

# **White Paper: Comparing Budget Modems and Intelligent Fax Hardware**

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***How Companies of All Sizes Can Achieve Carrier-Grade  
Reliability and High-Performance at an Affordable Price***

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## Comparing Budget Modems and Intelligent Fax Hardware

*How Companies of all Sizes Can Achieve Carrier-Grade Reliability and High-Performance at an Affordable Price with their Fax Communications*

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## Introduction

This document reviews the role intelligent fax boards play in providing RelayFax™ customers with reliable, high-performance, secure – yet affordable – messaging solutions. Written for organizations that are deciding which fax hardware option best suits their communications needs, this paper examines the feature differences between budget modems and intelligent fax boards. It analyzes overall cost savings and presents why the RelayFax / Mainpine combination offers the best choice for sending and receiving business-critical fax documents.

Fax hardware plays a critical role in the sending and receiving of business documents. Under pressure to keep costs down some organizations are swayed by the lower price tags of general purpose budget modems. Not realized until after deployment are the ongoing, hidden costs of these budget modems – dropped fax calls, high error rates, sluggish transmission times, risk of security breaches and incomplete or lost documents.

All too often, generic modems cause delayed responses, frustrated or irate customers and higher than necessary fax phone bills. Moreover, the fax features of these basic modems are so limited that they are generally not considered a serious option for business-level fax messaging.

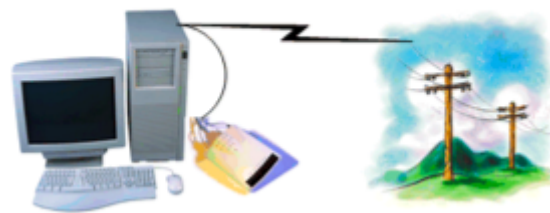
Companies deploying network fax server software such as Alt-N Technologies' RelayFax™ solution must choose between using budget modems or intelligent fax boards such as Mainpine's RockForce™ hardware line.

## Budget Modems and Intelligent Fax Boards

### Definition of a Budget Modem

For the most part, budget modems are low-cost, dual-purpose devices that attach internally or externally to a personal computer. Basic modems enable faxing from a desktop computer at connection speeds limited to 9600 bps (V.29) and 14.4 Kbps. Most generic modems do double duty as regular modems.

### Typical Budget Modem Configuration



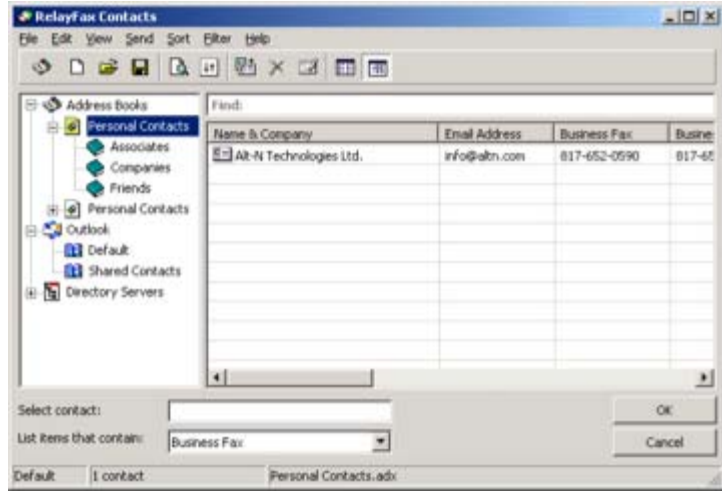
Examples of budget modems include:

- Hayes
- Microcom
- Motorola
- Multi-Tech
- Paradyne
- Racal
- Telebit
- U.S. Robotics/3Com
- Zoom
- Zyxel

Budget modems depend completely on the power of PC micro-processors for tasks critical to sending faxes. These include the conversion of PC files to fax format and the management of the fax call. According to Peter Davidson, an independent fax industry analyst, converting PC files to faxable formats consumes 10 to 20 times more processing time than managing the actual fax phone call – consuming a significant amount of PC power. Because budget modems place the document conversion burden on the PC, faxing processes often cause major production bottlenecks on a user's workstation – interfering with the ability of employees to use their computers while documents are converted.

