

ICD Traces from Liverpool

Heart Rhythm Congress
October 2011

Dr Derick Todd



No. 1
in England for
Overall Patient Care

ICD Traces with an EP Perspective

- $A > V$
- $V > A$
- 1 to 1 A / V
- Onset of tachycardia
- Manipulation of tachycardia (ATP)
- Body of tachycardia (which chamber leads)
- Termination of tachycardia

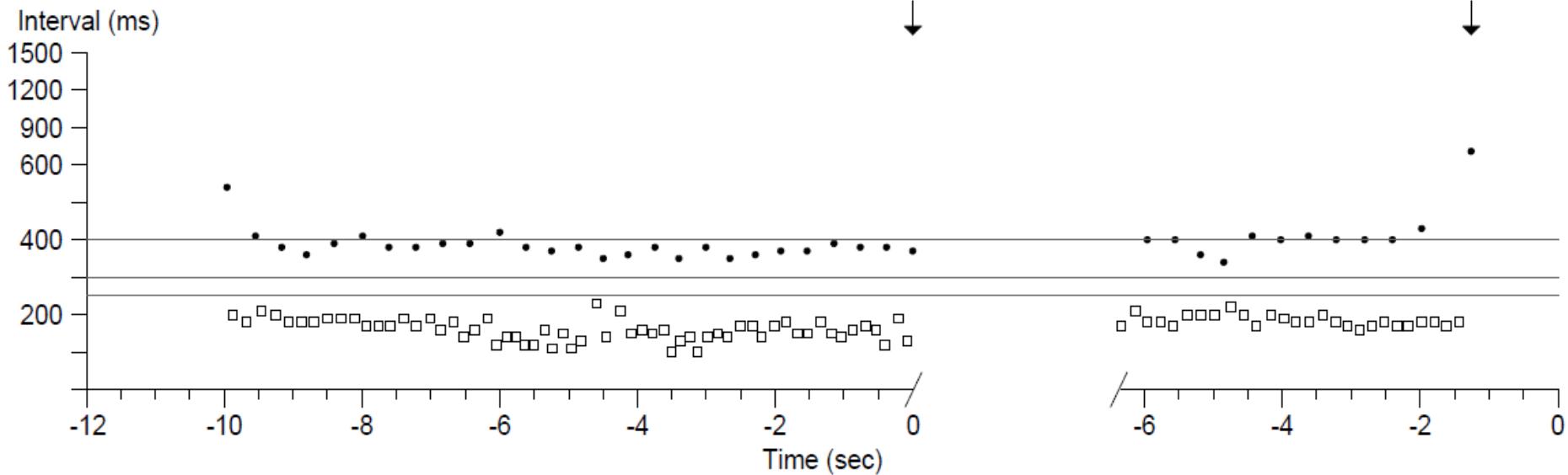


If she hasn't...she will soon

A > V

| Type | ATP Seq | Shocks | Success | ID# | Date | Time hh:mm | Duration hh:mm:ss | Avg bpm A/V | Max bpm A/V | Activity at Onset |
|--------|---------|--------|---------|-----|-------------|---------------|----------------------|----------------|----------------|----------------------|
| SVT-AF | | | | 339 | 16-Oct-2007 | 09:10 | :11 | 400/158 | 545/162 | Rest |

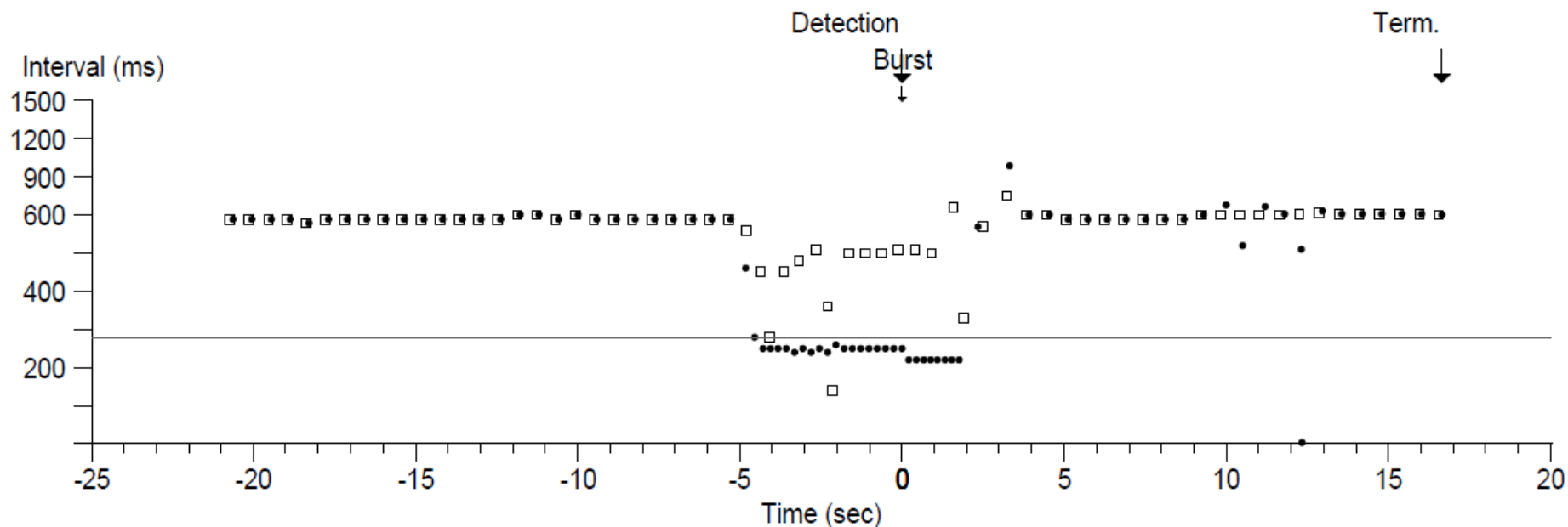
• V-V □ A-A VF = 300 ms FVT = 250 ms VT = 400 ms
 VT/VF Detection Withheld



V > A

| Type | ATP Seq | Shocks | Success | ID# | Date | Time hh:mm | Duration hh:mm:ss | Avg bpm A/V | Max bpm A/V | Activity at Onset |
|------|---------|--------|---------|-----|-------------|---------------|----------------------|----------------|----------------|----------------------|
| VF | 1 | | Yes | 64 | 23-Jul-2011 | 09:56 | :16 | 120/240 | ---/240 | Active |

