Galileo-NMS Field Services

NAS5-29344

Final Report

July 3, 1996

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Space Physics Research Laboratory
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2455 Hayward St.
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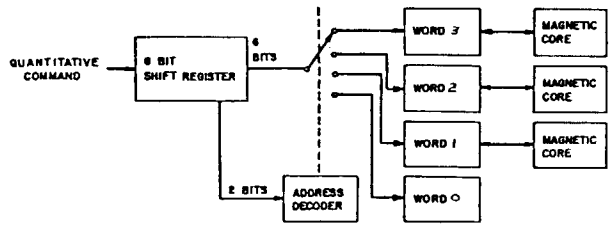
BIT	WORD 0 SHIFT REGISTER	WORD 1 (CORE MEMORY)	WORD 2 (CORE MEMORY)	WORD 3 CORE MEMORY
0	ADDRESS 0	ADDRESS 0	ADDRESS 1	ADDRESS 1
1	ADDRESS 0	ADDRESS 1	ADDRESS 0	ADDRESS 1
2	NOT AVAILABLE	LF AC GAIN MSB	AC OFFSET MSB	CAL VALVE DISABLE
3	NOT AVAILABLE	LF AC GAIN	AC OFFSET LSB	SELECT FIL 2
4	VALVE DISABLE	LF AC GAIN LSB	DC OFFSET MSB	HV MSB
5	HEATER DISABLE	DC GAIN MSB	DC OFFSET LSB	HV LSB
6	FILAMENT OFF	DC GAIN	HF AC GAIN MSB	DISCRIMINATOR MSB
7	COMMUTATOR STOP	DC GAIN LSB	HF AC GAIN LSB	DISCRIMINATOR LSB

- A COMMAND ENVELOPE RESETS THE SEQUENCE INITIATION LATCH, ENABLING A SUBSEQUENT SEQUENCE INIT COMMAND TO RESET THE PROGRAM COUNTER TO ZERO POSITION.
- WORDS MAY BE ENTERED IN ANY SEQUENCE, ANY NUMBER OF TIMES.
- THE ENTIRE WORD MUST BE ENTERED, i.e. INDIVIDUAL BITS OF A WORD MAY NOT BE CONFIGURED.

NOTE: REV 5/17/82 REVERSED ORDER OF WORDS i.e. bit 2 NA WD0, WAS bit 2 NA WD 3 JM/WP



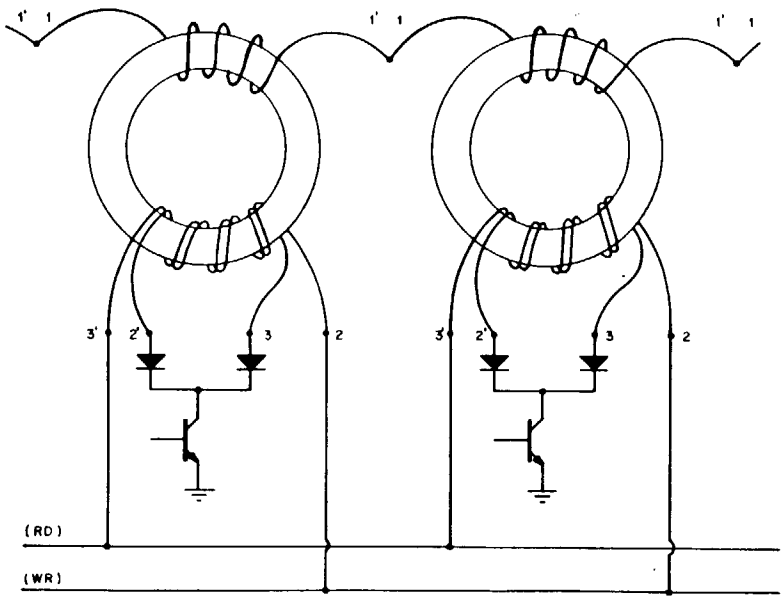
- 18 COMMAND BITS STORED IN MAGNETIC CORE MEMORY.
- 4 BITS STORED IN VOLATILE MEMORY.
- MAGNETIC MEMORY READ INTO STORAGE REGISTERS AND REWRITTEN AT EACH POWER ON.
- MAGNETIC CORE FULLY REWRITTEN AFTER EACH COMMAND WORD.

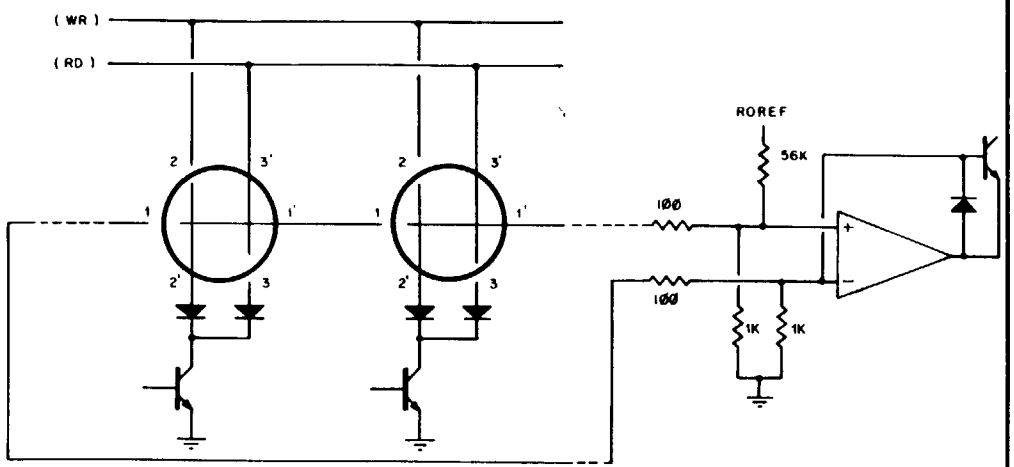
SEE ALSO: B-E4717 (COMMAND SYSTEM CONCEPT)

ENGINEER J. MAURER	DRAFTSMAN MN 9/28/81	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	QUANTITATIVE COMMANDS GNMS	6/25/82 6/9/82 5/17/82
	B-E6692	DATE

LAST USED R C D L

COMMAND MEMORY WIRING DIAGRAM





WINDING #1: 4 TURNS, #38

#2, #3 4 TURNS, BIFILAR, #40

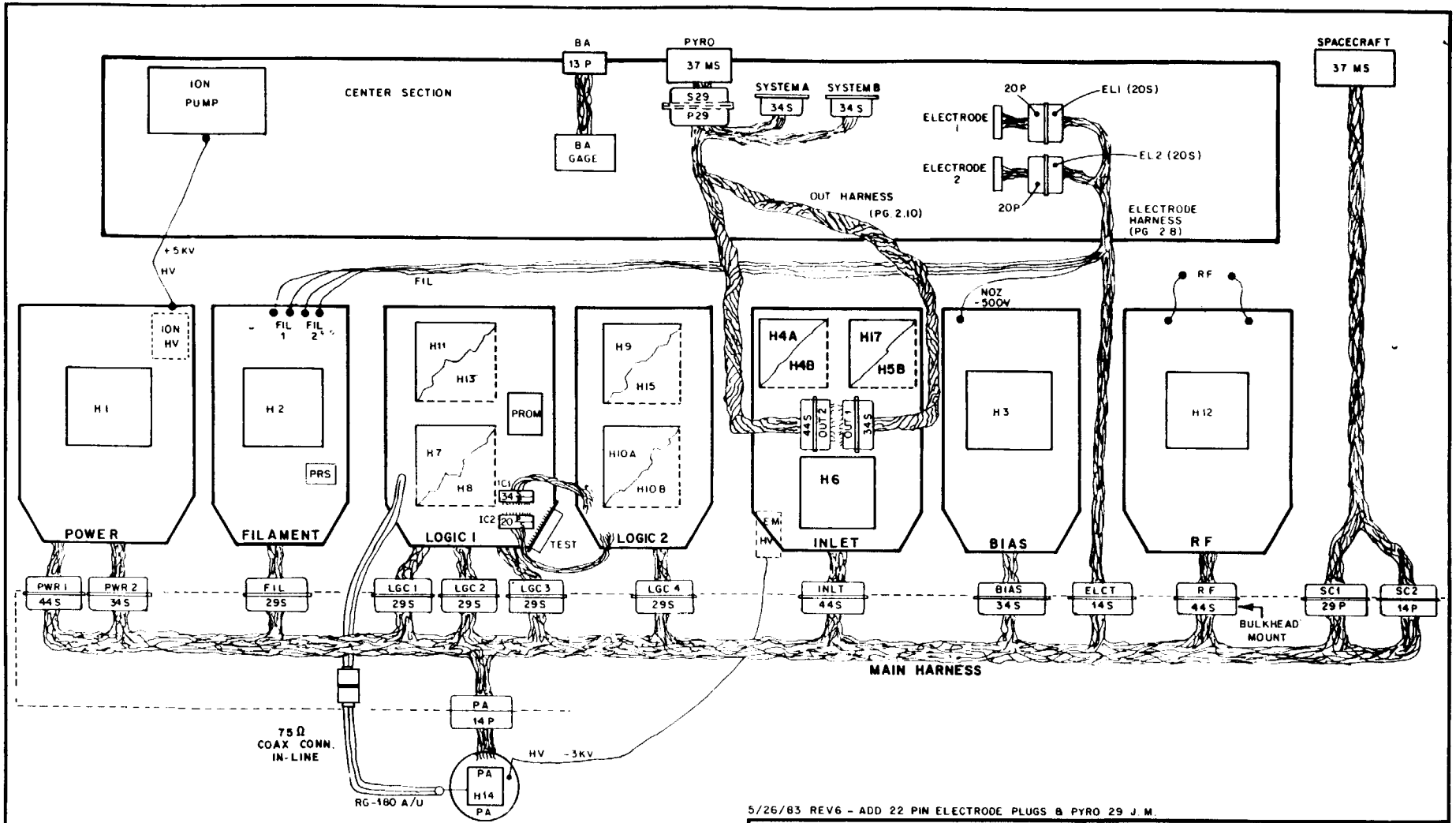
CONTROLLED

APR 16 1984

PRINT

ENGINEER W. PINKUS 3/22/80	DRAFTSMAN KS/BT 4/4/79	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	COMMAND MEMORY CORE WIRING DIAGRAM GALILEO-NMS	1/29/82 12/3/80 7/9/80 6/5/79
	B-E 5196 CONTROLLED	DATE

LAST USED R C D L



5/26/83 REV6 - ADD 22 PIN ELECTRODE PLUGS & PYRO 29 J M.

ENGINEER J MAURER / E PELERO	DRAFTER MFG 8/12/80	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	HARNESS SCHEMATIC REV. 6 GNMS	12/21/83 5/26/83
	B-E 6150C	DATE

LAST USED R C D L

DEC 22 1983

2.1

MS PN	37P SIGNAL	COLOR	20-Mar-81 LINK TO
ED	*3-21-81	*	
1	+PWR	22RED	S/C1: A
2	-PWR	22BRN	S/C1: W
3	PWR ON	PUR	S/C1: C
4	PWR OFF	W/BLK	S/C1: D
5	CMNDENV	GRN	S/C1: E
6	CMNDCLK	WHT	S/C1: F
7	CMNDDAT	GRY	S/C1: H
8	SHLDGND 1	22BLK	S/C1: J
9	MNRFRM1	GRN	S/C1: K
10	MNRFRM2	PUR	S/C1: L
11	32768HZ1	BLU	S/C1: M
12	32768HZ2	WHT	S/C1: N
13	SEQINIT	W/BLK	S/C1: P
14	DATAENV1	BLU	S/C1: R
15	DATAENV2	PUR	S/C1: S
16	DATAOUT	WHT	S/C1: T
17	SHLDGND 2	24BLK	S/C1: U
18	GSE RY MON	PUR	S/C2: J
19	+PW	22RED	S/C1: B
20	-PW	22BRN	S/C1: X
21	PYRO PW A	24RED	S/C1: Y
22	PYRO GND A	24BRN	S/C1: a
23	PYRO PW B	24RED	S/C1: Z
24	PYRO GND B	24BRN	S/C1: b
25	PUMP ON	W/BLK	S/C1: c
26	PUMP OFF	PUR	S/C1: d
27	ON MON	WHT	S/C1: e
28	DATACLK1	GRN	S/C1: f
29	DATACLK2	WHT	S/C1: h
30	CASE GND	24BLK	S/C2: P
31	SIG GND	24BLK	S/C2: A
32	PUMP MON	WHT	S/C2: B
33	GSEENABL1-	PUR	S/C2: D
34	GSE DATA	PUR	S/C2: F
35	GSE ANAMUX	GRN	S/C2: H
36	GSEENABL2-	PUR	S/C2: E
37	+GSE PWR	22RED	S/C2: R

S/C1 PN	29 S SIGNAL	COLOR	20-Mar-81 LINK TO
ED	*3-21-81	*	
A	+PWR	22RED	MS : 1
B	+PW	22RED	MS :19
C	PWR ON	PUR	MS : 3
D	PWR OFF	W/BLK	MS : 4
E	CMNDENV	GRN	MS : 5
F	CMNDCLK	WHT	MS : 6
H	CMNDDAT	GRY	MS : 7
J	SHLDGND 1	22BLK	MS : 8
K	MNRFRM1	GRN	MS : 9
L	MNRFRM2	PUR	MS :10
M	32768HZ1	BLU	MS :11
N	32768HZ2	WHT	MS :12
P	SEQINIT	W/BLK	MS :13
R	DATAENV1	BLU	MS :14
S	DATAENV2	PUR	MS :15
T	DATAOUT	WHT	MS :16
U	SHLDGND 2	24BLK	MS :17
V	* NOT USED		
W	-PWR	22BRN	MS : 2
X	-PW	22BRN	MS :20
Y	PYRO PW A	24RED	MS :21
Z	PYRO PW B	24RED	MS :23
a	PYRO GND A	24BRN	MS :22
b	PYRO GND B	24BRN	MS :24
c	PUMP ON	W/BLK	MS :25
d	PUMP OFF	PUR	MS :26
e	ON MON	WHT	MS :27
f	DATACLK1	GRN	MS :28
h	DATACLK2	WHT	MS :29

S/C2 PN	14 S SIGNAL	COLOR	20-Mar-81 LINK TO
ED	*3-21-81	*	
A	SIG GND	24BLK	MS :31
B	PUMP MON	WHT	MS :32
C	*		
D	GSEENABL1-	PUR	MS :33
E	GSEENABL2-	PUR	MS :36
F	GSE DATA	PUR	MS :34
H	GSE ANAMUX	GRN	MS :35
J	GSE RY MON	PUR	MS :18
K	*		
L	*		
M	*		
N	*		
P	CASE GND	24BLK	MS :30
R	+GSE PWR	22RED	MS :37

ENGINEER J. MAURER		DRAFTSMAN 3/23/81	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN		SPACECRAFT HARNESS GNMS	
		B-E6472	DATE

LAST USED R C D L

[illegible] 22-Jun-82

	SIGNAL	COLOR	LINK TO
[illegible]	*		
A	-PWR	22RED	PWR1: A
B	-PW	22RED	PWR1: B
C	PUMP ON	W/BLK	PWR1:VV
D	PUMP OFF	W/BLK	PWR1:WW
E	[illegible]	PUR	LGC4: M
F	[illegible]	W/BLK	LGC4: N
H	[illegible]	GRY	LGC4: P
J	[illegible] 1	24BLK	S/C1:LG
K	* [illegible]	GRN	LGC4: S
L	MT[illegible]	PUR	LGC4: T
M	[illegible]	PUR	LGC4: U
N	[illegible]	WHT	LGC4: V
P	SE [illegible]	W/BLK	LGC4: R
R	DATAENV1	BLU	LGC1: M
S	DATAENV2	PUR	LGC1: N
T	DATADET	BLU	LGC1: S
U	SECSGND 2	24BLK	S/C1:LG
V	* NOT USED		
W	-PW	22BRN	PWR1: F
X	-PW	22BRN	PWR1: H
Y	PTRN PW A	24RED	IN :WW
Z	PTRN PW B	24RED	IN :ZZ
a	PTRN GND A	24BRN	IN :YY
b	PTRN GND B	24BRN	IN :XX
c	PUMP ON	W/BLK	PWR2:LL
d	PUMP OFF	PUR	PWR2:MM
e	ON MON	WHT	PWR2:FF
f	DATACLKEN	GRN	LGC1: P
h	DATACLKEN	WHT	LGC1: R
.	*		
LG	SECSGND 1	24BLK	S/C1: J
LG	SECSGND 2	24BLK	S/C1: U
.	*		
.	LG=SHD LTG		S/C2: .
.	*		

S/C2 14 P 22-Jun-82

PN	SIGNAL	COLOR	LINK TO
ED	*6-22-82		
A	LGCSHD SC	22BLK	LGC4:K#
B	PUMP MON 1	WHT	PWR2:HH
C	*		
D	GSEENABLE-	PUR	LGC4: W
E	GSEENABLE-	PUR	LGC3: b
F	GSE DATA	GRY	LGC1: T
H	GSE ANAMUX	GRN	LGC3: e
J	RY MON	PUR	PWR1:XX
K	*		
L	*		
M	*		
N	*		
P	CASE GND	24BLK	S/C2:LG
R	+GSE PWR	24RED	PWR1: S
LG	CASE GND	24BLK	S/C2: P
.	*		
.	LG=SHD LTG		S/C1: .
.	**		

PWR1 44 S 22-Jun-82

PN	SIGNAL	COLOR	LINK TO
ED	*6-22-82		
A	+PWR	22RED	S/C1: A
B	+PW	22RED	S/C1: B
C	PUMP VOLTS	GRN	LGC3: Y
D	+28 HEAT A	22RED	IN : K
E	+28 HEAT B	22RED	IN : L
F	-PWR	22BRN	S/C1: W
H	-PW	22BRN	S/C1: X
J	28 GND A	22BRN	IN :LL
K	28 GND B	22BRN	IN :MM
L	+18 PW1 IL	24ORG	IN : E
M	+18 PW2 IL	24ORG	IN : H
N	+18 CORE	ORG	LGC4: B
P	18 GND1 IL	24BRN	IN : C
R	18 GND2 IL	24BRN	IN : D
S	+GSE PWR	24RED	S/C2: R
T	+36 PW RF	24RED	RF : H
U	+29 PW BI	24RED	BIAS: F
V	+29 PW ER	24RED	FIL : b
W	29 GND BI	24BRN	BIAS: E
X	29 GND ER	24BRN	FIL : Y
Y	36 GND RF	24BRN	RF : M
Z	+5 PA	ORG	PA : H
AA	+5 LGC1	ORG	LGC1: E
BB	+5 LGC4	ORG	LGC4: J
CC	+5 ER	ORG	FIL : N
DD	+5V RF	ORG	RF : S
EE	+5V BI	ORG	BIAS: L
FF	-5 LGC1	YEL	LGC1: H
HH	*		
JJ	-5 ER	YEL	FIL : S
KK	-5 RF	YEL	RF : N
LL	5 GND PA	24BRN	PA : J
MM	+15R LGC1	ORG	LGC1: A
NN	+15R LGC4	ORG	LGC4: A
PP	+15R BI	ORG	BIAS: A
RR	+15R RF	ORG	RF : A
SS	+15R PA	ORG	PA : B
TT	+15R ER	ORG	FIL : F
UU	*+15R SPAR		
VV	PWR ON	W/BLK	S/C1: C
WW	PWR OFF	W/BLK	S/C1: D
XX	RY MON	PUR	S/C2: J
YY	TMP PWR	GRY	LGC4: h
ZZ	PW MON	WHT	LGC3: B
.	[] PLUG		
.	*ADD PUMP	VOLTS	
.	*11-25-81		

RF 44 S 22-Jun-82

PN	SIGNAL	COLOR	LINK TO
ED	*11-25-81		
A	+15R RF	ORG	PWR1:RR
B	+10L RF	ORG	PWR2: D
C	5 GND RF	BLK	PWR2: L
D	OSC TMP	W/BLK	LGC3: N
E	OSC AGC	WHT	LGC3: W
F	ANA GND RF	BLK	PWR2: T
H	+36 PW RF	24RED	PWR1: T
J	*		
K	-10R RF	YEL	PWR2: X
L	-15R RF	YEL	PWR2:CC
M	36 GND RF	24BRN	PWR1: Y
N	-5 RF	YEL	PWR1:KK
P	*		
R	*VDCADJ TP	*	
S	+5V RF	ORG	PWR1:DD
T	*VACADJ TP	*	
U	LS0	BLU	LGC2: A
V	LS1	PUR	LGC2: B
W	LS2	GRY	LGC2: C
X	LS3	W/BLK	LGC2: D
Y	LS4	BLU	LGC2: E
Z	LS5	PUR	LGC2: F
AA	LS6	GRY	LGC2: H
BB	LS7	W/BLK	LGC2: J
CC	LS8	BLU	LGC2: K
DD	LS9	PUR	LGC2: L
EE	LS10	GRY	LGC2: M
FF	LS11	GRN	LGC2: N
HH	DCSTR	BLU	LGC2: P
JJ	HIFREQ	BLU	LGC2: U
KK	ZERO	PUR	LGC2: W
LL	TOTAL	GRY	LGC2: X
MM	DESENS	W/BLK	LGC2: Y
NN	MTA0000	GRN	LGC2: a
PP	INTRST	GRY	LGC2: b
RR	RFWEN	GRN	LGC2: d
SS	RFDAT	GRN	LGC2: V
TT	HKSCLK RF	GRY	LGC2: f
UU	*		
VV	*		
WW	*		
XX	*		
YY	+130	RED	BIAS:KK
ZZ	-130	YEL	BIAS:JJ

PWR2 34 S 22-Jun-82

PN	SIGNAL	COLOR	LINK TO
ED	*11-25-81		
A	+10L LGC1	ORG	LGC1: C
B	+10L LGC4	ORG	LGC4: C
C	+10L IL	ORG	IN : J
D	+10L RF	ORG	RF : B
E	+10R LGC1	ORG	LGC1: B
F	+10R ER	ORG	FIL : K
H	+10B LGC1	ORG	LGC1: D
J	+10B LGC4	ORG	LGC4: E
K	SIG GND BI	BLK	BIAS: B
L	5 GND RF	BLK	RF : C
M	SIG GND PA	BLK	PA : A
N	SIGGND1 IL	BLK	IN : A
P	SIGGND2 IL	BLK	IN : B
R	SIG GND ER	BLK	FIL : C
S	ANAGND LGC	BLK	LGC1: J
T	ANA GND RF	BLK	RF : F
U	GND LGC1	BLK	LGC1: F
V	GND LGC4	BLK	LGC4:H#
W	-10R BI	YEL	BIAS: C
X	-10R RF	YEL	RF : K
Y	-10R LGC1	YEL	LGC1: L
Z	-15R LGC1	YEL	LGC1: K
AA	-15R LGC4	YEL	LGC4: L
BB	-15R BI	YEL	BIAS: D
CC	-15R RF	YEL	RF : L
DD	-15R PA	YEL	PA : D
EE	-15R ER	YEL	FIL : V
FF	ON MON	WHT	S/C1: e
HH	PUMP MON 1	WHT	S/C2: B
JJ	PUMP MON 2	W/BLK	LGC3: D
KK	PUMP I	PUR	FIL : M
LL	PUMP ON	W/BLK	S/C1: c
MM	PUMP OFF	PUR	S/C1: d
NN	+29 MON	W/BLK	LGC3: c
.	O PLUG		

CONTROLLED

AUG 8 1983

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ENGINEER J. MAURER 1-30-79	DRAFTSMAN PWP 2-2-79	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	HARNESS PG 1 of 3 GALILEO-NMS B-E5071A CONTROLLED	6/2/83 6/22/82 3/6/8[illegible] DATE

LAST USED R C D L

2.5

LGC1 29 S 22-Jun-82			
PN SIGNAL	COLOR	LINK TO	
ED *3-9-81			
A +15R LGC1	ORG	PWR1:	MM
B +10R LGC1	ORG	PWR2:	E
C +10L LGC1	ORG	PWR2:	A
D +10B LGC1	ORG	PWR2:	H
E +5 LGC1	ORG	PWR1:	AA
F GND LGC1	BLK	PWR2:	U
H -5 LGC1	YEL	PWR1:	FF
J ANAGND LGC	BLK	PWR2:	S
K -15R LGC1	YEL	PWR2:	Z
L -10R LGC1	YEL	PWR2:	Y
M DATAENV1	BLU	S/C1:	R
N DATAENV2	PUR	S/C1:	S
P DATACLK1	GRN	S/C1:	f
R DATACLK2	WHT	S/C1:	h
S DATAOUT	BLU	S/C1:	T
T GSE DATA	GRY	S/C2:	F
U LD0A	GRN	IN :	M
V LD1A	BLU	IN :	N
W LD2A	PUR	IN :	P
X LD3A	GRY	IN :	R
Y LD4A	W/BLK	IN :	S
Z LD5A	GRN	IN :	T
a PYROPLSA1	BLU	IN :	U
b PYROPLSB1	PUR	IN :	V
c PYROPLSA2	GRY	IN :	W
d PYROPLSB2	W/BLK	IN :	X
e PBUSENA	GRN	IN :	Y
f PBUSENB	BLU	IN :	Z
h FIL2FLG	PUR	FIL :	f

LGC2 29 S 02-Jun-83			
PN SIGNAL	COLOR	LINK TO	
ED *6-10-83			
A LS0	BLU	RF :	U
B LS1	PUR	RF :	V
C LS2	GRY	RF :	W
D LS3	W/BLK	RF :	X
E LS4	BLU	RF :	Y
F LS5	PUR	RF :	Z
H LS6	GRY	RF :	AA
J LS7	W/BLK	RF :	BB
K LS8	BLU	RF :	CC
L LS9	PUR	RF :	DD
M LS10	GRY	RF :	EE
N LS11	GRN	RF :	FF
P DCSTR	BLU	RF :	HH
R T2 CNT	GRN	BIAS:	H
S T3 CNT	GRY	BIAS:	J
T BS LENS V	W/BLK	ELCT:	N
U HIFREQ	BLU	RF :	JJ
V RFDAT	GRN	RF :	SS
W ZERO	PUR	RF :	KK
X TOTAL	GRY	RF :	LL
Y DESENS	W/BLK	RF :	MM
Z IFBCTR	BLU	BIAS:	P
a MTA0000	GRN	RF :	NN
b INTRST	GRY	RF :	PP
c ISWEN	W/BLK	IN :	HH
d RFWEN	GRN	RF :	RR
e HKSCLK ILT	BLU	IN :	JJ
f HKSCLK RF	GRY	RF :	TT
h T=29	W/BLK	FIL :	Z

LGC3 29 S 22-Jun-82			
PN SIGNAL	COLOR	LINK TO	
ED *11-25-81			
A SOURCE TMP	GRY	ELCT:	P
B PW MON	WHT	PWR1:	ZZ
C MULTANA	WHT	PA :	F
D PUMP MON 2	W/BLK	PWR2:	JJ
E REP MON	WHT	FIL :	a
F ACC MON	PUR	FIL :	d
H EMIS 1 MON	WHT	FIL :	R
J EMIS 2 MON	W/BLK	FIL :	U
K FIL 1 MON	GRN	FIL :	h
L FIL 2 MON	WHT	FIL :	e
M HV MON	BLU	BIAS:	R
N OSC TMP	W/BLK	RF :	D
P CELL 1 TMP	GRY	IN :	PP
R CELL 2 TMP	W/BLK	IN :	RR
S LEAK 1 TMP	GRY	IN :	SS
T LEAK 2 TMP	W/BLK	IN :	TT
U PLUM 1 TMP	GRY	IN :	UU
V PLUM 2 TMP	GRY	IN :	VV
W OSC AGC	WHT	RF :	E
X T2 BIAS MN	BLU	BIAS:	S
Y PUMP VOLTS	GRN	PWR1:	C
Z SENSOR TMP	GRY	ELCT:	R
a SHELL PRS	GRN	FIL :	L
b GSEENABL2-	PUR	S/C2:	E
c +29 MON	W/BLK	PWR2:	NN
d SDATOUT B	WHT	IN :	KK
e GSE ANAMUX	GRN	S/C2:	H
f INLETWD	BLU	IN :	AA
h -HV CNT	PUR	BIAS:	K
. *CHANGE Y	TO		
. *PUMP VOLT			
. *11-25-81			

LGC4 29 S 15-Mar-83			
PN SIGNAL	COLOR	LINK TO	
ED *11-8-82 *			
A +15R LGC4	ORG	PWR1:	NN
B +18 CORE	ORG	PWR1:	N
C +10L LGC4	ORG	PWR2:	B
D *			
E +10B LGC4	ORG	PWR2:	J
F *			
. *ADDED 4-1 -81			
H# GND LGC4	BLK	PWR2:	V
J +5 LGC4	ORG	PWR1:	BB
K# LGCGND SC	22BLK	S/C2:	A
L -15R LGC4	YEL	PWR2:	AA
M CMNDENV	PUR	S/C1:	E
N CMNDCLK	W/BLK	S/C1:	F
P CMNDDAT	GRY	S/C1:	H
R SEQINIT	W/BLK	S/C1:	P
S MNRFRM1	GRN	S/C1:	K
T MNRFRM2	PUR	S/C1:	L
U 32768HZ1	PUR	S/C1:	M
V 32768HZ2	WHT	S/C1:	N
W GSEENABL1-	PUR	S/C2:	D
X VALVEN-	GRN	IN :	BB
Y *CALEN-	GRY		
Z HTREN-	BLK	IN :	DD
a FMTRST FIL	W/BLK	FIL :	J
b FMTRST ILT	GRN	IN :	FF
c FILSOFF	GRY	FIL :	E
d SEL FIL 2	PUR	FIL :	B
e *			
f *			
h TMP PWR	GRY	PWR1:	YY
# *TIE H&K O HARNS			

CONTROLLED

AUG 3 1983

PRINT

ENGINEER	DRAFTSMAN	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	HARNESS PG 2 of 3 GALILEO – NMS	6/2/83 3/15/83 6/22/82 3/6/81
	B-5072A CONTROLLED	DATE

LAST USED R C D L

IN 44 S 15-Mar-83

PN	SIGNAL	COLOR	LINK TO
ED	*11-8-82	*	
A	SIGGND1 IL	BLK	PWR2: N
B	SIGGND2 IL	BLK	PWR2: P
C	18 GND1 IL	24BRN	PWR1: P
D	18 GND2 IL	24BRN	PWR1: R
E	+18 PW1 IL	24ORG	PWR1: L
F	+6 HEATER	spare	
H	+18 PW2 IL	24ORG	PWR1: M
J	+10L IL	ORG	PWR2: C
K	+28 HEAT A	22RED	PWR1: D
L	+28 HEAT B	22RED	PWR1: E
M	LD0A	GRN	LGC1: U
N	LD1A	BLU	LGC1: V
P	LD2A	PUR	LGC1: W
R	LD3A	GRY	LGC1: X
S	LD4A	W/BLK	LGC1: Y
T	LD5A	GRN	LGC1: Z
U	PYROPLSA1	BLU	LGC1: a
V	PYROPLSB1	PUR	LGC1: b
W	PYROPLSA2	GRY	LGC1: c
X	PYROPLSB2	W/BLK	LGC1: d
Y	PBUSENA	GRN	LGC1: e
Z	PBUSENB	BLU	LGC1: f
AA	INLETWD	BLU	LGC3: f
BB	VALVEN-	GRN	LGC4: X
CC	*CALEN-	GRY	
DD	HTREN-	BLU	LGC4: Z
EE	OVP B1	PUR	FIL : c
FF	FMTRST ILT	GRN	LGC4: b
HH	ISWEN	W/BLK	LGC2: c
JJ	HKSCLK ILT	BLU	LGC2: e
KK	SDATOUT B	WHT	LGC3: d
LL	28 GND A	22BRN	PWR1: J
MM	28 GND B	22BRN	PWR1: K
NN	*		
PP	CELL 1 TMP	GRY	LGC3: P
RR	CELL 2 TMP	W/BLK	LGC3: R
SS	LEAK 1 TMP	GRY	LGC3: S
TT	LEAK 2 TMP	W/BLK	LGC3: T
UU	PLUM 1 TMP	GRY	LGC3: U
VV	PLUM 2 TMP	GRY	LGC3: V
WW	PYRO PW A	24RED	S/C1: Y
XX	PYRO GND B	24BRN	S/C1: b
YY	PYRO GND A	24BRN	S/C1: a
ZZ	PYRO PW B	24RED	S/C1: Z

BIAS 34 S 25-Jan-84

PN	SIGNAL	COLOR	LINK TO
ED	*1-25-84	ADD F	
A	+15R BI	ORG	PWR1:PP
B	SIG GND BI	BLK	PWR2: K
C	-10R BI	YEL	PWR2: W
D	-15R BI	YEL	PWR2:BB
E	29 GND BI	24BRN	PWR1: W
F	+29 PW BI	24RED	PWR1: U
H	T2 CNT	GRN	LGC2: R
J	T3 CNT	GRY	LGC2: S
K	-HV CNT	PUR	LGC3: h
L	+5V BI	ORG	PWR1:EE
M	ER1 +REF	BLU	FIL : D
N	ER2 +REF	ORG	FIL : H
P	IFBCTR	BLU	LGC2: Z
R	HV MON	BLU	LGC3: M
S	T2 BIAS MN	BLU	LGC3: X
T	T3 BIAS MN	GRN	
U	D14	W/BLK	PA : K
V	EA1	GRN	ELCT: B
W	EA2	BLU	ELCT: C
X	IFB	GRY	ELCT: J
Y	DEF	PUR	PA : L
Z	IFA	BLU	ELCT: K
AA	FS1	GRN	ELCT: E
BB	FIL 1 BIAS	BLU	FIL : P
CC	FS2	PUR	ELCT: F
DD	FIL 2 BIAS	ORG	FIL : T
EE	FC1 (FIL1)	W/RED	ELCT: D
FF	E LENS	GRN	PA : P
HH	*		
JJ	-130	YEL	RF :ZZ
KK	+130	RED	RF :YY
LL	IG	GRN	PA : N
MM	FC2 (FIL2)	W/ORG	ELCT: H
NN	MASK	YEL	PA : R

6-2-83 ADD FC1 AND FC2 WIRES CHANGED NAME OF DELTA IFB TO IFBCTR.

1-25-84 CHANGED NAME OF WINDOW TO IG. CHANGED NAME OF IFA TO IFB AND REVERSE.

FIL 29 S 22-Jun-82

PN	SIGNAL	COLOR	LINK TO
ED	*3-9-81		
A	GUN GND	24BLK	ELCT: A
B	SEL FIL 2	PUR	LGC4: d
C	SIG GND ER	BLK	PWR2: R
D	ER1 +REF	BLU	BIAS: M
E	FILSOFF	GRY	LGC4: c
F	+15R ER	ORG	PWR1:TT
H	ER2 +REF	ORG	BIAS: N
J	FMTRST FIL	W/BLK	LGC4: a
K	+10R ER	ORG	PWR2: F
L	SHELL PRS	GRN	LGC3: a
M	PUMP I	PUR	PWR2:KK
N	+5 ER	ORG	PWR1:CC
P	FIL 1 BIAS	BLU	BIAS:BB
R	EMIS 1 MON	WHT	LGC3: H
S	-5 ER	YEL	PWR1:JJ
T	FIL 2 BIAS	ORG	BIAS:DD
U	EMIS 2 MON	W/BLK	LGC3: J
V	-15R ER	YEL	PWR2:EE
W	I ACC	GRY	ELCT: M
X	REP	YEL	ELCT: L
Y	29 GND ER	24BRN	PWR1: X
Z	T-29	W/BLK	LGC2: h
a	REP MON	WHT	LGC3: E
b	+29 PW ER	24RED	PWR1: V
c	OVP B1	PUR	IN :EE
d	ACC MON	PUR	LGC3: F
e	FIL 2 MON	WHT	LGC3: L
f	FIL2FLG	PUR	LGC1: h
h	FIL 1 MON	GRN	LGC3: K

PA 14 S 25-Jan-84

PN	SIGNAL	COLOR	LINK TO
ED	*1-25-84	ADD F	
A	SIG GND PA	BLK	PWR2: M
B	+15R PA	ORG	PWR1:SS
C	*		
D	-15R PA	YEL	PWR2:DD
E	*		
F	MULTANA	WHT	LGC3: C
H	+5 PA	ORG	PWR1: Z
J	5 GND PA	24BRN	PWR1:LL
K	D14	W/BLK	BIAS: U
L	DEF	PUR	BIAS: Y
M	*		
N	IG	GRN	BIAS:LL
P	E LENS	GRN	BIAS:FF
R	MASK	YEL	BIAS:NN
.	*		

1-25-84 CHANGED NAME OF WINDOW TO IG.

X1	PA OUT	COAX
X2	PA SHLD	COAX
#	*SIDE PLUG	

ELCT 14 S 25-Jan-84

PN	SIGNAL	COLOR	LINK TO
ED	*1-25-84	ADD F	
A	GUN GND	24BLK	FIL : A
B	EA1	GRN	BIAS: V
C	EA2	BLU	BIAS: W
D	FC1 (FIL1)	W/RED	BIAS:EE
E	FS1	GRN	BIAS:AA
F	FS2	PUR	BIAS:CC
H	FC2 (FIL2)	W/ORG	BIAS:MM
J	IFB	GRY	BIAS: X
K	IFA	BLU	BIAS: Z
L	REP	YEL	FIL : X
M	I ACC	GRY	FIL : W
N	BS LENS V	W/BLK	LGC2: T
P	SOURCE TMP	GRY	LGC3: A
R	SENSOR TMP	GRY	LGC3: [illegible]

6-2-83 ADD FC1 AND FC2 WIRES

1-25-84 CHANGE NAME OF IFA AND IFB WIRES.

CONTROLLED

ENGINEER	DRAFTSMAN	1/27/84
SPACE PHYSICS RESEARCH LABORATORY	HARNESS Pg 3 OF 3	6/2/83
COLLEGE OF ENGINEERING		3/15/83
UNIVERSITY OF MICHIGAN	GNMS	6/22/82
		3/6/81
ANN ARBOR, MICHIGAN	B-E 6318A CONTROLLED	DATE

LAST USED R C D L

2.7

FIL PCBD 25-Jan-84

PN	SIGNAL	COLOR	LINK TO
ED	*1-25-84		
X1	FIL 1 +A	22RED	EL1 : R
X1	FIL 1 +B	22RED	EL1 : X
X2	FIL 1 -A	22BLK	EL2 : N
X2	FIL 1 -B	22BLK	EL2 : P
X3	FIL 2 +A	22ORG	EL1 : J
X3	FIL 2 +B	22BLK	EL1 : S
X4	FIL 2 -A	22ORG	EL2 : V
X4	FIL 2 -B	22BLK	EL2 : W

BIAS PCBD 25-Jan-84

PN	SIGNAL	COLOR	LINK TO
X1	NOZ	PUR	EL1 : D

EL2 20S 25-Jan-84

PN	SIGNAL	COLOR	LINK TO
ED	*1-25-84		
A	*		
B	*		
C	*		
D	IFB	BLU	ELCT: J
E	FC1(FIL1)	W/BLU	ELCT: D
F	*		
H	*		
J	*		
K	FS1	GRN	ELCT: E
L	REP	YEL	ELCT: L
M	I ACC	GRY	ELCT: M
N	FIL 1 -A	22BLK	FIL :X2
P	FIL 1 -B	22BLK	FIL :X2
Q	*		
R	*		
S	*		
T	HEAT- N.C.		
U	EA2	BLU	ELCT: C
V	FIL 2 -A	22ORG	FIL :X4
W	FIL 2 -B	22BLK	FIL :X4
X	*		
Y	*		
Z	*		
a	*		
b	*		
c	*		
d	*		
e	*		
f	*		
h	*		

EL1 20S 25-Jan-84

PN	SIGNAL	COLOR	LINK TO
ED	*1-25-84		
A	*		
B	*		
C	*		
D	NOZ	PUR	BIAS:X1
E	HEAT+ N.C.		
F	*		
G	*		
H	*		
J	FIL 2 +A	22ORG	FIL :X3
K	FS2	PUR	ELCT: F
L	IFA	GRY	ELCT: K
M	BS LENS V	W/BLK	ELCT: N
N	*		
P	*		
R	FIL 1 +A	22RED	FIL :X1
S	FIL 2 +B	22BLK	FIL :X3
T	EA1	GRN	ELCT: B
U	FC2(FIL 2)	WHT	ELCT: H
V	*		
W	*		
X	FIL 1 +B	22RED	FIL :X1
Y	*		
Z	*		
a	*		
b	*		
c	*		
d	*		
e	*		
f	*		
.	*		
LG	GUN GND	24BLK	ELCT: A

1-25-84 ADDED REDUNDANT FILAMENT WIRES

ELCT 14 P 25-Jan-84

PN	SIGNAL	COLOR	LINK TO
ED	*1-25-84		
A	GUN GND	24BLK	EL1 :LG
B	EA1	GRN	EL1 : T
C	EA2	BLU	EL2 : U
D	FC1(FIL1)	W/BLU	EL2 : E
E	FS1	GRN	EL2 : K
F	FS2	PUR	EL1 : K
H	FC2(FIL 2)	WHT	EL1 : U
J	IFB	BLU	EL2 : D
K	IFA	GRY	EL1 : L
L	REP	YEL	EL2 : L
M	I ACC	GRY	EL2 : M
N	BS LENS V	W/BLK	EL1 : M
P	*		

1-25-84 REVERSE J/K IFA/B

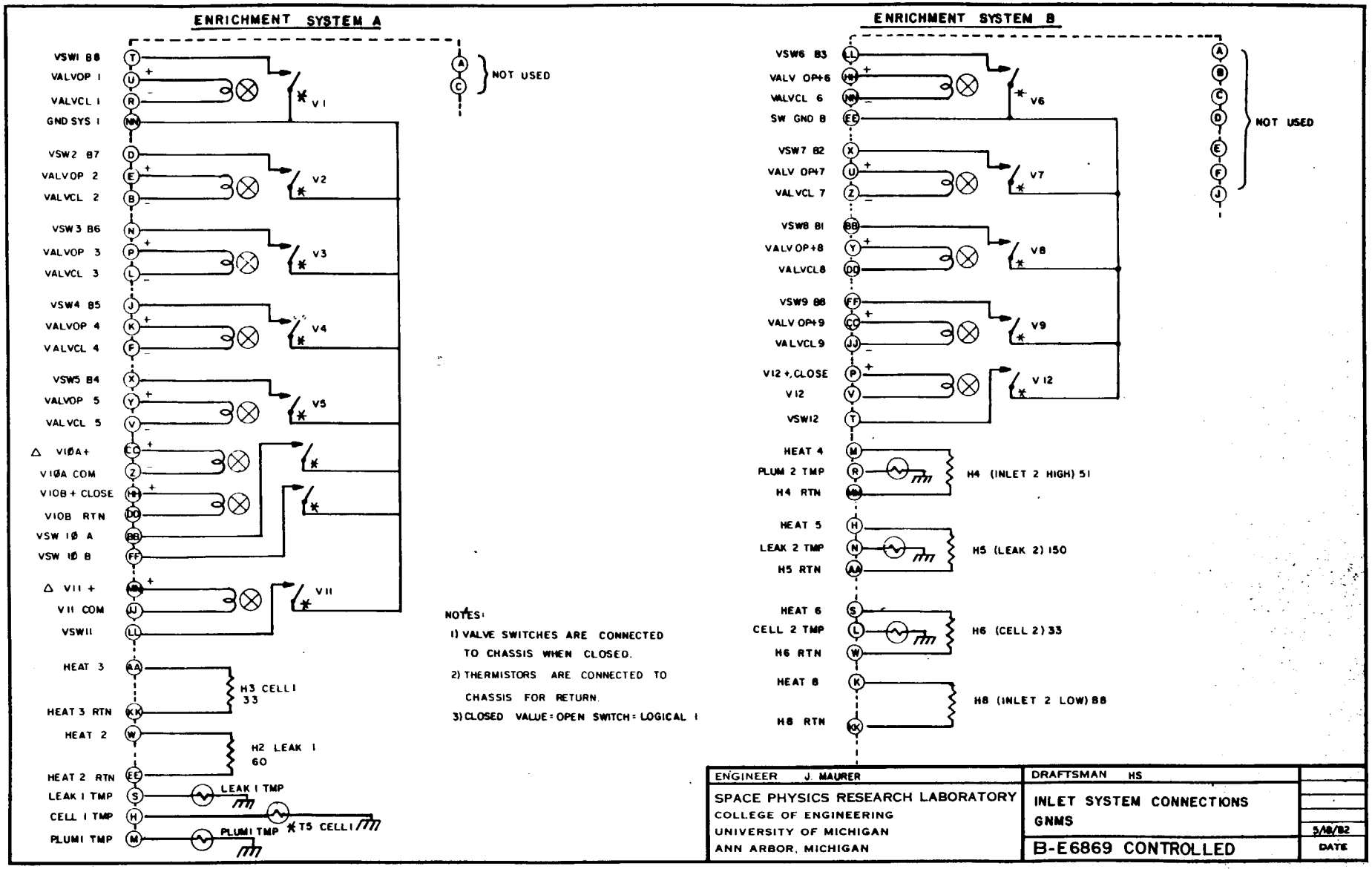
FILE:ELECHR.DOC
DISK:GNMS-WIRE CONNECTIONS

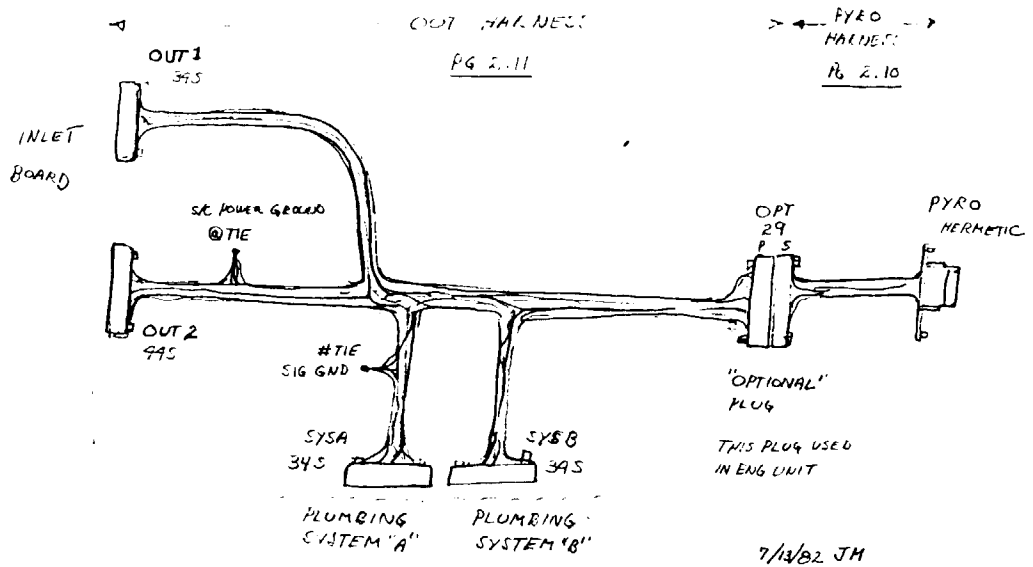
CONTROLLED

PRINT

ENGINEER J.MAURER		DRAFTSMAN 3/23/81	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN		ELECTRODE HARNESS GNMS	1/27/84 6/2/83
		B-E6471A CONTROLLED	DATE

LAST USED R C D L


ENRICHMENT SYSTEM A
VSW1 B8
VALVOP 1
VALVCL 1
GND SYS 1
V1
VSW2 B7
VALVOP 2
VALVCL 2
V2
VSW3 B6
VALVOP 3
VALVCL 3
V3
VSW4 B5
VALVOP 4
VALVCL 4
V4
VSW5 B4
VALVOP 5
VALVCL 5
V5
△ V10A+
V10A COM
V10B + CLOSE
V10B RTN
VSW 10 A
VSW 10 B
△ V11 +
V11 COM
VSW11
V11
HEAT 3
HEAT 3 RTN
H3 CELL 1 33
HEAT 2
HEAT 2 RTN
H2 LEAK 1 60
LEAK 1 TMP
CELL 1 TMP
PLUM1 TMP
LEAK 1 TMP
T5 CELL1
PLUM1 TMP
NOT USED
NOTES:
1) VALVE SWITCHES ARE CONNECTED TO CHASSIS WHEN CLOSED.
2) THERMISTORS ARE CONNECTED TO CHASSIS FOR RETURN.
3) CLOSED VALUE = OPEN SWITCH = LOGICAL 1
ENRICHMENT SYSTEM B
VSW6 B3
VALV OP+6
VALVCL 6
SW GND 8
V6
VSW7 B2
VALV OP+7
VALVCL 7
V7
VSW8 B1
VALVOP+8
VALVCL8
V8
VSW9 B8
VALV OP+9
VALVCL9
V9
V12 +, CLOSE
V12
VSW12
V12
HEAT 4
PLUM 2 TMP
H4 RTN
H4 (INLET 2 HIGH) 51
HEAT 5
LEAK 2 TMP
H5 RTN
H5 (LEAK 2) 150
HEAT 6
CELL 2 TMP
H6 RTN
H6 (CELL 2) 33
HEAT 8
H8 RTN
H8 (INLET 2 LOW) 88
NOT USED
ENGINEER J. MAURER
SPACE PHYSICS RESEARCH LABORATORY
COLLEGE OF ENGINEERING
UNIVERSITY OF MICHIGAN
ANN ARBOR, MICHIGAN
DRAFTSMAN HS
INLET SYSTEM CONNECTIONS
GNMS
B-E6869 CONTROLLED
5/18/82
DATE
LAST USED R C D L



OPT OPTIONAL 12-Jul-82

PN	SIGNAL	COLOR	LINK TO
ED	*5-21-82		
A	/GNDPYRO1A	24BRN	PYRO: 2
B	/GNDPYRO2B	24BRN	PYRO: 8
C	/GNDPYRO3A	24BRN	PYRO:10
D	/GNDPYRO3B	24BRN	PYRO:12
E	PYRO 3A PW	24RED	PYRO: 9
F	PYRO 1B PW	24RED	PYRO: 3
H	PYRO 1A PW	24RED	PYRO: 1
J	PYRO 3B PW	24RED	PYRO:11
K	PYRO 4A PW	24RED	PYRO:13
L	PYRO 2B PW	24RED	PYRO: 7
M	PYRO 2A PW	24RED	PYRO: 5
N	PYRO 4B PW	24RED	PYRO:15
P	*		
R	V1Ø GND	BLK	PYRO:20
S	V1Ø COMMON	24B/W	PYRO:20
T	V1ØA+CLOSE	24R/W	PYRO:21
U	V1ØA +CLSE	PNK	PYRO:22
V	V1ØB +CLSE	PNK	PYRO:23
W	V1ØB+CLOSE	24R/W	PYRO:24
X	V11 GND	BLK	PYRO:25
V	V11 COMMON	24B/W	PYRO:25
Z	V11 +CLOSE	24R/W	PYRO:26
a	V11 +CLSE	PNK	PYRO:27
b	V12 GND	BLK	PYRO:28
c	V12 RTN	24B/W	PYRO:28
d	V12 +CLOSE	24R/W	PYRO:29
e	V12 +CLSE	PNK	PYRO:30
f	*		

PYRO PYRO PLU 12-Jul-82

PN	SIGNAL	COLOR	LINK TO
ED	*5-18-82		
1	PYRO 1A PW	24RED	OPT : H
2	/GNDPYRO1A	24BRN	OPT : A
3	PYRO 1B PW	24RED	OPT : F
4	/GNDPYRO1B	JUMP	
5	PYRO 2A PW	24RED	OPT : M
6	/GNDPYRO2A	JUMP	
7	PYRO 2B PW	24RED	OPT : L
8	/GNDPYRO2B	24BRN	OPT : B
9	PYRO 3A PW	24RED	OPT : E
10	/GNDPYRO3A	24BRN	OPT : C
11	PYRO 3B PW	24RED	OPT : J
12	/GNDPYRO3B	24BRN	OPT : D
13	PYRO 4A PW	24RED	OPT : K
14	/GNDPYRO4A	JUMP	
15	PYRO 4B PW	24RED	OPT : N
16	/GNDPYRO4B	JUMP	
17	*		
18	PYRO SHLD	LUG	
20	V1Ø GND	BLK	OPT : R
20	V1Ø COMMON	24B/W	OPT : S
21	V1ØA+CLOSE	24R/W	OPT : T
22	V1ØA +CLSE	PNK	OPT : U
23	V1ØB +CLSE	PNK	OPT : V
24	V1ØB+CLOSE	24R/W	OPT : W
25	V11 GND	BLK	OPT : X
25	V11 COMMON	24B/W	OPT : V
26	V11 +CLOSE	24R/W	OPT : Z
27	V11 +CLSE	PNK	OPT : a
28	V12 GND	BLK	OPT : b
28	V12 RTN	24B/W	OPT : c
29	V12 +CLOSE	24R/W	OPT : d
30	V12 +CLSE	PNK	OPT : e
31	*		
32	*		
33	*		
34	*		
35	*		
36	*		
37	*		
.	*		
.	/TIE ALL	PYRO	
.	GNDS AT MS	PLUG.	

ENGINEER MAURER	DRAFTSMAN
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	INLET PYRO HARNESS B-E 6897
	7/13/82 DATE

LAST USED R C D L

2.10

OUT1 CONNECTN 12-Jul-82

PN	SIGNAL	COLOR	LINK TO
ED	*5-18-82	*	
A	VALV OP+ 1	PNK	SYSA: U
B	VALVCL1	GRN	SYSA: R
C	VALV OP+ 2	PNK	SYSA: E
D	VALVCL2	BLU	SYSA: B
E	VALV OP+ 3	PNK	SYSA: P
F	VALVCL3	YEL	SYSA: L
H	VALV OP+ 4	PNK	SYSA: K
J	VALVCL4	PUR	SYSA: F
K	VALV OP+ 5	PNK	SYSA: Y
L	VALVCL5	WHT	SYSA: V
M	VALV OP+ 6	PNK	SYSB:HH
N	VALVCL6	YEL	SYSB:NN
P	VALV OP+ 7	PNK	SYSB: U
R	VALVCL7	GRN	SYSB: Z
S	VALV OP+ 8	PNK	SYSB: Y
T	VALVCL8	BLU	SYSB:DD
U	VALV OP+ 9	PNK	SYSB:CC
V	VALVCL9	YEL	SYSB:JJ
W	V10A +CLSE	PNK	OPT : U
X	V10B +CLSE	PNK	OPT : V
Y	V11 +CLSE	PNK	OPT : a
Z	*	*	
AA	V12 +CLSE	PNK	OPT : e
BB	*	*	
CC	V10 GND	24BLK	OPT : R
DD	V11 GND	24BLK	OPT : X
EE	V12 GND	24BLK	OPT : b
FF	VSW12 B3	BLU	SYSB: T
HH	*	*	
JJ	SW GND A	BLK	SYSA:NN
KK	* GND		
LL	CELL 1 TMP	GRY	SYSA: H
MM	CELL 2 TMP	GRY	SYSB: L
NN	*	*	

OUT2 44 12-Jul-82

PN	SIGNAL	COLOR	LINK TO
ED	*5-18-82	*	
A	/GNDPYRO1A	24BRN	OPT : A
B	/GNDPYRO2B	24BRN	OPT : B
C	/GNDPYRO3A	24BRN	OPT : C
D	/GNDPYRO3B	24BRN	OPT : D
E	PYRO 3A PW	24RED	OPT : E
F	PYRO 1B PW	24RED	OPT : F
H	PYRO 1A PW	24RED	OPT : H
J	PYRO 3B PW	24RED	OPT : J
K	PYRO 4A PW	24RED	OPT : K
L	PYRO 2B PW	24RED	OPT : L
M	PYRO 2A PW	24RED	OPT : M
N	PYRO 4B PW	24RED	OPT : N
P	*	*	
R	HEAT 3 RTN	24BLK	SYSA:KK
S	SW GND B	24BLK	SYSB:EE
T	HEAT 6 RTN	24BLK	SYSB: W
U	HEAT 5	22ORG	SYSB: H
V	VSW1 B8	BLU	SYSA: T
W	*	*	
X	VSW7 B2	GRN	SYSB: X
Y	HEAT 6	22ORG	SYSB: S
Z	VSW2 B7	PUR	SYSA: D
AA	HEAT 2	22ORG	SYSA: W
BB	VSW8 B1	YEL	SYSB:BB
CC	*	*	
DD	VSW3 B6	WHT	SYSA: N
EE	HEAT 3	22ORG	SYSA:AA
FF	VSW9 B8	GRN	SYSB:FF
HH	HEAT 8	22ORG	SYSB: K
JJ	VSW4 B5	PUR	SYSA: J
KK	HEAT 4	22ORG	SYSB: M
LL	VSW10A B7	YEL	SYSA:BB
MM	VSW10B B6	WHT	SYSA:FF
NN	VSW5 B4	BLU	SYSA: X
PP	S/C GND 1	BLK	@TIE: @
RR	VSW11 B5	GRN	SYSA:LL
SS	S/C GND 2	BLK	@TIE: @
TT	VSW6 B3	YEL	SYSB:LL
UU	S/C GND 3	BLK	@TIE: @
VV	* B4		
WW	LEAK 2 TMP	GRY	SYSB: N
XX	PLUM 2 TMP	GRY	SYSB: R
YY	LEAK 1 TMP	GRY	SYSA: S
ZZ	PLUM 1 TMP	GRY	SYSA: M

SYSA 34PIN 12-Jul-82

PN	SIGNAL	COLOR	LINK TO
ED	*5-18-82	*	
A	*	*	
B	VALVCL2	BLU	OUT1: D
C	*	*	
D	VSW2 B7	PUR	OUT2: Z
E	VALV OP+ 2	PNK	OUT1: C
F	VALVCL4	PUR	OUT1: J
H	CELL 1 TMP	GRY	OUT1:LL
J	VSW4 B5	PUR	OUT2:JJ
K	VALV OP+ 4	PNK	OUT1: H
L	VALVCL3	YEL	OUT1: F
M	PLUM 1 TMP	GRY	OUT2:ZZ
N	VSW3 B6	WHT	OUT2:DD
P	VALV OP+ 3	PNK	OUT1: E
R	VALVCL1	GRN	OUT1: B
S	LEAK 1 TMP	GRY	OUT2:YY
T	VSW1 B8	BLU	OUT2: V
U	VALV OP+ 1	PNK	OUT1: A
V	VALVCL5	WHT	OUT1: L
W	HEAT 2	22ORG	OUT2:AA
X	VSW5 B4	BLU	OUT2:NN
Y	VALV OP+ 5	PNK	OUT1: K
Z	V10A RTN	BLK	#TIE: #
AA	HEAT 3	22ORG	OUT2:EE
BB	VSW10A B7	YEL	OUT2:LL
CC	V10A+CLOSE	24R/W	OPT : T
DD	V10B RTN	BLK	#TIE: #
EE	HEAT 2 RTN	BLK	@TIE: @
FF	VSW10B B6	WHT	OUT2:MM
HH	V10B+CLOSE	24R/W	OPT : W
JJ	V11 RTN	BLK	#TIE: #
KK	HEAT 3 RTN	24BLK	OUT2: R
LL	VSW11 B5	GRN	OUT2:RR
MM	V11 +CLOSE	24R/W	OPT : Z
NN	SW GND A	BLK	OUT1:JJ

SYSB 34PIN 12-Jul-82

PN	SIGNAL	COLOR	LINK TO
ED	*5-18-82	*	
A	*	*	
B	*	*	
C	*	*	
D	*	*	
E	*	*	
F	*	*	
H	HEAT 5	22ORG	OUT2: U
J	*	*	
K	HEAT 8	22ORG	OUT2:HH
L	CELL 2 TMP	GRY	OUT1:MM
M	HEAT 4	22ORG	OUT2:KK
N	LEAK 2 TMP	GRY	OUT2:WW
P	V12 +CLOSE	24R/W	OPT : d
R	PLUM 2 TMP	GRY	OUT2:XX
S	HEAT 6	22ORG	OUT2: Y
T	VSW12 B3	BLU	OUT1:FF
U	VALV OP+ 7	PNK	OUT1: P
V	V12 RTN	24B/W	OPT : c
W	HEAT 6 RTN	24BLK	OUT2: T
X	VSW7 B2	GRN	OUT2: X
Y	VALV OP+ 8	PNK	OUT1: S
Z	VALVCL7	GRN	OUT1: R
AA	HEAT 5 RTN	BLK	@TIE: @
BB	VSW8 B1	YEL	OUT2:BB
CC	VALV OP+ 9	PNK	OUT1: U
DD	VALVCL8	BLU	OUT1: T
EE	SW GND B	24BLK	OUT2: S
FF	VSW9 B8	GRN	OUT2:FF
HH	VALV OP+ 6	PNK	OUT1: M
JJ	VALVCL9	YEL	OUT1: V
KK	HEAT 8 RTN	BLK	@TIE: @
LL	VSW6 B3	YEL	OUT2:TT
MM	HEAT 4 RTN	BLK	@TIE: @
NN	VALVCL6	YEL	OUT1: N

OPT OPTIONAL 12-Jul-82

PN	SIGNAL	COLOR	LINK TO
ED	*5-21-82		
A	/GNDPYRO1A	24BRN	OUT2: A
B	/GNDPYRO2B	24BRN	OUT2: B
C	/GNDPYRO3A	24BRN	OUT2: C
D	/GNDPYRO3B	24BRN	OUT2: D
E	PYRO 3A PW	24RED	OUT2: E
F	PYRO 1B PW	24RED	OUT2: F
H	PYRO 1A PW	24RED	OUT2: H
J	PYRO 3B PW	24RED	OUT2: J
K	PYRO 4A PW	24RED	OUT2: K
L	PYRO 2B PW	24RED	OUT2: L
M	PYRO 2A PW	24RED	OUT2: M
N	PYRO 4B PW	24RED	OUT2: N
P	*	*	
R	V10 GND	24BLK	OUT1:CC
S	V10 COMMON	24B/W	#TIE: #
T	V10A+CLOSE	24R/W	SYSA:CC
U	V10A +CLSE	PNK	OUT1: W
V	V10B +CLSE	PNK	OUT1: X
W	V10B+CLOSE	24R/W	SYSA:HH
X	V11 GND	24BLK	OUT1:DD
V	V11 COMMON	24B/W	#TIE: #
Z	V11 +CLOSE	24R/W	SYSA:MM
a	V11 +CLSE	PNK	OUT1: Y
b	V12 GND	24BLK	OUT1:EE
c	V12 RTN	24B/W	SYSB: V
d	V12 +CLOSE	24R/W	SYSB: P
e	V12 +CLSE	PNK	OUT1:AA
f	*	*	

#TIE SPLICE 12-Jul-82

PN	SIGNAL	COLOR	LINK TO
ED	*5-18-82	*	
#	V10A RTN	BLK	SYSA: Z
#	V10B RTN	BLK	SYSA:DD
#	V11 RTN	BLK	SYSA:JJ
#	V10 COMMON	24B/W	OPT : S
#	V11 COMMON	24B/W	OPT : V

@TIE SPLICE 12-Jul-82

PN	SIGNAL	COLOR	LINK TO
ED	*5-18-82	*	
@	HEAT 4 RTN	BLK	SYSB:MM
@	HEAT 5 RTN	BLK	SYSB:AA
@	HEAT 8 RTN	BLK	SYSB:KK
@	HEAT 2 RTN	BLK	SYSA:EE
@	S/C GND 1	BLK	OUT2:PP
@	S/C GND 2	BLK	OUT2:SS
@	S/C GND 3	BLK	OUT2:UU

FILE: OUTHR.PIN

ENGINEER J.MAURER	DRAFTSPERSON MFG 11/15/79		
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	INLET OUTPUT HARNESS GNMS		
	B-E5806	DATE	

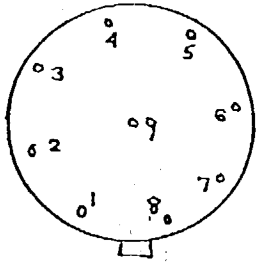
LAST USED R C D L

2.11

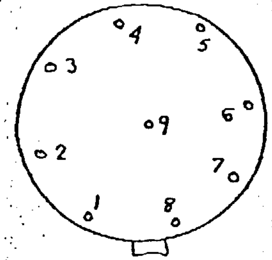
Galileo Sensor Pin Assignments 4/13/80

Hanson D. Powers Jr.