## Definition of an Intelligent Fax Board

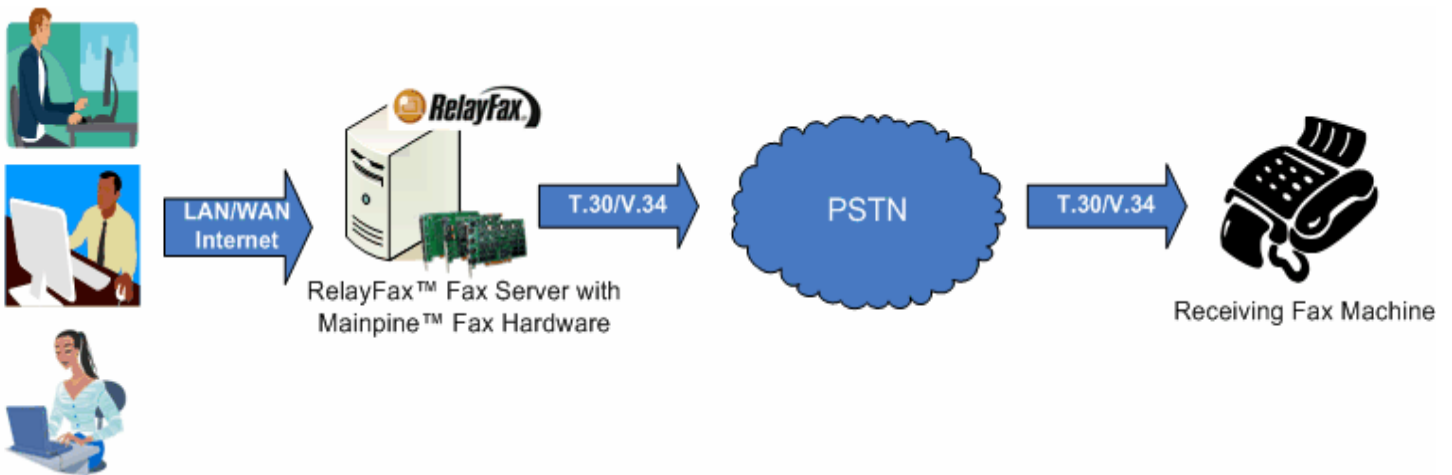
Intelligent fax boards, such as Mainpine RockForce™ boards, are generally more expensive than budget modems but are designed specifically for fax server applications such as Alt-N Technologies' RelayFax™ solution. Intelligent fax hardware includes advanced fax features like super-fine resolution, color fax and the ability to convert between different page sizes – all features modems simply are not able to offer. Boards reside internally within a server that has LAN fax server software installed and include multiple ports or channels dedicated to the sending and receiving of fax documents.



*Alt N technologies' RelayFax server has been certified to work with Mainpine's RockForce intelligent fax board series*

And unlike budget modems, cards include an on-board microprocessor, eliminating the reliance on a user's workstation for document conversion and the management of the fax call.

## RelayFax™ Server and Mainpine RockForce™ Network Configuration



## Budget-Based Modem Shortcomings

A number of alarming disparities exist when comparing the performance and reliability offered by a low-cost modem versus that of an intelligent fax board.

**Dropped Fax Calls:** Budget modems have a limited amount of call progress information reported back to the application compared to the Smart Port™ technology of RockForce™ boards. This results in less robust call-control and is a key reason why basic modems experience significantly higher failed fax attempts as well as a much greater number of retries.

**Higher Long Distance Phone Charges:** The first minute is the most expensive part of any long distance call. According to industry analyst Peter Davidson, businesses relying on generic modem implementations often have to try two or three times each time a fax is sent before a modem is able to get the fax through. This contributes to higher than necessary long distance charges.

**More Modems?** Budget modems support only one port per PC. If you need additional ports, businesses must purchase more PCs and modems. And because most modems can only send at 14.4 Kbps, slower transmission rates force some organizations to invest in additional workstations equipped with more modems.

**Headaches and Delays:** Most employees who depend on a basic modem spend more time than necessary faxing critical documents. It is well-documented throughout the industry that faxes sent from modems have an unnecessarily high percentage of non-completions. Generic modems depend completely upon the power of PC microprocessors for tasks critical to sending faxes, including the conversion of documents to fax formats, management of the fax phone call itself including the signaling required to set-up, maintain and complete a fax call.