• V-V □ A-A VF = 280 ms



V > A EGM

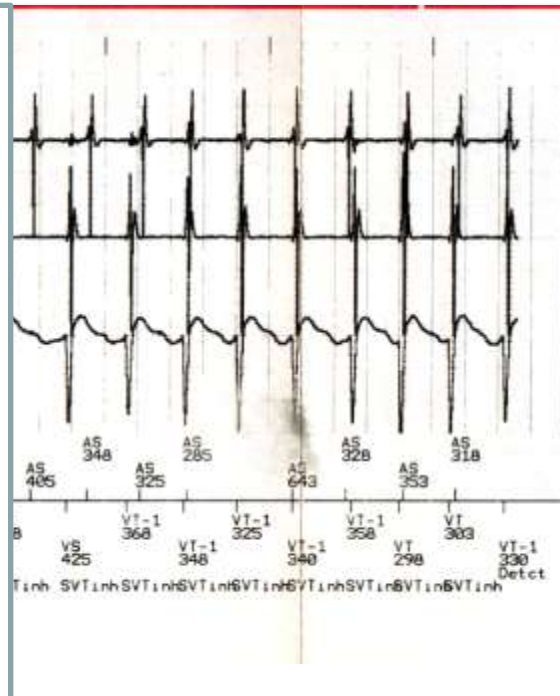


1 to 1 A / V

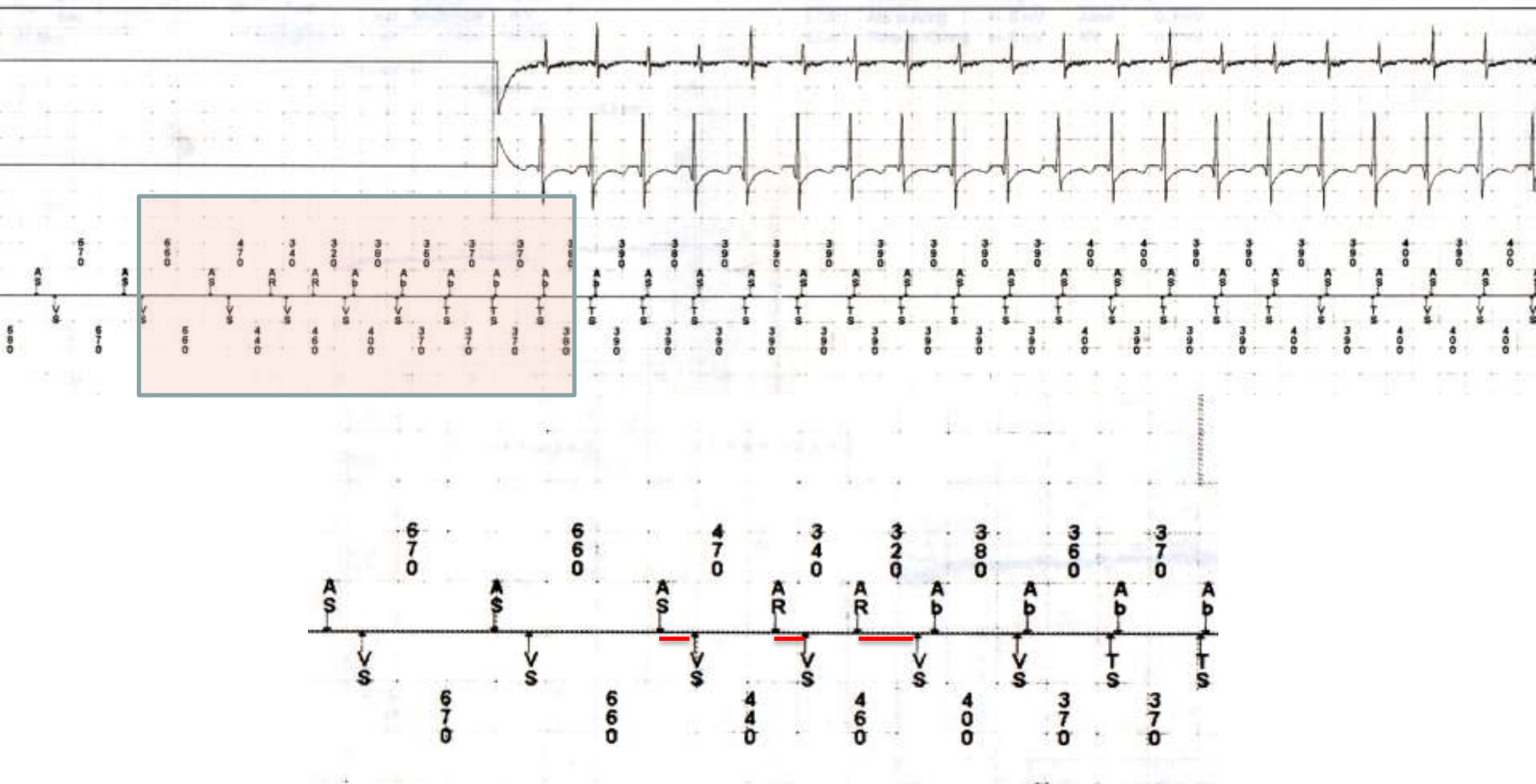
Most difficult to figure out

Modern devices do well

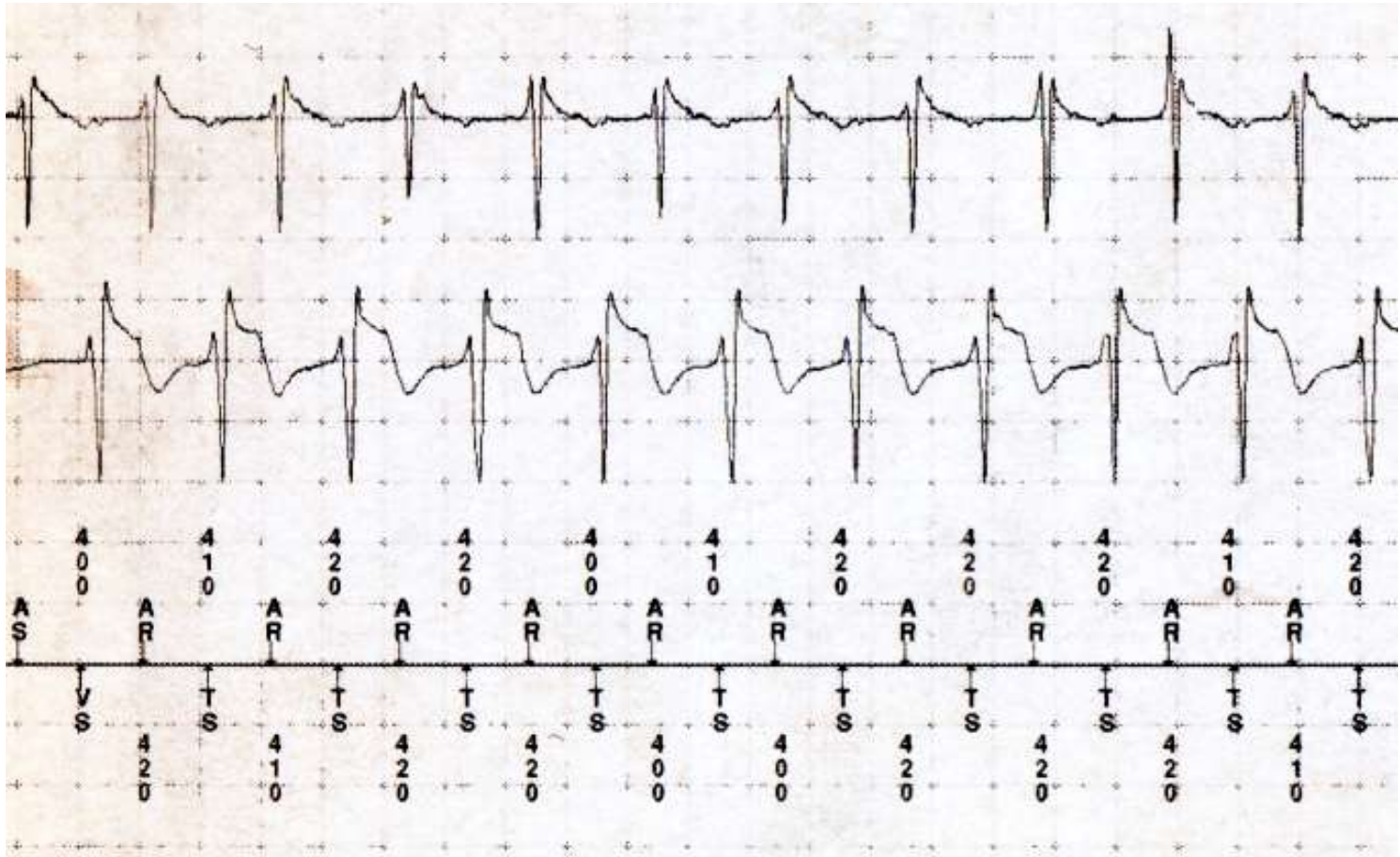
Still nice to understand what has happened



