

TASCAM

TEAC Professional Division

MTS-30

MIDI Tape Synchronizer



OWNER'S MANUAL

5700101600

Recording is an art as well as a science. A successful recording is often judged primarily on the quality of sound as art, and we obviously cannot guarantee that. A company that makes paint and brushes for artists cannot say that the paintings made with their products will be well received critically. The art is the province of the

artist. TASCAM can make no guarantee that the MTS-30 *by itself* will assure the quality of the recordings you make.

Your skill as a technician and your abilities as an artist will be significant factors in the results you achieve.

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WARNING:
TO PREVENT FIRE OR SHOCK
HAZARD, DO NOT EXPOSE THIS
APPLIANCE TO RAIN OR
MOISTURE.

This appliance has a serial number located on the rear panel. Please record the model number and serial number and retain them for your records.

Model number _____

Serial number _____

This product is manufactured to comply with the radio interference of EEC directive “82/499/EEC.”



CAUTION

RISK OF ELECTRIC SHOCK
DO NOT OPEN



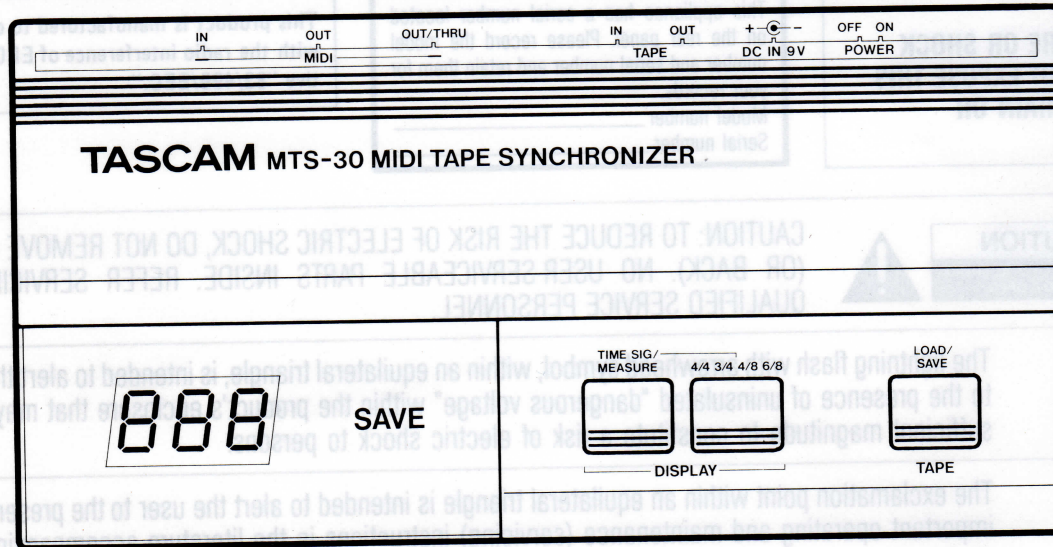
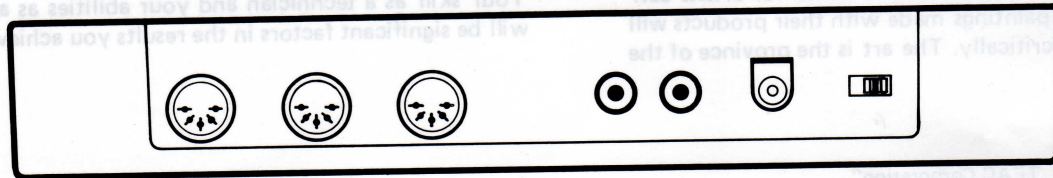
CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.



The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated “dangerous voltage” within the product’s enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.



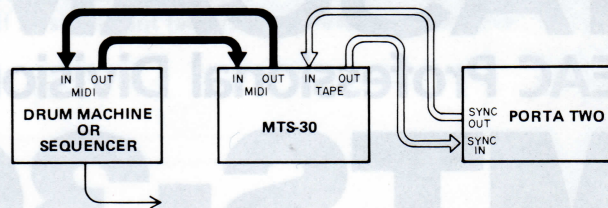
Connections

The first thing that you'll have to do to get started is to connect the MTS-30 to the other equipment in your system. If you have a TASCAM Ministudio PORTA TWO just connect the TAPE OUT of the MTS-30 to the SYNC IN of the PORTA TWO and the SYNC OUT of the PORTA TWO to the TAPE IN of the MTS-30.

