

UTMB 2005

Mead Ed
COMPOSITION

18 Jan, '05

100 sheets • 200 pages
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5 squares per inch

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Lesson 4 Q1 S_1 and S_2 are the usual sounds heard in this area but there is a 'mid' systolic click consistent $\hat{=}$ a mitral valve prolapse and partial failure of the valve ^{which produces some degree of} retrograde flow. In this case the flow produces a typical high to low pressure murmur which begins $\hat{=}$ the click and continues to at constant amplitude to S_2 . (Lessons 3 + 4)

Q2 S_1 has an unusual 'zig' sound which is followed by a relatively soft low pitched S_2 . Most of diastole is occupied by a rumbling crescendo-decrescendo murmur which peaks in ^{only low frequencies are transmitted by a relaxed ventricle in} first third of the interval. ^{This is a secondary murmur} produced by excess filling flow from a shunt or retrograde flow which may or may not produce a primary murmur in another area. Remember that all diastolic murmurs indicate pathology. (Lesson 4)

Q3 Both S_1 + S_2 are buried in a ^{loud, coarse} pan systolic constant amplitude murmur. A distinct additional sound follows and may ^{be a split S_2 produced by a} result from difference in emptying time of the ventricles. ~~It is unlikely to~~ It is less likely to be an abnormal valve opening, an opening snap. ^{the} primary murmur ^{was} best heard in the mitral area.

10 Jan '05 Comments, Contd.

2

hence was mitral regurgitation

A faint diastolic decrescendo murmur is present. From examination of the phono, it begins $\bar{c}$ the end of the primary murmur & S_2 and continues through the extra sound, and reaches extinction near the last third of diastole. This was not included ⁱⁿ the questions and answers on the possibly faulty assumption that few students at this level would pick it up. It may be a filling flow murmur.

4) ~~Time this one carefully with~~ A loud S_1 , probably enhanced by the murmur, is followed by an S_2 almost buried in the biphasic diastolic murmur. The first ^{decrescendo} portion of the murmur is ^{passive} ~~initial~~ atrial flow through a stenotic valve while the second ^{contraction of} ~~over~~ rapid crescendo is produced by enhanced flow from a hypertrophic atrium. An opening snap is often present but depends on valve flexibility which may be absent here. This is a severely stenotic valve, but if you can remember this sound profile, advanced mitral stenosis will be simple for you to recognize. There is a faint biphasic systolic sound assumed to be recording artefact.

10 Jan Comment.

3

5] ~~You should be aware that~~ $S_1 + S_2$ are the usual normal heart sounds heard in this area but there is an extra heart sound, an S_3 . There is also an early systolic ejection murmur. The combination of ~~this~~ ^{can} this murmur and S_3 both of which ^{can} indicate an ~~order~~ increased flow implies ~~means~~ that the murmur and S_3 are likely to be innocent or physiologic.

11 Jan

6] (See photo before completing)
Q.7 S_1 and S_2 are unremarkable for this area. A prominent diastolic ~~and~~ decrescendo murmur begins a very short time after S_2 and stops well before the end of systole as the ^{increasing} back pressure in the volume limited ventricle reduced or even stopped the regurgitant flow from the aortic valve. This is a classic picture of severe aortic regurgitation. (L. 4)

26

Lesson 4 Q8 Both S_1 & S_2 are buried in the loud harsh pan systolic murmur which is ~~to~~ relatively constant through the interval. This profile is consistent $\bar{c}$ regurgitation from a ~~pulmonic~~ ^{tri} valve or a ventricular septal defect which may also be best heard in the ~~pulmonic~~ ^{tri} area. A constant rise may be seen & heard in diastole.

Q9 S_1 & S_2 may be heard through this continuous murmur & with S_1 louder - This is a patent ductus arteriosus, an aorta to pulmonary artery shunt with a pressure difference and flow throughout the cycle & cannot be classified as either systolic or diastolic. The murmur crescendos in systole & decrescendos in diastole as blood is first ejected into the aorta raising pressure and flow and then empties reducing pressure & flow. Strictly speaking, this is an extra cardiac sound but was included for it will be encountered in pediatrics. This is another classic sound and murmur shape.

11 Jan '05

Lesson 4

6

Q10 A cardiac sound you should never forget: S_1 and S_2 are usual and normal for the area and there is a quiet early systolic m which has a moderate crescendo-decrescendo & usually ends near ^{the} last third of systole. In spite of sometimes encroaching on the last third of systole it may well be an innocent ejection murmur, or if it disappears in any condition that causes ~~an~~ increased cardiac output it was physiological, a pathological early stenosis also begins this way. This is the most common murmur in an unselected murmur population.

Q11 One can literally hear the to and fro flow of ^{the} regurgitant fraction in this example. Beginning in an S_1 embedded in the murmur a sizable fraction of the stroke volume of the $\frac{1}{2}$ left ventricle is ejected in retrograde fashion into the atrium. Since a larger than normal filling volume is required to sustain both forward and retrograde flows filling flow is increased producing the typical early diastolic filling murmur. S_2 is even harder to hear but ~~is~~ present, but and coupled to the systolic murmur. 'Mitral regurgitation is

11 Jan - Review of Δ's needed for Lesson + Aus Eval. DF's 10

Lesson 1 - Card. - Remove VO + Video of Junction box - Scene 4d

- Add Auto Load - All
- Increase VO level on all scenes, by ~
"and for this reason, mandatory"
- Remove ^{It is imperative that you complete your} Scene 126 ^{sound diagram + turn them in for credit;} in Card. Vers -
- Remove all credits from Card. V

Lesson 2

- Verify same autoload procedure ^{video} Q₂ - Respiratory
- Scene 4 - remove V.O. - "Plug the ear phones ^{on the junction box} into the indicated jacks as directed"
- + ~~Sc. 103 Ques 3 Sc 106 Q 6~~ - would be nice to remove 'very' from 'very quiet' in Ans 5d
- + ? Sc 110 repeat lesson

Cardionics only

- Remove all credits

- Verify that pause maintains scene

Lesson 3

- Verify Auto Load.

X Sc 6 can scenes be vibrated

- Q-6 ^{S₁} should be S₂ (Ans) ^{Aus Area}
- Q-8 ⁿ should be aortic not pulmonic (Aus, Area)
- Q-11 5b. Should be correct if Δ to; by a still flexible but obstructed outlet valve)
- Q-13 A-2 S₁ is louder than S₂
- Remove end credits from Cardionics Vers.
- Verify that pause maintains scene

14 Jan 05

Δ's to Lesson Files

11

Lesson 4

- Sc. 4. Delete Sound + video portion dealing with Junction Box
- Pause function doesn't stop video, only sound - varies in early scenes 4, + Variations in Audio level Drums 1, 2, 3, 4, 5, 7, 8

Note: 'Master' version has same probs. as 'JCAT' version - Used JCAT as reference

- Remove Credits From Cardionics Version
- Add Auto Load

Aus Eval - 1

- Add Auto Load

20 Jan JCAT - Directed to Δ as below:

TBD

Aus Eval - UTMB

Auto Load

Lesson 1

- Auto Load
- Adj. VD level

Remove Jct Box
Video

Cardionics

Auto Load

Auto Load

Adj V.O. level

Remove - Sound
diagram turns on
Remove Support
Remove credits

Cont'd - 13

19 Jan '05 Summary of Aus Eval at Ttx. 12

16th Marco not in - Told V.T. would pay after proposal

17th 0730 ^{P.O. Invoice} Revd. corr. c M.I.Z. Then reviewed A's in sound, photos, etc. Passed to programmer

At 1330 began review of file on CD.

Had 5 errors three of which were mine -

B.M.I.Z. corrected + I re-reviewed +

• V.T.'s bill is \$1440

• signed release that I approved of & was satisfied w/ changes

• Picked up some source files ~~but~~ provided Ttx. but Marco kept a goodly # told him they would have to be copied

• Ttx wants to keep sound + pulse &ducers + jct. box - has to be arranged

• Received - Aus Eval - review - ? + A to Aus Rev. on 4 C.D.s

- Source files of above -

20 Jan '05 JOqT:

Keith Johnson went c.mer

Keith wants JOqT to add his imprimatur to front of file create a sales video

• All present agreed that there was little point in passing cleaned up versions through UTMB - so JOqT will keep them and Cardionics changes

• JOqT will produce CD's c UTMB and Cardionics A's

• I gave JOqT source files + master for Aus Eval. He copied both

• Cannot find source files for Aust lesson.

• Called Marco and will ^{the} P/U copy in morning / done

• Est. price for UTMB Δs is \$800

• Advanced \$500 for purch of S.W. to generate Δ's

Loat 20 Jan 85

Lesson 2

UTMB

Add Auto Load
to all

Cardiovascular

Remove Jct box

Remove scene
ic - Support credits

Can't do
3 major work

remove 'very' from Sc 106

Freeze Sc. on pause

Lesson 3

Auto Load

Remove Credits

Sc 6 Vibrate

Q 6 2 S₂ not S₁

Q 8 A₀ not P₀

Q 11 5b - A+ still flex

Q 13 A₂ - S₁ not S₂

Sc 10 Remove Comments

Lesson 3

Lesson 4

Remove Jct box Sc

15 Feb. Review of all sounds, Q/A vs descript. 16
in appendix.

Prob. Q 11 Rev. Gj (m) + S₃

A-1 Q 11- Phone $S_1 > S_2$ Aus. $S_2 > S_1$ Q/A $S_2 > S_1$

Can sound
die be redrawn?

2 Q 8 $S_1 > S_2$ $S_2 > S_1$ $S_1 > S_2$

3 Q 13 $S_1 > S_2$ $S_2 > S_1$ $S_1 > S_2$

4 Q 9 — — —

consistent

Rev. ✓ $S_1 > S_2$ $S_2 > S_1$ $S_1 > S_2$

✓ Last SQA in A-1 is opening snap but Rev has
description called it S₃. Replaced Txt

Am. may be an ejection (m)
may be pathological

— Q 3 in review

Q 6 Diff between Areas?

