TS1 MIDI TAPE SYNC UNIT

The talented **TS1** can successfully record a sync stripe and synchronise a MIDI sequencer using any decent tape machine. Moreover, you won't need to swap around the MIDI wiring between stripe record and playback, as the **TS1** has four MIDI ports and automatic signal routing.

Multiple formats

A sync tone is a digitally coded signal that will fit into an audio channel, similar to a modem or fax warble. When a sync tone is recorded on a tape track it is called a stripe. The stripe and MIDI datastream format (SMPTE/MTC or SPP/SRT - see below) is easily selected by means of a straightforward front-panel rotary control.

Even reads dodgy stripes

The TAPE IN port has special signal conditioning, so it can recover the data from dodgy stripes that would defeat lesser units. The **TS1** is generally immune to tape dropouts and flutter (thanks to high jitter tolerance). Furthermore, the **TS1** features a very fast `lock-in' capability when a valid received sync tone is recognised.

The **TS1** TAPE IN port is so good that it will work through noise reduction - even *dbx*!

SMPTE and MIDI Time Code

The **TS1** can generate and recognise all four SMPTE frame-rate formats (24 frames per second, 25 fps, 30 fps and 30 fps drop frame). The **TS1** will convert SMPTE to MIDI Time Code (MTC). **TS1** is not able to converts a MIDI Time Code datastream into a SMPTE signal - you are very unlikely to want to do this anyway.

The start time of the SMPTE sync tone can be left at zero or manually set (using a small pushbutton on the right-hand side panel) to any number of hours and minutes. By using special MIDI commands any start time can be selected and the SMPTE User Bits can be set if required.

Song Pointer/SRT format

Even if your sequencer is not MTC capable, you can use the **TS1** by way of its Song Position Pointer/System Real Time format ("*FSKplus*").

When syncing to an SPP/SRT format stripe, the **TS1** provides two different restart timing options. `Fast chase' gives you rapid `lock-in' and is compatible all modern sequencers and drum machines. The `slow chase' option extends compatibilty to older devices which require the five-second delay between the Song Position Pointer and subsequent Continue command.

When recording an SPP/SRT format stripe the **TS1** can generate a tone based on the clock stream arriving at the MIDI SYNC IN port. For non-musical applications, it can also generate a tone based on an internal 120 beats per minute fixed tempo clock.

The **TS1** *FSKplus* SPP/SRT format stripe is similar to what other people call "Smart FSK". It is not the same thing as ordinary "FSK", but is functionally superior.

Level adjustments

An LED is provided to tell you when a valid sync signal is being received or transmitted by the **TS1**. Screwdriver-operated level adjusment presets are provided for both the TAPE IN and TAPE OUT ports, so you can adjust for optimum signal levels without having to use a mixer channel. The adjustment spans from -20dB to +6dB, so both -10dB and +4dB standards are within range.
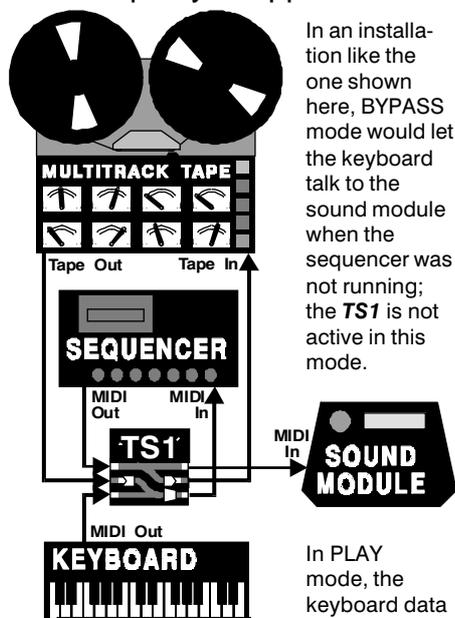
Flexible MIDI routing

The **TS1** merges MIDI data received at its MIDI AUX IN port with the timing datastream it generates. This lets you overlay new tracks on your sequencer in sync with your tape machine. The diagram here shows a basic example of a **TS1**-based installation using a reel-to-reel multitrack and hardware sequencer.

The MIDI routing through the **TS1** is different for each of its four operating modes. The MIDI routing scheme is summarised in the table below.

BYPASS	MIDI AUX IN	MIDI AUX IN
PLAY stripe	MIDI SYNC IN	MIDI AUX IN merged with SYNC STREAM
STANDBY	MIDI SYNC IN	MIDI AUX IN
RECORD stripe	MIDI SYNC IN	MIDI AUX IN merged with SYNC STREAM
TS1 MIDI flow by mode	MIDI THRU	MIDI OUT

MIDI tape sync applications

In an installation like the one shown here, BYPASS mode would let the keyboard talk to the sound module when the sequencer was not running; the **TS1** is not active in this mode.

In PLAY mode, the keyboard data is merged with the sync data (derived from the tape input) and passed to the MIDI In of the sequencer, the output of the sequencer is passed to the sound module. In STANDBY mode the keyboard talks to the sequencer, the sequencer talks to the module, while the **TS1** processor monitors the output of the sequencer; STANDBY mode is used while recording an *FSKplus* stripe in time with a workpiece sequence. RECORD mode is used when writing a SMPTE stripe to tape, or when writing a fixed temp 120bpm *FSKplus* stripe; RECORD mode simulates the PLAY mode, but the source of the SYNC data is now the internal clock of the **TS1**.

Useful features

When syncing to a SMPTE or *FSKplus* stripe you are free to shuttle your tape backward or forward as you wish. The synchronisation should pick up wherever you start to play.

You can also use the **TS1** to copy any compatible stripe between tape tracks.

The **TS1** is remarkably compact (109mm x 109mm x 41mm), especially bearing in mind that it includes an built-in mains power supply, obviating the need for an external adaptor. The integral mains lead comes fitted with a plug.