ATTN:
T. MAURER



VIEWED
FROM
OUTSIDE



Header #1

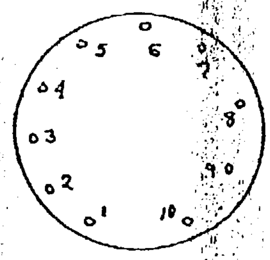
Fil 1… 1 Filament 1
2 Thermocouple
1.7K 3 electron accelerator 1
4 split lens IFA
5 Nozzle
*6 Repeller heater
7 Focus cone 2 FS2
8 Filament 2
9 Beam Shaping Lens

Header #2

1 Filament 2
2 electron accelerator 2
*3 Repeller heater
4 Repeller
5 Split lens IFB
6 Focus cone 1 FS1
7 Thermocouple
8 Filament 1
9 Ion accelerator

Multiplier Header

1 High Voltage (Cone)
2 Mask
3 Inlet aperture (Window)
4 Case ground
5 Deflector



6 Anode
7 Einzel Lens
8 N.C.
9 Interceptor Grid
10 Shield (E.M. ground)

Galileo NMS[?] 12 July 1979

Symbol	Electrode	Typical Bias Voltages Fil 1 on	Fil 2 on
Fil 1…	Filament 1	-70.0	0
Shield	Shield 1	-87.0	-17
EA1	Electron Accellerator 1	-40.0	+30.0
Ion Rep	Ion Repeller	+1.0	+1.0
Ion Acc	Ion Accelerator	-1.0	-1.0
EA2	Electron Accellerator 2	+30.0	-40.0
Shield 2	Shield 2	-20	-90[?]
Fil 2…	Filament 2	0	-70
IFA	Ion Focus A	-32.0
IFB	Ion Focus B	-31.0
Noz	Nozzle	-500
BSL	Beam Shaping Lens	-4.50
QB	Quadrupole Bias	-4.00
Mask	Mask	-250.0
Ein	Einzel Lens	-75.0
Int Grid	Interceptor Grid	Gnd
Wind	Window	-77.0
Def	Deflector	-26.0
Mult Cone	Multiplier Cone	-2.3KV
Anode	Multiplier Anode	6…[?] Elec/nA

DC Filament Power 1.5V/1.5A

ER J MAURER | DRAFTSMAN
PHYSICS RESEARCH LABORATORY | SENSOR PIN ASSIGNMENTS
…E OF ENGINEERING | GNMS
…SITY OF MICHIGAN |
…RBOR, MICHIGAN | B-E 5622

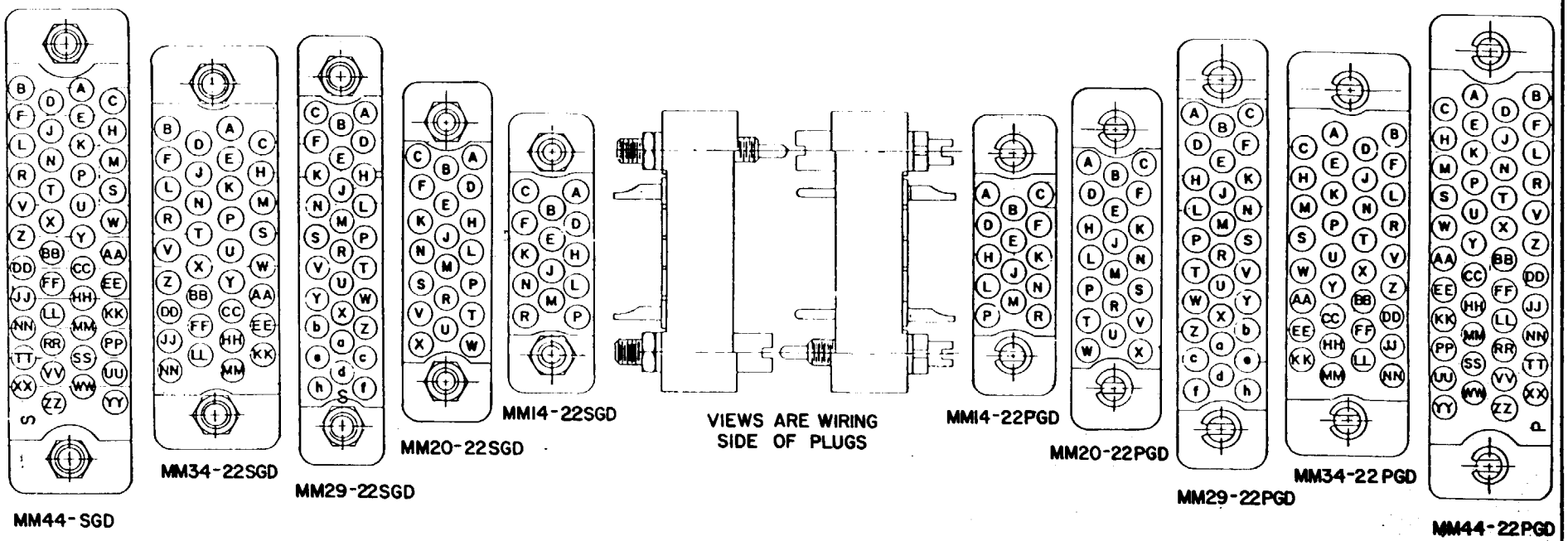
10/11/79
DATE

R C D L

2.12

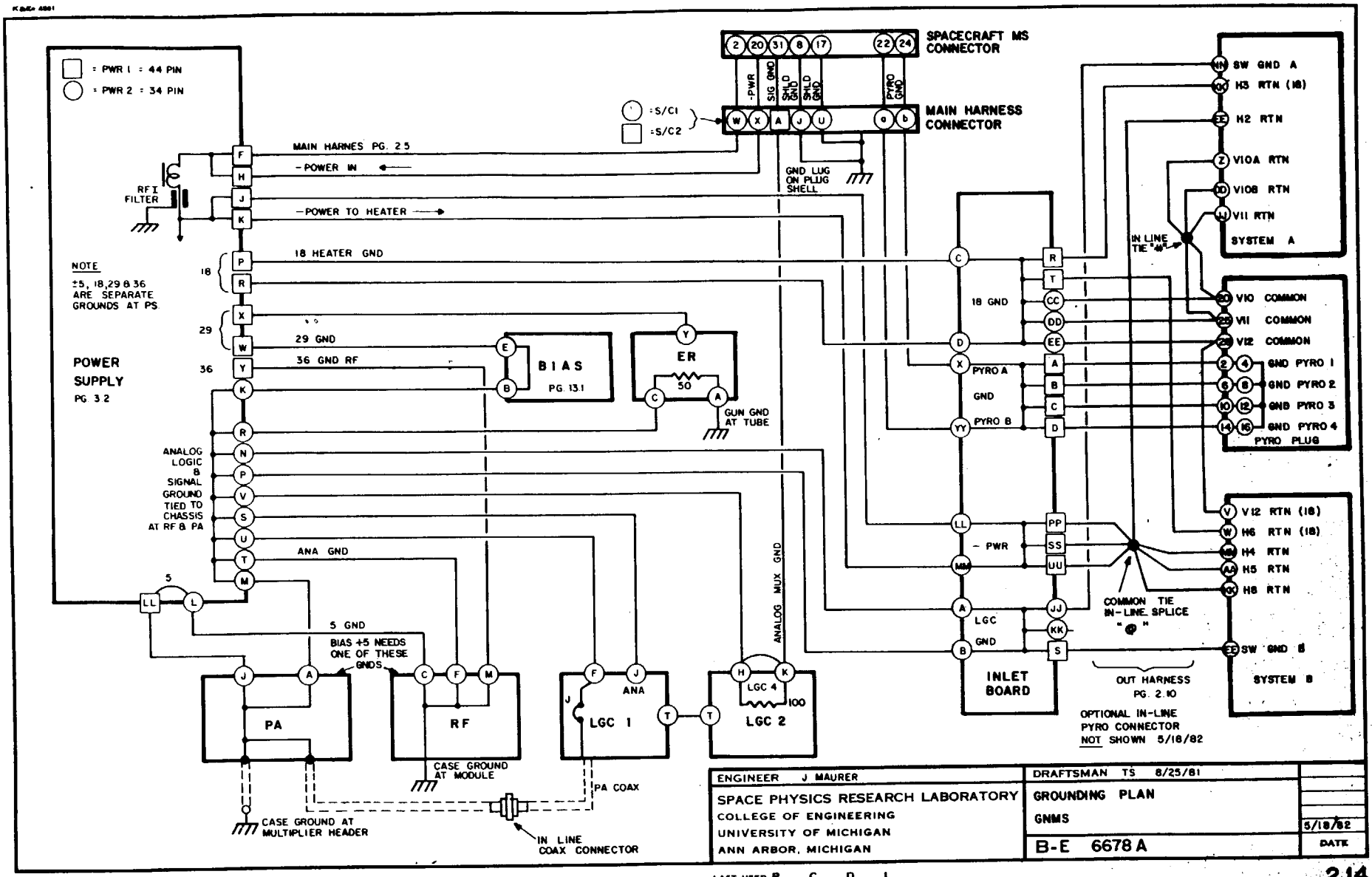
SOCKETS

PLUGS



ENGINEER J. MAURER / M. HUETTEMAN	DRAFTSMAN B.T. 9/23/80	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	CONTINENTAL CONNECTOR LAYOUT GNMS	9/81/81 9/23/80 DATE
	B-E6280	

LAST USED R C D L

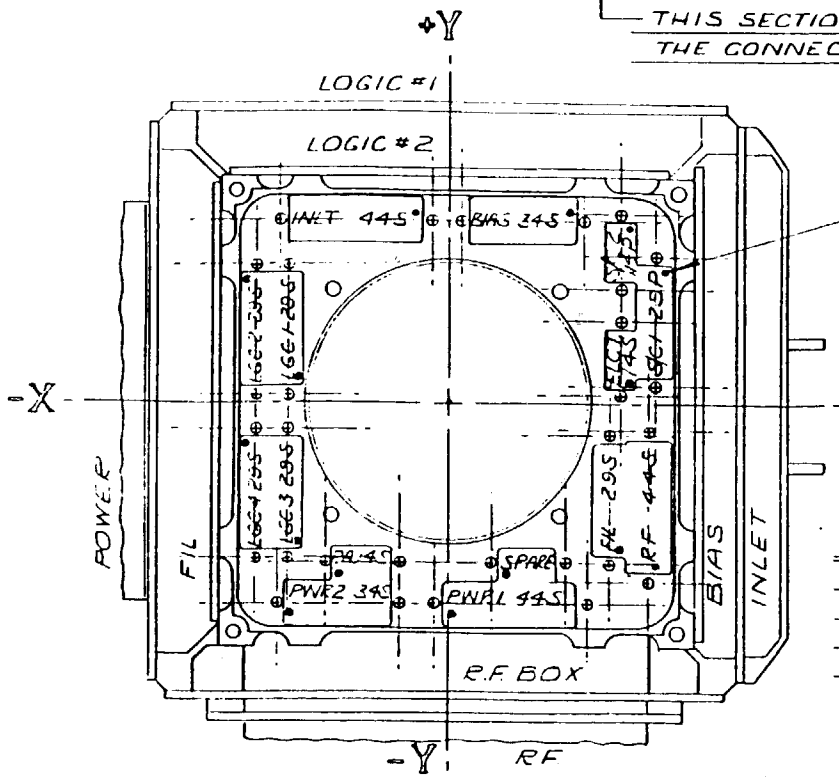


ENGINEER J MAURER	DRAFTSMAN TS 8/25/81	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	GROUNDING PLAN GNMS	5/18/82 DATE
	B-E 6678 A	

LAST USED R C D L

SECTION C C

THIS SECTION DOES NOT SHOW THE CONNECTOR BULKHEAD

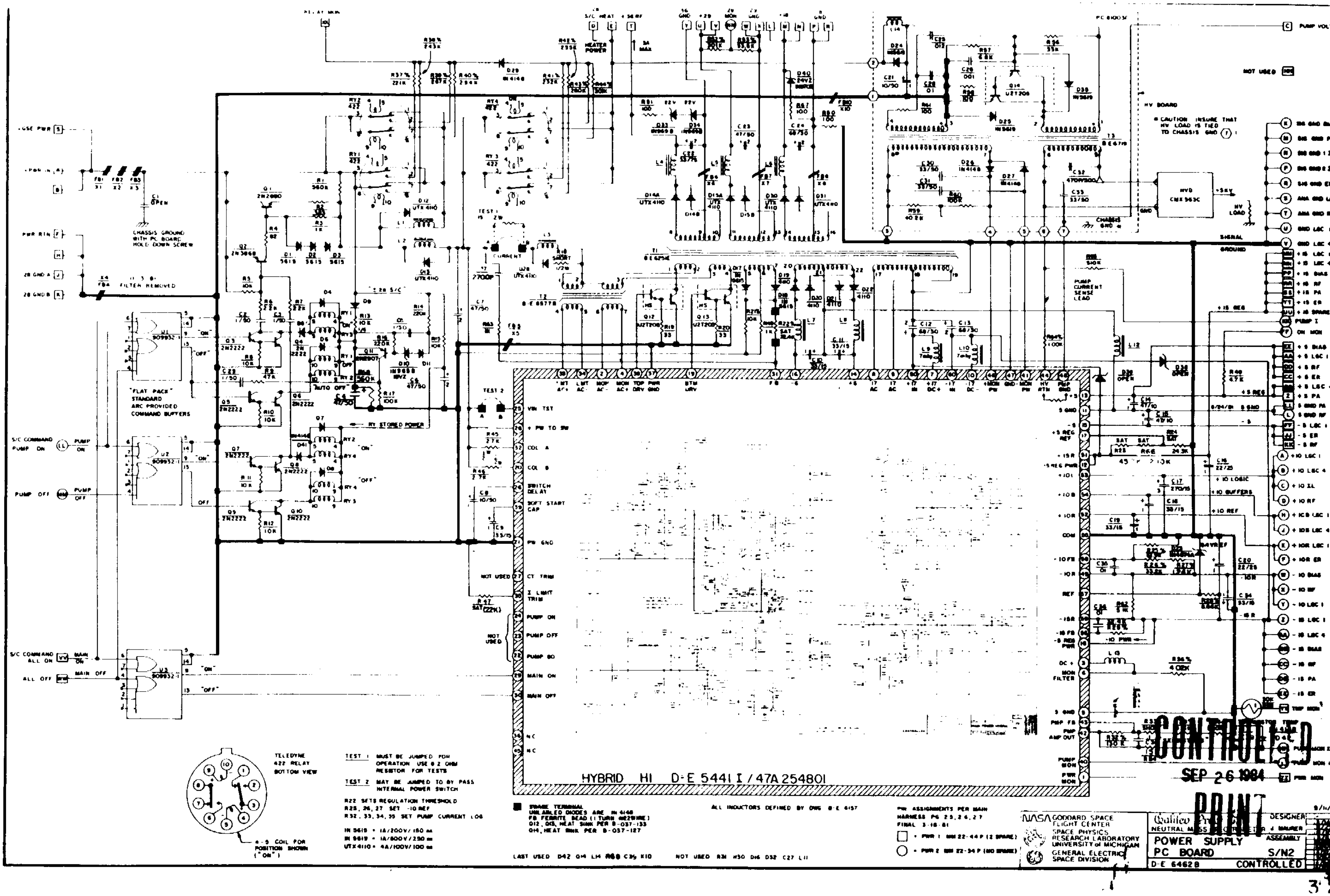


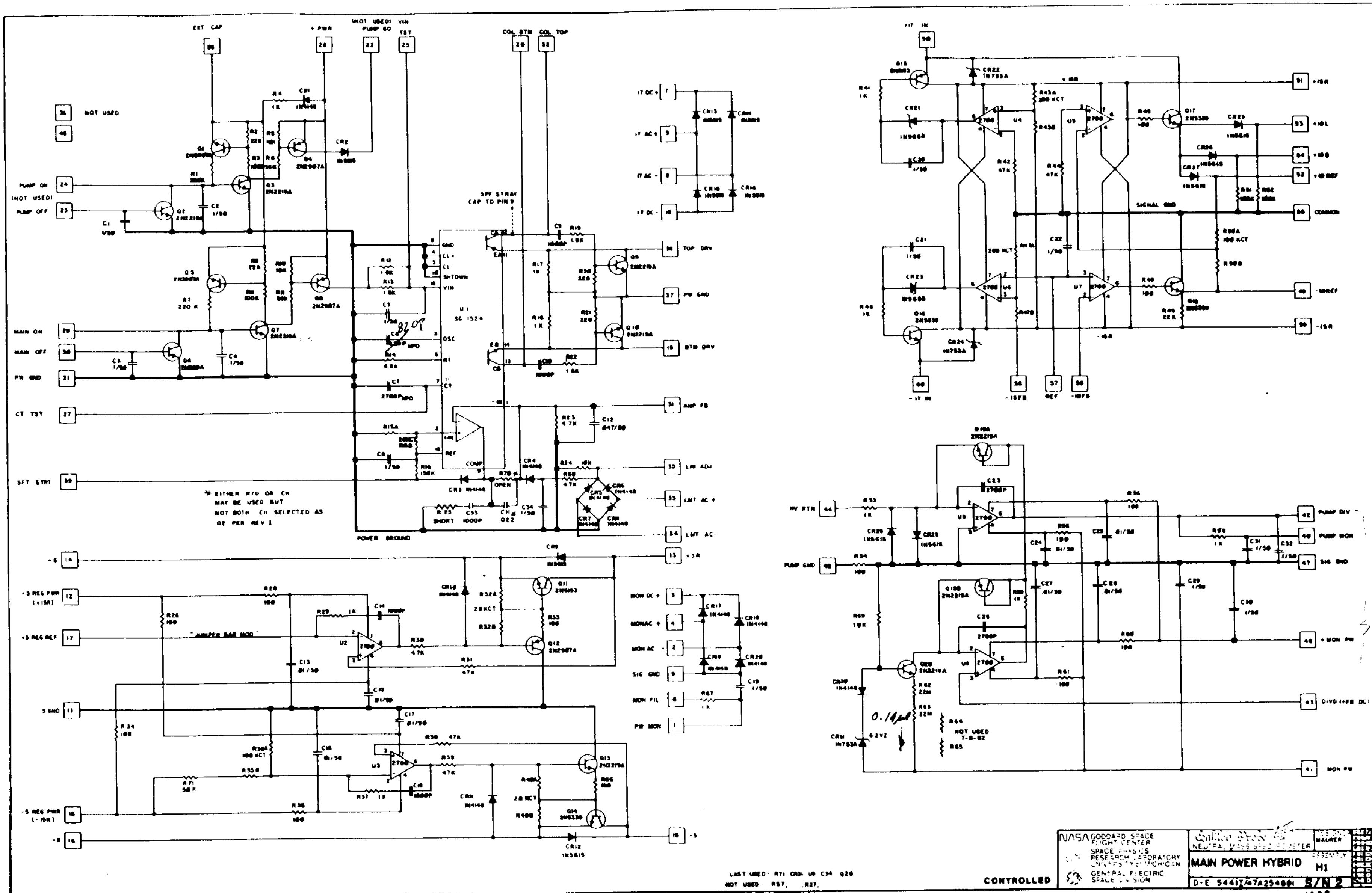
(1) PIN "A" (TYPICAL 15 PLACES AS SHOWN.)

(2) END VIEW
CONNECTOR BKT AS SEEN FROM DOME END OF INSTRUMENT HOUSING.

ENGINEER MAURER	DRAFTSMAN G. WIGGINS 3/13/81	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	MAIN HARNESS CONNECTOR LOC. NEUTRAL MASS SPECTROMETER GALILEO	
	B-E6466	DATE

LAST USED R C D L


HYBRID HI D-E 5441 I / 47A 254801
TELEDYNE 422 RELAY BOTTOM VIEW
TEST 1 MUST BE JUMPED FOR OPERATION. USE 0.2 OHM RESISTOR FOR TESTS
TEST 2 MAY BE JUMPED TO BY PASS INTERNAL POWER SWITCH
R22 SETS REGULATION THRESHOLD
R25, 26, 27 SET -10 REF
R32, 33, 34, 35 SET PUMP CURRENT LOG
IN 5619 = 1A/200V/150 ns
IN 5619 = 1A/800V/250 ns
UTX4110 = 4A/100V/100 ns
ALL INDUCTORS DEFINED BY DWG D-E 6157
LAST USED D42 Q14 L14 R68 C35 K10
NOT USED R31 R50 D16 D32 C27 L11
NASA GODDARD SPACE FLIGHT CENTER
SPACE PHYSICS RESEARCH LABORATORY UNIVERSITY of MICHIGAN
GENERAL ELECTRIC SPACE DIVISION
Galileo
POWER SUPPLY
PC BOARD
S/N2
D-E 6462B
CONTROLLED
SEP 26 1984
PRINT


NOT USED
EXT CAP
+ PWR
(NOT USED) VIN PUMP GO
TST
COL BTM
COL TOP
PUMP ON
(NOT USED)
PUMP OFF
MAIN ON
MAIN OFF
PW GND
CT TST
SFT STRT
POWER GROUND
SPF STRAY CAP TO PIN 9
U1 SG 1524
TOP DRV
PW GND
BTM DRV
AMP FB
LIM ADJ
LMT AC +
LMT AC -
+5R
* EITHER R70 OR CH MAY BE USED BUT NOT BOTH CH SELECTED AS 02 PER REV 1
+5 REG PWR (+15R)
+5 REG REF
"JUMPER BAR MOD"
S GND
-5 REG PWR (-15R)
MON DC +
MONAC +
MON AC -
SIG GND
MON FIL
PW MON
+17 IN
SIGNAL GND
COMMON
-17 IN
-15FB
REF
-10FB
HV RTN
PUMP GND
PUMP DIV
PUMP MON
SIG GND
+ MON PW
DIVD (+FB DC)
- MON PW
NOT USED 7-8-82
LAST USED R71 CR31 U8 C34 Q20
NOT USED R57, R27,

CONTROLLED

NASA GODDARD SPACE FLIGHT CENTER

SPACE PHYSICS RESEARCH LABORATORY UNIVERSITY OF MICHIGAN

GENERAL ELECTRIC SPACE DIVISION

MAIN POWER HYBRID H1

D-E 5441T/47A254601 S/N 2

SEP 9 1982

15.2

J. Maurer/dn 1/4/82

GRMS MAIN POWER SUPPLY INDUCTORS

measured 7/1/81 PF

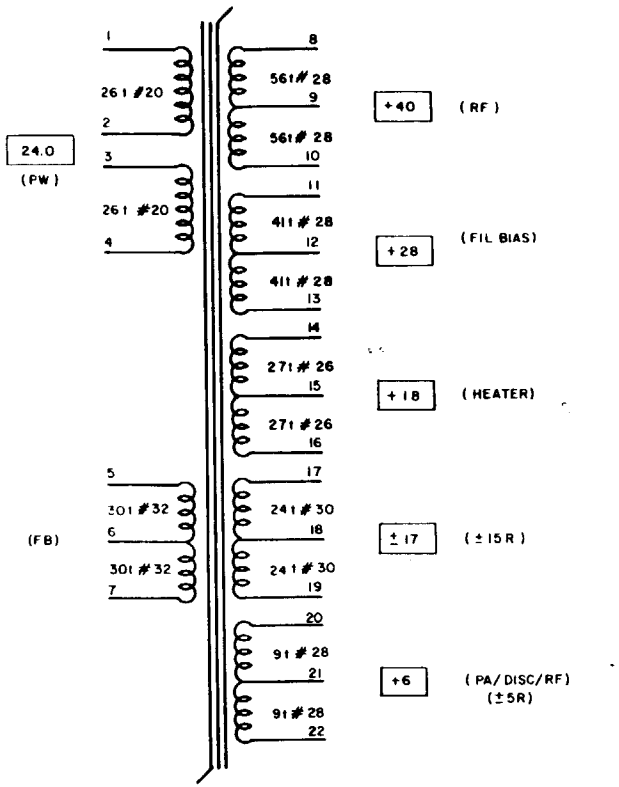
Item	Use	Dia/u(1)	Arnold P/N	Winding	L (2)	A (3)	R	Z (4)	Dia.	H (5)	ℓ (6)	L Meas.	R Meas.	Item
L1	Rx Input	.65/250	369144	27t #22/26"	105 uhy	1.6	.035	45	.66	13	4.20	100.4uhy	0.042	L1
L2	Cap Input	.68/173	194123	54t #22/65"	358 uhy	1.5	.084	160	.72	24	4.21	340.5uhy	0.078	L2
L3	Sat. limit	.65/250	369144	22t #22/21"	70 uhy	2.0	.03	3.0	.68	13	4.20	67uhy	0.036	L3
L4	+36 filter	.68/175	194123	162t #24/173"	3.2 mhy	.5A	.38	1.5k	.80	24	4.21	3.15mhy	0.377	L4
L5	+29 filter	.68/175	194123	162t #24/173"	3.2 mhy	.5A	.38	1.5k	.80	24	4.21	3.07mhy	0.365	L5
L6	+18 filter	.68/175	194123	162t #24/173"	3.2 mhy	.5A	.38	1.5k	.80	24	4.21	3.23mhy	0.372	L6
L7	+6 filter	.38/250	365132	47t #28/30"	290 uhy	.5A	.17	90	.40	13	2.26	320.6uhy	0.182	L7
L8	-6 filter	.38/250	365132	47t #28/30"	290 uhy	.5A	.17	90	.40	13	2.26	330.5uhy	0.182	L8
L9	+17 filter	.38/250	365132	225t#32/125"	7 mhy					13	2.26	7.17mhy	1.95	L9
L10	-17 filter	.38/250	365132	225t#32/125"	7 mhy					13	2.26	7.17mhy	1.95	L10
L11	NOT USED													
L12	5 GND	.26/300	384130	40t #30/20"	220 uhy	.28A	.20	100	.28	10	1.45	220u	0.185	L12
L13	PWR MON	.26/300	384130	110t #36	1.9 mhy					10		1.95mhy	1.92	L13
L14	Pump In	.38/250	365132	47t #28/30"	290 uhy	.5A	.17	90	.40	13	2.26	320.6u	0.173	L14

NOTES:
(1) O.D. of core in inches/permeability.
(2) The zero current inductance.
(3) Current for a 25% decrease in inductance.
(4) Impedance at 70 Khz.
(5) Flux density in Oersteds for 75% inductance.
(6) Effective core length in cm.

$$H = \frac{.4\pi NI}{\ell} \qquad I = \frac{H\ell}{.4\pi N}$$

ENGINEER J MAURER	DRAFTSMAN TS 7/1/81	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	MAIN SUPPLY INDUCTORS GALILEO – NMS	9/22/81 7/6/81
	B-E 6157A CONTROLLED	DATE

LAST USED R C D L



CORE : ARNOLD 6T5502 - H1

857 w/1 PRI @ 24V IN 85 % ON TIME.

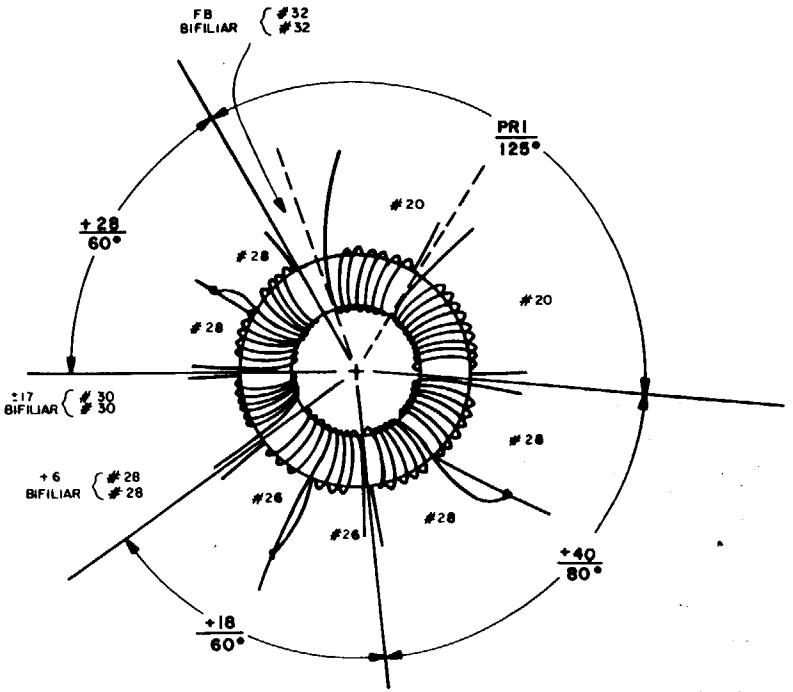
$$f_{o\ MIN} = \frac{E \times 10^8}{4NAB} = \frac{30.8 \times 10^8}{4 \times 27 \times .0313 \times 7000 \times 6.45} = 20.1\ \text{KHZ (WORST CASE)}$$

$$= \frac{27 \times 10^8}{4 \times 27 \times .0313 \times 7000 \times 6.45} = 17.7\ \text{KHZ (TYPICAL)}$$

$\propto$ 40% MARGIN

LOG

REV A BREADBOARD
REV B GSFC BREADBOARD
REV C ENG. 11/3/81 MOD. TO 'D'
REV D ENG. 11/13/81
REV E ENG. 11/23/81 4μ DEAD TIME & SMALLER WIRE.



SECTION WIND APPROXIMATELY AS SHOWN.
BANK WIND AS MUCH AS POSSIBLE IN SECTION.
DO NOT OVERLAP SECTIONS.
PRIMARY HALVES SHOULD BE CLOSE AND SYMETRIC, BUT NOT OVERLAPPED.

ENGINEER J MAURER 5/28/81	DRAFTSMAN TS 5/28/81
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	MAIN XFMR T1 GALILEO NMS B-E 6251E CONTROLLED
	5/31/82 DATE

LAST USED R C D L

3.10(E

ELECTRON MULTIPLIER HIGH VOLTAGE SUPPLY

1. INPUT - PRIMARY REGULATED AND PROGRAMMED

2. TYPE - PARALLEL MULTIPLIER

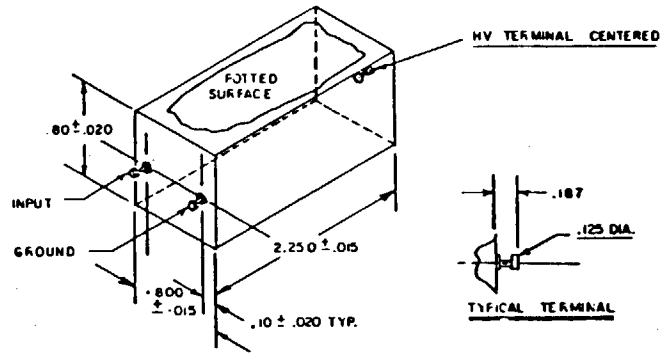
3. STAGES - 4 STAGES

4. INPUT
   - SINE INPUT
   - 32 KHZ +/- 3 KHZ
   - 875V p-p NORMAL INPUT
   - 1750V p-p MAXIMUM TEST INPUT

5. OUTPUT
   - NEGATIVE
   - 3.5KV @ 60 ua: NORMAL
   - 7.0KV @ 0 ua: MAXIMUM TEST
   - 2% REGULATION W/ R-C OUTPUT FILTER
   - .5V MAXIMUM p-p RIPPLE

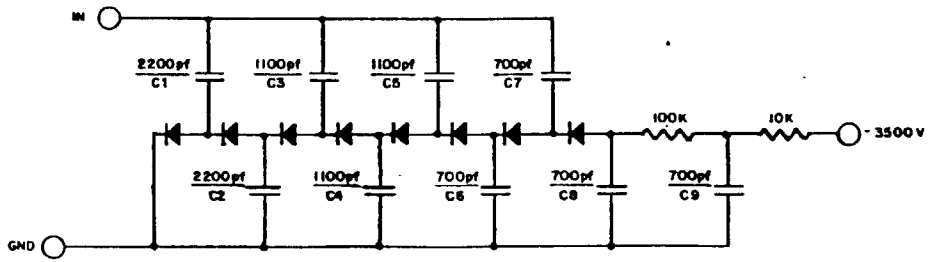
6. ENVIRONMENTAL
   - -20 TO +60 DEG C. OPERATING
   - -30 TO +60 DEG C. STORAGE
   - +30PSIA TO HARD VACUUM

7. MISC.
   - 100K R-C OUTPUT FILTER
   - 10K OUTPUT ARC CURRENT LIMIT
   - SPRL 79/112 R&QA SPECIFICATION
   - POTTING: E&C 285OFT BLACK W/CAT11
   - WITH HIGH TEMP BAKE.
   - WEIGHT: 61 GRAMS
   - MFG: HIGH VOLTAGE DEVICES. INC.



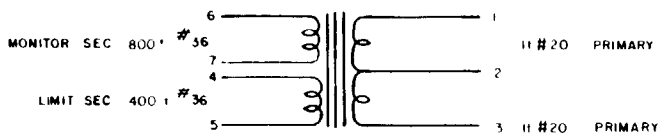
WT. = 61 GRAMS

CMX 564C



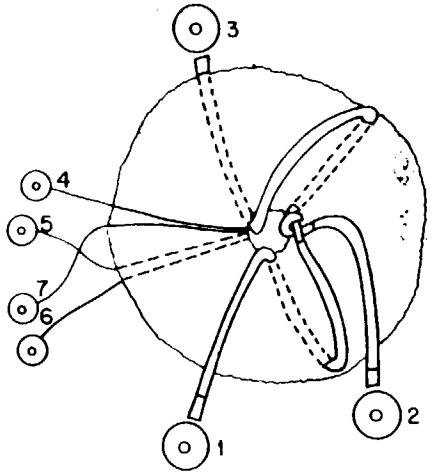
ENGINEER J. STEVENS	DRAFTSMAN MRN 5/11/81	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	VOLTAGE MULTIPLIER GNMS	6/16/83 5/11/81
	B-E5342 A CONTROLLED	DATE

LAST USED R C D L



CORE ARNOLD 390134 2 500/300 MPP

WINDING: BIFILAR WIND INITIAL 400 PASSES TERMINATE WINDING 4 & 5 BUT SWITCH TO SMALLER SHUTTLE AND CONTINUE WITH 400 MORE PASSES TO FINISH MONITOR SECONDARY.



CONTROLLED

1984

PRINT

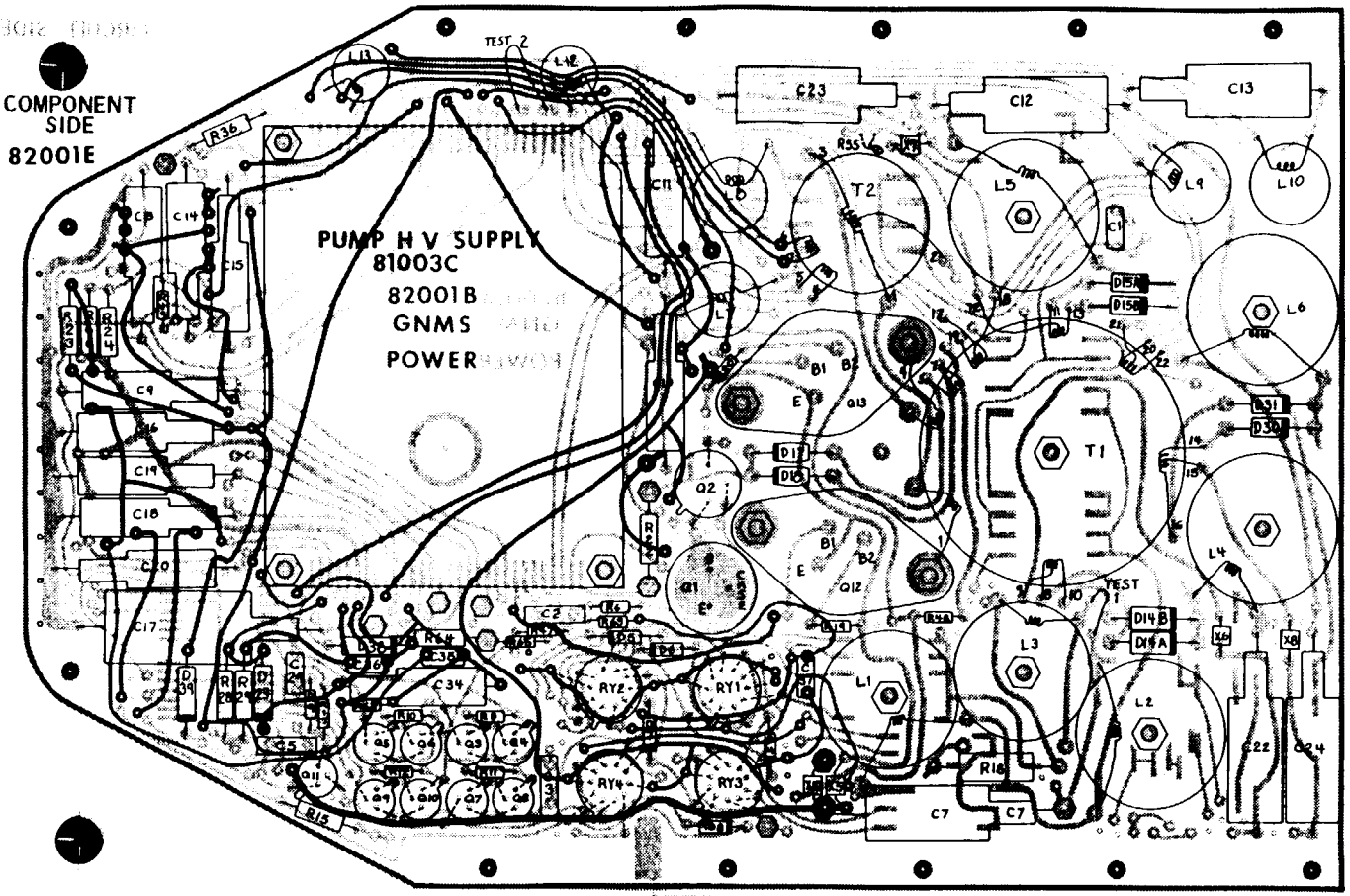
ENGINEER J MAURER	DRAFTSMAN D B J 5/8/81	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	CURRENT TRANSFORMER (T2) MAIN SUPPLY GNMS	3/29/84 3/12/82 2/26/82 11/13/81
	B-E6577B CONTROLLED	DATE

LAST USED R C D L

3.12

COMPONENT SIDE

82001E



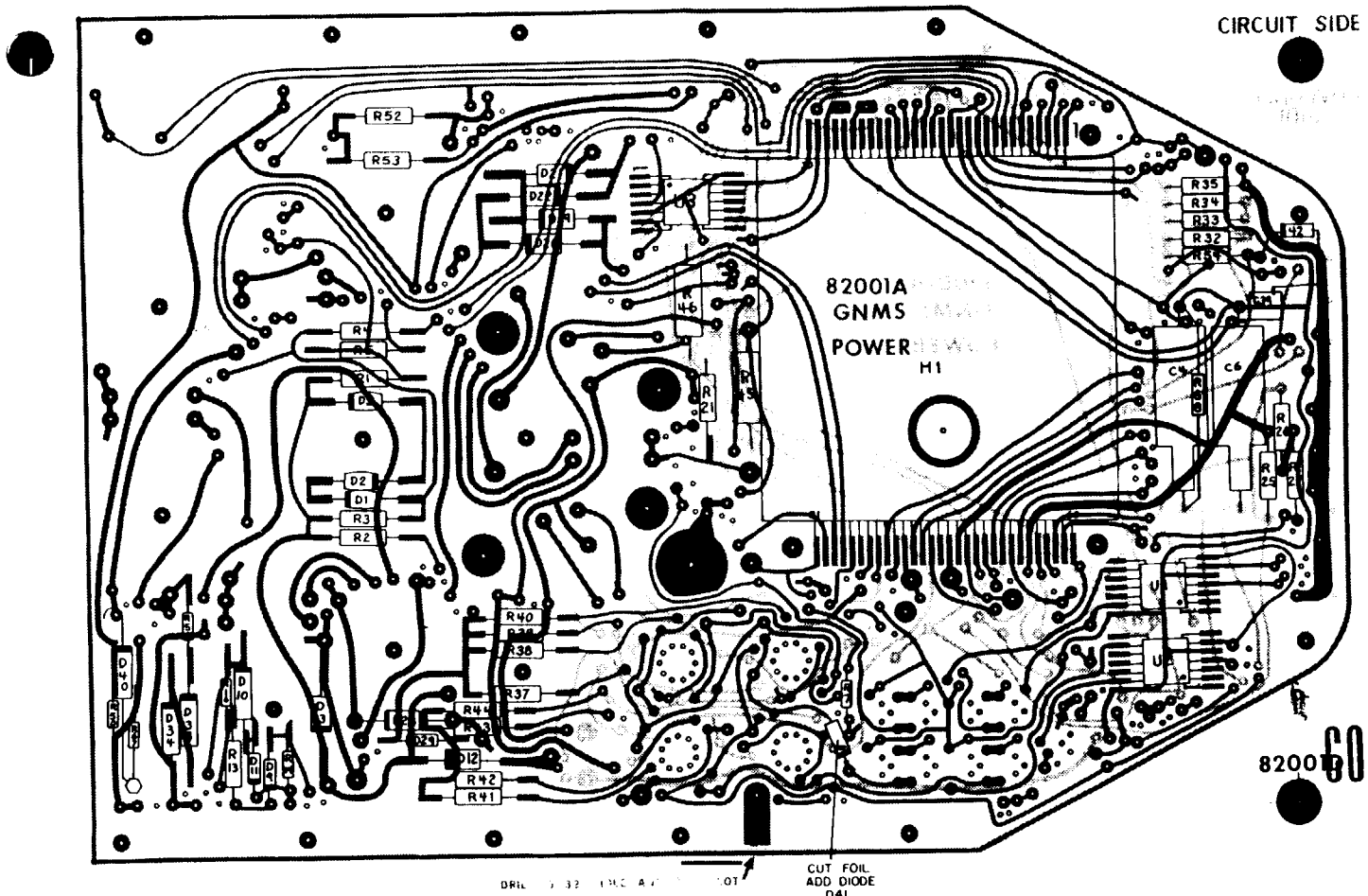
COMPONENT OR "TOP" SIDE VIEW

VISIBLE COMPONENTS ONLY

VISIBLE RUNS DARKER

ENGINEERING BLEDSOE/MAURER	DRAFTSMAN N.D.	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	COMPONENT LAYOUT POWER SUPPLY GNMS S / N 2	3/31/82
	B-E6855 CONTROLLED	DATE

LAST USED R C D L



CIRCUIT OR "BOTTOM" SIDE VIEW

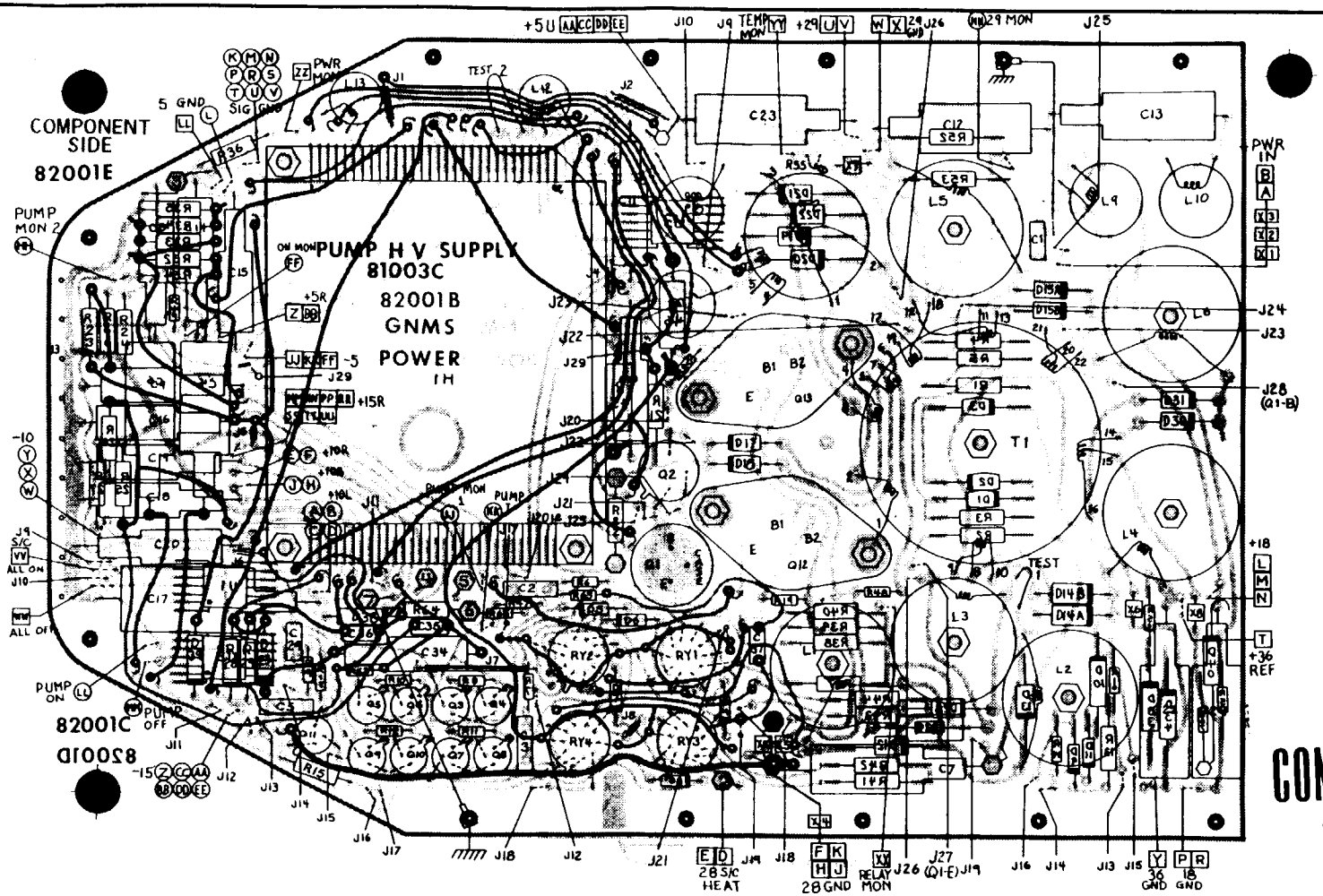
VISIBLE COMPONENTS ONLY

VISIBLE RUNS DARKER

ENGINEER BLEDSOE/MAURER	DRAFTSMAN N.D.	9/11/84
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	COMPONENT LAYOUT REVERSE POWER SUPPLY GNMS S/N2	8/29/83 8/10/83 3/31/82
	B-E6854 CONTROLLED	DATE

LAST USED R C D L

3.15



CONTROLLED
SEP 21 1984
PRINT

NOTES

R68 NOT SHOWN (ACROSS C4)
D41 NOT SHOWN
C39, D42 NOT SHOWN (BETWEEN ⑱ AND SIG GND)

COMPONENT OR "TOP" SIDE VIEW

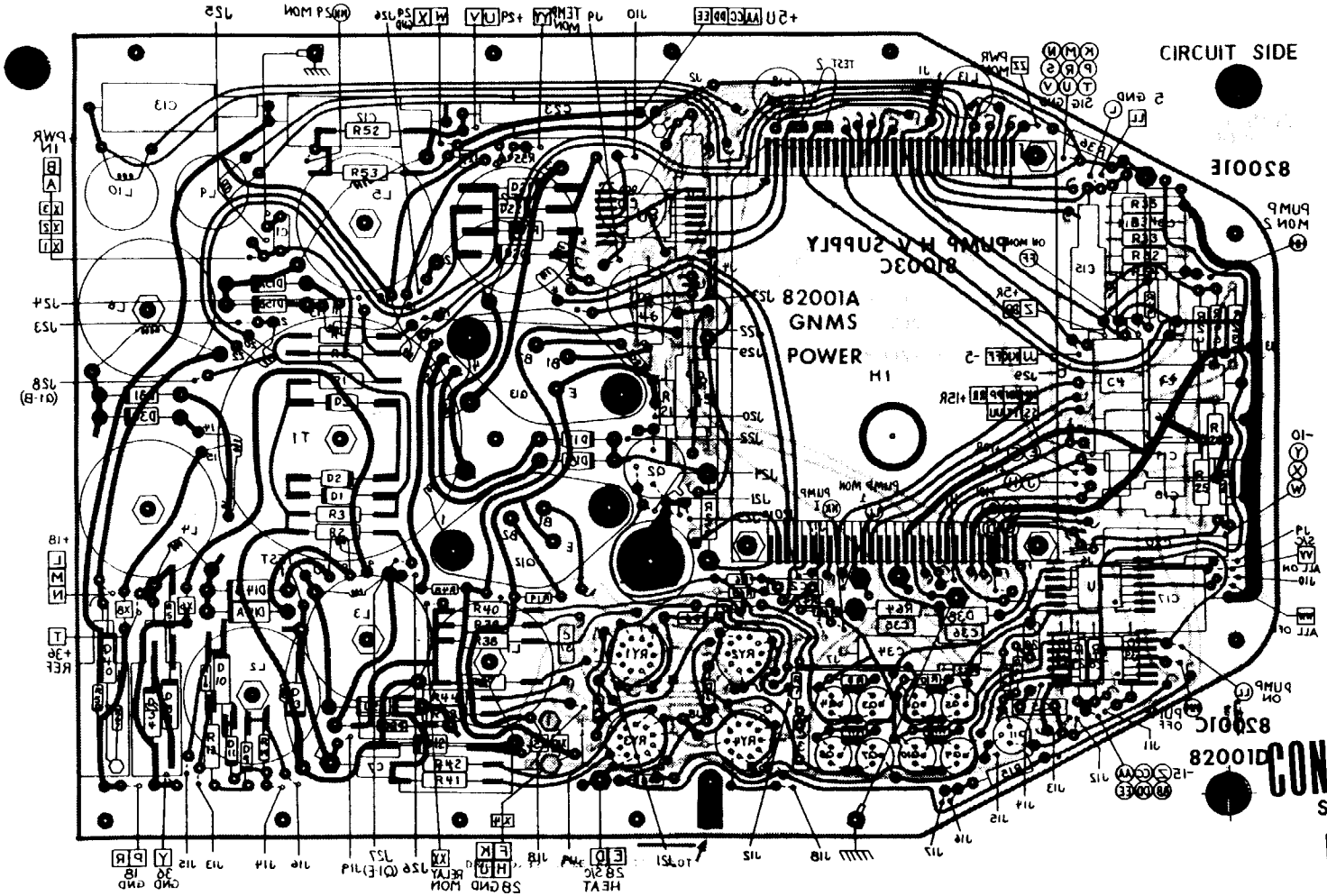
VISIBLE RUNS DARKER

VISIBLE COMPONENTS SOLID AND READABLE

ENGINEER BLEDSOE/MAURER	DRAFTSMAN N.D.	9/21/84
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	COMPONENT LAYOUT COMPOSITE POWER SUPPLY GNMS S/N 2	9/11/84 8/29/83 8/10/83 6/11/82 5/31/82
	B-E6853 CONTROLLED	DATE

LAST USED C D L

3.16



NOTES

R68 NOT SHOWN (ACROSS C4)
D41 NOT SHOWN
C39, 042 NOT SHOWN (BETWEEN (H) AND SIG GND)

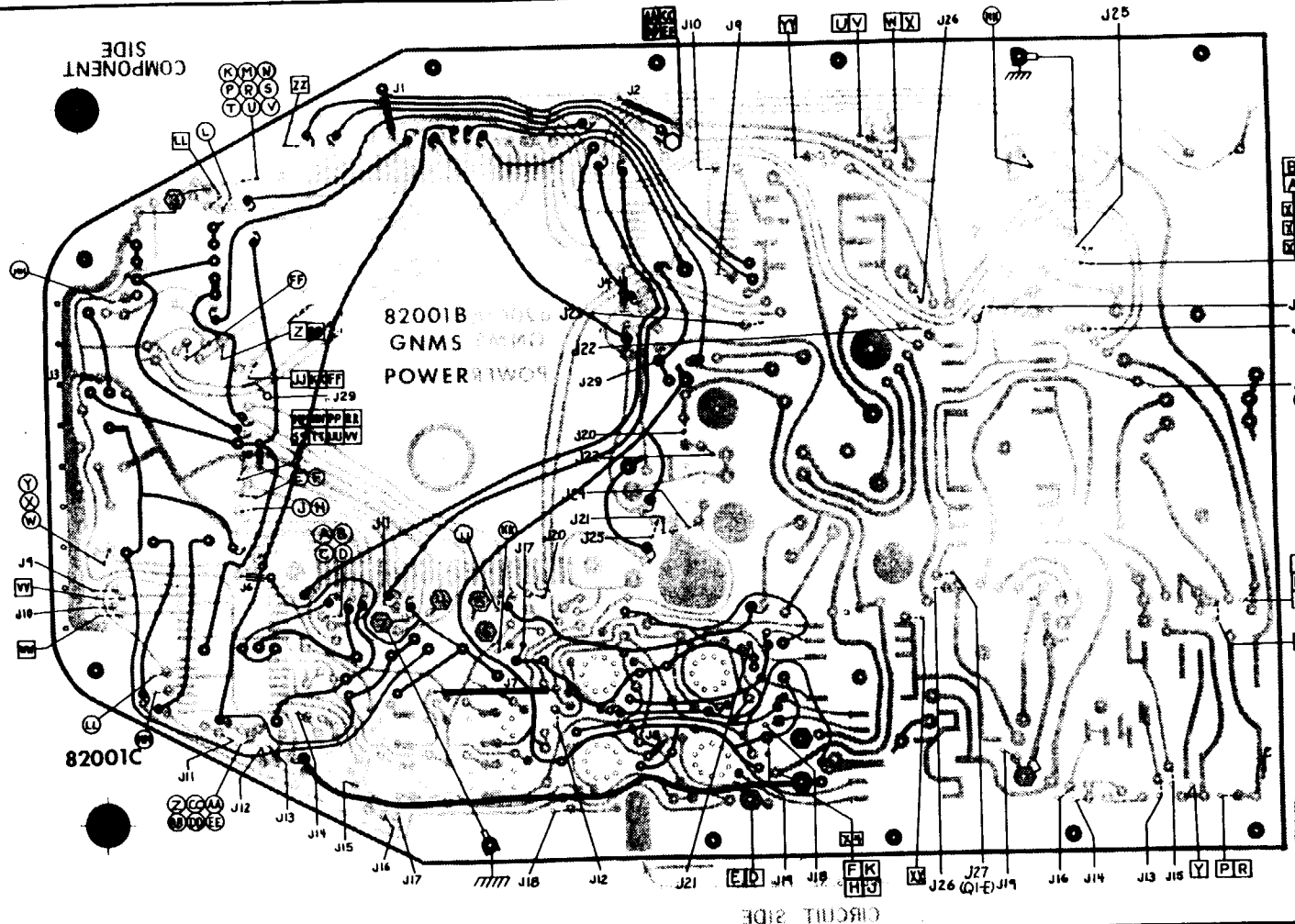
CIRCUIT OR "BOTTOM" SIDE VIEW

VISIBLE RUNS DARKER

VISIBLE COMPONENTS SOLID AND READABLE

ENGINEER BLEDSOE / MAURER	DRAFTSMAN N.D.	9/20/84
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	LAYOUT COMPOSITE POWER SUPPLY GNMS S/N 2	9/11/84 8/29/83 8/10/83 6/11/82 3/31/82
B-E6852 CONTROLLED		DATE

LAST USED R C D L



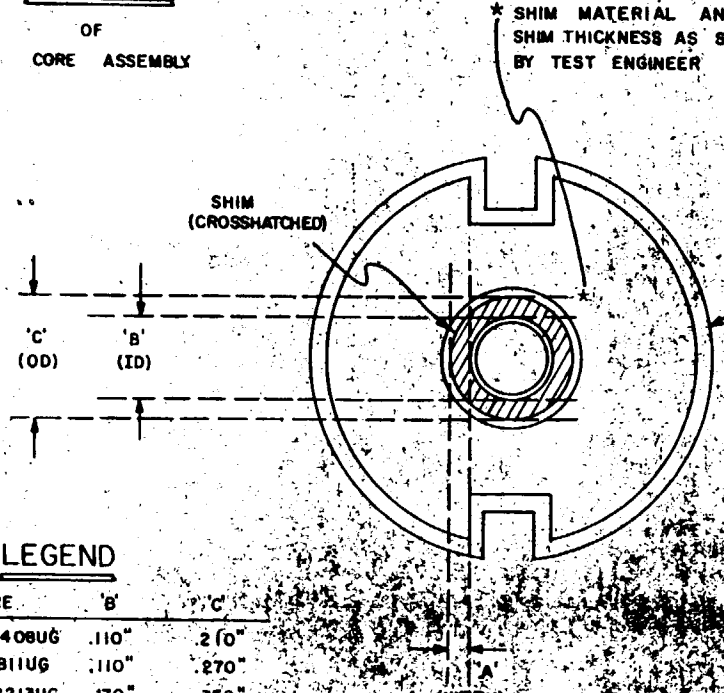
CONTROLLED
SEP 21 1984
PRINT

ENGINEER BLEDSOE / MAURER	DRAFTSMAN	9/21/84
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	WIRING LAYOUT POWER SUPPLY GNMS	9/1/84 6/11/82 4/6/82 3/31/82
	S/N#	DATE
B-E6809	CONTROLLED	

TOP VIEW

OF

CORE ASSEMBLY



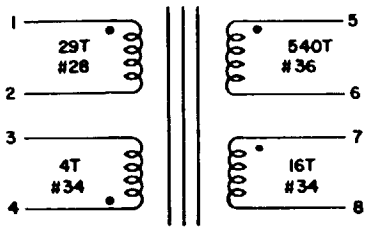
NOTE: THIS DESIGN INITIALLY USED 7/8" IN GNMS BIAS SUPPLY TO [illegible] T#5 TO ADJUST FREQUENCY. [illegible]

DESIGNATION T #	CORE USED	SHIM THICKNESS
5	F42213UG	.020

LEGEND

'A'	CORE	'B'	'C'
.050"	F41408UG	.110"	.210"
.075"	F41811UG	.110"	.270"
.085"	F42213UG	.170"	.360"

ENGINEER J. BROOKS	DRAFTSMAN [illegible] 8/23/71
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	TRANSFORMER PUMP [illegible] V SHIM DESIGN GNMS [illegible]
	B-E6758



• NOTE: PHASING OF 1-2 & 3-4 MUST BE AS SHOWN.

CORE: F42213 -UG (POWER FERRITE)
BOBBIN: B2213-1 (DELRIN)
MAGNETICS, INC.

WINDING PROCEDURE

1. WIND FB 3-4 START 3 AT LEFT EDGE. DRESS 3 OUTSIDE SLOT OF BOBBIN WITH 4, CLOSE WOUND, "SEE FIGURE 1".
2. PLACE TWO LAYERS OF KAPTON OVER FB 3-4 WINDING.
3. WIND SEC 5-6 START 5 NEXT TO 4 DRESS 5 OUTSIDE SEPARATE SLOT (SEE FIGURE #2). CLOSE WIND SEC 5-6 ACROSS ENTIRE BOBBIN FILL SURFACE EDGE TO EDGE. DRESS 6 OUTSIDE SLOT OPPOSITE 5 (SEE FIGURE #2). SECURE WINDING WITH ONE LAYER OF KAPTON TAPE.
4. WIND PRIMARY 1-2 START AT LEFT EDGE EXIT LEADS FROM BOBBIN WITH SLOT 3-4. SECURE PRIMARY WINDING WITH KAPTON TAPE.
5. WIND SEC 7-8 START AT LEFT EDGE EXIT LEADS WITH 6. SECURE WINDING WITH KAPTON TAPE.
6. "DIP COAT" BOBBIN ONLY IN SOLITHANE 113 PER POTTING PROCEDURE. SEE FIGURE #3.
7. ASSEMBLE BOBBIN IN CORE, OPERATE TRANSFORMER IN TEST CIRCUIT (BREADBOARD).
8. SHIM CORE HALVES APPROXIMATELY .020" TO GET DESIRED FREQUENCY RANGE. (FREQUENCY WILL DECREASE WITH MULTIPLIER LOAD).

FIG 1

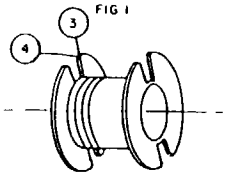


FIG.2

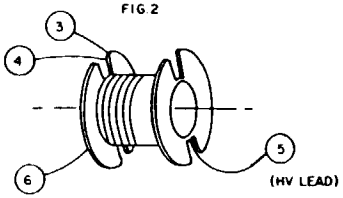
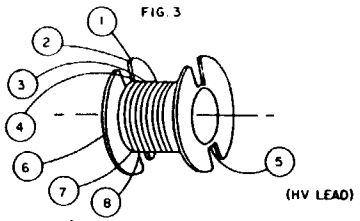
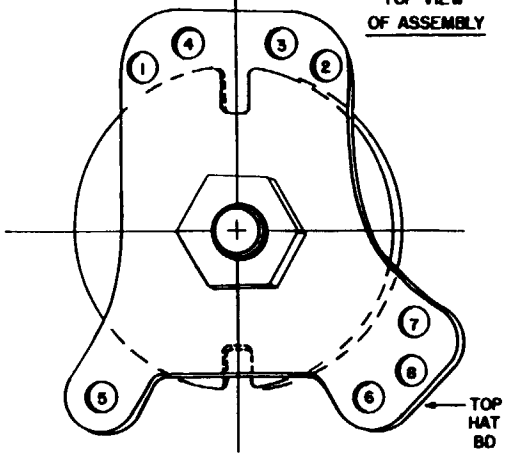


FIG.3



T3

TOP VIEW OF ASSEMBLY

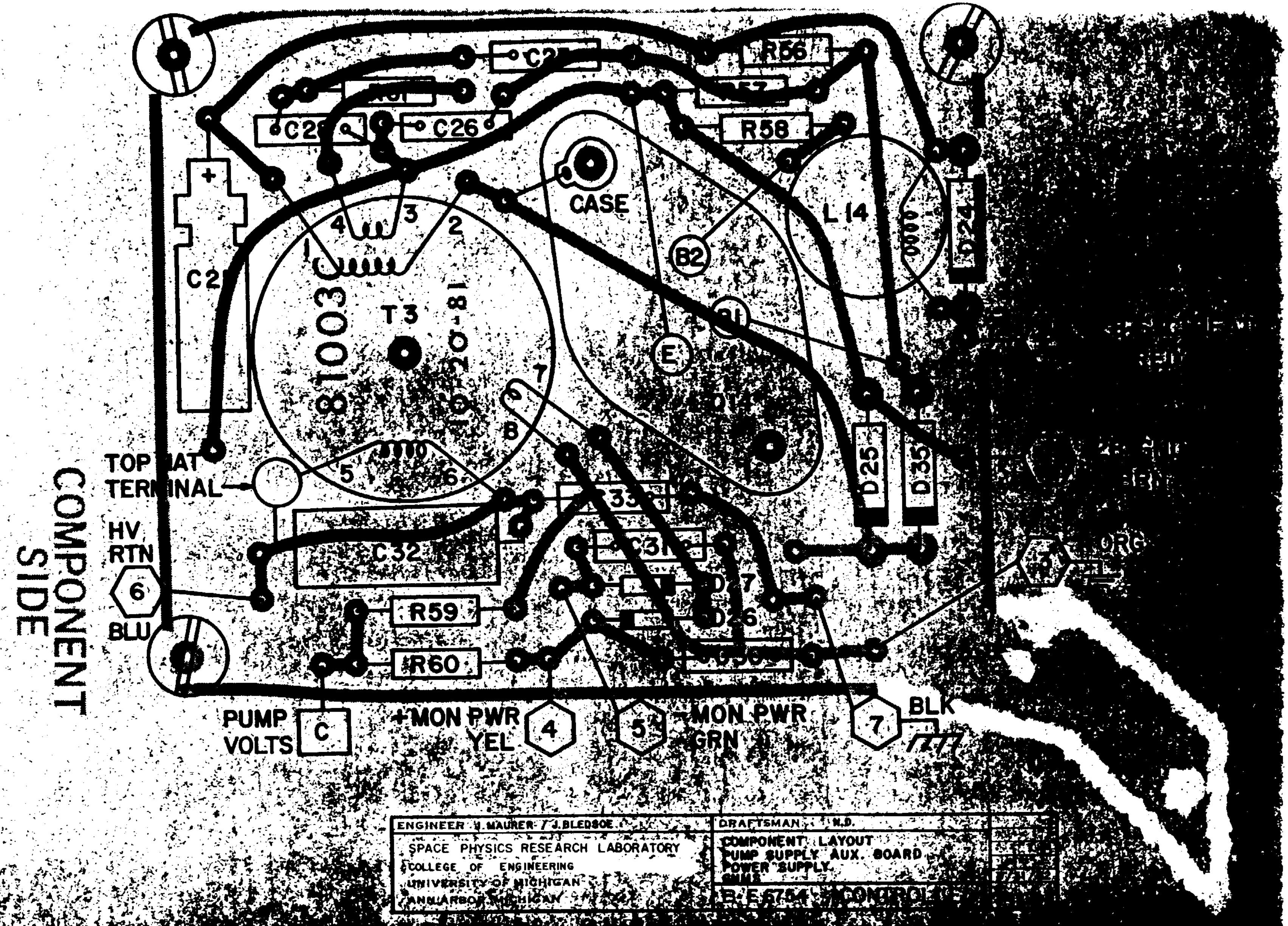


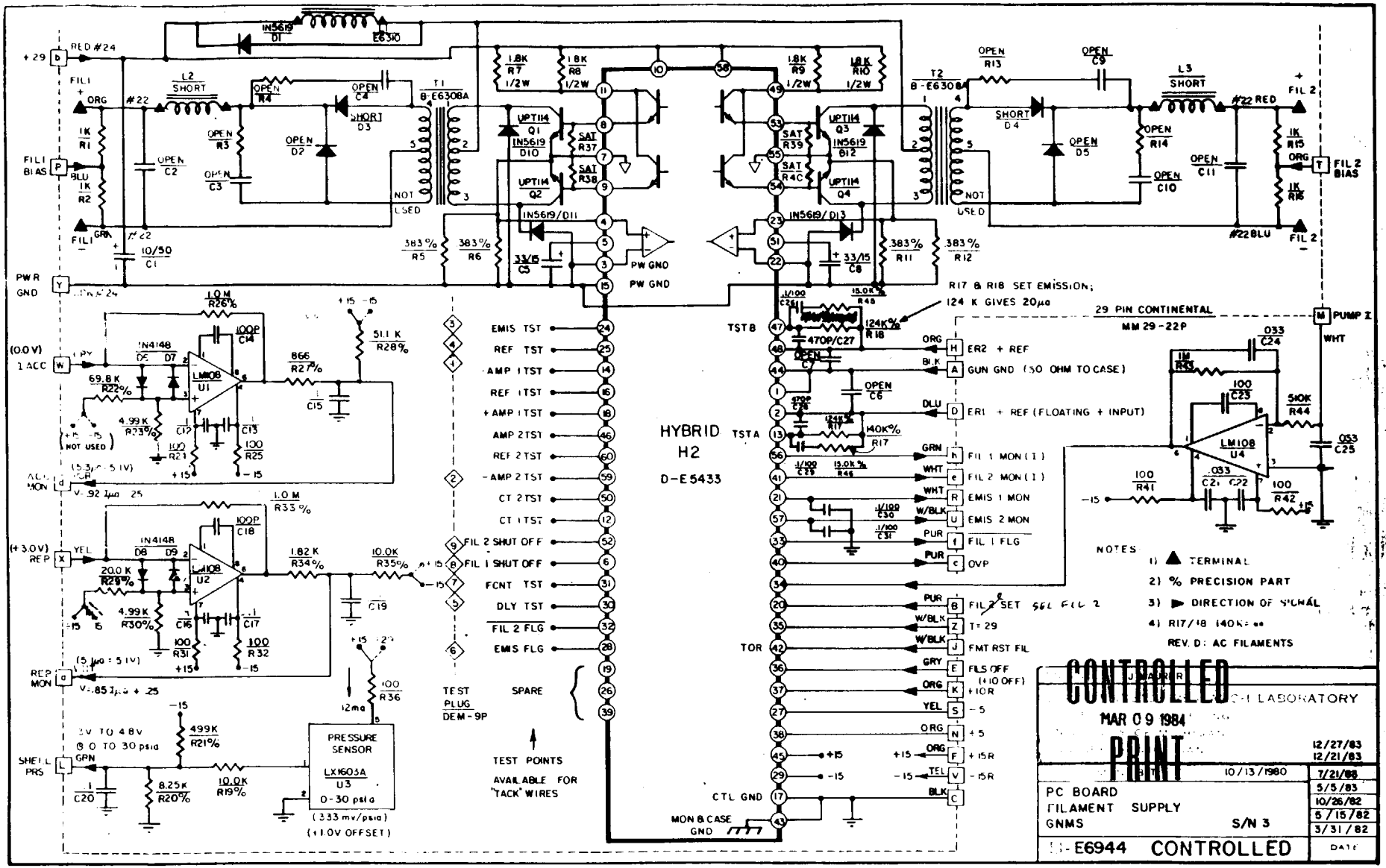
NOTES:

1) WINDING ORDER:
   - 3-4 FB
   - 5-6 SEC
   - 1-2 PRI
   - 7-8 SEC
2) SCRIBE S/N ON BOBBIN
3) DRESS LEADS ON TOP HAT #810030
4) TOP HAT BOARD 1/32 PC MATERIAL.
   SWAGE TERMINALS - USECO #252084
   HOLE SIZE - DRILL SIZE #49
5) DRILL #21 HOLE FOR MOUNTING SCREW
6) USE #8 - 32 BD HD NYLON MOUNTING SCREW

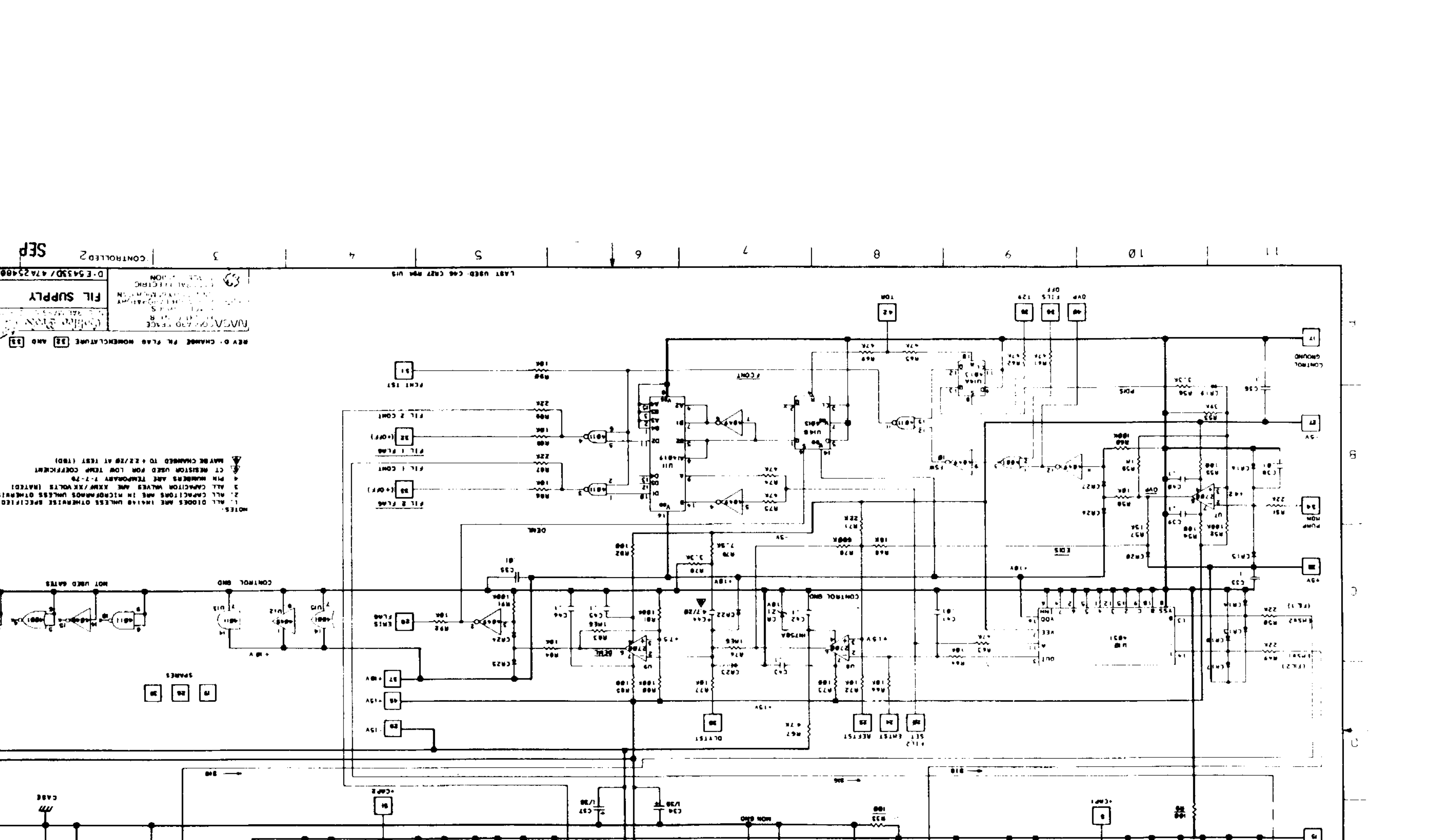
ENGINEER J. MAURER / M.A.H.	DRAFTSMAN D.R. 10/27/81	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	PUMP SUPPLY TRANSFORMER T3 POWER SUPPLY GALILEO	9/3/82 3/31/82
	B-E6719 CONTROLLED	DATE

LAST USED R C D L


COMPONENT SIDE
TOP HAT TERMINAL
HV RTN
6
BLU
PUMP VOLTS
C
+MON PWR YEL
4
5
-MON PWR GRN
7
BLK
ORG
C2
C25
C26
C27
R56
R57
R58
R59
R60
C31
C32
C33
D24
D25
D26
D27
D35
L14
T3
81003
10-20-81
CASE
B1
B2
E
ENGINEER J. MAURER / J. BLEDSOE
DRAFTSMAN N.D.
SPACE PHYSICS RESEARCH LABORATORY
COLLEGE OF ENGINEERING
UNIVERSITY OF MICHIGAN
ANN ARBOR, MICHIGAN
COMPONENT LAYOUT
PUMP SUPPLY AUX. BOARD
POWER SUPPLY



LAST USED D13 R46 C31 U3 L3 Q4



NOTES:
1. ALL DIODES ARE 1N4148 UNLESS OTHERWISE SPECIFIED.
2. ALL CAPACITORS ARE IN MICROFARADS UNLESS OTHERWISE SPECIFIED.
3 ALL CAPACITOR VALVES ARE XXMF/XX VOLTS (RATED)
4 PIN NUMBERS ARE TEMPORARY 7-7-79
△ CT RESISTOR USED FOR LOW TEMP COEFFICIENT
▲ MAY BE CHANGED TO 4.2.2/20 AT TEST (TBD)

LAST USED C46 CR27 R94 U15

REV D: CHANGE FIL FLAG NOMENCLATURE [32] AND [33] NO HYBRID IMPACT

NASA GODDARD SPACE FLIGHT CENTER

GENERAL ELECTRIC

MAURER/ R. CALDWELL

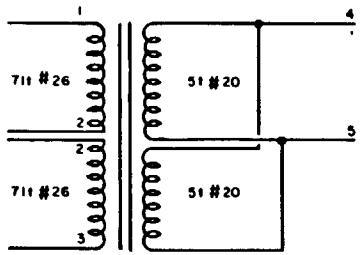
FIL SUPPLY

H2

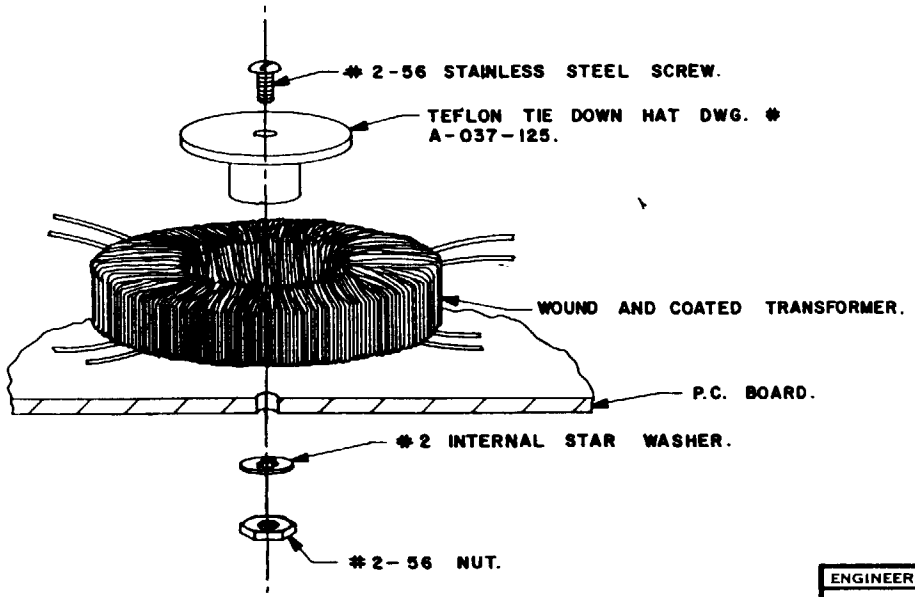
D-E5433D/47A254802 S/N 2

CONTROLLED 2

SEP 9 1982 15.3



CORE:
6T-5340-HI-AA



ASSEMBLY NOTES

1. WIND 1/2 OF PRIMARY ON 1/2 OF CORE (71 TURNS). DO THE SAME FOR OTHER HALF.
2. ADD SINGLE WOUND SECONDARIES EVENLY OVER (NOT WOUND BIFILAR) EACH PRIMARY. CONNECT IN PARALLEL.
3. WINDING WIRE TO BE USED FOR TRANSFORMER LEADS AND SOLDERED DIRECTLY TO P.C. BOARD.
4. TEST PER TEST PROCEDURE. RECORD RESULTS.
5. COAT WITH EPON 828/VERSAMID 125 EPOXY IN VACUUM PER POTTING PROCEDURE.
6. TEST PER TRANSFORMER TEST PROCEDURE. RECORD RESULTS.
7. ATTACH TO P.C. BOARD PER SKETCH AND BOND ALL SURFACES WITH EPOXY.

