



SYNTHAXE

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SYNTHAXE

SYNTHAXE OWNER'S MANUAL

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## SYNTHAXE OWNERS MANUAL

\*\*\*\*\* IMPORTANT \*\*\*\*\*

PLEASE REMEMBER  
THE SYNTHAXE MUST NEVER BE OPERATED  
WITHOUT A SECURE ELECTRICAL GROUND  
CONNECTED VIA THE POWER CORD

THE INSTRUMENT YOU HAVE RECEIVED HAS BEEN CAREFULLY SET UP AND THOROUGHLY TESTED BEFORE LEAVING THE FACTORY.

THE ACTION OF THE NECK IS PRESET AND NOT ADJUSTABLE. MODIFICATIONS TO THE NECK SUCH AS STONING OR ATTEMPTING TO RAISE OR LOWER THE ACTION WILL ALMOST CERTAINLY DAMAGE THE INSTRUMENT. IF REPAIR WORK IS EVER REQUIRED IT SHOULD ONLY BE CARRIED OUT BY QUALIFIED SYNTHAXE PERSONNEL.

THE GAUGES OF THE STRINGS FITTED HAVE BEEN CHOSEN BECAUSE THEY GIVE THE BEST PERFORMANCE IN TERMS OF NECK RESPONSE AND TRIGGER SENSITIVITY. NECK STRINGS, USUALLY 0.013 GAUGE ARE TENSIONED ENOUGH TO SIT FIRMLY IN THE 'V' PIN CONTACTS BUT NOT THAT TIGHT AS TO IMPAIR PLAYABILITY. TRIGGER STRINGS, USUALLY 0.020 GAUGE AND TUNED TO TOP E, HOWEVER CAN BE ALTERED 2-3 SEMI-TONES UP OR DOWN.

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The major functional descriptions in this manual refer to software releases:

RD3V4 and RT3V2 for the SynthAxe  
RC3V1 for the Console

Updates to functional descriptions will be covered in addenda issued for future software releases.

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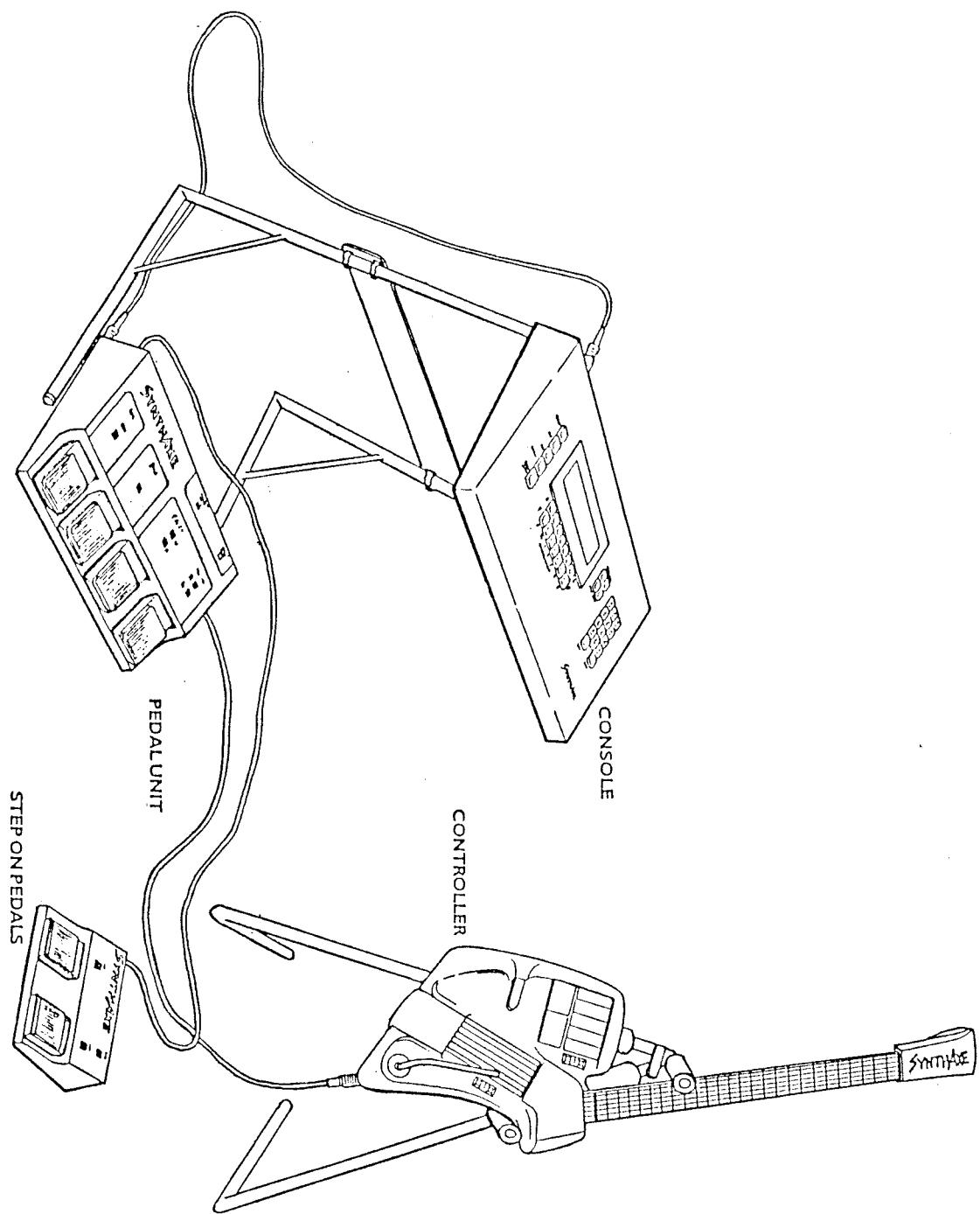
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SYNTHAXE OWNERS MANUAL

SECTION 1

INTRODUCTION

## SYNTHAXE OWNERS MANUAL

### 1.1 INTRODUCTION

The SynthAxe is a radical and revolutionary instrument which allows the guitar player complete control over any MIDI equipped synthesiser. All of those techniques peculiar to guitar playing - string bending, finger vibrato, glissando styles, etc., are faithfully sensed by the latest digital technology and allow the SynthAxe player to reach unprecedented levels of musical expression.

The SynthAxe is completely unique and it is therefore important to approach it as a totally new instrument. Take everything steadily - don't try to play your fastest licks straight away. Take a little time to adjust to it, both physically and mentally, and you will find yourself equipped with a musical armoury of phenomenal power.

A quick word about this manual. It contains a lot of information, particularly the section on the Console. For those of you who want to make a quick start, try reading GETTING STARTED first!

Good Luck!

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SECTION 2

GETTING STARTED

## SYNTHAXE OWNERS MANUAL

### 2.1 GETTING STARTED

As a new SynthAxe owner, the first thing you will want to do is get to grips with the system, master the instrument and play some music. A tool as powerful as the SynthAxe, with its depth and breadth of expression, is best approached like learning to swim. Start at the shallow end and you can end up an expert - diving in at the deep end can land you in all sorts of difficulty!

This section shows you how to get the SynthAxe plugged in, turned on, and ready to play. It then goes on to give a guided tour of the major features of the instrument, pedals and console. Follow the chapters step by step with your own instrument and you will get a taste of the SynthAxe world. When you need more detailed information use the reference sections of the manual.

### 2.2 SETTING UP

Throughout this tutorial we shall refer to the SynthAxe instrument as the 'Axe' and the synthesiser it is controlling as the 'Synth'. The term 'SynthAxe' usually refers to the whole system.

In order to simplify this tutorial we have assumed that you are using a polyphonic synth. Any MIDI synth will work providing it is in poly mode. Most modern synths can receive poly MIDI data but if you have a multi-voice mono synth (e.g. TX816 or Xpander) you may need to use the synth manual to set it up.

Plug one end of the Axe lead into the Axe and the other end into the "Controller" socket on the Pedal Unit. This cable should have plugs with black sleeves at either end but, if you are in doubt, don't worry as the SynthAxe sockets will not accept the wrong type of plug.

Take the lead with white sleeves at each end and insert one end into the "Console" socket on the Pedal Unit. Plug the other end into the Console. If you have the SynthAxe Step-On Automation system, don't plug this in yet - we'll take a look at that later.

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Check that the voltage selector on the rear panel of the Pedal Unit is set correctly for your A.C. mains supply then connect the mains cable. If you are not using a console you will need to set the Software Select switch on the rear of the Pedal Unit to 4.

Switch on the SynthAxe system using the rocker switch on the rear of the Pedal Unit. Take care not to move the wang bar or any of the keys on the instrument while waiting for the System Ready light to come on. If any error messages appear on the Console refer to section 7.4.

Switch on the synth which you are going to control and check that you have wired up the audio output. Set up the synth to receive MIDI data on channel 1. Select a synth sound which has a good sustain (does not die away while a keyboard key is held). Connect a MIDI cable from the MIDI port (output) 1 on the rear of the Console to the MIDI input of the synth.

Press the Clear button, followed by the Normal button on the Console. This is not something you will need to do each time you switch on the Axe but is useful the first time since it guarantees that everything in the Console is set to 'Normal'.

At last! You should now be able to pluck a trigger string or press a key and hear the results.

### 2.3 POINTS TO WATCH OUT FOR

There is no Nut on the SynthAxe neck. The lowest fret (fret zero) is where you would normally expect to find the nut.

If the synth triggers, but the Wang Bar and String Bend don't work, check that the particular sound you have chosen uses the pitch bender. It is usually possible to adjust the range of the pitch bend on the synth and it may be set to zero. If the Wang Bar and String Bend are too sensitive or not sensitive enough, adjust the range of the Pitch Bend parameter. Three to five semitones full range up (and down) is usually about right.

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If the dynamics are uneven or difficult to control so that notes are sounding with widely varying loudness then try cancelling the velocity sensing on the synth, or choose a more 'forgiving' sound for the moment. Later on you will find out how to use the LAWS page to get control over dynamics. It can take some time and experimentation to set up both the synth and the Axe (Console) so that the velocity sensing feels right.

If you find that many notes sound together when you slide up the neck then it's a good idea to shorten the release time of the envelope generator on the synth.

Keep checking the lights on the Pedal Unit. Whilst getting to grips with the Axe, make sure that the only lights lit on the Pedal Unit are:-

Green Light .....System Ready

Two Yellow Lights .....Left Hand Damping ON

This can be considered the 'Normal' state. If any of the other lights come on then you have probably inadvertently selected a special mode of operation. Don't worry if you do not understand these modes yet. When you get to know the system you will find that they open up a lot of exciting possibilities. However, if you have pressed some button by accident you might be getting some unexpected results!

It may be worth remembering that a red light coming on means that a severe departure from usual guitar performance is to be expected. If any of the other lights do come on, you can cancel them as follows:-

Red Light .....Left Hand Trigger ON

This mode causes notes to be played whenever you press the strings against the fingerboard without waiting for the string to be plucked. Cancel the Left Hand Trigger mode by pressing either of the switches on the body of the Axe. Press the end of the switch nearest the neck. When the Left

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Hand Trigger mode has been cancelled the red light will go out. Experiment with each of the switches while watching the light to discover exactly how they work. In SynthAxe language, one end is a 'latching' switch and the other is a 'fleeting' switch.

Two Red Lights .....Left Hand Damping OFF

Cancel this condition by pressing the pedal second in from the right just once to 'latch' the effect back ON. The pedal to its right does a similar thing but only acts while your foot is resting on it - it is a 'fleeting' pedal switch.

Other Yellow Lights .....Hold, or Capo ON.

If the notes are permanently droning, cancel the Hold feature by pressing the Hold pedal once. If the open string tuning has been altered due to selection of a Capo, cancel the capo by pressing the Capo pedal once while your left hand is away from the neck.

### 2.4 MAIN FEATURES OF THE AXE

#### DAMPING

Perhaps the strangest thing for a guitarist to get used to (after all the computer technology and jargon) is thinking about when the notes STOP. In fact a secret to playing the SynthAxe well is to understand the various ways in which notes are ended.

The most obvious way for a guitarist to stop ringing notes is by DAMPING. Touching either the neck (pitch) strings or the body (trigger) strings will cause the note to be damped. It sometimes helps to deliberately touch the back of the neck at the same time (although this usually happens automatically).

Notice that the action of releasing a chord with the left hand means you damp the strings for a fraction of a second thereby ending the notes just as on a guitar. The damping occurs while you are touching a string AND the string is NOT touching the frets.

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So now you can start and stop notes at will - you have control.

The damping of the left hand strings can be turned off, for some very interesting effects, and this is dealt with in the 'PEDALS' section.

### Trigger Strings

Play a few notes, picking with the trigger strings. If you go gently and don't try to play your fastest lick or your trickiest passage straight away, you will find the SynthAxe very easy to play.

Look at your hands as you play, to familiarise them with the instrument and to connect their actions - go back to basics for a few minutes.

The trigger strings are velocity sensitive - the harder you pluck, the higher the level of MIDI velocity sent to the synth. Whether this is used to cause the sound to be louder or brighter or whether it is completely ignored depends on the type of synth and the programming of the sound patch on the synth.

### The Keys

OK. Having done that, let's have a go at the keys. As you know, each key corresponds to a particular string on the neck, so that if you press the top key it will sound the top string, whether open or fretted.

Try and think of it as playing fingerstyle but, instead of plucking strings, the fingers are pressing keys. Play a few barre chords, moving up and down the neck so that the principles of key playing become firmly embedded.

All SynthAxe players are astounded by the amount of use they eventually give the keys. Remember that you are combining keyboard sensitivity with the unrivalled expression of the guitarists left hand.

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The remaining keys are 'BASS GROUP', 'TREBLE GROUP' and 'MASTER'. The bass and treble 'group' keys play the bottom three and the top three strings respectively, whilst the MASTER triggers all six simultaneously.

The treble group key is great for recording 'string' triads with real accuracy and the bass group is most commonly used for heavy synthesiser 'power' chords.

All keys are velocity and pressure sensitive.

REMEMBER, some synths do not have 'pressure' and the velocity range of the synth may need to be matched using the LAWS page of the Console in order to get the best results.

### Left-Hand Trigger Mode

As previously mentioned, there are two double-ended, Left Hand Trigger switches, one below the strings and the other below the keys. Pressing the neck end of either switch puts you into permanent (latching) Left Hand Trigger Mode.

In this mode, any time you touch any frets with a string you will trigger those notes. You must exercise a bit of caution here because literally everything you touch will be played - bummers and all! After some practice, though, you will find you can play things at incredible speed, using this mode.

The other end of the switch produces the effect only whilst the switch is being held down (fleeting).

### SOME TIPS!

Watch the fleshy part of your index (first) finger; it can often rest on the edge of the fingerboard and play the top string when you don't want it to.

Also, it is definitely best to keep to single note runs in Left Hand Trigger mode ... Chuck Berry can become very messy.

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A good method of using the fleeting LHT mode is as a sort of 'selective master trigger'. Fret a chord and press the switch. Only the notes you fret in that chord will be played so, unlike the main 'master' key, you can play three, four or five note chords without the unwanted notes sounding - or having to damp them out.

### STRING BEND

When used in poly modes, the Axe will send all MIDI information on one MIDI channel. It follows that the synth will expect to receive MIDI information for only one pitch bender. In order to work properly with poly synths the Axe has to combine the six different string bend measurements and send data for just one bender. It is for this reason that you will not be able to do 'country style' bending in poly modes (i.e. playing two strings and bending only one of them). The way to get separate string bending for each string is to use a multi-voiced mono synth such as the Yamaha FB01, TX816, TX81Z or Oberheim Xpander or Matrix 12 and put the Axe in a mono mode (see section 7.3.5.).

### WANG BAR

The Wang Bar is simply another MIDI controller and as such can be assigned to a number of parameters - volume, filter, modulation etc., although almost certainly it will generally be used to control pitch.

As it is electronic, rather than mechanical, it does not suffer from the physical constraints of the guitar's vibrato arm. You can set the range on the Synth to any amount of bend you like and the Wang Bar will respond to it exactly.

Naturally the notes all move in parallel, not always the case on a guitar, so complete transposition of chords can be easily achieved.

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### 2.5 A BRIEF TOUR OF THE PEDALS

The SynthAxe pedal unit offers some interesting and subtle facilities: HOLD, CAPO and LEFT-HAND DAMPING DISABLE.

#### Hold

Press the 'Hold' pedal and play a chord and release the pedal; the notes in the chord will be held indefinitely. Melodies can be played on any remaining strings and the effect can be turned off by pressing the pedal again or playing over the droning strings.

Check the light on the pedal unit which displays the on/off status of the Hold effect.

#### Capo

The second feature on the Pedal unit is 'Capo'. Barre any fret, or play any chord, press the Capo pedal and you have installed an invisible electronic Capo.

It can be used exactly like a traditional mechanical capo but because there are no physical obstructions, you can play below as well as above it. The Capo function is silent, quick to use and can be brought in for the occasional passage in a song if desired.

Check the light on the Pedal for on/off status of the Capo function.

#### Left Hand Damp Disable

This is a very interesting pedal feature and it does exactly what it says - disables the left hand damping. What this means to the player is that he can lift his hand from one chord to another and the notes will ring on, since they have not been damped.

There are two modes of operation - latching and fleeting.

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The latching pedal keeps the SynthAxe in undamped mode continuously

The fleeting pedal works only while it is being pressed

Using the latching mode, you can create beautiful dreamy 'overlaid' effects, while fleeting mode is generally used in simulation of a piano's sustain pedal, linking chords together smoothly.

Check the lights on the pedal unit for on/off status of Left Hand Damping Disable.

There are two further lights on the Pedal Unit.

The first is a 'SYSTEM READY' light. This tells you that the system has booted up successfully and is ready to go. The second is the on/off status light for the Left Hand Trigger mode.

### 2.6 A TUTORIAL INTRODUCTION TO THE CONSOLE

Simply put, the SynthAxe Console is the thing that you use to tell the Axe what to do. No two synth manufacturers have ever built two synths with exactly the same features. The MIDI interfaces on any two synths, even though they share the same MIDI standard, are never identical. For this reason and also because no two guitarists share the same playing technique, SynthAxe provides a great deal of flexibility in the way the instrument can use MIDI.

This has the advantage that each player can set up the instrument to do exactly what he or she requires. The penalty is that a first glance at some of the inner complexities of the Console can leave you feeling that you are on the wrong planet. First time users are heard to exclaim, "What on earth does Valid Fret Response mean?".

A word of reassurance: You don't need to learn that stuff to play the Axe at its basic level. In fact you could ignore this entire section and still have hours of creative music without ever pressing a single button on the console. On the other hand, the Console is a part of the instrument and the more you know about it, the more you will get out of your investment. You've already done the hard part - learning the basic guitar technique. In comparison the rest is easy.

## SYNTHAXE OWNERS MANUAL

You should explore the Console at your own pace. Just use the features that you find useful. When you need to know about some particular display in more detail, read the relevant section of this manual. Don't be afraid to play. Remember:

IT IS TOTALLY IMPOSSIBLE TO HARM THE SYNTHAXE OR THE SYNTH BY PRESSING THE WRONG BUTTONS.

If in doubt - try it, it may sound weird, or more likely, won't make any sound at all, but it won't do any damage.

### PLAYING SETUPS AND MEMORIES

The Console can be pictured as a collection of dozens of Switches, Dials and 'look-up' tables (we call them LAWS), arranged in a particulay way and accessed by you via the buttons and display. Switches can be ON or OFF and may affect, for example, whether notes will sustain. Dials usually have values from zero to 99 and can be used, for example, to turn up the amount of string bend. Defining a look-up table (or LAW) is like drawing a graph and can be used to alter the dynamics of, say, Key Pressure.

All these Switches and Dials (etc) make up what we refer to as the 'Playing Set-up' (or just 'Set-up') of the Axe. They tell it how to behave. There is only one currently active Set-up - the one that is currently controlling the Axe. However the Console can record the values of ALL the Switches and Dials and store them in a memory. In fact, it can store copies of 99 different Set-ups in 99 memories. Remember that only one of these Set-ups will be affecting the behaviour of the Axe at any one time - the currently active Set-up (we call this the Current Playing Set-up). This is the only one that you can ever see on the various Console displays. The others exist in the background (in the memories) and only become visible when (and also active) when you recall their particular memory number.

When you receive a new Console, all the memories contain the same 'Normalised' information. In other words, all the Switches and Dials an all the memories have been set to what we arbitrarily called 'Normal'. Since there isn't such a thing as a normal SynthAxe player you will probably want to change them to suit yourself. (No offense intended). Don't worry about losing the original data, it is written out in Appendix C and you can always get it back instantly by using the PANIC page and then saving the normalised data in memory.

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Let's start pressing buttons.

### MAKING YOUR OWN SETUP

We begin by modifying the 'Normalised' set-up and storing it in a memory. I'll assume you have been following the tutorial and have pressed the CLEAR button while on the front page, followed by the NORMAL button. The front page is the one you always start on. If you cannot find it, press EXECUTE. This always takes you back to it.

The first thing we will do, is to use the Console to select a particular patch on the synth.

Press SYNTH PATCH:                                                          This takes you to the PATCH page

Press the Numeric keys:                                                          Enter the patch number for a sound which has a good sustain level. Try something like a 'flute' sound.

Press SYNTH PATCH:                                                          This sends the patch command to the synth.

Repeat the last two steps until you have selected a sound you like. Pick a sustaining sound since we will use this later.

If you cannot get the synth to change it's sound (patch), you may find that there is a switch on the synth which disables MIDI patch changes. Make sure that it is OFF so that patch changes are enabled.

Press EXECUTE:                                                                  Takes you back to the front page.

(You could press EXECUTE instead of SYNTH PATCH which will send the patch change to the synth and take you back to the front page in one operation).

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To save this Set-up, all you do is:-

Press SAVE: A message will appear on the display: 'Save in memory'.

Press 1: On the numeric keypad. As we are just starting out we might as well save our first Set-up in Memory 1, our second in Memory 2, and so on.

Press EXECUTE: Your Current Playing Set-up is stored in Memory 1. Notice that the message now reads 'Sent to memory 1'.

You just did two things. You saved the set-up in memory 1. YOU ALSO ERASED WHATEVER USED TO BE IN MEMORY 1. You now have 98 unused memories. (They are not really EMPTY since they all hold data for a normalised Set-up - but they are free for you to overwrite so you can regard them as 'blank').

Now let's store a second Set-up with a different patch Number.

Press SYNTH PATCH: Back to the patch page again.

Press Numeric keys: This time select a percussive sound with a fairly rapid decay - something like a 'piano'.

Press EXECUTE: Send the patch and return to the front page.

Press SAVE: We're going to save this Set-up ...

Press 2: ...in memory 2.

Press EXECUTE: Set-up has been 'Sent to memory 2'.

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If this has worked, we should now be able to select either of the two sounds simply by RECALLing the right memory. Try this:-

Press RECALL: A message will appear 'Recall from memory'.

Press 1: Let's choose memory number 1.

Press EXECUTE: Message should read 'from memory 1'.

You should now be able to play the original sustaining (flute?) sound.

When you Recalled the memory, you ERASED WHATEVER USED TO BE IN THE CURRENT PLAYING SET-UP by overwriting it with the contents of memory 1.

Press RECALL, 2, EXECUTE: You should get the second decaying (piano ?) sound.

### MODIFYING A SETUP

Over the next few pages we will build on the two Set-ups which we have started with, refining them for specific purposes. Eventually we will build them into a song. The general process for modifying any Set-up is:-

First:- Recall the memory you wish to modify. When you recall a memory it then becomes the Current Playing Set-up.

Second:- Make any changes you want using any page of the Console, play the Axe as you try various things out. Every change you make should be regarded as temporary until you perform the third step ...

Third:- Save the modified Set-up back in the memory.

You should always follow these three basic steps while working with the Console. There are of course variations, such as missing out the second step and saving to a different memory. This is like 'bouncing' a track in audio terminology.

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You do not have to bother with the first and third steps if you are purely experimenting, but it is a good habit to get into, since you are less likely to overwrite something you may have spent considerable time on. Of course, you may find (during the second of these steps) that you want to keep both the original Set-up and the newly edited one. No problem, simply save to a new memory. This way you get to save the edited memory and avoid overwriting (and losing) the original, which remains unaltered.

Back to the buttons:-

Let's tailor the 'piano' Set-up for use with the Trigger Keys, and since the far end of the neck seems a long way away, we will put a capo on the 12th fret to make the left hand position nearer.

Press RECALL, 2, EXECUTE:                    Let's get the 'piano'.

We didn't really need to do that since we already had the right Set-up, but it's a good habit to get into when editing.

