Subject: [WTB] TED 8360 and PLA for Commodore 16/116
Posted by sebastienmarty on Sun, 20 Oct 2013 08:49:52 GMT
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Hi,

Would anyone here know of a good source for chips for the Commodore 16/116 ?

I'd specifically need two TED 8360 chips and one PLA chip (82S100, P/N 251641-02). Lowest price possible and in working condition, of course :)

Thx :)

P.S. : I'm located in France, so a European source would even be better...
--
[SbM]
"If the French were really intelligent, they'd speak English" (W. Sheed)

Subject: Re: [WTB] TED 8360 and PLA for Commodore 16/116
Posted by <address_is on Mon, 21 Oct 2013 22:13:51 GMT
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SbM <sebastienmarty@yahoo.fr> wrote:
> Hi,
>
> Would anyone here know of a good source for chips for the Commodore
> 16/116 ?
>
> I'd specifically need two TED 8360 chips and one PLA chip (82S100, P/N
> 251641-02). Lowest price possible and in working condition, of course :)

Those chips, especially TED, were not built to last. They fail in every 264 series machine If you are lucky you may buy a working C16 for the price some dudes ask for TED alone :-(

--
SD!

Subject: Re: [WTB] TED 8360 and PLA for Commodore 16/116
Posted by sebastienmarty on Mon, 21 Oct 2013 23:04:20 GMT
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<address_is@invalid.invalid> wrote:

> SbM <sebastienmarty@yahoo.fr> wrote:
>> Hi,
>>
>> Would anyone here know of a good source for chips for the Commodore
>> 16/116 ?
>>
>> I'd specifically need two TED 8360 chips and one PLA chip (82S100, P/N
>> 251641-02). Lowest price possible and in working condition, of course :)
>
> Those chips, especially TED, were not built to last.

So I've been told :(

> They fail in every 264
> series machine If you are lucky you may buy a working C16 for the price
> some dudes ask for TED alone :-(

I have a few other working 264 series machines here, luckily. I was
hoping to fix the dead ones but I guess they'll end up as sources of
spare parts, I guess.

Thanks for your reply anyway :)

--
[SbM]
"If the French were really intelligent, they'd speak English" (W. Sheed)

Subject: Re: [WTB] TED 8360 and PLA for Commodore 16/116
Posted by <address_is on Wed, 23 Oct 2013 21:45:35 GMT
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>>> I'd specifically need two TED 8360 chips and one PLA chip (82S100, P/N
>>> 251641-02). Lowest price possible and in working condition, of course :)
>>
>> Those chips, especially TED, were not built to last.
>
> So I've been told :(

I was running a repair workshop in the eighties and the TED failure rate
was unbelievable even back then. Bill (c128.com) once said something like
"I am surprised that some of them still work".

> I have a few other working 264 series machines here, luckily. I was
> hoping to fix the dead ones but I guess they'll end up as sources of
> spare parts, I guess.

Well, other parts are much more reliable. Meaning you probably won't use
any out of those left ;-)

I have some working units too. All models, except the "true" 264. But I
have no spare TEDs either.

--
SD!

Subject: Re: [WTB] TED 8360 and PLA for Commodore 16/116
Posted by Clocky on Wed, 23 Oct 2013 23:28:43 GMT
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address_is@invalid.invalid wrote:
>>>> I'd specifically need two TED 8360 chips and one PLA chip (82S100, P/N
>>>> 251641-02). Lowest price possible and in working condition, of course :)
>>>
>>> Those chips, especially TED, were not built to last.
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> Well, other parts are much more reliable. Meaning you probably won't use
> any out of those left ;-)
>
> I have some working units too. All models, except the "true" 264. But I
> have no spare TEDs either.
>

Keep those chips cool is my advice. Heatsink and fan.

Subject: Re: [WTB] TED 8360 and PLA for Commodore 16/116
Posted by <address_is on Thu, 24 Oct 2013 10:25:27 GMT
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Clocky <notgonn@happen.com> wrote:

>> I have some working units too. All models, except the "true" 264. But I

>> have no spare TEDs either.
>>
>
> Keep those chips cool is my advice. Heatsink and fan.

You are right. Keeping cool is probably the only thing we can try doing in order to preserve them in working condition for longer.

--
SD!

Subject: Re: [WTB] TED 8360 and PLA for Commodore 16/116
Posted by George on Sun, 27 Oct 2013 01:13:58 GMT
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address_is@invalid.invalid says...

> Those chips, especially TED, were not built to last.
> They fail in every 264 series machine If you are lucky
> you may buy a working C16 for the price some dudes ask
> for TED alone :-(

Nah. I've had a Plus4 running continuously since 1992.
It's my caller ID computer. And it still runs fine.