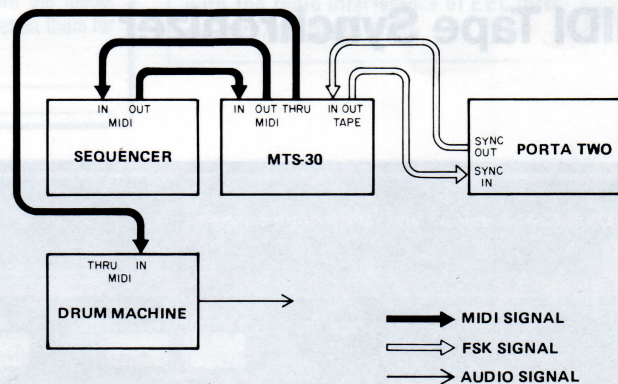
If you have any other Portastudio, Ministudio product connect the TAPE OUT of the MTS-30 to the input of channel four. And, the output of channel four to the TAPE IN of the MTS-30.

The MIDI connections are just as easy. Using standard MIDI cables, connect the MIDI sequencer, drum machine or rhythm composer's MIDI OUT to the MTS-30's MIDI IN terminal and the MTS-30's MIDI OUT terminal to the MIDI sequencer's MIDI IN.

If you want to send MIDI code to your MIDI sequencer and MIDI drum machine or synth, connect the MIDI OUT of the MTS-30 to the sequencer's MIDI IN and the OUT/THRU of the MTS-30 to the drum machine/synth's MIDI IN.



RECORDING (MIDI → FSK)



PLAYBACK (FSK → MIDI)

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Understanding what is going on inside your equipment will help improve your sound. Think of this manual as a reference handbook. You won't need all of what is here to begin, and it is certainly not necessary to memorize it, but do try to find the time to read it thoroughly at least once, that way you will be familiar with its contents and if you need answers they will be here waiting.

Introduction

With the MTS-30 MIDI Tape Synchronizer you will be able to locate the tape to any location within a song and have your MIDI keyboards, drum machine and sequencer sync-up when you start the tape recorder. You no longer have to go back to the beginning of the song as you may have had to with DIN Sync or other FSK Sync to tape units. No more time lost waiting for the tape to rewind.

The MTS-30 takes MIDI timing information generated by a MIDI drum machine, rhythm composer or sequencer and translates it into FSK (sync tones) that can be recorded on tape. During playback, the MTS-30 reads the FSK sync tones from the recorder and translates them back to MIDI clocks that the system uses to stay in tempo (sync) with the tape recorder.

Depending on the size and complexity of your system you can control your MIDI drum machine, rhythm composer, sequencer and keyboards all from your tape recorder with the MTS-30's unique "SONG POSITION POINTER SYNC" facility. Your MIDI equipment will all stay in sync and follow the tape no matter where you move it within a song. Accuracy of the sync performance is ensured by the use of an advanced, data-loss compensation circuit exclusive to TASCAM. Drop outs or other trouble in the FSK tone on tape are automatically got over.

Your system configuration does not have to change when you use the MTS-30. If your system configuration

has all the equipment slaved to your sequencer or drum machine nothing will change. Just add the MTS-30 between the sequencer or drum machine and your tape recorder.

It's really very easy to hook-up and just as easy to start to use. We have tried to cover all the basics in this manual. If we didn't cover your specific system set up, Not to worry! Just remember that the MTS-30 is an addition to your system it doesn't change the way the system operates.

1. *Keep the MTS-30 sufficiently apart from radio or TV sets.* Close proximity to these will cause a mutual interference and a malfunction can occur to the MTS-30.
2. Be sure to *use standard MIDI cables.* Any others that do not follow the MIDI specifications will prevent your system from functioning correctly because of a signal distortion or other trouble in the MIDI data transmission.
3. *FSK is not standardized* and the signals differ depending on what manufactures converters are used. Be sure to *use the MTS-30 to convert FSK back to MIDI only if FSK was recorded using the MTS-30.*

IMPORTANT

Use sequencers or drum machines that can receive the MIDI Song Position Pointer instructions. Otherwise, the MTS-30 achieves sync only from the beginning of a song.

