

# ALPHA 1

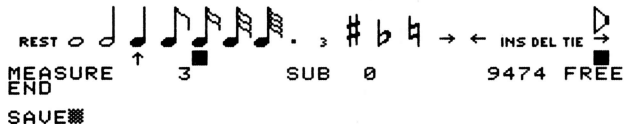
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**A L F Products Inc. 1448 Estes Denver, CO 80215**

ALPHA is ALF's newsletter, intended primarily as a source of information on new products (and tidbits on existing ones). It is published whenever it seems like a good time to do so. If you wish to receive future issues, you should subscribe by sending \$5.00 for 5 issues (to help

cover printing and postage costs).

**NOTICE:** prices given in this newsletter are current U.S.A. prices only and are subject to change without notice. Ask for a recent pricing catalog if this issue is not recent.



## "ENTRY" SCREEN DISPLAY NEW PRODUCTS

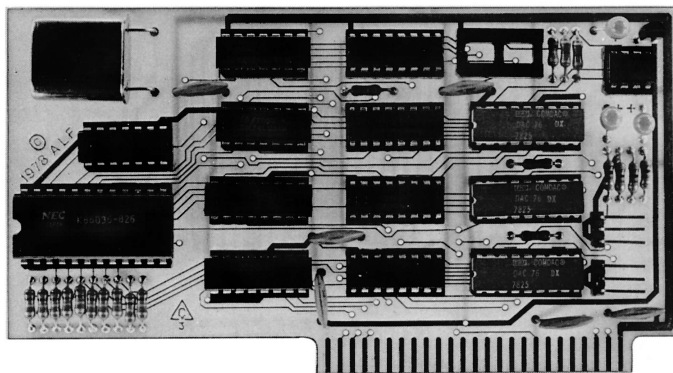
10-5-16  
APPLE MUSIC SYNTHESIZER

The "Apple Music Synthesizer" is a simple music synthesizer with price and performance designed for the hobby market. With a suggested list price of only \$265.00, this synthesizer is easily one of the lowest priced synthesizers of its class. Although the synthesizer is somewhat limited by the necessities of economics, each feature included has been carefully selected for maximum usefulness and is exploited virtually to the limits of the synthesizer and the Apple II computer it plugs into.

The synthesizer consists of a circuit card, an audio output cable, a cassette tape, and an owner's manual. The circuit card is designed to plug into an Apple II computer (manufactured and sold by Apple Computer Inc.), and the audio output cable connects to this card and to a home stereo system. Directed by the computer, the synthesizer creates electronic signals which are turned into sounds by the stereo system. The cassette tape contains computer programs which are loaded into the Apple. These programs are used to easily enter songs from sheet music and play them back.

A variety of different sound qualities can be produced. Although the synthesizer is not intended to be able to closely duplicate conventional instrument sounds, most of the sounds produced by the sample songs (included with the synthesizer) seem familiar. Pleasant sounds are easily created, and the synthesizer's audio output contains no audible noise or distortion.

The circuitry of the synthesizer consists of three nearly identical "channels". Each channel can produce thousands of different pitches, ranging from about 27.5 Hz to beyond human hearing. The full standard piano range can be produced, with a worst-case tuning error of less than 2 cents, including crystal inaccuracies. (A "cent" is a musical term meaning 1/100th of the difference in pitch between one piano-scale note and the next higher or lower note. Two notes played in succession which vary by



## APPLE MUSIC SYNTHESIZER CIRCUIT

only 2 cents are generally considered indistinguishable.) The waveform produced is a square wave (although variable width pulse waves can also be produced when using one channel to control the frequency of another). The pitch can be produced at any of 256 volume levels which increase exponentially (which is required for an apparently constant increase).

The programs provided allow for the convenient entry of songs from standard sheet music. Three independent pitches can be played at once, or six or nine can be played using two or three synthesizers. (Stereo outputs are available when using more than one unit.) Standard attack-decay-sustain-release envelopes are easily created. ("Envelope" is a musical term which refers to the volume contour of each note.) Notes can be produced over an eight octave range with 12 or 24 notes per octave. Whole notes through sixty-fourth notes (plus dotted and triplet notes) can be entered and can be tied to other notes. Entered notes are shown on a television display in standard musical form (see photo). Typing is minimized by an interactive graphics system which uses the two rotary knobs of the Apple computer to select note types and positions on a treble and bass staff. Errors made during entry are easily detected since each pitch is played by the synthesizer as it is entered, and measure bars are automatically drawn at the correct places. Key signatures are easily specified, and notes entered are automatically corrected for the current key.

