ICOM

VHF DIGITAL RF MODULE

ID-RP2000V

UHF DIGITAL RF MODULE

ID-RP4000V

DIGITAL VOICE + DIGITAL DATA

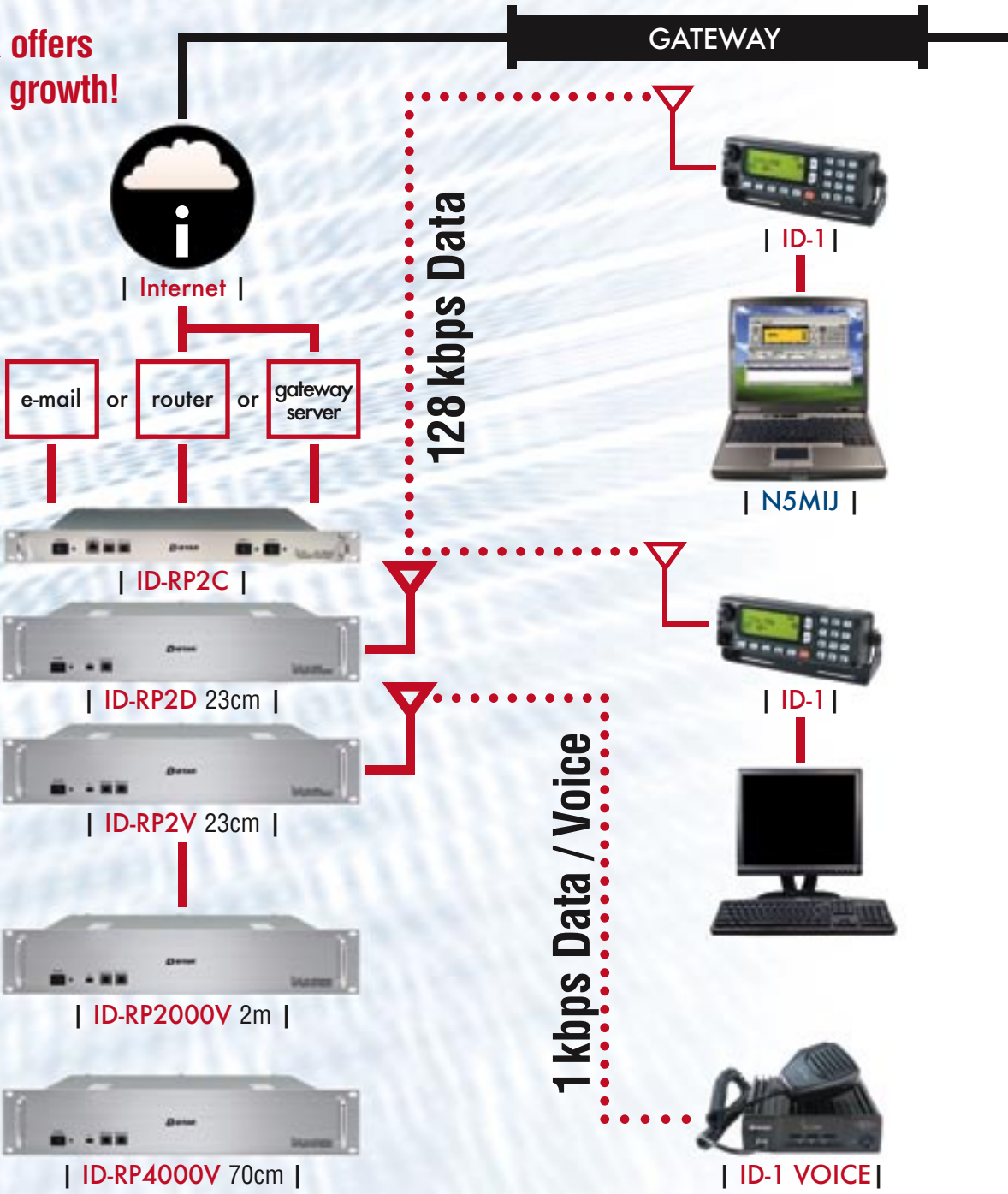
Imagine a world where you can get a VHF and UHF repeater pair! Or when VHF and UHF DX does not require a band opening! Or even a plug and play repeater system that gives you functionality and capabilities that no other radio service in the world can offer! This dream has become a reality with Icom's ID-RP2000V and ID-RP4000V D-STAR modules.

Whether you are a repeater owner wanting to experiment in the digital world or a club who wants more from their repeater network, D-STAR is definitely the future of amateur radio.

Icom America Inc.

D-PRS® | AUTO I.D. | INTERNET ACCESS | CROSSBANDING

The power of D-STAR offers flexibility and system growth!



