

Westel DRB-25 Digital Basestation / Repeater



Westel Wireless Systems

- Westel wholly owned AUS company with development and manufacture in Sydney
- First demonstrated in 1995 and first fielded in 1998 (as ADI Ltd)
- Westel acquired business in 2000
- Approx 600 repeaters deployed in the USA; DOI, NPS, USDA etc and 50 in Russia



Features

- Core philosophy that 'its all in the box'
- Analog / Digital operation as standard
- Inbuilt DTMF and Tone control
- Inbuilt IMBE and P25 DES-OFB encryption
- Inbuilt VOIP capability and Web-based diagnostics
- Crossbanding / Crossmoding
- Easy setup with Windows software



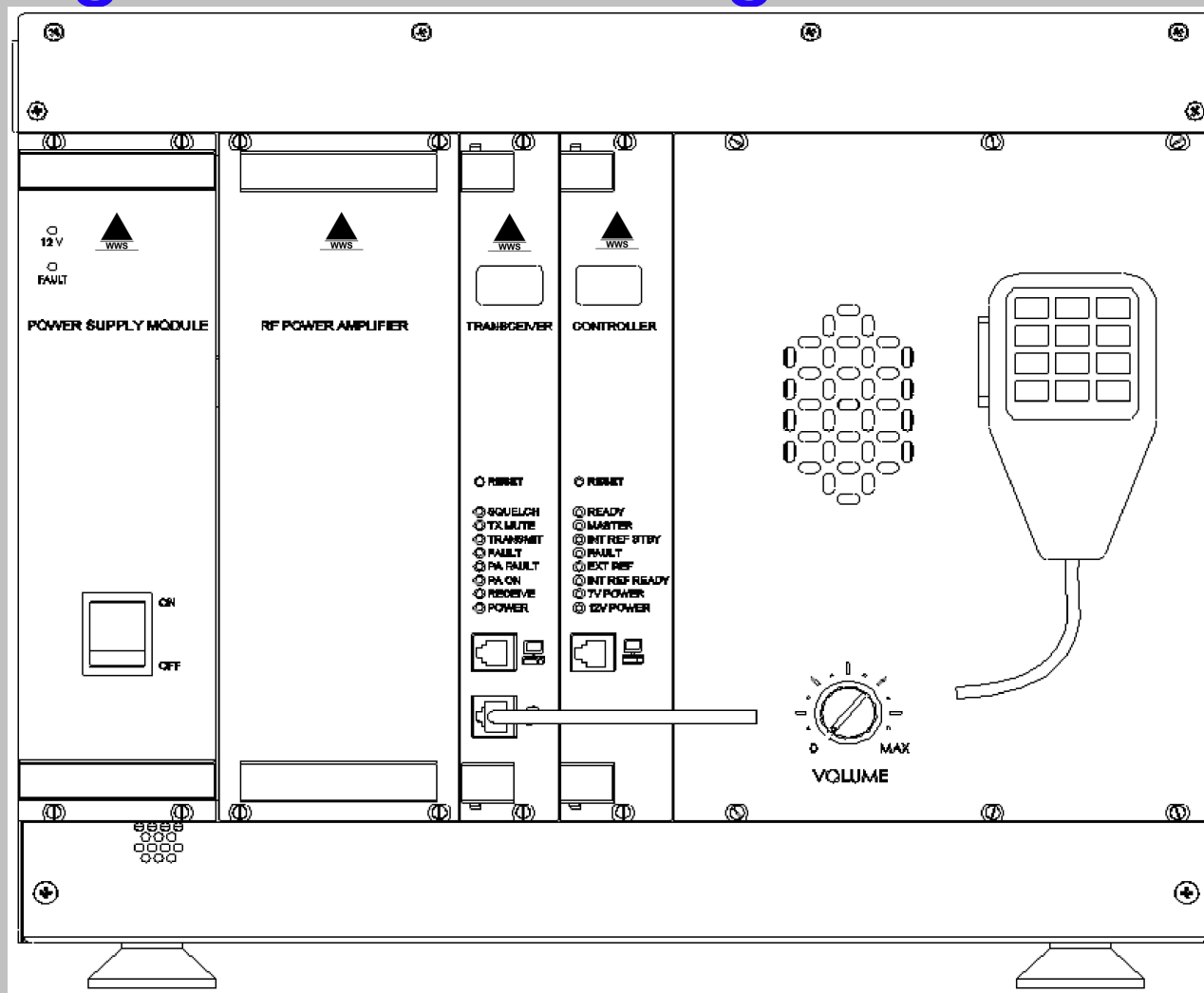
System Configurations

- Single or Dual radios, independent or linked
- Repeater and Basestation operation
- Modes
 - Analogue FM (12.5/25 kHz) - TIA/EIA 603 / AS4295
 - Digital C4FM (12.5 kHz) - TIA 102.CAAB / AS4768
- Frequency bands
 - VHF 136 - 174 MHz : 10 – 100W
 - UHF 380 - 520 MHz* : 6 – 60W
- Supply: 110V / 240 VAC with 12V DC revert

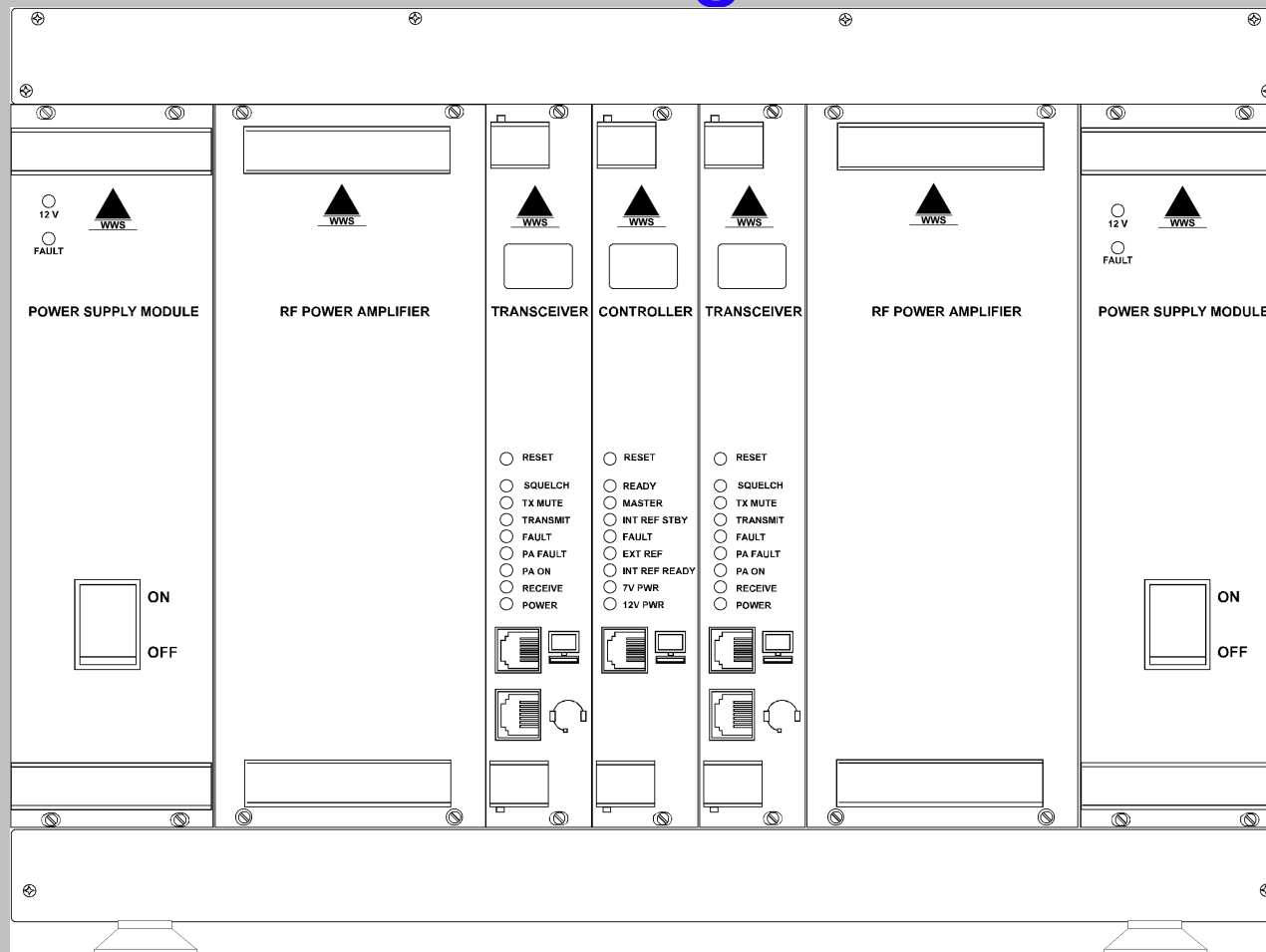
* Not all bands type accepted in all countries