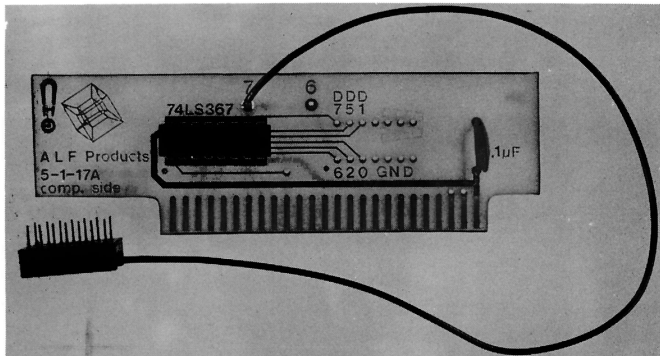
Once entered, songs can be saved on cassette tapes or on disk (if the Apple is equipped with a DISK II). Since the song is written on the tape or disk in a special digital format, there is no degradation of sound quality. Each performance sounds exactly like the first. Corrections and additions can be made at any time. Songs entered by ALF and by other ALF synthesizer owners are available in this digital format in our ALF ALBUM tape and disk series.

In addition to the song entry and playback programs, other programs are provided for simplifying unusual and custom applications. Detailed instructions on programming the synthesizer directly are given in the manual for those who prefer to create their own programs.

**NEW PRODUCTS (cont.)**

At the time the synthesizer was released, the music Entry program was the largest Assembly Language program available for the Apple (even larger than Applesoft floating-point BASIC). Along with the other programs on the tape (CHROMA, PERFORM, PLAY, DISCO, and 5 sample songs), plus the optional tape of Applesoft versions, the Apple Music Synthesizer is undoubtedly the most software-supported accessory available for the Apple II computer.

For further information, request the 10-5-16 Data Sheet.

**TIMING MODE INPUT BOARD**

10-5-17  
TIMING MODE INPUT BOARD

This simple circuit card is designed for use with the 10-5-16 Apple Music Synthesizer. It plugs into any slot in an Apple II computer, and a small cable connects to the synthesizer. This card allows an Apple program to monitor the frequency output of one of the synthesizer channels. Programming in the PLAY and ENTRY programs allow the desired playback speed of a song to be programmed into the synthesizer channel, and monitored through the Input Board. This allows song playback speed to be set programmatically rather than by game knob setting. The Timing Mode is mostly useful for songs which have ritards or other variations in tempo, and for "album" playback using DISCO. (Normally, playback speed must be adjusted manually for each song during DISCO album playback. Using the Timing Mode, songs can be played at the correct tempos automatically without interruption.)

Playback tempo (speed) is specified when using ENTRY with the TEMPO command. It need be specified only in one part, and can be changed at any point in the music. Playback speed is controlled by the Timing Mode only when the "suggested speed" is edited to zero (otherwise speed is controlled by the paddle timers). Note that one channel of one synthesizer cannot be used for music production when the Timing Mode is activated.

The Timing Mode Input Board can also be used by electronic experimenters as a 6-bit unlatched TTL input port.

Suggested list price is \$20.00. For further information, request the 10-5-17 Data Sheet.

11-1-7  
TECHNICAL MANUAL INSERT

A Technical Manual Insert for the 11-1-6 Apple Music Synthesizer manual is now available. This 6 page insert forms a Section 8 ("Technical") at the back of the regular owner's manual. (The white plastic 3-hole spine snaps open so the insert can be added, then is easily snapped shut.) It includes: timing requirements and signal descriptions of the bus connections, "empty socket" specs, schematic diagram, connector locations, replacement parts list, board dimensions, and circuit board repair diagram.

Suggested list price is \$7.00.

11-2-1  
MUSIC NOTATION BOOK

Gardner Read's "Music Notation, A Manual of Modern Practice" is an excellent book on sheet music, which our synthesizer customers might find useful. Although it is available at a lower cost through your local book store, we are offering it for \$15.00.

13-2-1B  
SOFTWARE TAPE

The 13-2-1A software tape sent with all 10-5-16 Apple Music Synthesizers has been replaced with a new version, labeled 13-2-1B. The A version was written for Apple's DOS 3.1, but could be patched for use with DOS 3.2. The new B version is written for DOS 3.2, and can be patched for use with 3.1. (Only the Entry program need be modified for use with 3.1.) The new B tape is compatible with the Auto-Start ROM (on the A tape, CHROMA called a machine language routine which was removed on the Auto-Start ROM, and there was no way to use RESET in ENTRY).

The cassette information sheet for the A tape stated that details on using CATALOG with DOS 3.2 from PLAY and DISCO would be given in Alpha 1. The only reasonable solution is to order a copy of the 13-2-1B tape.

