LYRA /COCO MIDI NEWSLETTER

Published by Speech Systems as a service to its music customers.

Volume 1 Issue 2 (Summer 87) $3.00

Announcing

LYRA PRINT

COCO MIDI

STEP TIME INPUT

LYRA LYBRARY

Supplements

Piano Rolls

are entered into the track and the program waits for your next key presses before inserting the next notes. Before pressing any key you can easily define the note durations that you want. You can literally input sheet music without any keyboard dexterity needed. I really like this feature myself. My keyboard technique is somewhat less than desirable and laying down a bass or rhythm pattern on my CZ-101 (mini-keys) can get to be a little sloppy in real-time. By using STEP INPUT I can take my time and tell the computer how long each note or chord is supposed to last. If you have the special sequence in your head that Mozart might have given up on, no problem, you have COCO MIDI 2 (version 2.5) and he didn't.

SONG PLAN. Some sequencers refer to this as the "SONG MODE". This description falls short of describing its true characteristics. I prefer to call this feature SONG PLAN. Basically this feature allows you to string together parts of tracks to complete a composition. It allows multiple repeats of track segments so that very long sequences can be strung together using very little memory. For example, you could repeat measure 1 through measure 4 of track 6 one hundred times before moving on to repeating measure 1 through measure 8 of track 3 seventy two times. When this feature is used, the tracks hold parts of songs that are played sequentially, not all at the same time as is the normal mode of COCO MIDI 2.

JOIN TRACKS. This feature makes the PLAN MODE much more powerful. The ability to JOIN the notes of two tracks together into a third track allows you to mix as many tracks together as you want. Some other sequencers refer to this as track MERGING, although in COCO MIDI 2 the original tracks are not changed allowing you to experiment with no fear of losing your original composition. (You should save frequently anyway, it is a good computer habit to get into).

With the ability to join tracks you can easily build songs, working on only a few measures at a time. After you have the first few measures to your liking join all the tracks into one and save it here. You can now re-use the original tracks to compose the next couple of measures and repeat the process for a long time before you run out of memory or tracks. After you have all your segments you can use the SONG PLAN mode to string them together in the right order.

To upgrade to version 2.5 of COCO MIDI ask for the COCO MIDI upgrade, it is $15 plus $3 P&H. You do not have to return your original disk.The upgrade includes only an addendum sheet. If you wish a new manual, the additional charge is $5. Note if your manual is 21 pages followed by 5 un-numbered pages describing MIDI editing, you have the newest manual.

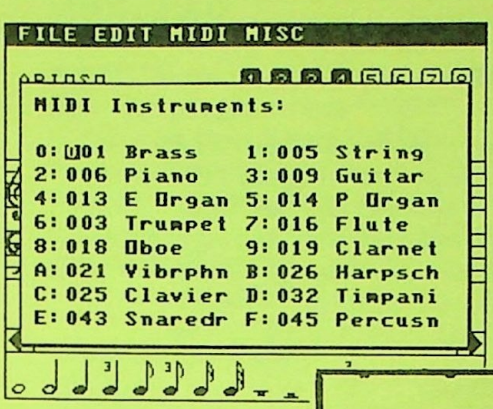
TAPE SYNCH - Rich Parry

For many getting their musical masterpiece to tape for demo purposes, critical listening, or promotion is very important. For others with a single synthesizer making music with multiple sounds is desirable. The following technique describes a way to do just that and should be most valuable.

Recall that COCO MIDI 2 have the ability to synchronize to a drum machine, using the Color Computer as wither the MASTER (COCO controls the drums) or SLAVE (the drums control the tempo). This is done by having the master unit send out MIDI synchronization information. If we can get this information on audio tape we are all set. However, MIDI information is digital whereas a tape can only require audio information. Therefore, all we need to do is convert the digital information to audio and we are all set. Several people make such a unit. SYNTECH sells one for about $90. YAMAHA offers one, but at a higher price. The units have MIDI IN and OUT as well as AUDIO IN and OUT.

RECORDING. Assuming you have the converter, you simply set COCO MIDI up in the MASTER mode and play the piece of music to the tape sending the audio that comes from the converter to an unused track on the tape recorder. One would typically use a 4 track recorder and record the synchronization information on track 4.

