ProService Magazine

October 2002

THE XOBON FOCUS, MICROPROCESSORS & SURVEY RESULTS!

An official journal of NESDA (National Electronics Service Dealers Association), and ISCET (International Society of Certified Electronics Technicians).

PURPOSE

ProService Magazine, a publication for members of NESDA and ISCET, is produced by NESDA, the National Electronics Service Dealers Association, 3608 Pershing Ave., Fort Worth, TX 76107. It is intended for the enlightenment, education and entertainment of the members of NESDA and ISCET.

With the exception of official announcements, the statements and opinions expressed herein are those of the authors and not necessarily those of the associations.

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CONSUMER ELECTRONICS ASSOCIATION
PACIFIC COAST PARTS
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— Part Two —

The Xobon FOCUS

C.W. Villademoros explores the future possibilities for Electronic Technicians, in the second article of a series.

by C.W. Villademoros PhD/CET, ISCET Secretary

What are the opportunities available in the several areas of enterprise for the Electronic Technician of the future?

Research reveals that electronics industry will move forward at an ever-increasing pace. Currently, technology has broached the 110-nanometer barrier. Innovative breakthroughs are on the horizon, and the 100-nanometer goal is within reach. That technology will lead to major development of new and imaginative electronic applications. The dominant areas of consumer electronics will include robotics, bioelectronics, communications and security.

> ***"Our society is rapidly coming to a collective realization that technology is a natural fit for many daily activities."***

Our society is rapidly coming to a collective realization that technology is a natural fit for many daily activities. The consumer robotics sector has enormous potential in this area. As the household appliance market converges with robotic technology, a massive new market space is being created. The first few home cleaning robots and lawn mowers are already on the rack and more competitive devices will be available very soon. Many new products are currently in production, and we may very well see them on the shelf in time for Christmas this year. It is expected that in a few years North American homes will ordinarily run several robotic devices such as, interior surface cleaners, garbage disposals, lawn mowers, and snow blowers, just to name a few. The 100-nanometer barrier will also greatly enhance speech synthesizer technology to the point that in the near future all toys and home appliance devices will have speech recognition capability.

As time goes by robotic products such as cleaning machines, food preparation, climatic control, home security, etc. priced in the $100 to $200 ranges, will be common in many homes. They will be controlled via on-the-fly wireless communications.

Bioelectronics is experiencing an unprecedented advancement with move to 100-nanometer technology. Within ten years advanced personal robots will appear, as will robot-assisted surgery. As time goes by people will accept the concept of "Borg" Technology and adopt robotics into their

(Xobon Focus, continued on page 3)

— Technical —

A Journey Into Microprocessor Terminology

Bob Rose shares his views on the microprocessor, including definitions and examples, to guide the reader through this important electronic component.

By Bob Rose

As you read through various technical manuals, you come across terms like CPU (central processing unit), microcomputer, micro, and system control IC—each one referring to what I call "the microprocessor." Let's take a look at each of them.

Central Processing Unit (CPU)

CPU is a term that is more personal computer (PC) oriented than "microprocessor"— the term that we in the service industry are becoming accustomed to using. Let me approach the point I'm trying to make like this: You might say that a computer is composed of four major elements: memory, arithmetic logic unit (ALU), control unit, and input/output unit. For the moment, however, I'm concerned just with those "parts" that make up the microprocessor or CPU.

