Minnesota Educational Computing Consortium

**MUSIC III - SCALES & CHORDS**

Five practices for recognizing musical tones

Diskette: 16K (APX-20161)

User-Written Software for ATARI Home Computers
MINNESOTA EDUCATIONAL COMPUTING CONSORTIUM

MUSIC III

SCALES & CHORDS

Developed for the ATARI® Computer
Distributed By
The ATARI Program Exchange
P.O. Box 3705
Santa Clara, CA 95055

To request an APX Product Catalog, write to the address above, or call toll-free:
800/538-1862 (outside California)
800/672-1850 (within California)

Or call our Sales number, 408/727-5603

Trademarks of Atari
The following are trademarks of Atari, Inc.

ATARI®
ATARI 400™ Home Computer
ATARI 800™ Home Computer
ATARI 410™ Program Recorder
ATARI 810™ Disk Drive
ATARI 820™ 40-Column Printer
ATARI 822™ Thermal Printer
ATARI 825™ 80-Column Printer
ATARI 830™ Acoustic Modem
ATARI 850™ Interface Module

Printed in U.S.A.
MUSIC III: SCALES & CHORDS

Version 1
MECC shall have no liability or responsibility to purchaser or any other person or entity with respect to any liability, loss or damage caused or alleged to be caused directly or indirectly by this software, including but not limited to any interruption of service, loss of business or anticipatory profits or consequential damages resulting from the use or operation of this software.

© Minnesota Educational Computing Consortium
2520 Broadway Drive
St. Paul, Minnesota  55113

February 15, 1982

ATARI ® is a registered trademark of ATARI, Inc.
# TABLE OF CONTENTS

- **Introduction** .............................................. 1
- Index to Programs on Diskette ..................................... 2
- **General Description** ........................................ 3
- Programs
  - **INTRODUCTION** ........................................... 7
    - Background Information .................................. 8
    - Sample Runs ............................................. 9
  - **WHOLE-HALF** .............................................. 10
    - Background Information ................................ 11
    - Use in an Instructional Setting ......................... 11
    - Handout 1 - Recording Sheet ........................... 12
    - Sample Runs ............................................ 13
  - **FIND THE HALF** ........................................... 15
    - Background Information ................................ 16
    - Use in an Instructional Setting ......................... 16
    - Handout 2 - Recording Sheet ........................... 17
    - Sample Runs ............................................ 18
  - **TRIADS** .................................................. 20
    - Background Information ................................ 21
    - Use in an Instructional Setting ......................... 23
    - Handout 3 - Recording Sheet ........................... 24
    - Sample Runs ............................................ 25
  - **SCALES** .................................................. 28
    - Background Information ................................ 29
    - Use in an Instructional Setting ......................... 29
    - Handout 4 - Recording Sheet ........................... 34
    - Sample Runs ............................................ 35
  - **SEVENTHS** ................................................. 37
    - Background Information ................................ 38
    - Use in an Instructional Setting ......................... 40
    - Handout 5 - Recording Sheet ........................... 41
    - Sample Runs ............................................ 42
- Appendices
  - **Getting to Know Your ATARI Computer** .................. 44
  - **Using a MECC Diskette** .................................. 45
  - **Definitions of Terms** ................................... 47
  - **Technical Information** .................................. 49
  - **Credits** .................................................. 50
  - **MECC Instructional Services Activities** ............... 51
  - **Evaluation Sheet** ....................................... 52
INTRODUCTION

Music III: Scales and Chords is the third of a series of three modules to be developed by MECC Instructional Services for music theory drill and practice. The diskettes of programs make use of the capabilities of the ATARI Computer to generate tone and produce high-resolution graphics. Each program is designed to allow students to choose the difficulty of the problems to be presented and to select exercises of increasing difficulty as skills improve.

Music theory is a skill-oriented discipline that requires much practice. Typically this practice is not a solitary activity. A teacher must evaluate the student's efforts and, in the case of ear training, also present the music to be heard. This is a tedious and time-consuming task. The ATARI Computer presents both visual and aural stimuli and provides instant feedback to student responses. In addition, it can produce many problems of a given type randomly, relieving the teacher of tedious drill work while providing students with individualized activities.

Handout pages in this booklet are numbered sequentially in the upper right corner and may be duplicated for use with students.
INDEX TO PROGRAMS ON DISKETTE

INTRODUCTION
acquaints students with the ATARI computer and demonstrates the capabilities of the computer that are used on some of the programs on the three music theory diskettes.

The following music theory programs are listed in order of suggested use (see General Description).

WHOLE-HALF
provides aural drill in differentiating between whole and half steps.

FIND THE HALF
provides aural drill in finding the half step in a series of whole steps.

TRIADS
provides drill in aural recognition of arpeggiated major, minor, augmented, and diminished triads.

SCALES
provides aural practice in identifying major scales, three minor scales (harmonic, natural, and melodic), and four modes (dorian, phrygian, lydian, and mixolydian).

SEVENTHS
provides aural practice in identifying major, minor, dominant, half diminished, and full diminished seventh chords.
GENERAL DESCRIPTION...

The three diskettes of music programs for the ATARI Computer can be used singly or in a combination to drill students at successive levels of difficulty.

Below is one possible sequence of instruction for using the five programs on Music I: Terms and Notations; the seven programs on Music II: Rhythm and Pitch; and the five programs on Music III: Scales and Chords. Each diskette has a menu of programs with an END option. The END option provides for ending work on the current diskette and inserting another. Instruction on the three diskettes is divided into nine levels. The student does Level One first and when all parts of Level One are successfully completed, moves on to Level Two, etc. While a student is using a program, the computer keeps track of which problems have been answered correctly and selects subsequent problems from ones the student has not tried or has answered incorrectly.