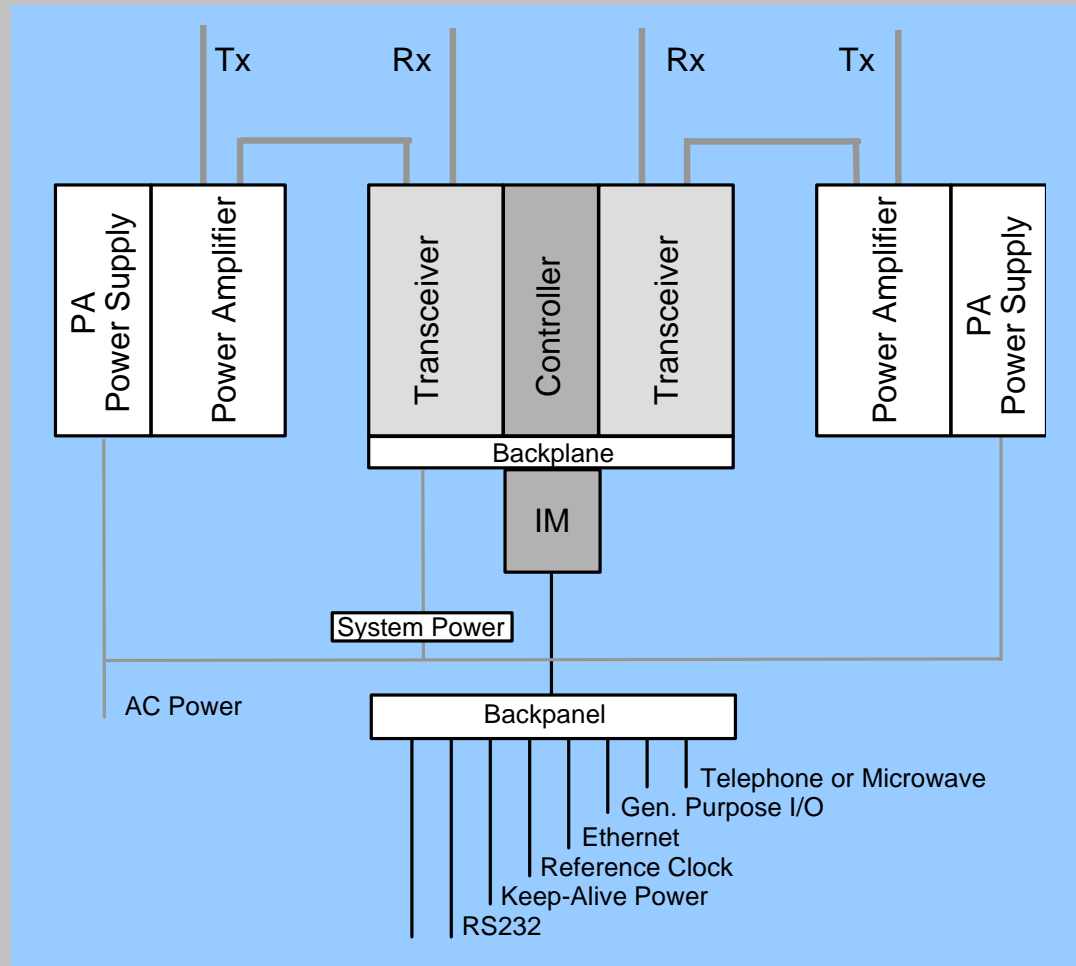
Single Radio Configuration



Dual Radio Configuration



Functional Overview

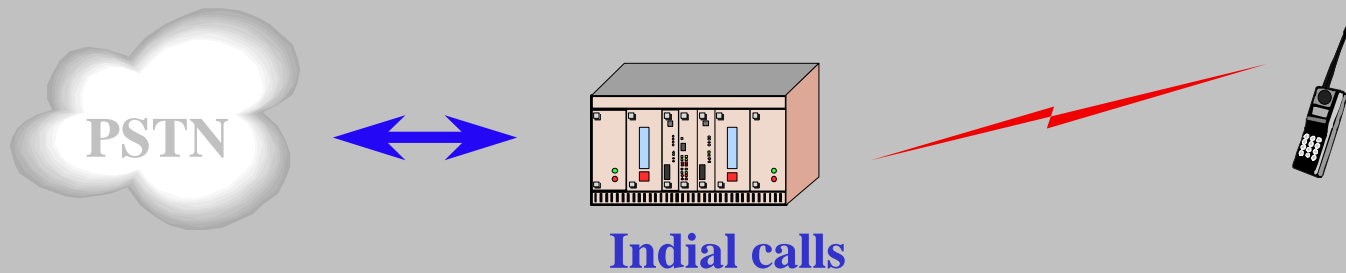
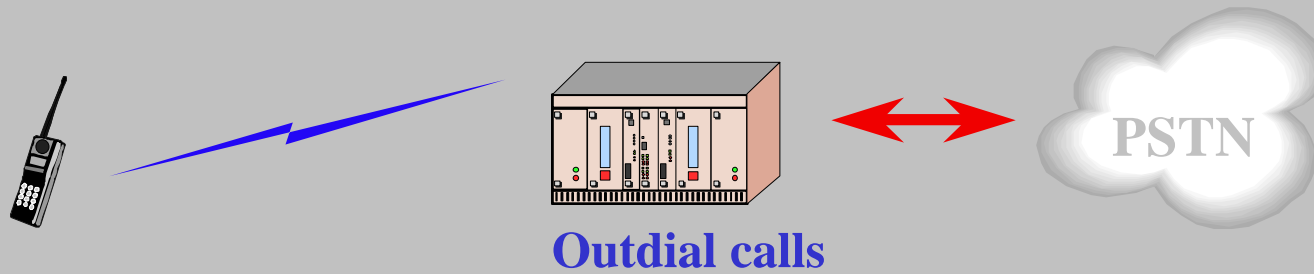
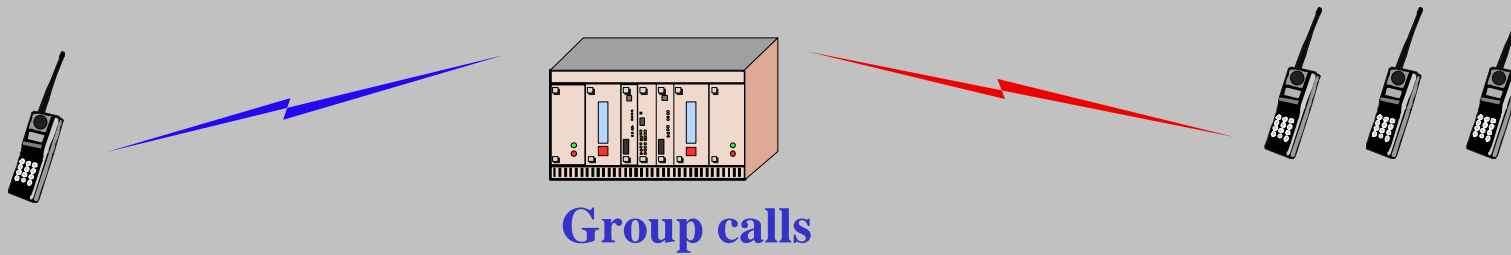
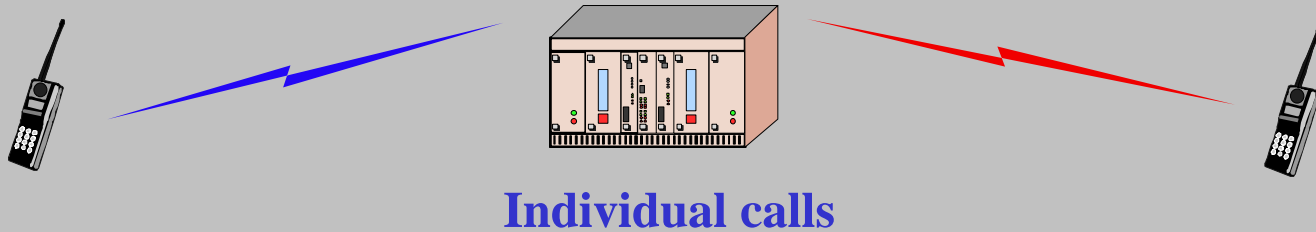


External Interfaces

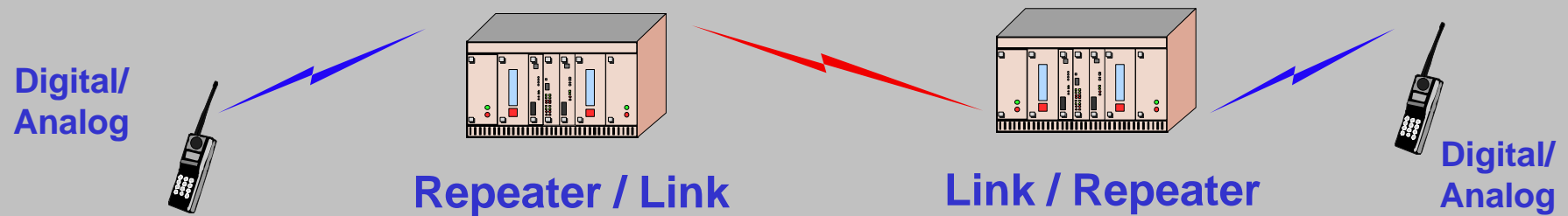
