

## 1- System Concept

**HyperCable®** is an asymmetrical network system delivering data services at a high data rate to a large number of users stations via Terrestrial HyperCable® transmitters using DVB standards. By using standard technology (which is also used for commercial set-top boxes) and taking advantages of the high data rates available in the **DVB - MPEG-2 system**, a very favorable cost/performance ratio can be achieved.

The current implementation can deliver data at a rate **up to 60Mb/s**.

A central server station sends the data packets over the HyperCable® transmitter (or Satellite uplink) directly to the end user station.

The System can operate in one of three modes :

1- Passive-receive only, 2- fully interactive, 3- partly interactive transaction mode.

The end-user station can access the base station in a number of ways, the telephone line/modem connection being the most popular one, this connection called "the return link", is used for transmitting requests and control information only.

In the case of **interactive services** the return link must be available during the whole session, for the **request-reply transaction services** the link is only required for the transmission of the requests and can be released during the reply phase, for example the transmission of a large multimedia file.

For **passive receive-only** operation (**like push Email**) no return link is required at all.

The return link can also be established with a 2Mb/s MDS radio system.

## 2- Base Station

The base station consists of a workstation with **MPEG-2 DVB output** (QPSK DVB output optional).

At the system maintenance level, a set of utilities is provided for installation and configuration of the system, user management, access control and management, security and authentication functions, accounting for system operation and supervision.

In most cases, a number of local application servers is connected to the base station with a high speed LAN.

At the application level the Internet Radio Server acts as a server or proxy for common Internet services.

In addition the Internet Radio Server supports a set of multicast and broadcast applications and allows the user **interaction in-line and of-line**.

Unless a pure Intranet configuration is desired the base station needs a high-speed interconnection with the Internet.

The Internet Radio Server software provides a set of lower functions for addressing and routing and a set of higher functions for group and traffic management. It supports unicast, multicast and broadcast applications and services.

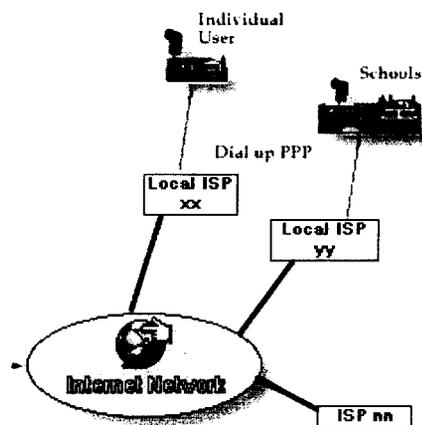
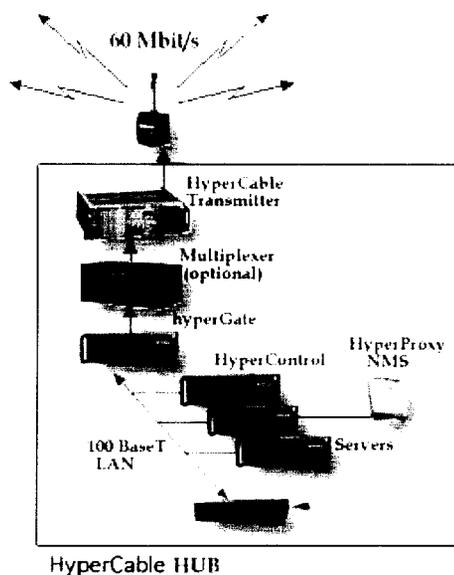
Services requests from user are processed by the proxy software either through the local cache or relayed to the appropriate server on the Internet.

The Internet Radio Server support several levels of **conditional access, security and privacy** (owe to the HyperControl Unit).

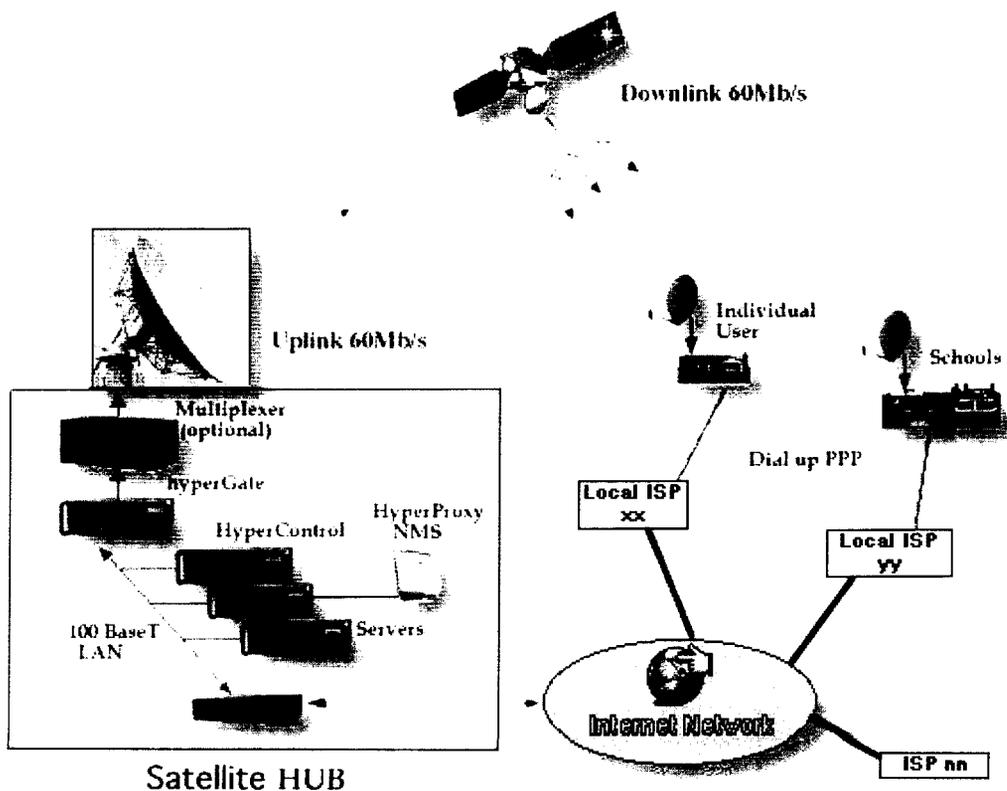
The basic mode of operation assumes that multicast packets are sent to groups of user stations.