<table>
<thead>
<tr>
<th>Sequence of Instruction</th>
<th>Diskette</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Level One</strong></td>
<td></td>
</tr>
<tr>
<td>- NOTE TYPES (all sets)</td>
<td>I</td>
</tr>
<tr>
<td>- NAME THE NOTE (all sets)</td>
<td>I</td>
</tr>
<tr>
<td>- ENHARMONICS (all sets)</td>
<td>I</td>
</tr>
<tr>
<td><strong>Level Two</strong></td>
<td></td>
</tr>
<tr>
<td>- TERMS (set 1)</td>
<td>I</td>
</tr>
<tr>
<td>- KEY SIGNATURES (major only)</td>
<td>I</td>
</tr>
<tr>
<td>- COUNTING (all time signatures)</td>
<td>II</td>
</tr>
<tr>
<td>- AURAL INTERVALS (major and minor 2nds)</td>
<td>II</td>
</tr>
<tr>
<td>- VISUAL INTERVALS (2nds)</td>
<td>II</td>
</tr>
<tr>
<td>- WHOLE-HALF</td>
<td>III</td>
</tr>
<tr>
<td><strong>Level Three</strong></td>
<td></td>
</tr>
<tr>
<td>- WRONG NOTE (2nds)</td>
<td>II</td>
</tr>
<tr>
<td>- MISSING NOTE (2nds)</td>
<td>II</td>
</tr>
<tr>
<td>- RHYTHM (set 1)</td>
<td>II</td>
</tr>
<tr>
<td>- RHYTHM PLAY (set 1)</td>
<td>II</td>
</tr>
<tr>
<td>- AURAL INTERVALS (3rds, and a mixture of 2nds and 3rds)</td>
<td>II</td>
</tr>
<tr>
<td>- VISUAL INTERVALS (3rds, maximum of 1 sharp or flat)</td>
<td>II</td>
</tr>
<tr>
<td><strong>Level Four</strong></td>
<td></td>
</tr>
<tr>
<td>- WRONG NOTE (3rds, maximum 1 sharp or flat)</td>
<td>II</td>
</tr>
<tr>
<td>- MISSING NOTE (3rds, maximum 1 sharp or flat)</td>
<td>II</td>
</tr>
<tr>
<td>- RHYTHM (set 2)</td>
<td>II</td>
</tr>
<tr>
<td>- RHYTHM PLAY (set 2)</td>
<td>II</td>
</tr>
<tr>
<td>- AURAL INTERVALS (4ths and 5ths)</td>
<td>II</td>
</tr>
<tr>
<td>- VISUAL INTERVALS (4ths, maximum of 1 sharp or flat)</td>
<td>II</td>
</tr>
</tbody>
</table>
Sequence of Instruction

**Level Five**
- WRONG NOTE (4ths, maximum 1 sharp or flat)  II
- MISSING NOTE (4ths, maximum 1 sharp or flat)  II
- RHYTHM (set 3)  II
- RHYTHM PLAY (set 3)  II
- FIND THE HALF (3 notes)  III
- TERMS (set 2)  I
- VISUAL INTERVALS (5ths, maximum 1 sharp or flat)  II

**Level Six**
- WRONG NOTE (5ths, maximum 2 sharps or flats)  II
- MISSING NOTE (5ths, maximum 2 sharps or flats)  II
- FIND THE HALF (4 notes)  III
- VISUAL INTERVALS (6ths, maximum 3 flats or sharps)  II
- AURAL INTERVALS (sixths)  II
- TRIADS (major and minor only, both fixed and random root)  III

**Level Seven**
- WRONG NOTE (6ths, maximum 3 sharps or flats)  II
- MISSING NOTE (6ths, maximum 3 sharps or flats)  II
- FIND THE HALF (5 notes)  III
- VISUAL INTERVALS (7ths, and mixture of 6ths and 7ths)  II
- AURAL INTERVALS (7ths, and mixture of 6ths and 7ths)  II
- TRIADS (all types, both fixed and random root)  III

**Level Eight**
- WRONG NOTE (7ths, maximum 4 sharps or flats)  II
- MISSING NOTE (7ths, maximum 4 sharps or flats)  II
- SCALES (major and minor)  III
- SEVENTHS (major, minor, dominant, both fixed and random root)  III
- AURAL INTERVALS (all intervals)  II
- KEY SIGNATURES (set 2)  I
- TERMS (set 3)  I

**Level Nine**
- SCALES (major, minor, and modal)  III
- SEVENTHS (major, minor, dominant, half diminished, full diminished, both fixed and random root)  III
Sequence of Instruction

<table>
<thead>
<tr>
<th>Level Nine (continued)</th>
<th>MUSIC Diskette</th>
</tr>
</thead>
<tbody>
<tr>
<td>- KEY SIGNATURES (set 3)</td>
<td>I</td>
</tr>
<tr>
<td>- VISUAL INTERVALS (7ths, maximum 6 flats or sharps)</td>
<td>II</td>
</tr>
<tr>
<td>- WRONG NOTE (7ths, maximum 6 flats or sharps)</td>
<td>II</td>
</tr>
<tr>
<td>- MISSING NOTE (7ths, maximum 6 flats or sharps)</td>
<td>II</td>
</tr>
</tbody>
</table>

Recording Sheets

A student Recording Sheet is provided for each music theory program so that teachers have a record of student progress and students are given direction and can see progress.

The preceding Sequence of Instruction is one example of a plan for moving students through nine levels using the three diskettes of the music theory programs. To use the programs effectively, students will need direction. While teachers know that students should be familiar with the sounds of fourths and fifths in order to use these intervals in a program like WRONG NOTE (see Music II: Scales and Chords), students may not know this. Students who try programs that are beyond their level of competence usually gain nothing and feel they have failed. Therefore, if the three diskettes of the music programs are to be used with students, a plan should be devised for each student individually or for the class as a whole.

After the decision has been made on which programs to use and in what order, a Recording Sheet should be prepared for each program each student is to use.

Here is how a Recording Sheet might be filled out for a hypothetical student named Sue Collins who has advanced through the beginning levels of the music theory programs. Sue is now ready to work with AURAL INTERVALS on the Music II: Rythmn and Pitch diskette.

Sue has some background in intervals and can usually identify major and minor 2nds. She can identify a third but has trouble distinguishing between major and minor thirds. Sue is very weak on most other intervals. One plan for Sue could be the following:

1. Give her a few drills to discriminate between major and minor 2nds (both low to high and high to low). This will give her familiarity with the equipment and build her confidence.

