

## JUPITER-8 MIDI INTERFACE

GROOVE-(iv) 1987

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## Introduction

The installation of the Groove JP-8 MIDI interface will restore the Jupiter-8 to the center of your MIDI setup. It will soon become apparent to you that the advanced MIDI spec. provides far greater control, via MIDI, of the Jupiter-8 than is possible on many current synths. For a start it is possible to assign each of the three controllers (pitchbend, modulation and aftertouch) to one of eight destinations:

- |               |             |             |                  |
|---------------|-------------|-------------|------------------|
| 1.VCO LFO MOD | 2.PWM LEVEL | 3.CROSS MOD | 4.VCO2 FINE TUNE |
| 5.SOURCE MIX  | 6.RES       | 7.LFO RATE  | 8.VCF LFO MOD    |

Velocity information may be assigned "monophonically" to control the VCA and VCF, ie. sounds may be made louder and/or brighter by the velocity of the received notes. Patch-change codes may be accepted in the range 1 to 64 and select the corresponding JP-8 patch. Sustain-pedal, tune request and active sensing receive are also implemented. It is also possible to receive panel control data for most of the JP-8 front panel controls.

The MIDI transmit spec is rather less spectacular than the receive spec., obviously velocity transmit is not possible with the JP-8's unresponsive keyboard. Similarly there is no mod-wheel. or aftertouch data to transmit and unfortunately, it is not possible to send pitchbend data (or assign received P/B to the JP-8's pitchbend circuit) with the interface as it stands. So basically the JP-8 will only transmit note on/off data, patch-change data (again in the range 1 to 64) and active sensing. This isn't really too much of a limitation as the JP-8 keyboard can hardly be considered a serious contender in the mother keyboard stakes !

By now you are probably asking "I wonder how this totally amazing Groove MIDI interface deals with the Dual and Split modes available on the JP-8 ?", with considerable ingenuity is the simple answer ! Seriously though, the JP-8 may be considered two, separate, four-note polyphonic synth. modules as far as received data is concerned. Each may be assigned to a different MIDI channel, and all the features mentioned above can be assigned different values on the two 'modules'. As far as data transmit is concerned, in Split mode notes played on upper/lower keys are transmitted on the appropriate MIDI channel, while in Dual mode notes are transmitted simultaneously on both channels.

It is now becoming obvious that there are rather a lot of MIDI parameters to alter for a given MIDI set-up. Hence the Groove interface enables MIDI patches to be stored in battery-backed RAM so that they may be recalled instantly on power-up, there are 16 such MIDI patch stores. As for editing the parameters it is simplicity itself and is performed with the front-panel switches while the JP-8 display keeps you informed as to what you are doing.

The final enhancement to the JP-8 operating-system is the ability to send/receive patch data bulk-dumps over MIDI, so the JP-8 can join in with all those other synths 'dumping bulk'.

## 1. EDITING MIDI PARAMETERS:

First a word about the nomenclature used in this manual, you will notice that certain words are enclosed in square brackets:

[arp. range 1]\*

[pan. mode up]\*

and may also be followed by an asterix. The square brackets and words within refer to a key on the JP-8 front panel, which must be pressed to perform the described function. Whilst the asterix indicates that the LED on the switch will light to show that the parameter/mode associated with the switch is currently on (or will not light if the parameter/mode is off !). If there is no asterix then the LED should be ignored as it conveys no useful information and may infact be misleading.

Terms enclosed in curly brackets are what will appear on the JP-8 seven-segment display. Note the terms x and n refer to letters and numerals, respectively, in the display which will vary according to the value of the parameter displayed. Thus the term {ct xn} indicates that the controller data (mod-wheel) is routed to destination x, where x is a letter A to H, and scaled by a factor n, where n is a numeral in the range 1 to 8 in this case.

### 1.0 SELECTING EDIT MODE:

There are four basic edit modes and it is necessary to be in one of them to edit the MIDI parameters. To enter an edit mode one of the four arpeggiator range keys (1 4) must be pressed whilst not in arpeggiator mode. The edit modes are as follows:

[arp.range 1]*	RECEIVE edit	{rc nn}
[arp.range 2]*	TRANSMIT edit	{tr nn}
[arp.range 3]*	BULK DUMP	{bu }
[arp.range 4]*	MIDI STORE/RECALL	{id nn}

To change edit mode, simply press the new edit mode key and the new edit mode will be entered. Similarly to exit edit mode press the edit mode key which is currently active (LED lit) and the JP-8 will return to the normal operating mode. Note that the edited parameters (ie. the active parameters) are stored in volatile memory, hence if you remove power from the JP-8 these will be lost, so it's important to save your edited parameters before powering-down if you wish to keep them. On power-up a set of parameters from ROM are installed, ie. they are fixed and cannot be changed.

