EDIT mode.

2) The display will change to the following in accordance to the TIME BASE setting.



3) When a number is entered by the keypad when in the REAL or BAR display, the flashing dot of the lowest digit will show this number and the next significant digit will display a (-) Hyphen to indicate standby of the next input.
   The number entered next will be shown at the second digit. A number from the ten key can be entered any number of times until (.) period is depressed.
4) The flashing dot will shift to the next digit to standby for the next input when the (.) key is depressed. If there is no need to change the presently displayed number, simply depress the (.) key and it will go to the next digit for the input standby mode.
   In the case of RELATIVE, (+) or (-) is entered first. The (.) key or (+), (-) key is depressed for (+) input, and (-), (.) key for (-) input. After this, the procedure is the same as for REAL.
5) STO key is depressed upon completing input of the numbers. The STO LED will then be lit, the dot will change from flashing to a continuous light of each lowest digit dot, and be at standby for input of the memory destination.
6) The memory destination is input by the keypad. This completes the input procedure and the display will return to the NORMAL mode.
7) If the input numbers are not correct (For example, 65 minutes or 70 seconds) or if the input numbers contradict with the MIDI MEASURE SET, depressing the STO key will display an ERROR, emit a BEEP, then return to the display immediately before depressing the STO key.

8) Examples of various TIME BASE inputs

(*) indicates blinking of the dot.

REAL:	1 2 HOUR	3 4 MIN	5 6 SEC	1 2 FRAME	3 SF
CLR	0 0_*	0 0.	0 0.	0 0.	0.
1	_ 1_*	0 0.	0 0.	0 0.	0.
2	1 2_*	0 0.	0 0.	0 0.	0.
.	1 2.	0 0_*	0 0.	0 0.	0.
3	1 2.	_ 3_*	0 0.	0 0.	0.
4	1 2.	3 4_*	0 0.	0 0.	0.
.	1 2.	3 4.	0 0_*	0 0.	0.
5	1 2.	3 4.	_ 5_*	0 0.	0.
6	1 2.	3 4.	5 6_*	0 0.	0.
.	1 2.	3 4.	5 6.	0 0_*	0.
1	1 2.	3 4.	5 6.	_ 1_*	0.
2	1 2.	3 4.	5 6.	1 2_*	0.
.	1 2.	3 4.	5 6.	1 2.	0_*
3	1 2.	3 4.	5 6.	1 2.	3_*
STO	1 2.	3 4.	5 6.	1 2.	3.
n	To NORMAL mode.				

RELATIVE:	+ 0 HOUR	1 5 MIN	3 0 SEC	0 0 FRAME	0 SF
CLR	+ 0 0.	0 0.	0 0.	0 0.	0.
.	+ 0 0_*	0 0.	0 0.	0 0.	0.
.	+ 0 0.	0 0_*	0 0.	0 0.	0.
1	+ 0 0.	_ 1_*	0 0.	0 0.	0.
5	+ 0 0.	1 5_*	0 0.	0 0.	0.
.	+ 0 0.	1 5.	0 0_*	0 0.	0.
3	+ 0 0.	1 5.	_ 3_*	0 0.	0.
0	+ 0 0.	1 5.	3 0_*	0 0.	0.
STO	+ 0 0.	1 5.	3 0.	0 0.	0.
n	To NORMAL mode.				

RELATIVE: - 0 HOUR 0 MIN 4 5 SEC 0 FRAME 0 SF

CLR	+ 0 0.	0 0.	0 0.	0 0.	0.
_	- 0 0.	0 0.	0 0.	0 0.	0.
.	- 0 0*	0 0.	0 0.	0 0.	0.
.	- 0 0.	0 0*	0 0.	0 0.	0.
.	- 0 0.	0 0.	0 0*	0 0.	0.
4	- 0 0.	0 0.	_ 4*	0 0.	0.
5	- 0 0.	0 0.	4 5*	0 0.	0.
STO	- 0 0.	0 0.	4 5.	0 0.	0.
n	To NORMAL mode.				

BAR: 12 BAR 3♩ 12 /24

CLR	- -	- * - . -	- .		
1	- -	1 * - . -	- .		
2	- 1	2 * - . -	- .		
.	0 1	2 . _ * -	- .		
3	0 1	2 . 3 * _	- .		
.	0 1	2 . 3 . _	_ .		
1	0 1	2 . 3 . _	1 *		
2	0 1	2 . 3 . 1	2 *		
STO	0 1	2 . 3 . 1	2 .		
n	To NORMAL mode.				

6.11.2 Input of position data while monitoring the tune in PLAY mode

1) Enter recorder in the PLAY mode.
2) Make sure the display is in NORMAL mode and depress the STO key to set the position while monitoring the tune. The display will indicate the position at the instant the key was depressed.
3) The indicated data will be entered in the memory when the No. "n" key of the CUE memory is depressed and the display will return to the NORMAL mode.