For those who received the A tape and wish to obtain the B tape, it is available for \$5.00.

13-2-2  
ALF ALBUM 1

This tape contains 16 songs programmed for the 10-5-16 Apple Music Synthesizer (the songs cannot be played without the synthesizer). It is great for demonstrations and for learning how to program songs by seeing how other songs were programmed.

There are 8 songs for use with one or more synthesizer:

2 Part Invention in Dm by Bach  
2 Part Invention in F by Bach  
2 Part Invention in A by Bach  
2 Part Invention in C by Bach  
3 Part Invention in C by Bach  
March in D by Bach  
Sonata by Scarlatti  
Rondo Alla Turca by Mozart

There are 8 songs for use with two or more synthesizers:

The Entertainer by Joplin  
Waterfall by Bloom  
Musette by Bach  
Promenade by Moussorgsky  
Polka by Weinberger  
Cottage Cheese by Ridges  
Air in D by Bach  
Symphony #94:II by Haydn

Suggested list price is \$14.95.

13-2-3  
APPLESOFT TAPE

This tape contains the same programs and songs as the standard 13-2-1 tape which is included with all 10-5-16 Apple Music Synthesizers, except that all Integer BASIC programs have been rewritten in Applesoft. This tape is recommended only for those without Integer BASIC (that is, Apple PLUS systems not equipped with an Integer ROM card or the PASCAL Language card).

There is no trade-in of the standard tape; PLUS system owners must purchase the Applesoft version at extra cost. Suggested list price is \$14.95.

## NEW PRODUCTS (cont.)

13-2-5  
ALF ALBUM 0

This tape contains 24 Christmas carols programmed for the 10-5-16 Apple Music Synthesizer (the songs cannot be played without the synthesizer). It is great for demonstrations and for learning how to program songs by seeing how other songs were programmed (as is ALF Album 1). Many examples of subroutines are included. All selections require 2 or 3 synthesizers. These songs have been specially entered to allow playback with a single paddle setting, thus allowing album (continuous) playback without a Timing Mode Input Board (instructions are included).

The following songs are included:

We Wish you a Merry Xmas  
O Holy Night  
Hallelujah Chorus  
We Three Kings  
Midnight Clear  
I Saw Three Ships  
Hark the Herald Angels Sing  
I Heard the Bells  
O Come all Ye Faithful  
Good King Wenceslas  
O Christmas Tree  
Away in a Manger  
The Holly and the Ivy  
What Child is this?  
Here we come A-wassailing  
The First Noel  
The Coventry Carol  
Carol of the Bells  
Deck the Hall  
Jingle Bells  
Joy to the World  
God Rest you Merry  
Jolly Old Saint Nicholas  
The Twelve Days of Xmas

Suggested list price is \$14.95.

13-3-n  
SOFTWARE ON DISK

The various software tapes (part numbers 13-2-n) are also available on floppy disks which are compatible with Apple's DISK II. To order, simply replace the -2- of the tape part number with -3-. The pricing remains the same. For example, to order ALF Album 1 use part number 13-2-2 for cassette tape, or 13-3-2 for disk.

## NEW APPLICATION NOTES AVAILABLE

## USING HEADPHONES DIRECTLY WITH THE 10-5-16

This application note describes how to use the Apple Music Synthesizer with headphones connected directly to the synthesizer (without an amplifier).

1 sheet. Order AN 79-1. Price: \$0.50.

## USING 13-2-1A ENTRY WITH DOS 3.2

This application note describes how to modify the Entry program from tape 13-2-1A for use with Apple's new DOS version 3.2. (This was included with most synthesizers shipped with tape A.) Since we are now shipping a new tape (13-2-1B), this application note is obsolete.

1 sheet. Order AN 79-2. Price: \$0.50.

## CREATING A SIMPLE SONG WITH APPLE ENTRY

This application note describes step by step how a song is entered from sheet music using the Entry program from tape 13-2-1A, 13-2-1B, or 13-2-3A.

3 sheets. Order AN 79-3. Price: \$0.50.

## ARTICLES

## SEND IN THOSE SONGS!

Do you have some snazzy songs programmed for the Apple Music Synthesizer? Send them in--we pay cash for the best ones. You won't get rich, but you can appear in the next Song Tape and become notorious, if we like your song. For complete details, send a self-stamped, self-addressed envelope and ask for Publications 7901 and 7902 on "Submittings Songs to ALF".

## THE MICRO MUSIC TO ALF SONG DATA CONVERTER

ALF Products has recently completed work on a program which will allow the conversion of song data available from Micro Music Inc. for their Micro Composer program so that it may be used by the synthesizer products available from ALF. The program requires a Disk II to operate.