Onset



Body of Tachycardia



1 to 1 A / V

Manipulation of Tachycardia



VAAV – diagnosis atrial tachycardia

1 to 1 A / V

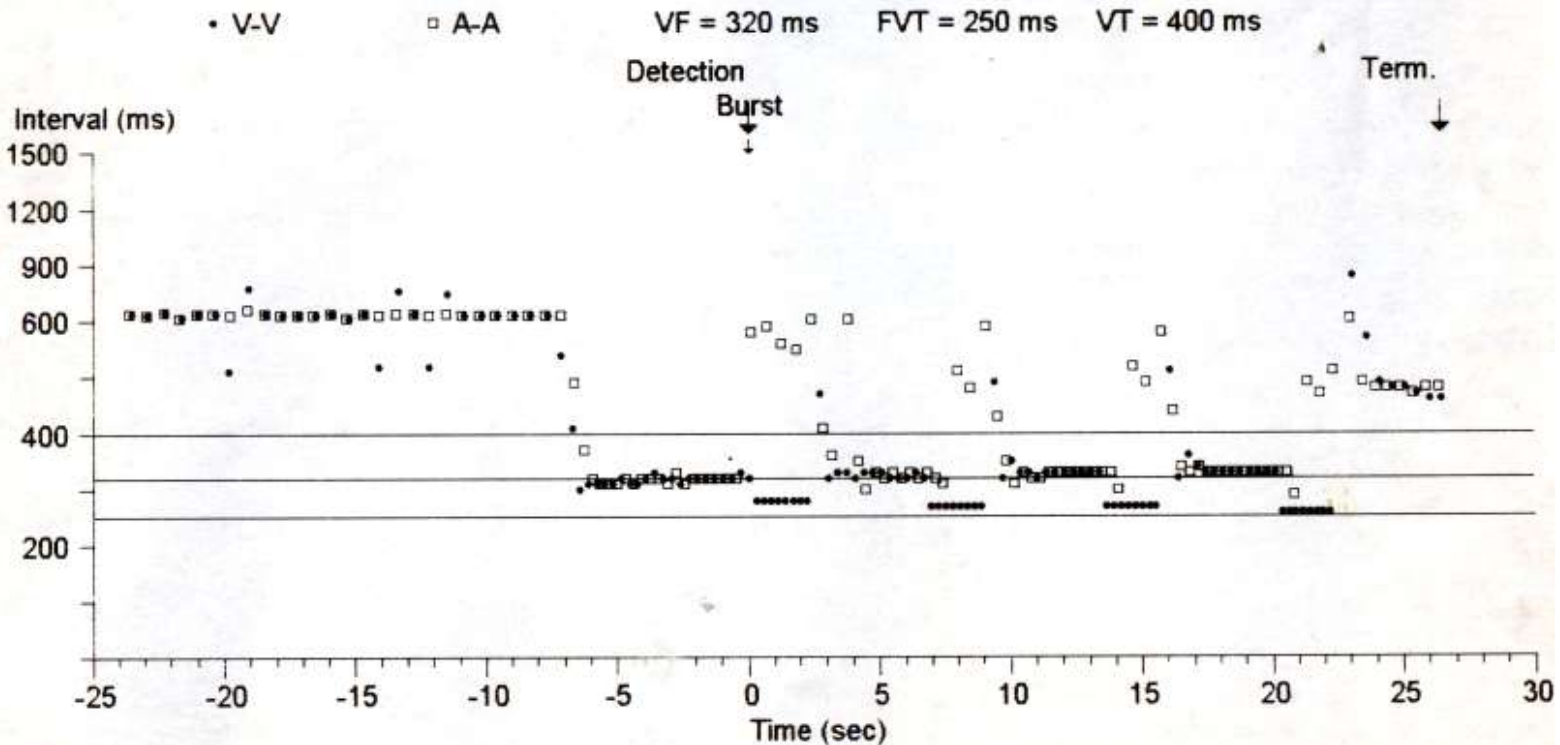
Device: **Concerto II CRT-D D294TRK**
Serial Number: **PZU600488S**

9995 Software Version 7.0
Copyright © Medtronic, Inc. 2006

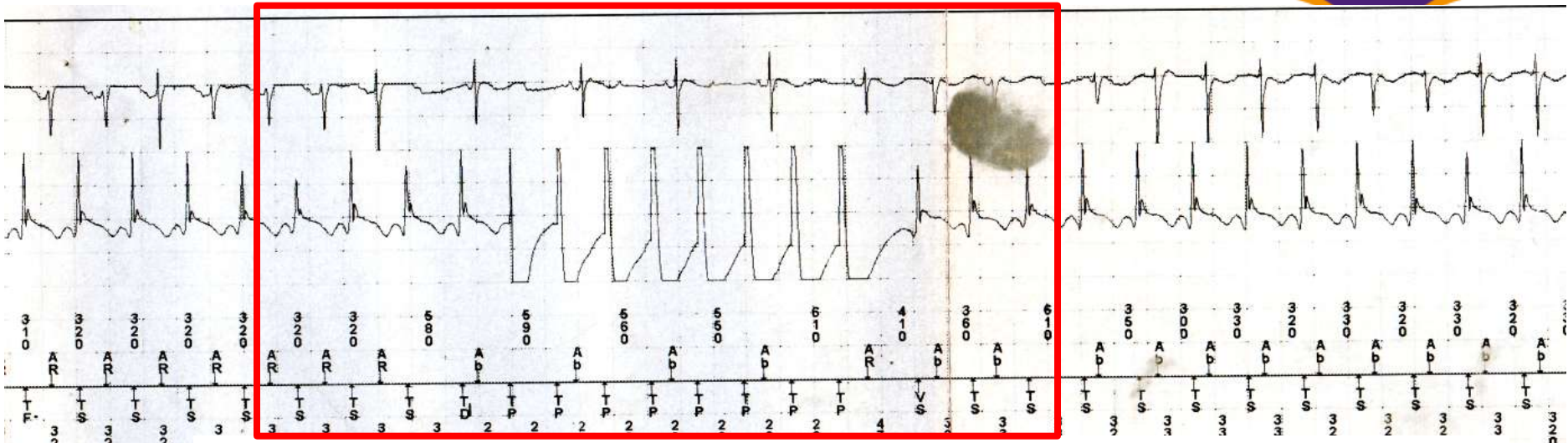
Treated VT/VF Episode #2

Page 1

| Type | ATP Seq | Shocks | Success | ID# | Date | Time hh:mm | Duration hh:mm:ss | Avg bpm A/V |
|------|---------|--------|---------|-----|-------------|---------------|----------------------|----------------|
| VT | 4 | | Yes | 2 | 27-Oct-2009 | 11:52 | :29 | 188/188 |

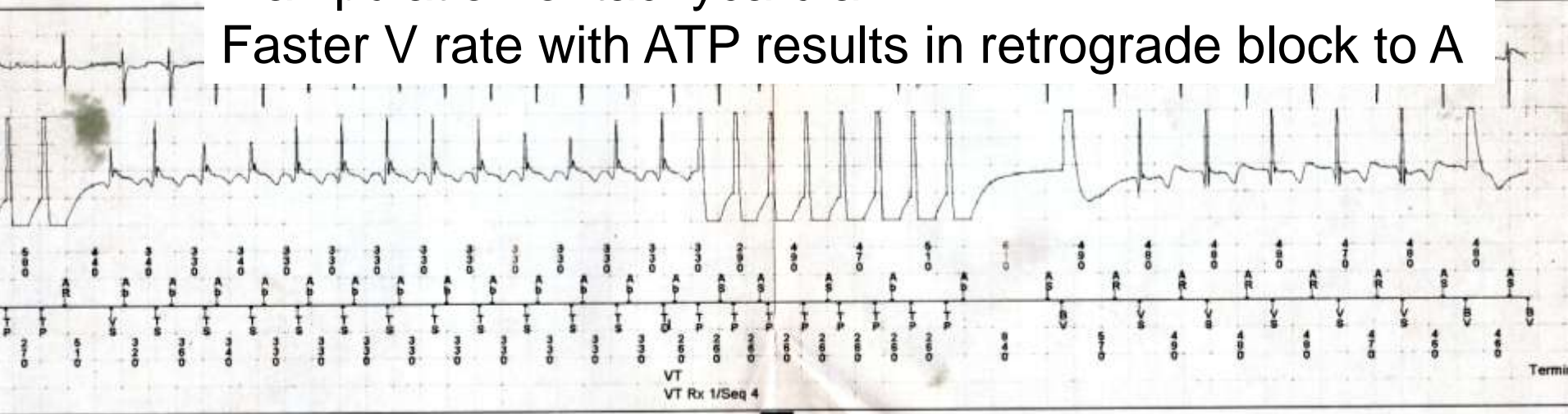


1 to 1 A / V



Manipulation of tachycardia

Faster V rate with ATP results in retrograde block to A



AV nodal function

Manipulation of tachycardia

Faster V rate with ATP results in retrograde block to A

Normal AV nodal function will have:

