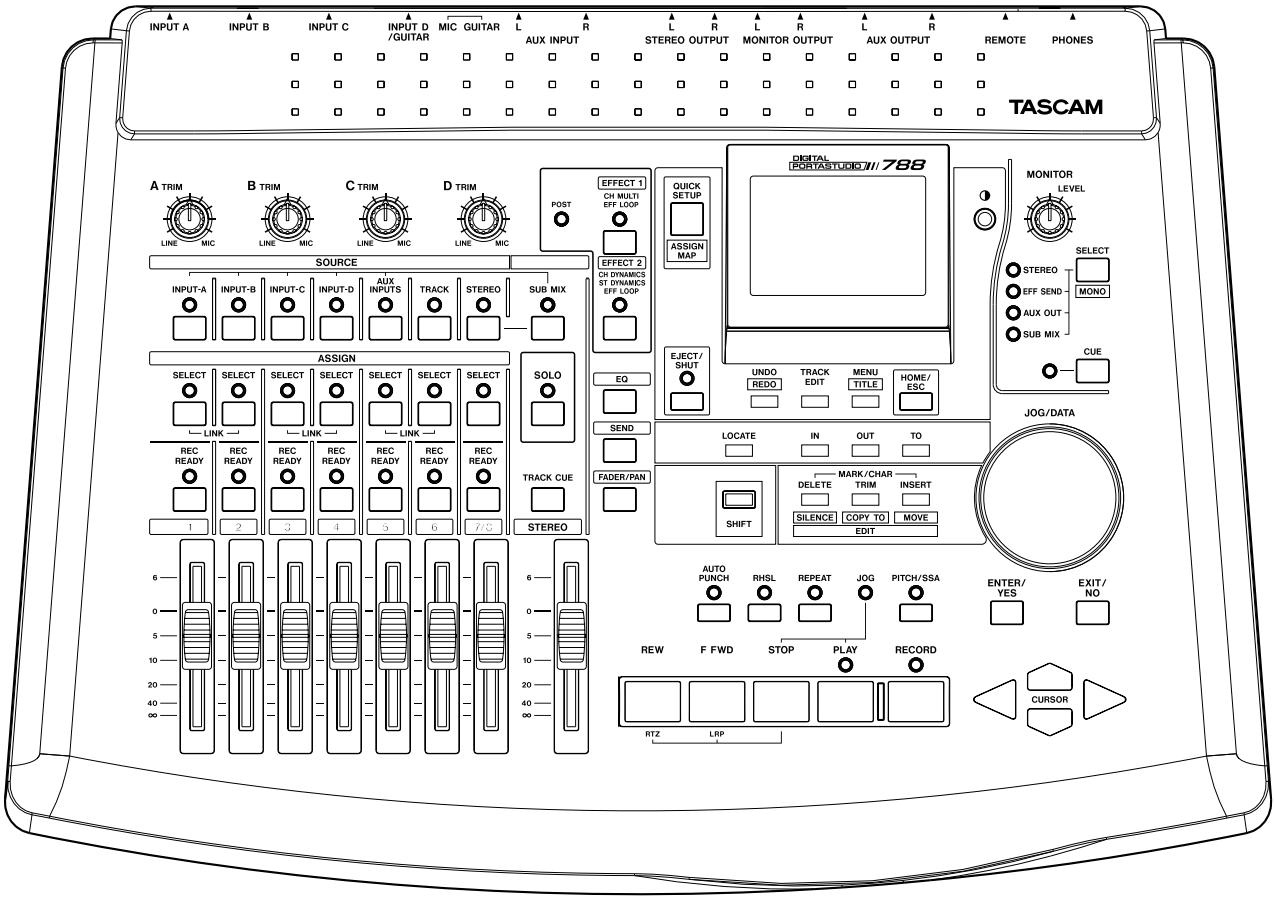
TASCAM

TEAC Professional Division

9101420600

788 DIGITAL PORTASTUDIO



OWNER'S MANUAL

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.

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 _____

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

IMPORTANT (for U.K. Customers)

DO NOT cut off the mains plug from this equipment.
If the plug fitted is not suitable for the power points in your home or the cable is too short to reach a power point, then obtain an appropriate safety approved extension lead or consult your dealer.

If nonetheless the mains plug is cut off, remove the fuse and dispose of the plug immediately, to avoid a possible shock hazard by inadvertent connection to the mains supply.

If this product is not provided with a mains plug, or one has to be fitted, then follow the instructions given below:

IMPORTANT: DO NOT make any connection to the larger terminal which is marked with the letter E or by the safety earth symbol ⏚ or coloured GREEN or GREEN-and-YELLOW.

The wires in the mains lead on this product are coloured in accordance with the following code:

BLUE	**:** NEUTRAL
BROWN	**:** LIVE

As these colours may not correspond with the coloured markings identifying the terminals in your plug proceed as follows:

The wire which is coloured BLUE must be connected to the terminal which is marked with the letter N or coloured BLACK.

The wire which is coloured BROWN must be connected to the terminal which is marked with the letter L or coloured RED.

When replacing the fuse only a correctly rated approved type should be used and be sure to re-fit the fuse cover.

IF IN DOUBT — CONSULT A COMPETENT ELECTRICIAN.

For U.S.A

TO THE USER

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures.

a) Reorient or relocate the receiving antenna.

b) Increase the separation between the equipment and receiver.

c) Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

d) Consult the dealer or an experienced radio/TV technician for help.

CAUTION
Changes or modifications to this equipment not expressly approved by TEAC CORPORATION for compliance could void the user's authority to operate this equipment.

IMPORTANT SAFETY INSTRUCTIONS

CAUTION:

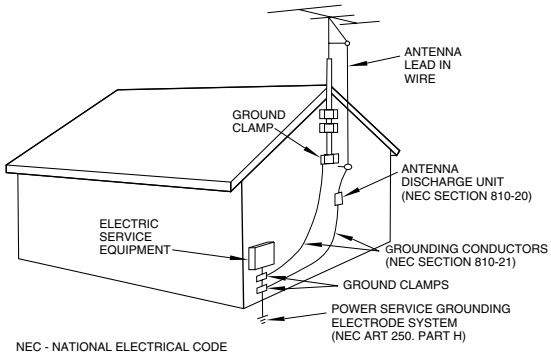
- **Read all of these Instructions.**
- **Save these Instructions for later use.**
- **Follow all Warnings and Instructions marked on the audio equipment.**

1) Read Instructions — All the safety and operating instructions should be read before the product is operated.
2) Retain Instructions — The safety and operating instructions should be retained for future reference.
3) Heed Warnings — All warnings on the product and in the operating instructions should be adhered to.
4) Follow Instructions — All operating and use instructions should be followed.
5) Cleaning — Unplug this product from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.
6) Attachments — Do not use attachments not recommended by the product manufacturer as they may cause hazards.
7) Water and Moisture — Do not use this product near water — for example, near a bath tub, wash bowl, kitchen sink, or laundry tub; in a wet basement; or near a swimming pool; and the like.
8) Accessories — Do not place this product on an unstable cart, stand, tripod, bracket, or table. The product may fall, causing serious injury to a child or adult, and serious damage to the product. Use only with a cart, stand, tripod, bracket, or table recommended by the manufacturer, or sold with the product. Any mounting of the product should follow the manufacturer's instructions, and should use a mounting accessory recommended by the manufacturer.
9) A product and cart combination should be moved with care. Quick stops, excessive force, and uneven surfaces may cause the product and cart combination to overturn.

10) Ventilation — Slots and openings in the cabinet are provided for ventilation and to ensure reliable operation of the product and to protect it from overheating, and these openings must not be blocked or covered. The openings should never be blocked by placing the product on a bed, sofa, rug, or other similar surface. This product should not be placed in a built-in installation such as a bookcase or rack unless proper ventilation is provided or the manufacturer's instructions have been adhered to.
11) Power Sources — This product should be operated only from the type of power source indicated on the marking label. If you are not sure of the type of power supply to your home, consult your product dealer or local power company. For products intended to operate from battery power, or other sources, refer to the operating instructions.
12) Grounding or Polarization — This product may be equipped with a polarized alternating-current line plug (a plug having one blade wider than the other). This plug will fit into the power outlet only one way. This is a safety feature. If you are unable to insert the plug fully into the outlet, try reversing the plug. If the plug should still fail to fit, contact your electrician to replace your obsolete outlet. Do not defeat the safety purpose of the polarized plug.
13) 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 product.
14) Outdoor Antenna Grounding — If an outside antenna or cable system is connected to the product, be sure the antenna or cable system is grounded so as to provide some protection against voltage surges and built-up static charges. Article 810 of the National Electrical Code, ANSI/NFPA 70, provides information with regard to proper grounding of the mast and supporting structure, grounding of the lead-in wire to an antenna discharge unit, size of grounding conductors, location of antenna-discharge unit, connection to grounding electrodes, and requirements for the grounding electrode.

"Note to CATV system installer:
This reminder is provided to call the CATV system installer's attention to Section 820-40 of the NEC which provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding system of the building, as close to the point of cable entry as practical.

Example of Antenna Grounding as per National Electrical Code, ANSI/NFPA 70



15) Lightning — For added protection for this product during a lightning storm, or when it is left unattended and unused for long periods of time, unplug it from the wall outlet and disconnect the antenna or cable system. This will prevent damage to the product due to lightning and power-line surges.
16) Power Lines — An outside antenna system should not be located in the vicinity of overhead power lines or other electric light or power circuits, or where it can fall into such power lines or circuits. When installing an outside antenna system, extreme care should be taken to keep from touching such power lines or circuits as contact with them might be fatal.
17) Overloading — Do not overload wall outlets, extension cords, or integral convenience receptacles as this can result in risk of fire or electric shock.
18) Object and Liquid Entry — Never push objects of any kind into this product through openings as they may touch dangerous voltage points or short-out parts that could result in a fire or electric shock. Never spill liquid of any kind on the product.
19) Servicing — Do not attempt to service this product yourself as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.
20) Damage Requiring Service — Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions:
a) when the power-supply cord or plug is damaged.
b) if liquid has been spilled, or objects have fallen into the product.
c) if the product has been exposed to rain or water.
d) if the product does not operate normally by following the operating instructions. Adjust only those controls that are covered by the operating instructions as an improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the product to its normal operation.
e) if the product has been dropped or damaged in any way.
f) when the product exhibits a distinct change in performance – this indicates a need for service.
21) Replacement Parts — When replacement parts are required, be sure the service technician has used replacement parts specified by the manufacturer or have the same characteristics as the original part.
Unauthorized substitutions may result in fire, electric shock, or other hazards.
22) Safety Check — Upon completion of any service or repairs to this product, ask the service technician to perform safety checks to determine that the product is in proper operating condition.
23) Wall or Ceiling Mounting — The product should be mounted to a wall or ceiling only as recommended by the manufacturer.
24) Heat — The product should be situated away from heat sources such as radiators, heat registers, stoves, or other products (including amplifiers) that produce heat.

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If you are new to disk-based recording or to multitrack recording generally, there may be some ideas with which you are slightly unfamiliar. This section briefly introduces you to some of the concepts regarding the 788 and its operation. Even if you are familiar with the idea of multitrack recording and disk-based recording, you may find this to be a useful introduction.

Multitrack recording (general)

Multitrack recording allows you to make recordings of many different signals separately, allowing a high degree of control over the finished sound.

Tracking The signals of the first tracks to be recorded as part of the song are fed through a mixing console, and recorded on many different tracks on a multitrack recorder ("tracking")

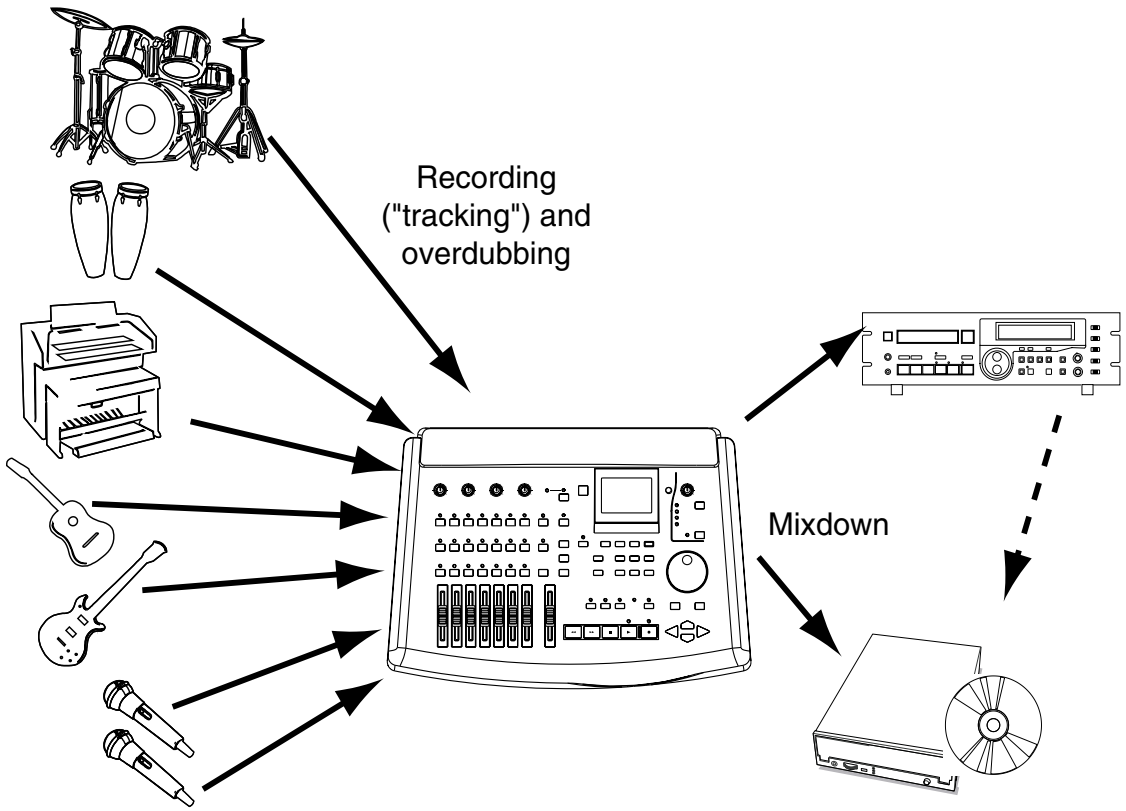
Overdubbing New material can be recorded on a track while listening to previously-recorded tracks—this is known as "overdubbing". For instance, the vocal parts of a song can be recorded after all the backing instruments have been recorded, allowing the singer to concentrate on getting the best vocal performance. While tracking or overdubbing, effects can be added to enhance the recorded sound.

Punching Most recorders have silent "punch-in" and "punch-out" facilities, i.e. if you make a mistake in only a short passage, you don't have to re-record the whole piece—you can re-record only the part where the mistake occurred.

Mixdown These recorded tracks are then "mixed down"—this means that the volumes, tonal balance (the amount of bass and treble, etc.) of the different recorded tracks are adjusted and fed to a stereo recorder (a DAT recorder can be used for this purpose). At this stage, additional effects such as echo, reverb, etc. may be added to individual tracks, to help produce a "feel" to the piece.

Alternatively, with the 788 it is possible to mix to CD. First the song is mixed to a special stereo mastering track and then written to CD, using a CD-R or CD-RW drive connected to the SCSI port of the 788.

Mastering If the mixdown has not already been done to CD, then an audio CD (or an analog cassette) may be then mastered and duplicated from the master stereo recording.



Multitrack recorders can be analog (for example, the TASCAM PORTASTUDIO cassette series) or digital (for example, the TASCAM series of DTRS recorders), and likewise mixing consoles can be analog or digital. The 788 is digital, that is, after the signals enter the 788, the mix, recording process, the internal effect processors and mixdown are all digital. This avoids any possible loss of quality caused by repeated conversion between analog and digital.

This also allows a consistent frequency response (i.e. there is no loss of the very high or very low frequencies) and dynamic range (from quiet to loud), since all the components in the integrated 788 system are designed to work with each other.

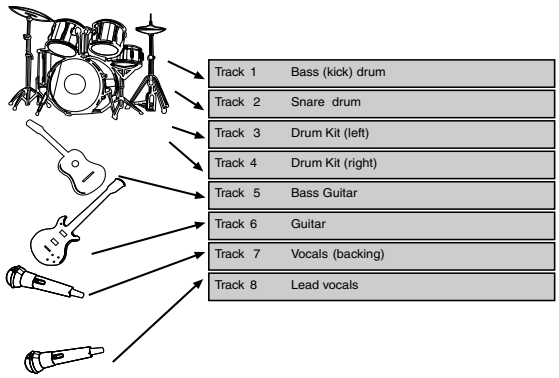
Disk vs. tape recording

The 788 uses a disk for recording, but traditionally, multitrack recording has been done on tape. The methods of recording with tape and disk recording systems differ in a number of ways.

Multitrack tapes

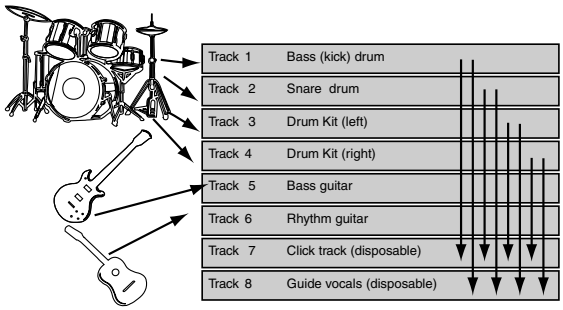
A tape is divided into a number of different "tracks"; usually either 4, 8, 16 or 24.

A typical arrangement of tracks used during a tape-based recording session is shown below:

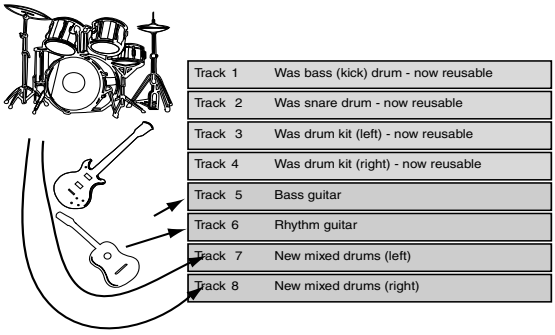


If more tracks are required in the course of a session, there are a number of alternatives:

- It is possible to record on unused parts of a track (for instance, if there is a saxophone part which is never played at the same time as the backing vocals, you can use the spare portions of track 7 for recording the saxophone).
- By sacrificing a track of audio, special synchronizing timecode can be recorded on the "sacrificed" track, allowing sequenced MIDI instruments to play along with the audio tracks.
- If there are more instruments than tracks, it is possible to do a "mini-mixdown" from some existing tracks to a spare track or tracks. This is known as "track bouncing" or "ping-pong".



- In the example above, the four recorded tracks incorporating the drum parts will be bounced and combined onto tracks 7 and 8. Tracks 1 through 4 may now be reused for other purposes.



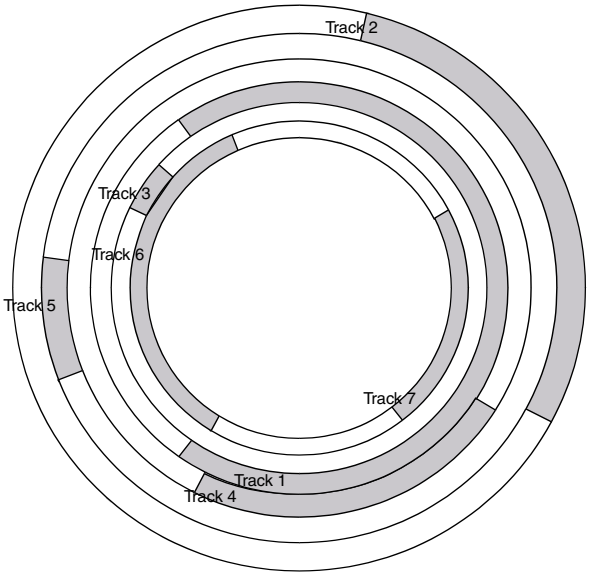
Multitrack disks

On an analog tape deck, the number of tracks available is determined (mainly) by the width of the tape. By contrast, in a disk system, the power of the processor determines how many tracks can be recorded and played back at one time. On the 788, eight tracks can be recorded and played back at one time.

While a tape's tracks are recorded side-by-side along the length of the tape, a disk track may be placed anywhere on the disk.

If you could see the magnetic patterns that are recorded on a hard disk, you might find that the

tracks recorded in a session would look something like:



Actually, the arrangement of tracks on a disk is more complicated than this, but the diagram above gives you an idea of how tracks don’t need to live side by side as they do on tape.

Another thing to notice is that the tracks are of different lengths. Unlike a multitrack tape, where the length of the track has to be equal to the length of the tape, a disk recorder can be “smart” enough to recognize when nothing is recorded, and use that space for other tracks, if necessary. This means that it’s difficult to say that you can record a song of a certain length on a disk of a given size (unlike a cassette, say, which is clearly labelled with the length of material that can be recorded on it).

When recording or playing back material, the processor (“brain”) of the 788 must collect all the tracks together and play them simultaneously, so that you hear them playing together in perfect timing with each other.

This is what we meant when we talked earlier about the number of tracks that can be replayed at one time. If we asked the 788 to play back hundreds of tracks together, it would end up having to do too much work, and the tracks would be out of time with each other.

The “song”

On the 788, as on many MIDI sequencers, etc., a piece of music is referred to as a *song* (whether or not it has a vocal part). Because on a multitrack tape system, a piece of music takes up a fixed length of all tracks of the tape—no more, no less, there is no need to pre-divide a tape into songs.

On a disk-based system, however, before you start recording a piece, you must “tell” the recorder that you are recording a new song.

To the 788, a song is all the audio data you record, together with the playlist which allows you to select parts of the song for playback, until you start working on another song.

You can copy songs to other songs (or to another disk), erase them, protect them against further changes, and so on.

Since the song is a collection of digital data, there is no loss of quality when a song is stored or copied to another disk.

What do “16-bit” and “24-bit” mean?

The 788 is capable of recording at 16-bit and 24-bit resolution. Basically speaking, in digital audio, the more bits, the better. This is because in a digital audio device like the 788, incoming sound is *digitized*, that is, converted into numbers, which in the case of the 788 are stored on the disk.

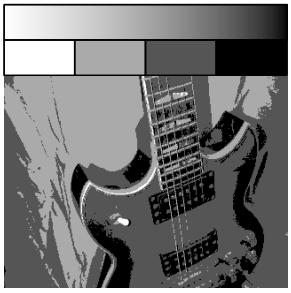
When it is time to replay the sound, the 788 reads the numbers from hard disk and converts them back into sound.

In each second, the 788 takes a “snapshot” of the incoming sound 44,100 times. By playing back these snapshots one after the other at the same speed (44.1 kHz, in technical terms), the 788 provides you with an accurate reproduction of the sound, in much the same way as a movie camera takes a series of still pictures (frames) 24 times a second, which are replayed by the movie projector to give you the feeling of a continuously moving picture.

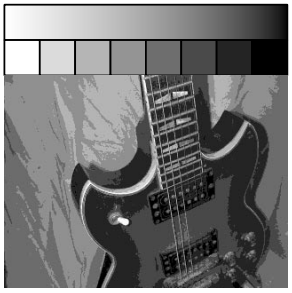
However, the speed at which the *sampling* is carried out is only half the story. The depth at which the sampling is carried out is also important.

To illustrate this, let’s think of a black and white photograph. In such a photograph, there can be an infinite number of grays, all the way from complete white to total blackness.

If we sample this photograph, which originally contains pure white, pure white and almost every shade of gray in between, we must convert it to a fixed number of gray levels. Here, we can see that the more grays we use to represent the picture, the more realistic the photo appears.



2-bit resolution
(4 gray levels)



3-bit resolution
(8 gray levels)

8-bit resolution
(256 gray levels)

Note that we use the number of bits (a bit is either "on" or "off") to show how many grays are used to make up the picture. The number of grays can be given as 2^n, where n = the number of bits.

So: 2 bits give us $2^2 = 4$ grays, 3 bits give us $2^3 = 8$ grays, and 8 bits give us $2^8 = 256$ grays,

For our eyes, 256 grays is just about enough, but our ears need a little more quality. If you listen to sound recorded at 8-bit resolution, you'll notice that it sounds somewhat rough, especially in the quieter passages.

CDs are therefore produced at 16 bits ($2^{16} = 65{,}536$ "grays") and this is fine for playback. For recording, though, when sound is being manipulated and processed, it's a good idea to have more bits available. The 788 therefore gives you 24 bits of resolution ($2^{24} = 16{,}777{,}216$) which allows complete precision and sonic quality at all stages of the production process.

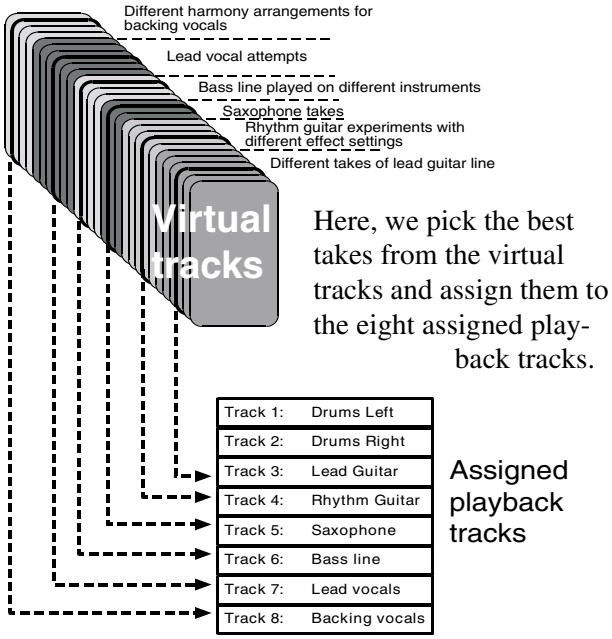
At the final stages, when the mix is transferred to CD or to any other digital medium, the 24 bits are reduced to 16 for compatibility with other audio equipment.

Note, though, that when you record using 24 bits rather than 16, more space is used on the hard disk (50% more, as you might well expect). In practice, given the size of the hard disk in the 788, this should make little or no difference to the way you work with your recordings.

Real and virtual tracks on the 788

When you use the 788, you can record "spare" tracks; for instance, different versions of the lead vocals, and pick and choose between the different versions to find the one which works best.

These "spare tracks" are known as *virtual tracks*. With the 788, you can record up to 250 tracks per song. From those 250 tracks, you pick the eight that you want to fit together to make your finished mixed song. This can be re-takes of the same material (for instance, many attempts by a singer to capture the perfect vocal line), or alternative tracks (different guitar lines or effect settings, etc.). This allows you much more freedom to experiment than a tape recorder can provide.



Editing

One of the most useful features of a disk-based recorder such as the 788 is the ability to edit material. When working with a stereo tape recorder, the usual way of editing was with a white pencil, a razor blade and sticky splicing tape. In this way, unwanted parts of tape could be removed, and parts of a song (e.g. verses, choruses, intros) could be moved from one part of the song to another. However, there were many disadvantages to this (and it didn't work with multitrack recorders).

The other way of tape editing is assembly from one recorder to another—you need two recorders, and some very precise (and often expensive!) synchronization equipment to do this.

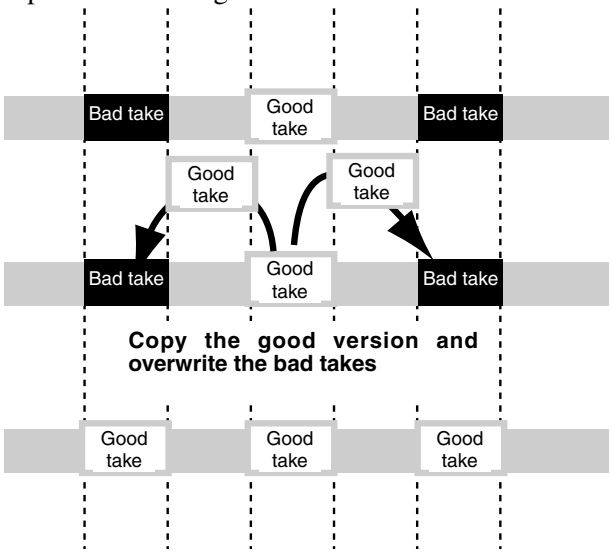
Nondestructive editing on the 788 By contrast, the 788 allows you to use a wide variety of sophisticated editing techniques with no additional equipment.

If you have ever used a computer for word-processing, you will know that you can cut and copy parts of a document, and paste them into other locations in the document, saving you a lot of boring, repetitive work.

Since the 788 stores its information as digital data, just as a word-processor stores your documents as digital data, parts of a song can be cut, copied and pasted to other locations in the song. You can cut, copy and paste all the tracks which have been recorded to make a song, or just one or a few tracks.

As a practical example, let's suppose that you're recording a song that has three chorus sections, with an identical, rather complex, guitar hook at the end of each of them. If you were recording to tape, you would record the hook for these three sections three times, each one in the appropriate place. Because this is a slightly tricky passage to play, you might only get it right once or twice. You'd have to go through the process of punching in and out at the places where you made the mistake, until you got it right three times.

With the 788, this becomes easier. You can copy and paste the part which was recorded properly, and replace the bad versions. This makes life a lot simpler and quicker, as you only have to get the hook right once—the other times are simply "clones" of the perfect recording.



There are other ways you could use this feature—used with care, it could be used to correct timing problems with an out-of-time player, or signals from microphones which are widely separated.

788 editing On the 788, you can copy, move, paste, add silence, close up gaps, wipe whole tracks, etc. in very simple operations. See "Track editing" on page 65 for details of the track editing operations available with the 788.

Undo and redo Furthermore, compared with a tape recording system, disk offers one very big plus—the ability to undo changes. For instance, if you make a mistake and copy a bad take of the chorus over a good copy, you can undo it and restore what you originally recorded. You can't do this with tape. This is why we call editing with disk "non-destructive"—you don't actually destroy the data immediately when you write over it, cut it or delete it, but you have a "safety net" to catch your mistakes.

However, the undo function is not available for every operation, though. For instance, there is no way to undo formatting a disk (and destroying all data on it). This is an operation from which there is no escape, once it has started (there are a few other non-undoable operations, such as erasing a song—these functions are explained as being non-undoable when they are described in this manual).

Multi-take punch-ins on the 788

Similar to the concept of "virtual tracks", and also to the editing procedure above, is the idea of multi-take punches.

The 788 allows you to repeat a punch-in section, playing or singing the same phrase many times until you stop the punch procedure. All the successive takes of this phrase are stored on disk, and you can audition them all, and pick the best one to insert into the track.

Instant location on the 788

With a tape recorder, you must always wait a certain amount of time before moving from one part of a song to another. This is because it takes time for tape to be wound or rewound (even with the fast DTRS or DAT systems, moving between the start and end of a repeated section takes a definite amount of time).

However, a disk-based system like the 788 does not need to rewind, and therefore if a section is being looped, the start can follow immediately after the end section. This can be a little unnerving for musicians brought up on tape systems, and so the 788 allows you to set the period between the end and the start, simulating a tape rewind time.

You can set many location marks throughout a 788 song, allowing you to jump instantly around even the longest pieces of music.

Recording technique

Remember, the 788 is a tool which helps you create recordings. Although it has many features which will assist you in making high quality recordings easily, the use of a 788 (or indeed, of any piece of equipment) does not in and of itself guarantee a perfect recording.

Above all else, we encourage you to learn to listen critically to your recordings—this will enable you to make the most from your equipment and add to your ultimate enjoyment.

Assignment

When recording signals on a multitrack system, the outputs of the signal sources (microphones, instruments, effect returns or previously-recorded multitrack tape tracks) must be plugged into the appropriate channels of the mixing console and *assigned* or *routed* to the appropriate destination.

When recording the first tracks, the destination will usually be the track or tracks of the multitrack recorder on which the signal will be recorded.

In the mixdown phase of a project, the destination will usually be the stereo pair to which the tracks will be mixed (usually on another recorder).

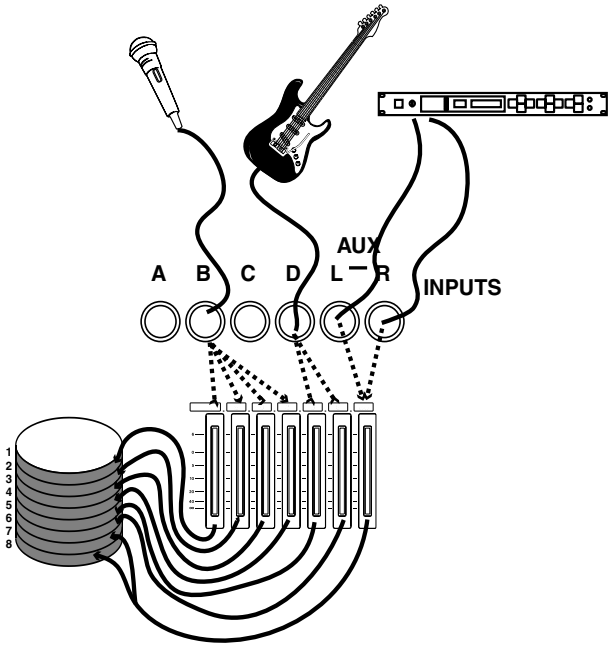
In a conventional system, to change (say) a microphone signal from input channel 1 of the mixer to input channel 4, it is either (in a small setup) necessary to unplug the microphone from the mixer and reconnect or (in larger setups) to use a *patchbay*, where all the inputs and outputs are permanently connected at the rear of a "patch panel" and links are made using *patch cords* on the front. Digital patchbays are also available for the connection of digital signals.

The 788 internal patchbay

With the 788, no external patchbay is necessary. The unit incorporates its own digital patchbay with many advanced features. The techniques of actually making the assignments in this internal patchbay are explained in more detail in "Assignment on the 788" on page 36. This section provides a brief overview of the facilities available when using the assignment patchbay of the 788.

The illustration here tries to show that although the sound sources may be connected to the same inputs of the 788 throughout a session, the signals from

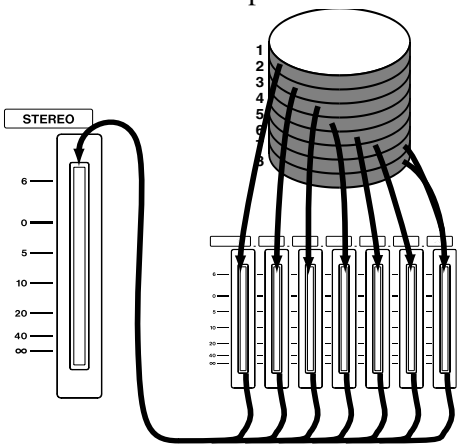
these inputs may be assigned to different mixer channels as required during the recording process.



Although only a few dashed lines are shown here for simplicity, it is possible to connect any of the shown inputs to any of the eight mixer channels.

Every mixer channel is tied directly to the associated recording track on disk. This means that when recording, the output of mixer channel 1 always feeds recording track 1, mixer channel 3 always feeds track 3, etc. This cannot be changed.

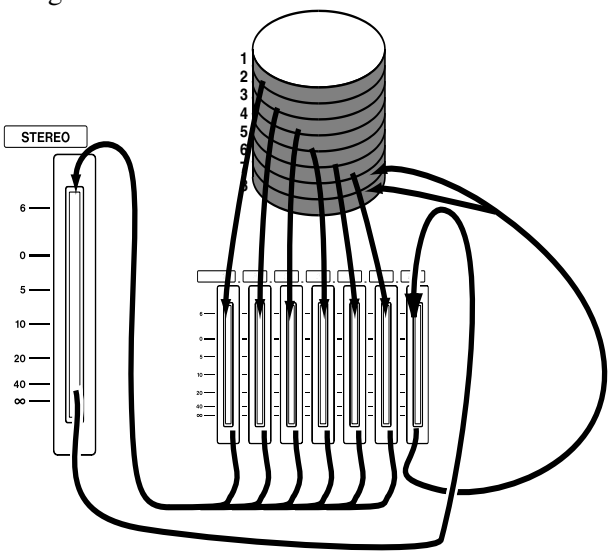
However, when mixing down or track bouncing, the tracks themselves, which are usually the destination of the signals, become signal sources. In this case, tracks are assigned to channels, becoming the signal source. Again, track 1 is always assigned to channel 1, track 2 is always assigned to channel 2, etc. In this case, however, there are 250 virtual tracks per song (see "Real and virtual tracks on the 788" on page 11) to choose from, and the virtual track that is currently assigned to a real track will be sent through the mixer channel to the **STEREO** outputs.



Track bouncing

As a further refinement, it is also possible to send the stereo output signal to a track or pair of tracks, allowing track bouncing to take place, as described in "Multitrack tapes" on page 9.

In this illustration tracks 7 and 8 are used to receive the mixed stereo tracks, which are fed by tracks 1 through 6:



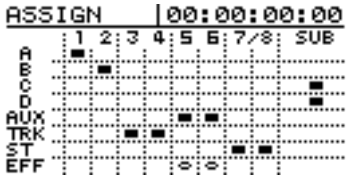
Note that the stereo fader does not actually affect the volume of the mixed tracks—it is placed in this diagram for illustrative purposes only.

Quick setup and the assign screen

The 788 allows you to see your current assignments easily in two ways (as explained in more detail in “Assignment on the 788” on page 36):

Firstly, when you press a mixer channel’s **SELECT** key, it flashes, along with the inputs that have been assigned to it.

Secondly, to see the whole map of the current assignments, press and hold down the **SHIFT** key while pressing the **ASSIGN MAP** key:



Inputs are listed down the left side of the screen, and destinations along the top. A black mark at the intersection of the input and destination means an assignment of the input to the destination.

As well as this map, the 788 also allows you to set up different commonly-used assignment maps using the **QUICK SETUP** key.

The assignment maps that you can set up in this way are: RECORDING (where the inputs are assigned to the mixer channels (and hence to the tracks on a one-to-one basis), MIXDOWN, where the recorded tracks are routed to the stereo output bus, and BOUNCE 7/8 where tracks 1 through 6 are routed to the stereo bus, which in its turn is routed to channels 7 and 8.

There is also a special library, as described elsewhere in this manual, where custom routing patterns can be stored and retrieved (as well as a library for storing the whole of the mixer’s settings).

Synchronization and the 788

One of the other key features of the 788 is its ability to synchronize with other equipment. This is especially useful when working with MIDI equipment, as the MIDI instruments do not actually need to be recorded until the final mixdown stage.

Instead, one way of working is to record the basic MIDI tracks (say a bass and drums sequence) on a sequencer, and play it back as a guide “click” or backing track while recording guitars, vocals, etc.

Alternatively, the acoustic tracks may be recorded first, and MIDI tracks added later as atmosphere.

In either case, at mixdown, the 788 provides you with a sub mix facility, that allows the inputs to be routed through to the master stereo mix in addition to the tracks recorded on disk.

There is no “right” or “wrong” way of working—you should choose the method that works best for you and your material.

Note that in either case, the MIDI must be accurately synchronized to the acoustic recorded material at all times.

There are three basic methods of synchronization between the 788 and a MIDI system, briefly explained below. Full details of how to use these synchronization facilities are provided in “Synchronization” on page 94.

Timecode synchronization

Timecode is a way of specifying an absolute position in a recording. It is expressed in hours, minutes, seconds, frames and bits. The number of frames in a second depends on the timecode type—these are related to the audio-visual industry where timecode (sometimes known as “SMPTE” or “SMPTE/EBU” timecode originated. There are five major “flavors” of timecode supported by the 788:

Frames/ second (fps)	Timecode type
24	Movie
25	PAL/SECAM TV
29.97 drop	NTSC color for broadcast
29.97 non-drop	NTSC color TV
30 non-drop	NTSC mono TV

The 788 converts internal timecode so that it can be transmitted over MIDI (MIDI Time Code or MTC) and this is the way in which the 788 transmits and receives timecode.

When synchronizing acoustic recordings to MIDI instruments using MTC, the 788 can act as a timecode master or a slave with respect to your MIDI system. Of course, your sequencer must be able to use MTC in order to do this.

In other words, when the 788 acts as a timecode master, the sequencer determines its playback/record position from timecode received from the 788.

When the 788 acts as a timecode slave, the sequencer sends out MTC to locate the 788 playback/record position. Note that many computer sequencers are not very accurate timecode masters, though—using the 788 as a timecode slave is probably best if you are going to use a stable MTC source, such as another 788.

Tempo map synchronization

As well as timecode, there is another way in which the 788 can be synchronized to MIDI sequencers, which depends on the position in bars (measures) and beats of a song .