**Only authorized users may connect** to the base station through Internet and operate in interactive mode (web session). They are served according to the proxy and catching strategies implemented by the system manager.

## High Speed Internet with MPEG2 DVB MMDS HyperCable®



## High Speed Internet with MPEG2 DVB Satellite



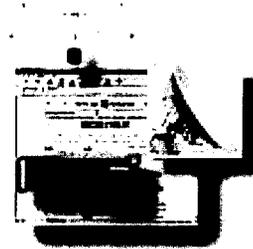
### 3- I.R.S. Technical Specification :

DVB - MPEG2 Compliant

To be connected to an MPEG2 Multiplexer, or directly to a DVB QPSK Transmitter, or QAM modulator

#### 3-1 HyperGate

- ✓ **Real Time DATA ENCODER**
- ✓ **MPEG DVB**
- ✓ **60 Mb/s Data Output**
- ✓ **Satellite, MMDS HyperCable®, LMDS, Cable**
- ✓ **Multicast-Unicast-Push...**
- ✓ **IP Telephone network (NEW)**
- ✓ **Features and Technical Characteristics**



#### General

The HyperGate is a real time data encoder that encodes and combines one data input transport stream (ITS) into one or several MPEG2 output transport streams (OTS) in compliance with DVB recommendations. The effective data output rate per OTS is up to 60 Mbps.

The HyperGate provides a Full MPEG-2 DVB Multimedia solution by multiplexing multiple MPEG-2 programs.

The HyperGate can be controlled by an operator via Ethernet or Internet Network using the NMS (Network Managing System) and HCU (HyperControl Unit).

As an integral part of network management and security, the HCU HyperControl Unit is allowing addressed distribution, multiple network users as well as proprietary scrambling and Conditional-Access (CA) ready multiplexing.

#### Controlling and Monitoring the HyperGate

Operation mode for the HyperGate is determined by a set of parameters stored on its chip disk. The last used configuration is saved so that the HyperGate can be initialized properly in the event of a power failure, without external intervention.

**These parameters are set by the operator in one of 3 methods:**

- ◆ From the NMS Network Management System
- ◆ From the HCU HyperControl Unit
- ◆ From the HyperGate internal parameters

**Control Interfaces:**

- ◆ Ethernet NMS and HCU interface
- ◆ Protocol TCP/IP, proprietary

An Internet digital distribution and broadcast system, typically consisting of one or several HyperGate can be controlled centrally from the NMS and HCU.

The HyperGate connect to the NMS and HCU via Ethernet or Internet, using TCP/IP protocol.

Using the NMS user-friendly graphical user interface support is provided for **Automatic Redundancy**, Operator Alert, Timed Event Scheduling, History Logging, Graphical Topology Definition and Multi-Protocol Statistics.

The HCU module provides key management and scrambling data or DVB Transport Stream individually per user, while the key management system is using the return path for key exchange.

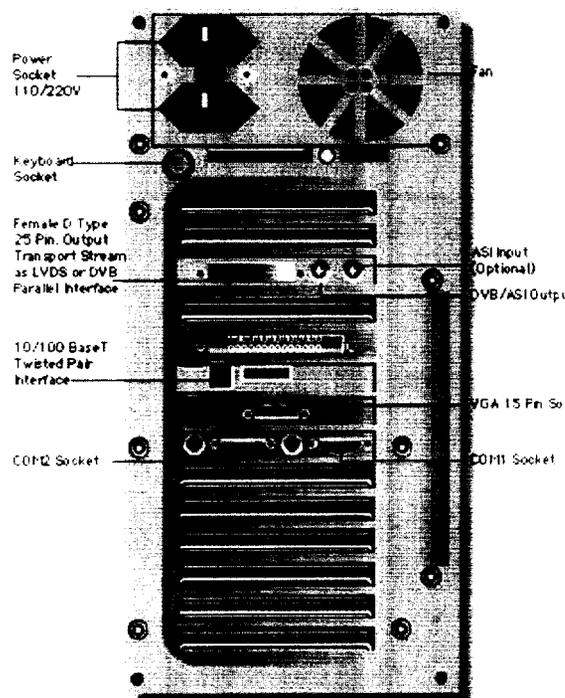
The HCU uses an ODBC (SQL syntax) compliant data base and final authentication is RADIUS compliant.

### MPEG-2 DVB HyperGate Specifications

The HyperGate's many configuration options enable service providers to tailor the operation of the HyperGate to suit their specific circumstances, to improve operational performance and to offer subscribers a high quality, versatile level of service.

**HyperGate features include:**

- ✓ Multicast broadcasting, enabling the same message to be sent to many subscribers simultaneously.
- ✓ Data mapping mode for IP datagrams, piping, streaming or multi-protocol encapsulation (SI-DAT 360).
- ✓ DVB mapping options, enabling the HyperGate to operate as a fully DVB compatible system, usable with SCPC and MCPC applications.
- ✓ Datagram stuffing to maintain TCP/IP performance through DVB multiplexers with internal buffers.
- ✓ Quality of Service prioritizing, to enable the service provider to optimize output bandwidth allocation according to subscribers' profiles, while guaranteeing minimum bit-rate requirements.
- ✓ Packet encryption for the privacy of HyperCable subscribers.
- ✓ Passwords to enable remote NMS access.
- ✓ Remote download of new versions of the HyperGate's software and firmware.
- ✓ Support for static users.
- ✓ Support for user groups.



The values for these and other options can be set from the local terminal connected to the HyperGate and, with some restrictions, also from a remote NMS. .

### **Quality of Service Management:**

Quality of Service Management (QoS) is a feature that determines how each subscriber is allocated bandwidth. The feature can either be enabled or disabled.

When QoS is enabled, each subscriber receives their bandwidth share according to the level of quality specified in their individual subscription fees.

When QoS is disabled, the HyperGate will provide best effort service, resulting in the available bandwidth being equally divided among the various subscribers.