Place your finger across the neck at the 12th fret and press the capo pedal. Check that the yellow Capo light on the pedal unit is lit. Release first the pedal, then your barre.

Press MENU:                                    To take you to the MENU page.

This is divided into twelve sections. Notice that they correspond exactly to the STRING TUNE buttons below them. The page you wish to enter is accessed by pressing the corresponding String Tune button. When the system is first switched on and the menu is called up, it shows the 'first level menu' - a fairly simple one. Pressing any of the transposition buttons toggles to the 'second level menu' a more sophisticated version.

We will keep to the first level for now. The second level isn't any more difficult to use, it just has more options.

Press STRING TUNE:                            The one that corresponds to SWITS.

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This brings you to the SWITCHES pages. There are three pages (that is three functions that you can turn ON or OFF) and page 3 is SUSTAIN. You can flick through these pages using the TRANSPOSE SEMITONE UP/DOWN buttons, noting a message in the top right hand corner of the display telling you which page you are on. Find page 3, the SUSTAIN page.

The message:- 'When on, a note will continue to sound until a string is damped' appears above the six individual 'ON' messages which are themselves directly above the STRING TUNE buttons. Each of the top row toggles the SUSTAIN of it's corresponding string ON and OFF, so you can select the string you want to SUSTAIN. Any of the bottom row will turn all six ON and OFF.

Press one of the STRING TUNE DOWN buttons to turn the SUSTAIN OFF for all strings, then EXECUTE to return to the FRONT page.

If you now pluck a string it will produce little more than a short 'toot'. However, playing the keys, you will find that the notes will sound for as long as the key is held, and release the moment that your finger is removed. This is far closer to how a piano works than when the Axe is in the 'SUSTAIN' mode and is useful for 'string' sounds. (In SUSTAIN mode, notes will continue to ring until damped).

O.K. you will have a 'piano' sound which you can play on the keys, with a capo at the 12th fret. Let's transpose down one octave so that the 12th fret sounds the same notes as the nut usually gives, then save it.

Press TRANSPOSE OCTAVE DOWN: To drop by 12 semitones.

Press SAVE, 2, EXECUTE: To update memory number 2.

### MODIFYING THE OTHER SET-UP

Now we are going to work on the other Setup. Let's change the amount of String Bend that we get from the Axe. We can do this on the Dials page.

Press RECALL, 1, EXECUTE: This should give us the 'flute' again.

Press MENU: To get to the MENU page.

Press TRANSPOSE OCTAVE UP: To reach the Second Level Menu.

## SYNTHAXE OWNERS MANUAL

Press STRING 3 TUNE UP: To select the DIALS page.

Press TRANSPOSE SEMITONE DOWN: There are 14 pages which can be flipped through. We want page 5, STRING BEND GAIN.

The message:- 'High gain reduces the amount of movement required to change pitch' appears on the display along with the number 64, which is the factory setting.

At this point it is worth doing some String Bending to familiarise yourself with the feel of the factory setting.

Press numeric keys 1 and 0: Setting the value to 10 gives almost no response.

Press numeric keys 9 and 9: Setting the value to 99 probably makes it uncontrollable.

It is important to realise that the String Bend Gain value you have been adjusting governs the sensitivity of the Axe to mechanical string movement. The pitch bend range on the synth however will determine the maximum amount any note can be bent. If the pitch bend range on the synth is set to two semitones (which is common for keyboard players) no amount of Axe String Bend gain will give you more than two semitones, you will just get there with less string movement. This is why we recommend a large total range on the synth - say five semitones. You can always turn the gain down on the Console if you do not want this much.

Now try a few settings of your own and see what feels best. For the purpose of this excercise choose a value which is NOT 64.

Press EXECUTE: To return to the FRONT page.

You should see a message telling you that the Dials are active. This simply confirms that something on the DIALS page has been modified from the factory settings.

Let's make another change before saving this Set-up. We will try something that sounds a bit strange. That is to invert String Bend so that notes go DOWN when strings are bent !

## SYNTHAXE OWNERS MANUAL

Press MENU: To take you to the MENU page.

Select CTRLs (CONTROLLERS) Use the STRING TUNE button.

On this page you can choose the MIDI controllers to be used for String Bend, Wang Bar, Damping and Key Pressure. The arrow cursor is moved by the STRING 4 TUNE UP/DOWN buttons because they are directly below it. It is probably pointing at String Bend already but move it up and down anyway to get used to it, then get it back to pointing at 'String Bend'.

Press STRING 1 TUNE You can use either the UP or the DOWN key. A message directly above it will toggle between 'TRUE' and 'INVERT'.

Leave it at 'INVERT' and try some string bending on the Axe. This is pretty strange stuff, but probably has some use somewhere.

While on the CONTROLS page, try this:-

Press STRING 4 TUNE DOWN: To move the cursor to Key Pressure. (Press 3 times).

Press STRING 3 TUNE DOWN: To flip through until the message reads 'BENDER'.

Any Axe key will now control the pitch bend - another strange effect, demonstrated here to give a feel for the flexibility of the instrument. Let's not keep this last effect.

Press NORMAL: This will set the line on which the cursor sits back to its factory default (Normal Value).

The NORMAL button usually sets whatever is displayed to the 'Normal' factory default - a useful feature. Note that the String Bend is still inverted.

## SYNTHAXE OWNERS MANUAL

We have almost finished the work on the 'flute' Set-up. Finally, let's turn on the Left Hand Trigger mode by using the switch on the body of the Axe. Now :-

- Press EXECUTE: To return to the front page.
- Press SAVE, 1, EXECUTE: To update the memory.
- Check that the two Set-ups are as we expect by recalling each in turn:
- Press RECALL, 2, EXECUTE: Will get the 'piano' sound set up for the keys with a capo.
- Press RECALL, 1, EXECUTE: Will get the 'flute' with the Left Hand Trigger ON and String Bend inverted.

### THE STEP-ON SYSTEM - CREATING A SONG

If you have the optional SynthAxe automation system, make sure it is plugged into the 'EXPANDER' socket on the main Pedal Unit, using the cable with the grey sleeved plugs.

The idea of this system is that you can use the pedals to step through a sequence of memories in a pre-arranged order. In a live situation, this allows songs to be played through with changes of synth, synth patches, tunings, switches and dials plus any of the other performance parameters at the press of a pedal, exactly when you want. You can also store lists of songs in 'Sets' and step through Songs and Sets in the same manner.

So, using the memories which we have already stored, let's put them in a sequence of Steps in a Song and give the Song a name.

- Press MENU: To get to the MENU.
- Press 'SONGS': Use STRING 1 TUNE DOWN.

The SONGS page is a directory of 48 songs and you can use the TRANSPOSE SEMITONE buttons to scroll through the complete list. A number of factory songs are already written in as examples but we will enter one of our own.

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You will see an arrow cursor to the left of the Song list. STRING 5 TUNE UP/DOWN buttons move this up through the list. Take the cursor to position 1, the first song.

Press SAVE: This removes the memory protect feature allowing us to make changes.

Press CLEAR: This clears the current Song name - just the name.

You will now see a flashing line at the beginning of the blank Song title. This is the character entry cursor and can be moved along using the STRING 1 and 2 TUNE UP buttons. The STRING 1 and 2 TUNE DOWN buttons roll through a sequence of letters and numbers that are used to name songs (a maximum of twelve characters per title).

Let's call this Song 'magic'. Make sure that the entry cursor is at it's leftmost position:

Press STRING 1 or 2 TUNE DOWN: Roll through the alphabet until you reach the letter 'm'.

Press STRING 1 UP: Move on to the next character position.

Repeat the process until 'magic' is spelled out.

Press TRANSPOSE OCTAVE DOWN: This takes you to the STEPS page.

This is where you enter your sequence of memories as steps within a song. First we will clear out any rubbish which is already here:

Press CLEAR: To clear out the steps. Hold it down until all the steps are blank.

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Just to be perverse, we will use memory 2 as the first step, memory 1 as the second and memory 2 as the third step.

Press 2:	This writes memory 2 into step 1.
Press STRING 6 TUNE DOWN:	Move the cursor to step 2.
Press 1:	Enter memory 1 as step 2.
Press STRING 6 TUNE DOWN:	Move the cursor to step 3.
Press 2:	Enter memory 2 as step 3.
Press SAVE:	This puts the memory protection back on so that the data is 'Safe'.
Press NORMAL:	To ensure that the black Step-on cursor is at the first step.

If you now press the + pedal on the Step-On Unit, the black Step-On cursor will move down the Step-On list, recalling each memory in turn. When it reaches the first '--' (this is an End-of-Song marker) it will go no further. The + and - buttons on the keypad can be used instead of the Step-On pedals.

### PUTTING THE SONG INTO A SET

We have defined our song, but at the moment we can only use it when we are on the STEPS page which we reached from the SONGS page. Why? The reason is that whenever you press a Step-On pedal ON ANY CONSOLE PAGE OTHER THAN THE STEPS PAGE the memory which is recalled is the one in the Currently Active SET! We haven't used SETS yet, so let's have a go.

Press MENU 'SETS': (Use STRING 2 TUNE DOWN).

The STRING TUNE buttons directly below the arrow cursor move the cursor up and down the SET list so that you can choose which set you want to use. The names you can see were put in at the factory as examples but the data INSIDE each set is meaningless until you program in your own songs.

Set the cursor to point to SET number 6:

## SYNTHAXE OWNERS MANUAL

Press TRANSPOSE OCTAVE DOWN: To take you 'into' the Set.

This is called the PLAYLIST page, and is literally that - the list of SONGS that you want to play. First clear out the rubbish.

Press SAVE: To remove the memory protection.

Press CLEAR: Hold this button down until each song is removed.

Press STRING 5 TUNE DOWN: Using this button, you can roll through the SONG list and select the song you want at this position.

Press STRING 5 TUNE UP: To roll back to Song 1 if you went past it.

Explore what the other STRING TUNE buttons do but, before you continue to the next step, get the display back to showing 'magic' as the first and only song in the set. It may seem pointless but there is a reason ...

Press EXECUTE: To return to the front page.

MAGIC!! By using the Step-On pedals we can now step through the song 'magic'. You should now be able to step through that three step song NO MATTER WHICH PAGE YOU ARE ON. Remember, The Step-On system works on the Currently Active SET even when you are viewing other Console pages. The only time that it doesn't do this is on the SONGS/STEPS page. on the SONGS/STEPS page, the currently active SET is ignored.

## SYNTHAXE OWNERS MANUAL

### 2.7 USING A YAMAHA DX7

This section covers the basic operations involved in making a popular synth - the DX7 - work with the SynthAxe.

The Console part is straight forward enough. Just Normalise the Playing Setup by pressing CLEAR followed by NORMAL on the FRONT page.

The following buttons should be pressed on the synth itself. Numbers enclosed in square brackets such as [ 8 ] refer to the green buttons numbered 1 through 32.

Press the Brown FUNCTION button to select function mode.

Press [ 8 ] to access the MIDI receive channel page.  
Use the Data Entry Slider to select MIDI input Channel 1.

Press [ 3 ] to access the Pitch Bend Range function.  
Use the Slider to select 5 semitones.

Press [ 2 ] to access the Poly/Mono function.  
Use the slider to select Poly operation.

Press [ 1 ] to access the Master Tune function.  
Use the slider to tune the synth with any others you are using.

If you want to use the keys on the Axe and you do not want the Pressure modulation effects which seem to be programmed into most of the Yamaha factory presets, you can easily remove the modulation:

Press [ 30 ] to access the After Touch Pitch control.  
Use the slider to select 'OFF'.

Finally,

Press the green Internal Memory Select button.

If you forget this last step, everything will work but the synth will not respond to patch changes.

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### 2.8 USING AN OBERHEIM XPANDER

The Xpander is one of the best analogue synths to use with the SynthAxe since it has a very powerful and flexible MIDI interface. It can be used in Mono or Poly modes but is usually used in Mono since this gives you individual String Bending and Legato Note Update (pitch updates while sliding up the neck, without a new envelope every time you reach a new fret).

To set the Axe correctly first Normalise the Setup by pressing CLEAR followed by NORMAL from the FRONT page. Then go to the MENU page, select the PORTS page and use the STRING TUNE 1 UP key to select MONO 3 mode.

Setting up the Xpander is slightly more complex. We will list the Xpander buttons which you should press and give just minimal explanations. If a page or option is not mentioned it is because it is irrelevant for the setting up procedure.

Press SINGLE PATCH button.

Press MASTER PAGE button.

Press the button directly below the 'MIDI' message.

Press the button directly below the 'CHANNEL' message.

Rotate the knob below the Channel number to select '1'.

Press PAGE 2 button.

Press the button under the 'CTRLS' message.

The top row of the display should read:

LEVER 1, LEVER 2, PEDAL 1, PEDAL 2, PRESSR.

Use the bottom row of knobs to select the following data:

1, 2, 31, PEDAL 2, PRESSR.

With the Normalised Axe Setup this means that LEVER 1 is the String Bender, LEVER 2 is the Wang Arm, and PEDAL 1 is the Damping Controller. The key Pressure is assigned to PRESSR

Press PAGE 2 button.

Press the button under 'ENABLES'

Ensure the 'CONTROL' and 'PATCH' messages are underlined by using the buttons directly below the messages.

The bottom line of the display should read:

VELOCITY=LINEAR at the left and NO DEFAULTS at the right.

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Press MASTER button.

Press the button below CV/MIDI on the bottom line.

The top line will read:

VOICE 1, 2, 3, 4, 5, 6

Use the bottom row of knobs to get the bottom line to read:

CH 1, CH 2, CH 3, CH 4, CH 5, CH 6.

The Expander is now ready to work in Mono mode. You may find that you have to edit patches, adding more LEVER 1 modulation to the FREQUENCY of VCO 1 and VCO 2, in order to get enough String bend.

If you want to use the Xpander in Poly modes, all the voices should be assigned to ZONE 1 instead of Channels 1 to 6, so the last operation would be replaced by:

Press MASTER button.

Press the button below CV/MIDI on the bottom line.

The top line will read:

VOICE 1, 2, 3, 4, 5, 6

Use the bottom row of knobs to get the bottom line to read:

ZONE 1, ZONE 1, ZONE 1, ZONE 1, ZONE 1, ZONE 1

For poly 1 mode, you should set up ZONE 1 as follows:

Press MASTER button.

Press the button under the 'ZONE' message.

Press the button under the 'INPUT' message.

Use the knob at the left of the bottom row to select 'CH 1'.

Press PAGE 2 button.

Press the button under the 'LIMITS' message.

Use the two knobs at the left of the bottom row to get:

'0 TO 127'.

Press PAGE 2 button.

Press the button under the 'MODE' message.

Use the knob at the left of the bottom row to select 'ROTATE'.

To use poly 1 mode you should also use a different controller assignment:

Press MASTER button.

Press button under 'MIDI' message.

Press button under 'CTRLS' message.

The top row will read:

LEVER 1, LEVER 2, PEDAL 1, PEDAL 2, PRESSR

Use the bottom row of knobs to make the bottom row read:

BENDER, BENDER, PEDAL 1, PEDAL 2, PRESSR

These examples assume that you are using the SINGLE patch mode on the Xpander. Using the MULTI patches is no harder to set up, but you need to repeat the Voice Assignment (and ZONE setting up if using Poly modes) selections for EACH MULTIPATCH.

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### 2.9 SOME USEFUL TIPS

#### REAL MAGIC:

There is a jewel hidden in the software of the SynthAxe. By using the keys in SUSTAIN mode you can sustain ANY note at any position on the fretboard while playing at a completely different position - WITHOUT using any pedals or buttons. Simply reverse the order in which you move each hand away after a note has been triggered. Move the left hand WHILE the key is held, THEN release the key. Try it.

#### DRIVING MORE THAN ONE POLY SYNTH:

If you drive several synths, each on a separate port, all in a poly mode and on the same MIDI channel, it would be handy to be able to send each synth a different patch number. This is not currently possible without using several Step-On steps. Send each synth in turn its separate patch, while activating ONLY that synth's port then use a Set-up with no patch change which turns on all the ports together.

#### USING SEQUENCERS:

The Axe in 'full flight' produces more MIDI data than any other MIDI controller. It pushes MIDI close to the limits in order to give you maximum power of expression. Some of the earlier 'hardware' sequencers cannot cope with the high data rate. Most of the newer breed are fine, but don't expect to produce a multitracked MIDI sequence using many Axe tracks, each with String Bend, Wang bar and Pressure data AND have everything play back in 'real time' down one MIDI cable.

If you use a sequencer to save Console data, try setting the sequencer to the lowest tempo while dumping data, then replaying at the highest tempo. Its possible using this technique to load data back into the Console at a fraction of the time it took to dump.

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### TOO MANY NOTES:

The SynthAxe can sometimes seem to be TOO sensitive. Finger pickers with long nails can sometimes get double triggers - one from the flesh of the finger, another from the nail. Try increasing the TRIGGER THRESHOLD dial or increasing the value of the FAST RETRIGGER INHIBIT dial.

If you are used to picking every note that you fret, (i.e. you don't use hammer-ons, pulloffs or slurs) try switching OFF the HAMMER ENABLES on the SWITCHES page. Alternately, since the note from a hammer-on can be made as 'attacking' as a picked note in poly modes (or with MULTI-TRIGGER ON in mono modes) you can now use the pick more sparingly.

It is sometimes easier to play very percussive sounds if you increase the VALID FRET RESPONSE to a value of about 6.

### HOW TO GET NOTES HAMMERED FROM OPEN:

Make the LEFT HAND DAMPING RESPONSE SLOWER than the VALID FRET RESPONSE. Setting the LEFT HAND TRIGGER RESPONSE to about 10 usually works fine.

### LAWS ARE USEFUL:

The Axe can sometimes give you too much dynamic range. Try using the laws to 'compress' the Velocity response. With a velocity sensitive DX7 patch try a velocity law which starts at 40 and rises steadily to 99.

Laws which are constant values can be very useful. (i.e. nine numbers all with the same value) They can provide an easy way of ensuring that every note has the same velocity (e.g. for playing a MIDI drum machine sequence).

Want to have pitch bend in semitone steps? Try a pitch bend law which goes 0, 0, 0, 40, 40, 80, 80, 80 with maximum STRING BEND GAIN, and a synth pitch bend range of 5 semitones.

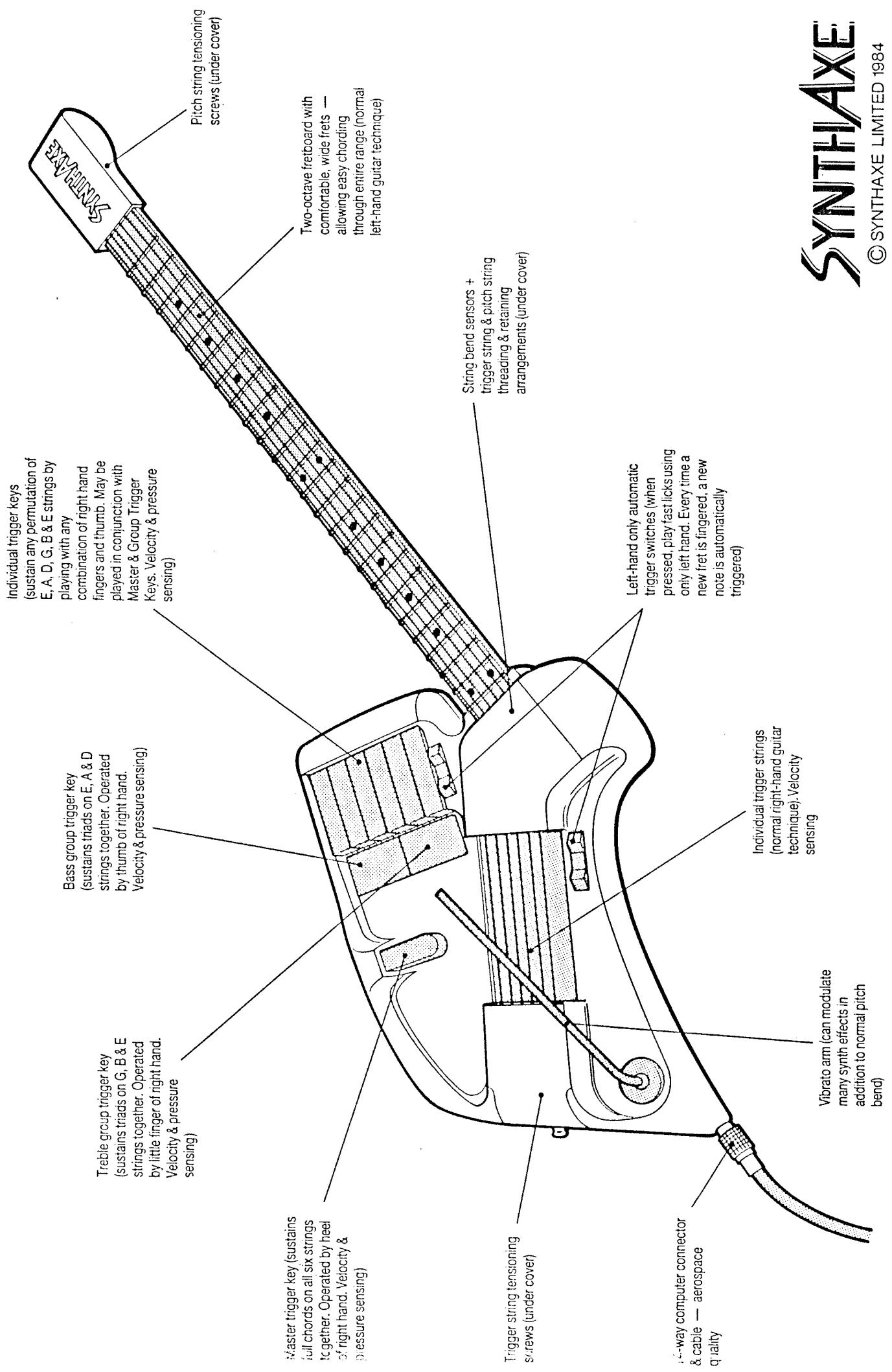
Try using a pressure LAW and assign key pressure to the MIDI controller that governs portamento time on a mono synth.

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SECTION 3

THE SYNTHAXE

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## SYNTHAXE OWNERS MANUAL

### 3.1 BASIC USE

Section 2.1 'Getting Started' gives detailed instructions on how to connect up and use the SynthAxe equipment. This section gives the recommended order for switching on and off the system.

First connect all the multicore cables and the power cord. Next switch on at the pedal unit and check the console display and pedal lights. Switch on the synthesiser(s) you are using and lastly connect the MIDI cable(s) from the console to the synth.

When switching off, first disconnect the MIDI cable(s), then switch off the synth(s) and the SynthAxe. Lastly disconnect the multicore and power cables.

The SynthAxe, as you probably already know, does not produce any sound by itself. You play the instrument as if it was a guitar, and your movements are interpreted into streams of digital information which can then be relayed to a synthesiser, via MIDI. It is the synth that actually makes the sound; you can use the SynthAxe to go beyond anything that's possible on ordinary guitar or keyboard synths.

You can see on the diagram what each part of the SynthAxe does, but it may be useful to consider what the synth needs to know, and how the instrument goes about telling it.

The most important messages that need to be sent are:-

1. Start a note
2. This is the pitch
3. Stop the note

It might be better if we called this last message "Start the end of the note" - because notes need to die away rather than just stop; more of that later.

## SYNTHAXE OWNERS MANUAL

### 3.1.1 STARTING A NOTE

The trigger messages, which start the note, can be generated in any one of three ways; you can use your normal guitar technique to pluck or strum the Trigger Strings, you can use your left hand on the neck to trigger by simply holding down a note, or you can use the Trigger Keys.

#### TRIGGER STRINGS

The Trigger Strings work in much the same way as the strings on your guitar. If you pluck or strum them, a note will start and die away; if you damp them, the note will stop quickly. The strings are velocity sensitive, so that by plucking you can play loud or soft, or change the tone of the sound.

#### TRIGGER KEYS

Why does the SynthAxe have Trigger Keys? Simply because they can be used to control the synth in more subtle ways than is possible with guitar technique.

There are nine of them:-

MASTER which plays all six strings together,

BASS GROUP which acts on the E, A and D strings,

TREBLE GROUP to trigger the G, B and top E,

and then, of course,

ONE KEY for each string.

The keys respond not only to the speed with which you play them, but also to how far you press them down. So, for example, you could set up your synth with a patch that has a soft tone when you press the key slowly and a harsher beginning to the sound when you press the key more quickly; then you could press harder to add vibrato to the sound.

## SYNTHAXE OWNERS MANUAL

You can use Key Velocity or Key Pressure sensing to control the volume of the note, change the tone, add vibrato, or put the pitch up an octave, or control any other synth parameter.