The 788 is provided with a "tempo map", which allows it to recognize that bar 1 starts at timecode time 00:00:00.00, and bar 2 starts 2 seconds later (for example).

To use this method of synchronization, it is first necessary to set up this tempo map, so that musical positions can be mapped to timecode times.

Sync track recording

In this method of synchronization, the 788 records a MIDI timing clock data from the sequencer, and can later use this information for synchronization and song positioning.

MIDI external control (MMC, etc.)

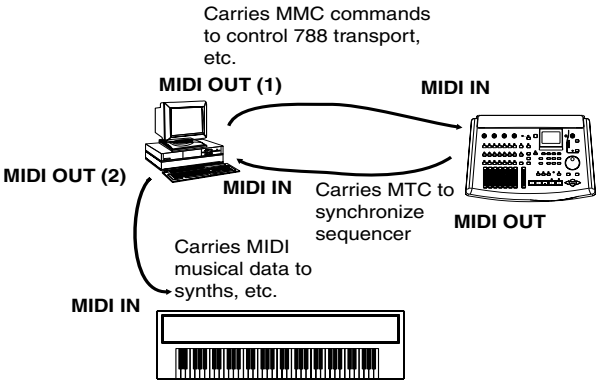
As well as synchronization, the transport controls of a sequencer can be used to control transport, etc. functions on the 788.

Or, if you want to work the other way, MIDI commands sent from the 788 can be used to control the sequencer.

These commands are known as MIDI Machine Control commands (MMC). Any machine capable of transmitting or responding to MMC may be provided with a unique ID, from 0 to 127.

Note that it is possible for a machine such as the 788 to be a timecode slave at the same time that it is a MMC master (i.e. MTC timing information is obtained from an external source, but the transport controls of the 788 are used to control other devices, including possibly the timecode source) or *vice versa*.

In the illustration below, the MIDI interface of the computer is fitted with two outputs, one of which provides the slaved 788 with the MMC transport commands, and the other driving the synthesizer bank, etc. The sequencer takes its timing from the MTC output by the 788.



When starting synchronized playback, the sequence of events is therefore that the sequencer first sends an MMC Play command to the 788, which then locates to that position and starts playback. Meanwhile, the sequencer is waiting for MTC so that it can "lock in" and start playback. When the 788 starts playing, this MTC is received by the sequencer which then finally starts playback to the synthesizer.

MIDI remote control

In addition to the transport control described above, the 788 is able to accept MIDI Program Change messages to change mixer scenes, and routing tables, etc. as well as previously-set effector settings.

It can also accept Control Change messages, which allow a sequencer, for example, to control mixer parameters as well as individual effector parameters, so that remote control of the sound can be carried out in real time for the final mix.

SCSI issues

SCSI (usually pronounced “scuzzy”) stands for Small Computer Systems Interface, and is a way of connecting computers and peripheral devices (e.g. hard disks, removable disk drives, scanners, tape drives, etc.).

The 788 uses SCSI to communicate with its hard disk, since SCSI is a reliable, efficient way of sending data between devices.

You can connect different types of SCSI device to the 788, for example external hard disks, magneto-optical disks or other types of removable media, as well as SCSI-equipped CD-R and CD-RW drives.

SCSI connections

The 788 uses the SCSI-2 protocol, which is used by most modern hard disk drives, and storage devices. You can connect almost any SCSI storage device to the 788, and use it for data storage.

Any CD-R or CD-RW drive that you use with the 788 must be a SCSI drive. Contact your TASCAM dealer or consult the TASCAM Web site for details of which drives are known to work well with the 788.

NOTE

You should never plug or unplug SCSI devices from the chain with the power to any of them switched on. If you do, there is a real risk that you will damage the devices beyond repair.

SCSI IDs

SCSI devices are connected together in a “daisy-chain” arrangement. The total length of the chain should be less than 3 m (about 10 ft.).

Within each chain, each device must have its own unique identifier, known as a “SCSI ID”.

There may be up to eight devices within a SCSI chain, including the main SCSI controller (the 788 is a SCSI controller). Numbering of devices typically starts at 0 (zero) and goes up to 7.

The internal disk in the 788 has SCSI ID 0, and the 788 itself has SCSI ID 7.

Make sure that every device in your SCSI chain, including the controller (788) has a different ID. If you create a SCSI chain with more than one device using the same ID, you will find that you have problems with the setup.

Consult the documentation for your other devices to find out how to set the ID (it may be a set of switches or a rotary switch).

SCSI termination

At each end of a SCSI chain, there must be a terminator. This may either be a separate plug, or may be built into the SCSI device.

Consult the documentation for your other devices to find out how to set the termination for them.

The 788 is always at the end of its SCSI chain, and is always terminated.

SCSI devices and backing up

The 788 contains a large, fast hard disk, which allows the recording of many songs on the same disk.

However, if you keep all your material, eventually this disk will fill up, and you must do some "housecleaning" to sweep away the unwanted material.

The 788 incorporates a very useful feature which allows you to back up a song to CD-R or CD-RW media. These discs can hold a lot of data. In the case of a song being too big to fit on a single disc, the 788 will automatically create multi-disc archives on which you can store your work. This, of course, is in addition to you being able to use a CD-R/RW disc as the final mastering device (mixdown of the final mastered stereo tracks to CD-R/RW via SCSI).

In case you do not have a CD-R/RW drive, we suggest the use of an external SCSI device which uses removable disks: the Iomega® zip® and jaz® drives can hold large amounts of data, as can magneto-optical (MO) disk drives. The songs on the internal hard disk can be copied to the external media for archival.

Note that you should not attempt to install an internal disk drive (either hard disk or removable) in your 788. This is an operation that should be performed only by authorized TASCAM service agents.

Further reading

This section does not pretend to be a comprehensive listing or explanation of all these issues. If you have the time and interest, reading about these subjects is a very good way to add to your practical experience with the 788.

If you have Internet access, the Web is an excellent source of information. The following books are also useful reference sources, if you wish to explore these subjects in more depth.

Sound & Recording, 2nd edition 1994, Francis Rumsey & Tim McCormick, Focal Press, Oxford, is a good general introduction to recording theory and practice, starting from basic principles. However, the section on hard disk recording is not very long.

For detailed information on digital audio, including disk recording theory, *The Art of Digital Audio*, 2nd Edition 1994, John Watkinson, Focal Press, Oxford, is invaluable, but is somewhat technical in places.

MIDI Systems and Control, 2nd Edition 1994, Francis Rumsey, Focal Press, Oxford, has an excellent section on synchronization and machine control (chapter 6).

There are also many resources regarding SCSI. It's not a subject that you usually need to know in enormous detail, but an Internet search for "SCSI primer" will probably give you all the information you need.

If you are using your 788 with a sequencer, make sure that you read and understand the relevant sections of the sequencer manual, as well as the 788 manual. This will probably avoid many problems with regard to synchronization.

This section explains some of the principles of using your 788. It is not a "tutorial"—there are so many different ways in which the 788 can be used that it would probably not be useful for us to give you step-by-step instructions here covering every possibility. Instead, we have provided you with general instructions that will work in most cases.

Precautions, etc.

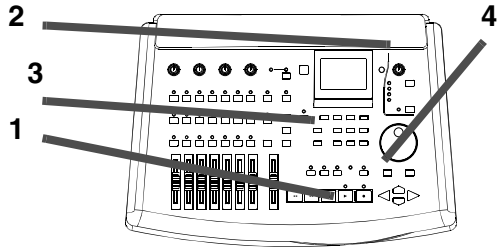
Treat the 788 with the same care and respect that you would treat a notebook or laptop computer, and it will last for a long time, and act as a useful creative tool to help you in your music-making.

However, there are a few precautions you should take with the 788:

- **always** operate the 788 on a firm level surface. Do not locate it where it can be knocked or shaken—hard disks are more sensitive than tapes.
- **always** take note of any special instructions regarding the care and maintenance of removable media, if you are using such media with the 788.
- **never** eat or drink over the 788. Spilled liquid or food crumbs will not improve its performance! Also, smoke particles are the enemy of studio equipment. If possible, we suggest that you make your 788 work area a no-smoking area.
- **always** allow the 788 to adjust to room temperature if you are bringing it from a cold to a warm place. This may take between 1 and 2 hours.
- **never** connect or disconnect audio equipment with the monitoring levels turned up. This can cause damage to speakers (and ears!). Always turn down levels before making or breaking such connections.
- **always** shut down the 788 before turning it off (see the following section).
- **never** move the 788 while it is powered on. Take special care never to move it while recording or playback is taking place, in order to avoid any possible damage to the disk. Shut down and power off the unit before moving it.
- **never** make external SCSI connections with the power to the 788 or the external SCSI device turned on. Making SCSI connections with the power turned on can cause damage to the units, including the 788, which is expensive to repair! Shut down the unit and turn it off before making or breaking these connections.

Shutting down the 788

It may seem strange that the first thing we explain is how to turn off the 788. This is important, though, and you should get into the habit of *always* turning off the 788 in this way, as this will avoid any possible loss of data.



1 Stop playback or recording (you cannot shut down the 788 while playback or recording is taking place).

2 Turn down the level of the monitoring amplifier (to avoid speaker "thumps").

3 Press the EJECT/SHUT key.

4 The indicator lights, and a message appears on screen asking if you are sure. Press ENTER/YES to shut down the 788.

5 As the 788 "tidies up" before closing down, appropriate messages appear on screen. At the end of the shutdown process, the message:

is shown and the indicator flashes. Turn off the 788 with the power switch on the rear panel.

Power-on

When the power is turned on, the display shows the power-up screen. All the front panel indicators light briefly.

The disks are then scanned, and the 788 performs internal self checks.

You will probably be able to hear the sound of the disks as the startup progresses. Depending on the number of disks connected to the 788, this may take a little time.

After the check is complete, the 788 loads the song you were last working on.

NOTE

When you first purchase the 788, a demonstration song ("Liquor Store") is already recorded on it. See the "Brief Guide" for details of how to load this song.

The song is recorded in 24-bit resolution and is protected. If you want to edit this song, or change parts of it, you must unprotect it, or make an unprotected copy of it first.

When the "home" screen ("The "home" display" on page 26) is shown, you can start to use the 788.

NOTE

There may be some noise output through the monitoring system while the 788 is turned on. For this reason, we strongly suggest that you follow the power-on order described previously (i.e. turn on the 788 before the monitoring system. If the monitoring system is already turned on when you need to turn on the 788, make sure the monitoring system volume is turned down before you turn on the 788.

Remember that you must always turn off the 788 "properly", that is, using the method described in "Shutting down the 788" on page 19.

Do not simply press the power switch to turn off the 788—there is a risk of possible loss of your recording if you do this.

About the demonstration song

We suggest that you use this song "Liquor Store" to experiment with some of the features of the 788.

However, before you start editing and experimenting with the song, you may want to make a copy (if only for comparison purposes), even though the 788 includes a sophisticated undo function. Use the song copy function described in "Copying songs" on page 29.

A few notes about this manual

When we refer to a control or a connector on the 788, the name of the control, as printed on the front panel, is written like this: the **RECORD** key (front panel controls are called "keys"). We refer to the cursor keys as ▲, ▼, ◄ and ► or sometimes as **UP**, **DOWN**, **LEFT** or **RIGHT**.

When we refer to a control or connector on another unit, it is written like this: the sequencer's **MIDI OUT** connector.

On-screen messages are written like this: Go.

Always take note of the notes and tips if things aren't working quite the way you might expect—they may contain information that you need to make things work properly.

Do take note of warnings and cautions—these contain information which advises you of possible damage to you and the equipment!

NOTE

Notes like this are useful additional information which explain features and other matters, etc. that affect the working of the 788.

TIP

Tips like this provide additional information to help you use the 788 to its best advantage.

"Roadmap" to this manual

Each section of this manual deals with a different topic:

1 "Introductory concepts" (page 8) This section provides an introduction to some of the theory behind the 788.

Read this section to: familiarize yourself with the ideas behind multitrack recording and disk recording.

2 "Getting started" (page 19) This section provides you with basic information regarding the first use of the 788, and the basic principles regarding menu operations, etc.

Read this section to: become familiar with the basic principles of operating the 788's menu system, etc.

3 "Before recording" (page 34) This section helps you get started before actually recording using the 788.

Read this section to: understand how to assign inputs to mixer channels, and to listen to your work.

4 "Mixer" (page 41) The digital mixer which is part of the 788 allows you to control equalization, level, pan, etc.

Read this section to: understand the mixer functions of the 788.

5 "Recorder operations" (page 49) The other major component of the 788 apart from the mixer is the disk recorder, which allows you to record, punch in and out, play back, perform repeat playback, etc.

Read this section to: understand the recorder functions of the 788.

6 "Location operations" (page 60) The 788 allows you to set and move to location marks throughout your song, for convenience.

Read this section to: find out how to use these location functions effectively.

7 "Track editing" (page 65) The 788 provides you with a wide range of editing tools to help you in your work.

Read this section to: find out how to select, copy, move and paste sections of recorded material, as well as other editing features.

8 "Mastering and backup (CD-R)" (page 72) You can use a CD-R or CD-RW drive connected to the 788 to create master stereo recordings on disc, as well as backing up and restoring song data for future use.

Read this section to: understand how to use recordable CDs with your 788.

9 "Effects" (page 81) The effectors in the 788 can be used for many different purposes: as multi-effect processors, dynamics processors, and single stereo effect processors. You can make your own settings for these effectors, and can store them on the 788 disk.

Read this section to: make the most of the effectors built into the 788, and for reference to the parameters you can set.

10 "Routing and scene libraries" (page 91) The 788 allows you to store mixer settings and routing settings into libraries.

Read this section to: learn how to store and recall commonly-used scenes, etc.

11 "Synchronization" (page 94) You can synchronize the 788 with other equipment, allowing you to play along with MIDI instruments, etc.

Read this section to: learn how to synchronize the 788 with other equipment.

12 "MMC and MIDI functions" (page 101)

Various parameters of the 788 can be controlled by MIDI messages. In addition, the 788 transport can be controlled by MIDI Machine Control commands.

Read this section to: learn how to control the 788 using MIDI.

13 "Specifications, etc." (page 119) As well as the specifications of the 788, this section also contains a lost of error messages.

Read this section to: understand what to do if an error message appears, or for hard facts and figures about the 788.

Connecting other equipment to your 788

For a typical recording session, you will need:

- the 788 itself
- some sound sources (instruments and/or microphones)
- a stereo mastering recorder (cassette, DAT, MD). Alternatively, you can use a CD-R or CD-RW drive which will allow you to master the song, and also to back up and restore your working material.
- an external effects unit (optional)
- a monitoring system (this is a grand name for a good amplifier and a pair of good speakers which you will use to listen to your recorded material—this can be your stereo system)
- if you are using microphones in the same room as the 788, you should use headphones (headphones are also sometimes useful for general monitoring purposes as well)
- cables to connect everything together, with the appropriate connectors
- if you are using MIDI instruments, you will almost certainly be using a sequencer (either as a stand-alone unit, as a computer program, or built into a workstation instrument)

1 Find a stable level surface on which to put your 788 and place the 788 on it.

2 Make sure that all equipment is switched off.

3 Connect the MONITOR OUTPUTs of the 788 to a pair of inputs of the monitoring system.

4 Connect the STEREO OUTPUTs of the 788 to the inputs of the mastering recorder (if it is an analog-connected recorder). Connect the outputs of the mastering recorder to another pair of inputs on the monitoring system (if they are available).

Alternatively, if you are using a DAT, CD recorder or MD recorder with a digital (coaxial) audio input, connect the 788's DIGITAL OUTPUT to the COAXIAL IN of the recording device. Set the input selector of the recording device appropriately.

As yet another alternative, you can make a SCSI connection (see "SCSI issues" on page 17) to a suitable CD-R or CD-RW drive. Even though no audio connection is made, the drive will be able to accept audio data through the SCSI cable, and to transfer it back to the 788 for replay.

5 If you are using an external effects unit, connect the AUX OUTPUTs of the 788 to the inputs of the effects unit, and the outputs of the effects unit to the AUX INPUTs of the 788.

6 Connect the MIDI OUT of the sequencer to the MIDI IN of the 788 and the MIDI IN of the sequencer to the MIDI OUT of the 788.

7 Connect the audio outputs of your instruments to the inputs of the 788.

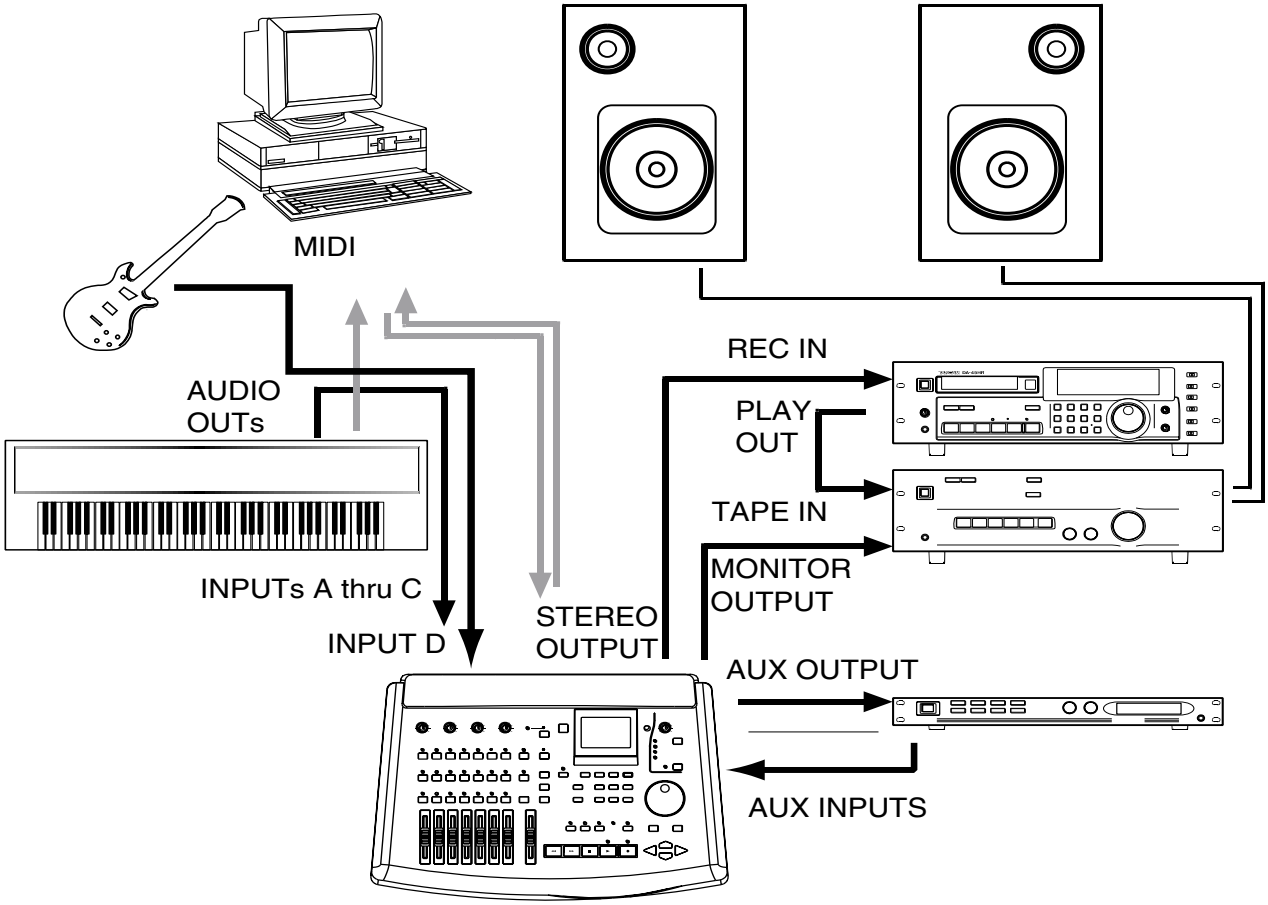
8 Connect the PS-P788 AC adaptor supplied with your 788 to the 788.

9 Turn on the power, starting with the instruments, and finishing with the monitoring system.

Additional connection notes

- Make sure that you have enough space to plug and unplug cables, etc. and that you can reach the controls, read the display, etc. comfortably.
- If you are using a home stereo amplifier, do not connect the 788 to any **PHONO** inputs on the amplifier. These are the wrong kind of inputs for this kind of equipment. Use inputs labeled **AUX**, **CD**, **VIDEO,** etc.
- Always use the TASCAM PS-P788 AC adaptor designed for use with the 788, making sure that the input voltage marked on the adaptor matches the power supply in your area. Never use any other adaptor with the 788. If you are unsure, consult an electrician. If you move to an area with a different voltage, contact your TASCAM distributor regarding the supply of a new adaptor.
- When switching on equipment, a general rule is to work from the signal source through to the final end result. In this case, assuming a synthesizer is plugged into the 788, the switch-on order would be:
  Synthesizer → 788 → Mastering recorder → Monitor amplifier
  Switch off in the reverse order (end result through to signal source).

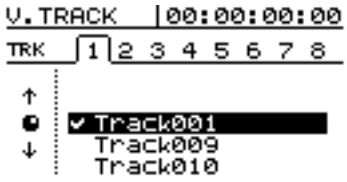
- If your external effects unit can only accept a mono input, connect the **L AUX OUTPUT** of the 788 to the input.
- The MIDI connections described here do not have to be direct connections—your sequencer will need to accept data from the instrument chain and to pass data to them. However, you should make sure that MTC (MIDI Timecode) can be sent from the 788 to the sequencer, and MIDI Machine Control commands can be received by the 788 from the sequencer, even if this means routing the MIDI signals through some **MIDI THRU** ports.
- If you are connecting an electric guitar (or bass guitar) directly into the 788, use **INPUT D** and set the switch to **GUITAR**—this allows the matching of the input impedance to the high impedance of an electric guitar.



About the menus

The 788 uses a menu interface to display and select operations that you cannot carry out using the front panel keys.

The **JOG/DATA** dial is often used to scroll through a list. When the dial can be used, the screen will usually show a small icon representing the dial (as shown at on the left of the screen).



Generally, the transport must be stopped (not playing back or recording) when using the menus.

When scrolling through a list, when the option you want is highlighted, you should select the option by pressing the **ENTER/YES** key.

The **EXIT/NO** key allows you to move up a level without selecting an option.

Selecting multiple entries

Sometimes multiple entries can be selected from a list (for instance, when copying songs). In this case, the selected entries in the list are shown by a check mark (✔) beside the list entry.

To set a check mark by a list entry, press the **INSERT/MOVE** key.

To clear a check mark from a list entry, press the **DELETE/SILENCE** key.

The MENU key

The **MENU** key allows you to make settings with the "system" menus.

These menus provide access to system-level settings that you will probably not use very often (for instance, you will only create a song once in the lifetime of a song).

SONG menus (see "The SONG menu" on page 28	CREATE SAVE REVERT LOAD ERASE COPY DELETE UNUSED PROTECT
DISK menus (see "DISK menu" on page 31)	SELECT EJECT FORMAT CHECK
CD-R menus (see the section "Mastering and backup (CD-R)" on page 72)	PRE MASTERING CHECK MASTER CD WRITER CD FINALIZE CD PLAYER DATA BACKUP DATA RESTORE
SYNC/MIDI menus (see the section "Synchronization" on page 94)	SYNC SYNC TRACK TEMPO MAP METRONOME CONTROL
OPTION menus (see "The OPTION menu" on page 33)	GLOBAL MIXER RECORDER USER WORD

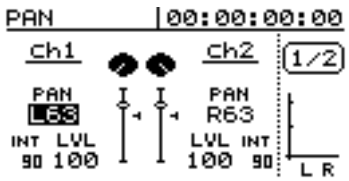
Other control screens

There are a number of dedicated menus and screens available, which are accessed with the following keys. These are all described in the appropriate sections of this manual:

EQ	Channel equalization
SEND	Channel Aux and Effect send
FADER/PAN	Channel fader and pan settings
TRACK CUE	Off-disk level and pan positioning for cue mix
QUICK SETUP	Preset routing options, scene read and write, routing assignment read and write
EFFECT 1	Effect selection and parameters
EFFECT 2	Effect selection and parameters
LOCATE	Location recall, naming and time viewing
TRACK EDIT	“Copy and paste”, etc. of recorded material
UNDO/REDO	Menu to undo or redo editing operations
STEREO	Stereo section settings
SUB MIX	Sub-mixer settings
TRACK	Virtual track assignment

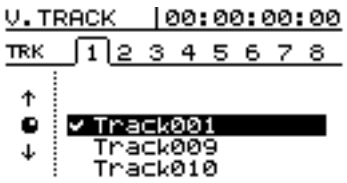
Selecting parameters

If there are many parameters on a screen, use the cursor keys to highlight the parameter you want to change before setting the value with the dial.



Here, the two PAN values can be highlighted, and changed with the dial. In the example above, the pan value of channel 1 is highlighted for editing.

Sometimes there are “tabs” at the top of the screen. Use the ◄ and ► cursor keys to select the tab where you will be making the change.



Here, the left and right keys are used to select the tab from 1 through 8 at the top of the screen (tab 1 is selected in this screen).

The virtual tracks are then selected with the dial.

Setting values

When a value is to be changed, use the **JOG/DATA** dial to change the value.

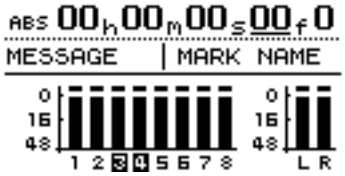
The **ENTER** key is often used as a “yes” key to answer questions like Are you sure? which may sometimes be shown on screen (for example, the screen below).

If you change your mind about carrying out an operation, use the **EXIT** key.

The **EXIT** key can also be used as a “no” key to answer on-screen questions.

The “home” display

There is one special display which is always available with the touch of one key—the **HOME/ESC** key. This “home” display provides the following information:



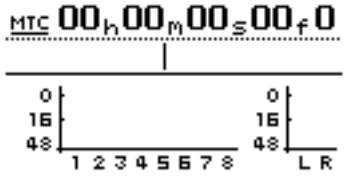
- A large display of the time counter (see below)
- Track/monitor meters and the recording source
- The title of the currently active location mark
- A space for messages
- The record ready status of the tracks (in this example tracks 3 and 4 are ready for recording)

The time display

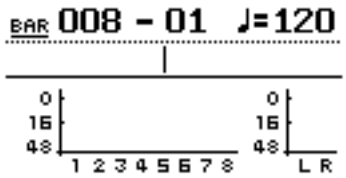
When the home display is shown, moving the cursor to the left field on the top line of the display allows you to use the dial to change the time mode shown in the top line of the home (and other screens) between the following options:

- Absolute time

- MIDI Timecode

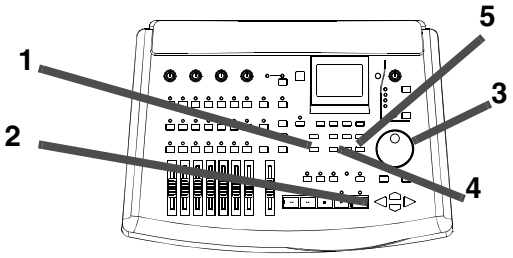


- Bars and beats and the current tempo (when working with a tempo map)



Entering and editing titles

The 788 allows you to use titles up to 12 characters in length that you choose to identify songs, virtual tracks, location marks, library settings, etc. (the titles of location marks can be up to 10 characters long).



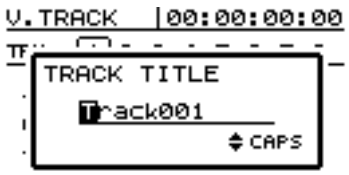
It is probably much easier for you to remember a virtual track title such as `Good solo` than `V.TRACK 97`, or a real song title rather than `SONG 12` (of course, if you prefer to use titles like `V. TRACK 97`, or `Mark 006` to `Bass hook`, you’re always free to leave things that way!).

You can set and edit a title for the following items in almost every screen where you select or store them:

- Location marks (except the IN, OUT and TO points, which are a special case)
- Songs
- Virtual tracks
- Mixer scenes
- Mixer routing tables
- Effect settings

The way in which you enter titles, and edit existing titles is as follows:

1 **From any of the screens listed above, press the SHIFT + MENU (TITLE) key:**



The screen above shows the titling of a virtual track.

2 **Use the LEFT and RIGHT cursor keys to move the cursor (the reversed character).**

3 **Use the dial to change the cursor character.**

4 **Press ENTER when you have finished editing a title (EXIT to leave the title unchanged).**

Use the **DELETE** key to delete the character at the cursor—*(i)* below, and the **INSERT** key to insert a space at the cursor—*(ii)* below.

(i) *(ii)*

Use the ▲ and ▼ keys to change between the following character modes as shown at the bottom right of the title area:

CAPITAL (uppercase) letters (A through Z). This mode is shown on the screen by CAPS

small (lowercase) letters (a through z). This mode is shown on the screen by small

Numbers (0 through 9). This mode is shown on the screen by NUM

Preset words and phrases. This mode is shown on the screen by WORD

NOTE

In the first three of these modes, common punctuation characters are also available.

In the preset word mode, words such as COUNT IN, VERSE, INTRO, CHORUS *are available. Consult the section below for a full list of these words, and details of how to edit them to suit the way in which you work.*

Setting and editing preset words

The 788 provides a number of useful preset words, but you may want to add your own (up to a total of 100) preset words and phrases of up to 12 characters in length to include your own names and titles.

1 **Press the MENU key.**

2 **Use the dial to scroll down to** OPTION**, and press ENTER.**

3 **Use the dial to scroll down to** USER WORD**, and press ENTER.**

4 **Use the dial to scroll down to the place where you want to enter your own word (this can be an existing word) and press SHIFT+MENU (TITLE).**

5 **Enter your word or phrase in the way described above ("Entering and editing titles" on page 26).**

6 **Press ENTER when you're finished, and you can then select another word to enter.**

TIP

Use this to enter musical section names (some are provided, but if you're recording classical pieces, phrases like Allegro *might be useful).*

You can also add the names of special instruments that you record a lot (for some people, the user word Bagpipes *might be more useful than* Bass*).*

You might even want to add the names of the musicians you record a lot so you can use these names to make titles like Joe solo*.*

The SONG menu

The SONG menu, as the name suggests, is concerned with the management of songs on the 788.

You can load, save, copy and protect songs, as well as deleting the data which is currently on disk but unused in the song.

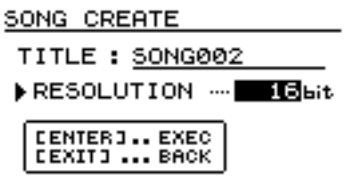
Creating a new song

Before you start recording, you must create a song on the disk. This means that any audio data you record on the 788 will be associated with that song until you select a new song. Any currently-loaded song will be saved when the new song is created.

1 **Press the MENU key.**

2 **Use the dial to scroll down until SONG is highlighted, and press ENTER:**

3 **Move the cursor to CREATE and press ENTER:**



4 **Press the SHIFT + TITLE (MENU) key to enter a title for the new song (as described in "Entering and editing titles" on page 26).**

5 **Use the dial to select between 16-bit and 24-bit resolution. As you might expect, 24-bit songs take up more space on disk than 16-bit songs of the same length, but the audio quality is higher (there is more subtlety in the dynamic range).**

6 **Press ENTER/YES to close the current song, and create the new song.**

If you entered the song creation process by accident, or you change your mind about creating a new song, press the EXIT/NO key.

TIP

If you need to name or rename a song later on, you can reload the song, and press the **SHIFT** *+* **MENU** *(***TITLE***) key to enter a title for the song when the 788 is displaying the title.*

Saving a song

Typically, there is no need to perform a special operation to save songs on the 788, as the 788 automatically saves the song. The function described here is provided as a manual method of saving the song, to which you can return ("Reverting to the previous saved version of a song" on page 28):

1 **Press the MENU key.**

2 **If SONG is not highlighted, turn the dial until it is, and press ENTER.**

3 **Turn the dial until SAVE is highlighted and press ENTER.**

As the song is saved, appropriate messages are displayed. The current song will be reloaded after it has been saved, and you can resume work on it.

Reverting to the previous saved version of a song

If you have saved a song, or the song has been automatically saved by the 788 (e.g. when it was last shut down), and you want to return to the version of the song at the time it was last saved:

1 **Press the MENU key.**

2 **If SONG is not highlighted, turn the dial until it is, and press ENTER.**

3 **Turn the dial until REVERT is highlighted and press ENTER.**

4 **The 788 asks if you are sure. Press YES if you want to throw away all changes since the last save operation, otherwise press NO.**

NOTE

You will lose all recordings and edits made since the last save, and they will disappear from the undo list ("Undoing and redoing actions" on page 70). This revert operation is not undoable. Be sure that the work you have done since the last save operation is really work that you do not want to keep before reverting to a previous version.

Loading a song

To load a previously-saved song from disk (the current song will be written to disk automatically when the song is loaded):

1 **Press the MENU key.**

2 **If SONG is not highlighted, turn the dial until it is, and press ENTER.**

3 **Turn the dial until LOAD is highlighted and press ENTER.**

4 **Select the song to be loaded (from the currently selected disk).**

The current song is saved, and the selected song is loaded from disk.

NOTE

This menu reads the songs stored on the currently-selected disk or partition. If you are loading a song from another disk or partition, you must select it first ("Selecting a disk" on page 32).

Erasing a song

To free up space on a disk partition, and delete a song or songs, you should perform the following operations:

1 **Press the MENU key.**

2 **If SONG is not highlighted, turn the dial until it is, and press ENTER.**

3 **Turn the dial until ERASE is highlighted and press ENTER.**

4 **Select the song or songs to be erased using the dial to highlight the songs and the INSERT/MOVE key to place a check mark (✔)beside them.**

If you select a song for erasure by acident, use the DELETE/SILENCE key to deselect it.

5 **Press YES to erase the selected song(s).**

6 **The 788 asks you if you are sure. Press YES if you really are sure that you want to erase these songs.**

NOTE

This operation cannot be undone. Erasing songs is a permanent operation. Always think carefully before you erase a song or songs.

This menu can erase only the songs stored on the currently-selected disk or partition. If you want to erase a song or songs from another disk or partition, you must select it first ("Selecting a disk" on page 32).

If you have selected all the songs on a disk or partition for erasure, a new song will automatically be created (at 16-bit resolution) after all the existing songs have been erased.

Copying songs

As well as copying songs, so that you can work on another version of them, you can also use this menu item as a tool to back up songs to removable media (you can also back up to CD-R, but this is a separate process and is described in "Mastering and backup (CD-R)" on page 72).

1 **Press the MENU key.**

2 **Use the dial to scroll down until SONG is highlighted, and press ENTER.**

3 **Turn the dial until COPY is highlighted, and press ENTER.**

4 **Select the song or songs to be copied using the dial to highlight the songs and the INSERT/MOVE key to place a check mark (✔) beside them.**

If you select a song for copying by accident, use the DELETE/SILENCE key to deselect it.

5 **When all the songs to be copied have been marked, press the ENTER key. A list of all the currently-available drives and partitions is shown.**

6 **Use the dial to select the drive or partition to which the selection will be copied and press ENTER.**

7 **The 788 asks you if you are sure that you want to make the copy. Press YES to continue with the operation, and NO to cancel.**

NOTE

Copying a song may take some time. Be patient while the song is being copied, and take care not to power down the 788 in the middle of a copy operation.

If you copy a song to the disk or partition where it was originally stored, it will be copied with the same title as originally, so the list will contain two songs with the same title. If you want two copies of the same song on one disk or parti-

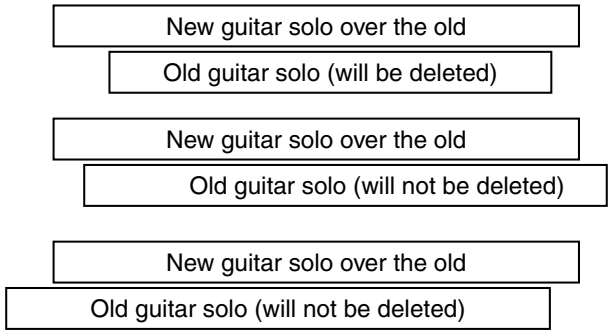
tion, you should rename one of the copies immediately after the copy operation has been carried out.

When you make the selection for copying, only those songs in the currently-selected disk or partition are listed. If you need to back up from many different disks or partitions, you must select each partition in turn ("Selecting a disk" on page 32) and then select the songs on the selected disk or partition.

Deleting unused space from a song

As we explained earlier, a song does not consist of just the recorded audio, but also of the "playlist" and the recorded but unused parts of the song.

By "unused", we mean parts of a song which have been completely overwritten by other parts. If the start or end or both of a new part extends beyond the start or end of a new part, it will not be deleted in this operation.



A virtual track which is not currently assigned as an active track does not count as "unused" here.

To free up this disk space, once you've made all your edit decisions (there's no undo on this):

1. **Press the MENU key.**
2. **Use the dial to scroll down until SONG is highlighted, and press ENTER.**
3. **Turn the dial until DELETE UNUSED is highlighted, and press ENTER.**
4. **The 788 asks you if you are sure. If you want to delete all the unused portions of the song, press YES. If you have second thoughts, press NO.**

TIP

Although there is no undo operation here, and you lose all the unused parts of the song permanently, you can back up the song, to removable SCSI media, or to CD-R , before performing this "cleanup" operation. If you change your mind later on, you can restore this backed up version.

NOTE

Remember that you cannot undo this operation.

Protecting a song

When a song is protected, recording is not possible (the **REC READY** keys are disabled), it cannot be edited using the track editing functions ("Track editing" on page 65), and it cannot be erased, etc. using the SONG menu.

It is also impossible to set or edit location marks ("Location operations" on page 60) except the IN and OUT points for repeat operations, or to permanently reassign virtual tracks as in "Assigning virtual tracks" on page 54. Virtual tracks can be assigned for audition purposes, but not permanently saved.

In operations which show a list of available songs (for instance, loading a song), any protected songs have a small padlock icon beside the song title.

Only the currently-loaded song can be protected or unprotected at any one time (though, of course, songs stored on the disk can be stored as protected or unprotected).

1. **Press the MENU key.**
2. **Use the dial to scroll down until SONG is highlighted, and press ENTER.**
3. **Turn the dial until PROTECT is highlighted, and press ENTER.**
4. **Use the dial to set the protection ON or OFF, and press ENTER to confirm the setting.**

NOTE

You can retitle the song at this stage, before it is protected, by pressing the **SHIFT** *+* **MENU** *(***TITLE***) key.*

DISK menu

These functions all deal with the use of disks (internal and external) with the 788. Note that a CD-R or CD-RW drive is not counted as a disk in this case (even though it is connected via SCSI in the same way), but it has its own menu, as described in a separate section of this manual ("Mastering and backup (CD-R)" on page 72.

Formatting a disk

Before you start working with a new disk on the 788 for the first time, you must prepare the disk for use. This is called initializing or "formatting" the disk (the same as on a computer), and it will provide a "clean slate" to start recording. You usually only need to do this once, when you first use a disk.

NOTE

*You do **not** need to do this with the internal disk supplied with the 788. This disk has already been formatted.*

Formatting will erase any data already on the disk. The operation cannot be undone. Only format a disk if you are really sure that you have no information on it that you want to keep.

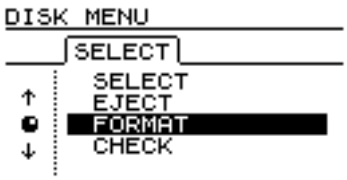
The format used on the 788 is not compatible with the format used by personal computers. You cannot read a computer-formatted disk on the 788, or the other way round.

To format a disk connected to the 788:

1 **Press the MENU key.**

2 **Turn the DATA dial until the DISK option is highlighted, and press ENTER.**

3 **Turn the DATA dial until the FORMAT option is highlighted, and press ENTER.**



The 788 scans through all the SCSI disks connected to the 788, and displays a list.

4 **If you have more than one disk connected to the 788, use the DATA dial to scroll through the list and press ENTER when the disk you want to format is highlighted.**

5 **Set up the parameters for formatting the disk. A disk can be split into a number of different partitions. The maximum partition size is 4096 MB (4 gigabytes) and the minimum size is 512 MB. Use the dial to select between 4096, 2048, 1024 and 512 MB.**

If the disk size is not an exact multiple of these values, the unused space at the end will be turned into the largest possible partition , using all the space available.

NOTE

If you choose the smallest partition size (512 MB), you will not be able to perform the backup operation to CD-R (see "Backup using CD-R" on page 79).

TIP

As a very rough guide, remember that a 16-bit stereo (i.e. 2-track) 74-minute CD is equivalent to 650 MB. As explained elsewhere, it is difficult to say exactly how much space a song will use on disk—this depends on factors such as the number of virtual tracks, etc.

