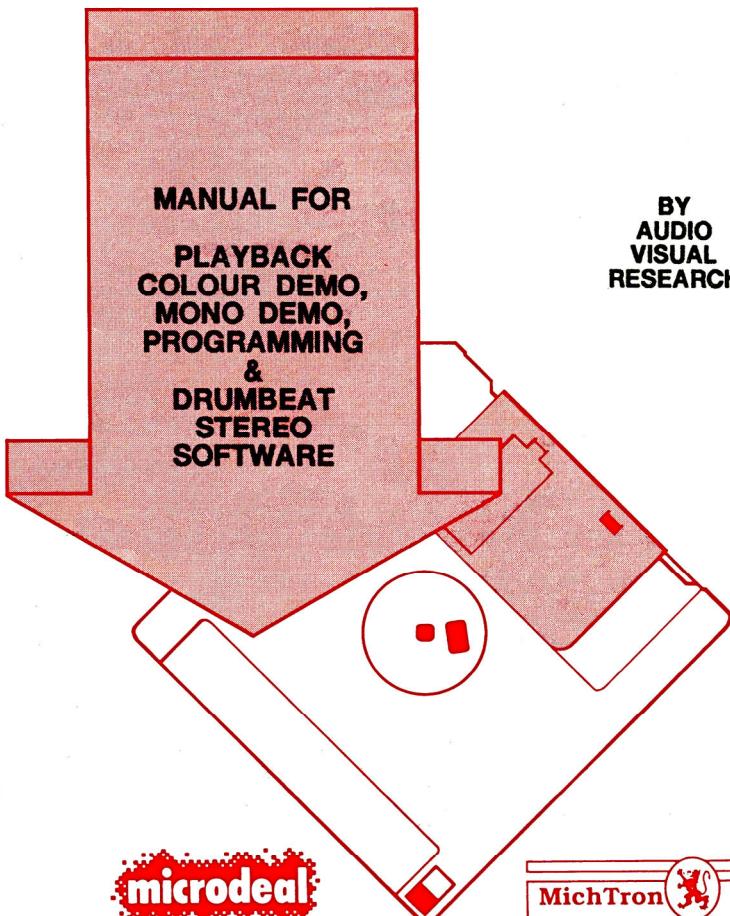


PLAYBACK



FOR THE ATARI
ST-STF-STFM

PLAYBACK

STEREO OUTPUT CARTRIDGE FOR THE ATARI ST-STF-STFM
USER GUIDE
FIRST EDITION - JANUARY 1991

CREDITS

PLAYBACK CARTRIDGE DESIGN

DRUMBEAT STEREO
PLAYBACK COLOUR DEMO
PLAYBACK MONO DEMO
QUARTET STEREO HELP
MANUAL

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Thank you and hello to:

Everybody who has helped with PLAYBACK and the code.

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IMPORTANT BACKUP INSTRUCTIONS

The disks enclosed with PLAYBACK have been formatted as single sided with 10 sectors per track, this allows us to include more information on the disks, this also means that you cannot copy these disks using the desktop disk copy routine but can copy them by 1 of 2 means;

1) USE A COPY PROGRAM

We suggest that you use DASH, FCOPY or similar selecting single sided 10 sectors per track copying.

2) MAKE A FILE COPY

Do the following; Format a blank disk then following the instructions in your Atari ST manual copy just the folders/files you require onto the disk.

IMPORTANT STE OWNERS

Before running the DRUMBEAT program on a colour monitor/TV please ensure that you select MEDIUM resolution from the options menu of your desktop.

1.0 INTRODUCTION

Thank you for buying the STEREO PLAYBACK system for use on your ATARI computer. We hope that you will find all the programs and routines you require contained within this package. If you own QUARTET then you will now be able to play QUARTET music in stereo through an amplifier rather than through the monitor, TV or in mono through Replay.

If you own QUARTET Version 1 then you will need to upgrade to version 1.5 to use PLAYBACK in stereo, please contact Microdeal on 0726 68020 for upgrade information. Until you receive your upgrade you can playback your own QUARTET compositions by using either the colour or mono demo routines contained on PLAYBACK disk 1.

On disk 2 is a stereo version of Drumbeat. The old DRUMBEAT program which was sold with REPLAY 4 has been completely re-written to enhance the system still further. The latest version of DRUMBEAT is a Stereo version of the DRUMBEAT program sold within REPLAY 8. It offers advanced editing with powerful MIDI support and instead of being an interesting demonstration of the sort of program that can be written to use PLAYBACK, it is now a full blown digital Drum machine of the highest quality. The source code for Quartet Stereo output can be found in the QUARTET folder on disk 1. Also on disk 2 we have included as much in the way of Source program as the home programmer is likely to need. Basic language code includes; STOS, GFA, HI-SOFT & ATARI, and the Machine code routines include drivers for mono sample output and Stereo sample output.

We hope that you enjoy using PLAYBACK and continue to support Microdeal products. We at Microdeal operate a policy of continuous improvement and compatibility of our products and in purchasing a Microdeal product you are supporting future research and design and ensuring that your products are compatible and upgradeable.

BEFORE YOU START !

Throughout the course of this manual, it is assumed that the user is familiar with such terms as 'OPENING A DIRECTORY', 'DOUBLE CLICKING' and 'RUBBER BANDING'. These terms are important abbreviations for simple operations of your ATARI ST, but with fairly lengthy explanations. If the user is fairly new to the computer, it is recommended that a thorough examination of the relevant sections of the ATARI ST users guide is made before attempting to read this manual or operating the software contained within this system. The Authors of the software packages which go to make up PLAYBACK have spent a great deal of time and effort trying to make the system as simple to use as possible. Knowing a few technical terms makes the manual both easier to read and understand.