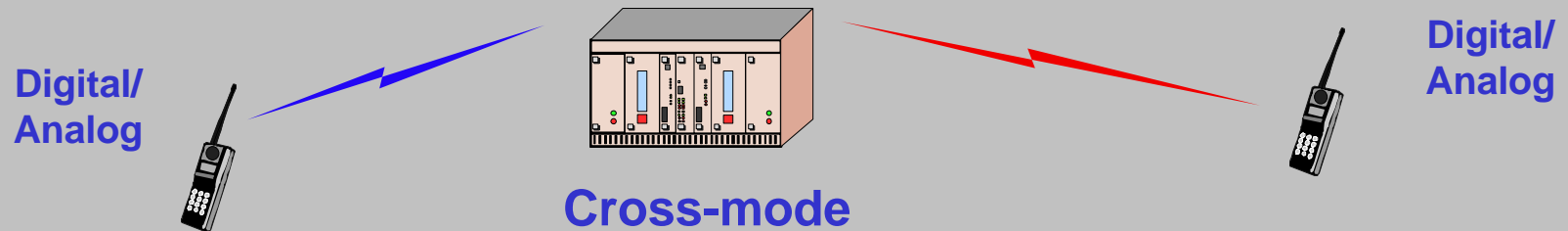
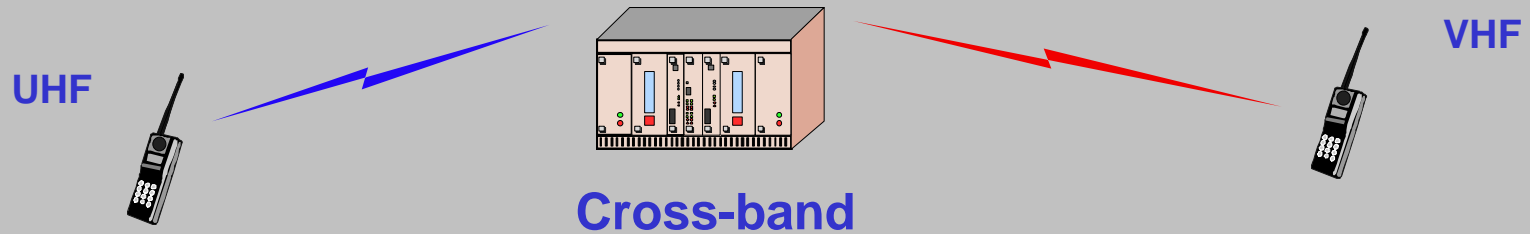
- LINE: 2 wire, 4 wire + E/M, PSTN/PBX, microwave, tone remote, console
- NET: Ethernet
- I/O: RS232 diagnostic data, TxRx
Relays, Tx Inhibit, COR
- EXT REF: External 10 MHz input
- STBY PWR: OCXO keep-alive power
- -48 V DC