CONTROLLED

PRINT

REV. B: PARALLEL SECONDARY & 41

REV. A: REVISE SECONDARY TO SINGLE WINDING FOR AC OPERATION

ENGINEER J. MAURER	DRAFTSMAN TS / BT 5/10/79	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	T1/T2 TRANSFORMERS FILAMENT SUPPLY GNMS S/N 2	1/24/84 5/5/83
	B-E6308B CONTROLLED	DATE

LAST USED R C D L

132 uhy/1000t

$$L = \frac{N^2}{1000^2} \times L_{1000} = 53 \text{ uhy}$$

25 % DOWN AT 13 OERSTEDS

$$I \text{ FOR } 75\ \% L = \frac{H\ell}{.4\pi N} = 1.2 \text{ A}$$

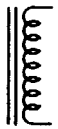
173 uhy/1000t

$$L = \frac{N^2}{1000^2} \times L = 156 \text{ uhy}$$

25 % DOWN AT 11 OERSTEDS

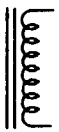
$$I \text{ FOR } 75\ \% L = \frac{H\ell}{.4\pi N} = 1.2 \text{ A}$$

(REF. ARNOLD PC-104E PG 18 & 69)



20 TURNS #26 L1

ARNOLD
A365132-2
OD = .380"
u = 250



30 TURNS #22 L2/L3

ARNOLD
A391173-2
OR
GSFC/VIKING
SV73030-7E
OD = .655"
u = 300

NOTES:

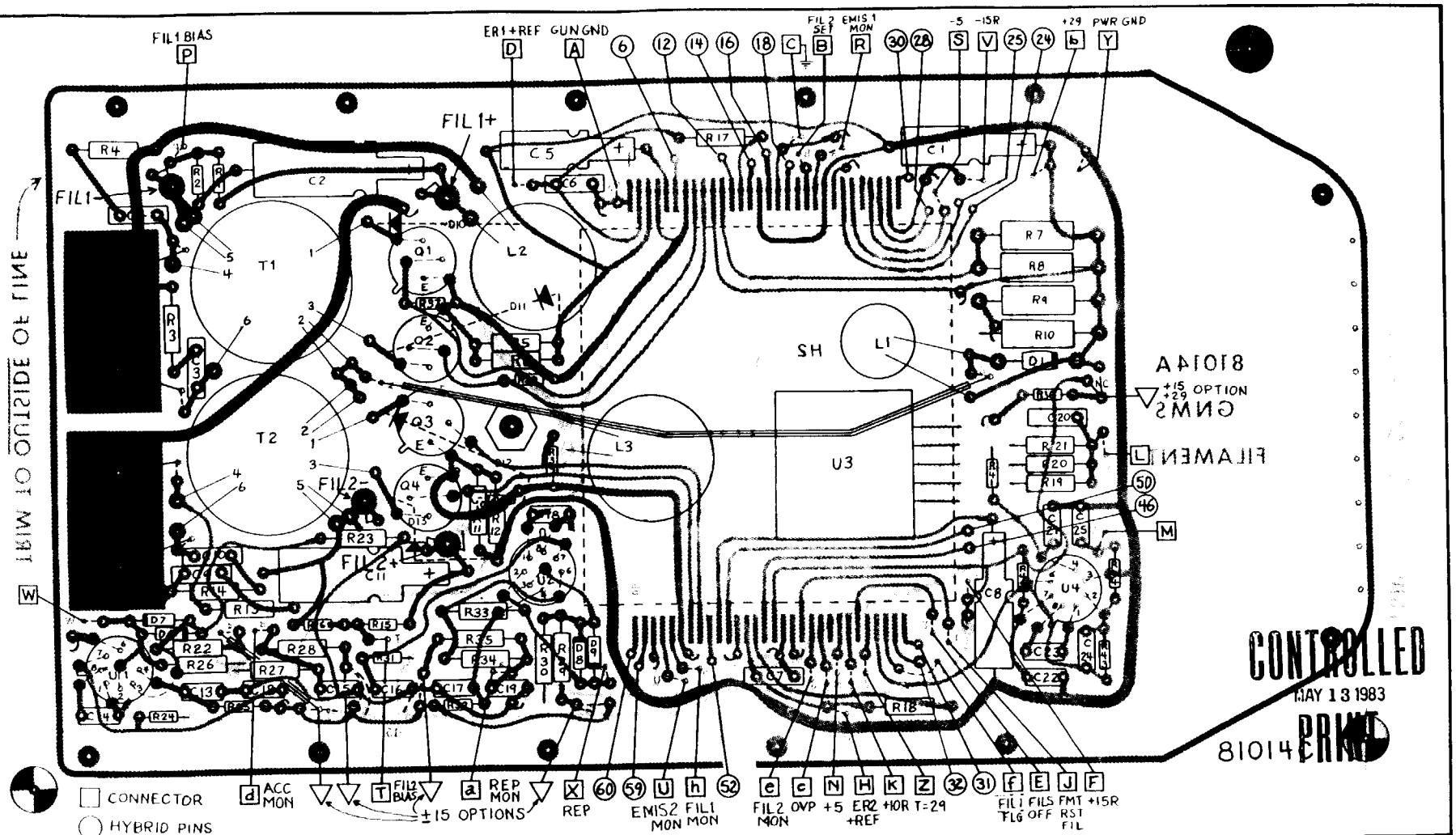
1) WIRE EVENLY DISTRIBUTED AROUND CORE. BANK WOUND. DO NOT CROSS ENDS.

2) CORES TO BE BONDED TO PC BOARD WITH EPOXY.

3) MEASURE AND RECORD L, Q, AND R

ENGINEER J. MAURER	DRAFTSMAN B.T. 10/3/80	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	INDUCTORS FILAMENT SUPPLY GNMS	12-2-80
	B-E6310 CONTROLLED	DATE

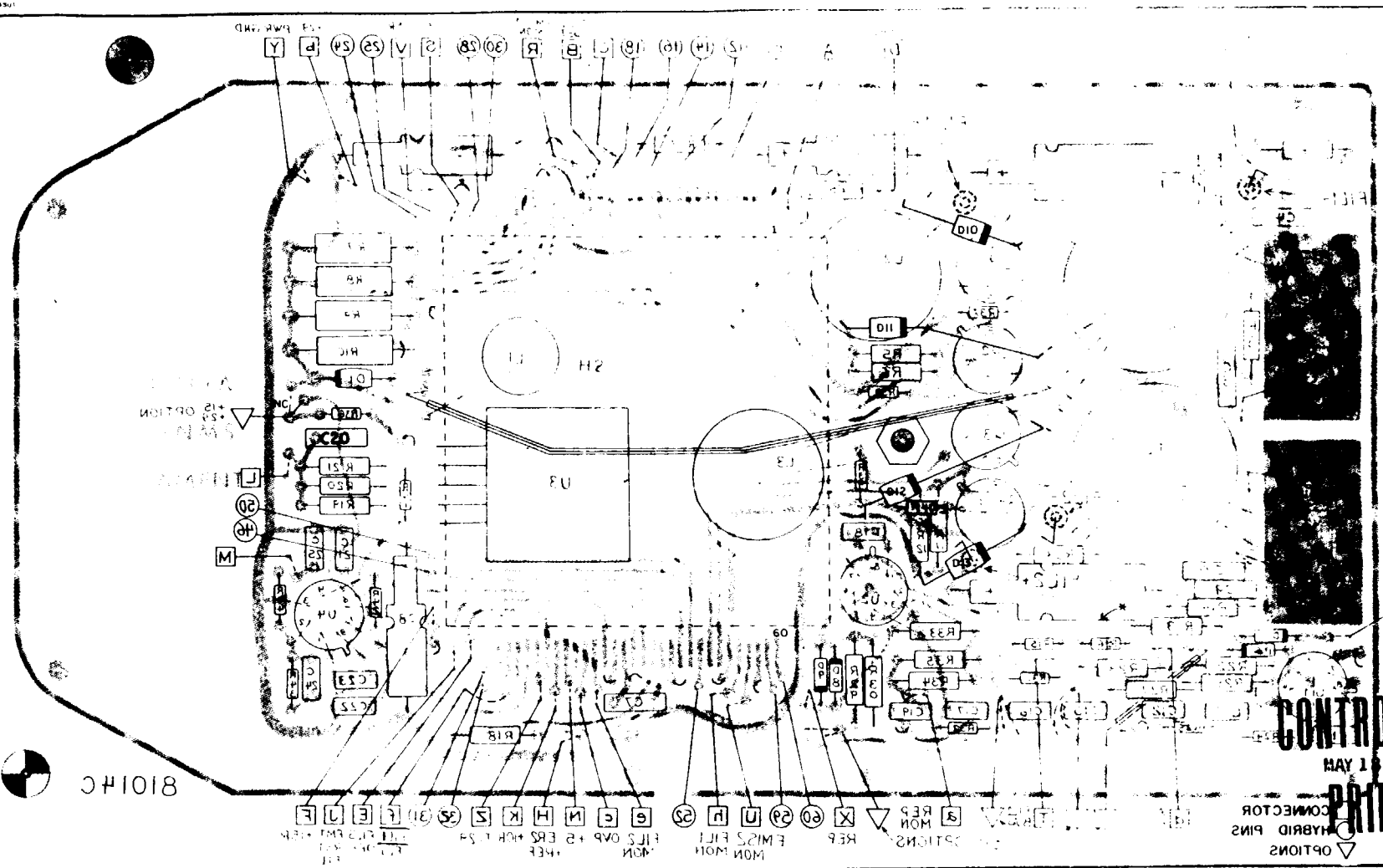
LAST USED R C D L



COMPONENT SIDE RUNS LIGHTER
C2,3,4,9,10,11,D2,5,R3,4,13,14 NOT USED (OPEN)
D3,4,L2,3 NOT USED (SHORT)

ENGINEER J. MAURER	DRAFTSMAN G. WIGGINS 1/13/81	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	COMPONENT LAYOUT FILAMENT SUPPLY GNMS S/N2	5/5/83 5/15/82 2/3/82
	B-E 6763 CONTROLLED	DATE

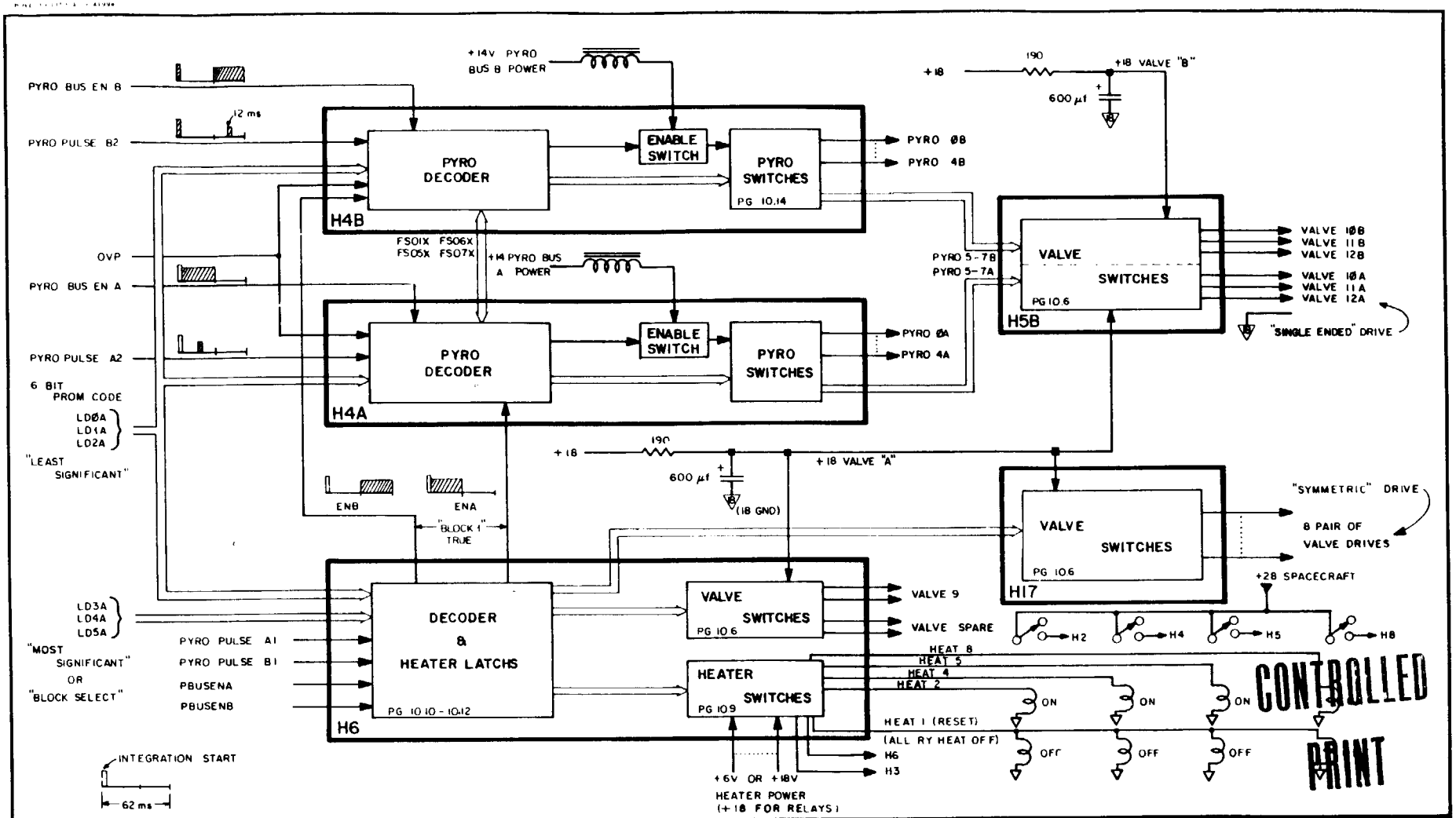
LAST USED R C D L



CIRCUIT SIDE RUNS LIGHTER
D10-13, H2, R40 AND C20 MOUNT ON CIRCUIT SIDE
* CUT AND SEPARATE RUNS
C2,3,4,9,10,11, D2,5, R3,4,13,14 NOT USED (OPEN)
D3,4, L2,3 NOT USED (SHORT)

ENGINEER J. MAURER	DRAFTSMAN G. WIGGINS 1/13/82	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	COMPONENT LAYOUT REVERSE FILAMENT SUPPLY GNMS S/N2	5/5/83 5/15/82 2/3/82
	B-E6764 CONTROLLED	DATE

LAST USED R C D L

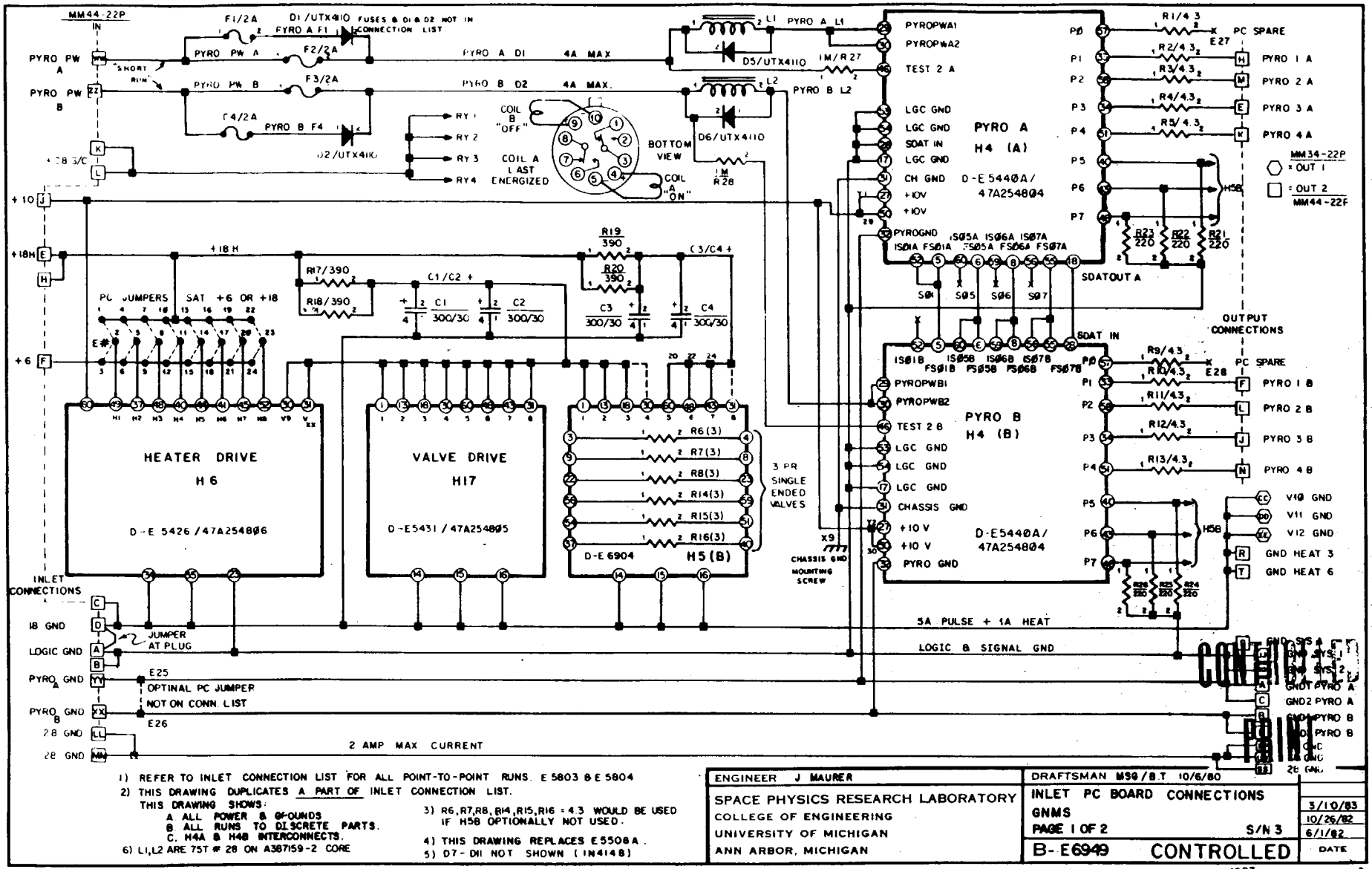


ENGINEER J MAURER	DRAFTSMAN B T 10/14/1980	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	INLET CONTROL BLOCK DIAGRAM GNMS S/N 2 B-E6328A	3/10/83 10/27/82 1/15/81 DATE

LAST USED R C D L

MAR 2 4 1983

10.1



1) REFER TO INLET CONNECTION LIST FOR ALL POINT-TO-POINT RUNS. E 5803 & E 5804
2) THIS DRAWING DUPLICATES A PART OF INLET CONNECTION LIST.
THIS DRAWING SHOWS:
A ALL POWER & GROUNDS
B ALL RUNS TO DISCRETE PARTS.
C. H4A & H4B INTERCONNECTS.
3) R6,R7,R8,R14,R15,R16 = 4.3 WOULD BE USED IF H5B OPTIONALLY NOT USED.
4) THIS DRAWING REPLACES E 5508 A.
5) D7 - D11 NOT SHOWN (1N4148)
6) L1,L2 ARE 75T # 28 ON A387159-2 CORE

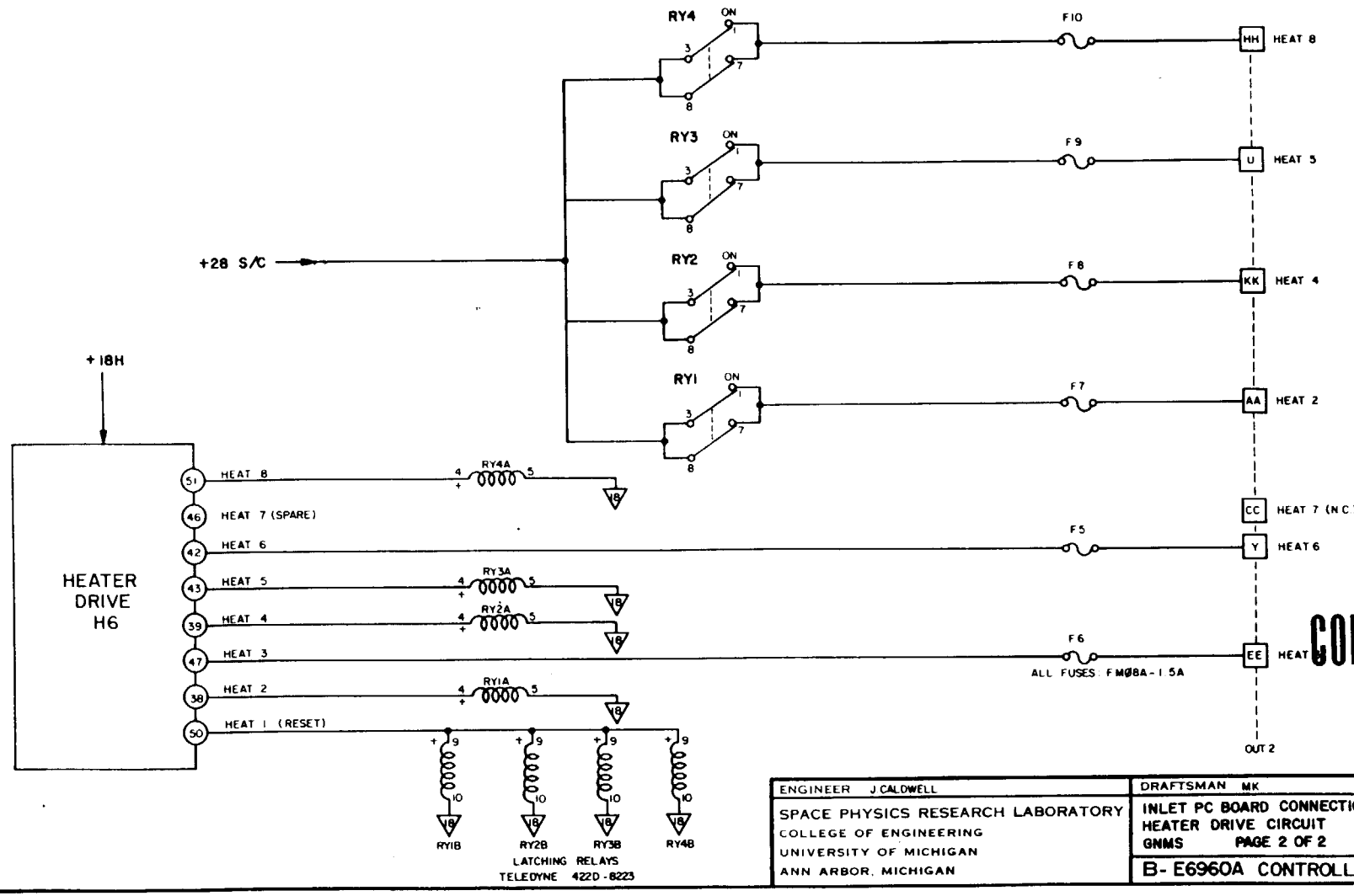
D3 & D4 NOT USED

LAST USED R28 C4 D11 F4 L2

ENGINEER J MAURER	DRAFTSMAN MSG/B.T 10/6/80	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	INLET PC BOARD CONNECTIONS GNMS PAGE 1 OF 2 S/N 3	3/10/83 10/26/82 6/1/82
B-E6949 CONTROLLED		DATE

MAR 24 1983

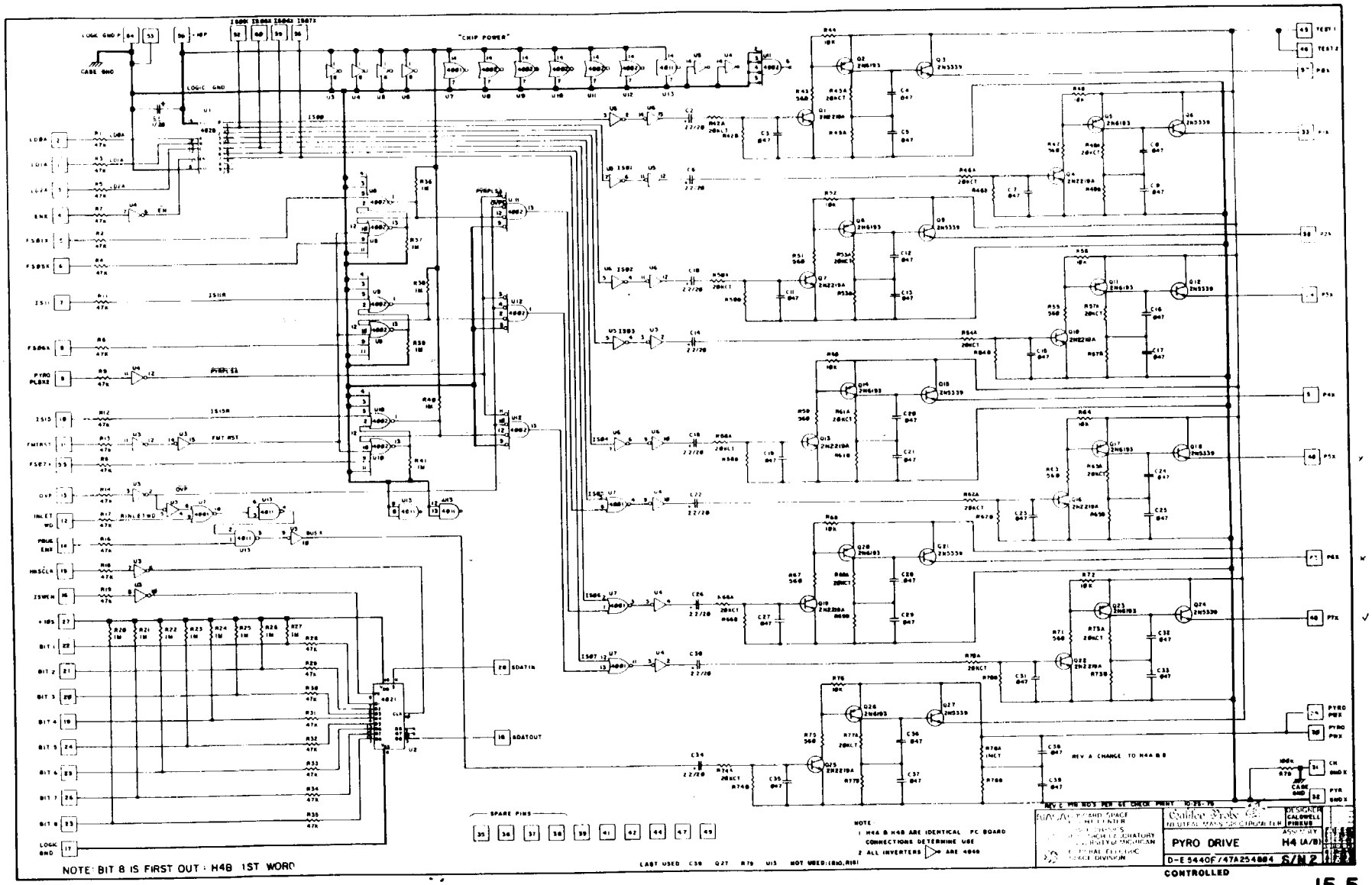
10.3A



ENGINEER J CALDWELL	DRAFTSMAN MK 10/27/82	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	INLET PC BOARD CONNECTIONS HEATER DRIVE CIRCUIT GNMS PAGE 2 OF 2 S/N 3	3/10/83 DATE
	B-E6960A CONTROLLED	

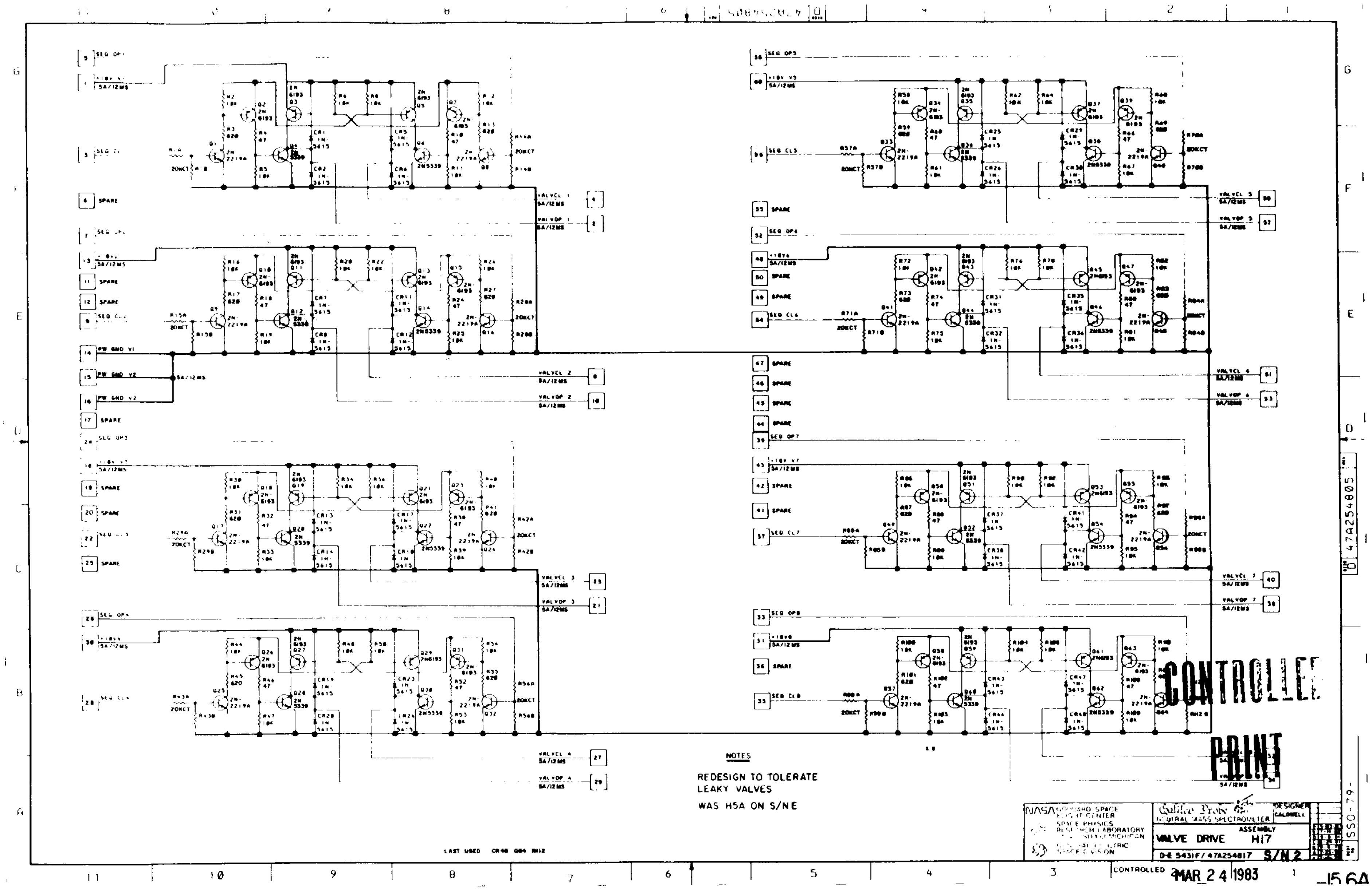
LAST USED R C D L

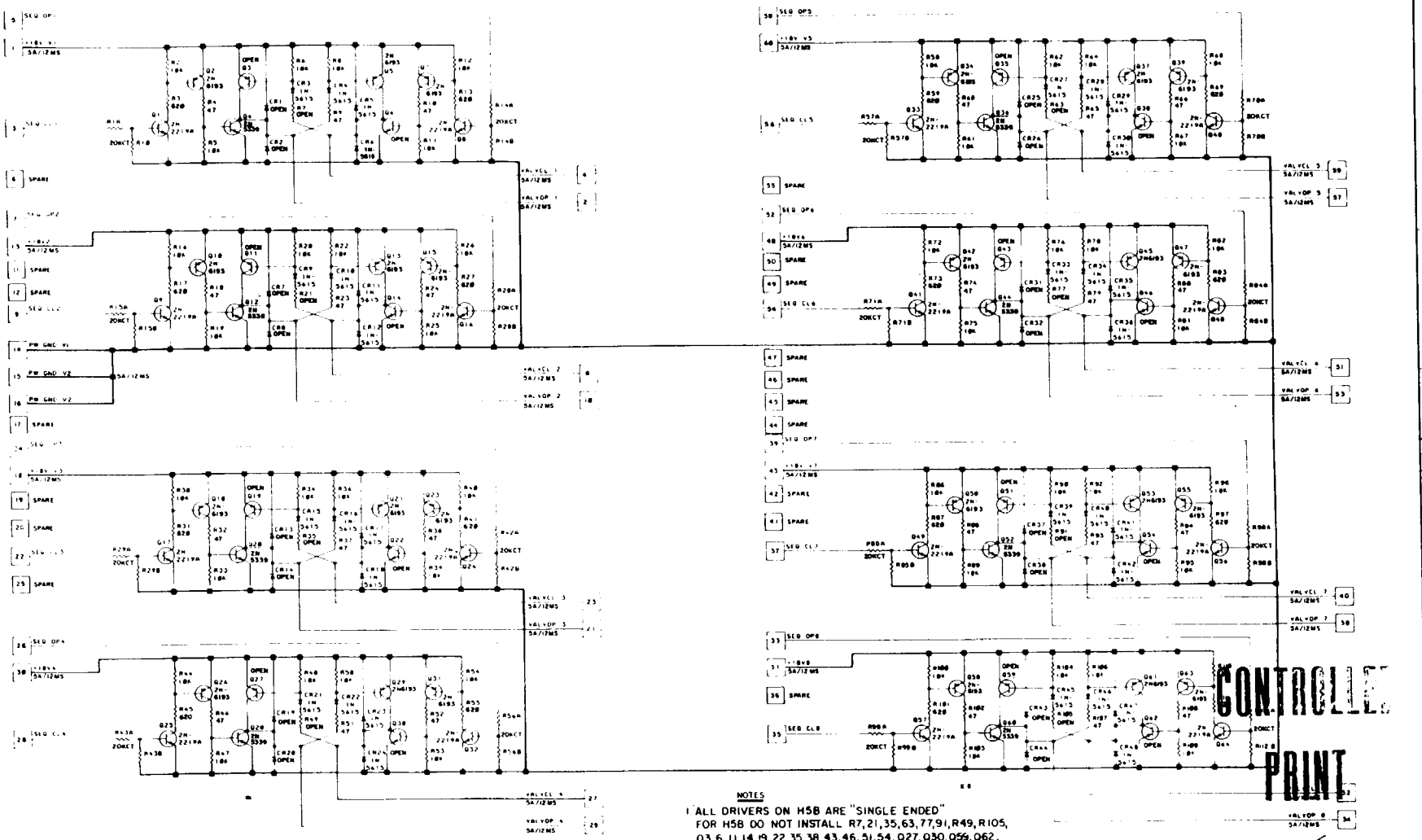
MAR 24 1983 10.3B



SEP 9 1982

15.5


NOTES
REDESIGN TO TOLERATE
LEAKY VALVES
WAS H5A ON S/N E
LAST USED CR48 Q64 R112
NASA GODDARD SPACE FLIGHT CENTER
SPACE PHYSICS RESEARCH LABORATORY
UNIVERSITY OF MICHIGAN
GENERAL ELECTRIC SPACE DIVISION
Galileo Probe
NEUTRAL MASS SPECTROMETER
ASSEMBLY
VALVE DRIVE H17
DESIGNER CALDWELL
D-E 5431F/47A254817 S/N 2
CONTROLLED PRINT
CONTROLLED MAR 2 4 1983
47A254805
SSO-79-
15 6A



NOTES

1. ALL DRIVERS ON H5B ARE "SINGLE ENDED"
   FOR H5B DO NOT INSTALL R7,21,35,63,77,91,R49,R105,
   Q3,6,11,14,19,22,35,38,43,46,51,54,Q27,Q30,Q59,Q62,
   CR19,20,43,44,CR1,2,7,8,13,14,25,26,31,32,37,38

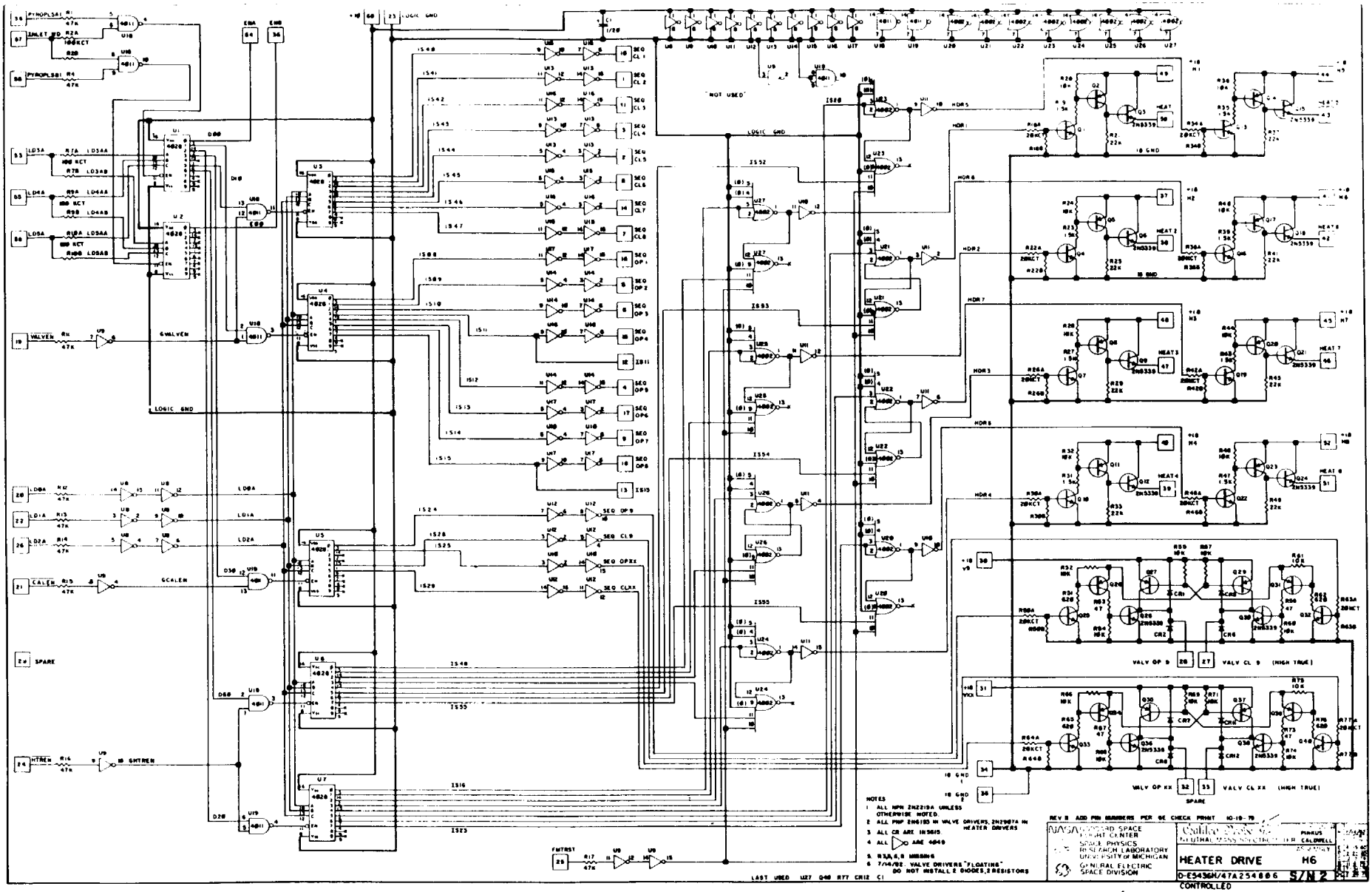
2. 7-14-82: H5B CREATED FROM H5

LAST USED CR48 Q64 R112

CONTROLLED PRINT

VALVE DRIVE	H5B
D-E 69046/ 47A2540858	S/N2

CONTROLLED 2 MAR 24 1983 1 15.66


HEATER DRIVE H6
D-E5436H/47A254886 S/N 2
CONTROLLED
NOTES
1 ALL NPN 2N2219A UNLESS OTHERWISE NOTED
2 ALL PNP 2N6180 IN VALVE DRIVERS, 2N2907A IN HEATER DRIVERS
3 ALL CR ARE 1N5615
4 ALL ARE 4049
5 R3A,4,8 MISSING
6 7/14/82: VALVE DRIVERS "FLOATING" DO NOT INSTALL 2 DIODES, 2 RESISTORS
LOGIC GND
SPARE
VALV OP 9
VALV CL 9 (HIGH TRUE)
VALV OP XX
VALV CL XX (HIGH TRUE)
HEAT 1
HEAT 2
HEAT 3
HEAT 4
HEAT 5
HEAT 6
HEAT 7
HEAT 8
SPACE PHYSICS RESEARCH LABORATORY UNIVERSITY OF MICHIGAN
GENERAL ELECTRIC SPACE DIVISION

*FILE:ILTN5.PIN

INLET PC BOARD INPUT FILE

FOR NODE NAME SUMMARY

EDIT 1/21/81 Changed format across all devices, corrected RY-3 pin 4. Added H5B 30 ... supply (per GE node list).

EDIT 1/22/81 CHANGED IN/OUT PLUGS BACK TO LETTER DESIGNATIONS. Added R6,7,8 14,15,16, and E26, E27 (Pyro 0A/B)

EDIT 1/22/81 This release is a change in documentation presented to GE for fabrication of the Inlet multilayer PC board. Only this "source" file, and the Node name list is included in the controlled documentation. This documentation reflects the preliminary GE Node list dated 6 Jan 81. This Node list includes ALL nodes.

EDIT 1/23/81 Chgd OUT3 pinY to pinL (typo), chgd H5B 54 to SEQCL10B, chgd H5B 65 to SEQCL11B, both from A. (Was right on previous release.) with changes, agrees with GE Node list dated 1/23/81.

EDIT 5-14-81 Changed Relays 1,2,3,4, to add pin 3 (com) to the +28 s/c lines. Relay was connected with pins 2 and 3 interchanged. Both pins 2 and 3 are now +28 s/c. Add note to H6-16 for engineering unit PC board. Eng. unit has short between pins H6-16 and ... Pad H6-16 and H5A-5 to be lifted.

EDIT 5-15-81 Corrected OUT 2 Pins K and L...again....... K=PYRO 4A L=PYRO 2B

Also added "E" designations to color column.... Node list rerun with "K" and "L" corrections.

EDIT 5-28-81 Changed Relays 1,2,3,4, (again!!!) to make pin 3 now tied to Pin 1 (NOT pin 2). ....

EDIT 6-17-81 Changed relay connections, again!!!!!! Above changes wrong. Coil A and B functions (ON/OFF), interchanged! This changes the layout on layers 3, 4, and 7.

EDIT 11/22/81 Add 1 meg resistor R27 and R28, to reduce transistor output spike.

EDIT 11/5/82 Delete CALEN- from inlet wiring. H6-21 jumpered to VALVEN-. But note that CALEN- wire remains in main harness. HEAT7 connection deleted. BPB

EDIT 3/10/83 Change H5A to H17- all places.

*Page 1 of 14

*PC BOARD INPUT PLUG...44 PIN

*INPUT FROM MAIN HARNESS

ED	IN	INPUT *1/22/81
A	1	LGIC GND
B	2	LGIC GND
C	3	18 GND
D	4	18 GND
E	5	+18 H
F	6	+6 H
H	7	+18 H
J	8	+10V
K	9	+28 S/C
L	10	+28 S/C
M	11	LD0A
N	12	LD1A
P	13	LD2A
R	14	LD3A
S	15	LD4A
T	16	LD5A
U	17	PYROPLSA1
V	18	PYROPLSB1
W	19	PYROPLSA2
X	20	PYROPLSB2
Y	21	PRUSENA
Z	22	PRUSENB
AA	23	INLETWD
BB	24	VALVEN-
CC	25	*
DD	26	HTREN-
EE	27	OVP B1
FF	28	FMTRST
HH	29	ISWEN
JJ	30	HKSCLK
KK	31	SDATOUT B
LL	32	28 GND
MM	33	28 GND
NN	34	*
PP	35	CELL 1 TMP
RR	36	CELL 2 TMP
SS	37	LEAK 1 TMP
TT	38	LEAK 2 TMP
UU	39	PLUM 1 TMP
VV	40	PLUM 2 TMP
WW	41	PYRO PW A
XX	42	PYRO GND B
YY	43	PYRO GND A
ZZ	44	PYRO PW B

*page 2 of 14

*OUTPUT PLUG #1:
*TO INLET HEATERS
*AND VALVES.
*BOTH NUMERICAL AND
*ALPHA NOTATION.
*Pins with same name
*are tied at the PC board.

ED	OUT1	OUTPUT 1 *1/22/81
A	1	VALVOP1
B	2	VALVCL1
C	3	VALVOP2
D	4	VALVCL2
E	5	VALVOP3
F	6	VALVCL3
H	7	VALVOP4
J	8	VALVCL4
K	9	VALVOP5
L	10	VALVCL5
M	11	VALVOP6
N	12	VALVCL6
P	13	VALVOP7
R	14	VALVCL7
S	15	VALVOP8
T	16	VALVCL8
U	17	VALVOP9
V	18	VALVCL9
W	19	V10A +CLSE
X	20	V10B +CLSE
Y	21	V11A +CLSE
Z	22	V11B +CLSE
AA	23	V12A +CLSE
BB	24	V12B +CLSE
CC	25	18 GND
DD	26	18 GND
EE	27	18 GND
FF	28	VSW12A B3
HH	29	VSW12B B2
JJ	30	LGIC GND
KK	31	LGIC GND
LL	32	CELL 1 TMP
MM	33	CELL 2 TMP
NN	34	*

*"+CLOSE" INDICATES
*THAT A PLUS SIGNAL
*ON THIS LEAD WILL
*>>>>CLOSE<<< VALVE.

*page 3 of 14

*OUTPUT PLUG 2...INLET PYROTECHNICNICS AND MONITORS
*BOTH NUMERICAL AND ALPH NOTATION
*Pins with same name are tied at the PC board.

ED	OUT2	OUT 2 *12/22/80	
A	1	PYRO GND A	
B	2	PYRO GND B	
C	3	PYRO GND A	
D	4	PYRO GND B	
E	5	PYRO 3A	
F	6	PYRO 1B	
H	7	PYRO 1A	
J	8	PYRO 3B	
K	9	PYRO 4A	
L	10	PYRO 2B	
M	11	PYRO 2A	
N	12	PYRO 4B	
P	13	*	
R	14	18 GND	
S	15	LGIC GND	
T	16	18 GND	
U	17	HEAT 5	
V	18	VSW1 B8	
W	19	*	HEATER 1 DELETED 12/8/80
X	20	VSW7 B2	
Y	21	HEAT 6	
Z	22	VSW2 B7	
AA	23	HEAT 2	
BB	24	VSW8 B1	
CC	25	*	heat 7 not wired on F.U.
DD	26	VSW3 B6	Lower case to make
EE	27	HEAT 3	alphebetical list as last
FF	28	VSW9 B8	item.
HH	29	HEAT 8	
JJ	30	VSW4 B5	
KK	31	HEAT 4	
LL	32	VSW10A B7	
MM	33	VSW10B B6	
NN	34	VSW5 B4	
PP	35	28 GND	
RR	36	VSW11A B5	
SS	37	28 GND	
TT	38	VSW6 B3	
UU	39	28 GND	
VV	40	VSW11B B4	
WW	41	LEAK 2 TMP	
XX	42	PLUM 2 TMP	
YY	43	LEAK 1 TMP	
ZZ	44	PLUM 1 TMP	

*PAGE 4 of 14

	H4A	PYRO A
1	LD1A	
2	LD0A	
3	LD2A	
4	EN A	
5	S01	
6	S05	
7	IS11	
8	S06	
9	PYROPLSA2	
10	IS15	
11	FMTRST	
12	INLETWD	
13	OVP B1	
14	PRUSENA	
15	HKSCLK	
16	ISWEN	
17	LGIC GND	
18	SDATOUT A	
19	VSW11B B4	
20	VSW12A B3	
21	VSW12B B2	
22	OVP B1	
23	VSW9 B8	
24	VSW11A B5	
25	VSW10B B6	
26	VSW10A B7	
27	+10V	
28	LGIC GND	
29	PYRO A L1	
30	PYRO A L1	
31	CH GND	(TIED TO CHASSIS GND THRU MTNG SCREW)
32	PYRO GND A	
33	P1A R	
34	P3A R	
35	*SPARE *	
36	*SPARE *	
37	*SPARE *	
38	*SPARE *	
39	*SPARE *	
40	SEQCL10A	
41	*SPARE *	
42	*SPARE *	
43	SEQCL11A	
44	*SPARE *	
45	*TEST 1	
46	TEST 2A	
47	*SPARE *	
48	SEQCL12A	
49	*SPARE *	
50	+10V	
51	P4A R	
52	S01	
53	LGIC GND	
54	LGIC GND	
55	S07	
56	*IS07A *	
57	P0A R	
58	P2A R	
59	*IS06A *	
60	*IS05A *	

FILE: ILTN5.PIN DISK: GNMS-I

ENGINEER J. MAURER	DRAFTSMAN	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	INLET BOARD CONNECTIONS GNMS 1 OF 3 S/N2	3/10/83
	B-E5803C CONTROLLED	DATE

LAST USED R C D L

10.4

*Page 5 of 14
*PYRO DECODER HYBRID "B"

	H46	PYRO B
1	LI1A	
2	LD0A	
3	LD2A	
4	EN B	
5	S01	
6	S05	
7	IS11	
8	S06	
9	PYROPLSB2	
10	IS15	
11	FMTRST	
12	INLETWD	
13	[illegible]	B1
14	FBUGENB	
15	H SCLK	
16	ISWEN	
17	LGIC GND	
18	SDATOUT B	
19	VSW5	B4
20	VSW6	B3
21	VSW7	B2
22	VSW8	B1
23	VSW1	B8
24	VSW4	B5
25	VSW3	B6
26	VSW2	B7
27	+10V	
28	SDATOUT A	
29	PYRO B L2	
30	PYRO B L2	
31	CH GND	(TIED TO CHASSIS GND THRU MTNG SCREW)
32	PYRO GND B	
33	F1B B	
34	F3B B	
35	*SPARE	*
36	*SPARE	*
37	*SPARE	*
38	*SPARE	*
39	*SPARE	*
40	SEQCL10B	
41	*SPARE	*
42	*SPARE	*
43	SEQCL11B	
44	*SPARE	*
45	*TEST 1	
46	TEST 2B	
47	*SPARE	*
48	SEQCL12B	
49	*SPARE	*
50	+10V	
51	F4B F	
52	*IS01B	*
53	LGIC GND	
54	LGIC GND	
55	S[illegible]	
56	S07	
57	F2B B	
58	F1B F	
59	S06	
60	S05	

*

*Page 6 of 14
*VALVE DRIVER HYBRID "A"

	H17	VALVE
1	+18 C1/C2+	
2	VALVOP1	
3	SEQCL1	
4	VALVCL1	
5	SEQOP1	
6	*SPARE	*
7	SEQOP2	
8	VALVCL2	
9	SEQCL2	
10	VALVOP2	
11	*SPARE	*
12	*SPARE	*
13	+18 C1/C2+	
14	18 GND	
15	18 GND	
16	18 GND	
17	*SPARE	*
18	+18 C1/C2+	
19	*SPARE	*
20	*SPARE	*
21	VALVOP3	
22	SEQCL3	
23	VALVCL3	
24	SEQOP3	
25	*SPARE	*
26	SEQOP4	
27	VALVCL4	
28	SEQCL4	
29	VALVOP4	
30	+18 C1/C2+	
31	+18 C1/C2+	
32	VALVCL8	
33	SEQOP8	
34	VALVOP8	
35	SEQCL8	
36	*SPARE	*
37	SEQCL7	
38	VALVOP7	
39	SEQOP7	
40	VALVCL7	
41	*SPARE	*
42	*SPARE	*
43	+18 C1/C2+	
44	*SPARE	*
45	*SPARE	*
46	*SPARE	*
47	*SPARE	*
48	+18 C1/C2+	
49	*SPARE	*
50	*SPARE	*
51	VALVCL6	
52	SEQOP6	
53	VALVOP6	
54	SEQCL6	
55	*SPARE	*
56	SEQCL5	
57	VALVOP5	
58	SEQOP5	
59	VALVCL5	
60	+18 C1/C2+	

*

*Page 7 of 14
*VALVE DRIVER HYBRID "B"

	H58	VALVE	
1	+18 C1/C2+		
2	*VALVOP10A		
3	SEQCL10A		
4	V10A +CLSE		
5	*SEQOP10A		
6	*SPARE		
7	*SEQOP11A		
8	V11A +CLSE		
9	SEQCL11A		
10	*VALVOP11A		
11	*SPARE		
12	*SPARE		
13	+18 C1/C2+		
14	18 GND		
15	18 GND		
16	18 GND		
17	*SPARE		
18	+18 C1/C2+		
19	*SPARE		
20	*SPARE		
21	*VALVOP12A		
22	SEQCL12A		
23	V12A +CLSE		
24	*SEQOP12A		
25	*SPARE		
26	*SEQOP4		
27	*VALVCL4	SPARE	
28	*SEQCL4 SPARE		
29	*VALVOP4		
30	+18 C1/C2+		SPARE..LEFT OPEN AT ASM'B
31	+18 C3/C4+		SPARE..LEFT OPEN AT ASM'B
32	*VALVCL8	SPARE	
33	*SEQOP8		
34	*VALVOP		
35	*SEQCL8	SPARE	
36	*SPARE		
37	SEQCL12B		
38	*VALVOP12B		
39	*SEQOP12B		
40	V12B +CLSE		
41	*SPARE		
42	*SPARE		
43	+18 C3/C4+		
44	*SPARE		
45	*SPARE		
46	*SPARE		
47	*SPARE		
48	+18 C3/C4+		
49	*SPARE		
50	*SPARE		
51	V11B +CLSE		
52	*SEQOP11B		
53	*VALVOP11B		
54	SEQCL11B		
55	*SPARE		
56	SEQCL10		
57	*VALVOP10B		
58	*SEQOP10B		
59	V10B +CLSE		
60	+18 C3/C4+		

*

*Page 8 of 14
*HEATER DRIVE HYBRID

	H6	HEATER	
1	SEQCL2		
2	SEQCL5		
3	SEQCL4		
4	SEQOP5		
5	SEQOP2		
6	SEQOP3		
7	SEQCL8		
8	SEQCL6		
9	SEQOP7		
10	SEQCL1		
11	SEQCL3		
12	IS11		
13	IS15		
14	SEQCL7		
15	SEQOP4		
16	SEQOP1		
17	SEQOP6		
18	SEQOP8		
19	VALVEN-		
20	LD0A		
21	VALVEN-		
22	LD1A		
23	LGIC GND		
24	HTREN-		
25	FMTRST		
26	LD2A		
27	VALVCL9		
28	VALVOP9		
29	*SPARE	*	
30	+18 C1/C2+		
31	+18 C1/C2+		
32	*VALVOP 11	SPARE	
33	*VALVCL 11	SPARE	
34	18 GND		
35	18 GND		
36	EN B		
37	+18 H2 [E5]		
38	HEAT2 HYRB		
39	HEAT4 HYRB		
40	+18 H4 [E11]		
41	+18 H6 [E17]		
42	HEAT 6		
43	HEAT5 HYRB		
44	+18 H5 [E14]		
45	+18 H7 [E20]		
46	*heat7		heat 7 not wired on F.U.
47	HEAT 3		
48	+18 H3 [E8]		
49	+18 H1 [E20]		
50	HEAT1 HYRB		
51	HEAT8 HYRB		
52	+18 H8 [E23]		
53	LD3A		
54	EN A		
55	LD4A		
56	PYROPLSA1		
57	INLETWD		
58	PYROPLSB1		
59	LD5A		
60	+10V		

*

ENGINEER J. MAURER	DRAFTSMAN	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	INLET BOARD CONNECTIONS GNMS 2 OF 3 S/N2	3/10/83
	B-E5804C CONTROLLED	DATE

LAST USED R C D L

10.5

```
*page 5 of 14
*
* RELAYS....(Teledyne IC-5, 422. Latching, w/spreader pads)
* Pins are CW from tab, bottom view. (tab = pin 10).
* Due to confusion in Engineering board, this detailed input file:
*
        RY1     HEATER 2
ED      *6-17-81
1       HEAT 2  *
2       *NC     *
3       +28 S/C *
4       HEAT2 HYRB (ON)
5       18 GND  *
6       *NC     *
7       HEAT 2  *
8       +28 S/C *
9       HEAT1 HYRB (RESET/OFF)
10      18 GND  *
*
*
        RY2     HEATER 4
ED      *6-17-81
1       HEAT 4  *
2       *NC     *
3       +28 S/C *
4       HEAT4 HYRB (ON)
5       18 GND  *
6       *NC     *
7       HEAT 4  *
8       +28 S/C *
9       HEAT1 HYRB (RESET/OFF)
10      18 GND  *
*
*
        RY3     HEATER 5
ED      *6-17-81
1       HEAT 5  *
2       *NC     *
3       +28 S/C *
4       HEAT5 HYRB (ON)
5       18 GND  *
6       *NC     *
7       HEAT 5  *
8       +28 S/C *
9       HEAT1 HYRB (RESET/OFF)
10      18 GND  *
*
* Note (11/5/82): The representation of RY4 is a sneaky trick due to JM
* (which he didn't document) that prevents the maximum number of
* plugs allowed from being exceeded. Notice that the RY4 plug declaration
* is preceeded by an asterisk. This permits HARNES to assign connections
* to RY4 but under the guise of RY3. Therefore, the hardcopy output
* must be fixed to read "RY4" instead of "RY3" where appropriate. BPR
*
*       RY4     HEATER 8
ED      *6-17-81
1       HEAT 8  *
2       *NC     *
3       +28 S/C *
4       HEAT8 HYRB (ON)
5       18 GND  *
6       *NC     *
7       HEAT 8  *
8       +28 S/C *
9       HEAT1 HYRB (RESET/OFF)
10      18 GND  *
*
*
*
```

```
*page 10 of 14
*
*
*DIODES
        D1      DIODE 1
1       PYRO A F1
2       PYRO A D1
*
*
        D2      DIODE 2
1       PYRO B F4
2       PYRO B D2
*
*
        D5      DIODE 5
1       PYRO A L1
2       PYRO A D1
*
*
        D6      DIODE 6
1       PYRO B L2
2       PYRO B D2
*
*
*
        D7      RESET
1       18 GND
2       HEAT1 HYRB
*
*
*
        D8      RY1
1       18 GND
2       HEAT2 HYRB
*
*
        D9      RY2
1       18 GND
2       HEAT4 HYRB
*
*
        D10     RY3
1       18 GND
2       HEAT5 HYRB
*
*
        D11     RY4
1       18 GND
2       HEAT8 HYRB
*
*
```

```
*page 11 of 14
*
*
*CAPACITORS
        C1      300/30
1       18 GND
2       +18 C1/C2+
*
*
        C2      300/30
1       18 GND
2       +18 C1/C2+
*
*
        C3      300/30
1       18 GND
2       +18 C3/C4+
*
*
        C4      300/30
1       18 GND
2       +18 C3/C4+
*
*
*
```

```
*INDUCTORS AND FUSES
        L1      L1
1       PYRO A D1
2       PYRO A L1
*
*
        L2      L2
1       PYRO B D2
2       PYRO B L2
*
*
*
        F1      FUSE 1
1       PYRO PW A
2       PYRO A F1
*
*
*
        F2      FUSE 2
1       PYRO PW A
2       PYRO A D1
*
*
*
        F3      FUSE 3
1       PYRO PW B
2       PYRO B D2
*
*
*
        F4      FUSE 4
1       PYRO PW B
2       PYRO B F4
*
*
```

```
*page 12 of 14
*PC BOARD TERMINATION & JUMPERS
*
*JUMPERS...(EXTRA PART)
*
        E       EXTRA
1       +18 H
2       +18 H1
3       +6 H
4       +18 H
5       +18 H2
6       +6 H
7       +18 H
8       +18 H3
9       +6 H
10      +18 H
11      +18 H4
12      +6 H
13      +18 H
14      +18 H5
15      +6 H
16      +18 H
17      +18 H6
18      +6 H
19      +18 H
20      +18 H7
21      +6 H
22      +18 H
23      +18 H8
24      +6 H
25      PYRO GND A
26      PYRO GND B
27      PYRO 0A
28      PYRO 0B
*
*
```

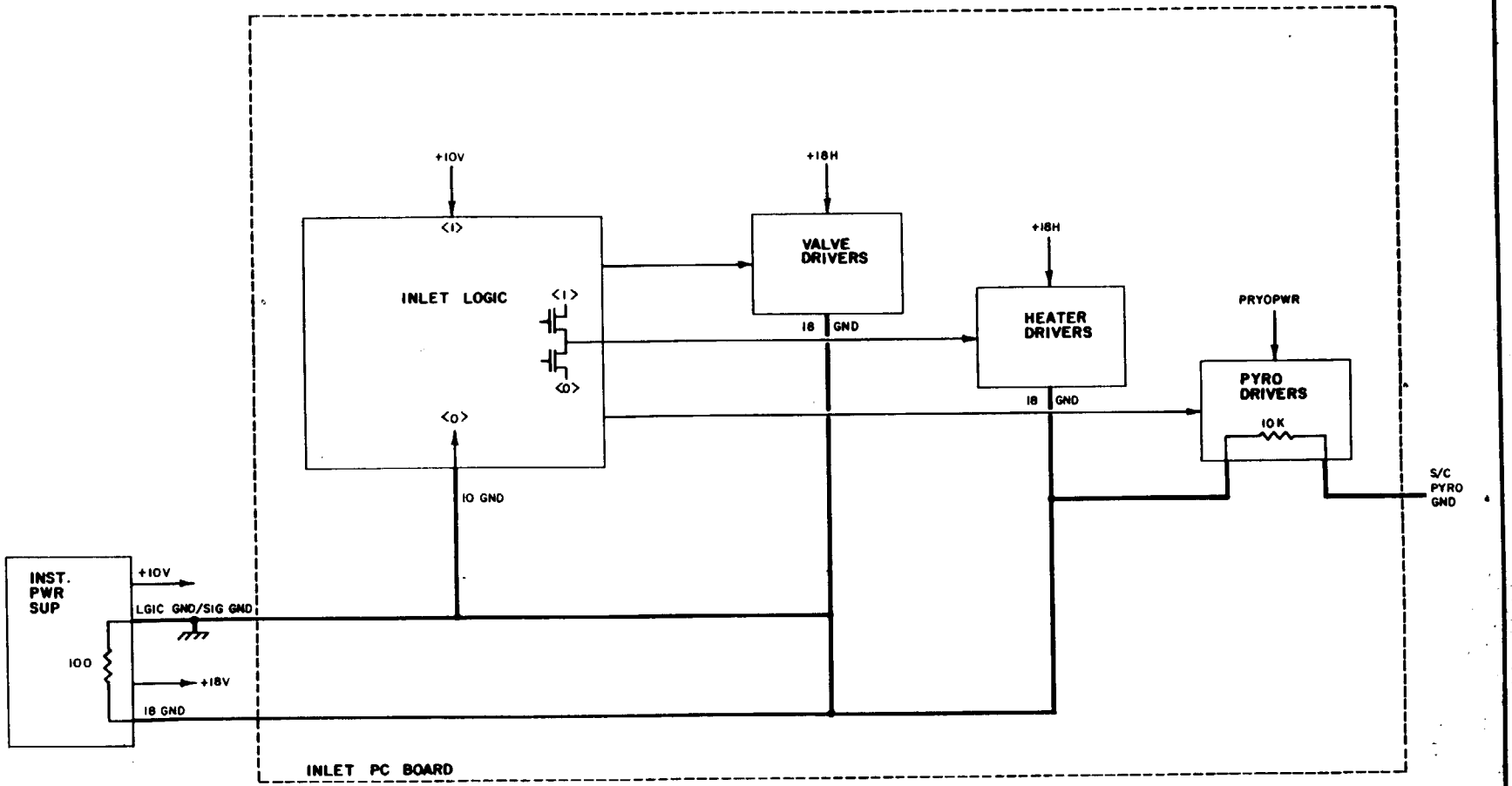
```
*page 13 of 14
*
*
        R1      4.3 OHM
1       P0A R
2       PYRO 0A
*
        R2      4.3 OHM
1       P1A R
2       PYRO 1A
*
        R3      4.3 OHM
1       P2A R
2       PYRO 2A
*
        R4      4.3 OHM
1       P3A R
2       PYRO 3A
*
        R5      4.3 OHM
1       P4A R
2       PYRO 4A
*
        R6      4.3 OHM         REPLACES H5B
1       SEQCL10A
2       V10A +CLSE
*
        R7      4.3 OHM         REPLACES H8B
1       SEQCL11A
2       V11A +CLSE
*
        R8      4.3 OHM         REPLACES H5B
1       SEQCL12A
2       V12A +CLSE
*
        R9      4.3 OHM
1       P0B R
2       PYRO 0B
*
        R10     4.3 OHM
1       P1B R
2       PYRO 1B
*
        R11     4.3 OHM
1       P2B R
2       PYRO 2B
*
        R12     4.3 OHM
1       P3B R
2       PYRO 3B
*
        R13     4.3 OHM
1       P4B R
2       PYRO 4B
*
        R14     4.3 OHM         REPLACES H5R
1       SEQCL10B
2       V10B +CLSE
*
        R27     1MEG
1       PYRO A D1
2       TEST 2A
*
        R28     1MEG
1       PYRO B D2
2       TEST 2B
*
*
```