CAUTION

To power the MTS-30, use only the provided AC adapter PS-M30. Using an AC-DC converter of any other brand or manufacturer will cause damage to the MTS-30 and *such damage would not be covered by the limited warranty on the product.*

Operation

Getting Started

By now we can assume that you have the MTS-30 unpacked, hooked-up and you are ready to go. But, let's cover some of the basics first.

RECORDING THE FSK SIGNALS

1. Create a finished rhythm track on your MIDI drum machine, rhythm composer or sequencer that you will sync your keyboard and other MIDI equipment to. At this time you must decide the tempo as it cannot be changed after the sync track is recorded. The reason is, during tape sync, the synchronizers will follow MIDI clocks and ignore internal clocks and machine tempo knobs.
2. Press the TAPE key on the MTS-30 to switch the MTS-30 to SAVE. The word SAVE will light-up. The measure (BAR) indicator will read 001. The MTS-30 will output a constant level tone. Use the tone to set your record level for the sync track, to 0 VU on the meters.
3. Press the DISPLAY (TIME SIG/MEASURE) key to switch the display to TIME SIG then press the right four position key until the desired time signature appears in the display window. If the selections do not match your tune, use 4/4.

4. Set track 4 on the recorder, the track the FSK signal is to be recorded on and start recording.

NOTE: If FSK is recorded with the noise reduction system on, you must be sure to reproduce it with the noise reduction system on. The optimum FSK recording level should be about 0 VU on the meter. Be sure the EQ is set to 0 (flat, no boost or cut).

5. Allow a lead-in section on tape (pre roll) by letting the tape roll 2 or 3 seconds after starting its motion. Only then, start to play your MIDI equipment. The tape should now start recording the sync signal together with the information on the number of bars counted, as the recording takes place, on the basis of the time signature you selected in step 3.

NOTE: The best recording level for FSK is 0 VU. If the FSK signal is recorded at too low of a level you may have trouble achieving sync. Be sure to maintain the recorded FSK level between -10 and 0 VU on the meters and the EQ is flat (no boost or cut).

6. Stop the tape after the MIDI instruments stop playing. Allow a post roll of 2 or 3 seconds for good reference.
7. To check if the FSK recording has been made correctly, perform the next two operations.

Sync Play Procedure I – Starting from the beginning of the tune.

- a. Press the TAPE key to switch the MTS-30 to its LOAD position. SAVE will go out and the measure number will be replaced with three dash marks.
- b. Set your rhythm programmer or sequencer to MIDI Sync mode to operate with an external MIDI clock signal.
- c. Rewind the tape and play it from the beginning of the recording. The MIDI instruments will start playing in sync with the tape.

Sync Play Procedure II – Starting from any point of tune.

- a. Locate the tape to the desired point where playback is to be started.
- b. Run the tape in Play. After an interval during which the MTS-30 recognizes the tape position in terms of the number of bars (during this time, two or three bars will pass), the rhythm programmer or sequencer will start in sync.

CAUTION:

- 1. Putting the tape recorder into CUE or REV(iew) modes when tape sync play is in process unlocks the

sync. The MEASURE (bar) indication will then become equivocal.

- 2. In mixers or recorders with questionable crosstalk specifications, *the crosstalk can cause miscuing in the song as well as miscuing while recording adjacent tracks. In this situation be sure that all pan pots and assignments are in the extreme positions to avoid the possibility of crosstalk. You should lower the recording level on the adjacent tracks and look to lower the playback level into the MTS-30.* In extreme situations with poor equipment as a last resort we would suggest recording FSK alone with no other channels being recorded to avoid the crosstalk. When the crosstalk occurs, the number of bars in the MTS-30's display window will become equivocal.

WARNING

When using the MTS-30 together with a combination mixer/recorder having a dedicated FM modulation Sync Input, be sure to record the FSK signals from the beginning of the tape until its end without any interruption. Otherwise, FM modulated signals will be recorded instead of FSK. The MTS-30 could then recognize them as an FSK signal, causing a malfunction.