DK

Q 8 Too Low?

?

Ej M + S₃ Cont'd.

A-L-2 Q 8 $S_2 > S_1$

A-L-3 Q 13 $S_2 > S_1$

Talk around A-1 Δ - A-2 { A-3

L-3 Q 8 Rev - Mitral Area

Q 9 Rev - $S_1 > S_2$ (M)

Q 10 ↓ - $S_2 > S_1$ (P)

✓ Aus 3
 $S_1 > S_2$
✓ S_1 or S_2
✓ (P)

16 Feb. File Discrepancy

17

Q/A L-1, Q11 $\frac{Aus}{S_2 > S_1}$ $\frac{Rev}{S_1 > S_2}$

L-2, Q8

L-3, Q13

L-4, Q5

—

—

all use the ej. m , S_3 recording in which S_2 sounds louder but S_1 is greater on phono and in Andries description. Ans. to ques. in L-1, 2, 3 in Aus files show S_2 loudest. To avoid student confusion I will try to have Aus files Δ , but can't complete FF Tst/WBK Mss til Δ is done.

Q/A L3 Aus File - Q/A 11 -

Need to add Δ " - - caused by an abnormal opening

Aus 3 Q/A 8 should show Mitral area -

~~Aus 4 - Rev Q 2 - Two Aus -~~

~~a) 4 not 3 sounds~~

~~b) 1 not 0 m~~

17 Feb. Tasks to complete STS 18

1. Modify and review Aus 1-4 and review files
2. Copy and deliver: UTMB master & source files
Cardionics master files
3. Reconcile Txt./W.BK. Mss. & Lesson Files
- 4.

19 Feb 2005

Bell 51, 101, 127

19

Rcvd. modified Aus 1 file & autoload from Jimi yesterday
Would not load - Displayed warnings against

computer reverted, ~~Screen~~ Desk Top $\hat{p} \sim 60$ sec.
Program ~~re~~ resumed? Tried today + loaded loaded + ran.

Review of revised Aus 1

Sc. 103 C, Sounds now V. Loud

5 12b Remove - Turn in for credit
Credits

Tt. w BR

Tt. Sc 113

card. Spec Missing

~~Mod-~~ Aus Rev has only 12 Practice sounds

Aus 1 has: Appendix

Aus Rev L-1 has: App-

Ques

- 1 A S₁, S₂
- 2 P S₁, S₂, spl. S₂
- 3 T S₁, S₂, wide S₁
- 4 M Same
- 5 - Same
- 6 - Same
- 7 - Same
- 8 - Same
- 9 - Same
- 10 - Same
- 11 - Same
- 12 - Same

- A S₁, S₂
- P S₁, S₂, spl. S₂
- T S₁, S₂, wide S₂
- M S₁, S₂
- P S₁, S₂, S₄
- P S₁, S₂, S₄ (M) S₄ S₄
- A S₁, S₂, spl. S₂, S₄ S₄ (M)
- M S₁, S₂, 1/2 M S₄
- A S₁, S₂, S₄ + Dias M
- * P S₁, S₂, E₁ (M) + S₃
- M S₁, S₂, S₃

O.K. ex Q11

* Problem

19 Feb - Aus File Corrections

20

All; must be able to start prog. from desk top icon
Cardionik Remove all credits at end.

Aus 1; Cardionics

UTMB

- Reverse S_1 and S_2 on Q11 sound diagram
- Decrease cardiac sound level on both
- Remove V.O. " - - - and turn them in for credit "Sc 126"
- Lv. Jct. box scene and V.O. comment

Aus 2;

- Less 2-Q B - Reverse S_1 and S_2 in answer
- X • Freeze scene on pause function
- Remove "very" from answer Sc 106

Aus 3 • Vibrate ~~Sc 60~~ Sc. 6

24th

- Q 6 pt. 2 S_2 not S_1 ✓
- * • Q 8 Ao not Pu Area ✓
- Q 11 pt. 5b add still flexible X
- Q 13 pt A2 S_1 not S_2 ✓
- Sc 11b Remove Comments

+ Remove ~~Sc~~ Junct box
portion - Video + VO
SC

24th
Now VO LV

UTMB - LV Credits

23 Feb '05 2000

27

Aus 1

1. Unmarked CD had all the errors -
Discarded

Disc marked Lesson 1, 2-23 Feb Loaded - ~ 15 min

2. 4d has erroneous sound from Sc 47

• 19 - cut off -

• 103 - card. sound msg. - Tone contam

• 104 - " " " " " "

• 108 - 122 low intens -

• 126 - mandatory still present

• Index - clinical Ausc 92.1 instead of 2

Aus 4

Installation program is μ soft Wizard?
7:20

• 4,1 - too loud
7,8

too low

See

23 - distorted
24 - stopped

Aus 3

Loaded 2:36

• 1 Too loud

• 2 -- Too soft

• Doesn't fill screen

• 115 Wavering sound

• 117 " " "

SEE Pg 20

25 Feb 05, Review MK11 AUS 4 28
Removed existing AUS 4
2nd Inst. 1:47 - T.Bar - Inst UTMB STS -
6:45 Needs more virtual memory
14:27 loaded

- ring index - Msg on b.Flow Mur. - Repeats
- Doesn't fill screen
- X • Sc. 7 - Prob. Msg - rptd. on man adv - & auto
Bypassed c index to Sc 11
- ✓ Sc. 16 one patent ductus arter. ?
- X • Sc 29 Prob msg - OK on Auto - Skips 28
- Sc 74 ↓ Vel. of VD
- ✓ Sc 75 wrong AA - Should be Pw
- ✓ Sc 123 Prob. msg -
- ✓ Sc 125 back clicked to reach
but had error msg.
- ✓ Sc 128
A4 A2 - Sc. 82 had script error couldn't reproduce

Jim made above Δ's - new disc
Loaded into Dell Inspiron Laptop - w sft. XP
My Computer - Click on disc.
1st Installation appears - SLC
(?) T. bar icon briefly appears then nada
til T. bar msg. appears - SLC
Screen msg.
~12:00 then OK SLC
2nd Screen msg. Finish SLC

24

JO at

29

Aus 1 - Jimi showed me corrected computer,
 ? apparently he gave me old file that I read.
 last started inst. on ^{my} Dell L.T. $\approx 3\frac{1}{2}$ min after
 clicking on first msg. Tool bar note came up
 but not msg on screen. Msg. to install came
 up after SLC on bar note which started
 prog. inst. Loaded (total) ~ 12 min

ITx Att. to load - Aus 1

Directory Struct on File Sys depends on
 machine -

24.2.05 2000 -

Install Aus 4 on COPAQ -

Begin Installation ~ 10 Sec - UTM B - on T. Bar

SLC $\sim 1:35$ T. bar msg. disappears

$\sim 1:30$ " " appears

$\sim 2:00$ screen " "

SLC - T. bar " disappears

N A ☐ A

Install - SLC. 1st Install } L-4 23 02 05

Installing - on T. bar

SLC on 2nd Install 2 of 44

"Error whilst uncompressing
 OK

Install error seems to be corr -

OK
 Finish

OK

Flashing $\equiv$
 N A B

Install:
 L 3

2-23-05

Inst. #1 - SLC

"UTM B - Intro to - -

No Indic but Installed -

ICON on Desk Top p

24 02 05 L-3 Review Cont'd. 25th 30

Drums n/l., V.O. ↓↓

25th at JOAT

2-24-14 wouldn't load on Compag

Loaded on Dell at JOAT

Pulled CB Dell.

Loads slowly but OK

Fry5-

21300
Gulf

Rev. Ans 1, 2/24/05 1200 - 4TMB

100- Practice
100

99 → 100 → 100.1 → 101

Card: 01305

Remove-4d

12b - Remove
"mandatory"

Replace credits
2 Parts list

25 Feb. 05 UTMB

31

Took Aus 1 & Aus Eval to computer^{lab} in library
& both loaded w difficulty - Both ran well.
Promised to send proof copies to B.J.

26 Feb. 05 Status; plan

Take Δ copies of All Files today
Review all today

Mon. 28: Make any Δ 's necessary

Take Copy home & Send B.J. copy

Get JQAT copy p B.J. & W.T. (home) rev

Above Δ does not include PAUSE

Funct. I think that 3 director file
this would take 2 wks - Will
provide the msg. file

Possibly has Aus 2 Archive

Richard Davila

home 713.467.9778

cell 713.302.7559

email richard@richarddavila.com

26 Feb 05 Rev of AUS - Dell Inspir 1000 34
1 at JOAT

Cardo Vers.
TBID

4d - "Must be
plugged in - - -
to -
Min Volume

Remove "Mandatory
you-turn in sound diagrams."

AUS 2

Loaded < 12 min -

21 - needs EXIT or autoexam

22 -

23 -

26 3 ~~4~~



✓ 10.3 may be pathological
Contd. 27 Feb '05

✓ Q & Can Amplitudes be reduced?
Good Phone

✓ No Can Comments on Answers be removed?
2 wk to reconstruct base

Add: -
Cardiograms

Remove "

"Plug into,"
box.

be removed?

Add P/L

AUS 3 Sc 7 Stuttered - Comp restarted

- V.D. level &

Sc 10 start Reload - repeated but
reloaded & worked around -

- Q/A 3 - is probably an - 5d.
- Q/A 11 - add 5C to correct ans. list

and [AUS Eval] ~ 3.00 - Review

Q/A Aus 2

Icon does not come up

Aus 3

Q 3 - 1 - # of heart sounds is 2 but
would not retain ans.