### LEFT HAND TRIGGERING

There are two Left Hand Trigger switches on the body of the instrument, one next to the Trigger Keys and one next to the Trigger strings. Both perform identical functions, and are only duplicated for your convenience

A red indicator Light on the Pedal Unit is lit when Left Hand Trigger Mode is selected.

While in Left Hand Triger Mode, the SynthAxe starts a new note every time you hold down a note on the fretboard. On each switch, one end is latching and the other is non-latching, so that you can hold the switch down while playing a left hand run, or lock it down and use both hands on the neck.

You can even play open strings in Left Hand Trigger Mode by fretting behind the Zero Fret, which corresponds to the nut on a conventional guitar. Note that you can also slide to and from open notes using the Zero Fret.

It is also possible to use the Left Hand Trigger Mode in conjunction with the Trigger Strings and keys for a variety of different multi-triggering effects.

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### 3.1.2 THIS IS THE PITCH

You tell the synth what notes to play by using normal guitar technique. That is, if you hold down a note or a chord on the fretboard, those pitches are sent to the synth. If you bend the string, the rise in pitch is sent as a MIDI 'Pitch Wheel' instruction.\*

Every point of contact between each string and each fret produces a unique digital code which represents the pitch of the string at that point. Most players displace the string slightly when they play, and the SynthAxe allows for that; any further movement sideways, however, is detected by six string bend coils located under the neck strings.

A further variation in pitch can be produced, as on an electric guitar, using the Wang Bar. This naturally acts on all strings at once and, because it is free of the mechanical constraints of a 'normal' Wang Bar, all notes shift parallel to one another, up or down in pitch.

Like the string bend codes, and many other parameters which are sensed by the SynthAxe instrument, you don't have to use the Wang Bar to change pitch; you could assign it to change the tone instead, or add any other effect of which your synth is capable. All these functions are written in the initial programming, and are easily accessible once you get to know your way around the instrument.

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\* There is a potential problem here, depending on which synth you are using. The SynthAxe can send out six 'Pitch Wheel' codes, one for each string. However, many keyboard synths unfortunately only have one pitch wheel, which acts on all the notes on that synth. The SynthAxe Poly 1 Interface caters for all synths on a very basic level, and therefore addresses this single Pitch Wheel every time you bend any string, or use the Wang Bar. This means that any string bending will bend all the notes! (See Section 6 - MIDI)

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### 3.1.3 STOPPING THE NOTE

As we mentioned earlier, this is actually a signal to start the end of the note, because you don't necessarily want the sound to stop dead. This subject deserves a whole chapter on its own, which is why there is a section in this manual called 'Synthesiser Dynamics' (Section 5). That section will explain in detail the various ways you can use the SynthAxe to shape the notes the synth produces.

For now, let's just look at the principles involved.

### 3.1.4 ENVELOPES

Every note can be said to have a beginning and an end. Some notes have a middle too. This shape of a sound is called the Envelope.

The beginning may be quick or slow; that stage of the sound is called the Attack (A), and the time a note takes from start to its peak, or loudest point, is called the Attack time. After this there is normally a rapid fall in volume, called the Decay (D).

At its end, the sound will die away, usually slowly, which is called the Release (R) of the note.

Sometimes the sound remains at a constant level after the initial Decay and before the Release. That period is called the Sustain (S) of the note. Actually, Release begins when Note Off starts.

When you pluck a guitar string, it has an initial peak, then dies away slowly. That's like an A-D-R envelope. The more resonant the guitar, the slower the note dies away - the Release is longer.

As we've already seen, you can use the SynthAxe to start notes in several different ways.

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If you pluck the Trigger Strings when the Sustain Enables are turned off, the instrument sends a Note On instruction which signals the start of the Attack. Almost immediately, the Note Off command is sent and this begins the Release phase of the note. Depending on the synth patch you're using, this will give you something like the A-D-R envelope.

If you use the Trigger Keys, the Note On instruction is sent when you press the key down, and this starts the Attack/Decay phase of the note. When the end of the Decay stage is reached, if you are still holding down the key, the note will Sustain until you release the key, when a Note Off instruction will be sent; this will start the Release phase of the note. Depending again on the synth patch you are using, this will be an A-D-S-R envelope, a bit more like the shape of a trumpet note.

One of the unique features of the SynthAxe in the Mono Mode is that you can use the Trigger Keys or the Trigger Strings to start the envelope of the note, but at any time change pitch, by moving the left hand without restarting the envelope.

### 3.1.5 DAMPING

As we have already seen, the Note Off instruction tells the synth to enter the Release phase of the note, which will die away as normal. On the guitar you can damp the string, which changes the speed at which the note dies away. The SynthAxe can also do this in Mono 3 mode. When you touch either set of strings, the SynthAxe senses that you have damped those notes, and sends MIDI information which can be used by the synth to change the Release part of the envelope \*\*

You can of course still pluck, whilst damping the right hand Trigger Strings, which gives guitar style 'muting' effects - another thing that keyboard players just cannot do.

---

\*\* Unfortunately only certain specialised synths allow you this much external control, so the Damping option is only operational on the Mono 3 Interface. (See Section 6 - MIDI)

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### 3.2 CARE AND MAINTENANCE OF YOUR INSTRUMENT

The SynthAxe needs very little maintenance compared to a conventional guitar. There is no truss rod in the neck, no bridge to require height or intonation adjustments and no potentiometers to eventually become 'scratchy'. Occasional cleaning and changing of strings is all that is required to keep the instrument in good working order.

#### 3.2.1 CLEANING

You should remove dust by occasionally wiping the body and neck of the SynthSxe with a clean, dry, lint - free cloth. If a polish is used it should be non abrasive and free from plastics solvents. Do not polish the Console or the Pedal Unit. A wipe with a dry cloth or slightly damp (soapy water) is all that is needed..

#### 3.2.2 THE NECK

THE ACTION OF THE NECK IS PRESET AND NOT ADJUSTABLE. MODIFICATIONS TO THE NECK SUCH AS STONING OR ATTEMPTING TO RAISE OR LOWER THE ACTION WILL ALMOST CERTAINLY DAMAGE THE INSTRUMENT. IF REPAIR WORK IS EVER REQUIRED IT SHOULD ONLY BE CARRIED OUT BY QUALIFIED SYNTHAXE PERSONNEL. THE INSTRUMENT YOU HAVE RECEIVED HAS BEEN CAREFULLY SET UP AND THOROUGHLY TESTED BEFORE LEAVING THE FACTORY.

The frets are made of stainless steel and are significantly harder wearing than traditional guitar frets. The only adjustment which you ever need to make to the neck is adjustment of string tension, usually following the fitting of new strings.

#### 3.2.3 CHANGING THE NECK STRINGS

The only time that you ever need to change a string is when it starts to feel pitted and rough due to the natural processes of corrosion. Occasional use is enough to keep the contact areas of the string clean enough to make reliable contact with the frets. The strings supplied fitted to your

## SYNTHAXE OWNERS MANUAL

SynthAxe are normal guitar 0.013 gauge. You may change the gauge or tension of the neck strings to suit your own playing style. Wound strings can be used but most people who have tried both prefer plain types.

Although this procedure looks daunting on paper, don't be put off. It isn't much more complicated than changing a string on a guitar. Go through it first with the SynthAxe in front of you.

To remove a neck string, first remove the Headstock by pulling it off the end of the neck.

Next take the 2mm Allen key provided in the toolkit and remove the four screws which hold the cover plate at the body end on the neck. The cover plate can then be lifted off revealing the ball ends of the strings.

Slacken off the tension of the string using the 2mm Allen key on the screw at the headstock(less) end of the neck. Keep unscrewing until the screw can be removed. This frees the String Tensioner which can then be lifted with the string attached. Sometimes it helps to also remove the round string retaining 'mushroom' under which the string passes (use a 2.5mm Allen key). Take care to keep all these small parts safe.

The old string can now be removed from the string tensioner by loosening the 2mm clamp screw and pulling the old string out.

To fit a new string, first pass the free end of the string through the hole in the small black string tensioner block.

Place the block in position at the end of the neck and fasten it in place using the long tensioner screw which should first be passed through the hole in the plate at the end of the neck. Turn the tensioner screw until the tensioner block is held well clear of the round mushroom shaped retainer.

## SYNTHAXE OWNERS MANUAL

Now hook the ball end of the string under the plastic anchor at the body end, pull the string taut and tighten down the string clamp screw in the tensioner to grip the string firmly. Check that the string passes over the 'V' pin contacts at each end of the neck and also under one edge of the round mushroom shaped retainer at the headstock end. This ensures that the string is held in good electrical contact with the 'V' pins.

Tighten the string to a comfortable playing tension using the long adjuster screw at the end of the neck. At SynthAxe Ltd we tune each string audibly to the note of a guitar top E string. Any tension for the neck strings can be used provided that:-

- (a) They are tight enough to sit firmly in the 'V' pin contacts at each end of the neck.

and

- (b) They are not so tight that the speed of the neck response is impaired. Very tight strings require more 'squeezing' force in order to contact the frets. This can affect the speed of playing especially when using Left Hand Triggers.

Try bending the string to check that the clamp screw is tight enough to prevent the string slipping. The loose end of the string should be cut off close to where it emerges from the tensioner and the sharp end should be bent down with pliers to render it less dangerous. Keep the projecting length short enough to avoid any possibility of shorting out to an adjacent string. This would do no damage but cause wrong notes.

Finally replace the cover plate on the body using the four screws. Put each screw in position before tightening down any of them, then screw each down lightly. Make sure they are not cross threaded as this will damage the brass insert. Push the headstock back on the neck.

## SYNTHAXE OWNERS MANUAL

### 3.2.4 CHANGING THE TRIGGER STRINGS

\*\*\*\*\* WARNING \*\*\*\*\*

The strings fitted to the right hand trigger system should be 0.020 gauge and set to a tension such that when plucked they sound the same note as a guitar open 'top E' string. We recommend that you do not change the gauge or tension of these strings. Take care if replacing them to set the tension correctly. If they are set too tight then this can seriously impair trigger sensitivity - sometimes causing individual strings to miss a pick stroke. The tension may be set several semitones either way to obtain the best compromise between feel and trigger sensitivity. Note that SynthAxe controllers built before June 1986 used a different trigger system and did not need to be set up this way.

\*\*\*\*\*

Although this procedure looks daunting on paper, don't be put off. It isn't much more complicated than changing a string on a guitar. Go through it first with the SynthAxe in front of you.

To remove a trigger string, first get the 2mm Allen key from the toolkit and remove the four screws which fasten the front cover plate where the neck joins the body. Lift off the cover plate to expose the ball ends of both neck and trigger strings.

Next remove the two screws which secure the cover plate at the other end of the trigger strings. You may find it helps to loosen the strap fastener screw (using the 3mm Allen key) to free this cover. This allows access to the right hand string tensioners. Pluck the strings and note down how they are tuned.

Loosen the tensioner screw until it becomes free and lift off the string with the small black tensioner block attached. Use the 2mm Allen key to loosen the string clamp screw on the tensioner block and pull the old string free. Keep all the small parts somewhere safe.

## SYNTHAXE OWNERS MANUAL

To fit a new string, take the free end of a 0.020 gauge string and thread it through the hole in the small black tensioner. Fit the long tensioner screw through the hole in the plastic 'bridge' and screw it well into the tensioner. Hook the ball end of the string under the anchor point at the neck end and while holding the string taut at the other end, tighten down the string clamp screw on the tensioner. Check that the string passes cleanly over the 'V' pin contacts at each end.

Tighten the tensioner screw until the string vibrates when plucked to the note of a guitar open 'top E'. Cut the loose end of the string close to where it emerges from the tensioner and bend down the sharp exposed end of the string using pliers so that it is less dangerous. Never allow the free ends of the strings to be long enough to touch each other. This would not do damage but will prevent proper operation.

It is advisable to replace the cover since accidental touching of the loose string ends by the palm of the hand during playing will be interpreted by the SynthAxe as intentional string muting. Remember to re-tighten the strap fastener screw after fixing the cover plate if you loosened it earlier.

Finally replace the neck cover plate on the body using the four screws. Make sure they are not cross threaded as this will damage the brass insert. Put each screw in position before tightening down any of them, then screw each down lightly.

### 3.2.5 CHANGING FUSES

Never check or change a fuse without first disconnecting from the A.C. supply. It isn't enough to switch off, pull out the plug as well in order to remove danger of electric shock.

The only fuses which can be changed by the customer are located in the pedal unit. There is one on the back panel and three more inside.

## SYNTHAXE OWNERS MANUAL

The mains fuse is accessible on the rear panel and will only need changing if the mains switch light fails to illuminate when the unit is switched on. The fuse is a 1 amp anti-surge type for 220V to 240V operation, or 2 Amp Anti-surge for 115V operation. Before reconnecting to the A.C. supply check that the voltage selector is correctly set for either 115V or 230V operation.

If the pedal unit lights fail to come on, or the console display remains blank then it is possible that one of the three internal pedal unit fuses has blown. Check first that the cables are not the cause of the fault.

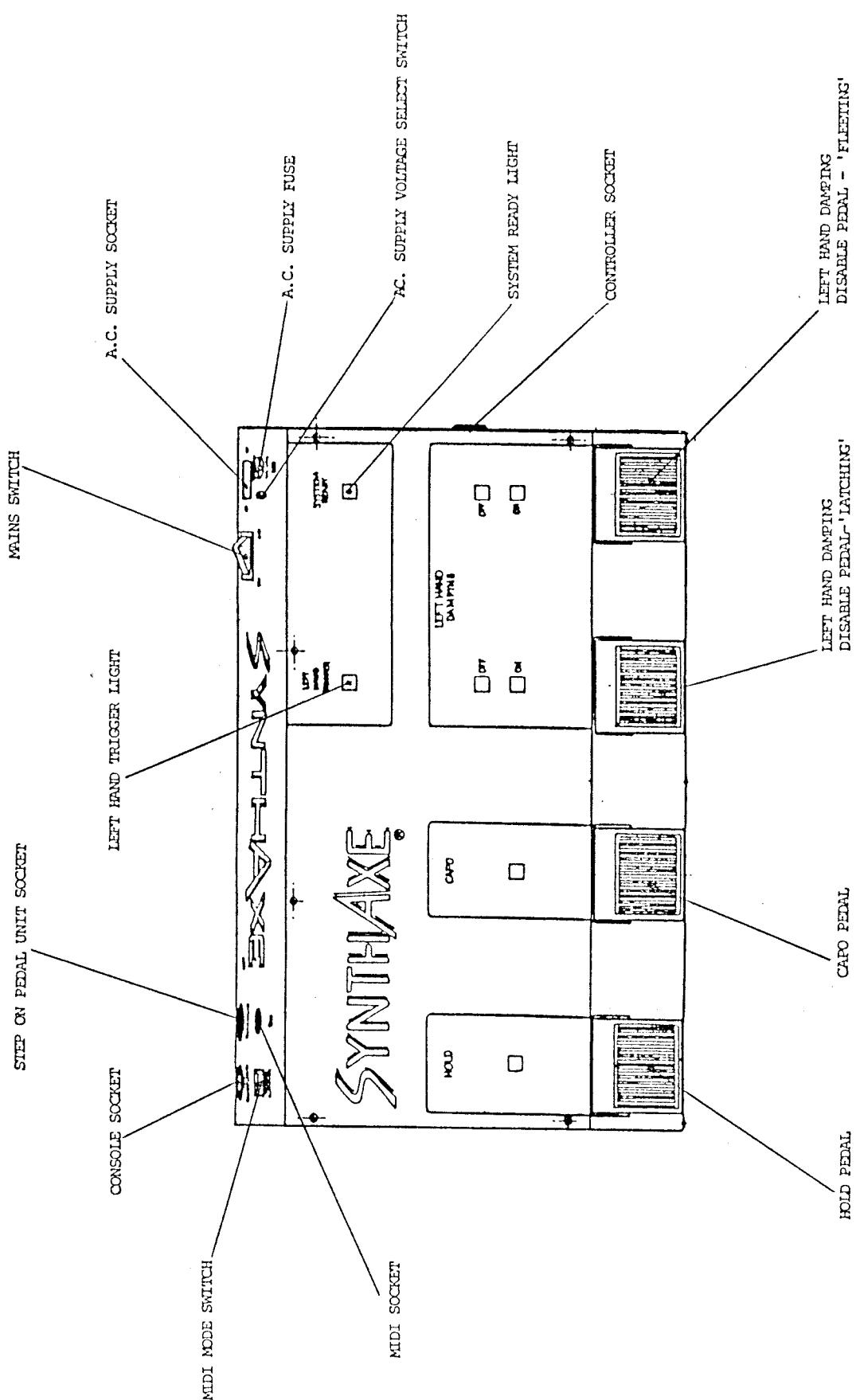
To access the internal fuses, first disconnect completely from the A.C. supply then remove the six screws on the top edge of the lid. Remove three similar screws from the front edge of the Pedal Unit and raise the lid by the top edge so that it stands vertically on the front edge. The three fuse carriers are accessible on the right hand edge of the circuit board mounted on the inside of the lid. It is not necessary to unplug any connectors to access these fuses. They are all 5 Amp rated (irrespective of mains supply voltage). When replacing the screws which fasten the lid ensure that each screw is fitted in position before any of them are tightened down.

SYNTHAXE OWNERS MANUAL

SECTION 4

THE PEDALS

TOP VIEW OF PEDAL UNIT



## SYNTHAXE OWNERS MANUAL

### 4.1 THE PEDALS

The SynthAxe Pedals give the player three extra control functions. These are Automatic Hold, Automatic Capo and Left Hand String Damping Disable.

#### 4.1.2 HOLD PEDAL

When the Hold Pedal is pressed, any note played is permanently sustained by the system. Any combination of strings can be put on Hold and the function can be cancelled at any time by simply playing another note on the same string, or by pressing the Hold pedal again. If any note is being held by the Hold function, this is indicated by a yellow light on the Pedal Unit.

This function is particularly useful when Sustain Mode Has not been selected.

#### 4.1.2 CAPO PEDAL

The digital Capo takes the place of the normal mechanical capo you might use on a guitar, but takes the concept a lot further. To operate the Automatic Capo, simply place your finger across the neck or hold down any chord shape, press the Capo Pedal, then release it and the notes you have registered become the open string tunings. The Capo will remain until it is cancelled, by removing your hand from the neck and pressing the pedal once. If a Capo is selected, this is indicated by a yellow light on the Pedal Unit. Note that you don't need to cancel a capo in order to change it.

#### 4.1.3 DAMPING PEDAL

As we have seen, it is possible to damp notes on either set of strings simply by touching the string, as you would on the guitar. This pedal makes it possible to cancel the Damping function on the neck strings. This allows you, for example to play a chord, move your left hand to the next position while the old notes are still sounding, then trigger the new notes with your right hand. In this manner you can avoid breaks in the sound while moving your left hand.

## SYNTHAXE OWNERS MANUAL

### 4.2 THE PEDAL UNIT

The Pedal Unit contains the power supply for the SynthAxe system. Before connecting the IEC power cord, ensure the correct operating voltage has been selected on the slide switch at the back and the correct fuse is inserted.

The indicator in the power switch will illuminate to show the system has been powered.

As well as containing the sockets which connect up to the Controller, Console and Step-On Pedals, there is also a 5-pin DIN connector wired to the MIDI Out standard.

From this socket comes a copy of MIDI data from the Console output ports. It can be used as a ninth port to provide MIDI back to the Console for MIDI Examiner purposes, (See Section 7.3.19), or to drive a synth in the absence of a Console.

If the SynthAxe is used without a Console, then this provides the means of getting MIDI Out from the system. The performance potential of the instrument is now obviously very restricted and this facility is generally intended for test and service purposes. The switch on the rear panel can be used to select the MIDI mode in which the SynthAxe operates. The switch is only read as the system is turned on, and is ignored whenever the console is in use.

MONO 1	Is selected in switch position 8
MONO 2	Is selected in switch position 4
MONO 3	Is selected in switch position C
POLY 1	Is selected in switch position 2
POLY 2	Is selected in switch position A

## SYNTHAXE OWNERS MANUAL

### 4.3 THE STEP-ON PEDAL UNIT

The Step-On pedals are used to automate the recall of memories during a performance. See Section 7.3.14 and 7.3.15 for a full description of the Step-On pedals.

When they are plugged into the system they become active when the System Ready light is on. The System Ready light will not be lit if the Console is doing power-up checks or if the Console is either faulty or disconnected.

The Step-On pedals allow you to step through a sequence of Set-ups in a single song.

If the Console is operated on a Song STEPS page, the Step-On pedals will only move the Step-On cursor within that selected song. This is useful for rehearsing a song as well as for playing songs in an ad lib order which could not be pre-loaded into a Playlist.

If the Console is operated on any other page, the Step-On pedals will move the Step cursor through the active Playlist. Stepping forwards through the Playlist takes you from the last valid Step of the previous song to the first Step of the next song in the list.

Stepping backwards through the Playlist takes you from the first Step of a song to the last Step before the end marker of the previous song.

If the Step-On cursor on the active Set playlist gets positioned on a end of set marker, the pedals will have no effect. This allows you to disable your Step-On pedals.

Operating the Step-On Pedals will cause an update of the playing setup data. This data change will be seen on some Console page displays as you Step along.

Should your Step-On Pedals not be connected, the Plus (+) and Minus (-) buttons can be used as Step-On controls when the Console is displaying a SONG/STEPS page or the PLAYLIST Page. These buttons are inoperative on all other Console pages.

SYNTHAXE OWNERS MANUAL

SECTION 5  
SYNTHEISER DYNAMICS

## SYNTHAXE OWNERS MANUAL

### 5.1 BEYOND THE GUITAR

On the face of it the SynthAxe is like a guitar, which is a plucked instrument. It is possible to use the SynthAxe in a plucking mode, but even when you are using the Trigger Strings with your right hand or a pick, it is possible to trigger the SynthAxe in a permanent sustain mode as well as a plucking mode. The SynthAxe pedals and damping systems also give you a number of variations in the way the instrument uses the dynamics of a synthesiser.

These variations in dynamic control make a significant contribution to the musical power of the SynthAxe. If you are going to get the most out of the system, then it is worth spending some time learning something about synthesiser dynamics and then figuring out how you can take advantage of these effects in ways that cannot be achieved on either a keyboard controlled synthesiser - or a conventional guitar.

### 5.2 ENVELOPE SHAPES WAVE TABLES ETC.

The SynthAxe can control synthesisers of various kinds; analogue, digital, FM, sampling systems and various hybrids. For the purposes of explaining the dynamic controls available on the SynthAxe we shall, with licence, use the A (Attack), D (Decay), S (Sustain) and R (Release) functions of the familiar analogue ADSR (Attack, Decay, Sustain, Release) envelope shaper terminology to explain what happens between the SynthAxe and the synth it is driving. Whether the attack of a synthesised sound is fashioned by a VCA (voltage controlled amplifier) in an analogue synth, or by the manipulation of bits at the front end of a digital wavetable, a note will start its Attack as a result of a synth player pressing a key on the keyboard. This note may be sustained, (or held), as long as the player holds the key down on the keyboard. When the player releases the key, the sound of the note will release (or die away). How much the sound sustains when the key is held down (if at all) and how quickly the sound dies away when it is released, again depends on the programming of the synthesiser.

### 5.3 DEFINING TERMINOLOGY

However, before we even look at what happens within the synth, let us define what happens when a player strikes a key on a keyboard. (See Figure 5 at the end of this Section).

## SYNTHAXE OWNERS MANUAL

### NOTE ON

In keyboard terms, Note On is the moment when a player presses a key down.

### NOTE OFF

In keyboard terms, Note Off is the moment when the player releases the key.

### NOTE SUSTAIN

When a keyboard player plays a note, he presses the key down, holds it down as long as he wants the note to sustain, and then takes his finger off the key.

### ADSR ENVELOPES

A - Attack (rate)  
D - Decay (rate)  
S - Sustaintion (level)  
R - Release (rate)

(See Figure 2 at the end of this Section).

#### 5.3.1 ATTACK RATE

The Attack of a note is the speed at which a note gets louder at its very beginning, when first triggered into action.

Notes produced by percussive instruments (See Figure 3 at the end of this Section) such as pianos, bells etc., have steep, or fast attacks. Notes produced by bowed or blown instruments such as strings and woodwinds, tend to have slower attacks

#### 5.3.2 RELEASE RATE

In general terms, instruments which produce percussive sounds do not truly sustain a note. A note from a percussion instrument may take a long time to die away (or Release) due to energy ringing inside the instrument long after it has been struck, or plucked. Tubular bells and an undamped harpsichord string will ring for a relatively long time, but the note will eventually die away.