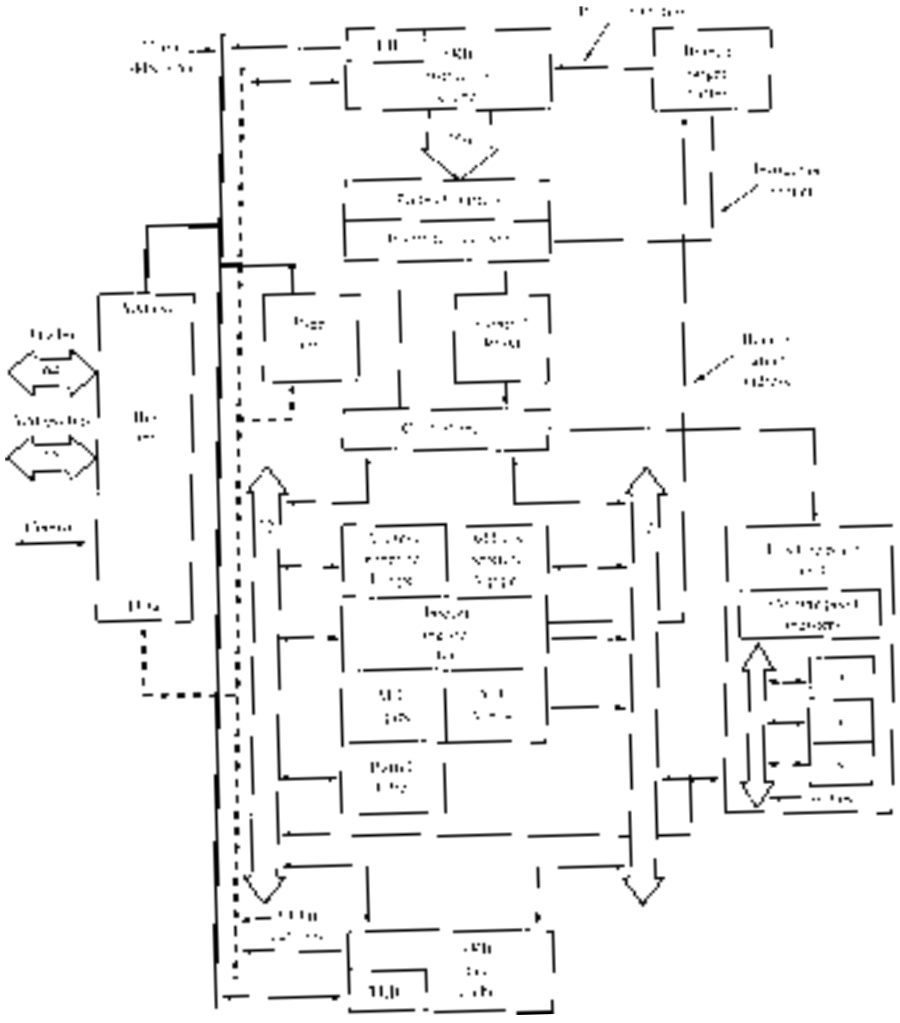
Of course memory stores information of which there are two types, data and instruction. "Data" (as I use the term here) refers to information that the user wants to store, and might be an article, financial records, or photographs, etc. "Instructions" refer to information that tells the computer what to do, for example, how to handle the data that is in storage. To a certain extent, you can think of a software package as a set of instructions that tell the CPU what to do with a given set of data. Those who are far more computer literate than I might want to quarrel with such simplistic definitions of data and instructions. I took such a course to keep the discussion as elementary as possible and I ask you not press the definitions I have given. Please regard them as illustrations rather than defnitions.

The control element executes the instructions that are in the software package by issuing various commands to the other parts inside the PC. It also ensures that everything happens in the right place at the right time. The ALU is the smart part of the chip performing commands like adding, subtracting, multiplying, and dividing. It even knows how to read logic commands like OR, AND, or NOT. Messages from the control unit tell the ALU what it should do and when it should do it. As I understand it, the central processing unit is the result of merging the ALU and control element into a single package. Of course the package must include a register because the CPU needs a place to store data temporarily while it executes its instructions (program or software). I know what I have written is simplistic, but I think it will be sufficient here.