Q 10 - 5, louder in L-J & Rev - but
Ans is 52 in AUS Eval

[AUS 4]

Cardiac sounds
Remove text

3 - Pause
Maps video in mutes sound

Jump from Sc 6 to 7 -

Sound & 75

Sc 17 - Need "SECONDARY"

Sc 9C - Script Error
Ans. 5d and reload

27 Feb.
Installation -

36

My Computer - SLC → 10-20 Sec.
10 Load Msg. SLC →

Load Aus Eval - ~ 3:00 - Review

QA Aus 2

- Icon doesn't come up

Aus 3

- Q 3 - 1- # of heart sounds is 2 but wouldn't retain ans -
- Q 16 - S₁ louder in L-3 & Rev - but Ans is S₂ in AUS Eval

A

AUS 4

NB - Pause
loops video & mutes sound

- Jumps from Sc ⁵ 4 → 7-
- Sound ↓ 7-
- Sc 67 - Need "SECONDARY"
- " ^{see Sc 125} 92 "Script Error"
- Ran OK on reload

cardionics
Remove - J box

Rev. of: at JOAT 28 Feb 05 31

Aus 1 - 28 Feb ✓

" 1, Cardion
 $\Delta_1 - 2 \text{ min}$ ~~4 min~~ $\Sigma 10 \text{ min}$

Looks Good -

Aus 2 - 28 Feb UTMB

$\Sigma 4 \text{ min}$
Aus 3 - UTMB
 $\Sigma 2:21$

Quick rev. of all 5 STS files OK

Simi produced following review files

Source	AUS -	UTMB	Cardionics	Copies
1	1	61 2:25 $\Sigma 5:00$ 1 3 OK	$\Sigma 3:26$ 1 - OK	1
1	2	4:30 est 1:30 1 2 OK		
1	3	$\Sigma \sim 1:00$ 1 2 OK		
1	4	$\Sigma \sim 3:00$ 1 2		
1		#1 - 1:00		
1	Rev/Eval	1 2		

Copy sent to B.J.,
leaving numbers in green
31 Mar

Corr. has "been" completed

2 Mar Status

2 Sets of Aus Files have been completed except for possible Δ to Aus 2 pause function - Karen found file Δ on it and has sent copy to JOAT. Steve wants to wait for decision on this.

Agreed to \$2500.

Asked him to review Cardionics version of Aus 1. Discussed w J.K., JOAT who agreed to revise Aus 2 if source file is adequate & deliver copies of all. Sending him \$1000 + 500 prev. advance on inv. to S.L. UTMB.

7 Mar '05 JK/JaT Δ Aus 2

38

Aus 2 c corr - + Loading, N- Ext +

Aus 2 Δ - corr prase -

Add - Corr + Ans -
" Auto

C version remove J box

K. John. wants to add 1D to Aus Eval, appar. for grading - Since questions have 2nd chance this may/may not be appropriate - If 2nd chance is removed 2 answers this might work but this is funct. of Aus. Exam - Sent him an e-mail plus comment on sales release.

9 Mar -

Received 2 CDs - one supposed to be UTM B vers, one Card. vers. (JK said two were id -

After 5 apparently nl. loadings have the following probs -

No auto adv.	Sc. 2	man adv. to	Sc. 3
↓	" 3	↓	Sc 4
↓	" 6	(blank Ser.	↓ 16
↓	" 15	↓	↓ 20
↓	" 19	↓	↓ 22
↓	" 21		
↓	" 27		
↓	29		
↓	35	OK	
↓	36		
↓	97		

98 scrip error

10 Mar - Jimi now says the obvious - that there are multiple problems in the Mult. Med ~~Δ~~ Aus 2 - Directed him to make a full dress copy of all Aus files incl. source + Card. vers for review prior to prod - Going to see Bruce McFadden - Matson Multimedia See next pg. for things learned

12 Mar. JOqT/Keirn - Wants advance on UTMB ⁴⁰ pay.
I have: - Loaned a Dell L.T. Cost 1500
• Paid Check #400 for Audio - Couldn't use
• Paid #1500 for corr. & mod.

7 days - partial - wk.

Shipping, etc.

~~What~~ What was UTMB billed for?

How will I be reimbursed?

14 Mar.

Contacted: J.K. who billed UTMB 2500

S.L. who will expedite payment

J.K. sent CD's to himself - Shipped by Fed-Ex

15 Mar. Rcvd. by Fed. Ex. 11 CD's

<u>Cardionics</u>	<u>UTMB</u>	<u>Source Files</u>
-------------------	-------------	---------------------

Lesson 1	Lesson - 1	Lesson 1
	2	2
	3	3
	4	4
	R/Er.	R/Er.

15 Nov. Jimi Still owes #1600

Recovered Lap Tap

15 Mar '05

41

Spent an hour w/ Kevin Klein VP sales of Galaxy Scientific Corp. a large company w/ a "knowledge engineering" div which has done a lot of interactive multi-media programs for a number of local organizations such as SAM. Has a lot of resources including testing. However he didn't know word Haptics. He communicated easily and he claimed interest. I left demo copy of AVS 4 and he promised to review & get back. Claims they can typically do multi-media for \$40-50 K/hr. Discussed possibility of doing a demo program - say introduction to Cordic P & Qx.

1

1 MB - A1 8:50 & 2:40
 So far mandatory that you - credit
 A-1 5:100 2:100 50 36 out of place when
 selected by index Too low
 A-2 8:0040 2:100 V.L. 4, 0.6 114 9.1
 no 30 Too low
 A-3 - Begin installation not auto? Too low
 A-4 2:100 50 1 too low 50 7 0 OK
 50 9 ul
 A-5 2:100 2:100 OK
 Source Files
 A-1 OK - Auto load?
 A-2 OK - Auto load?
 A-3 V.L. 4 / Folder 5 Dic, Stamp Image,
 Macro Med Proj,
 A-4
 A-5 OK Where are auto load data?

15 Mar 05 Rev of Aus. series CDs 41

Card A-1 2:56 3:03 No obvious Prob.
Titlescon does not appear ? Spinal Here!
Completed still in autoload file

UTMB-A-1 2:50 < 2:40 hvl-
Sc for this mandatory that you-- credit' hvl OK

A-2 < 1:00, $\approx$ 1:00 Sc 36 out of place when
selected by index Too low

A-3 2:50 43 ~~into~~ V.O. $\downarrow$, nl in Sc 114 & 1
 $\approx$ 0:50 Too Low

A-4 - Begin Installation not auto-? Sc 1 too low Sc 7 $\downarrow$ OK
 $\sim$ 2 min Sc 4 nl

A-Rev < 1: $\sim$ 2:00 OK

Source Files

A 1 ? OK - Autoload?

A 2 ? OK - Autoload?

A 3 V. little 1 Folder E Dir, Bitmap Image,
A 4 Macro Med Proj;

R/EV - ? OK Where are autoload details?

16 Mar. Problems 2 JOaT

42

Problems 2 JOaT

Wants me to pay him in advance of UTMB payment - I have paid him 1500 already

File problems

- Did not send Aus 234 ~~review~~ Cardionics files
- Do source files contain Δ 's & autoload
- No Cardionics source files 'word doc. on AL
- Material Undated
- Vol. of Aus 3 is low
- ~~St~~ Aus 1 still has comment on "turning in for grade" in Sc 126 (mandatory - - credit)
- Aus 2 has scene 36 out of place when selected by index - Innocent Election (m)
- Installation tag - 'been' appears to have been omitted - prior to completed.

Fixes - See Copy of e-mail

21 Mar - Problems $\bar{c}$ JK/JOAT

43

Background-

Review Specs + Dates

Review Files -

Copy CDs to verify

Action

~~Send J.K. results of rev~~

1. See if local producer can finish job
2. Give Jimi Ultimatum

Background

Copy CDs to verify

Cardionics Aus 1 -

$\phi 1$ load 3 mins

$\phi 2$ " Est 5 mins - ? $\downarrow$ Vol - J. box removed
Extraneous has been removed -

Copy Would not run -

UTMB Aus 1 copied - copy indications normal

1. Install $\phi 1 \sim 3$ min (203 files) $\phi 2 \sim 3$ min
2. " $\phi 1$ 1:52 $\phi 2$ (207 files) 3: min

Appears to run OK

2. Trial Copying Card Aus 1

Loading Copy $\phi 1$ 2:20 $\phi 2$ 209 files -

Copy appeared to run normally, ex - will not terminate - (Script error) Terminator $\bar{c}$ escape

After a weeks desperation, review, etc. and email drafts J.K. called saying 20 CD were in DHL?!

22nd

21 Mar. Cardionics

44

K.J. wants to incorporate pulse into his
Heart Sound Teaching System -

Apparently they have a digital file driving up
to 3 channels on a screen. Could not determine
what they have.

Should be simple -

Pointed out to Keith that we have demed
principles in PxDx & have pats. pend.

29th After reflection: it is irrational for me to try to guess
what the nature of their 'digital' sound & EKG generator is
from their engineers monosyllabic answers. Promised K.J.
an e-mail yesterday.

Txt. W.B. - S.J. is editing revisions of this but the cover
art promised by UTM B & K.J. has never been recd.

K.J. obviously wants to get copies of the Cardionics
STS files which are still awaiting receipt of a usable
Ans 2 from Jimi - Warned him against accepting
this file before my review and release

Mitchell Smith - send to Ad agency & agency will e-mail
~~good~~ Cardionics & W.T. Cardionics CD to S.J.