## SYNTHAXE OWNERS MANUAL

### 5.3.3 DECAY RATE AND SUSTAIN LEVEL

Notes from a bowed or blown instrument, however, may be truly sustained (See Figure 4 at the end of this Section) for as long as the violin player keeps bowing the string, or as long as the trumpet player's breath holds out. These instruments go through the Attack part of the dynamics at the beginning of the note, reach a maximum volume at the top of the Attack, then Decay to a settled Sustain level which is maintained as long as the note is sustained by bowing or blowing. Unlike percussive sounds these sounds tend to tail off very sharply when the player stops sustaining them - so that when the violin player stops bowing, or the trumpet player stops blowing, the note Releases (or dies) very quickly. This is in stark contrast to an electric guitar string, which will take a long time to die (Release) - unless of course the player deliberately damps the ringing string.

### 5.3.4 ADSR ON THE SYNTHAXE

So, in general terms, traditional percussion instruments have sharp or fast attacks but no true sustains - although they may have long releases if not damped. Traditional bowed or blown instruments tend to have slower attacks, potentially long sustains - so long as the note is maintained - and fast releases when the bowing or blowing stops.

A synth, however, is capable of conjuring up a delicious mixture of dynamics and can combine sharp attacks, infinite sustains and long releases - or slow attacks, zero sustain and short releases in the most perverse and intriguing manner. You will be glad to know that the SynthAxe is equipped to exploit all these dynamic possibilities (both traditional and electronic) in ways that no other musical instrument can - and so far, we are only talking about dynamics!

If you refer to the drawings at the end of this Section, you will see an electronic control signal represented in Figure 5. This signal has two conditions, LO and HI. When the player is not pressing the key, the signal is LO. In Sustain Off Mode, when the player presses the key (Note On), the signal goes from LO to HI. As the player keeps the key pressed (Note Hold), the signal stays HI, and when the player stops pressing the key (Note Off), the signal goes from HI back to LO. Simple!

## SYNTHAXE OWNERS MANUAL

### DEFINITION

You can make two general rules to relate the Note On and Note Off events to an ADSR envelope.

Note On starts the Attack part of the envelope.

Note Off starts the Release part of the envelope.

What happens during Note Hold (the Sustain part of the note) depends on the programming of the envelope. For example, in Figure 6 (See end of Section), Note On starts the Attack of the note, and after it has gone through its pre-programmed Decay, the note stays at the Sustain level so long as Note Hold is maintained. As the example in Figure 6 has a relatively fast Attack and a fast Release, the length of the note can be accurately controlled by holding down the key.

In contrast, the envelope drawn in Figure 7 (See end of Section), has a very long release. The key is held down for a relatively short period, (Note On is quickly followed by Note Off), and in this example the length of the note is not controlled by holding down the key, but by the length of the release time.

These two examples will help you to understand the operation and significance of Sustain Mode in the SynthAxe.

### 5.4 USING SUSTAIN

The SynthAxe has two main modes of operation:-

Sustain ON mode (ADS envelope )  
Sustain OFF mode (ADR envelope )

The SynthAxe will fire up (default) with Sustain ON, but this can be changed by using the SWITCHES page of the Console, See Section 7.3.6

## SYNTHAXE OWNERS MANUAL

### 5.4.1 SUSTAIN MODE

#### STRINGS

When you pluck a trigger string with Sustain ON, a Note On signal is sent to the Synth. (See Figure 8 at end of this Section). That string will now stay in the Note Hold condition until you damp with either the left or the right hand. This is because a Note Off signal is not sent until the damping conditions are met. A Note Off signal will also be sent when that note is retriggered in order for it to start its envelope all over again. So we have the rather confusing situation of a Note Off not being sent until just before the next Note On!

#### KEYS

When you press a trigger key with Sustain ON, a Note On signal is sent to the synth when the key is pressed, but a Note Off signal is NOT sent until the damping conditions are met AND the key has been released. (See Figure 9 at end of this Section). You should release the key first, then lift your fingers from the strings thus damping the note.

Sustain Mode has the potential for something that guitarists have wanted for a long time - infinite sustain. And this infinite sustain is very easily controlled - with no need for high amplifier levels, feedback etc. All you do is play a note in Sustain Mode, and if the synthesiser dynamics are programmed properly, then the note will keep sustaining until the string is damped.

### 5.4.2 SUSTAIN OFF MODE

When you pluck a String with Sustain OFF, a Note On signal is sent to trigger the synth, and shortly after a Note Off signal is automatically sent. This is the equivalent of stabbing a key on a keyboard for only a very short time.

Note On starts the Attack of the synth dynamics, and Note Off puts the synth dynamics into Release. As there are only a few milliseconds between the Note On and Note Off, the note will only last as long as the release time programmed on the synth. This means that you need to have a reasonably long release time programmed to get a meaningful note with Sustain OFF. This mode is good for percussive envelopes with fast attacks and relatively long releases, and the Note On, Note Off action is the electronic equivalent of plucking.

## SYNTHAXE OWNERS MANUAL

(NB: There is a way of adjusting the minimum time in between the Note On signal and the Note Off signal in this mode (See the Trigger Pulse Duration Dial in Section 7.3.7)

When you trigger a note using the keys with Sustain OFF, a Note On signal is sent when the key is pressed, and a Note Off is sent when the key is released. This is good for simulating percussive keyboard parts, particularly when the release time on the synth is short.

### 5.5 EXPERIMENTING WITH DYNAMICS

Until you are completely familiar with both your SynthAxe and your synth, you will find that the dynamic interaction between the two can cause some unexpected results. For example, you may be working with Sustain ON, and expecting the synth to give you an infinite sustain. However, it is possible that the S (Sustain) level in the ADSR section of the synth is zero, and even if you were holding a key down on a keyboard, this synth setting would not give you any sustain at all.

Alternatively, you may be using the trigger keys with Sustain OFF, expecting a percussive keyboard response. But if there is a long release time programmed on the synth, the note will not stop immediately you release the key, but will carry on into the Release part of the dynamics, (until you damp the string).

Don't worry if it seems to take a great deal of experimenting with the SynthAxe and the synth before you are confident about the dynamic interactions between the two. The results will be very worthwhile.

SYNTHAXE OWNERS MANUAL

fig 2

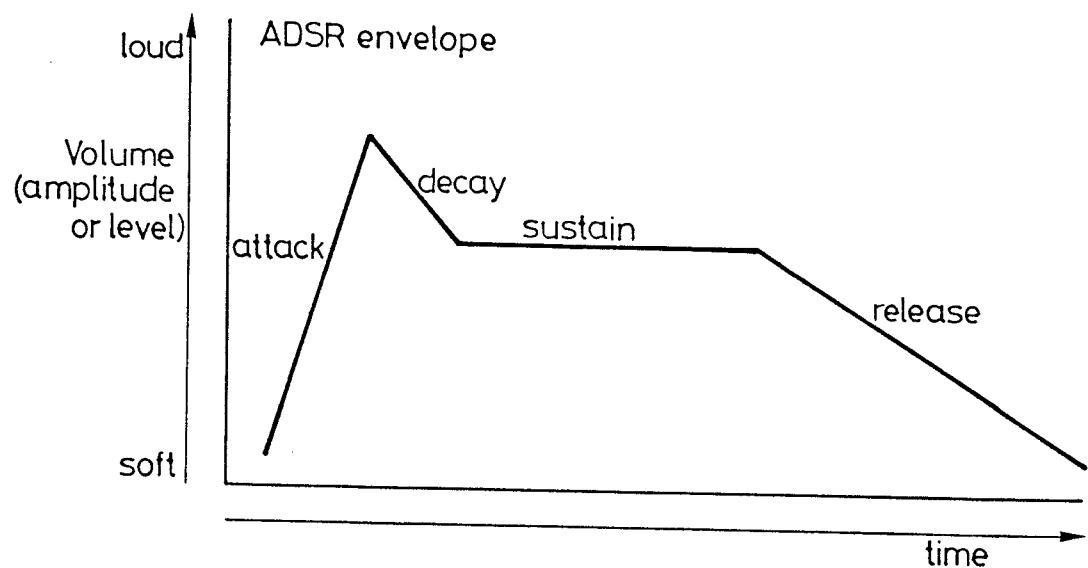
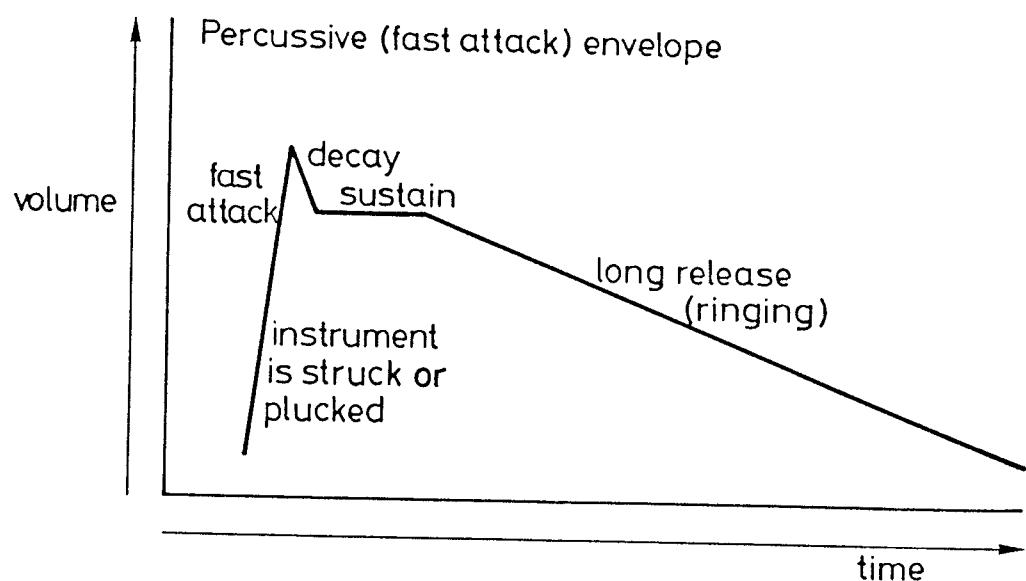


fig 3



SYNTHAXE OWNERS MANUAL

fig 4

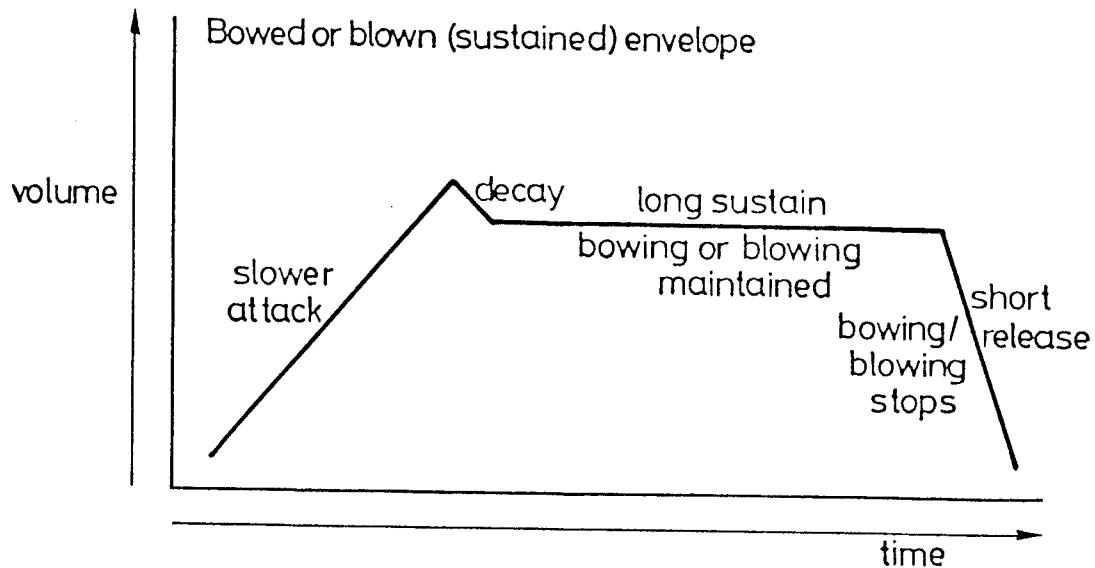
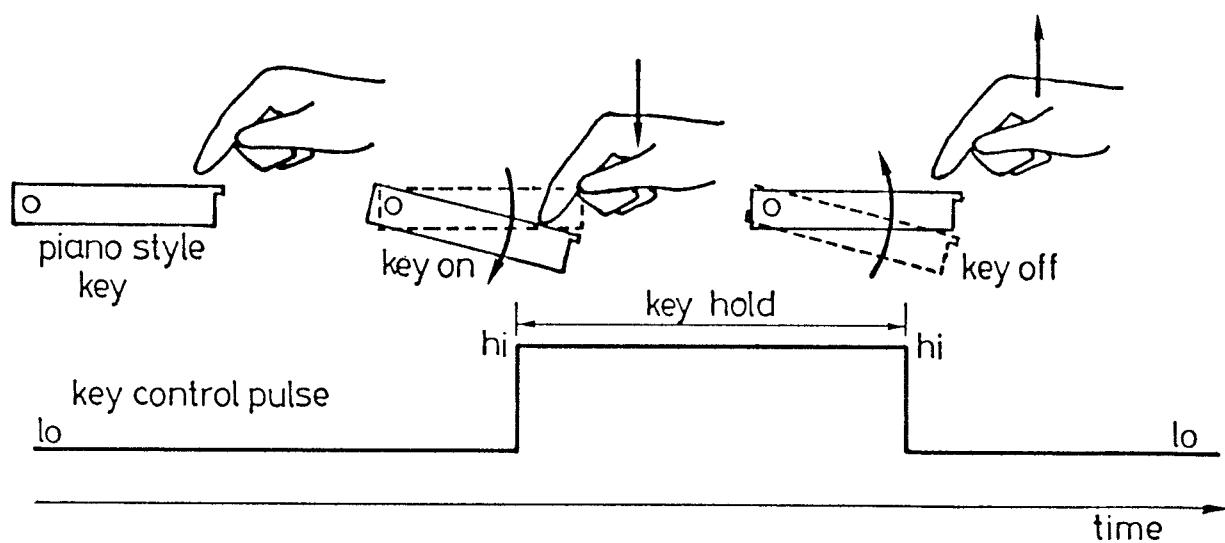


fig 5



SYNTHAXE OWNERS MANUAL

fig 6

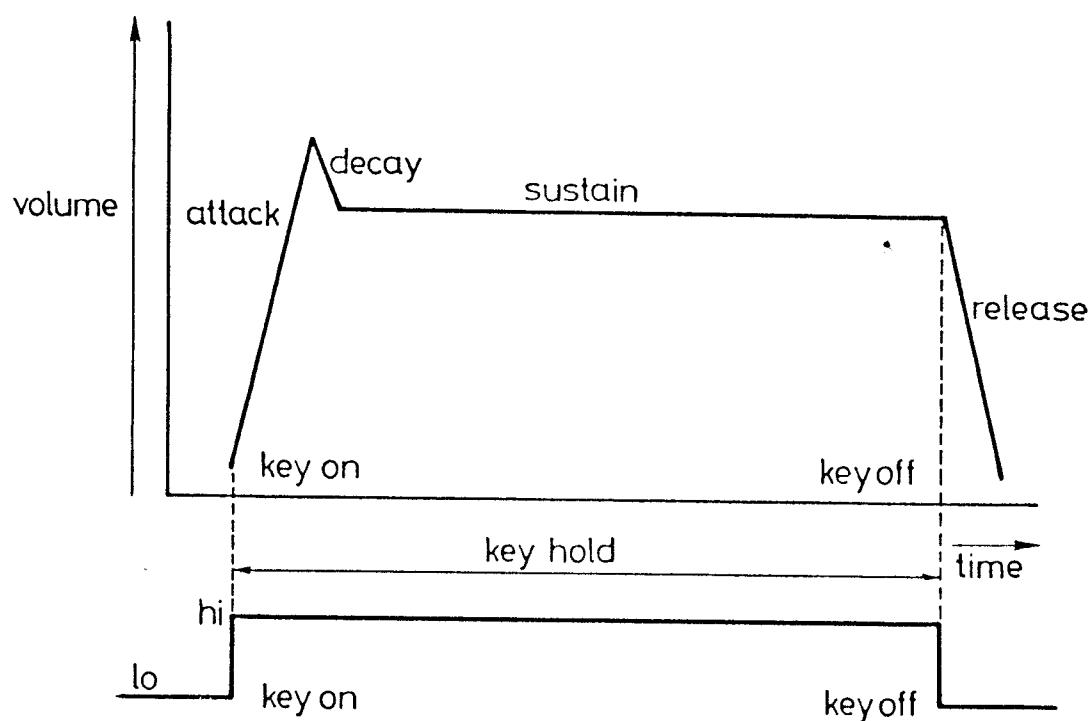
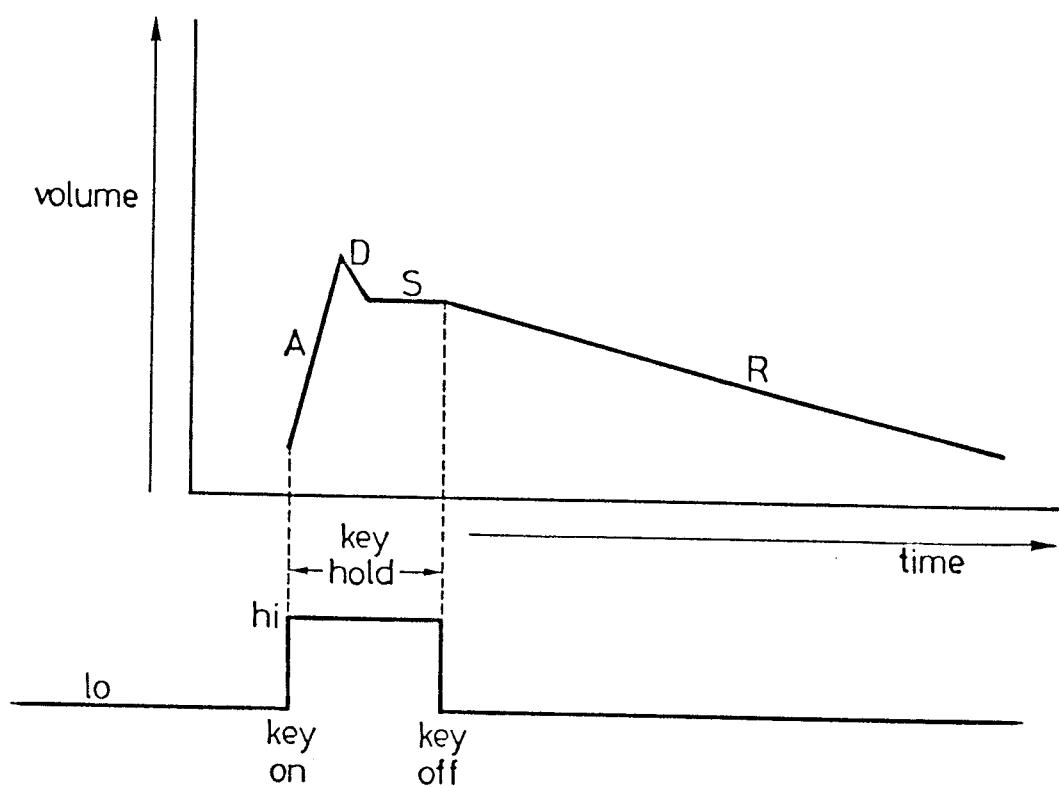


fig 7



SYNTHAXE OWNERS MANUAL

fig 8

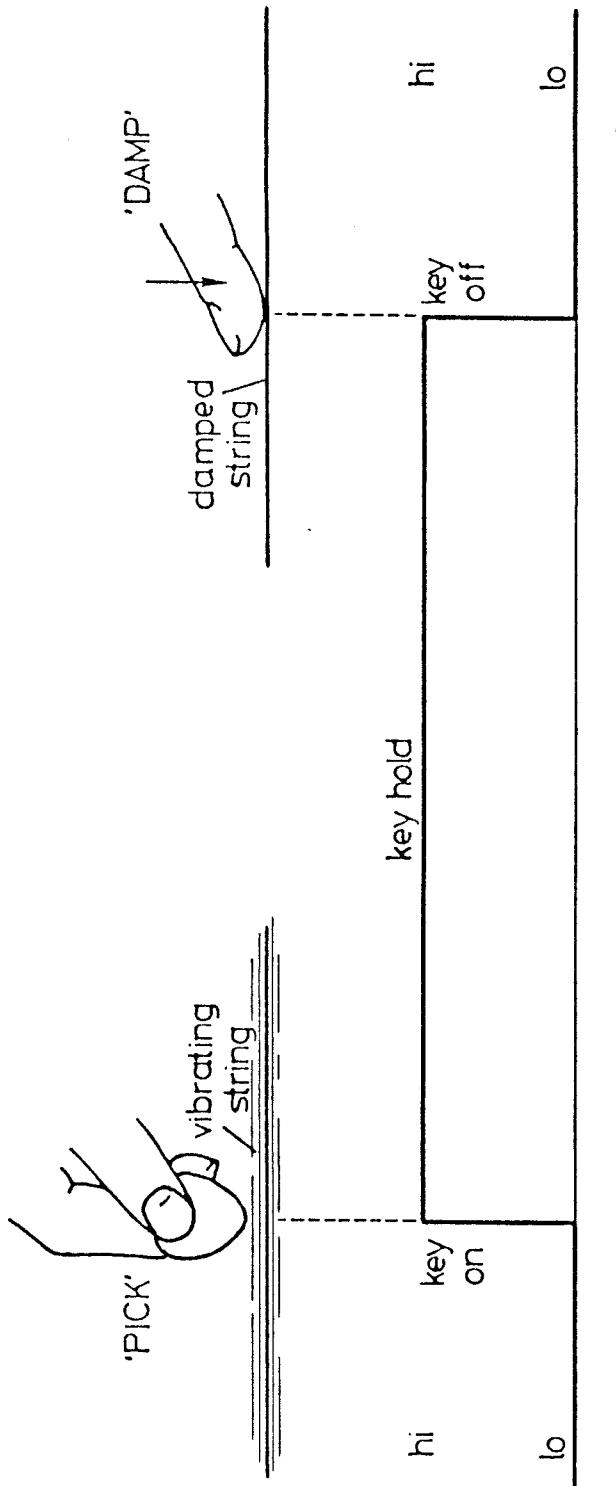
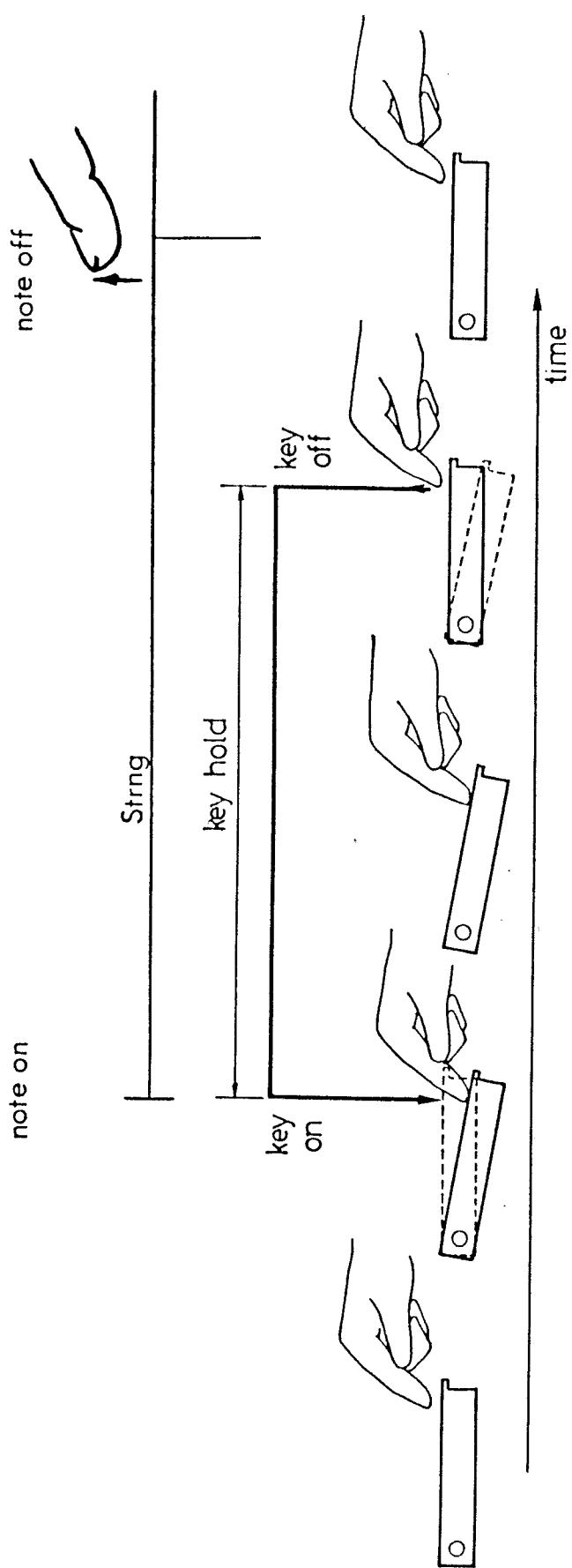


fig 9



SYNTHAXE OWNERS MANUAL

SECTION 6

MIDI

## SYNTHAXE OWNERS MANUAL

### 6.1 MIDI

MIDI stands for Musical Instrument Digital Interface. It is a code which sends signals for notes to start and stop, containing details of pitch, duration and the velocity.