P0A & P0B ARE SPARE CIRCUITS AND ARE NOT USED AS OF 1/21/81

```
*page 14 of 14
*
*
        R15     4.3 OHM         OPTIONAL FOR H5B
1       SEQCL11B
2       V11B +CLSE
*
        R16     4.3 OHM         OPTIONAL FOR H5B
1       SEQCL12B
2       V12B +CLSE
*
        R17     390 OHM
1       +18 H
2       +18 C1/C2+
*
        R18     390 OHM
1       +18 H
2       +18 C1/C2+
*
        R19     390 OHM
1       +18 H
2       +18 C3/C4+
*
        R20     390 OHM
1       +18 H
2       +18 C3/C4+
*
        R21     220 OHMS
1       SEQCL10A
2       PYRO GND A
*
        R22     220 OHMS
1       SEQCL11A
2       PYRO GND A
*
        R23     220 OHMS
1       SEQCL12A
2       PYRO GND A
*
        R24     220 OHMS
1       SEQCL10B
2       PYRO GND B
*
        R25     220 OHMS
1       SEQCL11B
2       PYRO GND B
*
        R26     220 OHMS
1       SEQCL12B
2       PYRO GND B
*
*END OF FILE:ILTN5.PIN
*
```

ENGINEER J. MAURER	DRAFTSMAN	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	INLET BOARD CONNECTIONS GNMS 3 OF 3 S/N2	3/10/83 DATE
	B-E6392C CONTROLLED	

LAST USED R C D L



ENGINEER J MAURER 4-5-79	DRAFTSMAN TS 4-17-79
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	GROUNDING PLAN H4,H5,H6 INLET SYSTEM GALILEO-NMS B-E 5231
	6-6-79 DATE

LAST USED R C D L

FILE:ISFUNC.TXT DISC:GNMS-1

INLET SYSTEM FUNCTION TABLE REV 3 9-17-81 WP/JM

OCTAL SWITCHES ON LOGIC TEST BOX

NUMBER	CODE	FUNCTION
0	000	00 PYRO #0 (NOT USED) (TODAY)
1		01 PYRO #1 (INLET 1) (ENABLE BC1)
2		02 PYRO #2 (INLET 2)
3		03 PYRO #3 (OUTLET 1)
4		04 PYRO #4 (OUTLET 2)
5		05 VALVE #10 CL (BC 1)
6		06 VALVE #11 CL (BC 2)
7		07 VALVE #12 CL (BC 3)
8	001	10 VALVE #1 OPEN
9		11 VALVE #2 OPEN
10		12 VALVE #3 OPEN
11		13 VALVE #4 OPEN (ENABLE BC 2)
12		14 VALVE #5 OPEN
13		15 VALVE #6 OPEN
14		16 VALVE #7 OPEN
15		17 VALVE #8 OPEN (ENABLE BC 3)
16	010	20 RY HTRS OFF
17		21 HEATER #2 ON (RY)
18		22 HEATER #3 ON
19		23 HEATER #4 ON (RY)
20		24 HEATER #5 ON (RY)
21		25 HEATER #6 ON
22		26 HEATER #7 ON (SPARE)
23		27 HEATER #8 ON (RY)
24	011	30 VALVE #9 OPEN
25		31 VALVE SPARE OPEN
26		32 NO OPERATION
27		33 NO OPERATION
28		34 VALVE #9 CLOSE
29		35 VALVE SPARE CLOSE
30		36 NO OPERATION
31		37 NO OPERATION
32	100	40 NO OPERATION
33		41 NO OPERATION
34		42 NO OPERATION
35		43 NO OPERATION
36		44 NO OPERATION
37		45 NO OPERATION
38		46 NO OPERATION
39		47 NO OPERATION
40	101	50 VALVE #1 CLOSE
41		51 VALVE #2 CLOSE
42		52 VALVE #3 CLOSE
43		53 VALVE #4 CLOSE
44		54 VALVE #5 CLOSE
45		55 VALVE #6 CLOSE
46		56 VALVE #7 CLOSE
47		57 VALVE #8 CLOSE
48	110	60 NO OPERATION
49		61 NO OPERATION
50		62 HEATER #3 OFF
51		63 NO OPERATION
52		64 NO OPERATION
53		65 HEATER #6 OFF
54		66 HEATER SPARE OFF
55		67 NO OPERATION
56	111	70 NO OPERATION
57		71 NO OPERATION
58		72 NO OPERATION
59		73 NO OPERATION
60		74 NO OPERATION
61		75 NO OPERATION
62		76 NO OPERATION
63		77 NO OPERATION

COMMAND BIT #2 (VALVEN) DISABLES CODES 001 & 101 (VOLATILE COMMAND)
COMMAND BIT #3 (HTREN) DISABLES CODES 010 & 110 (VOLATILE COMMAND)
COMMAND BIT #18 (CALEN) DISABLES CODE 011 (STORED COMMAND)

LABELS AGREE WITH B-E6142D (VALVE SCHEMATIC) REV 12-16-80 WP

END FILE:ISFUNC.TXT

ENGINEER W PINKUS	DRAFTSMAN MSG 8/23/79	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	INLET SYSTEM FUNCTION TABLE GNMS	9/19/79 8/23/79 6/6/79 DATE
	B-E 5296	

LAST USED R C D L

NO.	SIGNAL	PLUG	PIN
1	+10V	IN	J
		E-A	27
		E-A	50
		E-B	27
		H4B	50
		H6	60
2	+18 C1/C2+	H17	1
		H17	13
		H17	18
		H17	30
		H17	31
		H17	43
		H17	48
		H17	60
		H5B	1
		H5B	13
		H5B	18
		H5B	30
		H6	30
		H6	31
		C1	2
		C2	2
		R17	2
		R18	2
3	+18 C3/C4+	H5B	31
		H5B	43
		H5B	48
		H5B	60
		C3	2
		C4	2
		R19	2
		R20	2
4	+18 H	IN	E
		IN	H
		E	1
		E	4
		E	7
		E	10
		E	13
		E	16
		E	19
		E	22
		R17	1
		R18	1
		R19	1
		R20	1
5	+18 H1	H6	49
		E	2
6	+18 H2	H6	37
		E	5
7	+18 H3	H6	48
		E	8
8	+18 H4	H6	40
		E	11
9	+18 H5	H6	44
		E	14
10	+18 H6	H6	41
		E	17
11	+18 H7	H6	45
		E	20
12	+18 H8	H6	52
		E	23
13	+28 S/C	IN	K
		IN	L
		RY1	3
		RY1	8
		RY2	3
		RY2	8
		RY3	3
		RY3	8
		RY3	3
		RY3	8
14	+6 H	IN	F
		E	3
		E	6
		E	9
		E	12
		E	15
		E	18
		E	21
		E	24
15	18 GND	IN	C
		IN	D
		OUT1	CC
		OUT1	DD
		OUT1	EE
		OUT2	R
		OUT2	T
		H17	14
		H17	15
		H17	16
		H5B	14
		H5B	15
		H5B	16
		H6	34
		H6	35
		RY1	5
		RY1	10
		RY2	5
		RY2	10
		RY3	5
		RY3	10
		RY3	5
		RY3	10
		D7	1
		D8	1
		D9	1
		D10	1
		D11	1
		C1	1
		C2	1
		C3	1
		C4	1
16	28 GND	IN	LL
		IN	MM
		OUT2	PP
		OUT2	SS
		OUT2	UU
17	CELL 1 TMP	IN	PP
		OUT1	LL
18	CELL 2 TMP	IN	RR
		OUT1	MM
19	CH GND	H4A	31
		H4B	31
20	EN A	H4A	4
		H6	54
21	EN B	H4B	4
		H6	36
22	FMTRST	IN	FF
		H4A	11
		H4B	11
		H6	25
23	HEAT 2	OUT2	AA
		RY1	1
		RY1	7
24	HEAT 3	OUT2	EE
		H6	47
25	HEAT 4	OUT2	KK
		RY2	1
		RY2	7
26	HEAT 5	OUT2	U
		RY3	1
		RY3	7
27	HEAT 6	OUT2	Y
		H6	42
28	HEAT 8	OUT2	HH
		RY3	1
		RY3	7
29	HEAT1 HYRB	H6	50
		RY1	9
		RY2	9
		RY3	9
		RY3	9
		D7	2
30	HEAT2 HYRB	H6	38
		RY1	4
		D8	2
31	HEAT4 HYRB	H6	39
		RY2	4
		D9	2
32	HEAT5 HYRB	H6	43
		RY3	4
		D10	2
33	HEAT8 HYRB	H6	51
		RY3	4
		D11	2
34	HKSCLK	IN	JJ
		H4A	15
		H4B	15
35	HTREN-	IN	DD
		H6	24
36	INLETWD	IN	AA
		H4A	12
		B	12
		H6	57
37	IS11	H4A	7
		H4B	7
		H6	12
38	IS15	H4A	10
		H4B	10
		H6	13
39	ISWEN	IN	HH
		H4A	16
		H4B	16
40	LD0A	IN	M
		H4A	2
		H4B	2
		H6	20
41	LD1A	IN	N
		H4A	1
		H4B	1
		H6	22
42	LD2A	IN	P
		H4A	3
		H4B	3
		H6	26
43	LD3A	IN	R
		H6	53
44	LD4A	IN	S
		H6	55
45	LD5A	IN	T
		H6	59
46	LEAK 1 TMP	IN	SS
		OUT2	YY
47	LEAK 2 TMP	IN	TT
		OUT2	WW
48	LG1C GND	IN	A
		IN	B
		OUT1	JJ
		OUT1	KK
		OUT2	S
		H4A	17
		H4A	28
		H4A	53
		H4A	54
		H4B	17
		H4B	53
		H4B	54
		H6	23
49	OVP B1	IN	EE
		H4A	13
		H4A	22
		H4B	13
50	P0A R	H4A	57
		R1	1
51	P0B R	H4B	57
		R9	1
52	P1A R	H4A	33
		R2	1
53	P1B R	H4B	33
		R10	1
54	P2A R	H4A	58
		R3	1
55	P2B R	H4B	58
		R11	1
56	P3A R	H4A	34
		R4	1
57	P3B R	H4B	34
		R12	1
58	P4A R	H4A	51
		R5	1

ENGINEER J. MAURER	DRAFTSMAN	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	NODE NAME LISTING INLET PC PG. 1 OF 2 GNMS S/N2	3/10/83
	B-E6379C CONTROLLED	DATE

LAST USED R C D L

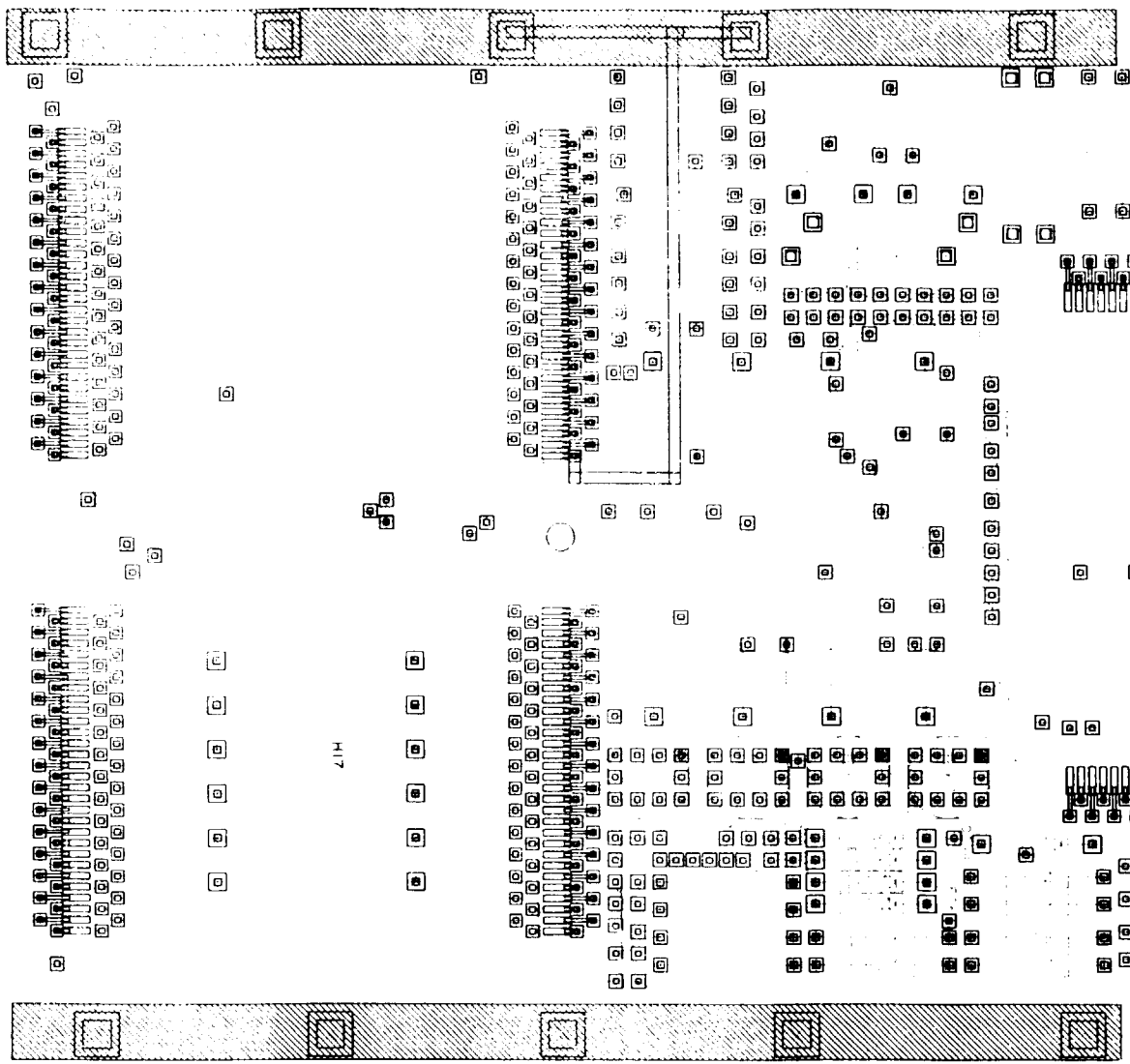
NO.	SIGNAL	PLUG	PIN
59	P4B R	H4B	51
		R13	1
60	PBUSENA	IN	Y
		H4A	14
61	PBUSENB	IN	Z
		H4B	14
62	PLUM 1 TMP	IN	UU
		OUT2	ZZ
63	PLUM 2 TMP	IN	VV
		OUT2	XX
64	PYRO 0A	E	27
		R1	2
65	PYRO 0B	E	28
		R9	2
66	PYRO 1A	OUT2	H
		R2	2
67	PYRO 1B	OUT2	F
		R10	2
68	PYRO 2A	OUT2	M
		R3	2
69	PYRO 2B	OUT2	L
		R11	2
70	PYRO 3A	OUT2	E
		R4	2
71	PYRO 3B	OUT2	J
		R12	2
72	PYRO 4A	OUT2	K
		R5	2
73	PYRO 4B	OUT2	N
		R13	2
74	PYRO A D1	D1	2
		D5	2
		L1	1
		F2	2
		R27	1
75	PYRO A F1	D1	1
		F1	2
76	PYRO A L1	H4A	29
		H4A	30
		D5	1
		L1	2
77	PYRO B D2	D2	2
		D6	2
		L2	1
		F3	2
		R28	1
78	PYRO B F4	D2	1
		F4	2
79	PYRO B L2	H4B	29
		H4B	30
		D6	1
		L2	2
80	PYRO GND A	IN	YY
		OUT2	A
		OUT2	C
		H4A	32
		E	25
		R21	2
		R22	2
		R23	2
81	PYRO GND B	IN	XX
		OUT2	B
		OUT2	D
		H4B	32
		E	26
		R24	2
		R25	2
		R26	2
82	PYRO PW A	IN	WW
		F1	1
		F2	1
83	PYRO PW B	IN	ZZ
		F3	1
		F4	1
84	PYROPLSA1	IN	U
		H6	56
85	PYROPLSA2	IN	W
		H4A	9
86	PYROPLSB1	IN	V
		H6	58
87	PYROPLSB2	IN	X
		H4B	9
88	S01	H4A	5
		H4A	52
		H4B	5
89	S05	H4A	6
		H4B	6
		H4B	60
90	S06	H4A	8
		H4B	8
		H4B	59
91	S07	H4A	55
		H4B	55
		H4B	56
92	SDATOUT A	H4A	18
		H4B	28
93	SDATOUT B	IN	KK
		H4B	18
94	SEQCL1	H17	3
		H6	10
95	SEQCL10	H5B	56
96	SEQCL10A	H4A	40
		H5B	3
		R6	1
		R21	1
97	SEQCL10B	H4B	40
		R14	1
		R24	1
98	SEQCL11A	H4A	43
		H5B	9
		R7	1
		R22	1
99	SEQCL11B	H4B	43
		H5B	54
		R15	1
		R25	1
100	SEQCL12A	H4A	48
		H5B	22
		R8	1
		R23	1
101	SEQCL12B	H4B	48
		H5B	37
		R16	1
		R26	1
102	SEQCL2	H17	9
		H6	1
103	SEQCL3	H17	22
		H6	11
104	SEQCL4	H17	28
		H6	3
105	SEQCL5	H17	56
		H6	2
106	SEQCL6	H17	54
		H6	8
107	SEQCL7	H17	37
		H6	14
108	SEQCL8	H17	35
		H6	7
109	SEQOP1	H17	5
		H6	16
110	SEQOP2	H17	7
		H6	5
111	SEQOP3	H17	24
		H6	6
112	SEQOP4	H17	26
		H6	15
113	SEQOP5	H17	58
		H6	4
114	SEQOP6	H17	52
		H6	17
115	SEQOP7	H17	39
		H6	9
116	SEQOP8	H17	33
		H6	18
117	TEST 2A	H4A	46
		R27	2
118	TEST 2B	H4B	46
		R28	2
119	V10A +CLSE	OUT1	W
		H5B	4
		R6	2
120	V10B +CLSE	OUT1	X
		H5B	59
		R14	2
121	V11A +CLSE	OUT1	Y
		H5B	8
		R7	2
122	V11B +CLSE	OUT1	Z
		H5B	51
		R15	2
123	V12A +CLSE	OUT1	AA
		H5B	23
		R8	2
124	V12B +CLSE	OUT1	BB
		H5B	40
		R16	2
125	VALVCL1	OUT1	B
		H17	4
126	VALVCL2	OUT1	D
		H17	8
127	VALVCL3	OUT1	F
		H17	23
128	VALVCL4	OUT1	J
		H17	27
129	VALVCL5	OUT1	L
		H17	59
130	VALVCL6	OUT1	N
		H17	51
131	VALVCL7	OUT1	R
		H17	40
132	VALVCL8	OUT1	T
		H17	32
133	VALVCL9	OUT1	V
		H6	27
134	VALVEN-	IN	BB
		H6	19
		H6	21
135	VALVOP1	OUT1	A
		H17	2
136	VALVOP2	OUT1	C
		H17	10
137	VALVOP3	OUT1	E
		H17	21
138	VALVOP4	OUT1	H
		H17	29
139	VALVOP5	OUT1	K
		H17	57
140	VALVOP6	OUT1	M
		H17	53
141	VALVOP7	OUT1	P
		H17	38
142	VALVOP8	OUT1	S
		H17	34
143	VALVOP9	OUT1	U
		H6	28
144	VSW1	B8 OUT2	V
		H4B	23
145	VSW10A	B7 OUT2	LL
		H4A	26
146	VSW10B	B6 OUT2	MM
		H4A	25
147	VSW11A	B5 OUT2	RR
		H4A	24
148	VSW11B	B4 OUT2	VV
		H4A	19
149	VSW12A	B3 OUT1	FF
		H4A	20
150	VSW12B	B2 OUT1	HH
		H4A	21
151	VSW2	B7 OUT2	Z
		H4B	26
152	VSW3	B6 OUT2	DD
		H4B	25
153	VSW4	B5 OUT2	JJ
		H4B	24
154	VSW5	B4 OUT2	NN
		H4B	19
155	VSW6	B3 OUT2	TT
		H4B	20
156	VSW7	B2 OUT2	X
		H4B	21
157	VSW8	B1 OUT2	BB
		H4B	22
158	VSW9	B8 OUT2	FF
		H4A	23

ILTNS .PIN 10-Mar-83

NO. SIGNAL PLUG PIN

ENGINEER J. MAURER	DRAFTSMAN	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	NODE NAME LISTING INLET PC PG. 2 OF 2 GNMS S/N2	3/10/83 DATE
	B-E6589C CONTROLLED	

LAST USED R C D L



CONTROLLED PRINT

D229390PCREVB
(APWBD,UMICH)
12-10-81

INLET PC BOARD
PARTS PLACEMENT & TOP
GNMS S/N2
B-E6429 B

10.21

MAR 24 1983

3/10/83

[illegible] FLIGHT DISTRIBUTION [illegible]

LAST INDEX EDIT: 11/17/82 BY [illegible]

PG#	DWG#	TITLE
0.0		COVER
0.1		CONTENTS PG 1
0.2		CONTENTS PG 2
1.0		SYSTEMS
1.1	4[illegible]	BLOCK DIAGRAM
1.2	4465A	LOGIC BLOCK DIAGRAM
1.3	[illegible]31B	ELECTRICAL INTERFACE
1.4	[illegible]B	POWER SYSTEM
1.5	4717C	CMND SYSTEM CONCEPT
1.6	4718B	DATA SYSTEM CONCEPT
1.7		INLET CNTRL SYS (OBSOLETE)
1.8	4[illegible]B	ION SOURCE BIAS SYSTEM
1.9	[illegible]B	DATA FORMAT & SYNC
1.10	[illegible]	PYROTECHNIC SYSTEM
1.11	614[illegible]F	INLET GAS SYSTEM
1.12	6404	HEATER POWER CONCEPT
1.13	6503	POWER SWITCH INTERFACE
1.14	6506	POWER SWITCHING CONTROL
1.15	6679	DIGITAL INTERFACES
1.16	6511	ANALOG MON INTERFACE
1.17	6592	QUANTATIVE COMMANDS
2.0		WIRING HARNESS
2.1	6150B	OVERALL HARNESS SCHEMATIC
2.2	6300	VALVE HARNESS PICTORIAL
2.3	6301	MAIN HARNESS PICTORIAL
2.4	6472	SPACECRAFT HARNESS
2.5	5071	MAIN HARNESS PAGE 1
2.6	5072	MAIN HARNESS PAGE 2
2.7	6318	MAIN HARNESS PAGE 3
2.8	6869	ELECTRODE HARNESS
2.9	6313B	INLET SYS CONNECTORS
2.10	6897	INLET PYRO HARNESS
2.11	5806	INLET OUTPUT HARNESS
2.12	5622	SENSOR PIN ASSIGNMENTS
2.13	6280	CONTINENTAL CONNECTORS
2.14	6678A	GROUNDING PLAN
2.15	6466	MAIN HR. PLUG POSITION

PG#	DWG#	TITLE 11/17/82
3.0		MAIN POWER SUPPLY
3.1	644[illegible]F	POWER SUPPLY PC SCHEMATIC
15.1	5441F	H1 POWER HYBRID
3.9	6157A	INDUCTORS
3.10	[illegible]51E	MAIN TRANSFORMER
3.11	5[illegible]43	HV MULTIPLIER
3.12	6577B	CURRENT XFMR
3.14	6855	COMPONENT LAYOUT
3.15	6854	COMP.LAYOUT REVERSE
3.16	6853	COMP. LAYOUT COMPOSITE
3.17	6852	LAYOUT COMPOSITE
3.18	6809	WIRING LAYOUT
3.19	6758	HV XFMER SHIM DESIGN
3.20	6719	PUMP HV TRANSFORMER
3.22	6754	PUMP PC LAYOUT
4.0		FILAMENT SUPPLY
4.1	6944	FIL PC BOARD
15.3	5433D	H2 FILAMENT HYBRID
4.4	6308A	TRANSFORMERS
4.5	6310	INDUCTORS
4.6	6763	COMPONENT LAYOUT
4.7	6764	LAYOUT REVERSE
10.0		INLET SYSTEM
10.1	6328A	INLET CONTROL BLOCK / 6960A
~~10.3~~	6949	INLET PC SCHEMATIC 1 of 2 / 10.3B 6960A INLET PC SCHEMATIC 2 of 2
15.5	5440F	H4A/B PYRO DRIVE HYBRID
15.6	5431E	~~H5A~~ VALVE DRIVE A HYBRID H17
15.6B	6904A	~~H17~~ VALVE DRIVE B HYBRID H5B
15.7	5431E	H6 HEATER DRIVE HYBRID
10.4	5803C	INLET PC CONECTION 1
10.5	5804C	INLET PC CONECTION 2
10.6	6392C	INLET PC CONECTION 3
10.17	5231	INLET GROUND PLAN
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10.20	6589C	NODE NAME LIST PG2
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10.22	6430B	LAYER 2 PC BOARD
10.23	6431B	LAYER 3 PC BOARD
10.24	6432B	LAYER 4 PC BOARD
10.25	6433B	LAYER 5 PC BOARD
10.26	6434B	LAYER 6 PC BOARD
10.27	6435B	LAYER 7 PC BOARD
10.28	6436B	LAYER 8 PC BOARD
10.29	6956	Heater Fuse BOARD

PG#	DWG#	TITLE 11/17/82
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11.1B	7109	LGC 1 AUX BD 2 - DELTA IF
11.1	6956	LGC 1 PC SCHEMATIC 1
11.1A	6947	LGC 1 PC SCHEMATIC 2
15.8	54[illegible]N	H7 TIMER HYBRID
15.10	5442F	H9 COMMAND MEM HYBRID
15.12	5445F	H11 CALC HYBRID PG1
15.13	5443F	H11 CALC HYBRID PG2
15.16	6125G	H13 FORMAT DATA HYB PG1
15.17	6155G	H13 FORMAT DATA HYB PG2
15.20	6126A	H16 CALCULATOR PROM
11.2	6320A	LGC1 NODE INPUT LST 1
11.3	6321A	LGC1 NODE INPUT LST 2
11.4	6322A	LGC1 NODE INPUT LST 3
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11.16	6882	LGC1 AUX. BD. LAYOUT
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15.9	5438F	H8 ANAMUX HYBRID
15.11	5444F	H10A/B PROGRAM MEM HYB
15.19	6124F	H15 CORE MEMORY HYBRID
11.18	6961	LGC2 NODE INPUT LST 1
11.19	6325	LGC2 NODE INPUT LST 2
11.20	6486	LGC2 NODE NAME LIST 1
11.21	6907	LGC2 COMPONENT LAYOUT
11.22	6906	LGC2 LAYOUT REVERSE
11.24	6946	LGC2 AUX.BD. SCHEMATIC
11.25	6917	LGC2 AUX LAYOUT

ENGINEER	DRAFTSMAN	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	ELECT. DWG. INDEX P. 2 OF 2 FLIGHT SPARE UNIT GNMS S/N 3 B- E6969	DATE

LAST USED R C D L

0.1

		[illegible]
		[illegible]
[illegible]		[illegible] LAYOUT
[illegible]		[illegible] DRAWING
[illegible]		H1 ROD CONTROL HYB PG1
[illegible]		H1 ROD CONTROL HYB PG2
[illegible]		[illegible] SOUNDING
[illegible]		[illegible]
[illegible]		[illegible] BOARD
[illegible]		[illegible]
[illegible]		[illegible]
[illegible]		RF [illegible]
[illegible]	[illegible]	LAYOUT MAIN RF
[illegible]	[illegible]	LAYOUT COMPOSITE
[illegible]	[illegible]	LAYOUT DRIVER
[illegible]	6663	LAYOUT AGC COMPOSITE
[illegible]	6664	LAYOUT AGC & DET
[illegible]	6670	LAYOUT TAN
[illegible]	6649	LAYOUT REGULATOR12.23
[illegible]	[illegible]	LAYOUT [illegible] DETAILS
[illegible]		BIAS SUPPLIES
[illegible]	[illegible]	[illegible] PC SCHEMATIC
[illegible]	[illegible]	[illegible] DIVIDER BOARD
[illegible]	[illegible]	[illegible] HYBRID
[illegible]	[illegible]	HV MULTIPLIER
[illegible]	[illegible]	[illegible] XFMER T1
[illegible]	[illegible]	[illegible] XFMER T2/T3
[illegible]	[illegible]	HV TRANSFORMER T4
[illegible]	[illegible]	TRANSFORMER T5
[illegible]	[illegible]	COMPONENT LAYOUT
[illegible]	[illegible]	LAYOUT REVERSE
[illegible]	[illegible]	COMPONENTS AUX BD
[illegible]	[illegible]	TRANSFORMER SHIMS
[illegible]		PULSE AMP
[illegible]		PULSE AMP PC SCHEMATIC
[illegible]	[illegible]	H14 PULSE AMP HYBRID
[illegible]	[illegible]	COMPONENT LAYOUT

PG#	DWG#	TITLE
15.0		HYBRID [illegible]
15.1	[illegible]	HYBRID [illegible]
15.2	[illegible]	H1 POWER SUPPLY
15.3	[illegible]	H2 [illegible]
15.4	[illegible]	H3 BIAS SUPPLY
15.5	5440F	H4 [illegible]
15.6	543[illegible] F	~~H17~~ VALVE DRIVE [illegible] H17
15.7B	7904 F	~~H17~~ VALVE DRIVE [illegible] H5B
15.7	[illegible]	H6 HEATER DRIVE
15.8	[illegible]	H7 TIMER
15.9	[illegible]	H8 [illegible]
15.10	[illegible]	H9 [illegible] MEM
15.11	5444F	H10 PROGRAM MEM
15.12	5445F	H11 CALC PG 1
15.13	5443F	H11 CALC PG 2
15.14	5432E	H12 ROD CTRL PG1
15.15	5434E	H12 ROD CTRL PG2
15.16	6125G	H13 FORMAT DATA1
15.17	6155G	H13 FORMAT DATA2
15.18	5435D	H14 PULSE AMP
15.19	6124F	H15 CORE
15.20	6126A	H16 PROM

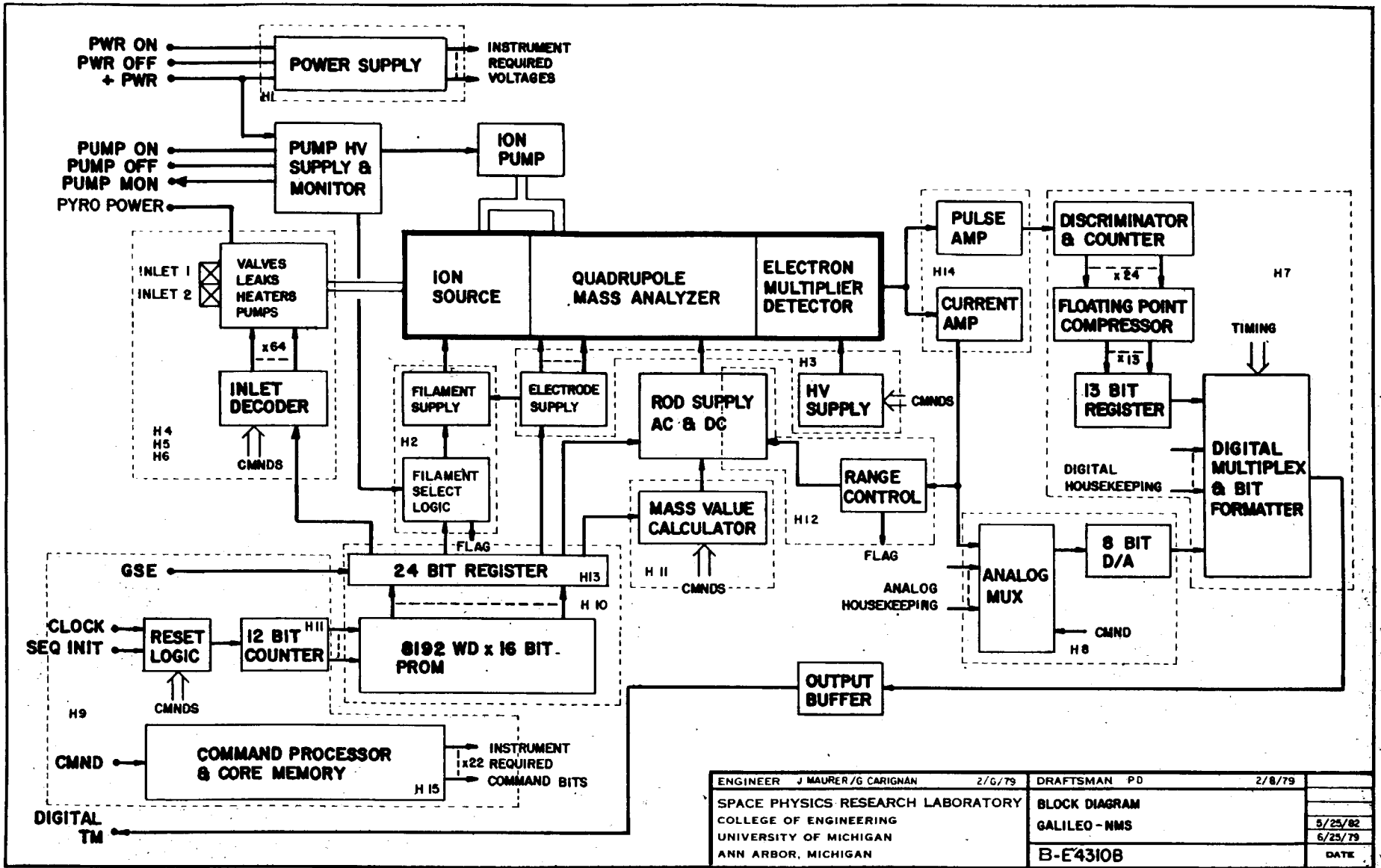
PG#	DWG#	TITLE 1/5/81
17.0		TIMING AND FLOW DIAGRAMS
17.1	4914A	INLET CONTROL TIMING
17.2	4980A	FORMAT CONTROL TIMING
17.3	4981A	DATA TRANS TIMING
17.4	4982A	SUBCOM FORMAT TIMING
17.5	4983A	A/D CONVERTER TIMING
17.6	4984C	CALC TIMING 1 OF 2
17.7	4985B	CALC TIMING 2 OF 2
17.8	5075A	CMND INPUT TIMING
17.9	5076A	TURN-ON-RESET TIMING
17.10	5094	POWER PROFILE
17.11	5201	FIL CONTROL TIMING
17.12	5300	INLET TIMING FUNC
17.13	6319	TM DATA FMT TIMING
17.14	5043A	PGM COUNTER TIMELINE
17.15	6388	H15 CORE TIMING

PG#	DWG#	TITLE 1/5/81
18.0		MISCELLANEOUS
18.1	[illegible]	FLOATING POINT TABLE
18.2	[illegible]	COMMUTATOR ASSIGNMENTS
18.3	[illegible]	HYBRID [illegible] PRINTOUT
18.4	[illegible]	[illegible] DEVICE DESCRIPTION
18.5	[illegible]	[illegible] BOARD RELATIONSHIPS
18.6	[illegible]	MECHANICAL DWG INDEX
19.0		TEST EQUIPMENT & BOXES
19.1	6739	RF TEST BOX
19.2	6740	RF TEST BOX
19.3	6741	RF TEST BOX
19.4	6742	RF TEST BOX
19.5	6744	RF TEST BOX
19.6	6745	RF TEST BOX
19.7	6747	RF TEST BOX
19.8	6748	RF TEST BOX
19.9		RF TEST BOX
19.10	6281	VALVE SIMULATOR
19.11	6282	FROM PRGM INTERFACE
19.12	[illegible]	MANUAL PROGRAMMER
19.13	[illegible]	SEMI-MANUAL PROGRAMMER
19.14	[illegible]	PROM PROGRAMMER
19.15		
19.16	6490	TEST JIG H16 PROM
19.17	6755	H1 TEST BOX
19.18	5210	PROM SIMULATOR PG1
19.19	5212	PROM SIMULATOR PG2
19.20	5682	PROM SIMULATOR PG3
19.21	5307	GSE LOGIC INTERFACE
19.22	6756	BIAS XFMER TEST CIRCUIT
19.23	6757	BIAS GENERAL TEST SETUP

ENGINEER	DRAFTSMAN	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	FLIGHT SPARE UNIT P.2 OF 2 S/N 3	
	B- E6970	DATE

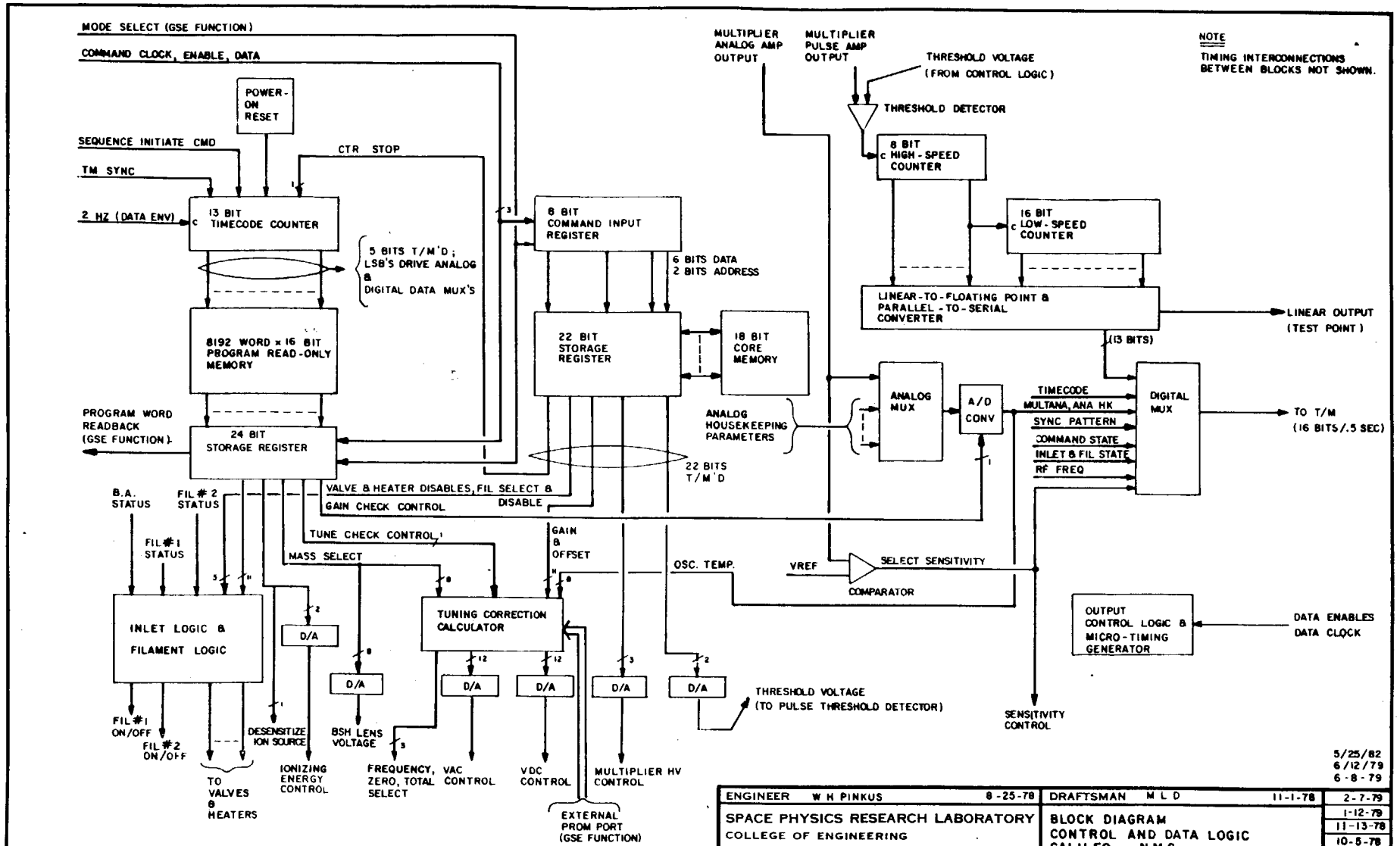
LAST USED R C D L

0.2



ENGINEER J MAURER/G CARIGNAN 2/6/79	DRAFTSMAN PD 2/8/79	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	BLOCK DIAGRAM GALILEO - NMS B-E43108	5/25/82 6/25/79 DATE

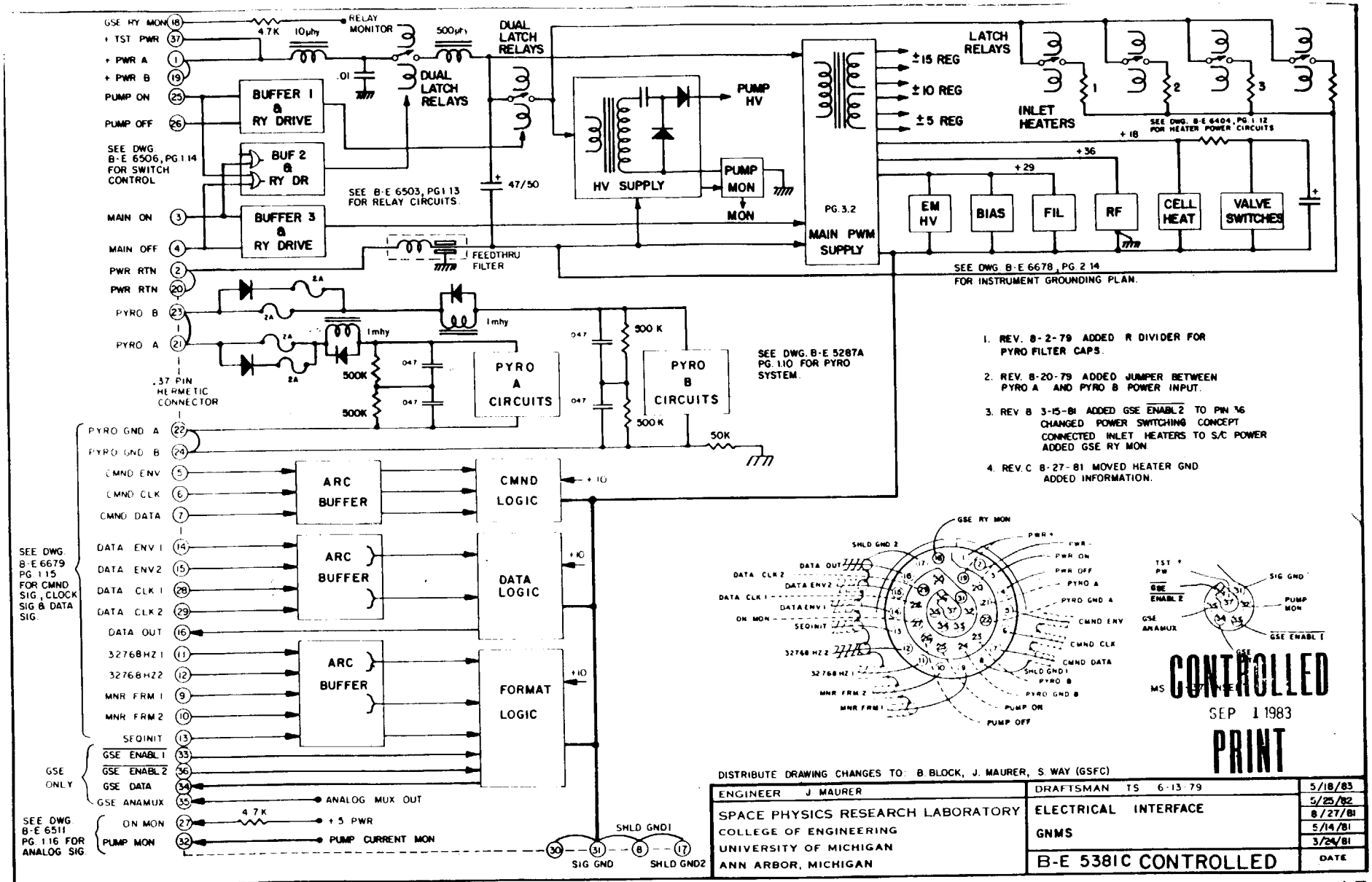
LAST USED R C D L

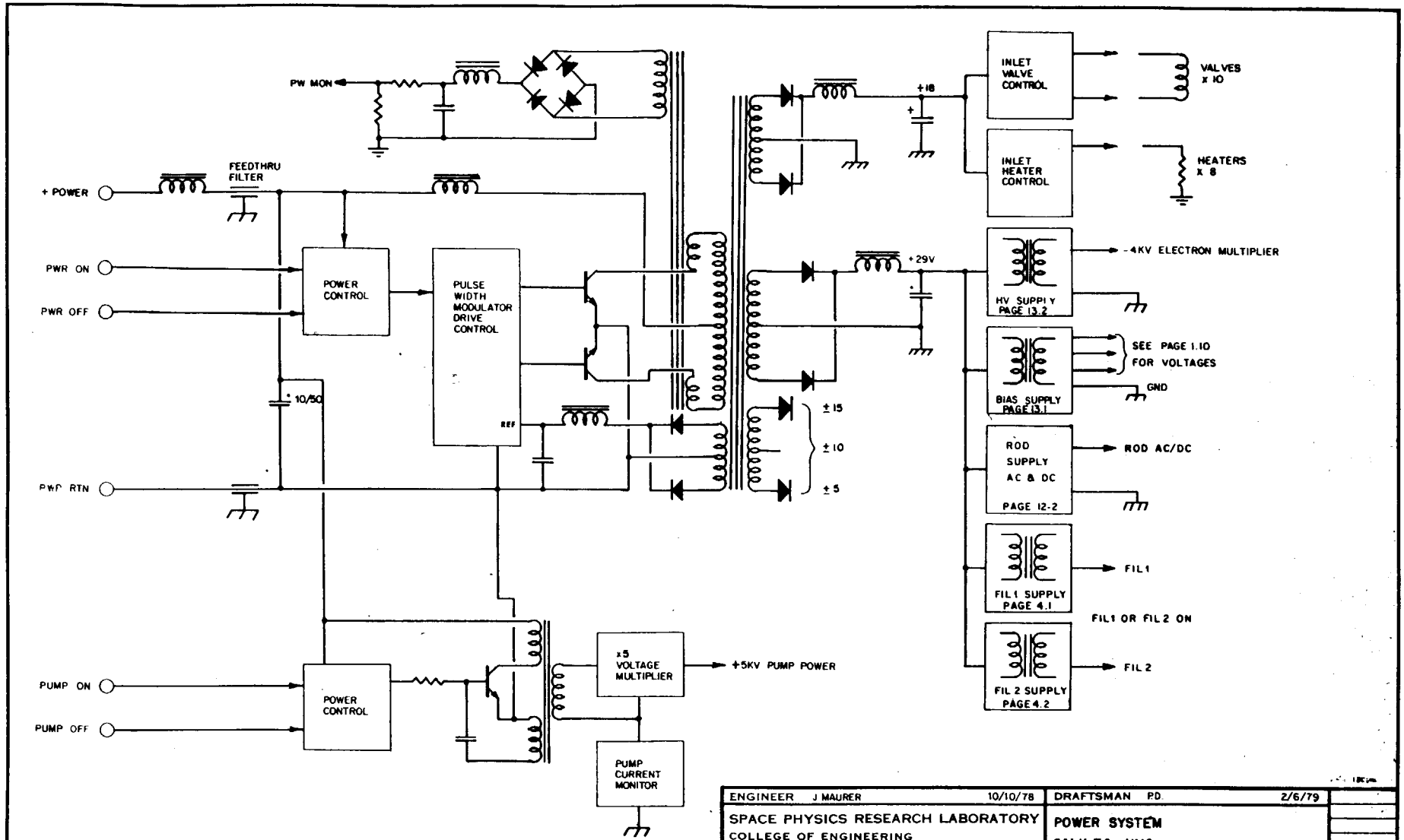


5/25/82
6/12/79
6-8-79

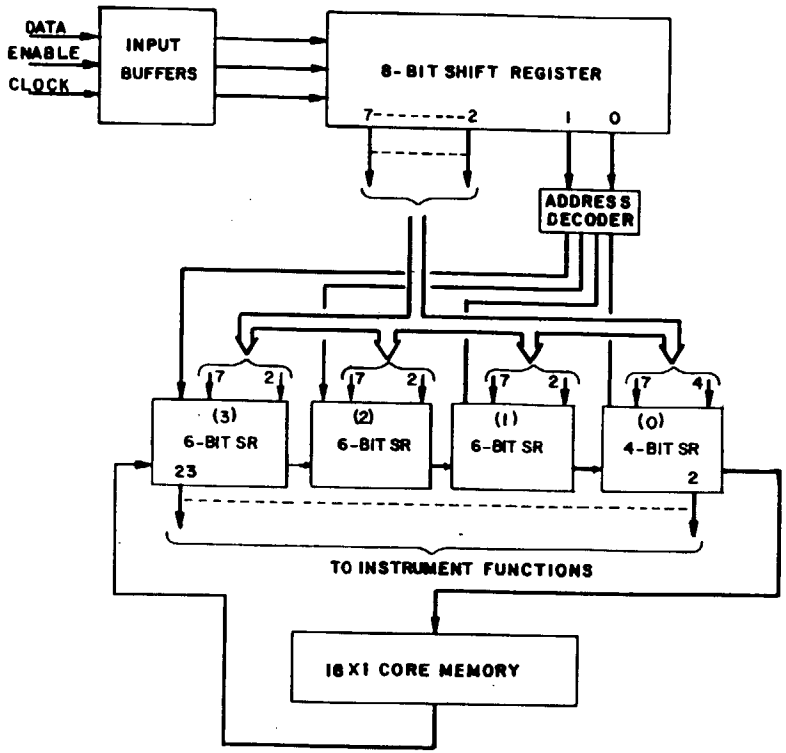
ENGINEER W H PINKUS 8-25-78	DRAFTSMAN M L D 11-1-78	2-7-79
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	BLOCK DIAGRAM CONTROL AND DATA LOGIC GALILEO — NMS	1-12-79 11-13-78 10-5-78 8-29-78
	B-E4465A	DATE

LAST USED R C D L


GSE RY MON 18
+ TST PWR 37
+ PWR A 1
+ PWR B 19
PUMP ON 25
PUMP OFF 26
MAIN ON 3
MAIN OFF 4
PWR RTN 2
PWR RTN 20
PYRO B 23
PYRO A 21
.37 PIN HERMETIC CONNECTOR
PYRO GND A 22
PYRO GND B 24
CMND ENV 5
CMND CLK 6
CMND DATA 7
DATA ENV 1 14
DATA ENV 2 15
DATA CLK 1 28
DATA CLK 2 29
DATA OUT 16
32768HZ 1 11
32768HZ 2 12
MNR FRM 1 9
MNR FRM 2 10
SEQINIT 13
GSE ENABL 1 33
GSE ENABL 2 36
GSE DATA 34
GSE ANAMUX 35
ON MON 27
PUMP MON 32
SEE DWG B-E 6679 PG 1.15 FOR CMND SIG, CLOCK SIG & DATA SIG.
GSE ONLY
SEE DWG B-E 6511 PG. 1.16 FOR ANALOG SIG.
4.7K
10μhy
RELAY MONITOR
500μh
.01
DUAL LATCH RELAYS
BUFFER 1 & RY DRIVE
BUF 2 & RY DR
BUFFER 3 & RY DRIVE
SEE DWG B-E 6506, PG 1.14 FOR SWITCH CONTROL
SEE B-E 6503, PG 1.13 FOR RELAY CIRCUITS.
47/50
FEEDTHRU FILTER
HV SUPPLY
PUMP HV
PUMP MON
MON
PG. 3.2
MAIN PWM SUPPLY
±15 REG
±10 REG
±5 REG
LATCH RELAYS
INLET HEATERS
SEE DWG. B-E 6404, PG. 1.12 FOR HEATER POWER CIRCUITS
+18
+36
+29
EM HV
BIAS
FIL
RF
CELL HEAT
VALVE SWITCHES
SEE DWG B-E 6678, PG 2.14 FOR INSTRUMENT GROUNDING PLAN.
2A
1mhy
500K
.047
PYRO A CIRCUITS
PYRO B CIRCUITS
SEE DWG. B-E 5287A PG. 1.10 FOR PYRO SYSTEM.
ARC BUFFER
CMND LOGIC
DATA LOGIC
FORMAT LOGIC
+10
ANALOG MUX OUT
4.7K
+5 PWR
PUMP CURRENT MON
SHLD GND1
SHLD GND2
SIG GND
30
31
8
17
1. REV. 8-2-79 ADDED R DIVIDER FOR PYRO FILTER CAPS.
2. REV. 8-20-79 ADDED JUMPER BETWEEN PYRO A AND PYRO B POWER INPUT.
3. REV B 3-15-81 ADDED GSE ENABL 2 TO PIN 36 CHANGED POWER SWITCHING CONCEPT CONNECTED INLET HEATERS TO S/C POWER ADDED GSE RY MON
4. REV.C 8-27-81 MOVED HEATER GND ADDED INFORMATION.
GSE RY MON
SHLD GND 2
DATA OUT
DATA CLK 2
DATA ENV 2
DATA CLK 1
DATA ENV 1
ON MON
SEQINIT
32768 HZ 2
32768 HZ 1
MNR FRM 2
MNR FRM 1
PWR +
PWR -
PWR ON
PWR OFF
PYRO A
PYRO GND A
CMND ENV
CMND CLK
CMND DATA
SHLD GND 1
PYRO B
PYRO GND B
PUMP ON
PUMP OFF
TST + PW
GSE ENABL 2
GSE ANAMUX
SIG GND
PUMP MON
GSE ENABL 1
CONTROLLED
SEP 1 1983
PRINT
DISTRIBUTE DRAWING CHANGES TO: B. BLOCK, J. MAURER, S. WAY (GSFC)
ENGINEER J MAURER
DRAFTSMAN TS 6-13-79
SPACE PHYSICS RESEARCH LABORATORY
COLLEGE OF ENGINEERING
UNIVERSITY OF MICHIGAN
ANN ARBOR, MICHIGAN
ELECTRICAL INTERFACE
GNMS
B-E 5381C CONTROLLED
5/18/83
5/25/82
8/27/81
5/14/81
3/24/81
DATE



ENGINEER J MAURER 10/10/78	DRAFTSMAN PD 2/6/79
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	POWER SYSTEM GALILEO-NMS B-E48068
	6/12/79 DATE



1. CORE FULLY REWRITTEN AFTER EACH RECEPTION
2. CORE DUMPED INTO REGISTER & REWRITTEN AT EACH POWER TURN-ON

QUANTITATIVE COMMAND INPUT TABLE

BIT / WD	(MSB) 0	1	2	3	4	5	6	7 (LSB)
0	0	0	X	X	2	3	4	5
1	0	1	6	7	8	9	10	11
2	1	0	12	13	14	15	16	17
3	1	1	18	19	20	21	22	23

ADDRESS BITS

(FOUR QUANTITATIVE WORDS TO COMPLETELY CONFIGURE TUNE MEMORY)

HOUSEKEEPING DATA READBACK TABLE

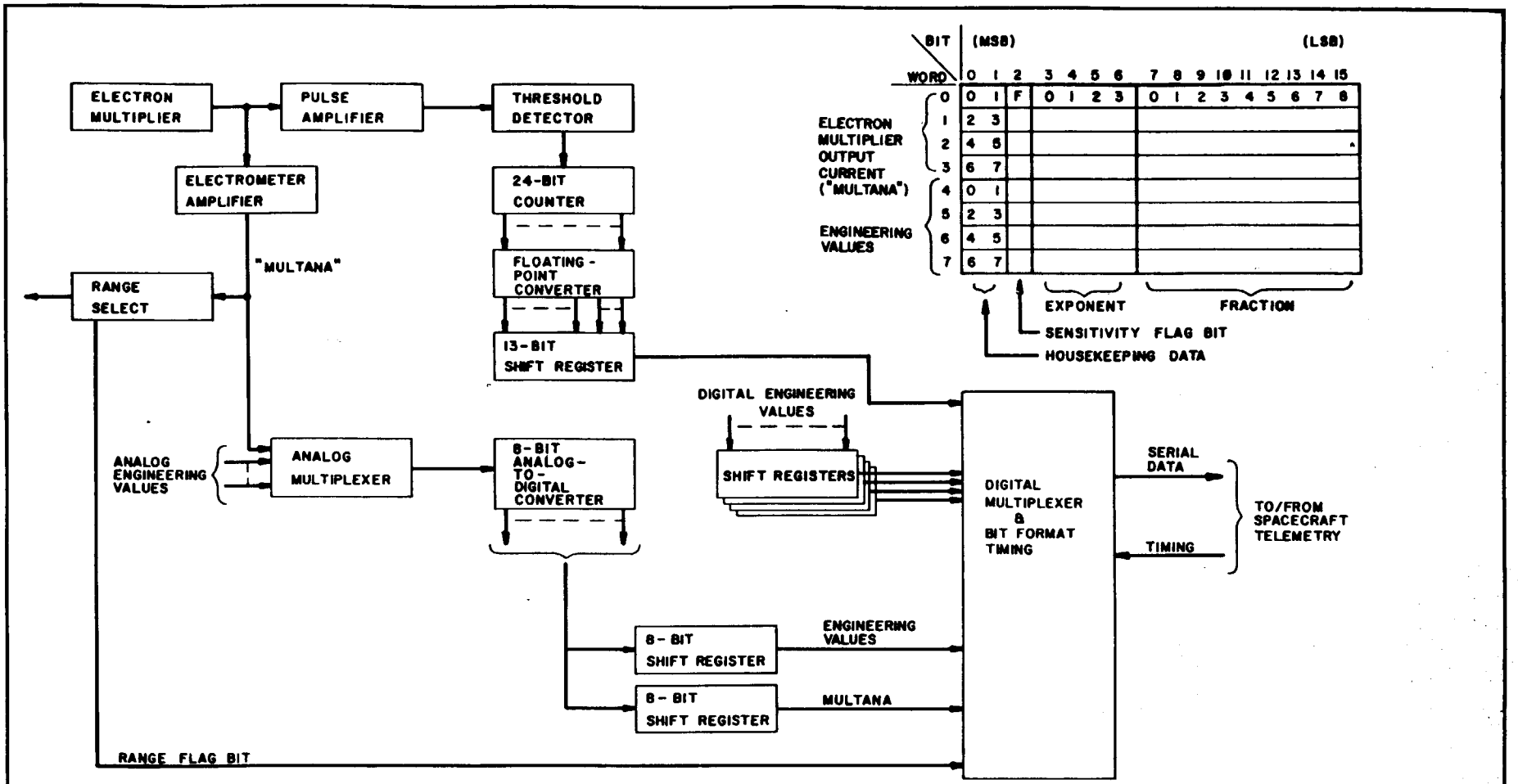
BIT / WD	(MSB) 0	1	2	3	4	5	6	7 (LSB)
5	X	X	2	3	4	5	6	7
6	8	9	10	11	12	13	14	15
7	16	17	18	19	20	21	22	23

(READ BACK ONLY WHEN PROGRAM STEP (HK WORD 2) READS 0 OR 1)

SEE ALSO: B-E6692 (QUANTITATIVE COMMANDS)

ENGINEER W H PINKUS	DRAFTSMAN AGK 2-4-79	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	COMMAND SYSTEM CONCEPT GALILEO - NMS B-E4717C	5/25/82 2-8-79 DATE

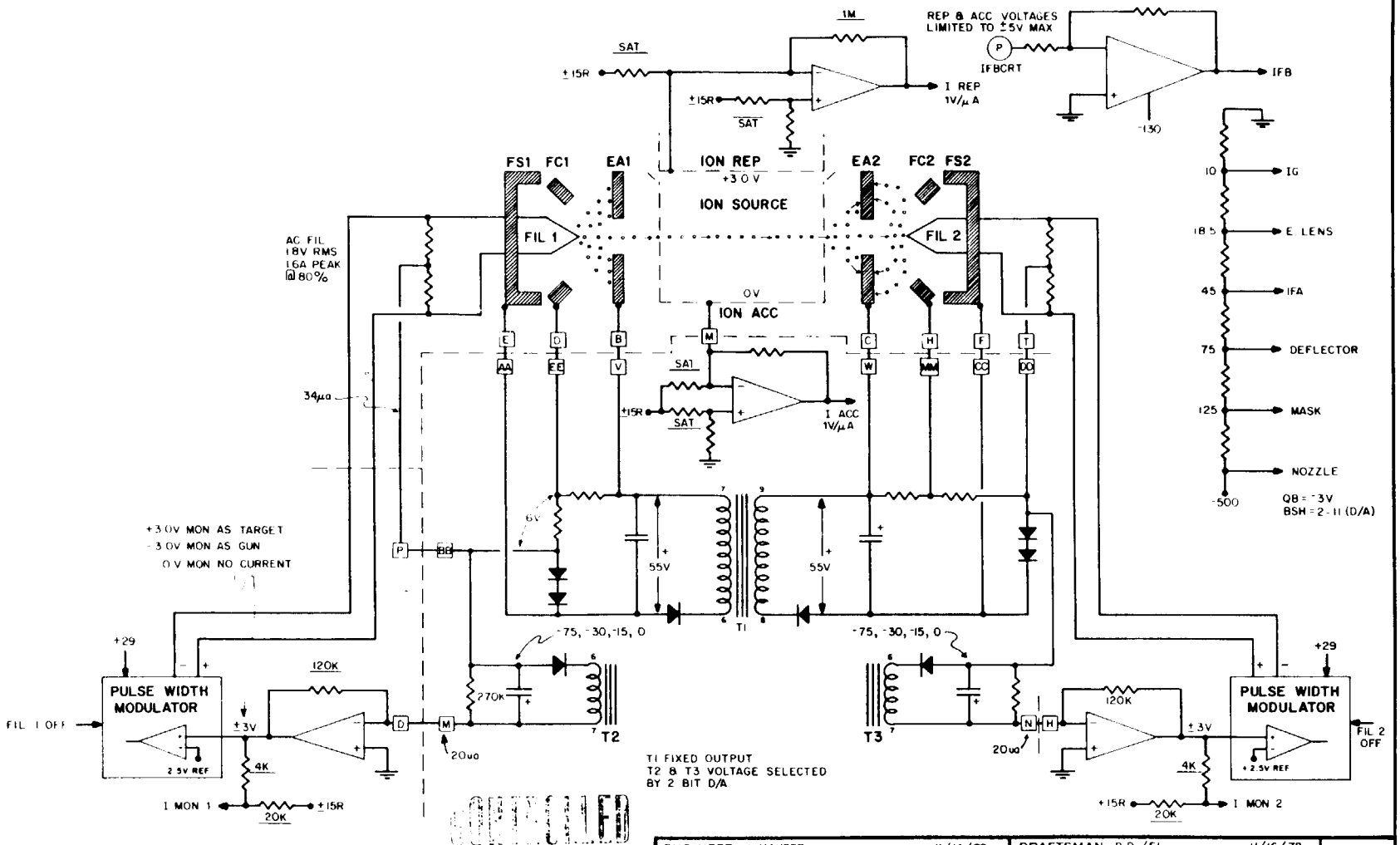
LAST USED R C D L



SEE ALSO: B-E5269 (DATA FORMAT)

ENGINEER W.H PINKUS	DRAFTSMAN G.A.W 2-6-79	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	DATA SYSTEM CONCEPT GALILEO – NMS B-E 47188	5/25/82 DATE

LAST USED R C D L



ENGINEER J MAURER 11/14/78	DRAFTSMAN P D /EL 11/16/78		
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	ION SOURCE BIAS SYSTEM GNMS	12/23/84 11/1/83	
	B-E4890E	DATE	

LAST USED R C D L

GALILEO PROBE TM MINOR FRAME

0	1	2	3	4	5	6	7
8						14	15
16						22	23
24						30	31
32						38	39
40						46	47
48						54	55
56						62	63

NMS MINOR FRAME STARTS WITH 1 ST READOUT (6&7) AFTER MINOR FRAME SYNC.

PROBE MINOR FRAME SYNC PULSE

NO PROBE MAJOR FRAME SYNC USED

64 WORDS/MINOR FRAME
8 BITS/WORD

BIT/SEC	64	128	512	1024
WORDS/SEC	8	16	64	128
FRAMES/SEC	.125	.25	1	2
SEC/MJR F	256	128	32	16

NMS WILL OPERATE AT ANY OF THE ABOVE BIT RATES, WITH PROPER SCALING FOR COUNTS PER INTEGRATION TIME.

FIRST 2 WORDS CONTAIN A 16-BIT NASA-STD SYNC. (0001111010110010)
MSB LSB

BETWEEN POWER TURN-ON & SEQINIT COMMANDS, PROGRAM COUNTER CYCLES THRU LAST MAJOR FRAME REPEATEDLY. SEQINIT RESETS PROGRAM COUNTER TO WORD 0 AND RELEASES IT FOR NORMAL OPERATION.

NMS MAJOR FRAME

0	1	2	3	4	5	6	7
	SYNC						
8	9	10	11	12	13	14	15
16	17	18	19	20	21	22	23
24	25	26	27	28	29	30	31

NMS 16 BIT WORD

MAIN FRAME WD6								MAIN FRAME WD7							
0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
HSKP	S	EXPONENT						MSB FRACTION							LSB

NMS HAS 8, 16-BIT WORDS PER PROBE TM MINOR FRAME.

NMS DATA STARTS WITH 1 ST MINOR FRAME SYNC AFTER SEQ INIT. RESULT OF FIRST INTEGRATION IN FORMAT READS OUT IN MF WORDS 14 & 15.

SENSITIVITY
1=LOW
0=HIGH

MAIN SCIENCE DATA

NMS 8 WORD MINOR FRAME

6 7	14 15	22 23	30 31	38 39	46 47	54 55	62 63

6	14	22	30	38	46	54	62
0 1	0 1	0 1	0 1	0 1	0 1	0 1	0 1
0 1 2 3 4 5 6 7				0 1 2 3 4 5 6 7			

MULTIPLIER CURRENT

HOUSEKEEPING SUBCOM

TWO BITS PER NMS WORD ASSEMBLED TO MAKE 1, 8-BIT HOUSEKEEPING WORD & 1, 8-BIT MULTIPLIER CURRENT WORD PER PROBE MINOR FRAME.

THE HOUSEKEEPING WORD IS MULTIPLEXED TO MAKE A NMS INSTRUMENT MAJOR FRAME OF 32, 8-BIT WORDS

MULTIPLIER CURRENT VALUE COLLECTED DURING ANY ONE INTEGRATION IN PREVIOUS MINOR FRAME - AS SELECTED BY PROGRAM PROM.

HOUSE KEEPING ANALOG VALUES COLLECTED DURING MF WORD 7. DIGITAL VALUES COLLECTED AT BEGINNING OF MF WORD 38.

PROGRAM STEP IS THE NUMBER OF NMS MAJOR FRAMES X8, SINCE SEQUENCE INIT. READS "00" BEFORE SEQ. INIT.

COMMAND STATUS IS A COMPLETE READ BACK OF THE COMMAND MEMORY.

