PROGRAMMING QLOS COMPATIBLE EPROMS

A PRIMER

This paper will give the beginning programmer a quick lesson in programming QLOS compatible EPROMs. It is not meant to replace the technical manual packed with the quikLoader.

We will make certain assumptions before we start. We will use a 2764 EPROM, as it is the least cost per bit at this writing. The working array of the PROM programmer starts at $2000. This means that, although we will be putting the information in the area between $2000 and $3FFF, we have to remember that in actual use, the computer will be seeing the PROM in the area between $E000 and $FFFF. A last assumption is that our katalog will be at location $FF00. While this is not the best location for the purpose of saving space, it is a convienent round number. Remember, $FF00 translates to $3F00 in our working array.

There are three parts to a quikLoader compatible PROM; the TOP OVERHEAD, which may be considered invariable for the time being, the KATALOG entry, and the actual file. We will show this by example.

For this first example, we will start with a very simple APPLESOFT program. Let's start off by having our PROM programmer in the computer with a 2764 set in place.

1) Turn on the computer.
2) Type in the following:
```
10 FOR X = 1 TO 10:PRINT X:NEXT
```
3) Type "CALL -151". This will put you into the monitor.
4) Type "69.6A". (Don't include the quote marks.) This gives us the ending address of the program, low byte first. Since the computer answered "14 08", this tells us that the ending address of the program is at $814. Since all normal APPLESOFT programs start at $801, simple subtraction tells us that the length of the program is $13. We will need this information.
5) Let's move this program to the bottom of our working array:

```
2000<801.814M
```

6) We will call this program "TEST". Our Katalog entry will start at $3F00. Page 22 of the technical manual tells us that we want the following format:

```
ID  $LO $HI LLO LHI DLO DLI NAME  86
```

ID = $81 (APPLESOFT PROGRAM)
$LO & $HI = Source address in the PROM for the program, in this case 00 E0. REMEMBER: The low byte is first, and the address is offset, since we are using a working array.
LLO & LHI = Length of file, low byte first.
DLO & DHI = Destination in RAM. These numbers are meaningless for APPLESOFT files, as these programs are assumed to reside starting at $801.
NAME = TEST. The name is entered using the hexadecimal code where "A" = $C1, "B" = $C2, etc.
86 = Code for termination of katalog entry.

Thus, our katalog entry, starting at $3F00 is:

```
81 00 E0 13 00 00 00 D4 C5 D3 D4 86
```

7) The TOP OVERHEAD is just copied as follows, starting at $3FE7:

```
A6 26 AD 0A 02 9D 81 C0 4C 98 FF
00 00 00 60 00 00 00 FF FB 03
```

The bytes at location $3FF8 & $3FF9 are the location of the katalog entry. PLEASE NOTE: The addresses on all EPROMS used with the quikLoader are all referenced with the top, i.e. A 2764 starts at $E000, and ends at $FFFF.

8) Now, program the PROM, following the instructions given with the PROM programmer.

9) After turning the computer off, install the PROM in the quikLoader, into any empty socket, remembering that pin one goes next to the white dot on the quikLoader board.

10) If you call up the quikLoader katalog (CTRL-Q RESET), you will see that the program "TEST" is now available for loading and/or running.

SAVING A BINARY FILE

We will now try a short machine language program. To get into the monitor, type "CALL -151", or, better yet, just hit "M" reset (if your quikLoader is installed).

Type the following:

```
2000: CE 00 30 AE 00 30 CA D0 FD AD 30 C0 4C 00 20
```

The katalog entry is:

```
3F00: 82 00 E0 0F 00 00 20 CE CF C9 D3 C3 86
```

The top overhead for this is the same as before.

Program the PROM, and you will have a program called "NOISE" available to you. Before you run it, be sure you know how to "RESET" out of the program, or at least turn off the computer.

NOTE: If you are going to program a PROM from a binary file on disk, first BLOAD the file. Enter the monitor, and type "AA60.AA61. This will give you the length of the file, low byte first. AA72.AA73 will give the destination address.

Obviously, to maximize your enjoyment and utility of the quikLoader, it is necessary to study the technical manual. We hope that this cursory treatment of programming will start you on your way to more exotic programs.
While we cannot be expected to teach basic programming skills, we are usually available for some technical help. Call us at (805) 685-1931.

quikLoader PRELIMINARY Instructions

NOTE: These are preliminary instructions. The quikLoader is capable of many functions which require detailed directions. We have your name on file, and you should receive more detailed directions within one month. If not, call us on our toll-free number; (800) 635-8310 (in California call (800) 821-0774).

WARRANTY

Southern California Research Group warrants that the enclosed hardwar will perform as advertised. We also have a non-conditional money-bac ten day trial period. If, for any reason, you are not pleased with the quikLoader, you may return it within this period for a full refund. After this trial period, we warrant the quikLoader to be free of mechanical or electronic defects for a period of six months. We will repair or replace any defective merchandise within this period. It is the responsibility of the user to make sure that the software provided with this package is suitable for its intended usage.

