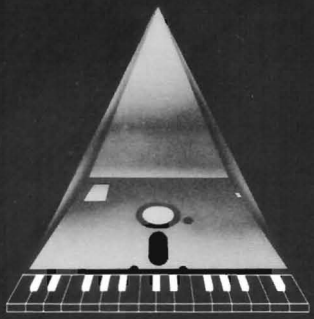

STEINBERG

pro16

INSTRUCTION MANUAL

pro16

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INTRODUCTION

pro16 is a professional sequencer program that will turn a Commodore 64/128 into a MIDI-based digital recording system, all the features of which are briefly listed in **Section 1**, and than explained later in detail in **Section 5.**

If you just want to dig in and get a feel for the program, go straight to **Section 3**. If you need help hooking everything together, go first to **Section 2.**

The basic concept behind composing with **pro16** is the modular method employed by most programmable drum machines:
build a song a piece at a time.
The repetitive nature of pop music lends itself naturally to this treatment, where a song may be made up of, say, a couple of verses fundamentally identical to each other, followed by a chorus, then another verse or two and another chorus, a bridge, and so on. **pro16** allows you to work on `pieces´ of a song anywhere from one to sixty-four bars in length.

Let´s take an example. Say your verse is 16 bars in length. You may decide to work on it in four smaller segments of 4 bars each, building up each track like a 16-track tape recorder until each segment sounds just the way you envisioned. Maybe you like what you played, except for the program patch. No problem, no re-recording necessary, just change the synth´s sound. When you´re satisfied, move on to the next segment of 4 bars, where again you have a whole new 16 tracks to play with. (It is these segments of variable bar-length that we will call `sequences´ here). You may feel that patterns recorded on one track in one sequence might be useful elsewhere, maybe transposed up a fourth or fifth. Again, no problem, copy that track from that sequence to another track in another sequence and then transpose it, all with just a few keystrokes. When you have a sufficient number of sequences ready, you can arrange them in order as steps in your song.

Here´s where MIDI-recording surpasses the trusty old tape recorder:
editing. Say you´ve decided suddenly you want to repeat a verse at a particular spot. Again, no problem, no need to re-record the whole song,or even think of splicing; by tapping just a few keys you can insert the sequences comprising the verse at those steps in the song where you want the verse added.

1. FEATURES - WHAT pro16 CAN DO

• RECORD 16 DIFFERENT TRACKS PER SEQUENCE.
• RECORD 64 DIFFERENT SEQUENCES.
That means up to 1,024 different tracks!

• REARRANGE THESE SEQUENCES INTO SONGS OF UP TO 256 STEPS.
(In practical terms that means you can have a maximum of about 4 or 5 songs of 50 or 60 steps each in the Commodore memory at any one time), and you can

• SAVE ALL YOUR SONGS ON FLOPPY DISKS.
• INSERT OR DELETE SEQUENCES AT ANY GIVEN STEP WITHIN A SONG.
• PUNCH IN/PUNCH OUT.
• AUTO-CORRECT WHILE RECORDING OR AFTERWARDS,
adjustable all the way from 1/4 notes up to 1/64 note triplets and realtime.

• RECORD IN REALTIME WITH COUNTDOWN LEAD-IN, OR IN SINGLE STEP MODE
• COPY TRACKS, COPY COMPLETE SEQUENCES, OR COPY JUST SEQUENCE PARAMETERS
(such as MIDI-channel assignment and tempo) from one sequence to another.

• TRANSPOSE INDIVIDUAL TRACKS, OR ENTIRE SEQUENCES.
• CHANGE THE TEMPO OF INDIVIDUAL TRACKS, SEQUENCES OR OF ALL SEQUENCES WITHIN A SONG.
• SEND EACH RECORDED TRACK (1-16) TO ANY MIDI-CHANNEL (1-16) YOU WANT.
• SOLO JUST ONE TRACK.
• MUTE ANY TRACK.
With 16 tracks to play with, gives you a lot of room to try out different parts.

• RECORD VELOCITY (DYNAMICS). ALTER VELOCITY
of a recorded track up or down, or level it off completely. pro16 visually displays the velocity of each recorded track.

• RECORD PITCH-BENDING.
(set quantizing to a larger number for higher resolution).

• RECORD AFTER-TOUCH.
Or, if you don´t need it on a particular track, leave pro16´s after-touch recording capability turned off and save memory.

• RECORD SOUND-PATCH CHANGES,
and let pro16 switch a given synth from one sound to another at the point you pre-determine.

• SYNC UP TO DRUM MACHINE
with either 24, 48, or 96 pulses per beat.

• SYNC TO TAPE AND SYNC FROM TAPE
Use only one track of your tape recorder to drive all your MIDI-instruments at once. If you have only one synth you can layer sounds in perfect time: have the sync track trigger the sequencer to play the same part on the same synth, but with a different sound.

• MIDI-SONGPOINTER
information is received from Roland SBX 80, TR707, SYNC Tech SMPL-LOCK and other systems, enabling you to synchronize a song from points other than the beginning.

2. INITIAL HOOK-UP

1
Turn everything off. This may not be necessary, but if you have a bad cord, or if you short some pins while plugging a cord in the wrong way, you could blow some integral part, requiring a trip to the repair shop, a wait of several weeks, and a lightening of your wallet.

2
Gently insert the STEINBERG MIDI-INTERFACE into the right rear slot (expansion port) of the Commodore 64, printed side up. It´s best to look around the back and line up the contacts visually, so that you don´t break anything off.

3
Connect one MIDI-cable from the master keyboard MIDI-out to the STEINBERG INTERFACE MIDI-in. Another MIDI-cable from interface MIDI-out to keyboard MIDI-in. If you have a second synthesizer or an expander module, connect a third MIDI-cable from the second MIDI-out on the STEINBERG INTERFACE to the MIDI-in of your second device. If you have more than one keyboard you´ll be playing from into the sequencer, you might want to think about a MIDI-switching box, or else you have to do a lot of un-plugging and re-plugging, which, as we just said a moment ago, isn´t such a great idea. In either case, the idea is that the signal from whatever keyboard you play to record has to get from its MIDI-out into the interface MIDI-in.

4
If you have more synthesizer-expanders to hook up, you can go from the MIDI-thru from one of the synths you´ve already hooked up into the MIDI-in of the expander module.

5
Hooking up your drum machine to the rest of the system so that everything runs in sync is not difficult. But depending on the capabilities of your equipment there may be several different ways of doing it. And you may want to do it differently at different times depending on the particular song project you´re working on. We count four possible ways, each of which we´re about to describe in some detail. But to keep things simple, we suggest you try the first for now, and read the rest at your leisure. As soon we´ve got the drum machine hooked up in one of these four ways, we can move on to loading the program and recording something. In fact, since **pro16** has´ its own metronome, you may prefer to hold off with the drum machine until later anyway. If so, you could straight go to **Section 3** (Simplified Instructions) or **Section 5** (Detailed Instructions), and come back here another time.

3. SIMPLIFIED INSTRUCTIONS

In a nutshell, here is how **pro16** works:

1
To record: move the cursor to the track you want to record and press **<R>**. Wait through a two-bar countdown, and play! **pro16** will automatically start playing back what you´ve just recorded. To stop playback, press **<RUN/STOP>.**
To do an overdub, move the cursor to the next track and press **<R>** again. After a two-bar countdown, start playing together with what you have already recorded.

2
To change **anything** under the cursor (that is, to change any of those many parameters on the screen that you can move the cursor over, such as tempo, time signature, MIDI-channel, or auto-correct value), strike **<F1>** to increase or **<F3>** to decrease.

3
To change steps within a song, press **<F5>** to advance or **<F7>** to go to an earlier step.

4
To change the number of the sequence you´re presently working on at your present step, press **<SHIFT><F5>** to increase or **<SHIFT><F7>** to decrease.
In other words:
To make a change under the cursor: **<F1> <F3>**
To change step number: **<F5> <F7>**
To change sequence number: **<SHIFT><F5> <SHIFT><F7>**

4. THE BASIC IDEA: TRACKS, SEQUENCES, STEPS, SONGS

Let´s discuss a few fundamental terms at this point, and try to get the total picture. Our eventual goal is to compose songs, and in the process we deal with tracks, sequences and steps.