I've always felt that CBM computers in general were subject to damage caused by power glitches and a resulting collision in which two or more chips end up trying to drive the address or data lines at the same time, which should never happen normally, but can happen when the power flutters and the chips get confused.

So I added a Max 690 circuit to my Commodores. That's a little 8-pin watchdog chip that pulls a hard ground on the *Reset line when Vcc drops below about 4.5V, which turns off all the line drivers of the various chips, and holds *Reset low until Vcc has again stabilized at 5V for a period of time. Seems to work well to prevent power glitches from causing damage.

Of course I can't prove this theory, but, you know, 1992.

By the way, with respect to looking for replacment chips, it's possible that a number of the major chips are the same in the C16 and +4, even including the PLA. As I recall, the kernal determines whether it's running in a C16 or +4 based on how much ram is present, or something

similar.

Subject: Re: [WTB] TED 8360 and PLA for Commodore 16/116
Posted by <address_is on Sun, 27 Oct 2013 02:24:51 GMT
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George <gh424NO584SPAM@cox.net> wrote:
> address_is@invalid.invalid says...
>
>> Those chips, especially TED, were not built to last.
>> They fail in every 264 series machine If you are lucky
>> you may buy a working C16 for the price some dudes ask
>> for TED alone :-(
>
> Nah. I've had a Plus4 running continuously since 1992.
> It's my caller ID computer. And it still runs fine.

Not everyone's got that much luck as I can still well remember.

> I've always felt that CBM computers in general were subject
> to damage caused by power glitches and a resulting
> collision in which two or more chips end up trying to drive
> the address or data lines at the same time, which should
> never happen normally, but can happen when the power
> flutters and the chips get confused.

I've seen many machines fried by power supplies or by users (after CBM introduced the PSUs with just four pins in a round DIN plug,meant to connect to 7-pin socket in the C64) but I am rather skeptical about your theory.

> So I added a Max 690 circuit to my Commodores. That's a
> little 8-pin watchdog chip that pulls a hard ground on the
> *Reset line when Vcc drops below about 4.5V, which turns off
> all the line drivers of the various chips, and holds *Reset
> low until Vcc has again stabilized at 5V for a period of
> time. Seems to work well to prevent power glitches from
> causing damage.

I did some rather extensive tests back in the days, when I tested how much down can the voltages go in a 64 and how the machine behaves under such conditions. I got a number of strange effects at various levels of 5,12 and AC but never caused any damage by under-powering the computers. But maybe I've been just lucky too.

>
> Of course I can't prove this theory, but, you know, 1992.

>
> By the way, with respect to looking for replacment chips,
> it's possible that a number of the major chips
> are the same in the C16 and +4, even including the PLA.

All 264 series share the TED and many other chips, but - according to my
in-memory statistics - none of the others is as susceptible to failures as
the mighty TED. The CPU comes next, trailed by the 16/116 PSU..
--
SD!

Subject: Re: [WTB] TED 8360 and PLA for Commodore 16/116
Posted by sebastienmarty on Sun, 27 Oct 2013 10:55:57 GMT
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<address_is@invalid.invalid> wrote:

> All 264 series share the TED and many other chips, but - according to my
> in-memory statistics - none of the others is as susceptible to failures as
> the mighty TED. The CPU comes next, trailed by the 16/116 PSU..

You're right, the PSU is prone to failure : I had two here, and they
died on me litterally one after the other.

As a side question : what would you all recommend as a good replacement
PSU to limit possible damage to the 264-series computers ?

--
[SbM]
"If the French were really intelligent, they'd speak English" (W. Sheed)

Subject: Re: [WTB] TED 8360 and PLA for Commodore 16/116
Posted by Ray Carlsen on Sun, 27 Oct 2013 16:14:25 GMT
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>> All 264 series share the TED and many other chips, but - according
>> to my in-memory statistics - none of the others is as susceptible
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> died on me litterally one after the other.
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> As a side question : what would you all recommend as a good
> replacement PSU to limit possible damage to the 264-series computers

> ?

A C128 PS is a good alternative since it's a switcher and its 5VDC source has a greater current capacity. I've "pigtailed" a C64 power connector on a few of them for customers. The first one I modded for myself, and it's presently in use on my test bench.

There are a few after-market "hacks" out there that users have assembled for themselves. They consist of a switching supply in the form of a wall wart (5VDC at 2 Amps or more), a transformer for the 9VAC, all fit in a case with the appropriate connector. Buying everything new makes it rather pricy but it's much more reliable than the Commodore brick.