6 **Using YES with the Quick Format option will work in most cases. There may be a few occasions (a very heavily damaged disk, for example), when you set this option to NO.**

7 **Ask yourself once again whether you really want to format this disk. Remember that the operation will lose all data on the disk.**

8 **Press ENTER.**

9 **The 788 asks you once more if you are sure. Pressing YES formats the disk, NO leaves it untouched.**

NOTE

You cannot undo a disk format.

You only need to format a disk for the 788 under the following circumstances: you are using a new removable disk (zip®, jaz®, etc.), or have connected a new external hard disk. The other time when you may want to format a disk is when a disk has become full and you want to re-use it.

However, it is probably safer to delete songs one by one, rather than formatting the whole disk.

Disks in the list are identified by their SCSI ID numbers (from 0 through 6; ID 7 is reserved for the788's internal controller). If the disks are divided into partitions, the partitions are listed as Part1, Part2, *etc.*

Selecting a disk

This selects the disk on which you will create new songs and on which you will work. Only formatted disks and partitions (see "Formatting a disk" on page 31 above) can be selected as the active disk, and only one at a time can be selected as the active disk.

1 Press the MENU key.

2 Turn the dial until DISK **is highlighted and press ENTER.**

3 If SELECT **is not highlighted, turn the dial until it is, and press ENTER.**

4 Turn the dial to select the disk or partition from the list, and press ENTER.

Ejecting a disk

This only applies to removable media (MO, zip and jaz drives, etc.). Of course, you cannot eject a hard disk. Since the SCSI standard allows the disk to identify itself as ejectable or not to the controlling device (in this case, the 788), you'll never see a disk in this list that cannot be ejected.

1 Press the MENU key.

2 Turn the dial until DISK **is highlighted and press ENTER.**

3 Turn the dial until EJECT **is highlighted, and press ENTER.**

4 Select the disk to be ejected (if you have more than one removable media drive connected you can only select one at a time), by pressing ENTER.

NOTE

While the 788 is connected to removable media drives and using the media, the eject button on the drive is locked. This software function is the way to eject such disks.

Checking disks

You use this operation to re-scan the drive list when you have inserted a removable disk and you need the 788 to recognize it.

1 Press the MENU key.

2 Turn the dial until DISK **is highlighted and press ENTER.**

3 Turn the dial until CHECK **is highlighted, and press ENTER.**

The 788 will close the current song and scan all connected drives and partitions. The process may take a little time, after which the song is reloaded.

NOTE

While this operation is in progress, do not turn off the power to the 788, and do not turn any drives connected to the 788 on or off. You should not insert or remove any removable media during this time (including recordable CD discs).

The OPTION menu

The OPTION menu allows you to set various system-wide options affecting the operation of the 788. There are four sub-menus here: GLOBAL options, affecting the whole of the unit, MIXER parameters which affect the mixer, RECORDER parameters which affect the recording part of the 788, and the USER WORD settings. The USER WORD settings are described in "Setting and editing preset words" on page 27, and are not described again here.

Global options

As the name suggests, these options affect the whole operation of the unit.

Key sense time Some of the keys on the unit have two different functions, spending on whether they are pressed and released in a short space of time, or whether they are pressed and held down for a longer period.

The pitch control is a good example of this. If the **PITCH/SSA** key is pressed and released briefly, the pitch control is turned on. If it is pressed and held for the time set here, a screen appears allowing you to make the settings for the pitch and the slow speed audition functions.

The setting for the key sense time is from 0.3 to 2.0 seconds, in 0.1 second steps.

Meter peak hold time The meters shown on the home display ("The "home" display" on page 26) and other pages can be configured to hold the peak value .

This parameter can take the following values: OFF, where the meters do not hold the peak value at all, ON; the peak meters hold the value for a second or so and then drop back, or KEEP, where the peak value is always shown on screen until this value is changed.

Use the cursor keys to highlight the parameter, and the dial to change it

TIP

The KEEP setting is useful if you want a permanent record of the highest value, but you cannot keep your eyes on the meters during the whole take or rehearsal.

Meter release time The meter "drop-back" time can be configured to be from 0ms to 100ms in 10ms steps using the cursor keys to highlight the parameter, and the dial to change it.

Note that the meters are always peak meters, and the rise time is fixed.

Mixer settings

Only one setting is currently implemented, as described here.

Fader settings This parameter allows the setting of the relationship between the physical and the internal faders when scenes are recalled, etc. The details are given in "Internal and physical faders" on page 45.

Recorder settings

Two settings, related to each other, connected to the recorder operations of the 788, may be made from this submenu.

These are the pre-roll and post-roll times concerned with auto punch operations. *Pre-roll* refers to the time difference between the point where playback starts before a punch operation and the punch point. *Post-roll* refers to the time after the punch-out point that the recorder keeps playing after a punch-out (or rehearsal). See "Auto punch operations" on page 55 for full details.

Both of these fields are set in the same way, by highlighting the field and using the dial to set the value.

The minimum time for both the pre-roll and post-roll is 1.0 seconds and the maximum time is 9.9 seconds. The values are changed in 0.1 second steps.

USER WORD

Described in the section on entering and editing titles ("Setting and editing preset words" on page 27).

We have already looked at how to connect instruments to the 788 (“Connecting other equipment to your 788” on page 22). Now we look at how the signals are passed from the input connectors on the back of the 788 to the recording tracks.

This process is known as *assigning*. There are two ways to assign signals to channels on the 788: the Quick Setup, described immediately below, and the manual assignment method (“Assignment on the 788” on page 36).

The theory of this patchbay is explained in “Assignment” on page 13. Consult this for an explanation of the principles, if you are unsure of how this feature of the 788 works.

Quick Setup

The quick setup allows the selection of one of three predefined assignment patterns, together with default EQ and send settings, for use when recording or mixing down, etc.

1 **Press the QUICK SETUP key beside the display screen.**

2 **Use the dial to select** RECORDING, MIX DOWN **or** BOUNCE 7/8 **(the library functions are explained in “Routing and scene libraries” on page 91).**

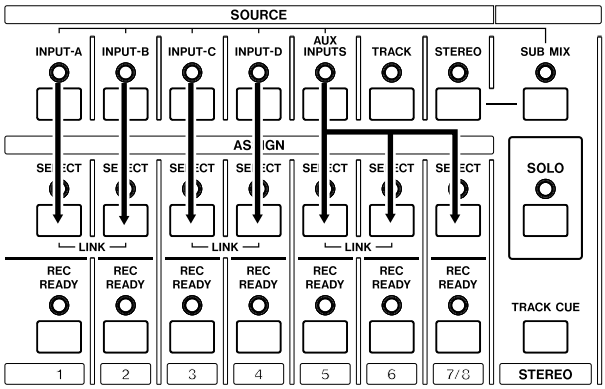
3 **Press ENTER. The current selection is shown on screen using the assign map (see below, “Viewing assignments” on page 37).**

4 **Return to the home screen by pressing the HOME/ESC key (“The “home” display” on page 26).**

After the setup has been loaded from the Quick Setup menu, it is possible to ‘fine-tune” the assignment to the exact requirements (“Assignment on the 788” on page 36).

RECORDING

The RECORDING setting sets up the following assignment:

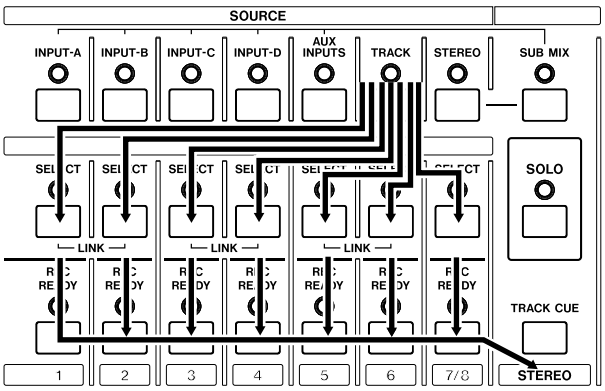


The inputs from **A** through **D** are assigned to channels **1** through **4**, and the **AUX INPUTS** are assigned to channels **5** and **6** and the **7-8** channel.

This is a good point to start recording the basic tracks in a project, allowing six simultaneous external sources to be recorded.

MIX DOWN

When **MIX DOWN** is selected, the following assignment is set up:



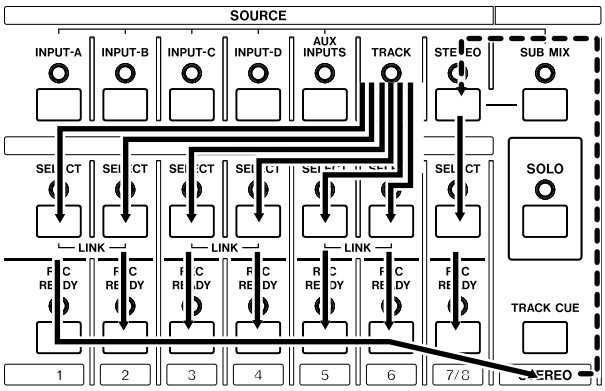
In this assignment pattern, all eight recorded tracks are assigned to the correspondingly-numbered channels, ready for mixdown.

TIP

If you are adding MIDI-synchronized instruments to the final mix, you can assign inputs **A** *through* **D** *and the* **AUX INPUTS** *to the software sub-mixer ("Assigning inputs to the sub-mixer" on page 37). This provides you with a total of 14 signal sources (in addition to the internal effect returns).*

BOUNCE 7/8

This allows you to take six recorded tracks and mix them into the two tracks of the **STEREO** bus, which are then recorded on 7 and 8:



Channels 1 through 6 are fed from tracks 1 through 6 and passed to the **STEREO** bus.

The **STEREO** signals, in their turn, are passed to channels 7 and 8, which will record on tracks 7 and 8.

The individual levels, etc. of the recorded tracks are adjusted using the channel controls, and the overall level of the mixed signal is adjusted using the faders of the destination tracks (in this example, the **7/8** fader). It is also possible to add a pre-fader compressor to the **STEREO** bus before the signal is passed to channels 7 and 8 ("Using EFFECT 2 as a stereo dynamics processor" on page 82). Care should be taken when using insert dynamics processors in this situation.

NOTE

Although it is possible to use both the stereo dynamics and channel dynamics processors at the same time, this is not recommended.

TIP

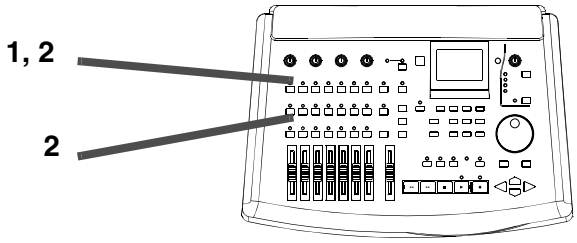
This shows tracks 7 and 8 used as the destination for the "bounce". Of course, any other pair of tracks can be used (but it is not possible to bounce tracks to themselves).

Assignment on the 788

This section explains how to use the 788's internal patchbay for your own settings.

Assigning sources to mixer channels.

To assign an input source (**INPUT**s **A** through **D**, the **AUX INPUTS**, the recorded **TRACK**s, the **STEREO** mix or the ~~**SUB MIX)**~~ to a mixer channel:



1 **Choose the SOURCE that you are going to feed into the mixer and press and hold down the SOURCE key of that source. The indicator flashes.**

   If the source is already assigned, the SELECT indicator(s) of the destination channel(s) also flash as the SOURCE key is held down.

2 **While pressing and holding the SOURCE key, press the SELECT key of the mixer channel into which you will feed the source.**

3 **The indicators of both the SOURCE and the SELECT keys flash to show that this assignment has been made.**

NOTE

You can assign a source to more than one channel. However, a channel cannot accept more than one source at a time. If a source has been assigned to more than one channel, the destination channels must be deselected individually (push and hold the **SOURCE** *key and then the* **SELECT** *keys of the channels).*

If you assign a stereo source (either **AUX INPUT** *or* **STEREO***), and press the* **SELECT** *key of one channel of a stereo linked pair (or the* **SELECT** *key of channels 7/8), the stereo source is linked to both channels of the pair.*

If you are assigning **INPUT***s to channels 7 and 8, note that* **INPUT***s A and C can only be assigned to channel 7, and* **INPUT***s B and D can only be assigned to channel 8.*

If you assign a stereo source (either **AUX INPUT** *or* **STEREO***) to an unlinked mono channel, the stereo link will automatically be created.*

If you assign a mono source to a stereo linked pair (or channels 7/8), the signal is split between the two channels.

TIP

You can also perform this operation by pressing and holding the mixer channel **SELECT** *key and pressing the* **SOURCE** *key of the source.*

Removing assignments

If you need to remove the assignment of an input to a channel or channels:

1 **Press and hold down the SOURCE key of the input you want to unassign. The indicator will start to flash.**

   The indicator of any channels to which this input has been assigned will also start to flash.

2 **Press the SELECT key of channels which are currently assigned, as shown by the flashing indicators. The indicators stop flashing.**

NOTE

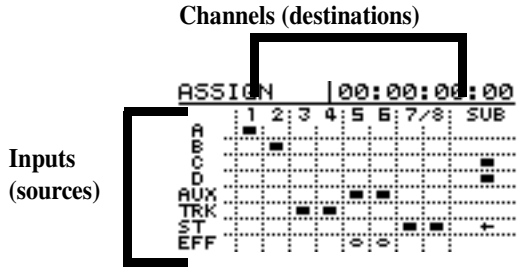
If the source has been assigned to two linked channels (including channels 7-8), pressing the **SELECT** *key of one of the channels will unassign the pair of channels. If the stereo link was automatically created when a stereo source was assigned, the channels will not be automatically unlinked.*

TIP

You can also perform this operation by pressing and holding the mixer channel **SELECT** *key and pressing the* **SOURCE** *key of the source.*

Viewing assignments

1 **Press the SHIFT + QUICK SETUP (ASSIGN MAP) key to make the assign map appear on the display.**



The eight tracks and the sub-mixer are shown along the top of the screen.

The inputs (sources) are shown down the left side of the screen.

When a source is assigned to a channel, a rectangle appears where the row and channel meet (an arrow shows when the sub-mixer is assigned to the stereo bus).

2 **While you make and remove assignments, the screen changes to show this.**

3 **After making and viewing the assignments, you can press the HOME/ESC key to return to the "home" display.**

Channel-to-track assignments

With a system consisting of a separate mixer and recorder, you sometimes need to set up the way in which the mixer channels will feed the recorder.

With the 788, this is not necessary. Mixer channel 1 is automatically routed to track 1, channel 2 to track 2 and so on.

Track-to-channel assignments

The **TRACK** key is used to assign recorded tracks to the mixer channels so that they can be replayed through the mixer, with all the facilities provided in each mixer channel (EQ, effect and aux sends, fader and panning, etc.).

There is only one **TRACK** key, which is used to assign the recorded tracks to the channels.

When you press and hold the **TRACK** key, and press the **SELECT** key of a mixer channel, the track whose number corresponds to the selected channel is assigned to that channel. Track 1 is always assigned to channel 1, track 2 to channel 2, etc.

If you press the **7/8 SELECT** key, the appropriate two tracks will be assigned to the pair.

Assigning inputs to the sub-mixer

The sub-mixer (**SUB MIX** key) is both an assignment source and a destination.

As a source, it can only be assigned to the **STEREO** mix.

As a destination, it can be used by the four inputs and the **AUX INPUT** pair.

This sub-mixer contains (software) faders for each of its inputs as well as (software) pan controls.

To assign the inputs to the sub-mixer:

1 **Press and hold one of the four INPUT SOURCE keys or the AUX INPUTS key.**

The indicator will flash.

2 **Press the SUB MIX key. The indicator will flash, along with the indicators of all other inputs that have been assigned to the sub-mixer.**

Assigning the sub-mixer to stereo

To assign the sub-mixer outputs to the **STEREO** bus:

1 **Press and hold the SUB MIX key. The indicator flashes, along with the indicators of any inputs currently assigned to it,**

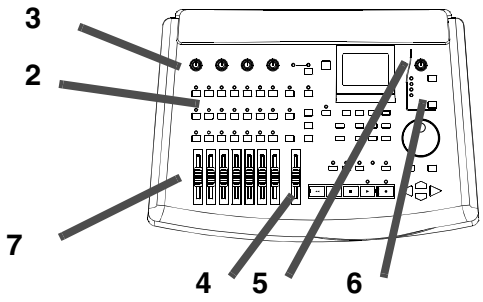
2 **Press the STEREO key to assign the sub-mixer outputs to the stereo output bus.**

For details of how to use the sub-mixer, see "Sub-mixer" on page 48.

Remove assignments to and from the sub-mixer in the same way as you do for other assignments ("Removing assignments" on page 36)

Monitoring

To make sure that everything is connected properly, you will need to listen to the signal sources feeding the inputs, as well as what you have already recorded.



1 **Make sure all the equipment is connected and powered up.**

2 **With the source connected to one of the four inputs of the 788 (A through D), assign the input to a mixer channel ("Assignment on the 788" on page 36). If you're using an electric guitar as the signal source, make sure that it is plugged into input D and that the MIC/GUITAR switch is in the GUITAR position.**

3 **Make sure that the input TRIM control is set to match the input source level (either LINE or MIC or in between, depending on the signal level).**

4 **Set the STEREO fader to the "nominal" (0) position, and the assigned channel's fader to the minimum (–∞) position.**

5 **Set the MONITOR LEVEL control to about the 2 o'clock position.**

6 **Make sure that the monitoring STEREO indicator is lit (press the upper MONITOR selection key to light it if it is unlit).**

7 **Start the input source, and slowly bring up the channel fader. You should hear the sound of the signal through the monitoring system.**

The meters on the right of the home screen ("The "home" display" on page 26) will show the overall volume of the stereo signal.

If you don't hear anything

We suggest you check the following if you don't hear anything after following the steps above:

- Make sure that all connections between the monitor amplifier and the monitor speakers are securely made, as well as the connections between the 788 and the monitor amplifier
- Make sure that the volume control of the monitoring amplifier is turned up, and if the amplifier has source selector switches, make sure that these are correctly set.
- If the sound source is an electric instrument, make sure the volume control of the instrument is turned up. If the sound source is a switchable microphone, make sure the switch is turned on. In all cases, make sure there is a good connection between the sound source and the 788.
- The **TRIM** control of the 788 input should be set to the appropriate level, and the input should be assigned to the channel whose fader is being moved.

How to monitor tracks

Here are the basic rules which control what you will hear from the 788's tracks (in the example above, we were listening to the input source, not the track):

- **If you are recording on a track, or the track is armed** (the track's **REC READY** indicator is lit or flashing) use the **MONITOR CUE** key to listen to the track. You control the volume of the monitored sound (as well as the volume of the signal sent to the track) with the channel fader, and the pan position of the recording using the channel's software pan control ("Fader and pan" on page 45).
- **If you have recorded on a track, and you want to play back the track while recording other tracks**, use the **MONITOR CUE** key, and the **TRACK CUE** mixer described below ("Monitoring the recorded sounds (TRACK CUE)" on page 39.
- **If you are mixing down, and you have assigned a track to a channel**, the track is automatically removed from the cue mix (the **TRACK CUE** mixer settings have no effect). Use the channel fader and software pan controls to affect the level and position in the stereo mix (which is what you will usually monitor here).

Monitoring the recorded sounds (TRACK CUE)

When you have done some recording, you will need to listen to what you have recorded previously (otherwise you will be unable to synchronize overdubs, etc.). To do this, you will need to use the track cue facility.

This is a small software mixer which provides a stereo output and is fed by the eight recording tracks. This output is from the **MONITOR OUTPUT** and **PHONES** connectors only—it is never sent from the **STEREO** outputs.

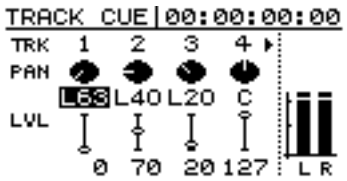
This facility allows you to set up a "cue mix" for the performers who will be overdubbing their parts; for example, you could have a mix which was very heavy on the kick drum and the bass line in order to keep a rhythm part in time.

The cue mix is only output from the **MONITOR OUTPUT** and **PHONES** when the **CUE** key (above the dial) is on (the indicator is lit). When this indicator is off, the cue mix cannot be heard.

To adjust the cue mix:

1 **Press the TRACK CUE key (above the STEREO fader).**

2 **You can see and set the parameter for four tracks at a time. Pressing the SELECT key of one of the tracks that cannot be seen on the screen shows the other four tracks. You can also use the ◄ and ► keys to move the cursor "past" the left or right of the screen.**



3 **The top row of controls shows pan controls to position the track in the stereo monitor image. Move the cursor so that one of these is highlighted (in the illustration, the pan control of track 1 is highlighted) and use the dial to make the pan setting.**

The setting can be made all the way from L63 (hard left) through C (center) to R63 (hard right).

4 **Move the cursor to the bottom row of this screen to adjust the track cue levels from 0 (minimum) to 127 (full).**

NOTE

The "faders" shown on screen here have no connection with the hardware physical faders of the 788.

5 **Adjust the overall level of the track cue mix with the MONITOR LEVEL control to the right of the display.**

Arming tracks and monitoring

When a track has been armed for recording (i.e. the **REC READY** key of the track has been pressed, and the red indicator is flashing), you can monitor any signal coming into the inputs assigned to armed tracks when the **CUE** monitor indicator is lit.

The levels of the monitored signals from the tracks which have been recorded are adjusted with the track cue mixer described above.

The channel faders are used to adjust the levels of the signals to tracks which are recording, and their levels in the **CUE** monitor mix. The track cue mixer settings do not affect these levels, or the levels at which recorded tracks are monitored.

In addition, in the home screen, the meters of the tracks to which the inputs have been assigned will show the incoming signal.

These incoming signals are mixed with the playback signals when armed tracks are played back.

When actually recording on an armed track, any signals previously recorded are, of course, not heard, and only the incoming signal is heard.

TIP

To prevent unwanted signals (microphone noise, stray guitar noises, etc.) from interfering with the playback made to check a take, get into the habit of switching off the **REC READY** *of any armed tracks, or turning on the* **CUE** *monitoring and turning off other (***STEREO***) monitoring before playing back, and restoring the monitoring to its original state before you record again.*

NOTE

When doing punch operations (see "Recorder operations" on page 49), the situation is slightly different, as the recording from disk is muted during the punch rehearsal as well as during actual recording.

More monitoring options

The monitor **SELECT** key below the **MONITOR LEVEL** control allows you to select what signals you will hear through the **MONITOR OUTPUT** and **PHONES** connections.

In addition to the track cue, which can be independently switched, the following monitor sources are available:

STEREO	The stereo output
EFF SEND	The overall send signal sent to the internal effect loop ("Using EFFECT 1 as a single stereo effect processor in the effect loop" on page 82)
AUX OUT	The overall send signal sent to the AUX loop (may be internal or external, see "Using EFFECT 2 as a single stereo effect processor in the AUX effect loop" on page 83)
SUB MIX	The sub-mixer stereo signal (see "Sub-mixer" on page 48)

To select the monitor source, press the monitor **SELECT** key. The indicators for the monitor sources listed above light in sequence as you continue to press the key.

There is a fifth setting, where all indicators are off. This allows you to listen to the track **CUE** in the monitor mix completely separately from any other monitor signals.

TIP

When recording, you will probably want to listen to the track cue (previous recordings)

Typically, when mixing down, you will want to listen to the **STEREO** *monitoring source, as this is the final mixed signal. Since the tracks are routed to the channels during mixdown, the track cue has no use here, and the CUE should be turned off.*

In both recording and mixdown, you may find it useful sometimes to listen to what is being sent to the effect and aux busses, as well as to be able to isolate the sub-mixer.

Monitoring in mono

It may seem strange to want to do such a thing, but there are sometimes occasions when it is a good idea to listen to your work in mono. For instance, if you expect your work to be heard over small portable radios or tape players, etc., or you are mixing a piece for TV or video where you are not expecting every listener to have stereo equipment, this is a necessary part of the production process.

1 **Press and hold down the SHIFT key and press the monitor SELECT key.**

The indicator of any selected monitor source (STEREO, EFF SEND, AUX OUT, SUB MIX or CUE) starts to flash, showing that mono monitoring is now taking place.

2 **Press the monitor SELECT key again to return to stereo monitoring. The indicators of the selected monitor sources will light steadily.**

NOTE

If a monitor source has not been selected at the time of the change between mono and stereo, when it is selected, it will flash (mono) or light steadily (stereo) to show the current monitor status.

Mixer features

The 788 has seven physical channel faders, controlling six mono channels and a stereo pair of channels. These channels can be assigned to take their signals from the input connectors, or from the recorded tracks.

The basic signal flow of each channel of the mixer section of the 788 is:

- Input-to-channel assignment (input or track)
- Digital pad/gain
- Three-band switchable EQ
- Fader
- Effect send (can be pre- or post-fader)
- Aux send (can be pre- or post-fader)
- Pan

Channels may be linked in stereo pairs, allowing them to share control settings.

The internal effectors can be used in a variety of ways with these channels; as in-line dynamics processors or as an in-line multi-effector.

In addition to these channels, there is a sub-mixer which can be used to accept signals from inputs **A** through **D** and the **AUX INPUT**s, and feed them through the stereo outputs through pan and volume controls. See "Assigning inputs to the sub-mixer" on page 37 for how to assign inputs to this sub-mixer, and "Sub-mixer" on page 48 for how to adjust the settings.

The track cue mixer goes to the monitor outputs and headphones only and allows the recorded tracks to be monitored. The operation of this is described in "Monitoring the recorded sounds (TRACK CUE)" on page 39.

Linking channels

When you are using the 788 to mix and record a stereo source (e.g. a stereo synthesizer or the outputs of a stereo effects unit), it is often useful to link two channels together, so that changes made to one channel automatically affect the other.

You can link the following pairs of channels: **1** and **2, 3** and **4,** and **5** and **6.**

Note that channels **7** and **8** are always linked as a stereo pair and you can never unlink them.

The parameters that are linked when two channels are linked are:

- Digital pad/gain
- Solo status
- EQ control and switching
- Effect and aux send levels
- Effect settings
- Faders (odd-numbered channel's fader controls the pair)

To link two channels

1 **Press and hold down the SELECT key of one channel in the pair to be linked. Its indicator flashes, along with the indicator of any assigned source.**

2 **Press the other SELECT key of the link pair (as described above) and then release both keys.**

Both SELECT indicators of the channel pair light, along with the assigned sources.

NOTE

If another **SELECT** *indicator flashes when you hold down the* **SELECT** *key of a channel, it means that this pair has already been linked. Pressing the* **SELECT** *key of the other channel will unlink the pair.*

Unlinking a pair of channels

1 **Press and hold down the SELECT key of one of the channel pair. The indicator will flash, and so will the indicator of the other channel in the pair and any assigned source.**

2 **Press the SELECT key of the other channel in the pair and then release the keys.**

When the SELECT keys are released, the indicator of the first channel to have its key pressed will be lit.

Notes on linked channels

When a linked pair is created, the pan settings for the two channels are set to hard left (odd-numbered channel) and hard right (even-numbered channel), regardless of their previous settings. However, pan settings made while the channels are linked as a pair are maintained when the pair is unlinked.

If a stereo source (**STEREO** or **AUX INPUT**) is assigned to one channel of a potential stereo pair, the two channels will automatically be linked as a pair.

If a stereo pair of channels has had **STEREO** or **AUX INPUT** assigned to it, and the pair is then unlinked, the link is broken, but the stereo source remains assigned to both channels.

Basic operations

The **SELECT** keys of the channels have been previously introduced ("Assigning sources to mixer channels." on page 36) as the way in which the input signals are routed to the mixer channels and as the way in which channels are linked and unlinked.

They are also used to select the channels when making mixer settings, together with the **EQ**, **SEND** and **FADER/PAN** keys:

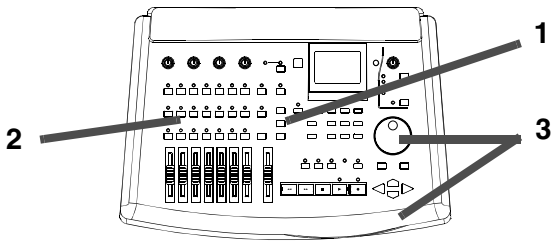
EQ	Allows equalization and digital pad/gain settings
SEND	Allows pre/post/off, level and pan for channel sends, as well as the master send level for both the effect and aux sends
FADER/PAN	Allows a view of the fader levels (including the internal level) and setting of the pan settings

1 Press the EQ, SEND or FADER/PAN key.

The screen changes to show the current settings for that parameter and the selected channel or channels.

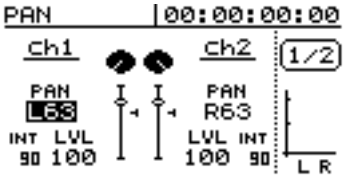
2 Press the SELECT key of the channel whose parameters are to be edited.

3 Use the dial and cursor keys to change the values as explained in this section.



About the screens

The example below shows the pan setting for channels 1 and 2:



In these "channel" screens, the bottom right of the screen is used for a pair of bargraph meters, showing the current monitor output levels. The current time position is also shown on the top line of the screen.

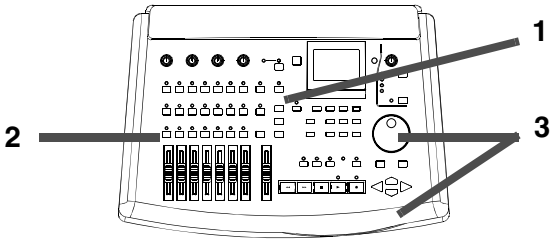
If you have linked two channels as a stereo pair (see "To link two channels" on page 41), you can press either **SELECT** key of the pair to change to the appropriate parameter editing screen.

TIP

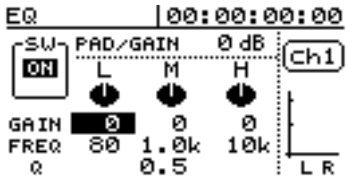
As an alternative way of working, you can also press the channel **SELECT** *key first, and then press the parameter key (***EQ***,* **SEND** *or* **FADER/PAN***) to adjust the parameters of one channel.*

Adjusting EQ

On the 788 channels, you can adjust the gain (the amount that the signal is cut and boosted), and the frequency (high or low) affected by the equalization in three bands. In addition, you can adjust the "Q" (the width of the effect) in the mid band.



1 Press the EQ key. The display screen shows the input channel equalization screen.



2 Select the mixer channel to be equalized by pressing the appropriate SELECT key.

3 Use the cursor keys to move the cursor to the value you want to change, and use the dial to change the values.

	L (low)[a]	M (mid)[b]	H (high)[a]
GAIN (cut or boost)	±12 dB	±12 dB	±12 dB
FREQ (center frequency)	32 Hz–1.6 Hz	32 Hz–18 kHz	1.7 kHz–18 kHz
Q (width)[c]	—	0.25/0.5/1/2/4/8/16	—

a.These bands are shelving type filters.
b.the mid band is peaking type
c."Q" (mid band only) is defined as the center frequency of the equalization band divided by the bandwidth. A high Q value provides narrow filtering.

4 As well as changing values in the three bands of the EQ section, you can also turn the whole of the EQ section on or off, so that you can easily do a comparison between the equalized and unequalized sound.

NOTE

Remember that unless the on-screen switch is set to ON, you will not hear the effects of the EQ settings.

TIP

It is also possible to use some effect settings which give further control over a channel's equalization ("Multi-effect processor settings" on page 87).

EQ and linked channels

If two channels have been linked (and always in the case of channels 7 and 8), there is one set of on-screen EQ controls which affects both channels. It is not possible to make different EQ settings for a pair of linked channels.

If two unlinked channels have different EQ settings and are then linked, the pair will take the odd-numbered channel's EQ settings.

If a linked pair of channels is unlinked, both channels will have the same EQ settings.

Channel digital pad and gain

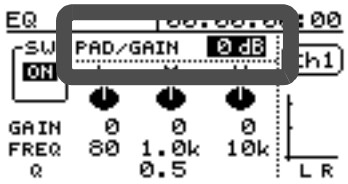
You may need to reduce the overall volume of the signal, or to boost its volume a little. This is done before the signal reaches the equalization section of the mixer.

The level of the signal can be reduced (attenuated) by up to 42 dB (cut settings are shown as negative values).

You can also use this feature to boost the signal by up to 6 dB (boost settings are shown as positive values).

The steps between the pad/gain settings are at 6 dB intervals.

1 With the EQ screen displayed, move the cursor to the PAD/GAIN field at the top of the screen, and use the dial to change the value.



TIP

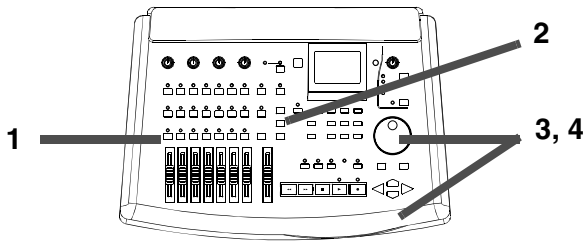
If you boost overlapping frequency bands by large amounts, the overall level of the signal is increased and may cause distortion. You should therefore use this feature to reduce the level of the signal before it is equalized so that distortion does not occur.

NOTE

Note that the EQ switch does not turn the pad/gain on or off.

Send levels

The 788 incorporates an effects (EFF) loop and an auxiliary loop (AUX). Both of these are stereo sends. See the section on "Effects" on page 81 for details of where these sends are actually routed, and their return paths.



The levels from each channel to these sends, and the pan between the two inputs of these stereo sends, can be set, as well as the master send level.

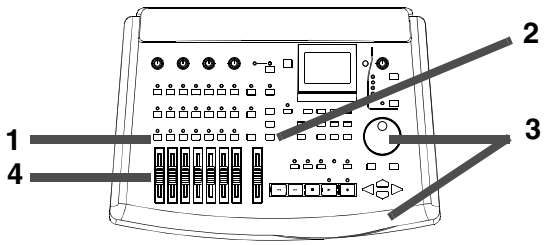
In addition, these two sends can be individually selected as off, or as pre- or post-fader on a per-channel basis (see "Pre- and post-fader sends explained" on page 84).

Stereo linked channels and channels 7 and 8 cannot have levels set independently for each channel. One control affects the send levels for both channels. In addition, the send pan controls change to stereo pan controls for these channels.

Full details of how these changes are made are given in the effector section (see "Send levels, etc." on page 83).

Fader and pan

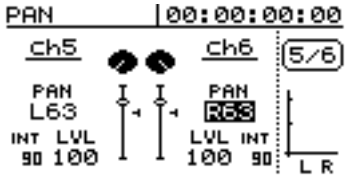
Adjust the pan position of a mixer channel (that is, its left-right position in the stereo image) using this method:



When a channel is recording on a track, this pan control has no effect. It is only useful when the channel is feeding the stereo outputs.

1 **Press the FADER/PAN key. The display screen shows the input channel fader/pan screen.**

2 **Select the mixer channel to be edited by pressing the appropriate SELECT key.**



3 **Use the cursor keys to move the cursor to the pan value you want to change, and use the dial to change the value.**

4 **Fader values are changed with the channel faders, and cannot be changed using this screen.**

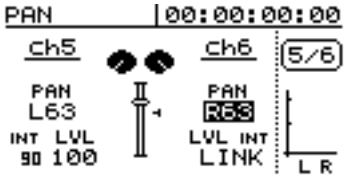
TIP

When one channel's pan is being edited (here, the pan value of channel 6 is being edited), pressing the other visible channel's **SELECT** *key moves the cursor to the corresponding pan control.*

NOTE

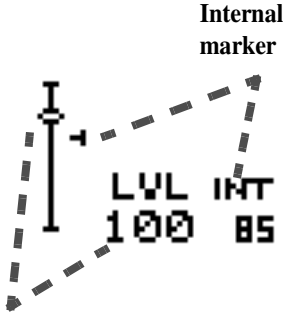
The maximum fader level is `127` *and the minimum value is* `0`*. When a channel is panned fully to the left, the display shows* `L63`*, and when it is panned hard right, the display shows* `R63`*. The center position is shown by* `C`*.*

In the case of stereo linked channels, or channels 7 and 8, one fader is shown on-screen here, since the channels are linked. The word `LINK` *is shown at the bottom right of the screen to show this is a linked pair of channels.:*



Internal and physical faders

The FADER/PAN screen ("Fader and pan" on page 45) also contains a representation of the channels' faders, as shown below in the enlarged view.



For each fader, there are two values, the "internal" (`INT`) value, and the physical fader (`LVL`) value.

This is because you can store and recall scene settings, including fader levels. The 788 can also receive MIDI messages which allow the channel level to be set.

When the fader levels are set in these ways, there are three options available which allow you to change the way in which the physical and internal fader levels are related.

1 **Press the MENU key.**

2 **Use the dial to scroll down so that** `OPTION` **is highlighted. Press ENTER/YES.**

3 **Use the dial to highlight** `MIXER`**. Press ENTER/YES.**

4 **The** `FADER -> MATCHING` **parameter can take one of three values, as explained below:**

- `REAL` — if the internal fader level is changed using a scene change or a MIDI Control Change, this is ignored. The actual physical fader is the only way in which the fader level is set.

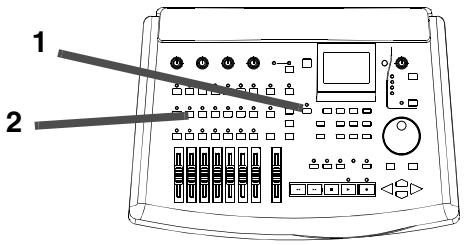
- JUMP — the internal fader level jumps to the level set by the physical fader as soon as the physical fader is moved. Since this can result in sudden changes in volume, resulting in possible damage to hearing and monitoring equipment, this option should be used with caution.
- CATCH — the fader level remains the same initially. However, if you then move the physical fader so that the physical level becomes the internal level (the faders "catch" the internal level), the physical level changes at that point. This ensures that there are no sudden leaps in volume due to a difference between the physical fader and the internal setting.

NOTE

Note that the setting made for this option will apply to the current song, and any songs loaded afterwards, until the setting is changed.

Soloing

To solo a mixer channel or channels (i.e. mute all other channels so that only the selected channels can be heard):



1 Press and hold down the SOLO key.

2 Press the SELECT keys of any mixer channels that you want soloed.

The SOLO indicator lights (orange) and the SELECT indicators of any soloed channels flash, to show that they have been soloed.

3 Release the SOLO key. The indicators stay lit (SOLO) or flashing (channel SELECT) as long as any channels are being soloed.

When channels are soloed, this is a after-fader solo. That is, you can hear the effect of all fader, EQ and in-line effect settings.

In addition, if you have assigned an effect to the effects loop or the aux loop ("Effects" on page 81), the soloed selection only will be sent to the effects send (all other channels will be muted in the send). The resulting effect return will be added to the solo mix, so that you hear the soloed selection, together with all applied effects.

NOTE

If a pair of channels has been stereo linked, pressing the **SELECT** *key of one channel of the pair will solo both channels.*

Remember that when you solo a channel, the output from all other channels will be muted, not just to the monitoring section, but also to the stereo bus. Soloing while mixing down will destroy the mix!

Turning off soloing

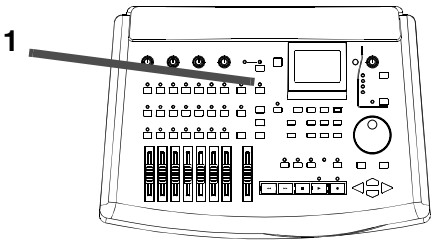
1 While in solo mode (the SOLO indicator is lit), press and hold the SOLO key.

2 Press the SELECT keys of any channels which are flashing to un-solo them.

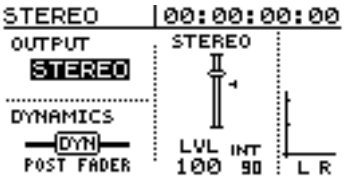
When all the soloed channels have been un-soloed, the SOLO indicator goes out.

Stereo output

The stereo output is a special “channel”:



Press the **STEREO** key briefly to view the current settings of the stereo output buss:



- The current physical fader value and internal fader value are displayed (as with “Internal and physical faders” on page 45). These follow the same rules as channel faders, as set in the OPTIONS menu.
- The stereo dynamics processor setting is displayed, if this has been assigned as described in the Effector section (“Using EFFECT 2 as a stereo dynamics processor” on page 82).
- The cursor is in the OUTPUT field, and cannot be moved.

Stereo output selection

This is the only user-selectable parameter on this screen. It allows you to perform a direct audition on track pairs.