N.C. STS Hdw - Keith may have set - promised to Vee

22 Mar '05 JOaT Verification 24 Mar 45

Cardionics: ✓ Vol. all max - Sony Phones

Auss 1 - last Title J box ✓ ✓ Script Error Credits
2:35 3:06

2 - 0:46 / ? ✓

No auto advance 2, 3, 6, 15, 19
* program runs 21, 27, 28, 36
** direction for adv. 43, 48, 51, 54
56, 57, 60, 67, 68, 71, 81

Sc 98 Script Error 82, 94, 97,
(S.Er)

Wouldn't finish Q A etc.

3 files 2:42
0:35 / ?
- 1:46

Vol. 1 am - Still has
does credits -

4 files 1:22 / ?

J box still, Credits still
present -

Rev. 84 1:54 / 1:40

Rev. Cardionics 1-4 revisions - Verif. (1)
File Install Title J box edit, 11 → E (Needs end)
A1 2:48 / 2:56 ✓ ✓ OK
Copy 210 Files /

A-2 Copy 1:46 / 1:52 ✓
Revised Orig 1:46 / 1:52

has all of prev. errors
won't advance on 2, 3 etc

A-3 - 1:53 ✓
31 Files Copy 35:46

↓ Vol OK (Needs end)

A-4 1:24 / - ✓
18 Files Copy - / 3:08

(Needs end)

2* Verif A4,
46 /

30th Received another copy of the A 2 ~~sent~~ rcd. 22 Mar

22 Mar + 2 Apr -

46

UTMB

Aus 1 ^{Install} 2:46/2:49 Sc. 126 OK.
207 files Made Copy, loaded 2:34/2:46

Aus 2 <:55/1:04 Word Pause - Sc 111 won't rever
33 Made copy, loaded copy 2:49/ OK

Aus 3 :40/:48 OK
Made, loaded copy

Aus 4
17

Review Copied master & installed copy

Rev Verif. of Aus 2 via K.J. 2 Apr '05

Auto load :39/1:00 ϕ 1/2

Title - OK

Old Pause F (Program Paused)

Sc. 21, 23 no auto adv.

Sc 21 shows 'Heart sounds' vs Cardiac

Error, Macromedia Proj. error sc 59(?) (40)
Clicked forward to

Run time error - Sc. 91 Prog

C:\CARDIONICS\AUSC2\UTMB.

exe (Cont'd on back of this pg.)

22 nd It is now obvious that this ϕ of Aus 46
will not be completed in the ~~presented~~ mode is.

Contacted Christien at Matson - Wants to see
what we have.

30th Met Christien - files are complex and would require
a major revision to correct Aus 2

30th Meeting $\bar{c}$ Galaxy Sci.; De Boot, Psychol. & program.
mer - Agreed they would make a proposal for a trial
run

With rpt. of 2nd erroneous A-2 it is obvious
that irrationality has entered the scene

31 Mar Summary and Inventory of Δ STS Files

28 Feb. Returned from JOAT $\bar{c}$ 2 copies of

- Aus 1-4 + Rev & 1 Source file copy of each -
Also 1 copy of Cardionics Aus 1 see P 37
- Received CD of Aus 2 $\bar{c}$ Mod. pause - N.G.

7 Mar See P 33

- 22 Mar See Pp 43,5

CD Copies of UTMB Aus 1-4 & Rev. + Source
of 1,2, & Rev. + unidentified 'source'

11 Apr Verification of Card A-4

Load $\sim 200/?$

Box removed but credits still
present -

31 Mar - Review of CD Aus 2 File per Jimi's
CD labelled. Aus 2 (Cardionics) 48
3 24 05 Rcvd 30 Mar

- Aus 2A
1. Removed 'Cardionics 2' and UTMB STSL-2
 2. Installed above disc -
 - 3 Start in line was C:\Cardionics\
Aus 2A \ UTMB.exe
 - 4 Pause Freezes Scene

Jimi has obviously been copying/sending the wrong files! K.J. was going to try to P/U & send a CD. Jimi persists in claiming my computer is bad.

2 Apr. Rcvd. Cardionics Aus 2 on CD. From -
Cardionics - Quick look shows it to apparently
be the long sought file -

Plan - Compare

- Review all files for content consistent c
UTMB files and latest txt/W.BK. files -

1 April Hardware {for UNC.} 49

My stock of STS H/W is missing ex Mini Cassette Sony, Walkman, Old J. box, Stetho & Pulse Xducers (latter 3 are non working).

Borrowed J box and Stetho & Pulse Xducers from Keith J., who sent a prototype production unit $\bar{5}$ airpath to surface & predictable response; bell has decreased amplitude & freq.

Repaired old Xducer (strain relief broke lead) -

Plan to:

Load all CD Files I am taking and $\bar{c}$ T/WBK review all sounds/pulses and Q & A's.

Try to get design of Cardionics sorted out



A/S RMS

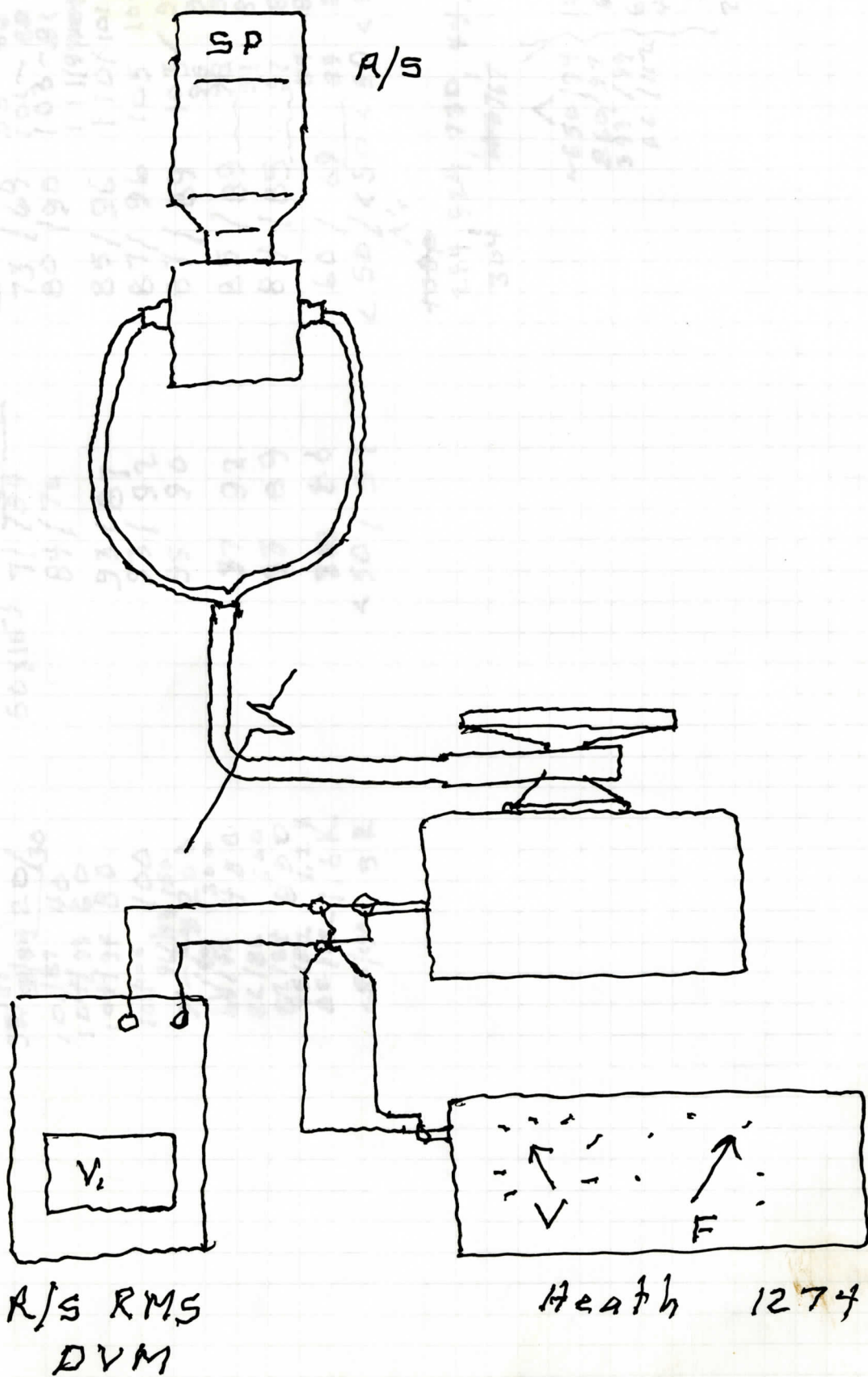
DVM

Heath

1274

1 Apr² 05

50



Transducer. 80165 F10
Bell 1010 89/11 Hz 15

98/87 98/64 20/30
101/87 40
104/93 60
104/94 80
101/106 100
97/94 193/150
97/93 200
97/93 300
86/90 400
86/86 600
87/84 800
75/82 1.2K
82/82 1.6K
450/450 5K

UTMB

S.P.

dB C

71/759

84/76

93/87

93/92

95/90

97/92

93/89

801/86

<50/51

V_i

Vrms

50x10⁻³

Cardi.

UTMB & Koss

S.P.

1081/78

15/90/83

73/69

80/90

85/96

87/96

87/89

85/89

84/85

60/69

<50/<50 <50 <50

1000

294, 924, 730, 449 D.

