10 Synchronization

Timecode All Menu

▲1:TC.GEN   2:TC.TYPE
 3:CHASE   4:LOCATE

[1:TC.GEN]   [2:TC.TYPE]   [3:CHASE]   [4:LOCATE]

TC Mode Select
▲TC.MASTER TC.SLAVE
[▶TC.MASTER]   [▶TC.SLAVE]

DMR Chase Mode
▲Parallel Serial
[▶Parallel]   [▶Serial]

REC.REHE Key Control
▲ON OFF

Serial Chase Mode
▲AUTO MANUAL
[▶AUTO]

Serial Auto Mix Mode
ON OFF

DMR Parallel Chase
▲SAMPLE TC CHASE

Slave No. Select
Slave No.1

DMR Chase Offset
+ 00:00:00.00

Offset (Fine)
+ 00s 00f 00b

Serial Chase Point
00:00:00.00

TC Display
▲TimeCode TimeCounter

Repeat Count
N = 1

Memory Offset
▲ -10 frme (333msec)

Locate Preroll
3 sec

Chase Lock Adjust
0 frame

TC Master Select
▲DMR EXTTC MIDITC
[▶DMR] [▶EXTTC] [▶MIDITC]

EXTTC Chase Mode
▲POINT ALL REMOTE
[▶POINT] [▶ALL] [▶REMOTE]

ALL Chase Mode
▲TC+9PIN 9PONLY

Time Code Chase Offset
+ 00:00:00.00

Offset (Fine)
+ 00s 00f 00b

MIDI TC Chase Offset
+ 00:00:00.00

Offset (Fine)
+ 00s 00f 00b

Chase Lock Speed
Slow 1 2 ▲3 4 5 Fast

*** END ***

Generator Mode
▲INT EXT MTC
[▶INT]   [▶EXT ▶MTC]

Generator Start TC
00:00:00.00

Generator User Bits
00 00 00 00

TC/MTC BURST OUT
▲ON OFF

Frame Type
▲30 30D 25 24

TimeCord Regenerate
▲JAMSYNC DIRECT
[▶JAMSYNC]   [▶DIRECT]

Ext Jamsync Offset
+ 00:00:00.00-00

Video Sync
▲OFF ON

Time Code Preset
00:59:30.00

10 Synchronization

The DMR8 is capable of being synchronized to another DMR8 or DRU8, to external timecode (from another recorder, or from a generator), or to MIDI timecode. In all these modes, the DMR8 may act as a master or a slave. The current master/slave status of the DMR8 is indicated by the appropriate LED above the tape slot.
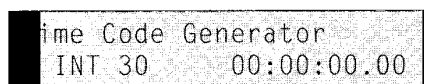
10.1 Timecode keys

The block of keys just above the LOCATOR keys are concerned with timecode operations. The following sections explain the options available.
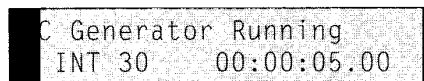
10.1.1 Free-running timecode generator

The DMR8 is capable of functioning as a free-running timecode generator. The tape must be stopped for this facility to be available. The analog timecode signal is output from the XLR TIMECODE OUT connector on the rear panel.

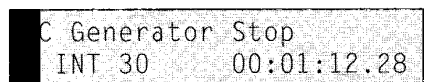To start the generator, press the (LOAD/HOLD) key so that it lights. The subdisplay will show:

```
ime Code Generator
  INT 30       00:00:00.00
```

To start the generator, press the (START/STOP) key.

```
C Generator Running
  INT 30     00:00:05.00
```

Pressing the (START/STOP) key again will stop the generator:
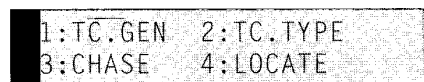
```
C Generator Stop
  INT 30     00:01:12.28
```

If (START/STOP) is pressed again, the generator will continue from the time when it was stopped.

The timecode generator, when first loaded, will start at the time value set in the MANUAL/AUTO timecode option of the ALL REC menu. If (RESET) is pressed, the timecode will be reset to the value set in the timecode menu option 2. The (RESET) key may be pressed when the generator is running, or when it is stopped.

With the "AMix TC GEN. WORKING" option turned on, automix can be used.

10.1.2 Timecode menus

These options can only be accessed when the tape is stopped. Pressing the (MENU) key produces the following on the subdisplay:

```
1:TC.GEN   2:TC.TYPE
3:CHASE    4:LOCATE
```

Move the cursor using the cursor keys and then press (SHIFT NEXT), or press the number on the numeric keypad corresponding to the desired option.

Timecode generator menu [1]

The first screen gives the option of using the DMR8's internal generator (INT), external timecode (EXT) or external MIDI timecode (MTC). Move the cursor and then press (SHIFT NEXT).

If INTernal is selected, the next screen allows the setting of a start time for the generator. This is linked to the MANUAL timecode setting in the ALL REC setup pages. It is the timecode value which will be written to tape, and the initial value when the free-running generator is first loaded.

For all options (INT, EXT or MTC), the next screen allows four hexadecimal (00h through FFh) characters to be entered as user bits. The cursor keys are used to enter these.

The next screen allows you to set the TC and MTC burst output mode for fast forward and rewind: ON – output TC/MTC bursts. OFF – no TC/MTC output (during FF and REW only). Some computer-based sequencers are prone to crash when they receive timecode bursts, this function can be used to prevent that situation.

Timecode type menu [2]

The first screen in this menu allows the selection of the timecode frame rate: 30fps (NTSC monochrome), 30 drop fps (NTSC color), 25fps (PAL/SECAM monochrome and color), and 24fps (film work). Use the cursor keys to select, and then press (SHIFT NEXT).

The next screen allows the choice of external timecode to be retransmitted from the TIMECODE OUT connector "as-is" (DIRECT), or transmitted with an offset (JAMSYNC).

If jamsync is selected, the next screen allows the setting of the jamsync offset, using the numeric keypad and/or the cursor keys. Note that this time is accurate to bit (rather than frame) level.

Regardless of the DIRECT or JAMSYNC choice, the next screen enables or disables synchronization to the video sync (V-SYNC) signal.

The next screen sets the time to which the free-running generator will be reset when the (RESET) key is pressed.

Chase menu [3] (MASTER)

This section does not describe the full principles and practice of chase and synchronization using a DMR8 - this is covered in a later section. It is a guide to the menu options available in this menu.

The first option is to decide whether the DMR8 is to be a timecode master or a timecode slave. When the setting is made, using the cursor keys, the appropriate LED (MASTER or SLAVE) above the tape slot will be lit. Press (SHIFT NEXT) to enter the next screen.

In MASTER mode, the next screen selects whether the slave DMR8 will be chasing in parallel with the master (making an effective 16-track recorder), or in serial mode (the slave starts when the master stops), thereby extending the recording time of the DMR8.

If PARALLEL MASTER chase mode is selected, the next screen determines whether the [REC] and [REHE] keys will operate the remote unit. Select ON or OFF with the cursor keys. This is the last screen for PARALLEL MASTER.

If SERIAL MASTER chase mode is selected, then the choice is between AUTO and MANUAL modes. These are explained further in the section on synchronization. This is the last screen for SERIAL MASTER.

Chase menu [3] (SLAVE)

If SLAVE is selected, the next screen asks whether the timecode needed for slaving will come from another DMR8 or DRU8 using the SLAVE connector (DMR), the TIMECODE IN XLR connector (EXT), or MIDI timecode (MIDITC).
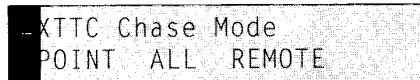
If the SLAVE DMR option is selected, the next screen allows the selection of a SLAVE number, which allows the setting of an "address" by which the DMR8 transport functions can be controlled from another DMR8 using the [SLAVE 1] and [SLAVE 2] control keys. The same address can also be used for mixing console control using the [REMOTE 1] and [REMOTE 2] keys.

Up to 16 units can be chained together. Though only two slave numbers (1 and 2) can be used for remote control, all units in the daisy-chain which share these numbers can be controlled simultaneously.

If SLAVE DMR is selected, the next two screens allow the setting of offset parameters so that the slave DMR8 can be slipped relative to the master to correct deficiencies in timing. The first screen allows setting of the offset in hh:mm:ss.ff, and the second allows ss.ff-bb settings.

If SLAVE DMR is selected, the next screen allows the serial offset to be set when the chase mode from the master is serial. This is the time at which the slave unit will "kick in" to allow continuous recording. This is the last screen for SLAVE DMR8.

If SLAVE EXT is selected, the next screen allows the choice of three modes of chasing when synchronized to external timecode:

```
XTTC Chase Mode
POINT  ALL   REMOTE
```

POINT is a chase method, involving the setting of a chase point from which the DMR8 will start chasing when external timecode matches this value. ALL chase allows the DMR8 to chase backwards and forwards so that its timecode matches the external timecode. If ALL chase is selected, the next screen allows you to select the type of control connection: TC and 9-PIN cables or 9-PIN cable only (check your controller to see if it can be used with just a 9-PIN connection). REMOTE allows the DMR8 to chase using V-sync signals and commands received through the REMOTE connector (Type 1, Type 2 or Type 3 protocol, as set up in the HELP screen).

If SLAVE EXT POINT or SLAVE EXT ALL is selected, the next two screens allow the setting of offset parameters so that the slave DMR8 can be slipped relative to the master to correct deficiencies in timing. The first screen allows setting of the offset in hh:mm:ss.ff, and the second allows ss.ff-bb settings.

In all SLAVE EXT modes, the next screen allows the chase lock speed (how quickly the DMR8 will lock and synchronize to external timecode):

```
▌ase Lock Speed
▌ow   1   2  >3   4   5 FAST
```

Select using the cursor keys. This is the last screen for all SLAVE EXT modes.

If SLAVE MIDITC is selected, the next two screens allow the setting of offset parameters so that the slave DMR8 can be slipped relative to the MIDI time-code master to correct deficiencies in timing. The first screen allows setting of the offset in hh:mm:ss.ff, and the second allows ss.ff-bb settings.

In all SLAVE MIDI TC mode, the next screen allows the chase lock speed (how quickly the DMR8 will lock and synchronize to external timecode).

```
▌ase Lock Speed
▌ow   1   2  >3   4   5 FAST
```

Select using the cursor keys. This is the last screen for the SLAVE MIDI TC mode.

Locate menu [4]

The LOCATE menu allows the setting of a number of miscellaneous parameters concerning the location functions.

The first screen sets the tape counter display to read either the timecode written on the tape, or the tach-generated absolute tape position:

```
▌ Display
▌imecode  TimeCounter
```

If the timecode option is chosen, the tape display will show the time in "hh:mm:ss.ff" format:

```
▌me Code    01:10:55.23
▌mory <ID3>01:00:25.00
```

If the absolute tape position is selected, the timecode will be shown only in "mm:ss" format:

```
▌me counter   12:17
▌emory    <ID3>00:25
```
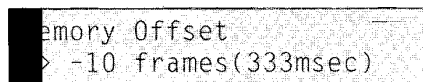
When in this mode, the LOCATE, START and RETURN points will be entered in "mm:ss" format. This tape counter display is not as accurate as a timecode display, but may find a use for estimating remaining tape time, etc.