*The HyperGate contains two QoS parameters for each user:*

- ✓ Committed Information Rate
- ✓ Maximum Rate

The **committed** information rate is the minimum the HyperGate will allocate to that individual subscriber. The maximum rate specifies how the overall rate divides among all subscribers.

If at a certain time free bandwidth is available, subscribers may or may not receive more than their **maximum rate**, depending on the QoS mode specified.

### **Multicast Broadcasting:**

The HyperGate receives TCP/IP datagrams addressed to subscribers, and maps them onto a DVB compatible MPEG2 transport stream.

*The HyperGate is capable of mapping two types of datagrams:*

- ✓ F Unicast Packets
- ✓ F Multicast Packets

Each Unicast packet is addressed to one individual user.

Multicast packets are addressed to a group of users, and are simultaneously sent to all members of the group.

These packets are usually for the distribution of files, or for streaming audio or video.

It is possible to disable Multicast broadcasting if, for example, this type of transmission is being handled by a separate HyperGate

### **Packet Encryption:**

To provide user privacy, the data addressed to individual subscribers is encrypted with the DES algorithm, implementing the CBC mode.

For more information regarding encryption, refer to FIPS-46-2 and FIPS-81.

### **Data Mapping and DVB Mapping**

Data mapping specifies how IP datagrams are mapped onto the output transport stream.

*There are three different mapping modes:*

- ✓ Piping
- ✓ Streaming
- ✓ Multiprotocol Encapsulation

Data piping and data streaming are proprietary mappings, data piping without encryption and data streaming with encryption. Multiprotocol encapsulation is used for compatibility with other DVB based systems.

**Accounting:**

The HCU informs the HyperGate each time a subscriber logs on or off the system.  
The HyperGate compiles an account of the packets that each individual subscriber downloads, and this information is later transferred for use by the Billing Server.

**Downloading Software:**

To enable new software versions of the HyperGate application and firmware to be downloaded, the NMS system can initiate a TFTP download process from any TFTP server.  
The HyperGate also supports FTP services.

**Default Application Fallback**

TFTP or FTP may be used to remotely download new software/firmware versions to the HyperGate.  
In the event that an invalid file is downloaded, the HyperGate will get stuck trying to run the invalid code.  
To overcome this problem, a fixed default software application is provided on the HyperGate's local hard drive.  
This default application enables the user to perform the download again.

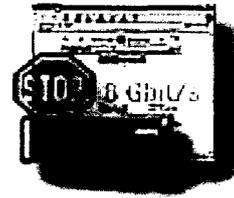
**HyperGate Specifications**

<b>Input Interface :</b>	10/100BaseT (auto-detect)
<b>Output Interface :</b>	Parallel LVDS and Serial ASI
<b>Craft Interface :</b>	Serial RS 232, 9600,8,n,1 to VT100 compatible terminal Telnet
<b>Transfer Rate :</b>	1 to 53 Mbps
<b>Format :</b>	DVB/MPEG2 Transport Stream
<b>Mapping :</b>	— Data Piping, Data Streaming and Multi-protocol Encapsulation Configurable PIDs
<b>Number of PIDs :</b>	8192
<b>Monitoring &amp; Control :</b>	SNMP based through LAN interface
<b>Encryption :</b>	DES based 56 bit keys
<b>QoS :</b>	From CIR=0 to CIR-256kbps, max rate=64kbps to 4Mbps permissive or restrictive modes
<b>Protocols :</b>	TCP, UDP and Multicast
<b>Software Upgrades :</b>	TFTP based, to hard disk
<b>Power :</b>	65-250VAC, 50-60Hz, 100WATT
<b>Dimensions :</b>	19" rack mountable, 4U height
<b>Weight :</b>	3.5 Kg
<b>Max No. of Users :</b>	Up to 10,000 users

### 3-2 H.C.U. HyperControl Unit

MPEG2 DVB Internet Authentication and Billing System Interface

- ✓ **Conditional access**
- ✓ **Authentication**
- ✓ **TCP/IP real time Encryption**
- ✓ **Billing System Interface**
- ✓ **Quality Of Service**
- ✓ **For Satellite, MMDS HyperCable®, Cable-Networks**



#### General

The HCU, which is the HyperControl Unit of the Fast Internet Access system developed by MDS, supports **authentication, authorization and billing** of clients by communicating with RADIUS-compliant authentication and billing servers.

This gives total flexibility in choosing the appropriate authentication and billing system.

#### Overview

The HyperControl Unit (HCU) is the access and configuration controller for clients.

The HCU can serve HC60 Satellite, HC60 HyperCable® (or HC60 Cable) clients.

The HCU runs on a Windows NT workstation, which is located at the hub.

*The HCU is responsible for the following activities:*

- ✓ Authentication of clients
- ✓ Automatic parameter configuration of the modem at the client's PC.
- ✓ Dynamic routing of clients' packets towards the HyperGate, at the hub (Transmission Center).
- ✓ Transferal of clients' activity statistics from the HyperGate to the RADIUS Billing Server.
- ✓ Load-balancing, to distribute clients evenly among HyperGate.
- ✓ Quality of Service (QoS) allocation.
- ✓ Quality of Service determines how much bandwidth share each subscriber receives.

#### *Starting a Session*

The client's existing Internet connection should already be active, prior to activating the HyperCable client application.

For example, if the subscriber's existing Internet connection is through a dial-up modem, the dial-up connection should be activated before the HyperCable client application is initiated.

After the client's standard Internet connection has been activated, the client should run the HyperCable client application, which initiates a fast Internet session with the HyperCable® service.

NOTE : for Multicast, Push Email, Push FTP, Push Web, Unicast, ... the client doesn't need to have an Internet connection.

