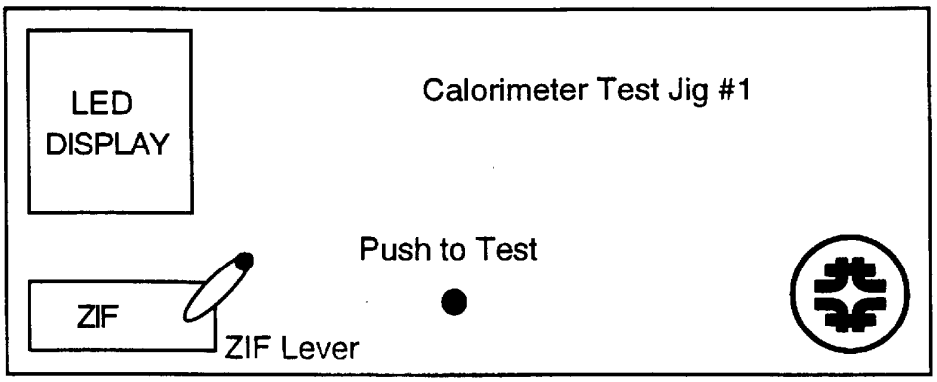
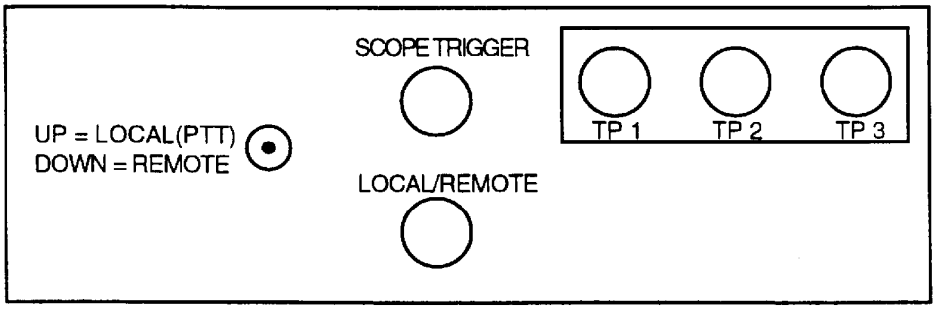
Figure 1: Mechanical Drawing