NOTE: Pressing any of the (F4) keys will return the display to timecode.

The next screen, "Repeat count", sets the number of repeat loops which will be performed when the (REPEAT) key is pushed and released. This parameter may take a value between 0 (the tape will locate to the start position) and 255 repeats.

NOTE: Holding the REPEAT key for more than half a second and then releasing it will repeat the cycle until PAUSE/STOP is pressed, regardless of the number set here.

The next screen allows the memory offset to be set. As explained earlier, when entering a location point in real time, the DMR8 "slips" the time by a value in order to compensate for reaction time. In this screen, it is possible to set an ideal value:

```
emory Offset
> -10 frames(333msec)
```

This field can be set from 0 frames (the stored time is exactly the timecode value read at the time the key is pressed), to one second (the number of frames depends on the timecode type currently selected. The default value is ten frames. The "milliseconds" field is for information only, and the relationship between the number of frames and the time in milliseconds varies according to the timecode type selected.

The next screen in this menu is the Locate Preroll time. When a location key is held down for over 0.5 seconds and then released, the tape will locate to a point set by the following:

Final tape position = Locate point – Locate preroll value

This can take values between 0 and 59 seconds.

Finally, the Chase Lock Adjust time can be altered to values of ± 1 second (in frames, the value depending on the timecode type set in MENU 2).

10.1.3 CHASE and OFF SET keys

The CHASE key is used to set the DMR8 into chase mode, either as a master or as a slave. If the DMR8 is set as a slave, pressing this key will initialize the DMR8 using the PLL so that the tape speed is automatically adjusted to lock with external timecode.

If the DMR8 is set as a master, pressing the CHASE key will start a network check for slave units. Full details of this, and other features of the chase modes are given later in this section.

The OFFSET key is used when the DMR8 is in slave chase mode and locked, in order to provide real-time fine adjustment to the synchronization master in samples (± 5000 samples). Move the underline cursor to the digit to be altered and use ↑ and ↓ to set the values.

10.2 HELP page

Some of these options are duplicated on the help screen. Press the (HELP) key, followed by ⑤ and (ENTER):

```
                 Chase Setup (Page1/3)              h
   DMR   Para: *Master   *Slave (Copy)              e
         Seri: >Auto   *Manual   *Slave             l
   Time Code: *Point *All *Remote *MTC              p
```

Use the ◄ and ► cursor keys to move around the screen, and the ▲ and ▼ keys to set and unset options. Some of the options are mutually exclusive, so setting an option (represented by ">") will unset another option ("*"). When all the options have been set, press (SHIFT NEXT) to enter the next HELP screen:

10.2.1 Remote protocol

This is a choice of options only

 in the HELP pages. If the REMOTE chase mode option has been chosen, this determines the protocol to which the DMR8 will respond, and hence determines compatibility with other equipment.

Type 1 is a protocol to be used with equipment such as the YAMAHA RC8 remote control/locator unit, giving a wider range of options than the others.

Type 2 corresponds to a protocol as implemented on the BVE-910 and RM-450 video editors, and the BVU-900 and BVU-950 VTRs (Sony).

Type 3 corresponds to the a protocol as implemented on the CMX300 (CMX) and ACE-200 (Ampex).

Select the desired protocol using the cursor keys. **NOTE** that this selection only becomes effective when a controller is connected to the 9-pin REMOTE connector of the DMR8.

10.3 DMR8 as master (parallel)

The DMR8 may be used to sync to another unit which will lock to the master, running in parallel to it. This may be used with another DMR8/DRU8 to provide more than 8 recording tracks, or with a VTR/VCR in post-production engineering. For units other than DMR8 or DRU8s, it will probably be necessary to use a "black box synchronizer" between the timecode received from the DMR8 and the unit.

A connection must be made from the TIMECODE OUT of the DMR8 to the appropriate connector on the slave device.

If the slave device is to be a DMR8 or DRU8, then the CONTROL OUT of the master unit should be connected to the CONTROL IN of the slave.

In addition, the slave device and the DMR8 must be set to use the same kind of timecode.

The procedure for using the DMR8 as a timecode master is therefore:

10.3.1 Set up internal timecode

Press (MENU) and then press (1). Select the INT option, and the timecode start time.

10.3.2 Set timecode type

Use MENU option 2 to select the appropriate timecode type.

If the timecode recorded on the DMR8 cassette is the same as that which has been recorded on the slave unit, jamsync operation is not required.

If, however, the timecode on the DMR8 cassette is different to that on the slave device, jamsync must be set ON, and the appropriate jamsync offset must be entered.

10.3.3 Set up master status

Use MENU option 3 to select TC MASTER. On the next screen, select the DMR8 chase mode to be "parallel". When recording with two DMR8/DRU8s, usually the REC/REHE control should be ON.
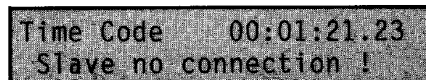
10.3.4 Set up the slave

If the slave unit is another DMR8/DRU8, follow the description in the following sections.

In other cases, follow the appropriate instructions for the other unit.

10.3.5 Chase (DMR8/DRU8 only)

If the slave unit is a DMR8 or DRU8, press the (CHASE) key on the master unit. The master will perform a "network check", inspecting the integrity of the connections along the CONTROL bus. If the slave is not connected, or has been wrongly connected using the CONTROL connectors, the following display will be shown:

```
Time Code     00:01:21.23
Slave no connection !
```

If all connections and settings have been made properly, the (CHASE) key on the slave unit should light, and the slave will locate (as shown on the master sub-display). If the (CHASE) key is pressed on the slave unit, and the master is not in chase mode, this will be shown on the slave's display.

For both parallel and serial modes, the setup should be as shown below:
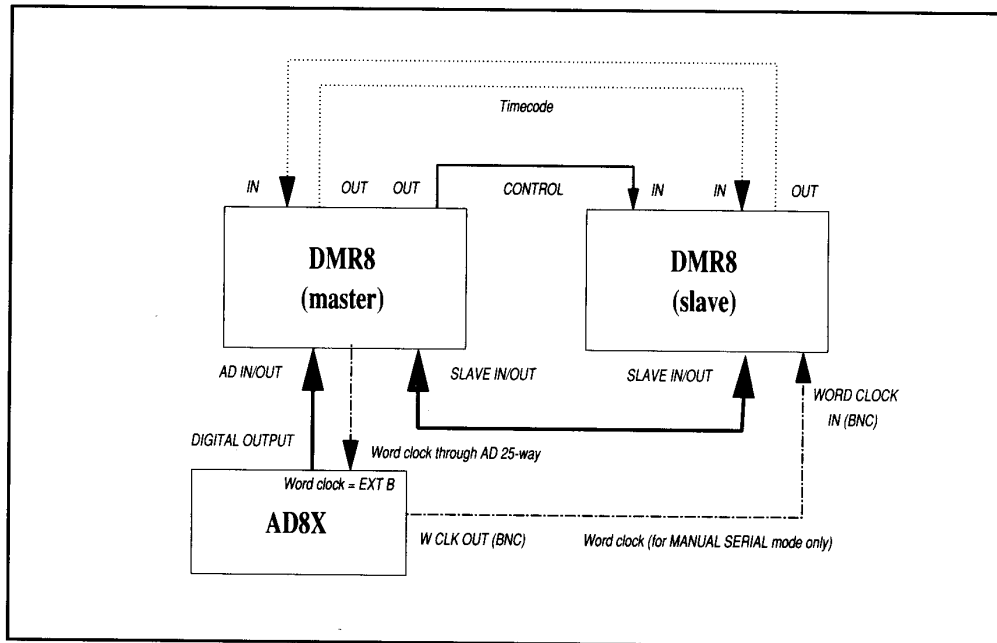
10.3.6 Remote operation

By pressing the (REMOTE 1) or (REMOTE 2) keys on the master, the master can be used to affect the following parameters on the appropriate slave:

* CH FADER levels
* CH FADER ON/OFF
* CH FADER pan positions
* MONITOR fader levels
* MONITOR ON/OFF
* MONITOR pan positions

The MONITOR parameters can also be used to control the internal monitor mixer of a DRU8. All of the above available are in fader center scroll in RECMIX modes only.

These parameters cannot be recorded in automix modes.

10.3.7 REMOTE control

Before controlling a slave DMR8 from the master DMR8, the (CHASE) key must be OFF (unlit).

Features that can be controlled from the master DMR8 are:

* Tape transport controls (including eject)
* Changing of recording modes (including ALL SAFE)
* In RECMIX modes (except ALL REC), the arming of REC tracks, and the choice of monitor sources (where possible)

After these parameters have been set, press [CHASE] to relocate the slave unit.

10.3.8 Use of parallel chase

Using timecode to sync a slave device (including another DMR8/DRU8 in DMR chase mode) is simply a matter of using the master DMR8's transport controls. The other unit should receive the master's timecode signals, compare with the slave's internal timecode, and adjust the speed and position of the slave medium so that the two timecodes are in sync taking into account any jamsync or offset that may be set.

If there are problems, check the following:

• the timecode from the master is what is expected; i.e., it is the same type and of the value expected (e.g., if the master is outputting 30Dfps values of 01:00:00.00, and the slave is expecting 30fps values of 00:00:00.00, there will be problems in chasing and locking).

• the slave device is set to be a slave and not a master.

• timecode connections are properly made according to the instructions of the appropriate units.

NOTE When the DMR8 is acting as a master, any settings made regarding SMPTE/EBU will also affect MIDI timecode.

10.4 DMR8 as slave (parallel DMR)

When using the DMR8 as a serial slave to another DMR8, it is important to make sure that the machines are set up in the way shown in the diagram in the previous section.

10.4.1 Initial settings

When in INITIAL SET mode, select SLAVE as the input source, and select the output to be REC/PB.
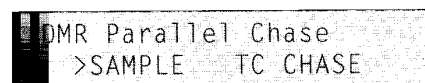
10.4.2 Set up DMR8 timecode

Use MENU option 1 to select external timecode.

10.4.3 Select slave mode
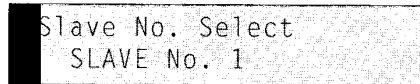
Use MENU option 3 to select timecode slave and (in the next screen) that a DMR will be the master.