The user specifies the name of the song he wishes to convert, and types in the parameters associated with the song. The program will load the song from the MMI disk and perform the conversion. The converted song is then stored on disk. (If the converted version is to be written on a different disk, switch floppies before typing in the MMI parameters.)

It is then necessary to run **ENTRY** and manually enter the envelope parameters, since MMI units are unable to control envelopes. The converted song may then be played and altered using standard ALF software.

This convenient conversion program is available from many of our dealers.

## THE JOY OF SUBS

By Forrest Thiessen

One very important feature of the **ENTRY** program is that it allows the user to create and use musical subroutines. This capability is what separates the synthesizer "men" from the synthesizer "boys". This ability to use subroutines has many applications, and I will attempt to illustrate a few of the more commonly used ones in this article.

For example, you can easily create sections which repeat one or more times through the use of musical subroutines, instead of re-entering the same portion of the score repeatedly when a repeat is desired.

To achieve this, first look over the score and identify a portion that is played more than once. The first "Part" of this section you should enter as **SUBROUTINE 0**. The second should be entered as **SUBROUTINE 1**, the third as **SUBROUTINE 2**, etc.

Now run **ENTRY** and type the command "**SUBROUTINE:0**". The place on the screen where the part number is usually displayed will now show "**SUB 0**". You may now enter the music for **SUBROUTINE 0**.

When you have finished, type "**SUBROUTINE:1**", and enter the music for **SUBROUTINE 1**. Continue in this manner until all parts have been entered as subroutines.

You are now ready to enter the main portion of the score. Enter the song in parts as you normally would, but every time you come to a section which you have entered as a subroutine, just type "**CALL:n**", where **n** is the subroutine number (which will be the same as the part number, in this case). When the piece is played, everywhere a **CALL** is found, **ENTRY** will play whatever is in the appropriate subroutine and continue.

If additional sections are played more than once, you can enter their notes in subroutines, too. Create these subroutines with a **SUB:n** command, where **n** is one higher than your previous subroutine number. Note that subroutines cannot be called until they have been created with a **SUB** command. You can call subroutines from within subroutines if you like. You should always create subroutines in order beginning with **SUB:0** and going up by ones, because the numbers will be changed to start at 0 each time a song is loaded or reset is pressed.

This technique has other applications which are equally useful. For example, you can also store a complete envelope description for your favorite musical

## ARTICLES (cont.)

instrument in a subroutine, and whenever you wish a part to change to that envelope, you simply call the subroutine.

Yet another popular application for subroutines is to program a section of the score into a subroutine, and then have two or more parts call the subroutine; one part calling the subroutine immediately, and another part calling it after a series of rests, to create a canon.

As you can see, subroutines are really quite invaluable. You should try experimenting with them to see what other uses you can come up with.

### TIPS ON USING THE APPLE MUSIC SYNTHESIZER

By Philip Tubb

There are a few items which are not quite clear in the present synthesizer Owner's Manual. Some of the most frequent problems result from the following items.

- PADDLE SETTINGS.** In general, paddle settings less than 150 should not be used. They cause "time periods" which are too short to complete all necessary calculations in, and this results in uneven timing.
- ITEMS/COMMANDS.** The manual mentions "items" and "commands". It is important to note that items are stored in the song data at the present [flying saucer] cursor location. During playback, these items will be seen by the playback programming, and properly evaluated. This means that you can put in envelope, volume, and other changes at any point in the song (not just at the beginning), and they will be seen by the playback programming and evaluated as they pop up. Commands, on the other hand, are not stored in the song data. However, many commands do effect the song data. For example, the STEREO command writes the specified stereo positioning into the song data at appropriate places. When the song is saved on disk or tape, the stereo positioning will be saved also.
- TEMPO.** When entering a song, you first break the song into "Parts". These parts are completely independent and have no effect on each other. They are merely played back simultaneously. There is one "exception" to this. The TEMPO command sets a hardware frequency control which is used to control the speed of all parts. Thus, a TEMPO command need appear in one part only.
- ADDING UNITS.** Many customers forget to change line 10 in ENTRY and PLAY when they purchase a second or third synthesizer. (Line 10 is used to set the slot number of the lowest synthesizer and the number of synthesizers available.) This causes incorrect initialization of the synthesizers, resulting in improper playback.
- TIMING MODE.** When using a Timing Mode Input Board, you must remember to edit the "suggested speed" of each song to zero if you wish to cause TEMPO controlled playback. Each song must have a TEMPO command in one of the parts before the first rest or note (or CALL to a subroutine with a rest or note). Further, the stereo settings must have less than three R's (when using two units) or less than three M's (when using three units).