1 **Use the dial to select between STEREO, and the four track pairs (Trk1/2, Trk3/4, Trk5/6, Trk7/8).**

When a track pair is selected, the signal output from the STEREO OUTPUT connectors (analog and coaxial digital) will be the signals from the appropriate tracks.

NOTE

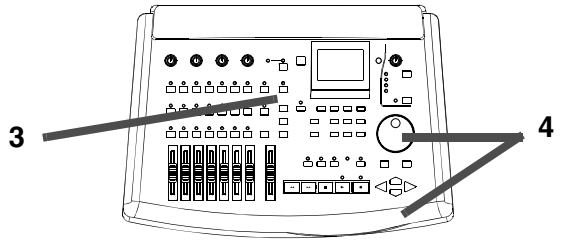
When track pairs are selected as the source for the stereo outputs, the channel faders and controls have no effect on the volume, and neither do the stereo faders. Any channel EQ and effects are bypassed, as is any stereo dynamic processor assignment and setting (“Setting up EFFECT 2” on page 82).

If **STEREO** *is selected as the monitoring source (see “Monitoring” on page 38), the tracks selected here can be heard through the* **MONITOR OUTPUTS** *and* **PHONES** *as well as through the* **STEREO** *outputs. The* **MONITOR** *control can be used to adjust the monitoring level, but this does not affect the level from the stereo outputs.*

If a track pair is selected for stereo output here, the sends to the effect and aux loops are not affected, and remain as they were before the selection.

Sub-mixer

The sub-mixer is typically used in mixdown mode to provide additional inputs while the disk tracks are being played back. An example of this would be if MIDI instruments are being played back, synchronized to the audio tracks recorded on the disk.

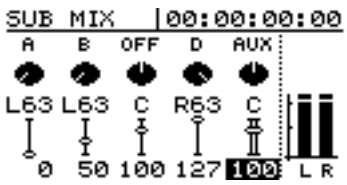


The sub-mixer allows the four inputs (**A** through **D**) as well as the **AUX INPUTS** to be mixed together and fed to the stereo output. On-screen level and pan controls are available.

1 **Assign inputs to the SUB MIX (see "Assigning inputs to the sub-mixer" on page 37).**

2 **Assign the sub-mixer outputs to stereo ("Assigning the sub-mixer to stereo" on page 37).**

3 **When the SUB MIX key is pressed, the display shows the** SUB MIX **screen:**



The screen above shows that inputs A, B, D and the AUX inputs have been assigned to the sub-mixer. Input C is not assigned (OFF**).**

If you need to change these assignments, you must use the INPUT and SUB MIX keys to make the assignments, and press the SUB MIX key again to show this screen if the display changes.

NOTE

Remember that an input cannot be assigned to both a mixer channel and the sub-mixer at the same time.

4 **Use the cursor keys to move the cursor around the fields (five pan settings and five level settings) and the dial to change the values.**

The maximum level for the levels is 127 and the minimum value is 0.

Pan settings can be made from L63 (hard left) through C (center) to R63 (hard right).

If the **AUX INPUTS** are assigned to the sub-mixer, they are treated as a stereo pair. The two inputs cannot be adjusted independently, and the pan control affects both channels together.

NOTE

There is no master level control for the sub-mixer; this setting must be done by adjusting the individual input levels.

The inputs assigned to the sub-mixer and the output from the sub-mixer cannot be used with either the internal effectors or the effect or aux loop. All effect processing on signals used to and from the sub-mixer must be done outside the 788.

This section deals with the recorder section of the 788; including the playback and recording operations you can carry out.

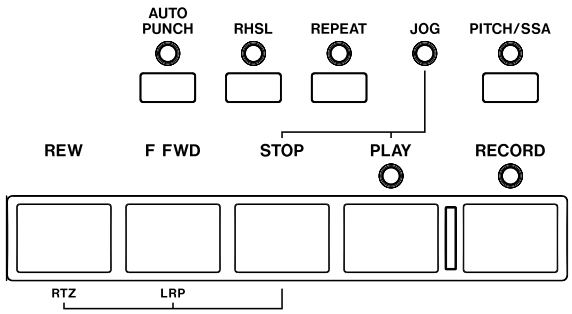
If you have not already read these sections:

- 2, “Getting started”
- 3, “Before recording”
- 4, “Mixer”

we strongly recommend that you do so now. Without a knowledge of the information contained in these sections, it may be difficult for you to understand some of the concepts presented in this section.

Basic transport controls

These controls have some similarity to the controls that you might find on a tape recorder.



However, there are one or two important differences of which you should be aware, due to the nature of the 788.

- There are some functions that you cannot access by a single key-press, but which need a combination of keys to be pressed in order to make them work.
- The “fast forward” and “rewind” keys do not work in quite the same way that a tape recorder’s wind keys. Since location can be almost instant, there is no wind time required. The way in which these keys work is explained later in this section (“Fast forward and rewind” on page 51).
- There is no “pause” key. Since the start and stop are virtually instant, there is no need for such a control.
- In the jog mode, which is accessed through the **STOP** and **PLAY** keys, the wind keys have a special function (see “Jog positioning” on page 50).

Playback

To play back recorded material from the current playback position:

1 Press the PLAY key.

The green PLAY indicator lights while playback is taking place.

2 Stop playback with the STOP key.

NOTE

It is not possible to start playback in some of the menu screens. Exit the menu system before starting playback.

If the PLAY indicator does not light steadily, but flashes, the 788 is waiting for external synchronization, or is otherwise prevented from entering playback. Check all the synchronization settings, etc. (see the section on “Synchronization” on page 94) for details of how to view and change these settings).

If you do not hear anything when the tracks are being played back, it may be because:

- nothing has been recorded on the tracks. The **HOME** screen (“The “home” display” on page 26) provides eight channel meters. If a channel’s **REC READY** is off, the meter shows the level of the track’s recorded contents (if **REC READY** is on, the level of the input signal is shown).
- the tracks are not routed to the monitoring system. Either use the track cue to route the track replay to the cue system (“Monitoring the recorded sounds (TRACK CUE)” on page 39), making sure that the **MONITOR CUE** indicator is lit (“Monitoring” on page 38), or assign tracks to channels (“Track-to-channel assignments” on page 37) and adjusting the faders, with the **STEREO MONITOR** indicator lit.

Setting the playback position

The 788 provides you with a number of ways to set the position from which playback starts when you press the **PLAY** key. Some of these are described in the section (“Location operations” on page 60).

The ways of setting the playback point which involve the transport keys are described here.

Return to zero (RTZ)

This allows you to return instantly to the “zero point”, (expressed as the absolute time).

To return to zero (from stop, play or record):

1 Press and hold down STOP.

2 Press REW. Playback/recording stops and the playback position returns to the zero point.

Last Recording Position (LRP)

This is an extremely useful feature that allows you to return instantly to the point where recording last started. You can use this in any of the following situations (these are examples, you may think of others for yourself):

- after you interrupt a bad take halfway through the recording and want to return instantly to the same position to retake
- after a successful take, and you want to return to the point where recording started to check the take
- when you are recording a number of different tracks in turn, all to start from the same point
- after a take, you may want to set the point where the take started as a reference location mark

To return to the position where recording last started (from stop, play or record):

1 Press and hold down the STOP key

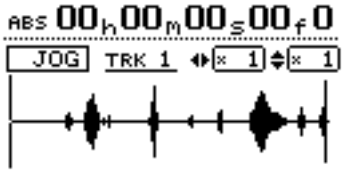
2 Press F FWD. Playback/recording stops, and the playback position returns to the point where recording last started.

Jog positioning

To position the playback point precisely, you can “jog” the playback position, using the dial. As you move backwards and forwards through the recording, you can hear the recorded sound at slow speed, either backward or forward, depending on the direction you are turning the dial.

1 Position the playback point to the rough position where you want the final point to be.

2 Press and hold the STOP key and press the PLAY key. The display shows a view of the waveform of the currently selected track at the current playback position.



3 Press the SELECT key of the track that you want to view (pressing the 7/8 key changes between viewing track 7 and track 8). The display changes to the waveform of that track.

4 Use the ◄ and ► keys to zoom out and in respectively horizontally. This is, pressing the ► key will increase the amount of space on the screen taken by a certain amount of time, and pressing the ◄ key will make the same amount of time take less space on the screen. The three zoom levels available are: × 1, × 2 (allowing approximately single-frame accuracy in adjustment), and × 32 (allowing approximately an accuracy of about 10 sub-frames). The resolution is shown below the time display.

5 Use the ▲ and ▼ keys to adjust the vertical scale (the way that the volume of the sound is shown). The zoom levels here are × 1, × 2, × 4, × 8, × 16 and × 32. Pressing the ▲ key increases the vertical scaling of the display, and pressing the ▼ key decreases the scale.

TIP

If you can’t see any waveforms when you first enter this display, press the ▲ key to zoom the volume so that you can see the quiet passages.

6 **Use the dial to move the cursor. You can monitor the "jogged" sound of the selected track through the monitoring system.**

7 **To move past the edge of the screen and position the cursor roughly at the correct location, press and hold the F FWD or REW keys to play all the tracks forwards or backwards at normal speed. When you release the keys, the playback will stop. You can then use the dial to position the cursor precisely.**

8 **Press STOP (or ENTER or EXIT) to return to the home screen, with the playback position now being the point which has just been set.**

NOTE

Because only one track can be jogged at a time, only one track of a stereo pair can be heard at a time in this mode. If it is difficult to hear the track , you may want to monitor in mono (see "Monitoring" on page 38).

Fast forward and rewind

On a tape recorder, you can use the fast forward and fast rewind keys to spool through a tape. A disk recorder like the 788 works in a somewhat different way.

The forward and rewind keys can be used in the following ways:

During playback When the 788 is playing back material, if you press and hold either the **F FWD** or the **REW** key, the playback position moves forward or backward (depending on which key is being held down) at ten times the normal playback speed (as shown by the FF ×10 or REW ×10 in the home display.

At this time, playback is muted, and the **PLAY** indicator flashes.

When you release the **F FWD** or **REW** key, playback starts at the position which has been reached.

NOTE

You cannot perform this operation while recording—only from playback.

From the stop position When playback is stopped, you can press and release the **F FWD** or **REW** keys to start "fast rewind" or "fast forward". While this "winding" is taking place, playback is muted.

Holding down the keys for more than one second, or pressing the keys repeatedly, changes the "wind speed" from ten times (×10 shown on the home screen), to fifty times (×50) to one hundred times (×100) to one thousand times (×1000).

While the 788 is "winding" in one direction, pressing the opposite key (for example, **F FWD** while rewinding) will immediately start location at 10× in the new direction.

Repeat playback

The 788 allows you to repeat playback of a section of the song. This can be useful to rehearse a tricky entry or break, for example.

The start point of the repeat loop is either the IN or the OUT point, depending on which comes first, and the second of the two points is used as the end point of the repeat loop (see "Setting the IN and OUT points" on page 52 below) for details.

1 **With playback stopped, or while playing back, press the REPEAT key briefly. The indicator lights and REPEAT is shown on the display.**

2 **Playback starts from the first point and continues to the second point. The PLAY key may flash for a while (see "Setting the time between repeats" below) before playback starts again at the IN point.**

3 **Stop repeat playback with the STOP key.**

4 **Pressing the REPEAT key briefly while repeat playback is in progress will exit the repeat loop (if the loop is actually playing, playback continues from the current playback position after a very brief muting of the playback; if it is paused in the interval between the OUT and IN points, playback starts from the IN point).**

NOTE

It is not possible to drop into record mode ("Recording (ii)" on page 53) while repeat playback is taking place. Neither is it possible to return to zero or the last recorded point, or to use the menu items.

If the IN and OUT points are too close together (less than half a second) for repeating, a message (IN-OUT TOO SHORT) is displayed. when the **REPEAT** *key is pressed and the repeat does not take place.*

Setting the IN and OUT points

To set the IN and OUT points:

1 **Locate to the position where the IN or OUT point is to be set. See "Setting the playback position" on page 50 and "Location operations" on page 60 for details.**

2 **Press and hold down the SHIFT key, and press the IN or OUT key.**

When the IN or OUT key has been pressed, `Set IN !` **or** `Set OUT !` **appears on the home display.**

NOTE

You cannot set the IN and OUT points while the repeat mode is active (the **REPEAT** *indicator is lit).*

Editing the IN and OUT points When the points have been set, it may be necessary to "trim" them, or to slip them backwards or forwards a little.

NOTE

You cannot edit the IN and OUT points while the repeat mode is active (the **REPEAT** *indicator is lit).*

To edit the points:

1 **Press the IN or OUT key to locate to the appropriate point.**

2 **Press and hold the STOP key and press the PLAY key. The JOG indicator lights. The display shows a view of the waveform of the currently selected track at the IN or OUT point (depending on which was pressed).**

3 **Press the SELECT key of the track that you want to view. The display changes to the waveform of that track.**

4 **Follow the instructions in "Jog positioning" on page 50 for zooming and moving the current jog position.**

5 **When you have set the point where you want the IN or OUT point to be, press and hold down the SHIFT key, and press the IN or OUT key to set the respective point. The display returns to the home screen.**

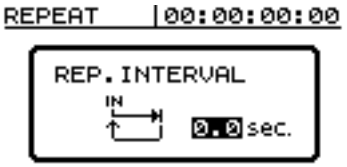
Press EXIT to return to the home screen without setting the points (remember that ENTER does not set these points).

Setting the time between repeats

On tape systems, it is common to use a repeat loop for rehearsal. However, because of the nature of tape systems, there is a definite gap between the end of the repeat loop and the start of the loop as it is replayed. On a disc system, the join between the end and the start of the loop can be seamless, which does not allow the listener to prepare for the next loop (for instance, a vocalist may need to draw a breath before starting the vocal phrase).

The 788 allows you to set an interval between the end of a repeat loop and the start of the next playback of the loop:

1 **Press and hold down the REPEAT key. The** `REP. INTERVAL` **pop-up screen appears.**



2 **Use the dial to change the interval between repeats from** `0.0` **seconds (seamless) through to** `9.9` **seconds in 0.1 second steps.**

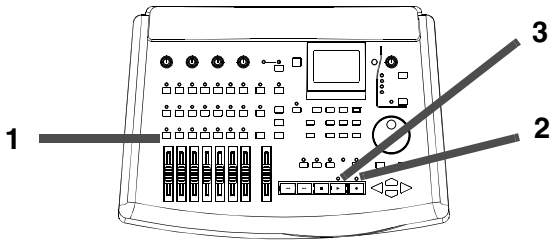
3 **Remove the pop-up screen by pressing ENTER.**

NOTE

You can enter the repeat interval screen while playback is stopped, or while playback, either repeat or normal, is taking place. You cannot set this value while recording is taking place.

Recording

To start recording from the stopped state:



1 **At least one track should be armed (press the REC READY key(s) of the track(s) on which recording is to take place). The REC READY indicator(s) start to flash).**

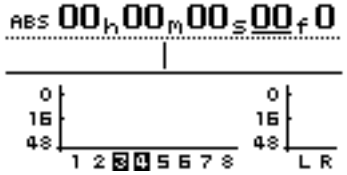
2 **Press and hold down the RECORD key.**

3 **Press the PLAY key. Both the PLAY (green) and RECORD (red) indicators light, and the flashing REC READY indicator(s) light steadily.**

4 **Stop recording by pressing the STOP key.**

NOTE

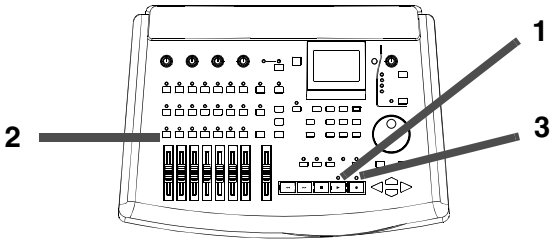
When a track is "armed" for recording (i.e. its **REC READY** *indicator is lit or flashing), the corresponding track indicator number in the bottom of the home screen is reversed to show this.*



In the screen above, tracks 3 and 4 are armed.

Recording (ii)

To drop into record mode while playing back:



1 **Start playing back a song by pressing the PLAY key. The PLAY indicator will light.**

2 **Arm one or more tracks by pressing their REC READY keys. Their indicators start to flash.**

3 **Press the RECORD key. The RECORD indicator will light, and the REC READY indicators of the armed tracks will also light.**

NOTE

At least one track must be armed before you start to record. It is ***not*** *possible to enter a "record ready" mode and press the* **REC READY** *keys of tracks to start recording.*

Hands-free recording

You can also use a suitable footswitch (for example the TASCAM RC-30P) connected to the **REMOTE** jack, to drop into record mode. When a track is armed, and playback is taking place, pressing the footswitch will change from playback mode to record mode.

When recording, pressing the footswitch will drop out of record mode into playback mode.

Dropping out of record mode

When record mode has been entered in any of the ways described above, it is possible to drop out of the recording mode simply by pressing the **PLAY** key. The **RECORD** indicator goes out.

Of course, you can always press the **STOP** key to stop recording.

You can "undo" recordings, (unlike on a tape recorder). Even if you accidentally record over a perfect performance, the UNDO function can still retrieve the original. See "Undoing and redoing actions" on page 70 for details.

Rehearsing recording

Sometimes, even with the undo facilities and the virtual tracks of the 788, it may be useful for you to rehearse a take without actually committing anything to disk. This is probably most useful in auto punch operations (see “Auto punch operations” on page 55) but can be useful in other situations as well.

In a rehearsal, the monitoring and other operations and recording functions are the same as when recording, but the input signal, although passed through to the disk track, does not actually go to the disk.

To use the rehearsal mode, simply press the **RHSL** key so that the indicator is lit.

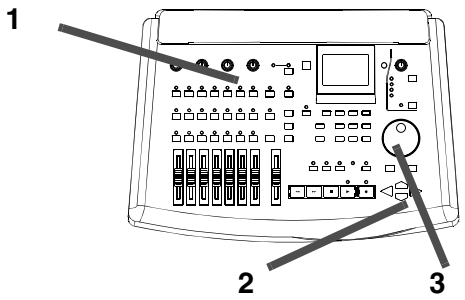
When actually “recording” in rehearsal mode, the **RECORD** indicator flashes, rather than lighting steadily, to show that the rehearsal is taking place.

Assigning virtual tracks

As explained earlier in “Real and virtual tracks on the 788” on page 11, the 788 allows you to record up to 250 virtual tracks, from which you can pick any eight to become the “active” disk tracks which will form your final mix.

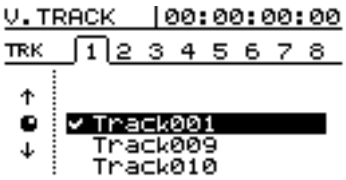
When a virtual track is assigned to be an “active” disk track, it cannot be assigned to any other track.

To assign a virtual track to a disk track:



1 Press and release the TRACK key briefly .

2 Use the channel SELECT keys or the (◄ and ► keys) to select the disk track to which the virtual track will be assigned, as shown by the tabs at the top of the screen.



Pressing the 7/8 key repeatedly cycles between selecting tracks 7 and 8.

3 Use the dial to choose which virtual track will be assigned to the disk track and become active.

4 Press ENTER (or PLAY) to make the assignment, or EXIT to exit the track assignment screen without actually making the assignment.

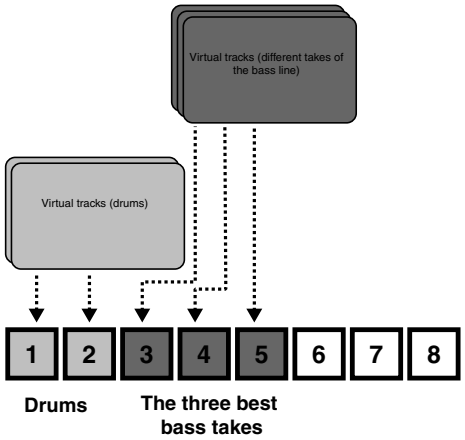
In this screen, you can press the SHIFT + MENU (TITLE) key to name the highlighted virtual track for future reference (as described in “Entering and editing titles” on page 26).

If you have not worked with a system using virtual tracks before, you may find it a little confusing.

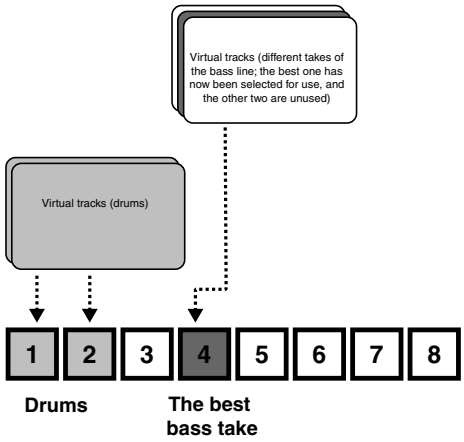
Some ideas to bear in mind:

- A virtual track can only be assigned once (a virtual track cannot be used on two active tracks at the same time). When you start a song, virtual tracks 1 through 8 are assigned to active tracks 1 through 8.
- If you’re recording a difficult part, you don’t have to re-record over the top of “almost, but not quite perfect” takes. You can keep these for later, just in case you never get a better take. Simply assign a different virtual track when you record the next take.
- You do not have to select all the final eight “active” tracks at the same time. For example, if you have recorded the drum part of a song, and you have recorded three different takes of the bass line on three different virtual tracks, you can assign these

three virtual tracks to three disk tracks and use the faders to listen to each of them in turn.



Then pick the one that fits best, and you can re-use the other two unused disk tracks with new virtual tracks—keep the alternative takes for the future if you change your mind later on.



- Alternatively, if you want to assemble a track for the whole song, you could assign the three different takes of the part to three different active tracks and use the track editing functions ("Track editing" on page 65) to copy and paste the good parts of each track to make a perfect whole. Then use the two non-perfect tracks with other virtual tracks for new parts.

TIP

Of course, virtual tracks take up disk space, even when you're not using them. If you really don't need a virtual track, you should assign it temporarily to a disk track and then clean it out (see "CLEAN OUT" on page 69) to save disk space.

Overdub recording

When the basic tracks (probably the rhythm or guide tracks) have been laid down, you will probably need to record other tracks beside them.

1 Make sure that the REC READY keys of all tracks are turned off, except for those tracks that you will be using for recording.

2 You will almost certainly need to hear the first tracks you recorded so that you can synchronize the new tracks with them. Adjust the TRACK CUE settings ("Monitoring the recorded sounds (TRACK CUE)" on page 39) and make sure the MONITOR CUE indicator is lit.

Auto punch operations

Punch operations allow you to start and stop recording at predefined points, and these can be automated, as described here.

When auto punch recording begins, playback starts at *pre-roll* point some time before recording is due to start, the *punch-in* point is reached, and recording starts. When the *punch-out* point is reached, recording stops, and playback continues until the *post-roll* point.

In addition, when you perform an auto punch recording, during the pre-roll period, you hear what has previously been recorded, together with the signal source; during the punch recording itself, you hear the signal source alone; and for the post-roll period, you hear the previously recorded material and the signal source together.

The 788 allows all of this to happen in rehearsal mode as well as in an actual recording mode. The

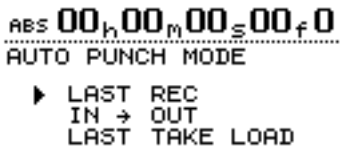
rehearsal mode allows you to simulate the punch recording, both to practise the actual take, and also to check punch points before recording actually begins.

You can also use the repeat function together with the punch operations, allowing you to make repeated rehearsals of a punch section, as well as repeated takes of the same section (*multi-takes*) or when you're recording, repeated recordings can be used as multi-takes. When you have recorded a section many times in this way, you can then choose the best possible take to insert into the track.

Setting the punch points

The 788 provides three different punch settings.

1 **With at least one track armed (the REC READY indicator flashing), and playback stopped, press the AUTO PUNCH key:**



2 **Select one of the three options, explained below, using the ▲ and ▼ keys to move the triangular cursor, and the ENTER key to confirm the selection (EXIT exits this screen without making any settings).**

3 **When the selection has been made, the AUTO PUNCH indicator lights, and the home display shows AUTO.**

NOTE

It is not strictly necessary to have a track armed when you first press the **AUTO PUNCH** *key, but this is probably the most logical way to work.*

LAST REC This sets the punch-in point to be the last point at which recording started (the same as the LRP described in "Last Recording Position (LRP)" on page 50. The punch-out point is set to be the point at which recording stopped (either when recording dropped into play mode, or when the transport was stopped). Note that this last recording does not have to be a punch recording.

IN -> OUT This uses the IN and OUT points (see "Setting the IN and OUT points" on page 52) as the punch-in and the punch-out points. The first of these points will be used as the punch-in point, and the second as the punch-out point, even if the OUT point is before the IN point.

LAST TAKE LOAD The cursor can only be moved to this option if a punch recording has taken place, and no recording, no track editing or undo/redo operations or virtual track assignments have been done since then. It allows you to select the takes from this punch session, in the same way as described later in this section ("If you change your mind" on page 58).

Checking the punch points

When the punch points have been set, you can press the **PLAY** key. The home display shows CHECK, and the playback starts at the pre-roll point. It continues to the post-roll point.

If the punch positions are not what you want, you can press the **AUTO PUNCH** key to turn off the punch mode, and reset the punch points as described above.

You can also adjust the pre-roll and post-roll time using the menu system ("Recorder settings" on page 33), but you must exit the auto punch mode first by pressing the **AUTO PUNCH** key so that the indicator goes out.

If you the punch points and pre and post-roll times are what you want, you should proceed to the rehearsal stage, as described below.

Rehearsing the punch

Although you don't have to use the rehearsal feature (see "Rehearsing recording" on page 54) with the auto punch, it's probably a good idea to rehearse most punch recordings a few times before making a take.

1 With the AUTO PUNCH indicator lit, and a track armed, press the RHSL (rehearsal) key. The indicator lights.

2 Press and hold down the RECORD key and press the PLAY key.

- The display shows TAKE.
- Playback starts at the pre-roll point. Both the input source and previously-recorded material can be heard in the cue mix.
- When playback reaches the punch-in point, the monitored signal on the armed track(s) is muted. The **RECORD** indicator flashes (to show that it is a rehearsal).
- When playback reaches the punch-out point, the recorded material is added to the incoming signal in the cue mix. The **RECORD** indicator goes out.
- Playback continues to the punch-out point and stops.
- Playback continues to the post-roll point and stops.

If you press the **REPEAT** key before the rehearsal, so that the indicator is lit (as well as the **AUTO PUNCH** and **RHSL** indicators), the rehearsal process will repeat until you press the **STOP** key. There is about a second's interval between the post-roll and the restarting of the rehearsal at the pre-roll point. You cannot change this interval.

Recording the punch

When you are happy with the rehearsed punch material, you record the punch in the following way:

1 Press the RHSL key so that the indicator goes out.

2 Press and hold the RECORD key and press the PLAY key.

- The display shows TAKE.
- Playback starts at the pre-roll point. Both the input source and previously-recorded material can be heard in the cue mix.
- When playback reaches the punch-in point, the monitored signal on the armed track(s) is muted. The **RECORD** indicator lights steadily.
- When playback reaches the punch-out point, the recorded material is added to the incoming signal in the cue mix. The **RECORD** indicator goes out.
- Playback continues to the punch-out point and stops.

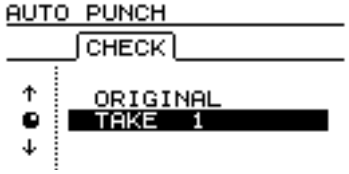
If the **REPEAT** indicator is lit, the punch recording will continue to repeat (up to 99 times) until you press **STOP**, allowing you to select from a list of "multi-takes" (see "Checking the take" on page 57).

The time between repeat takes is about one second. You cannot change this time.

Checking the take

After a take or series of takes has completed, you can make an instant check of the take by following the procedure here.

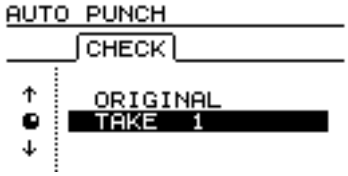
- When the take is complete, a screen similar to the following appears:



- The screen above shows one take and the original track.
- Use the dial to highlight a take from the list, including the original track before the punch was started.
- Press **PLAY** to check the highlighted take by playing it back (starting at the pre-roll point, and continuing to the post-roll point).
- If you are happy with the take, you can move to the next stage below ("After finishing the punch" on page 58.
- If you want to record another take, press and hold **RECORD**, and press **PLAY**.

After finishing the punch

When you have finished the punch recording use the screen below (or similar):



1 Use the dial to highlight the take which you feel is the best (or if none of them was any good, select ORIGINAL, which is the unchanged version).

2 Press ENTER to select the selected take (or the original version).

A pop-up display asks you if you are sure that you want to use the take.

3 Press ENTER if you are sure, but if you change your mind to select another take, press EXIT.

NOTE

You must select one of the takes or the original to exit auto punch mode.

The recording between the punch-in and punch-out points is now replaced by the selection. The AUTO PUNCH indicator goes out.

If you change your mind

Like recording, an punch operation is undoable (see "Undoing and redoing actions" on page 70). It is shown in the list of operations as an AUTO PUNCH operation.

In addition, as we mentioned earlier, the third choice when you press the **AUTO PUNCH** key, LAST TAKE LOAD, allows you to select any of the multi-takes from the last punch session.

However, if you have recorded anything, performed an undo or redo operation, or any track editing operations, (whether punch recording or not) since the last punch session, the list of multi-takes is no longer available. The list is available of a song has been saved, closed and reopened, however, if none of the above operations have been carried out.

NOTE

Even if you undo the recording that has overwritten the list of multi-takes, the multi-take list will not be available to you after the undo.

Varispeed operations (pitch and SSA)

You can play back and record at speeds which are greater or less than the original (±6%) to allow for differences in tuning, etc.

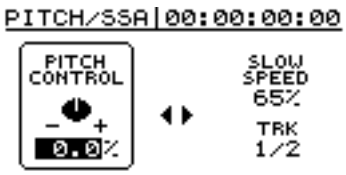
It is also possible to play back a selected pair of tracks at the same pitch, but slower than the original (the 788's Slow Speed Audition feature). This allows you to rehearse tricky lead lines, etc. at a slower speed, and can be combined with repeat playback ("Repeat playback" on page 51) for easy rehearsals.

NOTE

The monitoring status of the tracks played back using the pitch (varispeed) or SAA features is exactly the same as for normal playback,; that is, if they have been assigned to a channel, the volume, etc. is controlled by the channel faders and controls, otherwise they are monitored using the TRACK CUE facility and the **MONITOR CUE** *indicator must be turned on for them to be audible.*

Pitch

1 **Press and hold the PITCH/SSA key for about a second (see "Key sense time" on page 33) and release it. The indicator lights and the display changes:**



2 **If the PITCH CONTROL section at the left of the screen is not active (there is no box around it), press the ◄ key to move the cursor there.**

3 **Use the dial to change the pitch from −6.0% to +6.0% in 0.1% steps. If playback is being carried out while this is done, you will be able to hear the change.**

4 **Press the PITCH/SSA key to return to the home screen and once again to turn off the pitch change.**

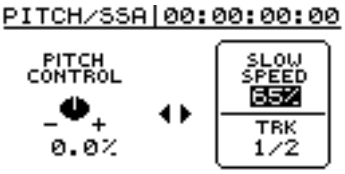
NOTE

The above steps can be carried out while playback is stopped or in operation, but cannot be carried out during recording. It is also possible to start playback while adjusting the pitch, but not to start recording at that time.

To use the set pitch When the pitch change value has been set in the way described above, and the 788 shows the home screen, simply press the **PITCH/SSA** key briefly to turn the indicator on and to change the pitch.

SSA (Slow Speed Audition)

1 **Press and hold the PITCH/SSA key for about a second (see "Key sense time" on page 33) and release it. The indicator lights and the display changes:**



2 **If the SLOW SPEED section at the right of the screen is not active (there is no box around it), press the ► key to move the cursor there.**

3 **Use the channel SELECT keys to select the tracks which will be played back. These tracks are always in pairs.**

4 **Use the dial to change the speed between 85%, 65% and 50% (the displayed values are approximate). If playback is being carried out while this is done, you will be able to hear the change.**

The above steps can be carried out while playback is stopped or in operation, but cannot be carried out during recording. It is also possible to start playback while adjusting the speed, but not to start recording at that time.

5 **Press the PITCH/SSA key to return to the home screen and once again to turn off the SSA mode.**

To use the SSA When the speed change value has been set in the way described above, simply press the **PITCH/SSA** key briefly to turn the indicator on and to change the speed, but without changing the screen display.

Press the **PITCH/SSA** key briefly once again to turn off the speed change.

As well as the IN and OUT points, which have already been introduced for use in punch operations (“Auto punch operations” on page 55) and for repeat playback (“Repeat playback” on page 51), and which are also used together with the TO point for track editing (“Track editing” on page 65), there are also 999 *location marks* available for each song.

These can be inserted, deleted, named and edited freely, and they are stored with the song, allowing you to return at any time to a part of the song which you have marked as needing attention.

There is also an easy method of directly locating to a position without using the location marks, as described here:

Direct location

In this method, you use the cursor keys and the dial to locate to a specified position.

As explained earlier in “The time display” on page 26, there are three modes in which the time can be shown on the home screen: ABS (the absolute time), MTC (MIDI Time Code) and BAR (which represents the time in bars and beats, according to an internal tempo map (see “Synchronization” on page 94).

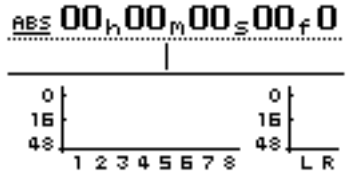
In the first two of these modes, you can locate to sub-frame accuracy. There are ten sub-frames in a frame, and the length of a frame depends on the frame rate set up in the sync operations, but is between 1/30 and 1/24 of a second. In the last mode, you can locate to beat accuracy.

Direct location (i)

For the first two modes (ABS and MTC), the way to locate directly is as follows:

1 Make sure the transport is stopped. You cannot perform this direct location when playing back or recording.

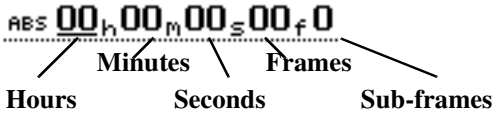
2 If the “home” display is not shown, press the HOME/ESC key.



3 There is an “underline” cursor at the top of the screen.

If the top left of the screen does not show ABS or MTC (that is, it shows BAR), press the ◄ key until the cursor is under BAR, and turn the dial counterclockwise until ABS or MTC is showing.

4 Use the ◄ and ► keys to move the cursor to any of the following fields: hours (h), minutes (m), seconds (s), frames (s) or sub-frames (no indication on the display, though the value is shown).



5 Use the dial to increase or decrease the number over the cursor (in the illustration here, the cursor is under the “hours” value).

If you increase a value past the maximum (for example, if you try to increase the “seconds” value over 59), the number will “wrap round”; that is, the “minutes” value will increase by one, and the “seconds” value will be set to 0.

6 When you change a value, the values on the top line will start to blink and will continue to blink for a few seconds.

If you press the EXIT key (or the STOP key) while the values are blinking, the time value will be reset to the previous value before you started to edit it.

7 Press ENTER while the values are blinking to set the value, or PLAY to start immediate playback at that value. Also, if you do not press any keys or turn the dial for a few seconds, the values stop blinking, and the new time value that has been set becomes the current playback position.

Direct location (ii)

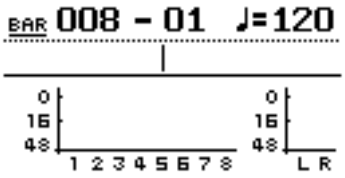
As well as the ABS and MTC timings just described, it is possible to locate to a "musical" time, when the display shows bars (measures) and beats, and the 788 is synchronized to a tempo map.

NOTE

This method of location only has any meaning when the 788 is synchronized to a tempo map (see "Synchronization" on page 94). If the 788 is not synchronized to such a tempo map, bars and beats in this screen have no meaning.

1 **Make sure the transport is stopped. You cannot perform this direct location when playing back or recording.**

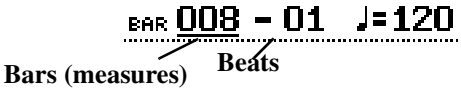
2 **If the "home" display is not shown, press the HOME/ESC key.**



3 **There is an "underline" cursor at the top of the screen.**

If the top left of the screen does not show BAR (that is, it shows MTC or ABS), press the ◄ key until the cursor is under the left field, and turn the dial clockwise until BAR is showing.

4 **Use the ◄ and ► keys to move the cursor to either of the following: bars (3 digits), or beats (2 digits).**



The tempo value cannot be altered here—it is set by the tempo map (see "Entering and editing the tempo map" on page 98).

5 **Use the dial to increase or decrease the number over the cursor (in the illustration , the cursor is under the "bars" value).**

If you increase the "beats" value past the maximum number of beats on a bar at that point in the tempo map, the number will "wrap round"; that is, the "bars" value will increase by one, and the "beats" value will be set to 0.

6 **When you change a value, the values on the top line will start to blink and will continue to blink for a few seconds.**

If you press the EXIT key (or the STOP key) while the values are blinking, the time value will be reset to the previous value before you started to edit it.

7 **Press ENTER while the values are blinking to set the value, or PLAY to start immediate playback at that value. Also, if you do not press any keys or turn the dial for a few seconds, the values stop blinking, and the new time value that has been set becomes the current playback position.**

Location marks

As mentioned earlier, the 788 allows you to set up to 999 location marks in each song. These location marks are stored in *slots* which may either be empty, or filled with a location point value.

As each mark is entered, its slot is filled (from 1 through 999). If a mark is deleted, the slot it occupied becomes available for another mark to be entered,

Location marks are handled in the following way:

Entering location marks

Location marks can be entered when playing back or recording, in jog mode, or when the transport is stopped. They cannot be entered when fast forward or rewind is taking place.

There are two ways of entering location marks:

1 Press and hold the SHIFT key and press the LOCATE key.

or

1 Press the MARK/CHAR INSERT (MOVE) key.

2 When a mark has been entered, the location value is entered into the next available slot, and the number of this slot (now the number of the mark) is shown on the screen on the right, below the time line.

Active location marks

When you have entered location marks, as playback progresses, and the playback point passes the points at which the marks are located, the marks' titles are displayed on the screen. The location mark which is shown on screen is referred to as the *active* mark.

This active mark can be accessed easily for titling, deletion and editing, as explained below.

Giving a title to the active location mark

You can give a title to the active location mark while playing back or recording, or while the playback is stopped.

1 When the active mark's current title is displayed (this will be `Mark xxx` when the mark is first set), press and hold down the SHIFT key and press theMENU/TITLE key.

The pop-up screen appears on the display, and you can edit the title as described in "Entering and editing titles" on page 26.

2 When you press ENTER after editing the name, the new name replaces the old mark name.

TIP

You can use the USER WORDs here (see "USER WORD" on page 33) to enter mark titles quickly.

Deleting the active location mark

You can delete the active location mark while playback is stopped, but you cannot delete it while playing back or recording (a message, `TRANSPORT MOVING`, appears briefly if you try).

1 To delete the active mark, press the MARK/CHAR DELETE (SILENCE) key. You do not have to confirm the deletion, but the word `Clear !` appears briefly on the display.

2 When the active mark has been deleted, the mark immediately before the active mark (if there is one) becomes the active mark, and its title is shown on screen.

NOTE

You cannot undo a mark deletion.

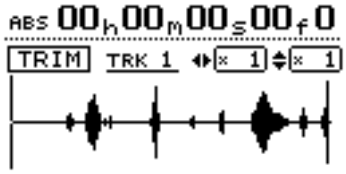
Editing the active mark

This process is sometimes referred to as *trimming*. This is a similar process to the jog positioning of the playback point (see "Jog positioning" on page 50), except that in this operation, the final position is stored as the position of the active mark.

You can edit the active mark when playback is stopped. You cannot edit the active mark when recording or playing back.

1 **Make sure that the mark you want to edit is shown on the home display and that playback is stopped.**

2 **Press the MARK/CHAR TRIM (COPY TO) key. The display shows TRIM and a view of the waveform of the currently selected track at the active mark.**



3 **Press the SELECT key of the track that you want to view. The display changes to the waveform of that track.**

Although the location mark applies to all tracks, if you have a track selected with nothing or little recorded on it at that point, it will be impossible to see or hear anything using this function.