The next screen allows you to set the parallel chase synchronization accuracy: SAMPLE or TC CHASE. To use SAMPLE accuracy, the M20P tapes must be formatted simultaneously in ALL REC Chase mode or duplicated using the tape copy function. TC CHASE provides sync accuracy to within 1 TC bit, and can be used with tapes that were formatted at different times.

```
 MR Parallel Chase
   >SAMPLE    TC CHASE
```

The next page allows the setting of a slave number (an address on the control bus) which enables the master to use the appropriate (REMOTE) and (SLAVE CONTROL) keys. Note that while 16 slave numbers are available for overall control, only machines set with slave numbers 1 and 2 can be remotely controlled from the master using these keys.

```
▌Slave No. Select
▌   SLAVE No. 1
```

The next page allows a chase offset to be added or subtracted from the received timecode, and the following page allows "fine-tuning" of this offset.
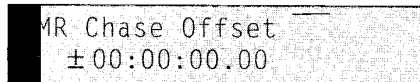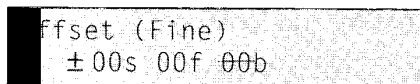
```
▌MR Chase Offset
▌  ±00:00:00.00
```

```
▌ffset (Fine)
▌   ±00s 00f 00b
```

10.4.4 Use of DMR8 as DMR slave

The DMR8 can be operated in slave mode from the master. Transport controls will be echoed on the slave, and the slave will chase and locate to the same timecode position as the master when the master tape is stopped. The number of frames or bits by which the slave is out of sync will be displayed on the sub-display.

When locked, the (OFFSET) key may be used to "fine-tune" or "slew" the synchronization (expressed in samples).

10.4.4a Tape formatting

M20P cassettes that are going to be used in a multi-machine system (DMR8/ DRU8 Parallel Chase), must be formatted at the same time using ALL REC mode, or duplicated using the "COPY" function. Tapes recorded at different times may have the same timecode, but the relationship between the timecode and PCM data sector address will be different, and this will not provide sample-accuracy synchronization.

If you need to synchronize tapes that have been recorded at different times, set the "DMR Parallel Chase" option to "TC CHASE" in the "3:CHASE" menus. The DMR8 will synchronize to an accuracy of 1 TC bit (1/80 frame).

10.5 DMR8 as master (serial)

The automatic serial chase method allows a second DMR8/DRU8 to "kick in" at a predetermined time, thereby allowing continuous playback and recording of times longer than the cassette length.

Note that the AD8X is acting as the word clock master in this MANUAL SERIAL chase system.

10.5.1 Initial settings

The master must be set in the INITIAL SET pages to accept audio data from the AD inputs and to output the REC-IN (PGM/PB) signals.

Additionally, in MANUAL SERIAL chase mode the word clock for both machines must be set to come from an external source, and for the master, this is the AD input/output port.

10.5.2 Set up internal timecode

This should be done in the same way as for parallel chase.

10.5.3 Set up timecode type

This should be done in the same way as for parallel chase.

10.5.4 Set up serial mode

In MENU option 3, select timecode MASTER, and on the next page, select the SERIAL option.

There are two methods of serial chase - automatic and manual. Automatic means that when the master reaches a predetermined timecode position (the position is determined on the slave unit), the slave will "kick in" at that point and continue recording or playback.

In manual mode, the units must be started and stopped manually, but timecode will continue to be generated continuously to allow a continuous recording. In manual mode, the tape from the first unit may be ejected, another tape inserted, the unit set to receive external timecode and the tape set to record when the second unit's tape nears the end.

10.5.5 Use of serial chase (auto)

When both the master and slave units have been set up, press the (CHASE) key on the master unit.

When recording in ALL REC mode (i.e., laying down timecode), the slave will read external timecode until just before the serial chase point minus 30 seconds, and then start recording.

In ALL REC mode only, stopping the master will continue to leave the free-running timecode generator operating, to provide a reference timecode for the slave machine. Use the (START/STOP) key to stop this generator when recording on the slave is finished.

In other modes (when timecode has already been laid down), the slave will locate to the previously-set pre-roll point before the serial chase point, and when the external timecode reaches this location point, it will start to chase and lock to the external timecode.

When recording on the slave, the SLAVE outputs of the master mirror the track busses of the master, so that the mix onto the slave's tape is controlled by the master's mixer.

Likewise, the input from the slave to the master via the slave'd CASCADE OUT to the master's SLAVE MIX connection can be monitored.

When Serial Chase mode is set to Auto, the "Serial Auto Mix mode" screen allows you to switch automix on and off. When set to ON, automix can be used for up to 40 minutes.

10.5.6 Use of serial chase (manual)

Manual mode works in the same way as the auto mode, except that the slave machine must be manually started at the required point.

The following description is intended for ALL REC mode.

When the slave machine is started in record mode, it will read timecode from the control master and write it onto tape. When the control master is stopped, the timecode generator of the second machine switches to internal, continuing the timecode from the previous external timecode.

The slave machine will then be automatically set to "TC MASTER", and the master machine to "TC SLAVE". The original cassette from the first machine may be ejected, and a new tape inserted. Use the MENU 1 option to select external timecode.

The first machine may then be used to start recording when the second machine's tape nears the end. Timecode will be read from the second machine.

Playback is performed in a similar way to recording.

Mixing and monitoring are the same as for the auto mode.

10.6 DMR8 as slave (serial DMR)

This is used, as explained previously, to extend the recording time beyond that allowed by a single cassette.

10.6.1 Initial settings

When in INITIAL SET mode, select SLAVE as the input source, and select the output to be REC/PB.

10.6.2 Set up DMR8 timecode

Use MENU option 1 to select external timecode.

10.6.3 Select slave mode

Use MENU option 3 to select timecode slave and (in the next screen) that a DMR will be the master.

The next page allows the setting of a slave number (an address on the control bus) which enables the master to use the (REMOTE) and (SLAVE CONTROL) keys. Note that while 16 slave numbers are available, only two machines can be remotely controlled from the master.

The next page allows a chase offset to be added or subtracted from the received timecode, and the following page allows "fine-tuning" of this offset.

If the DMR8 is to be in auto serial chase mode, use the next screen to set a time at which the slave will start recording.

10.6.4 Use of DMR8 as DMR slave (auto)

When in auto mode, press the [CHASE] key on the master unit. From this point on, the slave machine is under the control of the master, as described in the appropriate section.

The DMR8 can be operated in slave mode from the master. Transport controls will be echoed on the slave, and the slave will locate to the same timecode position as the master when the master tape is stopped. The number of frames or bits by which the slave is out of sync will be displayed on the subdisplay.

10.6.5 Use of DMR8 as DMR slave (manual)

In the manual mode, starting and stopping of the slave and master machines must be performed manually, but the external timecode from the master will continue running even after the master has been stopped. See the section above on using the DMR8 as a master in manual serial chase mode for full details.

10.7 DMR8 as slave (timecode or MTR)

In this series of options, timecode is received either through the TIMECODE IN connector or (in the case of REMOTE) through the REMOTE connector.

In MENU option 3, there are three choices: POINT, ALL and REMOTE.

10.7.1 POINT mode

In POINT mode, the DMR8 waits for a previously-set timecode point, and then starts chasing when the external timecode reaches this point.

NOTE A timestriped tape must be used for this operation. It is obviously not possible for the DMR8 to locate to a nonexistent timecode position. This chase mode should therefore not be used in ALL REC mode.

To set up POINT mode, select the DMR8 to be a timecode slave, with external timecode and point settings. Use the offset pages if necessary to set an offset from the received timecode.

The chase and lock speed can also be set (from slow to fast).

To set the timecode point, press the [CHASE] key and start the external timecode generator:

```
xt TC      01:00:02.12
oint       01:00:00.15
```

When the point at which chasing is to begin is reached on the external source, press [MEMORY] to set the point. Turn off the external timecode source and rewind

it to a point before the chase point. Use the (LOCATE) key to position the DMR8 at the chase point.

Restart the timecode source. When the timecode reaches the start point, the DMR8 will start the tape and chase and lock to the external timecode.

The (OFFSET) key can be used to slip the DMR8 backward or forward relative to the external timecode, in frames and bits.

NOTE In this mode, the DMR8 transport will stop when timecode is no longer received (the external generator is stopped).

10.7.2 ALL

If ALL is selected, the DMR8 will sync to external timecode. Once again, offsets and lock speed may be selected in MENU option 3.
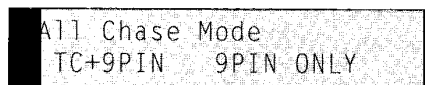
The PLL clock source will be used for this mode, as the DMR8 will need to alter its tape speed in order to chase external timecode accurately. The DMR8 will re-initialize itself if necessary.

NOTE A timestriped tape must be used for this operation. It is obviously not possible for the DMR8 to locate to a nonexistent timecode position. This chase mode should therefore not be used in ALL REC mode.

Starting the external timecode source will cause the DMR8 to move to the appropriate part of the tape. It will then automatically shuttle until it locks onto the timecode. A "countdown" on the subdisplay will indicate the progress of the chase.

When the DMR8 is locked, the (OFFSET) key may be used to "slip" the DMR8 relative to the external timecode in order to adjust the timing. The offset is displayed in frames and bits.

ALL Chase mode operation is possible using a 9-PIN cable connection only (no TC connection). When ALL Chase mode is selected, this option can be set on the "All Chase Mode" screen.

```
All Chase Mode
TC+9PIN    9PIN ONLY
```

When the DMR8 is used in 9 PIN ONLY mode, sometimes it may be necessary to adjust the chase offset to achieve correct synchronization.

10.7.3 REMOTE

The DMR8 can accept one of three remote editor/controller protocols through the 9-PIN REMOTE connector on the back panel. These three protocols are selected using the HELP 5 menu (page 2), as explained earlier in this section.

The remote controller can either be dedicated hardware or personal computer software which outputs RS-422 data in an approved format.

Since in this mode the DMR8 receives and transmits timecode through the 9-PIN connector, it is not necessary to make XLR timecode connections.

However, V-sync connections from an external unit are necessary. The DMR8 does not generate V-sync

See the remote controller documentation for full details of what facilities are available from the individual remote controller.

10.8 Timestriping from an external generator

If the DMR8's internal timecode generator is not to be used for timestriping the tape, use MENU option 1 in ALL REC mode. Select EXT timecode.

```
 nerator Mode
 T >EXT  MTC
```
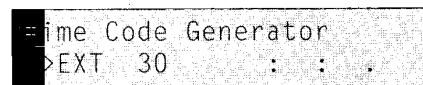
Start the external generator at a point a little before the desired timestripe value, and then press (PLAY) and REG . The DMR8 will record the external time-code onto tape.

This works equally well with MTC if "MTC" is selected in the MENU option 1 screen.

Alternatively, when in ALL REC mode, select the MANUAL option from the timecode setup screen:

```
 ,AUX,INDEX SETUP
    AUTO    >MANUAL
```
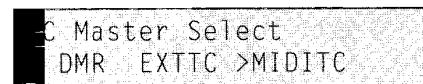
and in the next screen select the first field to be EXT or MTC:

```
 ime Code Generator
 EXT  30    :  :
```

This will enable timestriping of the tape from an external source.