## 1.1 RECEIVE EDIT: [arp. range 1]\*

There are two sets of MIDI parameters to edit, one for the upper channel and another for the lower. To switch between the two, at any time, use the panel mode keys:

[panel mode upper]\* Upper channel parameters are edited

[panel mode lower]\* Lower channel parameters are edited

There are basically four parameters to edit, the receive channel and the mod-wheel-, pitchbend- and aftertouch-routing/scaling, the parameter to be edited is selected by the following keys:

[manual] RECEIVE channel, 1-16 {rc nn}

[key mode dual] MOD-WHEEL, destination =A-H {ct xn}  
scaling =4-8

[key mode split] AFTERTOUCH, ditto {AF xn}

[key mode whole] PITCHBEND, ditto {Pb xn}

Having selected a parameter to edit the new value may now be entered, this is carried out with patch number/preset keys, the meaning of these keys is as follows:

[patch number 1-8] sets receive channel 1 to 8  
scales "controller" data (see below).

[patch preset A-H] sets receive channel 9 to 16  
routes "controller" data (see below).

Clearly the meaning of the keys varies depending on whether receive parameters or "controller" parameters are being edited.

Controller scaling may be set from 1 (max. scaling) to 8 (min. scaling), scaling refers to the degree received controller data is reduced before being assigned to the selected destination. Thus minimum scaling (8) means that the received data is not scaled at all ! whereas maximum scaling (1) effectively turns the controller data off. In fact setting the scaling to any value below (4) will effectively turn the data off.

Controller routing may be set from A to H and selects a destination for a given controller as follows:

A:VCO LFO MOD	B:PWM LEVEL	C:CROSS MOD	D:VC02 FINE TUNE
E:SOURCE MIX	F:RES	G:LFO RATE	H:VCF LFO MOD

It is quite feasible to route all the controllers to the same destination, but obviously the last value received, at any time, is the active value.

eg. {ct A8} is mod-wheel routed to VCO LFO MOD with no scaling  
{Pb E6} is pitchbend routed to SOURCE MIX, and divided by 4

Receive channel is set to a value of 1 to 16, with the patch number/preset keys selecting values 1 to 16 going left to right.

## 1.2 VELOCITY ROUTING:

Velocity data may be routed to VCA LEVEL and VCF ENV MOD, this routing is selected from within the receive edit mode by means assign mode (AM) keys:

[AM solo]*	UPPER VCF
[AM unison]*	UPPER VCA
[AM poly 1]*	LOWER VCF
[AM poly 2]*	LOWER VCA

The routing is either on (LED on) or off (LED off) and is flipped between the two states by pressing the relevant key. There is no scaling available for this function.

## 1.3 RECEIVE FILTERS:

There are three receive filtering options available, these are universal and apply to both upper and lower receive data. They are selected in the same manner as the velocity routing on the Arpeggio Mode (ArpM) keys:

[ArpM. up]*	PANEL CONTROL on/off
[ArpM. down]*	PATCH CHANGE on/off
[ArpM. used)*	OMNI ON/OFF

As before if the option is on the LED will be lit and vice-versa.

Omni on/off if on, the JP-8 will receive data on all 16 MIDI channels and assign it as if the JP-8 were in WHOLE MODE. When off data is only assigned if it is on a valid MIDI channel.

Panel control if on, enables control data on the upper MIDI channel to access the JP-8 synth. modules in the same way that the front panel controls do, when off control data is ignored.

Patch change if on, any patch change data received will be assigned to the appropriate module. When off all patch change data is ignored regardless of the MIDI channel it is on.

#### 1.4 TRANSMIT EDIT:

[arp. range 2]\*

The transmit parameters may be edited in transmit edit mode, there are basically two parameters, the transmit MIDI channel and the transmit filter options. As in receive edit the upper and lower channels are selected with the panel mode lower/upper keys and the LED will indicate which channel is selected. As the transmit channel is the only parameter, in this mode, that uses the seven-segment display, it will always show {tr nn}. Again the value is selected with the patch number/preset keys and is in the range 1 to 16.

#### 1.5 TRANSMIT FILTERS:

There are three transmit filter options, these apply to both upper and lower channels simultaneously. As for receive filters the options are selected via the Arpeggiator mode (ArpM) keys and the relevant LED indicates the current status. The options are:

[ArpM. up]\*            TRANSMIT ACTIVE SENSING on/off

[ArpM. down)\*        PATCH CHANGE TRANSMIT on/off

[ArpM. u&d]\*        TRANSMIT ALL on/off

Transmit active sensing if on, active sensing data is periodically transmitted to guard against notes hanging on should a MIDI cable be disconnected. If off this protection is not available.