ID-RP2C: With the capability of handling up to four RF modules, the ID-RP2C repeater controller is the cornerstone of the D-STAR repeater system. This includes basic in-band as well as crossband operation between any of the four digital voice RF modules. In addition to basic control of the RF modules, the RP2C also provides linking capabilities through the internet and future 10GHz backbone products.

RF Modules:

ID-RP2D: (23cm Data)
One of the most powerful functions of D-STAR is the ability to move data. The ID-RP2D provides an access point with a data rate of 128kbps. Depending on the system setup, the 128kbps is perfect for setting up an e-mail and/or file server for EmComm support. It's also perfect for connecting to the internet for web applications or support.

Whether you use the 128kbps for e-mail or file servers, connecting to an internet source via a router will give you the capability of checking out the radar from the National Weather Service or National Hurricane Center.

Digital Voice: No room for another repeater pair? ***No problem*** for the Icom D-STAR repeaters! In addition to the 128kbps data, D-STAR incorporates the power of digital voice and 1kbps data mode on 2m, 70cm, and 23cm. The spectral efficiency, crystal clarity, and the ability of repeating data and voice communications on a single 6.25 kHz channel is something yet to be seen in any other radio service! With this capability, expand the number of repeaters available in your area.

Icom's D-STAR compatible repeaters modules:
RP2V: (23cm) RP4000V: (70cm) RP2000V: (2m)

Crossband Operation: Finally, a commercially available legal crossband repeater! With proper callsign programming in any D-STAR compatible mobile or portable, the Icom D-STAR repeaters will automatically route your signal to any other RF module connected to a common RP2. With simple repeater commands, you can direct your communications through any of the RF modules.

Repeater Configuration:

There are three distinct repeater configurations currently available.

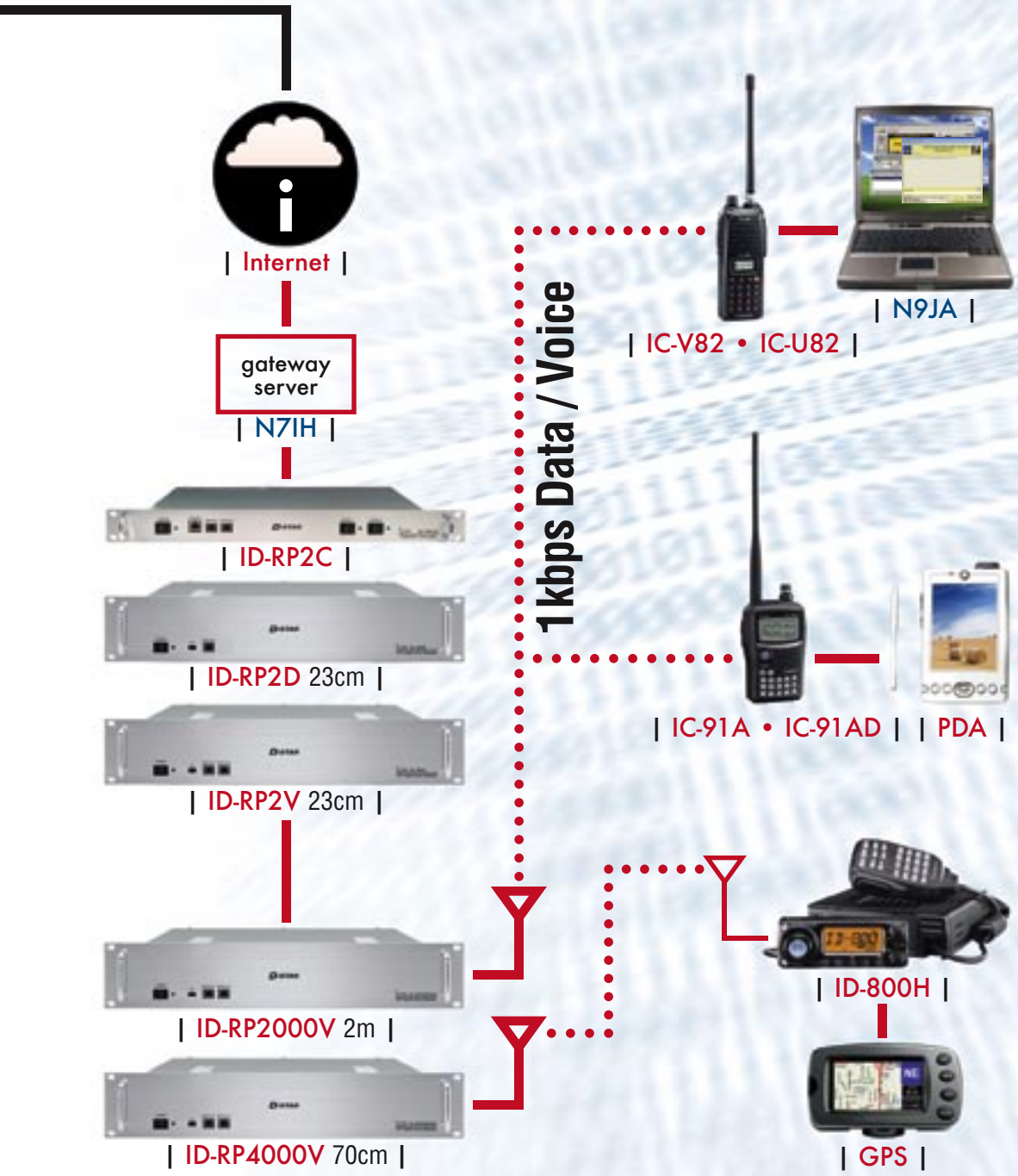
Local: This configuration is very similar to most analog repeater systems without any linking or internet requirements or capabilities, and is primarily used for Digital Voice and 1kbps operations.

