Cassette
Software

Model PHT 6011
Computer
Music Box

Three programs that let you create music with
your TI-99/4 Home Computer.
■ RANDOM MUSIC — Plays music based on
scales or on harmonic patterns which you may
select.
■ COMPOSER — Allows you to enter songs, play
them, and save them to be played again.
■ ADVANCED COMPOSER — Allows you to
compose music using sophisticated techniques.

Requires the use of a cassette tape recorder (not
included) for loading the program contents into the
TI-99/4 Home Computer memory.

COMPUTER MUSIC BOX

Table of Contents

Texas Instruments

Author: Texas Instruments

Language: 99/4 BASIC

Hardware: TI-99/4 Home Computer
           Cassette Recorder
           Solid State Thermal Printer (Optional)

Media: Cassette

Computer Music Box provides you the opportunity to produce music
with your computer, regardless of your musical skills. Random
Music, one of the three programs in this package, does not
require any musical skills because you generate music by just
selecting the tempo, scale, and bass and chord patterns you wish
to use. The programs, Composer and Advanced Composer, allow you
to enter and play songs. Composer offers two methods for
entering your favorite melodies quickly and easily. One method
allows you to type the description of each note you wish to
play. The other method allows you to use the computer keyboard
as a piano. This method is also used by Advanced Composer, a
more sophisticated program for composing music. This program
has numerous features which allow you to produce music, using
three voices.

Included with this package is a blank keyboard overlay. You may
use a lead pencil, felt-tipped pen, grease pencil, or
water-soluble marker to mark the position of the notes on your
computer keyboard. If you wish to mark the overlay permanently,
use a non-erasable transparency marker or an indelible laundry
marker. (See page 9 of this manual for a drawing of the
keyboard overlay with the positon of the notes marked.)

Random Music can be used by even a musical novice to create
music in only a few moments. The program produces music based
on movement within a scale or on harmonic patterns. Built-in
scales, bass patterns, and chord patterns greatly enhance the
quality of the music produced. You can select from five
built-in scales, bass patterns, and chord progressions, or set
up your own. You can then enjoy music automatically generated
by the computer.

STEP 1: If the computer is not already in the BASIC
         mode, select TI BASIC. To load the program
         from a cassette tape, refer to the "Loading
         Cassettes" section in this manual for
         instructions on determining the program's
         position on the cassette tape. Then insert
         the cassette into the recorder, type

                        OLD CS1

         and press ENTER. The computer then displays
         directions for loading the tape. Refer to
         "Loading Cassettes" if you have difficulty
         in loading the program from the cassette.

         NOTE: Copies of the program are located on
         both sides of the tape. If for any reason
         you experience trouble loading the program,
         try again, using the other side of the
         tape.

STEP 2: When the cursor reappears, type RUN, and
         press ENTER. When the RANDOM MUSIC title
         screen appears, press ENTER again.

STEP 3: Decide whether you wish to create music
         based on random steps within scales or on
         harmonic patterns. If you choose random
         steps, the three voices moves up or down the
         scale a specified distance. If you choose
         random harmony, two voices playing random
         notes from a musical scale are combined with
         a preset bass pattern. Enter 1 or 2 to
         select the desired method of music
         generation.

STEP 4: Once you have selected the method of
         composition, decide the elements you wish to
         use. The following chart lists the elements
         that you may choose.

	SCALE	BASS	CHORD						
1	Major	Swing	C	C	G	C			
2	Minor	Jazz	C	C	F	C	G	C	
3	Major (without F & B)	Western	C	B^b	A^b	G			
4	Blues (minor)	Waltz	C	A	D	G	C	F	D	G
5	Seventh chord	Rock	C	C#	D	C#			

Random Steps

If you select the random steps method,
choose a scale from those listed in the
chart. Scales 1 and 2 produce the most
pleasant sounds. Then, determine the
maximum interval the voices can move by
entering the step size, 1 through 5.
Finally, select the speed of the music by
entering a number from 1 to 9, with 9 being
the fastest.