## HyperCable Service®

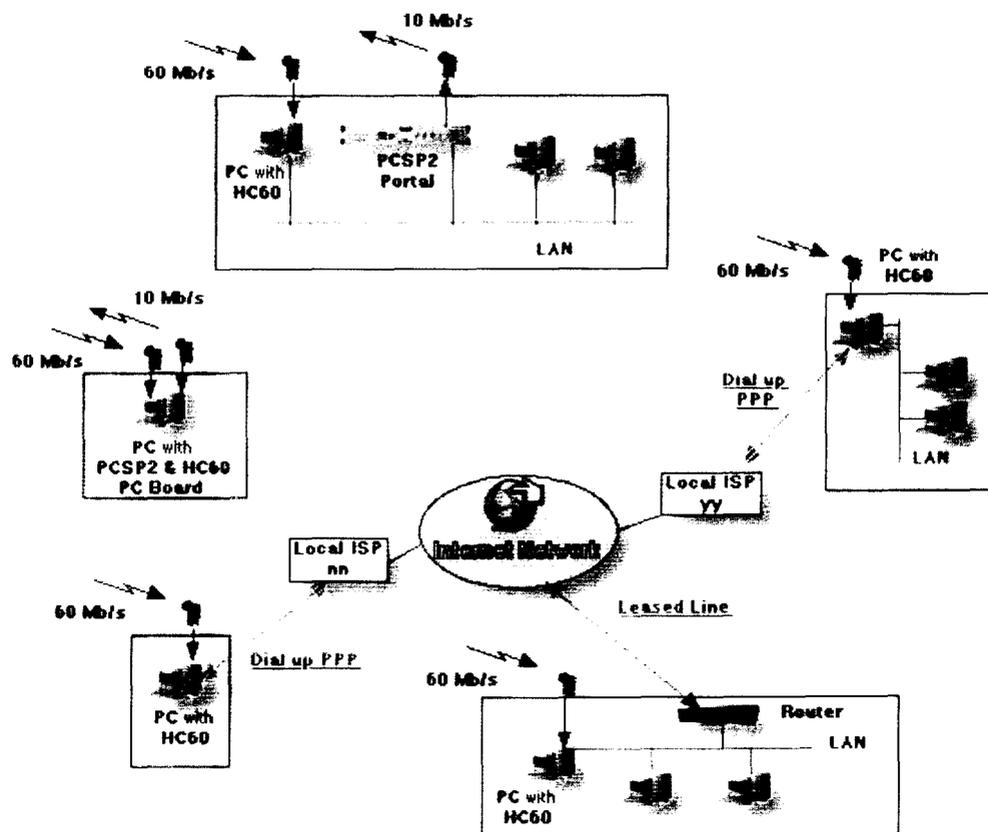
The HyperCable® service is incremental, meaning that it enhances the downloading speed of a subscriber's existing standard Internet connection.

This existing connection can be any standard connection, For example, a simple dial-up account, an ISDN connection or a frame-relay service.

The HyperCable® service makes use of the subscriber's existing Internet connection, and enhances the bandwidth of the downstream traffic (meaning traffic coming from the Internet to the client).

The upstream bandwidth is not changed, but due to the asymmetrical nature of typical Internet access overall web access becomes much faster.

### Reception Configuration



## HyperCable® Client Application Contacts HCU

When the HyperCable® client application is activated, it contacts the HCU using the subscriber's existing Internet connection.

A brief bi-directional exchange occurs, in which the HyperCable client application relays the following parameters to the HCU:

- ✓ User Name: Informs the HCU of the subscriber's unique user name.
- ✓ Encrypted Password: Enables the Authentication Server to confirm the identity of the subscriber.
- ✓ IP Address: Informs the system of its dynamically allocated IP address.  
(The HyperGate identifies the HyperCable subscriber's data by this address)
- ✓ MAC (Media Access and Control) Address: - Enables the HyperGate to encapsulate TCP/IP packets with this MAC address.
- ✓ Encryption Key: Enables the HyperGate to encrypt data sent over the DVB link.

The HCU responds with its own set of parameters as soon as all of the elements in the system have been notified of this new subscriber's connection.

## Equipment Configuration

### *Hardware :*

- ◆ Pentium II - 400MHz
- ◆ RAM 128 Mbytes
- ◆ HDD 6 Gbytes SCSI
- ◆ 100BaseT Ethernet
- ◆ Rack mounted 19 inches 4U

### *Software :*

- ◆ Windows NT
- ◆ HCU Server
- ◆ Radius server

## Billing System

**The following can be configured in the Billing server:**

- ✓ Accounts
- ✓ Users
- ✓ Hosts (HCU's)
- ✓ Billing Plans
- ✓ Billable Services
- ✓ Debit Services
- ✓ Invoices
- ✓ Payments
- ✓ Session Logs
- ✓ Event Logs
- ✓ Error Logs
- ✓ Activity Logs
- ✓ NTXacs Users
- ✓ System Parameters
- ✓ Server Properties

**Billing Plan** SystemID: \_\_\_\_\_

Name:

Billing	Rates	Services	Misc
<b>Billing Cycle</b> Monthly <input checked="" type="radio"/> Monthly <input type="radio"/> Weekly <input type="radio"/> Daily			
Every <input type="text" value="1"/> Month(s) On the <input type="text" value="1"/> day of the month			
Past Due Days: <input type="text" value="30"/>			
Past Due (2nd Notice): <input type="text" value="60"/>			
Past Due (Final Notice): <input type="text" value="90"/>			
Disconnect Day: <input type="text" value="91"/>			

### Network Security

Transactions between the HCU and RADIUS server are authenticated through the use of a shared secret, which is never sent over the network.

In addition, any user passwords are sent encrypted between the client and RADIUS server, to eliminate the possibility that someone snooping on an unsecured network could determine a user's password.

### Client/Server Model

The HCU operates as a client of RADIUS. The HCU is responsible for passing user information to designated RADIUS servers, and then acting on the response which is returned.

RADIUS servers are responsible for receiving user connection requests, authenticating the user, and then returning all configuration information necessary for the client to deliver service to the user.

A RADIUS server can act as a proxy client to other RADIUS servers or other kinds of authentication servers.

### Fault Tolerance

More than one RADIUS server may be operating concurrently.

The HCU will switch to secondary RADIUS servers if it does not receive a reply from the primary RADIUS server.

***Extensible Protocol***

All transactions are comprised of variable length Attribute-Length-Value 3-tuples.  
New attribute values can be added without disturbing existing implementations of the protocol.