I probably should cover one other aspect of the CPU before moving on. If I were writing a book about the microprocessor used in a PC, I'd want to touch on architecture and launch into a discussion of the two major computer architectures used in their manufacture, namely CISC (complex instruction set computer) and RISC (reduced instruction set computer). I mention the topic because I would like for you to be familiar with the term "architecture" when it is used with respect to the CPU/microprocessor. Thinking you might like an example of CPU/microprocessor architecture, I include **figure 1-1** that depicts an architecture block program for a typical Pentium class processor. I wish I could include such an illustration for a microprocessor used in a home entertainment

(Microprocessors, continued on page 6)

Figure 1-1



PTS Electronics

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(Xobon Focus, continued from page 1)

bodies. Artificial limbs will interface with the human brain. We will have mood sensors in our home, which will recognize emotions and adjust accordingly. Gene chips will be widely available. Medical researchers will use these chips to analyze the impact of chemicals on DNA and to develop gene therapies. Farther down the road we can expect customized medicine based on our individual genetic makeup. In less than fifty years scientists will have precise digital control of cells. Biological robots will enhance the performance of the human body. Nano-scale engineering will develop machines that are unseen by the human eye. Genes will be used as a form of identification.

Communications in the near future will take on a whole new mantel. Plazas, town squares, and other public spaces will be reinvented to include interactive digital-art installations. In terms of the so-called information highway, we will be computing and communicating simultaneously from devices we currently would not even recognize as computers. In less than five years computing and telecommunications will merge to become one. People will expect to be connected anywhere, and all the time. Telecommunications and computing will be blended together to the point they are indistinguishable. We are already seeing mobile phones with extra buttons for nontelephony functionality. Many new products are currently in their final stages of R&D and will soon go into full production on a very large scale. Such products will be made in mass quantities, and will be easy for the manufacturers to roll out. From that platform will come what I like to call the Conjoined Computer, The CC, as opposed to the PC, devices will control services provided by the network. The result of course will be very demanding customer that will expect reliability and increased capacity on scale that we cannot even begin to comprehend.

Security of course has commanded an increasing interest to the general public with events associated with 9-11-01. The consumer industry is moving rapidly to fill to the void that currently exists in personal security. New innovations in audio surveillance, alarm systems, sensors, card readers, tracking equipment, video surveillance, bomb detectors, identification scanners, etc. are already available to the consumer.

The one area that is least protected are our computer systems. High Energy Radio Frequency (HERF) weapons as well as Electromagnetic Pulse Transformers (EMPT) whose Electro-magnetic energy can be directed against computer systems which could lead to complete data loss are not that difficult to build. Most corporate computer experts are not even aware of the destruction that could be caused by terrorists. It is only a question of time before terrorists realize the crippling effect that could immobilize complete data centers with these mega-watt missiles. There are entities currently involved in developing the technology to defeat these new weapons, and the systems should be in production early next year.

So — how do we, the Dealers and the Technicians in the Consumer Electronics arena, prepare for this future? Look for some interesting and informative suggestions in our next installment of the Xobon Focus.

— NESDA President's Article —

Sucker Punching Our Service Industry

NESDA President John Eubanks CET discusses replacement parts sales and the problems he has had with misrepresented components.

by John Eubanks CET, NESDA President

Although it may seem hard to believe, allowing continuation of existing industry parts abuse policies amounts to a blow on our entire Independent Service Industry. There appears to be no ongoing efforts to control these defective replacement part sales beyond the repetition of the well-known cliché buyer beware.

Let me speak to a few specific problems, at the risk of revealing that I am not one of this association's larger servicers which some assume must be a required qualification for election to any NESDA office. My employment as bookkeeper as well as janitor should easily bring an understanding that I am also this huge firm's sole parts department representative.

Upon receipt of a Panasonic model CT32G33 television for service that failed during a recent thunderstorm in our customer's neighborhood, it was determined the power supply was not operating. This power supply utilizes a STR58041 regulator IC. Simple enough. Just replace the regulator. But that is when our problems began. Of course we didn't expend any efforts beyond just obtaining another STR58041 from our parts bin, because that is what was on the removed part. Both versions of this device are the same size and appear identical to the non-informed. After replacing this component nothing else changed except our opinion of the complexity of the failure. Now forced to pull a schematic diagram for the unit we noticed this regulator was a STR58041A and searched our cross-reference manuals for any suitable sub or replacement, which lead us to try a NTE 7078. Again nothing changed beyond wasting our time and money spent on this NTE replacement. We called several other servicers and of course no one knew of these problems we were experiencing. One told me he had learned to only use "OEM" (original equipment manufacturer) replacements. Although respecting his advice and ordering the OEM component, which amounted to an admission of being victimized by non-adherence, I still wanted to know what differences may be between these two components.