MIDI is a fully digital interface which operates at 31.25 kbaud. It is composed of 10 bit words (1 start, 8 data, 1 stop). Each message consists of a two or three bytes of information, though sometimes more, and begins with a status byte, which is followed by a predetermined number of data bytes.

### 6.2 MIDI MESSAGE TYPES

Messages are of two types, System or Channel, distinguished by the first byte in the message.

#### 6.2.1 SYSTEM INFORMATION

System information is of three distinct types:- Common, Real Time or Exclusive.

SYSTEM COMMON commands are intended for all units in the system and relate to the position within a song or sequence.

REAL TIME messages may be sent at any time, and their main purpose is to synchronise the entire system to the clock in the master unit.

SYSTEM EXCLUSIVE messages address only specific units in the system. For example, if the code 240 (system exclusive) is followed by 67 (the code for Yamaha) then all the subsequent instructions (until the next System Common instructions) will be obeyed only by Yamaha products.

#### 6.2.2 CHANNEL INFORMATION

Any MIDI instrument should be capable of receiving information on any one of sixteen channels and will respond exclusively to information on that channel. Channel information can also specify states of operation; Mono, Poly.

## SYNTHAXE OWNERS MANUAL

### MONO OPERATION

In Mono, each of the strings on the SynthAxe is associated with a synth voice which is dedicated to that string. Of course, you have to have a synth which is capable of this kind of operation, like the Oberheim Xpander.

### POLY OPERATION

In Poly there is no dedication of one voice to each string. The behaviour of the synth is determined solely by Note On/Off events sent down one channel of MIDI. The SynthAxe behaves like a keyboard controller in this mode, so all changes in pitch will re-trigger the synth.

## 6.3 SYNTAXE INTERFACE MODES

A wide variety of synths are available, and in order to control them to the best advantage the SynthAxe is capable of five different kinds of MIDI control. The table below will help you to decide which is the best for the synth or synth's you are using. The different MIDI channel modes on the SynthAxe are as follows:-

### MONO 1

6 MIDI channels, one for each string with 6 pitch benders, one for each channel, each formed from the individual string bend with the Wang Bar contribution added.

### MONO 2

6 MIDI channels, one for each string with 6 pitch benders, one for each channel. Wang Bar is sent simultaneously on another controller over the 6 channels which means you can assign the String Bend or Wang Bar separately to control things other than pitch, if you like.

### MONO 3

6 MIDI channels, one for each string with 6 pitch benders, one for each channel and 6 damping controllers. Wang Bar is sent as one Global controller.

## SYNTHAXE OWNERS MANUAL

### POLY 1

1 Basic MIDI channel with 1 global controller for pitch bend which is made up from the largest String Bend added to the Wang Bar data.

(This is the all-purpose default setting).

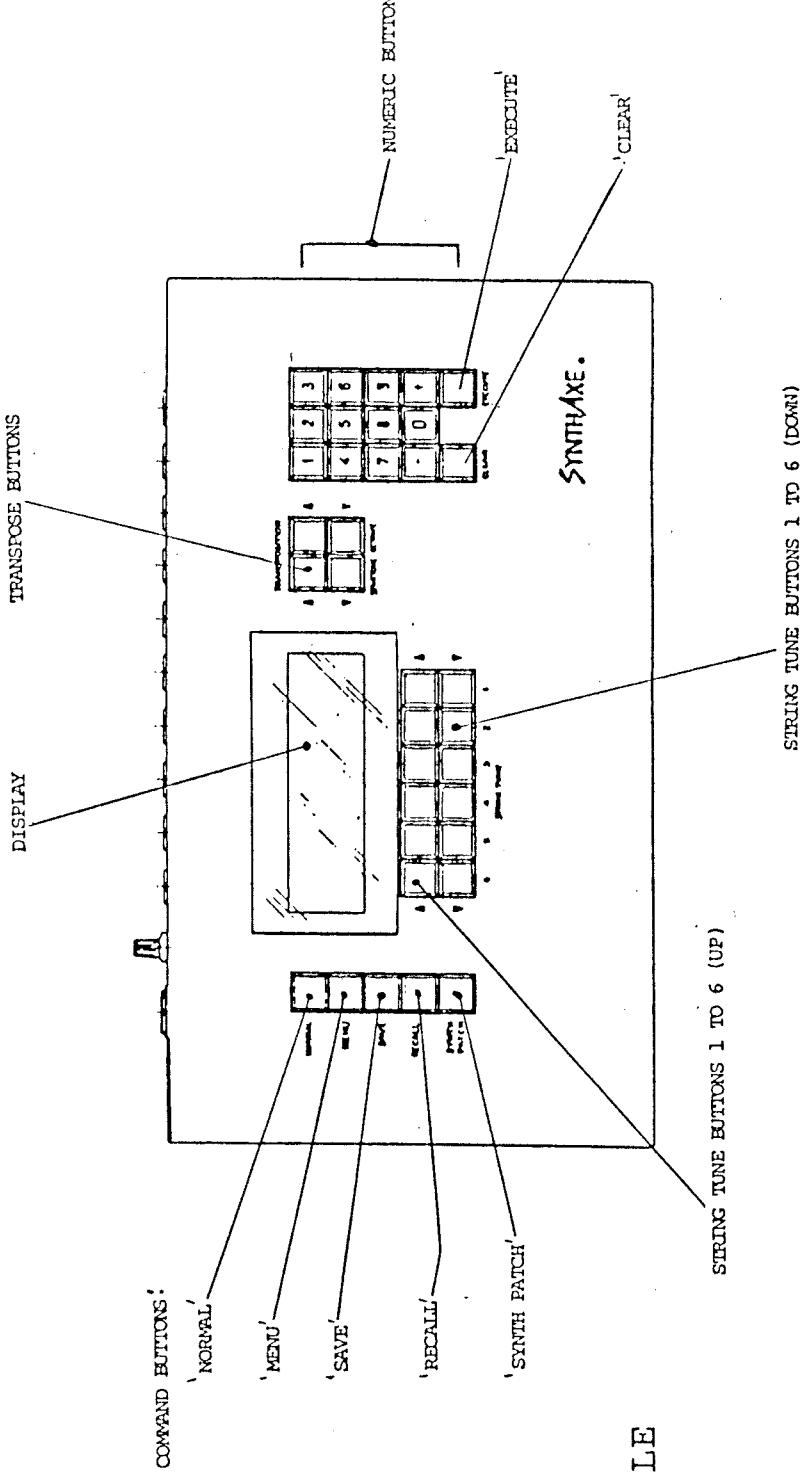
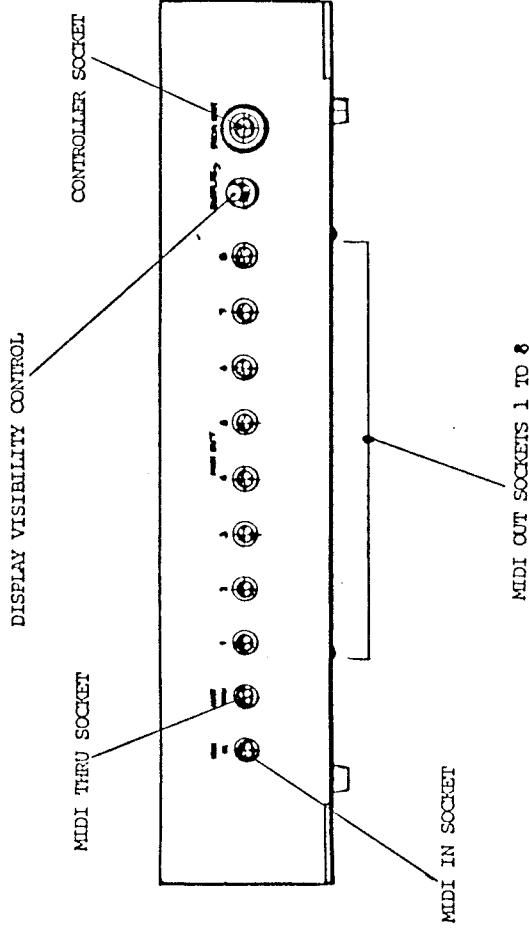
### POLY 2

1 Basic MIDI channel with 1 global controller for pitch driven by the largest String Bend data and one global controller driven by the Wang Bar data.

There is more information about this in Section 7.3.5, the Console PORTS Page, but for those owners wishing to understand MIDI better, you are advised to consult reference material on the subject.

SYNTHAXE OWNERS MANUAL

SECTION 7  
THE CONSOLE



## SYNTHAXE OWNERS MANUAL

### 7.1 CONSOLE INTRODUCTION

The following sections should help you in learning the various capabilities of the SynthAxe Console and how to put its many functions to use. The Console is the heart of the SynthAxe system, an extremely powerful unit which allows the player almost unheard of control over synthesised sound.

Up to eight different synths can be used at once, in any number of permutations. In view of the variation in the facilities and sophistication of synthesisers themselves, a number of different poly and mono interface modes are available to maximise compatibility. The SynthAxe player has, at his fingertips, control over such musical functions as string tuning and key transposition - plus the facility to edit the very basics of his playing technique. Being able to save up to 99 memories including tunings, transpositions, all of the pedal functions plus a host of playability parameters provides the SynthAxe player with an astonishing degree of musical power.

It is strongly recommended that you read through this part of the manual carefully - preferably with your SynthAxe powered up in front of you and connected to a MIDI synth (See Getting Started, Section 2). Certain of the Console buttons are multi-functional and will operate differently for given situations. DO NOT BE AFRAID TO HIT THEM!! There is very little damage you can do; it won't catch fire and it will speed up the learning process no end ..... EXPERIMENT!!

### 7.2 CONSOLE SUMMARY

The following is a Summary of the SynthAxe Console. Reading through should avail you of enough information to operate it. A far more detailed and specific documentation is contained later.

## SYNTHAXE OWNERS MANUAL

### 7.2.1 POWER-UP

The SynthAxe Console has a memory which is maintained by a battery situated on the printed circuit board. The life of this battery is approximately ten years. When you first apply power to the console, checks are performed on this battery-backed memory. If no errors are found, a Copyright message and a Software Revision Number will be displayed for a few seconds; then the FRONT Page will appear. If errors are found, see Section 7.4

The current string tuning will be displayed, together with an indication of any transpositions. Some interface information is also given, such as which output ports are selected, and which of the MIDI control interfaces is being used to control synthesisers. If you want to go further, pressing the Menu button will reveal the full range of options open to you.

### 7.2.2 CURRENT PLAYING SETUP

There are 99 memories in the Console, in which you can store the SynthAxe playing controls. The viewed settings on the Console display are part of another memory we call the Current Playing Set-up. Anything that you can see on the Console display at any time is part of the Current Playing Set-up. The stored memories are brought into action by recalling them into the Current Playing Setup:-

Press RECALL, the desired memory number (1-99), EXECUTE

This memory is now the Current Playing Set-up and can be edited or altered to your taste. If you then wish to save the edited set-up in a memory:-

Press SAVE, the desired memory number (1-99), EXECUTE

If you do not want to retain the original set-up (the unedited version) you can simply save the new set-up in the old memory. Of course, if the old one is still useful, leave it in the Console and store the edited version in a memory you haven't yet used.

## SYNTHAXE OWNERS MANUAL

### 7.2.3 BUTTONS

The MENU button always takes you to the menu page. There are two levels of menu and you can toggle between them using one of the TRANPOSE buttons, when a menu is being viewed. The First Level Menu is a simplified version of Second Level Menu, the use of which requires a rather more in-depth understanding of the Console.

The SYNTH PATCH button always takes you to the PATCH page where you can change patches remotely on your synth, via MIDI.

The EXECUTE button always takes you to the FRONT page, which shows the Current Playing Set-up, i.e. string tunings and transpositions. This button is also used to store and recall memories when you are on the FRONT page.

The OCTAVE TRANSPOSE buttons generally take you to a lower level page if one exists. An example of this is on the SETS page - hitting OCTAVE TRANSPOSE takes you to the PLAYLIST page and will toggle back and forth from this to the SETS page every time it is hit. Of course, when viewing the FRONT page (your current setup) the TRANSPOSE OCTAVE buttons will transpose all strings up or down by an octave when the relevant button is hit.

The SEMITONE TRANSPOSE buttons generally increase/decrease the page count if there is more than one page in a particular section. An example of this is the SWITCHES section, which has 10 pages. When viewing the front page, hitting the relevant SEMITONE TRANSPOSE button will transpose all notes by a semitone, up or down.

The NORMAL button usually sets a parameter on the viewed page to a factory default value. A complete list of the factory default values is shown in appendix B. (Section 8.2).

IN GENERAL, THE BUTTON TO OPERATE A PARTICULAR FUNCTION WILL BE DIRECTLY BELOW THE OBJECT ON THE DISPLAY. FOR INSTANCE, THE BUTTONS USED TO MOVE A CURSOR ON THE SCREEN ARE DIRECTLY BELOW THE CURSOR SCREEN POSITION.

## SYNTHAXE OWNERS MANUAL

### 7.2.4 PAGES

The MENU pages allow you to use the twelve STRING TUNE buttons to choose which page you would like to visit next. The First Level Menu gives you the following options:-

Ports	Patch	Swits	Panic	Dump	Load
-----:	-----:	-----:	-----:	-----:	-----
				Sets	Songs

- PORTS:** This page allows the MIDI output port to be changed and different synth types to be selected.
- PATCH:** This page allows you to change synth patch remotely.
- SWITS:** The performance switches page, on which you can modify a LIMITED number of switched functions of the instrument.
- PANIC:** This page allows you to restore the Current Playing Set-up of the instrument to its factory defaults. The PANIC page does not alter any of your stored performance memories, sets, songs or laws. A complete list of these factory defaults is included in appendix B.
- DUMP:** This page allows you to dump all the stored Console data via MIDI to a MIDI sequencer, computer or another SynthAxe Console.
- LOAD:** This page allows you to load your Console memories from a MIDI sequencer, computer or another SynthAxe Console.
- SETS:** On this page you can name a Set, i.e., a collection of Songs in order. Selecting a Set on this page specifies the active Playlist.
- SONGS:** This page allows you to name Songs. A Song is a collection of Playing Set-ups which can be recalled in order.

## SYNTHAXE OWNERS MANUAL

Hitting a TRANSPOSE button will take you to the Second Level Menu.

Ports	Patch	Swits	Dials	Midix	Tune
Capo	Comms	Ctrls	Laws	Sets	Songs

The Second Level Menu has the additional options:-

- SWITS:** This page allows you to modify ALL the available performance switches of the instrument.
- DIALS:** This takes you to performance dials page where you can modify parameters which make the instrument's response more to your taste.
- MIDIX:** This page allows you to filter and display a MIDI data stream.
- TUNE:** This takes you to the default tuning page where you can enter the string tuning you regard as normal.
- CAPO:** Takes you to the page where you select a neck capo.
- COMMS:** This page allows you to set the MIDI channels for communication with the synths.
- CTRLS:** This page allows you to set the MIDI controller numbers of the String Bend, Wang Bar, Damping and Pressure transducers.
- LAWS:** This page allows you to modify the response of the various controls on the SynthAxe. In particular, String Bend, Wang Bar, String Velocity, Key Velocity and Pressure.

## SYNTHAXE OWNERS MANUAL

### 7.3 THE CONSOLE PAGES

This section explains which page to go to to perform a particular operation. Pages marked with ++ are sub-pages and are accessed using the given page and then hitting the TRANSPOSE OCTAVE button. The front page is accessed by hitting the EXECUTE button.

FUNCTION	PAGE	LEVEL
Change string tune	FRONT	1 and 2
Transpose pitch	FRONT	1 and 2
Save/Recall a memory	FRONT	1 and 2
No sound/completely lost	PANIC	1
Change synth type, poly/mono	PORTS	1 and 2
Swap synths or drive more than one	PORTS	1 and 2
Change patch on synth	PATCH	1 and 2
Set your personal default tuning	TUNE	2
Put a capo on the neck	CAPO	2
Set MIDI base channel (Poly synths)	COMMS	2
Set a MIDI channel per string (mono)	COMMS	2
Set the patch change MIDI channels	COMMS	2

SWITCH ANY OF THE FOLLOWING:-

Automatic Hammer	SWITS, 1	1 and 2
Pull Off Inhibit	SWITS, 2	1 and 2
Sustain	SWITS, 3	1 and 2
String Switches	SWITS, 4	2
Left Hand Trigger Enables	SWITS, 5	2
Hammer Enables	SWITS, 6	2
Multi-Trigger Enables	SWITS, 7	2
Wang Arm Enables	SWITS, 8	2
Hold Pedal Enables	SWITS, 9	2
Left-Hand Damping Enables	SWITS, 10	2

## SYNTHAXE OWNERS MANUAL

FUNCTION	PAGE	LEVEL
<hr/>		
CHANGES ANY OF THE FOLLOWING:-		
Trigger Sensitivity	DIALS, 1	2
Trigger Threshold	DIALS, 2	2
Wang Arm Gain	DIALS, 3	2
Wang Arm Dead Band	DIALS, 4	2
String Bend Gain	DIALS, 5	2
String Bend Dead Band	DIALS, 6	2
Trigger Pulse Duration	DIALS, 7	2
Automatic Hammer Response	DIALS, 8	2
Left Hand Trigger Response	DIALS, 10	2
Fast Retrigger Inhibit	DIALS, 11	2
Left/Rt-Hand Co-ordination	DIALS, 12	2
Left Hand Damping Response	DIALS, 13	2
Valid Fret Response	DIALS, 14	2
SET ANY OF THE FOLLOWING:-		
MIDI controller numbers	CTRLS	2
Centre/Endstop mode of Wang Bar	CTRLS	2
String Bend and Damping Controllers	CTRLS	2
ASSIGN LAW TABLES FOR ANY OF THE FOLLOWING:-		
String Bend	LAWS	2
Wang Bar	LAWS	2
String Velocity	LAWS	2
Key Velocity	LAWS	2
Key Pressure	LAWS	2
Edit Law Tables	LAWS++	2
View Midi Input Data	MIDI++	2
Filter MIDI Input Data to display	MIDI	2
Name a Set (Collection of songs)	SETS	1 and 2
Make Playlist (Playing order of songs)	SETS++	1 and 2
Name a Song	SONGS	1 and 2
Make Song Steplist	SONGS++	1 and 2

## SYNTHAXE OWNERS MANUAL

### 7.3.1 PANIC PAGE

This page is entered from the Level 1 Menu page. Pressing the NORMAL button while on this page restores the Current Playing Setup to the Factory Default settings. A full list of these settings is included in Appendix B.

NB: It only affects the Current Playing Setup, it does not change any of the saved memories.

If you decide not to restore the factory default values, you may safely exit from this page by using the MENU, SYNTH PATCH or EXECUTE buttons.

ALL OTHER BUTTONS ARE INACTIVE

### 7.3.2 FRONT PAGE

This is the page the Console enters after the automatic Power-On checks. The Current String Tune, Transposition and active MIDI output ports are displayed. The current MIDI Communications Mode is shown on the right hand side of the screen. Playing Set-ups can also be saved or recalled from this page. If you wish to examine other pages, press the MENU button.

#### TUNING

A tuning can be entered for each of the six strings, using the STRING TUNE UP/DOWN buttons. The instrument tuning will be updated immediately.

The String Tune display shows the chromatic note of the string. The number alongside the note is the relative octave. This value is the octave range difference between the string tuning and the Default String Tuning for that string.

The Default String Tuning is the player's normal tuning and is entered on the DEFAULT TUNING Page (Section 7.3.4) and accessed through the Level 2 Menu.

Pressing the NORMAL button returns all the string tunings to their respective defaults and removes any transposition.

## SYNTHAXE OWNERS ANUAL

### PITCH RANGE

The whole of the instrument pitch range can be raised or lowered using the SEMITOME and OCTAVE TRANSPOSE buttons. The transposition is displayed in octaves and semitones. A negative sign next to the octave value indicates a downward transposition in pitch.

Activation of the TRANSPOSE buttons immediately affects the instrument's pitch.

When no transposition is selected the message 'No Transpose' will be displayed.

Pressing the NORMAL button removes any transposition.

A 'Capo' message will appear in the centre of the screen when the Capo is active.

### ACTIVE PORT

The Active Port is displayed at the top of the display. The Active Port is the one that is used to transmit MIDI information from the instrument to the synth. Switching between synths can be achieved by changing the Active Port on the PORTS page (Section 7.3.5) and is available on both Level 1 and Level 2 Menus.

### MIDI COMMS MODE

The COMMS (Communications) mode is displayed on the top right of the display; this is also set on the PORTS page and is selected to suit the type of synth you are using.

### SWITCHES AND DIALS

A 'Switches Active' message is displayed when the Playing Set-up has the Performance Switches set in a different way from the factory defaults. The message is not affected by tunings or transpositions; it is used to warn the player that he has his instrument set up in a Non-Default condition. See the SWITCHES section (7.3.6) for more information on this topic.

## SYNTHAXE OWNERS MANUAL

Similarly a 'Dials Active' message is displayed when the Playing Set-Up has the Performance Dials set in a different way from the factory treatment defaults.

### CURRENT PLAYING SET UP

Modification of the tunings and transpositions etc., on this page affect the Current Playing Set-up. If a new Set-up is recalled then the displayed tunings etc., will change accordingly, and the message 'From Memory (1-99)' will indicate which Playing Set-up has been selected.

The Current Playing Set-up can be saved in a memory. There are 99 memories (1-99) available to store Set-ups. When you save a Set-up, you save Tunings, Transpositions, Capos, Active Port, Synth Patch, Switches, Dials and Pedal Positions. All these parameters are brought into the Current Playing Set-up when a memory is recalled.

When you press the RECALL button the message 'Recall Memory' will be seen on the display. You then enter a memory number between 1 and 99 and press the EXECUTE button. The Set-up will then be loaded from the specified memory into the Current Playing Set-up. A message saying 'From Memory' will show where the information came from. You must, however, be careful when viewing this message. Although the original information came from a specified memory into the Current Playing Set-up, the Set-up may not always be a true copy of the specified memory - for instance, you may have modified tuning, transposition etc.

The Current Playing Set-up can be stored in a memory using the SAVE button. The display will show the message 'Save in memory'. The user can then enter a memory number using the NUMERIC buttons and on pressing the EXECUTE button the Set-up will be stored in the selected memory.

## SYNTHAXE OWNERS MANUAL

\*\*\*\*\* WARNING MESSAGE \*\*\*\*\*

Sometimes the message 'WARNING: Set-up normalized' will be displayed, this is to warn the user that an error was at some time found in the information in the recalled memory. In this event the stored Set-up is returned to the factory defaults. The string tune stored in the memory is returned to your normal Default Tuning provided that it is error free. If your Default Tuning had an error, the memory tuning will be returned to standard guitar tuning (EADGBE). The Warning message can be removed by storing new information in the affected memory location.

\*\*\*\*\*

The following buttons are active on this page:-

MENU        Takes you to the MENU page.

SYNTH PATCH    Takes you to the PATCH page.

NORMAL        Returns the strings to their default values and removes any transpositions

STRING TUNE    The STRING TUNE buttons raise or lower the tuning of the instrument strings. The octave ranges shown on the string tune display are relative to the factory standard tunings.

TRANSPOSE      The TRANSPOSE SEMITONE buttons transpose the instrument's pitch up or down by a semitone.

                The TRANSPOSE OCTAVE buttons transpose the instrument's pitch up or down by an octave.