Random Harmony

If you select the random harmony method,
choose a scale from the five listed on the
chart. When using this method, scales 3, 4,
and 5 generate the most pleasant music.
Next, select the bass pattern from those
listed on the chart by entering a number
from 1 to 5. Then choose a chord pattern
from the chart, and enter its number from 1
to 5. Finally, determine the speed of the
music by entering a number from 1 to 9, with
9 being the fastest.

NOTE: Not all combinations of the elements
produce pleasant sounds. The following
combinations are recommended:

```
RANDOM STEPS:      1,1,7    1,2,6    2,1,9
                   2,2,8    4,1,7
RANDOM PATTERNS:   3,1,3,9  3,1,2,9  5,2,2,9
                   5,1,4,9  4,1,2,8
```

STEP 5: Enjoy the music your computer has created
for you. Press the space bar at any time to
change any of the elements, and the option
list appears. When you wish to stop the
program, select option 3 from the option
list. The program stops, and the message
"** DONE **" is displayed.

In addition to the predefined patterns and scales listed in your
program, you may create your own. The patterns are defined in
DATA statements beginning in line 900. To see these DATA
statements, type LIST 900- and press ENTER. Each line consists
of the line number, the word DATA, the type of patterns (SCALES,
BASS, or CHORDS), and the patterns themselves.

To add to these lines or change the patterns, type the number of
the line you wish to change, and press the DOWN arrow. Make the
desired changes, but remember to preserve the order of the
patterns when changing these statements. SCALES must come
before BASS; BASS must precede CHORDS. Also, you may have no
more than nine patterns.

The SCALES determine the notes the computer can select. To
increase the probability of a note's selection, enter it more
than once in the pattern. The BASS pattern determines the
position of a bass note relative to the chord. The length of
the pattern should be the number of beats per measure. A
preceding minus sign indicates that the note is in a lower
octave. The CHORD patterns determine the chord of each
measure. The bass pattern is played once for each chord in the
chord pattern. You may add any number of patterns to the
current ones or change the ones listed.

After you have tested your changes and are satisfied with them,
you may wish to save them. To save the patterns on a cassette
tape, place a blank cassette in your recorder and type

                        SAVE CS1

To use the modified program, follow the "User Instructions" as
before.

Composer allows you to enter original compositions or songs from
sheet music. The program offers a three-octave range with
sharps and flats. You may enter the songs either by typing the
note names or by entering the notes from the keyboard as if it
were a piano. Once a song is entered, you may edit it, play it,
or print the notes if you have a printer. You may also store a
song on a cassette and retrieve it so that you can enjoy it
again and again.

STEP 1:   If the computer is not already in the BASIC
           mode, select TI BASIC. To load the program
           from a cassette tape, refer to the "Loading
           Cassettes" section in this manual for
           instructions on determining the program's
           position on the cassette tape. Then insert
           the cassette into the recorder, type

                    OLD CS1

           and press ENTER. The computer then displays
           directions for loading the tape. Refer to
           "Loading Cassettes" if you have difficulty
           in loading the program from the cassette.

           NOTE: Copies of the program are located on
           both sides of the tape. If for any reason
           you experience trouble loading the program,
           try again, using the other side of the
           tape.

STEP 2:   When the cursor reappears, type RUN, and
           press ENTER. When the Composer title screen
           appears, press ENTER again.

STEP 3:   When the option list is displayed, select
           the task you wish to perform by entering the
           number beside the option.

OPTION 1: ENTER AND EDIT
           If you press 1 to enter a song, the computer
           displays an "R" and a quarter note as the
           first note. Enter the note of your
           composition by first selecting the octave
           (1-4). Then type a letter from A to G or R
           for a rest. You may follow this note with a
           sharp (#) or a flat (%) if desired. Then
           designate the duration of the note by
           holding down the SHIFT key and pressing the
           appropriate number: 1=whole, 2=half,
           4=quarter, 8=eight, and 6=sixteenth. Type a
           period after the duration if the note is
           dotted.
           You may omit any of the above elements if
           they are the same as the note the computer
           displays. Press ENTER when you have defined
           the intended note. Continue entering notes
           until you reach the end of the song. Then
           enter a slash (SHIFT K) to mark the end of
           the song.