4 **Use the ◄ and ► keys to zoom out and in respectively horizontally. This is, pressing the ► key will increase the amount of space on the screen taken by a certain amount of time, and pressing the ◄ key will make the same amount of time take less space on the screen. The three zoom levels available are: × 1, × 2 at about single-frame accuracy), and × 32 at about 10-sub-frame accuracy (shown below the time display).**

5 **Use the ▲ and ▼ keys to adjust the vertical scale (the way that the volume of the sound is shown). The zoom levels here are × 1, × 2, × 4, × 8, × 16 and × 32. Pressing the ▲ key increases the vertical scaling of the display, and pressing the ▼ key decreases the scale.**

TIP

If you can't see any waveforms when you first enter this display, press the ▲ key to zoom the volume so that you can see the quiet passages.

6 **Use the dial to move the cursor. You can monitor the jogged sound of the selected track through the monitoring system.**

NOTE

You cannot move the mark to a position before the previous mark or after the next mark.

7 **To move past the edge of the screen, press and hold the F FWD and REW keys to play the tracks forwards or backwards at normal speed for a rough position. When you release the keys, the playback will stop.**

8 **Press ENTER to accept the new position as the location mark value (the playback position is now the new position), and return to the home screen.**

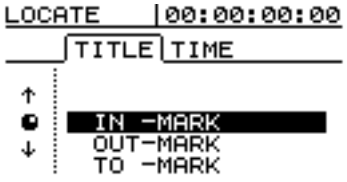
9 **Press EXIT to return to the home screen with the playback position being the point which has just been set, but the location mark value is unchanged.**

Using the location mark list

Every time a location mark is stored, it is entered into a list, and every time a mark is deleted, it is removed from the list.

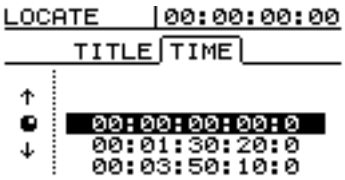
You can use this list to select a mark for location, or for giving a title to a mark. You cannot edit the time value of a mark, or delete a mark using the list.

To see the list, press the **LOCATE** key:



There are two ways in which the list can be viewed; by title (TITLE) and by time value (TIME), as shown by the tabs on the top of the screen.

Use the ◄ and ► keys to change between the two views:



NOTE

Even when the time display on the home screen is shown in bars and beats, or the MTC time display is selected, the marks' time values are always shown using the absolute time values.

The IN, OUT and TO location marks are always displayed at the top of the list.

Other items in the list is always sorted in time order, not the order of the location mark names or numbers.

Locating using the list

To locate using the location mark list:

1 **Press the LOCATE key.**

2 **Use the ◄ and ► keys to change to either the TITLE or the NAME view of the list.**

3 **Select the location mark using the dial (or the ▲ and ▼ keys).**

4 **Press ENTER. The playback point jumps to the selected location mark.**

Using the IN OUT and TO marks

These are special cases. When these marks have been set, you jump to them simply be pressing the **IN**, **OUT** or **TO** key, as appropriate. You can use the list as described above, but there is no need for this.

Titling using the list

1 **Press the LOCATE key.**

2 **Use the ◄ and ► keys to change to either the TITLE or the TIME view of the list.**

3 **Select the location mark to be renamed, using the dial (or the ▲ and ▼ keys).**

4 **Press and hold down the SHIFT key and press the TITLE (MENU) key.**

5 **Give a title to the mark, using the procedure described in "Entering and editing titles" on page 26.**

6 **When you press ENTER to confirm the name, the screen returns to the list.**

NOTE

You can select a mark for titling from either the TITLE or the TIME view of the list.

Two marks can have the same title (but it is not a very sensible idea to give the same title to more than one mark), but they cannot have the same time value.

It is not possible to rename the IN , OUT or TO marks—these have special functions, and cannot be renamed.

About track editing

One of the most useful features of a disk-based recorder such as the 788 is the ability to edit material easily. When working with a stereo tape recorder in the past, the usual editing method involved a white pencil, a razor blade and sticky splicing tape. This was not an easy process, and was very difficult to undo if there were any mistakes,

The 788 allows you to edit songs, copying and moving material from one part of a song to another. This editing is known as *non-destructive* editing, meaning that the operation does not actually destroy data, and you can undo mistaken editing operations easily.

If you have ever used a word-processor on a computer, you will probably find most of the 788's editing operations pretty simple. If you have never used a computer, the 788's editing operations are nothing to be scared about—just read through this section to see how it all works.

IN, OUT and TO

We have previously seen how the IN, OUT and TO points can be used for punching and for location. They are also used in these track editing operations.

The IN point marks the start of the part of the track which is selected when editing a part of a track (rather than a whole track).

The OUT point marks the end of the part of the track which is selected when editing part of a track.

The TO point marks the final destination of a copy or a move operation.

Entering the edit mode

1 **Make sure that the 788 is stopped (not playing back or recording).**

2 **Press the TRACK EDIT key (just below the screen).**

3 **Use the JOG/DATA dial to highlight the track editing function you will be using.**

4 **Press the ENTER key.**

5 **Select the appropriate values, as described below.**

6 **Press ENTER/YES to perform the operation, or EXIT/NO to exit without performing the operation,**

Track editing functions

The track editing functions available on the 788 are:

- COPY->PASTE
- COPY->INSERT
- MOVE->PASTE
- MOVE->INSERT
- OPEN
- CUT
- SILENCE
- CLONE TRACK
- CLEAN OUT

See the sections below for details of how to use these functions.

Remember!

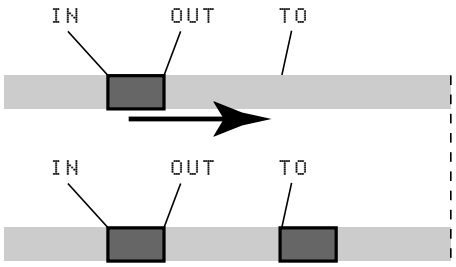
You can undo any of these operations (see "UNDO and REDO" on page 69). Even if you delete all the material on every track using these functions, you can still get it back with only a few key-presses.

TIP

Although you cannot use virtual tracks as the source for copy and move operations, you can assign a virtual track to a track temporarily to (say) copy part of a virtual track to an already-assigned track and then reassign the original.

COPY -> PASTE

This function takes the section of a track or tracks marked by the IN and OUT points, copies it, and places it at the TO point on the chosen track or tracks.



The original source is left unchanged.

The copy operation overwrites anything which is already recorded at the destination. The destination is the same length as it was before the operation.

You can copy the section more than once in one operation.

You can change the following values:

Src.Trk This sets the source track or tracks from which the section is copied. Choose 1 ,through 8 to select an individual track. Choose 1/2, 3/4, 5/6 or 7/8 to select a pair of tracks. Choose 1–8 to select all active tracks.

Dst. Trk This sets the destination track or tracks to which the selected section is pasted. What you can select here depends on what you have selected for the source track. If you have selected a single track, you can select tracks 1 through 8 here. If you have selected a pair of tracks (for instance, 1/2), you can only select track pairs here. If you have selected all active tracks (1–8), then this is the only option available to you here.

Times This is the number of times that the selected section is pasted into the destination track or tracks. You can set this value from 1 to 99.

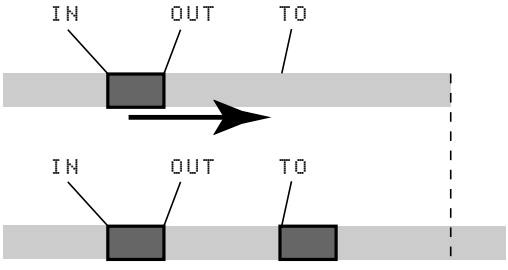
Press **YES** to perform the operation or **NO** to leave this screen.

TIP

You can also use the **SHIFT + TRIM** *key combination to enter this function easily.*

COPY -> INSERT

This function takes the section of a track or tracks marked by the IN and OUT points, copies it, and places it on the chosen track or tracks, inserting it as new material, starting at the TO point.



The original source is left unchanged.

The insert operation adds the selected section as new material to the destination. Nothing is overwritten on the destination, as any existing material following the TO point is moved to the end of the newly-inserted section. The destination is longer than it was before the operation.

You can copy the section more than once in one operation.

You can change the following values:

Src. Trk This sets the source track or tracks from which the section is copied. Choose 1 ,through 8 to select an individual track. Choose 1/2, 3/4, 5/6 or 7/8 to select a pair of tracks. Choose 1–8 to select all active tracks.

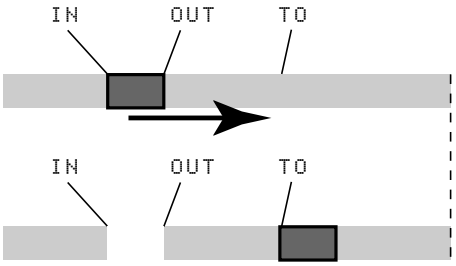
Dst. Trk This sets the destination track or tracks into which the selected section is inserted. What you can select here depends on what you have selected for the source track. If you have selected a single track, you can select tracks 1 through 8 here. If you have selected a pair of tracks (for instance, 1/2), you can only select track pairs here. If you have selected all active tracks (1–8), then this is the only option available to you here.

Times This is the number of times that the selected section is inserted (end-to-end) in the destination track or tracks. You can set this value from 1 to 99.

Press **YES** to perform the operation or **NO** to leave this screen.

MOVE -> PASTE

This function takes the section of a track or tracks marked by the IN and OUT points, and moves it to the chosen track or tracks, starting at the TO point.



After the operation, the selected section of the source between the IN and OUT points is replaced by silence.

This operation overwrites anything which is already recorded at the destination. The destination is therefore the same length as it was before the operation.

You can change the following values:

`Src. Trk` This sets the source track or tracks from which the section is taken. Choose `1` ,through `8` to select an individual track. Choose `1/2`, `3/4`, `5/6` or `7/8` to select a pair of tracks. Choose `1-8` to select all active tracks.

`Dst. Trk` This sets the destination track or tracks to which the selected section is moved. What you can select here depends on what you have selected for the source track. If you have selected a single track, you can select tracks `1` through `8` here. If you have selected a pair of tracks (for instance, `1/2`), you can only select track pairs here. If you have selected all active tracks (`1-8`), then this is the only option available to you here.

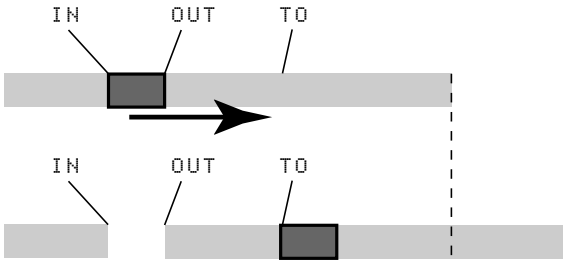
Press **YES** to perform the operation or **NO** to leave this screen.

TIP

You can also use the **SHIFT + INSERT** *key combination to enter this function easily.*

MOVE -> INSERT

This function takes the section of a track or tracks marked by the IN and OUT points, and moves it to the chosen track or tracks, inserting it as new material, starting at the TO point.



After the operation, the selected section of the source between the IN and OUT points is replaced by silence.

The insert operation adds the selected section as new material to the destination. Nothing is overwritten on the destination, as any material following the TO point is moved to the end of the newly-inserted section. The destination is therefore longer than it was before the operation.

You can change the following values:

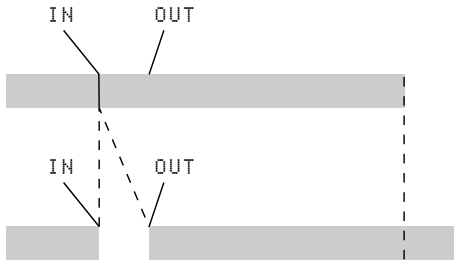
`Src. Trk` This sets the source track or tracks from which the section is taken. Choose `1` ,through `8` to select an individual track. Choose `1/2`, `3/4`, `5/6` or `7/8` to select a pair of tracks. Choose `1-8` to select all active tracks.

`Dst. Trk` This sets the destination track or tracks into which the selected section is inserted. What you can select here depends on what you have selected for the source track. If you have selected a single track, you can select tracks `1` through `8` here. If you have selected a pair of tracks (for instance, `1/2`), you can only select track pairs here. If you have selected all active tracks (`1-8`), then this is the only option available to you here.

Press **YES** to perform the operation or **NO** to leave this screen.

OPEN

This function “opens up” a silent gap between the IN and OUT points on the chosen track or tracks.



The source and destination are the same, and after the operation, the track is split at the IN point, with the material which followed the IN point now moved to follow the OUT point. The result is therefore longer than the original.

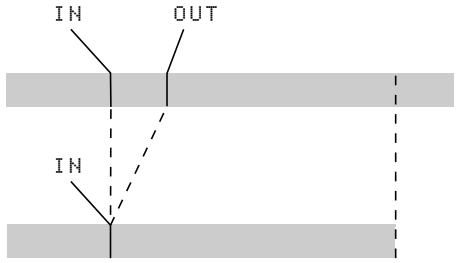
There is only one value that you can change:

`Src. Trk` Select an individual track (`1` through `8`), a pair of tracks (`1/2`, `3/4`, `5/6`, `7/8`), all of the eight active tracks (`1-8`) or all tracks, including the virtual tracks (`all`).

Press **YES** to perform the operation or **NO** to leave this screen.

CUT

This function deletes the material between the IN and OUT points on the chosen track or tracks and “closes up” the gap.



The source and destination are the same, and after the operation, the material which followed the OUT point now moved to follow the IN point. Material which was between the IN and OUT points is deleted. The result is therefore shorter than the original.

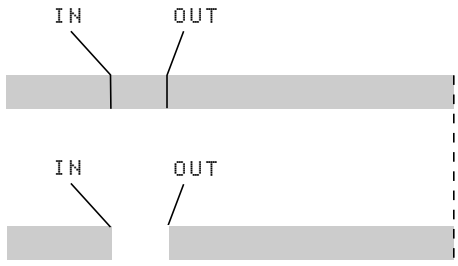
There is only one value that you can change:

`Src. Trk` Select an individual track (`1` through `8`), a pair of tracks (`1/2`, `3/4`, `5/6`, `7/8`), all of the eight active tracks (`1-8`) or all tracks, including the virtual tracks (`all`).

Press **YES** to perform the operation or **NO** to leave this screen.

SILENCE

This function is equivalent to recording silence between the IN and OUT points on the chosen track or tracks.



No material is added or deleted, and the length of the result is therefore the same as that of the original.

There is only one value that you can change:

`Src. Trk` Select an individual track (`1` through `8`), a pair of tracks (`1/2`, `3/4`, `5/6`, `7/8`), or all of the eight active tracks (`1-8`).

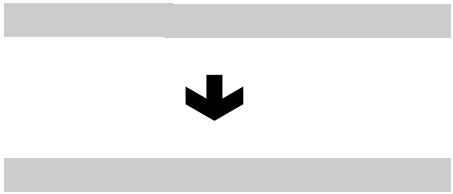
Press **YES** to perform the operation or **NO** to leave this screen.

TIP

You can also use the **SHIFT + DELETE** *key combination to enter this function easily.*

CLONE TRACK

This copies a track or pair of tracks to another track or pair of tracks. The IN and OUT points do not have any meaning here.



There are two values that you can change:

`Src. Trk` Select an individual track (`1` through `8`), or a pair of tracks (`1/2`, `3/4`, `5/6`, `7/8`).

`Dst. Trk` This sets the destination track or tracks to which the source track is cloned. What you can select here depends on what you have selected for the source track. If you have selected a single track, you can select tracks `1` through `8` here. If you have selected a pair of tracks (for instance, `1/2`), you can only select track pairs here.

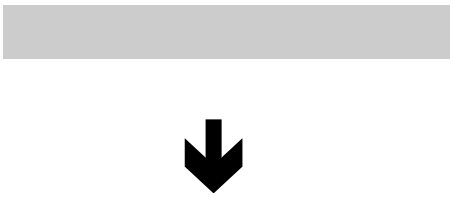
Press **YES** to perform the operation or **NO** to leave this screen.

If you try to select the same track as a destination that you have selected as the source, when you press the **YES** key, a message will appear: `SAME TRACK.`

Redo the operation with a different set of tracks.

CLEAN OUT

This deletes all the material in a track or tracks. The IN and OUT points do not have any meaning here.



There is only one value that you can change:

`Src. Trk` Select an individual track (`1` through `8`), a pair of tracks (`1/2`, `3/4`, `5/6`, `7/8`), or all of the eight active tracks (`1-8`).

Press **YES** to perform the operation or **NO** to leave this screen.

If you need to delete the contents of a virtual track that is not currently assigned to a track, you must assign it to a track and then perform this operation.

UNDO and REDO

Unlike a tape recorder, but like most word-processors, you can undo your mistakes (the 788 remembers up to the last 999 operations you perform in each song). What is more, you can undo your undo operations (*redo*).

The operations that you can undo are:

- The different track editing functions described in this section
- Recording operations
- Auto punch operations
- Mastering operations

In addition, all these operations are stored as part of the song on the disk; even when you turn the machine off, the history of all the previous operations is stored ready for next time.

What this means is that you can finish your work for the day, come back in the morning with fresh ears, and decide that maybe you didn't want that overdub after all. With the 788, this is no problem.

Undoing and redoing actions

1 Press the UNDO/REDO key and a list of the operations that you have done since the start of the song is shown on screen:

The first action (START UP) is numbered 0, and all the actions after this are then numbered in order. They are named: RECORDING, AUTO PUNCH, COPY->PASTE, etc.

2 Use the dial to scroll through the list until the cursor highlights the action to where you want to undo.

3 Press ENTER, to return to the point in your work just before you made your mistake.

You can also redo an action that you have undone in exactly the same way.

TIP

As well as using the dial to scroll through the list, you can also use the **UNDO /REDO** *key to position the cursor automatically at the event before or after the current event.*

If you press the **UNDO** *key (unshifted) , the cursor moves to the event immediately before the current event. Press ENTER to undo the last event.*

If you press **REDO** *(***SHIFT** *+* **UNDO)***, the cursor moves to the event immediately following the current event (i.e. the last action that has been undone). Press the* **ENTER** *key to redo this action.*

NOTE

Performing an action after the redo clears the list of redoable actions (i.e. those actions which have been undone).

An undo/redo example

Here's an extremely simplified example (in fact, it's extremely unlikely that you'd work this way, but it shows the principles involved):

>RECORDING	12	This is yet another retake of the lead vocal
RECORDING	11	Another attempt at the whole of the lead vocal
AUTO PUNCH	10	A try to correct a bad note in the lead vocal
RECORDING	9	First try at the lead vocal
AUTO PUNCH	8	Repairing the bad guitar bridge
RECORDING	7	Recording the guitar solo
RECORDING	6	Piano (alternative part)
RECORDING	5	Piano
RECORDING	4	Guide vocals
RECORDING	3	Bass line
COPY->PASTE	2	Looping the drum part
RECORDING	1	Basic drum loop
START UP	0	Beginning of song

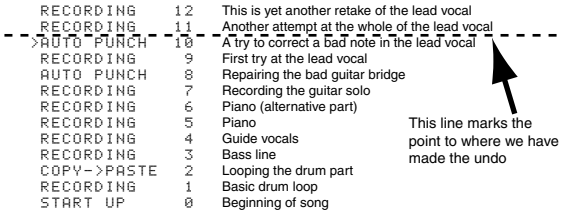
This is the history of a recording session so far. Suppose that you decide that items 11 and 12 in the list are not needed (in other words, the first take (9) with its correction (10) have been overwritten by 11 and 12, but you feel that the original take (9) with its correction (10) has more energy, so you want to retrieve it:

1 Press the UNDO key.

2 Use the dial to scroll down to the step to where you want to undo (here it's 10).

3 Press ENTER.

Now you have the track back again. If you press the **UNDO** key, you'll see that there's a check mark beside 10 - this shows that this is the "undo mark".



Notice that we can still see items 11 and 12. This is because we can still redo them, if we decide that the first vocal take (9 and 10) wasn't so great after all.

To redo them is just as simple as undoing them: press the **UNDO** key, highlight the step to which you want to return, and press **ENTER**.

Items above the “undo” line are visible and you can redo them until you perform another action after the undo operation.

For instance, if you decided that you wanted to have another go at repairing the lead guitar bridge…

You could undo all items up to item 7:

RECORDING	12	This is yet another retake of the lead vocal
RECORDING	11	Another attempt at the whole of the lead vocal
AUTO PUNCH	10	A try to correct a bad note in the lead vocal
RECORDING	9	First try at the lead vocal
AUTO PUNCH	8	Repairing the bad guitar bridge
>RECORDING	7	Recording the guitar solo
RECORDING	6	Piano (alternative part)
RECORDING	5	Piano
RECORDING	4	Guide vocals
RECORDING	3	Bass line
COPY->PASTE	2	Looping the drum part
RECORDING	1	Basic drum loop
START UP	0	Beginning of song

…and then re-record the guitar bridge.

After this, though, if you wanted to restore the vocal tracks which we’d recorded, you wouldn’t be able to. The new recording would replace everything above the line”.

All the previous items have now gone

AUTO PUNCH	8	This was the second go at repairing the bridge
>RECORDING	7	Recording the guitar solo
RECORDING	6	Piano (alternative part)
RECORDING	5	Piano
RECORDING	4	Guide vocals
RECORDING	3	Bass line
COPY->PASTE	2	Looping the drum part
RECORDING	1	Basic drum loop
START UP	0	Beginning of song

8 – Mastering and backup (CD-R)

The 788 can use a SCSI-connected CD-R or CD-RW drive for mastering and for backing up songs.

We strongly suggest that you contact your TASCAM distributor or visit the TASCAM Web site for up-to-date information regarding the compatibility of your CD-R or CD-RW drive with the 788.

You should also make sure that the CD-R and CD-RW media you use for recording and backing up songs meet the requirements specified by the drive.

NOTE

You cannot use the features here with an "audio" CD-R or CD-RW unit such as the TASCAM CD-RW2000. The CD-R drive used for these operations must be connected via SCSI.

Although you can connect CD-RW drives to the 788, and you can record on CD-RW media, you cannot use the erase capabilities of the drive or the media while recording songs from the 788. However, when you are backing up material to CD-RW media, you can erase old data from CD-RW discs using the CD-RW drive and re-use the discs.

Following common usage, we use the word "disc" to describe CD and CD-R and CD-RW media, and "disk" to describe the hard disk or any removable SCSI mass-storage media (except CD discs).

Unless otherwise stated, we use the term "CD-R drive" to refer to CD-R and CD-RW drives, and the term "CD-R disc" to refer to both CD-R and CD-RW media.

Connection

As explained in "SCSI issues" on page 17, each SCSI device connected to the 788 must have a unique ID. The IDs used for the 788 internal hard disk and for the internal SCSI controller are 0 and 7. You should therefore not use either of these IDs for the CD-R drive, and if any other SCSI devices are connected, you should not use their IDs for the CD-R drive, either.

The last unit in the chain (if the CD-R drive is the only device connected to the 788, it will be the last unit) should be terminated. Some drives have internal termination, some require an external terminator. Consult the documentation of the device to discover what termination is required for your CD-R drive.

Finally, remember that you should **NEVER** connect or disconnect SCSI devices with the power applied to them. If you make or break connections with the power turned on, there is a very real risk that you will damage the SCSI units.

Notes regarding the handling of CD-R discs

There are additional precautions that you should take when handling CD-R and CD-RW discs, that are different to those that you should take when handling ordinary CDs.

- Avoid touching the recording (non-label) side of a disc on which you will be recording. Recording on a disc requires a cleaner surface than playing back, and fingerprints, grease, etc. can cause errors in the recording process.
- CD-R discs are more sensitive to the effects of heat and ultraviolet rays than ordinary CDs. It is important that they are not stored in a location where direct sunlight will fall on them, and which is away from sources of heat such as radiators or heat-generating electrical devices.
- Always store CD-R discs in their "jewel cases" to avoid dirt and dust accumulating on their surfaces.
- Do not put labels or protective sheets on the discs and do not use any protective coating spray.
- When labeling CD-R discs, always use a soft oil-based felt-tipped pen to write the information. Never use a ball-point or hard-tipped pen, as this may cause damage to the recorded side.
- Dirty discs may be cleaned using a soft dry cloth and/or a commercial CD cleaning fluid or ethyl alcohol. Do not use thinner, gasoline, benzene or LP cleaning fluid, as these will damage the disc.
- If you are in any doubt as to the care and handling of a CD-R disc, read the precautions supplied with the disc, or contact the disc manufacturer directly.

Mixdown

As mentioned earlier, you can mix the contents of the recorded tracks, as well as inputs from the sub-mixer, to the **STEREO OUTPUT**s, which can then feed a DAT or cassette recorder, etc.

The 788 provides you with an additional feature, allowing you to "pre-master" the stereo mix to the 788's hard disk, so that you can audition the mix and re-do it if necessary, before committing it to disc.

Once the pre-master track has been recorded, it can be used many times, meaning that many CD copies of the same track can be recorded directly from the 788. As suggested in "Checking the master" on page 74, this pre-master track can also be recorded on non-CD-R media.

In addition, since the pre-master mix is saved as part of the song, any song which has been pre-mastered can be selected as part of a track list, allowing a whole CD to be produced from previously-recorded songs.

Pre-mastering

Pre-mastering can be carried out without the CD-R drive connected, as it uses the 788's hard disk only.

The start of the pre-mastered material is always the 00:00:00:00 point, and the end of the pre-mastered material is the OUT point.

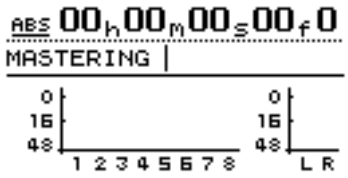
Before starting the pre-mastering process, make sure that all recorded tracks are assigned to mixer channels, and that if you are using the sub-mixer, this is assigned to the stereo outputs.

1 **Set the OUT point at the position where you want the pre-mastered material to stop ("Setting the IN and OUT points" on page 52).**

2 **With the transport stopped, press the MENU key.**

3 **Move the cursor to CD-R, and press ENTER.**

4 **Move the cursor to PRE MASTERING and press ENTER.**



The screen changes to the home screen, but with the word MASTERING at the top left of the screen.

If any REC READY indicators are on, they are turned off, and they cannot be turned on again while pre-mastering is being carried out.

While pre-mastering, transport controls work in the usual way, except that:

- Playback and fast forward will stop at the OUT point, and the playback position cannot move past this point.
- Auto punch operations are disabled.
- Jog and trim are disabled.
- Pitch control and SSA are disabled.
- Direct location is disabled ("Direct location (i)" on page 60).
- Recording is carried out as explained below.

Recording the pre-master To record the pre-master stereo tracks, press and hold the **RECORD** key, and then press the **PLAY** key. Both the **PLAY** and the **RECORD** indicators light.

Recording always starts (regardless of the current position) at 00:00:00:00.

The mastering records the effects of all mixer settings and effect settings, etc.

If you do not stop the recording before the OUT point, it will automatically stop at the OUT point. If you stop the recording at the OUT point, the master recording will stop there, and the length of the track will be from the 00:00:00:00 point to the point where the recording stopped.

NOTE

The minimum length for a CD track is four seconds. Make sure that all mastered recordings are at least this length.

The maximum length for a CD track recorded from the 788 is 70 minutes. Tracks made from the 788 should not exceed this length,

During the mastering operation, all channel operations (EQ, send, fader/pan) can be carried out, either from the 788's controls, or by means of MIDI com-

mands (see “MMC and MIDI functions” on page 101).

TIP

While you are recording the master, synchronization and the sub-mixer are active, and you can use these features to add synchronized MIDI sound sources to the stereo master mix.

You can set and edit effect parameters and recall effects from the effect libraries while mastering.

It is also possible for you to make assignments while mastering, but it is not possible to recall scene or routing memories (“Routing and scene libraries” on page 91).

When you have mastered the recording, you can either re-master the recording (simply press and hold the **RECORD** key and press the **PLAY** key again) or proceed to the master check operation (see “Checking the master” on page 74).

Mastering operations are included in the undo list (see “Undoing and redoing actions” on page 70). If you make an almost perfect pre-master, but all other attempts after that fail to achieve the perfection you are looking for, you can decide to use the almost-perfect original, and undo all the less-than-perfect attempts which followed.

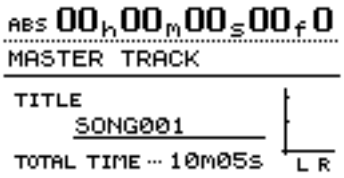
Exiting mastering To exit the mastering operation and allow normal operation:

1. **If the display does not show the home screen (see “The “home” display” on page 26), press the HOME/ESC key).**
2. **Press the EXIT/NO key to remove the** `MASTERING` **from the display.**

Checking the master

When the master has been recorded, you will almost certainly want to check it. After exiting from the mastering mode:

1. **With the transport stopped, press the MENU key.**
2. **Move the cursor to** `CD-R`**, and press ENTER.**
3. **Move the cursor to** `CHECK MASTER` **and press ENTER.**



The screen changes to the home screen, but with the word `MASTER TRACK` **at the top of the screen, the title of the current song, (it can be edited and changed from this screen) and the total time in minutes and seconds of the master track.**

All monitoring is now from the **STEREO** selection only. All other monitor selections are disabled and cannot be changed.

No faders or other mixer controls (including assignment) have any effect. The only possible control is of the monitor volume is through the **MONITOR** and **PHONES** jacks.

The transport controls work in the following way:

- **PLAY** plays back from the current position to the end of the master track.
- **REW** and **F FWD** move the playback position backward or forward at 10x, 50x, 100x or 1000x the normal playback speed (as usual), but the wind “speed” is not shown on screen.
- **STOP** stops playback or “winding” at the current position.
- Recording is disabled.
- All location functions are disabled.
- Jog, vari speed, SSA, repeat, etc. are disabled.

TIP

While playing back the master track, it is output from the **STEREO** *(and* **DIGITAL OUTPUT***) jacks as well as from the* **MONITOR** *and* **PHONES** *jacks. It is therefore possible to use the pre-mastering and master check functions to mix to a DAT or MD recorder, etc.*

Exiting master checking When you have listened to the master, you may decide to proceed with *burning* a CD-R, or you may want to re-master the song.

In either case, press the **EXIT/NO** key to return to the home screen, and restore the assignments, etc. which were in operation before the master check.

Trimming the master

You may sometimes want to trim the beginning or the end of a master track after checking it. For example, you may have made a perfect mix, except that there is too much "dead time" or a cough, fret noise, etc. before the start of the track, or there may be too much time after the end of the track, as the OUT point was not set correctly.

To correct these, without having to do the whole mix again:

1 **Make sure the 788 is in "normal" mode, that is, not in the master check mode or mastering mode.**

2 **Move the playback position to the approximate position where you want to trim (either the start or the end of the master).**

If you want to trim the start of the master:

3 **Set the IN point to be the 00:00:00:00 point.**

4 **Use the jog control to set the OUT point to the exact position where you want the master to start (see "Setting the IN and OUT points" on page 52).**

If you want to trim the end of the master:

3 **Set the IN point to the point where you want the end of the master to be, using the jog method to set the point (see "Setting the IN and OUT points" on page 52).**

4 **Set the OUT point to be some way after the existing OUT point.**

In both cases (trimming the start and trimming the end):

5 **Use the Track Edit CUT function (see "CUT" on page 68) to cut all tracks between the IN and the OUT point. You must select the all option for the master track to be cut in this way.**

If you are trimming the end of the master:

6 **Make sure that the OUT point is now located at the real end of the track (where you set the IN point previously).**

In both cases (trimming the start and trimming the end):

7 **Play back the master track, as described in "Checking the master" on page 74. The start and end should now be as you want them.**

Recording to CD-R

There are two ways of using the 788 to record a CD-R: either a track at a time; *TAO* (Track At Once) with the disc being finalized after the last track has been recorded, or a number of tracks together; *DAO* (Disk At Once), with the disc being finalized at the end of the session.

Recording many tracks at once allows you to reorder the tracks on the disc. It also allows you to put varying lengths of silence between tracks (ranging from 0 to almost 10 seconds).

Remember that whichever method you use to record your CDs, you can record a maximum of 99 tracks on one CD, the minimum length of a track is four seconds, and the maximum track length you can record from the 788 is 70 minutes.

NOTE

It is not possible to record a disc using both methods of recording. If you record a disk using the track method, you cannot then add a number of tracks together, but you can add single tracks. Likewise, if you record a number of tracks together, you cannot add any tracks (singly or together) later on.

Recording to CD-R (track recording)

Before starting this operation you must make sure that there is a recordable disc inserted in the CD-R drive. If there is no recordable disc (that is, a CD-R or CD-RW disc that has not been finalized), the 788 shows an appropriate message.

1 **Make sure the 788 is in "normal" mode, that is, not in the master check mode or mastering mode.**

2 **With the transport stopped, press the MENU key.**

3 **Move the cursor to CD-R, and press ENTER.**

4 Move the cursor to CD WRITER and press ENTER.

The 788 checks the CD-R drive. If there is a valid disc in the drive containing at least one pre-mastered song, the display shows the screen below (a list of the songs which have been mastered on the current partition).

NOTE

If a song has been recorded, but has not been mastered, it will not appear in the list.

If you want to change partitions, see "Selecting a disk" on page 32.

5 Use the dial to select the song to be recorded, and press ENTER.

You may now rename the song using the SHIFT + MENU (TITLE) key.

6 Choose at this point whether you want to finalize the disc.

If you finalize the disc at this stage, you cannot record any further songs on it. If you do not finalize the disc, you will not be able to play it on ordinary audio CD players.

TIP

If you choose not to finalize the disc at this point, you can finalize it later, without recording another song.

7 Press ENTER to continue, and EXIT if you want to choose a different song.

8 You are asked if you are sure that you want to record the song. Press ENTER to proceed with the recording, or EXIT to cancel.

If there is not enough space on the internal disk for preparation, or on the CD disc for the song that you have selected for recording, the 788 gives an appropriate error message.

9 The 788 makes an image of the song on disc (to allow for smooth and easy transfer) and then starts writing it to the CD.

The top line of the display gives an indication of the time remaining for the operation.

While the image and writing to disc is going on, all the 788 controls are disabled, and no action is possible.

NOTE

DO NOT TURN OFF the 788 or the CD-R drive while this writing operation is taking place. You will almost certainly spoil the disc and may corrupt the song data.

Two seconds of silence are added to the end of each track recorded to disc in this way.

10 To check the recorded disc, use the CD PLAYER option described below ("Playing back CDs using the 788" on page 78).

Finalizing the disc

When you have recorded the last track on the disc, you must finalize it in order to allow it to be played on ordinary CD players, but you can check the recorded tracks using the 788's CD PLAYER function ("Playing back CDs using the 788" on page 78).

The CD-R drive must contain an unfinalized disc before you start the process.

1 Make sure the 788 is in "normal" mode, that is, not in the master check mode or mastering mode.

2 With the transport stopped, press the MENU key.

3 Move the cursor to CD-R, and press ENTER.

4 Move the cursor to CD FINALIZE and press ENTER.

5 A pop-up screen asks if you are sure. Press ENTER to continue, EXIT to stop the finalize process.

6 If you continue, the CD session is closed and the finalizing material (Table of Contents or *TOC*) is written to the disc. A countdown timer at the top of the screen lets you know the time until the finalization is complete.

NOTE

You cannot record further tracks on a finalized disc. You can only finalize a disc once, and you cannot unfinalize a disc.

The CD-R drive eject button is locked while writing is going on. You can only eject the disc after writing has finished.

If you use CD-RW media, you cannot play the resulting discs in most audio CD players.

Recording to CD-R (multiple tracks)

When recording multiple tracks, the tracks can be recorded in any order, and varying lengths of silence can be added.

Once a CD has been made in this way, no further tracks can be added, as the CD is automatically finalized at the end of the operation.

There must be a recordable CD disc in the drive before starting this operation.

1 Make sure the 788 is in "normal" mode, that is, not in the master check mode or mastering mode.

2 With the transport stopped, press the MENU key.

3 Move the cursor to CD-R, and press ENTER.

4 Move the cursor to CD WRITER and press ENTER.

The 788 checks the CD-R drive. If there is a valid disc in the drive, the display shows the screen above (a list of the songs which have been mastered on the current partition).

NOTE

If a song has been recorded, but has not been mastered, it will not appear in the list.

If you want to change partitions, see "Selecting a disk" on page 32.

If you have a song in another partition which you want to add to the list in the current partition, you should copy it from the old partition to the current partition (see "Copying songs" on page 29).

5 Use the dial to scroll through the list of songs, and when you highlight a song that you wish to add to the final CD, press the INSERT key.

A check mark (✔) appears by the title of every selected song. There is no need to worry about the final running order of the CD at this stage.

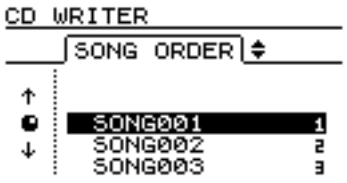
If you have made a mistake in adding a song to the list, you can remove it by highlighting the title and pressing the DELETE key.

6 When you have added all the songs to the list that you want to record on the CD, press ENTER.

NOTE

If you have only selected one song, the procedure from now is as if you had highlighted the song and pressed **ENTER***, as described in "Recording to CD-R (track recording)" on page 75. Read that section, and ignore the remainder of this section.*

The screen changes to the song order screen (if you want to return to the song selection screen, press EXIT.

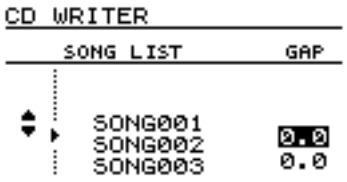


7 Use the dial to scroll through the list of songs.

8 When a song title is highlighted, use the ▲ and ▼ keys to move it up and down in the list. As the song is moved up and down in the list it remains highlighted.

9 Select further songs for rearrangement using the dial.

10 When you have finalized the running order, press ENTER .



The screen changes to the "gap setting" screen. This allows you to set the gap between tracks on the CD (press EXIT to return to the song order screen)

11 Use the ▲ and ▼ keys to move the cursor to the gaps between the songs on the CD.

12 Use the dial to set the time in seconds between songs, from 0.0 seconds (no gap) through 9.9 seconds in 0.1 second steps.

NOTE

When you come to play back the disc on a CD player, the start of the gap will appear as Index 0 on the track following the gap, and the start of the track will appear as Index 1. Because the gap counts as a part of the track, the total length of the track and gap together cannot exceed 70 minutes.

13 When all the gaps have been set, press ENTER. A pop-up asks if you are sure. Use the YES key to proceed with writing the CD or the NO key to cancel the operation.

14 When you press YES, a disk image is made of each song in turn, which is then written to the CD. A countdown timer at the top of the screen gives an indication of how long the process will take.

NOTE

DO NOT TURN OFF the 788 or the CD-R drive while this writing operation is taking place. You will almost certainly spoil the disc and may corrupt the song data.

15 When the last song has been written, the disk is finalized. You can now eject the disc and play it in a CD player.

NOTE

The CD-R drive eject button is locked while writing is going on. You can only eject the disc after writing has finished.

If you use CD-RW media, you cannot play the resulting discs in most audio CD players.

Playing back CDs using the 788

If an audio CD (either finalized or unfinalized) is inserted into a CD-R drive connected to the 788, the 788 can be used to play it back.

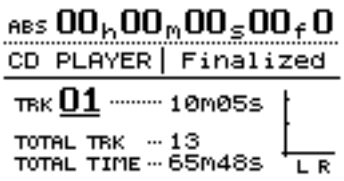
The sound is sent to the 788 through the SCSI connection, and is output through the **MONITOR** and **PHONES** jacks. The only control over the sound from the 788 is through the **MONITOR** control knob. All other mixer controls are disabled.

1 Make sure the 788 is in "normal" mode, that is, not in the master check mode or mastering mode.

2 With the transport stopped, press the MENU key.

3 Move the cursor to CD-R, and press ENTER.

4 Move the cursor to CD PLAYER and press ENTER.



The screen shows:

- The elapsed time of the current track.
- Whether the disc is finalized or not
- The current track and its length (when the CD player function is first entered, the track number will always be 1)
- The total number of tracks on the disc
- The total play time of the disc (including any gaps between tracks)
- The stereo meters also show the level of the audio recorded on the disc

The 788 transport controls are used to control playback of the CD, as explained here:

- **PLAY** starts playback from the current playback position. While the disc is locating, the **PLAY** indicator flashes, and while playback is actually taking place, it lights steadily
- **STOP** stops playback at the current position
- **REW** and **F FWD** take the playback position forward or backward one track, while playback is stopped
- The dial can also be used to move the playback position forward or backward one track while playback is stopped
- All other playback functions are disabled

NOTE

While this screen is displayed (the CD Player function is active), the eject button on the CD-R drive is disabled. To eject the CD, press **EXIT** *to exit the CD player function, and then press the CD-R drive eject key.*

Backup using CD-R

As well as allowing you to record the final mix to CD-R, the 788 also allows you to *back up* all of a song (tracks, virtual tracks, edits, undo history, effect settings, etc.) to CD-R.