TRACKS. **pro16** makes16 tracks available in each of its 64 possible sequences. If you followed our instructions just now (Section 3-1) and recorded one track and then overdubbed a second track, then what you should see on the screen is information about the 16 different tracks that make up sequence 1. (The information in this case is that two of the boxes above the numbers of the tracks you recorded turned from green to white, indicating something´s there). You didn´t have to give the sequence a name (as some other sequencer programs require), it was always called sequence 1 for you on start-up. Look at the ribbon of numbers reaching from top to bottom on the far right of the screen display. The number appearing in the very middle of that ribbon (in the white section) is always the number of the current sequence, that is, the number of the sequence you can work on at the moment. Whatever recording you do is always done on one specific track at a time within a specific sequence whose number is displayed here in the middle of the ribbon. The number in white off to the left of the ribbon is the number of the present step within a song. But before we get ahead of ourselves talking about steps, let´s make sure we understand what a sequence is within the context of **pro16**.

SEQUENCES. 'Sequence' here means: a segment of a song. These segments can be longer, consisting for example of an entire verse 16 bars in length, or they can be shorter, such as 4 seperate sequences, of 4 bars each, making up the same verse. On start-up, each of **pro16**´s 64 empty sequences are pre-set to a default value of 4 bars in length, but you can change the bar length of each sequence seperately by first calling up that sequence number, and then moving the cursor over the LENgth box and pressing <F1> or <F3>. Furthermore, in each of this song-segments we´re calling sequences, you can at any time choose to use up to 16 different tracks.

The basic idea is that you built a song by stringing a succession of sequences together.

pro16 is flexible. It gives you three different ways to call up the sequences you want to work on. As we already said in the section on tracks, the number of the current sequence, that is, the sequence you can work on now, appears in the middle of the ribbon on the far right of the screen. One way to change that number is to press <F6> (<SHIFT><F5>) to raise it or <F8> (<SHIFT><F7>) to decrease it. This is the way you´ll use most of the time. A second and third way that you´ll want to use at other times are described in Section 5-22 and 5-24.

STEPS. Here we are not talking about single-step recording of one note at a time (see Section 5-11 for that), but about placing whole sequences in a particular order within a song. As we mentioned a few paragraphs ago, the number of the current step appears in the white field just to the left of that ribbon of sequence numbers on the far right of the screen, and by current we mean the one you can work on now or effect some kind of change on now. Move to a later step by pressing <F5>, return to an earlier step by pressing <F7>.

The following little exercise should make the basic idea clear of how you can build a song by starting with tracks within sequences and then linking the sequences together by placing them in a particular order at particular steps within the song.

We´re going to record one verse of "Twinkle, Twinkle, Little Star" using three different sequences of two bars each.

Set the number of the current step to step 1. (press **<F5>** or **<F7>** as necessary). Let´s use sequence 1 as our first sequence. (Press **<F6>** or **<F8>** as necessary to get sequence number 1 to appear in the middle of the ribbon). If you have any tracks recorded here (boxes above track numbers white instead of green), either erase them (Section 5-9) or mute them (Section 5-14). Set the bar length to 2 for this sequence. (Move the cursor over the **LEN**gth box and press **<F3>** a couple of times). Make sure the volume on your monitor or TV is loud enough to hear the metronome. Press **<R>** on any free track, wait through the 2-bar countdown, and play the first seven notes of the tune (C-C-G-G-A-A-G...). Stop playback by pressing **<RUN/STOP>**, and move to step 2 (one tap on **<F5>**). Select sequence 2 to work on by pressing **<F6>** or **<F8>**. Again move the cursor over the **LEN**gth box and change the pre-set default length for this sequence from 4 bars to 2 by pressing **<F3>** twice. Move the cursor to a free track and play the next seven notes of the tune (F-F-E-E-D-D-C...). Press **<RUN/STOP>**. Move to song-step 3 by once more pressing **<F5>**. Place sequence 3 at step 3 by again pressing **<F6>**. Again adjust the length to 2 bars, and record the next seven notes in the same manner as before (G-G-F-F-E-E-D...). At this point your recording is done for this verse. Move to step 4 (**<F5>**) and place sequence 3 here (**<F6>/<F8>**) at the fourth step in the song. Advance to step 5 (**<F5>**), and set sequence 1 here (**<F8>**).Move to step 6 (**<F5>**), and place sequence 2 here (**<F8>**). Let us for the sake of this exercise consider the song finished at this point, so move one step beyond the end of the song to step 7 (**<F5>**) and tell **pro16** this is the end of the song by setting sequence number zero here (**<F8>**). Now to play back the entire `song´ move back to step 1 by pressing **<F7>**, then switch from sequence mode to song mode (move the cursor over the **MDE** box and press **<F3>**), and finally, press **<RETURN>**.

If you wanted to, you could now go to step 8 and start working on a whole new song beginning with sequence 4 or any of the other empty sequences from 4 to 64. (Remember first to return to sequence mode). And once you´re done with that song you can close it off by placing sequence zero in the final step, and then start working on a new song at the very next step, and so on, until all your available steps (255) and sequences (64) are used up.

So it should be clear by now what all those numbers are doing on the far right of the screen. The ribbon, which you can visualize as an endless loop with 256 places on it, is an electronic notepad. At any given time you can view 25 lines of it through the `window´ of your screen, where it give you an overview of which sequences you have coming down the line in what order. You write on this electronic scratchpad in only one place at a time, in the white field where the current step and current sequence numbers are displayed. But you can move to any part of the loop to see whats on it, that is, you can move to any step along the way, by pressing **<F5>** or **<F7>**.

5. DETAILED INSTRUCTIONS

SECTION 5-1 PREPARING A BLANK DISK TO HOLD YOUR COMPOSITIONS

Before you even load the program, it´s not a bad idea to `format´ a blank disk (using the standard Commodore 1541 format), so that once the **pro16** program is running you´ll have a disk ready for saving your compositions. The blank disks you pull out of a new box are not formatted, for each computer company uses its own method of formatting a disk and storing information on it. To format a disk now, flip up the door on the front of the disk drive, and insert a blank disk. Use one that has nothing on it that you want to keep (for this procedure will completely erase anything on it). Insert the disk into the slot, label up, the side with the two smaller, rounded notches first. Push it in all the way, and then pull down the door until it catches. Now type the following line on the C-64 keyboard, paying special attention to copying the punctuation perfectly:

OPEN 1,8,15,"N:COMPOSITIONS 1,A1"

Now press the **<RETURN>** key. The initial chattering noises you hear emanating from the 1541 are normal. This process of formatting ordinarily takes the drive about 80 seconds, during which time the red light on the front of the drive will stay on and you´ll hear gentle whirring sounds as the disk spins inside. Once the red light goes out, you can type the following line to make sure everything went all right:

LOAD"$",8

And press **<RETURN>**. After the message **READY** appears, type **LIST** and press **<RETURN>**. If all is in order, you should see the following on your screen:

0 "COMPOSITIONS 1 " A1 2A
664 BLOCKS FREE

In formatting your disk ("NEWing" it, thus the abbreviation "N" in the command) you could have called your disk anything you wanted up to 16 letters in length. The A1 is the disk ID, and can be any two characters of your choosing. Use a different ID for each disk. The 2A indicates this disk was made on a disk drive with operating system version 2A, the operating system of all Commodore 1541s.

There is also a short-cut way of formatting a blank disk from within **pro16**, and that short cut, together with order disk commands, will be explained later in Section 5-27.

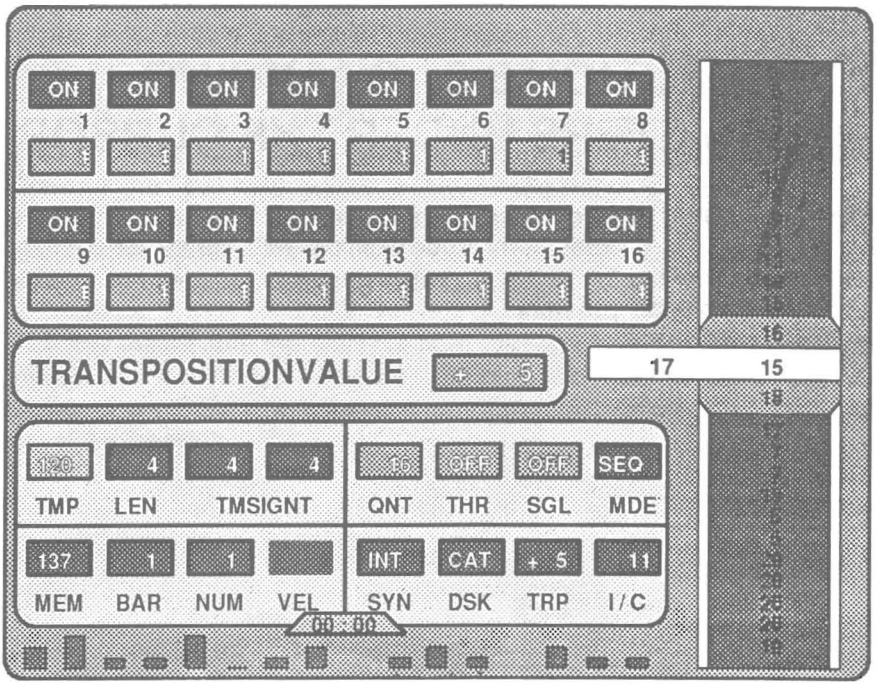
SECTION 5-2 LOADING THE PROGRAM

Assuming you've already made all the proper connections between the computer, interface, synchronizer, and MIDI-instruments as described in Section 2, now insert the **pro16** program disk in the 1541 all the way, bring the drive door down until it clicks, type exactly this:

LOAD"*",8,1

and press the **<RETURN>** key. After about a minute, you will see the **pro16** display screen appear.