The computer automatically plays each note
as a quarter note. To change a note's
duration, type SHIFT 1, 2, 4, 8, or 6 (for
sixteenth notes) before you play the note.
Use SHIFT (.) to enter dotted notes. (Note
that the SHIFT is required since a period
alone is a musical note on the keyboard.)
The SPACE BAR enters a rest. The minus sign
(SHIFT) may be used to back up one note.
Use the slash (SHIFT K) to end the song and
return to the option list.

OPTION 3:   PLAY SONG
             To play the song you have entered, press 3
             when the option list is displayed.
             Determine the speed at which the song should
             be played. Enter a number between 1 (slow)
             and 20 (fast), and the song in the
             computer's memory begins to play. If you
             wish to interrupt the music, enter a slash
             (SHIFT K), and the options list returns to
             the screen.

OPTION 4:   LOAD SONG
             Pressing 4 when the option list is displayed
             allows you to load a song into the
             computer's memory that has been previously
             saved with the SAVE command. Insert the
             cassette in the recorder that has the music
             on it, and enter CS1. If you do not wish to
             load a song, press ENTER to return to the
             options list.

OPTION 5:   SAVE SONG
             To save your song, press 5 when the option
             list is displayed. Insert a blank cassette
             in your recorder and enter CS1.   If you do
             not wish to save a song, press ENTER to
             return to the options list.

OPTION 6:   PRINT SONG
             Press option 6 when the option list is
             displayed to print a list of the notes of
             the song currently in memory. Enter the
             printer device name. If you are using a
             Texas Instruments Solid State Thermal
             Printer and designate the printer as "TP.U",
             you may print the note durations using the
             special, user-defined note characters.
             Otherwise, the numbers 1, 2, 4, 8, and 16
             are used. Remember the percent symbol

indicates a flat. Press the slash key
(SHIFT K) to stop the printing and return to
the options list.

OPTION 7:   ERASE MEMORY
             By selecting option 7 when the option list
             is displayed, the notes in the memory are
             effectively erased by resetting all notes to
             quarter rests. After you choose this
             option, type Y to delete the song that is
             currently entered in the memory.

OPTION 8:   END PROGRAM
             Pressing option 8 when the option list is
             displayed returns you to BASIC. Enter Y if
             you wish to end the program. NOTE: Any
             unsaved music is lost when the program ends.

The following is the notes for the familiar song, "My Bonnie
Lies Over The Ocean." To enter this song, select option 1,
Enter and Edit, when the option list is displayed. Then enter
the notes as they are listed below.

```
1:   G
2:   3E
3:   3D
4:   3C
5:   3D
6:   3C
7:   A
8:   G
9:   E (SHIFT 2)
10:  G
11:  3E
12:  3D
13:  3C
14:  3C
15:  B
16:  3C
17:  3D (SHIFT 1)
18:  R
19:  G
20:  3E
21:  3D
22:  3C
23:  3D
24:  3C
25:  A
26:  G
27:  E (SHIFT 1)
28:  G
29:  A
30:  3D
31:  3C
32:  B
33:  A
34:  B
35:  C
36:  /
```

When you enter the slash, the option list returns to your
screen. To play the song, select option 3, Play Song. Enter 19
as the speed at which this song should play. Notice that the
last note of this song is too low. It should be one octave
higher. To edit this song, select option 1, Enter and Edit. In
response to the first note, enter =35. When the computer
displays the thirty-fifth note, enter 3. Next, enter a slash
(SHIFT K). Again, select option 3, Play Song, and enter 19 as
the speed. Now the song ends as you expect.