Then there is the Computer Saver circuit that gets installed inside the computer or that can be built as a stand-alone device. That allows the computer to be used with any compatible PS safely.

Ray

Subject: Re: [WTB] TED 8360 and PLA for Commodore 16/116
Posted by sebastienmarty on Sun, 27 Oct 2013 16:30:20 GMT
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Ray Carlsen <rcarlsen@tds.net> wrote:

>>> All 264 series share the TED and many other chips, but - according
>>> to my in-memory statistics - none of the others is as susceptible
>>> to failures as the mighty TED. The CPU comes next, trailed by the
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> Then there is the Computer Saver circuit that gets installed inside
> the computer or that can be built as a stand-alone device. That allows
> the computer to be used with any compatible PS safely.

Thanks for all the info, Ray :)

As regards the C16/116, I guess any good-quality regulated 9VDC power supply should be OK, right?

--
[SbM]
"If the French were really intelligent, they'd speak English" (W. Sheed)

Subject: Re: [WTB] TED 8360 and PLA for Commodore 16/116
Posted by Ray Carlsen on Sun, 27 Oct 2013 17:07:06 GMT
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On 10/27/2013 9:30 AM, SbM wrote:
> Ray Carlsen <rcarlsen@tds.net> wrote:
>
>>>> All 264 series share the TED and many other chips, but -
>>>> according to my in-memory statistics - none of the others is as
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>> compatible PS safely.
>
> Thanks for all the info, Ray :)
>
> As regards the C16/116, I guess any good-quality regulated 9VDC
> power supply should be OK, right?

Yes, but it doesn't need to be regulated. The original C16/116 series PS
was just a transformer, rectifier and filter capacitor. The 5V regulator
is inside the computer. So, just about any DC supply of 9 volts at 1 Amp
or more would work as long as the DC connector is a correct physical
match and the polarity is correct. That's important!

Ray

Subject: Re: [WTB] TED 8360 and PLA for Commodore 16/116
Posted by sebastienmarty on Sun, 27 Oct 2013 17:58:38 GMT
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Ray Carlsen <rcarlsen@tds.net> wrote:

> On 10/27/2013 9:30 AM, SbM wrote:
>> Ray Carlsen <rcarlsen@tds.net> wrote:
>>
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> is inside the computer. So, just about any DC supply of 9 volts at 1 Amp
> or more would work as long as the DC connector is a correct physical
> match and the polarity is correct. That's important!

OK, thanks a lot for clarifying that. I have an Apple Stylewriter PSU
here that is a perfect replacement for the original C16 PSU.

--
[SbM]
"If the French were really intelligent, they'd speak English" (W. Sheed)

Subject: Re: [WTB] TED 8360 and PLA for Commodore 16/116
Posted by George on Mon, 28 Oct 2013 23:31:43 GMT
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SbM says...

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> regulated 9VDC power supply should be OK, right?

My C16 came with a pretty strange power supply setup inside.
Of course it has a 7805 regulator to produce +5VDC from the
+9VDC input supply. But in parallel with the regulator
circuit there's a 20-ohm, 5-watt resistor. So part of the
input supply goes directly from the 9V input to the output
of the regulator. I assume the resistor is chosen so that
by itself it produces a bit less current and voltage than
the computer's minimum requirements, and the regulator just
provides a small amount of additional power to keep the
output at a regulated 5V.

This setup greatly reduces the load on the regulator, which
is good, but it does mean that if the regulator fails, some
amount of unregulated current will still flow through the
resistor. It also means that if there's a spike on the 9V
input, it may get through the resistor whereas it wouldn't
make it past the regulator.

I've never seen this setup used anywhere else. It seems a
bit risky, but it means the resistor dissipates most of the
power consumed in dropping the voltage from 9V to 5V, so you
don't have to have a massive heat sink on the regulator,
which is probably why they did it that way.

Subject: Re: [WTB] TED 8360 and PLA for Commodore 16/116
Posted by Computer Nerd Kev on Wed, 30 Oct 2013 06:38:07 GMT
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On 27 Oct 2013, George wrote:

> address_is@invalid.invalid says...
>
>> Those chips, especially TED, were not built to last.
>> They fail in every 264 series machine If you are lucky
>> you may buy a working C16 for the price some dudes ask
>> for TED alone :-(
>
> Nah. I've had a Plus4 running continuously since 1992.
> It's my caller ID computer. And it still runs fine.