***Flexible Authentication Mechanisms***

The RADIUS server can support a variety of methods to authenticate a user.  
When it is provided with the user name and original password given by the user, it can support either PAP or CHAP.

Radius Server

***The Billing server.***

Windows NT Extended Authentication and Control Services is a comprehensive, client/server authentication and billing package for Windows NT.

NTXacs is designed to provide enterprise-wide authentication and tracking, automated billing and debiting services.

NTXacs consists of several components which may distributed throughout your local and wide area network(s).

The NTXacs Database resides on an SQL server when using the Enterprise Edition.

The NTXacs Database is a local file system database in the Standard Edition.

NTXacs Server provides authentication and accounting services to your Network Access Servers.

NTXacs SysAdmin manages your accounts, users, billing services and account balances. Currently, it also contains the interface to the billing services interface.

Billing plans

***Billing Plans are the definition of billing schemes.***

You create one or Bill Plans and then assign each Account to one of the Plans.

You can still add services to the Account in addition to the ones already part of the Billing Plan.

If you add a billing service already included in the billing plan to the account, then the billing service assigned to the account will override the billing plan's service values.

Once only services assigned to a Bill Plan are copied to new Accounts as Account Services.

This allows the service to be removed from the new Account once it is billed for the service without affecting the Bill Plan.

Accounts that are being billed for partial billing periods (e.g. an Account added in the middle of the month) will be prorated.

Billing Cycle: can be Daily/Weekly/Monthly

### 3-3 H.P.U. HyperProxy Unit

#### MPEG2 DVB High Speed Internet Server

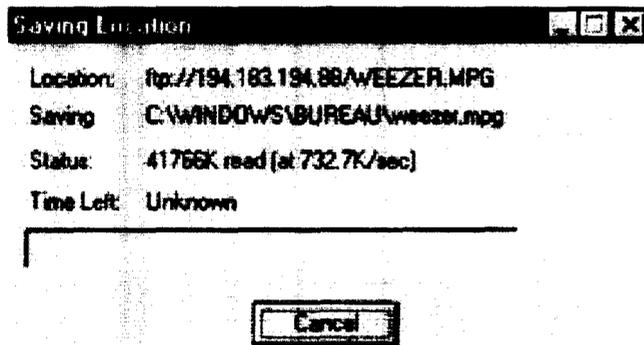
- ✓ High Speed Data Router (60Mb/s)
- ✓ TCP/IP Speed Accelerator
- ✓ Web Server
- ✓ FTP Server
- ✓ Push Email Server (optional)
- ✓ Satellite, MMDS HyperCable®, Cable-Networks



#### General

The HPU (Hyper Proxy Unit) is a Satellite and MMDS HyperCable® Proxy Server for MPEG2 DVB High Speed Internet.

The HPU Provides the Automatic High Speed Data routing via Satellite or MMDS HyperCable® systems. The HyperProxy Server allow a very high speed FTP (or HTTP ...) via Satellite or MMDS HyperCable®. Whatever the delay is (between user and server), the transfer speed will still be over 3Mb/s per session, up to 10Mb/s.



#### High Speed TCP/IP Protocol

The HyperProxy Unit Includes the HyperBoost Server.

The HyperBoost Server increases the Capacity of the TCP/IP transmission (up to 10Mb/s per FTP Session). The HyperProxy compress the Files, and send them to the subscriber PC Board.

The Subscriber need to have the HyperBoost client installed with the HC60 PC Board.

When HyperBoost Client Driver is working WITH the HC60 Receiver PC Board, the FTP speed is increased

up to 8Mbit/s (800kbytes/s).  
(1Mbit/s Without the HyperBoost Driver)

#### Technical Characteristics

##### **Hardware :**

Pentium II - 400MHz  
RAM 128 Mbytes  
HDD 10 Gbytes SCSI  
100BaseT Ethernet  
Rack mounted 19 inches 4U

##### **Software :**

Windows NT or (Linux)  
HyperBoost SERVER  
WEB Server  
FTP Server  
Push Server -Email-FTP-Web (optional)

