Q: What are the applications for the 2800?
A: The 2800 is ideally suited to concentrate dial-in users and routed IP LAN subnets. The Patton 2800 RAS offers three products: a 12 (T1 or E1)port unit, a 24 (T1) port unit and a 30 (E1) port unit. All units use the identical software and there are no hardware changes to support Ts1, E1 or PRI PSTN circuits This makes the 2800 RAS perfect for both the ISP and the Corporate user.

- 1U high box with 2-T1/E1/PRI, 1-console, 1-AUI/10Base-T Ethernet
- A two T1/E1/PRI box which can answer either 12, 24 or 30 V.90/K56Flex™/V.34+/ISDN Calls
- Dualmode V.90 **and** K56Flex™ support
- Built-in HTTP server for underline complete server management using a standard WWW Browser
- No "forklift" upgrade – all upgrades are through software
- Distributed architecture ensures throughput efficiency
- Supports **both** analog and digital on the same line using **one** phone number
- 1:1 ratio of dial-in ports to dial-in PSTN connections
- Extensive Front Panel Status Indicators
- Supports T1/E1/PRI PSTN connections in the same box with the same software
- Supports Drop-and-Insert and Frame Relay/SyncPPP for Enterprise service bundling
- Dual cooling fans – units run cool with less then 40 watts of power can be stacked on top each other

The 2800 permits the ISP or Enterprise to grow their dial-in remote access facilities **one** T1/E1/PRI line at a time. This allows a tighter connection to dial-up revenues to the capital investment costs.

The 2800 runs operationally cool consuming less then 40 watts of power. This point is important for the ISP installing uninterruptible power supply systems. Less power consumed by the 2800 means longer "on" time as well as the ability to use less expensive UPS's.

The 2800's management system is a success with **everyone** who has tried it. The built-in web server allows complete configuration and control of the 2800. Using a standard web browser, a user can configure and monitor the 2800 status from any computer, anywhere in the world.

The Patton 2800 is designed to eliminate the "forklift upgrade" procedure. All features are through free software upgrades. As new modem technologies emerge (e.g. VoIP, V.xx, etc) the 2800 will be able to stand ahead of the pack. Also, the software upgrade procedure allows remote upgrades using standard FTP tools.

Q: What is the difference between ports and modems?
A: For dial-in remote access a port is a modem. There is a 1:1 relationship between DSP's and ports. Each DSP can function as one V.90/K56Flex™/V.34+ analog or one ISDN B channel termination.

Q: How many simultaneous dial-in ports (either analog or digital) can the 2800 support.
A: The following chart shows the models and maximum number of simultaneous ports

Patton Model	MAX Number of Simultaneous Dial-In Connections (ports)
Model 2800	12
Model 2810	24
Model 2860	30

Q: What kind of data connections does the 2800 support?
A: The 2800 series can supports the following types of connections:

ASCII
Async PPP
Sync PPP
V.120 / V.110
Frame Relay

Q: What hardware options are there?
A: The **only** hardware option available for the 2800 are two DSP daughter boards. The base unit (Model 2800) comes standard with 12 DSP's. To expand the modem capacity of a Model 2800 you can a daughter board. There are two versions of this daughterboard. One has 12 DSP's and the other 18 DSP's. Adding a 12 DSP daughterboard to a Model 2800 will give it the capacity of a 2810. Adding an 18 DSP daughter board to a Model 2800 will give it the capacity of a 2860. Patton also has a 120Ω to 75Ω balun for connecting the 2800 to coax E1 lines.

Q: What is a digital modem and how many can the 2800 support?
A: The 2800 is a pure digital device. There is **no** analog processing in the 2800. The DSP's are best thought of as communications processors. At ring time, the 2800 is told what type the incoming call is – analog or digital – and then loads the correct program into the DSP's. The information from the phone call is a digital representation of an analog voice call. The DSP's process this digital information **without** conversion back to analog. This allows the modem to function consistently, accurately and error-free every time.

Q: How are DSP's allocated?
A: The DSP's are best thought of as a resource pool. At ring time the 2800 is told by the calling switch whether the call is digital or analog. At that time a DSP is allocated and assigned to that call. The way the DSP's are kept in the resource pool and allocated is in a Round-Robin fashion.

Q: How is the switching fabric for the DSP's organized?
A: There is no switching fabric in the 2800. There is a 4-wire interface from the line termination interface which contains all of the TDM information from the T1/E1/PRI line. All the DSP's listen to this TDM highway. This allows each DSP to process any call on any channel. The benefit to this design is that if a DSP fails it will not take down a channel or possibly a whole T1/E1/PRI line.