The following paragraphs pertain to that software included with t e quikLoader provided by APPLE COMPUTER, INC.

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INSTALLATION

The quikLoader plugs into any slot (except Ø) in the APPLE][or APPLE //e. If installation is made on an APPLE][or][+, the 16K language card must be modified as shown on the ~~next page~~. *INSIDE*

USE

The quikLoader is reset-driven. This means that the card is inactive unless it sees a reset signal. If this happens, the quikLoader then looks to see which, if any, key is pressed. It will then function depending on which key. For the APPLE //e, you press control x (where x= the key), and, while holding the key and control, press reset. Release reset, then the key. For the APPLE II, push the key (with control), release the key, then press reset. A complete list of functions are available on the quikLoader HELP SCREEN. This is available by pressing CTRL-Q reset, Then C, then R.

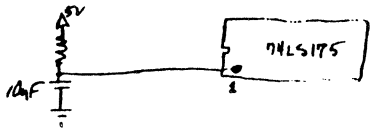
KEY	FUNCTION
A	Normal Reset
Z	Forced power-up reset
n (number 1-6)	Execute primary program of chip n
Q	quikLoader catalog
H	Power-up reset, then run program named "HELLO" or
B	Boot DOS only.
D	Boot disk (if autostart ROM available
C	Catalog disk. DOS must be connected
M	Go to monitor. Disconnect DOS. Reconnect with 3I
S	16K RAM card reset

After CTRL-Q RESET:.Z Toggle parameter display
A-W Select Program
L - Load only R - Run

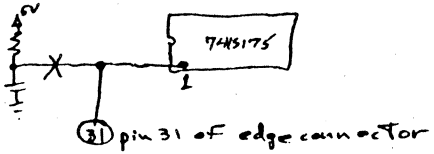
16K RAM Card Modification Page1

(required for Quick Loader operation in II or II+)

16K RAM cards have following power-up circuit:



modify as follows



① locate pin 1 of 74LS175; trace the conductor from LS175-1 to junction of 10uf capacitor and resistor (approx 3000 ohm).

② disconnect one lead of the resistor and one lead of the capacitor from the circuit board. (You may remove the capacitor and resistor completely if you desire).

③ connect a wire between LS175-1 and pin 31 of the edge connector. Solder the wire to the top of the edge connector so the solder does not make contact with pin 31 of the motherboard slot when the RAM card is installed.

Functions of USER Flipflop

WHEN HIGH:

DATA in the enabled chip is addressed from $C100-$FFFF.

I/O Selects are disabled in Apple II or II+. (requires USER jumper on QUIK LOADER and USER/ jumper on motherboard to be made).

256 byte of data in 16Kbyte chips at $C000-$C0FF are unaccessible with USER FF high.

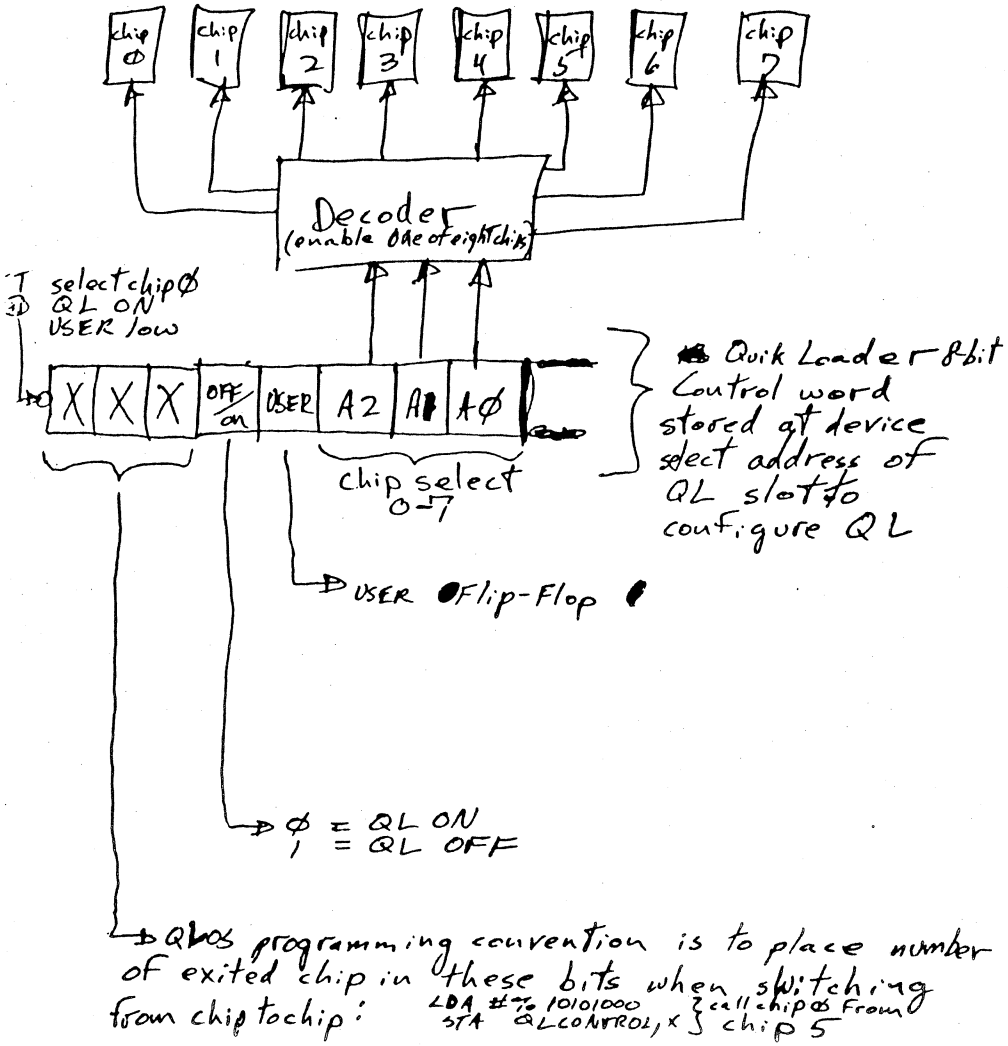
WHEN LOW:

High addressing of 16Kbyte chips is bank switched. $E000-$FFFF addresses the low half of 16K byte chips. This enables access to first 256 bytes of 16Kbyte chips at $E000-$E0FF.

I/O Selects are enabled on Apple II/II+. (Similar function must be handled under program control in the IIe.)

$C100-$DFFF addresse same data as when USER FF high BUT data from $C100-$C7FF only enabled when the I/O select for QL SLOT is low. This enables the QLOS to identify which slot the Quik Loader is in.

Hardware Description



16 K RAM Card Modification Page 2

The Page 1 steps are required for all 16K RAM Cards.

The Page 2 steps are required only for cards with a 24 pin EPROM or ROM.

The 24pin ROM/EPROM must be disabled for operation with the Quik Loader. Accomplish as follows

I Set switch 1-2 on the DIP switch to down

II Apple language System card or equivalent:

1. Remove the EPROM or ROM from the card.
2. Remove the 74LS20 from its socket.
3. Install a 74LS22 in the vacated socket with pin 6 bent out so contact is not made on pin 6.
4. Solder a jumper between pins and of the 74LS09 socket.

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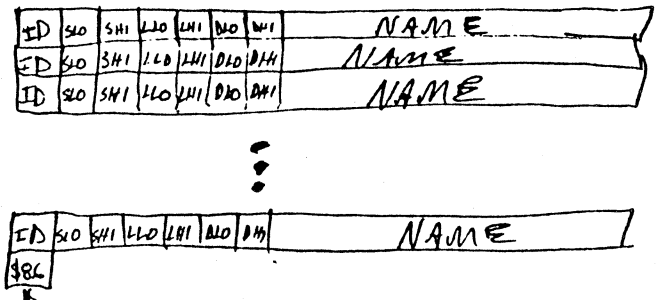
Quik Loader Katalog Format

$FFF8, $FFF9 contains address of beginning of Katalog record. ($FFF8 = KATLO, $FFF9 = KATHI)

No Katalog record on this chip if
$FFF8,9 = $FFFF or
$FFF8,9 < $C100.

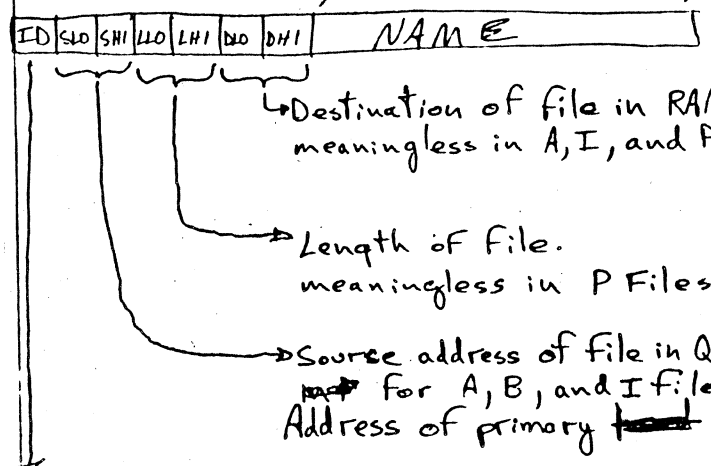
Katalog record is stored continuously at a selected address range beginning at the address specified at $FFF8, $FFF9.

KATALOG RECORD FORMAT



KATALOG ENTRY

ASCII Name of QLOS file:
All ASCII above $8F is valid. This includes numbers, uppercase, lowercase, and special characters. It excludes control, inverse, and flashing characters. Maximum Name length is 29 characters.



File ID:
CTRL-A = Applesoft program
CTRL-B = Binary file
CTRL-I = Integer program
CTRL-P = Primary routine
CTRL-F = Terminate Katalog record.