304

~650/94

860/97

343/99

66/112

1347/87

864/90

662/90

407/94

96/105

249/99

100

10 20 30

100

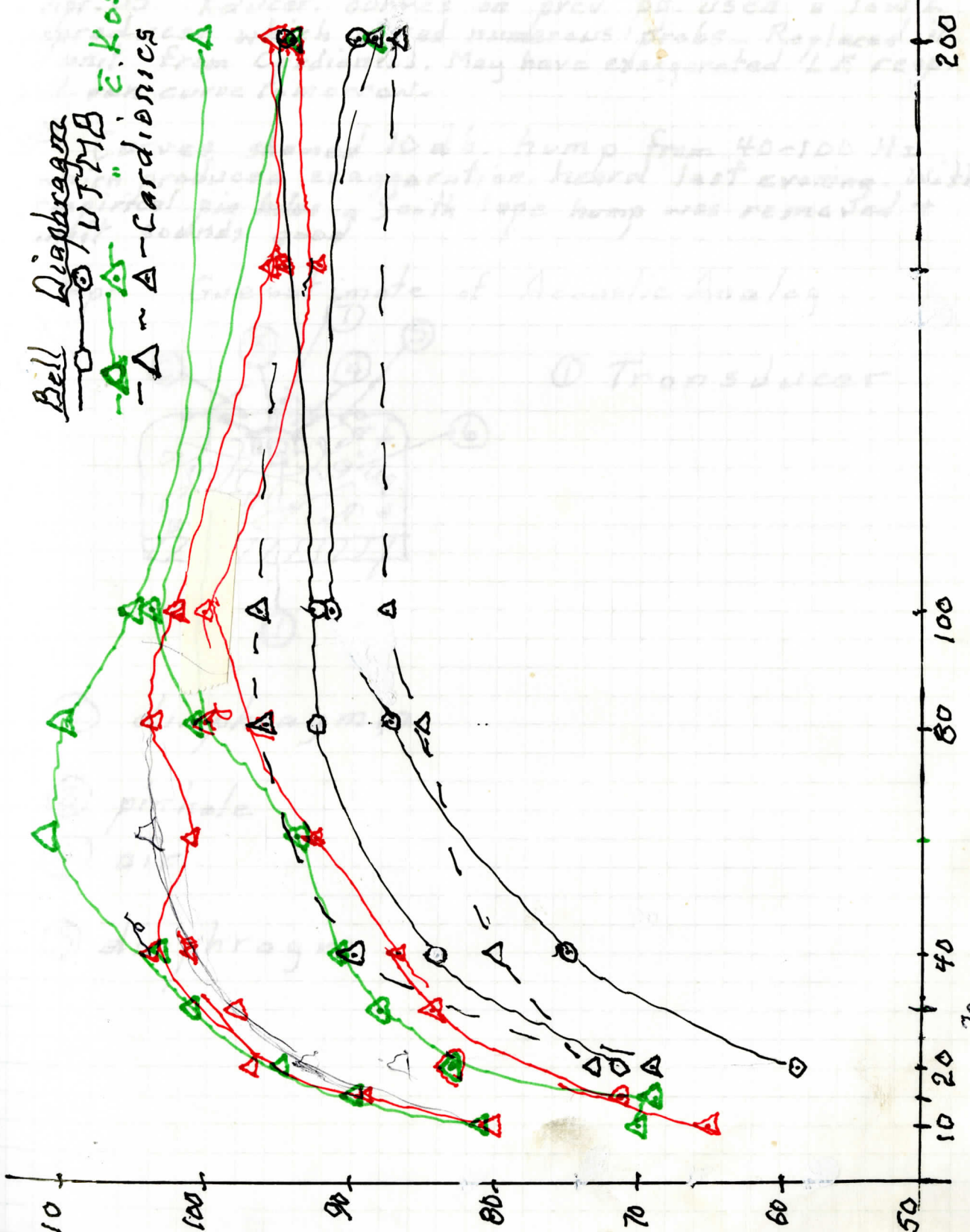
100

Sound Reproduction

Bell Diaphragm
UTMB

Δ-Koss
-Δ-Cardionics

SP-79C



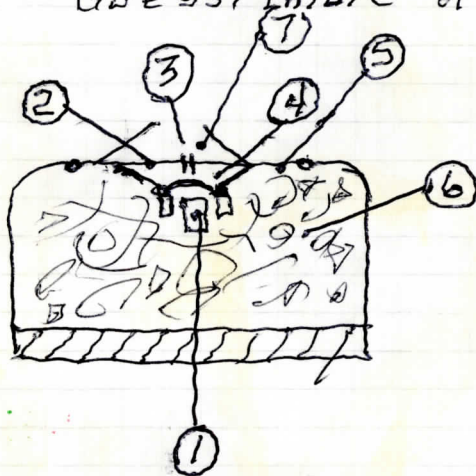
Sound Reproducer

53

7 Apr. 05 Xducer. curves on prev. pg. used a low Z reproducer which caused numerous probs. Replaced it with unit from Cardionics. May have exaggerated L.F. resp. Will run curve tomorrow.

8th Curves showed 10 db. hump from 40-100 Hz which produced exaggeration heard last evening. With empirical pin holes in Scotch tape hump was removed & unit sounds good.

12 Apr. Guesstimate of Acoustic Analog



① Transducer

② diaphragm, a

③ pinhole

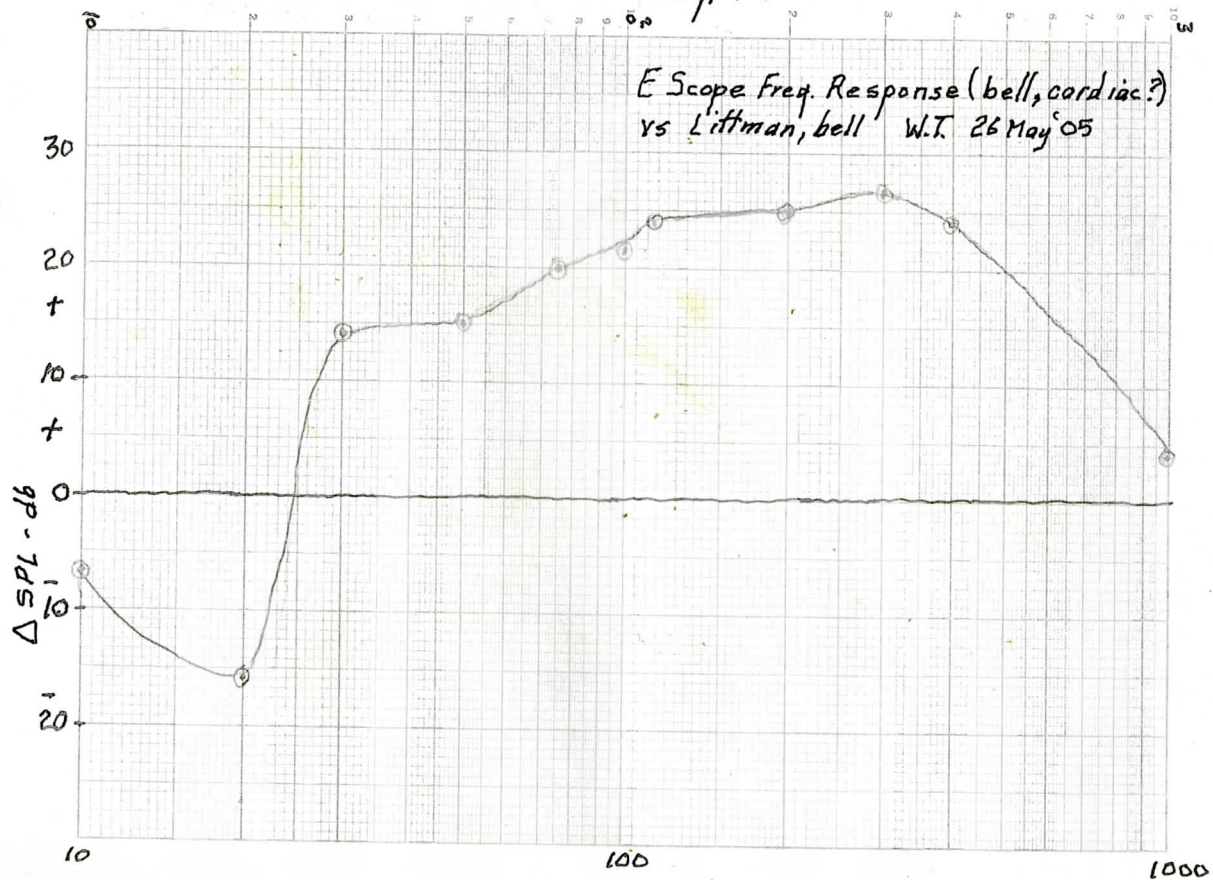
④ air

⑤ diaphragm

K-E SEMI-LOGARITHMIC 358-62
KEUFFEL & ESSER CO. N.Y.C.
CYCLES & 51 DIVISIONS

Freq. Hz

E Scope Freq. Response (bell, cardiac?)
vs Littman, bell W.T. 26 May '05



(20) (7) (9) (20)

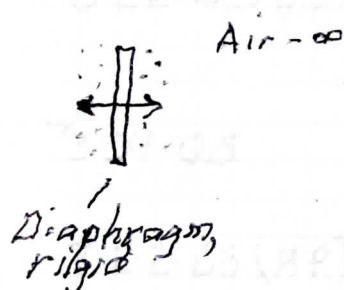
150
100
50
20
10
5
2
1

vertical line of text on the right margin, possibly a date or page number.

Sound Reproducer

54

Analogs



Air-Vol

PV

SPL

- 1 Littman, Bell
- 2 E Scope,

26 May '05 Stethoscope Response

See P 50-UTMB
Xducer E Koss

Freq Hz	V _r mV RMS	db 60	SPL-1 db	SPL db	2-1 db
10	49.8	23.9	81	74	-7
15	50.7	↓	93	77	-16
20	50.2	↓	97	111	+14
30	.7	↓	103	118	15
50	.7	↓	102	122	20
75	.9	↓	100	122	22
100	.8	↓	96	120	24
125	↓	↓	94		
150	↓	↓	95	120	25
200	.7	↓	96		
250	.9	↓	90	117	27
300	.7	↓	89	113	24
400	.4	.9	85		
500	.1	↓	83	87	4
1K	49.8	24	75		

4 Apr. Ver. II UTMB AUS 1-4, Rev. + Txt. W.Bk

- Try copying from Desk Top ~ After confusing ⁵⁵
start copied - Doesn't include A/L
- Will A/L Aus 1 to comp. 2:05/2:50-2:46/
- Will copy above source on M.C. disc.