## SYNTHAXE OWNERS MANUAL

SAVE	The SAVE button allows you to save the Current Playing Set-up into a memory. The display will reply with the message 'Save in memory'. The user must enter a number between 1 and 99 and then press the EXECUTE button.
	If you enter an incorrect number, or a number greater than 99, the CLEAR button can be used to clear the value. If you press EXECUTE with a clear value no storage is done. After saving a Set-up the display will reply with 'Saved in memory (1-99)'.
	The EXECUTE button must be pressed after initiating a Save operation.
RECALL	The RECALL button allows you to recall a memory Set-up into the Current Playing Set-up. The display will reply with 'Recall Memory'. You then enter a numeric value between 1 and 99 and press the EXECUTE button. The specified memory will be recalled to the Current Playing Set-up.
	If you enter an incorrect number or a number greater than 99, the CLEAR button can be used to clear the value. If you press EXECUTE with a clear value no recall is done. After a memory has been recalled the message 'From (1-99)' will be displayed. The EXECUTE button must be pressed after initiating a recall operation.
CLEAR	The CLEAR button takes you to the PANIC Page. It may also be used to clear the memory number entered during Save and Recall operations. If CLEAR is used when a Save or Recall has NOT been initiated, it will take you to the PANIC page.
EXECUTE	The EXECUTE button executes a Save or Recall operation after a numeric value has been entered.

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The EXECUTE button must be pressed after initiating a Save or Recall operation.

NUMERIC      The NUMERIC buttons specify a memory number in Save or Recall operations. If an incorrect value or a number greater than 99 is entered the CLEAR button can be used to erase the number.

ALL OTHER BUTTONS ARE INACTIVE

### 7.3.3 MENU PAGE

The MENU page is entered whenever the MENU button is pressed. There are two levels to the menu, the first level is a simplified selection of control options and the second level allows access to all of the SynthAxe performance controls. It is possible to switch between levels using any of the TRANSPOSE buttons. Most of the functions on the first level menu are available on the second level but some swapping between levels is unavoidable if all the options of the Console are being used.

The MENU pages allows you to use the STRING TUNE buttons to choose which page you would like to visit next.

#### LEVEL ONE MENU

The First Level Menu gives you the following options:-

Ports	Patch	Swits	Panic	Dump	Load	
					Sets	Songs

PORTS:      This page allows the output port to be changed and different synth types to be selected.

## SYNTHAXE OWNERS MANUAL

- PATCH: This page allows you to change the sound patches on the current active output ports.
- SWITS: To the performance SWITCHES pages, on this page you can modify a limited number of switched functions of the instrument.
- PANIC: This page allows you to restore the Current Playing Set-up of the instrument to its factory defaults. A full list of these settings is included in Appendix B. The PANIC page does not alter any of your stored performance memories, sets songs or laws.
- DUMP: This page allows you to dump all the stored Console data over MIDI to a MIDI sequencer, computer or other Console.
- LOAD: This page allows you to load your Console memories from a MIDI sequencer, computer or another Synthaxe Console.
- SETS: On this page you can name a set i.e., a collection of songs in order. Selecting a set on this page specifies the active playlist.
- SONGS: This page allows you to name songs. A song is a collection of playing Set-ups which can be recalled in order.

### LEVEL TWO MENU

Hitting a TRANSPOSE button gets the second level menu:-

Ports	Patch	Swits	Dials	Midix	Tune
Capo	Comms	Ctrls	Laws	Sets	Songs

## SYNTHAXE OWNERS MANUAL

The Second Level Menu has the following options:-

- POROS:** This page allows the output port to be changed and different synth types to be selected.
- PATCH:** This page allows you to change the sound patches on the current active output ports.
- SWITS:** This page allows you to modify all the available performance SWITCHES of the instrument.
- DIALS:** This takes you to the performance dials page where you can modify parameters which make the instrument's response more to your taste.
- MIDIX:** This page allows you to examine a MIDI data stream.
- TUNE:** This takes you to the default tuning page where you can enter the string tuning you regard as normal.
- CAPO:** This page allows you to examine or modify a neck capo.
- COMMS:** This page allows you to set the MIDI channels for communication with the synths.
- CTRLS:** This page allows you to set the MIDI controller numbers of the String Bend, Wang Bar, Damping and Pressure transducers.
- LAWS:** This page allows you to modify the transducer response laws of the instrument.
- SETS:** On this page you can name a set i.e., a collection of songs in order. Selecting a set on this page specifies the active playlist.

## SYNTHAXE OWNERS MANUAL

**SONGS:** This page allows you to name songs. A song is a collection of playing Set-ups which can be recalled in order.

The following buttons are also active on this page:-

**TRANSPOSE** The TRANSPOSE buttons change the menu level. If you are currently on the First Level Menu you will be taken to the Second Level and visa versa.

**SYNTH PATCH** Takes you to the PATCH page.

**ALL OTHER BUTTONS TAKE YOU TO THE FRONT PAGE**

### 7.3.4 DEFAULT TUNING PAGE

On this page you can select the tuning you regard as being normal. It doesn't have to be the guitar EADGBE standard tuning; it can be any combination of chromatic notes.

**NB:** The Default Tuning is the tuning that will be established on the instrument when the NORMAL button is pressed, when on the Front page.

The present default string tune is shown on the display and can be modified up or down with the STRING TUNE buttons. It is important to understand that the current tuning of the instrument is not affected by these buttons.

**NB:** The octave numbers shown alongside the string notes are octave ranges relative to standard guitar EADGBE tuning.

The following buttons are active on this page:-

**NORMAL** Returns the string tunings to standard guitar EADGBE tune.

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SYNTH PATCH Takes you to the PATCH page.

MENU         Takes you to the MENU PAGE

EXECUTE      Returns you to the FRONT page

STRING TUNE The STRING TUNE buttons allow the default tunings for each string to be modified. The UP buttons raise the pitch and the DOWN buttons lower the pitch by a semitone each time a button is pressed.

ALL OTHER BUTTONS ARE INACTIVE.

### 7.3.5 PORTS PAGE

This page shows which MIDI output port is active and what type of communication package is running in the instrument. An 'On' message adjacent to the output port numbers (1-8) indicates which ports are active.

A port is activated by moving the cursor to a port number and using the STRING 4 TUNE buttons to toggle the port on or off. An inactive port is indicated by the '---' symbol. The port changeover is activated immediately.

Individual ports may be switched on using the NUMERIC buttons e.g., button 7 switches on port 7 and turns off all others.

Activating a port results in MIDI instrument data being sent to a number of different synthesisers (assuming that several of them are connected to the MIDI output ports on the rear panel of the Console).

The synth type is shown on the right hand side of the display. This is more correctly the MIDI communication package the instrument will use to talk to the synthesisers. If several ports are active, then the instrument will communicate with all the connected synths with the same package. You may get unexpected results if you try to operate a mono synth in poly mode or visa versa.

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The following communication types are available:-

### MONO 1

This mode provides the simplest method of driving a Mono synth in order to achieve individual string bending. This mode sends the note information for each string on a separate MIDI channel. The MIDI channel for each string is selected on the comms page. The Wang Bar and String Bend information are combined and sent to the individual channel pitch benders (MIDI status hexadecimal EO), thereby allowing individual String Bend on each string. In this mode both the String Bend and Wang Bar control pitch bend, they cannot be assigned to control any other function.

Each button is capable of sending pressure information to its corresponding synth voice.

Mono 1 can be used to control six simple monophonic or polyphonic synths using one synth per string provided that each synth is assigned to a different MIDI channel.

### MONO 2

This is the same as Mono 1 except that the Wang Bar and string bend are sent to individual channel controllers. The controller numbers used for Wang Bar and String Bend are assigned on the controller (CTRLS) page. This arrangement allows you to control any assignable function in the synth with the wang bar or string bend.

One example of this is to control the filter cut-off frequency of a voice using the Wang Bar whilst using string bend to control the low frequency oscillator. The number of control possibilities available to the

## SYNTHAXE OWNERS MANUAL

player are then only limited by the capabilities of the synth. Additional MIDI data is transmitted in this mode compared to Mono 1, since one String Bend message and one Wang Bar message have to be sent for each string.

In this mode the Wang Bar MIDI controller data is updated by the SynthAxe every half second or so.

### MONO 3

This package is the same as Mono 2 except that the Wang Bar information, instead of being transmitted for each string channel (6 times), is only transmitted once. This reduces the amount of data being sent to the synth and can in some instances improve response. The Wang Bar information is now transmitted on MIDI base channel. Base channel is set on the COMMS page. Mono 3 is only usable on the more sophisticated synths, such as the Oberheim Xpander and Fairlight CMI.

In this mode the Wang Bar MIDI controller data is updated by the SynthAxe every half second or so.

### POLY 1

In Poly mode all note information is sent on the MIDI base channel. In Poly mode only one bender is available and this affects all notes played. The String Bend value sent to the synth is from the string which is deflected the most. MIDI pressure information is also transmitted from the keys but only the highest key pressure has an effect.

Damping effects are not possible in Poly mode. This mode can be used with virtually all forms of synth with greater or lesser success and is the Default mode for the SynthAxe.

## SYNTHAXE OWNERS MANUAL

### POLY 2

Poly 2 mode is similar to Poly 1, except the String Bend and Wang Bar controllers can be assigned to separate MIDI controllers. This allows much more flexibility of control provided that the synth being used is capable of receiving separate controller information.

In this mode the Wang Bar MIDI controller data is updated by the SynthAxe every half second or so.

The synth type can be changed by pressing the STRING 1 or 2 TUNE buttons. You will see the mode types roll round through a list.

When you modify this page you are changing the active output ports stored in the Current Playing Set-up. If you recall a new memory or activate the Step-on system, a new port assignment will be loaded from a memory into the playing Set-up. Pressing the Step-on pedals when you are on the synth page may result in the synth page display being updated with a new active port.

The following buttons are active on this page:-

MENU           Takes you to the MENU page.

SYNTH PATCH   Takes you to the PATCH page.

NORMAL         Turns on Port 1 and disables all the others.

EXECUTE       Takes you back to the FRONT page.

STRING TUNE   The STRING 1 and 2 TUNE buttons toggle the synth type.

                The STRING 4 TUNE buttons toggle the port pointed to by cursor.

## SYNTHAXE OWNERS MANUAL

The STRING 5 and 6 TUNE buttons move the cursor up or down.

- BUTTON 1 Turns on Port 1 and disables all others.
- BUTTON 2 Turns on Port 2 and disables all others.
- BUTTON 3 Turns on Port 3 and disables all others.
- BUTTON 4 Turns on Port 4 and disables all others.
- BUTTON 5 Turns on Port 5 and disables all others.
- BUTTON 6 Turns on Port 6 and disables all others.
- BUTTON 7 Turns on Port 7 and disables all others.
- BUTTON 8 Turns on Port 8 and disables all others.

ALL OTHER BUTTONS ARE INACTIVE

### 7.3.6 SWITCHES PAGE

The Performance SWITCHES pages allow you to enable or disable some of the operating modes of the instrument. When you modify a Switch value you are changing the Current Playing Set-up; when you recall a new Set-up the values will be changed accordingly. If you enter the Switches page from the First Level Menu, only a limited number of switch options will be available. Entering the SWITCHES page from the Second Level Menu will give you access to all the performance switches.

On entering the SWITCHES section, you will be returned to the page you last viewed.

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Some of the switches can be toggled on or off for each string on the instrument. The STRING TUNE buttons are used to switch the effect on or off for their respective string. The upper row of STRING TUNE buttons allow you to toggle individual switches, whereas the lower row of buttons cause all six switches to toggle.

### LEVEL 1 SWITCHES MENU

In Level 1, three pages are accessed; Automatic Hammer On, Inhibit Pull Off to Barre and Sustain. For further access to Performance Switches, select the Level 2 Menu.

#### AUTOMATIC HAMMER ON

If enabled, this function allows you to 'hammer on' to a string lower than the one you are playing without having to pick again. The function is activated by the picking of a string; once this has happened, any lower string can be played as if it were in Left Hand Trigger mode.

#### PULL OFF INHIBIT

This function is useful when changing chords while a barre is held down. Let's suppose you wanted to change from an A Major barre chord, on Fret 5, to a D minor barre chord, - also on Fret 5. With the barre still in place, when you lift your three fingers the SynthAxe will normally regard that as a 'three finger pull-off' to the barre. Obviously you do not always want this to happen, and that is where Pull Off Inhibit comes in. If the function is active, no rogue notes will sound as you lift your fingers to change chord. The number of strings which have to be played before the software inhibits any pull off can be defined using the STRING TUNE buttons.

## SYNTHAXE OWNERS MANUAL

### SUSTAIN

If enabled, this function will sustain any triggered note until you damp it. The synth patch must, of course, have a suitable envelope sustain value to allow this to work. If the switch is off, a plucked envelope will be produced.

### LEVEL 2 SWITCHES MENU

In Level 2, the additional switches are available:-

#### STRING SWITCHES

Allows you to turn individual strings off. This is helpful for bass players who are not familiar with a six stringed instrument. It also allows strumming or use of the Master Trigger Key on complex chords, without unwanted strings sounding.

#### LEFT HAND TRIGGER ENABLE/DISABLE

If on, notes may be triggered with the left hand without the need to pick the trigger strings or operate the keys. These switches only enable or disable the effect on individual strings. The Left Hand Trigger Switch on the SynthAxe body must be on to bring in the operation of the Left Hand Trigger mode. Disabled strings will not allow left hand only triggering.

#### HAMMER ENABLES

If on, a hammer stroke may be used to generate a new note without the need for another trigger. This function enables both hammers and pull-offs. If you always pick each note and never use hammers, then you may prefer to turn the hammer enables off . This will prevent double triggers occurring - one from the left hand and another from the right. The penalty is that you can no longer slide up or down the neck.

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### MULTI-TRIGGER ENABLE

In Mono modes, Legato or smooth pitch updates are usually made by moving the left hand without re-triggering the envelope of the note. If multi-triggers are enabled, then a new note envelope will be re-triggered whenever a pitch update occurs (in a similar way to the Poly modes). Note that some synths do not support legato note pitch updates.

### WANG BAR ENABLE

If on, the Wang Bar will effect the pitch of the string. This feature only works in modes in which there is a Wang Bar controller value transmitted to each voice of the synth, i.e., only works in Mono 1 and Mono 2 modes.

### HOLD PEDAL ENABLE

When this switch is on, any note triggered will be held on whilst the Hold pedal is pressed. The Hold function prevents the generation of a MIDI Note Off command. When the pedal is released, the MIDI Note Off command is sent.

### LEFT HAND DAMPING ENABLE

If on, the left hand may be used to damp a note when the Damping pedal is pressed. If the Damping pedal is released or the switch is off, the note will continue its envelope until damped by the right hand, or until a new note is triggered on that string.

The following buttons are active:-

MENU           Takes you to the current MENU Page.

SYNTH PATCH   Takes you to the PATCH page.

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EXECUTE	Takes you to the FRONT page.
NORMAL	Resets the parameter to its factory default value. Only that parameter is affected.
TRANSPOSE	The TRANSPOSE SEMITONE UP button takes you to the previous page.  The TRANSPOSE SEMITONE DOWN button takes you to the next page.
STRING TUNE	The upper row of STRING TUNE buttons toggle the switches for each individual string. The lower row of STRING TUNE buttons toggle all six switches simultaneously.

ALL OTHER BUTTONS ARE INACTIVE

### 7.3.7 DIALS PAGE

The Performance DIALS page allows you to change the performance dials of the instrument to suit your style of playing. The dial settings are stored in memory and can be recalled at will.

On entering the DIALS section you will be returned to the DIALS page you last viewed.

For access to Performance Dials, select the Level 2 Menu. The following Dials are available:-

#### TRIGGER SENSITIVITY

This affects the dynamic range of the Note On velocity generated by a string trigger. Low values produce Note On velocities which are similar regardless of how hard you pluck. Large values produce a wide range of Note On velocities which will be proportional to pick force. The parameter can be set for each string to allow for matching.

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### TRIGGER THRESHOLD

This determines how hard you have to pluck the string before a trigger is generated. This can be used to prevent double triggers from both the flesh and the nail when finger picking. Setting the threshold to about 20 will prevent the softer flesh trigger. The lower the threshold, the lighter the pluck required to trigger a note.

### WANG BAR GAIN

This controls the amount of Wang Bar deflection required to generate a maximum MIDI output value from the Wang Bar transducer. The higher the value, the less the movement required to produce maximum effect.

### WANG BAR DEAD BAND

This is the amount of physical movement of the Wang Bar which is allowed before any pitch change occurs.

### STRING BEND GAIN

This controls the amount of string movement required to generate a maximum MIDI control value from the String bend transducers. The higher the value, the less movement is required to produce maximum effect.

### STRING BEND DEAD BAND

This is the amount of physical movement of the string which is allowed before any pitch change occurs.

### TRIGGER PULSE DURATION

This specifies the minimum time between the generation of a MIDI Note On code and the sending of a Note Off code. It has the effect of changing the sound of some damped or percussive notes.

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NB: Some synths miss notes if this duration is too small.

### AUTOMATIC HAMMER

This Dial only works when the Automatic Hammer feature is switched on (SWITCHES page 1, see Section 7.3.xx). This Dial controls the period of time after the end of the original note, that the lower strings remain available for left hand automatic hammers.

### LEFT HAND TRIGGER RESPONSE

This Dial allows the player to choose how the instrument will respond to inaccurate fretting. The higher the dial value, the more tolerant the system will be to fretting errors. Very large values produce very slow pitch updates.

### FAST RE-TRIGGER INHIBIT

If you use the Left Hand Trigger mode and pick with your right hand, it is possible to produce double triggers. This function allows you to dial in a 'Time Window' in which double triggers are suppressed. Note that this can also inhibit re-triggers caused by both very rapid Left Hand Trigger playing and very rapid right hand picking.

### LEFT RIGHT CO-ORDINATION

Some players pick slightly before they fret. This parameter allows you to set the instrument's response to suit your own technique. The higher the value, the more delay the system will allow between the picking of a damped string and the subsequent fretting and sounding of a note.

### LEFT HAND DAMPING

Accidentally touching a string whilst playing can result in a note being damped. The higher this Dial, the less sensitive the instrument will be to accidental damping. This Dial can also be interpreted as how fast you must hammer from open before a new note will be triggered. Low numbers imply highest speed.

## SYNTHAXE OWNERS MANUAL

### VALID FRET RESPONSE

The techniques used by some players result in notes being fretted accidentally. This dial allows the player to set the tolerance of the system to inaccurate fretting. The higher the parameter, the more tolerant the system will be.

The following buttons are active:-

- |             |                                                                                                                                                                                                                                                            |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| MENU        | Takes you to the current MENU page.                                                                                                                                                                                                                        |
| SYNTH PATCH | Takes you to the PATCH page.                                                                                                                                                                                                                               |
| EXECUTE     | Takes you to the FRONT page.                                                                                                                                                                                                                               |
| NORMAL      | Resets the dial to its factory default value.<br>Only that parameter is affected.                                                                                                                                                                          |
| TRANSPOSE   | The TRANSPOSE SEMITONE UP button takes you to the previous page.<br>The TRANSPOSE SEMITONE DOWN button takes you to the next page.                                                                                                                         |
| STRING TUNE | Some Dials require a value to be entered for each string. These buttons can be used to select which string is affected; this is indicated by an arrow entry cursor (=). These buttons do not have any effect when there is only one parameter on the page. |
| NUMERIC     | These buttons are used to enter the performance Dial value, between 0 and 99. These buttons only affect the value to which the cursor is pointing.                                                                                                         |

### 7.3.8 PATCH PAGE

The PATCH page allows you to change the sound patch of the active synthesisers. The active synthesiser ports are shown at the top of the display. The NUMERIC value buttons are used to enter the patch numbers required. The patch change commands are sent when you press the SYNTH PATCH or EXECUTE buttons. The patch change messages are sent to all the active ports.

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The Console patches have a range 0-99 inclusive. Some synths e.g., the DX7, interpret these values as 1-100 so if you want Patch No. 22 on a DX7 send to it Patch 21.

The Console allows six patches to be entered, one per string. Six patches can only be in simultaneous operation with a six voice monophonic synth. The patch change messages are transmitted on the six patch channels shown on this page.

The patch MIDI channels can be altered on the COMMS page.

When you modify a patch you are changing the patch stored in the Current Playing Set-up. If you recall a new memory or activate the Step-on system, a new patch value may be loaded into the playing Set-up from the recalled memory. The display on the Patch page will be updated when the Step-on system is used to recall new playing Set-ups.

If the patch channels are made the same as the string MIDI channels, it is possible to select a patch value for each string of the instrument.

If you want the Console to remember the patch number with the Current Playing Set-up, then you must go to the FRONT page and store the modified Set-up in a memory.

The following buttons are active on the PATCH page:-

- |         |                                                                                                                                                                |
|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| MENU    | This takes you to the MENU page.                                                                                                                               |
| EXECUTE | This button sends the patches and returns you to the FRONT page.                                                                                               |
| NUMERIC | The NUMERIC buttons allow you to enter patch numbers. The patch values 0-99 may be entered. If you enter more than two characters the display will roll to the |

## SYNTHAXE OWNERS MANUAL

left. The patch value can be cleared using the CLEAR button. The arrow cursor indicates the patch channel to which the patch is being assigned.

**STRING TUNE** The STRING TUNE buttons move the position of the arrow entry cursor. This cursor indicates to which patch channel the entered patch number will be assigned.

**CLEAR** This button clears the patch display value to allow you to correct the patch value. The CLEAR button can also be used to prevent a patch being sent when a memory Set-up is being updated using the Step-on system. Some synths take several minutes to load a new patch and this can cause loss of sound during performance. When using the Step-on system you may require to change the tunings, say, of a synth but not change sound patch between one memory Set-up and another. If you leave the patch value clear, the string tune and other parameters will be updated but the patch number will not be sent to the synth. This will avoid loss of sound when using synths with long patch change times. A clear patch value is not the same as patch 00. A clear patch is indicated by a '---' symbol.

**SYNTH PATCH** This button sends the patches to the synths; the PATCH page display will remain in view. This button should be used when you want to try out several patch variations without leaving this page.

**RECALL** This button allows you to duplicate the patch value above STRING 1 TUNE button to all patch channels. The Yamaha TX816 synth requires the entry of six patch values to produce a uniform sound on all strings. The RECALL button allows you to enter six identical patches with fewer button pushes. The SYNTH PATCH button should be pressed to transmit the patches.

ALL OTHER BUTTONS ARE INOPERATIVE

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### 7.3.9 CAPO PAGE

The CAPO page shows the position of an imaginary capo on the six strings of the neck of the instrument. The values indicate the fret position at which the capo exists for each string.

It is not necessary to have capo values which are identical for each string nor is it necessary to have capo values within the range of the neck frets. A capo value can be indicated as negative but this will be the same as the nut value. An open string is one with a capo in the nut position.

When you alter the capo values, these values are stored in the Current Playing Set-up. If the Current Playing Set-up is changed by recalling a new memory or activation of the Step-on system, the capo values will be changed to the values recalled from the new memory. The capo values can also be changed by holding a chord, or barre, on the instrument and pressing the Capo pedal. The CAPO page will be updated when this happens.

The following buttons are active on the CAPO page:-

MENU This takes you to the MENU page.

EXECUTE This takes you to the FRONT Page.

SYNTH PATCH Takes you to the PATCH page.

NORMAL This button returns the capo to the normal guitar nut position, the display will indicate the strings are in their normal open condition.

STRING TUNE The STRING TUNE buttons set the capo values for each string, up or down.

TRANSPOSE The TRANSPOSE SEMITONE buttons take all six strings one semitone up or down.  
The TRANSPOSE OCTAVE buttons take all six strings twelve semitones up or down.

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### 7.3.10 CONTROL (CTRLS) PAGE

This page allows you to assign the String Bend, Wang Bar Damping and Key Pressure Transducer outputs to MIDI

controller numbers. The Damping controller assignment is valid in Mono modes only. The String Bend and Wang Bar assignments are only valid in Mono 2, Mono 3 and Poly 2 modes. In modes Poly 1 and Mono 1, the String Bend and Wang Bar values are added together and sent to the synth pitch bender control.

Assignment of control numbers allow you to control many functions of your synth with the Wang Bar or String Bend. An example of this is to control the filter cut-off frequency of a synth voice using the Wang Bar. There are many other control possibilities.

The Wang Bar and String Bend controllers can be selected to be centered or endstop. When centered, the controllers will produce the midrange (40 hex) output when in their normal physical resting position. In the endstop mode the controllers will produce a MIDI zero output when in their normal physical position. Damping and Key Pressure are in endstop mode and cannot be changed.

The following buttons are active:-

MENU        Takes you to the MENU page.

EXECUTE     Takes you to the FRONT page.

SYNTH PATCH Takes you to the PATCH page.

STRING TUNE The STRING 4,5,6 TUNE UP buttons move the cursor (= ) up.

The STRING 4,5,6 TUNE DOWN buttons move the cursor (= ) down.