2.0 SPECIFICATIONS

2.1 PLAYBACK CARTRIDGE

ANTI-ALIASING FILTER	- 2 (1 for each channel)
MAX. OUTPUT FREQUENCY	- Greater than 100 kHz(not guaranteed)
FREQUENCY SELECTION	- Software controlled
RESOLUTION (input & output)	- 8 BITS (Unsigned)
OUTPUT VOLTAGE	- 2.4 V Pk to Pk

2.2 DRUMBEAT

PLAY BACK FREQUENCY	- 22 kHz
MAX. KIT SIZE	- 15 SAMPLES
MAX. SAMPLE SIZE	- 10 kBytes (half second samples)
MAX. PATTERNS	- 50
MAX. PATTERN STEPS PER SONG	- 100
TEMPO	- 40 to 239 beats per minute
BEAT REGISTRATION	- 1/8, 1/16, 1/32 and triplets (2,4,8,3,6,9 Beats/quarter note)
MIDI SYNCHRONISATION	- INTERNAL TEMPO or EXTERNAL

2.3 WHAT YOU GET

Upon opening your PLAYBACK package, you should find the following :-

- 1) PLAYBACK sound digitiser cartridge
- 2) DISK 1 containing the Colour demo & Quartet Stereo source code.
- 3) DISK 2 containing the Mono demo, DRUMBEAT STEREO & source code.
- 4) This product user guide.
- 5) Purchase registration card. PLEASE RETURN THIS CARD !!

2.3 DISK 1 CONTENTS

COLOUR FOLDER -	<ul style="list-style-type: none"> - DEMO.4V - DEMO.NEO - DEMO.PRG - DEMO.SET - DEMO.TXT 	<ul style="list-style-type: none"> - 4 voice music file from Quartet - Neochrome picture for demo - Main colour demo program - Sample set from Quartet - ASCII file of text for scrolling demo message
QUARCOD.E FOLDER	<ul style="list-style-type: none"> - MADMAK.4V - PANTS.SET - ROB5.BIN - ROBPLAY5.S - ROBTEST5.PRG - ROBTEST5.S 	<ul style="list-style-type: none"> - Quartet music file for compiling - Quartet voice set for compiling - Binary file - Source file for Quartet player - Compiled Test program - Source code for above

2.4 DISK 2 CONTENTS

IN ROOT LEVEL OF DIRECTORY	<ul style="list-style-type: none"> - DRUM8ST.PRG - STAND8.PT1 - STAND8.SNG - STANDARD.KIT 	<ul style="list-style-type: none"> - Stereo Drumbeat program - Drum pattern for use with Drumbeat - Drum Song sequence for Drumbeat - Drum Kit for use with Drumbeat
BASIC FOLDER	<ul style="list-style-type: none"> - ABASIC FOLDER - GFA FOLDER - HISoft FOLDER - STOS FOLDER - ONE2.AVR - PLAYBACK.PRG - WELCOME.SPL 	<ul style="list-style-type: none"> - Atari Basic code - GFA Basic code - Hisoft Basic code - STOS Basic code & STOS player program - Stereo sample for use in Basic - Machine Code routine for use in Basic - Mono Sample for use in Basic
MONODEMO FOLDER	<ul style="list-style-type: none"> - DEMO.PRG - DEMO1.PI3 - DEMO2.PI3 - DEMO3.PI3 	<ul style="list-style-type: none"> - Main mono demo program
SOURCE FOLDER	<ul style="list-style-type: none"> - PLAYBACK.S 	<ul style="list-style-type: none"> - Monochrome pictures for display with demo
		<ul style="list-style-type: none"> - Machine code source for PLAYBACK.PRG

3.0 Setting up PLAYBACK

3.1 Inserting the Cartridge

Make sure that your computer is SWITCHED OFF. Place your PLAYBACK cartridge, label side up, on the left hand side of your ST. Place the cartridge so that the sockets are facing outwards from the computer, and the open end is facing in, towards the computer. Now locate the CARTRIDGE PORT on the left hand side of the ST (towards the rear). Gently slide the cartridge into the open slot of the computer and feel the cartridge engage the computers socket. When you are sure that the cartridge is in position, apply gentle but firm pressure on the cartridge to slide it into the machine about 8-10 mm.



The above operation may require some force if the cartridge is new, but should become easier with use. PLAYBACK should always produce a firm fit, NEVER switch your computer on if the cartridge is not fully inserted or if it feels loose. A catastrophic electrical failure may occur in either PLAYBACK or your ST (or both) if the cartridge is not inserted properly. When in place, switch on your computer, it should autoboot in the usual manner. If the disk light fails to appear, or the screen displays an unusual pattern and refuses to clear, switch the computer off IMMEDIATELY; recheck your computer connections and, most important, recheck the PLAYBACK or boot disk and ensure that it is correctly installed (I.E. LABEL SIDE UP AND FULLY PRESSED IN). If the fault persists, consult your dealer for help.

Once installed, there is no need to remove the cartridge. PLAYBACK will sit quite happily in the machine and will give no problems while running other software. It will only be necessary to remove PLAYBACK if you need to use another cartridge in the Cartridge port. Remember to switch off your computer before removing PLAYBACK.

3.2 Connection to an external Amplifier

Suitable cables must be connected between the sockets of your PLAYBACK cartridge and some form of amplification. Practically any HI-FI or practice amplifier with a CD/AUX input or an input capable of accepting a 2V input signal will work. The Quartet program can use both the ATARI monitor output OR the HI/FI output built into the cartridge. However, due to the advanced nature of the operation of DRUMBEAT, no sound will be audible UNLESS connected to an external amplifier via the connectors on the PLAYBACK cartridge. On some portable cassette decks it is only possible to use the the deck as an amplifier if the tape deck is set to record with a tape in it. In this case simply select an unwanted tape and switch the deck onto record.

4.0 THE COLOUR DEMO

4.1 OVERVIEW

This chapter explains the COLOUR DEMO MAKER (This will NOT work on mono systems), to run this demo simply open the folder called COLOUR on disk 1 and double click on the file DEMO.PRG.

Programmed by "The Phantom" and "Griff" of Electronic Images. (With thanks to Russ Payne for testing and debugging on his STE.)

The colour demo will perform the following functions;

- 1) Display a NEO file as a screen backdrop around 4 oscilloscopes displaying a QUARTET music sequence.
- 2) Display a scrolling text message which is held in an ASCII file.
- 3) Play a piece of Quartet music in stereo though the PLAYBACK cartridge or through the rear ports on an STE.

4.2 FILES.

The program loads the following files for its use...

DEMO.NEO - The picture file you see displayed while the music is played.

DEMO.4V - The Quartet programmed song file for the voiceset.

DEMO.SET - The Quartet voiceset.

DEMO.TXT - The text file for the scroller.

4.3 USAGE OF FUNCTION KEYS

Function keys 1-5 work the same as for QUARTET Version 1.5

F1	MONITOR OUTPUT
F2	REPLAY 4/8 (8 BIT MONO CARTRIDGE OUTPUT)
F3	REPLAY PROFESSIONAL (12 BIT MONO CARTRIDGE)
F4	PLAYBACK CARTRIDGE
F5	STE REAR PORTS OUTPUT

On initial running the program defaults to PLAYBACK cartridge output.