Q: What kind of management support do you have?
A: The 2800 supports an out-of-band RS-232 VT-100 console port, TELNET, HTTP (through our own embedded web server), and SNMP. The 2800 is based on SNMP. On top of the SNMP engine is our own embedded HTTP web server. This allows configuration and management using a standard web browser without having to purchase HPOpenview™. All of the configuration options are available through the web server interface.

Q: Can I access all of the configuration options via the WEB interface?
A: YES. All of the configurable options in the 2800 are accessible through the web interface.

Q: Is the HTTP interface a separate application on another system?
A: No. The HTTP/HTML server is built into the 2800 and not a separate system.

Q: Can the 2800 be used for dial-out?
A: Yes, The 2800 supports dial-out for both ASCII and TCP Raw users. This is achieved through a TELNET session into the 2800.

Q: How can I upgrade new software to the 2800
A: The 2800 allows a very simple way to upload new software. This is done using FTP from any computer. The steps are as follows.

1. FTP into the 2800
2. The username to enter is **KillImage**
3. The password is the superuser password for that 2800
4. Set the transfer mode for FTP to BIN (for Binary). On most FTP clients this done by typing in <u>BIN</u> at the FTP> prompt.
5. Use the FTP put command to put the file into the 2800. On most FTP clients this is done by typing <u>put *<name-of-image-file>*</u> where name-of-image-file is the name of the new 2800 software load.

Q: Why when I run T1 / PRI I only have 23 channels for dial-in, Why?
A: ISDN PRI requires one of the timeslots to do the signaling. This timeslots is called the D channel and is used to tell the 2800 when a call comes in.

Q: Does the 2800 support V.90/K56Flex™?
A: Yes. The 2800 supports both V.90 <u>and</u> K56Flex™.

Q: Why don't I get 56 kbps connections when calling with my V.90/K56Flex™ modem?
A: Current regulations only permit a connection which will yield a maximum speed of 53 kbps. Although there are movements underway to have these regulations lifted.

Q: What types of switches are supported for PRI service on the 2800?
A: EuroISDN - CTR-4, Japan INS1500, Australia TS014;NI-1; AT&T 5ESS; DMS-100

Q: Can I terminate <u>both</u> Digital ISDN and Analog Modem users in the same 2800?
A: Yes. The 2800 can terminate any combination of analog <u>and</u> digital users.

Q: How do I connect the two 75 Ω BNC cables my PSTN provider has given me to the 2800?
A: Use the Patton Model 2800-G703-BNC adapter.

Q: What are the types of telephone signaling the 2800 supports?
A: The 2800 supports the following
T1 Robbed-bit with either Loop-Start or Ground-Start, E&M Wink Start
E1 MFR2
T1 PRI
E1 PRI

Q: What is the difference between PRI and T1/E1?
A: A PRI line is delivered to the customer over the same facilities as a T1 or E1. When you specify PRI you are specify the signaling method used by the 2800 to communicate with the telephone company switch.

Q: Can the T1/E1 ports be set to either T1, E1, or PRI?
A: Yes, all 2800 series RAS devices have the software (and hardware) to select between any of these signaling and line types.

Q: Does the 2800 support DNIS and ANI?
A: Yes, Dialed-Number-Identification-String (DNIS) is the number the user <u>called</u> to get to the 2800. Automatic-Number-Identification (ANI) is the phone number of the person <u>calling</u> the 2800. Also known as caller-id.

Q: What are the pinouts of the RJ-48's on the they back of the 2800?
A: Pins 1&2 are data <u>from</u> the telephone network. Pins 3&4 are data <u>to</u> the telephone network.

Q: Can I terminate BRI lines directly into the 2800?
A: No. The 2800 terminates a PRI. The 2800 can terminate B channel calls from a BRI lines as long as they are delivered over the PRI.

Q: What types of compression does the 2800 support?
A: Van Jacobson TCP header compression, PPP address and protocol compression, V.42/V.42bis error correction and compression.

Q: Does the 2800 support R2 CAS signaling?
A: Yes. The 2800 allows full control over the R2 settings including the inter-register signaling parameters.

Q: What is MFR2?
A: In E1 environments, CAS is accomplished using MFR2 signaling. MFR2 is an international signaling system which uses six tones to provide end-to-end signaling of address (phone numbers) and call information. Time-slot 16 is used to convey signaling status such as answer, seizure and acknowledge. As R2 implementations within international regions can vary, the 2800 is designed to allow extensive user level configuration of R2 line and interregister signaling parameters. As an added feature, specific country profiles are preset in the 2800 to provided quick configuration on a country-by-country basis.