Actually as I understand it, where heat is involved in chip failure, leaving the chip on all the time is not much more damaging than never turning it on. The stress comes from materials expanding and contracting with heating and cooling cycles, so if it's on 24/7 it only needs to survive heating/cooling during the odd blackout. On the other hand, if it were turned on every morning and off every night, the stresses could quickly cause failure. That's what I read somewhere anyhow...

By the way, how does the Plus4 Caller ID system work?

--

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Subject: Re: [WTB] TED 8360 and PLA for Commodore 16/116
Posted by Computer Nerd Kev on Wed, 30 Oct 2013 07:14:29 GMT
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On 29 Oct 2013, George wrote:

> SbM says...
>
>> As regards the C16/116, I guess any good-quality
>> regulated 9VDC power supply should be OK, right?
>
> My C16 came with a pretty strange power supply setup inside.
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> circuit there's a 20-ohm, 5-watt resistor. So part of the

> input supply goes directly from the 9V input to the output
> of the regulator. I assume the resistor is chosen so that
> by itself it produces a bit less current and voltage than
> the computer's minimum requirements, and the regulator just
> provides a small amount of additional power to keep the
> output at a regulated 5V.

Hmm... that's a cheat I haven't seen before either.
Here's the bit of the C16 schematic with the PSU in it:
http://www.zimmers.net/anonftp/pub/cbm/schematics/computers/ pl
us4/c16-251788-1of3-left.gif

I'd love to find out more about this circuit. Running through
it in my head, it seems full of problems. I guess it probably
considers the inner workings of the 7805, perhaps I'll look
more deeply into it later and work out a theory.

--

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Subject: Re: [WTB] TED 8360 and PLA for Commodore 16/116
Posted by Ray Carlsen on Wed, 30 Oct 2013 16:38:51 GMT
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On 10/30/2013 12:14 AM, Computer Nerd Kev wrote:
> On 29 Oct 2013, George wrote:
>
>> SbM says...
>>
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>> resistor is chosen so that by itself it produces a bit less current
>> and voltage than the computer's minimum requirements, and the
>> regulator just provides a small amount of additional power to keep
>> the output at a regulated 5V.

> Hmm... that's a cheat I haven't seen before either.
<snip>

I have. As a TV repair tech in the tube days, I saw it in the low

voltage PS of portable TV's so they could use a smaller and cheaper regulator. The heat that would normally be thrown off by a big heat sink was passed to the resistor. That got hot instead but wasn't prone to failure as a regulator (IC or power transistor) would be.

Single chip regulators like the 7805 have something called fold-back current limiting, which means if the load becomes excessive (a short downstream), the voltage will drop to limit current flow and prevent damage. That's how they legally got away with no fuses in the +5V line inside the C64 "brick". However, if the regulator shorts input to output, all bets are off. That's what kills chips in the C64 because that voltage goes upwards of 11 volts at failure! Chips rated for 5 volts are "eaten" very quickly. A fuse wouldn't protect against that kind of failure anyway but it does prevent the overload from causing a fire. For that, most transformers have a heat sensitive thermal cutout built into them. It opens if the transformer gets too hot. That's why you never hear of a C64 PS, as bad as they are, from starting a fire.

Ray

Subject: Re: [WTB] TED 8360 and PLA for Commodore 16/116
Posted by George on Wed, 30 Oct 2013 16:42:19 GMT
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Computer Nerd Kev says...

> Actually as I understand it, where heat is involved in
> chip failure, leaving the chip on all the time is not
> much more damaging than never turning it on. The stress
> comes from materials expanding and contracting with
> heating and cooling cycles, so if it's on 24/7 it only
> needs to survive heating/cooling during the odd
> blackout. On the other hand, if it were turned on every
> morning and off every night, the stresses could quickly
> cause failure. That's what I read somewhere anyhow...

Yes, I think always-on minimizes the potential problems from heat cycles, but I just don't think the CBM chips are any worse than others. In my experience a CBM computer was usually discovered to be dead when it was powered up. It was rare for a computer to just die while it was running. While that could be due to heat cycles, it could also be due to those collisions I described when power is cut. So I added the Max690 circuits to mine. Actually, the Max 698 is cheaper and works the same.

Subject: Re: [WTB] TED 8360 and PLA for Commodore 16/116
Posted by George on Wed, 30 Oct 2013 17:03:40 GMT
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Computer Nerd Kev says...

> By the way, how does the Plus4 Caller ID system work?

It was just a hair-brained idea I had to have a computer receive the caller ID packets on my land line, and then convert the calling number to voice, and then broadcast it. I used the unused pair in the phone line as an intercom, and just had speakers at several places in the house near phone jacks. So when a call would come in, it would announce the calling number - so I wouldn't have to walk over and look at the caller ID.