SECTION 5-3 pro16 AT A GLANCE



SECTION 5-4 MOVING THE CURSOR

The cursor is that flashing thing on the screen, found initially in the upper left corner, vaguely reminicent of a UFO. You can move it around the screen, and then change the things in the boxes that it´s `hovering´ over. Take a look at your Commodore keyboard, lower right, and you´ll see two keys marked **CRSR** with arrows pointing in various directions, and next to these two keys a larger one marked **SHIFT**. Press the key with the arrows pointing left and right by itself, and then together with the SHIFT-key, and watch it move left. Try the other cursor-key by itself, and then together with the SHIFT-key and watch the cursor behave in a similar manner. Ignore for amoment the different messages appearing in the middle of the screen, and just play around with moving the cursor about the screen to get a feel for it. In time using these keys to move the cursor will become second nature.
A further aid to moving the cursor is the key **<T>**. Press **<T>**, and you´re immediately on track one.

SECTION 5-5 CHANGING PARAMETERS UNDER THE CURSOR

This is easy. Press **<F1>** or **<F3>** (Commodore keyboard far right): **<F1>** to increase, **<F3>** to decrease. Try it for example with the cursor over the **THR**u box. Either tap the key to increment in steps of one, or hold it down to zoom to the number you want.

SECTION 5-6 NON-CHANGEABLE DISPLAY PARAMETERS

A few boxes, those in the lower left of the screen, display parameters which you cannot change.These change automatically to let you know some things it´s helpful to know.

MEM tells you how much room you have left inside the Commodore itself for your composition. With pro16 you begin with 137 blocks corresponds to about 15,000 MIDI-events, ore somewhere around 8,000 notes more or less, depending on how much use you make of memory-hungry features like pitch bend, moduation wheel, and higher quantize values (e.g.96).
In the unlikely event you run out of c-64 memory while recording a track, only that last track will not be recorded. You can make a little more room by doing a bit house-cleaning, going back and erasing whatever tracks you can decide you don´t need.
By the way, the size of the blocks of remaining memory in the C-64 as listed here is not the same as the size of the blocks of available space as listed on a disk.

BAR and **NUM**. The purpose of these two display parameters is to let you know where you are within a given sequence during playback or recording. Play back any sequence (by pressing <RETURN>, and you´ll see these numbers change. We´ll be coming back to these two display parameters when we treat single-step recording.

VELocity. Make sure the MIDI-out from your keyboard is connected to the MIDI-in of the computer interface, and play a few notes. Assuming your keyboard is veloscity-sensitive, the bar graph you see will reflect how hard you strike the keys.

(Someone unfamiliar with keyboard developments of the last few years may be asking himself why we're talking about velocity here, rather than dynamics or touch-sensitivity. Velocity is speed, so what does speed have to do with how hard you strike the keys? Simple. Keyboard design engineers decided to use velocity to determine how hard you strike the keys. Keys are levers, resting on a fulcrum. Push the exposed end of this lever down, and the other end goes up. That other end, which was making electrical contact with point A when at rest, move to contact point B when the key is depressed. The microprocessor within the keyboard measures the time it takes to move from point A to point B, andfrom the measurement calculates the velocity with which the key was struck. Naturally, the harder you strike, the less time it will take forthe end of the key to move from point A to point B, and your MIDI-velocity-data-number will be higher. The softer you strike, the more milliseconds of time it takes, and the lower your MIDI-velocitynumber will be. Velocity differences are most often translated by a synth's sound patch into diferences in loudness, but another sound patch could just as easily be set up in such a way that increased velocity would translate into a more open filter, for example, for increased treble. In any case, however you use velocity to affect your sound patches, the VEL box will display the relative differences in how quicklythe end of that lever goes from point A to point B.
Furthermore, there is another kind of touch sensitivity available insome keyboards in addition to velocity, namely pressure, or after-touch. Velocity data reflects how hard the key s are struck, pressure information reflects how hard they are held down).

The **VEL** box is strictly for signals coming into the computer interface. The velocity of already recorded tracks is displayed at the bottom of the screen during playback, and how to change the velocity of these tracks is discussed in Section 5-20.

SECTION 5-7 SET TEMPO, BAR LENGTH, AND TIME SIGNATURE OF SEQUENCE

Before recording the first track of your first sequence, you'll want to set a few parameters. How many beats per minute do you want your tempo to be? Press **<RETURN>** and turn up the volume on your monitor or TV to hear the metronome. Move the cursor over the **TMP** box and press **<F1>** to raise or **<F3>** to lower the tempo.

Next to the tempo is the box marked **BAR**, for bar length of the current sequence. You must choose in advance how many bars you want to record in one take, and you may select from 1 to 64 bars at a time. (Again, move the cursor over this box, and press **<F1>** to raise the number appearing there or **<F3>** to lower it). If you're not sure how many bars you'll need, you can always overestimate and later cut off what you don't need, by simply reducing the number of measures (**<F3>**) to what you actually used.

Time signature, which defaults to 4/4 on program start-up, is likewise changed by moving the cursor to the respective boxes and pressing **<F1>** to raise, **<F3>** to lower.

SECTION 5-8 HOW TO ADJUST QUANTIZATION (AUTO-CORRECTION)

Move the cursor to the box marked **QNT**, and press **<F1>** to increase the value or **<F3>** to decrease it. The value in the box is the note value to which **pro16** will round off the notes you record (both the beginning and end of the notes). On start-up **pro16** is set to automatically correct your playing to the nearest sixteenth note. The higher you set this number, the more in time´ you have to play . If you want to play triplets, use a quantize value of 6,12,24, or 48.

If you wish to play in realtime without any correction, set this value to0. You can still quantize afterwards to some other value between 4 and 96 by performing the procedure described in Section 5-16.

Another alternative with **pro16** is **HYPER-QUANTIZE**. This will help in cases where normal quantizing may have worked too accurately, cutting off the ends of notes that you may actually have wanted to hold out a split-second longer. To activate **HYPER-QUANTIZE**, move the cursor to the record track you which to smooth out, and press **<Q>**. You may do this while the sequence is playing back.

SECTION 5-9 HOW TO RECORD/ OVERDUB/ ERASE ONE TRACK

Another recording feature of **pro16** enables you to cut the count-in time to only one bar, if you like. Do this by pressing **<SHIFT> <C>**. To toggle back to two bars, press **<SHIFT> <C>** again. To suppress the lead-in altogether, go to screen page two (press **left arrow)** and turn the **PRE** box **OFF**.

To erase a single track, select that track (by moving the cursor to the track, press **<R>** just as if you wanted to record this track), press **<R>** and immediately thereafter press **<RUN/STOP>**. Notice that the box above that track number will have changed color from white (recorded) to green (blank).

pro16 offers a handy way to record tracks which consist of repeating lines. You only need to play that repetitive pattern once. Try this. Let´s say you want to record a staccato eighth-note bass line, for example. Select a track,press **<R>**, wait through the count-in, but this time play just the first few notes of the line, and immediately thereafter - and in tempo - strike the **<RUN/STOP>** key. This will cause whatever notes you did actually record to loop upon playback. (Playback is initiated by pressing **<RETURN>** again).

With **pro16** you can record only one track at a time, and only within one sequence at a time. (Section 5-3 pointed out where the number of the current is displayed; Section 5-21, -24, or -25 show you how to move to a different sequence). You can, however, copy a track to somewhere else, either within the same sequence or to another sequence altogether (see Section 5-17 on copying).

