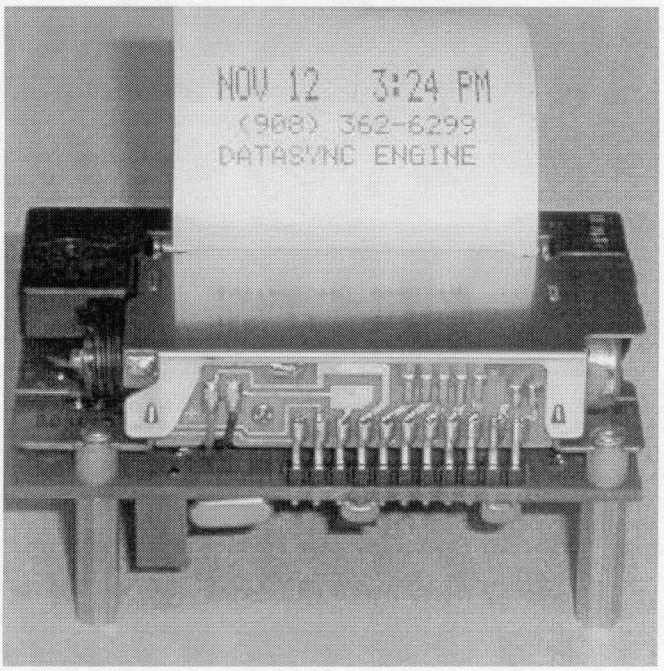
Caller ID
Printer Module



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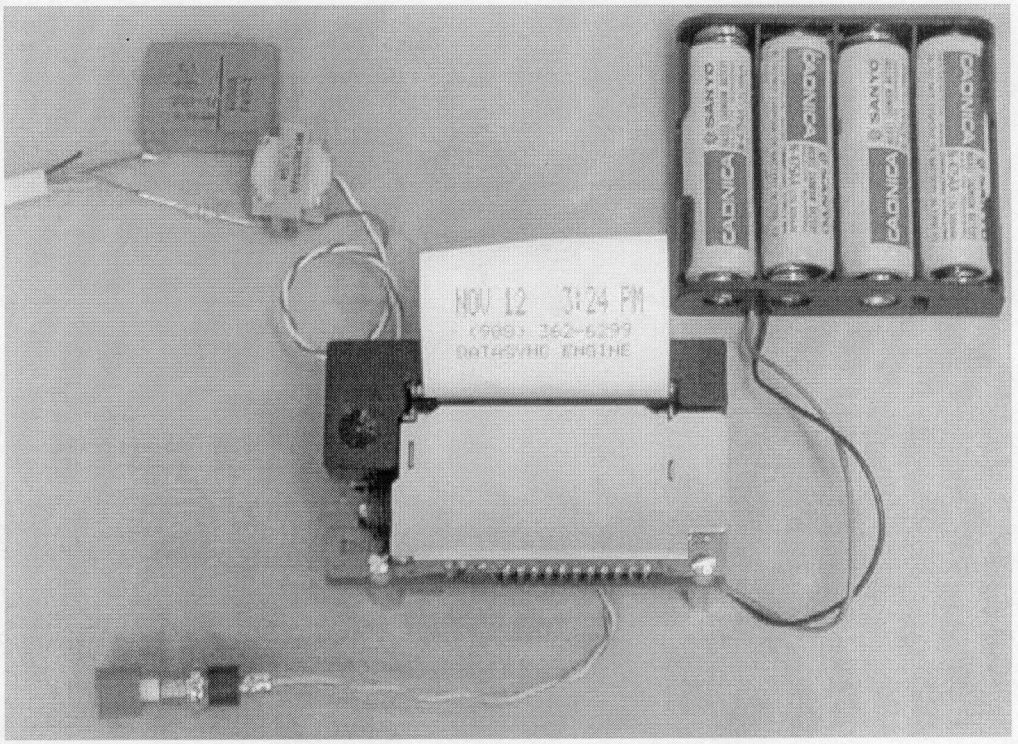
What is Caller ID ?

Caller ID telephone service enables a subscriber to see the caller's phone number as the telephone rings. Millions of subscribers currently use this telephone service in the U.S. and Canada, primarily for its call screening and security benefits. But thousands of small business users, ranging from pizza delivery companies to work-at-home professionals, use caller ID as well.

With this Caller ID printer, you can view the entire list of incoming calls instantly, without fumbling with buttons. Find out if a person really did call several times. The convenient hard-copy printout provides an easy way to save phone numbers.