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The STRING 3 TUNE buttons increment and decrement the controller number value pointed to by the cursor. The value can be set in the range 0-123. Numbers 122 and 123 select bender and pressure respectively.

The STRING 2 TUNE buttons toggle the string bend and Wang Bar modes from endstop to centre modes. The cursor indicates which value will toggle.

The STRING 1 TUNE buttons toggle the inversion of the transducer output. For example, when string bend is true, bending a string produces a rising pitch. When inverted, string bending produces a fall in pitch.

NORMAL	This returns the assignment and mode pointed to by the cursor to its factory values. Only the values pointed to by the cursor are defaulted.
CLEAR	This sets the controller number pointed to by the cursor to zero.
NUMBER	The NUMERIC buttons allow you to enter a controller number at the cursor position. Numbers 0-123 may be entered. Numbers 122 and 123 select pitch bender and pressure respectively. It is usually easier to enter a number after first clearing the existing value using the CLEAR button.

ALL OTHER BUTTONS ARE INACTIVE

### 7.3.11 COMMUNICATIONS PAGES

These pages allow you to set the MIDI transmission channels which will be used to communicate with different types of synthesiser. In Poly mode, the instrument will produce all its note data on the MIDI base channel. In Mono mode the instrument will send the note data from each string on its

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own MIDI channel. Exceptions to this are the Oberheim Xpander and Matrix 12 synths which operates in Mono 3 mode but additionally receives its Wang Bar information on the MIDI base channel. In this case both the string MIDI channels and base channels have to be set up correctly. There are sixteen available MIDI channels. These can be thought of as being the address of individual destinations to which the MIDI note data can be sent.

The three pages of the COMMS section allow the assignment of:-

### BASE CHANNEL

The MIDI channel on which all note data will be sent when you are in Poly 1 or Poly 2 mode. Wang Bar information is transmitted on this channel when in Mono 3 mode.

### STRING CHANNELS

In the Mono modes it is necessary to select a MIDI channel for each of the six strings. This allows each string to individually control its own voice so that damping and legato pitch changes are possible.

### PATCH CHANNELS

These are the MIDI channels over which the six patch change messages will be sent. They can be selected so that the patches effect the voices that are currently assigned to the strings. In this case the sounds produced would alter when a patch change is carried out. It is possible to select the patch channels to affect a synth that is not currently being played. This mechanism allows you to preload a slow patch change synth some time in advance. Sampling synths tend to take a long time to load and an attempt to change a patch whilst playing that synth would result in a silence or glitched notes. Pre-loading is only possible if you have two synths available, one to play and one which preloads in the background.

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The patch change can be executed using the Step-On system so that the player need not interrupt his playing whilst the patch loading is in progress.

The following buttons are active in this section:-

MENU        Takes you to the MENU page.

SYNTH PATCH Takes you to the PATCH page.

EXECUTE     Takes you to the FRONT page.

NORMAL       This returns the channel assignment on that page to the factory default.

STRING TUNE The STRING TUNE UP buttons increase the MIDI channel number.

The STRING TUNE DOWN buttons decrease the MIDI channel number.

TRANSPOSE    The SEMITONE TRANSPOSE UP button takes you to the previous COMMS page.

The SEMITONE TRANSPOSE DOWN button takes you to the next COMMS page.

ALL OTHER BUTTONS ARE INACTIVE

### 7.3.12 LAW PAGE

There are two parts to the law page:-

Assignment Page  
Tables Page

The Assignment Page is entered from the Level Two Menu

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### LAW ASSIGNMENT PAGE

This LAW ASSIGNMENT page lets you assign a law table number to the various transducers in the instrument. Laws may be assigned for String Bend, Wang Bar, String Velocity, Key Velocity and Key Pressure. The laws allow you to tailor the response of the transducers to your liking.

You may want the String Bend response to give very little pitch change on initial deflection but increasingly more effect as you bend the string towards the end of its travel. So assign a table to String Bend and set a law.

The Law Table Assignments are stored in each of the Console Set-ups and may be changed when memories are recalled.

There are a total of 21 Law Tables. Tables 17-21 inclusive are the factory defaults and cannot be modified. All the other tables may be edited to your requirements.

The following buttons are active on this page:-

MENU        Takes you to the MENU page.

SYNTH PATCH    Takes you to the PATCH Page.

EXECUTE        Takes you to the FRONT page.

STRING TUNE    The STRING 2-6 TUNE UP buttons move the arrow cursor (= ) up

The STRING 2-6 TUNE DOWN buttons move the arrow cursor (= ) down

The STRING 1 TUNE UP Button allows you to increment the Law Table number you want to assign to a transducer. Only the number pointed to by the cursor will be altered.

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The STRING 1 TUNE DOWN button allows you to decrement the Law Table number you want to assign to a transducer. Only the number pointed to by the cursor will be altered.

NORMAL This button sets the assigned Law Table number to its factory default number. Only the law number pointed to by the cursor will be affected.

TRANSPOSE The TRANSPOSE OCTAVE buttons take you to the LAW TABLES page where table editing is carried out.

ALL OTHER BUTTONS ARE INACTIVE

### LAW TABLES PAGE

This page is entered by hitting the TRANSPOSE OCTAVE buttons on the LAW ASSIGNMENT page. The 16 user editable Law Tables are displayed, one per page of display. The pages can be scrolled using the TRANSPOSE SEMITONE buttons. The title at the top of each page lets you know which table you are looking at.

The Law Assignments for the SynthAxe transducers are stored in each of the 99 memories of the Console. These may change from memory to memory.

The 16 Law Tables are a separate autonomous block and are not related to the 99 Console memories. It is the assignment of transducer to Law Table that changes with Console Set-up - not the Law Tables themselves.

A Law Table consists of 9 numbers, between 0 and 99, which can be thought of as the points on the Y-axis of a graph. These values are interpolated from left to right by the SynthAxe to produce a smooth curve.

### LAW TABLE FUNCTIONAL DESCRIPTION

The way in which the Law tables work is as follows:-

Consider the output from the Key Velocity transducer.

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If you hit the key gently the velocity will rise from zero to say 30.

As you hit the key harder the output from the transducer will rise to say 60.

A very hard hit will produce the maximum transducer output of 99.

Consider the Law Table to be linear i.e., increasing values equally spaced from left to right 0, 12, 24, 36, 48, 60, 72, 84 and 96.

The output from the transducer is used to look up a value in the Law Table. (In this case the transducer output would be sent to the synth as Note-On velocity).

Now consider the case where the law is 0, 30, 60, 90, 80, 70, 60, 50 and 45.

When we hit the key gently we get a very sharp rise in output velocity. (The start of the law is steep).

As we hit the key harder the Note-On velocity sent to the synth begins to fall again.

The value in the table can therefore be used to tailor the response of any of the SynthAxe transducers to your liking.

After editing a table or group of tables, hit the SAVE button to transmit the Tables to the SynthAxe.

The following buttons are active on this Page:-

MENU Transmits the Law Tables to the SynthAxe and takes you to the MENU page.

SYNTH PATCH Transmits the Law Table values to the SynthAxe and takes you to the PATCH page.

EXECUTE Transmits the Law Table values to the SynthAxe and takes you to the FRONT page.

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- SAVE This sends all the table values to the axe where they are interpolated ready for use. This button must be hit after table editing.
- TRANSPOSE The TRANSPOSE SEMITONE buttons let you change page numbers and so view the 16 user editable Law Tables.  
The TRANSPOSE OCTAVE buttons take you to the transducer LAW ASSIGNMENT page.
- STRING TUNE The STRING 2 and 6 buttons move the cursor ( ) left.  
The STRING 1 and 5 TUNE buttons move the cursor ( ) right.
- NUMERIC The NUMERIC buttons allow you to enter a numeric value in the table with a value between 0-99. The numeric value is entered at the cursor position.

ALL OTHER BUTTONS ARE INACTIVE

### 7.3.13 SONGS PAGE

A SONG is an ordered collection of Playing Set-ups in memory. These can be recalled in order using the Step-on system. This allows you to modify your tunings, synth patches, capos etc., as the Song progresses, whilst you are still playing the instrument.

The SONGS page allows you to name a Song in the Song List. There are a total of 48 Songs; they exist regardless of whether they are named or not.

The Songs exist on a series of eight pages. The pages will automatically scroll if you attempt to move the cursor beyond the six Song titles on the page. You can also page through the list using the SEMITONE TRANSPOSE buttons.

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The Song Name (if it has one) is displayed on the right hand side of the Song numbers. A name can be up to 12 characters long.

A '\*\*\*SAFE\*\*' message may appear at the top right hand side of the display, this indicating that the page is write protected. This prevents the stored information on the page being modified by accidental button pushes. The information on the page can be modified by first removing the protection. The protection can be toggled in and out using the SAVE button. The protection will be put on automatically when you go to any page except the STEPS page.

You can choose the active Song by moving the arrow entry cursor with the STRING 6 TUNE UP/DOWN buttons.

The flashing line cursor marks the position where letters will be entered in the name. The flashing line cursor can be moved left and right using the STRING 2 and STRING 1 UP TUNE buttons respectively.

Letters are inserted in the name by pressing or holding down the STRING 1 or STRING 2 DOWN TUNE buttons. The name can be cleared completely using the CLEAR button.

The following buttons are active on this page:-

MENU        Takes you to the MENU page

SYNTH PATCH    Takes you to the PATCH page

EXECUTE        Takes you back to the FRONT page

CLEAR        Clears the name of the set to all blanks. It does not destroy other information contained in the Song

STRING TUNE    The STRING 5 and 6 TUNE UP buttons move the entry cursor up, they have no effect if the cursor is pointing to Song 1. This button will cause page up-scroll if the cursor is pointing to the first displayed Song title on the page

## SYNTHAXE OWNERS MANUAL

The STRING 5 and 6 TUNE DOWN buttons move the entry cursor down, they have no effect if the cursor is pointing to Song 48. This button will cause page down-scroll if the cursor is pointing to the bottom line of the display.

The STRING 1 TUNE UP button moves the flashing line cursor right. If you try to move the cursor beyond the maximum length of the name, the cursor will return to the beginning of the name.

The STRING 2 TUNE UP button moves the flashing line cursor left. If you try to move the cursor beyond the beginning of the name the cursor will return to the end of the name

The STRING 1 TUNE DOWN button will roll the letter above the flashing cursor forwards through the alphabet

The STRING 2 TUNE DOWN button will roll the letter above the flashing cursor backwards through the alphabet

**TRANSPOSE**      The TRANSPOSE SEMITONE UP button produces an up-page scroll. It has no effect if you are on the first page (Songs 1-6)

The TRANSPOSE SEMITONE DOWN button produces a down-page scroll. It has no effect if you are on the last page of List (Songs 43-48)

The TRANSPOSE OCTAVE buttons will take you down to the STEPS page. This is a display of an ordered list of memory Set-ups which can be recalled during the performance of the Song. The arrow cursor is used on the SONGS page to select the active Song.

**SAVE**      Toggles the Protection ON and OFF

ALL OTHER BUTTONS ARE INOPERATIVE

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### 7.3.14 STEPS PAGE

The STEPS Page is entered from the SONGS page. The Steps display is an ordered list of memory Set-ups which can be recalled in forward or reverse Step order. This collection of Steps is termed a Song.

The idea behind the system is that a player may require, during the course of a Song, various tunings, sound patches, capos etc. The player can store the required Set-ups in memories, and these can then be recalled in order during the performance using the Step-On system.

To examine the Steps within a Song it is first necessary to go to the Songs page. Select the Song number you want to look at; it does not necessarily have to have a name. On pressing one of the TRANSPOSE OCTAVE buttons you will be taken down to the STEPS page for that Song. If the Song has a name it will be shown at the top of the display.

A '\*\*SAFE\*\*' message may appear at the top right hand side of the display, this indicating that the page is write protected. This prevents the stored information on the page being modified by accidental button pushes. The information on the page can be modified by first removing the protection. The protection can be toggled in and out using the SAVE button. The protection will be put on automatically when you go to any page except the SONGS page.

The STEPS display consists of eighteen Step numbers with associated memory numbers to the right hand side of them. The # sign is the Data Entry Cursor and the solid block is the Step-On Cursor. To enter a memory location at a particular Step position, first move the entry cursor to that Step using the STRING 6 UP or DOWN TUNE buttons. The entry cursor can be moved from column to column using the TRANSPOSE SEMITONE buttons.

The memory location number can then be entered at the cursor position using the numeric buttons. Memory numbers between 1 and 99 are allowed. A memory number of zero corresponds to a

## SYNTHAXE OWNERS MANUAL

Song End marker and is shown by a dash '--'. The memory number display rolls when several number button pushes are made. The numbers entered always overtype the existing memory number at the entry cursor position

A memory number can be deleted from the Step List using the CLEAR button. The memory number at the entry cursor position will be removed from the List. All the memory numbers in the List behind the delete position will be moved up in the List and an end marker will be placed at the end of the song.

A memory number can be inserted into the Steps List using the RECALL button. The insertion into the Steps List is made at the entry cursor position. All the memory numbers behind the entry cursor position are pushed back in the List and the previous last member of the List is lost. The inserted memory location is initially an end marker. This can be overtyped to a valid memory number as required.

The Step-On cursor can be moved by several methods. When it is moved the memory number shown at the Step position will be recalled to the current playing Set-up.

If the Step cursor is on Step 1 and a Step Back cursor command is given, the memory number shown at Step 1 will always be recalled.

This is how the Step-On cursor is initialised prior to use.

Similarly, if the Step-On cursor is on the last valid Step of a Song, the memory at the last Step will be recalled each time the Step-On cursor command is given.

The NORMAL button will return the Step cursor to Step 1 and recall the specified memory at that position. If the Step-On cursor is positioned on an end marker, no recall will be made.

## SYNTHAXE OWNERS MANUAL

The Step-On pedals cannot advance the Step cursor on to an end marker.

If this is attempted the current memory will be recalled again.

If the Step-On cursor is positioned on an end marker, the cursor will not move and no recall will be done.

The Plus and Minus buttons act in an identical way to the Step-On pedals whilst on this page and can be used if your pedals become disconnected.

When you are on the Steps page, the Step-On system cannot move the Step cursor to another song, only the selected song can be stepped through. This is useful for rehearsing a Song before it is added to a PLAYLIST or for playing various Songs in an ad lib order.

The STRING 1 TUNE buttons can be used to override the Step cursor. These buttons can move the Step cursor to any Step position including end markers. These buttons will cause memory recalls when the Step has a valid memory number.

If at any time an "## ERRORS ##" message is displayed, check your Step data. The message can be removed by any modification to the Step List.

The following buttons are active on this page:-

MENU        Takes you to the MENU page

SYNTH PATCH    Takes you to the PATCH page

EXECUTE      This button takes you to the FRONT page

SAVE          Toggles the Page Protection on and off. When the Protection is ON the page contents cannot be changed

STRING TUNE    The STRING 2-6 TUNE UP buttons move the entry cursor (#) up in descending Step order

## SYNTHAXE OWNERS MANUAL

The STRING 2-6 TUNE buttons move the entry cursor (#) down in ascending Step order

The STRING 1 TUNE UP button moves the step cursor up the list in descending step order. It will recall the specified memories as it moves. It can be used to start the Step-On position at any point in the song. This button can move the step cursor over end markers, a memory is not recalled when this is done.

The STRING 1 TUNE DOWN button moves the step cursor down the List in ascending order. It will recall the specified memories as it moves. It can be used to start the Step-On position at any point in the song. This button can move the step cursor over end markers; a memory not being recalled when this is done

TRANSPOSE      The TRANSPOSE SEMITONE UP button moves the entry cursor (#) into the previous column or descend six Step positions

The TRANSPOSE SEMITONE DOWN button moves the entry cursor (#) into the next column or ascend six Step positions

The TRANSPOSE OCTAVE buttons takes you to the SONGS page

NUMERIC      The NUMERIC buttons are used to enter a memory number at a Step position. These buttons always overtype the number pointed to by the entry cursor (#)

CLEAR      This button removes the memory number from the List at the entry cursor (#) position. All the other memory numbers behind the cursor position move up in the List and an end marker is put at Step 18

## SYNTHAXE OWNERS MANUAL

RECALL	This button inserts a memory number into the List at the entry cursor (#) position. All the memory numbers behind the entry cursor will move down in the List. The inserted Step will initially be an end marker but this can be overtyped to a new value as required. The previous data at Step 18 is lost
NORMAL	This button moves the Step cursor to the beginning of the Song and recalls the memory number specified at Step 1
PLUS	This button is a duplicate of the + Step-On pedal when you are viewing the STEPS page. It cannot move the step cursor on to or off an end marker. It can be used for Step-On purposes if your pedals become disconnected.  Pressing the plus button when the step cursor is at the end of a Song, or up against an end marker, will recall the current memory.
MINUS	This button is a duplicate of the - Step-On pedal when you are on this page. It cannot move the step cursor on to or off an end marker. It can be used for Step-Back purposes if your pedals become disconnected.  Pressing the minus button when the step cursor is at the start of a Song, or up against an end marker, will recall the current memory.

### 7.3.15 SETS PAGE

A set is a named collection of Songs. The SETS page allows you to name a Set and select the active Set.

There are a total of six Sets. The Set name (if it has one) is displayed on the right hand side of the Set numbers. A name can be up to 12 characters long.

You can choose the active Set by moving the arrow entry cursor with the STRING 6 TUNE UP/DOWN buttons.

## SYNTHAXE OWNERS MANUAL

The flashing line cursor marks the position where letters will be entered in the name. The flashing line-cursor can be moved left and right using the STRING 2 and STRING 1 UP TUNE buttons respectively. Letters are inserted in the name by pressing or holding down the STRING 1 or STRING 2 DOWN TUNE buttons. The name can be cleared completely using the CLEAR button.

A '\*\*SAFE\*\*' message may appear at the top right hand side of the display, this indicating that the page is write protected. This prevents the stored information on the page being modified by accidental button pushes. The information on the page can be modified by first removing the protection. The protection can be toggled in and out using the SAVE button. The protection will be put on automatically when you go to any page except the PLAYLIST page.

The following buttons are active on this page:-

MENU        Takes you to the MENU page

SYNTH PATCH    Takes you to the PATCH page

EXECUTE        Takes you back to the FRONT page

CLEAR        Clears the name of the Set to all blanks. It does not destroy other information contained in the Set

STRING TUNE    The STRING 5 and 6 TUNE UP buttons move the entry cursor up. They have no effect if the cursor is pointing to Set 1

The STRING 5 and 6 TUNE DOWN buttons move the entry cursor down. They have no effect if the cursor is pointing to Set 6

The STRING 1 TUNE UP button moves the flashing line-cursor right. If you try to move the cursor beyond the maximum length of the name, the cursor will return to the beginning of the name

## SYNTHAXE OWNERS MANUAL

The STRING 2 TUNE DOWN button moves the flashing line-cursor left. If you try to move the cursor beyond the beginning of the name the cursor will return to the end of the name

The STRING 1 TUNE UP button will roll the letter above the flashing cursor forward through the alphabet

The STRING 2 TUNE DOWN button will roll the letter above the flashing cursor backwards through the alphabet

**TRANSPOSE**      The TRANSPOSE OCTAVE buttons will take you down to the PLAYLIST of the Set pointed to by the entry cursor. This is the active Set PLAYLIST. Changing the position of the arrow cursor on the SETS page changes the active Set.

**SAVE**      Toggles the page protection on and off. When the protection is ON the page contents cannot be changed.

ALL OTHER BUTTONS ARE INACTIVE

### 7.3.16 PLAYLIST PAGE

The PLAYLIST page can be entered from the SETS Page.

The SETS page allows you to choose which set PLAYLIST is to be active.

A PLAYLIST is an ordered list of Songs which are to be played in sequence during the performance of the named Set. All six Sets have an associated PLAYLIST whether or not the Set has a name. You can have up to a maximum of twelve Songs in a PLAYLIST

To examine the Songs within a PLAYLIST it is first necessary to go to the SETS page.

Select the Set number you want to look at; it does not necessarily have to have a name.

## SYNTHAXE OWNERS MANUAL

On pressing one of the OCTAVE TRANSPOSE buttons you will be taken to the PLAYLIST PAGE for that Set.

If the Set has a name it will be shown at the top of the display.

The position of the block Step-On cursor shows the current active SONG and the display shows the current STEP position and the memory number recalled.

The PLAY display consists of twelve Song titles in the order that you want to play them

The arrow cursor (=) is the data entry cursor.

The entry cursor can be moved up or down the list using the STRING 6 UP/DOWN TUNE buttons.

If you use the SEMITONE TRANSPOSE buttons the cursor will move six positions at a time.

If the Song does not have a name, it is identified by its number from the SONGS page, in which case the Song title will be '?? SONG XX'

A Song that is in a PLAYLIST will be played whether it is named or not. A song can be entered into the PLAYLIST by first moving the entry cursor (=) to the required list position.

The STRING 5 TUNE buttons can then be used to roll the titles of all your Songs into the list.

A blank title indicates a play-stop.

A Song can be deleted from the PLAYLIST using the CLEAR button.

The Song at the entry cursor position will be removed from the list.

## SYNTHAXE OWNERS MANUAL

All the Songs in the list behind the delete position will be moved up in the list and a end of set marker will be placed at the end of the list.

A Song can be inserted into the list using the RECALL button. The insertion into the list is made at the entry cursor position.

All the Songs behind the entry cursor position are pushed back in the list and the previous last member of the list is lost.

The inserted Song is initially a blank marker, which will stop the Set at that point, but this can be rolled to a valid Song as required.

The Step-On cursor can be moved by several methods.

When this cursor is moved the memory number at the step position within the active Song is recalled to the current playing Set-up.

The idea behind the system is that the player wants to recall different playing Set-ups within each Song. The PLAYLIST allows you to do this for several Songs that you intend to play in order. The Songs used in the PLAYLIST have to be loaded with the appropriate memory Set-ups in order to make the PLAYLIST work in a defined manner.

The Step-On cursor will remain adjacent to a Song title in the list until the Step-On pedals are operated to advance its position.

The cursor will remain at a Song until an end marker is encountered within the Song.

At this point the step cursor will move to the next Song in the list.

The cursor will not move to the next Song if it is already at the end of the list (Song 12) or if it encounters an end of Set marker (i.e. a blank title).

## SYNTHAXE OWNERS MANUAL

The cursor will step forward to the first step of the next Song or will step back to the last valid memory location in the previous Song.

If the first step of a Song is an end marker no recall will be done and the display will indicate end of Song.

You will have to Step-On again to get past this empty Song.

The top right hand corner of the display will keep you informed about the Step position and the Current Playing Set-up.

If the Step-On cursor is on step 1 of the first Song, stepping backwards will always recall the specified memory.

Similarly if the Step-On position is on the last step of the last Song, stepping forwards will always recall the current specified memory.

The Step-On pedals cannot advance the step cursor on to a stop marker. If this is attempted the current memory will be recalled again.

If the Step-On cursor is already positioned on a stop marker, the cursor will not move and no recall will be done.

The PLUS and MINUS buttons act in an identical way to the Step-On pedals whilst on this page and can be used if your pedals become disconnected.

The NORMAL button will return the step cursor to the first step in the first Song and will recall the specified memory if it is valid i.e., not an end of Song marker. This is one way of initialising the step cursor ready to play the list.

## SYNTHAXE OWNERS MANUAL

The STRING 1 TUNE buttons can be used for step cursor override.

These buttons can move the step cursor to any list position including stop play markers.

These buttons move you to the first step of each Song in turn.

The memory specified at the first step of the Song will be recalled.

The Step-On pedals always activate the step cursor on the active playlist regardless of which display is showing on the Console, except when the STEPS page is displayed.

Any playing Set-up which is modified by stepping-on will be overwritten with the new information from the recalled memory.

If an end of Set marker is positioned in the middle of the PLAYLIST, a split playlist is produced.

This can used as a multiple playlist when a series of short sessions are required.

The STRING 1 TUNE buttons have to be used to move the step cursor over the stop play markers when a split playlist is used.

A '\*\*SAFE\*\*' message may appear at the top right hand side of the display, this indicating that the page is write protected. This prevents the stored information on the page being modified by accidental button pushes. The information on the page can be modified by first removing the protection. The protection can be toggled in and out using the SAVE button. The protection will be put on automatically when you go to any page except the SETS page.

If at any time an "\*\* ERRORS \*\*" message is displayed, check your playlist for valid entries. Any modification to the playlist will remove the message.

## SYNTHAXE OWNERS MANUAL

The following buttons are active on this page:-

MENU        Takes you to the MENU page

SYNTH PATCH Takes you to the PATCH page

STRING TUNE The STRING 1 TUNE UP button moves the step cursor up the list in descending order. It will recall the specified memories as it moves.