Then I added a database for the numbers of family and friends, which would be announced by name, and of telemarketers, announced simply as "pest".

I had to build a caller ID demodulator that plugged into the User Port, and then replace one of the "3" functions (of +4) roms with a battery-backed static ram chip where I loaded in the code, the phone book, the phonemes, etc. The code was done in assembler. So the whole thing ended up as a lobotomized +4 that just did one thing.

Of course today everybody uses cell phones, and even for land lines there are PC programs that duplicate all of those functions if your computer has a voicemodem card. But it was fun playing with it at the time, and I just never turned it off. I recently switched from AT&T land line to Ooma home phone service, and the CID thing still works fine.

It is still a conversation piece for visitors. The phone rings, and then this computer voice comes out of the ether and says "Barbara" or "pest" or whatever.

Subject: Re: [WTB] TED 8360 and PLA for Commodore 16/116
Posted by George on Wed, 30 Oct 2013 17:19:51 GMT
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Computer Nerd Kev says...

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> I'd love to find out more about this circuit. Running
> through it in my head, it seems full of problems. I
> guess it probably considers the inner workings of the
> 7805, perhaps I'll look more deeply into it later and
> work out a theory.

Yes, it's the 20-ohm R10 that provides a lot of the power. And as you see it's connected directly between the unregulated input and the regulated output. So the 7805 just has to provide enough juice to keep the output at 5V.

And I agree that there are potential problems. The main thing is that you have to be sure the computer is always drawing at least enough current so that some is flowing through the 7805. If for any reason that isn't happening, then the output voltage goes toward 9V. Where it ends up depends on how much current is drawn, which determines the voltage drop across the resistor.

I really have mixed feelings about this. It seems a bit dangerous, but on the other hand it's a pretty nifty idea. The main benefit is to greatly reduce the heat load on the 7805, which helps keep it running, and it transfers that heat to a power resistor that's designed for that and will probably never burn out.

Subject: Re: [WTB] TED 8360 and PLA for Commodore 16/116
Posted by Computer Nerd Kev on Thu, 31 Oct 2013 22:52:53 GMT
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Great work!

Sounds like a really fun project. I'm almost tempted to do
something like it myself one day...

--

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Subject: Re: [WTB] TED 8360 and PLA for Commodore 16/116
Posted by <address_is on Fri, 01 Nov 2013 22:30:12 GMT
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SbM <sebastienmarty@yahoo.fr> wrote:
> <address_is@invalid.invalid> wrote:
>
>> All 264 series share the TED and many other chips, but - according to my
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> You're right, the PSU is prone to failure : I had two here, and they
> died on me litterally one after the other.
>
> As a side question : what would you all recommend as a good replacement
> PSU to limit possible damage to the 264-series computers ?

These days I use switchers for all but AC. I've replaced the transformers
in my drives too. But for the 16/116 probably every modern, single voltage
piece will be more reliable than the original one :-) To be more on the
safe side you might want to build some protection in inside the computer
itself. What I did for my 64 (actually for heat reasons rather than over
voltage protection) are adjustable digital VRs just before the analogue
ones. Digital are set only slightly above the minimal ratings of the
analogue ones which makes them emit less heat but should incidentally also
provide a crude form of protection. At least minimise the SPOF effect.

--
SD!

Subject: Re: [WTB] TED 8360 and PLA for Commodore 16/116
Posted by <address_is on Fri, 01 Nov 2013 22:30:13 GMT
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George <gh424NO584SPAM@cox.net> wrote:
> Computer Nerd Kev says...
>
>> By the way, how does the Plus4 Caller ID system work?

>
> It was just a hair-brained idea I had to have a computer
> receive the caller ID packets on my land line, and then
> convert the calling number to voice, and then broadcast it.
> I used the unused pair in the phone line as an intercom, and
> just had speakers at several places in the house near phone
> jacks. So when a call would come in, it would announce the
> calling number - so I wouldn't have to walk over and look at
> the caller ID.
>
> Then I added a database for the numbers of family and
> friends, which would be announced by name, and of
> telemarketers, announced simply as "pest".
>
> I had to build a caller ID demodulator that plugged into the
> User Port, and then replace one of the "3" functions (of +4)
> roms with a battery-backed static ram chip where I loaded in
> the code, the phone book, the phonemes, etc. The code was
> done in assembler. So the whole thing ended up as a
> lobotomized +4 that just did one thing.

Wow! That's what we call a good fun project. And a useful one too!!
Wouldn't you like to share the details/code? I bet some of us would jump on
it, regardless of the fact that everybody uses cell phones :-)

--
SD!