SYNC TO TAPE RECORDING

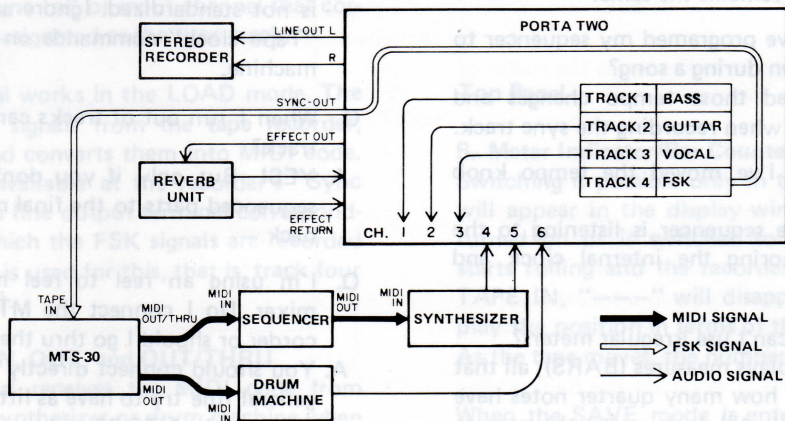
Now that you have a good sync track you can get to work. How you approach the recording will depend on your experience, the number of MIDI instruments, tape tracks and mixer channels in your system. Multi-track recording is always more of the same. Whether you have a 4, 8, 16 or 24 track system, the only real difference is the numbers and your experience.

We have used the Porta Two for our recording because it's easy to understand. After the sync track was recorded we added the bass to track 1 and the guitar

to track 2. The vocal was recorded on track 3. The drum machine (mono) and stereo synth controlled by the sequencer, were run as virtual tracks, driven by the FSK track in sync with the recorder.

This gave us four instruments plus a vocal and processing in the final mix created on a four track recorder and a six input mixer.

If you use this example as a base and spend some time working with the MTS-30 and your system we're certain you'll find more ways of doing more with what you already have and benefit from the experience.



QUESTIONS AND ANSWERS ABOUT THE MTS-30

- Q. Do I need a guard band (an empty track) between the sync track and the adjacent audio track?
- A. NO! Not if you are using TASCAM or a recorder with good crosstalk specs. If you are pinning the meter while recording on adjacent tracks reduce the recording levels.
- Q. Can I edit parts after the sync track is recorded?
- A. The MTS-30 only translates MIDI start, stop and clock commands. On, Off and pitch bending etc remain in the memory of the sequencer and can be changed any way you want, as long as the overall length of the sequence remains the same.
- Q. What will happen if I've programed my sequencer to speed up and slow down during a song?
- A. The MTS-30 will read those tempo changes and translate them exactly when recording the sync track.
- Q. What will happen if I've moved the tempo knob during sync playback?
- A. Nothing! Because the sequencer is listening to the MIDI clocks and ignoring the internal clock and tempo control.
- Q. Does that mean that I can't use irregular meters?
- A. NO! The MTS-30 displays measures (BARS), all that is recorded on tape is how many quarter notes have passed. Everything will still lock up to the correct

place in the music (even if the MTS-30 displays measure #37 when the drum machine displays measure #35)

- Q. My sequencer synchronizes to tape when I start from the beginning. But, when I do an overdub in the middle of the tape (song) the sequencer starts at the beginning. Why?
- A. Some sequencers do not receive the song pointer instruction. Please check your sequencer's manual to be sure.
- Q. My sequencer has its own tape sync ports. Can I use them with the MTS-30?
- A. NO! Each manufacturer has their own FSK signal it is not standardized. Ignore any tape "sync jacks" or "Tape clock" commands on the sequencer or drum machine.
- Q. When I run out of tracks can I record over the sync track?
- A. YES! But only if you don't plan on adding more sequenced parts to the final mix. There is not turning back.
- Q. I'm using an reel to reel multitrack recorder and mixer. Do I connect the MTS-30 directly to the recorder or should I go thru the mixer?
- A. You should connect directly to the recorder and as a general rule try to have as little electronics as possible between the MTS-30 and the MIDI devices.

Features and Controls

Rear Panel

1. POWER

Switch on the power to the MTS-30 only after all of the connections have been made correctly. Also be sure to turn the power off before disconnecting any cable.

2. DC IN 9 V

For connection of the AC adaptor PS-M30, supplied with the MTS-30. Using any other could cause damage.