Aus 1 Val. too low - Had Macro Media error 1/2
Self exam Video poor

UNC CD - Verification

Copy from JOAT - 3.20.05

✓ 1 Aus 2:28/5:22

✓ 2 :26/1:26

✓ 3 :32/1:20

4 :31/4:35
Review :52/1:40

Copies from my Comp. (5 Auto/Load)

✓ 2 "

✓ 3 "

✓ 4 "

Review

12 Apr '05 Summary - STS

56

Aus Intro files - are complete as possible under circumstance -

Neither Cardionics nor U T M B has any apparent interest in STS beyond what can be milked from it -

There is no effort to obtain patents -
Strozier does not perform

Potential proprietary items:

Combination of video sight, sound & haptics

Selection of areas - interaction -

Specific response - neuro etc.

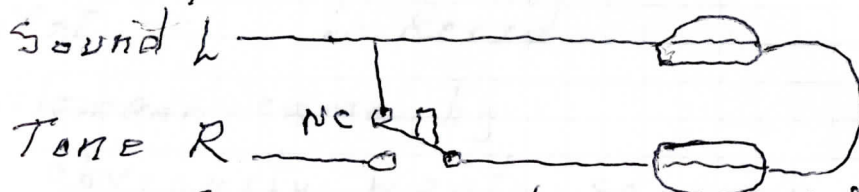
Light & sound - for timing

Text + Sound + Signal *

* on CD

sep. sound + tone

Headphone - Sound -



Pre Record - Track Sel.

A - Sound only

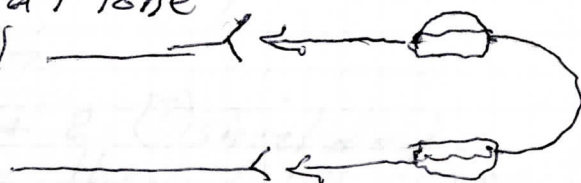
B - Sound + Tone

L - Sound -

- Sound -

R - Sound -

- Tone



12 Apr '05

enortfleet@aims.unc.edu

Installed Aus 1, 2, 3, 4 + Rev 3 difficulty & 58
everything ran -

Met Ch. Resid

Aleman came by -

obviously wants scoring sys -

Blaufuss ~~was~~ 'pulsator' was present

Sq heavy box & button

3 wirr pwr supply + 2 (?) shielded
cables from computer thru DIN connector
Andries reproducer plugged into box -
Don't know what programs Blaufuss has

13 Apr Democed. to Runge, Aleman & diffi-
culty - Runge is willing to support & funds -

Aleman runs PxD₁ program - seems to want it
but needs support & it

Aleman has Criley (Blaufuss) program but didn't
see it in action - It has testing - interactive -

Apr - 18th - 26th

59

Cardionics -

Ret. hdw. (Pulse xducer + P/S)

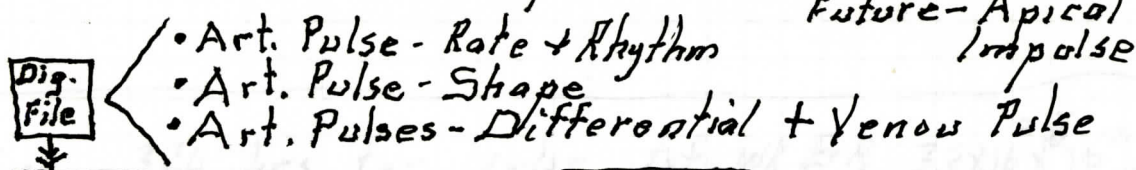
- Txt./WK BK - K.J. set price $\$25. \times 10\% = 2.50$ copy to W.T.
- Max Possible Sales 1st yr - 10 sets. $\times 200 = 2 \times 10^3$ cc
- " " " 25 " $\times 200 = 5 \times 10^3$ cc
- " " " 25 " $\times 200 = 12.5 \times 10^3$ cc

More Corrections!

Kinka italics faded -

Copies	WT	2
	SJ	1
	SL	1
	KH	1
	BJ	1
		<u>6</u>

- JIMI Shipped Files (Cardionics) but no LTMB files -
- K.J. wants pulse system - has EKG simulator which has DC to 40 Hz ? resp. 1 - Ch. 12 ? files.



- Need Txt for each ?

Lesson units are too small

Apr. 26 Pulse Txt W/BK

60

? Make this a seq. of CV Px Dx

Prelude to text- and STS

	Hrs
Text - $\rightarrow$ STS	
Background - (Hemodynamics)	160
• Observation ($\bar{c}$ maneuvers)	40
• Vital Signs - ① Rate + Rhythm	40
• Palpation - Pulse	
+ Shape ② incl. apical	60
+ Differential ③	60
• Impulse (Future?)	40
• Auscultation - Scale down Intro to ausc.	40
Conclusion	40
	<u>480</u>

Cost

Say 320 hrs for pulse txt W/BK $3.2 \times 10^2 \times 10^2 / \text{hr}$
 $\$ 3.2 \times 10^4$

Possible sales - max. 10^2 sch $\times 1.5 \times 10^2$ stud/sch

Dream On!

$= 1.5 \times 10^4$ studs & Txt.
 $\$ 5. / \text{text}$

$\frac{7.5 \times 10^4}{}$

130 - 65,000 -

Say: 10 yrs yr $\times 10^2$ stud $\approx 10^3$
Book 15 $\times .2 \approx \frac{3}{3} \times = 3 \text{ K yr}$

2.5

7th Plan for Pulse/Impulse Prog.

61

Stage

1. a Develop Pulse System -

Property

.1 Rate/Rhythm, Art.

WT

.2 Shape of pulse and impulse, Art.

WT

.3 Differential pulses (bimanual)
Art. + VV.

W.T.

b. Write text work book -

W.T. (C)

2. STS version of above
N.B. This is subset of CVPXDX

Covers same material

N.B. Will require digital or F.M.
pulse sys -

? W.T.

3. Standard pt. version c:

"strap-on" Hdw -

4. Segment of Text. ~~Wk~~ BK

StatusBlauFussPulse Unit

Contract-

Ownership
NeedFuturePulse - Intellect. Prop-
Transducers -STS - SCD on Sound chann. 2

Combined Xducers 1

Comb. $\bar{e}$ txt wk R 1

Assym. V.C. 3

V.C. only 1

CV P₁ D₁ - click on Screen - 3+

Interact

"

3+

Enspire

3 May 05, Writer, Shon, Justin Cone

What can they Do?

at AUS ofc. 64

V.O. - Provide Voice or have

Sounds in add. to voice

Synthesize Yes
Edit

Commands:

Digital No

Auto load
Option from sys.

W.T. send example

Video - Expensive

Graphics

OK

Commonality - stay 2 Flash

Animation

Testing - v. expensive

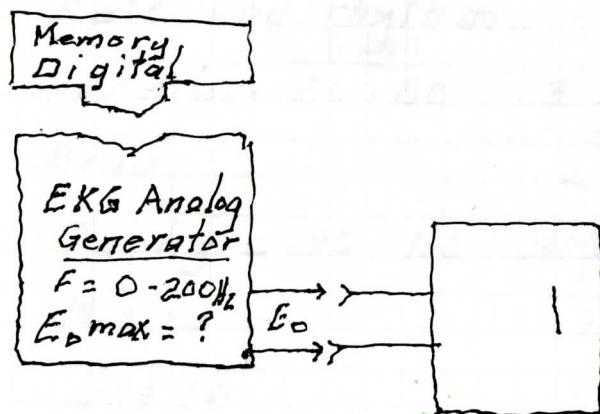
2 or 3 D

can be expensive

Reviewed status of STS - What I needed, what
might be avail from Source files.

After initial expensive start up Shon felt - 45-60
mins @ 20 scenes + 5% video (new) could be done
for 35-40K - D

W.T. Left. demo Aust + Aus? & Aotal - Promised
Justin set of Aust Source
Shon - will send a couple of their CD's



Need:

Ph. E. Keith - 25 May
Agree a demo kit but must be installed &
verified by salesman - Student will only click
on ICON - no passwords, etc.
Repair !

Cardio Sim - can't generate

Pulse - Still wants only profiles from
me - refused - no progress by Cardionics

Concl - Need papers & book -

11 Mag-Waveforms for Pulse Trainer

66

I Rate and rhythm - Intro.

Δ Contr-Pulse

Normal - ^{BPM} 60-80 3

Brady - 2

Tachy - 90 150 220/3

Missed - 2

Extra - 2

Fibr. - 2

Random - 2 Extra Add. 16

Σ 16

II Profile

-Intro.

Thrill?

Peda?

Pulse

Normal Rad 1

Hyper Carotid 1

Hypo 1

Parv & Tard. 1

Bitid 1

Bisfer 1

Apical

Normal 1

Sustained 1

Bitid - 1

Sust. + S3 1

Sust. + S4 1

Sust. + S3,4 1

Σ 6

Σ 7

III Differential ~~and Venous Differ~~-Arterial

NI - Bimanual - radial 1

NI - Biman. - carotid - radial 1

NI - Biman. - carotid - pedal 1

NI Biman. - carotid - femor 2

Aort. Sten. Biman. - carot. - fem - 1

Radial Sten. Biman. - 1

IV Venous-Arterial $\Sigma = 6$

NI - Carotid nl-venous

Obstruction

Regurgitation

V Review + Index

$$\Sigma = 10 + 2 = 12$$

28 May - After another session c.k.j. + more unkept promises there is no point in continuing. It appears that all they want are the pulse profiles

Steve L. wants to continue CVPK and thinks he can come up c. \$30-40 K which will allow the Pulse Impulse Variation of Vital Signs and other parts of the CVPK portion to be completed now.