10.9 MIDI timecode

If MIDI timecode (MTC) is selected in MENU option 1 as the timecode source, and the DMR8 is set to a slave chasing MTC in the following screen (MENU option 3):

```
 C Master Select
 DMR  EXTTC >MIDITC
```

then it will chase in POINT mode, following the rules for the external timecode POINT mode above. See the section for full details.

NOTE The DMR8 will always output MTC when it is outputting SMPTE/EBU timecode. No special settings are necessary for selecting this.

All Chase mode example
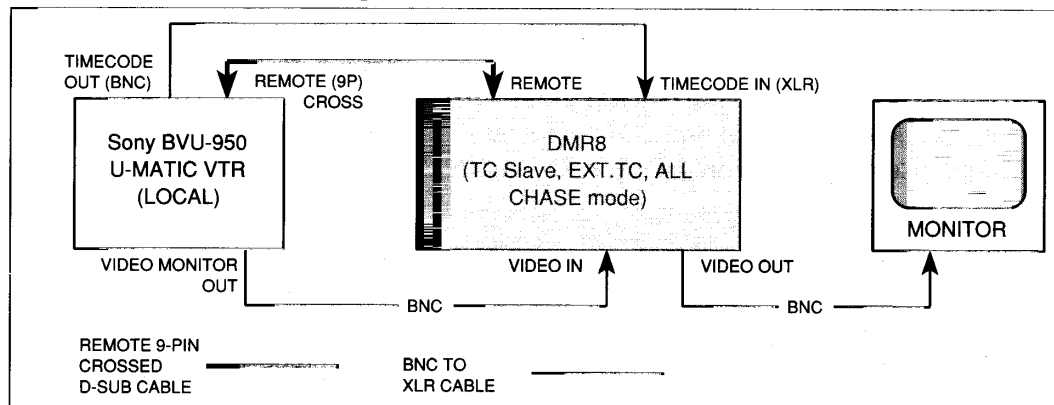
Remote Chase mode example

DMR8 Chase mode options


```
                              DRU8
                                    1
                                              RC24
       YPDR601                                      2
              10
                        PARALLEL/SERIAL
                        CHASE, SLAVE
                        CONTROL, COPY              RC8
              PLAY/STOP
              CONTROL                                    3

  DMC1000         AUTOMIX      DMR8/DRU8    PARALLEL/SERIAL    DMR8
                                           CHASE, SLAVE
           9                               CONTROL, COPY            4

       POINT CHASE
       or ALL CHASE
          MODE
                                                  VIDEO EDITOR
  VTR/DAT          ALL CHASE    ALL CHASE MODE     SONY: BVE910, BVE900
  (9-pin control not   MODE                             RM-450
  supported)                                      CMX: CMX300
           8                                      AMPEX: ACE200   5

              DAT                VTR/DAT
         FOSTEX: D-20        (9-pin control supported)   (VICTOR
                            VTR: SONY: BVU950,        BR-5611 requires an
                            BVU800, BVU900, BVW75,    SA-F911 interface)
                 7                VO9850
                            DAT: SONY 7000 series.  6
```
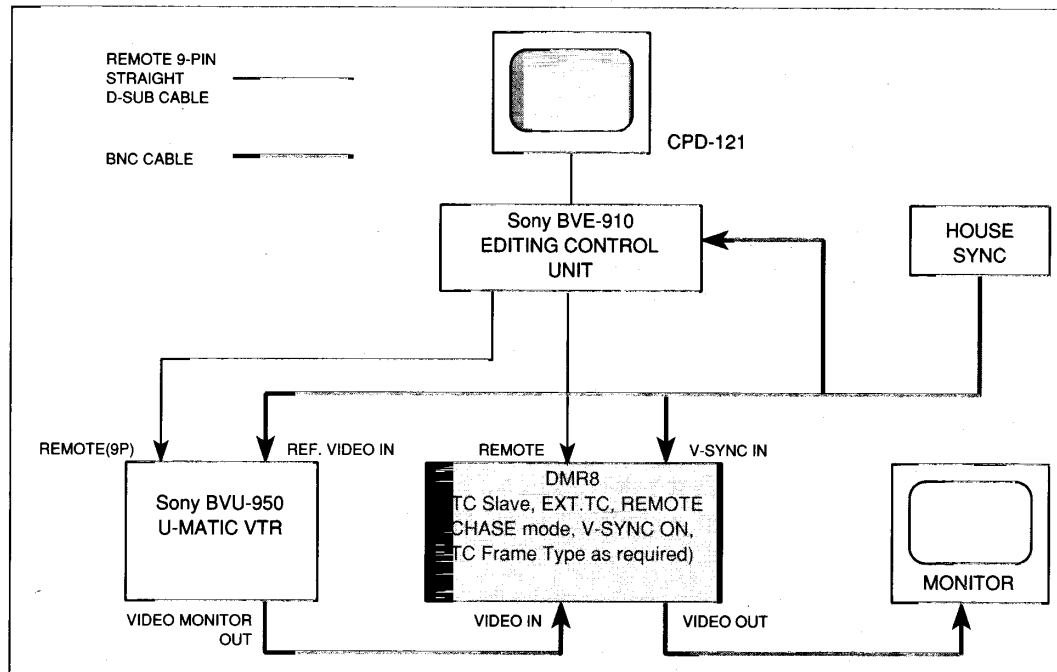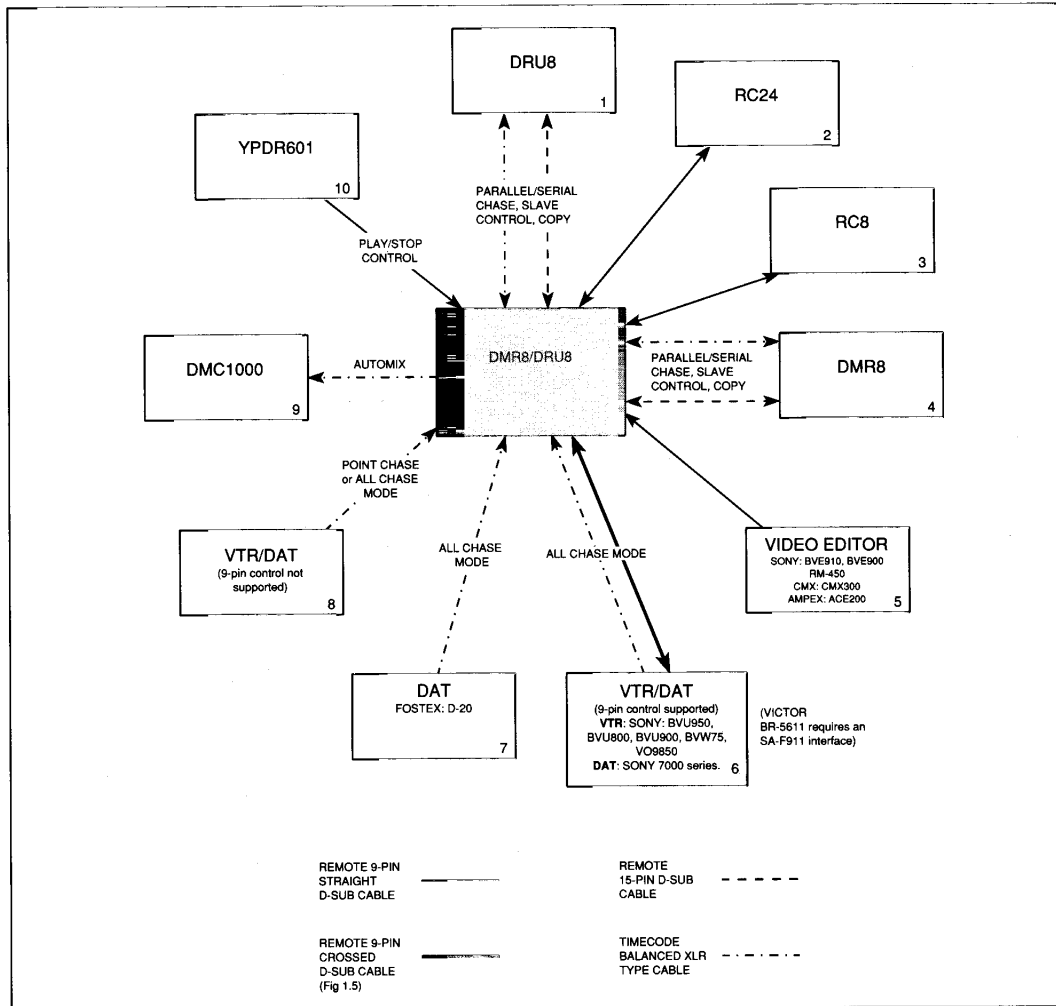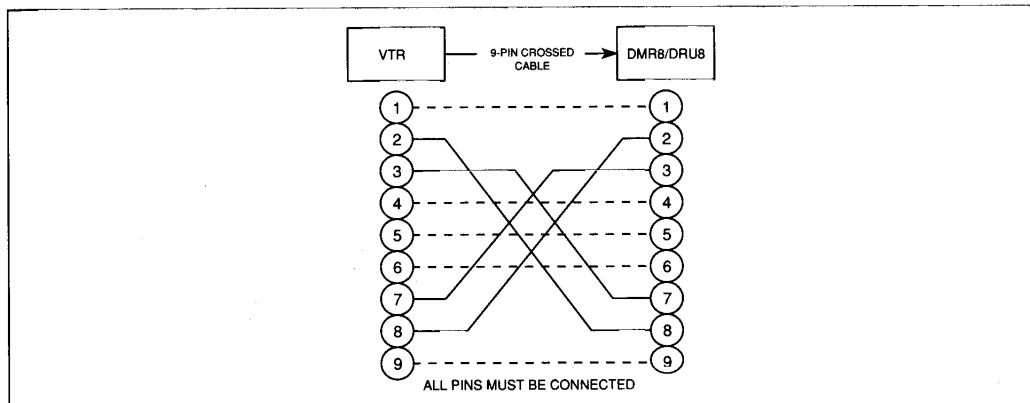
REMOTE 9-PIN   REMOTE
STRAIGHT   ———   15-PIN D-SUB   – – – –
D-SUB CABLE   CABLE

REMOTE 9-PIN   TIMECODE
CROSSED   BALANCED XLR   – · – · – · –
D-SUB CABLE   TYPE CABLE
(Fig 1.5)

Crossed cable wiring details


```
       VTR  ——  9-PIN CROSSED  ——►  DMR8/DRU8
                   CABLE
        1 – – – – – – – – – – – 1
        2                       2
        3                       3
        4 – – –       – – – –   4
        5 – – –  X  – – – –      5
        6 – – –       – – – –   6
        7                       7
        8                       8
        9 – – – – – – – – – – – 9
         ALL PINS MUST BE CONNECTED
```

11 Data storage and copying

11 Data storage and copying

The DMR8 allows storage of data in two different physical formats: to the memory card and to the recording tape itself (using the Table of Contents (TOC) function). Data may also be transmitted and received using the MIDI Bulk Dump facility, as described in the appropriate section of this manual.