PLAYBACK. To playback the piece, you take the audio output of the tape player and connect it to the converter which sends out MIDI. Put COCO MIDI 2 in the SLAVE mode, and the tape player will now control the tempo.



Introducing

COCO MIDI 2

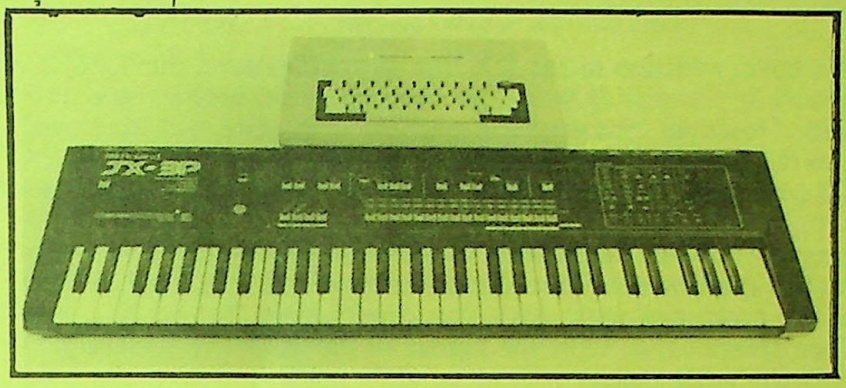
Lyra COMPATIBLE!

Coco 1, 2, 3 Compatible

Confused about MIDI?

"Understanding MIDI"

80 pages *$3.95*



Now shipping version 2.4

Previous users return original disk with $20.

Now your COCO can talk to your MIDI music synthesizer. Whether you have a Korg, Roland, Casio, Yamaha, or Moog, it doesn't matter as long as it's MIDI equipped. Choose from our entry level MUSICA MIDI system that plays MUSICA files or our Professional COCO MIDI 2 system.

- Supports 16 Track recording and playback.
- Adjustable tempo.
- Over 45 Kbytes available (Over 15,500 MIDI events possible).
- Record to any track.
- Low Level track editing.
- LYRA editing. (one voice per track).
- Playback from any number of tracks.
- Quantizing to 1/16, 1/32, 1/64 intervals.
- Dynamic memory allocation.
- Filter out MIDI data: Key pressure, Program change, Pitch wheel, Control Change, Channel Pressure, System Message
- Graphic Piano Keyboard Display in both record and playback mode.
- Adjustable Key (Transposition) for each track.
- Save recording to disk for later playback or editing.
- Syncs to drum machine as MASTER or SLAVE.
- PUNCH IN and PUNCH OUT editing.
- Sequencer features.
- 100% machine code.
- "Musician Friendly" Menu Driven.
- Metronome
- Many songs included.

Includes MIDI hardware interface, 2 MIDI cables, detailed manual, and software. Requires 64K CoCo, Y-Cable or Multi-Pak.

COCO MIDI 2 (disk only) #CM147 . **$149.95**
DOUBLE Y-CABLE #DY181 . . . . . **$28.95**
TRIPLE Y-CABLE #TY173 . . . . . **$34.95**

DX LIBRARIAN™

Save and load voice parameters for the Yamaha DX series of synthesizers (DX-7, DX-100, DX-21 etc.). Save sounds individually or as a group letting you load the entire synthesizer in seconds. Comes with professionally developed voices for the DX-7 worth 10 times the price. Requires COCO MIDI hardware interface.
DX LIBRARIAN (Disk only) #DX143 . . . . . $39.95

CASIO LIBRARIAN

Save and load voice parameters for any Casio synthesizer (CZ-101, CZ-1000, CZ-5000 etc.) You can save from the: presets, cartridge, memory or buffer. Requires COCO MIDI hardware interface.
CASIO LIBRARIAN (Disk only) #CL169 . . . . . **$39.95**

MUSICA MIDI™

MUSICA MIDI takes any MUSICA 2 music file and plays it through your MIDI synthesizer. We offer you over 800 tunes from our MUSIC LIBRARY series (sold separately) or create your own music using MUSICA 2. Inlcudes: documentation, plenty of music, and the cable to connect between the COCO and your synthesizer.
MUSICA MIDI Complete (Disk Only) #CM126 . . . . . **$39.95**