1. An earlier impulse is conducted more slowly
2. When impulses arrive too quickly some element of block
e.g 2 to 1 / 3 to 1 / Wenkebach
3. Conducts anterograde (A to V) in all and retrograde (V to A) in about 50%

Understanding the AV Node

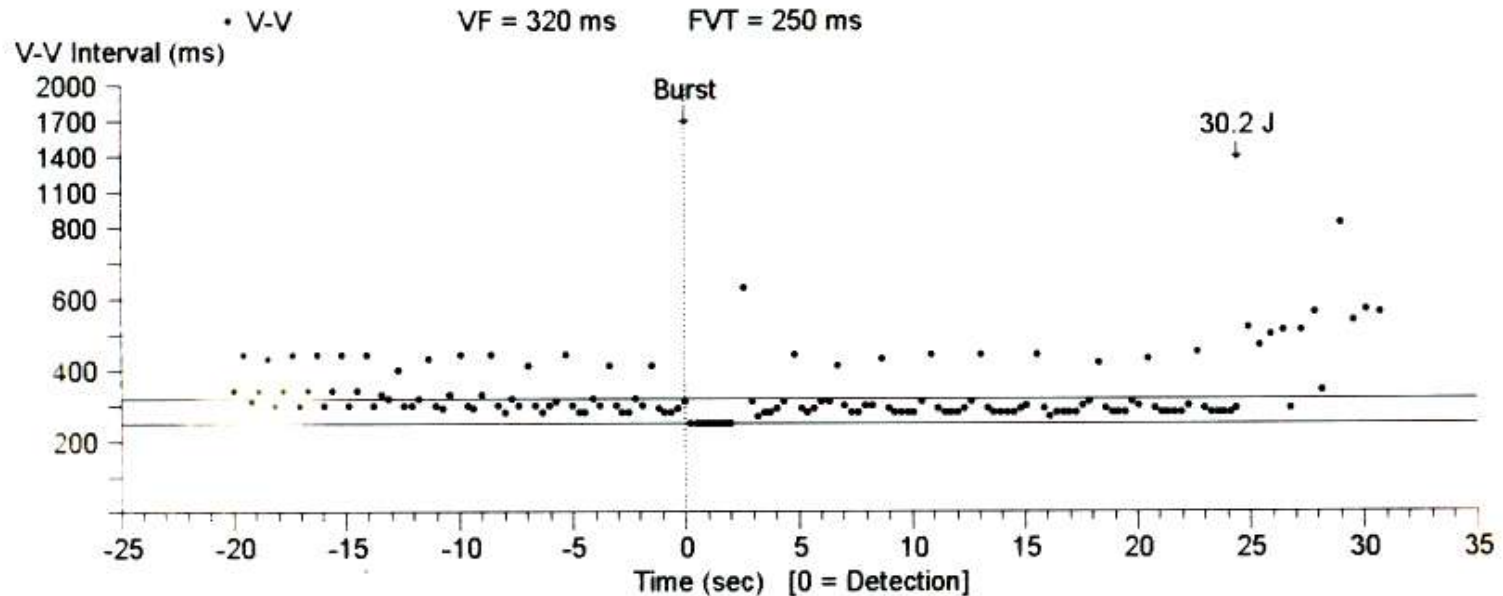
ICD Model: Marquis VR 7230
Serial Number: PKD608662S

9967 Software Version 7.0
Copyright Medtronic, Inc. 2002

VT/VF Episode #6 Report

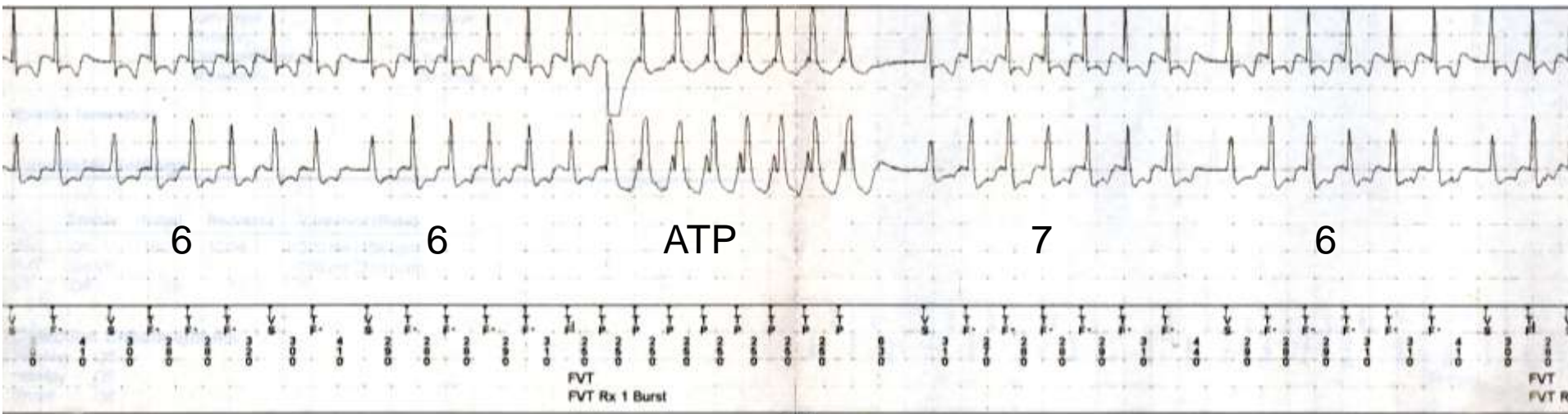
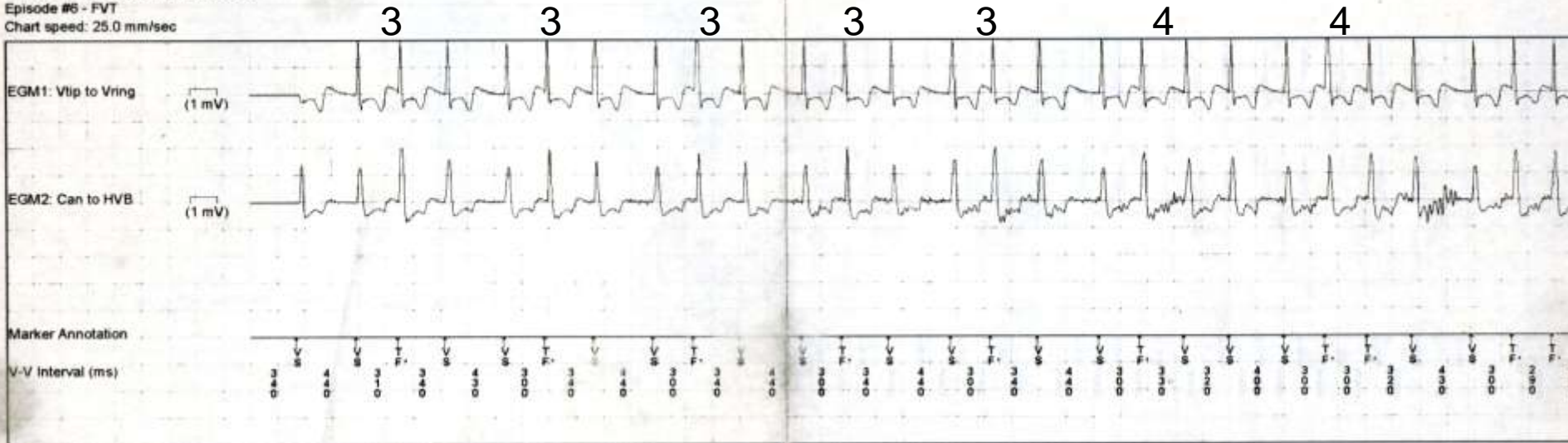
Page 1

| D# | Date/Time | Type | V. Cycle | Last Rx | Success | Duration |
|----|-----------------|------|----------|----------|---------|----------|
| 5 | Aug 03 14:40:07 | FVT | 290 ms | FVT Rx 2 | Yes | 50 sec |