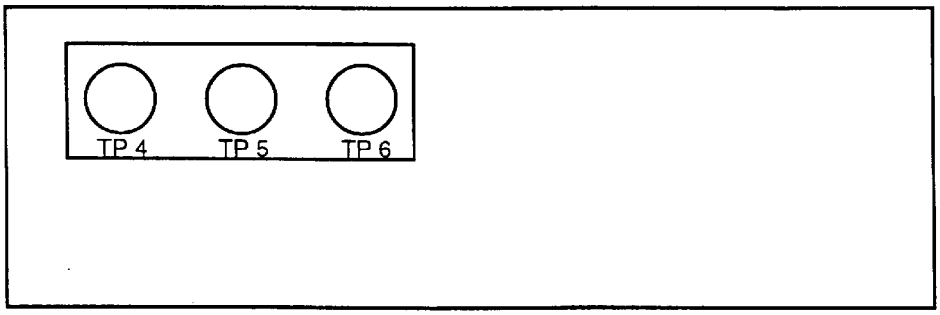
Top View



Left Side View



Right Side View



Rear View

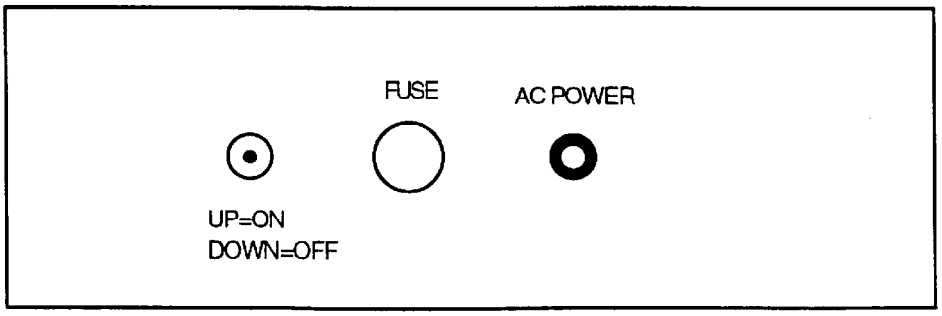
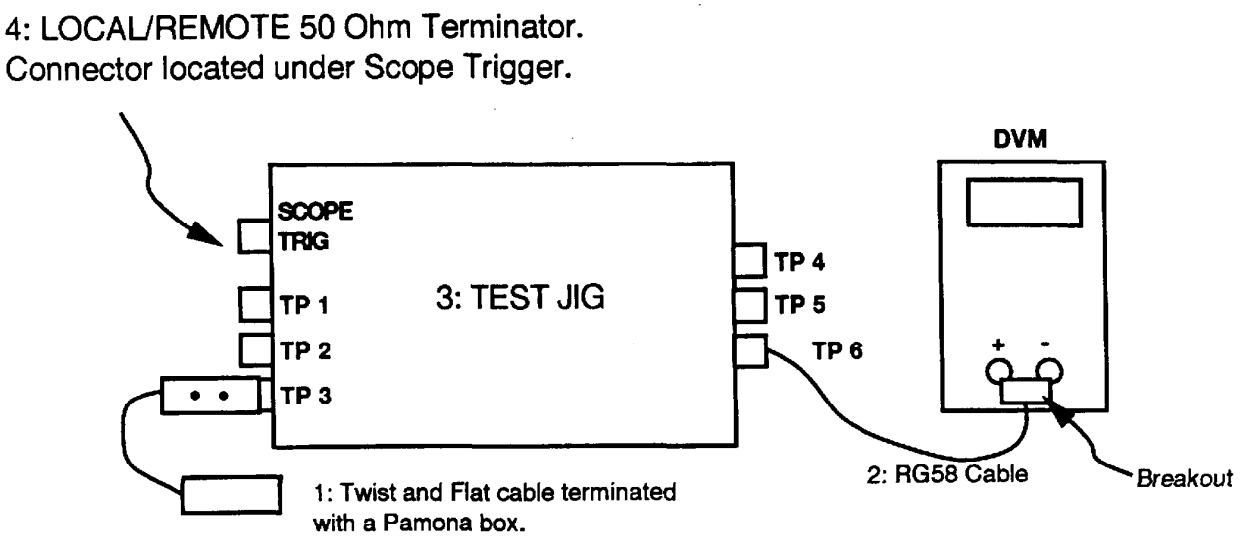


Figure 3: Current Test Setup



Fermilab Provided Parts

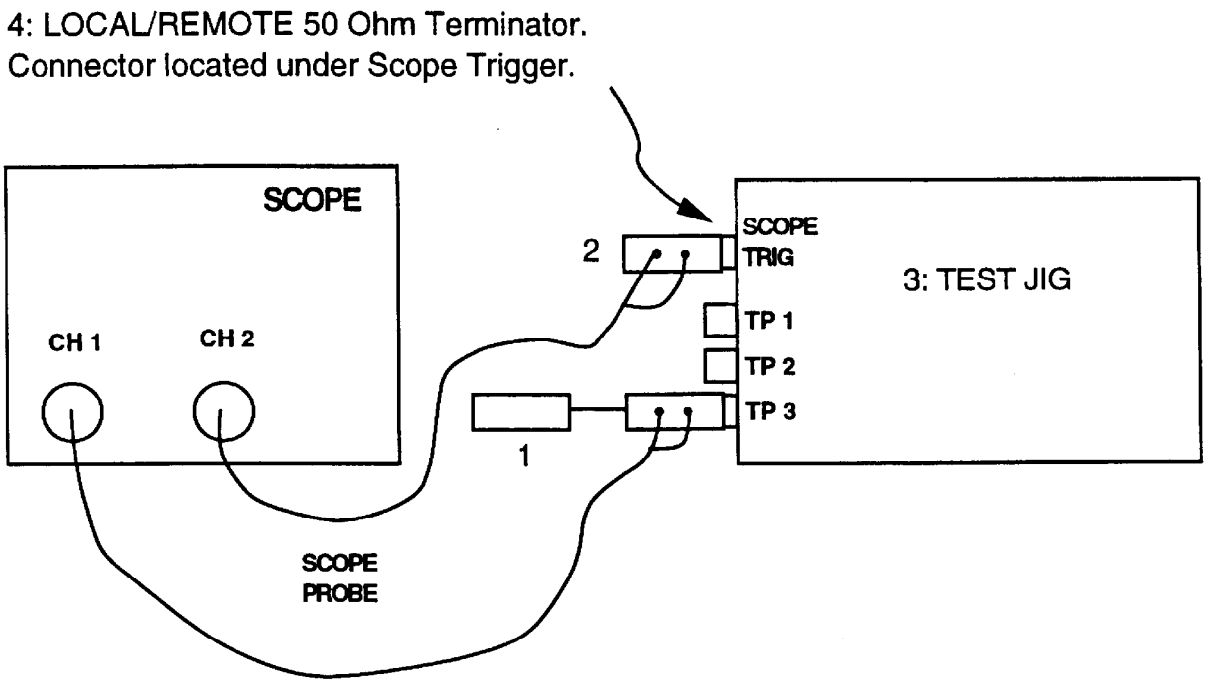
1. Twist and Flat Cable terminated with a Pamona Box on both ends. The Pamona box lid with protruding test points is connected to the test jig.