SECTION 5-10 PUNCH-IN /PUNCH-OUT

You can use the **<£>**-key to punch-in and -out of any already recorded track. First press the **<£>**-key, whereupon you´ll see a small **dot** appear on the screen to the right of the **THR** box. (Always check each time before you do a punch-in operation that this dot appears, for if it doesn´t, you´ll erase the track!). Now move the cursor to the track you want to punch-in and - out and press **<R>**, and you´ll hear the count-in, plus whatever has already been recorded. When you come to the point where you want to punch-in, press and hold down the **Commodore-key** (C-64 lower left) while you fill in the notes from your synth keyboard. Let the **Commodore-key** go at the moment you want to punch-out. Not playing will leave pauses. You can punch in and out as often as you like while the sequence is running the first time. If you want to try it over, again set the cursor to the right track and - very important - once again press the **<£>**-key, before pressing **<R>**.

SECTION 5-11 SINGLE-STEP RECORDING

Move the cursor to the box marked **SGL**, press **<F1>** to switch this box **ON**, move the cursor to the track to select the track to be recorded, and press **<R>**. The border of the screen will turn red, indicating you are in record mode, but there will be no count-in, since you won't be recording in realtime. Instead, **pro16** will wait.

Now each note you play will have the same time value as the value displayed in the **QNT** box. If you want to record a rest instead of a note, strike the space bar.
Let's consider a couple of examples. Say you want to play some sixteenth-note arpeggios. Once you've set things up for single-step recording as outlined above, set the **QNT** to 16 and press **<R>**. Let's assume you're using a piano-type sound. If you want the tail ends of the notes ring out, play them that way: play each note leisurely, release it, play the next not leisurely, release it, and so on. (if you play notes too quickly and too close together in single-step mode, **pro16** is programmed to interpret them as chords, so be sure to play notes intended as individual notes cleanly, with clear seperation between them). If you don't want the tail ends of the notes to ring out, play them in a staccato manner, and **pro16** will record them that way. To consider a potential problem, if you want your sixteenth notes to ring out, but all or some of them play back staccato nonetheless, **hyper-quantize** (move cursor to track and press **<Q>**) will ensure that all of them have the fulltime value you select in the **QNT** box.

What if it's staccato you want but you're not getting it? Say you want to record an even, staccato eighth-note bass line, but some of the notes are ringing out longer than you want. The solution is to do this. Instead of trying to record with a quantize value of 8, record sixteenth notes with sixteenth rests in beetween: that is, with **QNT** set to 16, play one bass note on your MIDI keyboard, release it, strike the space bare once, play the next bass note on the synth, release it, strike the space bar again, and so on. If that makes it too staccato, use hyper-quantize on the track, and that should round it out. If it still doesn't sound quite like you envisioned, maybe your problem is that the velocity of the notes you recorded in single-step mode was uneven. Fix that by moving the cursor to the appropriate track and pressing **<0>** (see Section 5-20 for more details on how to alter the dynamics of a recorded track).

One final point to consider is how you use single-step mode to record passages where the notes have varying time values, say a measure consisting of a quarter note followed by an eighth note, followed by an eighth rest, followed by four sixteenth notes and a quarter rest.
What you need to do first is ask yourself how much resolution you´ll need. What is the quickest, or shortest, note you´ll want to play? If it´s eighth notes, set the **QNT** value to 8. If it´s thirty-second-notes, set the **QNT** value to 32. If it´s sixteenth-note triplets, set the **QNT** to 24. In our example the shortest note is a sixteenth note, so we´ll set the **QNT** to 16.
By setting the **QNT** to 16 we are telling **pro16** that each measure will be divided into sixteen equal parts. One quarter note, or one fourth of the whole measure, makes up four of those sixteen equal parts. So to record the quarter note, press that note (this counts as 1) and while holding it down tap the space bar three times (this counts as 2, 3, and 4 out of sixteen). The next note to be played in our example is an eighth note, so press the next note and while holding it down tap the space bar once (counts as 5 and 6 of the 16). Let go of that note. Next, to play an eighth rest, simply tap the space bar twice (counts as 7 and 8 of the 16). To play the four sixteenth notes, play each one individually, releasing between notes. To record the final quarter rest, tap space bar four times.
In other words, when using single-step mode to record passages consisting of notes of varying time values, think of each note or rest as a multiple of that time value. If the shortest note is a sixteenth note, think of an eighth note as a succession of two sixteenth notes (1/8 = 2/16); think of a dotted eighth note, which has a time value 50% longer than that of a regular eighth note, as a succession of three sixteenth notes; think of a quarter note as a succession of four sixteenth notes. Then, play each note on the synth keyboard and, while holding each note down, count the initial striking of that note as one sixteenth part of the measure, and count each tap on the space bar asthe equivalent number of additional sixteenth notes needed to fill out the respective note.
This may seem a little confusing at the moment, but once you start doing it you´ll quickly get the hang of it. Once you have a little practice under your belt you´ll find that single-step recording with **pro16** is fast and easy to use, if you just remember what we said above:for arpeggios that are to ring out play the notes leisurely without running them together, and for staccato lines use a resolution twice as high as normal so that you can record rests between each note. An alternative to single-step recording for those hard to play passages is, of course, recording `live´ at a sharply reduced tempo, then playing back at the desired tempo. Or, something which is similar, recording a track at a half speed. Which brings us to the next section.

SECTION 5-12 RECORD A TRACK AT HALF SPEED

Strictly speaking, the half speed function which **pro16** offers is not a function of recording as much as it is a matter of altering a recorded track. The `true´ way to record a track at half speed is simply to cut the tempo in half by moving the cursor over the **TMP** box and holding down **<F3>** until you hit the desired number of beats per minute. But under certain circumstances, there´s an easier way. The circumstances are these: if what you want to record on this particular track is repetitive, so that the second half of the sequence is to be the same as the first half. If this is the case, you can leave the tempo of the track at the same setting that you´ll eventually want to play the track back at. Then simply record by playing at half speed. (If you´re mistake-prone, you may want to quantize downward, e.g. from 16 to 8, while doing this). Once you´re happy with what you´ve recorded, move the cursor to that track, and press **<6>.** This will double the speed of what you just recorded, and since what you just recorded will now be over in half the time, it will also loop once to fill out the sequence.

SECTION 5-13 PLAYBACK

To play back a recorded sequence, press **<RETURN>**. To insure that you won't be erasing any tracks unintentionally, check that the **REC** box shows **OFF**.

To stop playback, press **<RUN/STOP>**. You can continue from the exact point where you left off by pressing **<C>** for continue. Otherwise, to start from the beginning of the sequence again, press **<RETURN>**.

To play back an entire song, switch to song mode (SECTION 5-23) and, again, press **<RETURN>.** If nothing happens, maybe you're on sequence 0, which is only a place holder to mark the end of a song. Or perhaps you've jammed **pro16** through some kind of MIDI data error. If this is the case, strike the **<RESTORE>** key on the Commodore to accomplish a **pro16** system reset without erasing your compositions. You will then have

SECTION 5-14 MUTE/UNMUTE/SOLO A TRACK

When **pro16** first appears on the screen, the upper half of the display shows 16 pairs of boxes, one above the other, each pair identical except for the track-identifying number sandwiched in between. The upper box for each track will say **ON**, the lower box **1**. We´ll treat the lower box in the next section (5-15) on MIDI-channel assignment.

The upper box reveals the track status, wether **ON** or **OFF**. With 16 tracks to play with, **pro16** gives you a lot of room to try out different parts. If you want to mute a single track and try a new part on a new track without erasing the old one, move the cursor over the track status box (the ON-box)right above the track number of the old track, and press **<F1>** or **<F3>** to turn it **OFF.** Here it makes no difference which you use; with the cursor over the track status box, either **<F1>** or **<F3>** will work the same, like a toggle switch, repeated strikes turning the track on, off, on, off.

To mute all tracks but one, that is to solo a track, move the cursor over either the upper or lower box (it makes no difference) for the track you want, and press **<S>**, for solo. The **<S>**-key also works like a toggle switch. Alternate presses will turn solo mode on or off, so to get out of solo mode you´ll have to remember to press **<S>** a second time.

On program start-up, the track status box is green (blank), and turns white when something´s recorded on the track. Be aware that this upper box will turn white even if you went through the process of trying to record something on the track but didn´t succeed in doing anything but recording a long rest. Possible error: Did you forget to flip a switch to send the MIDI-output from the keyboard you´re playing to the MIDI-input of the computer interface? You can double-check whether anything is really recorded on one of these white tracks by looking for the velocity bar at the very bottom of the screen corresponding to this particular track. Or if a bar is there but you still don´t hear anything, maybe you forgot to tune in your receiving MIDI-instrument to the same MIDI-channel this track is sending. Which is what we´ll cover right now.