Patch change transmit if on, then patch changes are transmitted on the relevant channel. If off any patch changes made on the JP-8 will not be transmitted.

Transmit all if off, then no data is transmitted, this will take precedence over other transmit options. However bulk data may still be transmitted.

The LED on the [ArpM. random] key indicates whether active sensing data is being received. A side effect of the transmit process implemented in the JP-8 software is that received note data is transmitted. This is usually referred to as MIDI echo and is available on some sequencers, it shouldn't prove a nuisance in most instances, infact it could prove useful as a MIDI channel transposer (for note data) and/or data filter (passing note data only). If it does prove troublesome in your set up then transmit all may be turned off.

## 1.6 BULK DUMP: [arp. range 3]\*

There are two possible operations available in this mode, these are selected with the tape memory (TM) keys thus:

[TM save]*	BULK TRANSMIT	{bu tr}
[TM verify]	CANCEL BULK	{bu }
[TM load]*	BULK RECEIVE	{bu rc}

Bulk transmit, the patch and MIDI parameter data are transmitted in MIDI System Exclusive mode. On completion of the operation the program will automatically return the JP-8 to normal mode, so it is not necessary to manually exit the bulk dump mode. The whole operation takes a little over two seconds and dumps a total of 3995 bytes (including exclusive message).

Cancel bulk, pressing this key will terminate the current bulk operation and return to the initial bulk dump mode {bu } to await a new operation selection or exit. This is necessary mainly in bulk receive mode where the JP-8 will wait to receive a valid bulk dump file and if no such file is forthcoming "cancel bulk" is the only way to exit the bulk receive mode.

Bulk receive, this enables a JP-8 bulk file to be dumped into JP-8 memory, it is only possible to do this if memory protect is turned off. If mem. protect is on the display will show {bu no} and the JP-8 will await a new operation select or exit. If the bulk file is erroneous for some reason the JP-8 display will show {bu Er} and again the JP-8 will await a new operation or exit. Typical errors the system would detect are: bulk file of incorrect length, new status asserted before end-of-exclusive.

Data format, the bulk data format is as follows (in hexadecimal):

F0,41,lo,hi,lo,hi,.....,lo,hi,F7.

where lo is the lo-4 bits of a byte and hi the hi-4 bits, hence to reconstruct the data in a computer (if you feel so inclined) it will be necessary to do  $(lo+16*hi)$  for each byte. The codes F0, 41 and F7 are System Exclusive on, Roland ID and End of Exclusive respectively.

## 1.7 MIDI STORE/RECALL:

[arp. range 4]\*

This mode is used for storing newly edited MIDI parameters and recalling different MIDI set-ups. Upto 16 MIDI set-ups may be stored, the store number is selected with the patch number and preset keys (1-8 and A-H corresponding to 1-16). If the selected store number is different to the currently active MIDI set-up then the decimal-points in the numeric field will be lit, eg {id nn}. If the store number is the same then the decimal-points will not be lit, thus {id nn}. Having selected a store number, the next option is store or recall:

[manual]	RECALL set-up
[write]	STORE set-up

Recall, if all is well the decimal-points (if lit initially) will be extinguished and the new MIDI set-up installed. However if the message {id Er} appears then there is an error in the MIDI set-up data, it is still installed since such errors are not "fatal" and will not crash the system. An error indicates that the recalled data is not the same as that stored (determined by means of a checksum), this may be due to several reasons:

1. When the interface is first installed the stores may not be initialized.
2. The MIDI stores may be corrupted in a bulk data file which has recently been loaded into the JP-8.
3. The battery-backed RAM may be corrupted, due to the battery ageing.

Store, as with any write operation the mem. protect switch must be off, otherwise the message {id no} will be displayed indicating that it is not possible to store the data. If mem. protect is off the decimal-points will extinguish (if previously lit) indicating that the store is complete. The store and recall operations only take a fraction of a second.



## JUPITER 8 Controller Number Destination

<u>Controller No.:</u>	<u>JUPITER 8 Destination:</u>	
1	VCO 1	Freq LFO Mod
2	VCO 2	Freq LFO Mod
3	VCO	Freq Env Mod Env 1
4	VCO	Pulse width Mod
5	VCO 1	Cross Mod VCO-2
6	VCO 2	Fine Tune (0=54)
7	VCO 1+2	Source Mix (0=64)
8	VCF	Cutoff Freq
9	VCF	Resonance
10	VCF	Env Mod
11	Env 1	Sustain
12	Env 2	Sustain
13	LFO	Rate
14	LFO	Delay Time
15	HPF	Cutoff Freq
16	VCF	LFO Mod
17	VCF	Key Follow
18	VCA	Level Env-2
19	Env 1	Attack
20	Env 1	Decay
21	Env 1	Release
22	Env 2	Attack
23	Env 2	Decay
24	Env 2	Release