2. RG58 cable and breakout.

3. Test Jig. One for Species A-Hg, one for Species I.

4. LOCAL/REMOTE 50 Ohm terminator.

Figure 4: Rise Time, Fall Time, Undershoot/Overshoot Test Setup



Fermilab Provided Parts

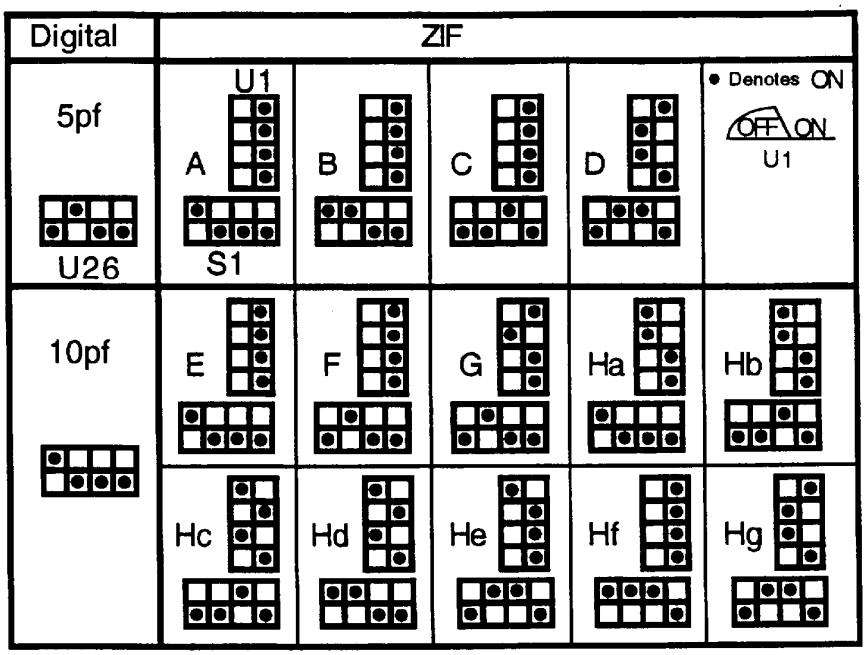
1. Twist and Flat Cable terminated with a Pamona Box on both ends. The Pamona box lid with protruding test points is connected to the test jig.

2. Scope Trigger Pamona Box terminator.

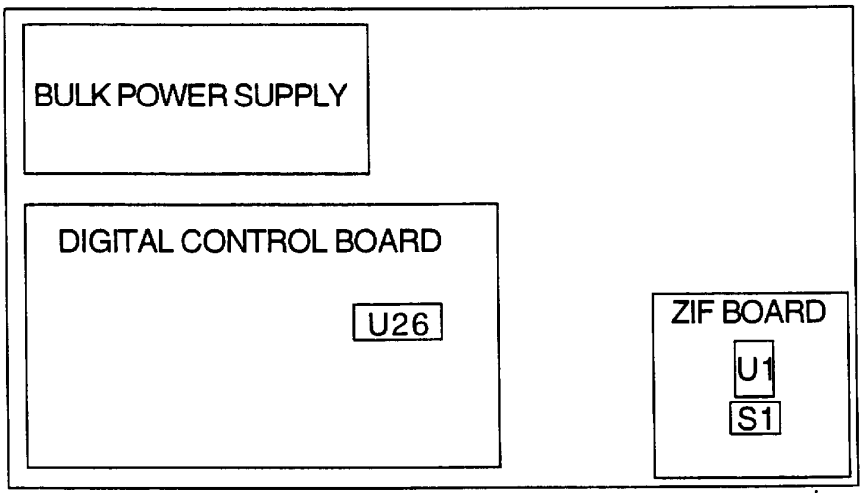
3. Test Jig. One for Species A-Hg, one for Species I.