6.11.3 Method of section input for AUTO RTN and ZONE LIMIT

1) Example of setting in CUE memory 2 ∿ 5 when TIME BASE is REAL.

CLR	0 0 $_{*}$ ^{H} 0 0. ^{M} 0 0. ^{S} 0 0. ^{F} 0. ^{SF}	
	↖Blinking	
2	_ 2 $_{*}$ 0 0. 0 0. 0 0. 0.	
-	2 - 0$_{*}$	TIME BASE display is extinguished here.
5	2 - 5$_{*}$	
STO	2 - 5	
ZONE LIMIT or AUTO RTN	To NORMAL mode.	

2) Example of setting in CUE memory 2 ∿ 5 when TIME BASE is RELATIVE.

CLR	+ 0 0 $_{*}$ ^{H} 0 0. ^{M} 0 0. ^{S} 0 0. ^{F} 0 ^{SF}	
	↖Blinking	
2	+ _ 2 $_{*}$ 0 0. 0 0. 0 0. 0.	
-	2 - 0$_{*}$	TIME BASE display is extinguished here.
5	2 - 5$_{*}$	
STO	2 - 5	
ZONE LIMIT or AUTO RTN	To NORMAL mode.	

3) Example of setting in CUE memory 2 ∿ 5 when TIME BASE is BAR.

CLR	0 0 $1_{\star}$ (B)	1. 0 0. (/24)
	Blinking ↗	
2	_ _ $2_{\star}$	0. 0 0.
-	2 - $0_{\star}$	TIME BASE display is extinguished here.
5	2 - $5_{\star}$	
STO	2 - 5	
AUTO RTN		To NORMAL mode.

6.12 DISPLAY OF DATA IN MEMORY

1) RCL LED will be lit when the RCL key is depressed and will be at standby for input of calling point.

2) When either CUE memory, (+) PRE ROLL, (.) DISP HOLD, START TIME, ZONE LIMIT, or AUTO RTN key is depressed, the 4050 will be at EDIT mode and the display will show the memory content of the assigned mode.

CUE memory key: The CUE memory position data will be displayed in the presently set TIME BASE.

(+) PRE ROLL: When this key is depressed, TIME BASE will change to REAL and display the PRE ROLL time.

(.) key: Position data at the instant this key is depressed will be displayed in the current TIME BASE.

START TIME key: The MIDI start position data will be displayed in the presently set TIME BASE when this key is depressed.

ZONE LIMIT or AUTO RTN key: When either key is depressed, the TIME BASE display will be extinguished and the section preset in CUE memory by n-m, will be displayed.

3) When (-) GEN is called, the TIME BASE LED will change to REAL, DISPLAY mode change to GEN, and the present time of the generator will be displayed.

6.13 LOCATE

The transport will automatically enter the F.FWD or REWIND mode and stop the tape at the preset point when the LOCATE switch is depressed.

6.13.1 LOCATING the position input by the ten key

1) Depress the CLR key.
2) Enter the locate point, using the keypad and (.). (Refer to method of input, item 4.11.)
3) The tape will search and stop at the position that was entered when the LOCATE key is depressed.

6.13.2 LOCATING the position in CUE memory

1) Depress the RCL key, then the required memory number "n" key.
2) Tape will be located at the memory number "n" position when the LOCATE key is depressed.

6.14 AUTO RETURN and REPEAT

AUTO RETURN is the function of automatically locating the start of a section, preset by two CUE memory points, upon reaching the end point during the PLAY (or REC/PLAY) mode. In addition, it will go to the REPEAT mode if the AUTO PLAY button (9) is depressed.

1) Depress the CLR key, then, keys (n), (-) and (m), in this order.
2) Depress STO, then AUTO RTN to set the section by numbers (n) and (m) in the CUE memory.
3) When the RCL, then the AUTO RTN keys are depressed, the display will show in what part of the CUE memory it is stored.
4) The front and back relation between (n) and (m) will be determined automatically. Although (n) and (m) are input in reverse order, they will be correctly displayed at recall.
5) If the LOCATE key is depressed, it will be located to (n) which is the start of the section.
6) AUTO PLAY button (9) is depressed for the REPEAT mode.
   It will either locate to the starting point of the AUTO RTN section or upon reaching the AUTO RTN end point in the PLAY mode, it will enter the REPEAT mode.

6.15 ZONE LIMIT

ZONE LIMIT is the function of limiting tape travel. ZONE LIMITS can be used to keep the tape from winding off the end of the reel, for one example. For this purpose, we suggest you set the zone limits about 15-20 seconds from each end of the tape. This feature can also be used to protect previously recorded sections. For example, if you have already used the first 5 minutes for one take and want to be certain that it won't be recorded over, all you do is set the beginning zone limit at 5 minutes, 15 seconds and the end-of-tape zone limit 20 seconds from the end of the tape.