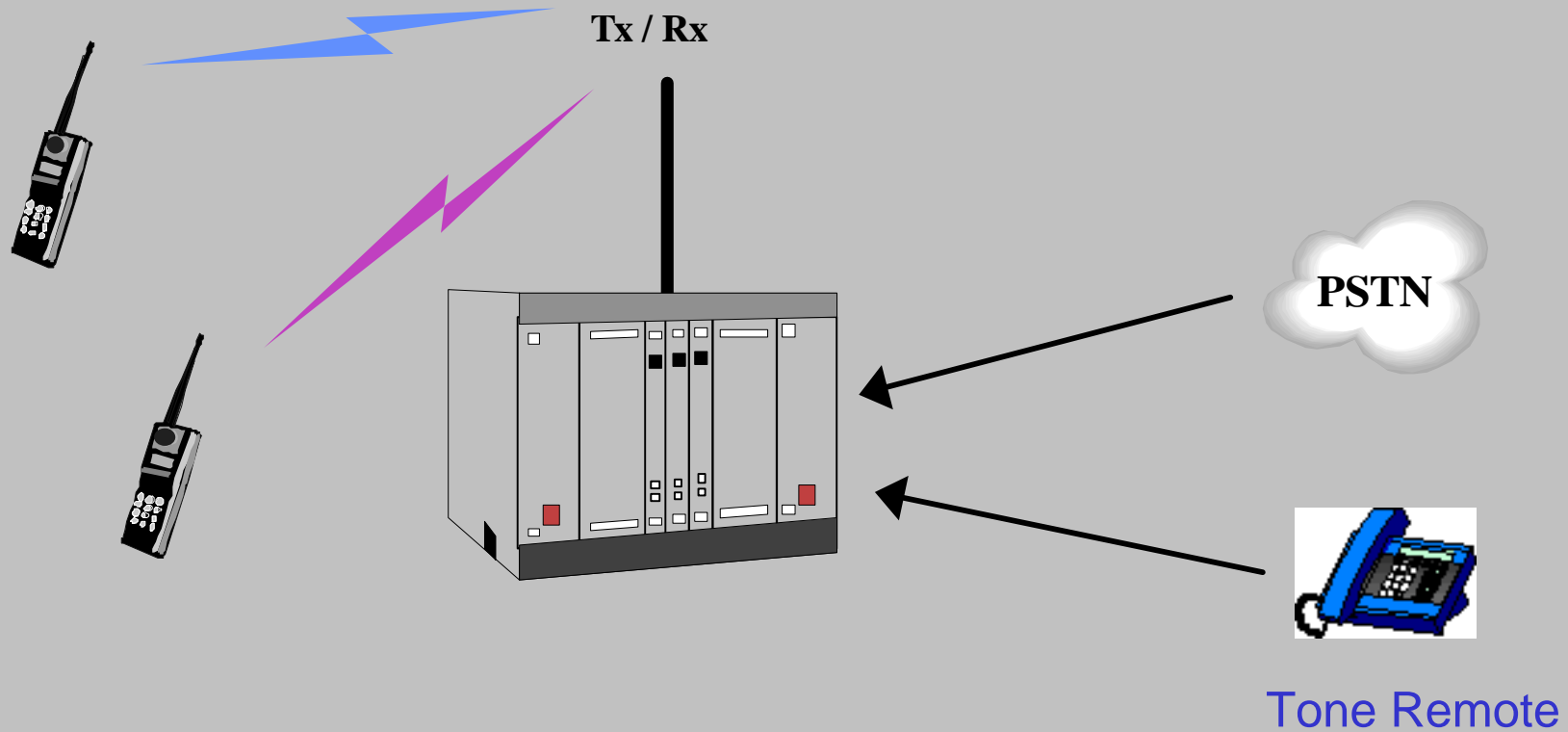
Call Types



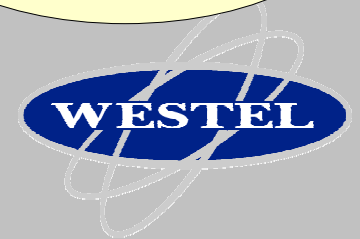
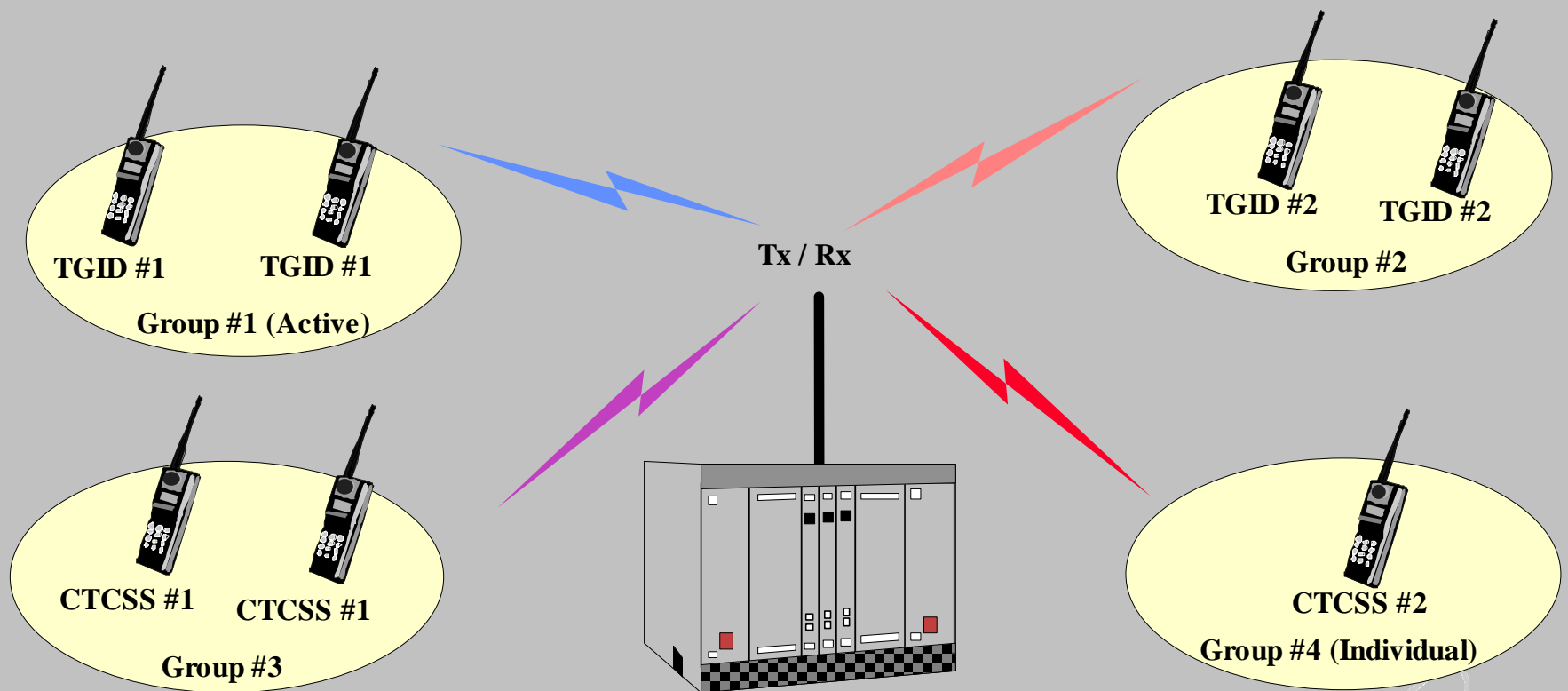
Sample Applications