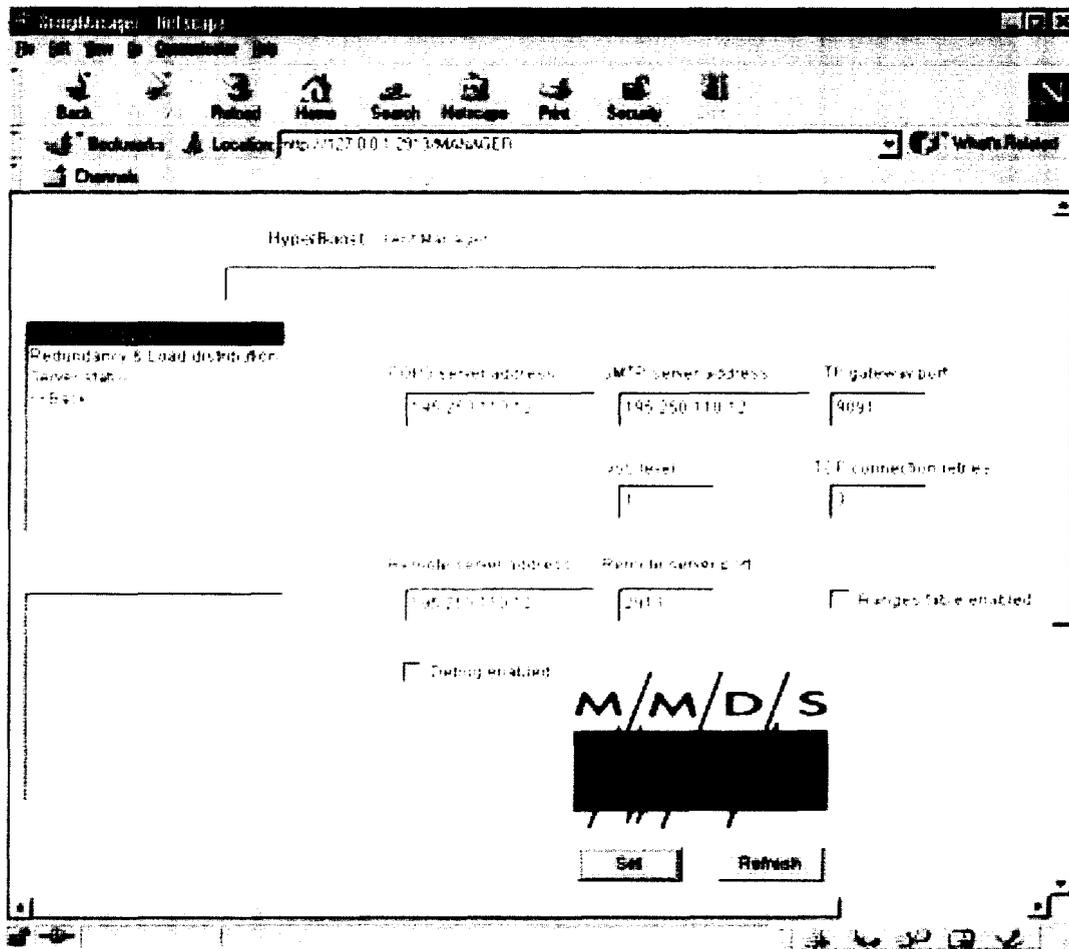
### Automatic High Speed Data routing

The HyperProxy Server Routes automatically the Data through the high speed way (mmds HyperCable® or Satellite), from the transmitter to the subscriber.

Even the Dynamic IP addresses of the subscribers are processed by the HyperProxy, It means that the subscriber can connect to ANY LOCAL ISP and receive the High Speed Internet Via the HyperCable® or Satellite network

The routing way is controlled with the HyperControl Unit

### HyperProxy Server Management with Netscape (or Explorer)



**APPENDIX 2:**

**REPRESENTATIVE INSTALLED MDS SYSTEMS  
AND DBS FOOTPRINT OVERLAPS**

## Appendix 2: Representative Installed MDS Systems and DBS Footprint Overlaps

MDS Installations: Installed Site Data				DBS Service Footprint on MDS Site				
Country Name	Customer Name	Start Date	Broadcast Freq (GHz)	Satellite Name	Carrier Freq (GHz)	Provider Name	Channel Name	
<b>Australia/New Zealand Overlap</b>								
New Zealand	IHUG	Internet; TV	Oct-97 12.338-12.410	PAS 8 - 166.0 E (Table 3.1)	12.326V	Pacific TV		
					12.330H	Pacific TV		
					12.366V	Pacific TV		
					12.394H	OSB	OSB 1 Christian TV OSB 3 Sky Shopping HMB Radio 1 HMB Radio 2 CNN Zhong Tian CNN Dadi Sun Movie Ufo TV CTV Satellite Channel Tzu Chi TV	
					12.400V			
					12.422H	HMV	HMV TV HMV Radio 1 HMV Radio 2 Pacific TV	
					12.446V			
					Optus B1 - 160.0 E (Table 3.1)	12.316H	ABC	ABC Feeds
						12.326H		ABC Feeds
						12.331V		
				12.336H			ABC Feeds	
				12.354H		7	7 Central	
				12.360H	Imparja	Imparja TV		

MDS Installations: Installed Site Data				DBS Service Footprint on MDS Site			
Country Name	Customer Name	Start Date	Broadcast Freq (GHz)	Satellite Name	Carrier Freq (GHz)	Provider Name	Channel Name
							Imparja PTTV Test Card
							Caama Music
							Caama Music
							Caama Music
							TAB Northern
					12.386H	7	7 Network
					12.404V	Mediasat	Thai TV Global Network
							Maharishi Open University (feeds)
							TRT International test card
							TRT FM
							Voice of Turkey
					12.415H	(feeds)	
					12.424H	(feeds)	
					12.430V	(feeds)	
					12.488H	9	9 Network
				<b>Optus B3 - 156.0 E (Table 3.1)</b>			
					12.336V	Mediastat	Mararishi Open University
							Thai TV Global Network (feeds)
							TRT International
							TRT FM
							Voice of Turkey
							Access 1
					12.369V	(feeds)	
					12.376H	Austar/Foxtel	
					12.407V	Optus Aurora	
					12.438H	Austar/Foxtel	

MDS Installations: Installed Site Data					DBS Service Footprint on MDS Site			
Country Name	Customer Name	Services	Start Date	Broadcast Freq (GHz)	Satellite Name	Carrier Freq (GHz)	Provider Name	Channel Name
<b>EUROPEAN OVERLAP</b>								
Macedonia	BS Holding	TV	Apr-97	11.78950				
Serbia	WIN							
	Electronic	TV	Jan-99	11.90700				
Ireland	South Coast		Jul-00 to					
	Community TV	TV	Feb-01*	12.35500				
Andorra	STA	TV	Nov-96	12.08450				
Lyon, France	MDS	demo	From					
		Internet; TV	Nov-94	12.64500				
					<b>Astra 1F - 19.2 E</b>			
					(Table 3.2)			
						11.758H	Premiere World	
						11.798H	Premiere World	
						11.934V	CanalSatellite Digital	
						12.304H	UPC Direct	
						12.38200	UPC Direct	
					<b>Astra 1G - 19.2 E</b>			
					(Table 3.2)			
						11.778V	CanalSatellite France	
						11.817V	CanalSatellite France	
						11.836H	ARD	ARD Digital
								Ard DAS Erste
								Bayerisches Fernsehen
								Hessen Fernsehen
								Arte
								SR Fernsehen Sudwest
								WDR
								BR Alpha
								Sud. Fern. Baden-
								Wurtemberg
								Phoenix
								Bayern 4 Klassik
								B5 Aktuell