MIDI KEYBOARD

If you own the Casio CZ-101 or similar MIDI synth, you know that the mini keys and the short 3 or 4 octave keyboard is limiting. MIDI KEYBOARD when used with our full size 5 octave keyboard gives you the flexibility you need. Comes with cable to connect the COCO to your MIDI synth.
MIDI KEYBOARD (Disk only) #MK167 . . . . . **$29.95**

DX Librarian - Tom Wilhelm

For the new MIDI user who is not sure what a librarian is, I thought I would mention that it is merely a program that allows one to save voice settings (parameters that describe how an instrument will sound i.e. violin sound versus a trumpet) to the Color Computer's disk. Most synthesizers allow you to save this information in a cartridge (usually expensive) or cassette (slow and cumbersome). Speech Systems offers the Casio Librarian for all CZ series synths (i.e. CZ-101, CZ-1000, CZ-500) and one for the YAMAHA synths such as the DX-7, DX-21, DX-100, and as Tom describes the TX812. (RP)

It seems YAMAHA's latest addition to the DX line of synthesizers, the TX812, is turning out be be quite a success, as well it should! It is a new four-operator, eight-voice synthesizer with many advanced capabilities. However, the cassette port used to save and load voice data is slow and unreliable. DXLIB to the rescue. Since the TX812 uses the same format to send and receive voice data as other DX-100 compatible instruments, it can be used with DXLIB to store and retrieve voices.

Here's a hint for those of you who might want to view the names of the voices in a bulk voice dump before you send it to the synthesizer. First select menu item (2) and load in the file that you want to examine. When you are prompted with: ARE you sure?", type "N" for NO. You will be returned to the menu screen. Then select (4) to view the names of the voices in the file that you just loaded. In this way, you can view the voice names without actually sending them to the synth.

MIDI READ & WRIT - Rich Parry

A few COCO MIDI 2 users have asked how to write a program to talk to your synthesizer through the COCO MIDI hardware. The hardware consists basically of a Motorola 6850 ACIA with baud rate set to exactly 31.250 KBaud which is the MIDI standard. The following programs are given without support. ONERROR do not GOTO Speech Systems.

MIDIWRIT

This program will initialize the ACIA then play a note by send a NOTE ON command and then a NOTE OFF command. The program takes advantage of the fact that it is written in BASIC and is therefore slow. Because of the slowness of BASIC, the ACIA does not have to be interrogated to see if it is ready.

```
100 CLS
110 ST=&HFF6E
120 DT=&HFF6F
130 POKE ST, &H03 :'MASTER RESET
140 POKE ST, &H15 :'8 BITS, NO PARIOTY, 1 STOP
150 '*
160 '* TURN ON NOTE C3
170 '*
180 PRINT "NOTE C3 ON"
190 POKE DT, &H90
200 POKE DT, &H3C
210 POKE DT, &H30
220 FOR I=1 TO 1111 : NEXT I
310 '*
320 '* TURN OFF NOTE C3
330 '*
340 PRINT "NOTE C3 OFF"
350 POKE DT, &H90
360 POKE DT, &H3C
370 POKE DT, &H00
```

MIDIREAD

BASIC is much too slow to allow one to read information coming from the synthesizer. Because of this, the program was written in machine language. The following simple program initializes the ACIA and then stores the first 100 bytes in memory starting at location $4100. After the program has been assembled, you can EXEC &H4000 and then PEEK into memory to get the data. Note that this reading program does not use interrupts which is really the correct way to get data. The COCO MIDI 2 hardware does indeed have the ACIA interrupt line connected to the COCO. Perhaps next issue I can talk Frank into showing a program to read data using interrupts.

```
            NAM     MIDI
MSTAT       EQU     $FF6E       ACIA CONTROL/STATUS REGISTER
MDATA       EQU     $FF6F       ACIA DATA REGISTER
*
* INITIALIZE ACIA
*
            ORG     $4000
START       LDA     #$03        MASTER RESET
            STA     MSTAT
            LDA     #$15        8 BITS, NO PARITY, 1 STOP
            STA     MSTAT
*
* READ FIRST 100 BYTES INTO MEMORY
*
            LDX     #$4100
            CLRB
MORE        LDA     MSTAT       DATA AVAILABLE?
            BITA    #$01
            BEQ     MORE
            LDA     MDATA       GET BYTE
            STA     0,X+        SAVE BYTE
            INCB
            CMPB    #100        GOT 100 BYTES?
            BNE     MORE
            RTS
*
            END     START
```

Piano Rolls - Joe Tributsh

Being involved with music has allowed me to meet many different people with many interests. Joe is quite unique. In this day of computer generated and controlled music, Joe has married an old technology to the new MIDI age. He gives a brief description of the history of Piano Rolls and describes how he moved paper piano roll information to MIDI disks.(RP)

There are several ways to make music without actually playing an instrument. Of course the easy way is to turn on the radio or to listen to cassettes. If you want to get more involved and have a color computer, you can program your own music, or play music someone else has programmed through the use of such programs as LYRA and MUSICA.