3. TAPE OUT and TAPE IN

The TAPE OUT terminal works in the SAVE mode of the MTS-30, sending the FSK-converted MIDI code to the tape recorder's "Sync In" or input channel that corresponds to the track designated as the sync track.

The TAPE IN terminal works in the LOAD mode. The MTS-30 receives FSK signals from the tape recorder, thru this connector and converts them into MIDI code. FSK signals may be available at the recorder's "Sync Out" terminal or at its line output terminal corresponding to the track on which the FSK signals are recorded (usually an edge track is used for this, that is, track four in case of 4-track tapes).

4. MIDI Terminals – IN, OUT, and OUT/THRU

The MIDI IN terminal receives the MIDI code from rhythm programmer, synthesizer or drum machine when

the MTS-30 is in SAVE mode.

The MIDI OUT terminal is activated in the LOAD mode, sending out the MIDI code as the FSK signals are fed into the MTS-30's TAPE IN terminal from the tape recorder.

The OUT/THRU terminal, switches automatically to THRU when the MTS-30 enters the SAVE mode and to OUT in the LOAD mode.

NOTE: While in SAVE, the MTS-30's MIDI OUT is electronically disconnected, preventing a signal loop from being formed.

Top Panel

5. Meter Indicator/Bar Counter

Switching is possible only in the SAVE MODE. "— — —" will appear in the display window when the MTS-30 is turned on or is switched to LOAD mode. When tape starts rolling and the recorder is feeding the MTS-30's TAPE IN, "— — —" will disappear and numbers will display the position in terms of the number of bars instead. As the tape moves, the number of bars will increase.

When the SAVE mode is entered, SAVE is illuminated

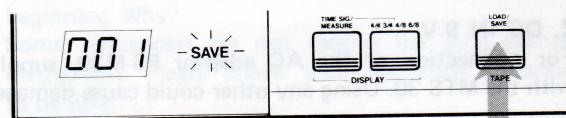
and the display will show "001" (bar number one) waiting for MIDI code to be fed into the MTS-30. Once the MIDI code starts feeding the MTS-30's MIDI IN, the display will start counting the number of bars.

When the TIME SIG/MEASURE selector switch is pressed, the display will switch to TIME SIG, indicating "4-4" (meter of 4/4). If the right four position TIME SIG key is pressed, the display will change to "3-4" (meter of 3/4). A second press, to "4/8," and a third press, to "6/8." The meter selection will continue to change in that sequence as you press the TIME SIG key repeatedly. When the left TIME SIG/MEASURE key is again pressed, the display will switch back to the MEASURE mode, indicating the number of bars.

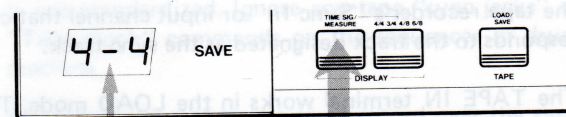
NOTE: The MTS-30 is automatically set to the meter of 4/4 when the unit is turned on.

The TIME SIG settings are only required when recording FSK-converted MIDI code, that is, when the MTS-30 is in the SAVE mode; there is no need of bothering about the settings when converting the FSK signals from tape to MIDI (the MTS-30 is in LOAD mode). But when selecting the time signature, be sure to select the correct meter. Otherwise, the bar count (in the DISPLAY MEASURE) will not match the number of bars on the score because the counting is done on the basis of the selected time signature.

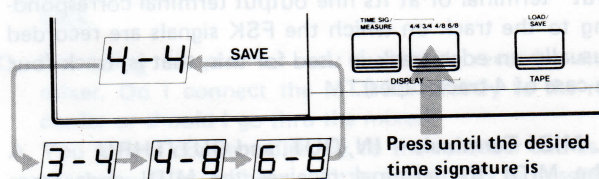
NOTE: As for the tunes of irregular meters (time signatures), ignore the TIME SIG settings and the MEASURE readouts. The MTS-30 achieves the Midi-Tape sync based on the MIDI and FSK signals and NOT on the display readouts.



Press to SAVE.



Press to TIME SIG.