\* This was a successful experimental test

MDS Installations: Installed Site Data				DBS Service Footprint on MDS Site			
Country Name	Customer Name	Start Date	Broadcast Freq (GHz)	Satellite Name	Carrier Freq (GHz)	Provider Name	Channel Name
							HR Chronos
							HR 2
							HR 2 Plus
							HR XXL
							Bayern 1
							NDR 4 Info
							Radio Bremen 2
							SR 1 Europawelle
					11.895V	CanalSatellite France	
					12.640V	Internet via the Sky	
				<b>Astra 2A - 28.2 E</b> (Table 3.2)			
					11.758H	Sky Digital	
					11.778V	Sky Digital	
					11.798H	Sky Digital	
					11.817V	Sky Digital	
					11.836H	Sky Digital	
				<b>Astra 1H - 19.2 E</b> (Table 3.2)			
					12.266H	CanalSatellite France	
					12.324V	CanalSatellite France	
					12.344H	CanalSatellite France	
					12.363V	CanalSatellite France	
				<b>Hot Bird 2 - 13.0 E</b> (Table 3.2)			
					11.747H	Dubai	Dubai mux
							Dubai EDTV
							Dubai Sports Channel
							Dubai Business Channel
							Dubai EDTV
							UAE Radio Dubai
							UAE Radio Dubai
					11.766V	RAI	RAI Uno

MDS Installations: Installed Site Data				DBS Service Footprint on MDS Site			
Country Name	Customer Name Services	Start Date	Broadcast Freq (GHz)	Satellite Name	Carrier Freq (GHz)	Provider Name	Channel Name
							RAI Due
							RAI Tre
							RAI Way Test Card
					11.785H	Canal 24 Horas	RAI Mosaico
							RNE Radio 1
							RNE Radio 5 Todo Noticia
							RNE Radio Ciasica
							RNE Radio 3
						RAI	RAI News 24
							Camera Dei Deputati
							TelePace
							RAI Sports Satellite
							RAI Nettuno Sat Due
							RAI Educational
					11.804V	RAI	RAI Nettuno Sat Uno
							RAI Radio 1
							RAI Radio 2
							RAI Radio 3
							FD Leggera
							FD Auditorium
							Blu Sat 2000
							GR Parlamento
							Isodorio
							FD Leggera (06-24)
							Notturmo Italiano (00-06)
					11.823H	Nova	Nova
					11.900H	D+	

MDS Installations: Installed Site Data					DBS Service Footprint on MDS Site			
Country Name	Customer Name	Services	Start Date	Broadcast Freq (GHz)	Satellite Name	Carrier Freq (GHz)	Provider Name	Channel Name
<b>Central Asian Overlap</b>								
Almaty, Kazakhstan	Aiba	Internet	May-98	12.750-12.775	<b>Eurasiasat 1- 42.0 E</b> (Table 3.3)	12.731H 12.731V		
<b>North East Asian Overlap</b>								
Korea	IST Korea	Internet demo, TV	Mar-98	12.500- 12.750	<b>Koreasat 3- 116.0 E</b> (Table 3.4)	12.550V 12.730H	Korea CATV Korea Satellite Broadcasting	Korea CATV  KSB Movie 1 KSB Movie 2 KSB Movie 3 KSB Board Game KSB Synthetic Channel Home Shopping

## **APPENDIX 3: SATELLITE DATA SOURCE\***

**\*The following data is representative of DBS systems having footprints that overlap with MDS installations. It is not intended to be a complete listing of such overlaps.**

## **TABLE 3.1**

*No Reserve Price!*



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## Lyngemark Satellite Chart

### PAS 8 at 166.0°E

PAS 8 © Lyngemark Satellite, last updated 2001-03-09 - <a href="http://www.lyngsat.com/pas8.shtml">http://www.lyngsat.com/pas8.shtml</a>							
Freq. Tp	Provider Name Channel Name	Video Encryption	SR - FEC SID - VPID	NID - TID Audio	Beam	Source Updated	
<b>3706 V</b> tp 1					East Asia H	T Termpaisi 001020	
<b>3740 H</b> tp 2	 <b>Viacom</b>	<input type="checkbox"/>	MPEG-2 27500 - 2/3		East Asia H	Anon 010107	
	<b>MTV Taiwan</b>		273	275			
	<b>MTV Korea</b>	<input type="checkbox"/>	289	291			
	<b>Nickelodeon New Zealand</b>	<input type="checkbox"/>	305	307			
	<b>Nickelodeon Japan</b>	<input type="checkbox"/>	321	323			
	[test card]		369	370			
<b>3780 H</b> tp 4	<b>CNN</b>		MPEG-2 25000 - 3/4		East Asia H	Ntsc 010131	
	<b>CNN International Asia</b> (CNN Newsource feeds)	<input type="checkbox"/>	PowerVu 1160	1120			
	<b>CNN Financial Network</b>	<input type="checkbox"/>	1260	1220			
	[CNN India test card]		1360	1320			
<b>3808 V</b> tp 5	 <b>EM TV</b>	<input type="checkbox"/>	MPEG-2 PowerVu 5632 - 3/4 1110	1211	East Asia V	D Nolan 010106	
	® Nau FM	<input type="checkbox"/>	PowerVu	1213			
	® Yumi FM		PowerVu	1214			
<b>3812 H</b> tp 6	(CNN Hong Kong feeds)		MPEG-2 10850 - 3/4		East Asia H	D Ross 000209	
<b>3813 V</b> tp 5	 <b>Lakbay TV</b>	<input type="checkbox"/>	MPEG-2 5044 - 3/4 4096	4097	East Asia V	A Bottu-Vongnipon 001022	
<b>3854 H</b> tp 8	(Mediasat feeds)		MPEG-2 6110 - 3/4		East Asia H	D Nolan 000806	
<b>3870 H</b> tp 8			MPEG-2 12000 - 3/4		East Asia H	Agust 000428	
	[JT Tokyo test card]		1160	1120			
	<b>Fuji TV International</b>	<input type="checkbox"/>	1260	1220 J			