SECTION 5-15 HOW TO SEND TRACK OUTPUT TO ANY MIDI-CHANNEL

The lower box under each track number shows destination MIDI-channel. On program start-up the default value for all tracks is channel 1. To select some other MIDI-channel for a recorded track, move the cursor to the lower box for that track, and press **<F1>** to raise or **<F3>** to decrease the MIDI-channel number. Then make sure your intended receiving MIDI-instrument is in poly-mode and is likewise tuned in to that channel.

SECTION 5-16 HOW TO QUANTIZE A TRACK AFTER RECORDING

We already explained in Section 5-8 how to quantize while recording, that is, how to auto-correct slight timing variations that may creep into your playing as you record.

If you recorded in realtime, and you decide you want to use quantization after all, you can still do this: Move the cursor over the **QNT** box and press **<F1>** or **<F3>** to select the amount of resolution by which you want **pro16** to auto-correct the track. Next, press the **<£>**-key as with punch -in/-out. Finally, move the cursor over the track to select the track you wish to tidy up, and press **<RETURN>** without touching the Commodore-key. Relax, and when the sequence reaches the end, it will be freshly quantized.

We should again mention the hyper-quantize function, which serves to smooth out notes that may sound `chopped off´ for having been released a bit too soon. To ensure that all the notes recorded in a given track will have the full time value shown in the **QNT** display, move the cursor to the track in question and press **<Q>**.

SECTION 5-17 HOW TO COPY A TRACK OR SEQUENCE: WHERE TO?

There´s one thing you´ll always have to remember whenever you do any kind of copying. First ask yourself: where to? Place the number of the destination sequence into the **I/C** (insert/copy) box first.

1
Copy a track. Say, for example, you´re laying down some tracks within sequence 8 (that is, the number in the middle of the sequence ribbon is 8, as it is in the example in Section 5-3), and you just recorded a bass line on track 5 that you want to fatten up by doubling it an octave lower. First thing you do is move the cursor to the **I/C** box, press **<F3>** a few times to reduce the 11 to 8. Next, move the cursor to track 5 (either upper or lower box, it doesn´t matter) and press the numeric key **<1>** on the upper left of the Commodore keyboard. This will take what´s in track 5 of the current sequence and copy it into a temporary buffer. Then, move the cursor to your destination track, let´s say track 13. Now strike the **<1>** key again to ´drop` what´s in the buffer into track 13 of sequence 8. From here you can transpose track 13 down an octave as will be described in the very next section in just a moment.

2
Copy a sequence. To copy all the tracks from one sequence to another sequence, say from 8 to 18, move the cursor over the **I/C** box and select 18 (by pressing **<F1> or <F3>**) as the destination sequence. Make sure 8 is the number of the current sequence, using **<F5>/<F7>** or **<F6>/<F8>** as necessary to have the number 8 appear in the middle of the sequence ribbon. Finally, press key **<2>** and you´re finished.

3

Copy sequence parameters. Do this just as you would copy a sequence, pressing key **<3>** instead of <2>. It will copy no recordings, only parameters like tempo, time signature, sequence bar length, and MIDI-channel assignments. This function can be very handy if you use a lot of expanders on different MIDI-channels, but it can also be quite useful with a more modest set-up to help organize the way you work. For example, you plan ahead and decide that for all the sequences of an entire song you´d like to use tracks 1-4 for trying out various parts to be played by a CZ-101, so you leave these four tracks all turned to MIDI-channel 10, which is what you also tune your CZ-101 to receive. Next you want to reserve tracks 5-8 for working out parts to go out to a Poly 800, so you set the lower boxes for tracks 5 through 8 all to MIDI-channel 2 and you tune in the Poly 800 accordingly. Tracks 9-10 will be used to check out alternative parts to go to a MIDI-fied Mini-Moog receiving on channel 1, and you decide to spread the different drums of your Drum-Traks over the remaining tracks 11 through 16, each of these, and the drum machine itself, tuned in to MIDI-channel 16. This function **<3>** saves you from having to go to each MIDI-channel assignment box for each new sequence. Instead, you can set this all up once for sequence 1, then move the cursor to the **I/C** box to select which other sequences you will want to copy these parameters to, and then press **<3>** and **<F1>**, **<3>** and **<F1>**, as many times as you figure you´ll need for the course of the song.

SECTION 5-18 HOW TO TRANSPOSE A TRACK OR SEQUENCE

Move the cursor to the lower right of the screen to the box marked **TRP**. Press **<F1>** and hold it down. You'll see the numbers increase from +1 to +31, and only after that go from -1 to -31. Bring them back again by pressing and holding down **<F3>**. These are the numbers of half-tones by which you can transpose either individual tracks or entire sequences. To do one track, first set **TRP** to the desired number of half-tones up or down, then move the cursor to the desired track, and press the **<4>**-key at the top of the Commodore keyboard.

To transpose all the tracks within a given sequence by the amount of half-tones displayed in the **TRP** box, make sure your desired sequence is displayed in the current sequence area in the middle of the sequence ribbon, and press **<5>**.

SECTION 5-19 DOUBLE/HALF THE SPEED OF A RECORDED TRACK

These functions work only on recorded tracks. They're simple to understand once you try them out. Let's record something and see what happens.

Set up a track (as described in Sections 5-7 and 5-9) to record at a tempo of 90 bqm with a sequence length of 2 bars in 4/4 time. Now record a leisurely downward-walking bass line consisting of 8 quarter notes: C, B, A, G, C, B, A, G. Next move the cursor up to the track you just recorded, and press the **<6>**-key to double the speed. To listen to what happened, press **<RETURN>**. The series of 8 quarter notes becomes a series of eighth notes. Since the series of 8 notes you recorded is played back in half the original time,the sequence is automatically filled out by that same series looping over once again. Now with the cursor on the same track, press **<6>** again, and press **<RETURN>** again. Now the series of 16 eighth notes plays twice as fast, and loops, to become 32 sixteenth notes.

With the cursor on the same track, you can reverse the process by pressing the **<7>**-key to cut the speed of the track in half, which will also cut the total number of notes in half.

SECTION 5-20 CHANGE THE DYNAMICS OF A RECORDED TRACK

Move the cursor up to the track you want to change, and press either **<+>** to add to the velocity data recorded as part of that track, or press **<->** to substract from it, or press **<0>** to smooth it out to a flat 5o% of maximum possible velocity for each of the notes recorded on that track in that sequence.

(We already went into some detail on what MIDI-velocity is all about, so if you need a refresher on that, refer to Section 5-6).

To see how this works, go to a sequence where you´ve got two or three different tracks that were recorded from a velocity-sensitive keyboard. Play the sequence back and take a look at the very bottom of the display screen (not the VEL box, which is strictly for displaying velocity coming into the computer interface ´live` from your keyboard). Here you´ll find as many vertical bars bopping up and down as you have tracks recorded. Although these velocity bars aren´t numbered, they run continuously from track 1 on the far left through to track 16 on the far right. Choose a track to work on and move the cursor up to the corresponding track-status box. Now while the sequence is playing press either **<+>** or **<->** or **<0>** to see and hear what happens.

What´s going on? Although these three keys won´t allow you to edit the velocity of each individual note, they will allow you to roughly alter the overall dynamics of a track. The **<+>** or **<->** functions do this by adding or substracting ever-increasing amounts to the velocity values of all notes in the track, effectively shifting the entire track into another range as far as velocity is concerned; the subtle velocity differences from note to note are still maintained. The **<0>** function is much more drastic, working as a great flattener, removing all velocity distinctions between the various notes of a track. Be careful with **<0>**, for once you use it, you can´t go back. Any fine nuances you may have had from note to note will be gone for good. After that you can only raise or lower the velocity values of all the notes in the track to the same level.

SECTION 5-21 HOW TO SELECT SEQUENCE NUMBER

We ´ve already discussed exactly what we mean by `sequence´in our Introduction and in Section 4. In the illustration 5-3 we showed where the `current sequence number´ is displayed, namely in the white section of that ribbon of sequence numbers stretching from top to bottom on the right side of the screen. (The number just to its left, also against a white background, is the number of the current step within the song).

With **pro16** you have four different ways to select the current sequence number, and which way you choose depends on what you want to do.