Advanced Composer is a sophisticated musical composition
system. You can compose three-part music using your computer
keyboard as a piano. After you have entered the music, you can
play, edit, and save it to be replayed later.

The features of this program include a four-octave range,
transposition, repeat factors, storage of up to seven songs in
the computer memory while the program is operating, and an
autochord capability which automatically generates a harmony and
a bass pattern to complement the melody already entered. You
may permanently store the music you have composed using your
cassette recorder. Advanced Composer also offers numerous
editing commands to help you compose your music.

Before using Advanced Composer, you should understand the basic
operation of the program, which accepts two methods of entry.
The first method lets you use the keyboard as a piano to enter
your composition. The second method uses commands to change
parameters, to display information about the position and number
of notes in a song, to edit music entered from the computer
keyboard, and to save or retrieve songs from the computer
memory. The parameters determine the mode in which the program
is operating, the speed of the music, its loudness, the lower
octave being used, the key, and the voice you are entering.

The input display is divided into three sections. The upper
section lists the parameters and the default values that are
automatically assigned to them. Each of these values may be
changed to fit your musical requirements. The methods for
changing these values are discussed in the "Commands" section of
this manual.

Beneath the list of parameters is the library of up to seven
songs that you may save in the computer's memory. Refer to the
"Commands" section for instructions on saving a song that you
have entered or retrieving a song from the library.

At the bottom of the display is the message "READY." When this
message appears, the computer is ready to accept your data
entry. If the message is not displayed, the computer is
performing some task, and you must wait.

STEP 1:   If the computer is not already in the BASIC
           mode, select TI BASIC. To load the program
           from a cassette tape, refer to the "Loading
           Cassettes" section in this manual for
           instructions on determining the program's
           position on the cassette tape. Then insert
           the cassette into the recorder, type

                        OLD CS1

           and press ENTER. The computer then displays
           directions for loading the tape. Refer to
           "Loading Cassettes" if you have difficulty
           in loading the program from the cassette.

           NOTE: Copies of the program are located on
           both sides of the tape. If for any reason
           you experience trouble loading the program,
           try again, using the other side of the
           tape.

STEP 2:   When the cursor reappears, type RUN, and
           press ENTER. When the Advanced Composer
           title screen appears, press ENTER again.

STEP 3:   If necessary, change the default values of
           the parameters displayed at the top of the
           video screen to those that fit your musical
           requirements. These changes are all
           executed by holding down the SHIFT key while
           pressing the letter that corresponds to the
           desired command. Refer to the "Commands"
           section for a list of the parameter commands
           available for changing these values.

           You may begin entering notes and commands
           whenever "READY" is displayed at the bottom
           of your screen. To enter a note, press the
           key that corresponds to the note you wish to
           enter. The chart below indicates the
           position of the notes on the keyboard. You
           may find it helpful to copy this chart onto
           the keyboard overlay included with the
           package. (NOTE: This chart is the same as
           the one used with Composer.)
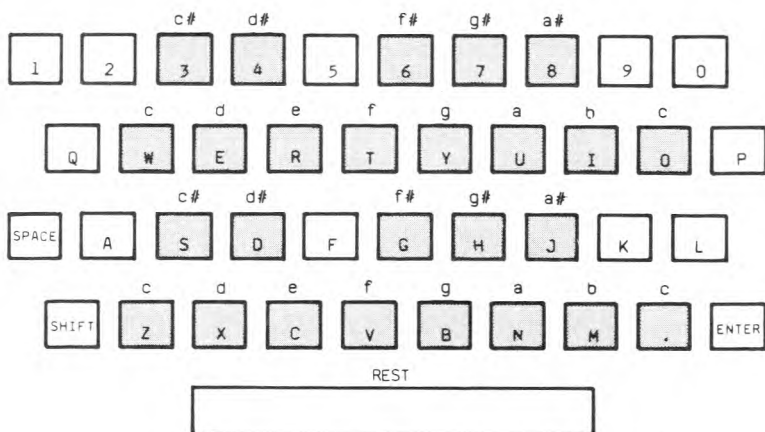
The lower octave, which is the Middle C
octave if you have not changed the default
value for the OCTAVE parameter, is entered
using the lower two rows of keys.   The C
that is sounded when you press the . key is
the same as the one played when you press
the W key.   The higher octave that begins
with the W key is entered using the upper
two rows of keys.