# JUPITER 8 MIDI IMPLEMENTATION

Groove-(iv) V1.0 Nov. 1987

function	receive	transmit	remarks
Channel	1-16	1-16	Separate channels for up. and low. Mode set on panel
Mode	no	no	
Key number assigns	0-127 36-96	36-96	
Vel. KEY ON KEY OFF	9n 1-127 9n 0 8n 1-127	9n 64 9n 0	Key off sent as note-on vel.=0
After KEY Touch CHAN.	no yes	no no	All controllers may be routed to one of eight destinations.
Pitchbend	yes	no	
Control 1:Mod Change wheel	yes	no	
64:sus.	yes	no	sustain=hold panel controls
2-23:panel	yes	no	
Prog. Change	1-64	1-64	=patch 11-88
Sys. Exclusive	yes	yes	id=41n
Sys. Common	tune req.	no	
Sys. Real time	Act. sens.	Act. sens.	

## INSTALLATION.

The following information lists the procedures required for the installation of the Jupiter 8 MIDI interface to keyboards fitted with or without the DCB interface. Certain drilling procedures will be different for each model, so please ensure that you follow the correct description.

It is essential to ascertain which Jupiter 8 model you have before commencing the modification, so if you are in any doubt, please do not hesitate to contact us at the heading address. It will help us if you can provide us with the following information;

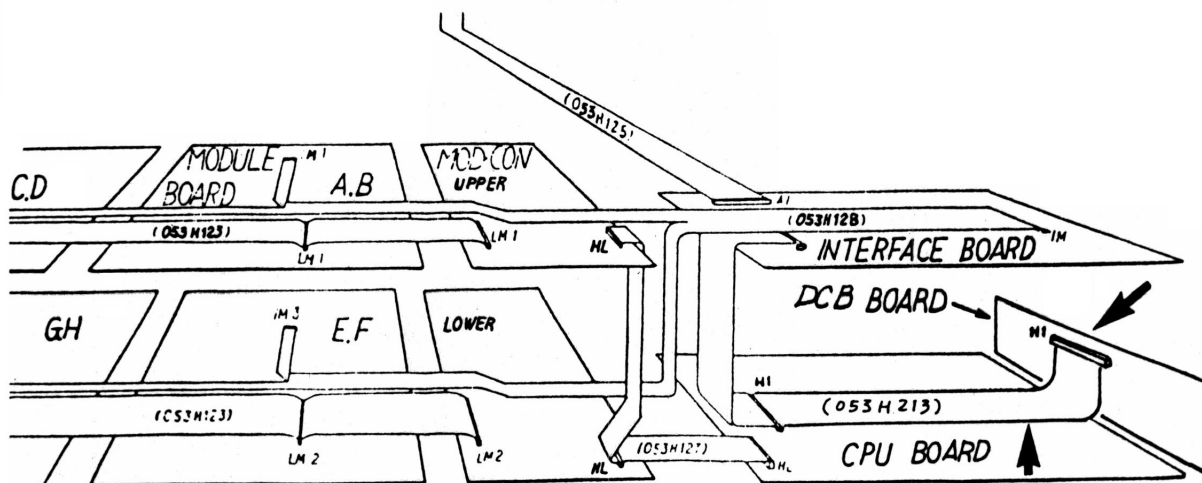
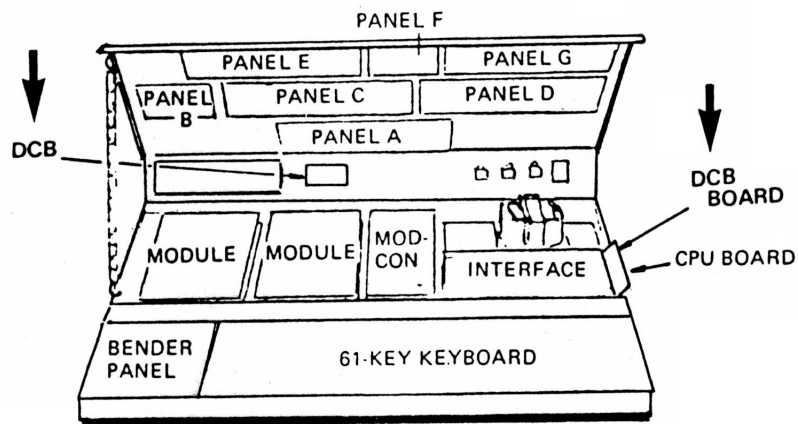
- a) The unit serial no.
- b) With or without DCB
- c) Any current modifications or updates.
- d) With the mains power switch OFF, hold down patch keys 1 & 3. whilst holding these down, turn the power ON. The display should now show a two digit number. What is this number?.