In addition, this section deals with the copying of audio data to and from another DMR8/DRU8, and the COPY functions.

The types of data which may be stored on card or TOC are:

* The memories (F1 - F4)
* The automix data moves
* Effect settings
* Program Change tables and the Control Change table
* The overall configuration of the system
* Notes on the recording session

11.1 Card data

The DMR8 uses the YAMAHA MCD64 RAM card for storage of memories and data. This card may be inserted and removed while power is supplied to the DMR8.
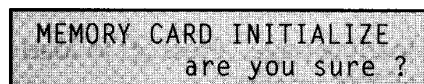
DO NOT use any other type of memory card in the DMR8, even if it appears to fit. Use of any card other than the MCD64 can lead to damage to both the card and the DMR8.

Basic storage and recall of the memories (F1 - F4) is covered elsewhere in this manual. When an "F" memory is STOREd or RECALLed, it is saved to or loaded from the card, rather than internal memory. If no card is inserted in the slot, then these memories cannot be stored or recalled.

11.1.1 Formatting a card

Follow the procedure below to reformat a card containing unwanted data, or format a new card:

* Insert the card into the slot, making sure that the write-protect switch on the card is set to OFF (use the end of a paperclip or similar to move it if it is set to ON)
* Press the MEMORY ⊕ or ⊕ key
* Press the ⎡SHIFT NEXT⎤ key until the following message appears on the subdisplay:

```
MEMORY CARD INITIALIZE
       are you sure ?
```

* Press the ASSIGN·EDIT ⊕ key in order to start the format
* The subdisplay will then show the progress of the format

11.1.2 Saving data to card

Press the (DATA SV/LD) key.

```
DATA SAVE/LOAD
>SAVE   LOAD   DEL   COPY
```

Use the cursor keys and (SHIFT NEXT) to choose the SAVE option.
The subdisplay will then show a screen similar to the following:

```
SAVE DMR→CARD   u50%:f99%
  >SETUP  AMix:C12-4----
```

The number following the "u" on the top line refers to the size (expressed as a percentage of total card memory) of the data pointed to by the cursor. The number following the "f" on the top line refers to the amount of memory available on the card (expressed as a percentage of total card memory).

Moving the cursor left and right to point to the DMR8 setup, and to the different automix memories (current, and data banks 1 - 8) will change the "u" and "f" values. If the "u" value exceeds the "f" value, the selected data cannot be saved to the card.

Selected the data to be saved, and press (SHIFT NEXT). The next screen confirms that data should be saved to the card. Use the (▲) key to execute the save operation, and (SHIFT NEXT) to return to the DATA SAVE/LOAD ***END*** screen.

If data has been saved, this screen will be shown after the save operation. To exit from this mode, press (SHIFT BACK) or (SHIFT NEXT), and then press another subdisplay key so that the (DATA SV/LD) LED goes out.

11.1.3 Loading data from card

From the main SAVE/LOAD menu (press (DATA SV/LD)), select the LOAD option, and press (SHIFT NEXT).

As in the SAVE option, the upper line of the subdisplay shows, with a "u" figure, the amount of data occupied on the card (as a percentage) by the currently selected data item, and the amount of free space ("f") remaining on the card. The lower line shows the data items that have been stored on the card

```
LOAD CARD→DMR   u14%:f76%
  >SETUP  AMix:--2------
```

Use the cursor on the bottom line of the display to select the data item to be loaded.

Press (SHIFT NEXT) to enter the data loading page. Press (▲) to load the data, and (SHIFT NEXT) to exit to the data ***END*** screen.

If you have selected data loading, you will be returned to the data save/load ***END*** page after the load has taken place. To exit from this mode, press [SHIFT BACK] or [SHIFT NEXT], and then press any subdisplay key so that the [DATA SV/LD] LED goes out.

11.1.4 Deleting data from card

> Deleting data from card is a non-reversible operation. Make sure that the data is not needed, or that there is a backup of the data before proceeding.

From the main SAVE/LOAD menu (press [DATA SV/LD]), select the DEL option, and then press [SHIFT NEXT].

As with the data load and save operations, the upper line of the subdisplay shows the percentage space of the selected data ("u"), and the data space available on card ("f").

```
DEL CARD DATA  u14%:f76%
  >SETUP  AMix:--2--:----
```

Select the data to be deleted and then press [SHIFT NEXT]. To delete the data, press [↑], and to escape to the SAVE/LOAD ***END*** screen, press [SHIFT NEXT]. Again, the SAVE/LOAD ***END*** page will be entered after data has been deleted from the card.

11.1.5 Copying cards

> **NOTES:**
> This operation copies the entire contents of a card to another card. The card on which the copy is to be made (the "target" card) must contain no data, and must have the memory protect switch set to OFF.
> The card from which the copy is to be made (the "source" card) must be inserted in the DMR8 before the DATA SV/LD pages are entered.
> **IMPORTANT NOTE!!**
> **This operation overwrites the DMR8's internal memory. ALL AUTO-MIX DATA CURRENTLY IN MEMORY WILL BE LOST! Make sure that the automix data is not needed, or that a security copy exists before you proceed.**

From the main SAVE/LOAD menu (press [DATA SV/LD]), select the COPY option, and then press [SHIFT NEXT].

The first page on the subdisplay asks if you want to delete the internal automix memory. Press $\boxed{\blacktriangle}$ to delete all internal automix memory, otherwise press $\boxed{\text{SHIFT NEXT}}$ to return to the ***END** page.

If the internal automix memory has been deleted, the screen will change to the following:

```
DATA COPY CARD→CARD
 LOAD FROM SOURCE? >EXET
```

If $\boxed{\blacktriangle}$ is pressed, the DMR8 will read the contents of the card, and then ask for the card to which the data is to be written (the target card):

```
DATA COPY CARD→CARD
 PLEASE INSERT TARGET
```

Insert the target card. The DMR8 will sense that the card has been inserted and then ask you to confirm the copy operation:

```
DATA COPY CARD→CARD
 TARGET CARD SAVE? >EXET
```

Press $\boxed{\blacktriangle}$ to save, or $\boxed{\text{SHIFT NEXT}}$ to go to the ***END*** screen without saving. After saving, the DMR8 will return you to the ***END*** screen.

11.1.6 Card batteries

The YAMAHA MCD64 cards are powered by a lithium battery, which has a life of several years. To check the battery voltage, press the MEMORY $\boxed{\blacktriangle}$ or $\boxed{\blacktriangledown}$ key, and then press the ASSIGN · EDIT $\boxed{\text{SHIFT NEXT}}$ key four times. The voltage of both the DMR8's internal backup battery and the currently-inserted card's battery will be shown. If the card battery drops below about 2.45 volts, it is time to replace the card battery.

Use a lithium CR2025 equivalent battery. Consult the documentation supplied with the card for full details of replacement. All data on the card will be lost, so the data should be backed up prior to battery replacement.

11.2 Tape data storage ($\boxed{\text{TOC}}$)

The DMR8 has a function which allows the recording of data in the first 20 seconds of a tape (reserved by the formatting process). This data ("TOC") includes notes on the recording session, the automix data, F1 through F4 memories, and settings.

Press the $\boxed{\text{TOC}}$ key to enter the first TOC page. There is a choice of saving or loading data to or from tape, of editing, copying or deleting notes on the recording session.

```
TOC MENU     >SAVE  LOAD
 NOTES( EDIT  COPY  DEL)
```

11.2.1 Editing TOC data

The DMR8 has space for five separate "notepads" and one current "scratchpad". Each contains four "pages", which can hold the following information:

Page 1	Title, date, Sampling frequency, timecode type, emphasis, start time, end time, track names
Page 2	Producer, composer, arranger, engineer, assistant, studio name and telephone number
Page 3	Entitled "Artists", this page can be used for general notes
Page 4	"Notes" - general notes on the tape/session - perhaps MIDI device program numbers (eg "SY77 Multi 45 - tracks 1 & 2")

TOC pages are displayed on the main display. The subdisplay is used to display details of the current TOC operation. In COPY mode (described later), it is possible to copy pages between notepads and to and from the scratchpad. This means that standard information such as engineers' and the studio name does not have to be rewritten every time.

Use this EDIT mode not only for editing TOC data, but also for examining it when you've loaded TOC data from a tape.

All characters in the TOC are entered either with the numeric keypad (using the (SHIFT) key for letters and the (small) key for lowercase letters) or the (↑) and (↓) keys to enter non-alphabetic characters (in addition to punctuation, the DMR8 ROM also includes Japanese *katakana* characters). The order of the character table is given in an appendix. The (←) and (→) keys are used to move around in a TOC page.

After pressing the (TOC) key, use the (←) and (→) keys to select EDIT, and then press (SHIFT NEXT).

Select one of the five "notepads" (1 - 5) or the current "scratchpad" (C) for editing. If there is nothing currently in the notepad memory, the numbers of the notepads will not be displayed, but hyphens will be shown in their place. As the cursor is moved to the position before the scratchpad or a notepad, the title of the pad will be displayed. Press (SHIFT NEXT) when the selection has been made.

The next page of the subdisplay determines which page of the TOC notes will be edited. Use the (SHIFT NEXT) and (SHIFT BACK) keys to select pages (if (SHIFT NEXT) is pressed after page 4, you will get the ***END** display, but press (SHIFT BACK) to return.

Now the data described above can be entered, using the cursor and numeric keys. Some of the details on Page 1 are automatically filled in by the DMR8 (eg sampling frequency, emphasis, etc) and cannot be altered, for obvious reasons.

11.2.2 Copying TOC data

From the main TOC screen, move the cursor to COPY and press (SHIFT NEXT). The subdisplay will then show something similar to the following:

```
TOC COPY  C - -  - - -
>Crnt P* → No.2    EXE↑
```

This means that the Current ("scratchpad"), all pages (represented by the "*") will be copied to notepad number 2. As you move the cursor, it will be noticed that you can select the source (Crnt, Nos 1 - 5), the pages to be copied (* = all or 1 - 4) and the destination (Crnt, Nos 1 - 5). It is not possible to copy a notepad or scratchpad to itself.

When the copy parameters have been set up, move the cursor to before the "EXE", and press (▲) to start the copy. If the notepad memory did not previously exist, the hyphen will change to a number. The copy screen will still be displayed, and further copies can be made. To exit from this screen, use (SHIFT NEXT) or (preferably) (SHIFT BACK).

11.2.3 Deleting TOC data

This is very similar to the COPY operation in the parameters which may be selected. One or all pages of a particular notepad or scratchpad may be selected for deletion. Choose "Crnt" or a number, and the page number(s) to delete (again, "*" represents all page numbers).