Following are procedures for setting the section.

1) Depress the CLR key.
2) Enter the start and end of the section in the CUE memory in the REAL or RELATIVE mode.
3) Depress key in order of CUE memory (m), (-), then CUE memory (n). Be sure the relative position on the tape is that "m" is the start and "n" is the end.
4) The section between "m" and "n" will be set by depressing the STO key and then the ZONE LIMIT key.
5) The preset section in the CUE memory will be displayed by depressing the RCL key, then depressing the ZONE LIMIT key.

6.16 PRE ROLL

A position ahead of the locate position can be located by setting PRE ROLL for the LOCATE and AUTO RETURN modes. PRE ROLL time will be defaulted at "0" second when the work area is reset.

6.16.1 Setting of time

1) Set TIME BASE to REAL.
2) Depress the CLR key.
3) Enter the PRE ROLL time by the ten key. 0 through 59 seconds can be entered.
4) Depress the STO key, then the PRE ROLL (+) key.
5) The PRE ROLL time can be displayed by depressing RCL and (+).

6.17 AUTO REC (Auto punch in/out)

The function of automatically recording the section preset in CUE memory No.8 and No. 9.

6.17.1 Setting

1) Depress AUTO REC (10) --- AUTO REC green LED will be lit.
2) Depress REC TRK SELECT ENABLE (3) --- LED will be lit.
3) Depress RECORDER ENABLE button --- LED will be lit.
4) Depress ALL INPUT MON button and confirm that the LED at upper left of this button is extinguished.
5) Depress the REC TRK button (4) of the channel to be recorded.

6.17.2 Setting of CUE memory No. 8 and No. 9

Memory setting while monitoring the tune in PLAY mode (Input of position displayed in NORMAL mode)

1) Depress STO key --- STO LED is lit and display will indicate EDIT mode.
2) The position on display will go into the memory and the display will return to NORMAL mode when key 8 (AUTO REC IN) is depressed.
3) Repeat operation for AUTO REC OUT (key 9).

Setting of recording section by the keypad

1) Depress the CLR key.
2) Record section starting data is input by the keypad and (.) period key.
3) Depress STO key (STO LED is lit) and put in memory by depressing key 8 (AUTO REC IN).
4) Input record end data by the keypad.
5) After depressing the STO key, depress key 9 (AUTO REC OUT).

Method of trimming the record section by the TRIM key

1) Depress the RCL key (RCL LED is lit)
2) Depress key 8 for correcting AUTO REC IN.
3) Depress TRIM key (12) --- TRIM LED is lit.
4) The unit of the flashing dot is corrected by the (+) or (-) key. Depress the (.) period key when the unit to be corrected is changed.
5) Depress STO key to put into memory the corrected value.
6) The procedure is the same for AUTO REC OUT.

6.17.3 Rehearsal

1) Put in the PLAY mode while in the above setting.
2) Upon entering the memory No. 8 section, the green LED adjacent to the RECORD button (1) will be lit and extinguished upon entering memory 9.

   A short beep can be heard at the beginning and end of this section to confirm if you have entered the information correctly.

6.17.4 Take

1) Depress the REC and PLAY button (1) while in the above setting.
2) The red LED adjacent to the AUTO REC (10) button will be lit.
3) The red REC LED adjacent to the RECORD button (1) will be lit within the section.
4) The RECORD TRK button LED will change from flashing to continuous lighting within the section, then return to flashing at end of the section.

6.18 MEMORY BANK

The 4050 has 10 banks of memory in which various setting data of the autolocator and MIDI synchronizer can be stored.

As data in the memory banks are battery backed up, it will be stored for long periods even though power is switched off and for this reason, the bank previously used will be effective at switch on of power again.

Data which are stored in the banks

1) CUE point memory (0 ∿ 9)
2) Locate
3) Pre roll
4) Auto return
5) Zone limit
6) Relative reset
7) Start time
8) Measure set
9) Tempo set

6.18.1 Call out of memory bank in use

When the MEMORY BANK button is switched on (MEMORY BANK LED is lit), the MEMORY BANK number in use will be displayed as shown below.

PrOG-05

6.18.2 Call out of memory bank

When a new memory bank is to be used or you must call a bank previously stored with data, the MEMORY BANK button is depressed so that its LED is lit, the RCL key is depressed, and depressing any key of the keypad will display PrO0-XX and the memory bank can be called out.

6.18.3 Copying of the memory bank

The memory bank can be copied such as when you must transfer data from the presently used bank to another bank for storage.