What is most needed is a haptics Xducer, finger sized:

Obvious methodologies.



69

Ch1 Ch2
47. mV

Freq.	E_{out}	
Hz.	Volt	
1394	13.94	max
10000	100.2	
1000	1.001	1.015
100	.976	.994

1 A Freq → Volt. Converters -

70

Natl. Semicond. - 1800 272 9959

Ordered LM2907/17 1CS - 21 Nov.

23 Nov 05

Hugh Flynn Enspire Producer

Discussed @

Reviewed Sources and Source File

	1	2	3	4	Rev	PxDx	UTMB Photo	UTMB Scam
WT-D.F.	CD	CD	CD	CD	CD	CD	CD	CD
S.F. DVD					CD	?		
Enspire-S.F.	CD	-	-	CD	-	CD copy	CD copy	CD copy
	Copied to comp	-	-	-	-			

Hugh left tone for me to eval.

Needs - **Pulse profiles**
Above SF & F
Graphics
P & A

Gave him script draft of First Look Ms

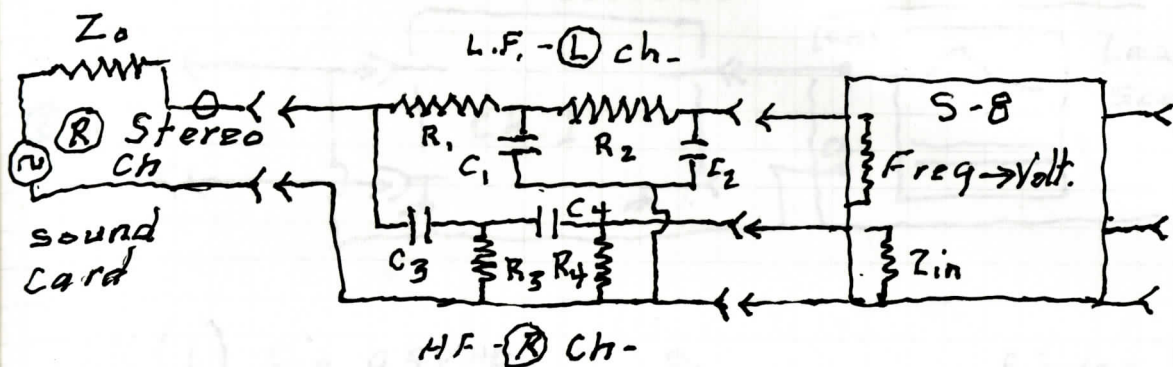
Transfer of S. Files

Aus 2 - UTMB Copy Sc (1-10) Wouldn't Copy.

Test Set Up for F.M. tones

24 Nov. 05

71



- Determine Z_0 , Z_{in} and Calc. perform.
For Z_0 estab. V_{∞} & shunt known r across it.

Do same $\bar{c}$ Z_{in}

$$\frac{V_{\infty}}{V_0} \approx \frac{Z_0}{R}$$

- Put X over components on ckt. bd. $\bar{c}$ proper connectors
- Design $F \rightarrow 0$ demod. & driver -

Plan - If L.F. can be shifted to $f_0 = 0.5$ KHz then
1 KHz pulse tone can be used directly $\bar{c}$ Aus 1

? Salvage old xducer?

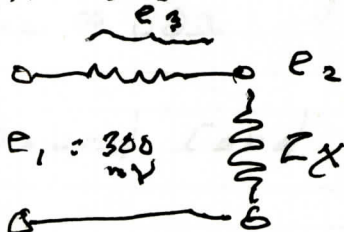
$$db_v = 20 \log \frac{E_1}{E_2}$$

$$\frac{3}{20} = \log \frac{E_1}{E_2} = \log X$$

Input Z - S-B
FM Demod

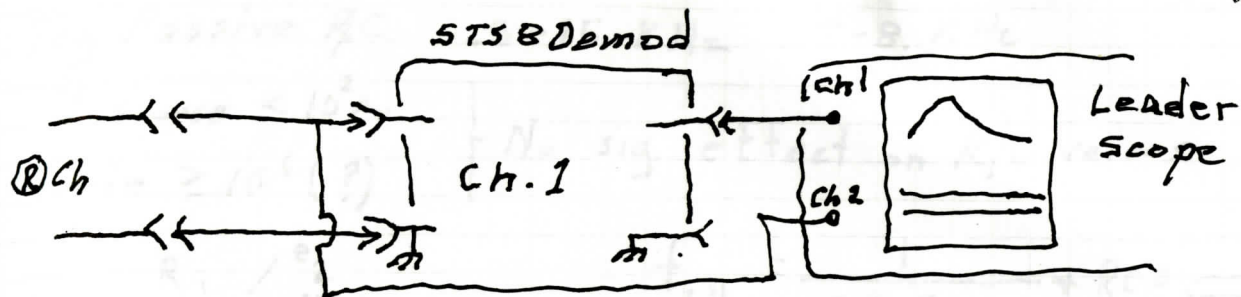
.015

$$.987 \times 10^4 \Omega$$

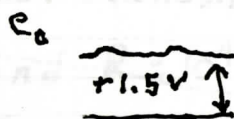


f	C_{H1}	C_{H2}
7 K	111/189	104/196
1 K	120/180	93/207

$\approx 1/2 M.$



1K(L) e_{in} 0.5VPP
RMS 175V

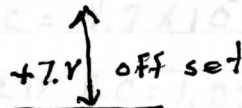


Ripple - $\sim 10mV$
Demod $G=1$
Offset 0

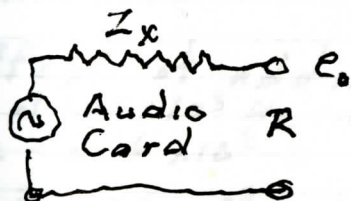


7K(R) 0.7VPP

don't trust Inst,
on this



$\leq 5mV$ Ripple



e_o	R
mVrms	Ω
176.mV	∞
164	1K
	0.5K
	100

1KHz R e_o 7.5 KHz

149.
138.

$Z_o \approx 80\Omega$

67.	50 (47)
20.	10
90.1	82

56.
16.
76.

Sound Card Max.

25 Nov - X over Network

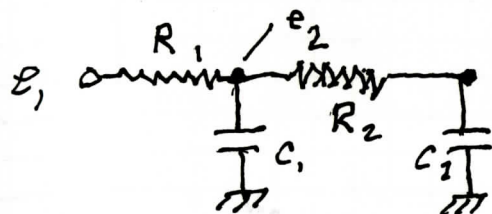
73

Try Passive RC .5 - 1.5 KHz 7-8. KHz

$Z_{source} < 10^2 \Omega$

$Z_{in} \geq 10^6 (?)$

No sig. effect on R/C values



at ≈ 7 KHz $e_2 = .1e_1$

26 Nov

Measured performance of R_1, C_1 alone

$$C_1 = 47.6 \times 10^{-9} = 4.76 \times 10^{-8}$$

$$R_1 = 2.16 \times 10^4$$

$$f_{3db} = \frac{1}{2\pi R_1 C_1} = \left(\frac{1}{2\pi \times 2.16 \times 10^4 \times 4.76 \times 10^{-8}} \right)^{-1}$$

$$= \left(6.46 \times 10^{-1} \times 10^4 \right)^{-1}$$

$$= 1.54 \times 10^3$$

$$\frac{C_1}{C_2} = \frac{1.000}{1.007} = "$$



7 KHz
.166

Effect of adding $R_2 C_2$

at 1.54×10^3 Hz at 7×10^3

$$R_2 = 2.16 \times 10^4$$

$$C_2 = 2.46 \times 10^{-8}$$

$$C_1 = 1.006$$

$$2.538$$

$$3.478$$

$$.584$$

$$.905$$

$$1.000$$

$$1.000$$

$$C_2 = 4.7 \times 10^{-8}$$

$$1.000$$

$$1.000$$

$$.145$$

$$.057$$

$$.151$$

$$.036$$

Try Passive to avoid active -

$$f_{3db} = \frac{1}{2\pi RC} \quad RC = \frac{1}{2\pi f}$$

$$\text{for } f = 1.5 \times 10^3 \quad RC = \frac{1}{2\pi \times 1.5 \times 10^3} = .66 \times 10^{-3}$$

$$\text{and } R = 10^4 \quad C = .66 \times 10^{-7} = .066$$

$$\text{for } C = 4.7 \times 10^{-8} \quad R = \frac{.66 \times 10^{-3}}{4.7 \times 10^{-8}} = 1.4 \times 10^5$$

$$RC = 0.106 \times 10^{-3} = 1.06 \times 10^{-4}$$

$$\text{for } C = 4.7 \times 10^{-8} \quad R = 2.2 \times 10^4$$

$$RC = 4.7 \times 10^{-8} \times 2.2 \times 10^4 = 10.3 \times 10^{-4}$$

$$2\pi RC = 1.03 \times 10^{-3} \times 6.28$$

$$\frac{1}{2\pi RC} = 6.46 \times 10^{-3} = .15 \times 10^3$$

off factor of 10! 2.2 K

$$\text{For } f = 7 \text{ KHz } RC = \frac{1}{2\pi \times 7 \times 10^3} = 1.1 \times 10^{-4}$$