4.4 MAKING YOUR OWN DEMO

All the files on the disk can be replaced by your own files, we suggest you format a new disk and then copy the program DEMO.PRG onto this newly formatted disk. Next copy onto the disk any files you have prepared yourself for example you might have prepared your own screen of artwork so copy this, but remember it must be called DEMO.NEO

If you have files of your own music from Quartet you can use these with this demo so copy them onto the formatted disk as well but remember to call them DEMO.4V and DEMO.SET. A file of your own text message can also be copied onto the disk but this must be called DEMO.TXT. You can mix your own files in with the ones supplied by us if you wish to but you must have all 4 DEMO files present on the disk in order to run the DEMO program otherwise you will get a "FILE ERROR" message. Further information on the files follows below.

4.5 DEMO.NEO

This is the picture that will be displayed on the screen when the demo finishes loading all its files. Please note that an area of 36 pixels height by 320 wide is used by the scroller, and will automatically overwrite whatever is under the scroller. This is in the middle. The areas you can use for your graphics are in two blocks. The block on top is from 0,0 to 319,79 (Xminimum, Yminimum, Xmaximum, Ymaximum), whilst the block at the bottom is from 0,119 to 319,199. Please note that this takes 0 as minimum coordinate and 319 or 199 as maximum coordinates onscreen (X and Y respectively).

Oscilloscopes. These occupy an area of 64x64 pixels each. They are at: (X,Y to X,Y)

Oscilloscope 1 (Channel 1) - 15,7 to 79,71
Oscilloscope 2 (Channel 2) - 239,7 to 303,71
Oscilloscope 3 (Channel 3) - 15,127 to 79,191
Oscilloscope 4 (Channel 4) - 239,127 to 303,191

NOTE: Please note that because the oscilloscopes are plotted on the screen in a certain way to get them fast, you will have to arrange the colours you use for the backing for the oscilloscopes. Let's take the first eight colours for example: 0 1 2 3 4 5 6 7 Now, if you draw any backing to the oscilloscope, make sure that you use even colours; the odd colours get used by the oscilloscope when a dot is over one of the even colours. Let me explain.

If a dot is plotted over background colour 2,
then the dot becomes colour 3.

If a dot is plotted over background colour 4,
then the dot becomes colour 5.

If you still do not understand the way it works, then experiment, or have a look at the example NEO picture. You might find it easier to copy DEMO.NEO onto your own disk and then load and amend this file rather than plot your own scopes. If your paint program will not save NEO files then we suggest you get one of the file convert programs available within the public domain, we recommend PICSWITCH.

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4.6 DEMO.TXT

This is a straight ASCII file for the message that will be scrolled in the middle of the screen. Please note that lower case and control characters are ignored and converted to a space.

Available characters are:

!"#\$%&'()*+,-./0123456789;:<=>?@ABCDEFGHIJKLMNPQRSTUVWXYZ

Text file limit - Because of the amount of memory used for the scroller, the text file for it is limited to 10K length. 10K is a lot of text and should be ample for most purposes. Make sure the first and last characters of your text are spaces. I.E. Begin with a space, then your text, then finish the text with a space at the end AT LEAST. Otherwise the scroller will look rather odd at the start and finish.

4.7 DEMO.4V & DEMO.SET

Unfortunately, due to memory and processing restrictions, there are a few limitations you will have to bear with. These aren't that restrictive, but we might as well let you know! Song frequency - The 4V song file can be from 16Khz downwards. Using this speed with the PLAYBACK cartridge you will find that the scrolling message slows down. It looks much smoother with the music at 14Khz or below. Using 16Khz song files with STE output (F5) does not affect the scrolling message.

Song and Voiceset length - can be any size, but remember that if you have a huge song or voiceset it might not load on a 520. We calculated that a 250K voiceset and a 30K song file will work fine on half a megabyte machines.

4.8 WARNINGS

To get the speed up, the demo is very naughty with memory. If you have some big song and voiceset files, it will probably write over any ramdisks or accessories that you will have installed. Make sure you do not have any resident ramdisk or accessory or program installed, or they might get wiped or corrupted. This is ONLY with memory; it will NOT, we repeat, NOT affect your disk!

4.9 FINALLY

Well, on behalf of Electronic Images and Microdeal, we hope that you will enjoy both PLAYBACK and this colour demo maker. As far as we know, this demo maker is bug free and has been thoroughly tested. If, by any chance, you DO have a problem please ensure you have read this manual thoroughly before writing to us. Thank you for reading this, and once again, enjoy!

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5.0 THE MONO DEMO KIT

5.1 OVERVIEW

This chapter explains the mono demo kit. Unlike the Colour Demo it is not possible to display moving text or oscilloscopes on the mono demo. This demo was programmed by Tim Moss.

The mono demo will perform the following functions;

- 1) Display up to 3 Degas picture files (PI3 files) in sequence.
- 2) Play a piece of Quartet music in Stereo through the PLAYBACK cartridge or through the rear ports on a STE.

5.2 FILES.

In the folder called MONODEMO on disk 2 you will find the following files;
DEMO.PRG - The main program file.

DEMO1.PI3 - A degas mono picture file(non-compressed)

DEMO2.PI3 - A degas mono picture file(non-compressed)

DEMO3.PI3 - A degas mono picture file(non-compressed)

In order to run the mono demo you will need to do the following;

- 1) Format a new disk.
- 2) Copy the 4 files listed above onto it.
- 3) Copy the following files from the COLOUR folder on DISK 1 onto it;
DEMO.4V - The Quartet programmed song file for the voiceset.
DEMO.SET - The Quartet voiceset.

You should now have 6 files on your newly formatted disk, now double click on DEMO.PRG to run the mono demo.

5.3 USAGE OF FUNCTION KEYS

Function keys 1-3 work the same as for QUARTET Version 1.5

F1	MONITOR QUTPUT
F2	REPLAY 4/8 (8 BIT MONO CARTRIDGE OUTPUT)
F3	REPLAY PROFESSIONAL (12 BIT MONO CARTRIDGE)
F4	PLAYBACK CARTRIDGE
F5	STE REAR PORTS OUTPUT

On initial running the program defaults to PLAYBACK cartridge output.