Before the invention of the phonograph and radio, (At the turn of the century) people also wanted to listen to music without actually having to play it. This led to the invention of the instruments that were operated by a paper roll that had been punched by a programmer. This roll was run over a bar with holes in it connected to a vacuum operated valve system. These valves would let air into the appropriate pneumatic actuator, which would sound the corresponding note on an actual instrument. Some of the actual instruments used were piano, xylophone, drums, cymbals, organ pipes, and even

violins. Some of the larger devices which contained organ pipes and other instruments were called "BANDORGANS". These were large and expensive and were frequently found in dance halls and circuses. Smaller device were found in arcades in amusement parks and had coin slots in them, so they were called "NICKELODEONS". These instruments were too expensive for the average person, however many people could afford the less expensive "player piano". The piano was a regular piano (usually an upright and not as frequently a grand), that had a player mechanism installed in it. It was operated by a paper roll as the band organ nickelodeon. The vacuum was supplied by pumping foot pedals. Later some players used electric vacuum sources. Some people adapted their pianos by using a roll player which could be set on top of the keyboard of a standard piano.

We bought one of these devices from a gentleman who mounted switches underneath it so the actuators which normally press on the piano keys closed the switches. He connected the switches to his pipe organ. He then could have the piano rolls play the organ. This player has 75 actuators although a piano keyboard has 88 keys. It omits the 3 lowest and 10 highest notes. Since the organ manuals have only 61 notes, he connected the two lowest octaves in parallel and connected the last three highest notes of the player to the three highest notes of the octave below it. This resulted in 60 output connections. Since our equipment has a range of 61 notes this arrangement fits right in.

ABOUT THE COMPUTER EQUIPMENT: The first step was to convert the roll player switches to MIDI. A COCO 1 using the rom pack from Speech Systems "61 note keyboard" ($119.95) and "MIDI KEYBOARD" ($39.95) software were selected to do the job. One problem though, this system is designed to work with a sampling keyboard. The roll player and switch combination is not. A logic board had to be built to do the conversion. A second COCO 1 equipped with the Speech Systems "COCO MIDI 2" received the MIDI information via the MIDI IN of the COCO MIDI, then COCO MIDI was set to record.

CHARACTERISTICS OF PIANO ROLLS: Piano rolls play many notes at a time. I've counted as many as 13. It is important that your synthesizer is capable of playing at least 8 notes at a time. Most piano keyboards have 88 keys, piano rolls usually play only 82 of these. Our equipment accomodates only 60 notes. This is not all bad because the possibility of more than 8 notes coming through is reduced. As mentioned above by paralleling switches, some notes are moved up or down an octave rather than discarded.

Since piano roll music is arranged to be used on pianos, and some notes are very short, we suggest that you select some form of piano, percussion, or plucked string or similar instrument with a fast attack for your synthesizer.

PIANO ROLL Volume 1

WHEN I'M 64	ELVIRA
MOONRIVER	CABARET
SOMEWHERE MY LOVE	ZIP-A-DEE-DOO-DAH
ALLEY CAT	EVERYTHING IS BEAUTIFUL
HELLO DOLLY	CHOPSTICKS

PIANO ROLL Volume 2

CLAIR DE LUNE	BEER BARREL POLKA
THE CRAZY OTTO	IT'S A SMALL WORLD
MUSIC BOX DANCER	UNFORGETABLE
STARS & STRIPES FOREVER	

You may notice relatively few songs per disk compared to LYRA LYBRARY. This is because of the great numbers of notes that are contained on a typical piano roll. Rest assured the disks are full and are unlike anything you have ever heard. At this writing, Speech Systems has not completed negotiations to distribute these disks. If unable to come to an agreement with the publisher, Speech Systems reserves the right to cancel orders. Each disk is $19.95