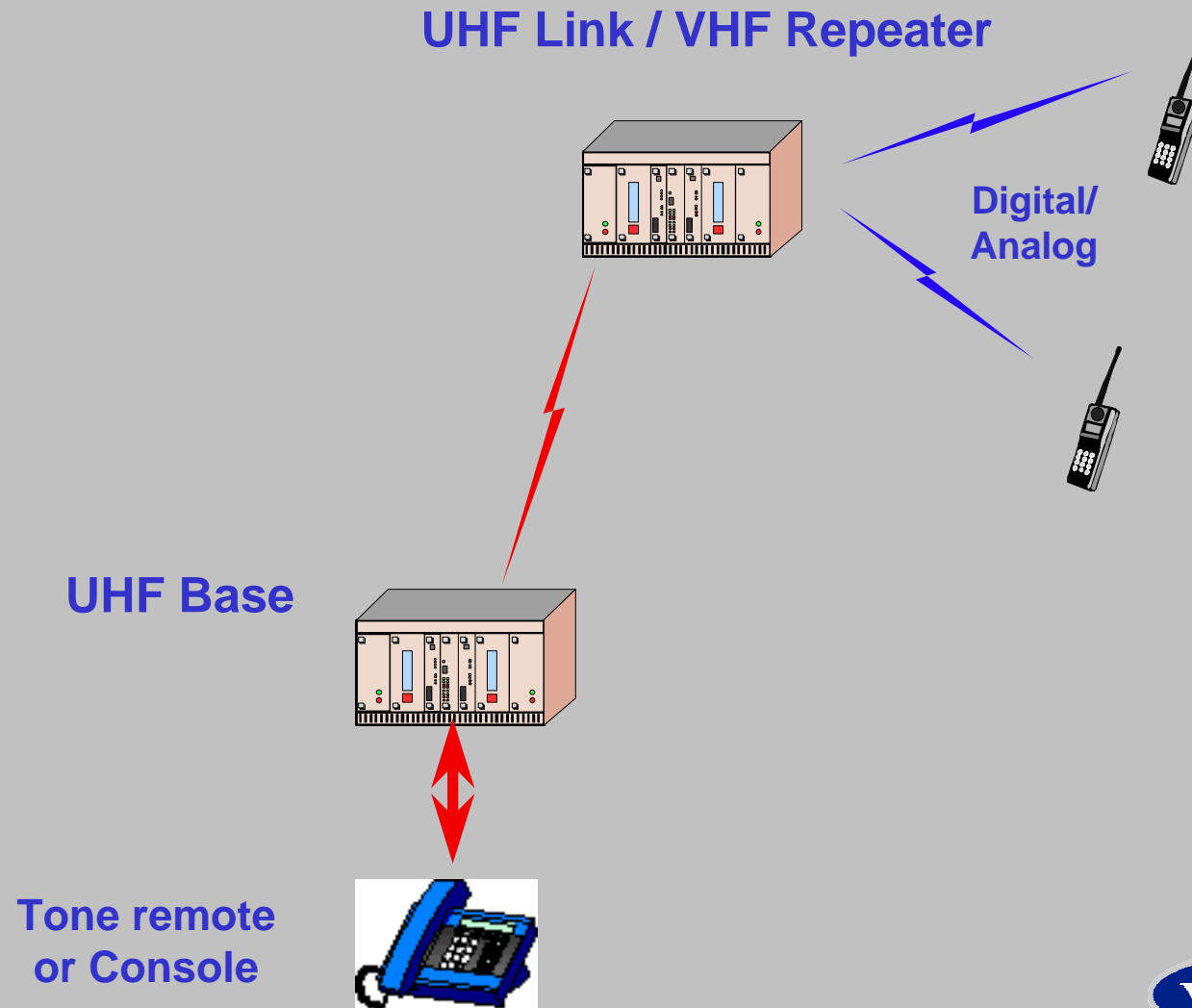
Basestation



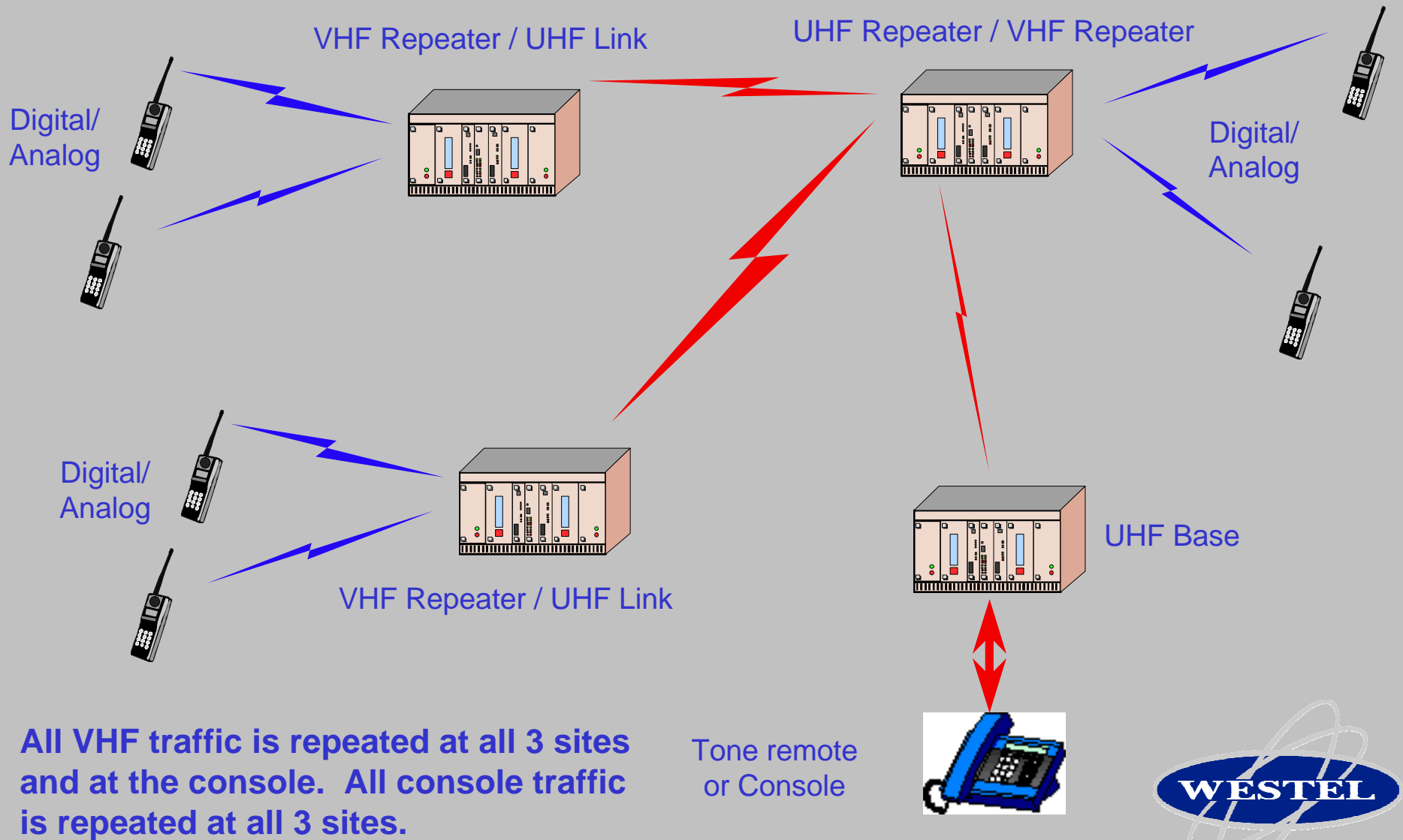
Auto Sensing Repeater



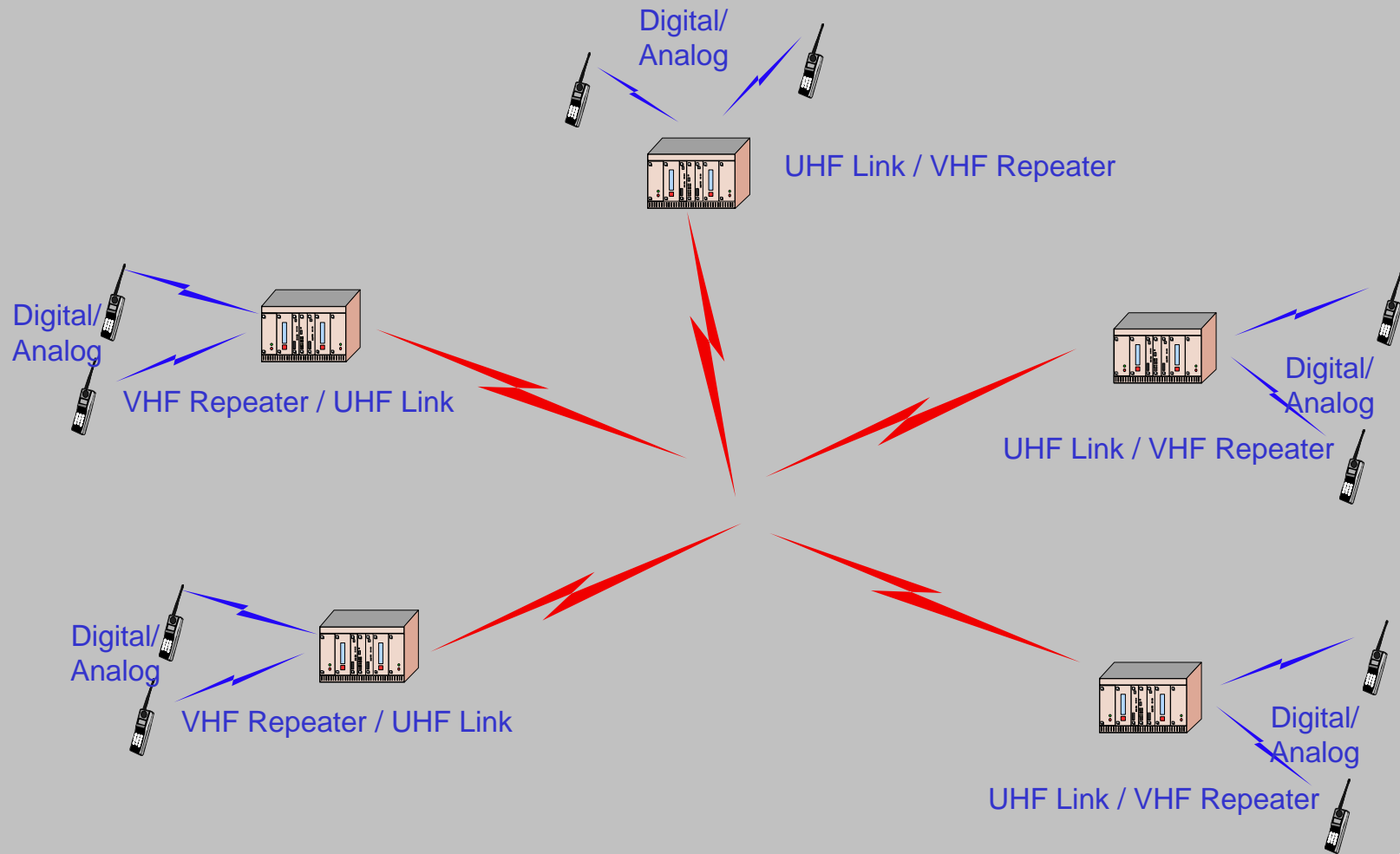
Deployment Scenario - 1



Deployment Scenario - 2