Before ordering, we should have already asked you these questions to ensure you receive the correct modification kit.

PLEASE NOTE: Any internal/external modifications made may invalidate any guarantee that you may have on your instrument. We cannot be held responsible for any damage/loss caused in the process of this modification.

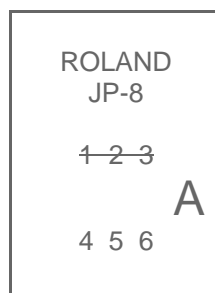
## Preparation.

- i) Disconnect Jupiter 8 mains supply at plug.
- ii) Remove all screws necessary to lift up front cover and to right hand end cheek.
- iii) Using the diagrams below, identify the following:
  - a) Interface Board
  - b) CPU Board
  - c) DCB/OC8 Board (if fitted)
  - d) DCB connector on rear panel (if fitted.)



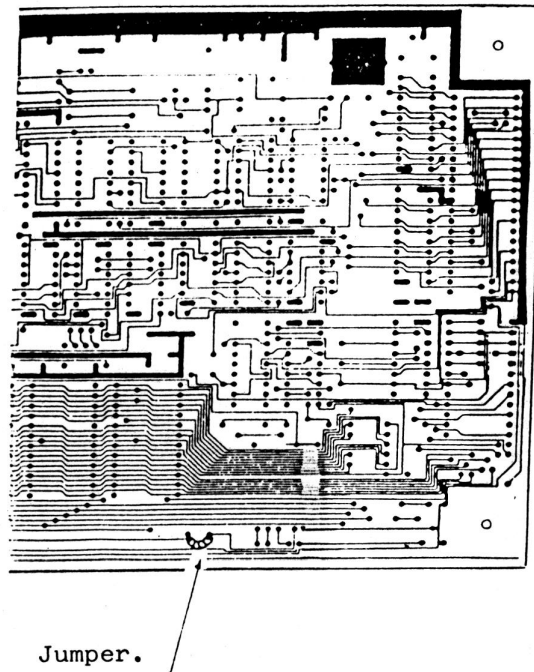
## Fitting.

- i) Remove the 4 screws that secure the interface board, and lift it up on its hinges, revealing the CPU board. If a DCB or OC8 board is currently installed, it will now be free. Remove and discard this and all cables attached between the DCB/OC8 board, the DCB port and any other Jupiter 8 boards.
- ii) If a DCB board is fitted, disconnect the 50 way IDC from the board so that this board can be completely removed. The 50 way connector will be used on our additional board (MIDI Board) at a later stage.  
If an OC8 board is installed then the above is also true, however, if neither is installed the 50 way connector mentioned above will not be present. When looking down on the interface board you should see a 50 way connector underneath the cable that runs the length of the interface board. By removing this connector, hence revealing the 50 way connector, you should now have enough access to remove the said 50 way IDC that connects the interface board to the CPU board beneath. Once removed, replace with the length of cable provided in your kit. This now brings the very early models into line with the later ones.
- iii) With the interface board hinged upwards, 4 Eproms should now be visible on the CPU board. They are labeled A to D from right to left, (i.e. D = far left.)  
Remove D from its socket on DCB models, it will not be present on pre-DCB models. Removal should be approached with caution, as its legs are easily bent and broken. Some models may not have their Eproms mounted in IC sockets.  
If you find this to be the case, the Eprom will have to be desoldered, and so obviously the CPU board will have to be removed.  
Eprom D, once removed, is to be replaced by the Groove MIDI ROM marked JP-8 V1.0. You will see that this Eprom has a yellow link attached to Pin 21 and is bent out. Install the ROM into its appropriate socket, and solder the yellow link to the point marked 'X' on the enclosed diagram Fig 1:11:A.  
'X' is the solder pad marked A13 on the CPU board.
- iv) With the above installed, check that the other 3 Eproms on the CPU board have the following markings on them, signifying version 3.2 software or greater. If they are not as described, please remove and return them to us and we will provide V. 3.4 software.



Labels on Eproms A to C must be marked like this, with the numbers 1 2 3, crossed with a dark line.

- v) Next, see the diagram below and check that the link 0 is fitted. If not it must be. On the CPU board in the lower right hand corner is a small dotted line. This indicates the position of the link. On DCB models, this link should be present, but please still check.



view from component side of CPU board.

- vi) with the above complete, fit the supplied MIDI interface board in the position shown for the DCB board. Replace and secure the interface board, hence securing the MIDI interface in position. The 50 way IDC can now be fitted to its mate on our board.
- vii) Finally, attach the connector fitted to the ribbon cable supplied to the 8 way minicon latch on the new MIDI board. This is polarized, so will only fit one way round.