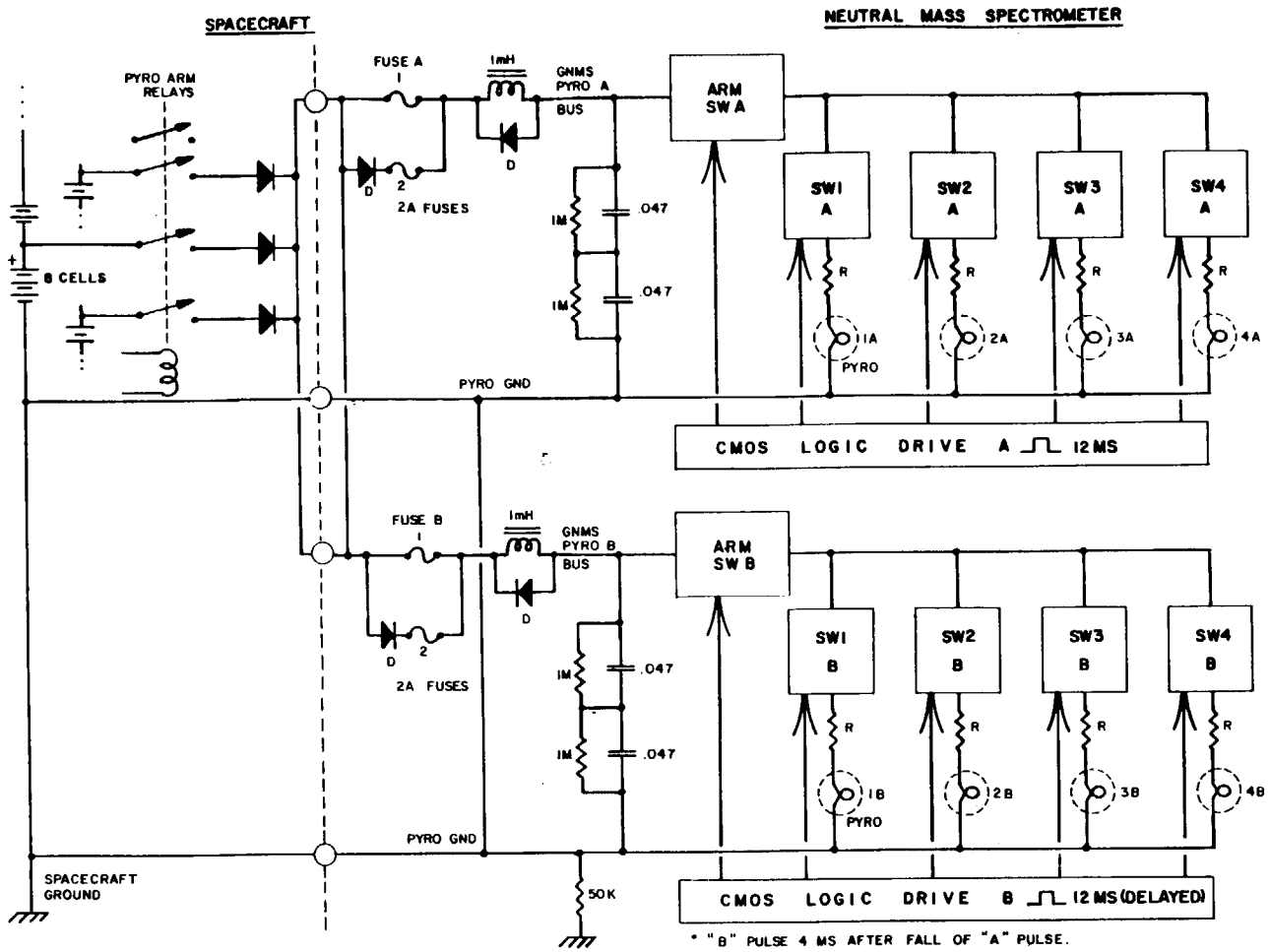
BEFORE SEQ INIT AND 1ST MAJOR FRAME AFTER SEQ INIT		FOLLOWING MAJOR FRAMES	
0	SYNC MSB	0	SYNC MSB
1	SYNC LSB	1	SYNC LSB
2	PRGM STEP	2	PRGM STEP
3	VALVE STATUS 1	3	VALVE STATUS 1
4	VALVE STATUS 2	4	VALVE STATUS 2
5	CMND STATUS 1	5	CELL 2 TMP (T6)
6	CMND STATUS 2	6	LEAK 2 TMP (T4)
7	CMND STATUS 3	7	INLT 2 TMP (T1)
8	PWR MON	8	PWR MON
9	MULTANA	9	MULTANA
10	PUMP CURRENT	10	PUMP CURRENT
11	HV MON	11	HV MON
12	EMIS 1 MON	12	EMIS 1 MON
13	EMIS 2 MON	13	EMIS 2 MON
14	RF FREQ	14	FIL 1 I
15	RF FREQ	15	FIL 2 I
16	REP MON	16	REP MON
17	ACC MON	17	ACC MON
18	+29 MON	18	+29 MON
19	SHELL PRS	19	SHELL PRS
20	BIAS T2	20	BIAS T2
21	PUMP VOLTS	21	PUMP VOLTS
22	OSC AGC	22	OSC AGC
23	OSC TMP	23	OSC TMP
24	ELECT TMP	24	ELECT TMP
25	CELL 1 TMP (T5)	25	CELL 1 TMP (T5)
26	LEAK 1 TMP (T3)	26	LEAK 1 TMP (T3)
27	INLT 1 TMP (T2)	27	INLT 1 TMP (T2)
28	ANODE (T8)	28	ANODE (T8)
29	ANALYZER (T7)	29	ANALYZER (T7)
30	RF FREQ	30	RF FREQ
31	RF FREQ	31	RF FREQ

SEE ALSO: B-E4718 (DATA SYSTEM CONCEPT)

8/1/80 REV ANALOG SUBCOM (JM)

ENGINEER PINKUS/MAURER 4-28-79	DRAFTSMAN TS 5-4-79	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	DATA FORMAT & SYNC GNMS B-E 5269B	5/25/82 10/6/80 8/1/80 DATE

LAST USED R C D L



NOTES:

$$R = \frac{E\ (\text{VOLTAGE AVAILABLE})}{4\ \text{AMP}}$$

$= 4.5\ \text{OHM} \quad (E = 18\text{V})$

FUSE: PICOFUSE FM08-125 2A PER MIL-F-23419/8

R: RWR-81-S4R53FS PER MIL R39007/9 (4.53 OHM)

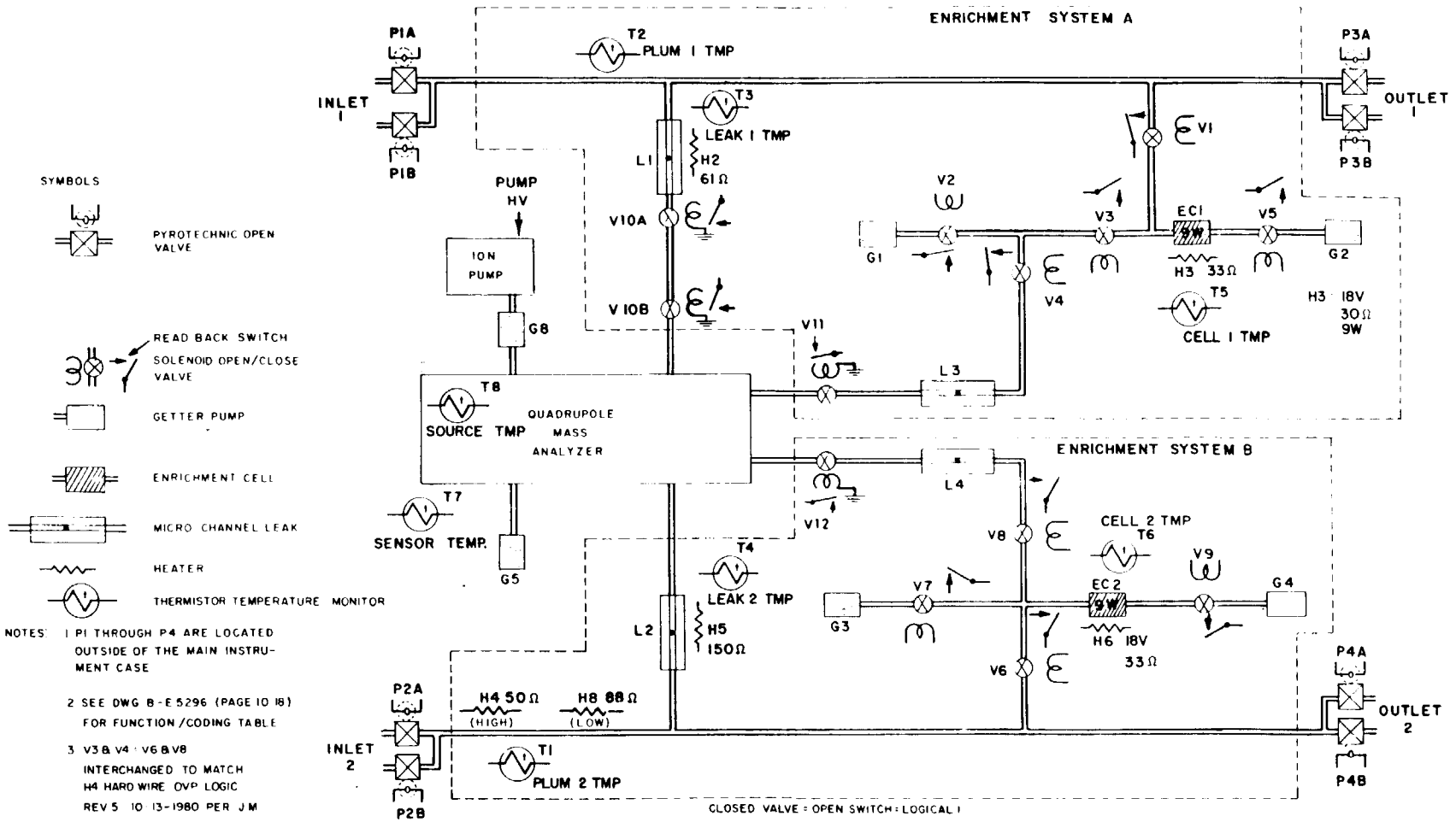
D: UTX4M0 PER JPL GALILEO BUY

4/15/81 ADDED 1mH INDUCTORS 8/21/81 CHANGED TO 4 PYRO DEVICES

ENGINEER J MAURER REV 4A 5/8/79	DRAFTSMAN TS 5-8-79		
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	PYROTECHNIC SYSTEM GNMS	5/25/82 8/21/81	DATE
	B-E 5287A		

LAST USED R C D L

1.10



NOTES:

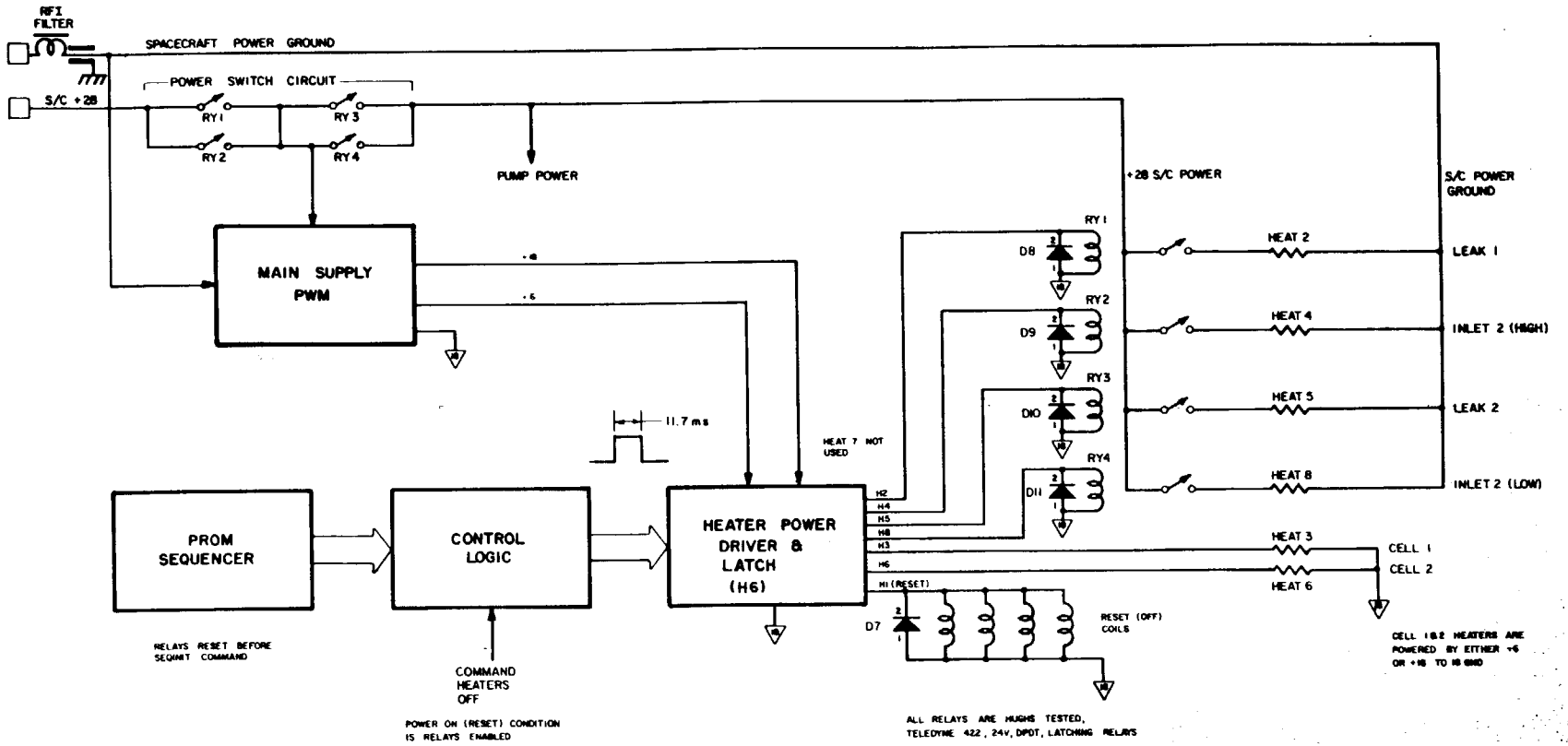
1. P1 THROUGH P4 ARE LOCATED OUTSIDE OF THE MAIN INSTRUMENT CASE
2. SEE DWG B-E 5296 (PAGE 10 18) FOR FUNCTION/CODING TABLE
3. V3 & V4 : V6 & V8 INTERCHANGED TO MATCH H4 HARD WIRE OVP LOGIC REV 5 10-13-1980 PER J M
4. 11/5/80 HEATER DESIGNATIONS CHANGED PER J COOLEY COMMENTS
5. HEATER 2,4,5,8 & 8 ARE POWERED DIRECT FROM S/C POWER THRU LATCHING RELAYS
6. H1 & H7 DELETED FROM DESIGN 12/16/80
7. V11 & 8 V12 DELETED 11/16/81
8. CHANGE TO ONLY 2 SYSTEM PLUGS 5/18/82 ADD COIL GROUNDS TO V10,11,12
9. MOVE V1 TO MATCH GSFC DRAWING OF 11/13/81. DELETE G6, G7 10/12/83

ENGINEER J MAURER 3/27/80	DRAFTSMAN MG 4/17/80	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	GAS INLET SYSTEM REV 9 GNMS	10/12/83 7/12/82 5/18/82 11/16/81
	B-E 6142F	DATE

GNMS CONTROLLED DISTRIBUTION

OCT 19 1983

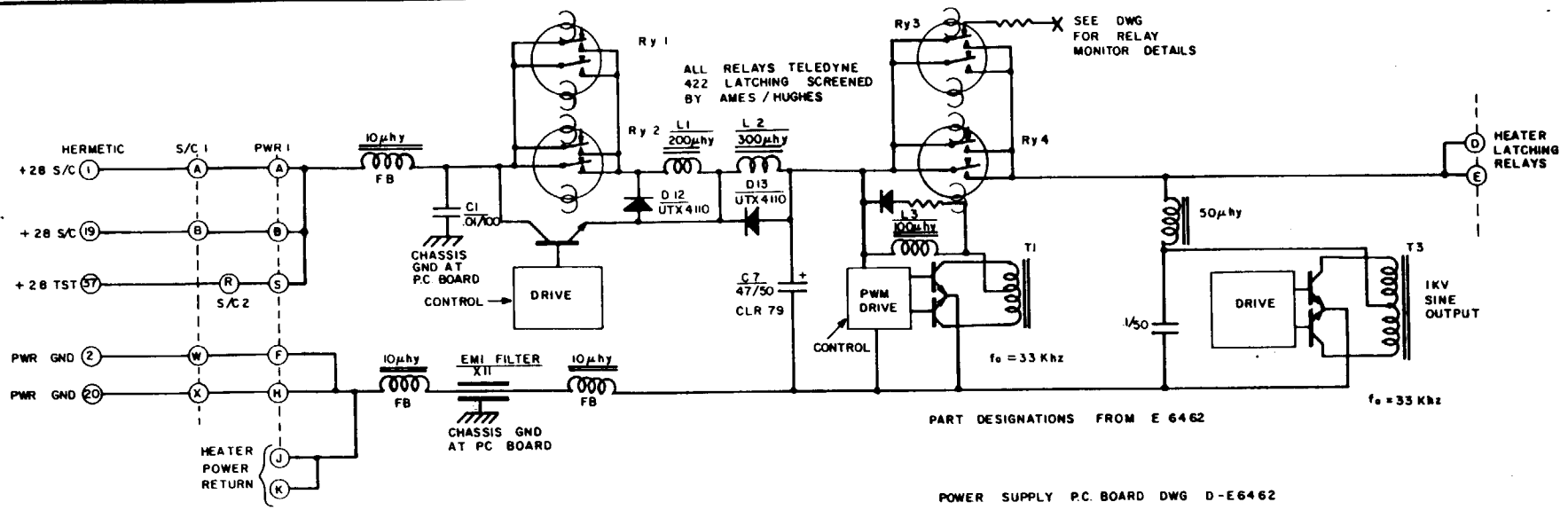
1.11



ENGINEER J. MAURER	DRAFTSMAN BT 1/16/80		
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	HEATER POWER CONCEPT GNMS	8/26/81 5/18/81	
	B-E6404	DATE	

LAST USED R C D L

1.12

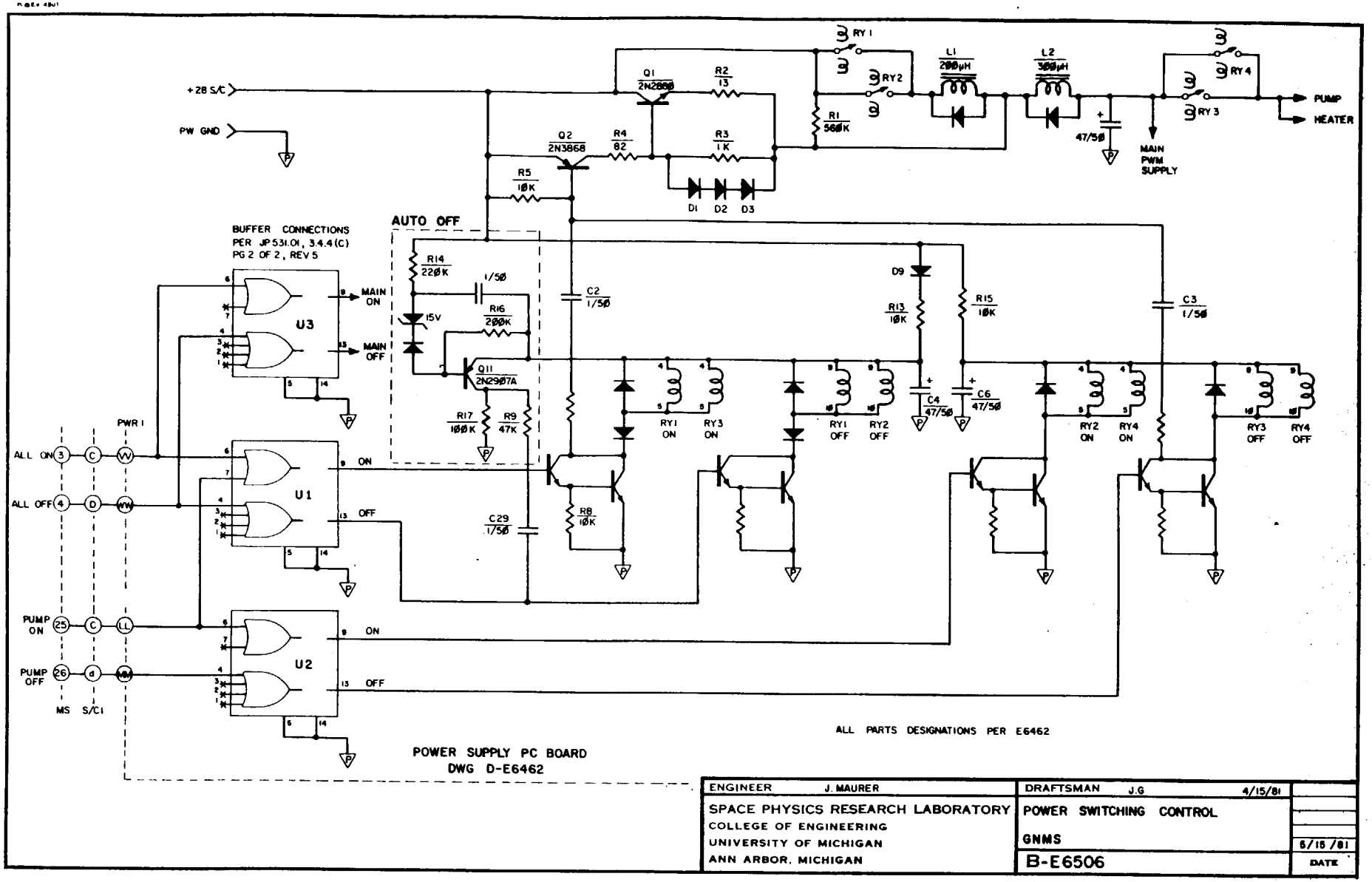


PART DESIGNATIONS FROM E 6462

POWER SUPPLY P.C. BOARD DWG D-E6462

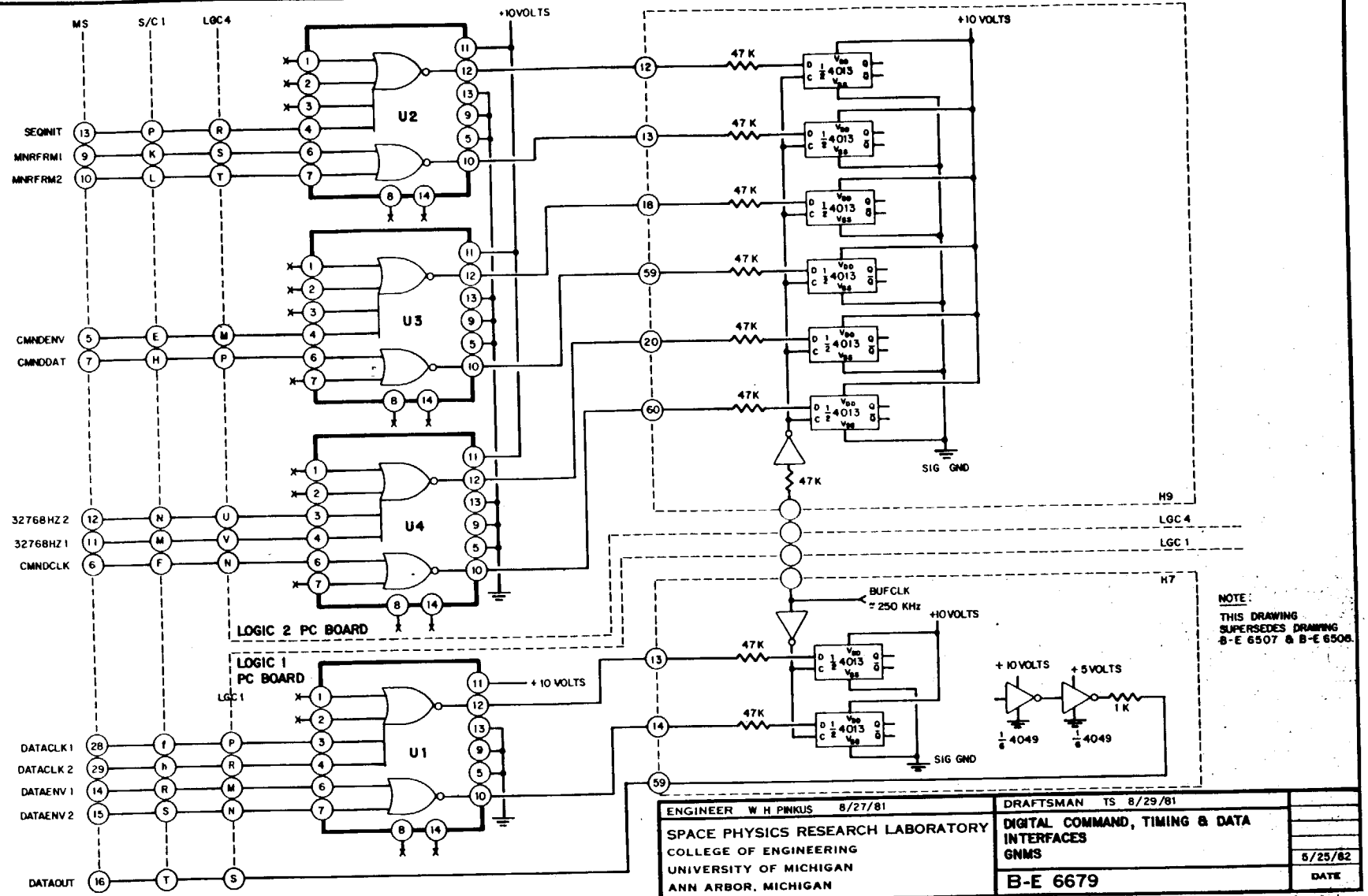
ENGINEER MAURER	DRAFTSMAN G.WIGGINS 4/15/81	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	POWER SWITCH INTERFACE GNMS	5/25/82 DATE
	B-E6503	

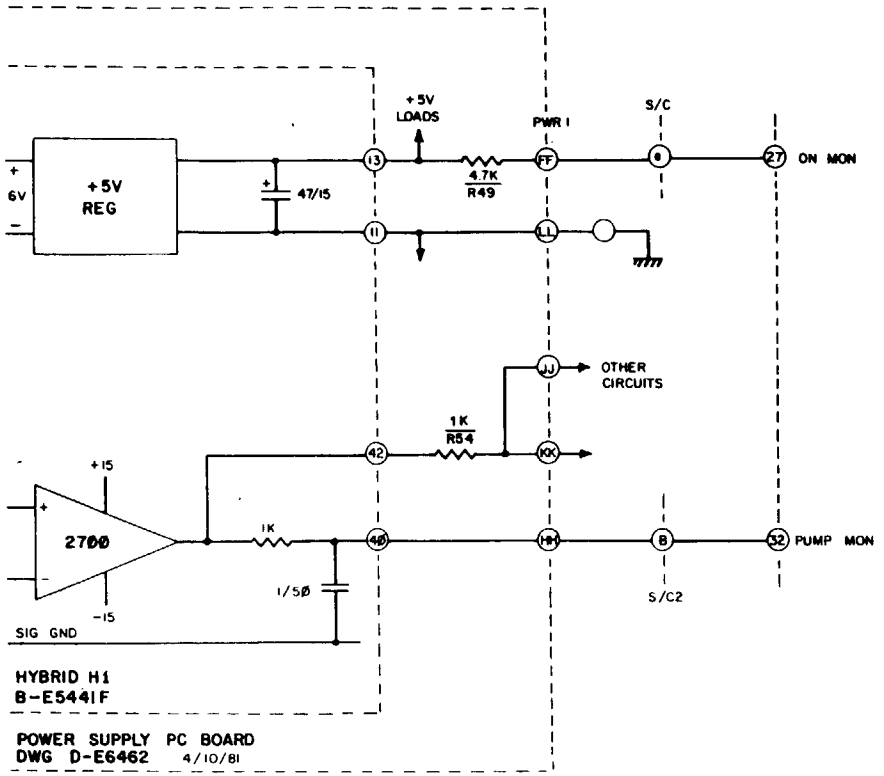
LAST USED R C D L



ENGINEER J. MAURER		DRAFTSMAN J.G 4/15/81	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN		POWER SWITCHING CONTROL GNMS	6/18/81 DATE
		B-E6506	

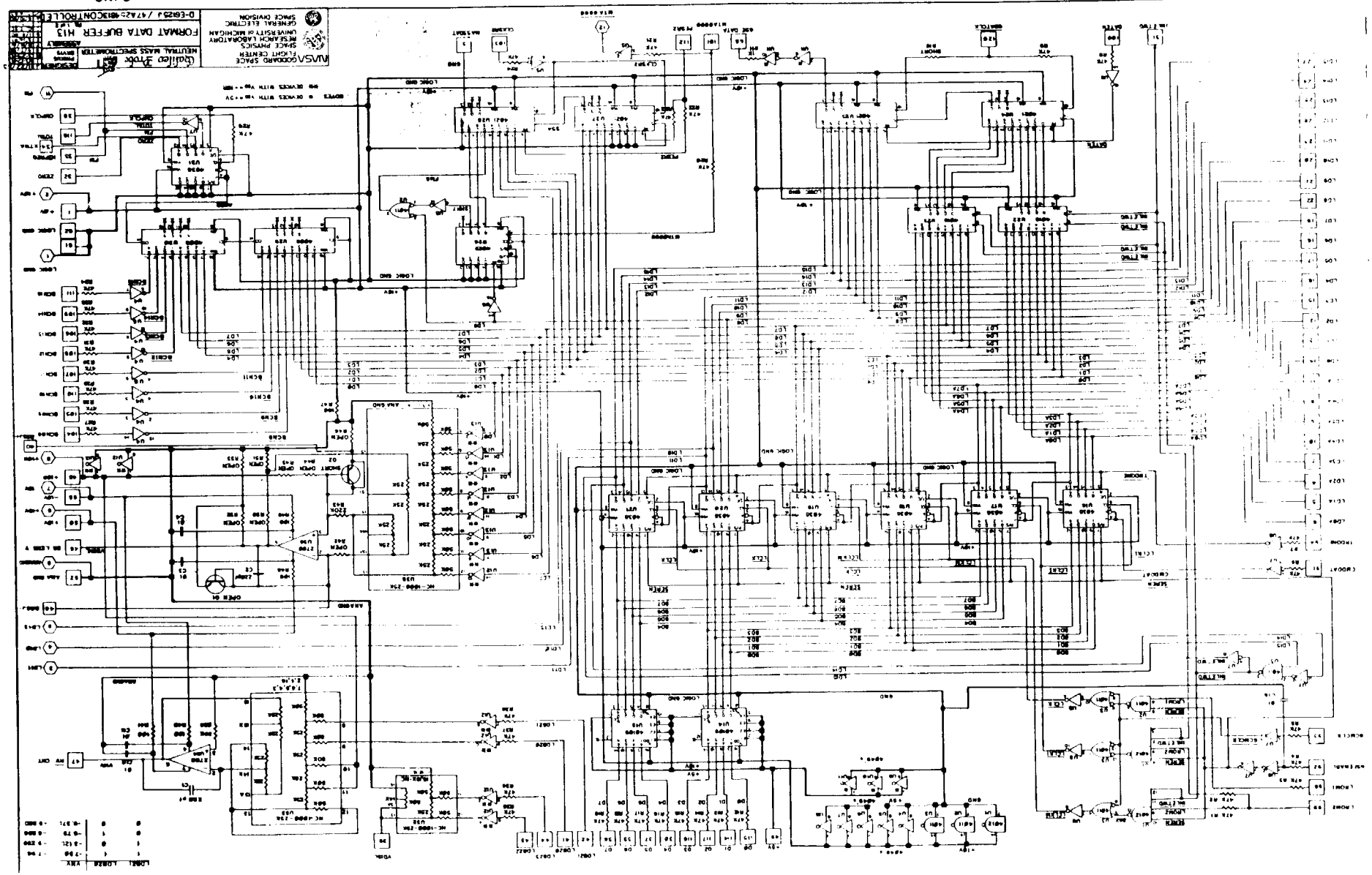
LAST USED R C D L

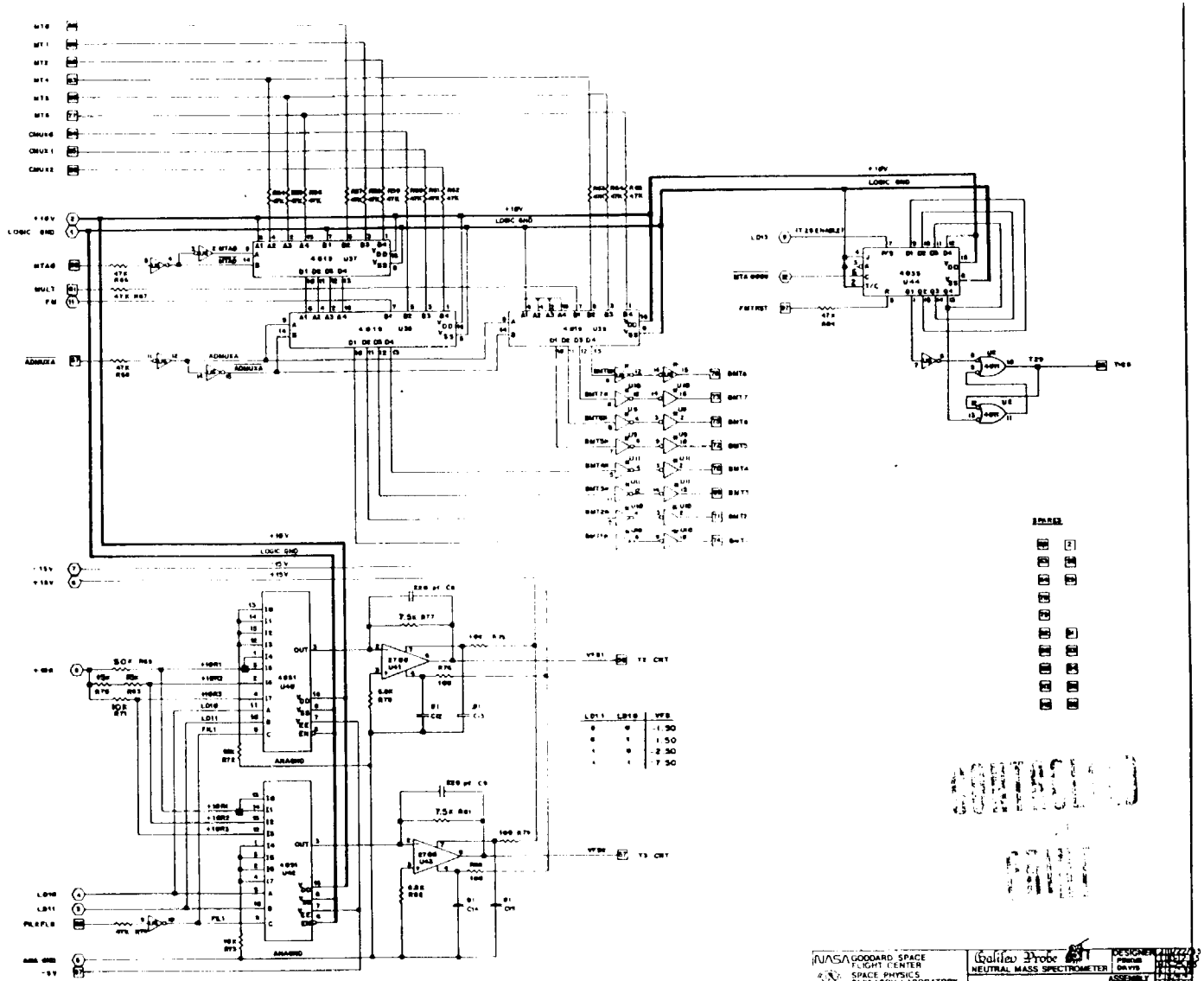

MS
S/C 1
LGC 4
+10VOLTS
+10 VOLTS
SEQINIT
MNRFRM1
MNRFRM2
CMNDENV
CMNDDAT
32768HZ 2
32768HZ 1
CMNDCLK
DATACLK 1
DATACLK 2
DATAENV 1
DATAENV 2
DATAOUT
U1
U2
U3
U4
47 K
47K
SIG GND
H9
LGC 4
LGC 1
H7
BUFCLK
≈ 250 KHz
+10VOLTS
+ 10 VOLTS
+ 5VOLTS
1 K
1/6 4049
LOGIC 2 PC BOARD
LOGIC 1
PC BOARD
LGC 1
NOTE:
THIS DRAWING
SUPERSEDES DRAWING
B-E 6507 & B-E 6508.
ENGINEER W H PINKUS 8/27/81
DRAFTSMAN TS 8/29/81
SPACE PHYSICS RESEARCH LABORATORY
COLLEGE OF ENGINEERING
UNIVERSITY OF MICHIGAN
ANN ARBOR, MICHIGAN
DIGITAL COMMAND, TIMING & DATA INTERFACES
GNMS
B-E 6679
5/25/82
DATE
LAST USED R C D L
1.15



ENGINEER J.MAURER		DRAFTSMAN J.G 4/10/81	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN		ANALOG MONITOR INTERFACE GNMS	
		B-E6511	DATE

LAST USED R C D L

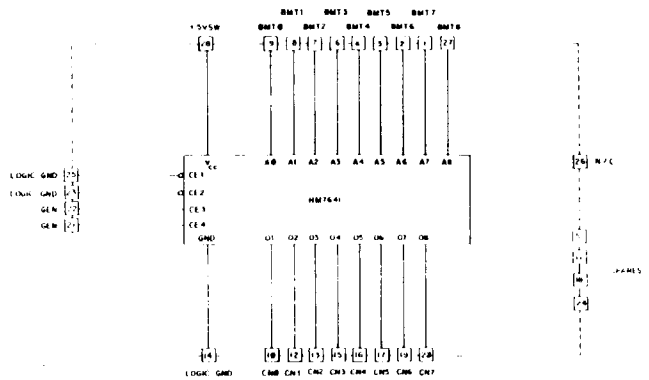




LD11	LD10	VF8
0	0	-1.50
0	1	-1.50
1	0	-2.50
1	1	-7.50

NASA GODDARD SPACE FLIGHT CENTER	Galileo Probe	DESIGNED
SPACE PHYSICS RESEARCH LABORATORY UNIVERSITY OF MICHIGAN	NEUTRAL MASS SPECTROMETER	ASSEMBLY
GENERAL ELECTRIC SPACE DIVISION	FORMAT DATA BUFFER H.3	
	D E6155J / 47A254813 S/M 2	

CONTROLLED



CONTROLLED

NASA GODDARD SPACE FLIGHT CENTER
SPACE PHYSICS RESEARCH LABORATORY
UNIVERSITY of MICHIGAN
GENERAL ELECTRIC SPACE DIVISION

Galileo Probe GST
NEUTRAL MASS SPECTROMETER
DESIGNER
ASSEMBLY
CALCULATOR PROM H16
D-E6126A
S/N 2
SIZE
SEP 9 1982 15.20

	H11 (2)	* H11 Mass Calculator
1	+10V	61 LS4
2	+10V	62 LS6
3	*	63 LS7
4	CLKSR2-	64 *
5	MT4	65 *
6	MTA0	66 *
7	MT5	67 *
8	MT6	68 BCN12
9	MT3	69 BCN14
10	MT2	70 BCN13
11	MT1	71 BCN15
12	MT0	72 CN4
13	INTEND	73 CN7
14	32KHZ	74 CN6
15	CN2	75 CN5
16	CN3	76 +5VSW
17	CN1	77 BMT0
18	CN0	78 EXTCNST-
19	BCN10	79 +5V
20	RFCALC	80 MULT
21	BCN08	81 *MTA000 TP
22	BCN09	82 ENCOMP
23	*	83 GEN
24	*	84 VTDAT
25	*	85 MASSDAT
26	*	86 PESR2-
27	*	87 LGCGND
28	*	88 LGCGND
29	*	89 LROM1
30	*	90 *
31	LS0	91 *
32	LS3	92 DCSTR
33	LS2	93 LROM2
34	LS1	94 *
35	*	95 *
36	*	96 PESR2
37	BCN11	97 *
38	LS11	98 *
39	LS9	99 *
40	LS10	100 *
41	*	101 *
42	*	102 ADMUXA-
43	*	103 PBUSENA
44	*	104 PBUSENB
45	*	105 ENROM
46	*	106 PYROPLSA2
47	*	107 PYROPLSB2
48	*	108 MTA200
49	*	109 PYROPLSB1
50	*	110 PYROPLSA1
51	*	111 ADCENA-
52	*	112 ADCENB-
53	*	113 MTA1000
54	LS5	114 MTA3000
55	*	115 CMPCLK
56	*	116 MTA2000
57	*	117 MTA0000
58	*	118 *
59	*	119 *
60	LS8	120 *
*pins continued on ne>		*end of pins for H11
*		*

	H10 PROM
*	*
1	BMT7 *
2	BMT6 *
3	BMT5 *
4	BMT4 *
5	* *
6	BMT3 *
7	BMT2 *
8	BMT1 *
9	BMT0 *
10	CN0 *
11	* *
12	CN1 *
13	CN2 *
14	LGCGND *
15	CN3 *
16	CN4 *
17	CN5 *
18	* *
19	CN6 *
20	CN7 *
21	GEN *
22	GEN *
23	LGCGND *
24	* *
25	LGCGND *
26	* *
27	BMT8 *
28	+5VSW *
*	*

*FILE:LGIN3.PIN DISC:GNMS WIRE LISTS (PRI REFERENCE FILE:81/103

REFER TO DRAWING B-E6146 (PG.11.1) FOR ADDITIONAL INFORMATION

EDITs: 3-11-81 BY JM
Added LGC1, LGC2, LGC3, Plug layouts per Main Harness

3-16-81 BY JM & WP
CHGED MUX1 TO CMUX1, CHGD ELECTMP to TMP PWR, CHGED HKSCLK ILT/RF to HKSCLK, ADDED EXTRA for DESENS OPTIONS, CHANGED H13:LD12 to LD12 DESNS.

3-30-81 BY JM
ASSIGNED PINS TO H7, H11, & H13, PER GE DWG.

4-2-81
Included red lines from 4-1-81, check prints.

4-3-81
Released to GE Multilayer for design.

5-18-81
Changed duplicate pin H13-36 [D6] to pin 35 and; Changed duplicate pin H13-21 [LDB21] to pin 42. Both changes redlined in Bob Gehris's copy. No other known errors this date.

5-20-81
Reversed pins 5 and 6 on H7, per latest GE check print. This changes 2 nodes: -5V, PA SHLD COAX.

5-22-81
Changed IC2 from a 34P to a 20P, to provide clearance between plug and instrument shell. This changes 6 nodes: CMUX0, CMUX1, CMUX2, +10R, CMDDAT-, TMP PWR.

8-24-81
Added crossreference between GE E numbers and plug no's. PIN T of IC2 from "NOT USED" to "LGC GND". No layout change.

9-29-81
Changed notation of sex of harness connectors from S and P. This conforms to harness listings.

UNCONTROLLED

5-6-83
Added MTA1000 to IC1-T and LGCGND to IC1-LL. BPB

5-25-83
Added C14 to H7-34, added BSSJ+, BSSJ- names to H7-1 and added C13, R7, R8, and R9. BPB

ENGINEER J.MAURER	DRAFTSMAN 4/2/81	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	LOGIC I NODE INPUT LIST PG. 1 OF 3 GNMS	4/10/81 4/2/81
	B-E6320A CONTROLLED	DATE

LAST USED R C D L

	H7 TIMER
1	PA OUT COAX
2	VTH
3	-15V
4	+15V
5	PA SHLD COAX
6	-5V
7	LGCGND
8	BUFCLK-
9	+5V
10	HKSCLK
11	DESENS
12	+10B
13	DATACLK-
14	DATAENV-
15	A09A
16	A10A
17	*Q 23 TEST
18	MTA200
19	A11A
20	+5V
21	A12A
22	SEQFLG
23	DATEN
24	A08
25	A06
26	MNRRST
27	*NOT USED
28	GDATCLK-
29	*A0 TST
30	+10V
31	DESENS A
32	MACOMP-
33	INTEND
34	INTRST
35	*DBS0 TST
36	*DBS1 TST
37	*DBS2 TST
38	*DBS3 TST
39	CMWEN
40	ISWEN
41	MASCLK-
42	A03
43	FRASYN
44	A02
45	A01
46	A07
47	A04
48	RFWEN
49	LDB5
50	A05
51	MADAT
52	RFDAT
53	SDATOUT B
54	CMDAT
55	AHKDAT
56	FMTRST
57	A13A
58	A13A-
59	DATAOUT
60	MTA0000

	H8 ANAMUX
1	CELL 1 TMP
2	LEAK 1 TMP
3	SOURCE TMP
4	TMP PWR
5	SENSOR TMP
6	PLUM 1 TMP
7	+10R
8	-5V
9	FIL 1 MON
10	FIL 2 MON
11	EMIS 2 MON
12	EMIS 1 MON
13	PUMP MON 2
14	PW MON
15	HV MON
16	MULTANA
17	CELL 2 TMP
18	PLUM 2 TMP
19	LEAK 2 TMP
20	A06
21	A05
22	T2 BIAS MN
23	OSC TMP
24	OSC AGC
25	T3 BIAS MN
26	+29 MON
27	SHELL PRS
28	REP MON
29	ACC MON
30	A04
31	MASCLK-
32	A03
33	A08
34	A07
35	AHKDAT
36	MADAT
37	CLKSR2-
38	MTA2000
39	LD9
40	PESR2-
41	HKSCLK
42	MTA1000
43	VTDAT
44	ADCOMP REF
45	FRASYN
46	MTA3000
47	ADCENB-
48	ADCENA-
49	MT2
50	*ADCOMP TST
51	-15V
52	+15V
53	LGCGND
54	MACOMP-
55	-10R
56	+10V
57	ANAGND
58	MT4
59	GSE ANAMUX
60	MT3

*Was called PUMPI

	COAX CONNECTR
ED	*12/16/80
1	PA OUT COAX
2	PA SHLD COAX

	TEST TEST CONN
ED	*4-2-81
1	LGCGND
2	+5V
3	LGCGND
4	+5V
5	
6	
7	EXTCNST-
8	CN0
9	CN1
10	CN2
11	CN3
12	CN4
13	CN5
14	CN6
15	CN7
16	BMT0
17	BMT1
18	BMT2
19	BMT3
20	BMT4
21	BMT5
22	BMT6
23	BMT7
24	BMT8
25	ENCOMP
26	
27	
28	
29	
30	

	BUF1 BUFFER 1
1	*NOT USED
2	*NOT USED
3	DATACLK2
4	DATACLK1
5	LGCGND
6	DATAENV2
7	DATAENV1
8	*NOT USED
9	LGCGND
10	DATAENV-
11	+10B
12	DATACLK-
13	LGCGND
14	*NOT USED

*LOGIC 1 PC BOARD LGC1 29 S	
E4 A	+15V
E5 B	+10R
E6 C	+10V
E7 D	+10B
E8 E	+5V
E9 F	LGCGND
E10 H	-5V
E11 J	ANAGND
E12 K	-15V
E13 L	-10R
E14 M	DATAENV1
E15 N	DATAENV2
E16 P	DATACLK1
E17 R	DATACLK2
E18 S	DATAOUT
E19 T	GSE DATA
E20 U	LD0A
E21 V	LD1A
E22 W	LD2A
E23 X	LD3A
E24 Y	LD4A
E25 Z	LD5A
E26 a	PYROPLSA1
E27 b	PYROPLSB1
E28 c	PYROPLSA2
E29 d	PYROPLSB2
E30 e	PBUSENA
E31 f	PBUSENB
E32 h	FIL2FLG

*LOGIC 1 PC BOARD LGC3 29 S	
E62 A	SOURCE TMP
E63 B	PW MON
E64 C	MULTANA
E65 D	PUMP MON 2
E66 E	REP MON
E67 F	ACC MON
E68 H	EMIS 1 MON
E69 J	EMIS 2 MON
E70 K	FIL 1 MON
E71 L	FIL 2 MON
E72 M	HV MON
E73 N	OSC TMP
E74 P	CELL 1 TMP
E75 R	CELL 2 TMP
E76 S	LEAK 1 TMP
E77 T	LEAK 2 TMP
E78 U	PLUM 1 TMP
E79 V	PLUM 2 TMP
E80 W	OSC AGC
E81 X	T2 BIAS MN
E82 Y	T3 BIAS MN
E83 Z	SENSOR TMP
E84 a	SHELL PRS
E85 b	GSEENABL2-
E86 c	+29 MON
E87 d	SDATOUT B
E88 e	GSE ANAMUX
E89 f	INLETWD
E90 h	-HV CNT

*LOGIC 1 PC BOARD LGC2 LGC2 29 S	
E33#A	LS0
E34#B	LS1
E35#C	LS2
E36 D	LS3
E37 E	LS4
E38 F	LS5
E39 H	LS6
E40 J	LS7
E41 K	LS8
E42 L	LS9
E43 M	LS10
E44 N	LS11
E45 P	DCSTR
E46 R	T2 CNT
E47 S	T3 CNT
E48 T	BS LENS V
E49 U	HIFREQ
E50 V	RFDAT
E51 W	ZERO
E52 X	TOTAL
E53 Y	DESENS
E54 Z	LD12 DESNS
E55 a	MTA0000
E56 b	INTRST
E57 c	ISWEN
E58 d	RFWEN
E59 e	HKSCLK
E60 f	HKSCLK
E61 h	T=29

*TO QB DESENS
*TO DELTA IFB

ENGINEER J. MAURER	DRAFTSMAN D.R. 4/2/81
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	LOGIC I NODE INPUT LIST PG. 2 OF 3 GNMS
LAST USED R C D L	B-E6321A CONTROLLED
	4/2/81 DATE

H13

		*H13 pins continu	
1	+10V	61	LGCGND
2	*	62	LGCGND
3	MASSDAT	63	*
4	LD2A	64	*
5	LD1A	65	GSE DATA
6	LD0A	66	FIL2FLG
7	LD3A	67	ADMUXA-
8	*LD6A	68	MTA0
9	LD5A	69	BMT3
10	LD4A	70	BMT4
11	*LD7A	71	BMT2
12	*LD2	72	BMT5
13	*LD1	73	BMT7
14	*LD0	74	BMT1
15	*LD3	75	BMT6
16	*LD6	76	BMT8
17	*LD5	77	MT6
18	*LD4	78	*
19	*LD7	79	*
20	*LD10	80	MT5
21	LD9	81	MULT
22	*LD8	82	*
23	*LD11	83	MT4
24	*LD14	84	CMUX0
25	*LD13	85	CMUX1
26	LD12 DESNS	86	CMUX2
27	*LD15	87	-5V
28	*	88	MT0
29	*	89	MT1
30	D4	90	MT2
31	INLETWD	91	CMDDAT-
32	ZERO	92	GSEENABL-
33	HIFREQ	93	GCMCLK
34	*EXTRA	94	TRDONE
35	D6	95	T=29
36	D7	96	LROM1
37	D5	97	FMTRST
38	CMPCLK	98	*
39	VDISC	99	LROM2
40	BSSJ+	100	DATEN
41	LDB20	101	MTA0000
42	LDB21	102	*
43	LDB22	103	CLKSR2-
44	LDB23	104	BCN08
45	+10R	105	BCN09
46	BS LENS V	106	BCN13
47	-HV CNT	107	BCN11
48	BSSJ-	108	BCN12
49	+5V	109	BCN14
50	+15V	110	BCN10
51	*	111	BCN15
52	ANAGND	112	PESR2
53	*	113	*
54	*	114	D1
55	-15V	115	D0
56	T2 CNT	116	D3
57	T3 CNT	117	D2
58	*	118	TOTAL
59	*	119	*
60	*	120	GDATCLK-

* INTERCONNECT #1
*

	IC1 34	
ED	*5-6-83	
A	HIFREQ	
B	HKSCLK	
C	A1	
D	A2	
E	A3	
F	A4	
H	A5	
J	A6	
K	A7	
L	A8	
M	A9A	
N	A10A	
P	A11A	
R	A12A	
S	A13A	
T	MTA1000	
U	LDB5	
V	FMTRST	
W	MNRRST	
X	BUFCLK-	
Y	CMWEN	
Z	CMDAT	
AA	CMDDAT-	#MOVED 5-22-81 (FROM JJ)
BB	32KHZ	
CC	MT0	
DD	MULT	
EE	ENROM	
FF	RFCALC	
HH	CMUX0	#MOVED 5-22-81 (FROM IC2)
JJ	CMUX1	#MOVED 5-22-81 (FROM IC2)
KK	CMUX2	#MOVED 5-22-81 (FROM IC2)
LL	LGCGND	#ADDED 5-6-83
MM	+10R	#MOVED 5-22-81 (FROM IC2)
NN	TMP PWR	#MOVED 5-22-81 (FROM IC2)
*		

* INTERCONECT #2 TO
*

	IC2 20P
ED	*5-22-81
A	D0
B	D1
C	D2
D	D3
E	D4
F	D5
H	D6
J	D7
K	*
L	GCMCLK
M	GSEENABL1-
N	SEQFLG
P	FRASYN
R	A13A-
S	TRDONE
T	LGCGND
U	LDB20
V	LDB21
W	LDB22
X	LDB23

*
*ON 5-22-81:
*IC2 CHANGED FROM A 34P
*TO A 20 P; TO PROVIDE
*SUFFICENT CLEARANCE BETWEEN
*MATING PLUG SHELL, AND
*OUTER PRESSURE SHELL.

	C1	1/50	
1	LGCGND		
2	+10V		
*			
	C2	1/50	
1	LGCGND		
2	+10B		
*			
	C3	1/50	
1	-5V		
2	LGCGND		
*			
	C4	1/50	
1	ANAGND		
2	+15V		
*			
	C5	1/50	
1	ANAGND		
2	+10R		
*			
	C6	1/50	
1	-10R		
2	ANAGND		
*			
	C7	1/50	
1	-15V		
2	ANAGND		
*			
	C8	33/15	
1	LGCGND		
2	+5V		
*			
	C9	.1/50	
1	VTH		
2	ANAGND		
*			
	C10	.033	
1	PLUM 2 TMP		
2	ANAGND		
*			
	C11	.033	
1	LEAK 2 TMP		
2	ANAGND		
*			
	C12	.033	
1	CELL 2 TMP		
2	ANAGND		
*			
	C13	100p	
1	BSSJ-		
2	BS LENS V		
*			
	C14	100p	
1	INTRST		
2	LGCGND		

	R1	R VDISC
1	VTH	
2	VDISC	
*		
	R2	THERM PW
1	VTH	
2	-10R	
*		
	R3	TH REF G
1	VTH	
2	ANAGND	
*		
	R4	ADCOMP R
1	ADCOMP REF	
2	-10R	
*		
	R5	ADCOMP R
1	ADCOMP REF	
2	ANAGND	
*		
	R6	GSE ENABL
1	GSEENABL-	
2	+10V	
*		
	R7	BS ADJ1
1	+15V	
2	BSSJ-	
*		
	R8	BS ADJ2
1	BSSJ-	
2	BS LENS V	
*		
	R9	BS ADJ3
1	BSSJ+	
2	ANAGND	
*		
*		
*	DIODES	
*		
	D1	IC DIODE
1	GSEENABL-	
2	GSEENABL1-	
*		
	D2	[illegible] DIO
1	GSEENABL[illegible]	
2	GSEENABL2-	
*		
	EXTR	
1	LD12 DESNS	
2	DESENS	
3	LGCGND	

CONTROLLED ... 1983 PRINT

ENGINEER J. MAURER	DRAFTSMAN D.R. 4/2/81	5/25/83
SPACE PHYSICS RESEARCH LABORATORY	LOGIC I NODE INPUT LIST	5/6/83
COLLEGE OF ENGINEERING	PG. 3 OF 3	9/2/82
UNIVERSITY OF MICHIGAN	GNMS	4/2/81
ANN ARBOR, MICHIGAN	B-E6322A CONTROLLED	DATE

LAST USED R C D L

LG1N3 .PIN NO.	SIGNAL	25-May-83 PLUG	PIN
1	+10B	LGC1	E7
		H7	12
		BUF1	11
		C2	2
2	+10R	LGC1	E5
		IC1	MM
		H8	7
		H13	45
		C5	2
3	+10V	LGC1	E6
		H7	30
		H8	56
		H11	1
		H11	2
		H13	1
		C1	2
		R6	2
4	+15V	LGC1	E4
		H7	4
		H8	52
		H13	50
		C4	2
		R7	1
5	+29 MON	LGC3	E86
		H8	26
6	+5V	LGC1	E8
		H7	9
		H7	20
		H11	79
		H13	49
		TEST	2
		TEST	4
		C8	2
7	+5VSW	H11	76
		H16	28
8	-10R	LGC1	E13
		H8	55
		C6	1
		R2	2
		R4	2
9	-15V	LGC1	E12
		H7	3
		H8	51
		H13	55
		C7	1
10	-5V	LGC1	E10
		H7	6
		H8	8
		H13	87
		C3	1
11	-HV CNT	LGC3	E90
		H13	47
12	32KHZ	IC1	BB
		H11	14

LG1N3 .PIN NO.	SIGNAL	25-May-83 PLUG	PIN
13	A01	IC1	C
		H7	45
14	A02	IC1	D
		H7	44
15	A03	IC1	E
		H7	42
		H8	32
16	A04	IC1	F
		H7	47
		H8	30
17	A05	IC1	H
		H7	50
		H8	21
18	A06	IC1	J
		H7	25
		H8	20
19	A07	IC1	K
		H7	46
		H8	34
20	A08	IC1	L
		H7	24
		H8	33
21	A09A	IC1	M
		H7	15
22	A10A	IC1	N
		H7	16
23	A11A	IC1	P
		H7	19
24	A12A	IC1	R
		H7	21
25	A13A	IC1	S
		H7	57
26	A13A-	IC2	R
		H7	58
27	ACC MON	LGC3	E67
		H8	29
28	ADCENA-	H8	48
		H11	111
29	ADCENB-	H8	47
		H11	112
30	ADCOMP REF	H8	44
		R4	1
		R5	1
31	ADMUXA-	H11	102
		H13	67
32	AHKDAT	H7	55
		H8	35

LG1N3 .PIN NO.	SIGNAL	25-May-83 PLUG	PIN
33	ANAGND	LGC1	E11
		H8	57
		H13	52
		C4	1
		C5	1
		C6	2
		C7	2
		C9	2
		C10	2
		C11	2
		C12	2
		R3	2
		R5	2
		R9	2
34	BCN08	H11	21
		H13	104
35	BCN09	H11	22
		H13	105
36	BCN10	H11	19
		H13	110
37	BCN11	H11	37
		H13	107
38	BCN12	H11	68
		H13	108
39	BCN13	H11	70
		H13	106
40	BCN14	H11	69
		H13	109
41	BCN15	H11	71
		H13	111
42	BMT0	H11	77
		H16	9
		TEST	16
43	BMT1	H13	74
		H16	8
		TEST	17
44	BMT2	H13	71
		H16	7
		TEST	18
45	BMT3	H13	69
		H16	6
		TEST	19
46	BMT4	H13	70
		H16	4
		TEST	20
47	BMT5	H13	72
		H16	3
		TEST	21

LG1N3 .PIN NO.	SIGNAL	25-May-83 PLUG	PIN
48	BMT6	H13	75
		H16	2
		TEST	22
49	BMT7	H13	73
		H16	1
		TEST	23
50	BMT8	H13	76
		H16	27
		TEST	24
51	BS LENS V	LGC2	E48
		H13	46
		C13	2
		R8	2
52	BSSJ+	H13	40
		R9	1
53	BSSJ-	H13	48
		C13	1
		R7	2
		R8	1
54	BUFCLK-	IC1	X
		H7	8
55	CELL 1 TMP	LGC3	E74
		H8	1
56	CELL 2 TMP	LGC3	E75
		H8	17
		C12	1
57	CLKSR2-	H8	37
		H11	4
		H13	103
58	CMDAT	IC1	Z
		H7	54
59	CMDDAT-	IC1	AA
		H13	91
60	CMPCLK	H11	115
		H13	38
61	CMUX0	IC1	HH
		H13	84
62	CMUX1	IC1	JJ
		H13	85
63	CMUX2	IC1	KK
		H13	86
64	CMWEN	IC1	Y
		H7	39
65	CN0	H11	18
		H16	10
		TEST	8

LG1N3 .PIN NO.	SIGNAL	25-May-83 PLUG	PIN
66	CN1	H11	17
		H16	12
		TEST	9
67	CN2	H11	15
		H16	13
		TEST	10
68	CN3	H11	16
		H16	15
		TEST	11
69	CN4	H11	72
		H16	16
		TEST	12
70	CN5	H11	75
		H16	17
		TEST	13
71	CN6	H11	74
		H16	19
		TEST	14
72	CN7	H11	73
		H16	20
		TEST	15
73	D0	IC2	A
		H13	115
74	D1	IC2	B
		H13	114
75	D2	IC2	C
		H13	117
76	D3	IC2	D
		H13	116
77	D4	IC2	E
		H13	30
78	D5	IC2	F
		H13	37
79	D6	IC2	H
		H13	35
80	D7	IC2	J
		H13	36
81	DATACLK-	H7	13
		BUF1	12
82	DATACLK1	LGC1	E16
		BUF1	4
83	DATACLK2	LGC1	E17
		BUF1	3
84	DATAENV-	H7	14
		BUF1	10
85	DATAENV1	LGC1	E14
		BUF1	7

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ENGINEER	DRAFTSMAN	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	NODE NAME LIST PG 1 OF 2 LOGIC #1 GNMS	5/25/83 4/2/84
	B-E6484A CONTROLLED	DATE

LAST USED R C D L

LGIN3 .PIN NO.	SIGNAL	25-May-83 PLUG	PIN
86	DATAENV2	LGC1	E15
		BUF1	6
87	DATAOUT	LGC1	E18
		H7	59
88	DATEN	H7	23
		H13	100
89	DCSTR	LGC2	E45
		H11	92
90	DESENS	LGC2	E53
		H7	11
91	DESENS A	H7	31
		EXTR	2
92	EMIS 1 MON	LGC3	E68
		H8	12
93	EMIS 2 MON	LGC3	E69
		H8	11
94	ENCOMP	H11	82
		TEST	25
95	ENROM	IC1	EE
		H11	105
96	EXTCNST-	H11	78
		TEST	7
97	FIL 1 MON	LGC3	E70
		H8	9
98	FIL 2 MON	LGC3	E71
		H8	10
99	FIL2FLG	LGC1	E32
		H13	66
100	FMTRST	IC1	V
		H7	56
		H13	97
101	FRASYN	IC2	P
		H7	43
		H8	45
102	GCMCLK	IC2	L
		H13	93
103	GDATCLK-	H7	28
		H13	120
104	GEN	H11	83
		H16	21
		H16	22
105	GSE ANAMUX	LGC3	E88
		H8	59
106	GSE DATA	LGC1	E19
		H13	65
107	GSEENABL-	H13	92
		R6	1
		D1	1
		D2	1
108	GSEENABL1-	IC2	M
		D1	2
109	GSEENABL2-	LGC3	E85
		D2	2
110	HIFREQ	LGC2	E49
		IC1	A
		H13	33
111	HKSCLK	LGC2	E59
		LGC2	E60
		IC1	B
		H7	10
		H9	41
112	HV MON	LGC3	E72
		H8	15
113	INLETWD	LGC3	E89
		H13	31
114	INTEND	H7	33
		H11	13
115	INTRST	LGC2	E56
		H7	34
		C14	1
116	ISWEN	LGC2	E57
		H7	40
117	LD0A	LGC1	E20
		H13	6
118	LD12 DESNS	LGC2	E54
		H13	26
		EXTR	1
119	LD1A	LGC1	E21
		H13	5
120	LD2A	LGC1	E22
		H13	4
121	LD3A	LGC1	E23
		H13	7
122	LD4A	LGC1	E24
		H13	10
123	LD5A	LGC1	E25
		H13	9
124	LD9	H8	39
		H13	21
125	LDB20	IC2	U
		H13	41
126	LDB21	IC2	V
		H13	42
127	LDB22	IC2	W
		H13	43
128	LDB23	IC2	X
		H13	44
129	LDB5	IC1	U
		H7	49
130	LEAK 1 TMP	LGC3	E76
		H8	2
131	LEAK 2 TMP	LGC3	E77
		H8	19
		C11	1
132	LGCGND	LGC1	E9
		IC1	LL
		IC2	T
		H7	7
		H8	53
		H11	87
		H11	88
		H13	61
		H13	62
		H16	14
		H16	23
		H16	25
		TEST	1
		TEST	3
		BUF1	5
		BUF1	9
		BUF1	13
		C1	1
		C2	1
		C3	2
		C8	1
		C14	2
		EXTR	3
133	LROM1	H11	89
		H13	96
134	LROM2	H11	93
		H13	99
135	LS0	LGC2	E33
		H11	31
136	LS1	LGC2	E34
		H11	34
137	LS10	LGC2	E43
		H11	40
138	LS11	LGC2	E44
		H11	38
139	LS2	LGC2	E35
		H11	33
140	LS3	LGC2	E36
		H11	32
141	LS4	LGC2	E37
		H11	61
142	LS5	LGC2	E38
		H11	54
143	LS6	LGC2	E39
		H11	62
144	LS7	LGC2	E40
		H11	63
145	LS8	LGC2	E41
		H11	60
146	LS9	LGC2	E42
		H11	39
147	MACOMP-	H7	32
		H8	54
148	MADAT	H7	51
		H8	36
149	MASCLK-	H7	41
		H8	31
150	MASSDAT	H11	85
		H13	3
151	MNRRST	IC1	W
		H7	26
152	MT0	IC1	CC
		H11	12
		H13	88
153	MT1	H11	11
		H13	89
154	MT2	H8	49
		H11	10
		H13	90
155	MT3	H8	60
		H11	9
156	MT4	H8	58
		H11	5
		H13	83
157	MT5	H11	7
		H13	80
158	MT6	H11	8
		H13	77
159	MTA0	H11	6
		H13	68
160	MTA0000	LGC2	E55
		H7	60
		H11	117
		H13	101
161	MTA1000	IC1	T
		H8	42
		H11	113
162	MTA200	H7	18
		H11	108
163	MTA2000	H8	38
		H11	116
164	MTA3000	H8	46
		H11	114
165	MULT	IC1	DD
		H11	80
		H13	81
166	MULTANA	LGC3	E64
		H8	16
167	OSC AGC	LGC3	E80
		H8	24
168	OSC TMP	LGC3	E73
		H8	23
169	PA OUT	H7	1
		COAX	1
170	PA SHLD	H7	5
		COAX	2
171	PBUSENA	LGC1	E30
		H11	103
172	PBUSENB	LGC1	E31
		H11	104
173	PESR2	H11	96
		H13	112
174	PESR2-	H8	40
		H11	86
175	PLUM 1 TMP	LGC3	E78
		H8	6
176	PLUM 2 TMP	LGC3	E79
		H8	18
		C10	1
177	PUMP MON 2	LGC3	E65
		H8	13
178	PW MON	LGC3	E63
		H8	14
179	PYROPLSA1	LGC1	E26
		H11	110
180	PYROPLSA2	LGC1	E28
		H11	106
181	PYROPLSB1	LGC1	E27
		H11	109
182	PYROPLSB2	LGC1	E29
		H11	107
183	REP MON	LGC3	E66
		H8	28
184	RFCALC	IC1	FF
		H11	20
185	RFDAT	LGC2	E50
		H7	52
186	RFWEN	LGC2	E58
		H7	48
187	SDATOUT B	LGC3	E87
		H7	53
188	SENSOR TMP	LGC3	E83
		H8	5
189	SEQFLG	IC2	N
		H7	22
190	SHELL PRS	LGC3	E84
		H8	27
191	SOURCE TMP	LGC3	E62
		H8	3
192	T2 BIAS MN	LGC3	E81
		H8	22
193	T2 CNT	LGC2	E46
		H13	56
194	T3 BIAS MN	LGC3	E82
		H8	25
195	T3 CNT	LGC2	E47
		H13	57
196	T=29	LGC2	E61
		H13	95
197	TMP PWR	IC1	NN
		H8	4
198	TOTAL	LGC2	E52
		H13	118
199	TRDONE	IC2	S
		H13	94
200	VDISC	H13	39
		R1	2
201	VTDAT	H8	43
		H11	84
202	VTH	H7	2
		C9	1
		R1	1
		R2	1
		R3	1
203	ZERO	LGC2	E51
		H13	32

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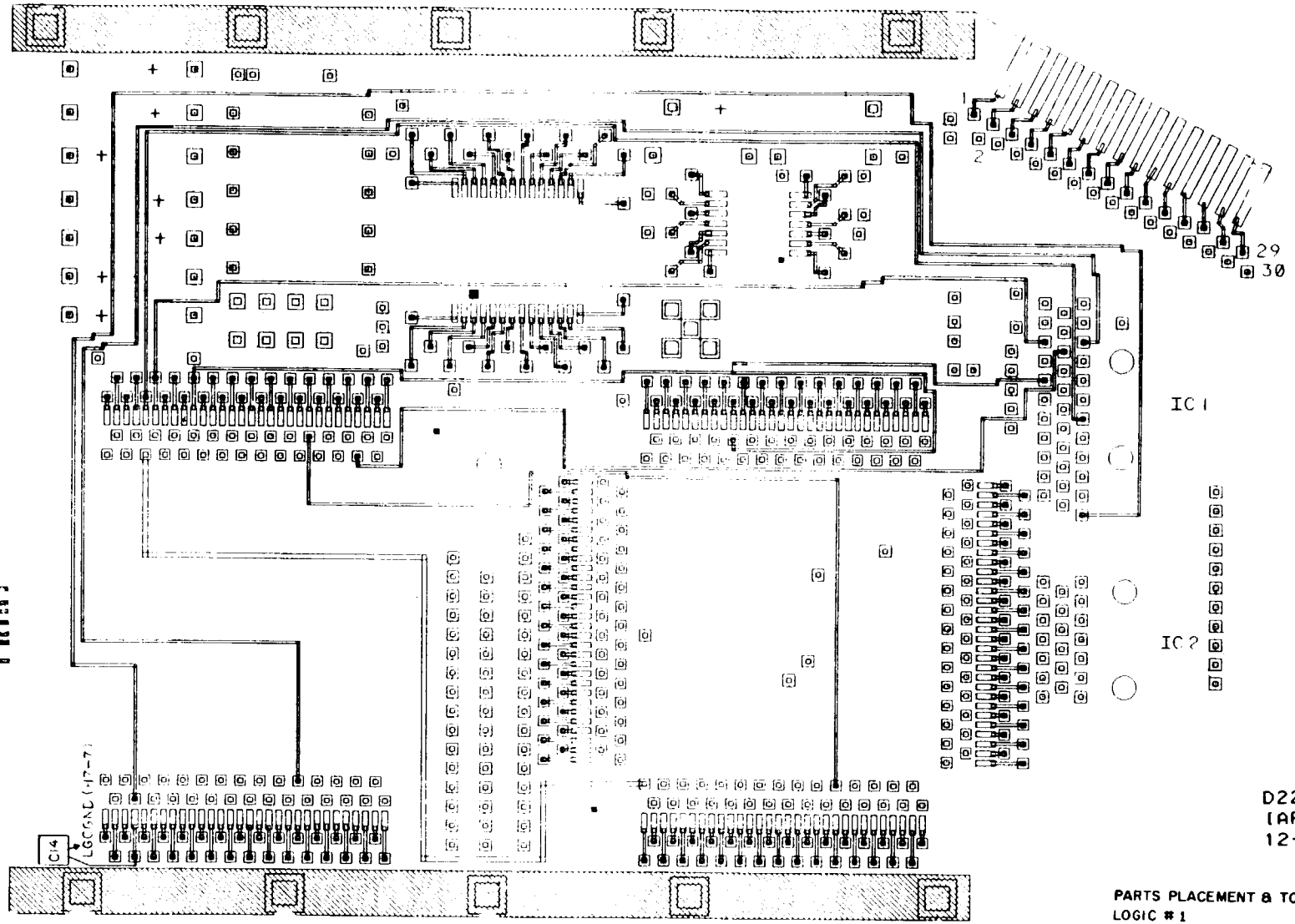
ENGINEER B.BLOCK	DRAFTSMAN	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	NODE NAME LIST PG 2 OF 2 LOGIC # 1 GNMS	5/25/83 5/6/83 4/15/81 4/2/81
	B-E 6485A CONTROLLED	DATE