This is a relatively cheap and portable way of storing your work. Even if you produce large songs and use smaller hard disk partitions (e.g. 1 GB), this function allows you to store the song reliably and safely, reuse the hard disk space, and reload (*restore*) the song from CD-R and continue work on it.

If the total amount of data that makes up a song is more than the capacity of a single CD disc, the 788 can split the backup over a series of discs. When you come to restore the song, it will ask for the discs in order and reassemble the song internally.

NOTE

There must be sufficient space on the 788 disk partition for this backup to be able to take place (at least 640 MB). If you have selected a partition size of 512 MB, backup can never take place of a song recorded on that partition. For this reason, we recommend using a large partition size when formatting a new external disk ("Formatting a disk" on page 31)

Backup discs cannot be played in a CD player (or read in a computer). They contain the audio data of a song in a form which can be read only by the 788.

Backing up a song

Before you start backing up, make sure you have a supply of blank CD-R discs. You cannot use discs that have already been used for mastering (and you cannot use backup discs for mastering, either).

You can only back up one song at a time.

1. **Put the first disc into the CD-R drive.**
2. **Make sure the 788 is in "normal" mode, that is, not in the master check mode or mastering mode.**
3. **With the transport stopped, press the MENU key.**
4. **Move the cursor to DATA BACKUP, and press ENTER.**

   If there is no recordable disc in the drive, the screen shows an error message, otherwise the screen shows a list of the songs on the current partition.

   If the disc is a CD-RW disc in a CD-RW drive, and it has been used for 788 backup before, you have the option to erase the old data.

5. **Use the dial to highlight the song to be backed up.**

   The 788 reads the song and performs some "housekeeping" tasks. At the end of this, it shows how many CD-R discs will be needed for the backup.

6. **If you have the discs ready and you want to proceed, press YES. If you do not have the discs ready, press NO.**
7. **If you press YES, the 788 makes an image of the song; its tracks, virtual tracks, playlist, edits, etc. and prepares to write this data. A countdown appears at the top of the display, providing a guide to how long the current operation will take.**
8. **If the backup is too big to fit on one CD-R disc, when the first disc is full, it is automatically ejected, and a message asks you to put in the next disc.**
9. **When the last disc has been written, it is ejected, and the song which was current when the backup started is reloaded.**

NOTE

The backup operation may take some time, as a song may have many different parts to it. If you use the DELETE UNUSED *function before backing up the song, this may save some time and space ("Deleting unused space from a song" on page 30).*

DO NOT TURN OFF the 788 or the CD-R drive while this backup operation is taking place. You will almost certainly spoil the disc and may corrupt the song data.

CD-R backup discs are finalized and cannot be reused for any other purpose (but CD-RW discs can be erased for other backups).

TIP

Label your discs as soon as you make them, using a soft water-based felt-tip pen. It is important that you keep notes of what is on each disc for future reference.

Restoring data from CD-R

This operation is basically the reverse of the backup operation.

Before you start restoring a song, make sure that you have all the discs that were used to back up the song. If some of the discs are missing, you will not be able to restore the song (you cannot load half a song).

1. **Put the first (or only, if there is only one) disc of the backup set into the CD-R drive.**
2. **Make sure the 788 is in "normal" mode, that is, not in the master check mode or mastering mode.**
3. **With the transport stopped, press the MENU key.**
4. **Move the cursor to** DATA RESTORE**, and press ENTER.**

   The 788 reads the title of the song from the disc and asks you if you want to continue.
5. **Press YES to continue, NO to eject the disc and cancel the operation.**
6. **If you go ahead with the restore, the 788 copies the data from the CD-R disc to the active disk partition. A bargraph on screen shows the progress.**
7. **If the backup is spread over more than one disc, when the first disc has been read, it is ejected, and a message asks you to put in the next disc. Insert the next disc and press YES.**

   If you insert the wrong disc (out of sequence or from a different backup set), the 788 ejects the "bad" disc and asks you again for the correct one. If you really cannot find the right disc, you must press NO to cancel the restore.

   If you cancel the restore operation part of the way through, none of the song is restored, and the 788 goes back to the state before the restore was started.
8. **When data is restored from the last disc, the disc is ejected, and the previous song (before the restore operation was started) is loaded.**

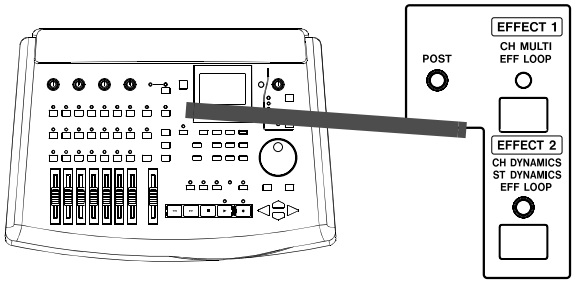
NOTE

If the song which has been restored has the same name as a song which is currently on the partition, there will be two songs with the same name. We suggest that you rename one of them after the restore operation, to avoid confusion ("Entering and editing titles" on page 26).

It is possible to make two different backups of a song, each with the same name, at different stages of the song's development. If you mix up the backup sets and insert a disc from the wrong set into the middle of a backup, the 788 is smart enough to recognize this, and it will eject the "bad" disc and ask you for the correct disc.

The 788 includes two high-end digital internal effects units, which can be used in a variety of ways to enhance your recording project. Since all effect processing is carried out in the digital domain, there is no loss of quality caused by conversion to and from the digital domain.

The two effects units (**EFFECT 1** and **EFFECT 2**) can be set up in a number of different ways, according to the current recording task:



EFFECT 1 This effects unit can be used as a multi-effect processor, incorporating five effects in one chain and inserted into the signal path of input signals. This is particularly useful when recording source material such as electric instruments.

Alternatively, it can be placed into the mixer's effects loop, as a single stereo effect processor (for example in the mixdown stage of a project).

EFFECT 2 This effects unit can inserted in input channels as up to eight dynamics processors, or be placed at the stereo output as a stereo dynamics processor.

Finally, like **EFFECT 1**, you can choose to use it as a single stereo effect processor, placed in the aux loop.

The reason for the different modes is that you will probably require different types of effect at different times.

- For instance, if you are recording many channels simultaneously using microphones, you may want to use compressors on many channels at once.
- When you come to overdub an electric guitar solo, you may want to use the multi-effects unit to give the guitar sound some life, without having to go through the trouble of micing up an amplifier.
- At mixdown, it's quite likely that you'll want to add a selective amount of the same effect to a number of tracks at the same time.
- Again, at mixdown you may want to engage a compressor on the final output. Digital distortion is a particularly unpleasant sound, and putting a compressor in front of the outputs is one way to avoid it (another way is simply to keep the levels at a reasonable volume, of course!).

Setting up EFFECT 1

Using EFFECT 1 as a multi-effect processor

1 **Assign a source to the mixer channel which will be using EFFECT 1 as a multi-effect processor, as described in "Assigning sources to mixer channels." on page 36.**

2 **Press and hold down the EFFECT 1 key. The indicator flashes, as does the indicator of the current assignment.**

3 **While holding down the EFFECT 1 key, press the SELECT key of the channel(s) to use the effector. The indicator(s) of the channel(s) flash along with the EFFECT 1 indicator.**

4 **Press the SELECT key of the channel again to change between pre-EQ and post-EQ insert (i.e. the effect settings are made on the unequalized or the equalized channel signal).**

The POST indicator flashes when post-EQ is selected, and is not lit when pre-EQ is selected.

After this operation when the keys are released, the input indicator, together with the SELECT indicator(s) of the channel(s), the EFFECT indicator and (optionally) the POST indicator will all be lit.

5 **Choose a multi-effect processor type. See "Selecting the type of effect" on page 84.**

NOTE

If you have previously made a stereo link between two input channels, or if you are using **EFFECT 1** *with channels 7 and 8, only the odd-numbered channel of the pair will be routed through the processor (except in the case of the double exciter, where each channel will be routed through the processor). The output from the multi-effect processor is always stereo.*

Using EFFECT 1 as a single stereo effect processor in the effect loop

1 **Press and hold down the SEND key. If EFFECT 1 or EFFECT 2 has already been assigned to the send loop, the appropriate indicator(s) will flash.**

2 **Press the EFFECT 1 key. The indicator flashes when the effects unit is assigned to the loop.**

3 **Select the mode for the effects unit. See "Single stereo effect processor settings" on page 85.**

NOTE

You can reverse this order of making the settings (press and hold the **SEND** *key, and then press the* **EFFECT 1** *key).*

You can remove the effects unit from the effects loop by repeating the process so that the indicator does not flash when the **SEND** *key is pressed.*

The effect send may be set to either pre- or post-fader on a channel-by-channel basis, as explained in "Changing between pre-fader and post-fader settings" on page 84.

Setting up EFFECT 2

The second effects processor is slightly different from the first in its options and the settings you can make, as explained here:

Using EFFECT 2 as a multi-channel dynamics processor

In this mode, the effects processor acts as a compressor, placed as an insert, before the equalization section, but after the digital pad and gain (see "Channel digital pad and gain" on page 44). Up to eight input channels may use the dynamics processor at a time.

1 **Press and hold down the EFFECT 2 key. The indicator flashes, together with the indicators of any currently assigned channels.**

2 **While holding down the EFFECT 2 key, press the SELECT key of any channels where you want to use the channel dynamics. As you press these keys, the channel SELECT indicators flash to show which channels are using the dynamics processor.**

   Pressing a channel's SELECT key which is already flashing when the EFFECT 2 key is held down will stop that channel using the dynamics processor.

For details of using the multi-channel dynamics processor, see "Dynamics processor" on page 90.

NOTE

If you have previously made a stereo link between two input channels, or if you are using **EFFECT 1** *with channels 7 and 8, pressing one* **SELECT** *key of the pair will assign the effects unit to both channels.*

You can also reverse the order of the key presses here (press and hold down a **SELECT** *key, and then press the* **EFFECT 2** *key).*

Using EFFECT 2 as a stereo dynamics processor

In this mode, the effects processor acts as a compressor on the stereo output, and may act on the signal sent to the **STEREO** fader (pre-fader), or on the final level (post-fader).

1 **Press and hold down the EFFECT 2 key. The indicator flashes, together with the indicators of any current assignments.**

2 **While holding down the EFFECT 2 key, press the STEREO key (in the top row of keys, immediately below the analog input gain controls). The EFFECT 2 and STEREO indicators flash.**

3 **To change the setting between pre-fader and post-fader, press the STEREO key again while holding down the EFFECT 2 key. When the setting is post-fader, the POST indicator flashes together with the other two indicators.**

   Repeated presses of the STEREO key while the EFFECT 2 key is held down cycle the dynamics processor assignment between pre-fader, post-fader and off.

For details of using the stereo dynamics processor, see "Dynamics processor" on page 90.

Using EFFECT 2 as a single stereo effect processor in the AUX effect loop

This allows the effect processor to be used in the second effects loop (**AUX**). If it is used in this way, this allows the **AUX INPUT** connectors to be used for (say) the stereo signal from an analog sub-mixer at mixdown time.

1 **Press and hold down the EFFECT 2 key. The indicator flashes, along with the indicators of any current assignments.**

2 **While holding down the EFFECT 2 key, press the SEND key.**

NOTE

You can reverse this order (press and hold the **SEND** *key, and then press the* **EFFECT 2** *key).*

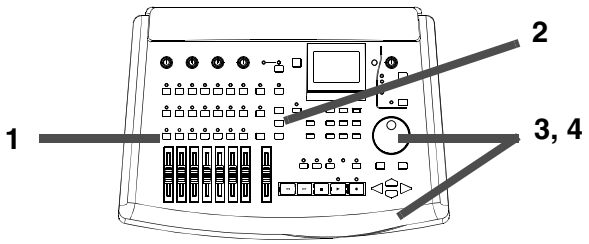
You can remove the effects unit from the effects loop by repeating the process so that the indicator does not flash when the **SEND** *key is pressed.*

The effect send may be set to either pre- or post-fader on a channel-by-channel basis, as explained in "Pre- and post-fader sends explained" on page 84.

While the effects unit is selected as the effects unit in the Aux loop, the **AUX INPUT***s and* **AUX OUTPUT***s are still active. The level of the mixed signal from the* **AUX OUTPUT***s is controlled with the channel and master Aux sends (see "Send levels, etc." on page 83).*

Send levels, etc.

The two effects loops (Effect and Aux) are both stereo sends.



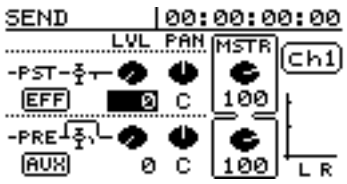
The levels from each channel to these sends, and the pan between the two inputs of these stereo sends, can be set, as well as the master send level.

In addition, these two sends can be individually selected as off, or as pre- or post-fader on a per-channel basis (see "Pre- and post-fader sends explained" on page 84 below).

Stereo linked channels and channels 7 and 8 cannot have levels set independently for each channel. One control affects the send levels for both channels. In addition, the send pan controls change to a stereo pan control for both channels.

1 **Press the SEND key. The display screen shows the channel send screen.**

2 **Press the SELECT key of the mixer channel whose send levels are to be adjusted.**



3 **Use the cursor keys to move the cursor to the value you want to change, and use the DATA dial to change the values of the channel send levels (**LVL**), the pan position of the channel in the send (**PAN**), and the master send levels (**MSTR**).**

4 **As also explained below ("Changing between pre-fader and post-fader settings" on page 84), the**

TIP

Level settings are from 0 *through* 127*, and pan settings are from* L63 *(full left) through* C *(center) to* R63 *(full right).*

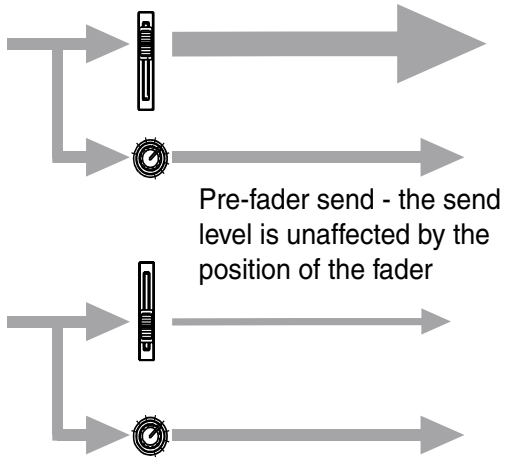
NOTE

When two channels are linked, the send levels are identical, taken from the odd-numbered channel's values before linking, as is the pre/post/off setting. The pan controls change to a centered mono pan.

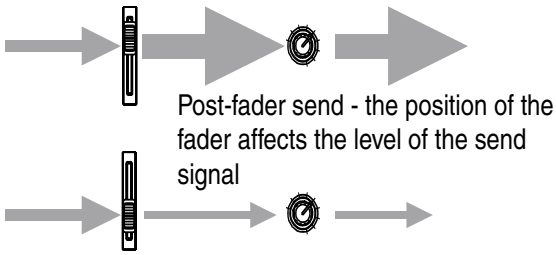
When two channels are unlinked, the stereo pan control changes back to mono pan controls, which are panned hard left (odd-numbered channels) and hard right (even-numbered channels). The send levels and pre/post/off settings are taken from the pair, and remain unchanged.

Pre- and post-fader sends explained

Pre-fader means that the level sent to the effects loop is independent of the fader setting, as the signal is taken before it reaches the fader.

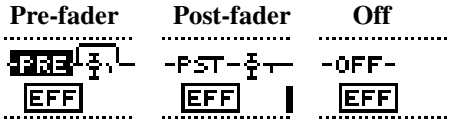


Post-fader means that because the level to the send control is controlled by the fader, the total effect send is increased and reduced with the fader.



Changing between pre-fader and post-fader settings

This applies to the Effect and Aux loops only.

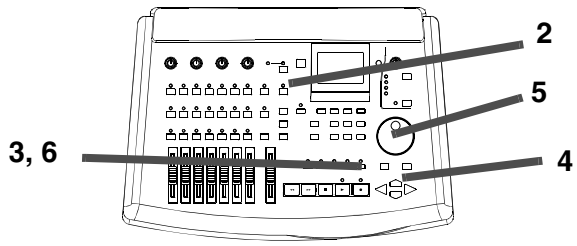


1 **Press the SEND key and then press the SELECT key of the channel where you want to make the setting.**

2 **Move the cursor to the box at the left of the send screen and use the dial to change between** PRE, POST **and** OFF **(a small on-screen diagram also indicates the change). In the example here, the first send is pre-fader, the next is post-fader, and the last is off.**

Selecting the type of effect

When using the inserted multi-effect processor (**EFFECT 1** only) or the single stereo effect processor (**EFFECT 1** or **EFFECT 2**), you can select the effect type that you want from a list of preset settings or from your own library of settings that you have stored previously.



To select from the preset list:

1 **Assign the effects unit to be a multi-effect processor (“Using EFFECT 1 as a multi-effect processor” on page 81) or as a single stereo effect processor (“Using EFFECT 1 as a single stereo effect processor in the effect loop” on page 82 or “Using EFFECT 2 as a single stereo effect processor in the AUX effect loop” on page 83).**

2 **Press the appropriate EFFECT key so that the top left of the screen shows** EFFECT **(the effect settings editor screen).**

3 **Press either the YES or NO key to bring up the** EFFECT LIBRARY **screen.**

4 **Use the ◄ and ► keys to make the PRESET tab “active”.**

5 **Use the dial to select the preset as listed below.**

6 **Press YES to confirm the selection (NO exits without selecting).**

Multi-effect processor preset settings

The preset effect settings available for the multi-effect processor (**EFFECT 1** only) are:

Display	Effects available
DIST_FLG_REV	Compressor, Distortion, Noise gate, Flanger, Reverb
DIST_FLG_DLY	Compressor, Distortion, Noise gate, Flanger, Delay
DIST_EXC_REV	Compressor, Distortion, Noise gate, Exciter, Reverb
DIST_EXC_DLY	Compressor, Distortion, Noise gate, Exciter, Delay
DIST_PIT_REV	Compressor, Distortion, Noise gate, Pitch Shifter, Reverb
DIST_PIT_DLY	Compressor, Distortion, Noise gate, Pitch Shifter, Delay
DIST_CHO_REV	Compressor, Distortion, Noise gate, Chorus, Reverb
DIST_CHO_DLY	Compressor, Distortion, Noise gate, Chorus, Delay
P.EQ_FLG_REV	Compressor, Noise gate, Parametric EQ, Flanger, Reverb
P.EQ_FLG_DLY	Compressor, Noise gate, Parametric EQ, Flanger, Delay
P.EQ_EXC_REV	Compressor, Noise gate, Parametric EQ, Exciter, Reverb
P.EQ_EXC_DLY	Compressor, Noise gate, Parametric EQ, Exciter, Delay
P.EQ_PIT_REV	Compressor, Noise gate, Parametric EQ, Pitch Shifter, Reverb
P.EQ_PIT_DLY	Compressor, Noise gate, Parametric EQ, Pitch Shifter, Delay
P.EQ_CHO_REV	Compressor, Noise gate, Parametric EQ, Chorus, Reverb
P.EQ_CHO_DLY	Compressor, Noise gate, Parametric EQ, Chorus, Delay
DESS_CHO_REV	Compressor, Noise gate, De-esser, Chorus, Reverb
DESS_CHO_DLY	Compressor, Noise gate, De-esser, Chorus, Delay
STEREO EXC	Two x Compressor, Noise gate, Exciter

There are also some preset effects which you can use as starting points for your own experiments. The descriptions of these effects are provided separately.

Single stereo effect processor settings

When either **EFFECT 1** or **EFFECT 2** is selected as a single stereo effect processor, the preset options available are:

Display	Effect setting
REVERB	Reverberation, with different reverberation types available
DELAY	Programmable delay, with different delay algorithms available
CHORUS	High-quality stereo chorus effect
PITCH SHIFTER	Pitch shifter with delay
FLANGER	High-quality stereo flanger
PHASER	High-quality stereo phasing effect
REVERB + GATE	Gated reverb effect

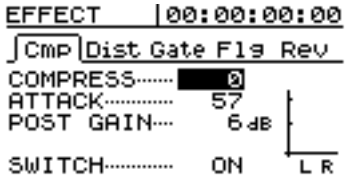
There are also preset effects that you can use “as-is” as starting points for experiments. The descriptions of these presets are provided separately.

Dynamics processor

Whether the dynamics processor is used as a channel dynamics processor, or whether it is assigned to the stereo output, there is only one type of setting that can be used: Dynamics (a compressor).

Making settings

Whatever type of effect has been selected for use by the **EFFECT 1** or **EFFECT 2** processor, the principles of editing are the same (the exact parameters which can be edited are different, of course). The details of these parameters are described in "Parameter details" on page 87.



1 **If the EFFECT screen is not shown (the example here shows a multi-effect processor), press the appropriate EFFECT key to bring up this screen (remember that EFFECT 2 cannot be used as a multi-effect processor, so this screen can never appear if you press EFFECT 2).**

2 **With the multi-effect processor setting, use the ◄ and ► keys to change between tabs (this allows the different parts of the multi-effect processor to be edited).**

3 **Use the ▲ and ▼ keys to move the cursor to the parameter to be changed.**

4 **Use the dial to change the values of the selected parameter. The changes are instantly audible.**

Using the user libraries

When you have made the effect settings that you want, they can be stored in a library for further use.

Up to 128 settings can be stored for the single stereo effect processors, 128 for the multi-effect processors, and 128 shared between the channel and stereo dynamics processors.

NOTE

It is not possible to use the library space for one type of effect to store another type of effect.

The single stereo effect library spaces may be used by both **EFFECT 1** *and* **EFFECT 2***, when they are used as single stereo effect processors.*

Storing an effect in the library

1 **From the effect parameter edit screen, press the YES or NO key.**

2 **Use the ► key to make the SAVE tab active.**

3 **Use the dial to scroll down to the user library memory where you will store the settings.**

4 **At this point you can use the SHIFT + MENU (TITLE) key to give the library setting a title that you can remember in the future. See "Entering and editing titles" on page 26 for details.**

5 **Press ENTER to store the settings. The display returns to the parameter editing screen.**

TIP

These settings are automatically stored on the internal disk when you power off the 788 (see "Shutting down the 788" on page 19).

Recalling a user setting from the library

1 **From the effect parameter edit screen, press the YES or NO key.**

2 **Use the ◄ and ► keys to make the USER tab active.**

3 **Use the dial to scroll down to the user library memory from where you will load the settings.**

4 **Press ENTER to load the settings. The display returns to the parameter editing screen.**

Parameter details

The following describe the ways in which the effector parameters can be edited, and a brief description of their effects.

Multi-effect processor settings

There are a number of different separate effects within each multi-effect processor setting (see "Using EFFECT 1 as a multi-effect processor" on page 81 for details of the multi-effect processor settings) which have parameters that may be edited independently.

Note that all of these also have a SWITCH field that turns the individual effect in the multi-effect processor ON or OFF.

Compressor The compressor in the 788's multi-effect processor settings limits the volume of the signal passed through to the other units in the chain. It has the following settings:

Parameter	Min.	Max.	Explanation
COMPRESS	0	100	Amount by which input signal is compressed
ATTACK	0	100	Time for compression to take effect
POST GAIN	0dB	30dB	Makes up lost volume if compression takes away some of the level

Distortion The distortion effect in the multi-effect processor provides a natural-sounding way of adding "life" to otherwise dry guitar sounds, etc.

The distortion in the 788's multi-effect processor has three parameters:

Parameter	Min.	Max.	Explanation
PRE GAIN	40dB	60dB	The amount by which the signal is amplified (and thereby distorted)
DRIVE	0	100	The "color" of the distorted sound
OUT LEVEL	0dB	12dB	The amount by which the output signal is boosted

Noise gate A noise gate acts as a way of keeping unwanted noise from passing (it "shuts the gate" when a signal is below a certain threshold level, and opens it when the signal rises above the level). You can use this with noisy effects pedals, etc. to avoid recording the unwanted noise of the units when the instrument is silent.

There are three parameters on the 788's multi-effect noise gate:

Parameter	Min.	Max.	Explanation
THRESHOLD	-76dB	-16dB	The threshold below which signals will be gated (relative to the nominal signal level)
RELEASE	0	100	The time it takes for the gate to close after the input signal drops below the threshold
SUPPRESS	-∞dB	0dB	The amount by which the gate is closed (0dB does not close it at all, minimum value closes it completely).

Flanger Flanging is a distinctive "swirling" sound. The flanger on the multi-effect processor in the 788 has three parameters:

Parameter	Min.	Max.	Explanation
RATE	0.0Hz	10.0Hz	The speed of the effect
DEPTH	0	100	The depth of the flanging effect
FEEDBACK	0	100	The amount by which the signal is fed back within the effect, adding to the character of the sound

Exciter An exciter is an effect which (usually) subtly emphasizes a range of frequencies, making them "sparkle" and stand out in the mix.

The multi-effect exciter in the 788 has two parameters that can be set:

Parameter	Min.	Max.	Explanation
FREQUENCY	1.0kHz	10.0kHz	The minimum frequency which is affected by the exciter
DEPTH	0	100	The amount by which the exciter affect the signal

Pitch shifter A pitch shifter allows the pitch of a signal to move up or down to harmonize with the original signal. The multi-effect pitch shifter in the 788 has three parameters:

Parameter	Min.	Max.	Explanation
PITCH	-12	+12	The amount by which the pitch is shifted expressed in semitones (coarse tuning)
FINE	-50	+50	The fine tuning amount, added to the coarse tuning, by which the pitch is shifted expressed in cents (100 cents = 1 semitone)
BALANCE	0	100	The balance between the original dry signal and the shifted (0=dry, 100=all shifted)

Chorus A chorus effect adds a slight doubling effect to the signal and "thickens" it. The multi-effect chorus effect in the 788 has three parameters:

Parameter	Min.	Max.	Explanation
RATE	0.1Hz	10.0Hz	The speed of the chorus effect
DEPTH	0	100	The depth (thickness) of the chorus effect
MIX LEVEL	0	100	The amount by which the chorus level is applied and passed down the chain

Reverberation (reverb). This is the "spacey" effect you get in tunnels, caves, large halls, etc. It adds a feeling of spaciousness and depth when added to a signal. The reverb on the 788's multi-effect processor has three parameters:

Parameter	Min.	Max.	Explanation
PRE DELAY	0ms	150ms	The time between the original signal and the start of the reverb
HI DAMP	0	10	The amount by which the high frequencies are removed from the reverb (0 is similar to a bare cave, 10 is similar to a heavily-furnished room)
MIX LEVEL	0	100	The amount of reverb relative to the original signal

Delay Sometimes referred to as "echo", this provides one or a series of copies of the sound at regular intervals. There are three parameters that you can set on the 788's multi-effect delay processor:

Parameter	Min.	Max.	Explanation
FB DELAY	0ms	1000ms	The time between repeats of the sound
FEEDBACK	0	100	The level of the repeated sounds (in practical terms, this controls the number of audible repeats—note that a high value here may result in runaway feedback, which is unpleasant)
MIX LEVEL	0	100	The amount of delay relative to the original signal

Parametric EQ This works to cut or boost a narrow part of the signal independently of the channel's EQ settings, and can be used for special effects, etc. Remember that this multi-effect may be added pre- or post-EQ, and therefore this may be used to equalize an already-equalized signal! The 788's multi-effect EQ has three parameters:

Parameter	Min.	Max.	Explanation
FREQUENCY	63Hz	16kHz	The frequency band affected by this effect
GAIN	-12dB	+12dB	The amount that the selected frequency band is cut or boosted
OUT LEVEL	-12dB	+12dB	The amount by which the overall signal is cut or boosted.

De-esser A de-esser removes the sharp "ess" sounds from vocals and so on (hence its name). Some vocal styles and some vocalists seem to need this treatment, and others don't seem to require it. A lot also depends on your microphones, and their placement. You don't have to use a de-esser with vocals only, but that's usually where it does most good. There are two parameters in the 788 de-esser:

Parameter	Min.	Max.	Explanation
FREQUENCY	1.0kHz	10.0kHz	Choose the minimum frequency at which the "ess" sounds are heard to cut them out of the recording.
DEPTH	0	60	The depth of the de-esser's effect

Single stereo effect settings

The single stereo effects typically have more parameters than their multi-effect "cousins", but essentially perform similar processing tasks on the signals.

Note that there is no on/off switch in these screens, but that the final effect return level is always set using an OUT LEVEL parameter at the bottom of the setting screen for each effect. This takes a value from 0 (no output) to 127 (full output).

REVERB This reverb processor allows you to set a simulated reverb type as well as other parameters affecting the spacious reverberant sound.

Parameter	Min.	Max.	Explanation
ROOM TYPE	Hall	Studio	Choose between Hall, Room, Live, and Studio to set up a reverberation pattern that mimics these different scenarios
PRE DELAY	0ms	250ms	The time between the original signal and the start of the reverb
REV TIME	0.1s	10.0s	The time that the reverb sound takes to die away
DIFFUSION	0	100	The "liveliness" of the reverb sound, affecting the character of the "room" that you have set up.

DELAY The "echo" settings here allow flexibility in the type of delay as well as other parameters affecting the delay sound:

Parameter	Min.	Max.	Explanation
TYPE	Stereo	Multi	Choose the delay type from: Stereo (a stereo delay pattern), PinPon (a "ping-pong" delay between the two stereo channels, or Multi (a multi-tap delay algorithm)
PRE DELAY	0ms	1000ms	The time between the original signal and the start of the repeated delays
FB DELAY	0ms	1000ms	The time between repeated echoes
FEEDBACK	0	100	The level of the repeated sounds (in practical terms, this controls the number of audible repeats—note that a high value here may result in runaway feedback, which is unpleasant)

CHORUS A "doubling" effect, which thickens the sound, giving additional character to it. Delay incorporated in this effect also helps to provide a fuller sound.

Parameter	Min.	Max.	Explanation
RATE	0.1Hz	10.0Hz	The speed of the chorus effect
DEPTH	0	100	The depth (thickness) of the chorus effect
FB DELAY	0ms	100ms	The time between the original and the delayed signal
FEEDBACK	0	100	The level of the repeated sounds (in practical terms, this controls the number of audible repeats—note that a high value here may result in runaway feedback, which is unpleasant)

PITCH SHIFTER A pitch shifter, allowing harmonization of the effected sound with the original (the pitch shifted sounds may sound a little strange in character—this is not a substitute for real harmony singing, but can be a very effective special effect). A delay setting provides additional 'harmonies" shifting the pitch by the specified amount on each repeat.

Parameter	Min.	Max.	Explanation
PITCH	-12	+12	The amount by which the pitch is shifted expressed in semitones (coarse tuning)
FINE	-50	+50	The fine tuning amount, added to the coarse tuning, by which the pitch is shifted expressed in cents (100 cents = 1 semitone)
FB DELAY	0ms	500ms	The time between repeats
FEEDBACK	0	100	The level of the repeated sounds (in practical terms, this controls the number of audible repeats—note that a high value here may result in runaway feedback, which is unpleasant)

FLANGER A swirling sound, adding depth to the original sound. At high settings, this can produce a jet-like "swooshing" sound. The built-in delay adds more life to this effect.

Parameter	Min.	Max.	Explanation
RATE	0.1Hz	10.0Hz	The speed of the flanging effect
DEPTH	0	100	The strength of the effect
FB DELAY	0ms	1000ms	The time between repeats
FEEDBACK	0	100	The level of the repeated sounds (in practical terms, this controls the number of audible repeats—note that a high value here may result in runaway feedback, which is unpleasant)

PHASER A more gentle effect than the flanger, which is similar, but a slightly more subtle effect (it's difficult to describe these things in words, sometimes you just have to try them!).

Parameter	Min.	Max.	Explanation
RATE	0.1Hz	10.0Hz	The speed of the phasing effect
DEPTH	0	100	The strength of the effect
RESONANCE	0	100	The way in which the filter works inside the effect. High values produce a "wah" effect
STEP	4	16	4, 8, 12 or 16 — affecting the quality and character of the phase effect.

REVERB + GATE The signal goes through a reverberator, and the reverb signal is then passed through a gate, which opens when it is above a given level (*threshold*) and closes again after a set time. Try this with a snare drum sound.

Parameter	Min.	Max.	Explanation
TYPE	Normal	Reverse	The reverb can be reversed (i.e. it starts quietly, and gets louder)
THRESHOLD	-46dB	-16dB	The level at which the gate opens to let the sound through
GATE TIME	0ms	3000ms	The time that the gate stays open before the threshold setting starts to take effect
DENSITY	0	100	The "thickness" of the reverb—low settings provide a sparse sound, and higher values make a complex, thicker sound.

Dynamics processor

When **EFFECT 2** is used as a compressor for channels and the stereo output, the following settings may be made:

Parameter	Min.	Max.	Explanation
THRESHOLD	-46dB	-16dB	The level at which the compressor starts to have an effect
ATTACK	0.1ms	10ms	The speed with which the signal is compressed
RATIO	1.0:1	∞:1	Expressed as a ratio. 1.0:1, 1.1:1, 1.3:1, 1.6:1, 2.0:1, 2.7:1, 4.0:1, 8.0:1, ∞:1 — 1.0:1 means no compression, and ∞:1 means full compression.
POST GAIN	0dB	30dB	Makes up any volume lost as the result of the compression settings.

The 788 allows you to store and recall commonly-used assignment (*routing*) patterns as well as *scenes* which contain the settings for the mixer.

Up to 10 scene settings may be stored in a library area for each song, which is automatically stored when the song is saved.

Routing patterns are stored in a common library area, available to all songs, and are automatically saved when the 788 is powered down.

There is no need to perform a special operation to save either type of library data.

Routing libraries

In the routing library, you store up to 128 patterns of input assignments to library entries.

The assignments stored in the routing patterns include:

- the assignments of the inputs to the mixer channels (see "Assigning sources to mixer channels." on page 36)
- the inputs to the sub-mixer (see "Assigning inputs to the sub-mixer" on page 37)
- the effect assignments (see "Setting up EFFECT 1" on page 81 and "Setting up EFFECT 2" on page 82).

NOTE

*The assignments of virtual tracks to tracks are **not** stored as part of a routing patterns. These assignments are stored as part of a song.*

Saving the current routing settings to the library

You can save to the routing library while playback is stopped, or while playing back or recording.

To store the current routing settings to a library entry:

1 Press the QUICK SETUP key.

2 Use the dial to scroll down to the ROUTING LIB. entry in the list, and press ENTER:

3 There are two tabs on the top of this display: the READ tab allows you to read settings from the library, and the SAVE tab allows you to store the current settings to the library.

If the SAVE tab is not highlighted, press the ► key to highlight it.

4 Use the dial to scroll to the entry where you want to store the current settings.

TIP

You can give a title to the highlighted entry at this point, following the instructions in "Entering and editing titles" on page 26.

5 Press ENTER. The settings are saved and the display returns to the home screen.

Loading routing settings from the library

You can load previously stored routing settings from the library while playback is stopped, or while playing back or recording.

NOTE

Take care when changing routing settings via MIDI control while playing back or recording, as major changes to the routing settings may "open up" some channels and close others, giving unexpected results, which could result in a spoiled recording or even damage to monitoring equipment and your ears.

To load routing settings from a stored library entry:

1 **Press the QUICK SETUP key.**

2 **Use the dial to scroll down to the** ROUTING LIB. **entry in the list, and press ENTER:**

3 **Use the dial to scroll to the entry from where you want to load the new routing settings.**

4 **Press ENTER. The settings are loaded and the display returns to the assign map screen (see "Viewing assignments" on page 37), where you can view the effects of the load.**

Scene libraries

The 788 also allows you to load and store up to ten mixer scenes in a library for each song. These scenes are stored automatically when the song is saved.

The 788 stores the following mixer settings as part of a scene:

- Input assignment (including virtual track assignment)
- EQ settings
- Effector settings and assignment
- Effect and aux send levels
- Pan
- Digital pad/gain
- Track cue mixer settings (level and pan)
- Fader settings (including the **STEREO** fader)
- Sub-mixer settings

Since routing is included as part of a mixer scene, you do not need to store routing assignments separately from scenes unless you need to use the routing assignments in other songs.

NOTE

Monitor settings (selection and level), and **TRIM** *control settings, are not stored as part of a scene.*

Saving a scene to the library

You can save to the scene library while playback is stopped, or while playing back or recording.

To store the current scene settings to a library entry:

1 **Press the QUICK SETUP key.**

2 **Use the dial to scroll down to the** SCENE LIB. **entry in the list, and press ENTER:**

3 **There are two tabs on the top of this display: the** READ **tab allows you to read scenes from the library, and the** SAVE **tab allows you to store the current scene to the library. If the** SAVE **tab is not highlighted, press the ► key to highlight it.**

4 **Use the dial to scroll to the entry where you want to store the current settings.**

TIP

You can give a title to the highlighted entry at this point, following the instructions in "Entering and editing titles" on page 26.

5 **Press ENTER. The scene is saved and the display returns to the home screen.**

Loading scenes from the library

You can load previously stored scenes from the library while playback is stopped. You cannot load scenes (or change scenes using MIDI Program Change commands) while playing back or recording. If you attempt this, a message appears:
TRANSPORT MOVING.

To load scenes from a stored library entry:

1 **Press the QUICK SETUP key.**

2 **Use the dial to scroll down to the** SCENE LIB. **entry in the list, and press ENTER:**

3 **Use the dial to scroll to the entry from where you want to load the scene.**

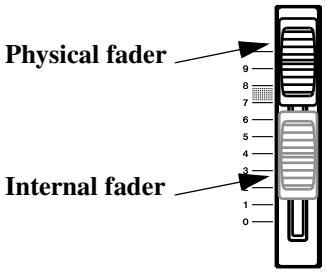
4 **Press ENTER. The scene is loaded and the display returns to the assign map screen (see "Viewing assignments" on page 37), where you can view the effects of the load.**

Other matters concerning scenes

Because the physical position of the faders on the 788 may not always match the position of the faders as recalled by the scene, this may cause unexpected results if you do not consider in advance what is happening when a scene is loaded.

This section explains some of the issues involved.

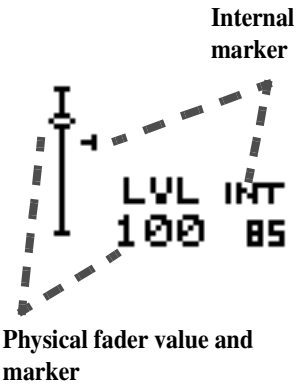
In this example, a channel's physical fader is set at a high level, and a scene is loaded from the library, where the internal fader setting is at a lower level.



NOTE

This also applies to the **STEREO** *fader, as well as the individual channel faders.*

As explained in "Internal and physical faders" on page 45, this means that when the **FADER/PAN** screen for the channel is shown, the values of both the internal fader and physical fader are shown:



The menu option described earlier in "Internal and physical faders" on page 45 allows you to specify what will be done when an internal fader value is loaded which is different from the physical fader value.

The CATCH option is probably the best option to choose in many cases, allowing you to leave the channel level unchanged until the physical fader catches the internal fader (that is, it matches the level of the internal fader).

The REAL option ignores the internal fader level which has been loaded—the physical fader is the only method of setting the level.

The JUMP option means that if the physical fader is moved, though, the level will instantly jump (up or down) to the physical fader position. This can cause unexpected results, and should be used with caution.

You can expand the options available to you when using the 788 by connecting it and synchronizing it to other musical equipment.

Typically, this extra equipment will be MIDI-based (sequencers, drum machines, synthesizers, etc.).

Of course, although it is possible to record MIDI instruments on the 788 tracks during the initial stages of the recording project, it may make more sense to use the eight audio tracks of the 788 for material that cannot be automated via MIDI (guitars and other acoustic instruments and of course vocals).

When it comes to mixdown time, the 788 allows you to extend the eight available audio tracks by playing additional sources through the sub-mixer and adding them to the mix (see "Sub-mixer" on page 48).

To make this work, though, the MIDI instruments and the 788 must be *synchronized* to each other, so that playback on one set of sound sources (the recorded audio tracks) keeps time with the sequenced MIDI tracks.

The 788 can synchronize with MIDI equipment in a number of different ways, as explained in this section, allowing a high degree of flexibility in the setup.

As well as synchronizing to other devices, it is also possible for the 788 to control other devices or to be controlled by them (see "MMC and MIDI functions" on page 101).

NOTE

All synchronization is carried out through the two MIDI ports on the rear panel of the 788, no matter what kind of synchronization is used, or the role of the 788 in the synchronization chain.