We called a well-known distributor and sought their assistance to find these answers. They were kind enough to send us the respective specification sheets along with our parts order. After receiving this Part (STR58041A) we noticed that it did not have the "A" after the device identification stamped upon its case. That caused us to question if we actually received an "A" version of this device. Close scrutiny of the respective specification sheet revealed the "A" version is indicated by a white dot only after the letters "STR" on the top identifying line. The part we re-

If you would like your event listed in this section, please contact stephanie@nesda.com or call 817/921-9061 ext. 13.

Upcoming Events:

NARDA Institute of Business Management
October 4-7, 2002
Fort Worth, TX
www.narda.com

CEA Industry Forum and Fall Conference
October 13-16, 2002
San Francisco, CA
www.ce.org

Electronic House Expo — Fall
November 11-14, 2002
Long Beach, CA
www.ce.org

2003 International CES
January 9-12, 2003
Las Vegas, NV
www.ce.org

United Servicers Association Institute of Service Management 2003
February 16-19, 2003
Orange (Anaheim), CA
www.unitedservicers.com

Electronic Distribution Show and Conference (EDS2003)
May 13-15, 2003
Las Vegas, NV
www.edsc.org

2003 Mid-Atlantic Electronics Conference
June 20-22, 2003
Dover, DE
www.vpea.exis.net

National Professional Service Convention (NPSC) 2003
July 16-19, 2003
Reno, NV
www.nesda.com

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(Microprocessors, continued from page 2)

product, but I haven't been able to locate one. **Figure 1-1**, then, will just have to do. However, it certainly ought to give you an idea about how complex the structure of a typical microprocessor is.

Though CPU and microprocessor refer to the same reality, I prefer the latter and intend to shy away from using "CPU" to designate devices like U13101.

Microcomputer

"Microcomputer" falls into the same category. Zenith engineers use it almost exclusively in some of their literature and I have also used it on occasion. Some of the literature has gone as far as to say that a microprocessor is a microcomputer minus peripherals like keyboard, monitor, and the like. I doubt that the statement is entirely accurate. As a matter fact, one of my friends in the computer service industry takes strong exception to it.

When I think of microcomputer, I think of, for example, a desktop computer like the one I am using versus a large mainframe. Incidentally, "micro" comes from a Greek word that means "small." So, "Microcomputer Service Center" is a business that specializes in small computer, personal computer, sales and service as opposed to mainframe sales and service. You see, in a large sense "microcomputer" and "PC" are synonymous.

System Control

"System Control" is another term that is liberally used in the service literature and training manuals of home entertainment products, like the phrase "system control IC." In modern home entertainment products, system control is made up of one or more microprocessors, a memory chip like an EEPROM, one or more communication buses, and a few other components thrown in for good measure. The neat thing about this term is that it stresses the microprocessor a part of a system, the "conductor" that stands at center stage. Please understand my point. I am simply trying to be clear with respect to the language I intend to use. I use "microprocessor" to refer to a single chip, and "system control IC" to refer to the "system" of which the microprocessor is center.

Dedicated Microprocessor

One more point before moving on. The microprocessors that I discuss are dedicated microprocessors, having been designed to perform a specific function. In other words, they have been designed to do a certain job as opposed to a wide set of tasks.

A dedicated microprocessor cannot be programmed in the field where you and I work. It is programmed at the factory. If it develops a program flaw, a dedicated microprocessor simply has to be replaced.

A dedicated microprocessor may be a bit more difficult to troubleshoot than one that isn't dedicated. In order to protect their product, some manufacturers consider the inputs and outputs of such microprocessors to be "proprietary." That's a sophisticated way to tell you and me that the manufacturer isn't going to tell us what the signals are at the various pins. When you read a technical manual or look at a schematic, you might see, for example, pins 9 through 20 labeled "A0" through "A11" and pins 26 through 33 labeled "D7" through "D0" respectively, giving virtually no information about what signals or voltages appear at these pins. This has implications for troubleshooting because how can you know that the chip is working properly if you don't know what to expect when you check those pins for voltages and data? Such is the state of the industry, and there appears to be little we can do about it.