LAST USED R C D L



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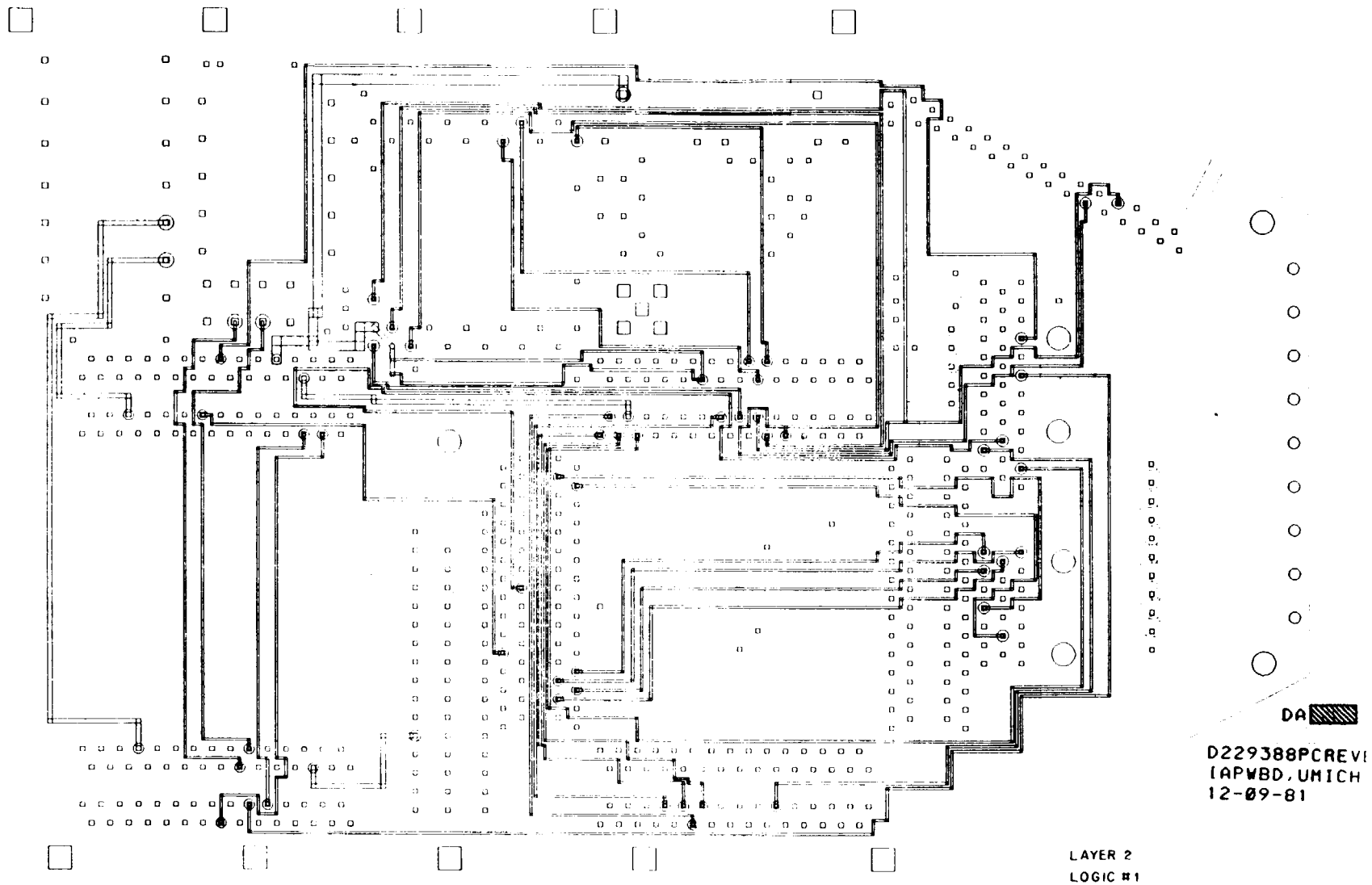
CA

D229388PCREVB
(APWBD,UMICH)
12-09-81

PARTS PLACEMENT & TOP LAYER 5/25/83
LOGIC # 1
GNMS S/N2
B-E 6811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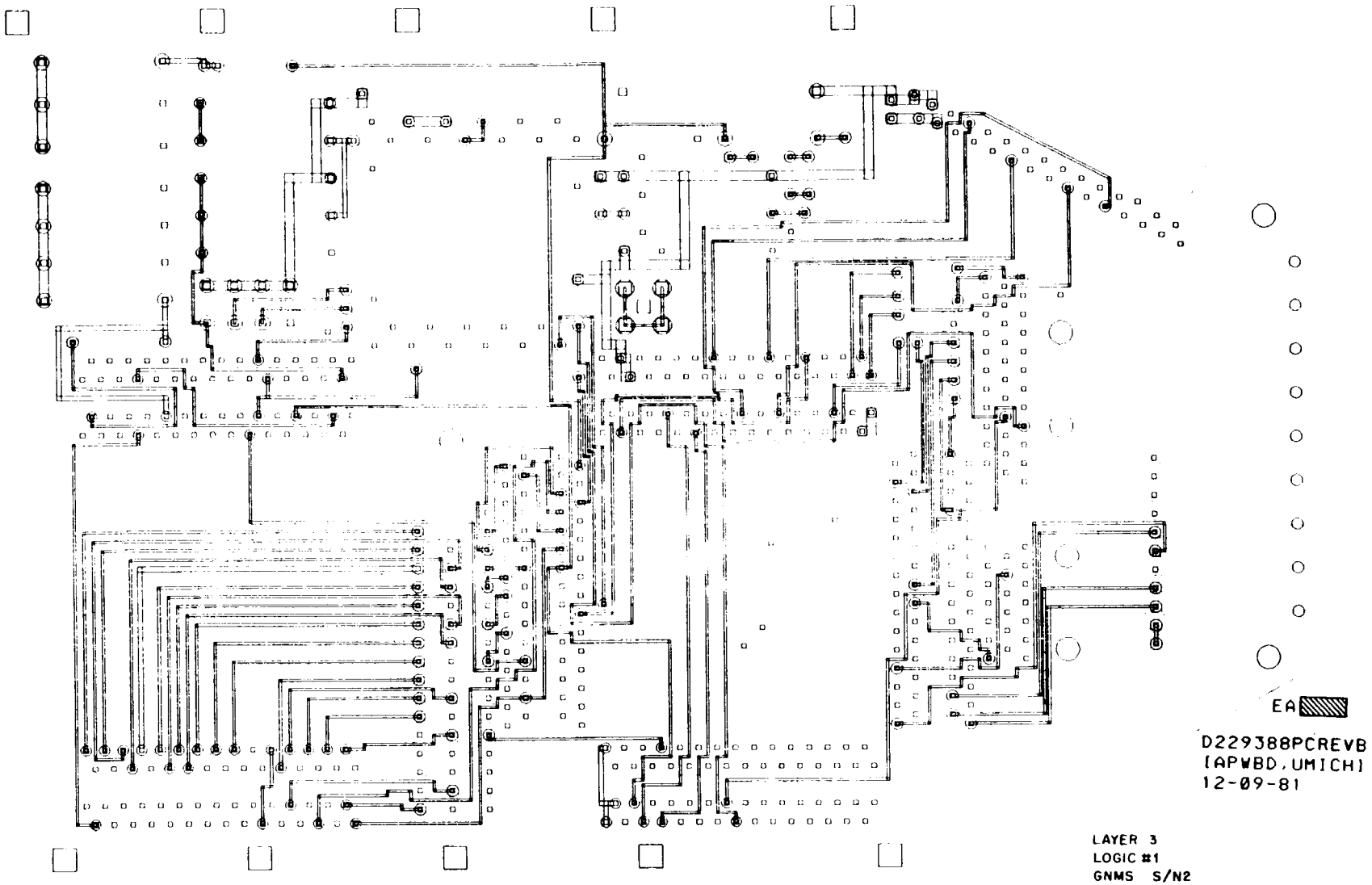
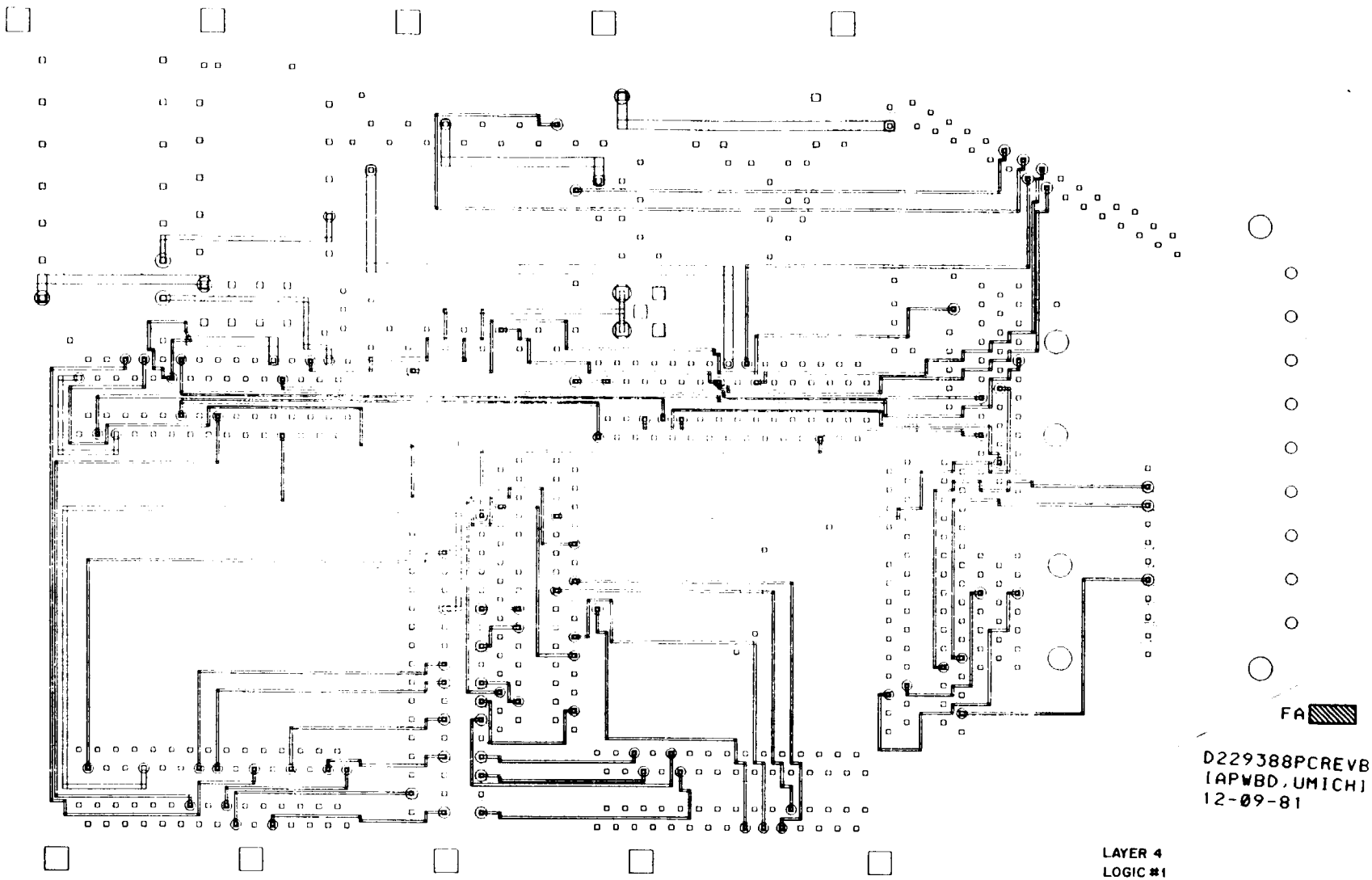
[APWBD,UMICH
12-09-81
LAYER 2
LOGIC #1
GNMS S/N2
B-E 6813



EA

D229388PCREVB
[APWBD,UMICH]
12-09-81

LAYER 3
LOGIC #1
GNMS S/N2
B E6814



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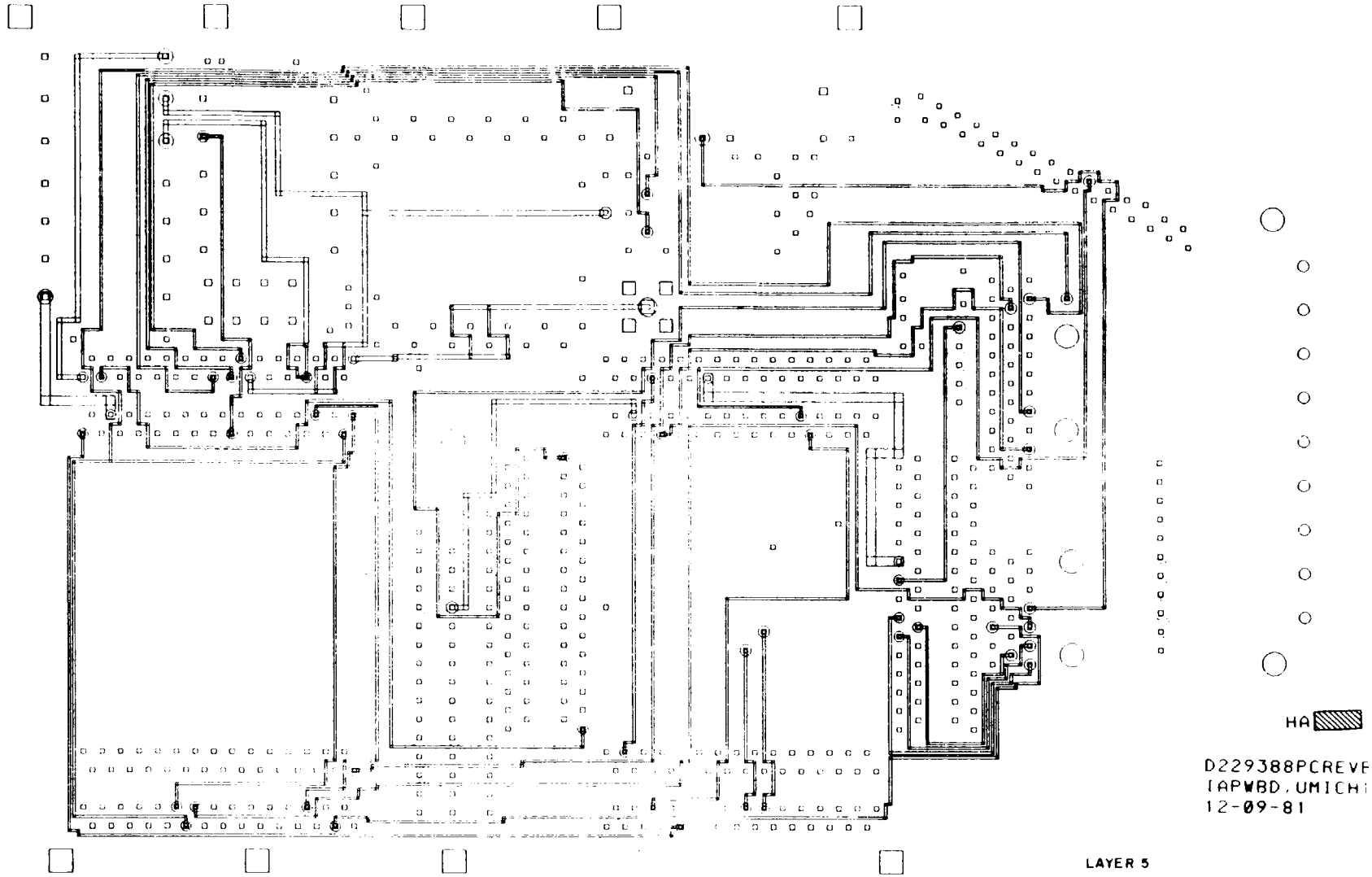
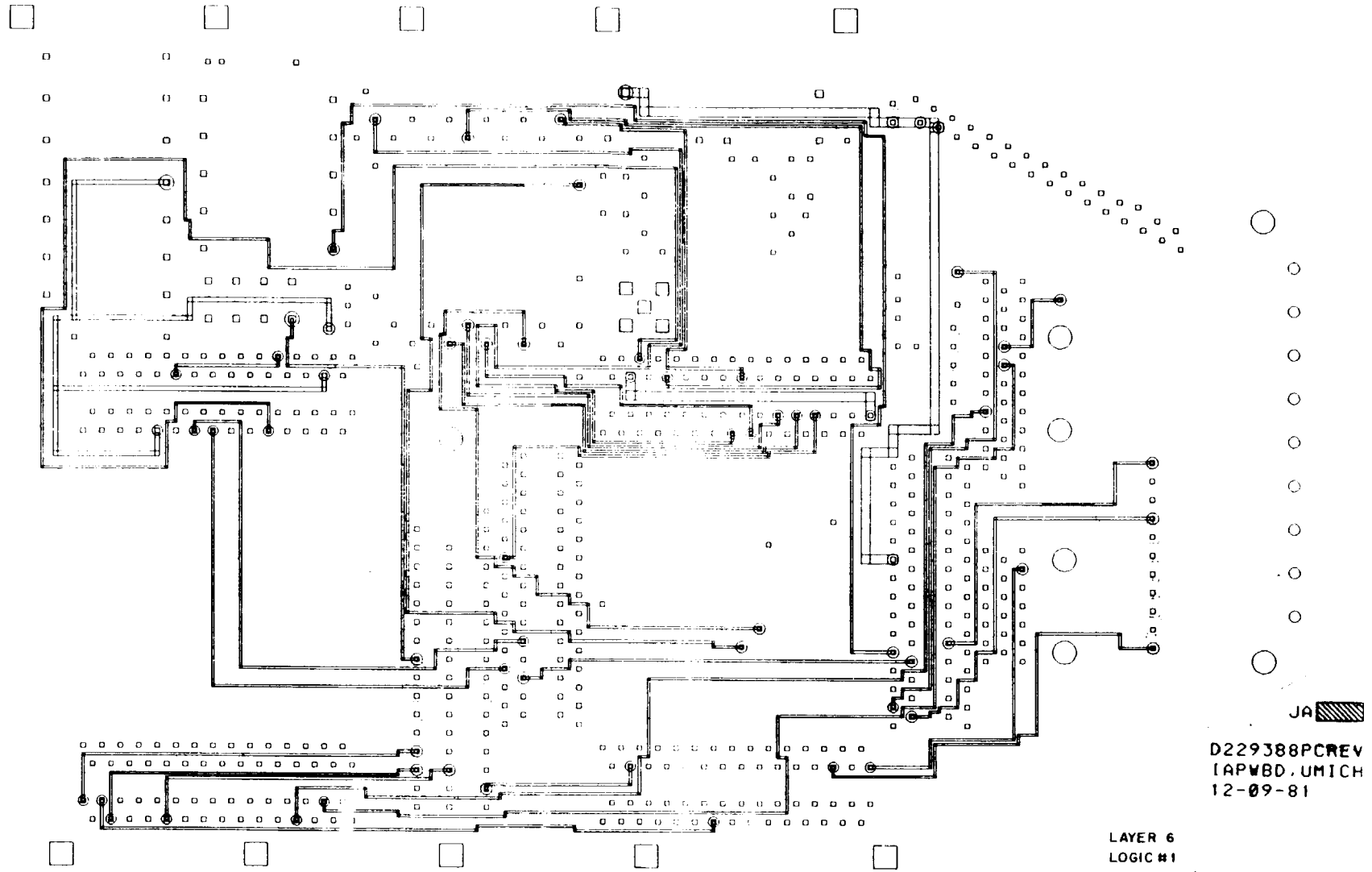
D229388PCREVB
[APWBD,UMICH]
12-09-81

LAYER 4
LOGIC #1
GNMS S/N2
B E 6815



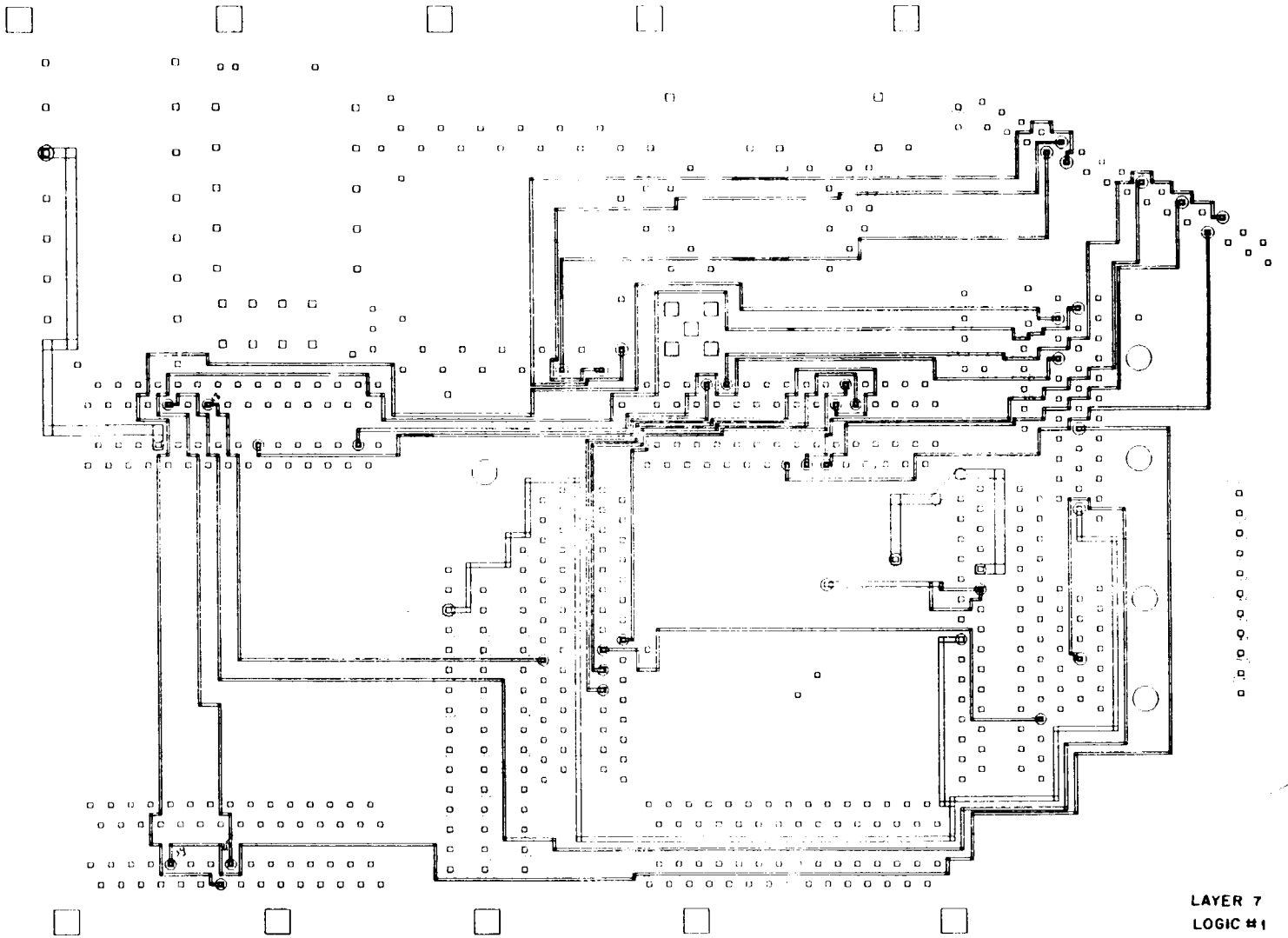
LAYER 5
LOGIC #1
GNMS S/N2
B-E 6816



JA

D229388PCREV
[APWBD.UMICH
12-09-81

LAYER 6
LOGIC #1
GNMS S/N2
B E 6817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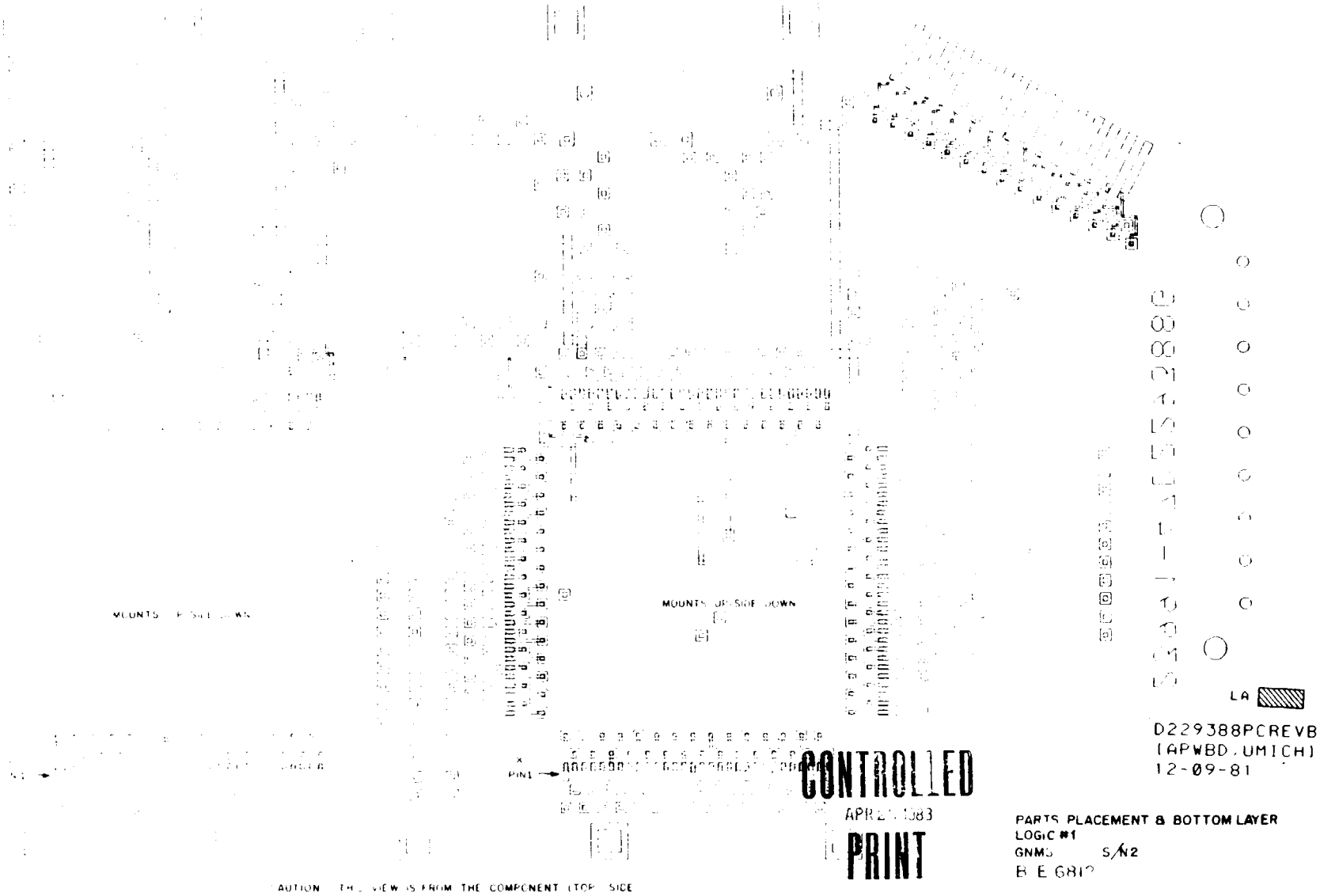
[APWBD,UMICH]
12-09-81
LAYER 7
LOGIC #1
GNMS S/N2
B E 6818



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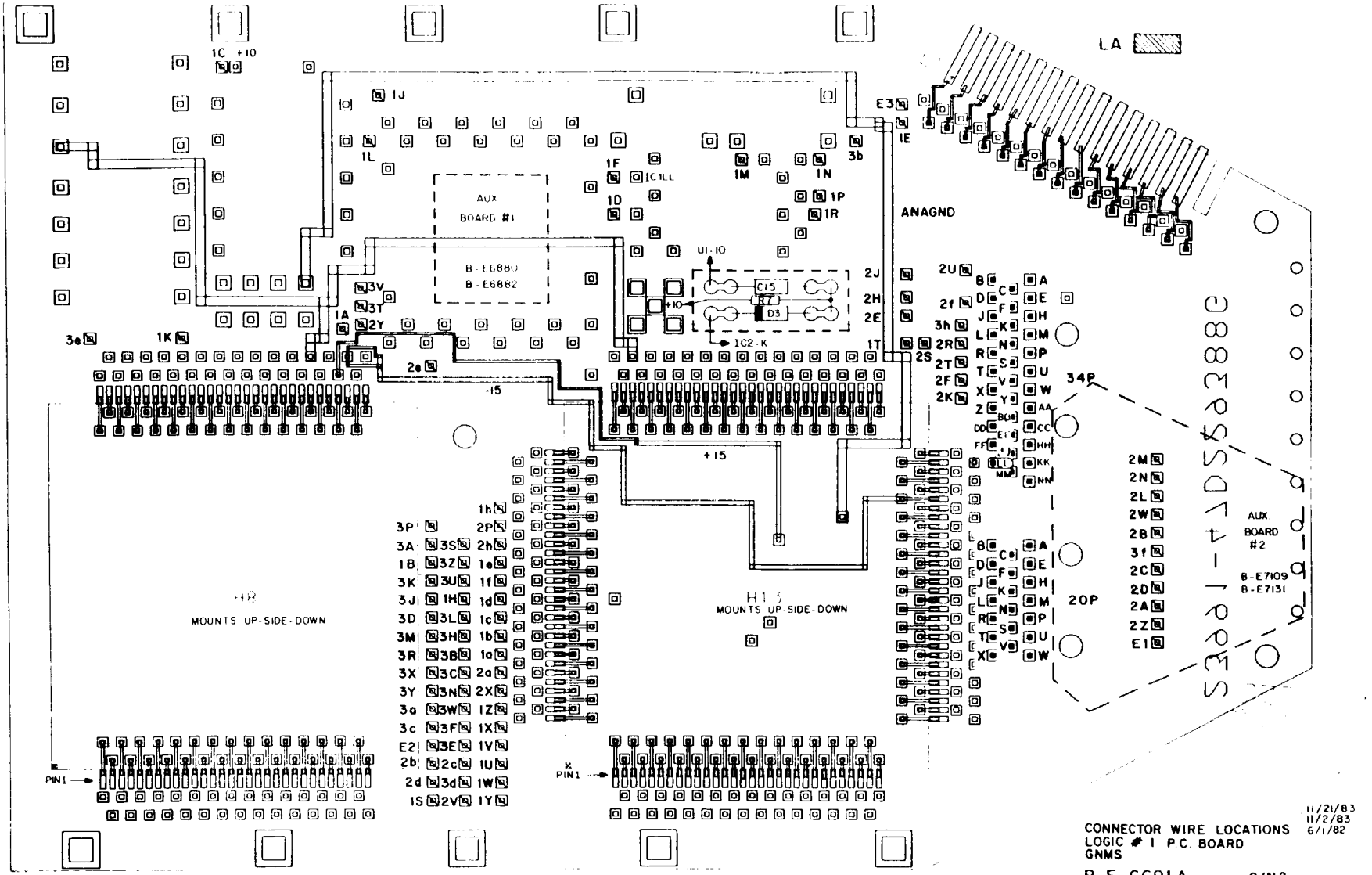
(APWBD.UM1CH1)
12-09-81

PARTS PLACEMENT & BOTTOM LAYER
LOGIC #1
GNMS S/N2
B E 6812



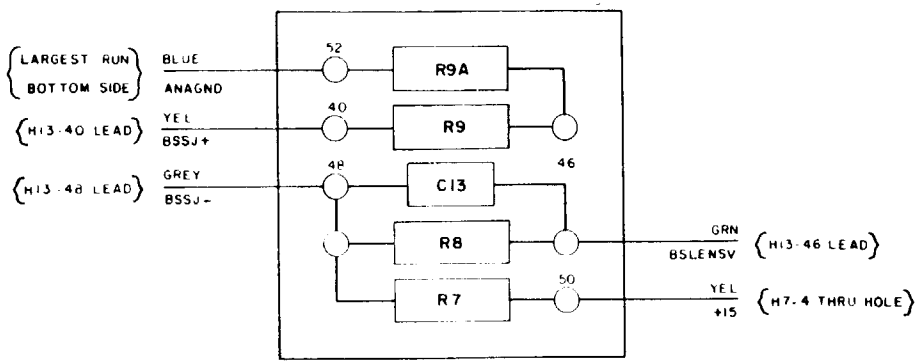
CAUTION THIS VIEW IS FROM THE COMPONENT (TOP) SIDE

11/21/83
11/2/83
6/1/82

CONNECTOR WIRE LOCATIONS
LOGIC # 1 P.C. BOARD
GNMS

B-E 6691A S/N2

CONTROLLED

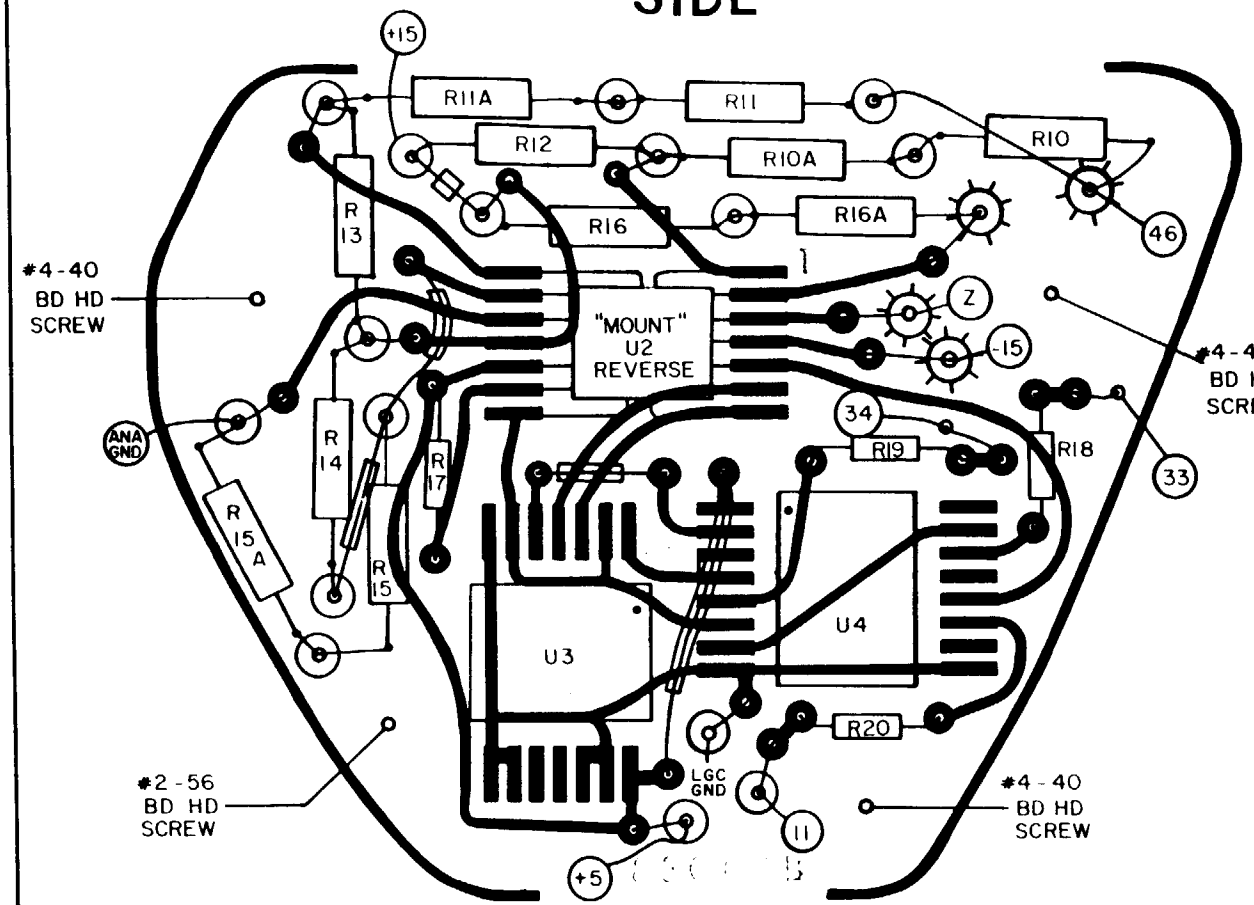


REFER TO B-E6880

ENGINEER FREED / PINKUS	DRAFTSMAN B.T. 5/27/82	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	LOGIC 1 AUX. BOARD GNMS S/N 2	6/1/82 DATE
	B-E6882	

LAST USED R C D L

COMPONENT SIDE



1. PROFILE #83006B TO OUTSIDE OF LINES.
2. ⓞ #2520A-4 SWAGE TERMINALS REQUIRED.
3. ⓞ #2520A-4 SWAGE TERMINALS MODIFIED.
4. #83006B AUX 2 BD (.031" THICK) MOUNTS TO LGC 1 BD WITH DELRIN SPACERS. SEE MECH DWG IN LGC 1 LOG BOOK.
5. COMPONENT U? MUST BE MOUNTED UPSIDE DOWN, WITH LAYER OF KAPTON TAPE.
6. ALL WIRES EXITING FROM #83006B MUST SOLDER TO SWAGE TERMINALS OR STRESS LOOP ON A SIDE OF BD. R17, 18, 19 & R20 CUT LEADS OFF FLUSH WITH SURFACE ON A-SIDE

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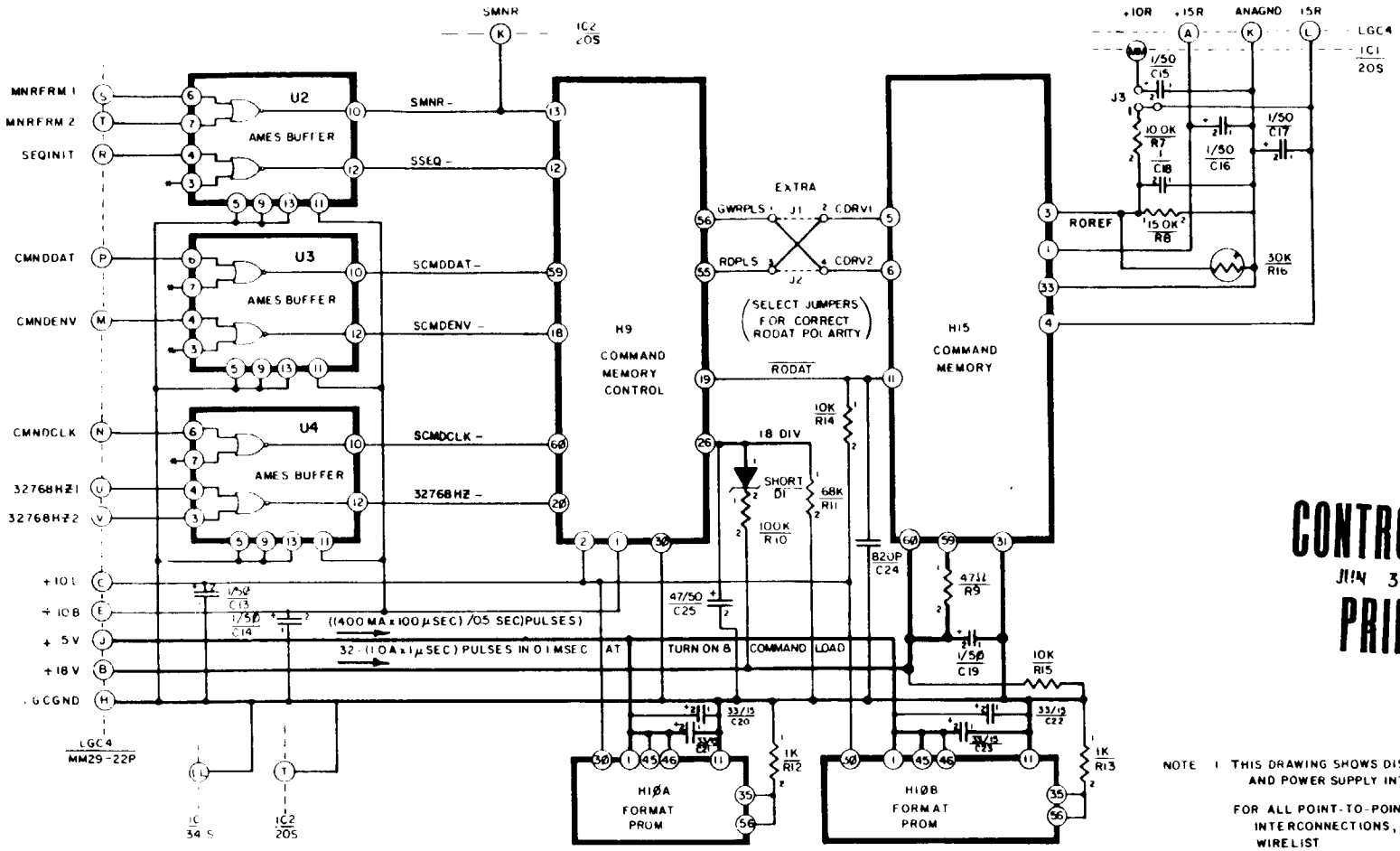
ENGINEER R BLOCK/M A H	DRAFTSMAN M A H / MK 8/5/83	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR MICHIGAN	AUX. BOARD 2 DELTA IF - LOGIC 1 GALILEO NMS	8/11/83
	B-E7131 CONTROLLED	DATE

SIZE CODE IDENT D L



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NOTE 1 THIS DRAWING SHOWS DISCRETE PARTS AND POWER SUPPLY INTERCONNECTIONS

FOR ALL POINT-TO-POINT SIGNAL INTERCONNECTIONS, SEE LG2CON PIN WIRELIST

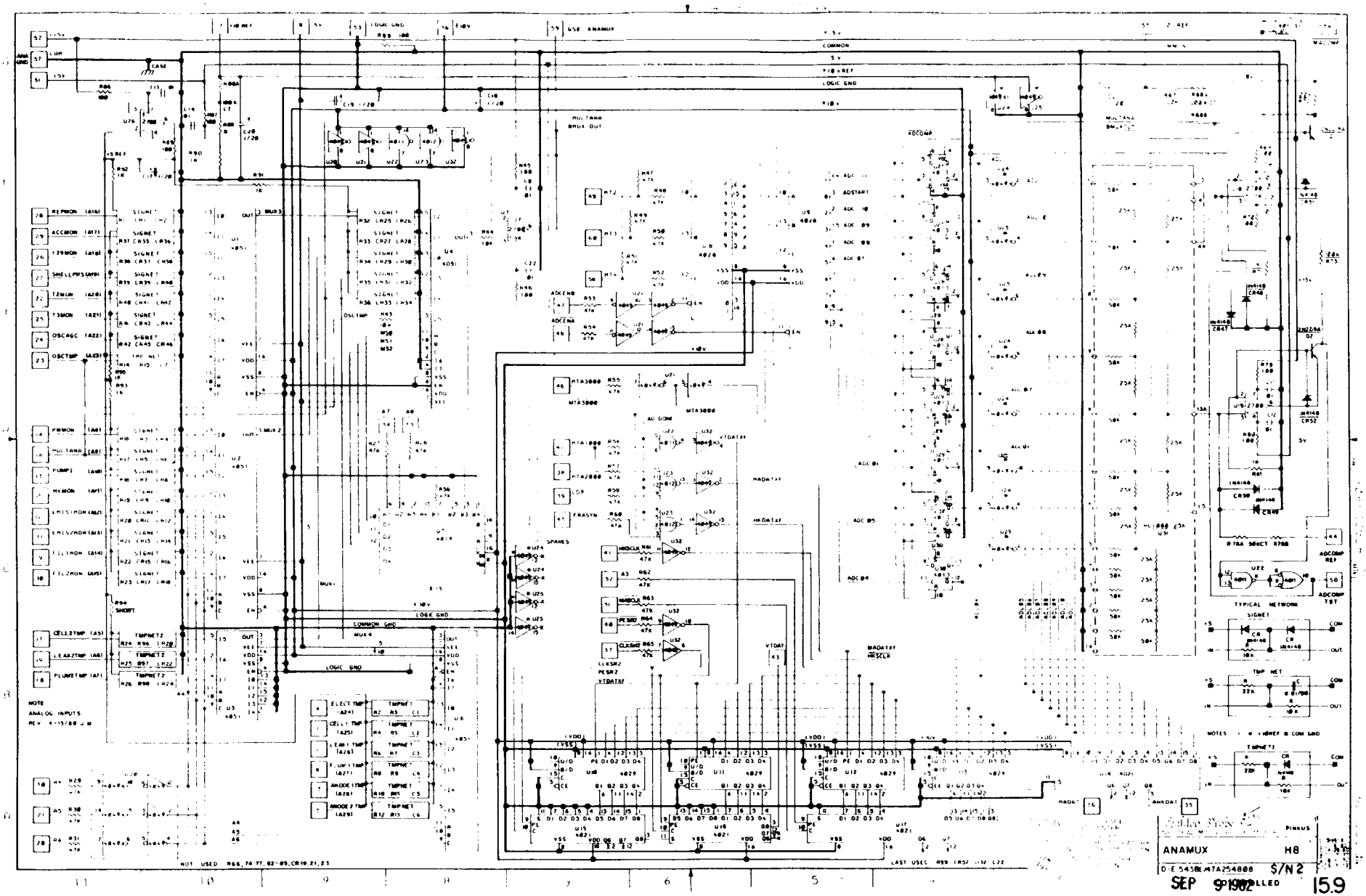
2 ALL RESISTORS SHOWN ARE SELECT - AT - TEST VALUES

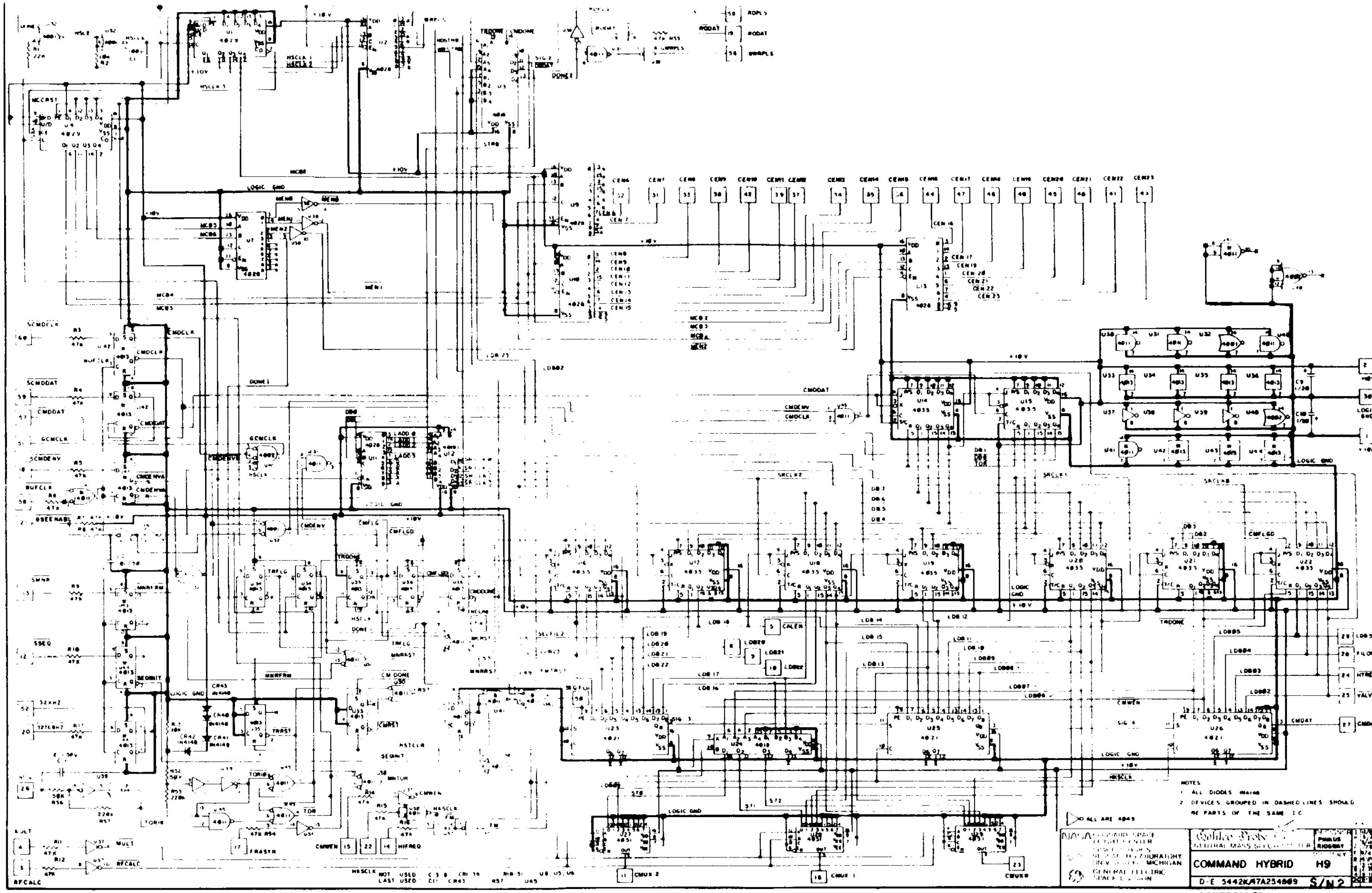
6/3/85
5/30/85
5/28/85
1/23/85
1/15/85
11/21/83
11/2/83

ENGINEER WH PINKUS 4/7/80	DRAFTER MFG 4/24/80	5/6/83
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	LOGIC 2 PC SCHEMATIC GALILEO-NMS S/N 3	10/26/82 7/15/82 7/2/82 6/1/82
	B-E6948 CONTROLLED	DATE

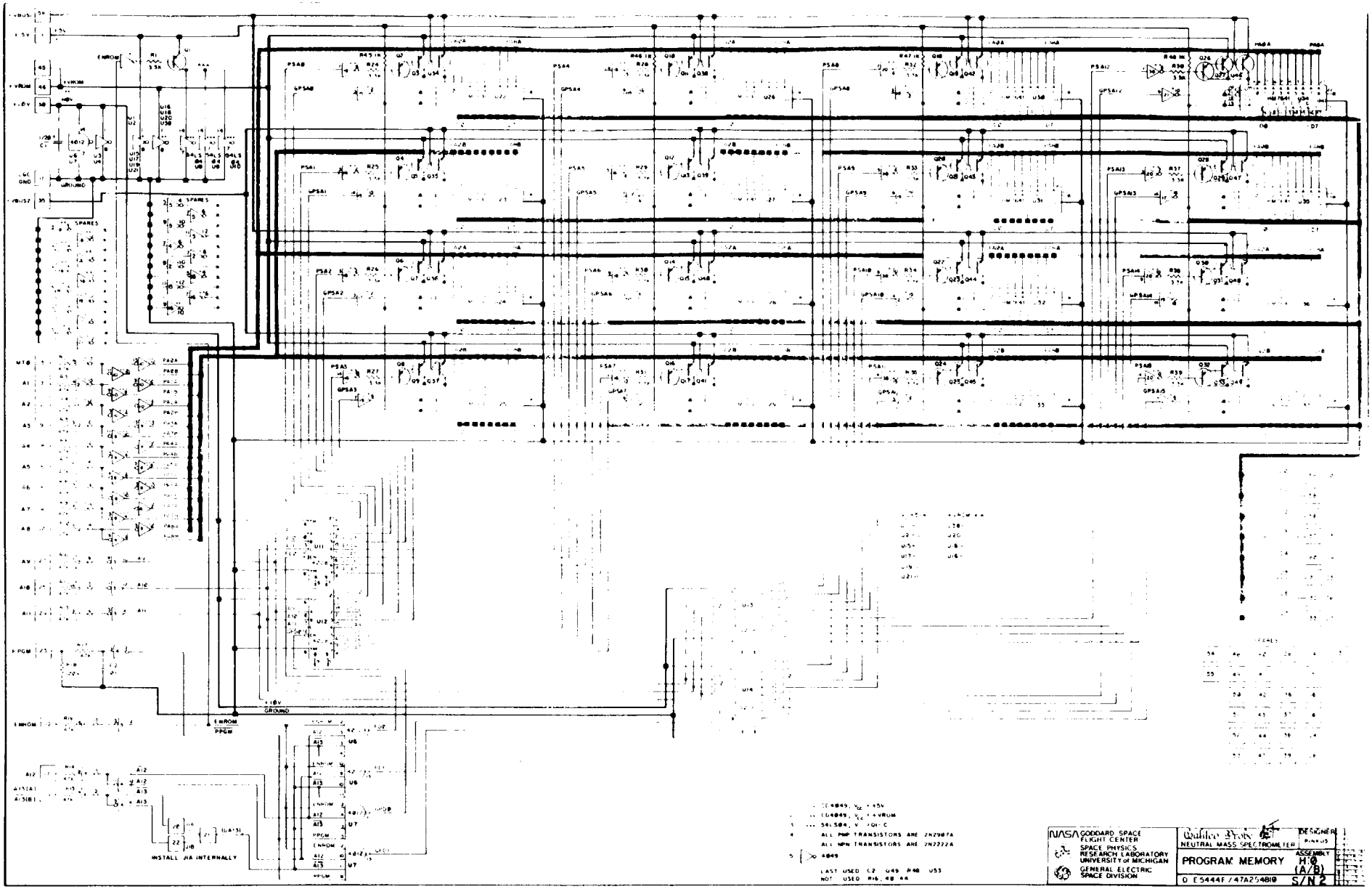
LAST USED R 7/14 C 13/23 D L

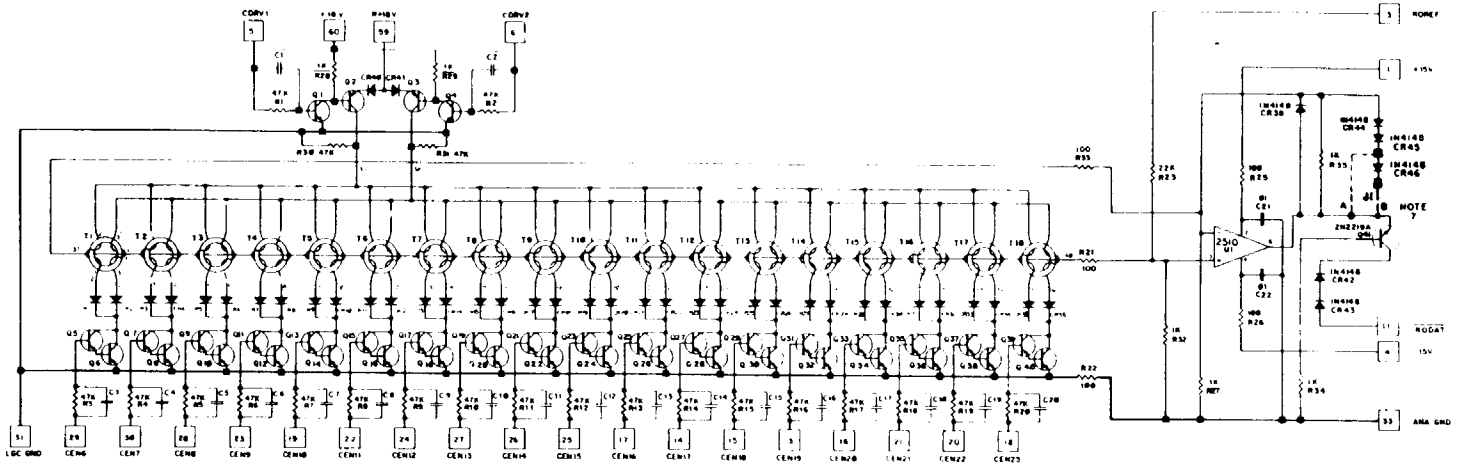
11.17


ANAMUX
H8
SEP 9 1982
15.9


NOTES
1 ALL DIODES IN4148
2 DEVICES GROUPED IN DASHED LINES SHOULD BE PARTS OF THE SAME I.C.
ALL ARE 4049
Galileo Probe
NEUTRAL MASS SPECTROMETER
COMMAND HYBRID H9
NASA GODDARD SPACE FLIGHT CENTER
SPACE PHYSICS RESEARCH LABORATORY UNIVERSITY OF MICHIGAN
GENERAL ELECTRIC SPACE DIVISION
D-E 5442K/47A254889 S/N 2
LOGIC GND
+10V
CMDAT
VALVEN
HTREN
FILOFF
LDB5
CALEN
CMUX 1
CMUX 2
CMUX 0

CONTROLLED
SEP 9 1982 15.10


NASA GODDARD SPACE FLIGHT CENTER
SPACE PHYSICS RESEARCH LABORATORY UNIVERSITY of MICHIGAN
GENERAL ELECTRIC SPACE DIVISION
NEUTRAL MASS SPECTROMETER
PROGRAM MEMORY
ASSEMBLY H:0 (A/B)
D E5444F / 47A254810 S/N 2
DESIGNER
SEP 9 1982 15.11



NOTE 1 ALL NPN TRANSISTORS 2N2219A
2 ALL PNP TRANSISTORS 2N2907A
3 ALL DIODES 1 N4148
4 TOTAL LENGTH OF "SENSE" LEAD (FROM R27 / ANA GND THROUGH ALL THE CORES, THROUGH R21, TO U1-31 SHOULD BE MINIMIZED
5 CORE WIRE SIZE / TYPE: 8 MIL
6 C1-C20 470 PF
7. SELECT AND INSTALL JUMPER J1-A OR J1-B AT TEST.

CONTROLLED
SEP 14 19
PRINT

LAST USED C22 CR46 Q41 R55 T18 U1 NOT USED: CR37, CR38, R24

NASA GODDARD SPACE FLIGHT CENTER SPACE PHYSICS RESEARCH LABORATORY UNIVERSITY of MICHIGAN GENERAL ELECTRIC SPACE DIVISION	Galileo Probe NEUTRAL MASS SPECTROMETER	DESIGNER PARKUS DAVIS ASSEMBLY	
	CORE MEMORY	H15	
	D-E6124H / 47A254815	S/N 2	

CONTROLLED

FILE:LG2CON.DIN

```
*********************************************
*                                           *
*      LOGIC 2 PC BOARD  CONNECTION LIST    *
*                                           *
*      INPUT FILE FOR NODE NAME SUMMARY     *
*                                           *
*********************************************
```

```
        IC1     34S
ED      *5-6-83
A       HIFREQ
B       HKSCLK
C       A01
D       A02
E       A03
F       A04
H       A05
J       A06
K       A07
L       A08
M       A09A
N       A10A
P       A11A
R       A12A
S       A13A
T       MTA1000
U       LDB5
V       FMTRST
W       MNRRST
X       BUFCLR-
Y       CMWEN
Z       CMDAT
AA      CMDDAT-  #MOVED 5-22-81
BB      32KHZ
CC      MT0
DD      MULT
EE      ENROM
FF      RFCALC
HH      CMUX0    #MOVED 5-22-81
JJ      CMUX1    #MOVED 5-22-81
KK      CMUX2    #MOVED 5-22-81
LL      LGCGND   #ADDED 5-6-83
MM      +10R     #MOVED 5-22-81
NN      TMP PWR  #MOVED 5-22-81     (THRU LG2 FOR THIS MON)
*
```

```
        IC2     20
ED      *8-26-81
A       D0
B       D1
C       D2
D       D3
E       D4
F       D5
H       D6
J       D7
K       *
L       GCMCLK
M       GSEENABL1-
N       SEQFLG
P       FRASYN
R       A13A-
S       TRDONE
T       LGCGND
U       LDB20
V       LDB21
W       LDB22
X       LDB23
*
*ON 5-22-81:
*IC2 CHANGED FROM A 34S
*TO A 20P; TO PROVIDE
*SUFFICENT CLEARANCE
*BETWEEN THIS PLUG AND
*OUTER PRESSURE SHELL.
*
```

```
*LOGIC 2 PC BOARD PLUG LGC4
        LGC4    29 P
ED      *9-29-81
A       +15R
B       +18V
C       +10L
D       *
E       +10B
F       *
H       LGCGND
J       +5V
K       ANAGND
L       -15R
M       CMNDENV
N       CMNDCLK
P       CMNDDAT
R       SEQINIT
S       MNRFRM 1
T       MNRFRM 2
U       32768HZ1
V       32768HZ2
W       GSEENABL1-
X       VALVEN-
Y       *
Z       HTREN-
a       FMTRST
b       FMTRST
c       FILSOFF
d       SEL FIL 2
e       *
f       *
h       TMP PWR
*
*
```

Refer to Drawing B-E6148A for additional information

EDIT'S.....

3/10/81
Included newest board connector list

3/16/81
Removed PC Board, added buffers, resistors caps, jumper, A01's to A1's etc.

3-31-81
Include new pinout for H9, & H10

4-2-81
Includes check print changes.

4-13-81
Revise H15 pins per latest GE pinout, (per phone from J. Booth).

5-4-81
Revise H9 pins 37,38,39 to correct original GE lists. [CEN9, CEN11, CEN12]

5-15-81
Change H9, CMUX0 and CMUX2, pin asignment. Previous prints had H9 pins 11 and 23 reversed.

5-22-81
Changed IC1 and IC2. Changed IC2 from a 34s to a 20S. Changed: CMUX0, CMUX1, CXMUX2, +10R, and CMDDAT-.

8-26-81
Added LGCGND to Pin "T" of IC2 Plug.