2. Give drill on a mixture of major and minor 2nds and minor 3rds (1h and 1½).
3. Give drill on major and minor 3rds (1h and hl).

4. Give drill on major 3rds, minor 3rds and perfect 4ths (hl and 1h).

5. Drill on perfect 4ths and 5ths (hl and 1h).

6. Drill on all intervals, minor 2nd through perfect 5th, excluding the tritone (1h and hl).

7. Drill perfect 4ths, perfect 5ths, minor 6ths (1h and hl).

8. Drill minor 6ths, major 6ths (1h and hl).

9. Drill perfect 4th, perfect 5th, major 6th, minor 6th, minor 7th (1h and hl).

10. Drill minor 7th and major 7th (1h and hl).

11. Drill major 6th, minor 6th, major 7th, minor 7th, tritone (hl and 1h).

12. Drill all intervals (1h and hl).

Structure and sequence are provided through the student recording sheets. The instructor fills in:

The student's name

The number of problems to do each session

The total needed for mastery

The sequence of instruction

At each computer session students use the Recording Sheet for the directions the instructor has filled in at the top. After work is finished on each program, students enter their scores and mark NO if mastery is not achieved and repeat the session. If mastery is achieved, they mark YES and move on to the program that is next in the sequence by returning to the menu and

1. pressing the number of the new program, or

2. selecting the END option on the menu and inserting a different diskette.
INTRODUCTION

MUSIC VIA MICROCOMPUTER

Specific Topic: ATARI capabilities on Music Volume I, II and III
Type: Demonstration
Reading Level: 7-8 (Dale-Chall)

DESCRIPTION...

INTRODUCTION acquaints the student with the ATARI computer in a non-threatening setting. It also demonstrates the capabilities that will be used in the other programs.

OBJECTIVES...

1. to become familiar with the operation of the ATARI Computer.
2. to learn how to use the ATARI keyboard.
BACKGROUND INFORMATION...

Microcomputer capabilities make music theory a fruitful area for computer-enhanced curriculum. Visual and listening skills are combined in the drill and practice routines presented for mastery of music fundamentals. This program demonstrates the use of high resolution graphics and tone and does not require prior work with computers.
INTRODUCTION

SAMPLE RUNS

THE COMPUTER CAN DISPLAY TEXT RAPIDLY

However, you will still be able to read at your own pace and learn to recognize musical terms like these...

Allegro  Al Segno
Adagio  Cantabile
Dolore  Crescendo
Piano  Forte

Press RETURN to continue.

EXAMPLES OF SCREEN OUTPUT

THE COMPUTER CAN DISPLAY MUSIC NOTATION

Students hear tones generated by the microcomputer and see music symbols displayed on the screen.

In some of the programs you will see notes, key signatures, and other music symbols.

Press RETURN to continue.
WHOLE-HALF

SCALES

Specific Topic: Hearing whole and half steps
Type: Drill and Practice
Reading Level: 5-6 (Dale-Chall)

DESCRIPTION...

WHOLE-HALF provides aural drill in differentiating between whole and half steps. The student is presented with two pitches and must determine whether the interval between them is a whole step or a half step.

OBJECTIVE...

to distinguish a half step from a whole step by ear.
BACKGROUND INFORMATION...

To work with this program students should know the definitions of whole and half steps. Being able to differentiate between whole and half steps is the key skill in aural scale identification. The program presents two tones, either a whole or a half step apart. Students listen and decide if the interval is a whole or half step.

USE IN AN INSTRUCTIONAL SETTING...

Instructors should fill in the top of Handout 1, the recording sheet for WHOLE-HALF, before students are sent to the computer. Space is provided for recording results for six sessions on WHOLE-HALF. If more practice is needed to achieve the expected total needed for mastery, an additional Recording Sheet should be prepared for students. WHOLE-HALF completes Level Two of the suggested sequence of instruction outlined in the General Description for the music theory programs.
WHOLE-HALF RECORDING SHEET

Name______________________________

Number of problems to do ____ (24 maximum)
Total needed for mastery ____

Session ____
Number Tried ____  Number Tried ____
Number Correct ____  Number Correct ____

Session ____
Number Tried ____  Number Tried ____
Number Correct ____  Number Correct ____

Session ____
Number Tried ____  Number Tried ____
Number Correct ____  Number Correct ____

Record date mastery is achieved ____
Whole-Half

You will hear two tones which will be either a whole or a half step apart. If the interval is a whole step, answer by entering the letter, 'W'. If the interval is a half step, answer by entering the letter, 'H'.

Press RETURN to continue.

Examples of Screen Output

How many problems do you want? 99
Enter a number between 1 and 24.

Students specify the number of problems by typing a number from 1 to 24.
WHOLE-HALF
SAMPLE RUNS

A sound is being played. Please adjust the volume on the TV set.

Press RETURN to continue.

EXAMPLES OF SCREEN OUTPUT

Press 'P' to play the interval again.

Is the interval a whole or half step? W

Students can control the volume of what is played.

The sound of the interval can be repeated before students select their answers.
SCALES

Specific Topic: Hearing half steps
Type: Drill and Practice
Reading Level: 5-6 (Dale-Chall)

DESCRIPTION...

FIND THE HALF provides aural drill in finding a half step in a series of whole steps.

OBJECTIVE...

to hear a series of five pitches that ascend by step and to determine between which two pitches a half-step interval occurred.
BACKGROUND INFORMATION...

Working with this program requires the ability to distinguish between a half-step and a whole step by ear (see WHOLE-HALF). Identifying scales by ear is based on the ability to hear a half-step in a series of whole steps. The computer plays a series of from three to five notes that ascend by step. With the exception of one, all the intervals between notes are whole steps. The student determines between which two pitches a half step occurred. The student specifies the number of notes (3-5) to be used for the exercises.

USE IN AN INSTRUCTIONAL SETTING...