This article is based on an unpublished manuscript by Bob Rose.

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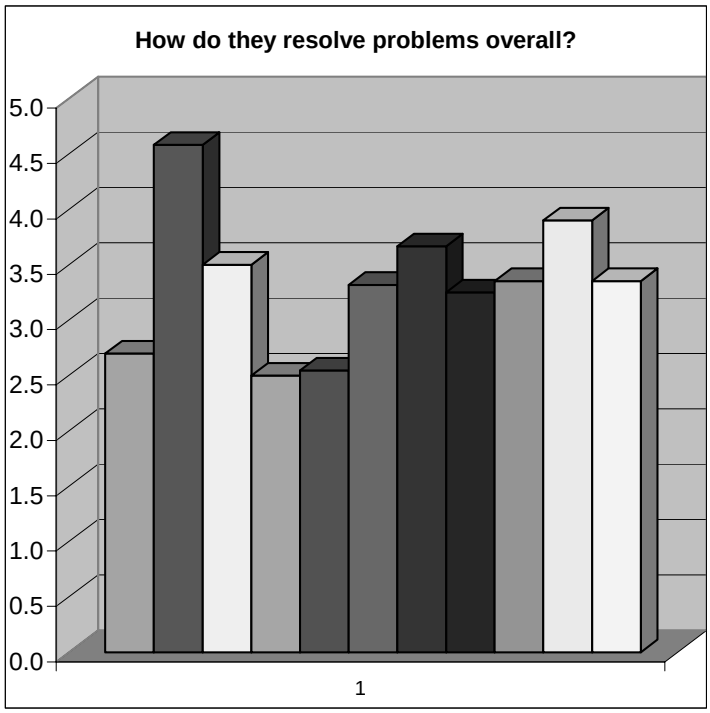