Move the cursor to before the "EXE" prompt, and press (▲). If all pages of a pad are to be deleted, the number will change to a hyphen. Press (SHIFT BACK) to return to the main TOC screen.

11.2.4 Saving TOC data to tape

The TOC notepads and all the automix data will be saved on the first twenty seconds of two tracks of the tape. Up to four sets of TOC notes can be saved on one tape. If there's only one set of TOC notes, or if more than one set of automix data is to be saved, all eight PCM tracks can be used.

From the starting TOC subdisplay, choose SAVE, and then press (SHIFT NEXT). The main display will allow you to choose the location where the data will be saved. Location 1 corresponds to tracks 3+4, location 2 to 5+6, location 3 to 7+8, and location 4 to 1+2. "Location *" corresponds to all tracks 1 through 8. The size of the data to be saved (this includes automix data) expressed as a percentage is displayed.

When the location number has been selected ((▲) and (▼) keys), press (▶)to move the cursor to before "SAVE EXEC". The (▲) may be pressed here to reselect the location number, or (SHIFT BACK) to return to the main TOC menu. If (▲) is pressed, the save process will start.

The TOC saving process

First, the DMR8 rewinds to the start of the tape. It then checks to see if the first twenty seconds are formatted or have been used as a TOC area. It then rewinds the tape, initializes, and preforms a data check on any TOC data already there. If data already exists in the specified location, it will ask if you it is to be replaced (YES=(▲) and NO=(▼)). Answering NO will abort the process. The tape is then rewound, and the data is prepared for saving. The data is then saved to tape, the tape is rewound, and a verification procedure is carried out. During these processes, a bar graph shows the progress of the current operation. The DMR is then reset. To exit after a successful verification, press (SHIFT NEXT).

If a RAM card is in the DMR8 when the save process takes place, all memories (F1-1 through 32 to F4-1 through 32) will be saved on tape.

TOC errors

On an error when finding a non TOC-formatted tape or on a verify error, the DMR8 will inform you, and suggest corrective action.

> At various times in the save procedure, the display will show you that by pressing the (PAUSE/STOP) key, the operation can be halted. There are times, however, when this cannot be done, and the DMR8 will inform you that no escape from the operation is possible.

11.2.5 Loading TOC data from tape

From the main TOC menu, select LOAD and press (SHIFT NEXT). Select the location to load from. Only two tracks can be selected here - the "*" option is not available. Again, Location 1 = tracks 3+4, etc.

```
LOAD >LOCATION NO.-1

LOAD EXEC↑          CANCEL → SHIFT BACK
```

When the location from which TOC data is to be loaded has been selected, press (→), and start loading by pressing (▲). If the load operation is to be halted here, press (◄) to reselect the location, or (SHIFT BACK) to enter the main menu.

TOC load process

On loading, the DMR8 rewinds the tape and performs a TOC area check. If it finds a valid area, it rewinds the tape, initializes itself, and loads the data. While loading, a bar graph on the screen will show the progress of the operation. If the data is valid, a "DATA OK" message and the title of the data set are displayed. An TOC area error or invalid data will produce an appropriate message, and a suggestion for corrective action.

TOC load confirm

Once the data has been loaded, and a memory card is in place, there is a choice of loading any or all of the "F" memory sets, and a confirmation to avoid overwriting existing data. Move the underline cursor to the appropriate "F" field.

```
>MEMORY F1_ F2- F3- F4-   RECALL↑ CANCEL↓
```

Change the "-" to "•" using the ⧈ key for any "F" memory area which is to be loaded from tape onto card.  Then move the cursor to the "RECALL" field.

Press ⧈ to cancel the overwrite process, and ⧈ to overwrite.  As the data is loaded from the buffer into memory and the RAM card, a bar graph display will show the progress so far.  With a lot of data, this can take a few minutes.  When the data has been rewritten into the Current memory location, the DMR8 will reset itself, and the data will be restored.

Press ( SHIFT NEXT ) to exit the TOC mode.

## 11.3 Copying data ( COPY )

Copying PCM audio data to or from the DMR8 requires the use of another DMR8 or DRU8.  The units should be set up in the following way:
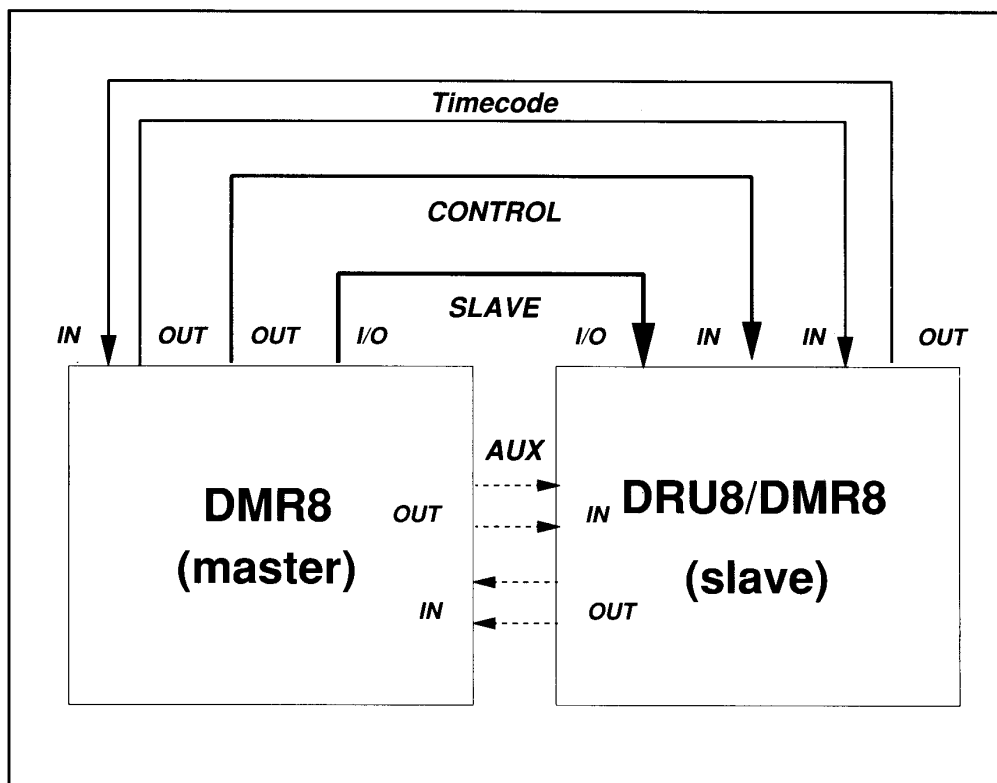
Note that the terms "master" and "slave" in the diagram above refer to the direction of copying, and also to the machine which is controlling the other ("control master" and "control slave"). However, the control master and copy master need not be the same machine. For instance, the DMR8 can be used to control a slave DRU8 which plays back data for recording on the control master DMR8. The analog AUX tracks need not be connected if these are not to be copied.

---

**NOTES**
* The unit **which is controlling the other** ("control master") must be set to **timecode MASTER.** The control master should also use **internal word clock**.
* The unit **being controlled by the other** ("control slave") must be set to **timecode slave** with "DMR" master. The control slave should also use **external word clock** from the SLAVE input.

---

Facilities available in the COPY mode include:
* The ability to make a straight copy (no mixer operation is valid)
* The ability to use the DMR8's mixer to affect the copy
* The ability to rewrite timecode
* The ability to assemble different parts of a master tape onto a slave (an electronic equivalent of razor-blade and splicing tape)

To enter COPY mode, press [COPY] (aka S3):

```
COPY MODE          [COPY]
 >COPY    EDIT
```

If no valid connection has been made from the CONTROL OUT to the CONTROL IN of another unit, an error message will be displayed on the control master.

The first screen allows the choice between direct copying of a whole tape (COPY) and editing a tape by taking selected portions of recorded material and writing them to another tape (EDIT).

Move the cursor to the appropriate position, and confirm by pressing [↑]. Note that the mode shown in the top line of the display will change as the [↑] key is pressed.

If connections have been made correctly, and the control slave unit has been configured correctly, it will display a message showing that it is now slaved for the copying process.

```
        COPY   [COPY]
        SLAVED
```

11.3.1 COPY mode

In COPY mode, the first option is to choose the direction of copying (this option is only available when the control master is in a RECMIX mode):

```
COPY DIRECTION     [COPY]
 >DMR→DRU    DRU→DMR
```

In this case, the "DMR" stands for the control master (the machine which has had the [COPY] key pressed), and "DRU" stands for the control slave. The remote "DRU" may, in fact, be another DMR8 unit.

When this has been selected, using the cursor keys, the next screen ([SHIFT NEXT]) allows the choice between direct copying and the use of the copy master's mixer (note that this option is only available when the control master is in a RECMIX mode):

```
SIGNAL MODE        [COPY]
 >DIRECT   MIXprocessing
```

In MIX processing mode, the level, EQ and channel effects may be dynamically altered during the copy procedure.

It may sometimes be necessary to rewrite the timecode on the copy. This is set up by the next screen:

```
TIME CODE          [COPY]
 >SAME    REWRITE
```

If REWRITE is chosen, the next screen allows the entry of a new start time in hh:mm:ss.ff format, using the numeric keypad.

The penultimate screen allows the setting of a copy-protect flag on the copy, prohibiting further digital copying of this copy:

```
8ch DIGITAL COPY GUARD
 >OFF   ON
```

When these parameters have been set, the final screen will show:

```
 READY FOR COPY    [COPY]
          PLAY
```

if the control master DMR8 is also the copy master. If the control master DMR8 is the copy slave, the display will show:

```
 READY FOR COPY    [COPY]
         PLAY+REC
```

Press the appropriate tape transport keys. The control slave machine will automatically enter the appropriate mode (REC if it is the copy slave, and PLAY if it is the copy master). Recording will take place (with the appropriate timecode being written).

If "MIXprocessing" has been chosen as an option, the changes to the mixer settings will be reflected in the copied tape.

The copy process will continue until the end of the tape is reached, or a transport key is pressed on the control master, whichever happens sooner.

Pressing almost any recorder mode or locator key will exit from the COPY mode while copying is not actually in progress. While copying is in progress, exit by stopping the tape and then exit the COPY mode.

11.3.2 EDIT mode

EDIT mode, as previously mentioned, allows the selection of parts of the source for subsequent copying (to frame accuracy). The three modes available in the EDIT mode are:

UNFORMAT   writes the first program and timecode to a blank unformatted slave tape, either the same as the original, or a newly-generated timecode value. The copy slave is automatically set in ALL REC mode.

ASSEMBLE   takes subsequent portions of the master tape and copies them to defined continuous positions on the slave tape. Once again, timecode is written contiguously from the point specified, and the copy slave is set in ALL REC mode.