Deployment Scenario - 3



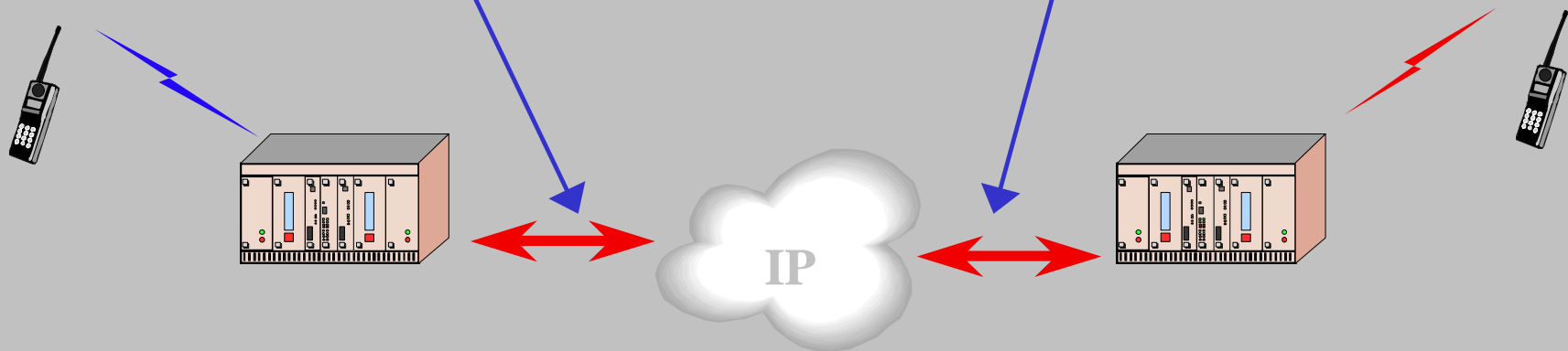
All VHF traffic is repeated at the local site and linked by UHF to the other 4 sites where it is linked to the VHF and retransmitted.