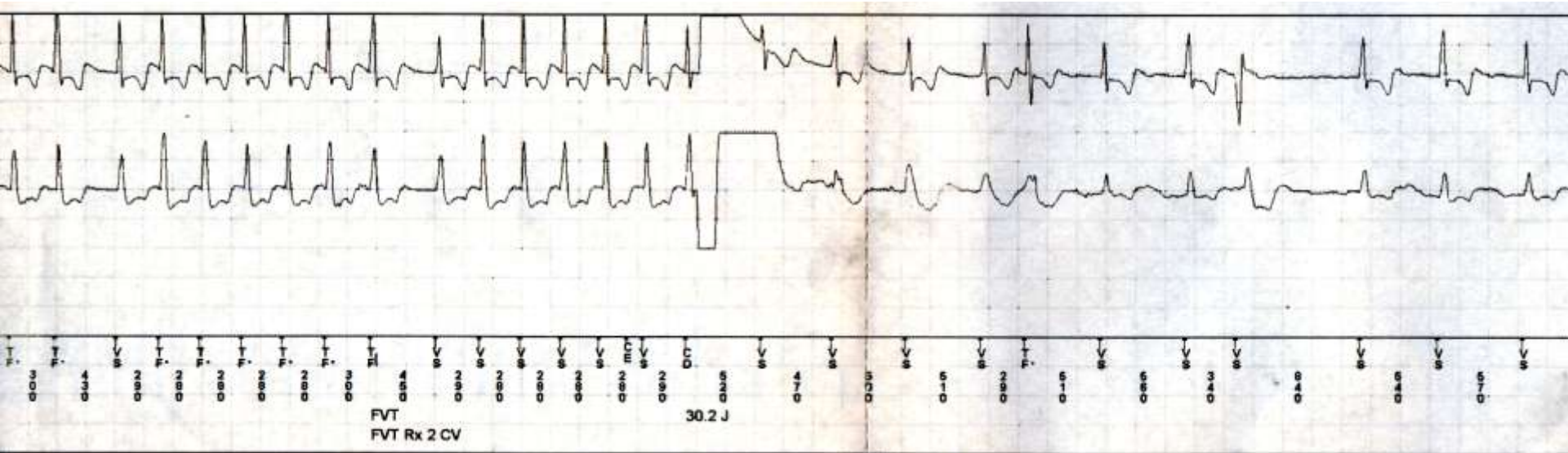


ICD Model: Marquis VR 7230
Serial Number: PKD608662S
VT/VF Episode #6 Report

Episode #6 - FVT
Chart speed: 25.0 mm/sec



Increased adrenergic tone enhances AV nodal conduction



DC shock cardioverts flutter so heart rate drops

Understanding the AV Node

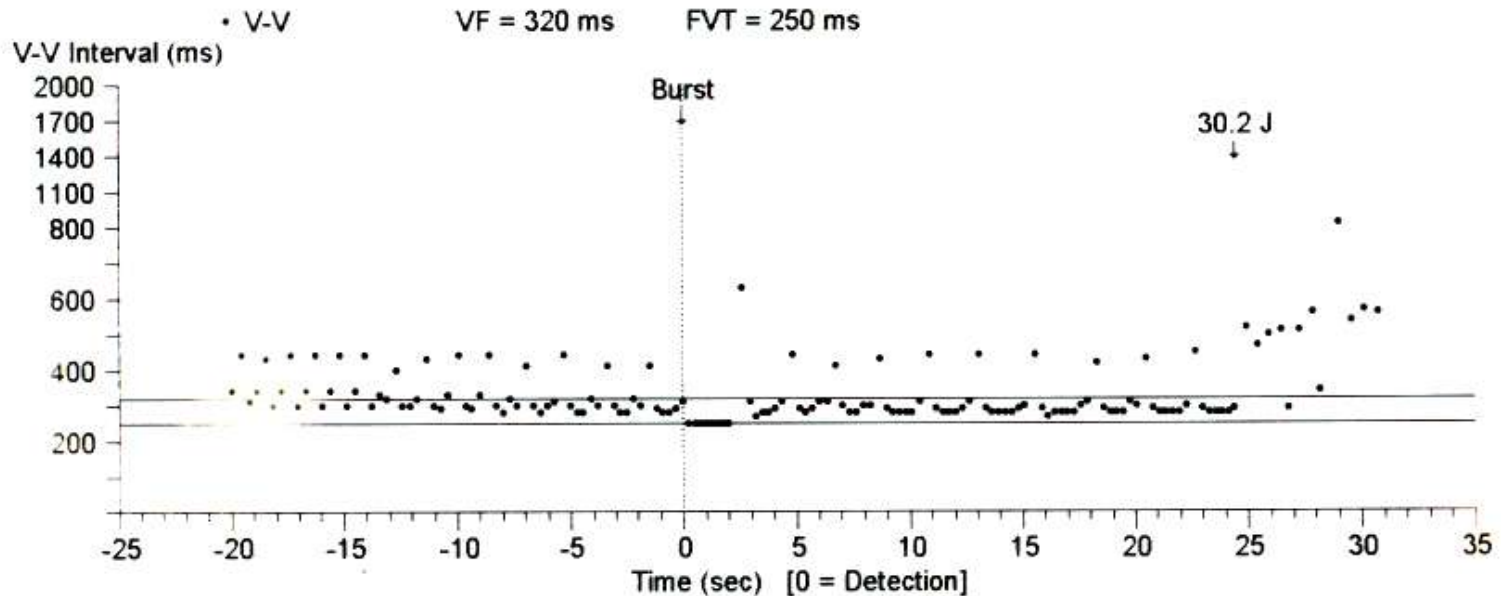
ICD Model: Marquis VR 7230
Serial Number: PKD608662S

9967 Software Version 7.0
Copyright Medtronic, Inc. 2002

VT/VF Episode #6 Report

Page 1

| D# | Date/Time | Type | V. Cycle | Last Rx | Success | Duration |
|----|-----------------|------|----------|----------|---------|----------|
| 5 | Aug 03 14:40:07 | FVT | 290 ms | FVT Rx 2 | Yes | 50 sec |