5.4 MAKING YOUR OWN DEMO

All the files on the disk with the exception of DEMO.PRG can be replaced by your own files. Copy onto the disk any files you have prepared yourself, for example you might have prepared your own screen of artwork, so copy this, but remember it must be called DEMO1.PI3, 3 screens of artwork must be on the disk and the program will display each one in turn, these files MUST be called DEMO1.PI3 DEMO2.PI3 & DEMO3.PI3. If you only wish to display 1 screen then simply copy the same file 3 times, renaming it as above.

If you have files of your own music from Quartet you can use these with this demo so copy them onto the formatted disk as well but remember to call them DEMO.4V and DEMO.SET. You can mix your own files in with the ones supplied by us if you wish to, but you must have the following 6 files for the demo to run; DEMO.PRG DEMO1.PI3 DEMO2.PI3 DEMO3.PI3 DEMO.4V DEMO.SET

Further information on the files follows below.

5.5 DEMO1.PI3 DEMO2.PI3 DEMO3.PI3

These files are simply Degas mono files saved in NON-COMPRESSED mode. If you do not own Degas but own another art program, then we suggest you purchase one of the conversion programs from a public domain library and convert to the PI3 format. We recommend PICSWITCH.

5.6 DEMO.4V & DEMO.SET

These are Quartet files and can be any files from any current version of Quartet.

6.0 DRUMBEAT STEREO

6.1 WHAT IS DRUMBEAT ?

DRUMBEAT turns your ST into a high quality MIDI sampling drum machine. Samples from the REPLAY package can be loaded into any of the 15 drum positions to make up a KIT. Two samples can be played at once. DRUMBEAT is similar to many commercial drum machines using a PATTERN and SONG structure to create sequences. Up to 50 patterns and 10 songs each having up to 100 pattern entries, can be held in memory. The MIDI options allow the user to externally synchronize the Drum machine tempo or allow DRUMBEAT to be the system master clock. A MIDI Note 'ON' command can also be sent to trigger an external device whenever a sample is played.

This part of the manual begins with a section to get you started, followed by a detailed description of each of the main menu bar functions.

6.1.1 GETTING STARTED

Ensure that your PLAYBACK cartridge is connected to your ST since DRUMBEAT outputs through the cartridge only. Insert the the PLAYBACK DISK 2 into the disk drive, open up a directory of its contents and double click on the program named DRUM8ST.PRG. The program will run automatically and display the main menu bar at the top of the screen. Using the mouse select the LOAD box at the top of the screen. The program will then display the load file options. Use the mouse again to select the following;

- a) KIT (to load all 15 samples)
Select "STANDARD.KIT" on the file selector
- b) SONG (to Load a single song)
Select "STAND8.SNG" on the file selector
- c) PATTERNS (to load 50 patterns)
Select "STAND8.PT1" on the file selector
- d) EXIT (to return to the main menu bar)

You have now loaded the KIT, PATTERNS and SONG and are now ready to play your first song. Select 'PLAY' from the menu option and then select the PLAY SONG option from the box which appears.

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DRUMBEAT will now start to play the song which is in memory and a BEAT marker bar with a line moving across it in time with the Tempo should be visible. The song should also be audible through the amplified speaker connected to the PLAYBACK cartridge. To stop the song, press the SPACE bar. This will cause the display in the centre of the screen to disappear and return execution to the main menu bar at the top of the screen.

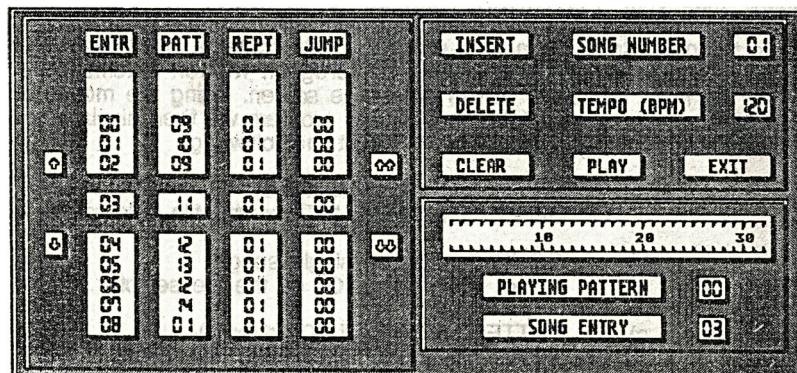
6.2 The MENU



6.3 QUIT

To exit the program and return back to the computers Desktop, select QUIT. You will be asked to confirm your decision to leave. Simply click on YES to return to the desktop or CANCEL to stay with the DRUM MACHINE.

6.4 SONG



6.4.1 EDITING SONG DATA

This screen allows you to link your patterns together to make a longer sequence by making a song list. Each song entry has 4 columns, these are shown on the left hand side of the screen.

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ENTR	-	Song entry number
PATT	-	Pattern number
REPT	-	Loop pattern count
JUMP	-	Jump to song entry

The up and down arrow boxes allow you to move through the song list to a song entry (Single arrow - move 1 position, Double arrow - move 10 positions). The current song entry can then be edited in the central box. The left and right mouse buttons allow you to increase or decrease the value of the PATT, REPT and JUMP columns.

There are 3 basic commands that can be entered:

i) Play or repeat pattern

ENTR	PATT	REPT	JUMP	
01	20	01	00	Play pattern 20 once only
01	25	10	00	Play pattern 25 & repeat 10 times

ii) Jump to song entry

ENTR	PATT	REPT	JUMP	
01	00	00	10	Jump to song entry 10
01	00	00	23	Jump to song entry 23

During song playback, it is possible to make the Drum machine jump from its present entry location to a new position in the entry list. Both PATTern and REPeat should be made zero. If a pattern entry is made, then the JUMP entry will be ignored.

iii) Stop Song

ENTR	PATT	REPT	JUMP	
01	00	00	99	Stop and return

By default, when the Drum machine gets to the end of a song it will go back to the start of the song and play the sequence all over again. It is possible to stop the song at any point during playback by inserting a Stop Song command. To stop the song at any point both the PATTern and REPeat entries must be zero and the JUMP entry must be 99. As soon as DRUMBEAT encounters a stop command, sample playback will cease and control will be returned to the user.

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6.4.2 INSERT

The INSERT button will create a space in the middle of a song. All entries above the current song edit line will be shifted up by one position. The current edit line will contain a copy of the entry above.

6.4.3 DELETE

The DELETE function will remove the entry on the current edit line from the song list. All entries above the current song entry number will be shifted down one position.