**System Overload:** Budget modems are typically installed on user workstations. Unfortunately many PCs struggle to provide enough power – and speed – to manage multi-faxing. Too often, systems become sluggish, causing big problems for both the faxing application and other processes.

**Outdated Standards:** Many generic modems still rely on 14.4 Kbps, which triples the page transmission time compared to a RockForce™ board at 33.6 Kbps (V.34). Slower connection times lead to much higher phone bills.

### Speed and the V.34 Standard

Most budget modems still only send faxes at V.17 speeds of up to 14.4 Kbps. Mainpine's RockForce boards were among the first intelligent fax cards to send and receive faxes at 33.6 Kbps using the V.34 fax standard.

- V.34 is over two times faster than V.17 (14.4 Kbps)
- V.34 is three times faster than V.29 (9.6 Kbps)
- All new fax machines sold support V.34 fax
- Faster transmission translates to lower phone bills
- Davidson estimates 35% of fax traffic in 2006 will be sent via V.34 capable fax devices
- Call setup and session management reduced by one-third, further slashing long distance charges
- Incoming faxes received faster, so time-sensitive documents can be processed quickly
- Carrier-class reliability compounds phone savings
- Improves handshake and connection process through a feature called "line probing"

### Savings Example: 4-Page Fax

	V.17	V.34
9.6 Kbps	14.4 Kbps	33.6 Kbps
166 seconds	124 seconds	41 seconds

*V.34 fax can save organizations thousands of dollars when compared to V.17 and 9.6 Kbps. For the example of a 4-page transmission, the connection time can vary from 166 seconds with a 9.6 Kbps modem to only 41 seconds using V.34, saving more than two minutes in long distance charges per call.*

**Compatibility Issues:** Many basic modems do not guarantee interoperability with fax applications. Mainpine partners with leading fax vendors like Alt-N Technologies' RelayFax™ application and is committed to ensuring its RockForce™ hardware provides the highest levels of compatibility and integration.

**Out-of-Date Firmware:** The firmware behind most generic modems has not changed in many years. This leaves companies behind the curve and unable to take advantage of increased completion rates and improved efficiencies in sending and receiving faxes.

**Security Risks:** A budget modem allows the transfer of data, not just fax images, making a network vulnerable to security breaches like potential hackers, viruses, worms and Trojans.

**Storage Issues:** Another problem with budget modems is that each document you receive requires a large amount of disk storage (about 100K per page). Not only does this eat up disk storage, but it takes a long time to print such files from a user's workstation.

## Field-Proven, Intelligent Fax Board Technology

All types and sizes of organizations have experienced challenges after deploying budget modems. The fax features of these basic modems are so limited that they are generally not considered a serious option for business-level fax messaging. For many it has been a quandary: live with the higher error rates and sluggish transmission times experienced with basic modems or deploy intelligent fax hardware to ensure the highest levels of reliability and security.

Deploying an intelligent fax board may cost a little more than some budget modems, but fax hardware such as Mainpine's RockForce™ board series offers superior, carrier-grade reliability, resulting in significantly higher fax completion rates, improved efficiencies, and lowered long distance fax charges.

RockForce™ intelligent fax boards may cost a little more than a basic, budget-modem, but they offer value-added features and benefits that speed the delivery of critical business documents, resulting in reduced costs that pay for themselves in a number of ways.

**On-Board Processing:** Enables superior fax compression methods and ultra-efficient conversion rates by freeing up PC resources. No longer are desktop users sitting needlessly at their PCs waiting for their systems to render documents to a fax format, connect and process. This saves valuable CPU resources, increases reliability and slashes long distance fax costs.

**Smart Port™ Technology:** With Mainpine's patent-pending Smart Port™ technology if one port experiences problems other ports are not impacted. Individual ports are automatically

### Smart Port™ Technology

Unlike with generic modems and other fax hardware, Mainpine intelligent fax boards are equipped with patent-pending Smart Port™ technology. This gives RockForce™ hardware the ability to offer carrier-grade reliability, power and speed.

Each port or channel on a RockForce™ board has a dedicated DSP (digital signal processor) and CPU (controller). If one port experiences problems, Smart Port™ technology detects which channel and automatically resets itself. This provides maximum reliability and up-time that is unrivalled in the intelligent fax board industry.