INSERT   sets the copy slave to SYNC DUB mode, and copying of portions of the source can be made to specified areas of the previously striped copy slave tape.

In EDIT mode, the first option is to choose the direction of copying (this option is only available when the control master is in a RECMIX mode):

```
COPY DIRECTION      [EDIT]
 >DMR→DRU    DRU→DMR
```

In this case, the "DMR" stands for the control master (the machine which has had the (COPY) key pressed), and "DRU" stands for the control slave. Note that the remote "DRU" may, in fact, be another DMR8 unit.

When this has been selected, using the cursor keys, the next screen ((SHIFT NEXT)) allows the choice between direct copying and the use of the copy master's mixer (note that this option is only available when the control master is in a RECMIX mode):

```
SIGNAL MODE         [EDIT]
 >DIRECT   MIXprocessing
```

In MIX processing mode, the level, EQ and channel effects may be dynamically altered during the copy procedure.

Following this, the next screen allows selection of the start and end times of the program to be copied from the copy master (again, if this is the control master, this is called "DMR", and if it is the control slave, it is called "DRU").

```
DMR START/END TIME[EDIT]
>00:02:30.12 00:03:14.23
```

or:

```
DRU START/END TIME[EDIT]
>00:02:30.12 00:03:14.23
```

The next screen allows the choice of the method to be used for copying on the slave:

```
DRU EDIT MODE      [EDIT]
>UNFORMAT/ ASMBLE/ INSRT
```

or

```
DMR EDIT MODE      [EDIT]
>UNFORMAT/ ASMBLE/ INSRT
```

UNFORMAT mode

UNFORMAT mode should be used to copy to virgin tapes (or tapes which have been through the ALL ERASE process) only, as it writes timecode to the copy slave.

In unformatted mode, the next screen asks whether the copy will take its time-code directly from the source, or whether it will be rewritten with a different value:

```
TIME CODE          [EDIT]
 >SAME    REWRITE
```

If the answer is that the timecode is to be rewritten, the next screen prompts for the copy slave's starting timecode value:

```
START TIMECODE    [EDIT]
 00:00:25.00
```

The last screen shows that the copy operation is ready to proceed.

```
READY FOR COPY    [EDIT]
       PLAY
```

(if the copy slave is also the control slave). Pressing the (PLAY) key on the control master will automatically start the control slave. If the control master is the copy slave, the display will ask for the (REC) and the (PLAY) key to be pressed. The process can be aborted by pressing (PAUSE/STOP) on either of the units.

Assembly

The ASSEMBLE mode should be used to append further program material to a tape which has had program material copied using the UNFORMAT mode. Program material copied onto the copy slave following this method will have timecode written continuous with the previous material's timecode.

The first screen allows the choice of the reference time for the copy slave; either the timecode track or the control track:

```
SYNC TIME BASE      [EDIT]
>TC TRACK    CTL TRACK
```

The time recorded on the copy slave's tape at which the copy slave should start recording is the next option available. The following screen assumes that the copy slave is also the control slave (otherwise "DRU" will be changed to "DMR").

```
DRU START TIME      [EDIT]
00:04:03.21
```

Following this, the last screen asks for the (PLAY) or (REC) and (PLAY) keys to be pressed on the control master (depending on whether the control master is the copy master or copy slave).

Insert

The INSERT mode should be used on pre-striped tapes in order to drop portions of the copy master tape into defined locations on the copy slave (referenced by timecode). If this mode is selected, the copy slave will automatically enter SYNC DUB mode.

NOTE that to rehearse the transfer selected of tracks only (rather than all eight tracks) from one DMR8/DRU8 to another, it is necessary to select PUNCH IN mode.

It is also possible to rehearse the insert edit operation by putting the copy slave into ALL SAFE mode and manually trimming the insert times.

The first screen allows the choice of disabling or enabling the sample offset (disabling allows frame-based offset) using the (OFFSET) key on the slave machine when the chase is on progress:

```
OFFSET in CHASE     [EDIT]
>DISABLE    ENABLE
```

The time at which the copy slave ("DRU" if this is also the control slave, "DMR" if this is the control master) is the next option to be set, using the same screen as the "ASSEMBLE" mode.

Following this, the last screen asks for the (PLAY) or (REC) and (PLAY) keys to be pressed on the control master (depending on whether the control master is the copy master or copy slave).

12 MIDI

12 MIDI

The DMR8 and MIDI (Musical Instrument Digital Interface) may be used together in a variety of ways.The following chart gives the options available when using MIDI:

- Program Change messages may be transmitted and received, to signal the recall of memories (F1 - F4 memories). Any memory may be linked to any MIDI program number.

- MIDI Control Change messages may be transmitted and received, to signal changes in the control settings of the DMR8.

- MIDI System Exclusive data may be transmitted and received, allowing bulk dumps between the DMR8 and a MIDI data filer (such as a sequencer or a suitably-equipped computer with the appropriate software).

- MIDI System Exclusive data may also be received for remote control of parameter changes on the DMR8.

To access the main MIDI menu, press the (MIDI) key ((S4)) below the tape transport controls to obtain the following display:

```
MIDI MENU
>I/O  ASSIGN  SYNC  BULK
```

From this screen, use the (◄) and (►) keys to select the desired option, and then press (SHIFT NEXT).

NOTE: This manual does not give an explanation of MIDI or MIDI terminology. If you are unsure of the meaning of any MIDI terms, it is recommended that you consult one of the many introductory textbooks available.

12.1 I/O

After selecting "I/O" from the main MIDI menu, the following screen will be displayed:

```
MIDI I/O MODE
 >CH= 1   OMNI•  ECHO•
```

Use the (▲) and (▼) keys to set the send/receive channel (these are the same channel on the DMR8) in the first field (values 1 through 16).

The second field, "OMNI", may be set on ("•") or off ("-"). When set on, the OMNI function will, of course, override the MIDI receive channel (the transmit channel will remain as set in the first field).

The third field, "ECHO", may be set on ("•") or off ("-"). When on, all data received at the MIDI IN port will be retransmitted through the MIDI OUT port (merged with any data generated internally by the DMR8). This feature gives the DMR8 a "soft" MIDI THRU port.

NOTE that when SYNC is ON, the following System Real Time Messages: Clock, Start, Stop, and Continue, as well as the System Common messages of Song Select and Song Position Pointer, will <u>not</u> be echoed through.

To move to the next screen, press `SHIFT NEXT`.

```
RECEIVE:>PGM• CTL• EXCL-
SEND    : PGM- CTL• EXCL•
```

This allows the enabling ("•") or disabling ("-") of Program Change messages, MIDI Controller messages, or System Exclusive messages (either transmitted or received). The filtering out of System Exclusive messages only applies to System Exclusive messages for parameter control. System Exclusive Bulk Dump messages can <u>always</u> be transmitted and received, irrespective of this setting.

Move the cursor to the appropriate field using the ◄ and ► keys, and enable or disable the messages using the ▲ and ▼ keys. The top line of this display refers to messages received by the DMR8, and the bottom line refers to messages transmitted from the DMR8.

If Program Change messages, for example, are set to off on reception, they will still be retransmitted from the MIDI OUT port if ECHO (in the previous screen) is set ON. However, the DMR8 will ignore these messages.

After setting these options, press `SHIFT NEXT` to return to the "***END***" screen.

12.2 ASSIGN

In the first screen, the following is displayed:

```
ASSIGN BANK SELECT
>A   B   C   D
```

The DMR8 contains four banks for the assignment of Program Change messages to memories.

Select the appropriate bank using the ◄ and ► keys, and then press `SHIFT NEXT` to enter the next screen.

12.2.1 Program Change assignment

The following screen will be displayed:

```
>PGM  1=MEM F1- 1
   Rec Mix Initial Data
```

The first parameter to be entered is the MIDI Program Change number. Any program change number from 1 to 128 may be entered, using either the numeric keypad, or the ▲ and ▼ keys. When the program number has been entered, use the ► key to move the cursor to select the memory bank (F1 to F4)

containing the memory with which the program change will be associated. Use the ⊙ and ⊙ keys to cycle through 1 to 4, with an "*" (no memory will be selected for this program number) coming between 1 and 4.

Move the cursor right once more (⊙ key), and use the ⊙ and ⊙ keys or the numeric keypad to select a memory number between 1 and 32 from the previously-selected memory bank. Note that the memory title is displayed in the bottom line of the display as a reminder of the contents of the memory.

12.2.2 Control Change assignment

The MIDI specification allows for 121 controllers. Of these, some are defined as 2-byte controllers, and some as 1-byte controllers. The DMR8 has 599 different parameters which may be controlled using MIDI controller data. To this end, 32 2-byte continuous and 52 1-byte MIDI controllers are available (0-31 being 2-byte, and 64 through 95, together with 102 through 120 being 1-byte). It is therefore necessary to map a subset of the MIDI controller set to the DMR8's parameters.

The controller assignment screen allows a subset of the most commonly-used parameters to be selected for control using MIDI.

```
>CTL64 = PRM 88
 SUST S  SOLO  ON
```

Select the MIDI controller using the ⊙ and ⊙ keys or the numeric keypad. If the controller is defined as a MIDI controller, either in the MIDI Specification, or by common inter-manufacturer agreement, the name of this controller will be displayed on the bottom line (eg controller 7 = VOLUME).

Use the ⊙ key to move the cursor to the DMR8 parameter which will be affected by this MIDI controller. Again, as the number is selected, using the ⊙ and ⊙ keys and/or the numeric keypad, the name of the parameter will be displayed on the bottom line.

A full list of the parameters and their numbers is given at the end of this manual.

When this feature is used with a MIDI sequencer or sequencing program, parameters such as fader movements can be quantized and synchronized to musical events (rather than timecode-based events).

12.3 SYNC

The DMR8 allows a MIDI sequencer to be played at a fixed tempo, using a set timecode starting point. The MIDI Start, Stop, Continue, Song Select and Song Position Pointer commands are transmitted, as well as clock information.

NOTE: This feature is completely unrelated to MIDI timecode, which is simply a method of transmitting SMPTE/EBU-type information using the MIDI medium.

When SYNC is selected from the first MIDI menu, the display shows:

```
SYNC INTERNAL CLOCK
 >OFF   FIX
```

Disable or enable the MIDI synchronization feature by selecting OFF or FIX respectively, and then pressing (SHIFT NEXT).

```
FIX:    NAME & SONG SEL
  >Anata wa    01
```

Enter the name using the numeric keypad in (SHIFT) mode (the [↑] and [↓] keys may also be used). This is for mnemonic purposes only. The song number can be entered in the next field. Any sequencer or sequencing software which responds to Song Select messages will load the appropriate song. Allow time for the song to be loaded - some sequencers may take some time to do this.