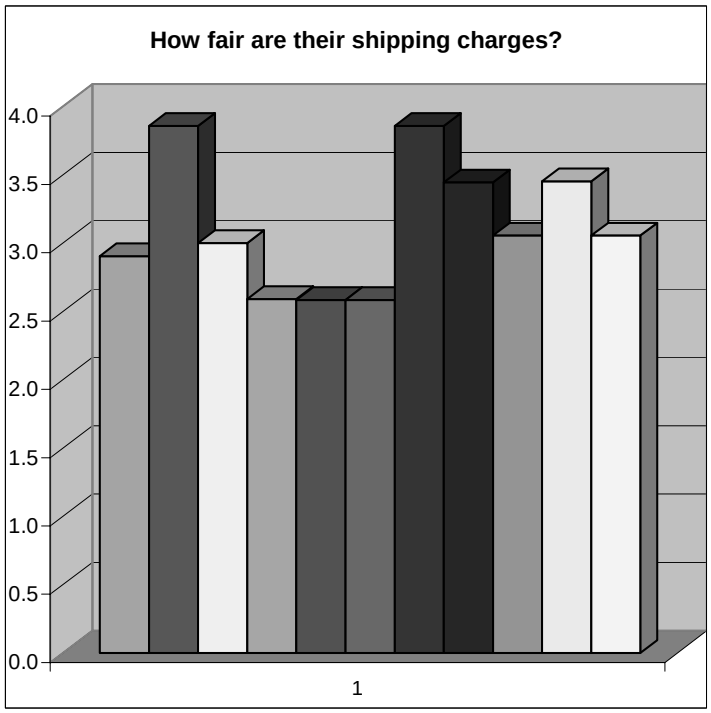

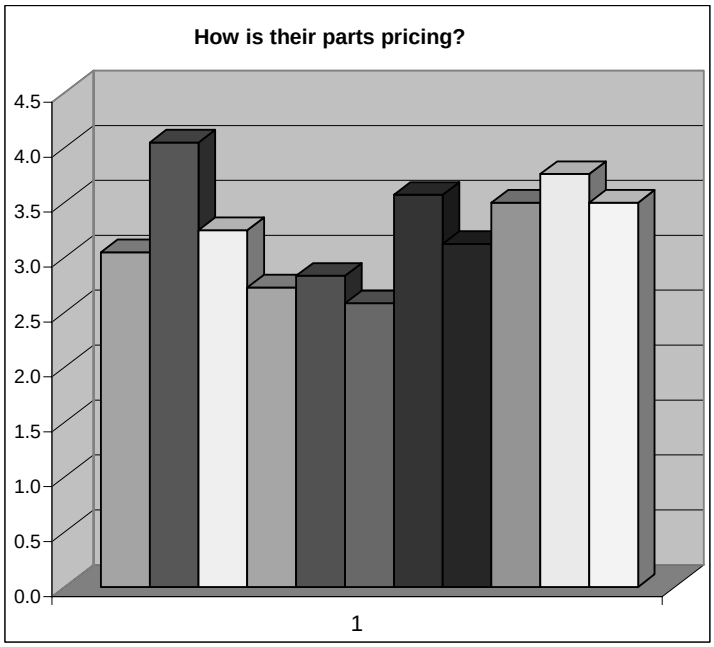

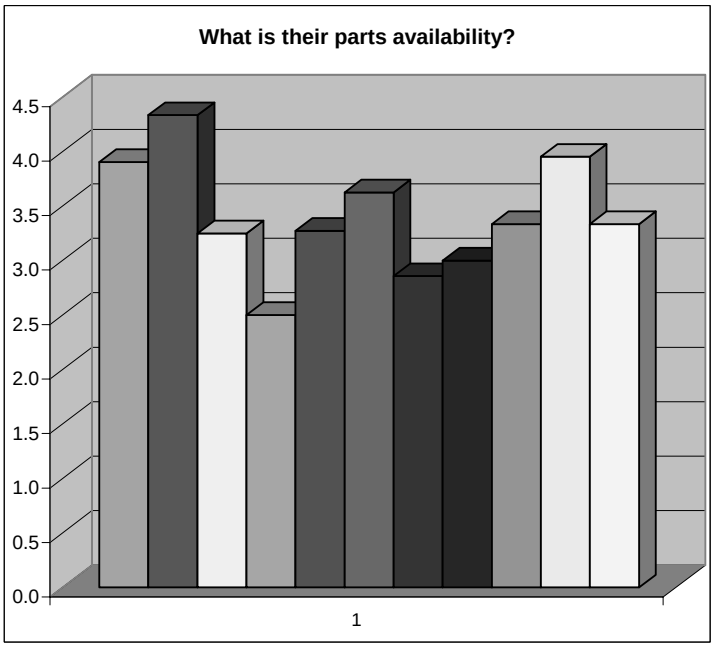

These graphs are representative of the three surveys conducted regarding manufacturers, distributors and tpa's. Please look at the enclosed mailing for the location of the final results.

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(NESDA President's Message, continued from page 4)

ceived had this dot and upon installation our power supply was now returned to its normal mode of operation.

Should these components be routinely placed in the same parts bin, this lesson likely must be relearned each time they are inadvertently used because of these very similar component markings. Seeking other visual differences we found that the "A" version has 3 pins (1, 3 & 5) bent forward whereas the straight version only has two pins (2 & 4) bent forward. Internal wiring is entirely different and it became obvious one will not work for the other. Another less obvious difference to determine which device you have is available by reading resistance between pin 2 and 5 of this device. It should be 560 ohms on the STR58041A whereas the STR58041 will have no reading between these pins.