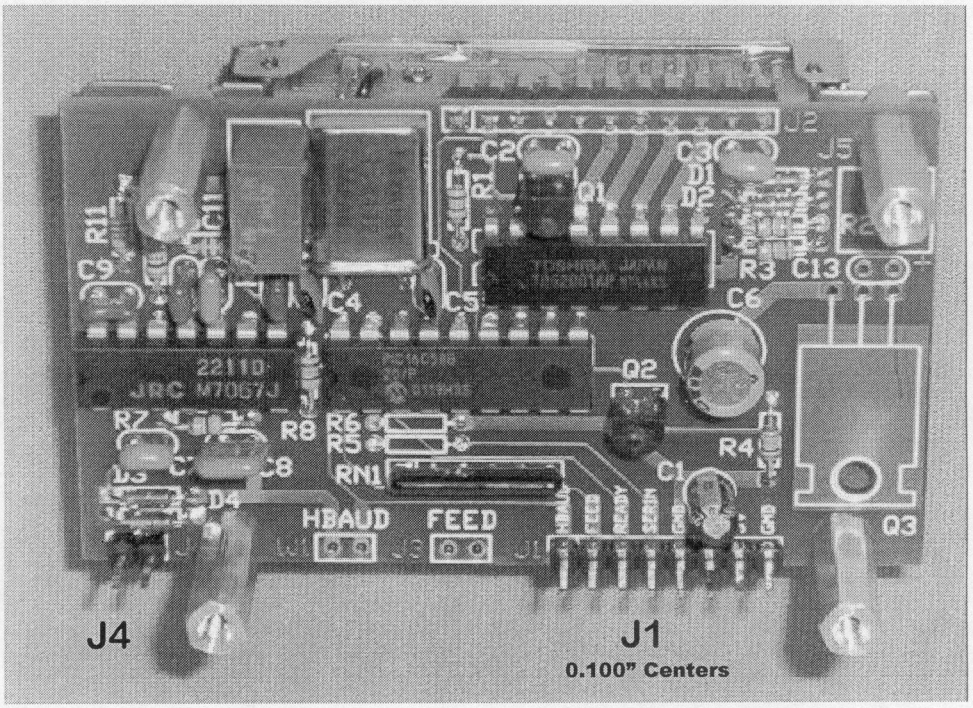


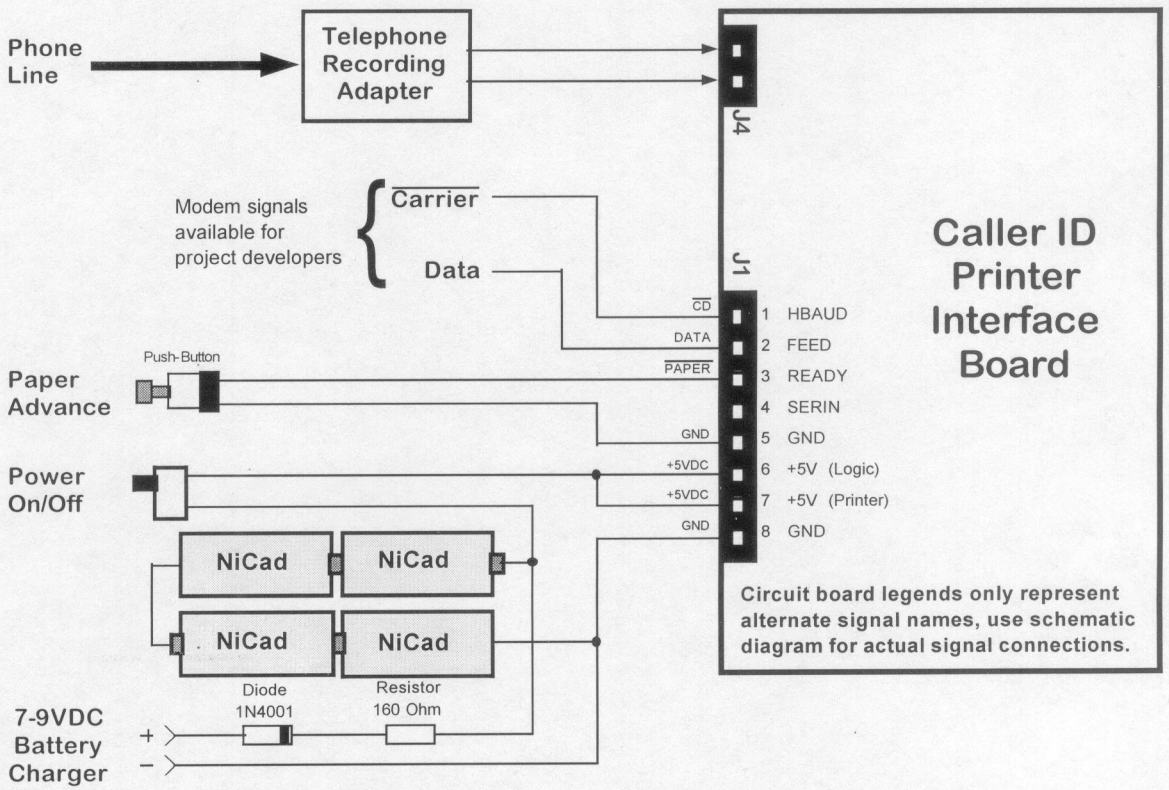
Product Description

The Caller ID Printer Module is a combination Bell 202A FSK modem demodulator integrated with an Epson 16-character impact dot matrix mini printer designed to print Caller ID messages as they are received from the telephone network. The CIDP Module is compatible with both single (SDMF) and multiple (MDMF) message formats. The CIDP does not wait for a phone ring to become active, it continuously monitors the phone line for CID message activity. The Carrier Detect and Data signals are also available on connector J1 for developers who wish to further explore Caller ID data transmissions. The CIDP features a diagnostic mode that prints the raw received data as displayed in the "Caller ID Message Format" section. This mode is enabled by holding the paper advance button while switching on power.

The CID Printer requires a 5 volt power supply (or batteries) and an FCC approved telephone line interface or telephone recording adapter. For experimental purposes, a diagram for a typical audio interface is shown in the "Telephone Line Audio Coupler" section of this manual.

Connector Pinouts





Caller ID Message Format

In the U.S. and Canada, Caller ID information is transmitted between the first and second ringing cycles using the Bell 202 standard. Data is transmitted at a rate of 1200 bits per second using frequency-shift keying (FSK), with 1200 Hz being a logical 1 and 2200 Hz a logical 0. Data is received serially with the least-significant bit first, and each 8-bit word is preceded by a start bit and followed by a stop bit.