Other alternative fax board options offer only one chip control for all ports or a hybrid-based approach. Drawbacks to this approach include:

- **Single point of failure.** If there is a problem with one port, all channels are impacted leading to higher error rates and greater down-times.
- **Inadequate processing power.** The hardware may not be able to provide the power necessary for demanding fax activities.

restarted when a problem channel is detected so that faxing activities are unaffected. This provides maximum up-time and reliability not found anywhere else in the market.

**Form-Factor Flexibility:** Mainpine boards boast the best 'form factor' on the market. With RockForce's universal "short board" form factor - cards fit easily into a full or half size PCI/PCI-X slot in any PC or Server. Moreover, boards are 100 percent PCI and PCI-X compatible. This compact and compatible design offers a smaller size making boards more flexible and available for a much wider range of servers compared to budget modems and alternative fax boards. Mainpine has engineered its cards to eliminate any slot issues and ensure RockForce hardware is the easiest of fax boards to install – giving it the nickname "plug-and-fax hardware."



As shown in the example, the RockForce QUATRO+ is significantly more compact than other intelligent fax cards, including Brooktrout boards.

All Mainpine boards conform to the latest PCI specification and have been designed to meet the standard 'short board' form factor. This ensures that the Mainpine boards fit into and work with **ANY** conventional PCI compliant PC or Server, from the very smallest to the largest.

**Best Connection Rates in Industry:** This translates to much lower fax phone bill charges as well as no more hassles dealing with dropped fax calls. Independent sources including Peter Davidson, a fax industry analyst, report that virtually every fax phone call made with a budget modem costs about twice as much as necessary in usage charges paid to one's telephone company. RockForce intelligent fax boards have one of the highest 'first try' connection rates compared to basic modems as well as other fax boards (testing data available on request).

**Rapid Transmission:** Mainpine RockForce™ intelligent boards were among the first hardware vendors to support the V.34 standard. Deploying V.34 fax technology with the RockForce™ series of intelligent fax boards will save any sized business money.

- Save up to 350% on the page-transmission portion of fax calls
- Faster compression speeds, results in lower fax phone bills costs
- Speeds the overall communications process, resulting in higher partner, vendor and customer satisfaction

**Saving Time and Money with Speed**

*In combination with RelayFax™, RockForce intelligent fax boards send 4 – 6 times faster than that of most budget modems.*

**RockForce Boards**

**Generic Modems**

**RoHS/WEEE Compliance:** RockForce boards the first among generic modems and intelligent fax hardware to comply with RoHS and WEEE directives. These EU directives restrict the use of

six hazardous substances and promote environmentally sound recovery and disposal of electrical and electronic equipment waste.

**Security:** A budget modem allows the transfer of data, not just fax images, making a network vulnerable to security breaches including hackers, viruses, worms and Trojans. Unique among intelligent fax board manufacturers, each RockForce board has its own identifying serial number. This is used to encrypt fax traffic – providing the highest levels of security available today.

**Image Handling:** Mainpine boards support a wide range of document formats for on-the-fly conversion to professional, business-quality fax formats. Standard TIFF files are supported. Unlike many budget modems that continue to rely on PCX/DCX file formats that are larger than TIFF files and prolong the duration of fax phone calls, contributing to higher than necessary fax charges. RockForce cards also support on-the-fly conversion of faxes received in MH or MR formats to smaller, more efficiently stored and processed MMR format.

**MTBF:** Mean Time Between Failures is the objective figure of hardware reliability that can be applied to almost any mechanical or electrical device. Using the Telcordia SR-332 "Reliability Prediction Procedure for Electronic Equipment" standard, RockForce boards receive a 49 MTBF – that is 49 years continuous operation (575,000 hours).

**Certification:** Mainpine puts each fax server application, like Alt-N Technologies RelayFax solution through a rigorous, testing process with the RockForce boards. This allows ISVs to gain insights into total cost of ownership and to accurately gauge compatibility, reliability, performance and speed of their fax applications with RockForce intelligent fax boards line across a range of conditions.

**Guaranteed Satisfaction:** A thirty-day guarantee and three-year warranty has given Mainpine's RockForce intelligent boards one of the highest customer satisfaction ratings in the industry.