The step cursor will be positioned on Step 1 of each Song as the cursor is moved with this button. It can be used to move the step cursor to any point in the playlist.

This button can move the step cursor over stop markers; a memory is not recalled when this is done.

It can also position the step cursor on to a stop marker; no memory recall is performed when this happens.

The display will signal 'PLAY STOPPED' if this occurs. The Step-On pedals are disabled in this condition.

The STRING 1 TUNE DOWN button moves the step cursor up the list in ascending order. It will recall the specified memories as it moves.

The step cursor will be positioned on Step 1 of each Song as the cursor is moved with this button. It can be used to start the Step-On position at any point in the list.

This button can move the step cursor over end markers, a memory not being recalled when this is done. It can also position the step cursor on to a stop marker, no memory recall being performed when this happens.

The display will signal 'PLAY STOPPED' if this occurs.

## SYNTHAXE OWNERS MANUAL

The Step-On pedals are disabled in this condition.

The STRING 3 and 6 TUNE UP buttons move the entry cursor (= ) up in descending step order

The STRING 2 and 5 TUNE UP buttons roll the Song titles upward (decreasing Song number order) at the entry cursor position

The STRING 2 and 5 TUNE DOWN buttons roll the Song titles downward (increasing Song number order at the entry cursor position)

**TRANSPOSE** The TRANSPOSE SEMITONE UP button moves the arrow entry cursor (= ) into the previous column or retreats six Song positions

The TRANSPOSE SEMITONE DOWN button moves the arrow entry cursor (= ) into the next column or advances six Song positions

The TRANSPOSE OCTAVE buttons take you to the SETS page

**CLEAR** This button removes the Song from the list at the entry cursor (= ) position. All the other Songs behind the cursor position move up in the list and a end of Set marker is put at Song 12

**RECALL** This button inserts a Song title into the list at the entry cursor (= ) position. All the Song titles behind the entry cursor will move down in the list. The inserted Song will initially be a stop marker but this can be rolled to a new Song title as required.

**NORMAL** This button moves the step cursor to the first step of the first Song and recalls the memory number specified at Step 1 of that Song. Use this button to initialise a play list.

## SYNTHAXE OWNERS MANUAL

PLUS	This button is a duplicate of the + Step-On pedal when you are on this page. It cannot move the step cursor on to or off of a stop marker.  It can be used for Step-On purposes if your pedals become disconnected.  Pressing the PLUS button when the step cursor is at a final step of the last Song in the playlist, will recall the memory specified by that step.
MINUS	This button is a duplicate of the - Step-On pedal when you are on this page. It cannot move the cursor on to or off a stop marker.  It can be used for step back purposes if the pedals become disconnected.  Pressing the MINUS BUTTON when the step cursor is at the first step of the first Song, will recall the memory specified at that step.
EXECUTE	This button can be used to initialise the Step-On cursor to the first page of the PLAYLIST.  Takes you to the FRONT page.

ALL OTHER BUTTONS ARE INACTIVE

### 7.3.17 DUMP PAGE

The DUMP page allows you to transmit the contents of the 99 memories, Set names, Song names, Songsteps and Law Tables over MIDI for storage in a MIDI sequencer, computer, or second Console unit.

This is a useful mechanism for saving Console contents for transporting to another system or as a security back-up.

The LOAD page can be used to restore the Console contents from the MIDI data.

## SYNTHAXE OWNERS MANUAL

The DUMP data is transmitted as running status string bend and pressure messages which can be recorded on most sequencers and computers. The data is transmitted from the currently active output ports.

The DUMP page allows you to Dump one Set-up memory at a time, or groups of data such as Songs. Before you Dump data you should check the capacity of sequencer or computer memory to make sure there is sufficient available to capture the complete block of data.

It is not possible to reload the Console with corrupted or incomplete blocks.

The sizes of the transmitted data blocks are as follows:-

1 memory	-	206 bytes
100 performance memories (including Set-up)	-	20,600 bytes
Songs	-	3,552 bytes
Sets	-	372 bytes
Laws	-	416 bytes

If you want to Dump a small number of performance memories this is probably best done one at a time.

The memory number to be Dumped is entered using the NUMERIC buttons and is shown on the display.

Memory '00' is the Current Playing Set-up.

The STRING TUNE buttons are used to initiate a Dump of the appropriate group.

## SYNTHAXE OWNERS MANUAL

The display will show a flashing

"\*\*\* DUMPING \*\*\*"

message whilst the dump is in action

A DUMP COMPLETE message will be displayed when the dump is finished.

The following buttons are active on this page:-

MENU        Takes you to the MENU page

SYNTH PATCH    Takes you to the PATCH page

EXECUTE        Takes you to the FRONT page

NUMERIC        The NUMERIC buttons allow you to enter a performance memory number prior to Dumping one specific memory. This is particularly useful if you have a small number of stored memories to save or if the capacity of your sequencer is limited

Memory 0 is the current playing Set-up

STRING TUNE    The STRING 6 TUNE buttons initiate a Dump of 99 performance memories and the Current Playing Set-up

The STRING 4 TUNE buttons initiate a Dump of the single performance memory, the number of the memory should be entered first using the NUMERIC buttons

The STRING 3 TUNE buttons initiate the Dump of all the Law Table data

The STRING 2 TUNE buttons initiate the Dump of all the Song titles and Song steps

## SYNTHAXE OWNERS MANUAL

The STRING 1 TUNE buttons initiate the Dump of all the Set names and Playlists

CLEAR Hold down the CLEAR button to abort a Dump.

ALL OTHER BUTTONS ARE INACTIVE

### 7.3.18 LOAD PAGE

This page allows you to load all the Console memories from the MIDI IN port.

It is advisable to Dump all your Console Set-ups, Set names, Song names, etc., to a MIDI sequencer using the DUMP page for security purposes.

You will then be able to restore your data using the LOAD page.

Connect the output of your sequencer to the MIDI IN socket at the rear of the Console.

The Console will show the memory 'PROTECTION ON' message at the bottom of the screen.

This means data will be received and checked but will not be moved into your memories. This provides a way of validating your data.

The screen will inform you when a message is being received and whether the data is valid.

As the protection should currently be on, a 'NO LOAD' message will be shown when the complete message is received.

The protection can be toggled ON or OFF using any of the STRING TUNE buttons.

If the protection is removed a 'READY TO LOAD' message will be displayed and received data will be loaded into the appropriate memory.

## SYNTHAXE OWNERS MANUAL

The received data is in the form of MIDI pitch bend and pressure messages. Sending any sort of pitch bend information into the MIDI IN port will cause the receiving operation to begin. The data is rigorously checked before storage so there is no possibility of random pitch bend data causing a memory load. The total number of errors found will be displayed. The error count can be cleared using the CLEAR button.

The following buttons are active:-

MENU        Takes you to the MENU page

SYNTH PATCH Takes you to the PATCH page

EXECUTE      Takes you to the FRONT page

STRING TUNE These buttons toggle the memory protection

CLEAR        Clears the error count.

ALL OTHER BUTTONS ARE INACTIVE

### 7.3.19 MIDIX PAGES

This page provides a useful diagnostic tool for examining MIDI data as seen by the MIDI input port. It has no effect on the function of the SynthAxe. There are TWO sections to the MIDI EXAMINER, the MIDI FILTER page and the MIDI DISPLAY page. You enter the FILTER page from the MENU.

#### MIDI FILTER PAGE

This page can be used to filter the MIDI IN data stream to allow you to examine only those messages of interest to you.

On entering the MIDI FILTER page you will see a list of MIDI events.

## SYNTHAXE OWNERS MANUAL

These can be selectively Captured (and displayed ) or removed from the stream (filtered out). Filtering is useful in cases where you want to examine say, Note On events without the display being saturated with String Bend data.

The MIDI data stream to be examined is connected into the MIDI IN socket on the rear of the Console.

The following buttons are active on this page:-

MENU        Takes you to the MENU page

SYNTH PATCH    Takes you to the SYNTH PATCH page

EXECUTE      Takes you to the FRONT page

NORMAL        This cancels all the MIDI display filters so that all the MIDI IN data may be displayed

TRANSPOSE     The TRANSPOSE OCTAVE buttons take you to the MIDI DISPLAY page where the MIDI IN data stream is shown in HEX format

STRING TUNE    The STRING 3-6 TUNE UP buttons move the cursor (==) up

The STRING 3-6 TUNE DOWN buttons move the cursor down.

The STRING 1 and 2 TUNE buttons toggle the input filter pointed to by the cursor. If a filter is on, FILTER will be shown on the page and this particular MIDI event will not be seen on the MIDI DISPLAY page

After you have set up the FILTERS on this page hit one of the TRANSPOSE OCTAVE buttons to take you to the MIDI DATA DISPLAY page.

## SYNTHAXE OWNERS MANUAL

### MIDI DISPLAY PAGE

This page is entered by hitting an TRANPOSE OCTAVE button on the FILTER page. The MIDI input stream will be first filtered to remove events you do not want to see and the remaining information will be displayed in hex format.

The block cursor indicates the position of the latest byte to arrive. The screen will fill from top left to bottom right and will begin to overwrite at the top as the amount of data overflows the screen. The block cursor will help you see where the current data is.

The following buttons are active on this page:-

MENU	Takes you to the MENU page
EXECUTE	Takes you to the FRONT page
SYNTH PATCH	Takes you to the PATCH page
TRANPOSE	Takes you to the MIDI FILTER page
CLEAR	Clears the screen of the current data
NORMAL	This toggles the display/freeze for viewing an event

The block cursor changes to an underline cursor to indicate freeze mode

The MIDI input data stream will be continually captured up to a maximum of 256 bytes. After this time data will be lost

Hitting this button in the FREEZE mode updates the display with any new MIDI data that is currently in the receive buffer. The new data may be invalid if more than 256 bytes were received during the display freeze interval

ALL OTHER BUTTONS ARE INACTIVE

## SYNTHAXE OWNERS MANUAL

### 7.4 ERROR MESSAGES

The console can display various error messages. All of these are warnings to the player that something, somewhere is wrong. There is always a simple explanation for the cause of an error message (for example maybe you switched on before plugging in the Axe and saw NO RESPONSE FROM SYNTHAXE). Remember that you can never do any damage by continuing to use the SynthAxe. The worst thing that could happen is that the console memory may forget some of the stuff which you have spent time programming in. This only happens when the internal battery needs replacing and it should last 10 years.

#### 7.4.1 NO RESPONSE FROM SYNTHAXE

This message is flashed temporarily if the console sends a message to the SynthAxe and gets no reply. This can happen if the Axe is not plugged in or if either the console cable, SynthAxe cable or Pedal Unit has developed a fault.

#### 7.4.2 NACK RECEIVED

Whenever the console sends a message to the Axe (such as a new string tuning) it checks to see that the Axe has sent a reply to acknowledge receipt of the message. This sort of communication goes on all the time and the player is not normally aware of it. NACK means No ACKnowledge and only occurs when the Axe DOES reply but a message was misunderstood. This usually means that the Console and the SynthAxe have incompatible versions of software, but could also happen if the hardware has failed.

#### 7.4.3 DATA TIMEOUT ERROR

This message can only occur on the Console LOAD page (see section 7.3.18). It happens if the console receives the start of a packet of data at its MIDI input but never receives the end of the message. Rather than waiting forever with the 'receiving' message displayed it waits a certain length of time and then gives up ('times itself out'). Note that any pitch bend data will be assumed to be

## SYNTHAXE OWNERS MANUAL

part of a previously dumped message and will start the 'receiving' process. The end of each data packet is marked with a MIDI pressure message. If you see this error, halt the sequencer or MIDI storage device, press CLEAR on the console to clear the error and then try to load the data again. Persistent errors may indicate a faulty MIDI cable.

### 7.4.4 ERRORS WHICH ARE ONLY DISPLAYED WHEN YOU SWITCH ON

The Console remembers that all the Setups, Songs, Laws (etc) in a memory which is maintained by an internal battery whenever the mains supply is turned off. Whenever the SynthAxe is switched on the Console first checks the contents of this battery backed-up memory. If any data has been 'forgotten' then errors will be displayed and the Console will remain in this condition until any button is pressed. It is worth noting down any errors before pressing any buttons. These errors usually signify that the battery needs changing. Please contact your SynthAxe dealer for further details.

There is no reason why you cannot continue to use the SynthAxe but remember that some console data will have been lost. It is worth keeping a written record of your favourite Setups using the program sheet in Section 8.2. Better still, dump a copy of the data to a sequencer using the MIDI dump utility (see section 7.3.17).

When a console is powered up a second time, some of the error messages will disappear. This is because certain errors such as Errors in Memory Setup data are cleared automatically as soon as they are seen. The Console overwrites Default data into the 'forgotten' memory and leaves the error message to warn you of what it has done. Other messages such as Errors in song/steps will not clear until you make changes to that particular song.

## SYNTHAXE OWNERS MANUAL

### ERRORS IN DEFAULT TUNING

If these are seen, you should re-enter your favourite string tune. The Default Tune option will return to standard guitar tuning in the case of an error being found.

### ERRORS IN EPROM CHECK SUM

This is a serious error and may indicate that the Console software is faulty. If this error occurs, the Console could fail at any time.

### ERRORS IN PLAYLISTS

If a PLAYLIST error is found, any illegal song numbers are converted to 'NO PLAY' songs. Inspection of all PLAYLISTS will reveal an error message at the top of the affected PLAYLIST page. ALL PLAYLISTS should be checked for errors. The error message will disappear when the PLAYLIST is modified in any way.

### ERRORS IN SONG/STEPS

If a Song/Step error is found, any illegal memory number is converted to a song end. Inspection of all the song steps will reveal an error message at the top of the affected SONG STEPS PAGE. All song steps should be checked for errors. The error message will disappear when the song steps are modified.

### ERRORS IN MEMORY SETUPS

If a memory Set-up error occurs, all the values in the memory are reloaded to their factory default values. A full list of these values is included in Appendix B. When you recall the memories to check them the message:

'WARNING : Set-Up Initialised'

will appear on the Front page if the memory was found to be in error. The message can be removed by saving the memory.

## SYNTHAXE OWNERS MANUAL

### ERRORS IN LAW TABLES

If a Law Table is found to have an error, an error message will be shown on the offending table. The message can be removed by modifying the table contents.

SYNTHAXE OWNERS MANUAL

SECTION 8

APPENDICES

## SYNTHAXE OWNERS MANUAL

### 8.1 APPENDIX A GLOSSARY

#### Attack

The speed at which a note gets louder at the very beginning of it's envelope.

#### Capo

A temporary repositioning of the fret which governs the open string note for one or all of the strings.

#### Comms Mode

The type of MIDI communication between the SynthAxe and the synths it is controlling. See Mono and Poly.

#### Console

The 'Control Panel' for the SynthAxe system. The Console gives the player access to remote control of his synths either directly, or by using pre-programmed Set-ups. It also allows all of the control sensitivities to be set to the players taste.

#### Current Playing Set-up

This is 'how the SynthAxe is currently set up' and includes the current settings of everything which can be stored in a console memory.

#### Decay

If a note fades down to a Sustain level instead of dying out altogether, Decay is the speed that the note fades after the initial attack.

#### Default Tuning

This is the tuning that the SynthAxe will be tuned to when you press the NORMAL button on the console front page.

## SYNTHAXE OWNERS MANUAL

### Envelope

This is the 'shape' of a note. It determines the speed at which the note starts, whether it decays after the initial attack (like a piano with the key held down) the level at which it sustains, and the rate at which the note dies away.

### Key Pressure

This is the pressure that a Trigger Key is pressed down with. The information is read by the SynthAxe and can be sent to a synth as MIDI controller information.

### Left Hand Trigger Mode

When Left Hand Trigger Mode is enabled, notes can be played simply by pressing a string onto a fret with your left hand without the need to pluck a Trigger String or press a Trigger Key.

### Midi

Musical Instrument Digital Interface. This is the International standard that is used by the SynthAxe to control it's synths.

### Mono Mode

A state in which the SynthAxe sends its data on six separate MIDI channels - one for each string.

### Poly Mode

A state in which the SynthAxe combines the note information from all six strings and sends it down one MIDI channel.

### Release

This is the speed that a note dies away completely at the very end of its envelope. The Release may start immediately after the Decay part of the envelope, or there may be a Sustain portion.

### Sustain

This is the level that the envelope of a note will decay to after the Attack part of the envelope, and before the Release.

## SYNTHAXE OWNERS MANUAL

### Trigger Keys

These are the Keys on the body of the SynthAxe that are used to trigger notes on the synth. The Keys have Key Velocity and Pressure sensing that can be sent to the synth to control extra functions in the synth.

### Trigger Strings

These are the right hand strings in the body of the SynthAxe that are used for Guitar style triggering of the SynthAxe.

### Velocity

How fast you press or release a key or how hard you hit a string the velocity of each note is transmitted as part of a MIDI note on command. It can be used by the synth to determine the character of the sound you get (typically the loudness) or it may be ignored.

### Wang Bar

This for simple effects in the same way as the Vibrato Arm on a conventional guitar, but unlike a conventional guitar, the Wang Bar can be used to control other facilities in a synth like filter cut off frequency without affecting the pitch of the strings.

### Zero Fret

This corresponds to the nut on a conventional guitar, but offers more facilities such as sliding to an open string.

## SYNTHAXE OWNERS MANUAL

### 8.2 APPENDIX B SPECIFICATIONS

Due to our policy of continuous product development and improvement SynthAxe reserve the right to change specifications without notice.

#### Weights and Dimensions

Flight case containing SynthAxe Controller, toolkit and strap:      1260 x 452 x 200mm  
                                                                                  20Kg

Flight case containing Console      542 x 342 x 154mm  
                                                                                  11Kg

Flight case containing Pedal Unit      537 x 408 x 200mm  
                                                                                  14Kg

Flight case containing Step-On pedals      358 x 300 x 154mm  
                                                                                  7Kg

Flight case containing Accessories      940 x 512 x 135mm  
                                                                                  16.5Kg

SynthAxe stand  
Console stand and stay bar  
3 metre A.C. power cable  
5 metre SynthAxe multicore cable  
1 metre Console multicore cable  
1 metre Step-on pedal multicore cable  
5 metre MIDI cable

Minimum rectangular crate size for 1260 x 512 x 535mm shipping (excluding pallette)

Total weight      70Kg

Weight of Instrument alone      5Kg

#### Power Requirements

Voltage:      Selectable 110V or 220V - 240V A.C.  
Frequency:      50 or 60 Hz AC.  
Power consumption:      Approx 25 watts.

#### Operating Temperature

0 to 30 deg C (Non condensing)

## SYNTHAXE OWNERS MANUAL

### Midi

8 MIDI Output sockets, any combination active for a Setup.  
1 MIDI Input socket used for loading console data.  
1 MIDI Thru socket.

Modes: 2 Polyphonic, 3 monophonic, only one mode active at a time

MIDI Channels: Notes on any single channel in Poly modes.  
Notes on any six channels in Mono modes.  
Patch changes on any six channels.

MIDI ON & OFF Velocity sensitivity on individual trigger keys.  
MIDI ON Velocity sensitivity on individual trigger strings.  
MIDI Pressure sensitivity on each individual key.

MIDI Controllers: Wang bar can be assigned to any.  
Key pressure can be assigned to any.  
String bend can be assigned to any.  
String Damping can be assigned to any.

Patch Numbers: Up to 6 can be sent on any MIDI channels  
on all currently active outputs.  
Range: 0 to 99

### Automation System

Memory Setups: 99 plus 1 currently active Setup.

Songs: 48 songs each with a 12 character name.  
Each Song can contain up to 18 Setups.

Sets: 6 Sets each with a 12 character name.  
Each Set can contain up to 12 Songs.

Pedals: Step forward (+), Step back (-)

## SYNTHAXE OWNERS MANUAL

### Neck

Frets: Zero to 24  
Scale Length: 542mm from fret zero (nut) to fret 24  
Fret Spacing: Nut to 1st fret is 26mm  
                  23rd to 24th fret is 19mm

Function...		Transmitted	Recognized	Remarks
Basic Channel	Default Channel	1 1 - 16		: AXE ONLY : WITH CONSOLE
Mode	Default Messages Altered	MODE 3 POLY - -		MONO/POLY SWITCH ON CONSOLE
Note Number	True Voice	40 - 88		0 - 127 WITH CONSOLE
Velocity	Note ON Note OFF	0 X		
After Touch	Key's Ch's	0		
Pitch Bender		0		STRING BEND OR WANG BAR OPERATED
Control Change		0 # 1		STRING PITCH BEND
		0 # 2		WANG BAR PITCH BEND
		0 # 31		STRING DAMPING (SUSTAIN)
Prog Change	True #	0 0 - 99		ONLY POSSIBLE WITH SYSTEM CONSOLE
System Exclusive		0		PEDAL STATUS SENT TO CONSOLE
System Common	: Song Pos : Song Sel : Tune	X X X		
System Real Time	: Clock : Commands	X X		
Aux Messages	: Local ON/OFF : All Notes Off : Active Sense : Reset	X 0 0 X		TRANSMITTED BY CONSOLE ON SYNTH OR PORT CHANGE
Notes	THE MIDI TRANSMISSION CHANNELS, MODES MAY BE ALTERED USING THE SYNTHAXE SYSTEM CONSOLE	CONTROLLER NUMBERS AND MONO/POLY HAXE SYSTEM CONSOLE		

Mode 1 : OMNI ON, POLY  
Mode 3 : OMNI OFF, POLYMode 2 : OMNI ON, MONO  
Mode 3 : OMNI OFF, MONOX : Yes  
O : No

MEMORY SETUP DATA				PROGRAMMER: DATE:	
CONSOLE MEMORY NUMBER				SYNTHS:	
NAME OF SETUP (NOT STORED)				NOTES:	
SYNTH PATCH NUMBER					
PORTS		ACTIVE PORTS			
MIDI MODE					
TRANSPOSE		OCTAVES			
		SEMITONES			
STRING TUNING					
CAPO					
COMMS	MIDI BASE CHANNEL				
	MIDI STRING CHANNELS				
	MIDI PATCH CHANNELS				
CONTROLLERS	STRING BEND	CTRL			
		TYPE			
		INVERT			
	WANG ARM	CTRL			
		TYPE			
		INVERT			
	DAMPING	CTRL			
		INVERT			
	KEY PRESSURE	CTRL			
		INVERT			
LAW ASSIGNMENTS	STRING BEND				
	WANG ARM				
	STRING VELOCITY				
	KEY VELOCITY				
	KEY PRESSURE				

## SYNTHAXE

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LAW TABLES	17 - 21	00	12	25	37	50	62	75	87	99
	16									
	15									
	14									
	13									
	12									
	11									
	10									
	9									
	8									
	7									
	6									
	5									
	4									
	3									
	2									
	1									
DEFAULT TUNING										

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MEMORY SETUP DATA						PROGRAMMER: DATE:					
CONSOLE MEMORY NUMBER						SYNTHS:					
NAME OF SETUP (NOT STORED)											
SYNTH PATCH NUMBER						NOTES:					
PORTS	ACTIVE PORTS						SWITCHES	AUTOMATIC HAMMER	1		
	MIDI MODE							PULL-OFF INHIBIT	2		
TRANSPOSE	OCTAVES							SUSTAIN ENABLES	3		
	SEMITONES							STRING SWITCHES	4		
STRING TUNING								LEFT H. TRIG. ENABLES	5		
CAPO								HAMMER ENABLES	6		
COMMS	MIDI BASE CHANNEL							MULTI TRIGGER ENABLES	7		
	MIDI STRING CHANNELS							WANG ARM ENABLES	8		
	MIDI PATCH CHANNELS							HOLD PEDAL ENABLES	9		
CONTROLLERS	STRING BEND	CTRL						LEFT H. DAMP ENABLES	10		
		TYPE					TRIGGER SENSITIVITY	1			
		INVERT					TRIGGER THRESHOLD	2			
	WANG ARM	CTRL					WANG ARM GAIN	3			
		TYPE					WANG ARM DEAD BAND	4			
		INVERT					STRING BEND GAIN	5			
	DAMPING	CTRL					STRING BEND DEAD BAND	6			
		INVERT					TRIGGER PULSE DURATION	7			
	KEY PRESSURE	CTRL					AUTO HAMMER RESPONSE	8			
		INVERT					- NOT IMPLEMENTED -	9			
LAW ASSIGNMENTS	STRING BEND					LEFT H. TRIG. RESPONSE	10				
	WANG ARM					FAST RETRIGGER INHIBIT	11				
	STRING VELOCITY					LEFT/RIGHT COORDINATION	12				
	KEY VELOCITY					LEFT H. DAMP. RESPONSE	13				
	KEY PRESSURE					VALID FRET RESPONSE	14				

## SYNTAXE

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You have opened the manual upside down.