9-9-81
Added R14 to RODAT-

9-29-81
Changed sex of harness connector from S tp P. This now conforms with the main harness designations. Corrected spelling of CMUX0 on IC2

6-22-82
Added D1, R14, change R701 to -15R

11-8-82
Removed CALEN- from LGC4 BPB

5-6-82 Added MTA1000 to IC1-T and LGCGND to IC1-LL BPB

CONTROLLED COPY

ENGINEER B.BLOCK	DRAFTSMAN MK 11/9/82	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	LOGIC 2 NODE INPUT LIST GNMS PAGE 1 OF 2	5/6/83 DATE
	B- E6961	

LAST USED R C D L

	H9 CMND		H10A PGMA		H10B PGMB
1	+10B	2	A2	1	A2
2	+10L	3	MTO	2	MTO
3	RFCALC	4	A7	3	A7
4	MULT	5	A6	4	A6
5	CALEN-	6	A5	5	A5
6	SEL FIL 2	7	A1	6	A1
7	LDB23	8	A4	7	A4
8	LDB20	9	A3	8	A3
9	LDB21	10	A8	9	A8
10	LDB22	11	LGC	10	LGCGND
11	CMUX2	12	M O	11	ENROM
12	SSEQ-	13	*SPARE	12	*SPARE
13	SMNR-	14	*SPARE	13	*SPARE
14	HIFREQ	15	*SPARE	14	*SPARE
15	CMWEN	16	*	15	*SPARE
16	CMUX1	17	A12A	16	*
17	FRASYN	18	*	17	A12A
18	SCMDENV-	19	A13A	18	*
19	RODAT-	20	*J1AA	19	A13A-
20	32768HZ-	21	*GA13	20	*J1AB
21	GSEENABL1-	22	*J1BA	21	*GB13
22	HKSCLK	23	*PPGM TST	22	*J1BB
23	CMUX0	24	*	23	*PPGM TST
24	HTREN-	25	A10A	24	*
25	VALVEN-	26	*	25	A10A
26	18DIV	27	A9A	26	*
27	CMDAT	28	*	27	A9A
28	FILSOFF	29	A11A	28	*
29	LDB5	30	+10L	29	A11A
30	LGCGND	31	D5	30	+10L
31	CEN7	32	D6	31	D5
32	CEN6	33	D7	32	D6
33	CEN8	34	D0	33	D7
34	CEN13	35	VBUS H10A	34	D0
35	CEN14	36	*	35	VBUS H10B
36	CEN15	37	*	36	*
37	CEN12	38	*	37	*
38	CEN9	39	*	38	*
39	CEN11	40	*	39	*
40	CEN21	41	*	40	*
41	CEN22	42	*	41	*
42	CEN10	43	*	42	*
43	CEN23	44	*	43	*
44	CEN16	45	+5V	44	*
45	CEN20	46	+5V	45	+5V
46	CEN18	47	*	46	+5V
47	CEN17	48	*	47	*
48	CEN19	49	*	48	*
49	FMTRST	50	*	49	*
50	SEQFLG	51	*	50	*
51	GCMCLK	52	*	51	*
52	32KHZ	53	*	52	*
53	MNRRST	54	*	53	*
54	TRDONE	55	*	54	*
55	RDPLS	56	VBUS H10A	55	*
56	GWRPLS	57	D3	56	VBUS H10B
57	CMDDAT-	58	D2	57	D3
58	BUFCLK-	59	D1	58	D2
59	SCMDDAT-	60	D4	59	D1
60	SCMDCLK-			60	D4

* All "flat-packs"

*

	U2 BUFF
1	*NOT USED
2	*NOT USED
3	*NOT USED
4	SEQINIT
5	LGCGND
6	MNRFRM 1
7	MNRFRM 2
8	*NOT USED
9	LGCGND
10	SMNR-
11	+10B
12	SSEQ-
13	LGCGND
14	*NOT USED

*

	U3 BUFF
1	*NOT USED
2	*NOT USED
3	*NOT USED
4	CMNDENV
5	LGCGND
6	CMNDDAT
7	*NOT USED
8	*NOT USED
9	LGCGND
10	SCMDDAT-
11	+10B
12	SCMDENV-
13	LGCGND
14	*NOT USED

*

	U4 BUFF
1	*NOT USED
2	*NOT USED
3	32768HZ2
4	32768HZ1
5	LGCGND
6	CMNDCLK
7	*NOT USED
8	*NOT USED
9	LGCGND
10	SCMDCLK-
11	+10B
12	32768HZ-
13	LGCGND
14	*NOT USED

*DISCRETE PARTS

*

* CAPACITORS

*

	C13	1/50	
1	LGCGND		
2	+10L		
*			
	C14	1/50	
1	LGCGND		
2	+10B		
*			
	C15	1/50	
1	ANAGND		
2	+10R		
*			
	C16	1/50	
1	ANAGND		
2	+15R		
*			
	C17	1/50	
1	-15R		
2	ANAGND		
*			
	C18	.1	
1	ANAGND		
2	ROREF		
*			
	C19	1/50	
1	LGCGND		
2	+18V		
*			
	C20	33/15	
1	LGCGND		
2	+5V		
*			
	C21	33/15	
1	LGCGND		
2	+5V		
*			
	C22	33/15	
1	LGCGND		
2	+5V		
*			
	C23	33/15	
1	LGCGND		
2	+5V		

*RESISTORS & DIODE

* ED 6-22-82 JM PER JE

*

	R7	20.0K
1	-15R	
2	ROREF	
*		
	R8	10.0K
1	ROREF	
2	ANAGND	
*		
	R9	68
1	R+18	
2	+18V	
*		
	R10	20K
1	R10-1	
2	+18V	
*		
	R11	47K
1	18DIV	
2	LGCGND	
*		
	R12	1K
1	LGCGND	
2	VBUS H10A	
*		
	R13	1K
1	LGCGND	
2	VBUS H10B	
*		
	R14	10K
1	RODAT-	
2	+10L	
*		
	D1	11VZ
1	18DIV	
2	R10-1	

ENGINEER	DRAFTSMAN	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	LOGIC 2 NODE INPUT LIST PG. 2 OF 2 GNMS B-E6325	DATE

LAST USED R C D L

11.19

LG2CON.PIN NO.	SIGNAL	22-Jun-82 PLUG	PIN
1	+10B	LGC4	E
		H9	1
		U2	11
		U3	11
		U4	11
		C14	2
2	+10L	LGC4	C
		H9	2
		H10A	30
		H10B	30
		C13	2
		R14	2
3	+10R	IC1	MM
		C15	2
4	+15R	LGC4	A
		H15	1
		C16	2
5	+18V	LGC4	B
		H15	60
		C19	2
		R9	2
		R10	2
6	+5V	LGC4	J
		H10A	1
		H10A	45
		H10A	46
		H10B	1
		H10B	45
		H10B	46
		C20	2
		C21	2
		C22	2
		C23	2
7	-15R	LGC4	L
		H15	4
		C17	1
		R7	1
8	18DIV	H9	26
		R11	1
		D1	1
9	32768HZ-	H9	20
		U4	12
10	32768HZ1	LGC4	U
		U4	4
11	32768HZ2	LGC4	V
		U4	3
12	32KHZ	IC1	BB
		H9	52
13	A1	IC1	C
		H10A	7
		H10B	7
14	A10A	IC1	N
		H10A	25
		H10B	25
15	A11A	IC1	P
		H10A	29
		H10B	29

LG2CON.PIN NO.	SIGNAL	22-Jun-82 PLUG	PIN
16	A12A	IC1	R
		H10A	17
		H10B	17
17	A13A	IC1	S
		H10A	19
18	A13A-	IC2	R
		H10B	19
19	A2	IC1	D
		H10A	2
		10B	2
20	A3	IC1	E
		H10A	9
		H10B	9
21	A4	IC1	F
		H10A	8
		H10B	8
22	A5	IC1	H
		H10A	6
		H10B	6
23	A6	IC1	J
		H10A	5
		H10B	5
24	A7	IC1	K
		H10A	4
		H10B	4
25	A8	IC1	L
		H10A	10
		H10B	10
26	A9A	IC1	M
		H10A	27
		H10B	27
27	ANAGND	LGC4	K
		H15	33
		C15	1
		C16	1
		C17	2
		C18	1
		R8	2
28	BUFCLK-	IC1	X
		H9	58
29	CALEN-	LGC4	Y
		H9	5
30	CDRV1	H15	5
		EXTR	2
31	CDRV2	H15	6
		EXTR	4
32	CEN10	H9	42
		H15	19
33	CEN11	H9	39
		H15	22
34	CEN12	H9	37
		H15	24
35	CEN13	H9	34
		H15	27

LG2CON.PIN NO.	SIGNAL	22-Jun-82 PLUG	PIN
36	CEN14	H9	35
		H15	26
37	CEN15	H9	36
		H15	25
38	CEN16	H9	44
		H15	17
39	CEN17	H9	47
		H15	14
40	CEN18	H9	46
		H15	15
41	CEN19	H9	48
		H15	13
42	CEN20	H9	45
		H15	16
43	CEN21	H9	40
		H15	21
44	CEN22	H9	41
		H15	20
45	CEN23	H9	43
		H15	18
46	CEN6	H9	32
		H15	29
47	CEN7	H9	31
		H15	30
48	CEN8	H9	33
		15	28
49	CEN9	H9	38
		H15	23
50	CMDAT	IC1	Z
		H9	27
51	CMDDAT-	IC1	AA
		H9	57
52	CMNDCLK	LGC4	N
		U4	6
53	CMNDDAT	LGC4	P
		U3	6
54	CMNDENV	LGC4	M
		U3	4
55	CMUX0	IC1	HH
		H9	23
56	CMUX1	IC1	JJ
		H9	16
57	CMUX2	IC1	KK
		H9	11
58	CMWEN	IC1	Y
		H9	15
59	DO	IC2	A
		H10A	34
		H10B	34
60	D1	IC2	B
		H10A	59
		H10B	59
61	D2	IC2	C
		H10A	58
		H10B	58

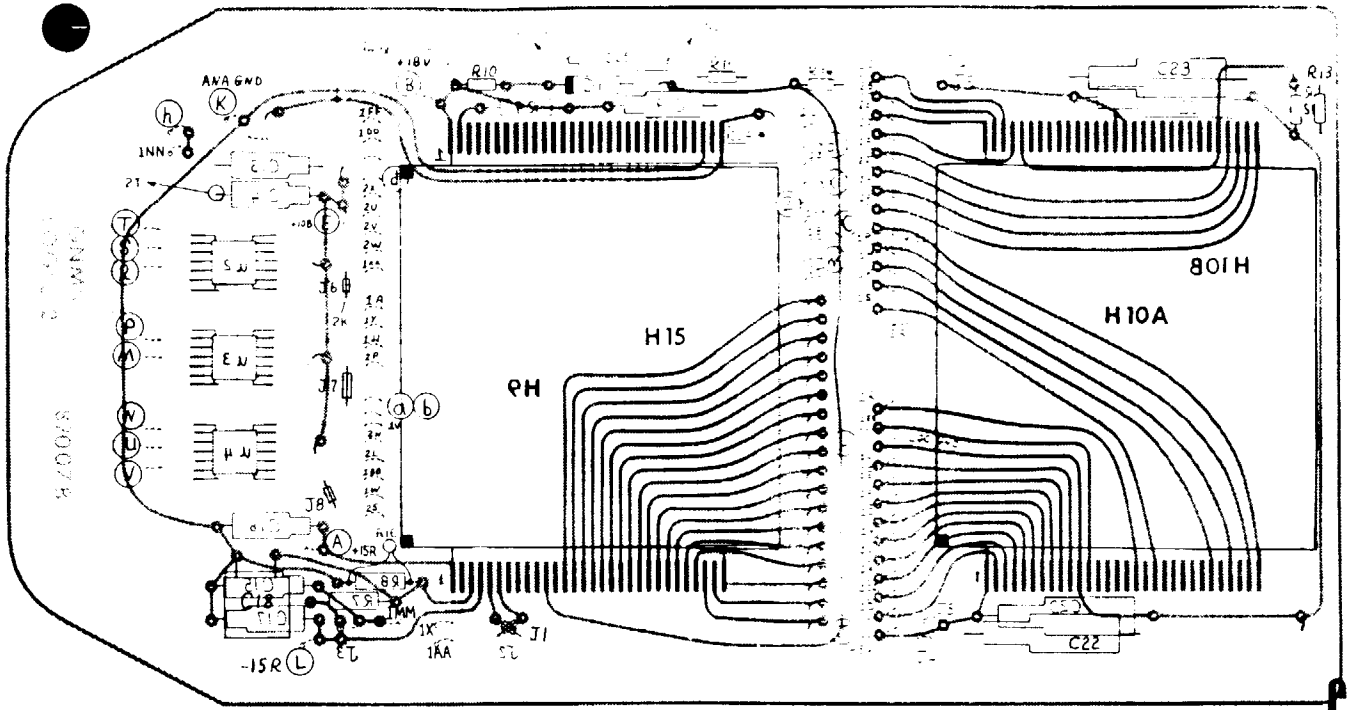
LG2CON.PIN NO.	SIGNAL	22-Jun-82 PLUG	PIN
62	D3	IC2	D
		H10A	57
		H10B	57
63	D4	IC2	E
		H10A	60
		H10B	60
64	D5	IC2	F
		H10A	31
		H10B	31
65	D6	IC2	H
		H10A	32
		H10B	32
66	D7	IC2	J
		H10A	33
		H10B	33
67	ENROM	IC1	EE
		H10A	12
		H10B	12
68	FILSOFF	LGC4	c
		H9	28
69	FMTRST	LGC4	a
		LGC4	b
		IC1	V
		H9	49
70	FRASYN	IC2	P
		H9	17
71	GCMCLK	IC2	L
		H9	51
72	GSEENABLI-	LGC4	W
		IC2	M
		H9	21
73	GWRPLS	H9	56
		EXTR	1
74	HIFREQ	IC1	A
		H9	14
75	HKSCLK	IC1	B
		H9	22
76	HTREN-	LGC4	Z
		H9	24
77	LDB20	IC2	U
		9	8
78	LDB21	IC2	V
		H9	9
79	LDB22	IC2	W
		H9	10
80	LDB23	IC2	X
		H9	7

LG2CON.PIN NO.	SIGNAL	06-May-83 PLUG	PIN
81	LDB5	IC1	U
		H9	29
82	LGCGND	LGC4	H
		IC1	LL
		IC2	T
		H9	30
		H10A	11
		H10B	11
		H15	31
		U2	5
		U2	9
		U2	13
		3	5
		U3	9
		U3	13
		U4	5
		U4	9
		U4	13
		C13	1
		C14	1
		C19	1
		C20	1
		C21	1
		C22	1
		C23	1
		R11	2
		R12	1
		R13	1
83	MNRFRM 1	LGC4	S
		U2	6
84	MNRFRM 2	LGC4	T
		U2	7
85	MNRRST	IC1	W
		H9	53
86	MTO	IC1	CC
		H10A	3
		H10B	3
87	MULT	IC1	DD
		H9	4
88	R+18	H15	59
		R9	1
89	R10-1	R10	1
		D1	2
90	RDPLS	H9	55
		EXTR	3
91	RFCALC	IC1	FF
		H9	3

LG2CON.PIN NO.	SIGNAL	PLUG	PIN
92	RODAT-	H9	19
		H15	11
		R14	1
93	ROREF	H15	3
		C18	2
		R7	2
		R8	1
94	SCMDCLK-	H9	60
		U4	10
95	SCMDDAT-	H9	59
		U3	10
96	SCMDENV-	H9	18
		U3	12
97	SEL FIL 2	LGC4	d
		H9	6
98	SEQFLG	IC2	N
		H9	50
99	SEQINIT	LGC4	R
		U2	4
100	SMNR-	H9	13
		U2	10
101	SSEQ-	H9	12
		U2	12
102	TMP PWR	LGC4	h
		IC1	NN
103	TRDONE	IC2	S
		H9	54
104	VALVEN-	LGC4	X
		H9	25
105	VBUS H10A	H10A	35
		H10A	56
		R12	2
106	VBUS H10B	H10B	35
		H10B	56
		R13	2

ENGINEER	DRAFTSMAN
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	NODE NAME LIST LOGIC #2 GNMS B-E 6486
	5/6/83 DATE

LAST USED R C D L



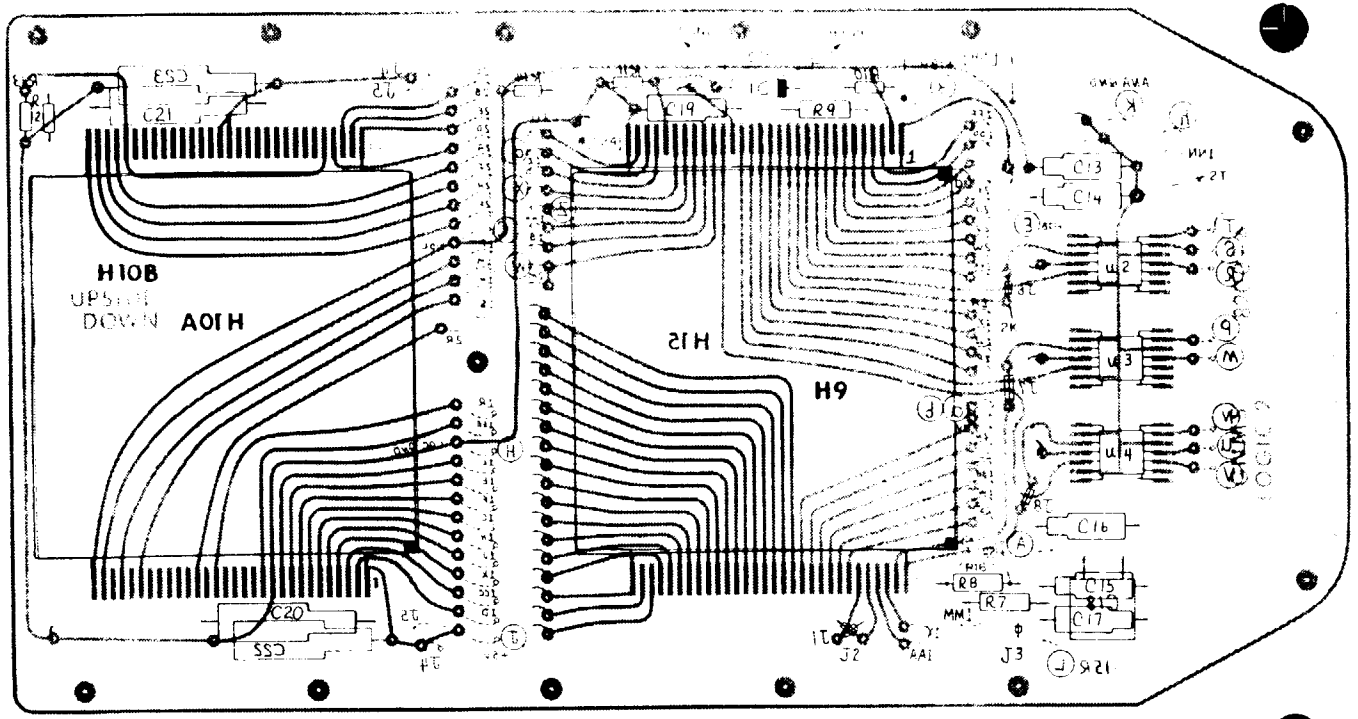
82007C
COMP SIDE PARTS

○=LOGIC CONNECTOR
1 = IC1 CONNECTOR
2 = IC2 CONNECTOR

NOTE R16 THERMISTOR EPOXIED TO H15

CONTROLLED
JUN 3 1985
PRINT

ENGINEER W.L. REE		
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	COMPONENT LAYOUT LOGIC 2 BOARD GNMS S/N 2	6/3/85 1/23/85 11/21/83 11/2/83
	B-E 6907 CONTROLLED	



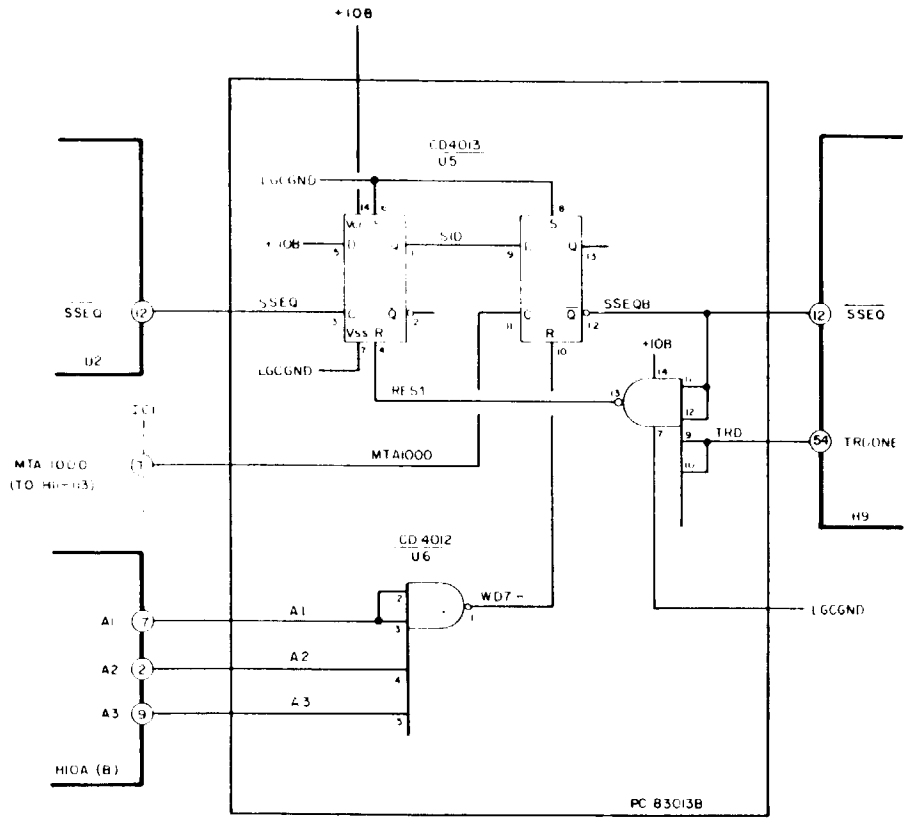
820070

CIRCUIT SIDE

CONTROLLED
JUN 3 1985
PRINT

NOTE H15 THERMISTOR EPOXIED TO H15

ENGINEER MAURER		6/3/85
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR MICHIGAN	COMPONENT LAYOUT REVERSE LOGIC 2 BOARD GNMS S/N2	1/23/85 11/21/83 11/2/83
	BE-6906 CONTROLLED	DATE



CONTROLLED

NOV 2 1 1983

PRINT

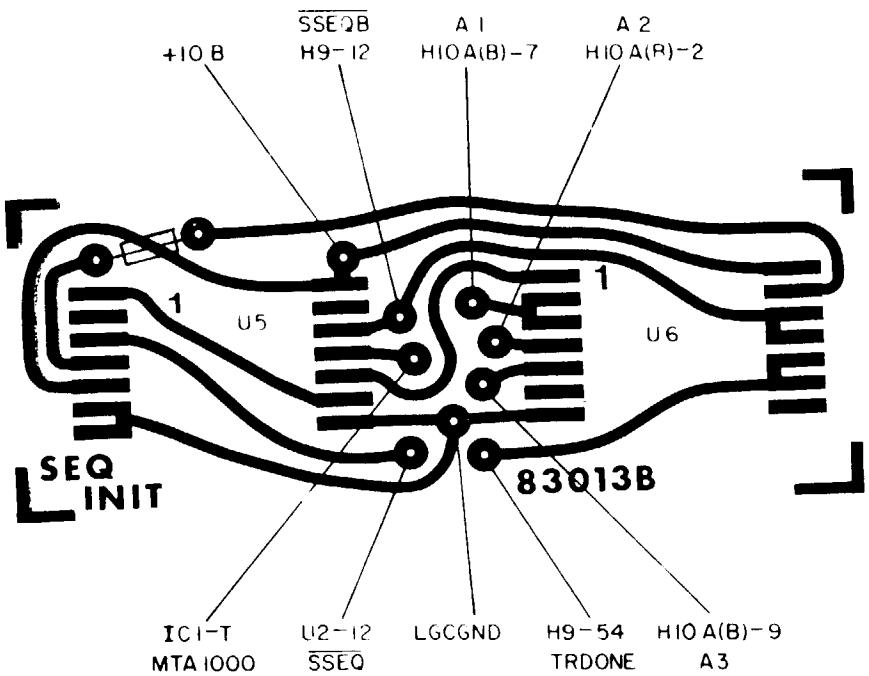
REFERENCE

1 ECN 10/18/83 (ALSO 9/2/83)
2 LAYOUT, B-E 7189

ENGINEER B BLOCK	DRAFTSMAN G WIGGINS 9/2/82	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR MICHIGAN	AUX. BOARD 1 LOGIC 2 GALILEO – NMS S/N 2	10/18/83
	B-E 6915A CONTROLLED	DATE

LAST USED R C D L

COMPONENT SIDE



NOTES:

1) .031" PC LAMINATE

2) CUT MAIN BOARD RUN BETWEEN U2-12 AND H9-12 AND RECONNECT EACH SIDE TO AUX. BD

3) REF ECN 10/18/83, B-E 6915 A

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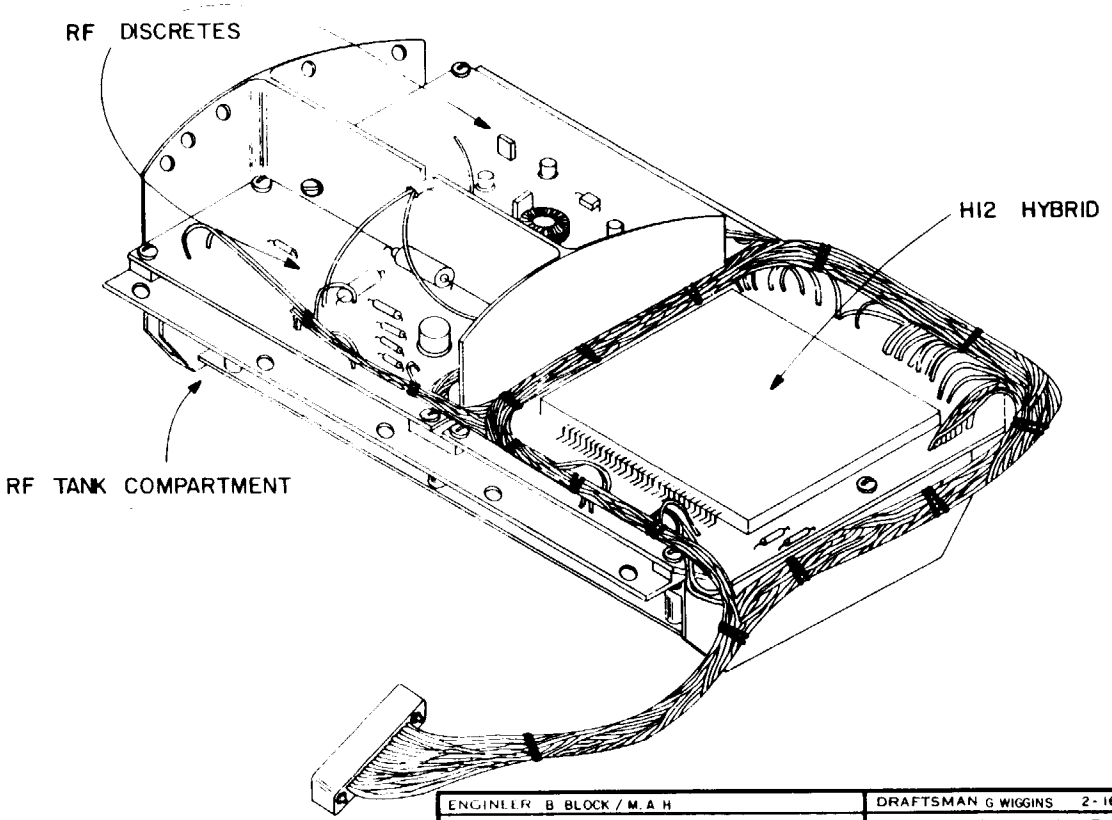
NOV 2 1 1983
PRINT

ENGINEER B BLOCK—M A H 10/18/83	DRAFTSMAN [illegible] 11/8/83	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR MICHIGAN	COMPONENT LAYOUT SEQ. INIT AUX. BD. LOGIC # 2 S/N 2	10/18/83
	B-E 7189 CONTROLLED	DATE

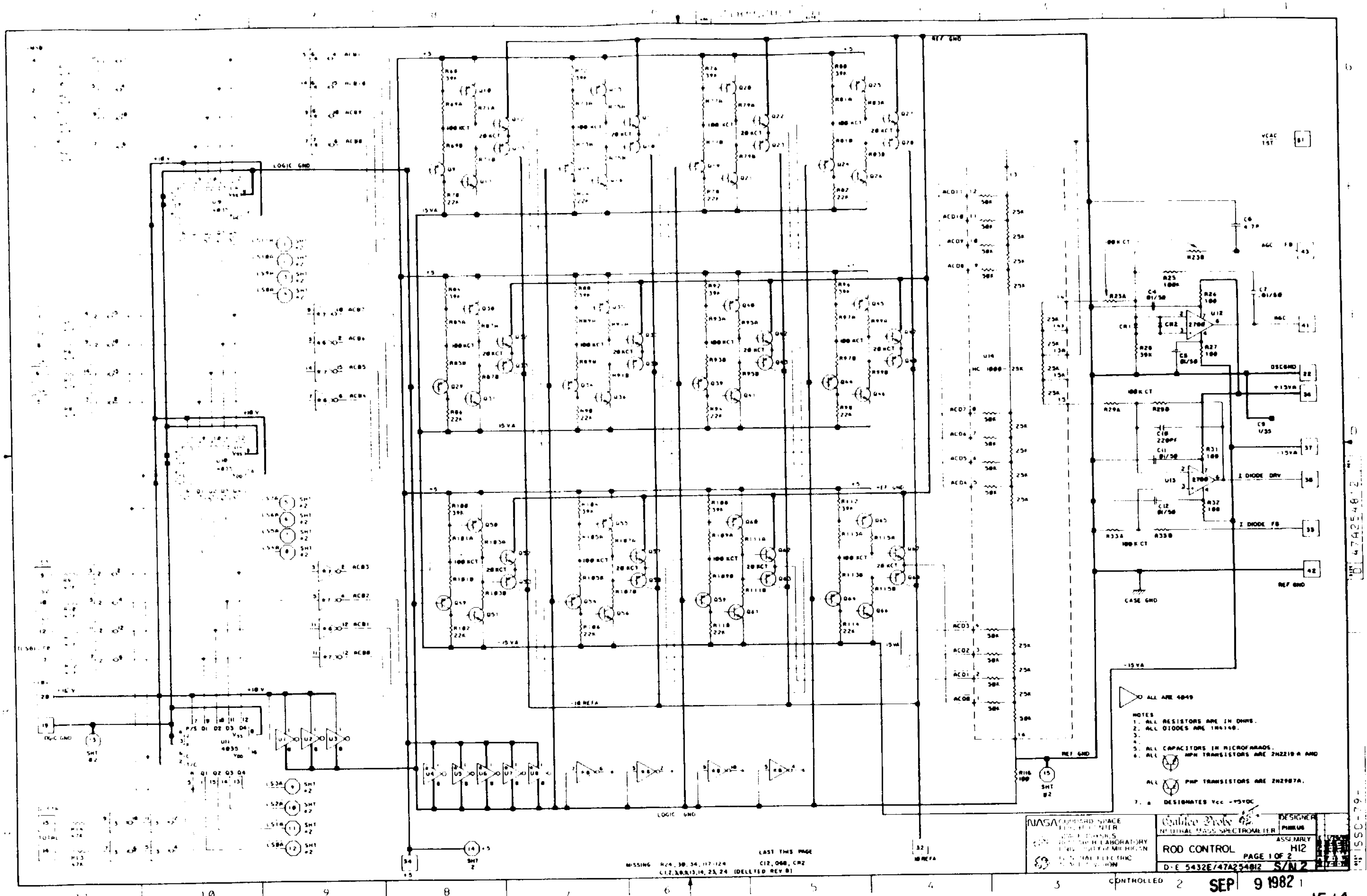
LAST USED R C D L



ENGINEER B BLOCK / M.A.H	DRAFTSMAN G WIGGINS 2-16-79	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR MICHIGAN	R.F. OSCILLATOR MODULE GNMS B-E5095	2-18-82 DATE

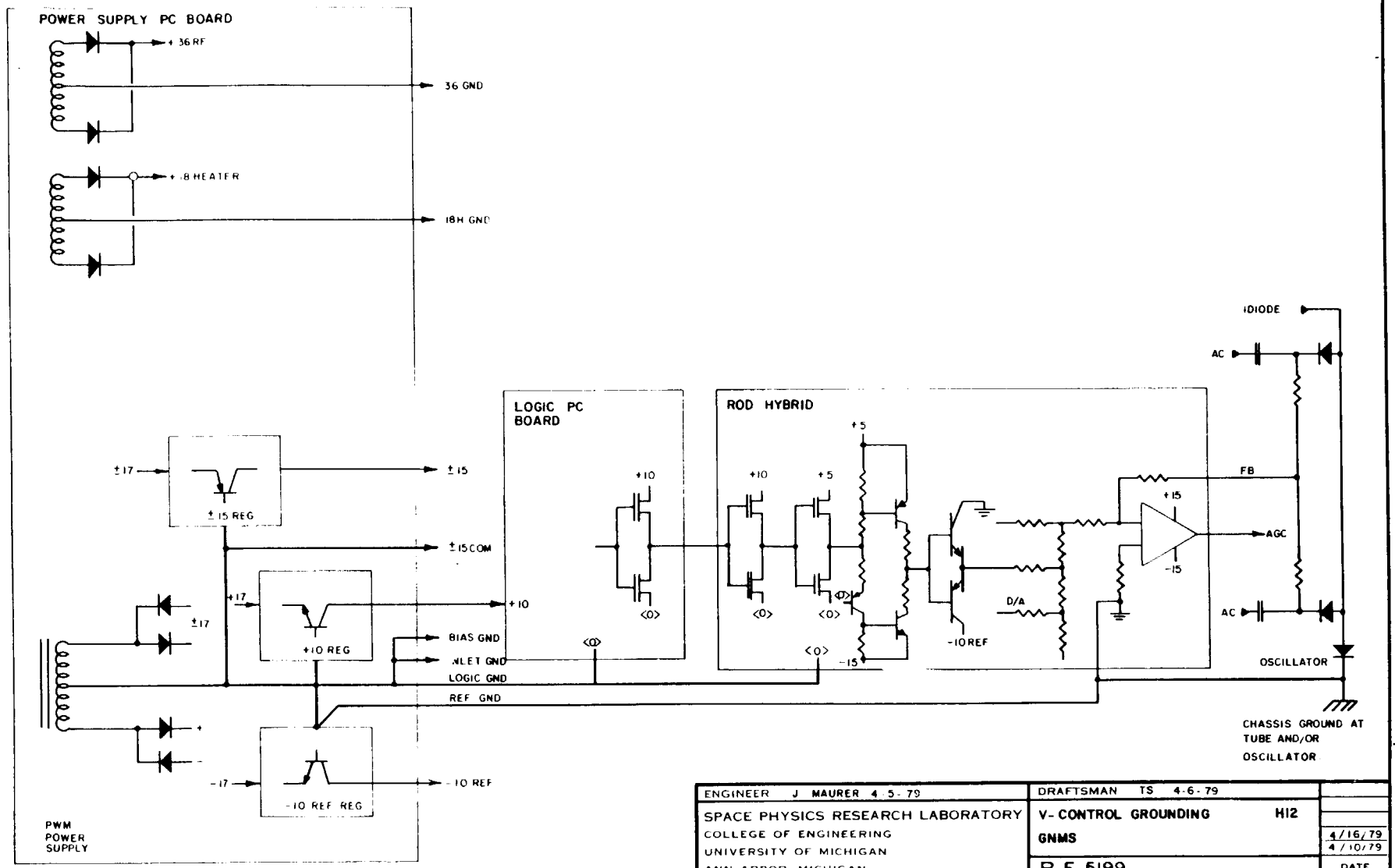
LAST USED R C D L

12.1


ALL ARE 4049
NOTES
1. ALL RESISTORS ARE IN OHMS.
2. ALL DIODES ARE 1N4148.
3.
4.
5. ALL CAPACITORS IN MICROFARADS.
6. ALL NPN TRANSISTORS ARE 2N2219 A AND
ALL PNP TRANSISTORS ARE 2N2907A.
7. DESIGNATES Vcc +5VDC
LAST THIS PAGE
C12, 068, CR2
MISSING
Galileo Probe
NEUTRAL MASS SPECTROMETER
DESIGNER
ASSEMBLY
H12
ROD CONTROL
PAGE 1 OF 2
D-E 5432E/47A254812
S/N 2
CONTROLLED
SEP 9 1982

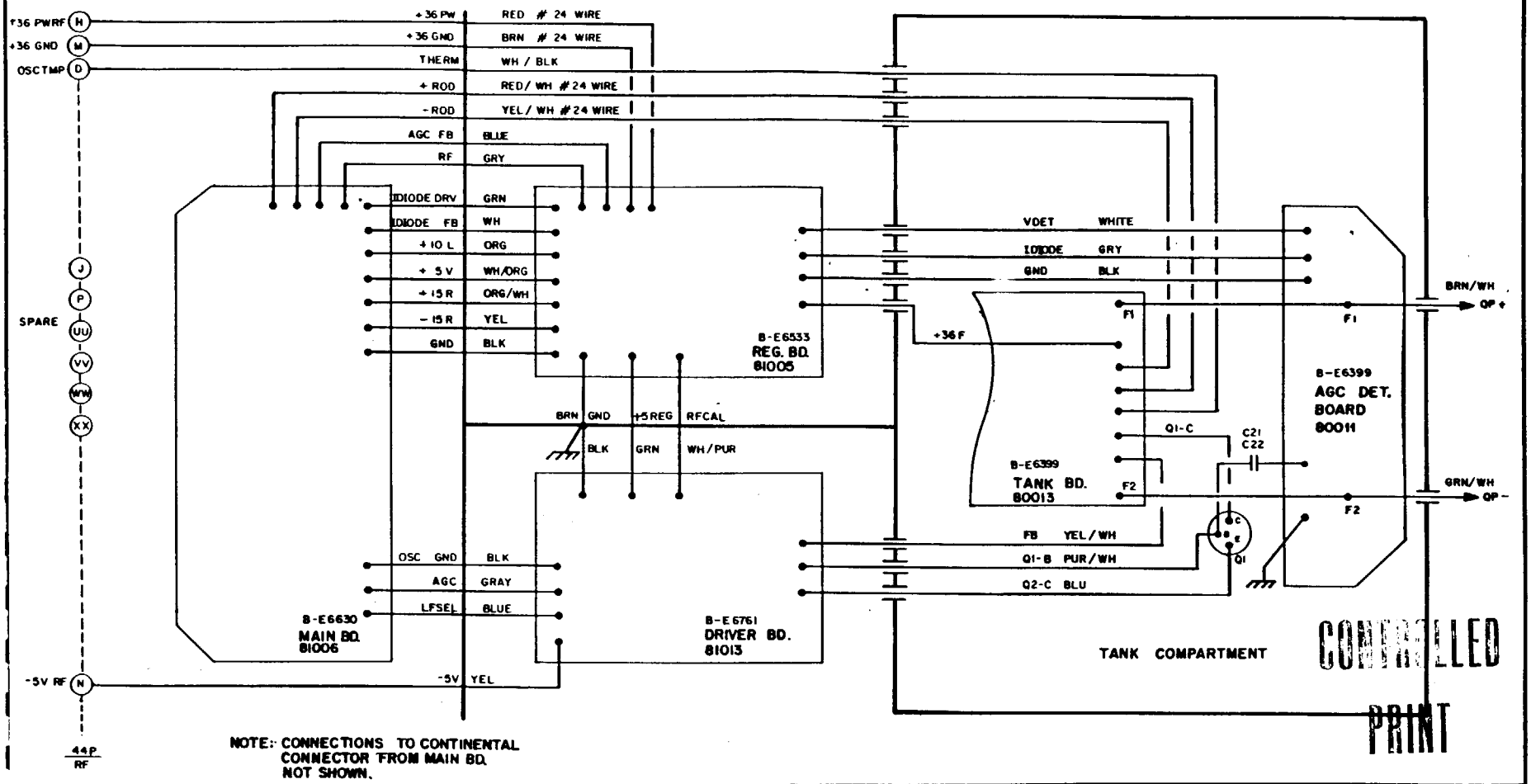
15.14

ROD CONTROL
SHEET 2 OF 2
SIZE
CONTROLLER 2



ENGINEER J MAURER 4-5-79	DRAFTSMAN TS 4-6-79	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	V-CONTROL GROUNDING H12 GNMS	4/16/79 4/10/79
	B-E 5199	DATE

LAST USED R C D L

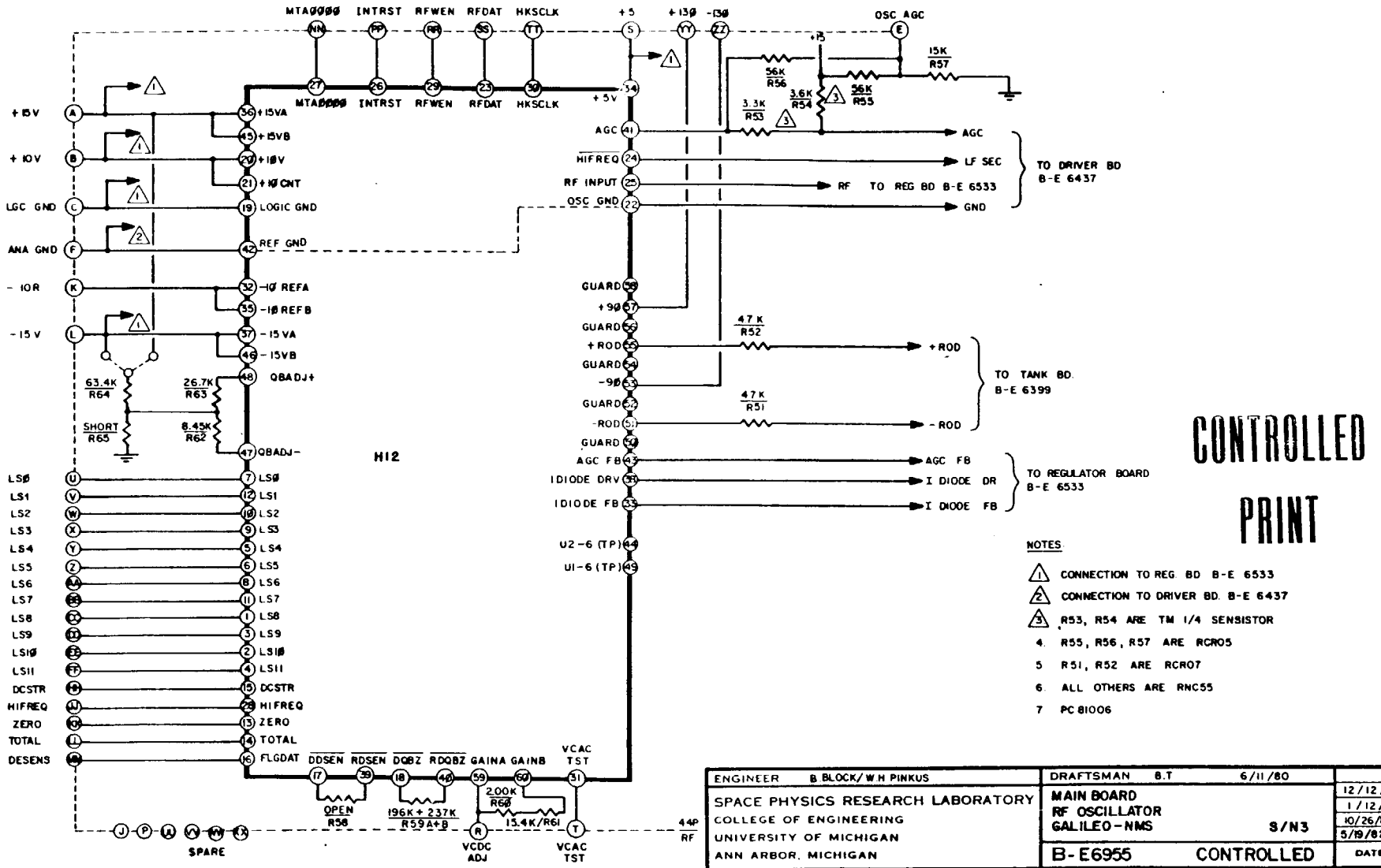


NOTE: CONNECTIONS TO CONTINENTAL CONNECTOR FROM MAIN BD. NOT SHOWN.

CONTROLLED PRINT

ENGINEER B. BLOCK	DRAFTSMAN MRN 6/3/81	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	INTERCONNECT PLAN RF OSCILLATOR GALILEO MMS	5/5/82 7/13/81 7/2/81
	B-E6625 CONTROLLED	DATE

LAST USED R C D L



CONTROLLED PRINT

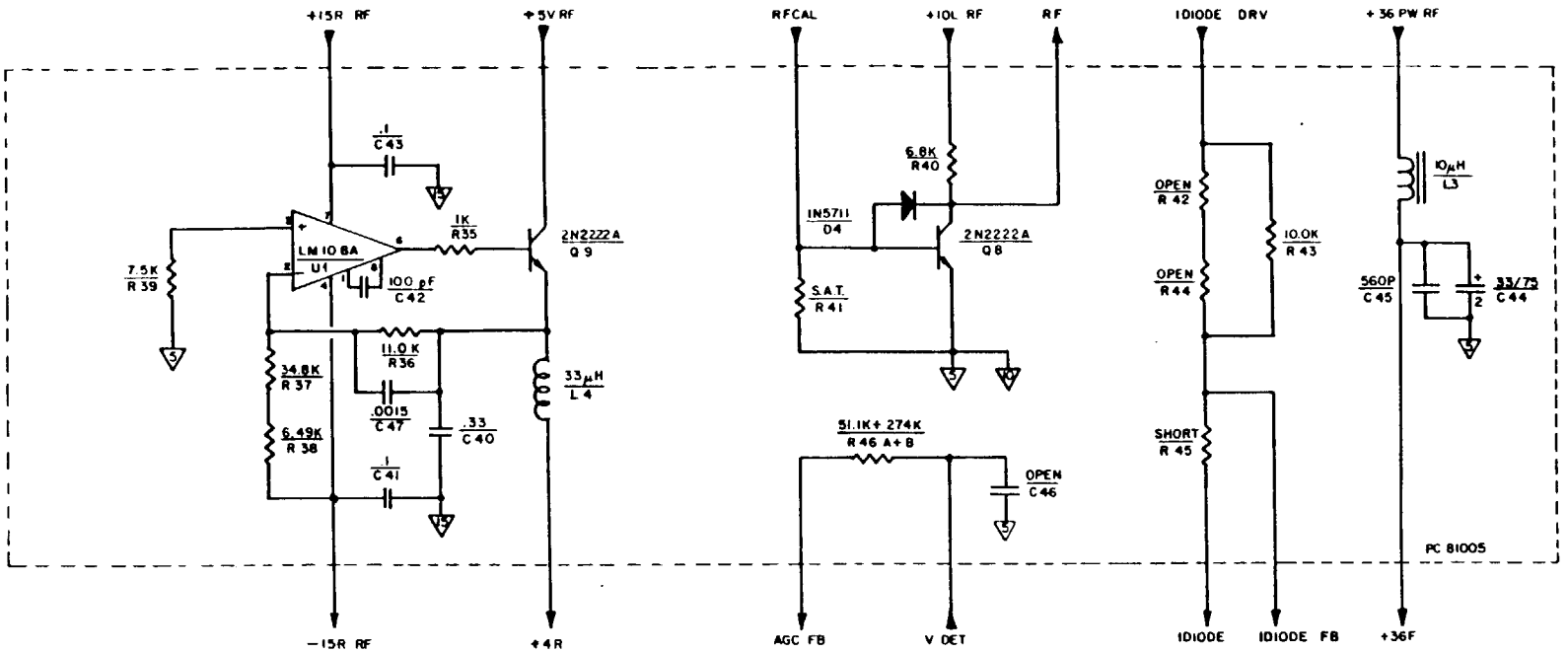
NOTES

1. CONNECTION TO REG. BD B-E 6533
2. CONNECTION TO DRIVER BD. B-E 6437
3. R53, R54 ARE TM 1/4 SENSISTOR
4. R55, R56, R57 ARE RCR05
5. R51, R52 ARE RCR07
6. ALL OTHERS ARE RNC55
7. PC 81006

ENGINEER B. BLOCK/W.H. PINKUS	DRAFTSMAN B.T 6/11/80		
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	MAIN BOARD RF OSCILLATOR GALILEO-NMS S/N3		12/12/86 1/12/86 10/26/82 5/19/82
	B-E6955	CONTROLLED	DATE

LAST USED R_{65}^{51} C D L

12.12



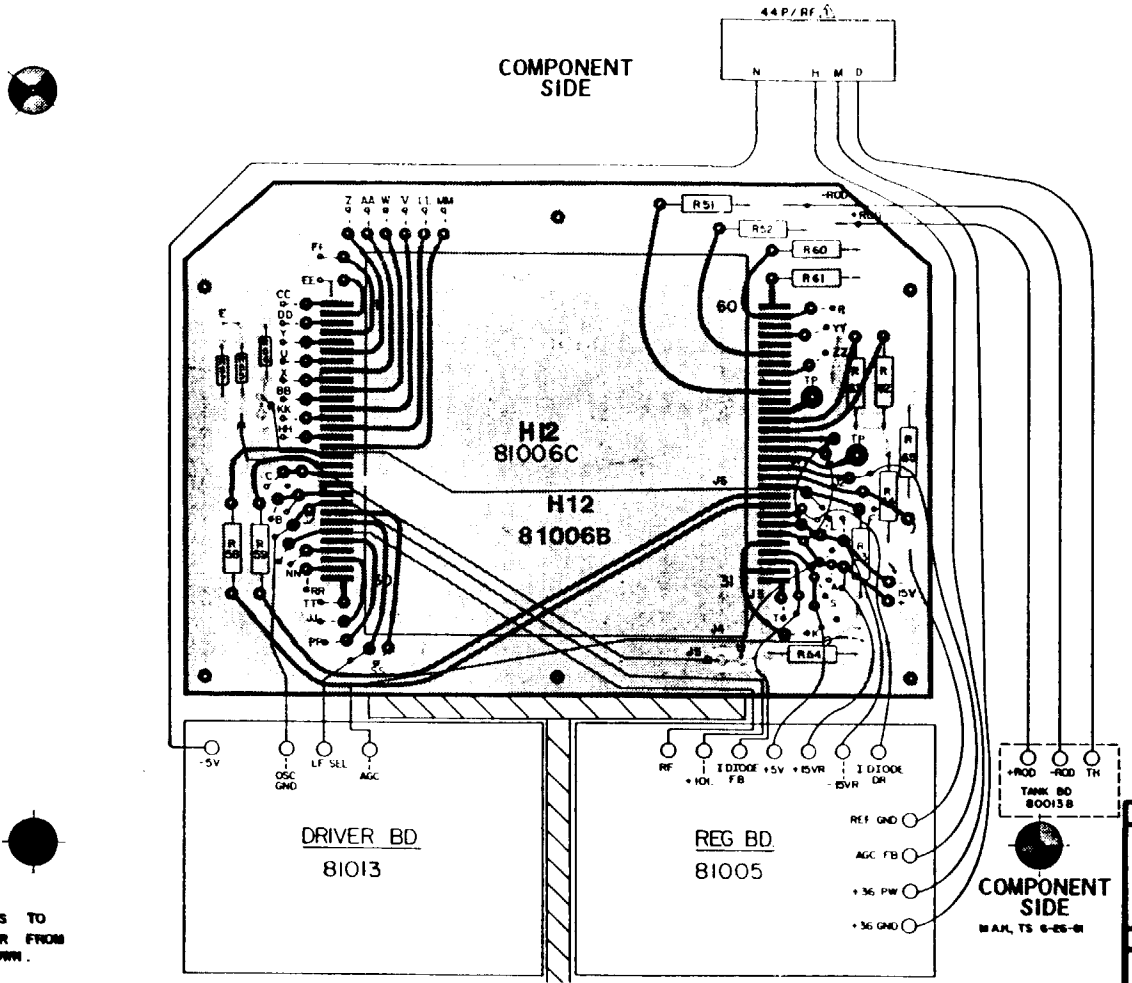
CONTROLLED

PRINT

ENGINEER B BLOCK	DRAFTSMAN D B J	12/12/86
SPACE PHYSICS RESEARCH LABORATORY	REGULATOR BOARD	3/21/84
COLLEGE OF ENGINEERING	RF OSCILLATOR	2/10/83
UNIVERSITY OF MICHIGAN	GALILEO NMS S/N 3	10/26/82
ANN ARBOR, MICHIGAN	B-E6950 CONTROLLED	5/19/82 DATE

LAST USED R 35/46 C 40/47 D L 3/4

12.15



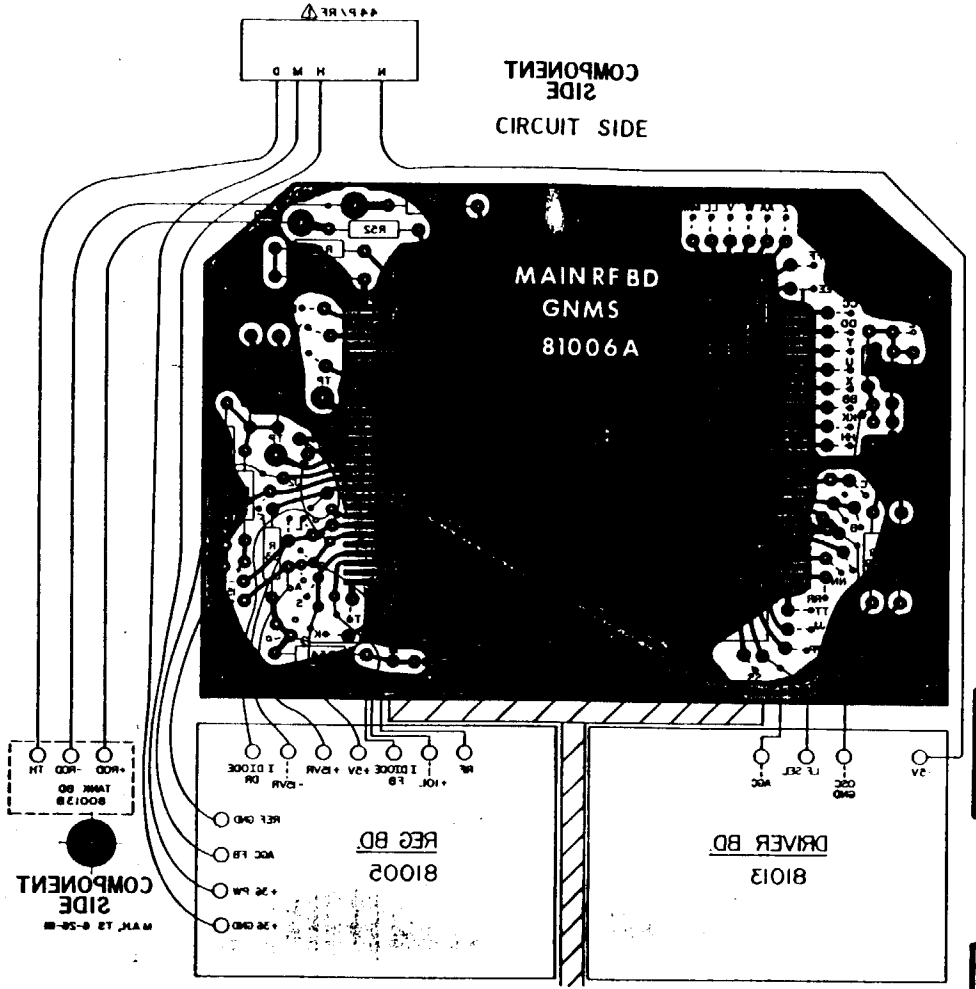
NOTE: ⚠ REMAINING CONNECTIONS TO CONTINENTAL CONNECTOR FROM MAIN BOARD NOT SHOWN.

CONTROLLED PRINT

ENGINEER B. BLOCK/M.A.H.	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	
DRAFTSMAN G.WIGGINS 5/19/82	
COMPONENT LAYOUT COMPOSITE MAIN RF BOARD GNMS	5/19/82
B-E6642A CONTROLLED	

LAST USED R C D L

12.16



NOTE: ⚠ REMAINING CONNECTIONS TO CONTINENTAL CONNECTOR FROM MAIN BOARD NOT SHOWN.

ENGINEER B. BLOCK / M.A.H.	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	CONTROLLED PRINT
DRAFTSMAN G WIGGINS 5/19/82	
LAYOUT COMPOSITE REVERSE MAIN RF BOARD GNMS	5/19/82
8-E6644A CONTROLLED	DATE

LAST USED R C D L

12-17

NOTES:

1. L7 & C34 OPTIONAL.
2. ◯ INDICATES SWAGE TERMINALS REQUIRED 5 PLS #2540 B4.
3. ⊛ INDICATES 4-40 INT STAR WASHERS SOLDER TO PCB SURFACE 4 PLS.
4. DRIVER BD. 81013
5. DRIVER AUX. BD. PAGE 12.18B

⚠6 +4R AND RF CAL WIRES DRESS TO REG BD

COMPONENT SIDE

COMPONENT SIDE

CIRCUIT SIDE

GND SOLDER LUG TO REG BD.

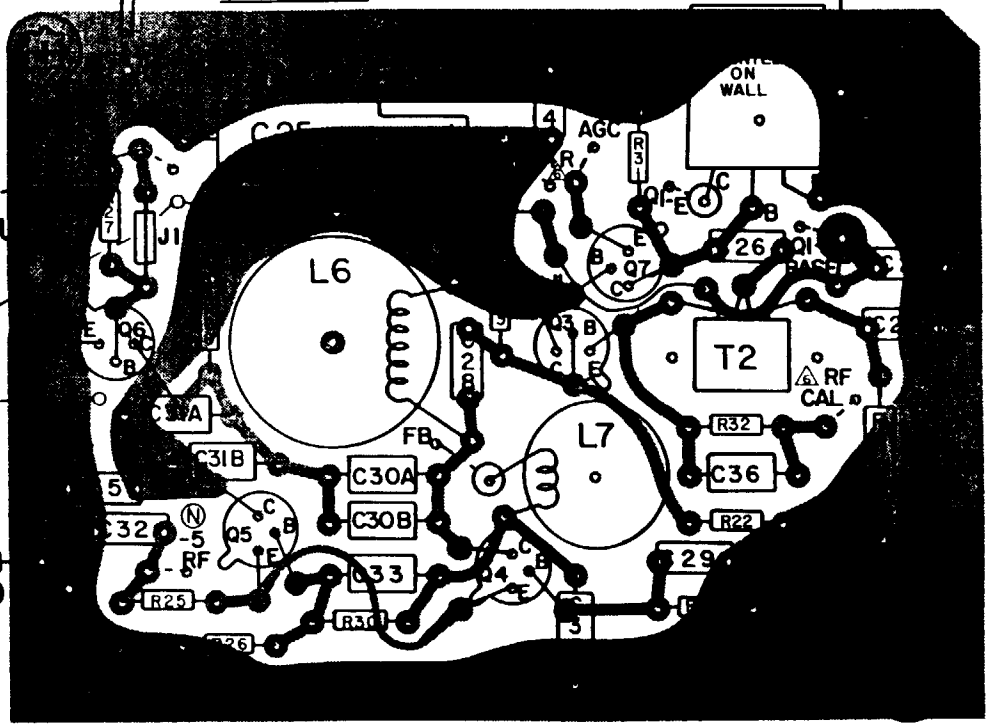
GND FROM AGC BD.

Q8-E
(TO DRV AU
WHT

+4R TO AUX BD GRN

GND TO AUX BD BLK

GND TO MN BD

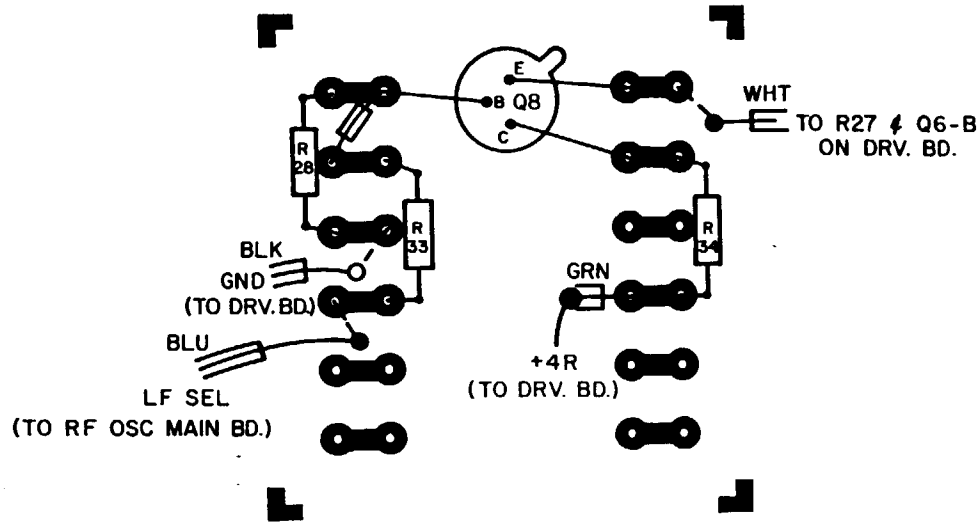


CONTROLLED PRINT

ENGINEER B. BLOCK / M A M.	DRAFTSMAN AGK	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR MICHIGAN	COMPONENT LAYOUT RF DRIVER BOARD 81013 GNMS P. 1 OF 2	12/20/63 9/19/62
	B-6766 CONTROLLED	DATE

12.18A

COMPONENT SIDE



NOTES:

1. ALL AUX. BD. WIRES CONNECT TO DRV. BD. EXCEPT LF SEL.
2. DRV. AUX. BD. .031" THICK.
3. PC #820128 MODIFIED

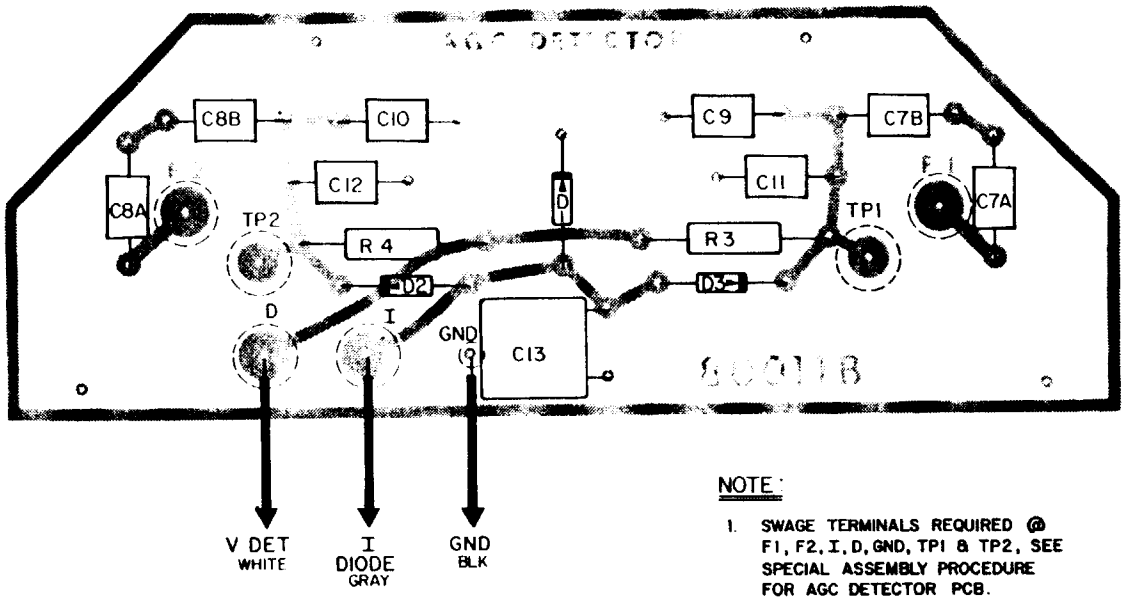
CONTROLLED PRINT

ENGINEER B. BLOCK / M.A.H.	DRAFTSMAN MK 2/9/84	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	COMPONENT LAYOUT RF OSC DRV. AUX. BD. GNMS P. 2 OF 2	12/20/83 DATE
	B-E7227 CONTROLLED	

LAST USED R C D L

12.18B

COMPONENT SIDE



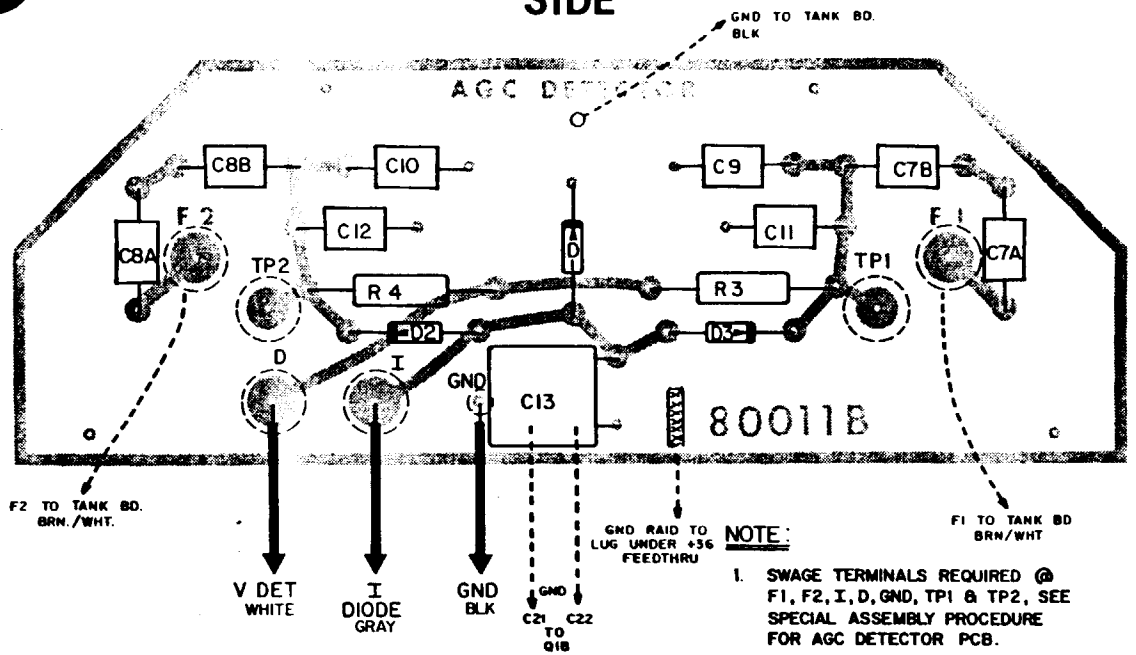
NOTE:

1. SWAGE TERMINALS REQUIRED @ F1, F2, I, D, GND, TP1 & TP2, SEE SPECIAL ASSEMBLY PROCEDURE FOR AGC DETECTOR PCB.
2. ◯ INDICATES SWAGE TERMINALS.

AGC DETECTOR
R.F. OSCILLATOR
GALILEO N.M.S.
M.A.H., G.A.W. 7/12/81

ENGINEER B.BLOCK, M.A.H.	DRAFTSMAN MN 7/29/81	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	COMPONENT LAYOUT COMPOSITE AGC DETECTOR BD 800118 GNMS	5/19/82
	B-E6663 CONTROLLED	DATE

COMPONENT SIDE



NOTE:

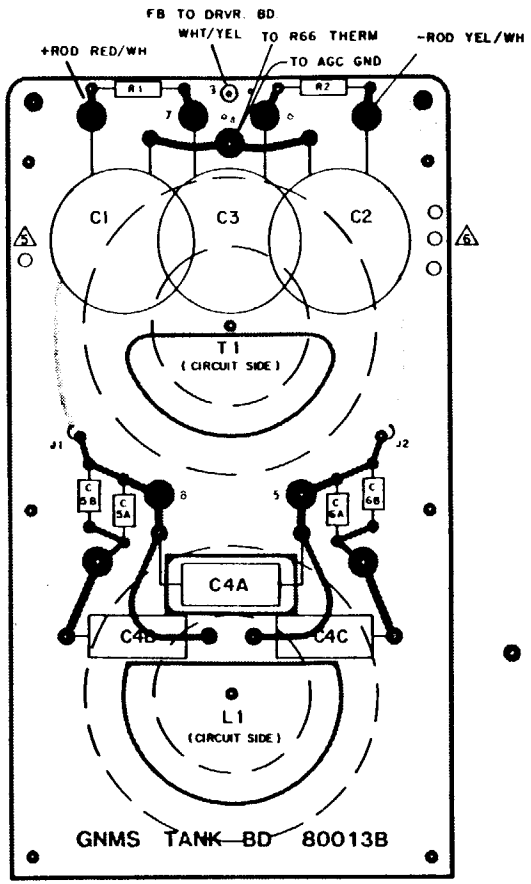
1. SWAGE TERMINALS REQUIRED @ F1, F2, I, D, GND, TP1 & TP2, SEE SPECIAL ASSEMBLY PROCEDURE FOR AGC DETECTOR PCB.
2. ◯ INDICATES SWAGE TERMINALS:
   2540-84 (#49 DRILL) 5PLS
   2021-84 (1/16 DRILL) 2 PLS

AGC DETECTOR
R.F. OSCILLATOR
GALILEO N.M.S.
M.A.H., G.A.W. 7/12/81

CONTROLLED PRINT

ENGINEER B BLOCK, M.A.H.	DRAFTSMAN MN 7/29/81	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	COMPONENT LAYOUT AGC DETECTOR BD 800118 GNMS	5/19/82
	B-E6664 CONTROLLED	DATE

COMPONENT SIDE



NOTE:

1. ○ INDICATES SWAGE TERMINALS 12 LOCATIONS. F1 & F2 USE TYPE #2540-84 (INSTALL ON 80013 A SIDE) ALL OTHERS USE #2021-84 (INSTALL ON 80013 B SIDE)
2. T1 & L1 LOCATED ON CIRCUIT SIDE
3. C4B, C4C, C5B & C6B OPTIONAL
4. TANK BD80013 RF OSC

△5 ROUTE FB WIRE THRU CLEARANCE HOLE

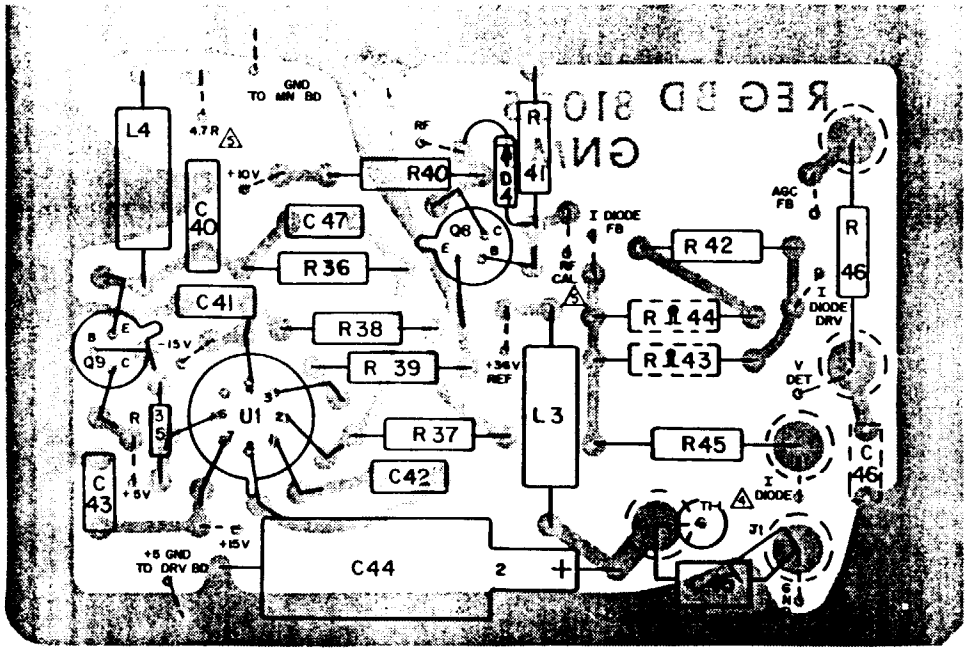
M.A.H.-T.S.
8-3-81

△6 ROUTE ± ROD AND WIRE TO R66 THRU CLEARANCE HOLES

CONTROLLED PRINT

ENGINEER B.BLOCK, M.A.H	DRAFTSMAN MH 8/11/81	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	COMPONENT LAYOUT COMPOSITE TANK BD 80013 GNMS	5/19/82
	B-E6670 CONTROLLED	DATE

COMPONENT 81005 SIDE



CONTROLLED PRINT

NOTE:

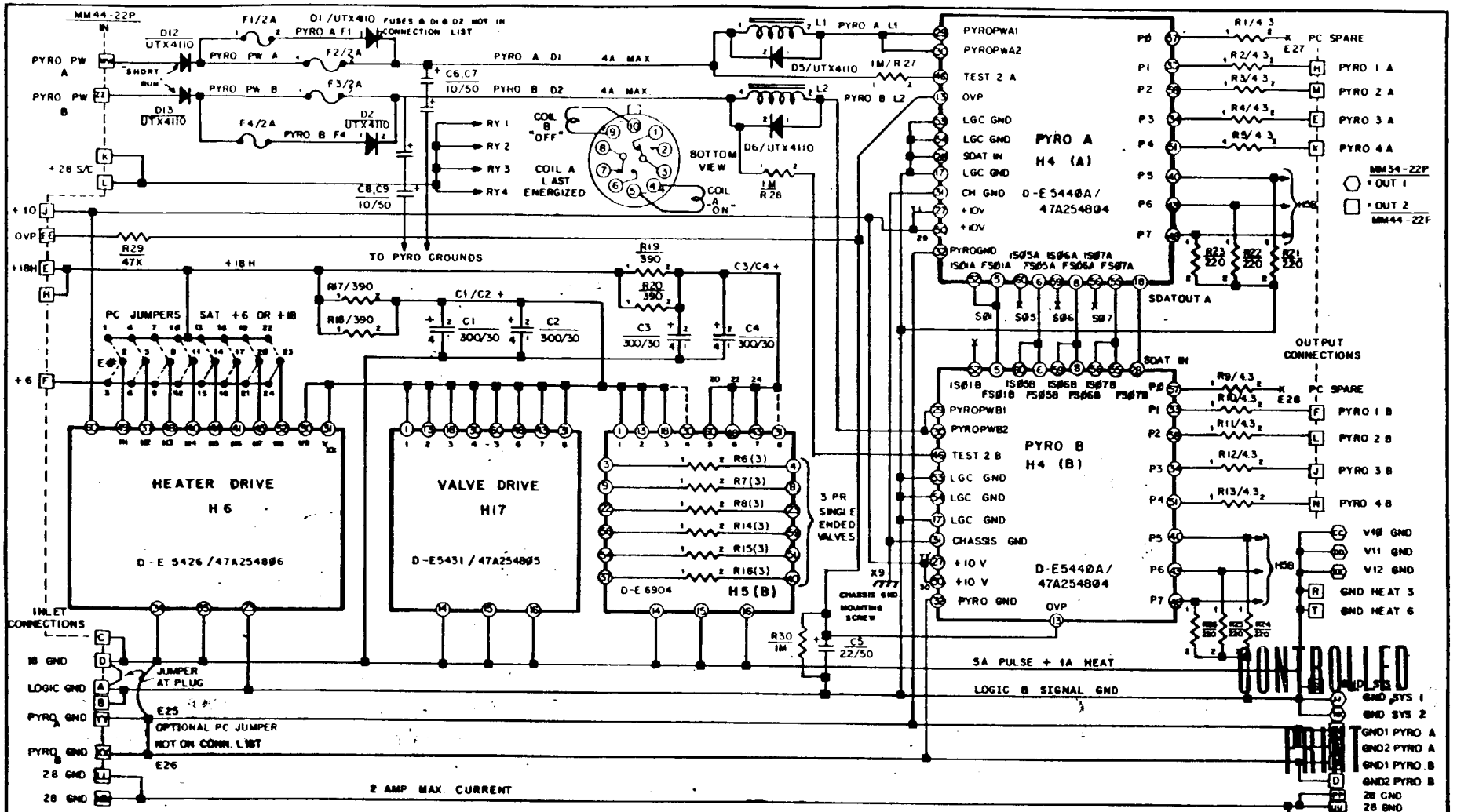
6-26-84 M.A.H., DR.