Local with Internet: Expand to the local repeater with the addition of the ID-RP2D and a simple DSL connection through a router. While this allows internet connectivity with an ID-1, there is no control over who is able to use the internet connection. (Interconnection with other remote users is not possible.)

Gateway: This is the ultimate D-STAR configuration providing a controlled internet connection as well as linking to other repeaters installed into a common D-STAR network. All users of the DV (digital voice) gateway of 128kbps internet connection must be registered in one of the D-STAR networked repeaters. (**NOTE:** A static IP address is required to set up a gateway D-STAR repeater. A few examples of a gateway network can be seen on www.dstarusers.org website.)

V/4000V

TEXT MESSAGING | DIGITAL VOICE & LOCATION | RESCUE TRACKING | CROSSBANDING



Applications and Uses

1kbps: The 1kbps is the transport layer for your data communications using the serial port of your computer. While considered a slow data rate, the 1kbps can move a considerable amount of data and co-exist on the same frequency with DV communications.

PC: An exciting new area to experiment, each of the Icom D-STAR compatible radios utilizes a serial port interface for 1kbps. So, any files, messages or data you send through the serial port or USB port on your laptop will move through the D-STAR network.

d*Chat: One of the first third-party Windows® software applications for D-STAR, d*Chat, created by NJ6N, works on low-speed D-STAR (DV data). It offers keyboard-to-keyboard instant text messaging between multiple stations on a simplex frequency or through a repeater. d*Chat can be set up to send automated status reports at regular intervals. A printable event log is kept. Download for free: http://nj6n.com/dstar/dstar_chat.html

PDA: (Applications pending) Communicate with others via text through the serial port on your PDA. Complete forms and send them from in the field, or just a quick text message to say "hello". This is a perfect combination for the amateur on the go!

GPS: Connect any NMEA compatible GPS to the serial port of the Icom D-STAR compatible radios and send GPS coordinates, either with each press of the PTT button or at preset TX intervals. The IC-2820H has optional GPS capabilities with coordinates relayed on its LCD.

Gateway Communications: Expand your VHF, UHF, and SHF horizons by adding the D-STAR gateway. The Gateway operates like a router, directing your communications either locally or over the internet based on the callsigns used. There are four callsigns used in routing calls over a D-STAR repeater. The most critical is the "My" or "Mycall" as it identifies the originating communication. There are two repeater callsign locations as well as a destination callsign, "Your" or "Urcall". The tables below show proper programming of these callsign locations.

Repeater Configuration (N7IH)

Module	Band	Mode
A	23cm	DV
A	23cm	DD
B	70cm	DV
C	2m	DV

Local communications (User radio)

Simple 2m repeater operation

Setting	Callsign
Mycall	N9JA
Urcall	CQCQCQ
RPT1	N7IH _ _ _ C
RPT2	off

Simple 2m – 70cm crossband operation

Setting	Callsign
Mycall	N9JA
Urcall	CQCQCQ
RPT1	N7IH _ _ _ C
RPT2	N7IH _ _ _ B

Gateway operation to N5MIJ

Setting	Callsign
Mycall	N9JA
Urcall	N5MIJ
RPT1	N7IH _ _ _ C
RPT2	N7IH _ _ _ G

Note: Each callsign location can hold up to eight characters. The 8th character is the "switch" and is necessary for controlling the repeater. Spaces are required to position the switch character into the 8th character location.