STEP 4:   Edit your music, if necessary, using the
          entry and edit commands. Refer to the
          "Commands" section for a list of all the
          entry and edit commands and their functions.

STEP 5:   Once you are satisfied with your musical
          composition, you may use the data storage
          commands to store your song in the
          computer's memory so that you may use it
          before you stop the program. The title of
          the song you save is displayed in the middle
          section of your screen. You may also use
          these commands to store up to seven of your
          songs permanently on cassette tape. Refer
          to the "Commands" section for a list of the

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To use any of the commands listed below, you must press the
SHIFT key and hold it down while pressing the command key.
Otherwise, the keys you press are treated as musical notes. The
entry and edit commands do not function unless the program is in
the RECORD mode.

If a command is entered by mistake, press ENTER. Generally
speaking, the command is ignored, and you may continue to enter
music or commands. If you have made an error, the screen border
becomes red.

Parameter Commands

    A--AMPS
Allows you to set the volume or
amplification of the three voices. The
level of volume is determined by the
number entered. A nine produces the
highest volume, and a zero turns off
the voice. The first digit controls
the first voice; the second digit, the
second voice; and the third digit, the
third voice. The default value for
AMPS is 978.

    E--END
Indicates that the end of the song has
been reached. This command updates the
end parameter and resets the pointer to
the first note of the song. Before a
composition can be played, the END
marker must be entered. The default
value for END is 0. NOTE: If you have
entered music and then use this command
when the pointer is positioned at 1 as
indicated by the WHERE parameter, you
cannot play the music. To access the
music you have entered, use the SHIFT G
(GOTO) command to move the pointer to
the end of your song and press SHIFT E
(END). You may then play the song you
entered.

    K--KEY
Allows you to enter a new key for
transposition of notes. Enter a letter
from A to G. You may also enter a
sharp (#) or a flat (%). The default
value for KEY is C.

    M--MANUAL
Places you in the manual mode. In this
mode, all notes are played as the keys
are pressed, but none are recorded.

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The other operational mode for this program is RECORD. The default value for MODE is MANUAL.

N--NUMBER   Specifies the maximum number of voices to be used in a composition. The number of voices is displayed as the second number in the VOICE parameter. If you wish to enter three voices, the number of voices must be entered prior to the entry of the second voice. The number of voices determines the maximum number of notes that may be entered. The following chart indicates the number of notes available when using one, two or three voices:

Number of Voices   Maximum Number
                         of Notes

      1   300
      2   150
      3   100

The default value for the number of voices is 2.

O--OCTAVE   Allows you to change octaves. The number you enter designates the lower octave (the lower two rows on your keyboard). Enter 1, and the lower octave begins one octave below Middle C. Enter 2, and the lower octave begins with Middle C. Enter 3, and the lower octave begins one octave above middle C. The higher octave (the upper two rows on your keyboard) is always one octave above the lower. The default value for OCTAVE is 2 (the octave beginning with Middle C).

R--RECORD   Places you in the record mode. When you are in this mode, any note entered replaces the note at the current postion and advances the song pointer one position. You may use the edit commands to edit or play the music entered while in the record mode. The default value for MODE is MANUAL.

T--TEMPO   Sets the playing speed for the music in
                    the workspace. Enter a number between
                    1 and 99. The higher the number, the
                    faster the song is played. The default
                    value for TEMPO is 60.