A real knockout punch came with the request to service a Mitsubishi CS-3503R that had also failed in this thunderstorm. This customer was an elderly gentleman with more medical problems than a Hong Kong made wooden pocket watch. He was an amputee whose daughter was staying with him providing all non-medical care that this TV could not. This television was his prime source of entertainment and we wanted to fix it quickly for him. We found the Horizontal Output Transistor to be shorted and used a well-known brand substitute as a replacement device. The OEM device installed in this unit was a 2SD2549 and of course we didn't have that exact component, but we did have a 2SD1881 that is capable of satisfactorily replacing it. That is if it were actually a real 2SD1881. Problem is though 2SD1881 was clearly written on our new part in its bag, when installed, it wouldn't work — leading us to believe we had other problems in this circuit and making the decision to remove the unit for shop service.

After obtaining the proper schematic and making many checks we were unable to read a damper diode junction in the circuit leading us back to the same horizontal output transistor we installed in the customer's home. When this device was removed we still could not read any damper diode junction that is supposed to be internal in both the 2SD1881 and 2SD2549 transistors. Since we had more than one of these 2SD1881 transistors we checked another one and found no damper in it either. As a matter of fact none of the 6 transistors we had in stock in unopened bags contained a damper junction. We then ordered both the 2SD2549 and 2SD1881 transistors between phone conversations with our anxious customer. When these parts were received we installed the OEM and the unit was returned to normal operations. Then questioning our decision to use a 2SD1881 as a sub we removed the 2SD2549 and replaced it with a 2SD1881. This unit operated just as well with it as it did with the OEM.

Our industry needs improvement but it is now obvious that improving the abilities of the average servicer is not a solution to our problems as long as it remains acceptable to routinely sell fraudulently represented components to servicers. We must continue working together with all our responsible partners to remove this blemish from our service industry.

Toshiba Challenge 2004 – Shoot for the Moon

Toshiba America Consumer Products, Inc. recently announced its commitment to sign up all Toshiba Authorized Service Stations as NESDA members by the year 2004. To encourage participation and help this become a reality, Toshiba will pay a portion of the dues, and each new member will pay dues at a reduced rate for the first year. NESDAnet will also be offered to these new members through the Toshiba program.

According to Chris Fabian, Vice President of the Service Division for Toshiba America Consumer Products, "Toshiba considers NESDA a key partner in our efforts to take care of our mutual customers, those consumers who buy Toshiba products. NESDA provides a strong service industry forum for service companies, manufacturers, parts distributors, and third-party providers through various services and activities. Key members of our National Service Division participate at the NESDA/ISCET National Professional Service Convention (NPSC) every year, as well as at regional NESDA conventions. These events afford us the opportunity to meet face-to-face with many of our Authorized Service companies."

NESDA welcomes all new Toshiba ASC members and thanks Toshiba for its ongoing support.

Member Information Updates Needed

NESDA is excited to announce that the 2003 ProService Yearbook will include, FOR THE VERY FIRST TIME, A LISTING OF CURRENT NESDA MEMBERS.

Depending on the space we have available, we expect the listing to include the member's name, company name, business address, business phone/fax, website, and e-mail address, number of CET's, number of CSM's, and number of A+ technicians. In a future edition we will also include a notation of Certified Service Center status.

In addition to the yearbook information, we also want to update member information on our website for consumers or manufacturers to use when they are looking for a servicer, so updating your listing will serve a dual purpose.

This listing will probably add a number of pages to the book, making it thicker and more expensive to produce and mail, so we want it to be as accurate as we can possibly make it. To achieve this level of accuracy, we need your assistance in updating the information we have in the NESDA member database, as this is where the listings will come from.

Please visit www.nesda.com and look for a link on the home page in the upper left corner, labelled "NESDA Members." Please click on this link, complete the form, and click the "Update my info!" button to send your contact info to the NESDA office. Even if you are sure we already HAVE good info, please complete the form and return it anyway, so we can check what we have against your current information.

Please submit this information as soon as possible. Do us a favor and complete the form even if you think we already have your most current information, as it will also give us another chance to check what we have. A printed copy of the form that can be faxed or mailed back appears as an insert in this issue of ProService Magazine.

IF YOU ARE ARE MANUFACTURER OR DISTRIBUTOR who may be thinking of advertising in the ProService Directory and Yearbook, please consider that the membership listing in this book will make the book an even more valuable resource for members, and will make advertising even more visible than it has been. For advertising rates and info, please contact Stephanie Peistrup at 817/921-9061 ext. 13 or by e-mail to stephanie@nesda.com.