4. LOCAL/REMOTE 50 Ohm terminator.

Figure 5: Species Selection Chart

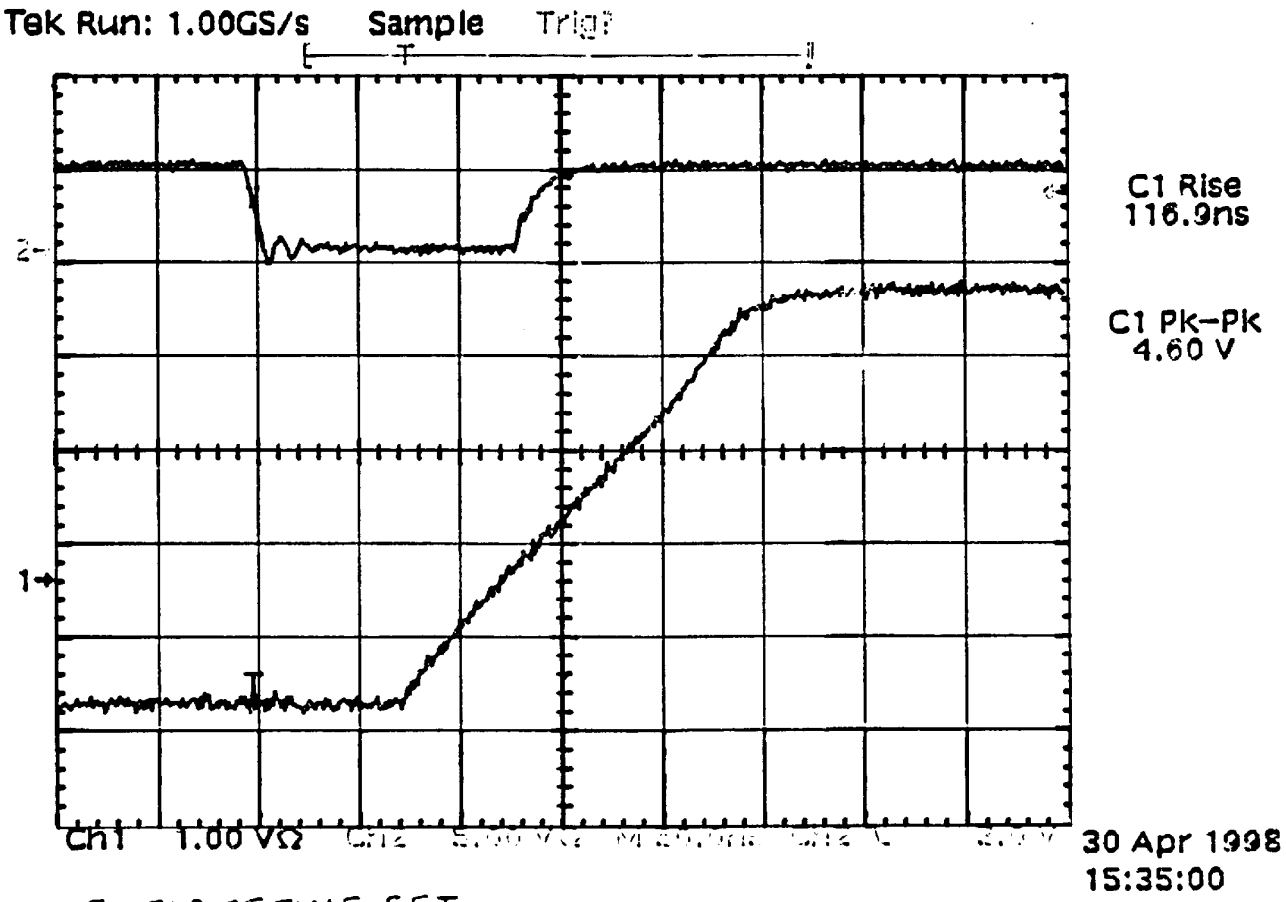


TEST JIG ELECTRONICS LAYOUT



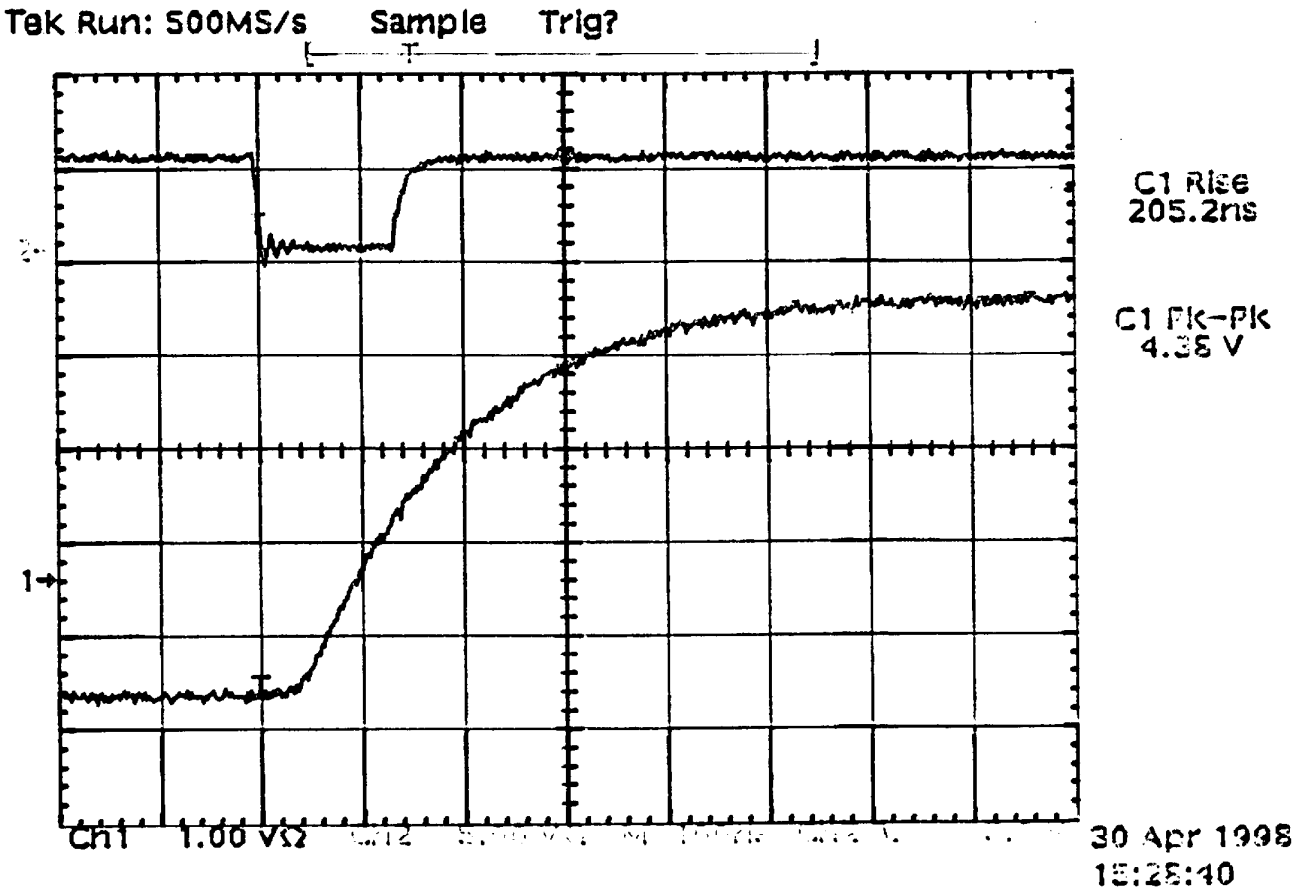
The Species Selection Chart can be found on the inside cover of the test jig. The chart is divided into four main sections; DIGITAL 5pF, ZIF A-D, DIGITAL 10pF, and ZIF E-Hg. Under the heading DIGITAL, the switch positions for U26 are diagrammed. Species A-D use the 5 pF position. Species E-Hg use the 10 pF position. Under the ZIF heading, the switch positions are shown for U1 and S1 located on the ZIF board.