One way is to press **<F6>** or **<F8>**, Do it, and watch the number of the current sequence increase (**<F6>**) or decrease (**<F8>**). Notice that the number in white off to the left of the ribbon, namely the number of the present step, will remain as it was. So use this way when you want to replace an old sequence with a new sequence at a particular step within a song.

The second way is actually intended for changing song-step numbers, but since each song-step number has a particular sequence tied to it, changing each of these may result in changing the current sequence number automatically at the same time. More on this in the next section. And more on the third and fourth ways in Section 5-24 and -25.

SECTION 5-22 HOW TO SELECT SONG-STEP NUMBER

Now press **<F5>** and hold it down. Watch the step-number (in white, just to the left of the current sequence number) rapidly increase, and also watch the ribbon of sequence numbers move from bottom to top at the screen.

You can think this function keys **<F5>** and **<F7>** as equivalent to the `**fast forward**´ and `**rewind**´ controls on a tape recorder.

Stop for a moment and try to visualize how this ribbon and these step-numbers are interrelated. The ribbon forms an endless loop, of which you can see a section of it as it passes through the `window´ of your display screen. Each sequence number takes up one place on that ribbon, and each place (or step) is numbered from 0 to 255. Where as you can see nearly a tenth of the ribbon at any given time, you can only see one of the step-numbers at a time, namely through that much smaller `window´ in white just to the left of the ribbon. To discover, for example, which sequence occupies place-, or step-number 25 on the ribbon, press **<F5>** or **<F7>** until 25 appears in the step-window, and look to see what appears to the right of it in the white sequence-window. On program start-up each place, or step, on the ribbon is filled by some sequence number between 1 and 64. Which sequence is where on start-up is arbitrary, but it doesn´t make any difference anyway since none of them are recorded. Step-number 25 happens to be occupied by sequence 7, but the programmer could have just as easily filled each slot with sequence 1. He decided to start off with four of each available number on the ribbon so that you could more easily visualize how the ribbon loops around, with 4 x 64 sequences taking up a total of 256 steps. You can change the number of any sequence at any step however you see fit.

Maybe another way of looking at it will help. Imagine this ribbon as a loop of recording tape which passes before the recorder´s heads (the white area), and which is marked by a code (the song-step numbers) that tells you where on the tape you are.

A little practice always helps to make things clear, so here goes. Let´s build a song, starting arbitrarily with sequence 10.

1
Press **<F5>** or **<F7>** to bring step number `00´ into the step-number window. (Computers only think in 0´s and 1´s anyway, so to them the first number is really 0).
2
Press **<F6>** or **<F8>** as necessary to select sequence number 10 on the ribbon at that step.
3
Record sequence 10 (as described in Section 5-9).
4
Press **<F5>** to bring step number `01´ into the step window.
5
Press **<F6>** or **<F8>** as necessary to select sequence `11´ on the ribbon at step 01.
6
Record sequence 11.
7
Say you wish to repeat sequence 10. Press **<F5>** to bring step `02´into the step window.
8
Press **<F6>** or **<F8>** to select sequence 10 on the ribbon at step 02.

And so on...

(A quick way to return to step 00 is by pressing **<CLEAR/HOME>.** Try it. Strictly speaking, **<CLEAR/HOME>** brings you either to step 00, or to the most recent step holding a sequence 0, whichever is closer. Sequence 0 cannot be recorded, it´s only a place-holder used to mark the end of a song. When **pro16** is running in song mode and it hits a sequence 0, it will come to a stop).

How to insert or delete sequences seamlessly and easily is handled in Section 5-24 and -25.

SECTION 5-23 SWITCH FROM SEQUENCE MODE TO SONG MODE

Move the cursor over the box marked **MDE** on the main display screen, and press **<F1>** to shift into song mode or **<F3>** to return to sequence mode.

SEQ here will cause a sequence to loop back into itself when finished playing back. (Stop by hitting **<RUN/STOP>**). **SNG** here will cause **pro16** to move to the next sequence on the ribbon just below the white section as soon as the current sequence is finished playing back.

Every time you record, **pro16** automatically reverts to **SEQ** mode. But you can change this on screen page two. To get to page two, press the **left-arrow** at the upper left of the Commodore keyboard. Then move the cursor to the **MDE** box (lower right), and press **<F1>** to turn **ON.** This will cause **pro16** to revert to song mode each time you finish recording a sequence (assuming, of course, that you're in **SNG** mode on the main screen page as well).

SECTION 5-24 INSERT A SEQUENCE INTO A SONG

Let´s say you´ve recorded all the sequences for an entire song, arranged the song by placing those sequences at the desired steps within the song, and then you decide, wouldn´t it be nice to add a bridge of about 4 sequences right in the middle of the song. Does this mean you have to go through a lot of work to move all the sequences from the second half a bit farther down on the ribbon? No problem. You can insert additional sequences in the following manner.

First choose which sequence you´ll want to insert. (These may be sequence numbers you havn´t even recorded yet). Put them, one at a time, into the **I/C** box by moving the cursor over the **I/C** box and pressing **<F1>** or **<F3>** as necessary to select the number of the desired sequence. Press **<F5>** or **<F7>** to locate the song-step where you want the new sequence to be. Finally, press **<F2>** (**<SHIFT>** **<F1>**). This will take the sequence number from the **I/C** box and place it on the ribbon at the present step within the song, thereby `pushing´ all the later sequences one rung down the ladder each. For example, the sequence that used to occupy step 25 is now at step 26, the sequence formerly at step 26 is now located at step 27, etc.

SECTION 5-25 DELETE A SEQUENCE FROM A SONG

To remove one or more sequences from a song, use **<F5>** or **<F7>** to locate the step where the first of the unwanted sequences is presently located. Then press **<F4>** (**<SHIFT> <F3>**) as many times as there are sequences you wish to remove. The remaining sequences at the tail end of the song will close ranks as the unwanted sequences disappear.

(The recordings contained in a deleted sequence will not be erased from the C-64´s memory, even if the number of that sequence no longer appears anywhere on the ribbon. You can still change your mind and use **<F6>** or **<F8>** to call it up again at any step. If you´re sure you do want to erase it, you need to summon the sequence in question into the current sequence number position at the center of the ribbon at some step, and then erase track by track as described in Section 5-9. This may seem cumbersome, but it is actually a safety feature: **pro16** allows no easy way to erase an entire sequence by mistake. There are only two ways to erase entire sequences that you have to watch out for:
1. Loading a song from disk without first having saved the one currently in memory, and **2.** pulling the plug.

SECTION 5-26 CHANGE THE TEMPO OF THE ENTIRE SONG

Move to the first step/first sequence in the song using either the **<CLR/HOME>** key or **<F7>.** Then move the cursor to the **TMP** box and select the desired tempo (**<F1>** / **<F3>**). Finally, press the **<9>** key. Each sequence on down through to the next `0´-sequence will receive the same tempo.

SECTION 5-27 DISK OPERATIONS

COM - command
CAT - catalog
LOD - load
SAV - save

Move the cursor over the **DSK** box. Pressing **<F1>** will move you up through this list. **COM** will allow you to perform any of 4 operations, the most important of which is formatting a disk. Let´s discuss this first , then **CAT**, **LOD**, and **SAV**, and finally the other 3 commands.

NEW - format this disk - prepare this disk to receive data. We covered this in some detail and also said some important things about disk care in Section 5-1. **pro16** offers an easier way of formatting a disk. Once you have loaded **pro16** and the **pro16** display is on the screen, insert a blank disk into the drive, move the cursor over the **DSK** box and select **COM** with **<F1>**, and then press **<D>**. The cursor will appear over a cross-like character in the middle section of the screen. Next press the **<N>**-key (for `new´) followed by a colon **< : >**. Then type in a name for the disk up to 16 letters in length. Follow this disk name with a comma, and immediately thereafter a two-character ID of your choosing. (Use different ID for each disk, otherwise you can confuse the drive and write over things you don´t really want to erase). Example: **N:MY TUNES VOL 1,X1** Press **<RETURN>** and wait about eighty seconds. In the first few seconds it will sound as if your drive wants to eat your disk, but this clatter is normal for the 1541. **pro16** also checks to make sure everything went all right, which it shows by displaying **"00,OK,00,00"** when the drive is finished. After this, press **any key** to bring **pro16** back to normal mode.

WARNING! Formatting a disk wipes out anything that was on it, so save yourself some agony by making sure each time you format that there´s nothing on the disk you wanted to keep. Additional safety can also be had by regularly making back-up copies of your compositions.