AV nodal function – dual tach

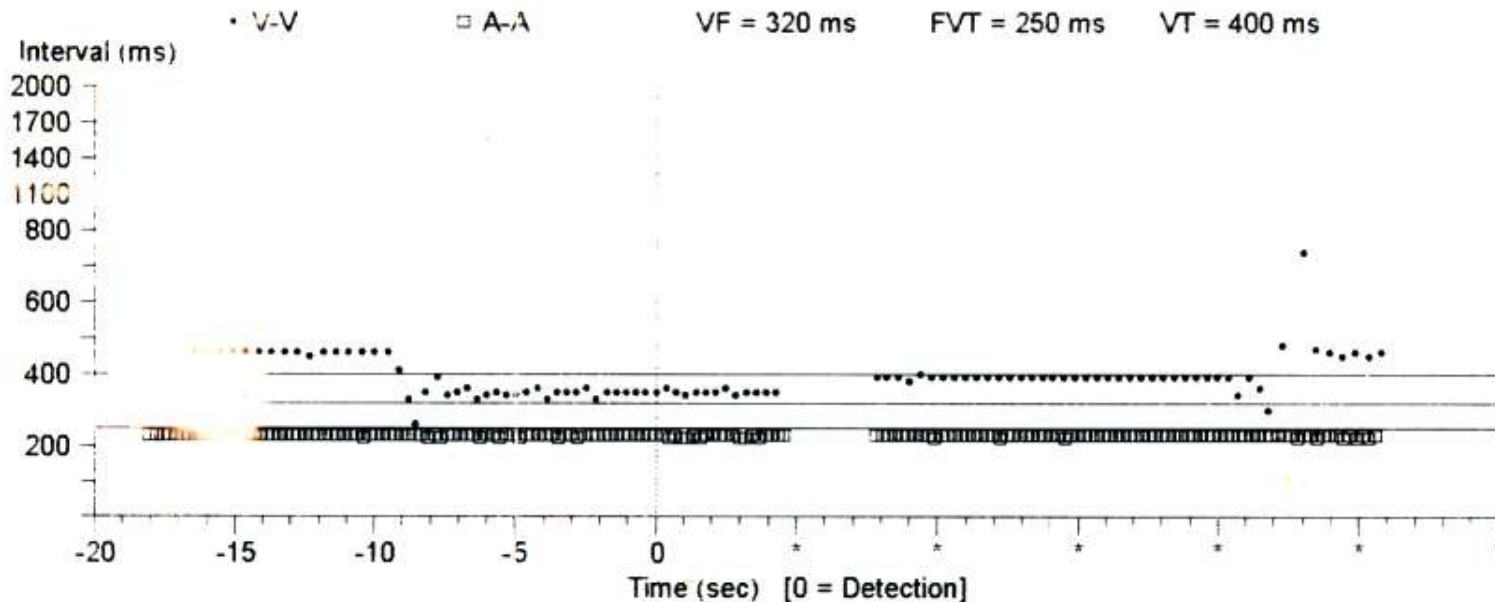
ICD Model: InSync[®] 7298
 Serial Number: PRK 450S

Software Version 7.0
 Copyright Medtronic, Inc. 2004

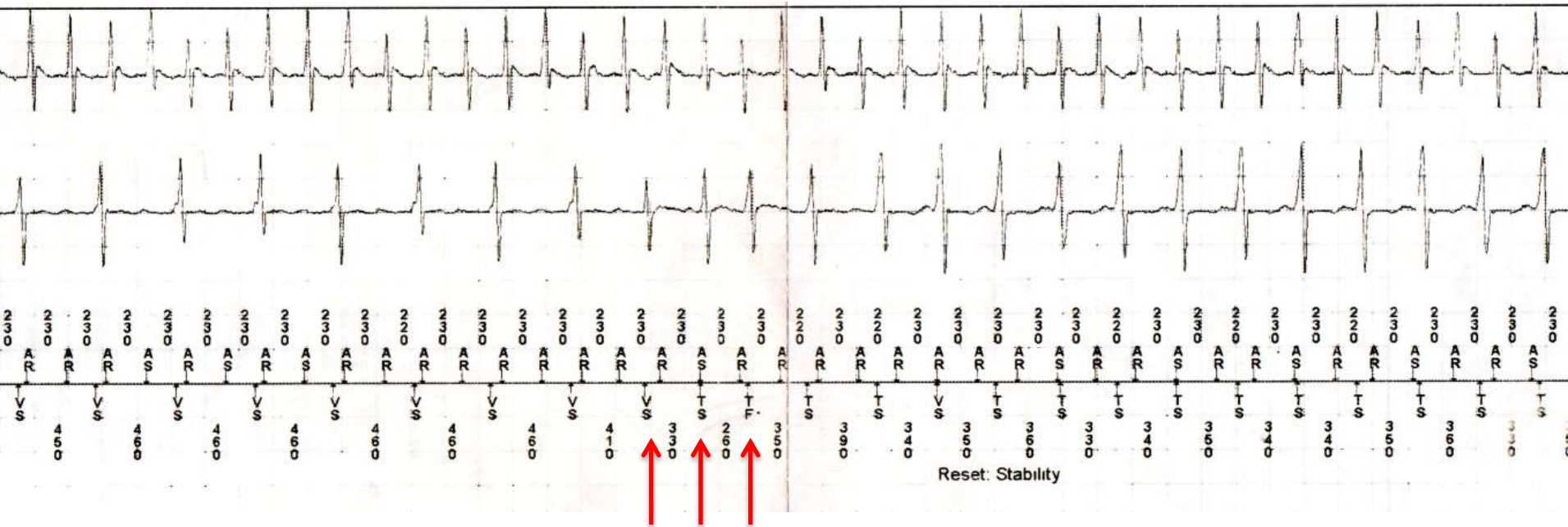
VT/VF Episode #6 Report

Page 1

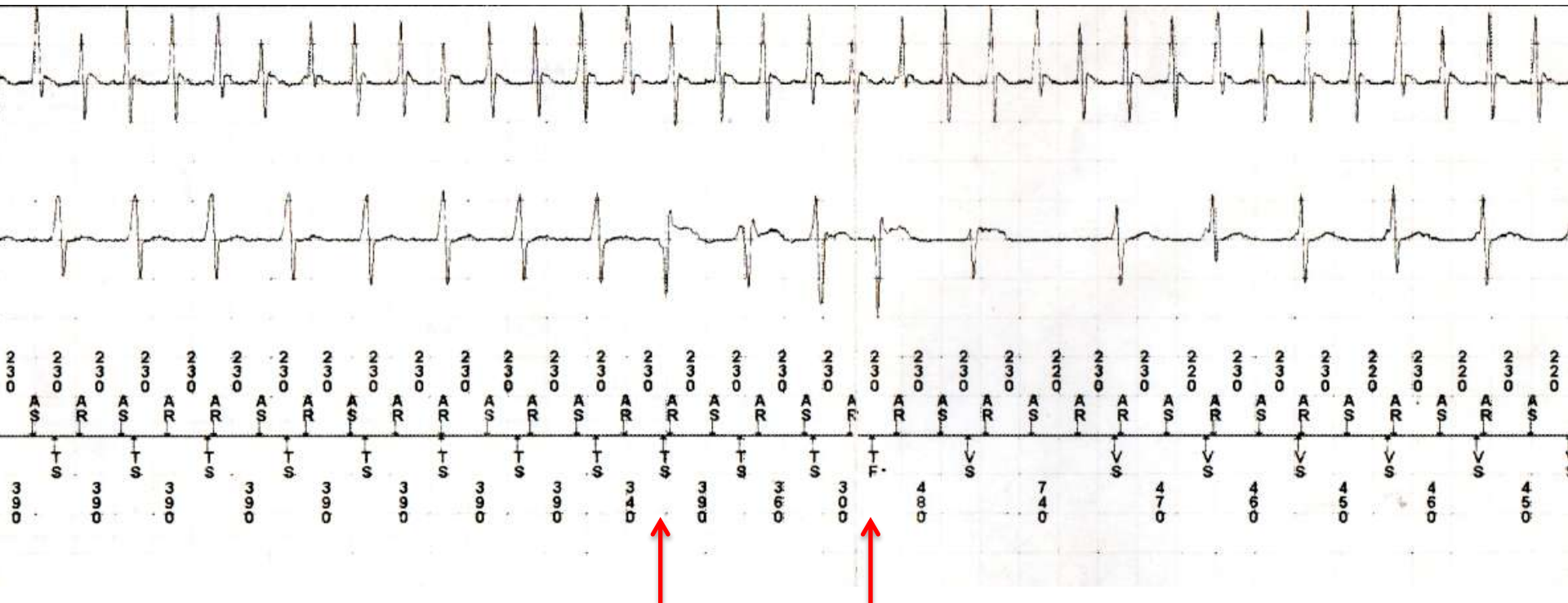
| ID# | Date/Time | Type | V. Cycle | Last Rx | Success | Duration |
|-----|-----------------|------|----------|-------------|---------|----------|
| 6 | May 06 08:30:12 | VT+ | 320 ms | (Monitored) | | 53 min |