Introducing

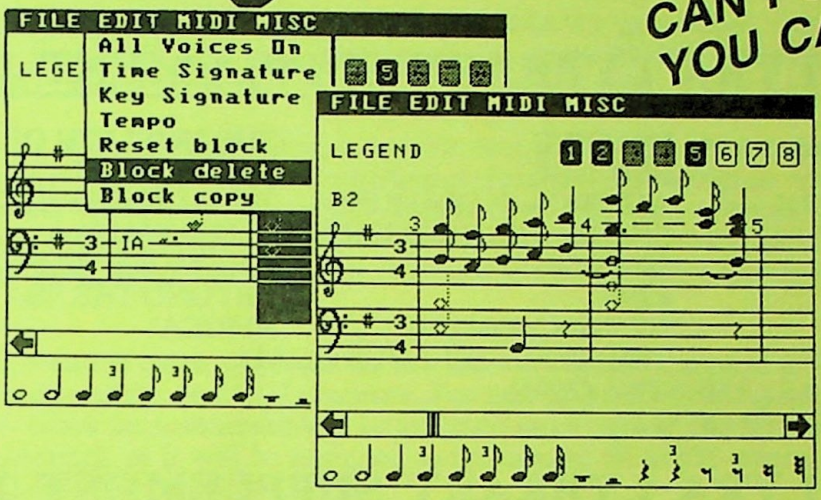
Lyra™

The Musical Coco Max™

ICONS!

IF YOU CAN POINT, YOU CAN COMPOSE

PULL DOWN MENUS



Coco 1, 2, 3 Compatible

A MUST FOR MIDI USERS

Now Shipping Version 2.4

LYRA is the most powerful music composition program we have seen on any computer. We don't mean just the COCO, we really mean any computer. Whether you are a novice trying to learn music or a professional musician with MIDI equipment you will find LYRA a powerful tool. You see, we wrote LYRA for musicians that hate computers. If you want proof, purchase a LYRA demo for $7.95. We will apply the demo price to your purchase. MIDI output requires the LYRA MIDI cable (#MC158) or COCO MIDI Seq/Editor (#CM147).

- Ultra Easy to use, just point with joystick or mouse and click.
- Compose with up to 8 completely independent voices.
- Room for over 18,000 notes. (This is not a misprint!)
- Super Simple Editing Supports:
  - Note insert
  - Note delete
  - Note change
  - Block insert
  - Block delete
  - Block copy
- Output music to:
  - TV Speaker
  - STEREO PAK
  - SYMPHONY 12
  - MIDI Synth
  - Monitor Speaker
  - ORCHESTRA 90
  - COCO MIDI S/E
  - MIDI Drum Machine
- Output up to 4 voices without additional hardware.
- Output all 8 voices using either SYMPHONY 12 or one or more MIDI synthesizers and drum machines.
- Output any voice on any of the 8 MIDI channels.
- Transpose music to any key.
- Modify music to any tempo.
- Automatically inserts bar for each measure as you compose.
- Key signature lets you specify sharps and flats only once, LYRA will do the rest.
- Plays MUSICA 2 files using LYRA CONVERT (#LC164).
- Each voice may be visually highlighted or erased.
- Each measure is numbered for easy reading.
- Solo capability
- Block edits are highlighted.
- Tie notes together for musical continuity.
- Name of note pointed to is constantly displayed.
- Jump to any point in the score instantaneously.
- Memory remaining clearly displayed, however you will have plenty of memory even for the most demanding piece.
- Help menu makes manual virtually unnecessary.
- LYRA is 100% software, no need for extra hardware unless you want more power.
- Music easily saved to tape or disk.
- Requires 64K and mouse or joystick.

LYRA (Disk only) #LY122 . . . . . **$54.95**

LYRA OPTIONS

These LYRA options are **not** required. They are provided for those wishing additional flexibility.