SPECIES A - FIGURE 6



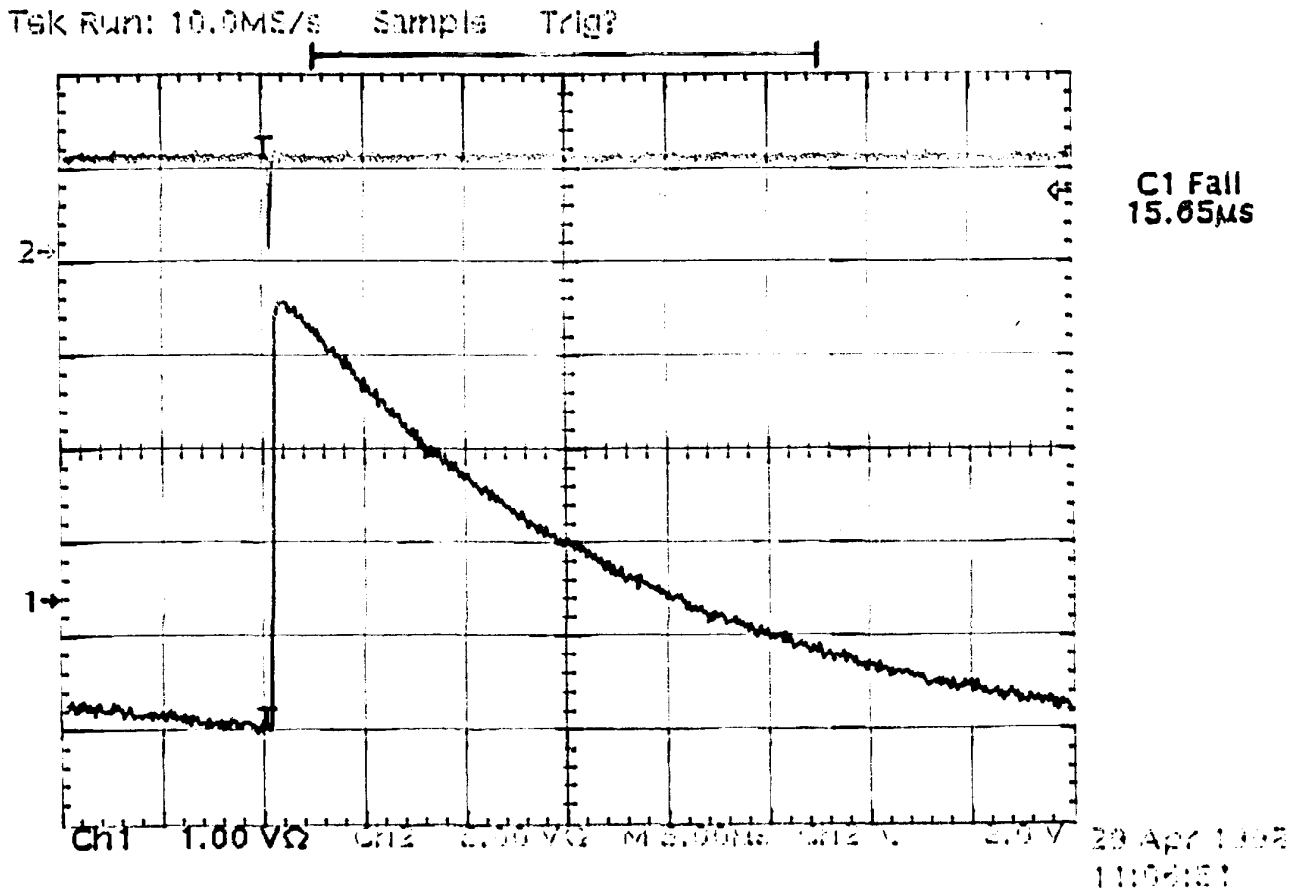
FILE: RISETIME.SET

SPECIES I - FIGURE 7



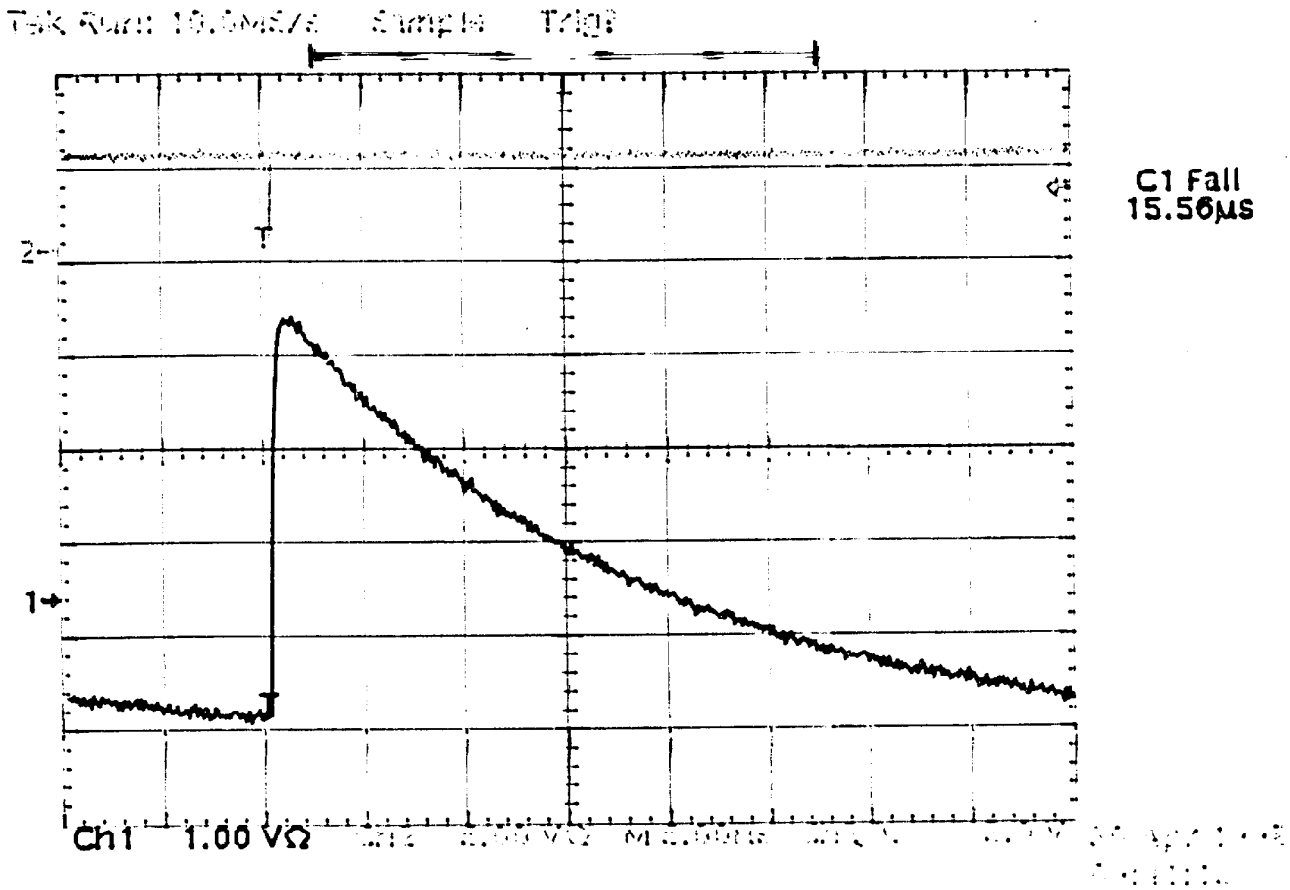
FILE: IRISE.SET

SPECIES A - FIGURE B



FILE: FALLTIME.SET

SPECIES I - FIGURE 9



FILE: FALLTIME.SET

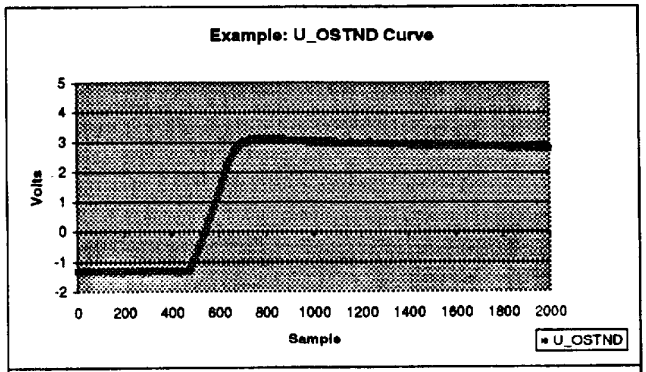
Figure 10: Undershoot/Overshoot Test

STEP 8: Tabular Form

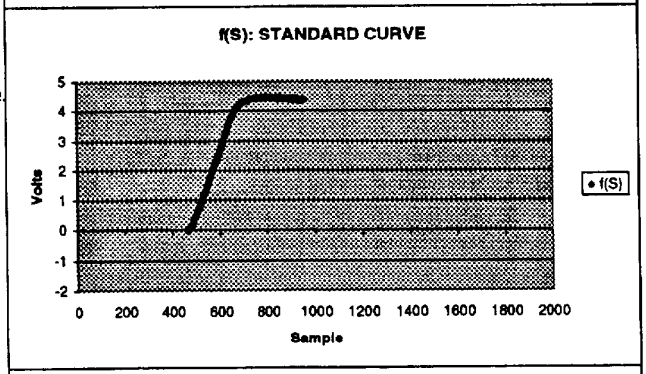
Sample	Time	Volts
401	0	-1.321
402	1E-09	-1.314
403	2E-09	-1.315
404	3E-09	-1.308
405	4E-09	-1.34
406	5E-09	-1.313
407	6E-09	-1.332
408	7E-09	-1.326
409	8E-09	-1.319
410	9E-09	-1.316
411	1E-08	-1.333
412	1.1E-08	-1.321
413	1.2E-08	-1.326
414	1.3E-08	-1.326
415	1.4E-08	-1.332
416	1.5E-08	-1.313
417	1.6E-08	-1.331
418	1.7E-08	-1.31
419	1.8E-08	-1.333
420	1.9E-08	-1.345
421	2E-08	-1.303
422	2.1E-08	-1.344
423	2.2E-08	-1.349
424	2.3E-08	-1.36
425	2.4E-08	-1.344
426	2.5E-08	-1.347
427	2.6E-08	-1.32
428	2.7E-08	-1.358
429	2.8E-08	-1.298
430	2.9E-08	-1.323
431	3E-08	-1.342
432	3.1E-08	-1.346
433	3.2E-08	-1.307
434	3.3E-08	-1.335
435	3.4E-08	-1.297
436	3.5E-08	-1.341
437	3.6E-08	-1.344
438	3.7E-08	-1.305
439	3.8E-08	-1.328
440	3.9E-08	-1.316