Q: My country uses a modified version of R2, how can I adjust the parameters?
A: Through the web pages there is a link for configuration of MFR2 parameters. You can select the meaning of the A-B-C-D bits, the transition timeouts and the inter-register signaling parameters.

Q: Is CLID (ANI) supported over R2 lines?
A: Yes. We will display the digits signaled to us from the forward switch.

Q: Are there any special configuration parameters when configuring R2?
A: Yes. The definition of the A-B-C-D bits and the interregister parameters. These may vary depending on country and region.

Q: What types of channelized T1 signaling can the 2800 support?
A: The 2800 supports Loop-Start, Ground-Start and E&M Wink start.

Q: Will the 2800 work with less then 12 or 24/30 timeslots on an T1/E1?
A: Yes. When configuring the 2800, you can select which timeslots are active. This is done under T1/E1 Link->Channel Assignment.

Q: Where do I find 2800 software updates?
A: You can find 2800 software updates at http://www.patton.com under Remote Access Server. Click on 2800. There is a link for software updates. If this is your first time to log in, you will need the Media Access Control (MAC) address. This is also known as the NIC address and is the Ethernet address of your 2800. This can be found on the rear of your 2800 near the Ethernet port.

Q: What facilities are there for logging 2800 operational activities?
A: The 2800 contains several syslog options. You can log to a syslog host. You can log to the console port. You can log to both volatile and non-volatile memory.

Q: Can I configure the 2800 to allow or disallow some modem modulations?
Q: Can I set a maximum speed allowed for a connection into the 2800?
A: Yes. This is under the Dial-In->Modify section on the web page. Under modem modulations you can select the maximum speed allowed as well as disabling certain modulations.

Q: What routing protocols are supported?
A: The 2800 supports RIPv1 and RIPv2 routing protocols. OSPF is currently in development.

Q: What routed protocols are supported?
A: The 2800 is an IP based system and fully supports TCP/IP and its sub-protocols. The 2800 will also pass NETBios broadcast messages which facilitates network neighborhood browsing from a dial-in session.

Q: Is the 2800 Year 2000 compliant?
A: Yes. There is no date information in the 2800. All clock and time references are relative to when the box was lasted booted and are counted from 10 ms ticks.

Q: What is V.90?
A: V.90 is the agreed upon 56K modulation standard and merges the K56Flex™ and X2 modulation schemes. As recommended by Study Group 16 of the ITU-T on February 6, 1998, V.90 allows for 56 kps transfers on the downstream side of a modem connection. V.90 was ratified and made official in September 1998.

Q: I have current users of K56Flex™. Will they still be able to call in and get a K56 modulation?
A: Yes. The 2800 supports both V90 and K56Flex™ users.

Q: What modem modulations do you support?
A: (V.34+) or digital (K56Flex™/V.90/ISDN) Modem modulations: K56Flex, V.34 Annex 12, V.34, V.8, V.32bis, V.32, V.22, V.22bis, V.23, V.21, Bell 212A, Bell 103, Bell 202, EIA PN-2330 Software sync/async receiver/transmitter for V.14.

Q: What protocols does the 2800 support?
A: TCP/IP Suite, ICMP, TFTP, FTP, Ethernet ARP, Proxy ARP and RARP protocols, PPP, Van Jacobson TCP header compression, PPP address and protocol compression RADIUS Authentication and Accounting with support for primary and secondary servers RIP & RIPv2 dynamic route distribution, TCP clear connections, Frame Relay, SyncPPP, V.120/V.110, NETBios broadcast.

Q: What types of authentication is supported by the 2800?
A: The 2800 supports several forms of authentication. First is ASCII based where a dial-in users enters his name and password. This then can be used to authenticate against the 2800's internal user database or via a RADIUS server. Also supported are PPP's PAP or CHAP which automatically obtains the username and password. Usernames and Passwords obtained from PAP or CHAP can be authenticated via the internal user database or via RADIUS.

Q: Does the 2800 support RADIUS Authentication, Authorization and Accounting?
Q: How many authentication and accounting servers can the 2800 support?
A: Yes. The 2800 supports the RADIUS RFC's 2138 (Authorization) and 2139 (Accounting). The 2800 also has the facilities to support multiple RADIUS servers for both authorization and Accounting.

Q: What GUI is available for the 2800?
A: The 2800 has a built in GUI through the use of your standard web browser. The most common web browsers are from Netscape and Microsoft.

Q: Can I use HPOpenview™?
A: You can use HPOpenview™ or anyother SNMP based management system with the 2800 and you can use them at the same time you use the web GUI.