SAVE. It´s a good idea at least once an hour to save your compositions to disk, for some reason power went out on your computer everything in there would be lost. To save your song, move the cursor over the **DSK** box, press **<F3>** until **SAV** appears, press **<D>** for disk operation, type in a name up to 16 letters/characters in length, and press **<RETURN>.** If you´ve been working on a song, saved it once, make some changes to it, and decide to save it again under the same name, you´ll have to use the save-and-replace syntax before the song title, namely the at-sign immediately followed by a colon (**a:MY TUNE 1**). Never save anything onto the **pro16** program disk.

CATALOG. Move the cursor over the **DSK** box, press **<F1>** or **<F3>** until **CAT** appears, and press **<D>**. Immediately the directory or table of contents of the disk will be displayed on the screen, including information about how many blocks of disk space are still unused. Press **any key** to get back to normal mode.

LOAD. You can only load those songs that were composed and saved with **pro16**. To load one of your compositions from disk, select **LOD** in the **DSK** box, press **<D>**, type in the name of the song exactly as it appears on the disk (or the first few letters of the song name immediately followed by an asterisk **<*>**, and press **<RETURN>**.
WARNING! Whatever composition you just had in the computer at the time will be written over. If you want to keep it, do a save operation first.

pro16 will save or load only the entire contents of memory, and not just parts of it. If you want to combine sequences from different save operations, the only way to accomplish this at present would be to borrow a second C-64 and STEINBERG MIDI-Interface, and transfer sequences one at a time, track by track, using the MIDI-clock for synchronization as described in Section 5-28.

More **COM** commands: **INITIALIZE**, **VALIDATE**, **SCRATCH**. With **COM** in the **DSK** box, press **<D>**, then press **<I>** and **<RETURN>** to `initialize´ the disk drive. This is sometimes handy if your disk drive gets struck. This command will move the read/write head in such a way that may help it get `unstruck´. To `validate´ a disk, do the same thing as above, but only press **<V>** instead of <I>. This command will do house-keeping on a disk that has been used a great deal, potentially re-allocating blocks on the disk in such a way that all available space is indeed utilized. The `scratch´ command is used to erase unwanted files from a disk. After pressing **<D>**, type **"S:"** and the exact name of the file to be erased, and press **<RETURN>**.

If you change your mind about carrying through with any disk operation, press the **<RUN/STOP>**-key.

To erase a disk that has already been formatted, use the formatting command as described above (COM, <D>, N:...), but leave off the comma and the last two ID characters. Example: **N:MY TUNE VOL1**. Press **<RETURN>**.
Never disconnect the disk drive from the computer, as this can lead to a program crash.

To be able to erase all your recordings from the computer´s internal memory in one fell swoop without having to turn the computer off and reload **pro16** altogether, do this ahead of time: On start-up of **pro16**, and without recording anything, do a save operation. You can call this `song´ something like EMTY FILE. Than later at some point where you decide you want to clear the C-64´s memory and start from scratch, you can load this file from disk. This will put **pro16** back into the same condition as on start-up.

SECTION 5-28 SYNCHRONIZATION

Look at the box marked **SYC** on the bottom line of **pro16**´s main screen page. By moving the cursor to this box and pressing **<F1>/<F3>**, you can select from **INT**ernal, **MIDi**, and **EXT**ernal. These require a bit of explanation, which we´ll get to in just a moment, but in general what you select here determines whether **pro16** is the master timekeeper (**INT**) or a slave (expecting MIDI-clock-signals at the MIDI-in of the computer interface, or expecting external clock pulses at the IN jack of the synchronizer).
Now press the **left-arrow** (Commodore upper left) to reach screen page two, and look at the boxes on the lower left of the screen marked **IN** and **OUT**. What you select in the IN box determines the rate of clock pulses expected by **pro16** at IN jack on the synchronizer. What you select in the **OUT** box determines the rate of clock pulses sent out by **pro16** over the **CLK** (clock out) jack of the Synchronizer. Look at the box on screen page two marked **MID**. What you select here determines whether or not **pro16** will send MIDI-clock-signals out over the MIDI-out of the computer interface. To get back to the main screen display, press the **left-arrow** again.
Since this a lot of information to digest all at once, it probably won´t hurt to go over it again in a more leisurely fashion.

INT will set **pro16** to run on its own internal clock, making it the `master´ timekeeper and other devices `slaves´, which will have to be set to receive external clock signals from the **CLK** jack of the synchronizer. Every time you press **<RETURN>**, clock pulses will be sent out of this jack at the rate set on screen page two in the CLOCK OUT box, either 48 or 24. (Exception: when you press **<R>** in record mode, clock pulses aren´t sent out until after the two-bar count-in).

MID in the **SYN** box on the main screen page sets **pro16** to be run by external MIDI-commands and MIDI-clock-signals coming into the MIDI-in jack of the computer interface. You cannot record in this mode, only play back.
In the **EXT**ernal mode **pro16** will not move until clock pulses come in through the synchronizer´s IN jack, and **pro16** can process either 48 or 96 clock pulses per beat as specified on screen page two in the CLOCK IN box.
So much for theory, now let´s get down to practice, first syncing **pro16** to MIDI-drum machines, then non-MIDI-drum machines, and finally utilizing sync-to-tape.

MIDI-drum machines. The simplest way to use a MIDI-drum machine with **pro16** doesn't require synchronization, Record drum parts straight into the sequencer just as you would keyboard parts. You can do this in one of two ways. Hook it up directly to the MIDI-interface just as you would a master keyboard, and play the drum machine's keypad. Or hook things up in such a way that the drums are played through **pro16** from your master keyboard . This requires connections from the MIDI-out of the master keyboard to the MIDI-in of the computer interface, and from the MIDI-out of the interface to the MIDI-in of the drum machine. This may have the advantage of allowing you to play the drums dynamically directly from a velocity-sensitive keyboard. To hear the drum machine (or any expander played from a master keyboard through **pro16**), you have to set the MIDI-channel of that track to the same channel as the drum machine is set to receive over. If you want to turn this MIDI-thru function on, move the cursor to the box marked **THR** , and select the MIDI-channel with **<F1>** or **<F3>**. You probably will want to turn it off when recording from the same instrument as you are playing, otherwise you will hear doubled notes on a synth, or flams on a drum machine.

You may want to transfer some songs presently stored in your MIDI-drum machine into **pro16**. The easiest way is to transfer one sequence at a time. Select a sequence in **pro16**, then the pattern from your drum machine. Make sure the bar length of the sequences is the same. Then on the screen page two move the cursor over **MID** box at the bottom of the screen and press **<F1>** to turn on. This will enable MIDI-clock signals to be sent out over the MIDI-out jack of the computer interface: the MIDI-start signal is sent when the **<RETURN>**-key is pressed, MIDI-stop signal when **<RUN/STOP>** is pressed, and MIDI-continue when the **<C>**-key is pressed. Make a connection from the MIDI-out of the interface to the MIDI-in of the drum machine, and from the MIDI-out of the drum machine to the MIDI-in of the computer interface. Check with your drum machine manual on how to prepare it to be driven by MIDI-clock signals. Return to the main screen display of **pro16** by pressing the left-arrow again. Then select the track onto which you want to dump the drum pattern and press **<R>**. The green block you see flashing towards the lower right of the screen indicates that MIDI-commands or MIDI-clock signals are passing through the interface.

Non-MIDI-drum machines. You´ll have to decide whether you want **pro16** or the drum machine to be the master or the slave, set the **SYN** box on screen page one accordingly, then move to screen page two to the clock **IN** or **OUT** box to select the appropriate number of the clock pulses per beat depending on the capabilities of your drum machine. If your drum machine gives you a choice of several clock pulses, choose 48. Finally, press the **start/play** button on the slave first to put it in a state of readiness, and then on the master to kick things off.

The external clock output of some drum machines may not be hot enough to drive the synchronizer´s IN jack (with **SYN** = **EXT**). In this case you´ll have to give the signal a slight boost, either through a trigger box or some other means of amplification, such as a channel with a direct out on your mixing board that can be isolated from the mix. Otherwise you´ll have to make **pro16** the master and the drums the slave.

Sync-to/from-tape. When running in record or playback mode, **pro16** sends out 48 or 24 clock pulses per beat over the **TO TAPE** jack, depending on the setting on screen page two. Make a connection from the **TO TAPE** jack to the input of one track on your multi-track recorder. One of the outer tracks is fine. In most cases it is better not to use noise reduction, in others it may actually be better, in some cases it may make no difference at all, so let experience be your guide. With **SYN=INT** let the sequencer play a little, and adjust the level of the signal to about **+3dB.** Record the sync signal for slightly longer than the length of the song. Record no instruments in this pass, only the sync signal.