1) With the MEMORY BANK LED in the lit condition, depress the RCL key and call the bank presently in use by entering the bank number from the keypad.
2) Depress the STO key, then enter the destination memory bank number from the keypad and the data will be copied.

6.19 TAPE DUMP

TAPE DUMP is the function of transferring the content of the 10 memory bank in the 4050 to tape and re-loading it again in the 4050 at a later date.

1) The various TAPE DUMP functions of SAVE, VERIFY and LOAD will become possible when the TIME CODE IN/OUT is changed to TAPE DUMP IN/OUT by enabling the TAPE DUMP switch on the rear panel.
2) TAPE will be displayed when the TAPE DUMP switch is enabled.

NOTE: When the TAPE DUMP switch is enabled, GENERATOR, MIDI synchronizer and auto locator functions will be nulled.

6.19.1 SAVE

Following is the method of recording the memory bank data on the tape.

1) Put the channel to which TAPE DUMP output is connected in the record ready mode, depress REC and PLAY buttons to put in the record mode.
2) Depress the (1) key.
   The display will show SAVE-00. If necessary, the file number can be specified by the keypad at the 00 position of SAVE-00.
3) When the STO key is depressed, the STO LED is lit, SAVE is started and upon completion of SAVE, the STO LED is extinguished and the display will show SAVE-GOOd.

NOTE: To assure positive saving of data, it is recommended to save the same data a second time, about 10 seconds after the first save is completed.

6.19.2 TAPE VERIFY

Following is the procedure to confirm whether the memory bank data recorded on the tape is free of error or not by comparing it with the data contained in the 4050.

1) Depress the VERIFY (3) key and vrF4-00 will be shown on the display.
   If necessary, the file number is entered by the keypad in the same way as for SAVE.
2) Input the data saved on tape to the TAPE DUMP input jack.
   At playback of the data, be sure to rewind the tape 4 or 5 seconds before the start of the recording. If ERROR or VERIFY-GOOD is not displayed after more than 30 seconds of playback, repeat the verify operation.
3) Verify will start upon depressing the STO key and on finding the specified file number, vrF4-XX is displayed but if not found, PASS-XX is displayed to indicate the skipped file number. If the saved data is free of error, vrF4-GOOd is displayed and the STO LED is extinguished. If there is an error, vrF4-Err is displayed.

6.19.3 LOAD

This is the procedure for loading into the 4050 the data recorded on the tape.

1) Depress the LOAD (2) key and LOAd will be displayed.
2) Data saved in the tape is playbacked and its output fed to the TAPE DUMP input jack.

   At playback of the data, be sure to rewind the tape 4 or 5 seconds before the start of the recording. If ERROR or LOAD-GOOD is not displayed after more than 30 seconds of playback, repeat the load operation.
3) Data loading is started upon depressing the STO key, and when the specified file number is found, FInd-XX is displayed, or if not the specified number, PASS-XX is displayed showing the number thus skipped.

   When loading is completed, LOAd-GOOd is displayed and the STO LED is extinguished. If there was an error in loading, the display will be LOAd-Err.

6.20 ALL MEMORY CLEAR and INITIALIZE

Upon finishing all your creation work and all data have been DUMPED on the tape, you can clear the 4050 of all data which are now unnecessary.

1) Momentarily, switch off power to the 4050.
2) While depressing the STO key, switch on power to the 4050.
3) All data will then be cleared except for data defaulted prior to shipping the unit from the plant.

CAUTION: Before clearing the memory, be sure TAPE DUMP is error free and complete.

Auto Locator
Model 4050

MIDI Implementation Chart

Date :
Version :

Function ...		Transmitted	Recognized	Remarks
Basic Channel	Default	x	x	Does not contain basic channel
	Changed	x	x	
Mode	Default	x	x	
	Messages	x	x	
	Altered	**********	x	
Note Number		x	x	*
	True voice	**********	x	*
Velocity	Note ON	x	x	*
	Note OFF	x	x	*
After Touch	Key's	x	x	*
	Ch's	x	x	*
Pitch Bender		x	x	*
Control Change		x	x	*
Prog Change		x	x	*
	True #	**********		
System Exclusive				
System Common	Song Pos	o	x	
	Song Sel	x	x	
	Tune	x	x	*
System Real Time	Clock	o	x	
	Commands	o	x	
Aux Mes- sages	Local ON/OFF	x	x	
	All Notes OFF	x	x	*
	Active Sense	x	x	*
	Reset	x	x	*

Notes : * Message received is directly transmitted.

MIDI will not operate during tape dump mode.

Mode 1 : OMNI ON, POLY Mode 2 : OMNI ON, MONO o : Yes
Mode 3 : OMNI OFF, POLY Mode 4 : OMNI OFF, MONO x : No

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