V--VOICE   Allows you to select the voice to which
                    notes are being entered, played, or
                    edited. The selected voice is the
                    first number displayed in the VOICE
                    parameter. You may enter one of four
                    voice settings. The numbers 1 through
                    3 select the corresponding voices. The
                    letter A is used to combine all voices
                    for playing a song. If you are using
                    the autochord feature, the A is also
                    used. The default value for VOICE is
                    1. NOTE: An error condition occurs if
                    you attempt to enter notes when the
                    VOICE parameter is A except when you
                    are using the autochord feature.

W--WHERE   Displays the location of the note at
                    which the pointer is positioned. This
                    location is updated only when you use
                    this command. The default value for
                    WHERE is 1.

Entry and Edit Commands

B--BEGINNING   Moves the song pointer to the first
                    note of the song. This command
                    operates exactly as the command GOTO 1.

D--DELETE   Deletes the note at the current
                    location, and moves all the notes that
                    follow back one location.

E--END   Indicates that the end of the song has
                    been reached. This command updates the
                    end parameter and resets the pointer to
                    the first note of the song. The SHIFT
                    P (PLAY) and SHIFT F (FAST) commands
                    function only if an END marker has been
                    placed at the end of the composition.

F--FAST   Plays the voice specified at the
                    fastest tempo, 99. Once the command is
                    issued, you cannot stop the playing of

the music. After the music has played,
the pointer moves to the first note.

G--GOTO   Moves the pointer to the location of
                 the note you specify.

H--BACKSTEP   Moves the pointer to the previous
                 entry. That note is played, and you
                 may change the note by entering a new
                 one.

I--INSERT   Inserts one note at the current
                 position by moving all notes to the END
                 down one position. The position of the
                 END is not changed. If you wish to
                 insert several notes, use the REPEAT
                 FACTORS. If you wish to insert
                 different notes, press SHIFT and the
                 number of notes you wish to insert.
                 Then press SHIFT I (INSERT), followed
                 by SHIFT 1. Enter the notes you wish
                 to insert. Because the position of the
                 END is not changed, you must shift the
                 END marker to save the notes at the end
                 of your composition. To do so, use
                 SHIFT G (GOTO) to enter the sum of the
                 notes you have inserted plus one and
                 the END parameter. Then press SHIFT E
                 (END) to place the END marker after the
                 last note.

P--PLAY   Plays the voice specified in the VOICE
                 parameter beginning with the current
                 note location, which may be determined
                 by using the SHIFT W (WHERE) command.
                 After the music has played, the pointer
                 moves to the first note. If you wish
                 to stop playing the music, press ENTER.

X--EXTEND   Moves the song pointer to the end of
                 the current voice, and displays the end
                 note number plus one on the video
                 screen. To add notes to the end of a
                 song, use this command, then enter the
                 desired notes, and finally press SHIFT
                 E (END) to move the end marker after
                 the last note added.

Y--SINGLE STEP   Plays the note at the current location
                 and moves the pointer to the next note
                 location.

Z--ZERO   Erases all notes that have been entered
                   to the workspace.

1 THROUGH 9--   Treats any key pressed after this
REPEAT FACTORS   command is issued as if it were pressed
                   the same number of times as the digit
                   entered. This command also steps
                   through the notes, inserts notes,
                   deletes the next note, or plays a
                   composition (using either the SHIFT P
                   (PLAY) or SHIFT F (FAST) command) the
                   same number of times as the digit
                   entered. A special use of this command
                   sets the number of beats per measure
                   when using the autochord feature. To
                   set the number, press SHIFT V (VOICE)
                   and enter A to activate the autochord
                   feature. Then press SHIFT and the
                   number of beats per measure. To cancel
                   the repeat factors, press ENTER.

SPACE BAR--   Enters a rest in the music.
REST

Data Storage Commands

L--LOAD   Loads the named song from the memory
                   into the workspace. To load a song,
                   press this command and enter the name
                   of one of the compositions displayed on
                   your video screen. If you wish to load
                   songs that you have permanently saved
                   on a cassette tape, use this command
                   and enter CS1.