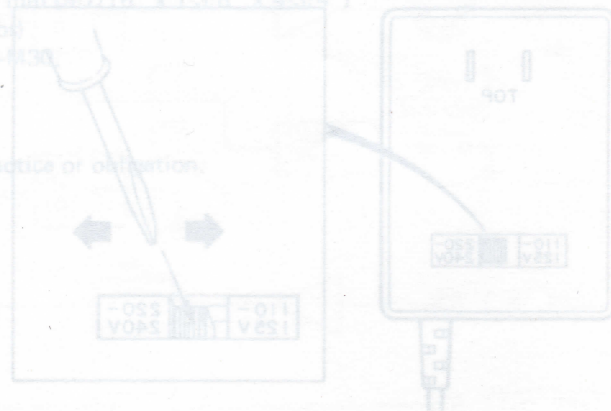
Press until the desired time signature is indicated.

6. TAPE LOAD/SAVE Key

The LOAD position is used when FSK signals fed into the TAPE IN terminal from the tape are to be converted back to the MIDI code.

In the SAVE position, the MTS-30 will translate MIDI start, clock, and stop messages fed to the unit's MIDI IN terminal into the recordable FSK tape sync signals. While in SAVE, the MIDI OUT/THRU terminal carries the same signal that is connected to the MIDI IN terminal. In the SAVE mode, the MTS-30 ignores the continue message.

NOTE: The MTS-30 will only save 999 measures. After measure 999 is saved the display will reset to -00. During LOAD the MTS-30 will not synchronize after the display has reset to -00.

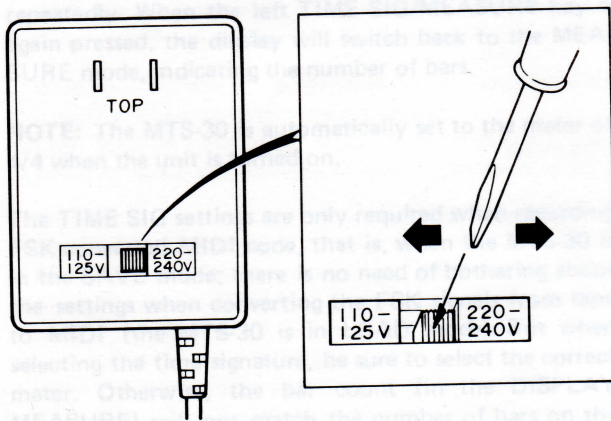


Use of the PS-M30 AC Adaptor

If for any reason you won't be using the MTS-30 for a period of time, it's always a good idea to remove the AC adaptor from the unit and the AC line.

Notes: I. For General Export units the voltage setting can be changed to match your mains power. ALWAYS DISCONNECT THE AC LINE BEFORE MAKING THE CHANGE.

1. Locate the voltage selector on the rear-panel of the PS-M30.



2. Two voltage ranges are available: 120 V (110 – 125 V) and 220 V (220 – 240 V). Using a regular (slotbladed) screwdriver, set the selector to the indication corresponding to the voltage requirements of your area.

II. This voltage conversion is NOT possible on units sold in the North America, U.K., Australia or Europe.

III. U.K. Customers

Due to the variety of plugs used in the U.K., the PS-M30 is supplied without an AC plug. Please request your dealer to install the correct plug to match the mains power outlet where your unit will be used as per these instructions.