Instructors should fill in the top of Handout 2, the recording sheet for FIND THE HALF, before students are sent to the computer. Space is provided for recording results for two sessions at Level Five, two sessions at Level Six, and two sessions at Level Seven, if students are following the suggested sequence of instruction.
FIND THE HALF RECORDING SHEET

Name ________________________________

Number of problems to do

<table>
<thead>
<tr>
<th>Note Set</th>
<th>(12 max.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-Note</td>
<td>12</td>
</tr>
<tr>
<td>4-Note</td>
<td>12</td>
</tr>
<tr>
<td>5-Note</td>
<td>12</td>
</tr>
</tbody>
</table>

Total needed for mastery ______

<table>
<thead>
<tr>
<th>Session</th>
<th>3-Note Set</th>
<th>Number Tried</th>
<th>Number Correct</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3-Note</td>
<td>______</td>
<td>______</td>
</tr>
<tr>
<td>(Level Five)</td>
<td>Number Correct</td>
<td>______</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Session</th>
<th>4-Note Set</th>
<th>Number Tried</th>
<th>Number Correct</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>4-Note</td>
<td>______</td>
<td>______</td>
</tr>
<tr>
<td>(Level Six)</td>
<td>Number Correct</td>
<td>______</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Session</th>
<th>5-Note Set</th>
<th>Number Tried</th>
<th>Number Correct</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>5-Note</td>
<td>______</td>
<td>______</td>
</tr>
<tr>
<td>(Level Seven)</td>
<td>Number Correct</td>
<td>______</td>
<td></td>
</tr>
</tbody>
</table>

Record date mastery is achieved ______

MECC
FIND THE HALF

SAMPLE RUNS

The computer will play a series of notes which are part of a scale. Every interval between the notes in the series will be a whole step, except one. You must determine between which two notes you hear an interval of a half step.

Press RETURN to continue.

EXAMPLES OF SCREEN OUTPUT

You may choose to work with a series of three notes, four notes, or five notes in a set of problems. Usually, more notes in the series makes the interval more difficult to find.

Press RETURN to continue.

For each set of problems, students choose to have three, four, or five notes in the series.
FIND THE HALF
SAMPLE RUNS

How many notes in a series?

Students specify the number of problems they want in the set: 3, 4, or 5.

EXAMPLES OF SCREEN OUTPUT

Press 'P' to hear the series again.

After which note in the series does the half-step occur?

Students are directed to type the number of the note which was played just before the half-step interval.
CHORDS

Specific Topic: Aural recognition of triads
Type: Drill and Practice
Reading Level: 7-8 (Dale-Chall)

DESCRIPTION...

TRIADS provides drill in aural recognition of arpeggiated major, minor, augmented, and diminished triads in root position. Students decide whether or not to include augmented and diminished triads in the drill.

OBJECTIVE...

to identify by ear the following arpeggiated triads:

major
minor
augmented
diminished
BACKGROUND INFORMATION...

Requisite to working with this program is understanding the definitions of major, minor, augmented, and diminished triads and being able to recognize major and minor thirds by ear.

A triad in root position consists of three notes played together as a chord. The interval between the lowest and middle notes is a third, as is the interval between the middle and highest notes. The type of triad is determined by the types of thirds used. The chart below shows these.

<table>
<thead>
<tr>
<th>Interval lowest and middle</th>
<th>Interval middle and highest</th>
<th>Triad type</th>
</tr>
</thead>
<tbody>
<tr>
<td>major 3rd</td>
<td>major 3rd</td>
<td>augmented</td>
</tr>
<tr>
<td>major 3rd</td>
<td>minor 3rd</td>
<td>major</td>
</tr>
<tr>
<td>minor 3rd</td>
<td>major 3rd</td>
<td>minor</td>
</tr>
<tr>
<td>minor 3rd</td>
<td>minor 3rd</td>
<td>diminished</td>
</tr>
</tbody>
</table>

Examples

![Triad Example]

major    minor    augmented    diminished
Looking at the triads that are built on the various degrees of the scale, we find:

<table>
<thead>
<tr>
<th>Degree of Scale</th>
<th>Triad Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>major</td>
</tr>
<tr>
<td>2</td>
<td>minor</td>
</tr>
<tr>
<td>3</td>
<td>minor</td>
</tr>
<tr>
<td>4</td>
<td>major</td>
</tr>
<tr>
<td>5</td>
<td>major</td>
</tr>
<tr>
<td>6</td>
<td>minor</td>
</tr>
<tr>
<td>7</td>
<td>diminished</td>
</tr>
</tbody>
</table>

Examples

```
:maj  m  m  M  M  m  m  d

major minor minor major major minor minor diminished
```

The augmented triad does not occur naturally on any degree of the major scale.

Students decide if both augmented and diminished triads are to be included in the drills and specify the number of problems to be presented.

Students decide whether or not the root of the triads is to be fixed. If the root of the triads is fixed, all triads heard will be some type of triad based on C, e.g., C-major, C-minor, etc. When first learning triads, students find it easier to differentiate between them if the root is fixed. More advanced students can request different roots. If different roots are used, then the first triad could be a C major, the second a G-minor, etc.
USE IN AN INSTRUCTIONAL SETTING...

Instructors should fill in the top of Handout 3, the recording sheet for TRIADS, before students are sent to the computer. Space is provided for recording results for two sessions at Levels Six and Seven if students are following the suggested sequence of instruction.
# TRIADS RECORDING SHEET

**Name**

<table>
<thead>
<tr>
<th>Chord</th>
<th>Root</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of problems to do</td>
<td>Set 1 - major &amp; minor</td>
<td>Fixed    (24 max.)</td>
</tr>
<tr>
<td></td>
<td>Set 2 - major &amp; minor</td>
<td>Random  (24 max.)</td>
</tr>
<tr>
<td></td>
<td>Set 3 - all types</td>
<td>Fixed    (24 max.)</td>
</tr>
<tr>
<td></td>
<td>Set 4 - all types</td>
<td>Random   (24 max.)</td>
</tr>
</tbody>
</table>

**Total needed for mastery**

<table>
<thead>
<tr>
<th>Session</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Session</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Set 1:</td>
<td>Number Tried</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Level Six) Number Correct</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Set 2:</td>
<td>Number Tried</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Level Six) Number Correct</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Set 3:</td>
<td>Number Tried</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Level Seven) Number Correct</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Set 4:</td>
<td>Number Tried</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Level Seven) Number Correct</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Record date mastery is achieved**
In each exercise, a triad is played as a series of notes - root, third, fifth, third, and root. You must identify the triad.