6.4.4 CLEAR

To wipe a SONG completely select CLEAR. All patterns and samples in the kit are left untouched.

6.4.5 SONG NUMBER (click on the number to the right of this box)

Use the left and right mouse buttons to increase or decrease the current SONG that is being displayed. Up to 10 songs can be held in memory.

6.4.6 TEMPO (click on the number to the right of this box)

Use the left and right mouse buttons to increase or decrease the current tempo. The Tempo is displayed in B.P.M. (beats per minute), and is adjustable from 40 to 239 B.P.M. Each of the 10 songs can have separate tempo values.

6.4.7 PLAY

The PLAY box will start playing the song, from the current song edit position. A real time beat marker displays the pattern position. The PLAYING PATTERN and SONG ENTRY boxes give a continuous up-date of the song position and the pattern currently playing. Always ensure that the song edit line does not contain 00,00,00, as the program will not play the song. If the BEAT marker appears but does not move and no sound is audible, press either the space bar or a mouse button to exit and check the MIDI SYNC page (section 6.8) for EXTERNAL sync. Change this to INTERNAL sync.

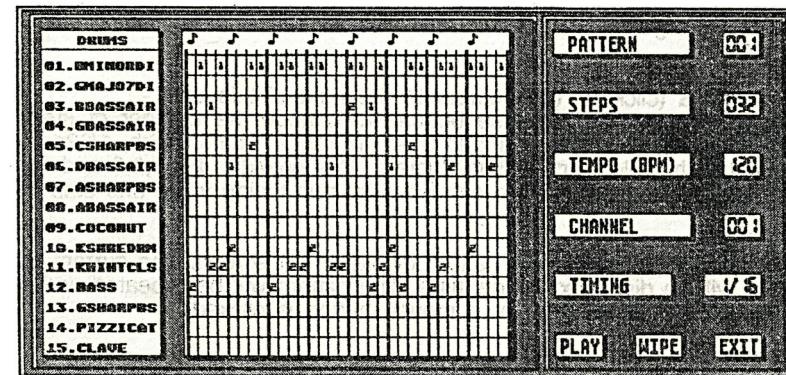
6.4.8 EXIT (song)

Returns program execution to the main MENU.

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6.5 PATTERN

This screen enables the user to program up to 50 different Drum patterns. Each pattern can be up to 32 beats in length. The box entitled DRUMS contains the names of the 15 samples currently loaded into memory.



6.5.1 EDITING A PATTERN

To enter a drum on the pattern grid, simply position the mouse pointer over the beat you want to enter at and press the Left mouse button. The current channel number will then appear in this box. To delete the entry press the Right mouse button. Up to 4 different channels can be entered into each step column at any one time.

6.5.2 PATTERN (click on the number to the right of this box)

Use the Left and Right mouse buttons to increase or decrease the current pattern number. Up to 50 patterns can be held in memory, single patterns may be saved to disk and reloaded into another pattern position. Each pattern can have separate TIMING and STEP information.

6.5.3 STEPS (click on the number to the right of this box)

Use the Left and Right mouse buttons to increase or decrease the number of steps in the current edit pattern. An end of pattern line marks the end step of the pattern. Drums cannot be entered to the right of this line.

6.5.4 TEMPO (click on the number to the right of this box)

Use the Left and Right mouse buttons to increase or decrease the tempo.

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The tempo value is displayed in Beats per Minute and has a range of 40 to 239 B.P.M. If DRUMBEAT has been set to external clock sync then the pattern will play at the tempo set by the external MIDI device and this setting is disregarded.

6.5.5 CHANNEL (click on the number to the right of this box)

Use the Left and Right mouse buttons to change the current channel number. This value (range 1-4) sets the current channel number to be used when editing patterns.

6.5.6 TIMING (click on the number to the right of this box)

Use the Left and Right mouse buttons to change the number of steps per quarter note. This can be changed over the range 1/8th, 1/16th, 1/32nd, 1/8th triplets, 1/16th triplets and 1/32nd triplets. This provides 2,4,8,3,6 and 9 beats per quarter note. Each pattern can have its own timing value and step length.

6.5.7 PLAY

This option plays the current pattern displayed on screen. The current pattern position will be displayed in real time. The pattern will be repeated until either the SPACE bar is pressed or a mouse button is clicked.

6.5.8 WIPE

This option will clear the current edit pattern on all the channels.

6.5.9 EXIT (pattern)

Returns program execution to the main edit line.

6.6 PLAY

This option allows you to play a pattern or song WITHOUT entering the relevant edit page. Please note that if external clock sync is selected, then PLAY will wait for an external MIDI start command and clock information. If no MIDI is present, the pattern step box will appear but the song will NOT play. To exit play mode and return to the MENU, either press the SPACE bar or click one of the mouse keys.

If during the play back of the song, a Stop Song command is encountered, all play back will cease and control will again return back to the user (see section 6.4).

6.6.1 PATTERN

This option will play the currently selected pattern. SPACE will return to the main menu bar.

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6.6.2 SONG

This option will play the current song from the very start. Pressing SPACE will return to the main MENU.

6.7 LOAD

This option allows you to load data into DRUMBEAT. Data can be loaded from either Floppy or Hard Disk. Please note that DRUMBEAT files are not compatible with the older DRUMBEAT (DIGIDRUM) program packaged with REPLAY 4.

6.7.1 PATTERNS

This option will load an entire set of 50 patterns at once. All patterns currently in memory will be erased. A pattern set has the file extension '.PT1'.

6.7.2 PATTERN

This option will load a single pattern into the current pattern number. This can also be used to copy patterns (use the edit pattern page to change the current pattern number). A single pattern file has the file extender '.PAT'.

6.7.3 SONGS

This option will load 10 songs. All songs currently in memory will be erased. A song set has the file extension of '.SN1'.

6.7.4 SONG

This option will load a single song into the currently selected song position (use the edit song page to change the song number). This option will also load the MIDI note and MIDI status information. A single song file has the file extender '.SNG'.

6.7.5 SAMPLE

If you have a sampler then this option allows a new drum/sample to be loaded into one of the 15 drum positions. This allows you to build a KIT which can be saved for future use. All samples should have been sampled at a 22Khz sample rate using the ST REPLAY software. Samples must also be saved from ST REPLAY using the standard sample save facility ('.SPL' format) which contains no header. The file name of the sample is the name used to identify the sample in the KIT list. Each sample must not exceed 10,000 Bytes in length. If a larger file is loaded, then the sample will be automatically truncated by the program.