3880 V tp 9		<b>ABS-CBN Bouquet</b>	<input type="checkbox"/>	MPEG-2 PowerVu	28694 - 3/4		East Asia V	W Sippawit 001214	
		Knowledge Channel	<input type="checkbox"/>	PowerVu	1060	1020			
		ABS-CBN Channel 1	<input type="checkbox"/>	PowerVu	1160	1120			
		ABS-CBN Channel 2	<input type="checkbox"/>		1260	1220			
		ABS-CBN Channel 3	<input type="checkbox"/>		1360	1320			
		Studio 23	<input type="checkbox"/>		1460	1420			
		TFC - The Filipino Channel	<input type="checkbox"/>	PowerVu	1560	1520			
		ABS-CBN News Channel	<input type="checkbox"/>	PowerVu	1660	1620			
		Lifestyle Network Channel	<input type="checkbox"/>	PowerVu	1760	1720			
		Pinoy Blockbuster Channel	<input type="checkbox"/>	PowerVu	1860	1820			
	Lakbay TV	<input type="checkbox"/>		1960	1920				
3900 H tp 10		<b>CNBC Asia Bouquet</b>	<input type="checkbox"/>	MPEG-2	27500 - 3/4		East Asia H	Anonymous 010213	
		CNBC Asia	<input type="checkbox"/>		1	512			650
		CNBC Australia	<input type="checkbox"/>		2	513			660
		[CNBC test card]	<input type="checkbox"/>		3	514			670
		CNBC India	<input type="checkbox"/>		4	515			680
		[CNBC test card]	<input type="checkbox"/>		5	516			690
		CNBC Hong Kong (CNBC feeds)	<input type="checkbox"/>		6	517			700
				7	518	710			
3940 H tp 12			<input type="checkbox"/>	MPEG-2	27690 - 7/8		East Asia H	R Anthony 001014	
		(Panamsat Napa feeds)	<input type="checkbox"/>		2660	2620			
		MusicCountry Pacific Rim	<input type="checkbox"/>		2760	2720			
		[test card]	<input type="checkbox"/>		2860	2820			
		TNT	<input type="checkbox"/>		14	2460			2420
		EWTN Asia	<input type="checkbox"/>		15	2560			2520
		[Panamsat test card]	<input type="checkbox"/>		16	2260			2220
		The Golf Channel	<input type="checkbox"/>		17	2160			2120
	[Panamsat test card]	<input type="checkbox"/>		18	2360	2320			
3980 H tp 14		<b>Discovery Asia</b>	<input type="checkbox"/>	MPEG-2 PowerVu	27690 - 3/4		East Asia H	R Brooks 000108	
		Animal Planet Japan	<input type="checkbox"/>	PowerVu	2060	2020			
		Animal Planet SE Asia	<input type="checkbox"/>	PowerVu	2160	2120			
		Discovery Channel Taiwan	<input type="checkbox"/>	PowerVu	2260	2220			
		Discovery Channel SE Asia	<input type="checkbox"/>	PowerVu	2360	2320			
		Discovery Channel China	<input type="checkbox"/>	PowerVu	2460	2420			
		Discovery Channel Australia & New Zealand	<input type="checkbox"/>	PowerVu	2560	2520			
		Discovery Channel Japan	<input type="checkbox"/>	PowerVu	2660	2620			
		Animal Planet Taiwan	<input type="checkbox"/>	PowerVu	2760	2720			
		Animal Planet Australia & New Zealand	<input type="checkbox"/>	PowerVu	2860	2820			
	Discovery Channel Korea	<input type="checkbox"/>	PowerVu	2960	2920				

<b>4020 H</b> tp 16		<b>ESPN</b>	<input type="checkbox"/>	MPEG-2 PowerVu	26466 - 7/8		East Asia H	MediaStar S 001009
		<b>ESPN Atlantic Network</b>	<input type="checkbox"/>	PowerVu	1160	1120		
		<b>ESPN 2</b>	<input type="checkbox"/>	PowerVu	1260	1220		
		<b>ESPN</b>	<input type="checkbox"/>	PowerVu	1360	1320		
		<b>ESPN Pacrim Network</b>	<input type="checkbox"/>	PowerVu	1460	1420		
		<b>ESPN Latin Network</b>	<input type="checkbox"/>	PowerVu	1560	1520		
<b>4050 V</b> tp 17				MPEG-2 PowerVu	12000 - 3/4		East Asia V	B Richards 001209
		<b>NTV International</b>	<input type="checkbox"/>	PowerVu	1160	1120 J		
		<b>Fuji TV International</b>	<input type="checkbox"/>	PowerVu	1260	1220 J		
<b>4060 H</b> tp 18		<b>NHK Joho Network</b>	<input type="checkbox"/>	MPEG-2	26470 - 3/4	8102-0	East Asia H	D Pemberto 000715
		<b>NHK World Premium</b>	<input type="checkbox"/>	PowerVu	1160	1120 J		
		<b>NHK World TV (525 lines)</b>	<input type="checkbox"/>		1260	1220 J 1222 E		
		<b>NHK World TV (625 lines)</b>	<input type="checkbox"/>		1360	1320 J 1322 E		
		<b>Channel J</b> © Radio Japan	<input type="checkbox"/>	PowerVu	1460	1420 E 1122		
<b>4140 H</b> tp 22		<b>The Disney Channel</b>	<input type="checkbox"/>	MPEG-2 PowerVu	21093 - 5/6		East Asia H	D Pemberto 001114
		<b>The Disney Channel Australia</b>	<input type="checkbox"/>	PowerVu	1160	1120		
		<b>The Disney Channel Malaysia</b>	<input type="checkbox"/>	PowerVu	1260	1220		
		<b>The Disney Channel Philippines</b>	<input type="checkbox"/>	PowerVu	1360	1320		
<b>4180 H</b> tp 24							East Asia H	R Anthony 001003

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Freq. Tp		Provider Name Channel Name		Video Encryption	SR - FEC SID - VPID	NID - TID Audio	Beam	Source Updated
<b>12286 V</b> tp 1		<b>Pacific TV</b>		MPEG-2 Viaccess	27500 - 3/4		SE Asia	Frank 001003
<b>12312 H</b> tp 14							Australia	R Anthony 001221
<b>12321 H</b> tp 14							Australia	R Anthony 001221
<b>12326 V</b> tp 2		<b>Pacific TV</b>		MPEG-2 Viaccess	27500 - 3/4		SE Asia	Frank 001003
<b>12330 H</b> tp 14							Australia	R Anthony 001221
<b>12366 V</b> tp 3		<b>Pacific TV</b>		MPEG-2 Viaccess	27500 - 3/4		SE Asia	W.C. 991018