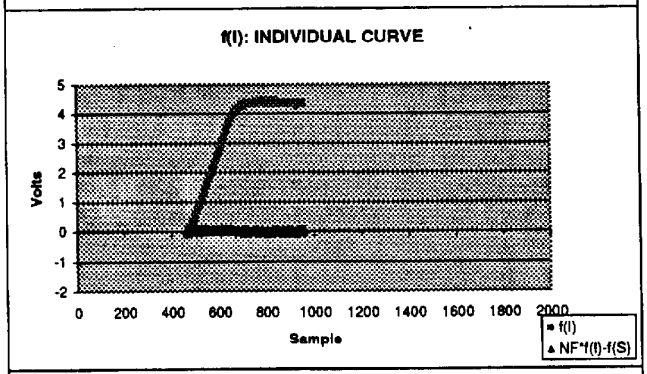
Baseline Offset	-1.32837	STEP 9: Calculated baseline from Sample 401 to 451.
Maximum V	4.45737	
Minimum V	-0.04463	
V pk-pk	4.502	
20% of V pk-pk	0.9004	STEP 11: Calculated 20% of MAX-MIN.
Sum f(S)	1672.717	STEP 13: Sample 462-962 Voltage of Standard Curve.
Sum f(I)	1666.997	STEP 20: Sample 462-962 Voltage of Individual Curve.
NF	1.003431	STEP 21: NF= Sum f(S)/ Sum f(I)

STEP 7:



STEP 12:
Sample 522 = 20% Vpk-pk.
Sample 522-60ns=Sample 462.
Sample 462=First data point.
Sample 462+500ns=Sample 962.
Sample 962=Last data point.





STEP 23:

This plot shows the difference between the normalized individual curve and the standard curve. All data points between Samples 462 and 962 are represented.

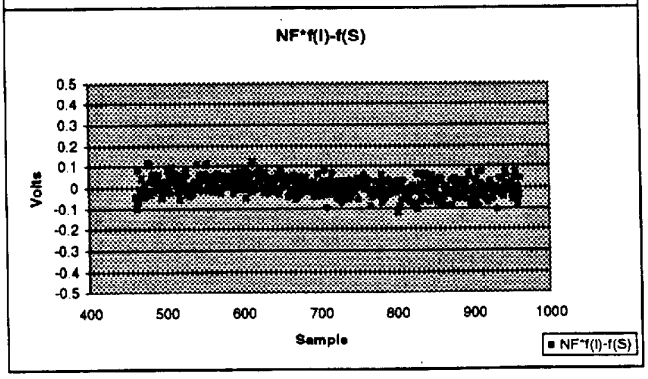


Figure 11

Resistor Values

180 -

Species	R3 (ohms)	R36 (ohms)	R37 (ohms)
A	238	0	0
B	218	5190	2600
C	195	10690	5350
D	120	21770	6590
E	239	0	0
F	227	1440	660
G	213	3170	1440
Ha	200	4720	2150
Hb	193	5690	2590
Hc	185	6590	3000
Hd	179	7310	3320
He	171	8360	3800
Hf	161	9610	4370
Hg	149	11060	5030
I	No Change	No Change	No Change

Output Test Windows

8V Current (mA)	-6V Current (mA)	12V Current (mA)	Vpp (V)	risetime(ns) 20%-80%	falltime (us) 80%-29%
13.5-16.5	9.3-11.5	8.3-10.2	4.2-5.2	106-130	14.1-17.3
14.3-17.6	9.3-11.5	8.3-10.2	4.1-5.1	107-131	14.1-17.3
15.5-19.0	9.3-11.5	8.3-10.2	4.1-5.1	107-131	14.1-17.3
22.4-27.5	9.3-11.5	8.3-10.2	4.1-5.1	108-134	14.4-17.8
13.4-16.5	9.3-11.5	8.3-10.2	4.1-5.1	110-136	14.0-17.2
13.9-17.1	9.3-11.5	8.3-10.2	4.1-5.1	107-131	14.1-17.3
14.5-17.8	9.3-11.5	8.3-10.2	4.0-5.0	111-137	14.0-17.2
15.2-18.7	9.3-11.5	8.3-10.2	4.1-5.1	107-131	14.1-17.3
15.6-19.1	9.3-11.5	8.3-10.2	4.1-5.1	107-131	14.1-17.3
16.1-19.7	9.3-11.5	8.3-10.2	4.1-5.1	107-131	14.1-17.3
16.4-20.2	9.3-11.5	8.3-10.2	4.1-5.1	107-131	14.1-17.3
17.0-20.9	9.3-11.5	8.3-10.2	4.1-5.1	107-131	14.1-17.3
17.8-21.8	9.3-11.5	8.3-10.2	4.1-5.1	107-131	14.1-17.3
18.9-23.2	9.3-11.5	8.3-10.2	4.1-5.1	107-131	14.1-17.3
16.5-20.3	9.3-11.5	8.3-10.2	3.9-4.9	191-235	14.2-17.4

5000 Channel Preproduction Run

Species	# Needed
He	182
A	1160
D	1530
F	1800
C	430
Total	5102