LYRA CONVERT
A program to convert MUSICA 2 files to LYRA files.
(Disk) #LC164 . . . . . **$14.95**

VERSION UPDATE
To receive the latest version of LYRA return your original disk. #UP162 . . . . . **$10.00**

LYRA MIDI CABLE
A cable to connect your computer to your MIDI synthesizer.
#MC158 . . . . . **$19.95**

LYRA SYMPHONY 12 ENHANCER
Lets LYRA play all 8 voices through SYMPHONY 12.
(Disk) #LS177 . . . . . **$19.95**

LYRA LIBRARY
A collection of 50 songs ready to play for hours. Most have 7 and 8 voices. #LL137 . **$39.95**

SYMPHONY 12
A real hardware music synthesizer, lets LYRA play all 8 voices in stereo.
(T or D) #SY149 . . . . . **$69.95**

COCO MID Seq/Editor
A professional quality MIDI interface for MIDI synthesizers.
(Disk only) #CM147 . . . . . **$149.95**

MUSIC LIBRARY
A collection of over 900 songs. When used with CONVERT, it gives an incredible LYRA library. Each volume 100 songs.
(T or D) #MLXXX **$29.95**

COCO MAX is a trademark of Colorware.
ORCHESTRA 90 is a trademark of Radio Shack.

We accept CASH, CHECK, COD, VISA and MASTER CARD orders.
Shipping and handling US and Canada $3.00
Shipping and handling outside the US and Canada $5.00
COD Charge $2.00
Illinois residents add 6¼% sales tax.

Speech Systems

38W255 DEERPATH ROAD
BATAVIA, ILLINOIS 60510
(312) 879-6880

LYRA LIBRARY - C. Clark Rulaford

C. Clark Rulaford is the genius behind a majority of the MUSICA LIBRARIES and LYRA LYBRARY. His 15 inch woofers have made him a popular guy in the neighborhood and the local music store loves him (RP)

The first thing I'd like to do is thank all of you that have purchased MUSIC LIBRARY and LYRA LYBRARY. Thank you! And yes, there's more to come for LYRA uses. The first LYBRARY "Supplement" FIFTY YEARS OF POP MUSIC is one full disk (68 granules - about 90 minutes playing time)

LYRA LYBRARY SUPPLEMENT 1

TAKE 5	IMAGINE	THE TWELFTH OF NEVER
SUDDENLY	EBB TIDE	JUST AS I AM
CHARIOTS OF FIRE	AMERICA (N DIAMOND)	THE LONNIE FALK MEDLEY
NOLA	SCARBOUROUGH FAIR	SLEEP WALK
BILLIE JEAN	BEAT IT	ONE MORE NIGHT
NIGHTSHIFT	RISE	BEYOND THE SEA
CARIOCA	AT THIS MOMENT	AFRICA
ROSSANNA	THE GREATEST LOVE OF ALL	

ALSO SPRACH ZARATHUSTRA (2001)
THE GREATEST LOVE OF ALL

LYRA LYBRARY SUPPLEMENT 2

For you classic buffs, you have not been forgotten, Supplement 2 is almost ready. I just finished the TOCCATA from Widor's 5th Organ Symphony. That piece is 10 granules and represents about 40 hours labor with the mouse! I did it in three parts then appended them into one file. If I had it to do all over again, I would do it one page at a time (there are ten); the result is worth the effort.

Also completed is SUITE GOTHIQUE OP. 25 by Leon Boellmann. This consists of four selections, one of which is "Priere a Notre Dame" You may recall that this was sample file supplied with MUSICA 1. There's more Bach on the way, and then there's this music store I found that has more sheet music than I have...???

SYNTHESIZERS: I don't know which is the most popular synth, but there seems to be a lot of Casio CZ-230S's out there. I have one and it's a good one to start with even though it will play only 4 notes at one time (this has been taken into account with all of my LYRA files), and misses a note now and then. If you have one and want details on how to disassemble it's disgusting auto shut-off feature, contact me through Speech Systems. If you have two of them, you can play all 8 LYRA channels; channels 1 to 4 on one synth and 5 to 8 on the other.

As supplied, LYRA LYBRARY contains imbedded commands to control the voices of the CZ-230S on MIDI channels 1-4. These channels contain the notes that would be used if I were using MUSICA. Note that none of the LYRA LYBRARY songs are songs that have been "converted" from MUSICA. The voices are actually in voices 1348 or 1458 etc. "CONVERT" puts MUSICA into voices 1234! Beginning with Supplement #1 I am also including commands for the FB-01 in all eight voices.

The YAMAHA FB-01 is a great under $400 synth. It has no keyboard, but then I already have 2 others that do (No, I don't play keyboard worth a darn, that's why I spend so much time with LYRA). It takes a little time to learn how to program its 8 push buttons; but once you get the hang of it, it's awesome. It's roughly equivalent to 8 DX-100's but they don't talk the same language as far as voice programming goes. Does any one out there have COCO patch editor for the FB-01, CZ-230S. The DX-100 doesn't need one, however, the DX Librarian is a good investment.