Rewind the tape, and now connect the output from the track you just recorded to the **FROM TAPE** jack on the interface. Set the **SYN** box to **EXT**, and press **<RETURN>**. The screen border will change to green to indicate playback mode, but **pro16** will not run yet. It will start with the first incoming pulse from tape.

Sync-from-tape gives you an easy way - especially in conjunction with the solo function - to `multiply´ your instrument(s). Get layered sounds on tape from only one instrument by using a new sound patch with each pass, or by using the same sound slightly detuned, or whatever your imagination

SECTION 5-29 MIDI-SONG-POINTER

For **pro16** to respond to MIDI-song-pointer commands, two boxes on the main display screen have to be set properly, namely **SYN** has to be set to **MID** and **MDE** to **SNG**, and in the middle of screen page two (press left-arrow) the box marked **SGP** must read **ON**. Then MIDI-song-pointer information has to come through the MIDI-in jack of the computer interface from some device capable of sending MIDI-song-pointer, such as the Roland SBX 80 sync box. MIDI-song-pointer is like a variable auto-locator. You won't need to do anything to **pro16** to tell it what measure to go to, for these external devices will do that for you. They read a time code from moving tape, and calculate how far into the song the tape is in terms of measures and beats. They send out a MIDI-message to the sequencer to get ready to start at a particular point in the song, which may be just a few beats.This gives the sequencer a chance to position itself and wait to kick in at the right moment. At the pre-arranged measure/beat within a song, the external device starts sending out the MIDI-sync-words (the 24 clock pulses per beat in MIDI-format) which the sequencer was waiting for. From that point **pro16** will run in sync with the tape.

This feature frees you from having to go to the beginning of the sync track each time you want to sync a new part onto tape from the sequencer. Run the tape anywhere, and within seconds the sequencer is right there with you.

SECTION 5-30 MIDI-DELAY

On screen page two (press **left-arrow**), you can delay the timing of each individual track by manipulating the values in the sixteen boxes on the top portion of the screen. You can also delay the clock pulses sent out from the synchronizer CLK jack, as well as the MIDI-clock signals sent out the computer interface, by whatever amount you set in the **DEL** box on the bottom of screen page two. Move the cursor to any of these boxes and press **<F1>** or **<F3>.** The numbers appearing there are to be interpreted as follows:

192	whole note
96	half note
48	quarter note
24	eighth note
16	eighth triplet
12	sixteenth note
8	sixteenth triplet
6	thirty-second note
3	sixty-fourth note

The amount of delay in real time depends on the tempo, but at whatever tempo you choose,48 units of delay will always amount to one quarter note. Delay values are global, that is to say, any track given delay will be delayed not only for one sequence but for th length of the entire song.

You might obtain some interesting echo effects by recording a part on one track, copying it to another track in the same sequence, introducing some delay to the copied track and perhaps reducing the velocity, and copying it again to yet another track but with a different amount of delay and velocity.

You may find MIDI-delay useful in compensating for certain sounds, especially some brass or string sounds, which may have such a long rise time in the attack portion of their envelopes that they seem to be coming in too late. To adjust, leave these tracks unmodified, but delay all the other tracks slightly to give the sounds with a slower attack the chance to catch up.

SECTION 5-31 INPUT FILTERS

In the middle section of screen page two (which you access by pressing the **left-arrow**) you have the opportunity to filter out undesirable MIDI-data from being recorded. For example, the Yamaha DX-7 keyboard is constantly sending after-touch information, even if the particular sound you're playing doesn't utilize after-touch modulation. Whatever you don't need, turn it off:

PLY stands for polyphonic key pressure, as on the Yamaha DX-1 and the newest version of the Oberheim Matrix-12, where each note played can receive a different amount of after-touch modulation. The DX-7 and most other keyboards do not have this feature, and so in most cases it should be turned off.

PGC - program change. Turn this **ON** if you want to be able to record sound patch changes. By the way, the easiest way to do this is to use a blank track set to the same MIDI-channel as the synth whose patch you want to change.

AFT - after-touch, or pressure. Leaving this on when you aren't using it will consume a lot of memory needlessly.

BND - pitch-bend.

SGP - song-pointer (see 5-29).

PC - permanent controllers. The numbers 1, 2, or 3 after the **PC** have no significance other than that **pro16** lets you select a total of three permanent controllers. The important numbers are the ones you put inside these boxes. If you don't want to filter out any permanent-controller data, set these to **00**. To prevent information from being recorded from a modulation wheel/lever, put a **01** in one of these three boxes. It seems all the manufacturers have agreed that permanent controller 1 will be the mod wheel, but other than that there is no industry-wide standardization, so you'll have to drag out the reference manual of each synth to discover the magic numbers to use when recording that synth.

SECTION 5-32 MISCELLANEOUS: MIDI-THRU, METRONOME, COUNT-IN

At the bottom right of screen page two (accessible with the **left-arrow** key), you´ll find boxes marked **THR**, **BEE**, and **PRE**, each of which you can turn **ON** or **OFF** by moving the cursor to the box and pressing **<F1>** or **<F3>**.

THR - Through. When this is on, the MIDI-out jack of the computer interface can become a MIDI-thru during recording, allowing you to play an expander from your master keyboard without having to re-plug your MIDI-cables.

Some master keyboards take the signals appearing at their MIDI-input and route them to their MIDI-out jack. In this case you will definitely want to keep **THRu** turned **OFF** (especially when recording after-touch information), or else you record everything double.

BEE - Metronome beep on/off.

PRE - Count-in before recording. If you don´t want the two-bar count-in at all, you can turn this OFF. If you´d prefer a one-bar lead-in, press **<SHIFT> <C>**.

MDE - See Section 5-23.

SECTION 5-33 HELPFUL HINTS

<Left-arrow>. Press this key to toggle back and forth between **pro16**´s main display screen and screen page two.

<RESTORE>. In the unlikely event that some kind of MIDI-data-error brings the program to a standstill, you can get moving again by pressing the **<RESTORE>**-key. This will reset **pro16** into the same state it was as on start-up, but without loosing you recordings.

<H> - Help. For a quick, on-screen review of the functions available from certain keys, press **<H>** once to turn the help line on, a second time to turn it off.

Some keyboards like the Prophet 2000, require MIDI-status-bytes. **<SHIFT> <S>** will send these out over all MIDI-channels.

Mono-mode on Casio keyboards. If you own a CZ-101 or other Casio MIDI-synth, and would like to utilize its solo-mode, press **<SHIFT> <M>**. This will ensure that the Casio stays in solo-mode when the sequence stops. **NOTE**: this switching to mono-mode affects all MIDI-channels. With some instruments (e.g. certain serial numbered DX-7´s) this may lead to notes staying on after the sequencer has stopped.

SECTION 5-34 TROUBLESHOOTING

Problem: You don´t hear what you think you just recorded on a given track.
Things to check: Play your master keyboard and look at the **VEL**ocity input box. If you see nothing there, you couldn´t have recorded anything. The track status box may have changed from green to white, but you only recorded rests. Check your connection from the MIDI-out of your master keyboard to the MIDI-in of the computer interface. To verify that you did record something, check the bottom of the screen with the sequencer stopped. Do you see a velocity bar graph in the spot corresponding to that track? If so, **pro16** will play it back. So check that you have a good connection going from the MIDI-out of the computer interface to the MIDI-in of the destination synth. If the cable is all right, we would suspect that the synth you want to hear playing back is not tuned in to the same MIDI-channel as is the track you just recorded (see 5-15 for MIDI-channel assignment). **pro16** records in omni-mode, that is, it accepts incoming data over any MIDI-channel. But each track of **pro16** plays back the recorded data over only the one channel to which that track is set, and this channel may be different for that track from one sequence to the next. If all else fails, you´ll have to check your audio connections, mixing board channel mute status, amp, etc.

Problem: You only hear some of what you recorded.
It is possible that the total number of notes all your recorded tracks are sending over a given MIDI-channel exceeds the total number of voices your receiving synth has available?

Problem: Your disk drive won´t load the program and seems to be stuck.
Try this. Take the disk out, type the following exactly: **OPEN 15,8,15,"I"** Then press **<RETURN>.** Finally, try loading the program again.

Problem: When punching in and out, some notes stay on unintentionally.
The reason for this is that digital recording is different from analog, and you may have punched in at a point where notes that were on had not yet received the message to be turned off. The simple way to avoid this problem is to play along with the part leading up to the punch-in point. As you release the notes in question, they will receive their necessary `note off´ commands.