S--SAVE   Saves the song in the workspace by
                   storing it in the computer's memory
                   under the name you specify. To save a
                   song, press this command and enter the
                   name of the composition (up to 10
                   characters). If you wish to save all
                   of the songs in the memory permanently,
                   place a blank cassette in your recorder
                   and enter CS1 instead of the name of a
                   song. All of the songs listed below
                   "SONGS IN MEMORY" are saved on the tape.

U--UNSAVE   Deletes the song you specify from the
                   library. To use this command, press
                   SHIFT U (UNSAVE), and enter the name of
                   the song you wish to delete.

Exit Command

J--JUMP BACK   Allows you to stop the program. If you
   TO BASIC   respond to the prompt "OKAY TO QUIT?"
                      by entering Y, the program stops.

To help you become accustomed to the commands used with the
Advanced Composer, enter the following example. Because many of
the edit commands are functional only when the program is in the
record mode, press SHIFT R (RECORD). The display indicates that
the mode is RECORD. Enter a C-major scale by pressing Z X C V B
N M . and press SHIFT E (END OF ENTRY) to mark the end of the
song. After you press SHIFT E (END OF ENTRY), the parameter END
changes from 0 to 8, which is the number of notes in the song.
To play the song, press SHIFT P (PLAY).

To edit the song, press SHIFT W (WHERE) to determine the note at
which the pointer is positioned. The number 1 is displayed
beside the parameter WHERE to indicate that the pointer is at
the first note location. Press SHIFT Y (SINGLE STEP) to move
through the song one note at a time. Your first note, C, is
sounded as the pointer moves to the next note. Press SHIFT W
(WHERE) to verify the pointer's position. The number 2 is
displayed beside the parameter WHERE. Press SHIFT Y (SINGLE
STEP) again, and the next note, D, is sounded as the pointer
moves to the third note. Press SHIFT H (BACKSTEP) to move the
pointer back to the second note. The D is sounded again as the
pointer moves back.

Assume that you wish to change the fourth note of the scale.
You can use the SHIFT B (BEGINNING) command to move to the first
note of the song, and then you can press the SHIFT Y (SINGLE
STEP) command three times to single step to the fourth note of
the scale. However, you can reach the fourth note more
efficiently by using the SHIFT G (GOTO) command. Press SHIFT G
(GOTO) and enter 4 beside the WHERE parameter. Change the F to
a C by pressing Z. Press SHIFT B (BEGINNING), followed by SHIFT
P (PLAY), to hear the altered scale.

Now assume that you wish to insert three notes in the middle of
the scale. Move the pointer to the fifth note by pressing SHIFT
G (GOTO) and entering 5 beside the WHERE parameter. Press SHIFT
3 to indicate that you are inserting three notes; then press
SHIFT I (INSERT) and SHIFT 1 to indicate that the three notes
are not duplicates. Now enter the three notes--D, E, and F--by
pressing X, C, and V. Press ENTER to cancel the repeat
factors. Press SHIFT B (BEGINNING) and then SHIFT P (PLAY) to
play the altered scale. The last three notes of the scale--A,
B, and C--are not played because the END marker has not been
moved. To move this marker, press SHIFT G (GOTO). Enter 12
which is the sum of the number of notes inserted plus one, 4,
and the current position of the END marker, 8. Now press SHIFT
E (END), and the marker is now correctly positioned. Press
SHIFT P (PLAY), and the altered scale is played in its entirety.

To understand the full potential of the Advanced Composer,
consider the following example which shows you how to enter a
three-voice composition.

When you begin to enter a song, assure yourself that the
workspace is clear by entering SHIFT Z (ZERO), followed by Y in
response to the prompt "OKAY TO ZERO?" Any notes in the
workspace are deleted. Then select three voices by pressing
SHIFT N (NUMBER) and entering 3.