If you have an FB-01 you will want to create a configuration based on memory number 18. Change the bank number to 1 or 2, and then move the voices listed in the instrument table to that voice bank.

Mr. Rulaford has done an outstanding job in developing LYRA LYBRARY a collection of 50 songs that are 7 and 8 voice masterpieces ($39.95 & $3 P&H). For those of you who already have LYRA LYBRARY, the Supplements should be of interest to you. ($19.95 & $3P&H).

MIDI MODES

The following is an excerpt from AFTERTOUCH, a YAMAHA newsletter. I think the information will be useful to many. If you are interested in more MIDI information, we suggest ***UNDERSTANDING MIDI 1 & 2.***

As information travels down a MIDI cable, it may be sent to (or through) a number of instruments; but each instrument may respond to this information differently, depending on how it has been set to operate. In other words, MIDI instruments have a number of different modes of operation, and these modes determine how the instrument will react to MIDI information. Along with MIDI channels, the MIDI modes are the most important elements that contribute to MIDI's ability to perform musical slight-of-hand.

Most basic MIDI information (such as a Note On or Note Off) comes complete with and informational flag that assigns it to one of the 16 MIDI channels. For instruments receiving this information, there are two possibilities- either the instrument will be assigned to recognize and respond to information on one specific MIDI channel, or it will be assigned to respond to all MIDI information, regardless of channel. This second condition is called OMNI.

When an instrument is not set up in OMNI mode, it responds only to information on the MIDI channels to which it is assigned. In addition, it may respond to this channel information in different ways, depending on whether it is set up to act like a POLYphonic instrument of MONOphonic instrument.

All in all, there are found MIDI modes-four different ways that an instrument may respond to incoming MIDI information. These four modes are specified by different combinations of the three MIDI mode messages outlines above: OMINI, POLY, and MONO. The combinations are pretty obvious, based on the simple conditions: An instrument can be in OMNI or not, and it may either POLYphonic or MONOphonic. With these conditions in mind, the four MIDI modes are easy to understand. There they are:

Mode 1: OMNI ON, POLY. An instrument in Mode 1 will respond to MIDI information sent over any of the 16 MIDI channels. This is sometimes call OMNI mode.

Mode 2: OMNI ON< MONO. This mode assigns MIDI information sent over any of the 16 MIDI channels to one voice. When set in this mode, an instrument will always play monophonically, no matter how much information is being sent over the various MIDI channels.

Mode 3: OMNI OFF, POLY. In this mode, an instrument will only respond to the MIDI information being sent on the channel to which it is assigned. Mode 3 is also known as POLY MODE

Mode 4: OMNI OFF< MONO. In this mode, an instrument will only respond to MIDI information being sent on the channel to which it is assigned, and it will respond to that information monophonically. Mode 4, also known as MONO mode, is most often used in multi-timbral instruments, where each voice can be assigned to a separate MIDI channel.

Since most synthesizers today are polyphonic, Mode 2 (OMNI ON< MONO) is least common of the four. Mode 3 (OMNI OFF, POLY) is the most common, especially when number of instruments are being used with a sequencer.

UNDERSTANDING MIDI 1 & 2

VOLUME 1. If you are not familiar with MIDI, this book will be of great interest to you. Even if you have worked with MIDI for some years, we think the book contains much good information as well as names and addresses of further MIDI sources. This book is a special 82 page special edition of *MUSICIAN* magazine that deals exclusively with MIDI. $3.95 plus $3 P&H.

VOLUME 2. Just when you thought you knew it all, along comes another issue of Understanding MIDI, 100 pages full of information on the latest developments in MIDI gear. Some of the topices covered in this all NEW issue are:

MIDI EFFECTS
MIDI GUITARS
MIDI PERCUSSION
THEORY OF SAMPLING
AUDIO MIXING
MIDI MAPPING MIDI UPDATES

plus lots more on sequencing, recording and controlling MIDI information.$3.95 plus $3 P&H.

SPEECH SYSTEMS
38 W 255 DEERPATH ROAD
BATAVIA, ILLINOIS 60510
(312) 879-6880

First Class