IP Link

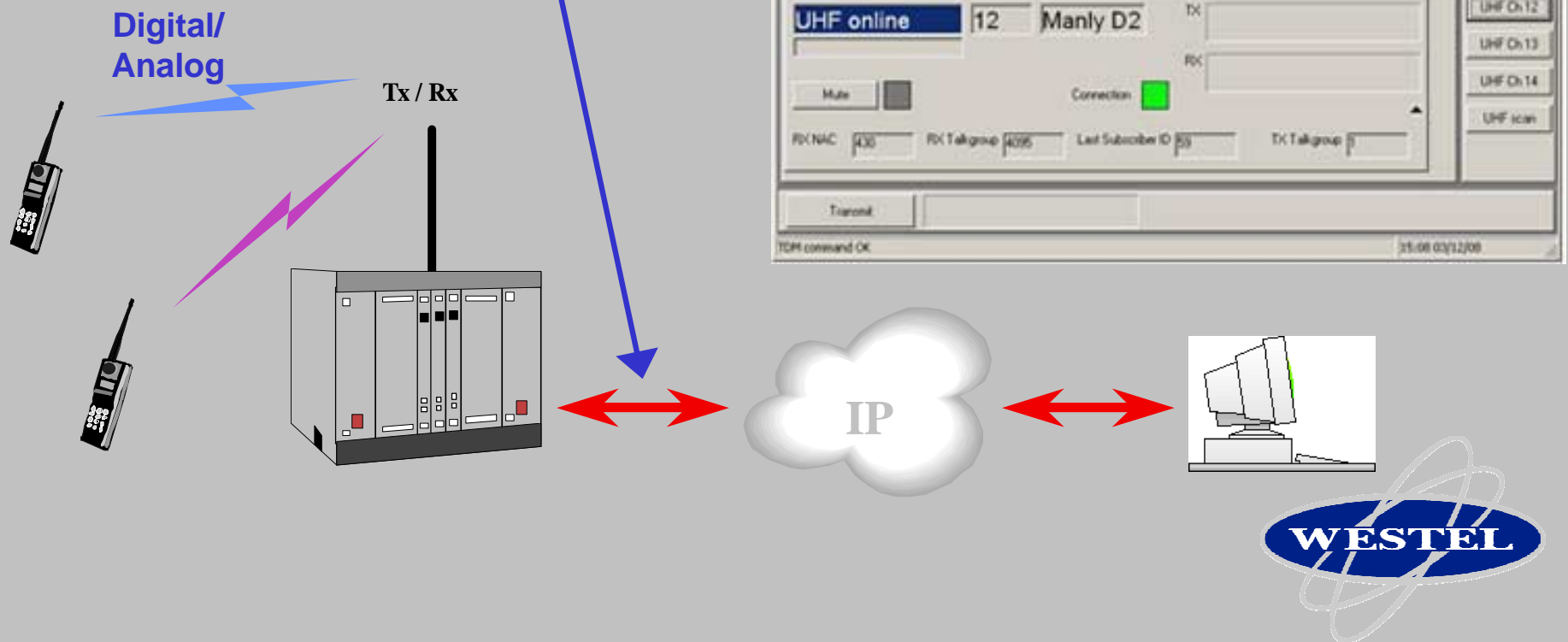
Analog traffic is
streamed as PCM
over RTP

Digital traffic is streamed
as P25 CAI (IMBE/DES)
over RTP



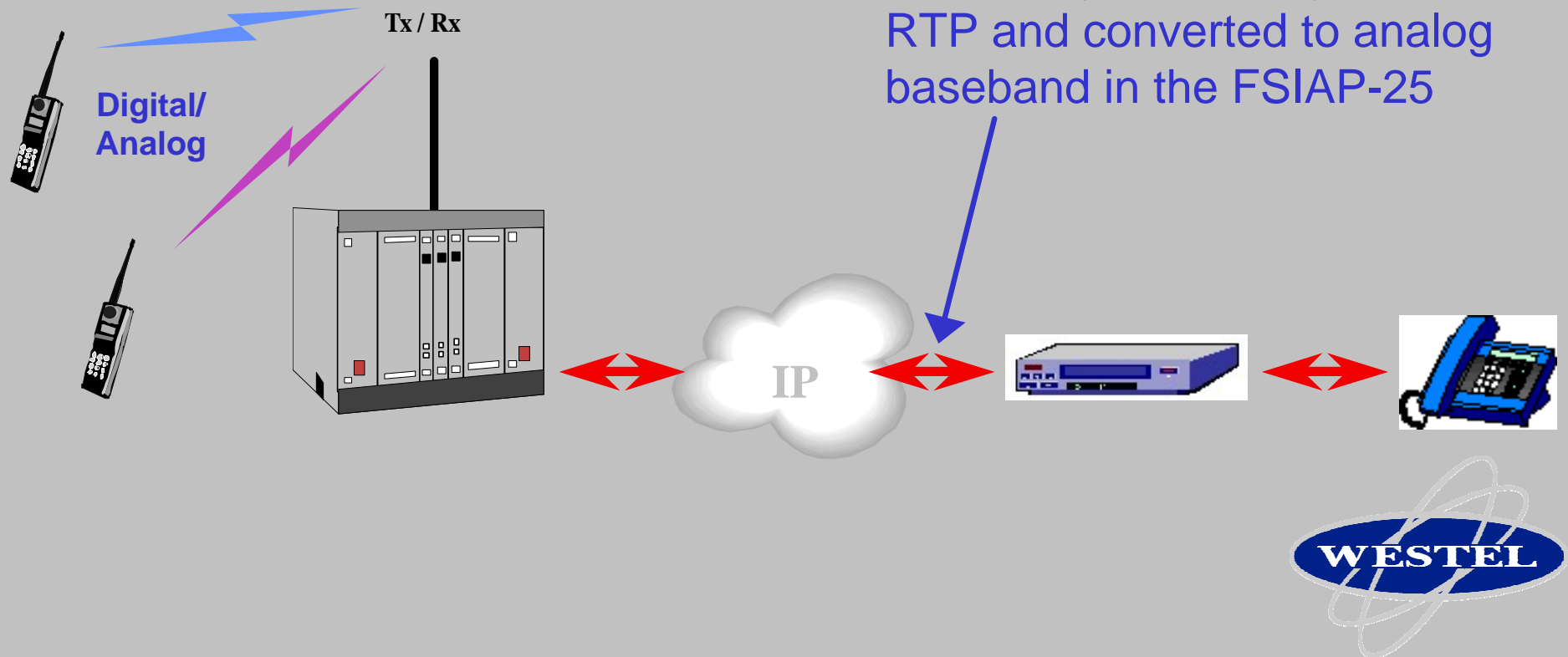
'PC Console'

Analog and digital traffic is streamed as PCM over RTP

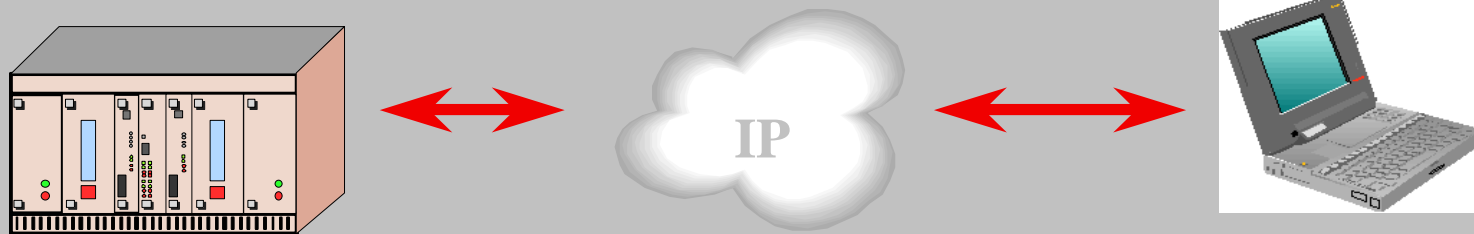


'FSIAP-25'

(Fixed Station Interface Access Point)



Web-based Diagnostics



DRB-25 DIGITAL BASESTATION

Not logged in

Host: DRB25

IP: 192.168.100.116

12:16:03 Thursday 11 March 2010

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Controller Module

Software Version: 4.3

Transceiver Module 1

Module Serial Number: L1D15003384

Software Versions	MPC:	-4.74
	DSP:	2.17
Current Channel	Number:	0
	Name:	Goose V
	Operating Mode:	Analog Repeater (CTCSS)

Transceiver Module 2

Module Serial Number: L1D15001295

Software Versions	MPC:	-4.74
	DSP:	2.17
Current Channel	Number:	1
	Name:	Goose U
	Operating Mode:	Analog Repeater (CTCSS)

[Westel Wireless Systems.](#)



DRB-25 DIGITAL BASESTATION

Not logged in

Host: DRB25

IP: 192.168.100.116

12:14:13 Thursday 11 March 2010

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Diagnostics and Monitoring

Transceiver Slot: 1

Slot 1: ☒ Slot 2: ☐

Channel Number: 0

Channel Name: "Goose V "