Press RETURN to continue.

In each exercise, the computer plays an arpeggiated triad in root position. Students may hear the triad repeated as many times as needed.

EXAMPLES OF SCREEN OUTPUT

The exercises cover these triads: major, minor, augmented, and diminished. In addition, you may choose to have the root of all the triads be the same note (fixed) or have a different root note used for each triad.

Press RETURN to continue.

Students decide whether or not the root of the triads is to be fixed.
Sets of triads:

1. Major and minor triads only.
2. Major, minor, augmented, and diminished triads.

Which choice of triads do you want?

---

EXAMPLES OF SCREEN OUTPUT

In each exercise, a triad is played as a series of notes - root, third, fifth, third, and root. You must identify the triad.

Press RETURN to continue.

---

After specifying the number of problems, students also specify which set of triads are to be presented.

Students also specify the type of root note for all the triads.
Enter your answers using these numbers:

1. Major
2. Minor
3. Augmented
4. Diminished

Press 'P' to hear the triad.

What type of triad did you hear? ■

Students get one try per problem. If the response is wrong, the correct answer is displayed.
SCALES AND MODES

Specific Topic:  Identifying scales and modes
Type:          Drill and Practice
Reading Level: 7 - 8 (Dale-Chall)

DESCRIPTION...

SCALES provides aural practice in identifying major scales, three types of minor scales (harmonic, natural, and melodic) and four modes (dorian, phrygian, lydian, and mixolydian). Students can decide whether or not the modes are to be included.

OBJECTIVE...

to recognize by ear the following scales and modes:

- major scale
- harmonic minor scale
- natural minor scale
- melodic minor scale
- dorian mode
- phrygian mode
- lydian mode
- mixolydian mode
BACKGROUND INFORMATION...

To work with this program students should know the definitions of the scales and modes to be studied and be able to differentiate between whole and half step intervals. (See WHOLE-HALF and FIND THE HALF).

Four different types of scales and four modes are commonly used in music. The descriptions in the following pages of each scale or mode include definitions, examples and descriptions of what to listen for in identifying the scale or mode.

USE IN AN INSTRUCTIONAL SETTING...

Instructors should fill in the top of Handout 4, the recording sheet for SCALES, before students are sent to the computer. Space is provided for recording results for two sessions at Levels Eight and Nine if students are following the suggested sequence of instruction.
KEY: W=whole, h=half

Major Scale

Ascending pattern: w w h w w w h
Descending pattern: h w w w h w w

Example

Things to listen for:

1. The interval between the 2nd and 3rd degrees is a whole step.
2. The interval between the 7th and 8th degrees is a half step.
3. The major scale is most easily confused with mixolydian mode.

Harmonic Minor Scale

Ascending pattern: w h w w h augmented-2nd h
Descending pattern: h augmented-2nd h w w h w

Example

Things to listen for:

This scale is easily recognized by the augmented 2nd between its 6th and 7th degrees. The harmonic minor scale is the only scale that has such an interval. The augmented 2nd sounds like a minor 3rd and gives the scale the sound of music that conjures up the image of a snake charmer.
Key:  \(w=\text{whole, } h=\text{half}\)

**Natural or Pure Minor Scale**

**Ascending pattern:** \(w\ h\ w\ w\ h\ w\ w\ h\ w\)

**Descending pattern:** \(w\ w\ h\ w\ w\ h\ w\)

**Example**

![Example of Natural or Pure Minor Scale](image)

**Things to listen for:**

1. The step between the 2nd and 3rd degrees is a half step.
2. The step between the 7th and 8th degrees is a whole step.
3. The step between the 6th and 7th degrees is a whole step.
4. The natural or pure minor scale is most easily confused with the dorian mode.

**Melodic Minor Scale**

**Ascending pattern:** \(w\ h\ w\ w\ w\ w\ h\)

**Descending pattern:** \(w\ w\ h\ w\ w\ h\ w\)

**Example**

![Example of Melodic Minor Scale](image)

**Things to listen for:**

The ascending and descending scales do not use the same notes. The melodic minor scale is the only one that does not use the same notes both ascending and descending.
Key:  w=whole, h=half

Dorian Mode

Ascending pattern:  w h w w w h w  
Descending pattern:  w h w w w h w  

Example

Things to listen for:

This sounds much like a pure minor scale. The distinguishing feature is the half step between the 6th and 7th degrees.

Phrygian Mode

Ascending pattern:  h w w w h w w  
Descending pattern:  w w h w w w h  

Example

Things to listen for:

The phrygian mode is the only mode or scale that has a half step between its 1st and 2nd degrees.
Key:  w=whole, h=half

Lydian Mode

Ascending pattern:  w w w h w w h
Descending pattern:  h w w h w w w

Example

Things to listen for:
The lydian mode is the only mode that begins with 3 whole steps.

Mixolydian Mode

Ascending pattern:  w w h w w w h w
Descending pattern:  w h w w h w w

Example

Things to listen for:
The mixolydian mode sounds very much like a major scale, as the first six degrees are the same. The interval between the 7th and 8th degrees, however, is a whole rather than a half step.
SCALES RECORDING SHEET

Name ____________________________

Number of problems to do
Set 1 _____ (24 max.)
Set 2 _____ (24 max.)

Total needed for mastery ________

Session ____  Session ____

Set 1: Number Tried ____  Set 1: Number Tried ____
Number Correct ____  Number Correct ____

Set 2: Number Tried ____  Set 2: Number Tried ____
Number Correct ____  Number Correct ____

Record date mastery is achieved ________
SAMPLE RUNS

Sets of scales:

1. Major and minor scales only.
2. Major and minor scales, and the four modes.

Which set do you want? •

EXCEPTION OF SCREEN OUTPUT

Enter your answers using these numbers:

1. Major
2. Harmonic Minor
3. Natural Minor
4. Melodic Minor

If students specify set 1, they are given these scales to identify.
SAMPLE RUNS

Enter your answers using these numbers:

1. Major
2. Harmonic Minor
3. Natural Minor
4. Melodic Minor
5. Dorian Mode
6. Phrygian Mode
7. Lydian Mode
8. Mixolydian Mode

If set 2 is selected four scales and four modes are presented for students to identify.