The 788 cannot use audible SMPTE/EBU timecode from the timestripe track of a tape. If the source to be synchronized with the 788 only has audible timecode available, it must be converted to and from MIDI timecode (MTC) as appropriate.

Master or slave?

The terms *master* and *slave* are used to name the controller and the controlled units in a chain of devices such as the 788 and other audio devices.

However, it is possible for a unit to be a master unit in one configuration at the same time as being a slave in another.

For example, the 788 may be set up to be a timecode master (other units receive their timecode from the 788 and act accordingly), and a control slave (it receives stop/start commands, etc.) from other units.

A 788 can also be a timecode (MTC) slave, and in this way, two 788s can be synchronized.

How to measure time?

There are two ways of counting time in music: one is the number of minutes and seconds since the beginning of the piece. This is the way in which tape recorders, etc. count time.

The other method of counting time is the number of bars (measures) since the beginning of the piece. This is the way in which MIDI sequencers typically count time.

There is no direct relationship between these two ways of counting, as the relationship depends on the tempo of the piece.

When synchronizing, therefore, one unit in the chain must be capable of making a map which relates the minutes and seconds of one system to the bars and beats of the other. If the tempo stays fairly constant throughout a piece, this is a matter of fairly simple arithmetic, but if the tempo changes through a piece, this is not so easy to do.

Synchronization methods

The 788 can use the following output synchronization methods for synchronization with other units:

MIDI Time Code (MTC) This is an absolute time position, which allows times to be defined to frame accuracy or better (the number of frames in a second depends on the frame rate, as explained later in this section). MTC has no direct relation to bars and beats in a song.

MIDI clock A MIDI clock defining the tempo at which a MIDI song is played back can be recorded.

MIDI Song Position Pointer (SPP): MIDI Song Position information data is used to position the slave device at the correct position in a song, expressed in bars and beats. Song Position Pointer information alone has no relationship to absolute time (minutes and seconds).

Synchronization settings on the 788

These synchronization methods listed above are used in the following way by the 788 when it is acting as a synchronization master for other units:

MTC The 788 outputs MIDI Timecode to the slave unit. It is the responsibility of the slave unit (sequencer, etc.) to turn this timecode into musically meaningful, i.e. bars and beats, information. This can also be used to synchronize another recording device which is not MIDI-based, but which can accept MTC, for example, another 788.

syncTrk (sync track) In this way of working, the 788 is synchronized to a slave MIDI device (sequencer, etc.) which is capable of recognizing and acting on MIDI clock and SPP information. The tempos to be used throughout the piece are first worked out on the slave device, and they have been finalized, the sequencer plays MIDI into the 788, which records the clock. The 788 can then play back these tempos, along with SPP information, and thereby act as a MIDI clock master for the system.

Tempo Map In this way of working, the tempos and time signatures throughout the song are entered on the 788, which then acts as the master unit, calculating the clock timings and transmitting them, together with Song Position Pointer information, to the slave devices.

In addition, the 788 can synchronize as a slave to incoming timecode (MTC), generated by a MIDI sequencer, etc. Note, however, that the MTC output by some computer systems may be a little erratic and unstable, and it is recommended that you do not use this method of synchronization with sequencers, but rather with other recording devices which can output stable MTC (such as other 788s).

Each of these different synchronization methods has its advantages and disadvantages. The most important thing to remember is that once something is recorded on the 788, it is impossible to change its tempo. By contrast, if something is recorded on a MIDI sequencer, it is easy to change its tempo.

For these reasons, you may find it easiest to determine the tempo on the sequencer, and record the MIDI *sync track* (click track) first. After you are completely happy with the tempo of this track, you can start to add the acoustic instruments, and lock the timing of the recorded sounds to that of the MIDI data.

Making synchronization settings

The 788 synchronization settings are all carried out using the SYNC/MIDI menu.

All synchronization information is carried through MIDI, so typically the **MIDI OUT** of the 788 must be connected to the **MIDI IN** of the MIDI device to which it is being synchronized, and the **MIDI IN** of the 788 should be connected to the **MIDI OUT** of the other unit.

Synchronization master/slave setting on the 788

To determine whether the 788 will act as the master or the slave with regard to synchronization:

1. **Make sure playback and recording are stopped, and press the MENU key.**
2. **Use the dial to scroll down to SYNC/MIDI, and press ENTER.**
3. **Use the dial to highlight SYNC, and press ENTER.**
4. **Use the ▲ and ▼ keys to move the cursor to SYNC SRC.**
5. **For internal synchronization (that is, the 788 becomes a synchronization master), use the dial to select INT. For external synchronization (synchronization slave), use the dial to select EXT.**

NOTE

If external synchronization is selected, the 788's transport keys (including jog and repeat) will not work until the synchronization is received at the **MIDI IN** *port. This is shown when you try to play or record, for example, by the appropriate key indicators flashing until the MTC is received. The 788 display also shows EXT SYNC when external synchronization is selected as explained here.*

6. **Press ENTER to return to the home screen, or use the ▲ and ▼ keys to select another option.**

Selecting the master synchronization type

If the 788 is set to be the synchronization master, you must then set the type of synchronization signal output to the slave units:

1. **Make sure playback and recording are stopped, and press the MENU key.**
2. **Use the dial to scroll down to SYNC/MIDI, and press ENTER.**
3. **Use the dial to highlight SYNC, and press ENTER.**
4. **Use the ▲ and ▼ keys to move the cursor to SYNC GEN.**
5. **There are four options available here (explained in more detail in "Synchronization methods" on page 95):**

OFF The 788 does not output any timing or sync information from the MIDI OUT when playing back or recording.

MTC MIDI Time Code—the 788 outputs MIDI timecode when playing back or recording.

CLOCK The 788 outputs a MIDI clock together with the Song Position Pointer information from the edited Tempo Map (see "Tempo map" on page 98) to synchronize an external sequencer.

SycTRK The 788 plays back a previously-recorded sync track (see "Sync track" on page 97) with SPP information, to synchronize an external sequencer.

NOTE

When the 788 is acting as a synchronization slave, the only synchronization source which is valid is MIDI Timecode.

MIDI Timecode frame rate

MIDI Timecode allows the use of different frame rates, which allow synchronization with all types of timecode available from other devices.

1. **Make sure playback and recording are stopped, and press the MENU key.**
2. **Use the dial to scroll down to SYNC/MIDI, and press ENTER.**
3. **Use the dial to highlight SYNC, and press ENTER.**

4 **Use the ▲ and ▼ keys to move the cursor to** FRAME RATE.

5 **Use the dial to select the frame rate for the outgoing timecode (or timecode to be received as a slave).**

24	24 frames/second. Used in the film industry
25	25 frames/second. Used in the EBU/SECAM (European, etc.) TV industry
29ND	29.97 frames/second non-drop. NTSC color TV for broadcast
29D	29.97 frames/second drop-frame. NTSC color TV
30ND	30 frames/second non-drop. NTSC mono TV

6 **Press ENTER to return to the home screen, or use the ▲ and ▼ keys to select another option.**

When you have made the selection on the 788, the other device (sequencer) must also be set to the same frame rate as that set on the 788. If they are different, you will not be able to synchronize the system properly. This applies whether the 788 is acting as a timecode slave or a timecode master in the system.

TIP

We suggest that unless you are working with video or movies, you use the 30ND setting, as this provides more frames per second, and hence greater precision.

MIDI Timecode offset (788 as slave only)

When the 788 is slaved to incoming MIDI timecode, you may need to adjust the time difference, so that the time used on the 788 closely corresponds to the "real" time.

For example, if the MIDI timecode master starts the timecode playback at 00:57:00:00, and the actual piece starts at 01:00:00:00, you might want to enter an offset of 3 minutes, so that when the piece starts, the ABS time on the 788 display shows 01:00:00:00 (see "The time display" on page 26). The MTC setting on the screen display will always show the incoming timecode values.

1 **Make sure playback and recording are stopped, and press the MENU key.**

2 **Use the dial to scroll down to** SYNC/MIDI**, and press ENTER.**

3 **Use the dial to highlight** SYNC**, and press ENTER.**

4 **Use the ▲ and ▼ keys to move the cursor to** MTC OFFSET.

5 **Use the ◄ and ► keys to move the cursor to the hours, minutes, seconds and frames field, and use the dial to adjust these values.**

NOTE

The maximum value you can set here is 23:59:59:xx (where xx is one less than the number of frames in a second—see "MIDI Timecode frame rate" on page 96).

Sync track

You can record a *sync track* from the source MIDI device, which allows the 788 to act as the synchronization master later on.

The sync track is not an audio track, but is a record of the MIDI clock. When replayed, SPP information is included.

It allows subtleties in tempo which are not possible with the tempo map method of working

Recording the sync track

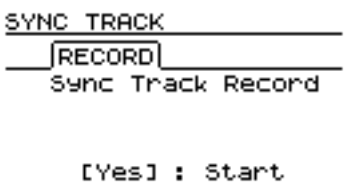
Before starting to record the sync track, make sure that:

- the tempo changes of the sequence are fixed and will not be changed in the future
- the **MIDI OUT** of the sequencer is connected to the **MIDI IN** of the 788
- the sequencer is set to transmit MIDI Clock and information when replaying

1 **Make sure playback and recording are stopped, and press the MENU key.**

2 **Use the dial to scroll down to** SYNC/MIDI**, and press ENTER.**

3 **Use the dial to highlight** SYNC TRACK**, and press ENTER.**



4 **Cue the sequencer to the start of the song (it is not possible to record from part of the way through).**

5 **Press ENTER/YES on the 788. The sync track is now "armed" and the display shows** `Wait for Start.`

6 **Start playing back the sequence. If the connections have been made properly, the 788 display shows** `Recording...`

To interrupt the recording of the sync track before the end, press NO.

7 **At the end of the sequence, or if the sequence is stopped, the 788 display shows** `Complete.` **Press EXIT/NO to save the sync track. If you press ENTER/YES at this point, you will re-arm the sync track and you will have to record it again.**

NOTE

The 788 and the sequencer should be independently controlled here (that is, neither should be a control slave of the other). See "MMC and MIDI functions" on page 101.

The start of the sync track is always the ABS 00:00:00:00 point, that is, the first beat of the first bar falls at the zero point. It is not possible to offset the sync track.

Using the sync track

To use the recorded sync track to control the external sequencer from the 788:

1 **Make sure that the synchronization source for the 788 is set to** `INT` **(internal)—see "Synchronization master/slave setting on the 788" on page 96. The MIDI OUT of the 788 should be connected to the MIDI IN of the sequencer.**

2 **Set the** `SYNC GEN` **parameter on the 788's** `SYNC` **screen to** `SycTRK` **(see "Selecting the master synchronization type" on page 96).**

3 **Set the sequencer to respond to an external clock source and make it ready to accept an external MIDI Start command.**

4 **Return to the home screen on the 788, and press PLAY. The sequencer starts playing back at the time position corresponding to the ABS time on the 788.**

NOTE

You do not have to start playback at the beginning of the song. If you locate to a time position on the 788, the sequencer will pick up the correct time from the MIDI SPP data output by the 788.

Although it is possible to change to the bars and beats display on the 788, the values displayed when using the sync track do not correspond to the bars and beats on the sequencer, unless a tempo map is entered on the 788 where the signature changes correspond to those in the sequence (note that even if the bar/beat position matches the sequencer, the tempo probably will not). You should therefore usually use the ABS time values when locating, as these are generally more meaningful location values.

Tempo map

You can enter the tempo map to allow the 788 to send tempo (clock) and SPP information to a MIDI device, when it is not possible to record a sync track.

Another advantage of using the tempo map is that it allows you to locate to bars and beat positions on the 788, as described in "Direct location (ii)" on page 61 (using the sync track does not automatically map the bars and beats), and this is therefore a more "musical" way of controlling the synchronization of the 788 with a sequencer.

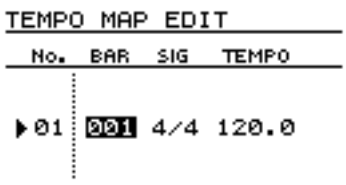
Entering and editing the tempo map

You must enter the tempo map manually, using the procedure described here:

1 **Make sure playback and recording are stopped, and press the MENU key.**

2 **Use the dial to scroll down to** `SYNC/MIDI`**, and press ENTER.**

3 **Use the dial to highlight** `TEMPO MAP`**, and press ENTER.**



4 There is one entry automatically included in a new tempo map. The four columns in the displayed table correspond to the following:

No.	The number of the entry in the table map (this cannot be edited)
BAR	The bar at which this table map entry starts to take effect
SIG	The time signature of this table map entry
TEMPO	The tempo in beats per minute of this tempo map entry

5 Use the ◄ and ► keys to move between the three editable fields, and use the dial to change the values of these fields.

BAR This value cannot be changed to a value which is equal to or less than that of the entry before it, and it cannot be changed to a value which is equal to or greater than that of the entry after it.

SIG You can set the time signature using the following rules: the number of beats in a bar can be set to be any number from 1 through 8, and the value of the beat can be 1 (full note (semibreve)), 2 (half-note (minim)), 4 (quarter-note (crotchet)) or 8 (eighth-note (quaver)). Values such as 7/8 are therefore possible, but 11/4 is not.

Tempo The maximum tempo value is 250.0, and the minimum value is 20.0. You can set the decimal part of the tempo value independently of the main part.

6 Use the INSERT (MOVE) key to insert a new entry after the currently highlighted entry.

7 Use the ▲ and ▼ keys to move between entries in the tempo map table.

8 Use the DELETE (SILENCE) key to delete the currently-highlighted entry.

9 Press ENTER when you have entered the complete tempo map.

NOTE

The tempo map must correspond to the musical structure of the song on the sequencer. If part of the song is in 3/4, but the tempo map is all in 4/4 time, it will be impossible to relate the tempo map to the song.

TIP

It is not possible to enter a tempo change part of the way through a bar, and therefore you cannot do gradual speeding up and slowing down using a tempo map. If you need this kind of capability, we suggest that you do these tempo changes on the sequencer, and then use the sync track facility to record the tempo changes from the sequencer.

The tempo map is stored as part of the song on disk and is reloaded automatically together with the song. It is therefore possible for you to make a song, complete with a tempo map, store it to removable media, and take it to another 788-equipped facility

Using the tempo map

When the tempo map has been recorded, you can use it in the following way:

1 Make sure that the synchronization source for the 788 is set to INT (internal)—see "Synchronization master/slave setting on the 788" on page 96. The MIDI OUT of the 788 should be connected to the MIDI IN of the sequencer.

2 Set the SYNC GEN parameter on the 788's SYNC screen to CLOCK (see "Selecting the master synchronization type" on page 96).

3 Set the sequencer to respond to an external clock source and SPP information and make it ready to accept an external MIDI Start command from the 788.

4 When you start playing the 788, from the home display, the MIDI device will also start playing.

5 You can use the bars and beats facility on the home display of the 788 to locate to specific bars and beats in the sequencer song.

NOTE

The tempo of the sequencer playback will be determined by the tempo map on the 788, and will not be affected by the settings made on the sequencer.

If you make a tempo map, this can be used as the source for the internal metronome (if the tempo does not need to change inside a bar).

Using MTC to control a sequencer

1 **Make sure that the synchronization source for the 788 is set to INT (internal)—see "Synchronization master/slave setting on the 788" on page 96.**

2 **Set the SYNC GEN parameter on the 788's SYNC screen to MTC (see "Selecting the master synchronization type" on page 96).**

3 **Set the sequencer to respond to MTC. Usually, sequencers will start automatically when MTC is received, if set up in this way.**

4 **When you start playing the 788, the sequencer will start playing at the point located to by the 788.**

5 **Use the ABS timing method to locate to time-based points on the 788.**

NOTE

The tempo of the sequencer is determined by the sequencer itself. If you record a track on the 788 in time with the sequencer, and then change the sequencer tempo while the sequencer is synchronized to the 788 in this way, the recorded audio track will be out of time with the MIDI tracks.

Bars and beats on the 788 have no meaning when synchronizing in this way, unless a tempo map is manually entered on the 788.

Not every sequencer or sequencer program is capable of accepting MTC. If your sequencer cannot accept MTC and use this to synchronize, you must use one of the other methods of synchronizing with the 788.

Metronome

The 788 also includes a metronome, which is related to the internal tempo map and takes its timing from the map. If you use the metronome, you should take care that the tempo used in the tempo map matches the tempo map of all other instruments in the setup.

NOTE

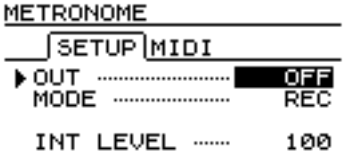
The metronome can only be output when the SYNC GEN option is set to CLOCK or SycTRK ("Selecting the master synchronization type" on page 96). It cannot be output when it is set to the OFF or MTC values.

It can be output through the monitor speakers, or as a MIDI note.

1 **Make sure playback and recording are stopped, and press the MENU key.**

2 **Use the dial to scroll down to SYNC/MIDI, and press ENTER.**

3 **Use the dial to highlight METRONOME, and press ENTER.**



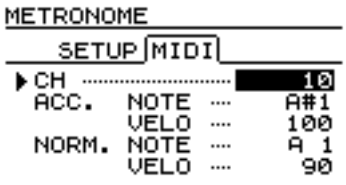
4 **Make sure that the SETUP tab is highlighted. Use the cursor keys and the wheel to set the following parameters:**

OUTPUT Determines the kind of metronome: OFF (no metronome), INT (internal, through the **MONITOR OUTPUT**s and **PHONES**) and MIDI (a MIDI note; see below)

MODE Determines when the metronome will be output: REC (recording only) or RECPLY (recording and playback)

INT LEVEL Sets the level of the metronome when INT is selected as the output type (from 0 through 127).

5 **If you selected MIDI as the output type, use the ► key to select the MIDI tab:**



CH The MIDI channel on which the metronome note will be transmitted (10 is the General MIDI channel used for drums).

ACC. NOTE The note on which the accented (first beat of the bar) metronome will be output.

(ACC.) VELO The velocity of the accented metronome notes (usually louder than the other beats).

NORM. NOTE The note on which non-accented metronome notes will be played.

(NORM.) VELO The velocity of non-accented metronome notes.

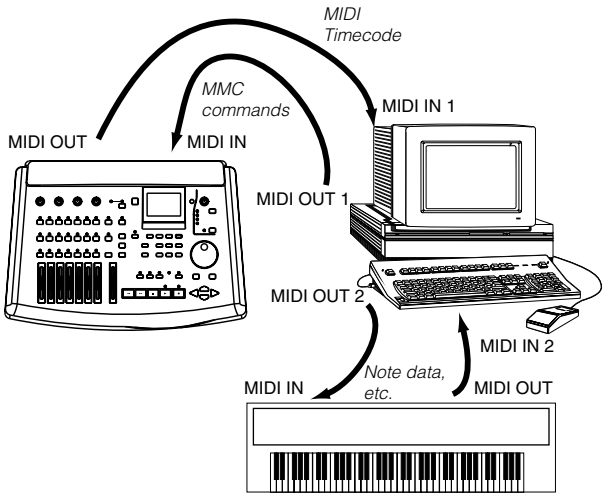
The 788 can both control other devices, and be controlled by them, using MIDI Machine Control messages (MMC).

In addition, MIDI messages can be sent to the 788 in order to control the parameters remotely.

MIDI Machine Control

The 788 can be either a control slave or master and a timecode slave or master. This means that your only restrictions are with the other unit.

One common way to set up the 788 with a sequencer is to allow all 788 transport operations to be controlled from the sequencer.



The sequencer is set to be a timecode slave, but an MMC master.

The 788 is set to be a timecode master, but an MMC slave.

In this setup, when the play command is issued from the sequencer, the appropriate locate and play commands are received by the 788, which starts its playback at the correct point.

The sequencer is waiting for MIDI timecode to be received before it can start playback, however.

MIDI Timecode is transmitted from the 788, and read by the sequencer.

The sequencer now starts to play back, locked to the incoming timecode.

When the sequencer issues a stop command, the 788 responds to this stop, and timecode also stops.

Because the sequencer needs timecode to continue playback, and the timecode has now stopped, the sequencer playback now stops.

However, this is not the only way in which the 788 can control and be controlled by MMC. You should consult the documentation of the other devices in your setup to find out the possible combinations which will help you work most efficiently with the 788.

NOTE

Not every MMC command is accepted or transmitted by the 788. See “Bit-map array of MMC commands” on page 103 and “Bit-map array of Response/Information fields” on page 104 for details of the MMC commands accepted and transmitted by the 788.

788 MMC slave/master setting

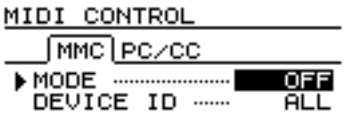
To set the 788 as either an MMC slave or master, follow the steps below.

1 **With the transport stopped, press the MENU key.**

2 **Use the dial to scroll down to the SYNC/MIDI menu and press ENTER.**

3 **Use the dial to scroll down to the CONTROL menu item and press ENTER.**

4 **There are two tabs on this screen. Use the ◄ key to ensure that the MMC tab is visible.**



5 **Use the ▲ and ▼ keys to highlight the MODE menu item.**

6 **Use the dial to select the appropriate setting:**

OFF	All MMC commands to the 788 will be ignored. The 788 does not transmit any MMC commands.
MASTER	All MMC commands to the 788 will be ignored. The 788 transmits MMC commands.
SLAVE	MMC commands to the 788 will be recognized. The 788 does not transmit any MMC commands.

7 **Press ENTER to confirm the setting.**

NOTE

If the 788 is set up as an MMC slave, this does not disable the local transport controls. You can still use these controls to play, record, locate, etc.

MMC ID

You can set an MMC ID for the 788. This ID can be used to distinguish it from other units in the control chain, and to receive messages which are intended only for it.

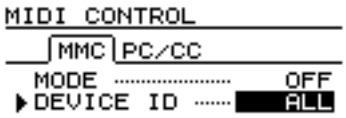
Alternatively, you can select a "universal" mode which means that the 788 will respond to all MMC commands received over the system.

1 **With the transport stopped, press the MENU key.**

2 **Use the dial to scroll down to the SYNC/MIDI menu and press ENTER.**

3 **Use the dial to scroll down to the CONTROL menu item and press ENTER.**

4 **There are two tabs on this screen. Use the ◄ key to ensure that the MMC tab is visible.**



5 **Use the ▲ and ▼ keys to highlight the DEVICE ID menu item.**

6 **Use the dial to make the setting: either ALL or a value from 1 through 127.**

Note that some devices may start counting from 0 and go up to 126 as the highest individual ID that can be set. With these units, a setting of 127 corresponds to the ALL setting.

Bit-map array of MMC commands

Byte	Bit7	Bit6 (40H)	Bit5 (20H)	Bit4 (10H)	Bit3 (08H)	Bit2 (04H)	Bit1 (02H)	Bit0 (01H)
c0	– 0	(06) RECORD STROBE	(05) REWIND	(04) FAST FORWARD	(03) DEFERRED PLAY	(02) PLAY	(01) STOP	(00) reserved
c1	– 0	(0D) MMC RESET	(0C) ~~COMMAND~~ ~~ERROR RESET~~	(0B) ~~CHASE~~	(0A) ~~EJECT~~	(09) PAUSE	(08) ~~RECORD~~ ~~PAUSE~~	(07) RECORD EXIT
c2	– 0	(14)	(13)	(12)	(11)	(10)	(0F)	(0E)
c3	– 0	(1B)	(1A)	(19)	(18)	(17)	(16)	(15)
c4	– 0	- 0	- 0	- 0	(1F)	(1E)	(1D)	(1C)
c5	– 0	(26)	(25)	(24)	(23)	(22)	(21)	(20)
c6	– 0	(2D)	(2C)	(2B)	(2A)	(29)	(28)	(27)
c7	– 0	(34)	(33)	(32)	(31)	(30)	(2F)	(2E)
c8	– 0	(3B)	(3A)	(39)	(38)	(37)	(36)	(35)
c9	– 0	– 0	– 0	– 0	(3F)	(3E)	(3D)	(3C)
c10	– 0	(46) SEARCH	(45) VARIABLE PLAY	(44) LOCATE	(43) ~~UPDATE~~	(42) READ	(41) MASKED WRITE	(40) WRITE
c11	– 0	(4D) ~~ADD~~	(4C) ~~MOVE~~	(4B) ~~MTC~~ ~~COMMAND~~	(4A) ~~GENERATOR~~ ~~COMMAND~~	(49) ~~ASSIGN~~ ~~SYS, MAS~~	(48) ~~STEP~~	(47) SHUTTLE
c12	– 0	(54) ~~DEFERRED~~ ~~VARI, PLAY~~	(53) ~~COMMAND~~ ~~SEGMENT~~	(52) ~~GROUP~~	(51) ~~EVENT~~	(50) ~~PROCEDURE~~	(4F) ~~DROP FR~~ ~~ADJUST~~	(4E) ~~SUBTRACT~~
c13	– 0	(5B)	(5A)	(59)	(58)	(57)	(56)	(55) ~~REC STROBE~~ ~~VARIABLE~~
c14	– 0	– 0	– 0	– 0	(5F)	(5E)	(5D)	(5C)
c15	– 0	(66)	(65)	(64)	(63)	(62)	(61)	(60)
c16	– 0	(6D)	(6C)	(6B)	(6A)	(69)	(68)	(67)
c17	– 0	(74)	(73)	(72)	(71)	(70)	(6F)	(6E)
c18	– 0	(7B)	(7A)	(79)	(78)	(77)	(76)	(75)
c19	– 0	- 0	- 0	- 0	(7F) ~~RESUME~~	(7E)	(7D)	(7C) ~~WAIT~~

Bit-map array of Response/Information fields

Byte	Bit7	Bit6 (40H)	Bit5 (20H)	Bit4 (10H)	Bit3 (08H)	Bit2 (04H)	Bit1 (02H)	Bit0 (01H)
r0	– 0	(06) ~~GENERATOR TIMECODE~~	(05) ~~LOCK DEVIATION~~	(04) ~~ACTUAL OFFSET~~	(03) ~~REQUESTED OFFSET~~	(02) ~~SELECTED MASTER CODE~~	(01) SELECTED TIMECODE	(00) reserved
r1	– 0	(0D) GP5	(0C) GP4	(0B) GP3	(0A) GP2	(09) GP1	(08) GP0/LOCATE POINT	(07) ~~MTC INPUT~~
r2	– 0	(14)	(13)	(12)	(11)	(10)	(0F) GP7	(0E) GP6
r3	– 0	(1B)	(1A)	(19)	(18)	(17)	(16)	(15)
r4	– 0	– 0	– 0	– 0	(1F)	(1E)	(1D)	(1C)
r5	– 0	(26) ~~Short GENERATOR TIMECODE~~	(25) ~~Short LOCK DEVIATION~~	(24) ~~Short ACTUAL OFFSET~~	(23) ~~Short REQUESTED OFFSET~~	(22) ~~Short SELECTED MASTER CODE~~	(21) ~~Short SELECTED TIMECODE~~	(20) reserved
r6	– 0	(2D) Short GP5	(2C) Short GP4	(2B) Short GP3	(2A) Short GP2	(29) Short GP1	(28) Short GP0 LOCATE POINT	(27) ~~Short MTC INPUT~~
r7	– 0	(34)	(33)	(32)	(31)	(30)	(2F) Short GP7	(2E) Short GP6
r8	– 0	(3B)	(3A)	(39)	(38)	(37)	(36)	(35)
r9	– 0	– 0	– 0	– 0	(3F)	(3E)	(3D)	(3C)
r10	– 0	(46) ~~SELECTED TIMECODE SOURCE~~	(45) ~~TIME STANDARD~~	(44) ~~COMMAND ERROR LEVEL~~	(43) ~~COMMAND ERROR~~	(42) ~~RESPONSE ERROR~~	(41) ~~UPDATE RATE~~	(40) SIGNATURE
r11	– 0	(4D) RECORD STATUS	(4C) RECORD MODE	(4B) ~~FAST MODE~~	(4A) ~~STOP MODE~~	(49) ~~VELOCITY TALLY~~	(48) MOTION CONTROL TALLY	(47) ~~SELECTED TIMECODE USER BITS~~
r12	– 0	(54) ~~STEP LENGTH~~	(53) ~~TRACK INPUT MONITOR~~	(52) ~~TRACK SYNC MONITOR~~	(51) ~~RECORD MONITOR~~	(50) ~~GLOBAL MONITOR~~	(4F) TRACK RECORD READY	(4E) TRACK RECORD STATUS
r13	– 0	(5B) ~~GENERATOR COMMAND TALLY~~	(5A) ~~CHASE MODE~~	(59) ~~RESOLVED PLAY MODE~~	(58) ~~CONTROL DISABLE~~	(57) ~~LIFTER DEFEAT~~	(56) ~~FIXED SPEED~~	(55) ~~PLAY SPEED REFERENCE~~
r14	– 0	– 0	– 0	– 0	(5F) ~~MTC SETUP~~	(5E) ~~MTC COMMAND TALLY~~	(5D) ~~GENERATOR USER BITS~~	(5C) ~~GENERATOR SETUP~~
r15	– 0	(66)	(65) FAILURE	(64) ~~RESPONSE SEGMENT~~	(63) ~~VITC INSERT ENABLE~~	(62) ~~TRACK MUTE~~	(61) ~~EVENT RESPONSE~~	(60) ~~PROCEDURE RESPONSE~~
r16	– 0	(6D)	(6C)	(6B)	(6A)	(69)	(68)	(67)
r17	– 0	(74)	(73)	(72)	(71)	(70)	(6F)	(6E)
r18	– 0	(7B)	(7A)	(79)	(78)	(77)	(76)	(75)
r19	– 0	– 0	– 0	– 0	(7F) ~~RESUME~~	(7E)	(7D)	(7C) ~~WAIT~~

Program Change messages

The 788 can receive MIDI Program Change messages to change the effect settings (“Effects” on page 81), the routing patterns stored in a library (“Routing libraries” on page 91) or scenes (“Scene libraries” on page 92).

It cannot transmit Program Change messages.

NOTE

Scene memories cannot be changed while the transport is moving. The transport must be stopped for these Program Change messages to have any effect.

MIDI Bank Select messages are used to distinguish between preset and user libraries.

The MIDI channel number is used to determine what setting will be changed on receipt of a Program Change message.

Effects		
MIDI ch.	**Target**	**Range**
1-7	Channel dynamics	bank0(preset):0-**, bank1(user):0-127
9	Stereo dynamics	bank0(preset):0-**, bank1(user):0-127
10	Stereo effect1	bank0(preset):0-**, bank1(user):0-127
11	Stereo effect2	bank0(preset):0-**, bank1(user):0-127
12	Multi effect	bank0(preset):0-**, bank1(user):0-127
Mixer		
15	Routing Library	0-127
16	Scene memory	0-9

Note that channel dynamic processors 1 through 7-8 are controlled through MIDI channels 1 through 7 (channel 7 handles the dynamics processor for channels 7-8).

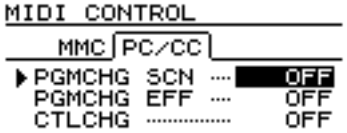
If two channels are linked as a stereo pair, MIDI Program Change messages for either channel of the pair will affect the effect assigned to the pair.

Enabling/disabling Program Change

You can enable or disable the way that the 788 responds to Program Change, as explained here.

The 788 can be set to respond to Program Change messages for the mixer (channels 15 and 16), for the effects (1 through 12), both, or neither.

1. **With the transport stopped, press the MENU key.**
2. **Use the dial to scroll down to the SYNC/MIDI menu and press ENTER.**
3. **Use the dial to scroll down to the CONTROL menu item and press ENTER.**
4. **There are two tabs on this screen. Use the ► key to ensure that the PC/CC tab is visible.**



5. **Use the ▲ and ▼ keys to highlight the PGMCHG SCN (Program Change for scenes and routing tables) or the PGMCHG EFF (Program Change for effects) menu item.**
6. **Use the dial to turn the appropriate parameter ON or OFF.**

Control Change messages

The 788 can also respond to Control Change messages in real time in order to allow control of individual parameters.

It cannot transmit Control Change messages.

Enabling/disabling Control Change messages

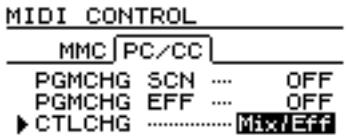
You can enable or disable the 788 response to Control Change messages, as explained here.

1 **With the transport stopped, press the MENU key.**

2 **Use the dial to scroll down to the SYNC/MIDI menu and press ENTER.**

3 **Use the dial to scroll down to the CONTROL menu item and press ENTER.**

4 **There are two tabs on this screen. Use the ► key to ensure that the PC/CC tab is visible.**



5 **Highlight the CTLCHG (Control Change) menu item.**

6 **Use the dial to turn the appropriate parameter on (Mix/Eff) or OFF.**

Mixer Control Change

The MIDI channel numbers are used to determine the mixer channel that will be affected by the Control Change messages.

Note that for channels 7 and 8 (and any stereo linked channels) that a Control Change command sent to one of the MIDI channels corresponding to these linked mixer channels will have an effect on the parameters of both mixer channels.

MIDI channel	Target	Remark
1– 8	Mixer channel	mixer channels1 through 8
16	Master block	Fader, Effect Level, Aux Level

The Control Change messages for the mixer are as follows:

Control No	Parameter	Range
7	Fader[a]	0 through 100 through 127 = –∞,through 0 through +6 dB
10	Pan	1 through 64 through 127 = L63 through C through R63
11	Pad/gain	0 through 8 = -42,-36,-30,-24,-18,-12,-6, 0,+6 dB
16	Low Frequency	0 through 31 = 32, 40, 50, 60, 70, 80, 90, 100, 125, 150, 175, 200, 225, 250, 300, 350, 400, 450, 500, 600, 700, 800, 850, 900, 950, 1.0k, 1.1k, 1.2k, 1.3k, 1.4k, 1.5k, 1.6k
17	Low Gain	0 through 12 through 24 = -12 through 0 through +12 dB
18	Mid Frequency	0 through 64 = 32, 40, 50, 60, 70, 80, 90, 100, 125, 150, 175, 200, 225, 250, 300, 350, 400, 450, 500, 600, 700, 800, 850, 900, 950, 1.0k, 1.1k, 1.2k, 1.3k, 1.4k, 1.5k, 1.6k, 1.7k, 1.8k, 1.9k, 2.0k, 2.2k, 2.4k, 2.6k, 2.8k, 3.0k, 3.2k, 3.4k, 3.6k, 3.8k, 4.0k, 4.5k, 5.0k, 5.5k, 6.0k, 6.5k, 7.0k, 7.5k, 8.0k, 9.0k, 10k, 11k, 12k, 13k, 14k, 15k, 16k, 17k, 18k
19	Mid Gain	0 through 12 through 24 = -12 through 0 through +12 dB
20	Mid Q	0 through 6 = 0.25, 0.5, 1, 2, 4, 8 , 16
21	High Frequency	0 through 31 = 1.7k, 1.8k, 1.9k, 2.0k, 2.2k, 2.4k, 2.6k, 2.8k, 3.0k, 3.2k, 3.4k, 3.6k, 3.8k, 4.0k, 4.5k, 5.0k, 5.5k, 6.0k, 6.5k, 7.0k, 7.5k, 8.0k, 9.0k, 10k, 11k, 12k, 13k, 14k, 15k, 16k, 17k, 18k
22	High Gain	0 through 12 through 24 = -12 through 0 through +12 dB
23	Effect Level[a]	0 through 100 through 127 = -∞ through 0 through +6 dB
24	Effect Pan	1 through 64 through 127 = L63 through C through R63
25	Aux Level[a]	0 through 100 through 127 = -∞ through 0 through +6 dB

Control No	Parameter	Range
26	Aux Pan	1 through 64 through 127 = L63 through C through R63
27	Cue Level	0 through 100 through 127 = –∞ through 0 through +6 dB
28	Cue Pan	1 through 64 through 127 = L63 through C through R63
80	EQ SW	0, 1 = OFF, ON
81	Effect Post	0, 1, 2 = OFF, PRE, POST
82	Aux Post	0, 1, 2 = OFF, PRE, POST

a.These parameters and only these parameters, apply to the master section on MIDI channel 16.

Effect Control Change messages

The parameters of the two internal effectors can also be changed using Control Change messages.

The bank (user or preset) and effect number are selected before the parameters are changed. This will load the appropriate effect settings, so that the effects of the Control Change settings can be auditioned.

The MIDI channel number of the message is used to determine which effector is affected by the message:

MIDI channel	Target	Remark
1 – 8	Channel dynamics	ch1 through ch8
9	Stereo dynamics	-
10	Stereo effect1	(for EFFECT1)
11	Stereo effect2	(for EFFECT2)
12	Multi effect	-

The parameters to be changed in this way are accessed following the table below.