Operating Mode: Analog Repeater (CTCSS)

TX Parameters

TX Frequency (MHz): 155.490000

CxCSS: 156.7

NAC: 155

Talkgroup ID: 1

Station ID: 0

RX Parameters

RX Frequency (MHz): 155.070000

Last CxCSS: 0.0

Last NAC: 0

Last Talkgroup ID: 0

Last Subscriber ID: 0

Signal Strength: 78

BER: 0

Radio Status:

OK

PA Temperature:

NORMAL

PA Status:

OK

VSWR:

NORMAL



DRB-25 DIGITAL BASESTATION

Not logged in

Host: DRB25

IP: 192.168.100.116

12:12:16 Thursday 11 March 2010

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Configuration Settings

Hostname:	<input type="text" value="DRB25"/>
IP Address:	<input type="text" value="192.168.100.116"/>
Gateway:	<input type="text" value="192.168.100.102"/>
Netmask:	<input type="text" value="255.255.255.0"/>
Primary DNS Server:	<input type="text" value="192.168.100.102"/>
Secondary DNS Server:	<input type="text" value="192.168.100.1"/>
Network Time Protocol (NTP) Server:	<input type="text" value="ntp.syd.connect.com.au"/>
Use DHCP:	<input type="text" value="No"/>
Timezone:	<div><div>Custom Timezone (enter below)</div><div>Custom Timezone: <input type="text" value="UTC-11"/></div><div>Note that DST = Daylight Saving Time</div></div>
Control Options:	<input type="text" value="Tone Remote/PSTN"/>
IP Link (master) IP Address:	<input type="text" value="0.0.0.0"/>
IP Link Encoding:	<input type="text" value="IMBE"/>
Allow Telnet Login:	<input type="text" value="No"/>
Require Web Login:	<input type="text" value="No"/>
Require IP Console Login:	<input type="text" value="No"/>

Store New Configuration

Apply New Configuration



DRB-25 DIGITAL BASESTATION

Not logged in

Host: DRB25

IP: 192.168.100.116

12:16:55 Thursday 11 March 2010

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Test Signal Generation

Slot 1: ☒ Slot 2: ☐

Channel Number:

Channel Name: "Goose V "

Standard 1101 Hz Test Tone



DRB-25 DIGITAL BASESTATION		Not logged in
Host: DRB25	IP: 192.168.100.116	12:17:37 Thursday 11 March 2010

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Feature Licensing

License: D173FD21987A4D720D1C389DF	Remove <input type="checkbox"/>
Duration: Permanent	
Features enabled by this license:	
<ul style="list-style-type: none"> • VoIP connection to DRB-25 with PCM audio 	

License: EF092A4162809DC245F5FB885	Remove <input type="checkbox"/>
Duration: Permanent	
Features enabled by this license:	
<ul style="list-style-type: none"> • VoIP connection to DRB-25 with Project 25 audio 	

Add license:	<input type="text"/>	Add License
Controller Module Serial# : L1D33012345		

Remove selected licenses:	Remove Licenses
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Programming Software

- Easy to use - Windows[™] interface
- Password protection
- Settings can be saved for re-use
- PC based, no special equipment needed



Channel Setup

Channel Settings [X]

Channel Selection

Channel Name: Number:

Channel Type: ☒ Fixed ☐ Scan

Scan Channels

[Add] [Edit] [Delete]

[OK] [Cancel]

Fixed Channel

Mode: Control:

Signal Type: Bandwidth:

Squelch System:

Squelch Group: ☐ Group Enable

☒ Link Radio ☐ Half Duplex

☐ Enable Front Panel PTT

Receive Configuration

Freq (MHz): CxCSS:

NAC: ☐ CDCSS Invert

Transmit Configuration

Freq (MHz): CxCSS:

NAC: ☐ CDCSS Invert

Autosense Tx

☒ Analog ☐ Digital

☐ Link Radio "Tx AS Rx"

Timers (sec)

PTT Tail

PTT Delay

PTT Timeout

Courtesy Tone

Tail (sec)

Tone

☒ Reverse Burst

Encryption

Algorithm ID: Key ID:

Other Settings

Talkgroup ID

Unit ID

Power (W)

Squelch Level



Squelch Group settings

Squelch Group Properties [X]

Group Name
SQUELCH GROUP 1

Squelch Group

Add Squelch

NAC
<< 0x001 >>

CTCSS
<< 67.0 >>

CDCSS
<< 023 >>

Delete

OK

Cancel



Encryption and General settings

Encryption Settings [X]

Active Keys Sorted by KID

KID: 0x014

[Add] [Delete]

[Close]

Add Key [X]

Key

0	52	91	49	f1	f1	ba	e9	ea
---	----	----	----	----	----	----	----	----

[Clear Key] [Generate Random Key]

Key ID

0	0x17
---	------

[OK] [Cancel]

Radio Wide Settings [X]

Front Panel

☐ Audio

[Audio Level]

Default Channel

[000] [Channel Number]

☒ Use Box ID (see User Manual)

Rear Serial Output

☒ Diagnostic Data

☐ P25 GPS Data (If Licensed)

[Cancel] [OK]



Getting on the air...

- Installation Manual covers:
 - module installation (plug & play)
 - programming
 - testing and commissioning
 - fault finding and trouble shooting
 - module repair and replacement



Fault Finding

- Transceivers output over-the-air diagnostics for system trouble shooting
- Modules have LEDs and Error Codes to indicate nature of fault
- 1st level repair is module replacement by agency
- Module repair by Westel

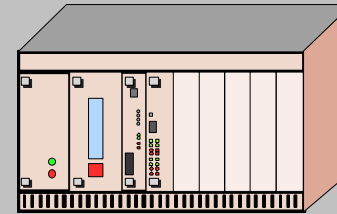


Upgrade paths

- Single to dual channel
- Dual to multi channel
- Complete re-use modules

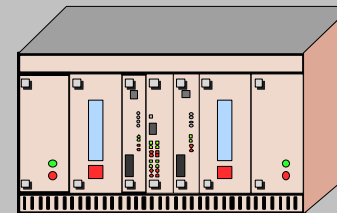
Single channel

- Repeater/Basestation
- Analog/Digital



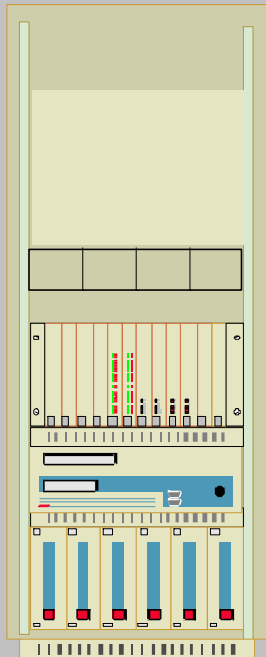
Dual channel

- Repeater/Basestation
- Cross-Band
- Cross-Mode



3 and 6 Radio Shelf

- Conventional/Trunking
- Cross-Band
- Cross-Mode



In summary...

- Designed for ease of setup, program & use
- Designed as a digital radio with Project 25 compliance with an analogue capability
- Modular configuration for maximum flexibility and upgrade capability
- Straightforward operation & trouble-shooting