## Installation of MIDI sockets.

Fitting the MIDI sockets is different for models with or without DCB installed. The wiring of the sockets is identical and will be described later, the positioning of the three sockets is however different and so will be described separately below.

### Pre-DCB Models.

- i) Remove OC8 connector and all leads attached to it and any other JP-8 boards and discard.
- ii) Remove the small cover/plate positioned approximately central on the lower fold of the Jupiter 8 case.
- iii) Fix the supplied plate over the exposed slot using the two 3mm nuts and bolts provided. Tighten and secure these screws to hold the plate firmly to the JP-8 case.
- iv) It will now be seen that the MIDI sockets will not fit into the holes provided on the plate without the removal of certain parts of the slot.  
This can be achieved using a file or a Q max sheet metal punch, (15.5-16.0mm Maplin Order No. BR80B.)
- v) with the three holes enlarged, insert the MIDI sockets and loosely secure.

Now turn to following page to complete the wiring.

### DCB Models.

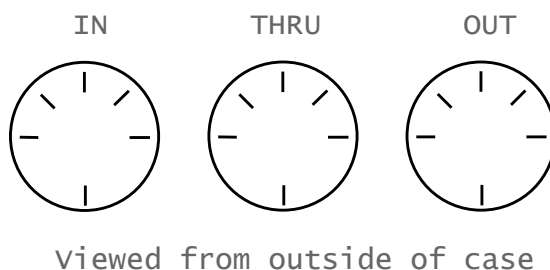
- i) Remove all cables from the PCBs that are also attached to the DCB connector.
- ii) Once removed, undo the 4 screws that secure the bar protectors above and below the DCB connector.
- iii) Undo the two screws that secure the DCB connector to the case
- iv) with this removed, there should now be a large rectangular hole exposed with a screw hole at each corner.
- v) Place the metal plate provided over this hole and replace the two protector bars over the holes that they were previously fitted, hence clamping the plate to the JP-8 case. Secure the bar protectors in position using the 4 screws that were originally holding them to the case.
- vi) with the plate secured, it will be seen that the two outer holes will require the removal of some of the JP-8 casing to allow the MIDI sockets to fit. This can be achieved using a file or a Q max sheet metal punch, (15.5mm-16.0mm Maplin Order no. BR80B)
- vii) with the three holes enlarged, insert the MIDI sockets and loosely secure.

Now turn to following page to complete the wiring.

## Completion of Wiring.

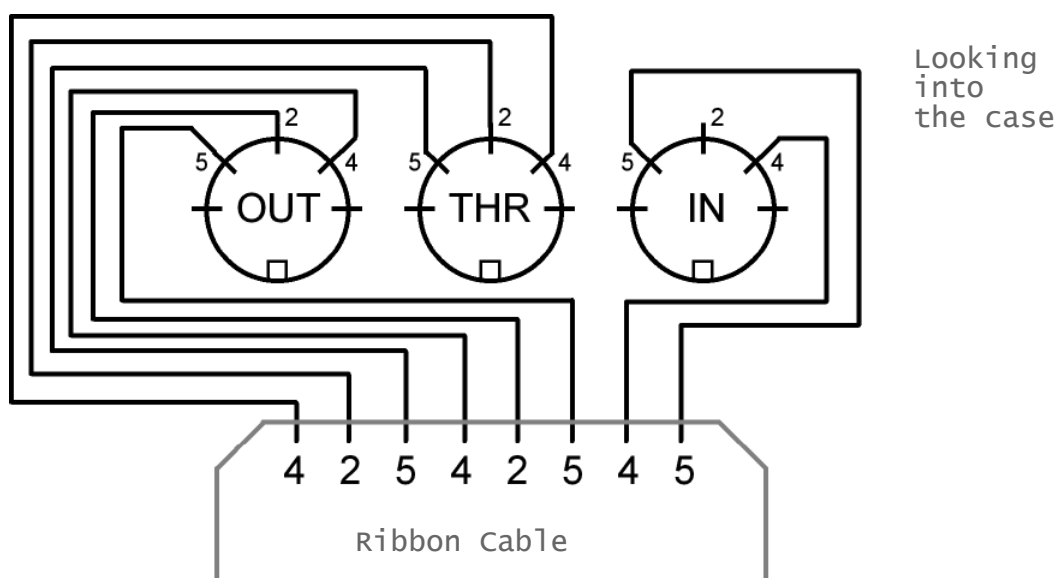
Having followed the previous steps for mounting the MIDI sockets on the various JP-8 models, all that remains to be done is the final connection of the ribbon cable to the MIDI sockets.