Specifications

Receiving MIDI Data

TAPE OUT

TAPE IN

MIDI Transmission Data

Compatible Tempo Range

Connectors

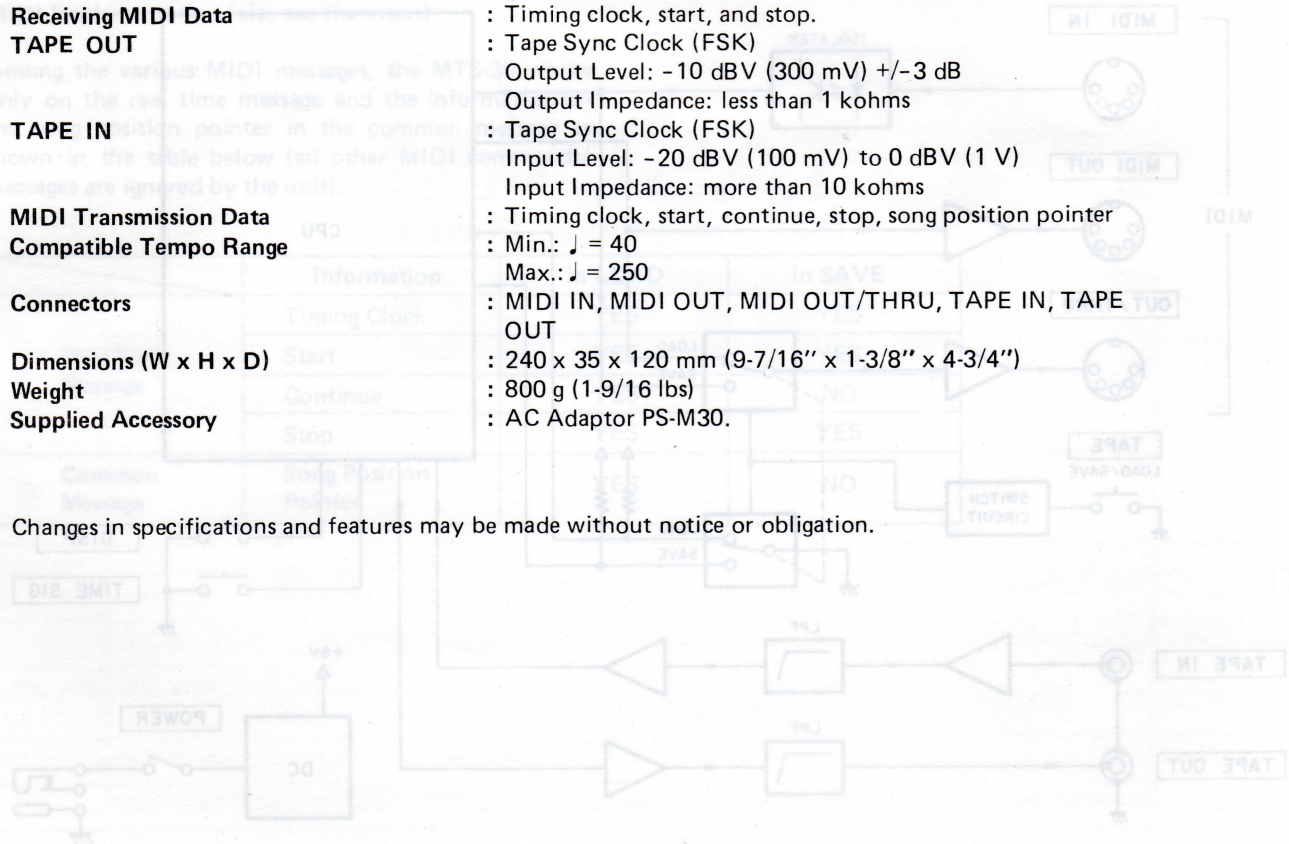
Dimensions (W x H x D)