The next screen allows the setting of a fixed tempo (in bpm), the length of the song (expressed in bars and beats) and the time signature of the song:

```
FIX:    END MEAS-BEAT
  >¶= 120.0 0024-04 04/04
```

The tempo may be adjusted in units of 0.1 bpm using the numeric keypad, and/or the [↑] and [↓] keys (press the [→] key once to move to the 0.1 bpm field).

Use the [→] key once more to move to the last bar/beat field, and enter this vaqlue using either the numeric keypad and/or the [↑] and [↓] keys.

Use the [→] key to move to the time signature field, and set the upper part (1 through 16), and the lower part (2, 4, 8 or 16). Now press (SHIFT NEXT) to enter the next screen:

```
FIX:>AREA 00:00:00.00-00
  ¶=120.0 00:00:47.15-00
```

In this screen, the start time of the song (in hours, minutes, seconds, frames and bits) can be set on the top line, using the numeric keypad and/or the [↑] and [↓] keys. As the start time is changed, the end time on the bottom row will automatically change to reflect this. For instance, if in the above example, the song is set to start at 00:01:30.00-00, the display will read:

```
FIX:>AREA 00:01:30.00-00
  ¶=120.0 00:02:17.15-00
```

By moving the cursor to the bottom row, the tempo can be adjusted (in bpm and tenths of bpm), using the numeric keypad and/or the [↑] and [↓] keys. This allows the fitting of a piece to a set time (say 30 seconds for a commercial jingle). In this case, adjust the tempo, so that the screen now reads:

```
FIX:  AREA 00:01:30.00-00
  >¶=190.0 00:02:00.00-00
```

NOTE that the end time cannot be entered directly - it is a function of the length of the song, the time signature, and the tempo.

Press ⌈SHIFT NEXT⌉ for the next screen, which allows you to specify a cue point for the DMR8, expressed in bars (measures) and beats of the MIDI piece, rather than in timecode values:

```
FIX: CUE      00:01:30.00
   ♩=190.0 >0001-01 04/04
```

Use the numeric keypad and/or the ⊙ and ⊙ keys to enter a value in bars and beats. The top line of the display will change to display the timecode value corresponding to this song position.

```
FIX: CUE      00:01:43.26
   ♩=190.0 >0012-01 04/04
```

If ⌈LOCATE⌉ is pressed now, the DMR8 tape will move to the timecode position indicated on the top line of the CUE screen. This position may be memorized as a location point, either by pressing ⌈MEMORY⌉, or by storing it to an F4 memory. When tape playback starts, the relevant Song Select, Song Position Pointer, and Continue MIDI messages will be transmitted, along with the MIDI Clock signals. When the tape is stopped, a MIDI Stop message will be transmitted.

Allow the sequencer time to "lock up" using the Song Position Pointer message before pressing ⌈PLAY⌉.

NOTE The DMR8 is not able to synchronize MIDI sequences with varying tempos and/or time signatures. For this, a unit such as the YAMAHA MSS1 is required.

12.4 BULK

The DMR8 is able to transmit and receive bulk data to MIDI bulk data recorders using MIDI System Exclusive data. In the BULK screens, the type of data to be transmitted can be selected prior to transmission.

From the main MIDI screen, select BULK and then press ⌈SHIFT NEXT⌉:

```
BULK OUT 1 BULK START?
>MEM:F*-ALL  PGM:*  CTL
```

In these bulk screens, the top line of the display indicates the action to be taken (select data to be transmitted, or perform transmission). The bottom line shows what data will be transmitted. If, as in the above example, the top line shows

```
BULK START?
```

pressing the ⊙ key will start transmission.

In the next field (use ⊙), all of the "F" memories can be selected ("*"), or all the F1, F2, F3 or F4 memories. For the F1, F2, and F3, memories relevant to either recmix ("R") or mixdown ("D") can be selected for transmission.

```
BULK OUT 1 BULK START?
MEM>F1R-**  PGM:*  CTL
```

The next field allows the selection of individual memories. Note that only those memories appropriate to the currently-selected mode (recmix or mixdown) can be selected for transmission.

When the program(s) to be transmitted have been selected, move the cursor to the beginning of the line and press ⊕ to transmit the data.

The next pair of options allow you to transmit either the Program Change table (all tables = "*", or individual tables A, B, C or D), or the Control Change parameter table. To transmit them, make sure that the top line displays the "BULK START?" message, and then press ⊕.

Pressing (SHIFT NEXT) will bring up the next screen:

```
BULK OUT 2 BULK START?
>EF:ALL  STYL:U*  NOTE:1
```

By moving the cursor, either the user-defined effects (one or all), the user styles (one or all), or the TOC notes (all or one) can be transmitted.

(SHIFT NEXT) brings up the third and final bulk screen:

```
BULK OUT 3 BULK START?
>SET  AMix:**  SYSTEM
```

Here, the all the settings, one or all of the automix memories (current or data) or the system setup can be transmitted.

NOTE: The MIDI Bulk Dump will be transmitted on the MIDI channel selected in the I/O screen.

The DMR8 can receive Bulk Dump data at almost any time. It is not necessary to enter the MIDI menus. However, it is not possible to receive MIDI Bulk Dump data at the following times: when TOC saving or loading, and when resetting the DMR8.

If the DMR8 receives TOC current data with different "F" memory settings, or system data, the DMR8 will reset itself.

If mixer current memory bulk data is recieved for a different mode from the current mode of the DMR8, this data will not be received (ie, when the DMR8 is in RECMIX mode, MIXDOWN data will not be received, and *vice versa*).

If automix data is transmitted to the DMR8, this will not be received if the free automix memory of the DMR8 is smaller than the received automix data. This data will also be ignored if the destination data area already contains data. Additionally, the DMR8 will not receive automix data if it is in automix record or edit mode.

Automix bulk data is transmitted using a number of separate System Exclusive packets.

System bulk data will not be received if the tape is moving (ie, the recorder must be in PAUSE or STOP mode, or the tape must be ejected).

If the MIDI receive buffer becomes full, the 2-digit LED will indicate this by lighting the left digit's decimal point.

Bulk Dump data must be transmitted on a channel on which the DMR8 is set to receive.

12.4.1 Bulk Dump Data

The following table shows what will be transmitted in different options:

MEM:F*-ALL	RECMIX 1-2 to 16, MIXDOWN F1-18 to 32, RECMIX F2-1 to 24, MIXDOWN F2-1 to 24, RECMIX F3-1 to 14, MIXDOWN F3-1 to 14, F3-15 to 32, F4-1 to 32
F1R-**	RECMIX F1-2 to 16
F1R-Cu	RECMIX current memory
F1D-**	MIXDOWN F1-16 to 32
F1D-Cu	MIXDOWN current memory
F2R-**	RECMIX F2-1 to 24
F2D-**	MIXDOWN F2-1 to 24
F3R-**	RECMIX F3-1 to 14, F3-15 to 32
F3R-Gr	RECMIX current grouping
F3R-SG	RECMIX current stereo grouping
F3D-**	MIXDOWN F3-1 to 14, F3-15 to 32
F3D-Gr	MIXDOWN current grouping
F3D-SG	MIXDOWN current stereo grouping
F4--**	F4-1 to 32
PGM:*	Program Change assignment tables (A to D)
EF:ALL	Effect user memories U21 to U30, channel effect user memories U8 to U10
EFF:E**	Effect user memories U21 to U30
EFF:C**	Channel effect user memories U8 to U10
STYL:U*	INITIAL SET style user memory U0 to U9
STYL:Cu	Current INITIAL SET style
NOTE:*	Current TOC note data 1 to 5
NOTE:C	Current TOC note data
SET	Program Change assignment tables (A to D), Control Change assignment table, effect user memories U21 to U30, channel effect user memories U8 to U10, INITIAAL styles U0 to U9, current INITIAL SET style, TOC note data 1 to 5, RECMIX current grouping, RECMIX current stereo grouping, MIXDOWN current grouping, MIXDOWN current stereo grouping, RECMIC current memory, MIXDOWN current memory

12.5 MIDI Events

These are four F3 memories (25 through 28) whose values may be set in the HELP screen - not in the MIDI page. When recalled manually, or at a specific timecode point, through the EVENT EDIT AUTO mode, the MIDI data previously specified will be output from the DMR8.

12.5.1 Editing MIDI events

Press the (HELP) key, followed by ③ on the numeric keypad, and then (ENTER).
The main display will show:

```
H        MIDI Event Edit (Page 1/4)        h
E              ***** F3-25 *****            e
L PGM (>--) *  0  CTRL(*--) *  0 * 64       l
P NOTE(*--) *C..3 * 64  *00m*01s*00f        p
```

As can be seen, the events which can be transmitted are: Program Change,
Controller, Note On messages with velocity and (less obviously), Note Off
messages.

There are three further similar screens, accessed by pressing (SHIFT NEXT), and
these bring up the same parameters for programs F3-26, F3-27 and F3-28.

Program Change

The first field can be set with a value from off ("--"), or 1 through 16. Use the
ASSIGN·EDIT ⊙ and ⊙ keys and/or the numeric keypad to enter the value.
This refers to the MIDI channel over which the Program Change message will
be sent.

Move the cursor (ASSIGN·EDIT ⊙) to the next field, and enter a program
number from 0 to 127 (⊙ and ⊙ and/or keypad, as with all fields in this
display) for the Program Change message value to be sent.

Controller

The field immediately following the "CTRL" display refers to the MIDI channel
number over which the message will be sent. No MIDI channel (no transmis-
sion) is represented by "--".

The next field refers to the MIDI controller number, which may take values
between 0 and 120.

Following this as the last field of the third line of the display is the controller
value, which may be set from 0 to 127. MIDI devices may react in various
ways to controller settings. Make sure that the MIDI device to be controlled
will interpret the controller message in a meaningful way.

Note On and Off

The first field on the last line refers to the MIDI channel number over which the
Note On message will be transmitted, off ("--") or 1 through 16.

The next field displays the MIDI note *name* of the note to be transmitted.
Entering a MIDI note <u>number</u> from the numeric keypad will display the note
name. For instance, pressing ⑥ followed by ⓪ (60) will display C..3. Note
values may be from 0 (C-2) through 127 (G8). The ⊙ and ⊙ keys may also be
used here.

The next fields allow the setting of the time till a Note Off message, in minutes, seconds and frames. Note that this is an absolute time, which has no connection with MIDI clocks. It would be useful, for example, if a video scene of a length of 00:01:12.23 requires the background sound of running water, provided by a looped sample, which could be "spun in" using this facility.

12.5.2 Playing back MIDI events

Using the (EVENT EDIT) key and menus, the MIDI event memories may be linked to F4 location memories in the same way as F1 scene changes, etc. Using a film or video cue sheet, F4 memory points may be directly entered to frame accuracy, and the MIDI events synchronized to them.

See the section on "Memories" for full details of this operation.

Selecting the F3 memory bank using the MEMORY keys, selecting one of the MIDI event memories, and (RECALL)ing it will also transmit the MIDI messages associated with this memory.