To enter the familiar song, "Mary Had a Little Lamb," in three
voices, first enter the melody in the first voice. If the
parameter VOICE does not have a 1 beside it, press SHIFT V
(VOICE) and enter a 1. To be certain that you are entering the
first note to the first position, press SHIFT B (BEGINNING). If
the parameter MODE does not say RECORD, press SHIFT R (RECORD).
Press the following keys to enter the melody: R E W E R R R
SPACE BAR E E E SPACE BAR R Y Y SPACE BAR R E W E R R R R E
E R E W W W W. (Pressing the space bar inserts a rest in the
melody.) Indicate the end of the melody by pressing SHIFT E
(END). Press SHIFT P (PLAY) to hear the melody.

To enter the second voice, you must change the VOICE parameter
from 1 to 2. Press SHIFT V (VOICE), and enter 2. If you press
SHIFT P (PLAY), no music is played because the melody was
entered to the first voice. To enter the second voice, press
the following keys: B N B N B C X C B V X N N B C X B N B N B C
X C B V C X Z Z Z Z. Press SHIFT E (END) to indicate that you
have finished entering the harmony for the second voice.

To enter the third part of the harmony, change the VOICE
parameter from 2 to 3. Press SHIFT V (VOICE) and enter 3.
Press the following keys to enter the third voice: W Y B Y W Y
B Y E Y B Y W Y B Y W Y B Y W Y W Y E Y B M W B Z Z. Then press
SHIFT E (END) to indicate that you have entered all of the notes
for the third voice.

To hear all three voices together, change the VOICE parameter
from 3 to A by pressing SHIFT V (VOICE) and entering an A.
Press SHIFT P (PLAY) to play the song.

To save this song in the library, press SHIFT S (SAVE). When
the word "SAVE" is displayed at the bottom of your screen, type
LAMB as the title for the song. To retrieve the song from the
library, use SHIFT L (LOAD). If you wish to make this song a ·
part of your library for some time, save the entire library as
described in the Data Storage Commands section of this manual.

The autochord feature of Advanced Composer allows you to enter a melody, the computer automatically produces the notes for the second and third voices.

To use the autochord feature, first determine if the program is in the RECORD mode. If it is not, change it to that mode by pressing SHIFT R (RECORD). Also the number of voices must be 3. If it is not, change the number by pressing SHIFT N (NUMBER). Next, enter a melody in the first voice, using the techniques described in the previous example. Now activate the autochord feature by pressing SHIFT V (VOICE) and entering A for the VOICE parameter. Finally, use the REPEAT FACTORS to specify the number of beats per measure. For instance, to play the same chord in a measure that has four beats, press SHIFT 4. If you wish to play a different chord with each note, enter SHIFT 1. NOTE: If you change any parameters after you have set the number of beats or press ENTER, you must reset the beats by pressing SHIFT and the number of beats.

To enter the chords, move the song pointer to the beginning note of the melody by pressing SHIFT B (BEGINNING). Enter the root of the chord you would like to play with the melody. Enter major chords using the lower two rows of keys; enter minor chords using the upper two rows of keys. To know how many notes you have left, you can press SHIFT W (WHERE) to determine the location of the song pointer and compare that to the END parameter.

The following example provides you with some experience in using the autochord feature. If the program is not in the RECORD mode, press SHIFT R (RECORD), and if the number of voices is not 3, press SHIFT N (NUMBER) and enter 3. If the VOICE parameter is not set to 1, change it by pressing SHIFT V (VOICE) and entering 1. Press SHIFT B (BEGINNING). Press Z C B V N . B M E to play the notes of the major chords C, F, and G. Press SHIFT E (END) to indicate the end of the melody.

To activate the autochord feature, press SHIFT V (VOICE) and enter A. Then press SHIFT 3 to indicate that the music has three beats to the measure. Press Z V B to enter the chords you wish to play with the melody. Press SHIFT B (BEGINNING) to move the pointer to the beginning of the song. Press SHIFT P (PLAY), and you can hear how the computer has automatically filled in the second and third voices.