CID data consists of two possible formats, the Single Message Format (SDMF), which provides the calling number, and the Multiple Message Format (MDMF), which provides the calling number and the customer or business name under which the number is listed.

All CID transmissions begin with a 250mS channel seizure sequence (01010101 pattern) then a 150mS of ones (1200 Hz) followed by one or more message strings. Each message string is identified with a type code and word count.

Message Examples

Single Data Message Format (**SDMF**)

`0412111215249083626299`

The first four digits (shown underlined) are the two hex words that specify the type code and word count. Code "04" is an SDMF caller's number string and "12" says 18 more words to follow.

"1112" is the month and day (NOV 12)
"1524" is local time in 24-hour format (3:24 PM)

The last 10 characters are the calling number.

Multiple Data Message Format (**MDMF**)

```
8027
0108 11121524
020A 9083626299
070F DATASYNC ENGINE
```

In MDMF format, data frames are broken down into parameter strings. Code "80" identifies this message as MDMF format with a total of 39 words (27 hex).

"0108" is the date & time parameter having 8 words.
"020A" is the Caller's Number having 10 words.
"070F" is the Caller's Name having 15 characters.

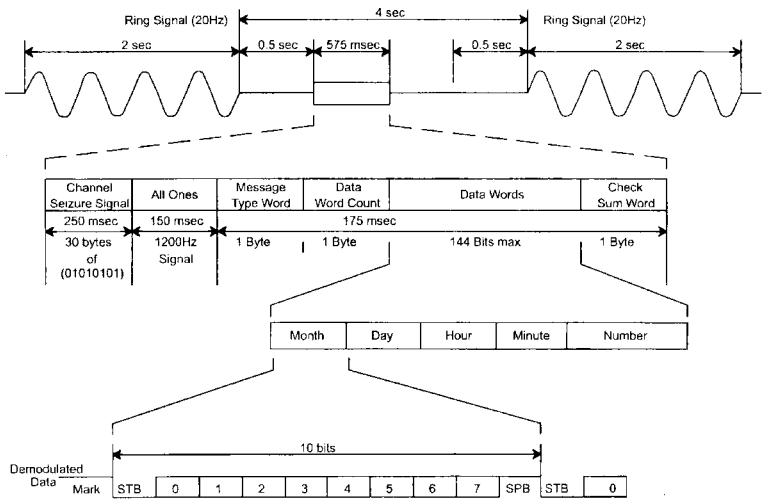
Type Code Summary
(nn is word count)

SDMF

04nn	Calling Number Delivery (CND)
06nn	Message Waiting Indicator
0Bnn	Reserved

MDMF

80nn	Call Setup (start of packet indicator)
01nn	Date and Time
02nn	Calling Line Directory Number (DN)
03nn	Called Directory Number
04nn	Reason for Absence of Caller's Number
05nn	Reserved
06nn	Call Qualifier
07nn	Caller's Name (ASCII Text)
08nn	Reason for Absence of Caller's Name
0Bnn	Message Waiting Notification
81nn	Test for Caller ID
82nn	Message Waiting Notification