EXAMPLES OF SCREEN OUTPUT

Enter your answers using these numbers

1. Major
2. Harmonic Minor
3. Natural Minor
4. Melodic Minor
5. Dorian Mode
6. Phrygian Mode
7. Lydian Mode
8. Mixolydian Mode

Which scale or mode was played? 8
No, the correct number was 2.

Press 'P' to play the scale again,
or
Press RETURN to continue.

The scale can be repeated as many times as students wish to hear it. When students select the incorrect answer, they are shown the number of the correct answer.
CHORDS

Specific Topic: Aural recognition of seventh chords
Type: Drill and Practice
Reading Level: 9-10 (Dale-Chall)

DESCRIPTION...

SEVENTHS gives students aural practice in identifying arpeggiated major, minor, dominant, half diminished, and full diminished seventh chords in root position. Students decide whether or not half and full diminished seventh chords are to be used and whether or not to use the same root note for all examples presented.

OBJECTIVE...

to distinguish by ear the following arpeggiated 7th chords:

- major
- minor
- dominant
- half diminished
- full diminished
SEVENTHS

BACKGROUND INFORMATION...

Working with this program requires the ability to identify by ear major, minor, augmented and diminished triads. (See TRIADS).

Seventh chords consist of a triad plus the note that is a 7th above the root of the triad.

The type of the 7th chord is determined by the type of the triad and the type of the 7th. Study the chart below.

<table>
<thead>
<tr>
<th>Type of Triad</th>
<th>Type of Seventh</th>
<th>Type of 7th chord</th>
</tr>
</thead>
<tbody>
<tr>
<td>major</td>
<td>major</td>
<td>major (or major-major)</td>
</tr>
<tr>
<td>major</td>
<td>minor</td>
<td>dominant (or major-minor)</td>
</tr>
<tr>
<td>minor</td>
<td>minor</td>
<td>minor (or minor-minor)</td>
</tr>
<tr>
<td>diminished</td>
<td>minor</td>
<td>half diminished</td>
</tr>
<tr>
<td>diminished</td>
<td>diminished</td>
<td>full diminished</td>
</tr>
</tbody>
</table>

Examples

\[
\begin{array}{c}
\text{major} \\
\text{dominant} \\
\text{minor} \\
\text{half diminished} \\
\text{full diminished}
\end{array}
\]
The seventh chords that can be constructed on the various degrees of the scale are as follows:

<table>
<thead>
<tr>
<th>Degree of scale</th>
<th>Seventh chord</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>major</td>
</tr>
<tr>
<td>2</td>
<td>minor</td>
</tr>
<tr>
<td>3</td>
<td>minor</td>
</tr>
<tr>
<td>4</td>
<td>major</td>
</tr>
<tr>
<td>5</td>
<td>dominant</td>
</tr>
<tr>
<td>6</td>
<td>minor</td>
</tr>
<tr>
<td>7</td>
<td>half diminished</td>
</tr>
</tbody>
</table>

**Examples**

```
\[\text{major minor minor major dominant minor half diminished}\]
```

In sheet music, symbols are used for 7th chords. A plain 7th chord, such as G7, indicates a dominant 7th chord. Major and minor 7ths are marked maj7 and min7 respectively.
USE IN AN INSTRUCTIONAL SETTING...

Students should be able to identify triads (see TRIADS) to work with this program. Instructors should fill out the top of Handout 5, the recording sheet for SEVENTHS, before students are sent to the computer. Space is provided for recording results for two sessions at Level Eight and Nine if students are following the suggested sequence of instruction.
SEVENTHS RECORDING SHEET

Name ____________________________

Chord Root

Number of problems to do
Set 1 - major, minor &
dominant 7ths (12 max.) Fixed ___

Set 2 - major, minor &
dominant, half
diminished, &
full diminished
(12 max.) Random ___

Total needed for mastery _______

Session ___  Session ___

Set 1: Number Tried ___  Set 1: Number Tried ___

(Level Eight) Number Correct ___  (Level Eight) Number Correct ___

Set 2: Number Tried ___  Set 2: Number Tried ___

(Level Nine) Number Correct ___  (Level Nine) Number Correct ___

Record date mastery is achieved _______

MECC
In each exercise, you will hear a chord played as a series of seven notes - root, third, fifth, seventh, fifth, third, and root. You must try to identify the chord.

Press RETURN to continue.

EXAMPLES OF SCREEN OUTPUT

Sets of chords:

1. Major, Minor, and dominant 7ths.

2. Major, minor, dominant, half diminished, and full diminished 7ths.

Which set do you want? □

In each exercise, the micromputer plays an arpeggiated 7th chord in root position. Students may request to hear it as many times as needed.

Students decide whether or not half and full diminished 7th chords are to be included in the exercises.
SEVENTHS
SAMPLE RUNS

Type of root note:

1. Fixed root note for every chord.
2. Different root note for each chord

Which type do you want? ■

EXAMPLES OF SCREEN OUTPUT

Enter your answers using these numbers

1. Major 7th
2. Minor 7th
3. Dominant 7th
4. Half diminished 7th
5. Full diminished 7th

Press 'P' to hear the chord again.

What type of seventh did you hear? 1
No, the correct answer is 5.

Press RETURN to continue.

Students decide whether or not to use the same root note for all chords presented. If the same root note is used, all chords will be some form of a C 7th chord, e.g., C major, C half diminished, etc. If students decide to use different roots, then the first chord could be an F minor, the second a D dominant, etc.

Set 2 presents five types of sevenths, and students identify which type of 7th chord was played. Students get one try per problem. If the response is wrong, the correct answer is displayed.
GETTING TO KNOW YOUR ATARI COMPUTER

Equipment

ATARI COMPUTER CONSOLE: The computer and keyboard.

BASIC LANGUAGE CARTRIDGE: A cartridge (containing the BASIC computer language) that is inserted into the console above the keyboard.

TELEVISION: A television set used to display information.

DISK DRIVE: A unit that holds and reads the diskette.

