# Z8018101ZA6

## LLAP DRIVER SOFTWARE

## GENERAL DESCRIPTION

The kit contains software and documentation to support AppleTalk® LocalTalk™ Link Access Protocol (LLAP) on Zilog's Z181™ (Z80181) .

The Z8018101ZA6 LLAP driver requires a software licensing agreement. The driver is written in ANSI Microtec C and partly in Z181 Assembler, all contained in diskettes to be executed using an IBM® PC and a Microtec C compiler. The driver is composed of a series of C function calls that allows the Z181 (in conjunction with proper LLAP hardware interface, e.g., Z8018101ZCO) to transmit and receive LLAP packets. The lower level transmission and reception routines are finely tuned using Z181 assembler codes. Interface of Zilog's LLAP driver to AppleTalk®'s upper layer is left for the user.

Two examples using the Z181 LLAP driver are included. "Demo.c" tests the RTS and CTS handshake between two Z8018101ZCO boards by transmitting data between them. This demo requires two terminals interfaced via the RS-232C ports to the Z8018101ZCO boards. "Mainecho.c" allows two Z8018101ZCO boards to transmit and receive LLAP packets. The user can then observe the transactions with his LLAP network analyzer. Although this example application program does not execute the higher layers of the AppleTalk stack, its inclusion demonstrates that the LLAP packets adhere to LLAP specifications. The example application programs also provide the user with models on which to base his own application program. Source codes and documentations are included in the kit.

## Z80181 LLAP Driver Description

The kit contains source code and documentation (User Guide, LLAP Driver for the Z181 and Design, LLAP Driver for the Z181) for the Z181 LocalTalk Link Access Protocol Driver. The User Guide, LLAP Driver for the Z80181 describes the Zilog-provided driver for the Z181 and explains how the driver is to be used. The Design, LLAP Driver for the Z181 explains how the driver works.

The kit is intended for users who wish to interface an AppleTalk node to a LocalTalk network using the Z181. Interface to the upper layers of the AppleTalk stack varies from user to user and is not addressed in the documentation. The documentation does provide a general overview of the ways the Z181 LLAP driver is intended to fit in a larger software system.

In general, the Z181 LLAP Driver implements the LLAP protocol described in Inside AppleTalk by Sidhu et.al. In particular, the driver performs the following functions:

- It establishes its own node address by transmitting ENQ frames as required.
- It responds to a received ENQ frame with an appropriate ACK frame.
- It responds to a received RTS frame with an appropriate CTS frame.
- It receives any data frames addressed to the node or to the broadcast address and routes them according to given instructions.
- It transmits an RTS frame before sending a broadcast data frame.
- It transmits an RTS frame and waits for a CTS frame in response before sending a non-broadcast data frame. It retries as necessary.
- It handles all of the hardware interactions necessary to send and receive frames.
- It deals with all of the timeouts and timings required by the LLAP protocol.

## Z80181 LLAP Driver Resource Usage And Hardware Requirements

Approximately 4.5Kbytes of program memory (ROM or RAM) written partly in Z181 assembler and in ANSI C (Microtec).

Approxiamtely 128 bytes of data memory (RAM).

TxD and RxD of the Z181's SCC are connected to the RS-422 differential drivers.

The /REQ pin from the Z181's SCC is connected to the Z181 DMA's /DREQ1.

A 3.6864 MHz crystal is attached to the RTxC and SYNC pins for LLAP clocking.

The Z181 uses a 10.0 MHz clock

Memory access requires no added wait states.

## Z8018101ZA6 Kit Contents

Software
Z181 LLAP Driver Source Code Diskette
(licensing agreement required)

Documentation
User Guide, LLAP Driver for the Z181
Design, LLAP Driver for the Z181



Zilog, Inc. 210 East Hacienda Ave.
Campbell, CA 95008-6600
Telephone (408) 370-8000
FAX 408 370-8056