Q: I want to monitor the number of users over time. What tools are available for this?
A: The freeware package called MRTG can be used to provide graphing of any SNMP variables on your 2800.

Q: How are IP addresses allocated for users?
A: IP addresses can be allocated one of three ways. 1) A dynamic pool is entered into the 2800. When the user is connected, the 2800 will issue one of these address and use this address for the duration of the call.   2) A user may have a static address which will be given to the user during the connection setup. 3) RADIUS can return an address which the 2800 will use for that user.

Q: Does the 2800 support TACACS, XTACACS or TACACS+
A: We have chosen RADIUS as the external authentication protocol of choice. The Internet community as a whole has also gone this route. RADIUS has always been an open protocol first developed by Livingston Enterprises. TACACS and XTACACS has always been a private protocol under the control of Cisco. Currently Cisco has issued an "End of Maintenance" notice in which they will not support these protocols. There are many RADIUS servers which offer enhanced functionality and are often freeware.

Q: What applications for Drop-and-Insert does the 2800 support?
A: The 2800 supports E1 R2 and T1 Robbed-Bit Drop-and-Insert. The timeslots are a one-for-one passthru and do not require the use of any DSP's. There currently is no ISDN D&I functionality.

Q: What is the range of the Power Supply?
A: The power supply auto adjusts to any voltage between 90-260 VAC 50/60/400 Hz.

Q: Does the 2800 come ready for installation into a 19" rack?
A: Yes, the 2800 comes with 19" rack mount brackets as standard equipment.

Q:What are the HTTP/SNMP password protection options?
A: There are two (2) passwords. The first is a monitor password which allows one to view all configuration options and statistical data---all passwords are hidden. The second is a superuser password which allows full configuration and password control. These passwords are the same for the SNMP RO and RW community strings.

Q: Are all the functions of the 2800 available through the web interface?
A: Yes. All of the configuration options and statistics are available through the web interface.

Q: Is the HTTP server a separate server which communicates with the 2800?
A: No. The web server is built into the 2800 and requires no external server or system to operate.

Q: I use RADIUS, why do I need to use the static users database?
A: It is good practice to put a system administrator login into the static user database. Thus, if the RADIUS server dies, the sysadmin can still login to the network and restart the RADIUS server.

Q: Do I have to initially use the front control panel port before using the web interface?
A: No. You can manually place a route into a WIN95 (or unix box) to gain access to the 2800. This is done using the command "MSDOS> route add 192.168.200.1 >your-ethernet-ip-address>". The PC and the 2800 have to be on the same ethernet "wire". At this point you can place the "real" IP address for your 2800 as well as other configuration options.

Q: Why do I need a default route?
A: Often you don't need to explicitly specify this route but good networking practice dictates that you shouldn't leave things to chance. Often other routers in your network will proxy-arp addresses which your 2800 doesn't know how to get to. In essence this is the "default" route. If you are running RIP, the 2800 will receive this from other systems in your network.

Q: What are the 2800 hardware differences between T1/E1/PRI
A: There are no hardware differences between T1/E1/PRI connections.

Q: How is time configured in the 2800?
A: Time is a relative number based on the number of ticks since the box was rebooted. There is no provision for entering the time of day or a date.

Q: How do I read the times that displayed? (For example: Call Duration 7:25:32.23)
A: This is read as 7 hours, 25 minutes, 32 seconds, 23 hundredths of a second.

Q: How do I set the 2800 for SS7 Signaling?
A: The 2800 currently does not support SS7. SS7 signaling is best used on the core and distribution of the telephone network and less so on the access portion.

Q: Can I define IP filters?
A: Yes, the 2800 allows up to 20 filters to be defined and applied on a per user basis. You can also use RADIUS to apply filters to dial-in users.

Q: Does the 2800 Support DNS?
A: No, the 2800 does not support resolving domain name queries.

Q: Can I TELNET into the 2800?
A: You can telet to the IP address of the Ethernet port and see the same user interface as the console port.

Q: Can I Ping and Traceroute from the 2800?
A: You can ping from the console (either through the front panel or telent) by entering the command:
M2800> *ping ip.address.to.ping

Q: What is the main processor?
A: The system processor is an Intel i960 RISC 32-BIT processor running at 33 MHz.

Q: What is the maximum DTE rate which can be supported by the built-in Modems?
A: The typical DTE rates do not apply to a system like this as there are no serial ports for the modems. Using MLPPP the users DTE system can can up to 30 64kbps channels or 1.920 mbps of speed.

Q: Can I do real-time monitoring of connections (including modems)?
A: All of the statistical data in the 2800 is real time, including the data in the dial-in page showing users connections, modem speeds, and data throughput.