DRUMBEAT cannot accept '.AVR' format samples which are used in Quartet.

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When the SAMPLE option is selected, another sub-menu will appear, this will allow you to load a sample into any one of the 15 sample positions.

6.7.6 KIT

This option will load a complete KIT of 15 samples.

6.8 SAVE

This option allows you to save data from DRUMBEAT. Data can be saved to a Floppy Disk or Hard Disk.

6.8.1 PATTERNS

This option will save all 50 patterns currently held in memory.

6.8.2 PATTERN

This option will save the currently selected pattern. This can also be used to copy patterns (use the edit pattern page to change the current pattern number).

6.8.3 SONGS

This option will save all of the 10 songs currently held in memory.

6.8.4 SONG

This option will save the currently selected song (use the edit song page to change the song number). This option will also save MIDI note and MIDI status information.

6.8.5 SAMPLE

This option saves a sample to disk. The sample will be saved as a standard .SPL file which contains no header information. When the sample option is selected another sub-menu will appear, this will allow you to select the sample you wish to save.

6.8.6 KIT

This option will save a complete kit of 15 samples. Each kit is over 150K in length, so please ensure that you have enough space on the disk.

6.9 MIDI

The DRUMBEAT program provides full MIDI support. The MIDI page allows you to assign each of the samples to a different MIDI note value. When a sample is played by DRUMBEAT, it will simultaneously send a MIDI note on command. Each sample can be independently assigned with a different MIDI channel, note value or velocity value.

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The program will display a drum box similar to that on the pattern page. Three separate columns, CHN (MIDI CHANNEL NUMBER), NOT (NOTE VALUE) and VEL (VELOCITY) define the MIDI information that is to be sent. To edit the information, move the mouse to the columns and use the Left and Right mouse buttons to increase or decrease the value. Please note that the SEND NOTE option must be set to ON (on the SYNC page) before the program will transmit any MIDI note data.

DRUMS	CHN	NOT	VEL	CHAN
81. BMINORD1	00 :	046	064	
82. GMGJ07D1	00 :	047	064	
83. BBASSAIRE	00 :	048	064	
84. GRASSAIR	00 :	049	064	
85. CSHARPBS	00 :	050	064	
86. DBASSAIRE	00 :	051	064	
87. ASHARPBS	00 :	052	064	
88. ABASSAIRE	00 :	053	064	
89. COCONUT	00 :	054	064	
10. KSHREDPM	00 :	055	064	
11. KHMHTCLS	00 :	056	064	
12. BASS	00 :	057	064	
13. ESHARPBS	00 :	058	064	
14. PIZZICAT	00 :	059	064	
15. CLAVE	00 :	060	064	
				EXIT

6.9.1 CHANNEL

This option allows you to change the MIDI Channel number for the Drum selected with the mouse.

6.9.2 NOTE

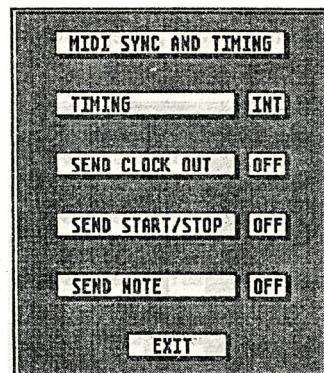
This option allows you to increase or decrease the MIDI Note value for the selected Drum.

6.9.3 VELOCITY

This option allows you to set the MIDI Velocity value for the selected Drum. This means that, when connected to an external Drum machine which supports Velocity sensitive Drums, DRUMBEAT can play volume balanced sounds on the machines kit.

6.10 SYNC

This screen controls the MIDI input and output commands.



6.10.1 TIMING

The DRUMBEAT timing can be set to INT or EXT. If INT (INTERNAL) timing is selected, then the program will play quite happily at the speed set using the TEMPO control (section 6.2.2). If, however, EXT (EXTERNAL) is selected, then the internal Tempo generator has no control over the program. Instead DRUMBEAT will synchronise to an external clock provided by some external MIDI source. The program will also wait for a MIDI START command before playing the song or pattern. The TEMPO value will be set by the speed of the external device (normally a drum machine or sequencer). In EXTERNAL mode DRUMBEAT cannot send CLOCK OUT or any MIDI NOTE ON information.

6.10.2 SEND CLOCK OUT

This can be set to ON or OFF. If OFF is selected then no MIDI clock information is sent. When ON is selected, clock information is sent across to external MIDI devices whenever a SONG or PATTERN is played. MIDI NOTE information can not be sent when this is selected.

6.10.3 SEND START/STOP

This value can be set to ON or OFF. If OFF is selected, no MIDI START or STOP information will be sent. If ON is selected the program will send a START command across the MIDI when a SONG or PATTERN is played. When the SPACE is pressed to exit, a MIDI STOP command is sent. This option allows synchronisation to external devices so they all start playing at the same time.

6.10.4 SEND NOTE

This value can be set to ON or OFF. If OFF is selected, no MIDI note information will be sent. If ON is selected, DRUMBEAT will send the NOTE information contained in the MIDI page whenever a SONG or PATTERN is played.

6.11 SAMPLING YOUR OWN SOUNDS

With the REPLAY 4/8, REPLAY PROFESSIONAL or MASTER SOUND cartridge you can sample your own drums or sounds to be included in the KIT's. Suitable sounds can be found on a large range of CD sample discs and tapes, these are normally advertised in the popular music magazines and are usually quite reasonably priced. Of course you can also sample sounds from other records (subject to copyright restrictions). Each sample must be a maximum of 10,000 bytes in length, if it is any longer the program will automatically truncate it upon loading. It is recommended that a good quality signal source is used, certain sounds can be improved using an external equaliser.

7.0 BASIC/MACHINE CODE ROUTINES

7.1 OVERVIEW

On disk 2 can be found two folders, BASIC and SOURCE. BASIC contains the Basic programs, PLAYBACK.PRG (the general purpose BASIC player code) and two demo samples (Welcome.SPL, a mono unsigned sample and One2.AVR, a stereo signed AVR format sample). The PLAYBACK.PRG program will work with most Basics including, ATARI BASIC,(HISOFITS) POWERBASIC,HISOFIT BASIC,GFA BASIC3 AND GFABASIC2 (.LST FILE). STOS has its own special machine code routine. This can be found in the STOS folder, called SPLAYER.PRG. It works in the same way as the PLAYBACK code but parameters are passed to the machine code in DATA regs 0 to 4.