- i) with the MIDI sockets loosely secured, insert a MIDI lead or old DIN plug into each socket in turn and secure/tighten using a 3/8" WW spanner.  
Please ensure for future reference, that when looking from outside the case the MIDI sockets are arranged as below;



- ii) Finally, connect the ribbon to the sockets in the following sequence as described below;

	Ribbon Color	MIDI	Pin
1	Red	OUT	5
2	Orange	OUT	4
3	Yellow	OUT	2
4	Green	THRU	2
5	Blue	THRU	5
6	Purple	THRU	4
7	Grey	IN	4
8	White	IN	5





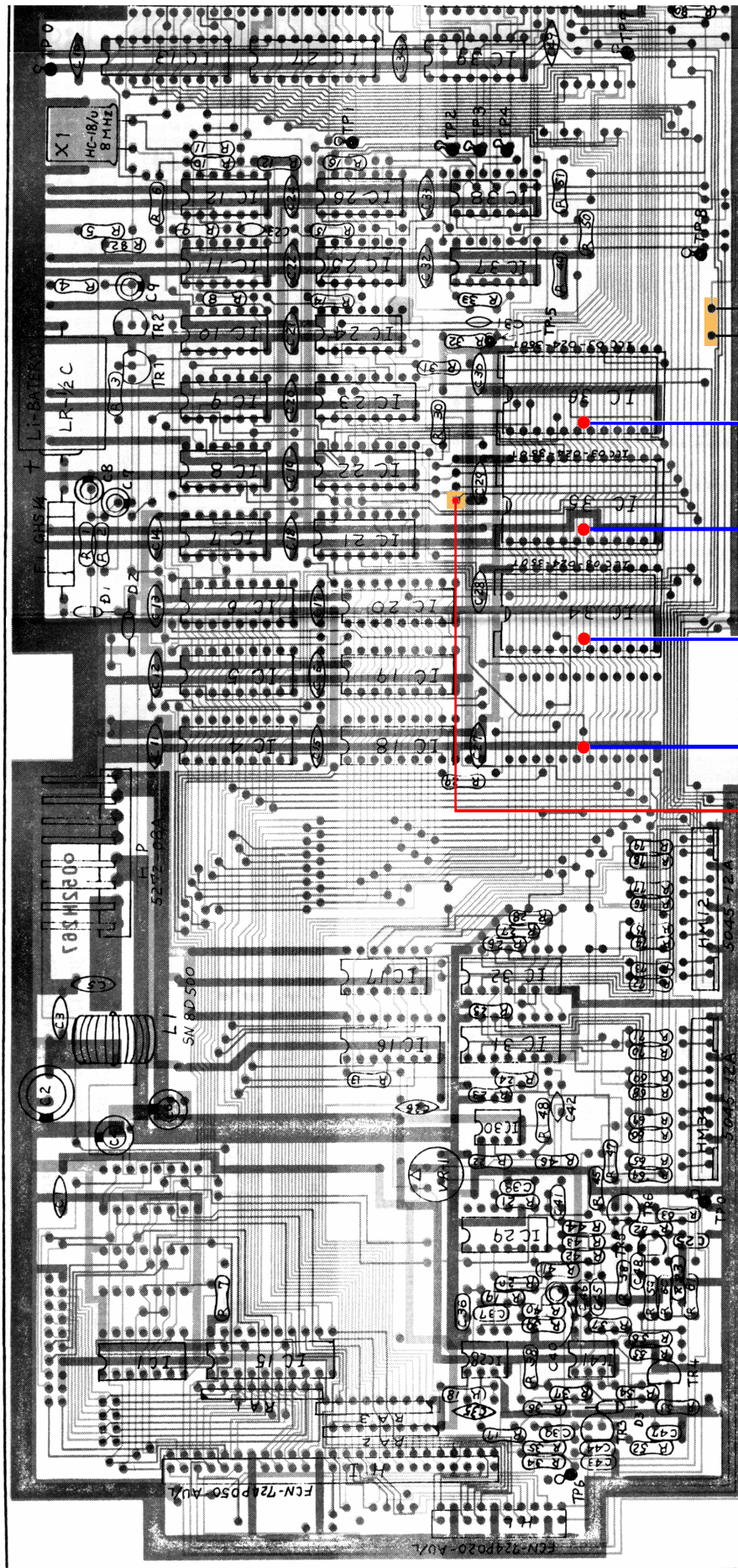
## Testing.