COMPATIBILITY CHART WITH ICOM DIGITAL TRANSCEIVERS

	IC-91AD or IC-91A + UT-121	ID-800H	IC-2200H + UT-118	IC-V82 + UT-118	IC-U82 + UT-118	IC-2820H + UT-123	IC-92AD	ID-1 (1.2GHz)
ID-RP2000V	✓	✓	✓	✓	--	✓	✓	--
ID-RP4000V	✓	✓	--	--	✓	✓	✓	--
ID-RP2V/2D	--	--	--	--	--	--	--	✓

SPECIFICATIONS

GENERAL

Frequency range	
ID-RP2000V:	144-148 MHz
ID-RP4000V:	440-450 MHz
Type of emission:	F1D (GMSK); F7W with ID-RP2C
Frequency stability	
ID-RP2000V:	±0.3 kHz (at 25˚C; +77˚F)
ID-RP4000V:	±0.8 kHz (at 25˚C; +77˚F)
Frequency resolutions:	5/6.25 kHz
Antenna impedance:	50Ω (type-N)
Transmission speed:	4.8 kbps (Voice 2400 bps, FEC 1200 bps, data 952 bps)
Power supply requirement:	13.8 V DC ±15% (negative ground)
Current drain	
TX High/Low:	Less than 7.0/3.0A
RX Stand-by:	Less than 0.7A
Operation temp. range:	-10˚ C to +50˚ C; +14˚ F to +122˚ F
Dimensions (proj. not incl.):	483(W)x88(H)x428(D) mm; 19(W)x3 15/32x16 27/32(D) in.
Weight (approx.):	7.5 kg; 16 lb 9 oz

TRANSMITTER

Output power:	25-30W (high)/2-3W (low)
Modulation system:	Quadrature modulation (244.8 MHz)
Occupied bandwidth:	Less than 6.25 kHz
Spurious emissions:	Less than -60 dB

RECEIVER

Intermediate freq.	
ID-RP2000V:	46.35 MHz/450 kHz (1st/2nd)
ID-RP4000V:	70.00 MHz/455 kHz (1st/2nd)
Sensitivity:	Less than 0.45µV @ BER $1x10^{-2}$
Adjacent Ch. Selectivity:	More than 65 dB (10 kHz offset)
Intermodulation rejection ratio:	More than 65 dB (±20 kHz/40 kHz)
Receive Spurious:	Less than -57 dBm
Spurious image rejection:	More than 70 dB

GENERAL

Frequency range		
ID-RP2D:	RX 1240-1300 MHz; TX 1240-1300 MHz	
ID-RP2V:	RX 1240-1300 MHz; TX 1240-1300 MHz	
Type of emission		
ID-RP2D:	F1D (GMSK)	
ID-RP2V:	F1D (GMSK) F7W for system operation	
Frequency stability:	±2.5 ppm (based on 25˚ C; +77˚ F)	
Frequency resolutions:	5/6.25 kHz	
Antenna connector:	Type-N (impedance: 50Ω)	
Communication speed		
ID-RP2D:	128 kbps	
ID-RP2V:	4.8 kbps	
Power supply requirement:	13.8 V DC ±15% (negative ground)	
Current drain		
ID-RP2D:	TX (high)	Less than 6.0 A
	TX (low)	Less than 2.7 A
	RX stand-by	Less than 0.7 A
ID-RP2V:	TX (high)	Less than 7.0 A
	TX (low)	Less than 3.0 A
	RX stand-by	Less than 1.0 A
Usable temperature range:	-10˚ C to +50˚ C; +14˚ F to + 122˚ F	
Dimensions (proj. not incl.):	483(W)x88(H)x428(D) mm; 19(W)x3 15/32x16 27/32(D) in.	
Weight (approx.):		
ID-RP2D:	6.2 kg; 13 lb 10 oz	
ID-RP2V:	7.5 kg; 16 lb 9 oz	

TRANSMIT POWER (at 13.8 V DC)

ID-RP2D:	High	9-12 W	Low	0.5-1.2 W
ID-RP2V:	High	6-12 W	Low	0.5-1.2 W

Modulation system:	Quadrature (243.95 MHz)
Occupied bandwidth	
ID-RP2D:	Less than 130 kHz
ID-RP2V:	Less than 5.5 kHz
Spurious emissions:	Less than -50 dB
Receive system	
ID-RP2D:	Double-conversion superheterodyne
ID-RP2V:	Triple-conversion superheterodyne

RECEIVER

Intermediate freq.		
ID-RP2D:	1st	243.95 MHz
	2nd	10.7 MHz
	3rd	N/A
ID-RP2V:	1st	243.95 MHz
	2nd	31.05 MHz
	3rd	450 kHz

Sensitivity (BER $1x10^{-2}$)	
ID-RP2D:	Less than 2.24 µV
ID-RP2V:	Less than 0.45 µV
Selectivity	
ID-RP2D:	More than 140 kHz/6 dB; Less than 520 kHz/40 dB
ID-RP2V:	More than 6 kHz/6 dB; Less than 18 kHz/50 dB
Receive spurious:	Less than -57 dBm
Spurious and image Rejection ratio:	More than 60 dB (General); More than 50 dB (IF and $^{IF}/_{2}$)

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