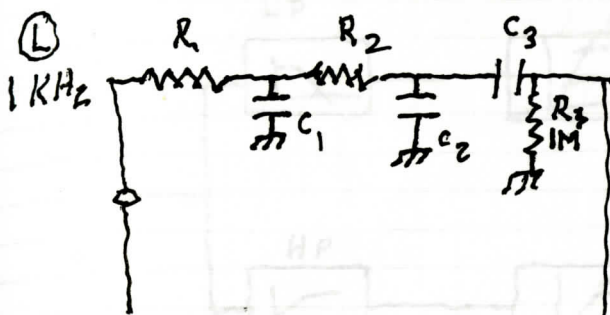
$$\text{if } R = 10^4 \quad RC = 2\pi f^{-1} = .227 \times 10^{-4}$$

$$C = .227 \times 10^{-7} = 2.27 \times 10^{-8} \quad 22.7 \text{ nF}$$

Wait for parts

26 Nov. 05 F → E LM 290T + 17

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Note - Start @ $V_{cc} = 12V$

$$V_{out} = f \cdot 12 \cdot R_c \cdot C_c$$

Note - ? max 1 KHz output
vs same for 1-7 K-
Less parts max 1K

If 1.5 KHz = 10V
0.5 KHz = 3.33 for
7V swing -
? Should drive V.C. direct.

$$10 = 1.5 \times 10^3 \times 12 \times 10^5 \times C_c \cdot 8 \times 10^{-8} = 8 \text{ nF}$$

$$C_c = 0.47 \mu F \quad V_{cc} = 11.52$$

f_{Hz}	R_c	C_{in}	C_{cc}
500	7.82	58 mV	
176	8.89	Max	
	$C_c = 0.01 \mu F$		
500	5.72		
1006	10.19	A447	

$$10 = 10^{-7} \times \frac{1}{R_c} \times 12 \times \frac{1}{C_c} \times 10^{-7} =$$

$$10V = 1.5 \times 10^3 \times 12V \times \frac{1}{R_c} \times 1 \times 10^{-8}$$

$$R = \frac{10^8}{1.2 \times 10^4 \times 1.5 \times 10^3 \times 10^{-8}} = \frac{10^4}{1.8} = 125 \times 10^3$$

328	504	
328	4.99	12.88
27	4.96	12.79
28	4.88	12

30 Nov. Calc., then meas. perform. for LM 290T

From spec sheet. $V_{out} = f_{in} \cdot V_{cc} \cdot R_1 \cdot C_1$ for $V_o = 9.0V_{max}$

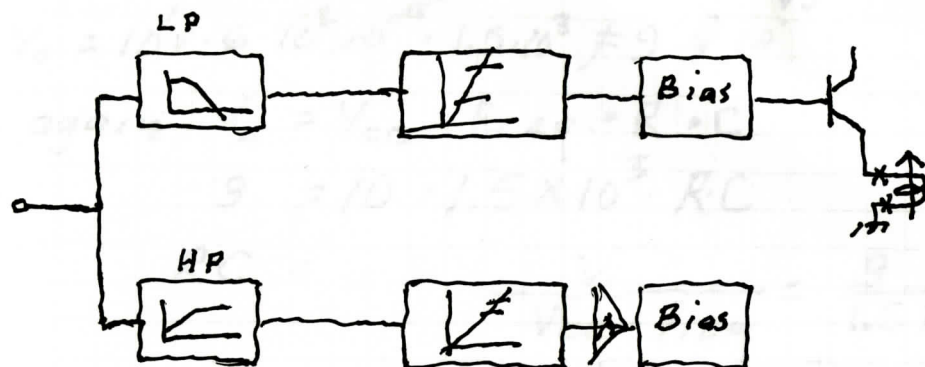
$$R_1 C_1 = \frac{0.9 \times 10^1}{1. \times 10^1 \times 1.5 \times 10^3} \quad R_1 C_1 = \frac{V_o}{f_{in} \cdot V_{cc}} \quad V_{cc} = 10V$$

$$f_{in} = 1.5 \times 10^3 \text{ Hz}$$

$$= \frac{.9}{1.5} \times 10^{-3} = 6 \times 10^{-2} \times 10^{-3} \text{ for } C_1 = 1 \times 10^{-8}$$

$$R_1 = \frac{6 \times 10^{-5}}{1 \times 10^{-8}}$$

$$= 6 \times 10^3 \quad C_1 = 10^{-9} \quad R = 6 \times 10^4$$



To complete, need; voltage rqmts. for driver.

Proper way would be a good voltage/displacement curve but since feel is final criterion will set up FET + V.C.

& see what it takes -

Need to validate -

Zero suppression	} LM 2907
Filter	
Gain control	

Quick look at Cardionics V.C. pulse X'ducer. shows it to have too little force for hyperkinetic pulses - They used too stiff a cover & ? - Will have to do that as well.

Plan get proto from Keith & in meantime complete demod.

& Ms. - 30 Nov. K.J. promised to deliv. tomorrow -

Sorted prev. doc. files on pulse design Hdw -

Nat. SemC. has prev. Freq → Volt but complex LM 33 -

See N.BK. PIM Work Book Jun 05

30 Nov. Confirm Values - of R & C p. 74

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$$V_o = 10^1 \cdot 6 \cdot 10^2 \cdot 10^{-8} \cdot 1.5 \cdot 10^3 \neq 9 \cdot 10^1$$

Once again $V_o = V_{cc} \cdot \text{freq} \cdot R \cdot C$

For $9 = 10 \cdot 1.5 \times 10^3 \cdot R \cdot C$

$$RC = \frac{V_o}{V_{cc} \cdot \text{freq}} = \frac{9}{1.5 \times 10^3 \times 10}$$

$$= \frac{.9 \times 10^{-3}}{1.5 \times} = .6 \times 10^{-3}$$

for $C = 10^{-9}$ $R = \frac{.6 \times 10^{-3}}{10^{-9}} = .6 \times 10^6 = 600 \text{ K}$

for $.01 \mu = 60 \text{ K}$

CK $V_o = 10^1 \cdot 1.5 \cdot 10^3 \cdot 10^{-9} \cdot 6 \times 10^5 = 9 \times 10^{4+9-9}$

$V_o \text{ calc.} = 13.06 \cdot 4.99 \cdot 10^3 \times .0592 \times 10^6 \times 1.045 \times 10^{-9}$

Meas. - $\bar{C} = 60 \text{ K} \pm .0104 \mu \pm R = 76 \text{ K}$

V_{cc}	V_o	freq	$V_{o \text{ max}}$	V_o calc.
----------	-------	------	---------------------	----------------

13.77	9.53	909 Hz		
.36	9.24	908		
11.76	8.11	↓		
10.16	6.93	902	876	
13.32	9.11	87.99	11.92	

* R5 22-174B

22-211

C = 1.041

9.95 MF

R = 58.9 K

59.2 K

Meas.?

13.26	11.86	903
.24	3.93	563
.23	7.83	907

4.079 (+1.038%)
7.35 (+1.045%)

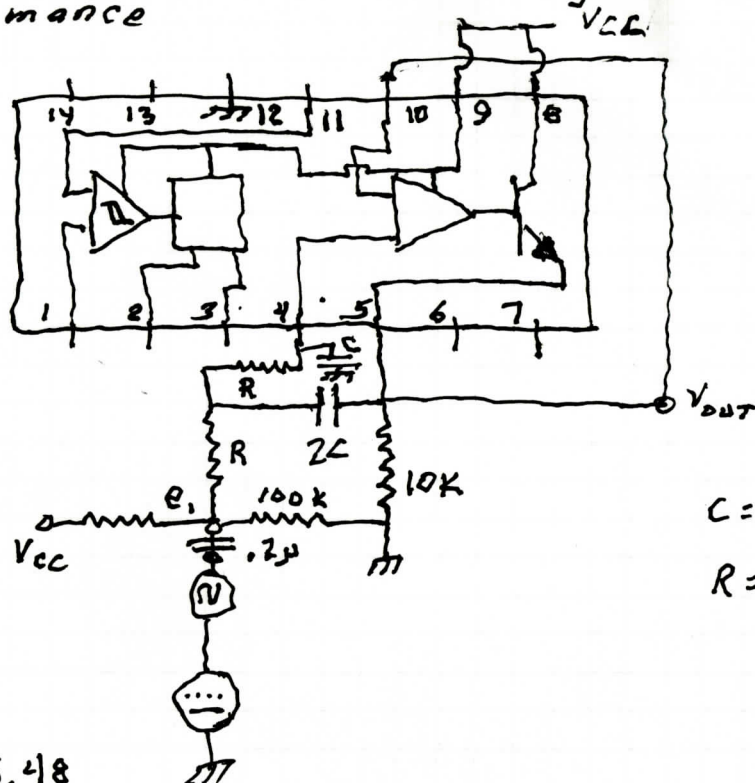
Repeat $\bar{C} = 1$

13.06	3.583	4.99 KHz
↓	7.13	10.01
11.45	6.22	.01
↓	7.97	13.09
13.05	9.6	13.55

$\times 10^{-9}$
4.03 (+1.125%)
8.81 (1.23)

30 Nov, Calc. & Meas - Integral Filter Performance

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$$C = .047 \mu$$

$$R = 47K$$

$$e_i, V_{DC} + 6.48$$

e_{out}	e_{in}
136.2	136.5
197.2	282
226	288
245	287
172.6	290
147	290
109	290
72	291
41	292
7	292
3	292
1	291
0.4	290

F Hz	
10	↑
20	Flat to
30	O.C.
40	
50	
60	
80	
100	
200	
300	
400	
500	
1000	

McLendon - 966 4333

www.mcl@mind.spring.com

Jane McNeer Med 966 1201

$$f_{3db} = \frac{.707}{2\pi RC} \quad \& \quad RC = \frac{.707 \times 10^{-1}}{2\pi \times f_{3db}} = \frac{1.125}{5 \times 10^2} = .225 \times 10^{-2}$$

$$R = \frac{.225 \times 10^{-2}}{5 \times 10^{-8}} = .045 \times 10^6 \approx 47K$$

Meas -