- i) Before closing the case you should do the following;
  - a) Check all wiring and connections to ensure everything is correct.
  - b) Tidy up all cables.
  - c) When you are happy with the connections so far, hold patch change keys 1 & 3 down, and turn the power on. If the Groove V1.0 message shifts left across the display then the ROM is O.K.
  - d) Next try linking into your system to ensure the MIDI is working. If it isn't, the fault will probably be due to a lack of a 5 volt supply to our MIDI board. This can be corrected by connecting pins 49 and 50 on the 50 way IDC mounted on the interface board of the Jupiter 8 to the point marked 'Y' on figure 1;11;B

With this connected the interface should now operate providing all other alterations are correct.

This completes the modification, we hope you find that once operational the interface greatly enhances and prolongs the life of your Jupiter. If you require any further assistance, please contact us on (0722) 743712.

# CPU BOARD OPH121(149H121)(pcb 052H267)



Link / Jumper Connection

ROM A, IC36

ROM B, IC35

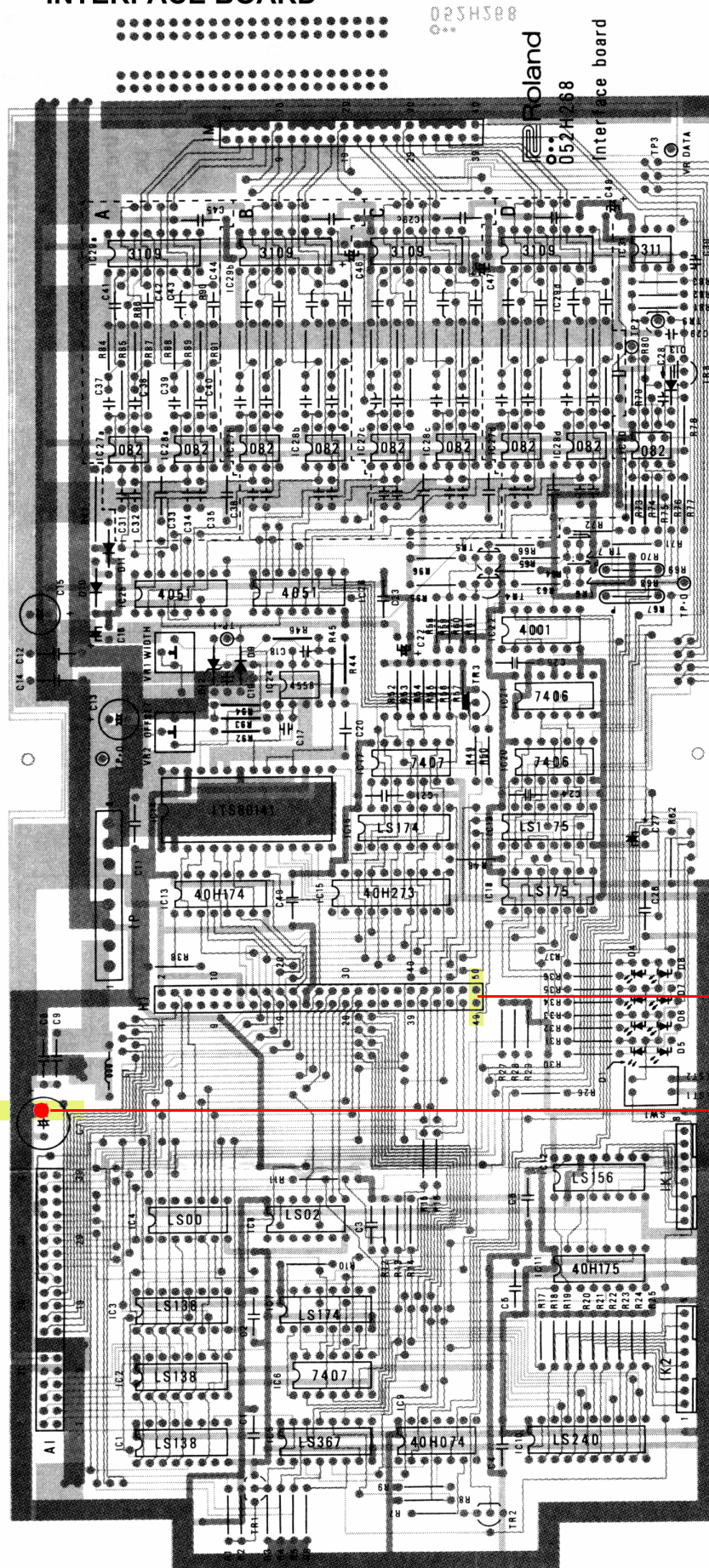
ROM C, IC34

ROM D (Socket), IC33, Groove V1.0

Point 'X'  
(Connect yellow wire to this point)



# INTERFACE BOARD



Looking from  
component side

Connections for  
+5 volt supply  
to be made on  
other side

Pins 49 & 50 on  
50 way IDC

'Y'

+5 volt supply