Note that the parameter to be accessed must first be selected using the Non-Registered Parameter Numbers as given here in this section:

Control Change	Effect	Range
0	Bank select (MSB)	0
32	Bank select (LSB)	0 = Preset, 1 = User
6	Data entry (MSB)	(for effect parameter)
38	Data entry (LSB)	(for effect parameter)
96	Data increment	(for effect parameter)
97	Data decrement	(for effect parameter)
98	NRPN (LSB)	(select effect parameter number)[a]
99	NRPN (MSB)	(select effect parameter number) *1

a.The 788 makes extensive use of Non-Registered Parameter Numbers (NRPNs) in order to address the large range of parameters available for the effects. These NRPNs are given below:

NRPN values for multi-channel and stereo dynamics processors

NRPN	Parameter	Range
00 00	Threshold	0 through 30 = -46 through -16 dB
00 01	Attack	0 through 15 = 0.1 through 0.6, 0.8, 1.0, 1.5, 2.0 through 6.0, 8.0, 10.0 msec
00 02	Ratio	0 through 8 = 1.0:1, 1.1:1, 1.3:1, 1.6:1, 2.0:1, 2.7:1, 4.0:1, 8.0:1, ∞:1
00 03	Post Gain	0 through 30 = 0 through 30 dB
00 04	Switch	0, 1 = Off, On

NRPN values for single stereo effects

Reverb

NRPN	Parameter	Range
00 00	Room Type	0 through 3 = Hall, Room, Live, Studio
00 01	Pre Delay	0 through 250 = 0 through 250msec
00 02	Rev Time	0 through 99 = 0.1 through 10.0sec
00 03	Diffusion	0 through 100
00 04	Out Level	0 through 100 through 127 = –∞ through 0 through +6 dB

Delay

NRPN	Parameter	Range
00 00	Type	0 through 2 = Stereo, Ping-Pong, Multi-Tap
00 01	Pre Delay	0 through 1000 = 0 through 1000msec
00 02	FB Delay	0 through 1000 = 0 through 1000msec
00 03	Feedback	0 through 100
00 04	Out Level	0 through 100 through 127 = –∞ through 0 through +6 dB

Chorus

NRPN	Parameter	Range
00 00	Rate	0 through 99 = 0.1 through 10.0Hz
00 01	Depth	0 through 100
00 02	FB Delay	0 through 100 = 0 through 100 msec
00 03	Feedback	0 through 100
00 04	Out Level	0 through 100 through 127 = –∞ through 0 through +6 dB

Pitch Shifter

NRPN	Parameter	Range
00 00	Pitch	0 through 12 through 24 = –12 through 0 through 12
00 01	Fine	0 through 50 through 100 = –50 through 0 through 50 cents
00 02	FB Delay	0 through 500 = 0 through 500 msec
00 03	Feedback	0 through 100
00 04	Out Level	0 through 100 through 127 = –∞through 0 through +6 dB

Flanger

NRPN	Parameter	Range
00 00	Rate	0 through 99 = 0.1 through 10.0Hz
00 01	Depth	0 through 100
00 02	FB Delay	0 through 1000 = 0 through 1000msec
00 03	Feedback	0 through 100
00 04	Out Level	0 through 100 through 127 = –∞ through 0 through +6 dB

Phaser

NRPN	Parameter	Range
00 00	Rate	0 through 99 = 0.1 through 10.0Hz
00 01	Depth	0 through 100
00 02	Resonance	0 through 100
00 03	Step	0 through 3 = 4, 8, 12, 16
00 04	Out Level	0 through 100 through 127 = –∞ through 0 through +6 dB

Reverb and Gate

NRPN	Parameter	Range
00 00	Type	0, 1 = Normal, Reverse
00 01	Threshold	0 through 30 = -46 through -16 dB
00 02	Gate Time	0 through 300 = 10 through 3000msec
00 03	Density	0 through 100
00 04	Out Level	0 through 100 through 127 = –∞ through 0 through +6 dB

NRPN values for distortion multi-effect processor settings (1)

Compressor->Distortion->Noise Gate->Flanger->Reverb

NRPN	Parameter	Range
00 00	Comp:Compress	0 through 100
00 01	Comp:Attack	0 through 100
00 02	Comp:Post Gain	0 through 30 = 0 through 30 dB
00 03	Comp:Switch	0, 1 = Off, On
00 04	Dist:Pre Gain	0 through 20 = 40 through 60 dB
00 05	Dist:Drive	0 through 100
00 06	Dist:Out Level	0 through 12 = 0 through 12 dB
00 07	Dist:Switch	0, 1 = Off, On
00 08	Gate:Threshold	0 through 60 = -76 through -16 dB
00 09	Gate:Release	0 through 100
00 10	Gate:Suppress	0, 1 through 31 = –∞,-30 through 0 dB
00 11	Gate:Switch	0, 1 = Off, On
00 12	Flanger:Rate	0 through 100 = 0.0 through 10.0Hz
00 13	Flanger:Depth	0 through 100
00 14	Flanger:Feedback	0 through 100
00 15	Flanger:Switch	0, 1 = Off, On
00 16	Reverb:Pre Delay	0 through 150 = 0 through 150msec
00 17	Reverb:Hi Damp	0 through 10
00 18	Reverb:Mix Level	0 through 100
00 19	Reverb:Switch	0, 1 = Off, On

Compressor->Distortion->Noise Gate->Flanger->Delay

NRPN	Parameter	Range
00 00	Comp:Compress	0 through 100
00 01	Comp:Attack	0 through 100
00 02	Comp:Post Gain	0 through 30 = 0 through 30 dB
00 03	Comp:Switch	0, 1 = Off, On
00 04	Dist:Pre Gain	0 through 20 = 40 through 60 dB
00 05	Dist:Drive	0 through 100
00 06	Dist:Out Level	0 through 12 = 0 through 12 dB
00 07	Dist:Switch	0, 1 = Off, On
00 08	Gate:Threshold	0 through 60 = -76 through -16 dB
00 09	Gate:Release	0 through 100
00 10	Gate:Suppress	0, 1 through 31 = –∞,-30 through 0 dB
00 11	Gate:Switch	0, 1 = Off, On
00 12	Flanger:Rate	0 through 100 = 0.0 through 10.0Hz
00 13	Flanger:Depth	0 through 100
00 14	Flanger:Feedback	0 through 100
00 15	Flanger:Switch	0, 1 = Off, On
00 16	Delay:FB delay	0 through 1000 = 0 through 1000msec
00 17	Delay:Feedback	0 through 100
00 18	Delay:Mix Level	0 through 100
00 19	Delay:Switch	0, 1 = Off, On

Compressor->Distortion->Noise Gate->Exciter->Reverb

NRPN		
00 00	Comp:Compress	0 through 100
00 01	Comp:Attack	0 through 100
00 02	Comp:Post Gain	0 through 30 = 0 through 30 dB
00 03	Comp:Switch	0, 1 = Off, On
00 04	Dist:Pre Gain	0 through 20 = 40 through 60 dB
00 05	Dist:Drive	0 through 100
00 06	Dist:Out Level	0 through 12 = 0 through 12 dB
00 07	Dist:Switch	0, 1 = Off, On
00 08	Gate:Threshold	0 through 60 = -76 through -16 dB
00 09	Gate:Release	0 through 100
00 10	Gate:Suppress	0, 1 through 31 = –∞,-30 through 0 dB
00 11	Gate:Switch	0, 1 = Off, On
00 12	Exciter:Frequency	0 through 90 = 1.0 through 10.0kHz
00 13	Exciter:Depth	0 through 100
00 14	(reserved)	
00 15	Exciter:Switch	0, 1 = Off, On
00 16	Reverb:Pre Delay	0 through 150 = 0 through 150msec
00 17	Reverb:Hi Damp	0 through 10
00 18	Reverb:Mix Level	0 through 100
00 19	Reverb:Switch	0, 1 = Off, On

Compressor->Distortion->Noise Gate->Exciter->Delay

NRPN	Parameter	Range
00 00	Comp:Compress	0 through 100
00 01	Comp:Attack	0 through 100
00 02	Comp:Post Gain	0 through 30 = 0 through 30 dB
00 03	Comp:Switch	0,1 = Off, On
00 04	Dist:Pre Gain	0 through 20 = 40 through 60 dB
00 05	Dist:Drive	0 through 100
00 06	Dist:Out Level	0 through 12 = 0 through 12 dB
00 07	Dist:Switch	0,1 = Off, On
00 08	Gate:Threshold	0 through 60 = -76 through -16 dB
00 09	Gate:Release	0 through 100
00 10	Gate:Suppress	0,1 through 31 = -∞,-30 through 0 dB
00 11	Gate:Switch	0,1 = Off, On
00 12	Exciter:Frequency	0 through 90 = 1.0 through 10.0kHz
00 13	Exciter:Depth	0 through 100
00 14	(reserved)	
00 15	Exciter:Switch	0,1 = Off, On
00 16	Delay:FB delay	0 through 1000 = 0 through 1000msec
00 17	Delay:Feedback	0 through 100
00 18	Delay:Mix Level	0 through 100
00 19	Delay:Switch	0,1 = Off, On

Compressor->Distortion->Noise Gate->Pitch Shifter->Reverb

NRPN		
00 00	Comp:Compress	0 through 100
00 01	Comp:Attack	0 through 100
00 02	Comp:Post Gain	0 through 30 = 0 through 30 dB
00 03	Comp:Switch	0, 1 = Off, On
00 04	Dist:Pre Gain	0 through 20 = 40 through 60 dB
00 05	Dist:Drive	0 through 100
00 06	Dist:Out Level	0 through 12 = 0 through 12 dB
00 07	Dist:Switch	0, 1 = Off, On
00 08	Gate:Threshold	0 through 60 = -76 through -16 dB
00 09	Gate:Release	0 through 100
00 10	Gate:Suppress	0, 1 through 31 = –∞,-30 through 0 dB
00 11	Gate:Switch	0, 1 = Off, On
00 12	Pitch:Pitch	0 through 12 through 24 = -12 through 0 through 12
00 13	Pitch:Fine	0 through 50 through 100 = -50 through 0 through 50 cents
00 14	Pitch:Balance	0 through 100
00 15	Pitch:Switch	0, 1 = Off, On
00 16	Reverb:Pre Delay	0 through 150 = 0 through 150msec
00 17	Reverb:Hi Damp	0 through 10
00 18	Reverb:Mix Level	0 through 100
00 19	Reverb:Switch	0, 1 = Off, On

Compressor->Distortion->Noise Gate->Pitch Shifter->Delay

NRPN	Parameter	Range
00 00	Comp:Compress	0 through 100
00 01	Comp:Attack	0 through 100
00 02	Comp:Post Gain	0 through 30 = 0 through 30 dB
00 03	Comp:Switch	0, 1 = Off, On
00 04	Dist:Pre Gain	0 through 20 = 40 through 60 dB
00 05	Dist:Drive	0 through 100
00 06	Dist:Out Level	0 through 12 = 0 through 12 dB
00 07	Dist:Switch	0, 1 = Off, On
00 08	Gate:Threshold	0 through 60 = -76 through -16 dB
00 09	Gate:Release	0 through 100
00 10	Gate:Suppress	0, 1 through 31 = –∞,-30 through 0 dB
00 11	Gate:Switch	0, 1 = Off, On
00 12	Pitch:Pitch	0 through 12 through 24 = -12 through 0 through 12
00 13	Pitch:Fine	0 through 50 through 100 = -50 through 0 through 50 cents
00 14	Pitch:Balance	0 through 100
00 15	Pitch:Switch	0, 1 = Off, On
00 16	Delay:FB delay	0 through 1000 = 0 through 1000msec
00 17	Delay:Feedback	0 through 100
00 18	Delay:Mix Level	0 through 100
00 19	Delay:Switch	0, 1 = Off, On

Compressor->Distortion->Noise Gate -> Chorus -> Reverb

NRPN	Parameter	Range
00 00	Comp:Compress	0 through 100
00 01	Comp:Attack	0 through 100
00 02	Comp:Post Gain	0 through 30 = 0 through 30 dB
00 03	Comp:Switch	0, 1 = Off, On
00 04	Dist:Pre Gain	0 through 20 = 40 through 60 dB
00 05	Dist:Drive	0 through 100
00 06	Dist:Out Level	0 through 12 = 0 through 12 dB
00 07	Dist:Switch	0, 1 = Off, On
00 08	Gate:Threshold	0 through 60 = -76 through -16 dB
00 09	Gate:Release	0 through 100
00 10	Gate:Suppress	0, 1 through 31 = –∞,-30 through 0 dB
00 11	Gate:Switch	0, 1 = Off, On
00 12	Chorus:Rate	0 through 99 = 0.1 through 10.0Hz
00 13	Chorus:Depth	0 through 100
00 14	Chorus:Mix Level	0 through 100
00 15	Chorus:Switch	0, 1 = Off, On
00 16	Reverb:Pre Delay	0 through 150 = 0 through 150msec
00 17	Reverb:Hi Damp	0 through 10
00 18	Reverb:Mix Level	0 through 100
00 19	Reverb:Switch	0, 1 = Off, On

Compressor->Distortion->Noise Gate->Chorus->Delay

NRPN	Parameter	Range
00 00	Comp:Compress	0 through 100
00 01	Comp:Attack	0 through 100
00 02	Comp:Post Gain	0 through 30 = 0 through 30 dB
00 03	Comp:Switch	0, 1 = Off, On
00 04	Dist:Pre Gain	0 through 20 = 40 through 60 dB
00 05	Dist:Drive	0 through 100
00 06	Dist:Out Level	0 through 12 = 0 through 12 dB
00 07	Dist:Switch	0, 1 = Off, On
00 08	Gate:Threshold	0 through 60 = -76 through -16 dB
00 09	Gate:Release	0 through 100
00 10	Gate:Suppress	0, 1 through 31 = –∞,-30 through 0 dB
00 11	Gate:Switch	0, 1 = Off, On
00 12	Chorus:Rate	0 through 99 = 0.1 through 10.0Hz
00 13	Chorus:Depth	0 through 100
00 14	Chorus:Mix Level	0 through 100
00 15	Chorus:Switch	0, 1 = Off, On
00 16	Delay:FB delay	0 through 1000 = 0 through 1000msec
00 17	Delay:Feedback	0 through 100
00 18	Delay:Mix Level	0 through 100
00 19	Delay:Switch	0, 1 = Off, On

NRPN values for clean multi-effect processors (2)

Compressor->Noise Gate->P.EQ->Flanger->Reverb

NRPN	Parameter	Range
00 00	Comp:Compress	0 through 100
00 01	Comp:Attack	0 through 100
00 02	Comp:Post Gain	0 through 30 = 0 through 30 dB
00 03	Comp:Switch	0, 1 = Off, On
00 04	Gate:Threshold	0 through 60 = -76 through -16 dB
00 05	Gate:Release	0 through 100
00 06	Gate:Suppress	0, 1 through 31 = –∞,-30 through 0 dB
00 07	Gate:Switch	0, 1 = Off, On
00 08	EQ:Frequency	0 through 24 = 63, 79, 99, 125, 158, 198, 250, 315, 397, 500, 630, 794, 1.0k, 1.3k, 1.6k, 2.0k, 2.5k, 3.2k, 4.0k, 5.0k, 6.3k, 8.0k, 10k, 13k, 16k
00 09	EQ:Gain	0 through 12 through 24 = -12 through 0 through 12 dB
00 10	EQ:Out Level	0 through 12 through 24 = -12 through 0 through 12 dB
00 11	EQ:Switch	0, 1 = Off, On
00 12	Flanger:Rate	0 through 100 = 0.0 through 10.0Hz
00 13	Flanger:Depth	0 through 100
00 14	Flanger:Feedback	0 through 100
00 15	Flanger:Switch	0, 1 = Off, On
00 16	Reverb:Pre Delay	0 through 150 = 0 through 150msec
00 17	Reverb:Hi Damp	0 through 10
00 18	Reverb:Mix Level	0 through 100
00 19	Reverb:Switch	0, 1 = Off, On

Compressor->Noise Gate->P.EQ->Flanger->Delay

NRPN	Parameter	Range
00 00	Comp:Compress	0 through 100
00 01	Comp:Attack	0 through 100
00 02	Comp:Post Gain	0 through 30 = 0 through 30 dB
00 03	Comp:Switch	0, 1 = Off, On
00 04	Gate:Threshold	0 through 60 = -76 through -16 dB
00 05	Gate:Release	0 through 100
00 06	Gate:Suppress	0, 1 through 31 = –∞,-30 through 0 dB
00 07	Gate:Switch	0, 1 = Off, On
00 08	EQ:Frequency	0 through 24 = 63, 79, 99, 125, 158, 198, 250, 315, 397, 500, 630, 794, 1.0k, 1.3k, 1.6k, 2.0k, 2.5k, 3.2k, 4.0k, 5.0k, 6.3k, 8.0k, 10k, 13k, 16k
00 09	EQ:Gain	0 through 12 through 24 = -12 through 0 through 12 dB
00 10	EQ:Out Level	0 through 12 through 24 = -12 through 0 through 12 dB
00 11	EQ:Switch	0, 1 = Off, On
00 12	Flanger:Rate	0 through 100 = 0.0 through 10.0Hz
00 13	Flanger:Depth	0 through 100
00 14	Flanger:Feedback	0 through 100
00 15	Flanger:Switch	0, 1 = Off, On
00 16	Delay:FB delay	0 through 1000 = 0 through 1000msec
00 17	Delay:Feedback	0 through 100
00 18	Delay:Mix Level	0 through 100
00 19	Delay:Switch	0, 1 = Off, On

Compressor->Noise Gate->P.EQ->Exciter->Reverb

NRPN	Parameter	Range
00 00	Comp:Compress	0 through 100
00 01	Comp:Attack	0 through 100
00 02	Comp:Post Gain	0 through 30 = 0 through 30 dB
00 03	Comp:Switch	0, 1 = Off, On
00 04	Gate:Threshold	0 through 60 = -76 through -16 dB
00 05	Gate:Release	0 through 100
00 06	Gate:Suppress	0, 1 through 31 = –∞,-30 through 0 dB
00 07	Gate:Switch	0, 1 = Off, On
00 08	EQ:Frequency	0 through 24 = 63, 79, 99, 125, 158, 198, 250, 315, 397, 500, 630, 794, 1.0k, 1.3k, 1.6k, 2.0k, 2.5k, 3.2k, 4.0k, 5.0k, 6.3k, 8.0k, 10k, 13k, 16k
00 09	EQ:Gain	0 through 12 through 24 = -12 through 0 through 12 dB
00 10	EQ:Out Level	0 through 12 through 24 = -12 through 0 through 12 dB
00 11	EQ:Switch	0, 1 = Off, On
00 12	Exciter:Frequency	0 through 90 = 1.0 through 10.0kHz
00 13	Exciter:Depth	0 through 100
00 14	(reserved)	
00 15	Exciter:Switch	0, 1 = Off, On
00 16	Reverb:Pre Delay	0 through 150 = 0 through 150msec
00 17	Reverb:Hi Damp	0 through 10
00 18	Reverb:Mix Level	0 through 100
00 19	Reverb:Switch	0, 1 = Off, On

Compressor->Noise Gate->P.EQ->Exciter->Delay

NRPN	Parameter	Range
00 00	Comp:Compress	0 through 100
00 01	Comp:Attack	0 through 100
00 02	Comp:Post Gain	0 through 30 = 0 through 30 dB
00 03	Comp:Switch	0, 1 = Off, On
00 04	Gate:Threshold	0 through 60 = -76 through -16 dB
00 05	Gate:Release	0 through 100
00 06	Gate:Suppress	0, 1 through 31 = –∞,-30 through 0 dB
00 07	Gate:Switch	0, 1 = Off, On
00 08	EQ:Frequency	0 through 24 = 63, 79, 99, 125, 158, 198, 250, 315, 397, 500, 630, 794, 1.0k, 1.3k, 1.6k, 2.0k, 2.5k, 3.2k, 4.0k, 5.0k, 6.3k, 8.0k, 10k, 13k, 16k
00 09	EQ:Gain	0 through 12 through 24 = -12 through 0 through 12 dB
00 10	EQ:Out Level	0 through 12 through 24 = -12 through 0 through 12 dB
00 11	EQ:Switch	0, 1 = Off, On
00 12	Exciter:Frequency	0 through 90 = 1.0 through 10.0kHz
00 13	Exciter:Depth	0 through 100
00 14	(reserved)	
00 15	Exciter:Switch	0, 1 = Off, On
00 16	Delay:FB delay	0 through 1000 = 0 through 1000msec
00 17	Delay:Feedback	0 through 100
00 18	Delay:Mix Level	0 through 100
00 19	Delay:Switch	0, 1 = Off, On

Compressor->Noise Gate->P.EQ->Pitch Shifter->Reverb

NRPN	Parameter	Range
00 00	Comp:Compress	0 through 100
00 01	Comp:Attack	0 through 100
00 02	Comp:Post Gain	0 through 30 = 0 through 30 dB
00 03	Comp:Switch	0, 1 = Off, On
00 04	Gate:Threshold	0 through 60 = -76 through -16 dB
00 05	Gate:Release	0 through 100
00 06	Gate:Suppress	0, 1 through 31 = –∞,-30 through 0 dB
00 07	Gate:Switch	0, 1 = Off, On
00 08	EQ:Frequency	0 through 24 = 63, 79, 99, 125, 158, 198, 250, 315, 397, 500, 630, 794, 1.0k, 1.3k, 1.6k, 2.0k, 2.5k, 3.2k, 4.0k, 5.0k, 6.3k, 8.0k, 10k, 13k, 16k
00 09	EQ:Gain	0 through 12 through 24 = -12 through 0 through 12 dB
00 10	EQ:Out Level	0 through 12 through 24 = -12 through 0 through 12 dB
00 11	EQ:Switch	0, 1 = Off, On
00 12	Pitch:Pitch	0 through 12 through 24 = -12 through 0 through 12
00 13	Pitch:Fine	0 through 50 through 100 = -50 through 0 through 50 cents
00 14	Pitch:Balance	0 through 100
00 15	Pitch:Switch	0, 1 = Off, On
00 16	Reverb:Pre Delay	0 through 150 = 0 through 150msec
00 17	Reverb:Hi Damp	0 through 10
00 18	Reverb:Mix Level	0 through 100
00 19	Reverb:Switch	0, 1 = Off, On

Compressor->Noise Gate->P.EQ->Pitch Shifter->Delay

NRPN	Parameter	Range
00 00	Comp:Compress	0 through 100
00 01	Comp:Attack	0 through 100
00 02	Comp:Post Gain	0 through 30 = 0 through 30 dB
00 03	Comp:Switch	0, 1 = Off, On
00 04	Gate:Threshold	0 through 60 = -76 through -16 dB
00 05	Gate:Release	0 through 100
00 06	Gate:Suppress	0, 1 through 31 = –∞,-30 through 0 dB
00 07	Gate:Switch	0, 1 = Off, On
00 08	EQ:Frequency	0 through 24 = 63, 79, 99, 125, 158, 198, 250, 315, 397, 500, 630, 794, 1.0k, 1.3k, 1.6k, 2.0k, 2.5k, 3.2k, 4.0k, 5.0k, 6.3k, 8.0k, 10k, 13k, 16k
00 09	EQ:Gain	0 through 12 through 24 = -12 through 0 through 12 dB
00 10	EQ:Out Level	0 through 12 through 24 = -12 through 0 through 12 dB
00 11	EQ:Switch	0, 1 = Off, On
00 12	Pitch:Pitch	0 through 12 through 24 = -12 through 0 through 12
00 13	Pitch:Fine	0 through 50 through 100 = -50 through 0 through 50 cents
00 14	Pitch:Balance	0 through 100
00 15	Pitch:Switch	0, 1 = Off, On
00 16	Delay:FB delay	0 through 1000 = 0 through 1000msec
00 17	Delay:Feedback	0 through 100
00 18	Delay:Mix Level	0 through 100
00 19	Delay:Switch	0, 1 = Off, On

Compressor->Noise Gate->P.EQ->Chorus->Reverb

NRPN	Parameter	Range
00 00	Comp:Compress	0 through 100
00 01	Comp:Attack	0 through 100
00 02	Comp:Post Gain	0 through 30 = 0 through 30 dB
00 03	Comp:Switch	0, 1 = Off, On
00 04	Gate:Threshold	0 through 60 = -76 through -16 dB
00 05	Gate:Release	0 through 100
00 06	Gate:Suppress	0, 1 through 31 = –∞,-30 through 0 dB
00 07	Gate:Switch	0, 1 = Off, On
00 08	EQ:Frequency	0 through 24 = 63, 79, 99, 125, 158, 198, 250, 315, 397, 500, 630, 794, 1.0k, 1.3k, 1.6k, 2.0k, 2.5k, 3.2k, 4.0k, 5.0k, 6.3k, 8.0k, 10k, 13k, 16k
00 09	EQ:Gain	0 through 12 through 24 = -12 through 0 through 12 dB
00 10	EQ:Out Level	0 through 12 through 24 = -12 through 0 through 12 dB
00 11	EQ:Switch	0, 1 = Off, On
00 12	Chorus:Rate	0 through 99 = 0.1 through 10.0Hz
00 13	Chorus:Depth	0 through 100
00 14	Chorus:Mix Level	0 through 100
00 15	Chorus:Switch	0, 1 = Off, On
00 16	Reverb:Pre Delay	0 through 150 = 0 through 150msec
00 17	Reverb:Hi Damp	0 through 10
00 18	Reverb:Mix Level	0 through 100
00 19	Reverb:Switch	0, 1 = Off, On

Compressor->Noise Gate->P.EQ->Chorus->Delay

NRPN	Parameter	Range
00 00	Comp:Compress	0 through 100
00 01	Comp:Attack	0 through 100
00 02	Comp:Post Gain	0 through 30 = 0 through 30 dB
00 03	Comp:Switch	0, 1 = Off, On
00 04	Gate:Threshold	0 through 60 = -76 through -16 dB
00 05	Gate:Release	0 through 100
00 06	Gate:Suppress	0, 1 through 31 = –∞,-30 through 0 dB
00 07	Gate:Switch	0, 1 = Off, On
00 08	EQ:Frequency	0 through 24 = 63, 79, 99, 125, 158, 198, 250, 315, 397, 500, 630, 794, 1.0k, 1.3k, 1.6k, 2.0k, 2.5k, 3.2k, 4.0k, 5.0k, 6.3k, 8.0k, 10k, 13k, 16k
00 09	EQ:Gain	0 through 12 through 24 = -12 through 0 through 12 dB
00 10	EQ:Out Level	0 through 12 through 24 = -12 through 0 through 12 dB
00 11	EQ:Switch	0, 1 = Off, On
00 12	Chorus:Rate	0 through 99 = 0.1 through 10.0Hz
00 13	Chorus:Depth	0 through 100
00 14	Chorus:Mix Level	0 through 100
00 15	Chorus:Switch	0, 1 = Off, On
00 16	Delay:FB delay	0 through 1000 = 0 through 1000msec
00 17	Delay:Feedback	0 through 100
00 18	Delay:Mix Level	0 through 100
00 19	Delay:Switch	0, 1 = Off, On

Compressor->Noise Gate->De-esser->Chorus->Reverb

NRPN	Parameter	Range
00 00	Comp:Compress	0 through 100
00 01	Comp:Attack	0 through 100
00 02	Comp:Post Gain	0 through 30 = 0 through 30 dB
00 03	Comp:Switch	0, 1 = Off, On
00 04	Gate:Threshold	0 through 60 = -76 through -16 dB
00 05	Gate:Release	0 through 100
00 06	Gate:Suppress	0, 1 through 31 = –∞,-30 through 0 dB
00 07	Gate:Switch	0, 1 = Off, On
00 08	De-esser:Frequency	0 through 90 = 1.0 through 10.0kHz
00 09	De-esser:Depth	0 through 60
00 10	(reserved)	
00 11	De-esser:Switch	0, 1 = Off, On
00 12	Chorus:Rate	0 through 99 = 0.1 through 10.0Hz
00 13	Chorus:Depth	0 through 100
00 14	Chorus:Mix Level	0 through 100
00 15	Chorus:Switch	0, 1 = Off, On
00 16	Reverb:Pre Delay	0 through 150 = 0 through 150msec
00 17	Reverb:Hi Damp	0 through 10
00 18	Reverb:Mix Level	0 through 100
00 19	Reverb:Switch	0, 1 = Off, On

Compressor->Noise Gate->De-esser->Chorus->Delay

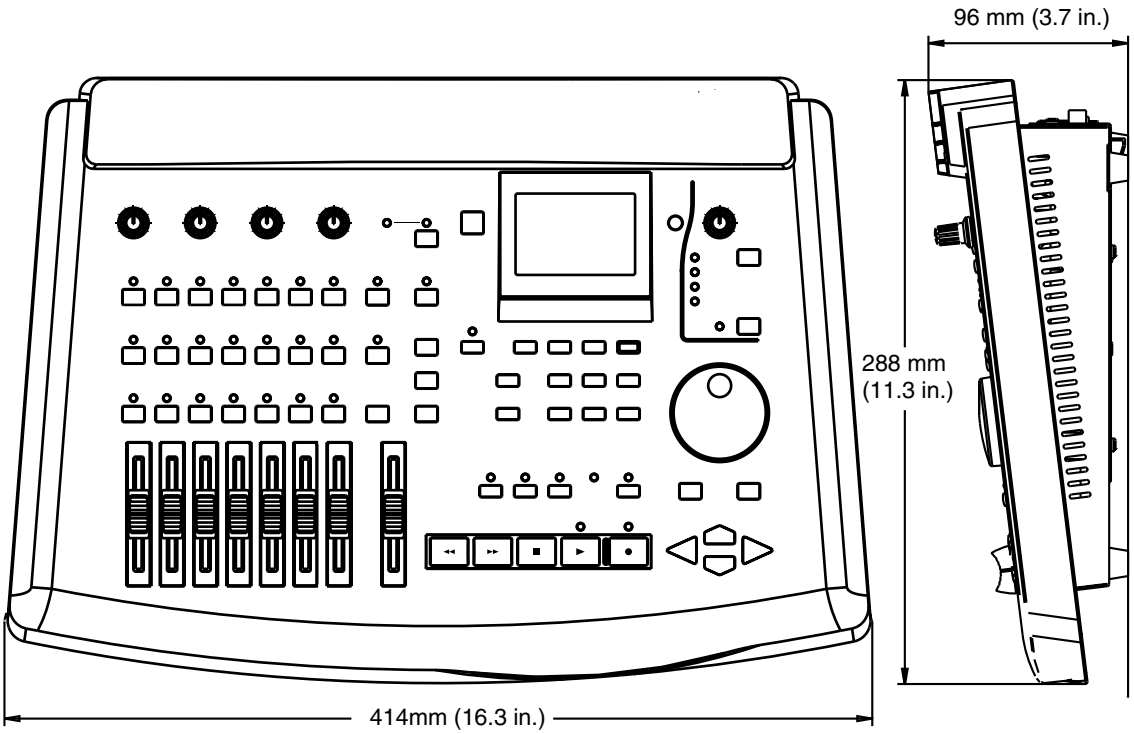
NRPN	Parameter	Range
00 00	Comp:Compress	0 through 100
00 01	Comp:Attack	0 through 100
00 02	Comp:Post Gain	0 through 30 = 0 through 30 dB
00 03	Comp:Switch	0, 1 = Off, On
00 04	Gate:Threshold	0 through 60 = -76 through -16 dB
00 05	Gate:Release	0 through 100
00 06	Gate:Suppress	0, 1 through 31 = –∞,-30 through 0 dB
00 07	Gate:Switch	0, 1 = Off, On
00 08	De-esser:Frequency	0 through 90 = 1.0 through 10.0kHz
00 09	De-esser:Depth	0 through 60
00 10	(reserved)	
00 11	De-esser:Switch	0, 1 = Off, On
00 12	Chorus:Rate	0 through 99 = 0.1 through 10.0Hz
00 13	Chorus:Depth	0 through 100
00 14	Chorus:Mix Level	0 through 100
00 15	Chorus:Switch	0, 1 = Off, On
00 16	Delay:FB delay	0 through 1000 = 0 through 1000msec
00 17	Delay:Feedback	0 through 100
00 18	Delay:Mix Level	0 through 100
00 19	Delay:Switch	0, 1 = Off, On

NRPN values for multi-effect processor (3)

Compressor->Noise Gate->Exciter

NRPN	Parameter	Range
00 00	Comp:Compress	0 through 100
00 01	Comp:Attack	0 through 100
00 02	Comp:Post Gain	0 through 30 = 0 through 30 dB
00 03	Comp:Switch	0, 1 = Off, On
00 04	Gate:Threshold	0 through 60 = -76 through -16 dB
00 05	Gate:Release	0 through 100
00 06	Gate:Suppress	0, 1 through 31 = –∞,-30 through 0 dB
00 07	Gate:Switch	0, 1 = Off, On
00 08	Exciter:Frequency	0 through 90 = 1.0 through 10.0kHz
00 09	Exciter:Depth	0 through 100
00 10	(reserved)	
00 11	Exciter:Switch	0, 1 = Off, On

Dimensional drawing



Specifications

Physical and electrical specifications

Dimensions (w x h x d)	414 x 96 x 288 (mm) 16.3 x 3.7 x 11.3 (in.)
Weight (excluding PS-P788 AC adaptor)	3.1 kg (6.8 lb)
PS-P788 AC adaptor	1.6 kg (3.5 lb)
Power requirements	USA/Canada 120 VAC, 60 Hz U.K./Europe 230 VAC, 50 Hz Australia 240 VAC, 50 Hz
Power consumption	26 W
Supplied accessories	PS-P788 AC adaptor, 2 x XLR balanced to 1/4” unbalanced adaptors

Digital recorder specifications

Recording resolution	16-bit or 24-bit linear (selectable by song)
Sampling frequency	44.1 kHz
Frequency response	20 Hz – 20 kHz
Wow and flutter	Unmeasurable
Number of active tracks	8
Number of virtual tracks	250/song
Varispeed	±6%
Slow Speed Audition	Allows 2-track playback at approx. 50%, 65%, 85% of normal speed

Mass storage

External connector	SCSI-2 female
Internal hard disk SCSI ID	0
Internal controller SCSI ID	7
Partitions	Up to 4 per physical disk
Partition size	512 MB, 1 GB, 2 GB, 4 GB
Data format	TASCAM original format

Analog audio I/O

INPUT A through D	1/4" balanced phone jacks, nominal level –50 dBu MIC, +4 dBu LINE, nominal impedance 4.0 kΩ (MIC/GUITAR at MIC)
MIC/GUITAR switch (INPUT D only)	Changes input impedance between 4.0 kΩ and 1 MΩ
AUX INPUT	1/4" unbalanced jacks, nominal level –10 dBV, nominal impedance 15 kΩ
STEREO OUTPUT	RCA jacks, nominal level –10 dBV, maximum output level +6 dBV
MONITOR OUTPUT	RCA jacks, nominal level –10 dBV, output impedance 820 Ω
AUX OUTPUT	1/4" unbalanced jacks, nominal level –10 dBV, output impedance 820 Ω,
PHONES	1/4" stereo jack, 60 mW + 60 mW approx. (load impedance 30 Ω)

Audio specifications

Frequency response (INPUT to analog STEREO OUTPUT)	20 Hz – 20 kHz ±1 dB
Noise level (One INPUT to analog STEREO OUTPUT)	<82 dBV (input terminated at 150 Ω)
Total harmonic distortion (INPUT to analog STEREO OUTPUT)	<0.01% at 1kHz, maximum input level with 400 Hz HPF and 22 kHz LPF

Error messages, etc.

The following is a list of error messages that may be displayed by the 788, together with a note of their possible cause, and the actions you can take when they occur.

Message	Meaning	Action
NO AUDIO ON CD	This message appears if you try to finalize a CD that is blank.	There is no point in finalizing a blank disc. Insert the correct disc and try again.
CD CANNOT BE FINALIZED PRESS [EXIT/NO]	When writing a CD, the finalize operation was not correctly performed.	Press **EXIT**/**NO** to make this message go away and stop the procedure. Try again with another disc. If this message appears continually, consult the documentation of your CD-R drive — the drive may require attention.
CD HAS DATA	If you are trying to do a multi-song CD recording, this message appears if data already exists on the CD.	Either write one song at a time, or use a new, blank CD.
CD-RW NOT BLANK ERASE CD-RW [YES] CANCEL [NO]	This message only appears if a CD-RW drive is connected to the 788. It appears if you are attempting a backup operation to a CD-RW disc, and the disc you have inserted for backup is not blank.	Press **YES** to erase the whole contents of the CD-RW disc and continue with the backup. Press **NO** to cancel the operation.
CD NOT FOUND	There is no disc inserted for a CD operation (play, write, finalize, backup or restore).	Load a suitable disc and continue.

Message	Meaning	Action
DRIVE NOT FOUND	You are trying to eject a non-removable disk. Or, you are trying to play, write or finalize a CD, or perform a backup or restore without a CD-R drive being connected.	Check and make the appropriate connections **after turning off** the power to the 788 and the external device.
EXT SYNC SELECTED	You are trying to play or record, or use the mastering, master check or CD player function while the 788 is slaved to external synchronization.	Use the sync master to control the 788, or set the 788 to internal sync and try again.
IN-OUT TOO SHORT	The interval between the IN and the OUT points is too short for track editing, repeat playback or punch operations.	Make sure that the gap between the IN and OUT points is at least 0.5 seconds long or at least 10 sub-frames in the case of auto punch operations.
NEED CD xx CONTINUE [YES] CANCEL [NO]	You are performing a backup to CD. The 788 is letting you know how many CDs will be required for the backup.	Press **YES** if you have enough discs and you want to continue with the backup. Or, press **NO** if you want to cancel the backup operation (not enough discs).
INSERT NEXT CD CONTINUE [YES] CANCEL [NO]	You are performing a backup or a restore operation ,and the 788 is asking you for the next disc in the set.	Insert a new disc (backup) or the next disc in the set (restore). Press **YES** when you have inserted the disc. Or, press **NO** if you want to cancel thebackup or restore operation.
INVALID CD! REPLACE CD PRESS [YES / NO]	You are attempting to record a song or songs to CD, but the CD is finalized and cannot be used for recording single tracks (or has already been used for recording and cannot be used for recording a song list). This message also appears if you are attempting a restore operation from the wrong disc.	Press **YES** or **NO** to make this message go away and stop the procedure. Use an unfinalized disc if you want to record a single song, or a blank disc to record a song list. If you are attempting a restore, make sure that you have the correct discs ready.
LOW DISK SPACE	There is not much space on the current disk or partition.	Delete unused songs and/or carry out a DELETE UNUSED operation.
LOCATE MARKS FULL	Each song can have up to 999 location marks, stored in “slots”. This message appears if the number is exceeded.	Delete any unwanted marks and try again.
NO ARMED TRACKS	You are attempting to record with no tracks armed.	Arm the tracks on which you want to record, and try again.
NO DISK SPACE!!	There is no space remaining on the current disk or partition.	Delete unused songs and/or carry out a DELETE UNUSED operation.
NO PRE-MASTERED SONGS FOUND PRESS [EXIT/NO]	You are trying to record songs on a CD-R, but the current partition does not contain any songs that have been pre-mastered.	Press **EXIT**/**NO** to make this message go away and stop the CD recording procedure. Follow the pre-mastering procedure for the songs you want to record to CD. It is also possible that you have selected a disk or partition that does not contain the songs you want to record. Check this, and re-select the disk or partition if necessary.

Message	Meaning	Action
NO SPACE ON DISK FOR IMAGE FILE PRESS [EXIT/NO]	You are attempting to record a song to CD, but there is not enough space on the disk to make the image file.	Press **EXIT**/ **NO** to make this message go away and stop the CD recording procedure. Erase any unwanted songs, or back them up to CD, or copy them to another partition or disk, and then erase them. Alternatively, copy the song you are trying to record to another disk or partition with more available space and try again.
NOT ENOUGH ROOM ON CD FOR SONG PRESS [EXIT/NO]	You are attempting to record a song or songs to CD, but there is not enough space on the CD to record the material.	Press **EXIT/NO** to make this message go away and stop the CD recording procedure. Finalize the CD, if there are no more songs you want to record on it, and try recording the song again on another disc.
NOT ENOUGH SPACE ON DISK PRESS [EXIT/NO]	When you try to perform any of the following operations, there is not enough space on the disk: creating a song, copying a song from one disk or partition to another, restoring a song from a CD backup. In addition when actually making a backup, you need to have 640 MB available for making the image before backing up. **NOTE** *If you are working on a partition whose size is 512 MB, you will not be able to perform a CD backup and this message will always appear if you attempt a backup.*	Press **EXIT/NO** to make this message go away. The operation you were attempting is then stopped. Erase any unwanted songs, or copy them to another partition or disk, and then erase them. Alternatively, try working on another disk or partition with more space available.
READ BUSY!!	This message may appear if: The 788 playback suddenly stops without warning A track is being played back erratically, or out of time with the other tracks There may be a noticeable drop in sound quality as well.	Reduce the number of tracks to determine (by ping-pong bouncing if necessary) Use blank virtual tracks instead of recorded unused active tracks
RECORD ERROR!!	Record timing, etc. suffers, or the 788 suddenly stops recording without warning.	Reduce the number of tracks being recorded simultaneously.
RESTORE SONG XXXXXXXXXXXXXX ? [YES] [NO]	You have started a song restore operation. The 788 has read the song title of the backed-up song, and is asking if this is the song you want to restore.	Press **YES** to continue restoring the song. Press **NO** to cancel the restore operation.
SONG PROTECTED	You are attempting to change a protected song.	Un-protect the song (SONG menu).
TOO MANY SONGS ON PARTITION PRESS [EXIT/NO]	If you try to create or restore a song, there are too many songs on the partition for the operation to succeed (there is a limit of 250 songs on each partition).	Press **EXIT**/ **NO** to make this message go away. The operation you were attempting is then stopped. Erase any unwanted songs, or back them up to CD, or copy them to another partition or disk, and then erase them. Alternatively, create or restore the song on another disk or partition with more available space.

Message	Meaning	Action
COMPLETED TAKES	The multi-take auto punch facility allows up to 99 takes in a single pass. This message appears if the number is exceeded.	Stop the punch operation and pick the take you want.
TRACK TOO SHORT	A CD track must be at least four seconds in length. You are trying to write a track which is less than this length to CD.	Add “dead time” to the end of the track and try again.
MOVING TRANSPORT	You are trying to perform an operation while the transport is moving (recording, playing back or winding).	Stop the transport and perform the operation.

MIDI Implementation Chart

TASCAM Multitrack Digital Disk Recorder — Date:2000.07.17
Model 788 — MIDI Implementation Chart — Version : 1.00

Function		Transmitted	Recognized	Remarks
Basic Channel	Default	1-16	1-16	
	Changed	1-16	x	
Mode	Default	x	x	
	Messages	x	x	
	Altered	**********	x	
Note Number		0-127 *1	x	
	True voice	**********	x	
Velocity	Note ON	0-127 *1	x	
	Note OFF	x 9n, v=0	x	
After Touch	Key's	x	x	
	Ch's	x	x	
Pitch Bender		x	x	
Control Change	0,32	x	o	*2 EFF Bank
	7,10,11	x	o	MIX Level,Pan,Att
	16-22	x	o	MIX EQ
	23-28	x	o	MIX Send
	80,81,82	x	o	EQ SW,EFF-Post,Aux Post send
	6,38	x	o	Data Entry
	96,99	x	o	Data Inc,Dec
	98,99	x	o	NRPN
Prog Change		x	x	Scene
	True #	**********		Routing
				Effect
System Exclusive		o	o	*3
System Common	Qu.Frame	o *4	o *5	
	Song Pos	o *6	x	
	Song Sel	x	x	
	Tune	x	x	
System Real Time	Clock	o *6	o *7	
	Commands	o *6	o *7	
Aux Mes- sages	Local ON/OFF	x	x	
	All Notes OFF	x	x	
	Active Sense	x	x	
	Reset	x	o	

Notes:
*1 Metronome set to MIDI *2 MIDI Control = ON
*3 MMC RP Version 1.00(T,R), MTC Quarter Frame Message; Sync Gen=MTC (T), Sync Src=EXT (R) *4 Sync Gen=MTC
*5 Sync Src=EXT *6 Sync Gen=CLOCK *7 Sync Track recording

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

A

B

C

D

E

F

G

H

I

J

K

L

M

N

O

P

Q

R

S

T

U

V

TASCAM
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788

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Printed in Taiwan MA-0409