AV nodal function – dual tach



AV nodal function – dual tach



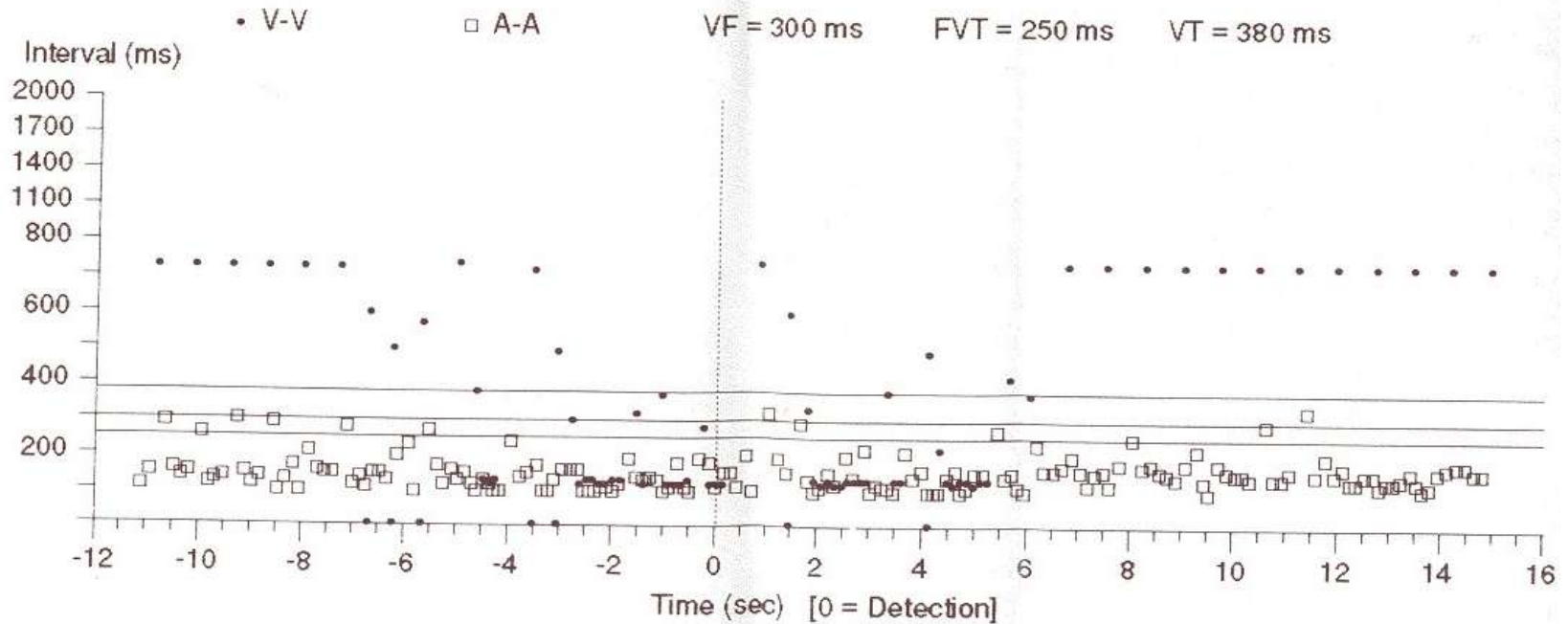
ICD Model: InSync Sentry 7298
 Serial Number:

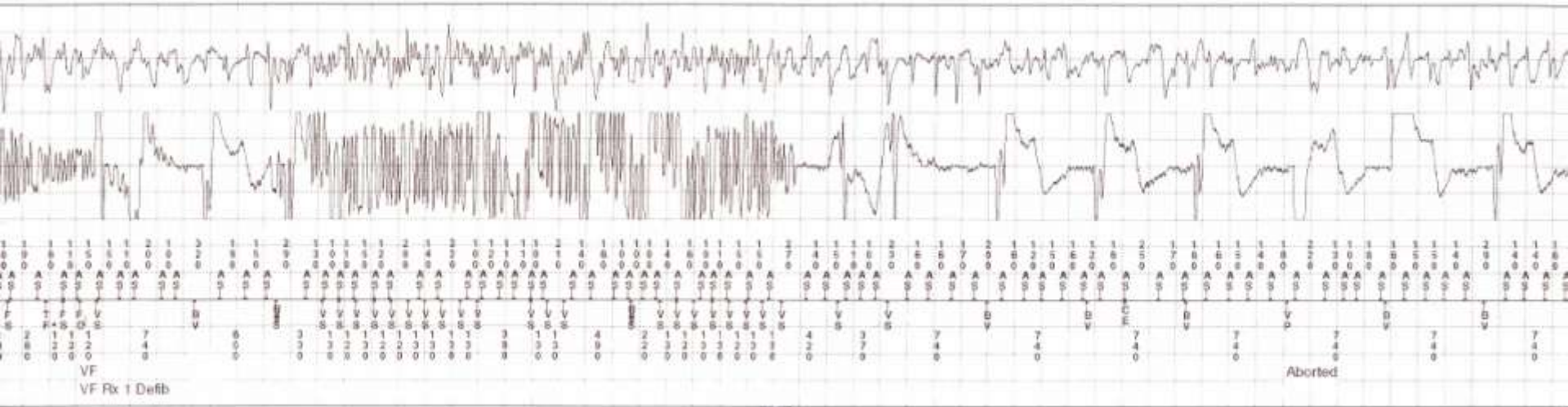
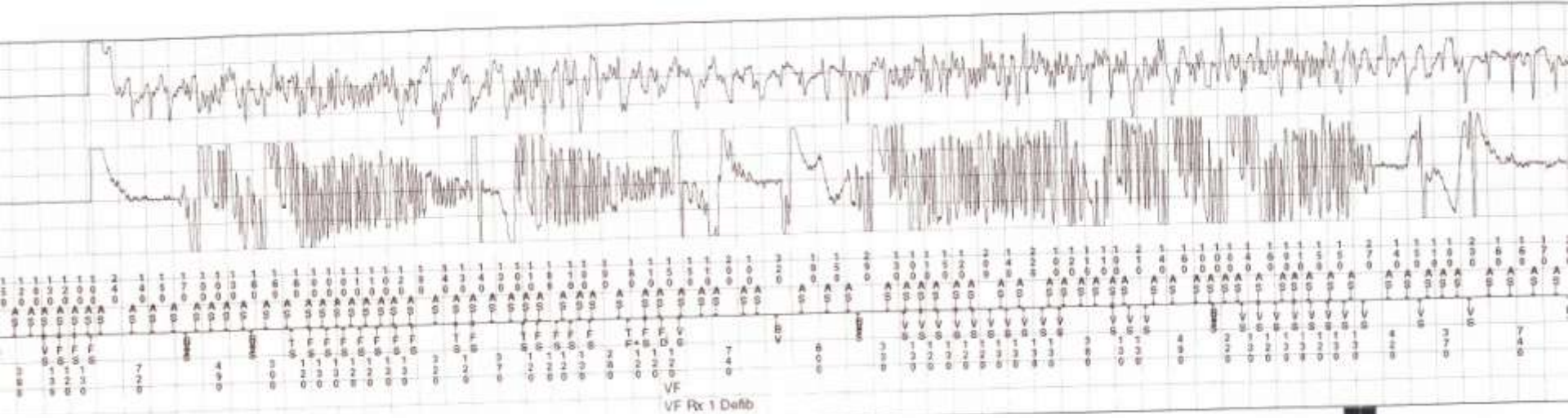
Sep 11, 2007 12:49:10
 9998 Software Version 2.0
 Copyright Medtronic, Inc. 2004

VT/VF Episode #1 Report

Page 1

| ID# | Date/Time | Type | V. Cycle | Last Rx | Success | Duration |
|-----|-----------------|------|----------|-------------------|---------|----------|
| 1 | Aug 23 14:04:43 | VF | 160 ms | (No Rx Delivered) | | 14 sec |