## Cost Justification and ROI Analysis

Reliability and performance can dramatically impact ROI. The fax features of basic modems are so limited that they are generally not considered a serious option for business-level fax messaging. The following table shows that while an intelligent fax board may cost a little more up front, the superior performance it is able to deliver translates into a real-world cost justification.

### Return-on-Investment Model

- Budget modems tend to cost between \$50 - \$200 per port; most being single port modems
- Intelligent fax boards such as Mainpine cost between \$250 – \$300 per port
- Each port is used to send 40 4-page faxes per day, 260 days per year
- Calculations in the table below are based on the following assumptions:
  - 25% faxes local (free), 65% long distance (.05 per minute), 10% international (.15 minute)
  - Fax traffic transmitted at various speeds and compression methods including 30% 9.6 Kbps, 30% at 14.4 Kbps and 40% at 33.6 Kbps and 18% MH, 35% MR, 42% MMR and 5% JBIG compression

### Intelligent Fax Board Return-on-Investment

	1 <sup>st</sup> Year Phone Bill	5 Year Fax Phone Bill
Budget Modems	\$3,057.60	\$15,288
14.4 Kbps Fax Card	\$2,059	\$10,298
33.6 Kbps Intelligent Fax Board	\$1,188	\$5,940

Using this model, Mainpine RockForce boards pay off in less than 3 months and over a five-year timeframe save nearly \$10,000 compared to a budget modem.

\* Model developed by Peter Davidson, Davidson Consulting

\*\* Savings after purchase price differential subtracted

There are additional considerations that are not calculated when comparing “costs” of budget modems versus intelligent fax boards. These can include:

- **Additional Equipment Savings.** Budget modems primarily support only one port per PC. If you need more than 1 port, you must buy a second PC. By contrast, one RockForce board can support up to 8 ports and a server can support multiple RockForce cards.
- **V.34 / 33.6 Kbps Savings.** Greater savings occurs with intelligent fax boards like RockForce that can send and receive faxes at 33.6 Kbps speeds.

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*Sending a fax with a budget modem may take as much as ten times longer, leading to higher than necessary fax phone bills, delayed business documents and frustrated customers.*

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## Summary

Fax servers can significantly increase a company's efficiency and productivity. With desktop faxing, organizations can save hundreds and typically thousands of dollars each year in worker productivity costs alone – even with office comprised of two to three employees. Moreover, a fax server solution like RelayFax™ from Alt-N Technologies® can provide the added security and confidentiality required for business environments.

All too often, generic modems cause delayed responses, frustrated or irate customers and higher than necessary fax phone bills. Many organizations that deploy budget modems quickly discover the fax features of these basic modems are so limited that they are generally not considered a serious option for business-level fax messaging.

RelayFax and RockForce™ offer organizations a winning combination of reliable, high-performance fax communications software and hardware – yet at an affordable price tag. Intelligent fax hardware offers a superior choice over generic modems for virtually all but the very lowest-volume computer application. Mainpine's RockForce intelligent fax boards provide the reliability, performance, security and affordability that organizations demand when considering the hardware needed to power their fax applications.

## Contact Information



### Alt-N Technologies

Alt-N Technologies specializes in developing communications software for Internet, Intranet, WAN and LAN applications. The company produces MDAemon, Outlook Connector for enabling Microsoft Outlook sharing through MDAemon, AntiVirus for MDAemon and RelayFax facsimile server. All products come with professional features and beginner-level ease of use and are sold and supported internationally through a network of exclusive distributors and resellers. Alt-N Technologies is a privately-held entity headquartered in Grapevine, Texas. For more information visit <http://www.altn.com>, call (817) 601-3222 or email [info@altn.com](mailto:info@altn.com).

### Mainpine, Inc.

For nearly a decade, Mainpine has been an industry innovator in the global fax hardware arena. The company has built a worldwide reputation for its line of reliable, intelligent RockForce™ fax cards that offer an affordable option to traditional expensive fax board alternatives. Along the way the company has introduced a number of innovative technologies, including Smart Port™ and Security Serialization™, that focus on delivering fax communications even smarter, faster and more securely and reliably than ever. Mainpine's RockForce™ series product line is sold through more than 40 regional, national, and international distributors and is available through hundreds of resellers and integrators worldwide. For more information please visit <http://www.mainpine.com> or email [info@mainpine.com](mailto:info@mainpine.com).