To use the Basic routines simply copy the samples , code and appropriate demo program on to a disk containing the correct implementation of BASIC to be used.

The SOURCE folder contains the machine code source routine used to generate the PLAYBACK program. It was assembled using HISOFIT's Devpak assembler package.

7.2 TECHNICAL DETAILS

The playback cartridge has output addresses mapped directly on to the cartridge port of the ST. The output ports are located at address \$FA0000 and \$FA0200. These ports cannot be written to directly, as the ST will generate a bus error. The technique for outputting via the port requires us to output by reading the port. The 8 bits of data is placed onto the address bus of the 68000. When the data strobe of the read cycle occurs, the PLAYBACK cartridge picks the data off the address lines A1 to A8 (not A0 to A7, the 68000 does not have A0,hence the ADD.W D7,D7 in the example). Address line A9 controls the output channel, if A9 is high, data will be sent to the right channel, if A9 is low it will be sent to the left channel. All data sent to the D-A convertors must be in an unsigned format and shifted left to preserve the L.S.B.

7.3 TYPICAL MACHINE CODE OUTPUT ROUTINE

OUTPUTL	EQU	\$FA0000	
OUTPUTR	EQU	\$FA0200	
OUTPUT	MOVE.L	#OUTPUTL,A1	FETCH OUTPUT ADDRESS
	AND.W	#255,D7	MASK OFF ANY RUBBISH FROM DATA
	ADD.W	D7,D7	PRESERVE L.S.B.
	TST.B	(A1,D7.W)	OUTPUT 8 BIT DATA TO LEFT CHANNEL
	MOVE.L	#OUTPUTR,A1	FETCH OUTPUT ADDRESS
	AND.W	#255,D7	MASK OFF ANY RUBBISH FROM DATA
	ADD.W	D7,D7	PRESERVE L.S.B.
	TST.B	(A1,D7.W)	OUTPUT 8 BIT DATA TO RIGHT CHANNEL

The source code for the BASIC playback routines is included on the disk. The file was written using DEVPACK by Hisoft, but should run on any assembler with a few minor modifications. This file is fully documented, and should be easy to modify to your own requirements.

7.4 USING THE PLAYBACK CARTRIDGE FROM BASIC.

Playing samples from BASIC programs is fairly straightforward. The PLAYBACK disk contains a folder called BASIC. Examples of how to use samples with most of the leading brands of BASIC interpreters or compilers can be found within this folder. For the most part a BASIC program should do the following :

- 1) Reserve space for the machine code, usually via a DIM statement.
- 2) Reserve space for the sample to be played (similar to above).
- 3) Note the start and end of addresses of samples loaded from disk. (remember to add 128 to the start address if you are loading an AVR format file)
- 4) POKE the addresses and frequency of the sample to be played into the correct locations in the machine code.
- 5) CALL the PLAY code in an appropriate manner to play the sample.

To produce a simple BASIC demonstration program, copy the PLAYBACK.PRG file from the BASICS folder to a newly formatted disk. Now copy "WELCOME.SPL" and "ONE2.AVR" samples onto the same disc, also copy the BASIC file, "PLAYA.BAS" from the ABASIC folder. Run your ATARI BASIC interpreter (found on the Language disc supplied with your computer). Load the program "PLAYA.BAS". Now type RUN and press return. BASIC expects to find the code and sample at the top level of the disc directory. The program should load in the machine code, then the two samples and finally you should hear the samples played in stereo through your HIFI.

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7.5 COMPATIBILITY

Most general purpose BASICs will enable you to use the PLAYER.PRG file in a similar manner to that described above. This subject is, however, a mine field for the unwary programmer since not all BASIC languages are the same. Some pointers to look out for are the BLOAD and POKE statements. The PLAYER.PRG file will be of general interest to users of ATARI, GFA, HISOF and POWER BASIC. STOS Basic owners must use the SPLAYER.PRG program.

7.6 PLAYBACK CONTROL

USER ROUTINES

The PLAYBACK machine code has 4 routines which can be called directly from BASIC. These are detailed below,

COMMAND ADDR DESCRIPTION

- | | |
|-----------------|--|
| PLAY (code%+28) | - This call will play forwards a sample held in memory starting from the long word start address. |
| BACK (code%+32) | - This call will play backwards a sample held in memory starting from the long word start address. |
| HALT (code%+36) | - Stops sample playback |
| WAIT (code%+38) | - Control will not return back to BASIC until the sample has finished playing |

PARAMETER BLOCK

This parameter block is used to pass sample information and type to the playback routines. It must be set up BEFORE calling any of the above routines

- | | |
|------------------------------|---------------------------------|
| SAMPLESTART.L
(code%+20) | - Start of sample to be played |
| SAMPLELENGTH.L
(code%+24) | - Length of sample to be played |

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FREQUENCY.W - Playback speed of sample,range 0 to 12
(Code%+28)

Frequency	Value	Frequency	Value
5.0 KHz	0	15 KHz	7
7.5 KHz	1	16 KHz	8
8.0 KHz	2	18 KHz	9
9.0 KHz	3	20 KHz	10
10.0 KHz	4	22 KHz	11
11.0 KHz	5	25 KHz	12
12.0 KHz	6		

LOOPMODE.W
(code%+30)

- Sample loop on/off,
0 - NOLOOP, 1 and above - LOOP ON

PLAYMODE.W
(code%+32)

- This word controls the output play mode,which allows you to play a wide range of file types,
0 - Play unsigned mono sample on left channel
1 - Play unsigned mono sample on right channel
2 - Play unsigned mono sample on right and left
3 - Play unsigned interleaved stereo sample
4 - Play signed mono sample on left channel
5 - Play signed mono sample on right channel
6 - Play signed mono sample on right and left
7 - Play signed interleaved stereo sample

7.7 SAMPLE FILE TYPE

There are a wide range of sampling systems available for the Atari ST. These save sample files, in different format types and sample frequencies. A list of sampling packages is provided below to help you to choose the correct playback mode for your system. The full specification of the AVR format is also provided below. This format allows you to check the type and frequency of a sample before playing it.