Weight

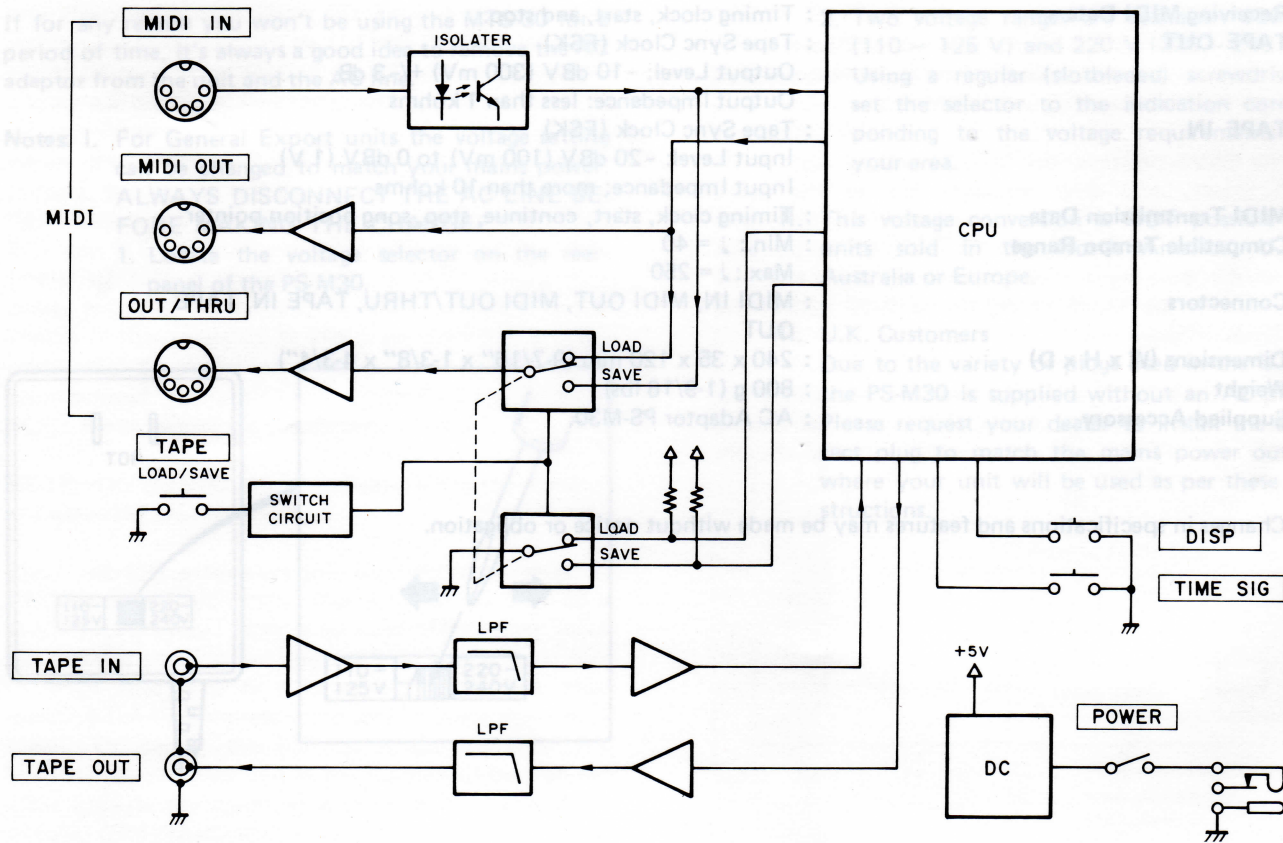
Supplied Accessory

- : Timing clock, start, and stop.
- : Tape Sync Clock (FSK)
- Output Level: -10 dBV (300 mV) +/- 3 dB
- Output Impedance: less than 1 kohms
- : Tape Sync Clock (FSK)
- Input Level: -20 dBV (100 mV) to 0 dBV (1 V)
- Input Impedance: more than 10 kohms
- : Timing clock, start, continue, stop, song position pointer
- : Min.: ♩ = 40
- Max.: ♩ = 250
- : MIDI IN, MIDI OUT, MIDI OUT/THRU, TAPE IN, TAPE OUT
- : 240 x 35 x 120 mm (9-7/16" x 1-3/8" x 4-3/4")
- : 800 g (1-9/16 lbs)
- : AC Adaptor PS-M30.

Changes in specifications and features may be made without notice or obligation.



Block Diagram



Appendix

MIDI Implementation (also see the insert)

Among the various MIDI messages, the MTS-30 works only on the real time message and the information on the song position pointer in the common message as shown in the table below (all other MIDI commands/messages are ignored by the unit).

	Information	in LOAD	in SAVE
Real Time Message	Timing Clock	YES	YES
	Start	YES	YES
	Continue	YES	NO
	Stop	YES	YES
Common Message	Song Position Pointer	YES	NO

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MTS-30

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Function		Transmitted	Recognized	Remarks
Basic Channel	Default	×	×	No Basic Channel
	Channel	×	×	
Mode	Default	×	×	
	Messages Altered	×	×	
Note Number	True Voice	×	×	
		×	×	
Velocity	Note ON	×	×	
	Note OFF	×	×	
After Touche	Key's	×	×	
	Ch's	×	×	
Pitch Bender		×	×	
Control Change		×	×	
Prog Change		×	×	
System Exclusive		×	×	
System Common	: Song Pos	○	×	
	: Song Sel	×	×	
	: Tune	×	×	
System Real Time	: Clock	○	○	**"Continue" not recognized.
	: Commands	○	○ *	
Aux Messages	: Local ON/OFF	×	×	
	: All Notes Off	×	×	
	: Active Sense	×	×	
	: Reset	×	×	
Notes				