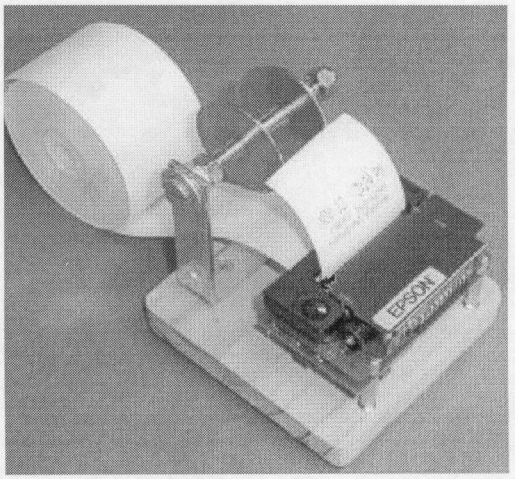


Inserting Paper / Changing Ribbon

INSERTING PAPER The Caller ID Printer uses standard cash register paper 1¾" wide. The paper if fed in through the back of the printer (below the ink cartridge). Use a straight cut paper edge. Hold the paper advance button while feeding in the paper. Gently pull the paper up from the top.

NEVER PULL THE PAPER OUT FROM THE BACK AS THIS MAY STRIP THE FEED GEARS

CHANGING RIBBON Gently press down on the right edge side of ribbon cartridge until the left side pops up. Set the new cartridge into place then press down. You may need to turn the ribbon take-up dial (left side) until the ribbon is properly seated.



Telephone Line Audio Coupler

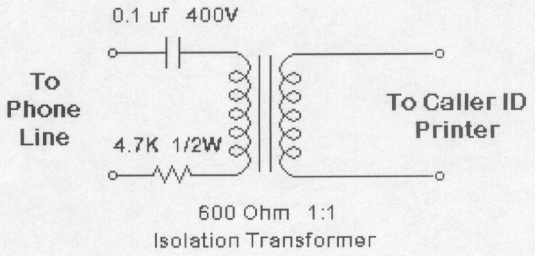
Telephone lines have a continuous potential of 48 volts DC and have an AC ringer voltage of 70-120 volts. Although, you can receive a good shock during the ringing cycle, the real danger comes from the fact that telephone lines are exposed to environmental effects such as lightning and nearby power lines. As a result, it is necessary that telephone lines be isolated from user equipment such as computers and fax machines. This is normally done by the using isolation transformers and relays.

The Caller ID Printer continuously monitors phone line audio for CID message activity. A telephone line audio coupler or a telephone recording interface is needed to isolate the CIDP from the phone line and to extract the audio signal. For permanent installations, an FCC approved device is recommended.

For experimental purposes, you can make a telephone line audio coupler using the circuit below. Any 600 ohm telephone isolation transformer will work. If you're in an area with a weak telephone signal, you may need to lower the value of the resistor, but not less than 600 ohms. The circuit is not polarity sensitive so it doesn't matter to which point the red and green wire is connected to.

You can learn more about telephone lines and other circuit suggestions at the following website

www.hut.fi/Misc/Electronics/circuits/teleinterface.html



SPECIFICATIONS

PRINTER

PRINT METHOD	Impact Dot Matrix, 5 x 7 format
COLUMN CAPACITY	16 (EPSON M150 Mechanism)
CHARACTER SIZE	1.8 x 2.5 mm
PRINT SPEED	1.0 lines/sec.
PAPER WIDTH	Standard cash register paper rolls, 1¾" wide (44.5 mm)
INK RIBBON	ERC-05

POWER SUPPLY

OPERATING VOLTAGE		+5 VDC ±5% (may be operated from 4 NiCad batteries)
CURRENT	(LOGIC)	4mA standby
		50 mA printing (max)
	(PRINTER)	0 mA standby
		500 mA printing (avg)
		1.5 A instantaneous (peak)

CALLER ID LINE SIGNAL (BELL 202A)

MODULATION SCHEME	Phase Coherent Frequency Shift Keying
LOGICAL 1 (MARK)	1200 ±12 Hz
LOGICAL 0 (SPACE)	2200 ±22 Hz
BAUD RATE	1200 bits per second
DATA	Serial, Asynchronous, 8 data bits, no parity, 1 stop bit (N81)
FREE RUN FREQUENCY	1647 ±12 Hz (measured on XR2211 Pin 11, J4 disconnected)