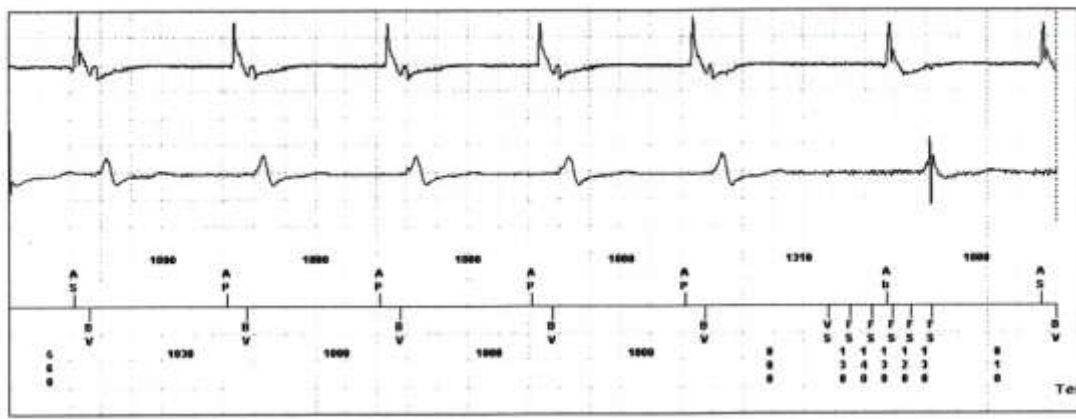


Noise



Non-sustained VT Episode #14

Device: Concerto™ C174AWK
 Serial Number: PVU614494S Date of Interrogation: 01-Feb-2011 10:55:31
 ID: 546510 Episode #14 Chart speed: 25.0 mm/sec



ICD Success?

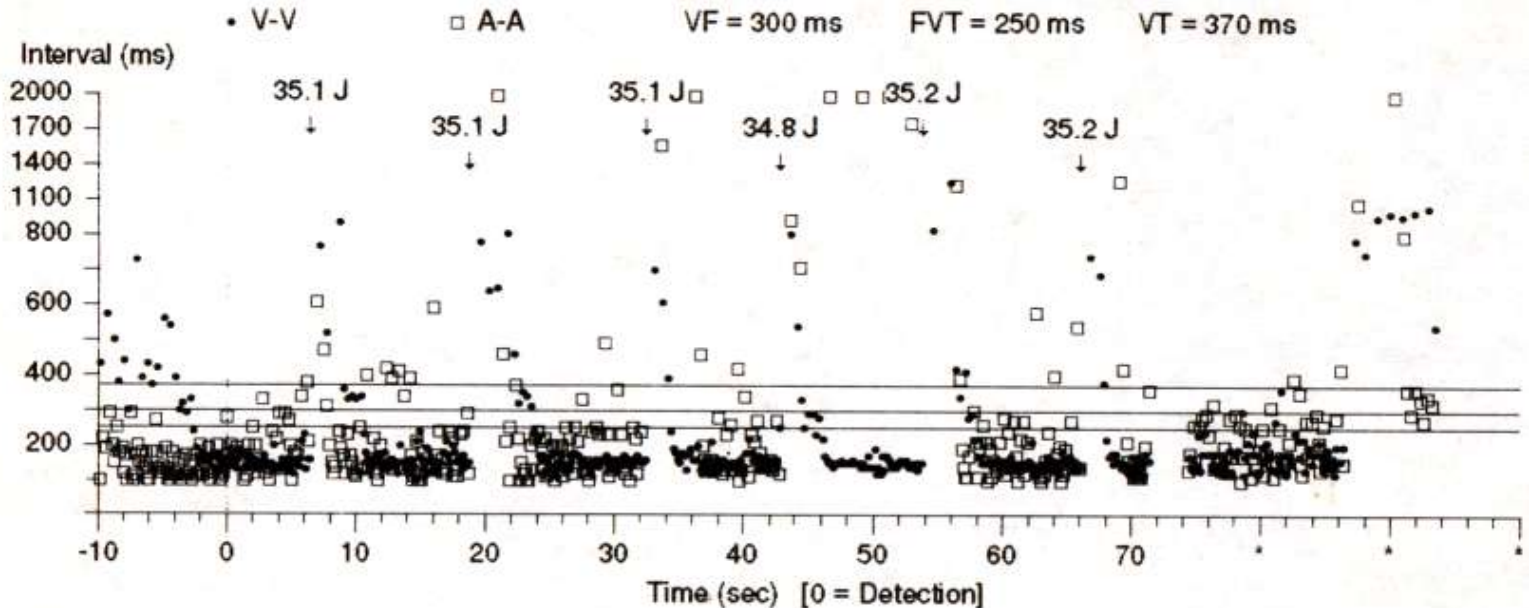
ICD Model: Maximo DR 7278
 Serial Number: PRM604896S

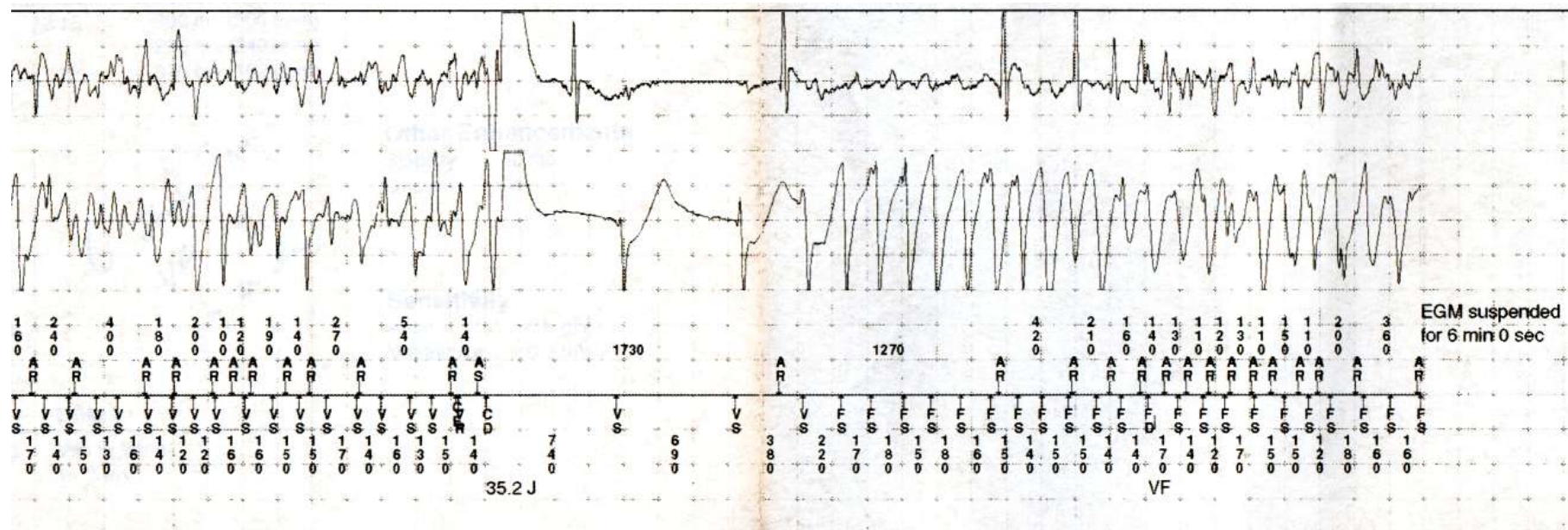
9978 Software Version 1.0
 Copyright Medtronic, Inc. 2003

VT/VF Episode #6 Report

Page 1

| ID# | Date/Time | Type | V. Cycle | Last Rx | Success | Duration |
|-----|-----------------|------|----------|---------|---------|----------|
| 6 | May 01 08:12:05 | VF | 140 ms | VF Rx 6 | No | 7.3 min |





ICD Traces

- Onset of tachycardia
 - does it start with early A's or early V's
- Manipulation of tachycardia
 - what is pattern during and after ATP
- Body of tachycardia (which chamber leads)
 - look for variations in cycle length
- Termination of tachycardia
 - does pattern change in one chamber first