DISKETTE: A 5 ½ inch "record" that contains a series of computer programs.

ATARI Computer Keyboard

The ATARI Computer keyboard looks much like the keyboard of a typewriter. Some special keys are noted below:

RETURN Key—When you are finished typing either a response to a question or a line in a program, you send the information to the computer by pressing the RETURN key.

BACKS (Backspace) Key—Each time you press the BACKS key, the cursor backs up one space and erases each letter it passes over. This feature allows you to correct typographical errors easily.
**BREAK** Key—Press this key to stop the execution of a program. The program will remain in the computer memory and may be run again. If **BREAK** doesn't work to stop the program, try the **RESET** key.

**RESET** Key—Like the **BREAK** key, the **RESET** key stops program execution. It also clears the screen. To restart, type **RUN"D:HELLO"**.

**ESC** (Escape) Key—While you are using MECC diskettes, press the **ESCAPE** key in response to a question to stop program execution. The computer will ask whether you wish to run the program again. If you do not, the computer will display the diskette menu, and you may choose another program.

**SHIFT** Key—Use the computer **SHIFT** key like that of a typewriter. If a key displays two characters, you may hold down the **SHIFT** key while typing to print the upper character. For example, holding down the **SHIFT** key and typing **"!"** will print !.

**CAPS/LOWR** (Capitals/Lower case) Key—When you press this key, the computer begins typing in lower-case letters. To capitalize individual letters, you must hold down the **SHIFT** key as with a typewriter. To switch back to all capitals, hold down the **SHIFT** key, and press the **CAPS/LOWR** key again.

**CTRL** (Control) Key—Hold down the **CONTROL** key while pressing another key if indicated by the computer instructions.

**Keys That Can Cause Confusion**

- **0** (Zero)—The zero is on the top row of keys. **Do not** use the letter O interchangeably with this number key.

- **1** (One)—The number one is on the top row of keys. **Do not** use it interchangeably with a lower-case L (l).
Using the Computer

1. Make certain that the ATARI Computer, BASIC language cartridge, disk drive and television are plugged in and connected to each other properly. (See the ATARI Computer New User's Guide by MECC for detailed instructions.)

2. Turn on the television.

3. Turn on the disk drive. The PWR ON and BUSY lights will come on. After about 10 seconds the BUSY light will go off, and the whirling sound will stop.

   **Turn on the disk drive before you turn on the computer.**

4. Press the rectangular release button below the disk drive to open the door. Insert a diskette into the disk drive, exposed oval part first, with the diskette label up. Diskettes are sensitive to dust, heat, cold and magnetic fields, so handle them with care. (See the User's Guide for information on diskette care.)

5. Close the door on the disk drive.

6. Turn on the ATARI Computer. The power switch is located on the right side near the power cord. The disk BUSY light will turn on, and you will hear a whirling sound from the disk drive.

   If the disk BUSY light does not go off in about 10 seconds, turn the computer off, and make sure that the diskette is placed correctly in the disk drive. Then turn the computer on.

   If no display appears on your television screen at this point, and the television is set at channel 2 or 3, the computer may be set for the wrong channel. The channel select switch is on the back of the ATARI 400 Computer. Switch it to the opposite position.

7. A MECC logo will appear on the screen with the diskette name. Then a "menu" will appear. The menu gives a list of programs on the diskette. To run a program, type the number shown in front of the program name, then press the RETURN key. To access any available teacher options on the diskette, hold down the CTRL key and type A.

8. Follow the directions given in the program. Remember to press the RETURN key after each answer.

9. To return to the menu while running a program, press the ESC (Escape) key in response to any question.

   The screen will then ask whether the current program is to be run again or not. If not, the menu is automatically displayed.
10. To use a different diskette, select the END option from the menu, and follow the directions on the screen.

**Turning Off The Computer**

1. Take the diskette out of the disk drive, and store it in its protective envelope.
2. Turn off the ATARI Computer, the disk drive and the television.
DEFINITIONS OF TERMS

BACKGROUND INFORMATION—The information that explains or enriches program content or provides technical information on the program.

COURSEWARE—A collection of computer programs together with accompanying support materials.

DOCUMENTATION—The written material for the teacher to use with the computer program (also called a support booklet or support materials).

DRILL AND PRACTICE—A computer program that provides repetitive practice on a skill or a set of facts.

EDUCATIONAL GAME—A computer program that presents an instructional purpose in a game format.

GRADE LEVEL—The range of grades for which the program was designed.

HANDOUTS—The pages of the support booklet that may be duplicated for student or teacher use.

MODULE—The package containing the computer program(s) and the support booklet.

OBJECTIVES—The results to be achieved by using the program and support materials.

PROBLEM SOLVING—A computer program that processes data for a problem defined by the student.

PROGRAM—The routines and operations that instruct the computer.

READING LEVEL—The readability of the text that appears on the computer screen.

SAMPLE RUNS—The pages of the support booklet that show examples of computer screen output and accompanying explanations to outline the program flow.

SELO—Some Essential Learner Outcomes prepared by the Minnesota State Department of Education. When applicable these are included with the objectives in MECC support booklets.

SIMULATION—A computer program that approximates a real-world environment for examination.

SUPPORT BOOKLET—The written material (also called documentation) that provides the information a teacher may need to use the program in a classroom.

TEACHER AID—A computer program designed to assist a teacher with classroom management tasks.

TUTORIAL—A computer program that provides new information to teach a concept and may include drill and practice.
MUSIC III - SCALES AND CHORDS

TECHNICAL INFORMATION

INTRODUCTION
Main Program: INTRO
Binary Files: FFS.BIN
              MUSIC.FNT

WHOLE HALF
Main Program: WHOLEHAF

FIND THE HALF
Main Program: FINDHAF

TRIADS
Main Program: TRIADS

SCALES
Main Program: SCALES

SEVENTHS
Main Program: SEVENTH
CREDITS

MUSIC III: SCALES AND CHORDS

Music III: Scales and Chords for the ATARI Computer was converted from a series of programs developed by Linda Borry Hausmann, formerly of the MECC staff.

Testing and evaluation of the original programs with students was greatly aided by Elwood Johnson of Minneapolis Roosevelt High School.