SAMPLING SYSTEM
PRO SOUND
MASTERSOUND I
MASTERSOUND II
REPLAY 4
REPLAY 8

REPLAY PRO
STEREOMASTER

AMIGA IFF

SAMPLE TYPE
.SAM (UNSIGNED MONO)
.SAM (UNSIGNED MONO)
.SAM (SIGNED MONO),.AVR (SIGNED MONO)
.SPL (UNSIGNED MONO)
.SPL (UNSIGNED MONO),
.AVR (UNSIGNED MONO)
.AVR (UNSIGNED MONO),
.SAM (SIGNED MONO),
.AVR (SIGNED MONO/STEREO)
.8SX (SIGNED MONO)

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7.9 AVR SAMPLE DATA FORMAT

Here is a brief description of the AVR sample format :-

The first 128 BYTES of an 'AVR' sound file on disk contain a sound file header. The first BYTE or WORD immediately following the header (START + 128) is the first BYTE or WORD of the sound sample itself. The contents of the header are as follows ...

OFFSET	SIZE(BYTES)	DESCRIPTION
0 - 3	4	4 BYTE ASCII CHARACTER I.D. CONTAINS '2BIT'
4 - 11	8	8 BYTE ASCII CHARACTER SAMPLE NAME. UNUSED BYTES PADDED WITH NULL (\$00).
12 - 13	2	WORD = 0 FOR MONO / \$FFFF FOR STEREO SAMPLE
14 - 15	2	WORD = SAMPLE RESOLUTION \$0008 (8 BIT) \$0010 (16 BIT)
16 - 17	2	WORD \$0000 = UNSIGNED SAMPLE WORD \$FFFF = SIGNED SAMPLE
18 - 19	2	WORD \$0000 = NON LOOPING SAMPLE WORD \$FFFF = LOOPING SAMPLE OTHER VALUES RESERVED FOR ALTERNATIVE LOOP TYPES
20 - 21	2	WORD = ASSIGNED MIDI NOTE / SPLIT \$FFFF = NO ASSIGNMENT (DEFAULT) \$FFXX = MIDI NOTE ASSIGNMENT
22 - 25	4	LONG = SAMPLE SPEED SPLIT INTO 1 BYTE & 3 BYTES BYTE 22 = 0 TO 7 OR \$FF BYTE 23 - 25 = 3 BYTE SAMPLE FREQUENCY IN HERTZ
26 - 29	4	LONG LENGTH OF SAMPLE IN DATA BYTES OR WORDS
30 - 33	4	LONG FIRST LOOP POINT (OFFSET IN DATA WORDS) FORCE \$0000 IF UNUSED
34 - 37	4	LONG END LOOP POINT (OFFSET IN DATA WORDS) FORCE TO SAMPLE LENGTH IF UNUSED
38 - 63	26	FILL WITH \$00 - DO NOT USE - RESERVED AREA
64 - 127	64	FREE AREA FOR DEFINITION BY USER. MAY HAVE ASCII MESSAGE OR OTHER USER DEFINED DATA.
128 - END		-SAMPLE- held in format described by header.

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This format represents a useful header which can be used to describe, samples with MONO/STEREO, 8, 12, 14 and 16 BIT data sizes. 2-BIT SYSTEMS recommend that users DO NOT occupy the reserved space in the first 64 BYTES of the header, the last 64 BYTES have been provided for miscellaneous use and abuse.

If the user is developing software which uses the AVR format, please note the following :-

When reading samples

i) Always check the first 4 BYTES for '2BIT' before attempting to load in any sample from disc. If this header is found, then it can be assumed that the sample is in AVR format, no matter what the file extender is. It is useful, though not important, to save AVR files out as XXXX.AVR, the important part is the header.

ii) After establishing that the sample is indeed an AVR file, load the 128 BYTE header into a separate area of memory. Interpret this header before attempting to load the rest of the file. This is important for a number of reasons, the least of which is that if a Stereo or 16 BIT sample were just about to be loaded, the load address for the sample block should be made on a WORD boundary.

iii) Do not take anything for granted about the sample. Ensure that all of the important parameters have been read and interpreted. E.G. SIGN status. If your program can only use BYTE EXCESS samples then ensure that the sample is not signed (and un-sign it if it is).

iv) When reading the FREQUENCY long word, mask off the top 8 BITS. When a sample is saved from the PRO 12 editor, these 8 BITS contain a value from 0 to 7 which denote the SYSTEM frequency (0 = 5 kHz, 7 = 48 kHz etc). If this value is read as \$FF then the editor assumes that the sample frequency is not immediately compatible with the choice of 8 which the EDITOR supports.

When writing a file

i) ALWAYS wipe the entire header area with zero's when constructing a new header.

ii) ALWAYS force default values and never leave any RUBBISH in areas unused by the program in question, remember, another program may look for DATA which is nonsense otherwise.

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- iii) If looping is not used within a sample, always force the start loop to be zero and the end loop to match the sample length.
- iv) When writing the sample record frequency long word into the header, ensure that the default of \$FF is placed into the top 8 BITS unless the frequency is an exact equivalent of those used by the EDITOR.

7.10 SIZES and POINTER OFFSETS

Please note the use of the phrase 'WORD size' when expressing the size of a sample or the offset of the loop pointers from the start of the sample. It is assumed that if the sample is an 8 BIT sample (or less), then this word size is BYTE. If the sample is greater than 8 BITS then the size is assumed to be a 16 BIT data WORD. Hence a 16 BIT file size of 10,000 words would actually be 20,000 BYTES in length. The value stored in the header should be 10,000.

7.11 STEREO SAMPLES

In an attempt to make the AVR format as 'FUTURE PROOF' as possible, a flag has been installed in the header for inspection by the loading software to denote STEREO samples. The intended Stereo format should ALWAYS be WORD aligned on loading. This ensures that Stereo BYTE samples will be readable straight into a full word of a register without causing a BUS ERROR and that 16 BIT samples will again be properly aligned. The Stereo information will be stored in an interleaved fashion with the LEFT channel data being first followed by the RIGHT channel second. As a result, all Left channel samples will be referenced with EVEN address offsets from the start of the sample beginning with 0 and continuing 2, 4, 6 ... etc. All Right data will be ODD byte or word offset from the start of the sample, starting from 1 and continuing 3, 5, 7 etc. Upon loading a stereo sample it would be quite possible to split the sample into 2 discrete MONO sample blocks.

8.0 QUARTET STEREO ROUTINES

The machine code routines for programming output from Quartet Stereo version 1.5 are included in the folder QUARTETC.ODE on disk 1. These routines are included to enable the experienced machine code programmer to include music with his programming. Fully commented code is included and no further information should be required.

- END -



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