### CHANGING ENTRY DIVISOR TABLES

By Forrest Thiessen

A number of individuals have asked us how they can change the divisor tables used by ENTRY so they can experiment with altered scales. If this has been your life-long desire, then this article is for you!

The ENTRY divisor table is composed of 24 sixteen-bit divisors, each stored with a low byte followed by a high byte. This divisor table occupies memory locations 0A76 to 0AA5 after the program has been run. These divisors specify the frequencies that will be produced by each note in the lowest octave. The frequency that any given divisor will produce is equal to  $1782000/D$ , where D is the divisor in question. The standard divisor table is shown in Figure 1.

The procedure to change the ENTRY divisor table is as follows: First, decide what you want the first octave frequency of each note to be. Then, compute the divisor table using the frequency-divisor relationship shown

above. Now type the following:

```
INT
HIMEM:24576
LOAD ENTRY
CALL -151
1A76.1AA5 (The current divisor table will now be printed)
(Now type in your new divisor table in hex, using the monitor)
3D0G
SAVE ENTRY1
INT
```

ENTRY1 will now use the scale you have specified. When it is run, ENTRY1 will copy that table into memory locations 0A76 to 0AA5. If you wish to alter the table after ENTRY1 is first run, you should alter these new locations (0A76 to 0AA5), instead of the old locations.

**IMPORTANT:** Note that this procedure will work only on Apples with 32K or more and a Disk II system.

One application of the technique is to cause ENTRY to use a true scale, instead of an equal-tempered scale. Below is a divisor table which will make ENTRY use a true scale for the Key of C. To enter it, follow the above procedure, and when you reach the point where you must enter the new divisor table, type the following:

```
1A76:6C FF EB F5 76 EF 1E E8
1A7E:60 E1 17 DB DA D4 CB CE
1A86:8C C7 30 C3 34 BD 3B B8
1A8E:1B B4 E4 AD 48 AA 22 A4
1A96:A4 9F EB 9A 09 98 39 92
1A9E:E7 8D 04 8A 09 85 45 82
```

Note that the above divisor table will play only songs in the Key of C correctly. You should be able to calculate a divisor table which will work for other keys with little difficulty.

Another interesting (?) experiment you might wish to try is to reverse the divisor table, as shown below, so that normally low notes in each octave will be played high in the octave, and normally high notes will be played as low notes. The result is amusing. Once.

```
1A76:45 82 17 86 04 8A 10 8E
1A7E:39 92 82 96 EB 9A 75 9F
1A86:22 A4 F1 A8 E4 AD FD B2
1A8E:3B B8 A1 BD 30 C3 E8 C8
1A96:CB CE DA D4 17 DB 82 E1
1A9E:1E E8 EB EE EB F5 20 FD
```

You may wish to modify the divisor table used by PLAY, PERFORM, and CHROMA as well.

To alter PLAY, use the same procedure as for ENTRY, except use a HIMEM value of 9216. For PERFORM, use a HIMEM value of 6822.

You can change CHROMA's divisor table by POKing in the new values. To determine what the starting POK address is, first run the CHROMA INITIALIZER in the normal fashion. The divisor table will then be located at PITCH+13. You may now POK the new values in locations from PITCH+13 to PITCH+60. (You must use the B software.)

FIGURE 1:

DIVISOR					DIVISOR				
ADDR	LO	HI	DECIMAL	NOTE	ADDR	LO	HI	DECIMAL	NOTE
1A76	20	FD	64800	A	1A8E	FD	B2	45821	D#
1A78	EB	F5	62955		1A90	E4	AD	44516	
1A7A	EB	EE	61163	A#	1A92	F1	A8	43249	E
1A7C	1E	E8	59422		1A94	22	A4	42018	
1A7E	82	E1	57730	B	1A96	75	9F	40821	F
1A80	17	DB	56087		1A98	EB	9A	39659	
1A82	DA	D4	54490	C	1A9A	82	96	38530	F#
1A84	CB	CE	52939		1A9C	39	92	37433	
1A86	E8	C8	51432	C#	1A9E	10	8E	36368	G
1A88	30	C3	49968		1AA0	04	8A	35332	
1A8A	A1	BD	48545	D	1AA2	17	86	34327	G#
1A8C	3B	B8	47163		1AA4	45	82	33349	

## IN FUTURE ISSUES

ALBUM 2 announcement.

ENVELOPE tips.

ANSWERS to questions from readers.

TIMING BOARD alternatives.

AND something completely different.

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