Ona Pinsoneault, an instructor of music theory at Normandale Community College, Minneapolis, served as consultant and principal reviewer for the project.

The diskette for the Atari computer was programmed by Cynthia Schroeder and Lee Jensen of the MECC staff.

The support booklet was compiled by Shirley Keran of the MECC staff.

This module is a production of the MECC Instructional Services Division.

51
MECC INSTRUCTIONAL SERVICES ACTIVITIES

PURPOSE: The primary purpose of the Minnesota Educational Computing Consortium (MECC) is to assist users and educational member systems in coordinating and using computing resources through cooperative planning and decision making. MECC also provides current computing methods and materials.

SERVICES: All MECC activities in instructional computing are the responsibility of the Director of Instructional Services (Telephone: 612/376-1105). Direct any questions related to MECC policy, procedures, or regulations to this office. The MECC Instructional Services Division is organized as follows:

Instructional Systems Development—This group is responsible for the production, coordination, and refinement of MECC instructional computing courseware products, computer programs, and their related user support material. Direct any questions on operations within this area to the Manager, Instructional Systems Development (Telephone: 612/376-1103).

Technical Services—This group is responsible for operation and operating systems maintenance of the MECC Timeshare System (MTS), a 400+ port, all-purpose, multiple language computer, which serves all Minnesota public higher education institutions and 300 school districts. Technical Services also establishes and maintains the MTS telecommunications network. Direct any questions on operations within this area to the Manager, Technical Services (Telephone: 612/376-1141).

User Services—This group is responsible for timeshare and microcomputer user communications and training and the distribution of computing equipment and MECC courseware products. A staff of instructional computing coordinators is located throughout Minnesota to promote and facilitate computer usage. Direct all questions on operations in this area to the Manager, User Services (Telephone: 612/376-1101).

GENERAL INFORMATION: MECC provides the above information to assist individuals who wish to contact the MECC office with specific questions. Direct all written requests for information to the appropriate office at MECC, 2520 Broadway Drive, St. Paul, MN 55113. The following two items address many routine questions:

MECC Publications and Programs Price List
MECC distributes this free list upon request and suggests that you obtain it quarterly. Contact the MECC Publications Office (Telephone: 612/376-1118).

MECC USERS Newsletter
MECC distributes this free newsletter regularly during the school year to individuals on the mailing list. Contact the User Services Office (Telephone: 612/376-1117).

All requests for visits to MECC must be scheduled in advance by calling 612/376-1130.
Limited Warranty on Media and Hardware Accessories. We, Atari, Inc., guarantee to you, the original retail purchaser, that the medium on which the APX program is recorded and any hardware accessories sold by APX are free from defects for thirty days from the date of purchase. Any applicable implied warranties, including warranties of merchantability and fitness for a particular purpose, are also limited to thirty days from the date of purchase. Some states don't allow limitations on a warranty's period, so this limitation might not apply to you. If you discover such a defect within the thirty-day period, call APX for a Return Authorization Number, and then return the product along with proof of purchase date to APX. We will repair or replace the product at our option.

You void this warranty if the APX product: (1) has been misused or shows signs of excessive wear; (2) has been damaged by use with non-ATARI Home Computer products; or (3) has been serviced or modified by anyone other than an Authorized ATARI Computer Service Center. Incidental and consequential damages are not covered by this warranty or by any implied warranty. Some states don't allow exclusion of incidental or consequential damages, so this exclusion might not apply to you.

Disclaimer of Warranty and Liability on Computer Programs. Most APX programs have been written by people not employed by Atari, Inc. The programs we select for APX offer something of value that we want to make available to ATARI Home Computer owners. To offer these programs to the widest number of people economically, we don't put APX products through rigorous testing. Therefore, APX products are sold "as is," and we do not guarantee them in any way. In particular, we make no warranty, express or implied, including warranties of merchantability and fitness for a particular purpose. We are not liable for any losses or damages of any kind that result from use of an APX product.

For the complete list of current APX programs, ask your ATARI retailer for the APX Product Catalog.
EVALUATION SHEET

Please comment on this manual and the accompanying diskette. MECC will carefully consider user suggestions and incorporate them into future documentation whenever practical.

COMMENTS ON COMPUTER PROGRAM

<table>
<thead>
<tr>
<th>Diskette Name</th>
<th>Vol. No.</th>
<th>Version</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


COMMENTS ON MANUAL

<table>
<thead>
<tr>
<th>Title of Manual</th>
<th>Program Name</th>
<th>Page No.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


From: Name

Institution

Address

ZIP

Please detach and mail to MECC.
Minnesota Educational Computing Consortium
Manager, Instructional Systems Development
2520 Broadway Drive
St. Paul, Minnesota  55113
Review Form

We're interested in your experiences with APX programs and documentation, both favorable and unfavorable. Many of our authors are eager to improve their programs if they know what you want. And, of course, we want to know about any bugs that slipped by us, so that the author can fix them. We also want to know whether our instructions are meeting your needs. You are our best source for suggesting improvements! Please help us by taking a moment to fill in this review sheet. Fold the sheet in thirds and seal it so that the address on the bottom of the back becomes the envelope front. Thank you for helping us!

1. Name and APX number of program.

2. If you have problems using the program, please describe them here.

3. What do you especially like about this program?

4. What do you think the program's weaknesses are?

5. How can the catalog description be more accurate or comprehensive?

6. On a scale of 1 to 10, 1 being "poor" and 10 being "excellent", please rate the following aspects of this program:

   ____ Easy to use
   ____ User-oriented (e.g., menus, prompts, clear language)
   ____ Enjoyable
   ____ Self-instructive
   ____ Useful (non-game programs)
   ____ Imaginative graphics and sound
7. Describe any technical errors you found in the user instructions (please give page numbers).


8. What did you especially like about the user instructions?


9. What revisions or additions would improve these instructions?


10. On a scale of 1 to 10, 1 representing "poor" and 10 representing "excellent", how would you rate the user instructions and why?


11. Other comments about the program or user instructions:


From


ATARI Program Exchange
P.O. Box 3705
Santa Clara, CA 95055

[seal here]