Online, or in the mail …

Over the past several months we have heard from several members that they like reading their ProService Magazine online and might be willing to forego the snail-mailed printed issues.

Rather than receiving a printed copy, you would receive an e-mail message containing a link or links to the magazine and inserts. If you wished, you could print copies for yourself or simply read them online.

If you would be interested in giving this a try, please let the NESDA office know either by telephone or via e-mail to judi@nesda.com. If you wish to continue receiving your copies in the mail, you do not need to do anything.

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Do you have technical information that you would like to share? Would you like to see your name in Pro*Service* Magazine? Why not write an article?

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— Press Release —

Americans Should Not Be Forced to Buy DTV Over-the-Air Tuners Says CEA

Costly FCC Mandate Ignores Need For Cable Standard and Broadcasters' $70 Billion Spectrum Giveaway — Arlington, Virginia, 8/8/02

A Press Release from the Consumer Electronics Association — 8/8/02

Pointing to high consumer costs and the scant percentage of households relying on over-the-air television reception, the Consumer Electronics Association (CEA) today opposed the Federal Communications Commission's (FCC) order requiring a broadcast digital television (DTV) tuner in all new TV sets.

"The FCC has just imposed a multi-billion dollar annual TV tax on American consumers," CEA President and CEO Gary Shapiro said. "With fewer than 13 percent of American households relying on over-the-air reception for their TV signal, we don't need a digital broadcast tuner embedded in every new television in order to accelerate the DTV transition; we need digital cable equipment compatibility - the option for consumers to buy a high-definition set, take it home, plug it into the cable jack in their wall and turn it on just like they do today in the analog world. A mandatory digital broadcast tuner would be a costly vestigial organ in the sets used by millions of American cable and satellite viewers.

"We certainly respect the Commission's interest in shifting broadcasters rapidly to DTV," Shapiro continued. "TV manufacturers have helped advance these goals by making and selling DTV products that consumers want. Set makers have also offered to help the transition by putting an over-the-air tuner in cable ready DTV sets of all sizes. We further share the FCC's urgency in achieving an 85% DTV penetration rate as quickly as possible. We believe minimizing the cost to consumers of new DTV products and making them cable compatible will best accelerate the process."

CEA argued a successful DTV transition is dependent not on over-the-air tuners, but rather on the adoption and implementation of a nationwide standard for sending high definition television (HDTV) programming over cable - often referred to as cable 'plug-and-play' compatibility. The current lack of compatibility is the single largest remaining obstacle to the DTV transition, according to CEA.

CEA also noted that ATSC tuning and decoding capability in virtually every TV set would result in a major cost increase and would jeopardize the consumer market for many models. Additionally, most television manufacturers already are incorporating DTV broadcast tuners (ATSC tuners) in their product lines and are offering consumers a wide array of choices.

"Everyone from consumer groups to the Cato Institute opposes a tuner mandate," Shapiro continued. "The FCC has proven the old-saying wrong that there is no such thing as a free lunch. Broadcasters are sitting on a $70 billion spectrum grant from the government. Rather than compelling consumers to buy DTV tuners by providing ample HDTV programming, broadcasters have imposed more costs on the American public. Americans should not be forced to buy over-the-air tuners for DTV when they are choosing not to purchase them on their own today.

"It is especially unfortunate that where consumers would benefit and Congress has called for action - on cable compatibility - the FCC has chosen the laissez-faire route. Instead, the Commission is imposing unnecessary costs on the vast majority of American consumers. We continue to ask the FCC to use its jurisdiction to make sure consumers can receive DTV and HDTV programming via cable as seamlessly and as quickly as possible."

NESDA Business Insurance Announcement

Sentry Insurance notified NESDA that it will no longer write new business insurance coverage for NESDA members. The NESDA office is seeking a suitable insurance carrier for the program and hopes to make an announcement soon.

RENO

JULY 16 – 19, 2003

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