1. INDICATES SWAGE TERMINALS #25408-4 5 LOCATIONS.
2. R32-33 THERMISTOR OPTION.
3. J1 & C31 OPTIONS.

4 FEED THRU CLEARANCE HOLE +36F TO TANK

5 RF CAL & 47R WIRES ROUTE TO DRWER BD.

ENGINEER B BLOCK , M A H	DRAFTSMAN TS 7/7/81	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	COMPONENT LAYOUT REGULATOR BOARD 81005 GNMS	2/10/83 8/19/82
	B-E 6649 CONTROLLED	DATE



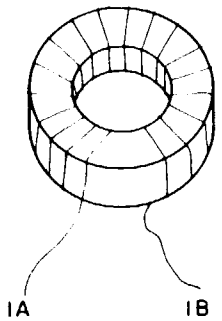
1) REFER TO INLET CONNECTION LIST FOR ALL POINT-TO-POINT RUNS. E 5803 & E 5804
2) THIS DRAWING DUPLICATES A PART OF INLET CONNECTION LIST.
THIS DRAWING SHOWS:
A. ALL POWER & GROUNDS
B. ALL RUNS TO DISCRETE PARTS.
C. H4A & H4B INTERCONNECTS.
3) R6, R7, R8, R14, R15, R16 + 4.3 WOULD BE USED IF H58 OPTIONALLY NOT USED.
4) THIS DRAWING REPLACES E5508A.
5) D7-D11 NOT SHOWN (1N4148)
6) L1, L2 ARE 75T # 28 ON A38759-2 CORE

D3 & D4 NOT USED

LAST USED R28 C4 D11 F4 L2

ENGINEER J MAURER	DRAFTSMAN MSG/B.T 10/6/80	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	INLET PC BOARD CONNECTIONS GNMS PAGE 1 OF 2 S/N 3	12/2/85 3/10/83 10/26/82 6/1/82
	B-E6949 CONTROLLED	DATE

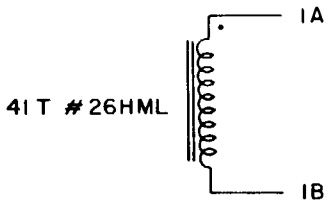
INDUCTOR L6



CORE: ARNOLD
FE - 0500 - 0601

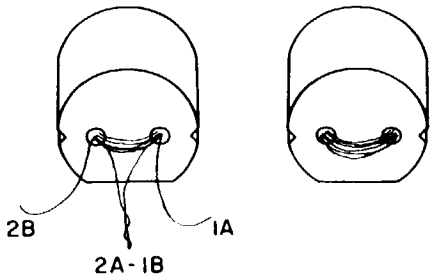
TYPE: TOROID,
POWDERED IRON

$\mu_0 = 8.5$



$L_T = 7.8\,\mu H$

TRANSFORMER T2



CORE: FAIR - RITE
2843000902

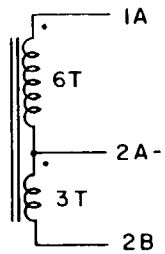
TYPE: 2 - HOLE BALUN,
FERRITE

$\mu_0 = 950$

PRIMARY = 9T #34HML

SECONDARY = 3T #34HML

TURNS RATIO = 3:1



$L_P = 160\,\mu H$

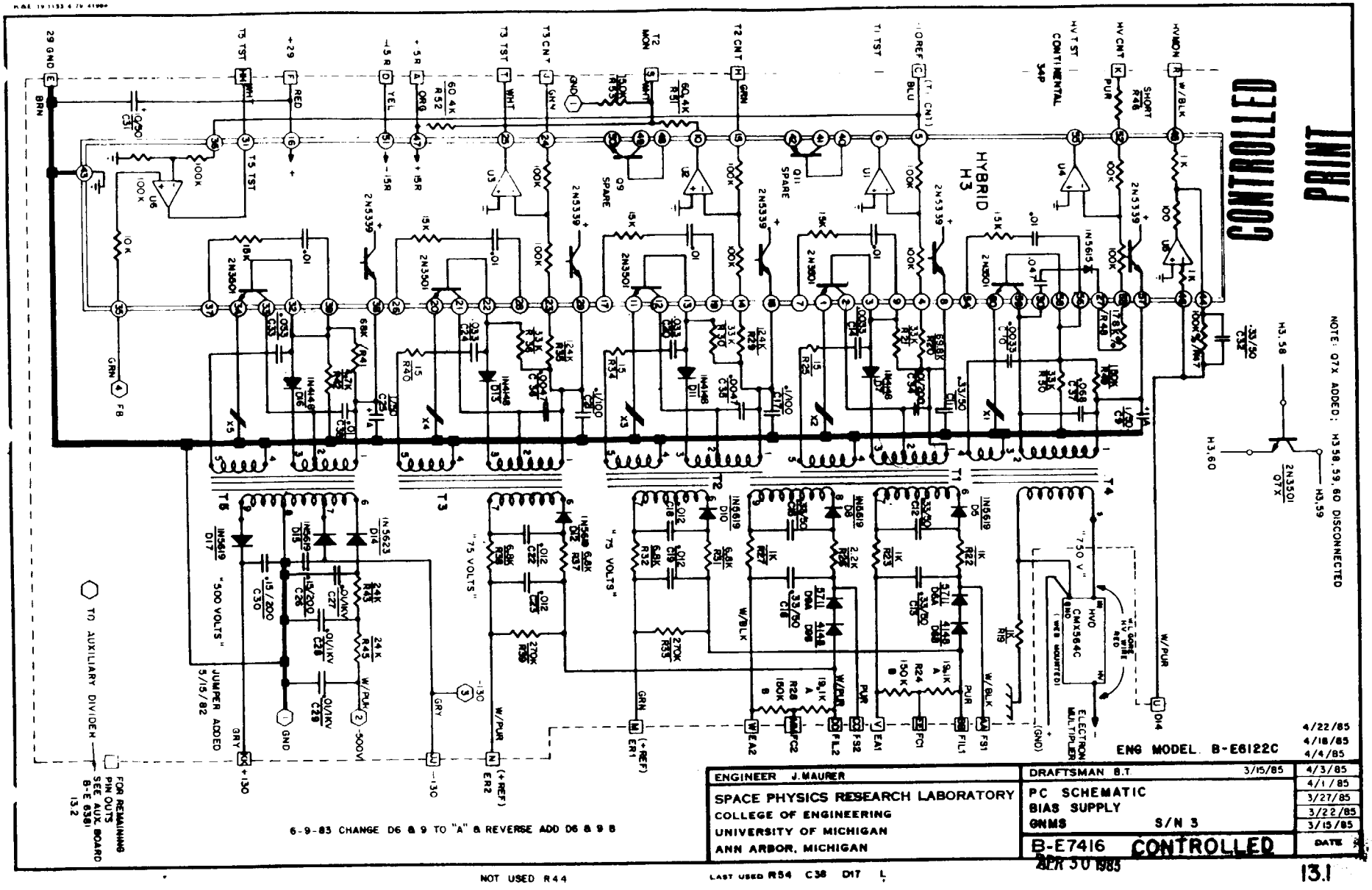
$L_S = 17.2\,\mu H$

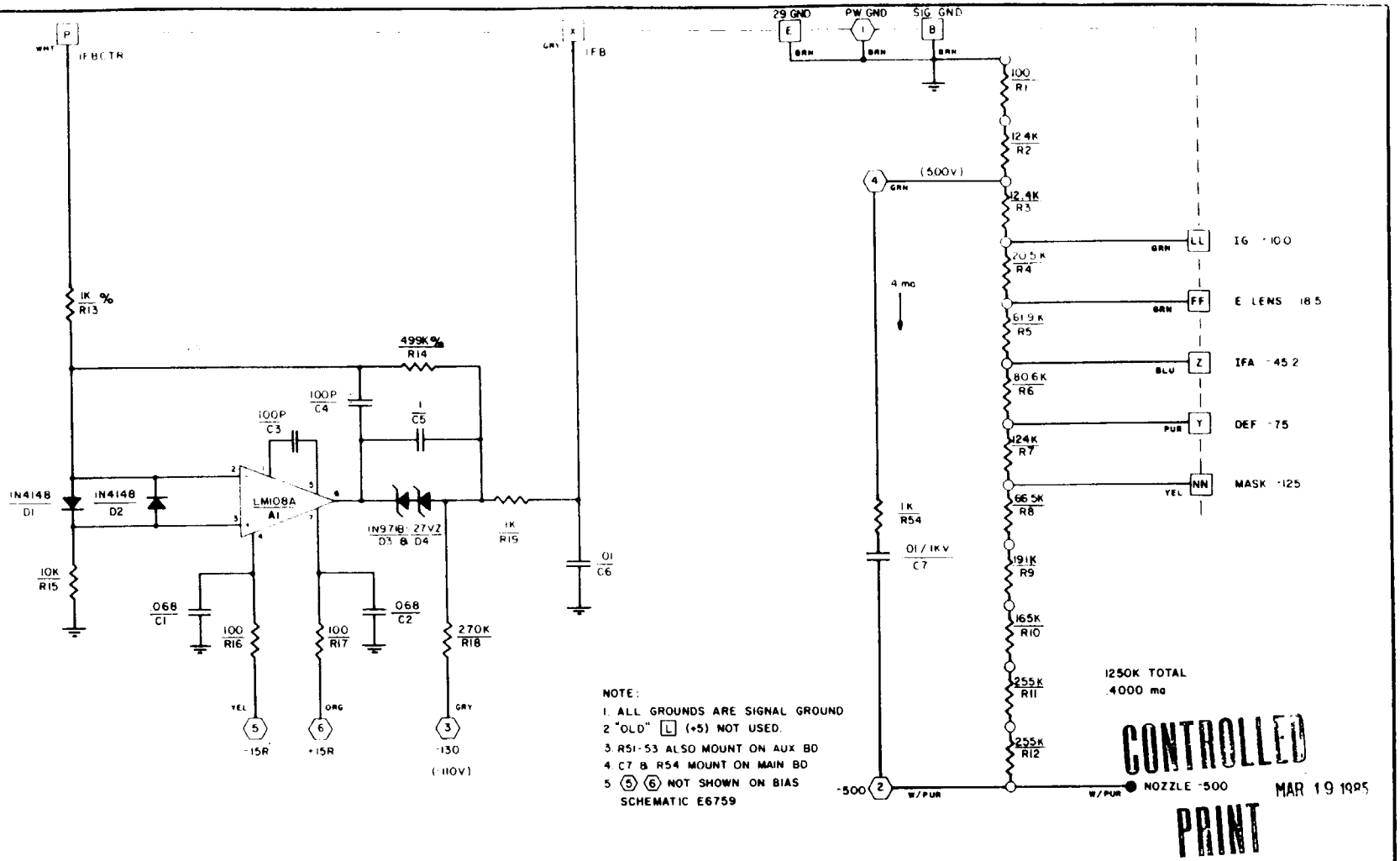
K = 0.99

ENGINEER B BLOCK	DRAFTSMAN N.D.	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	L6, T2 DETAIL RF DRIVER GNMS RF OSC.	5/19/82
	B-E6856 CONTROLLED	DATE

LAST USED R C D L

12.24


CONTROLLED PRINT
HYBRID H3
ENG MODEL B-E6122C
ENGINEER J.MAURER
DRAFTSMAN B.T. 3/15/85
SPACE PHYSICS RESEARCH LABORATORY
COLLEGE OF ENGINEERING
UNIVERSITY OF MICHIGAN
ANN ARBOR, MICHIGAN
PC SCHEMATIC
BIAS SUPPLY
GNMS S/N 3
B-E7416
4/22/85
4/18/85
4/4/85
4/3/85
4/1/85
3/27/85
3/22/85
3/15/85
DATE
6-9-83 CHANGE D6 & 9 TO "A" & REVERSE ADD D6 & 9 B
NOT USED R44
LAST USED R54 C38 D17 L
13.1

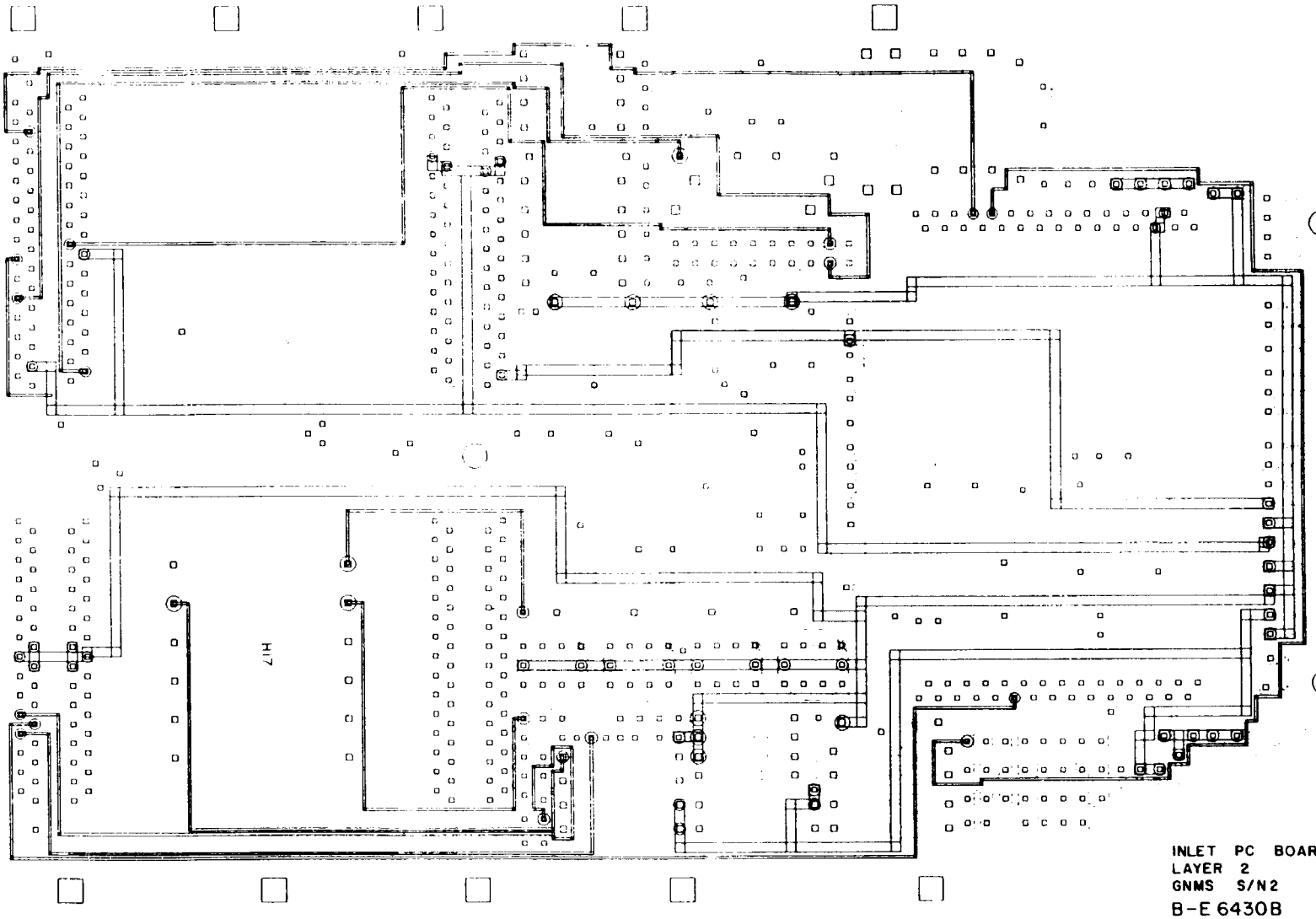


NOTE:
1. ALL GROUNDS ARE SIGNAL GROUND
2. "OLD" [L] (+5) NOT USED.
3. R51-53 ALSO MOUNT ON AUX BD
4. C7 & R54 MOUNT ON MAIN BD
5. (5) (6) NOT SHOWN ON BIAS SCHEMATIC E6759

CONTROLLED PRINT MAR 19 1985

ENGINEER J. MAURER	DRAFTSMAN EL 3/15/85	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	AUXILIARY DIVIDER BOARD BIAS SUPPLY GNMS S/N 3	
	B-E7415 CONTROLLED	DATE

LAST USED R54 C7 D4 L



DA

CONTROLLE

PRINT

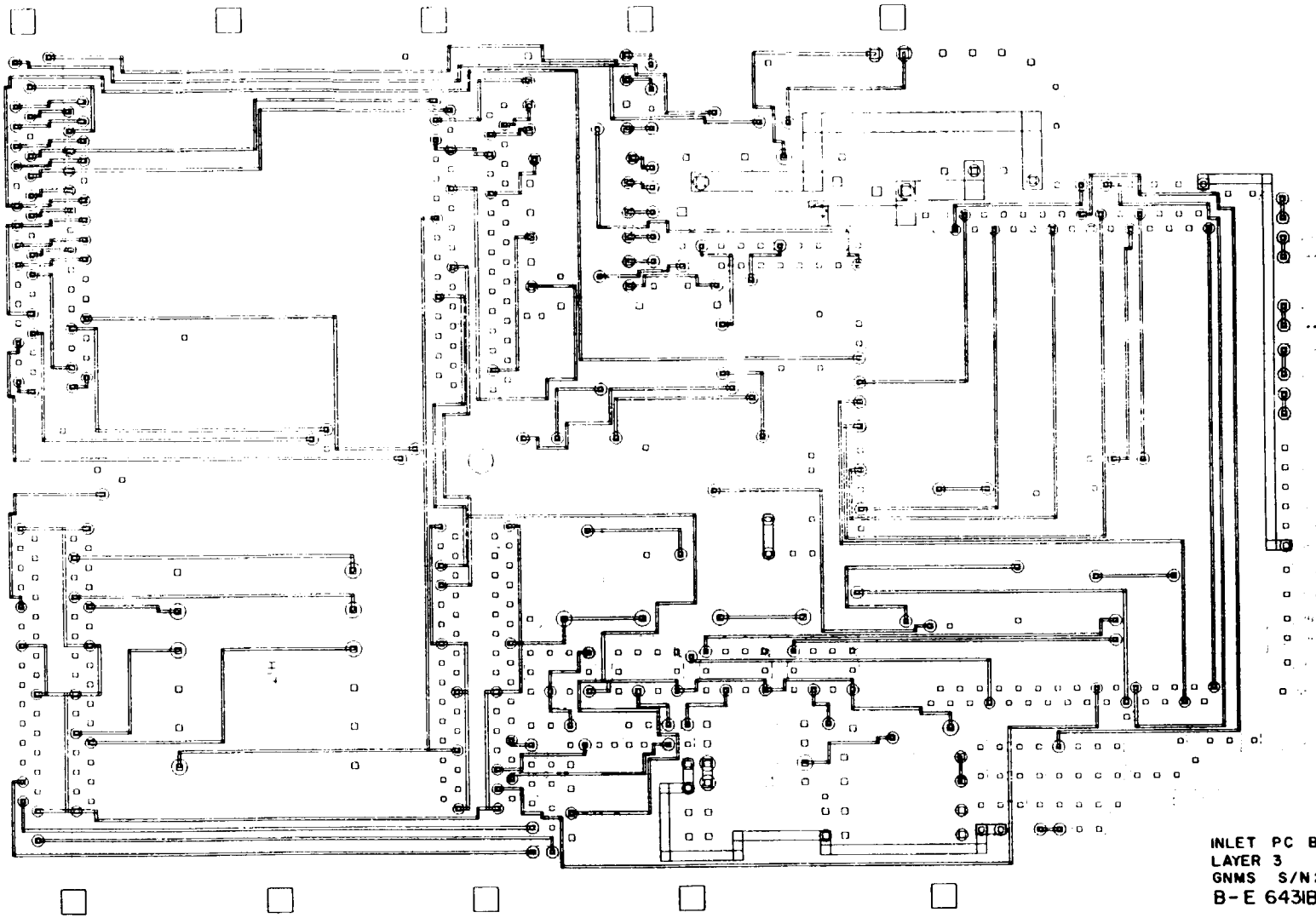
D229390PCREVB
[APWBD,UMICH]
12-10-81

INLET PC BOARD
LAYER 2
GNMS S/N2
B-E 6430B

10.22

MAR 24 1983

3/10/83



EA

CONTROLLE

PRINT

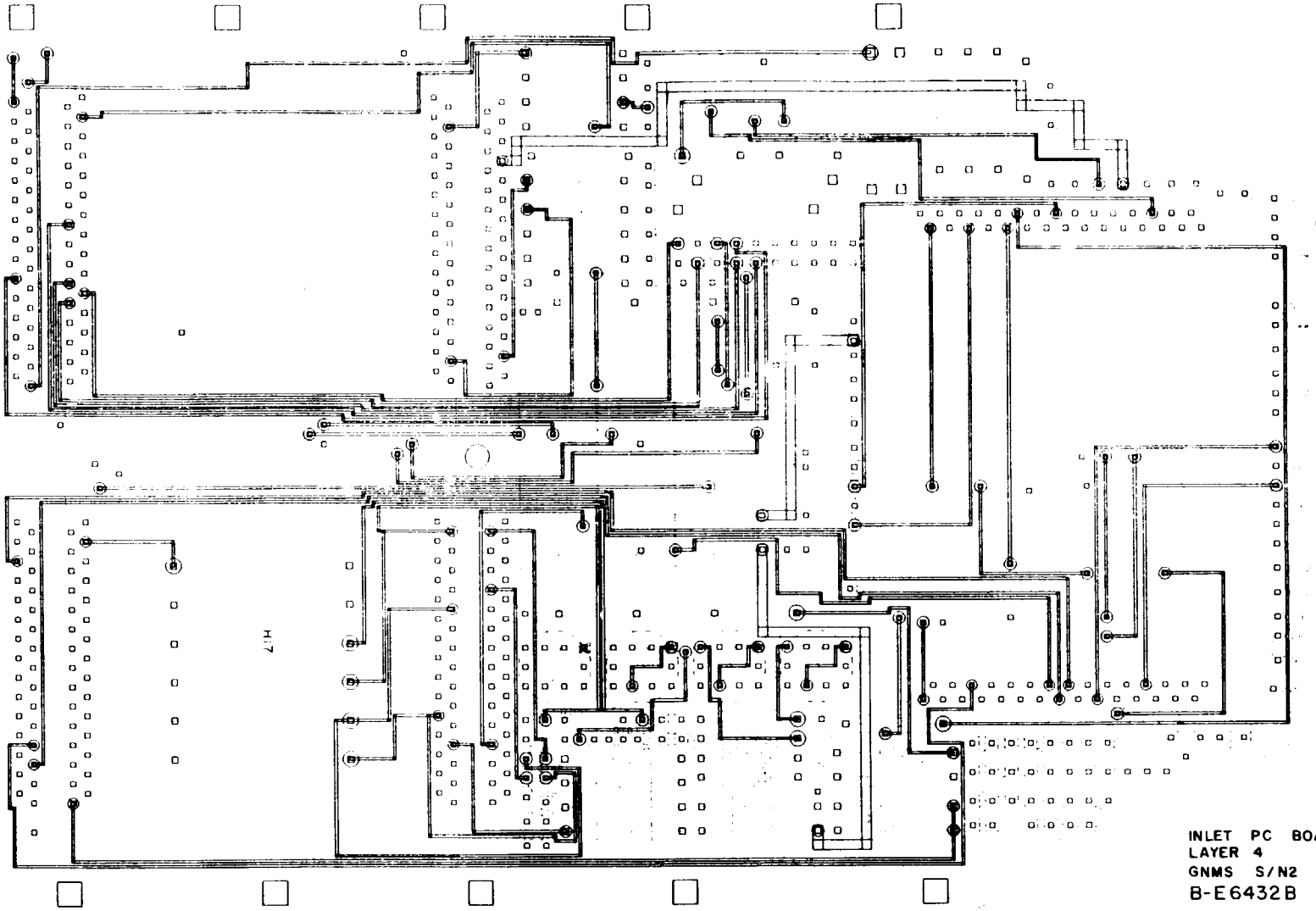
D229390PCREVB
[APWBD,UMICH]
12-10-81

INLET PC BOARD
LAYER 3
GNMS S/N2
B-E 6431B

MAR 24 1983

10.23

3/10/83



FA

CONTROLLER

PRINT

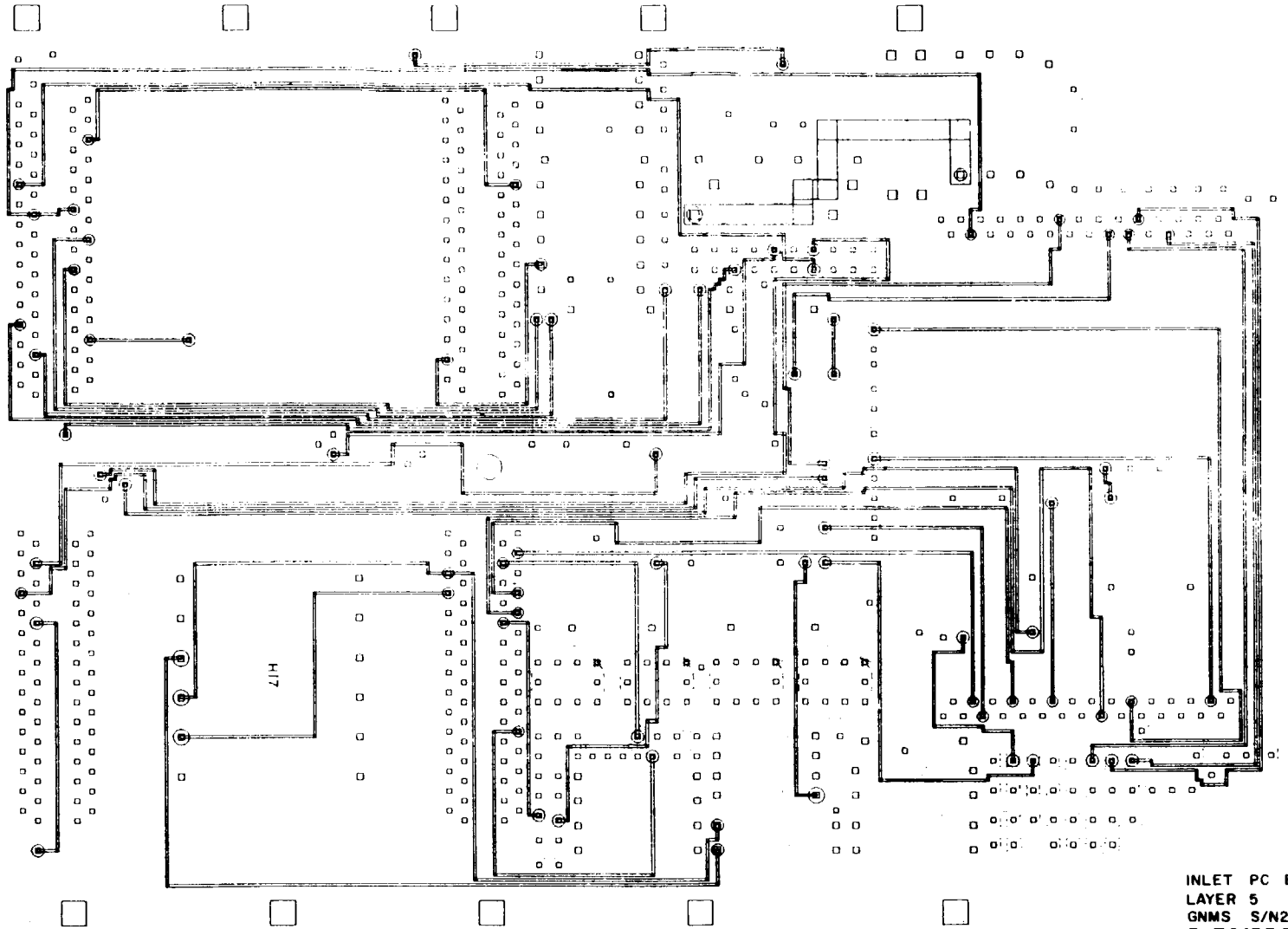
D229390PCREVB
(APWBD.UMICH)
12-10-81

INLET PC BOARD
LAYER 4
GNMS S/N2
B-E6432B

10.24

MAR 24 1983

3/10/83



HB

CONTROLLER

PRINT

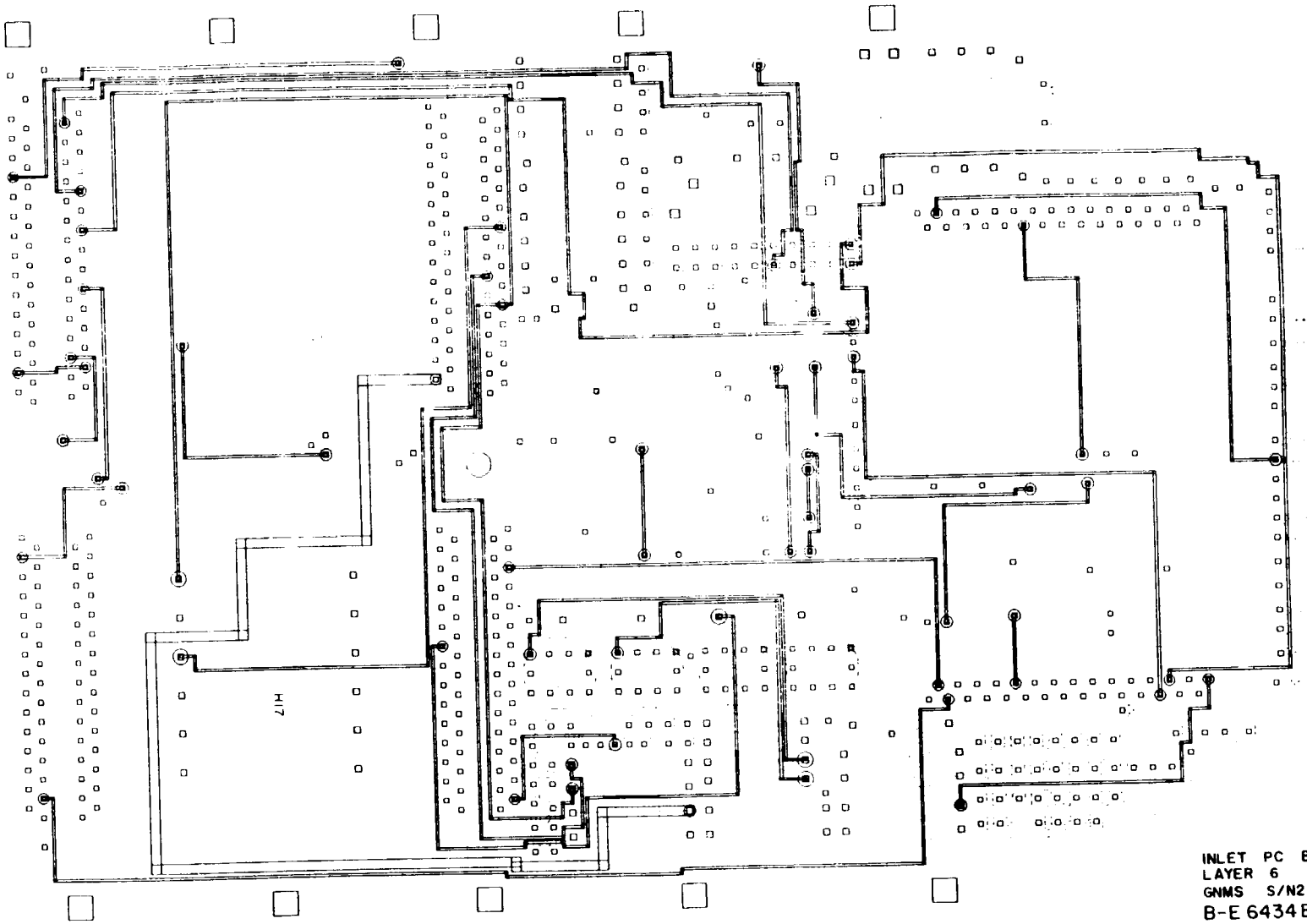
D229390PCREVB
[APWBD,UMICH]
12-10-81

INLET PC BOARD
LAYER 5
GNMS S/N2
B-E6433B

10.25

3/10/83

MAR 24 1983



JA

CONTROLLED

PRINT

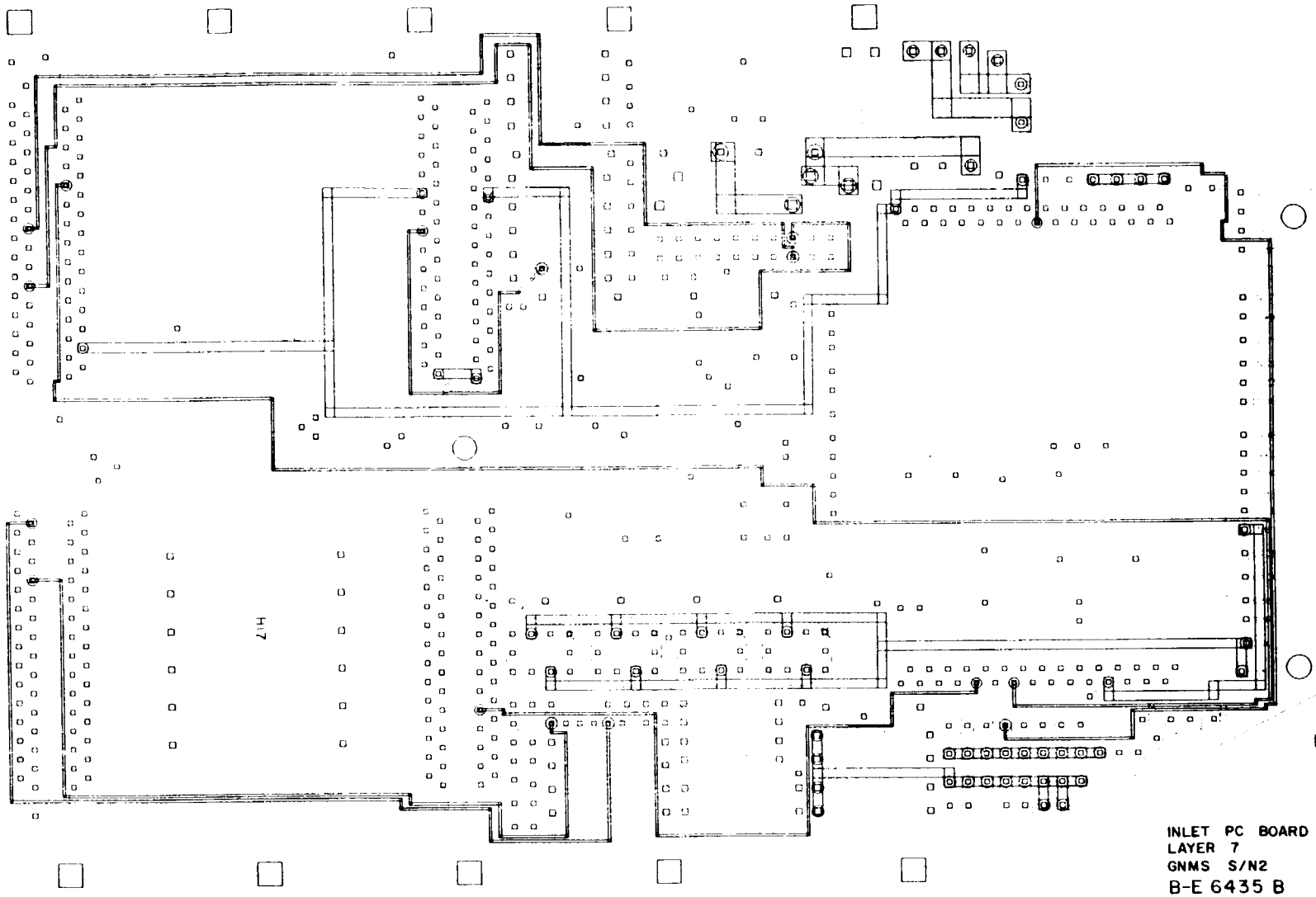
D229390PCREVB
[APWBD.UMICH]
12-10-81

INLET PC BOARD
LAYER 6
GNMS S/N2
B-E 6434B

10.26

MAR 24 1983

3/10/83



CONTROLLED
PRINT

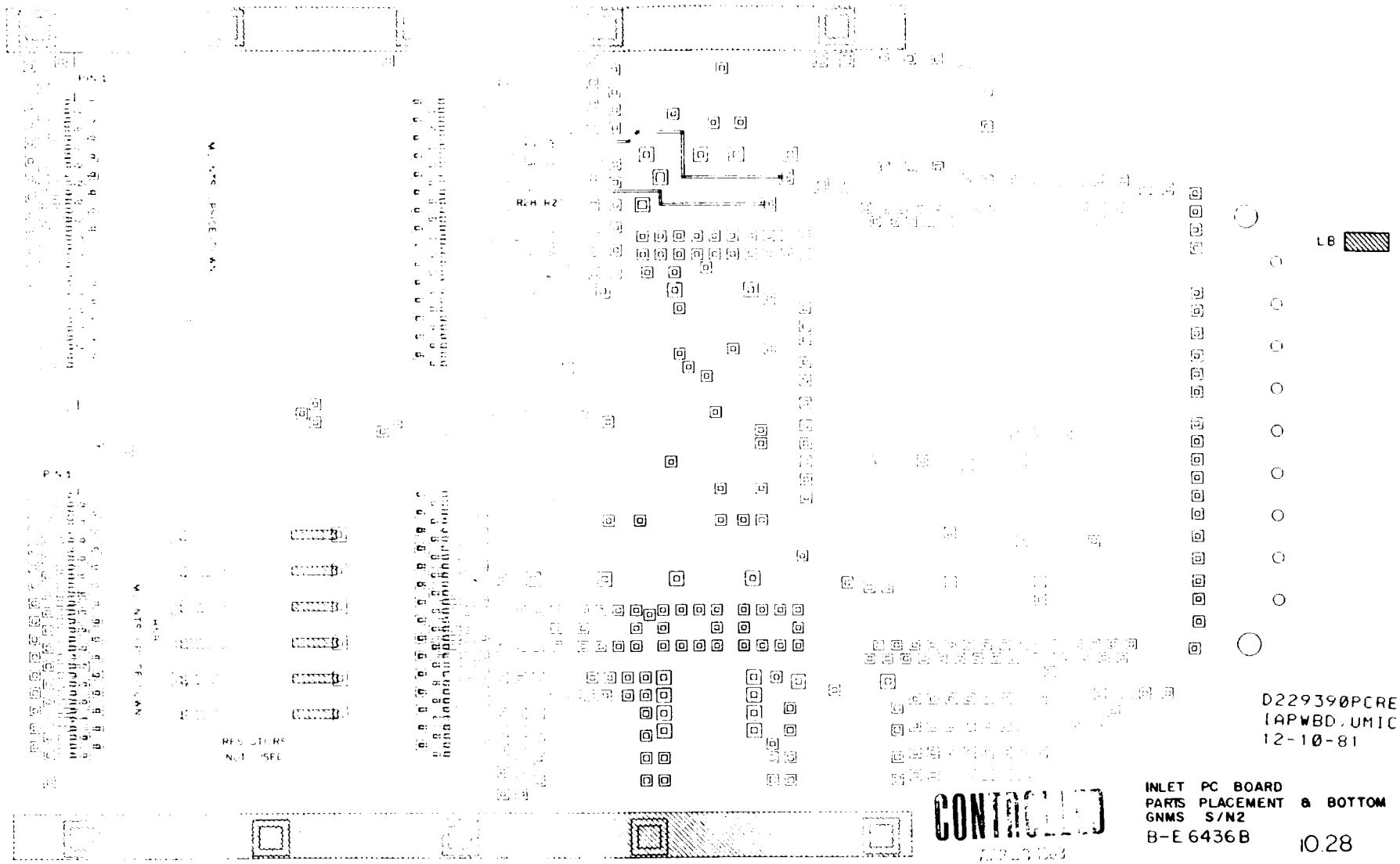
D229390PCREVB
[APWBD,UMICH]
12-10-81

INLET PC BOARD
LAYER 7
GNMS S/N2
B-E 6435 B

10.27

3/10/83

MAR 24 1983



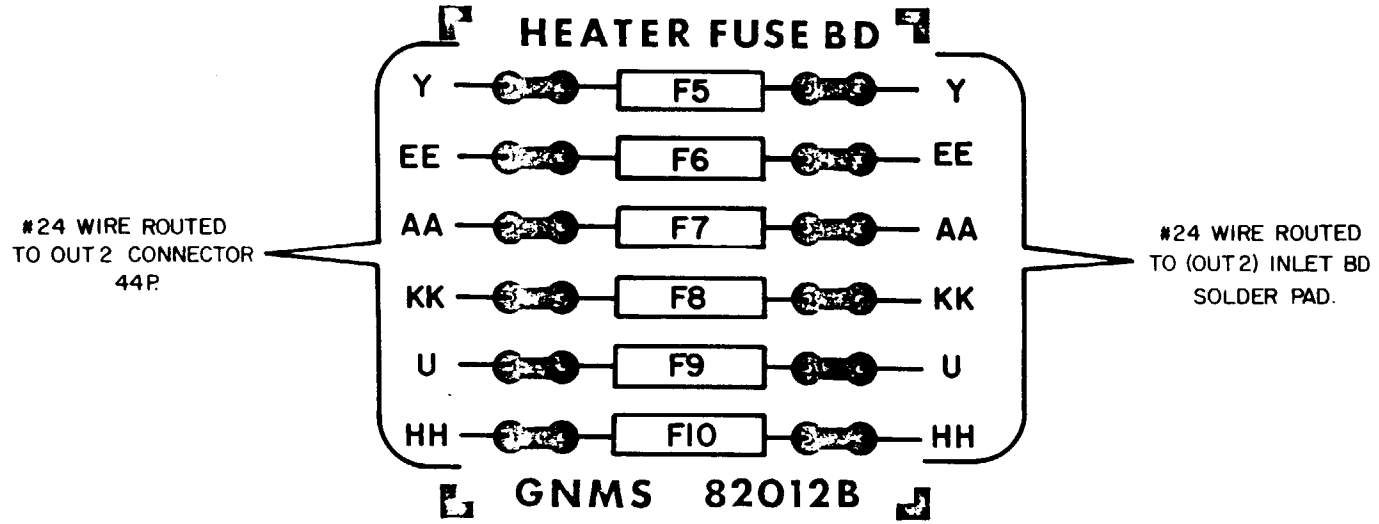
D229390PCREVB
[APWBD,UMICH]
12-10-81

CONTROLLED
PRINT

INLET PC BOARD
PARTS PLACEMENT & BOTTOM
GNMS S/N2
B-E 6436B

10.28

COMPONENT SIDE



CONTROLLED PRINT

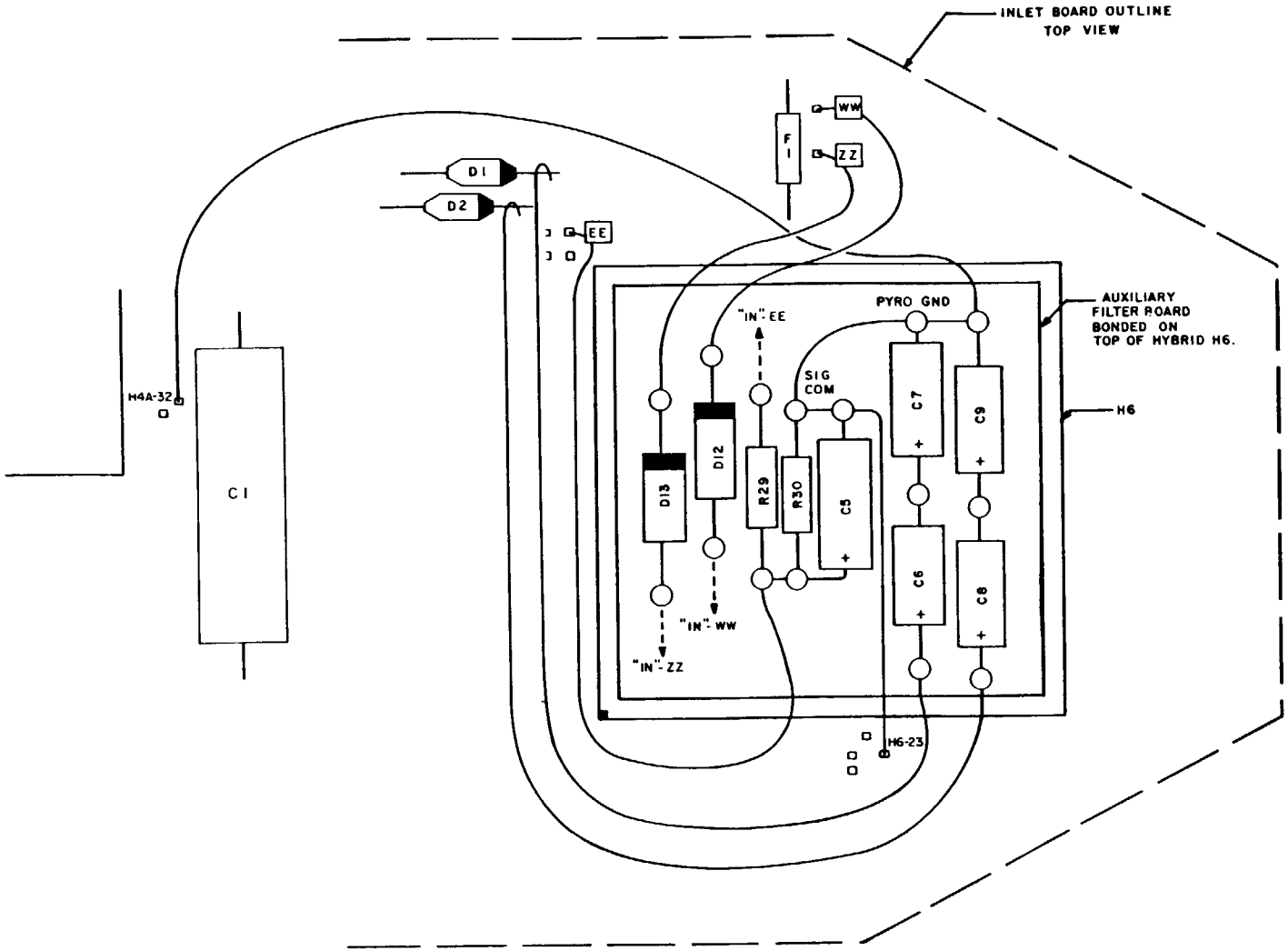
NOTES:

1. #82012B PCB .031" MATERIAL
2. TRIM TO OUTSIDE OF LINES.

ENGINEER B.BLOCK, M.A.H.	DRAFTSMAN MK 10/27/82	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	COMPONENT LAYOUT #82012B HEATER FUSE BD (INLET BD ADD ON) GNMS S/N 2	3/10/83 DATE
	B-E6958	

LAST USED R C D L

MAR 2 4 1983



NOTES:

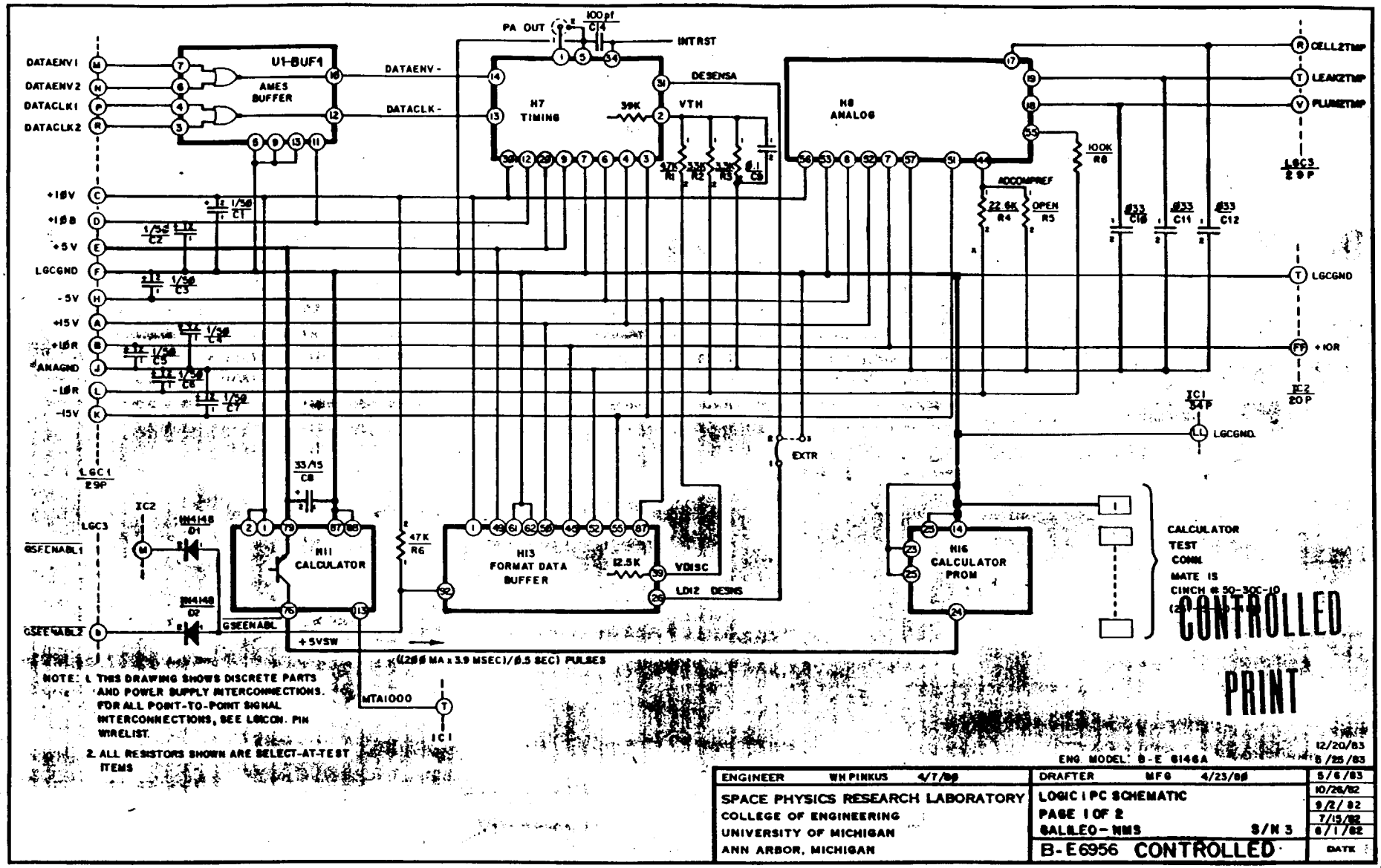
1. CONNECTOR WIRES EE, WW, ZZ NOW ROUTE TO H6 AUX. BOARD. OTHER WIRES RUN FROM THERE TO PREVIOUS MAIN BOARD LOCATIONS.
2. USE .010 MYLAR OR LAMINATE TO ISOLATE AUX. BOARD FROM H6 CASE. EPOXY DOWN AT FINAL ASSEMBLY.
3. WIRING SHOWN WAS ACCOMPLISHED ON S/N3 BY SPRL. S/N2 AUX WAS WIRED BY GSFC AND MAY DIFFER.

CONTROLLED
JAN 15 1987
PRINT

ENGINEER J.CALDWELL	DRAFTSMAN R.E.K, C.C.Z. 2/26/86	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	COMPONENT LAYOUT INLET AUXILIARY FILTER BOARD GNMS S/N 2	12/4/86 2/27/86
	B-E7758 CONTROLLED	DATE

LAST USED R C D L

10.30



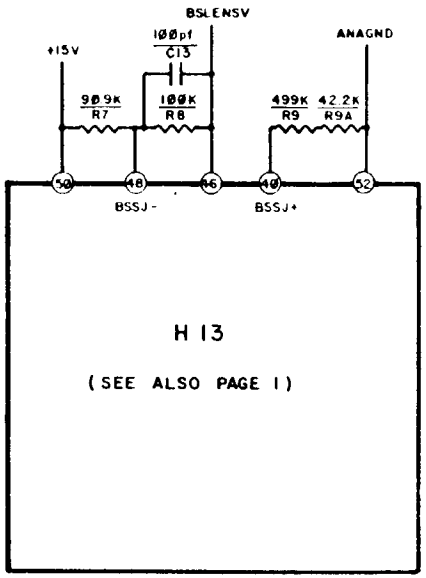
NOTE: 1. THIS DRAWING SHOWS DISCRETE PARTS AND POWER SUPPLY INTERCONNECTIONS. FOR ALL POINT-TO-POINT SIGNAL INTERCONNECTIONS, SEE LOGICON. PIN WIRELIST.

2. ALL RESISTORS SHOWN ARE SELECT-AT-TEST ITEMS

ENG. MODEL B-E 6146A

ENGINEER WH PINKUS 4/7/83	DRAFTER MFG 4/23/83		5/6/83
SPACE PHYSICS RESEARCH LABORATORY	LOGIC I PC SCHEMATIC		10/26/82
COLLEGE OF ENGINEERING	PAGE 1 OF 2		9/2/82
UNIVERSITY OF MICHIGAN	GALILEO-NMS	S/N 3	7/15/82
ANN ARBOR, MICHIGAN	B-E6956 CONTROLLED		6/1/82
			DATE

LAST USED R6 C14 D2 L



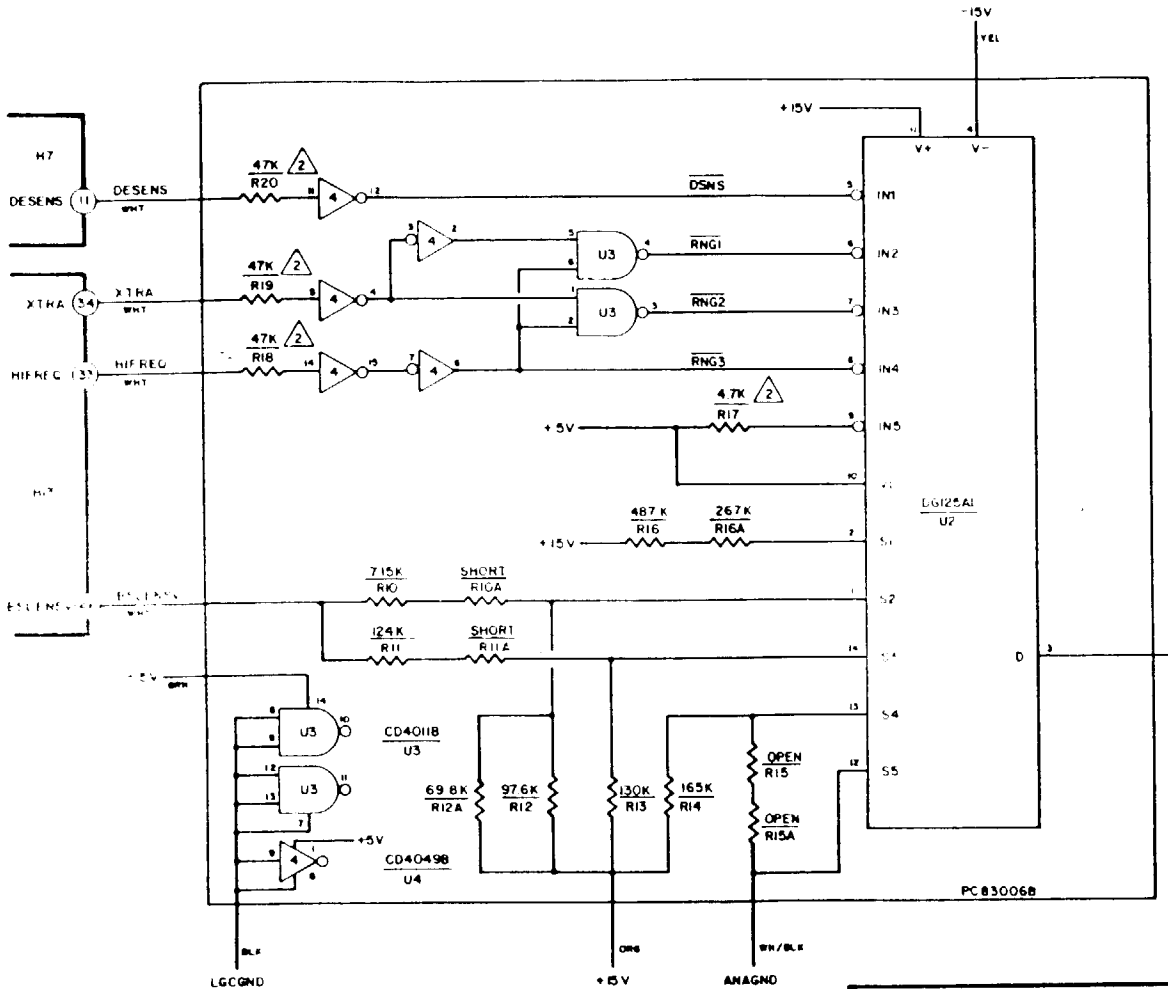
NOTES 1. R7 - 9A CONTROL GAIN OF THE BSLENS VOLTAGE AMPLIFIER.

CONTROLLED PRINT

ENG MODEL: B-E6828

ENGINEER W H PINKUS	DRAFTSMAN N.D.	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	LOGIC I PC SCHEMATIC PG 2 OF 2 GALILEO - NMS S/N3	6/1/82
	B-E6947 CONTROLLED	DATE

LAST USED R 16 C 15 D L 02



NOTES:

1 UNLESS NOTED, ALL R'S ARE RNC55

2 RCR05

3 ALL RNC55'S ARE S A T

STATE TABLE

HIFREQ	XTRA	STATE
0	0	RANGE 3, M ≥ 21
0	1	NOT ALLOWED
1	0	RANGE 2, 4 ≤ M ≤ 20
1	1	RANGE 1, 0 ≤ M ≤ 3

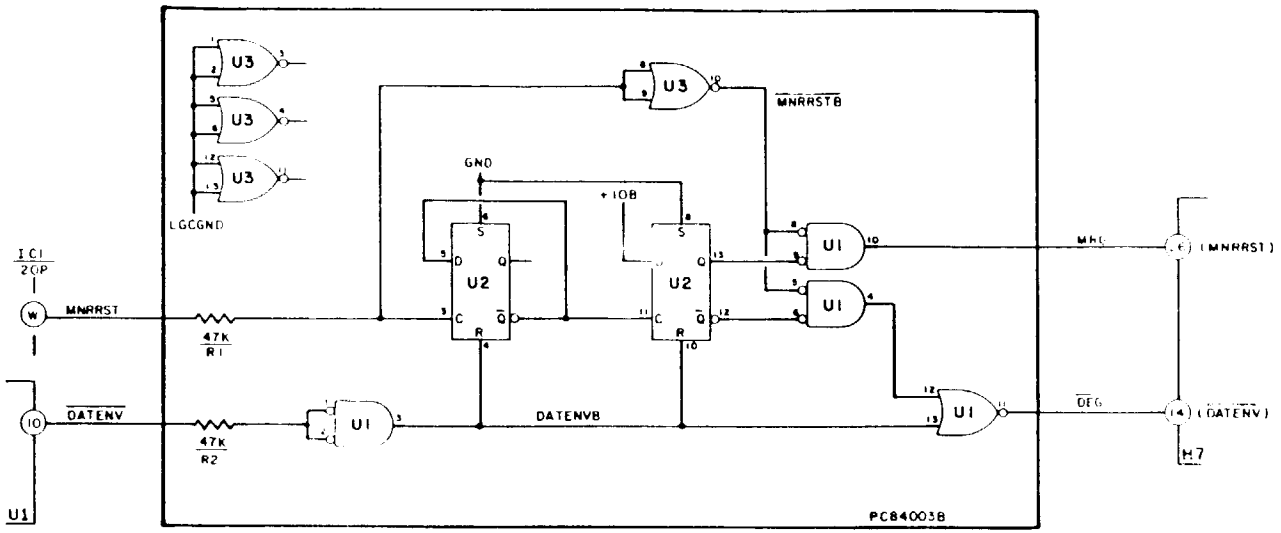
CONTROLLED

PRINT

1/24/85

ENGINEER B BLOCK	DRAFTSMAN EL 6/21/83	1/11/84
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	AUX BOARD 2 DELTA IF – LOGIC 1 GALILEO NMS S/N 3	11/7/83 11/3/83 9/20/83 8/2/83
	B-E7987 CONTROLLED	DATE

LAST USED R 20 C D L



NOTES:

1. ALL R'S RCR05
2. U1, U3 = CD4001B
   U2 = CD4013B
3. VSS = P7, U1, U2, U3 = LGCGND
   VDD = P14, U1, U2, U3 = +10B

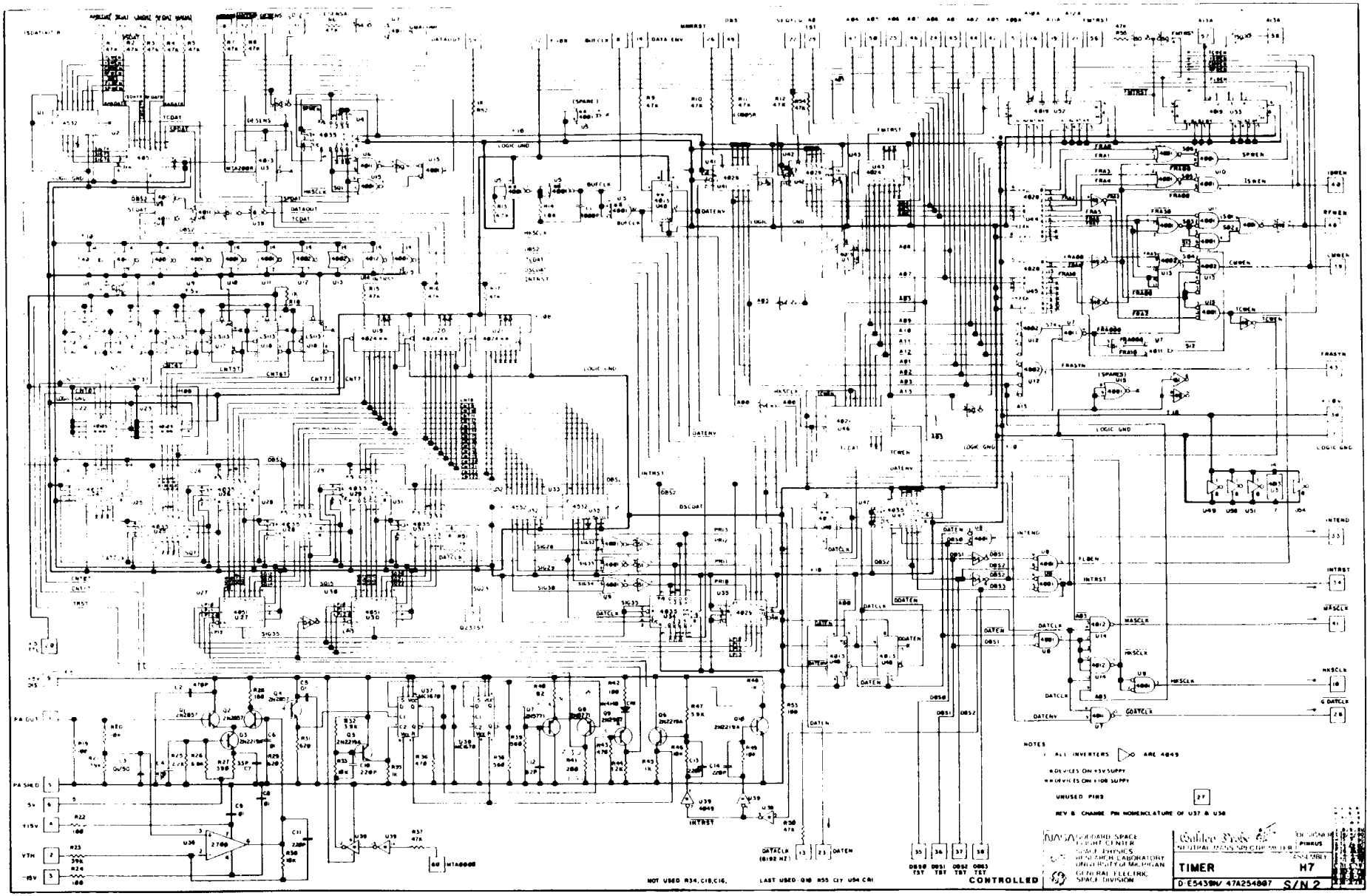
CONTROLLED

PRINT

ENGINEER B BLOCK	DRAFTSMAN MK 2/15/84	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	AUX BOARD 3 LOGIC 1 GNMS S/N 3 B-E7986 CONTROLLED	2/10/84 DATE

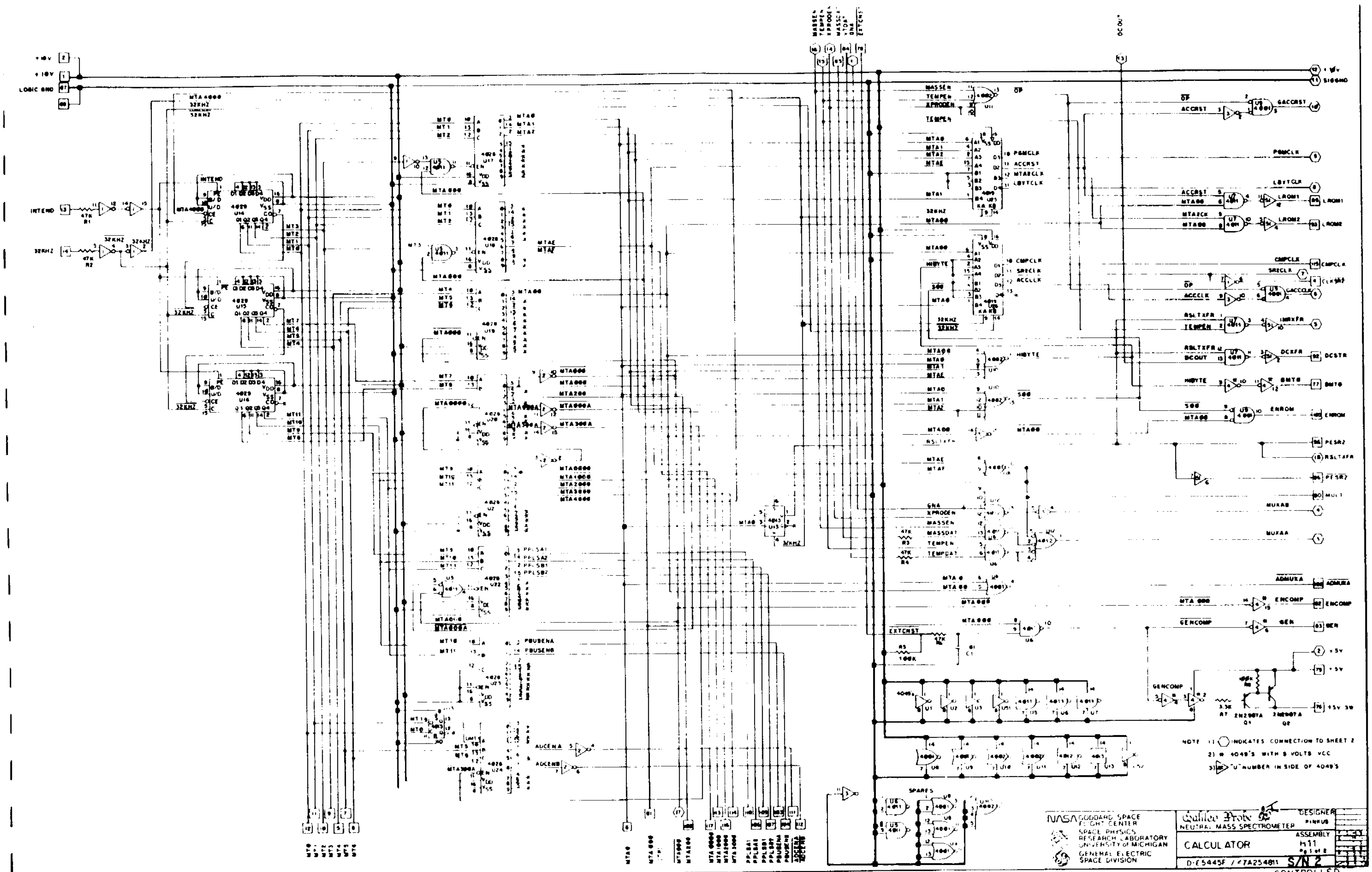
LAST USED R2 C D L

11.1C

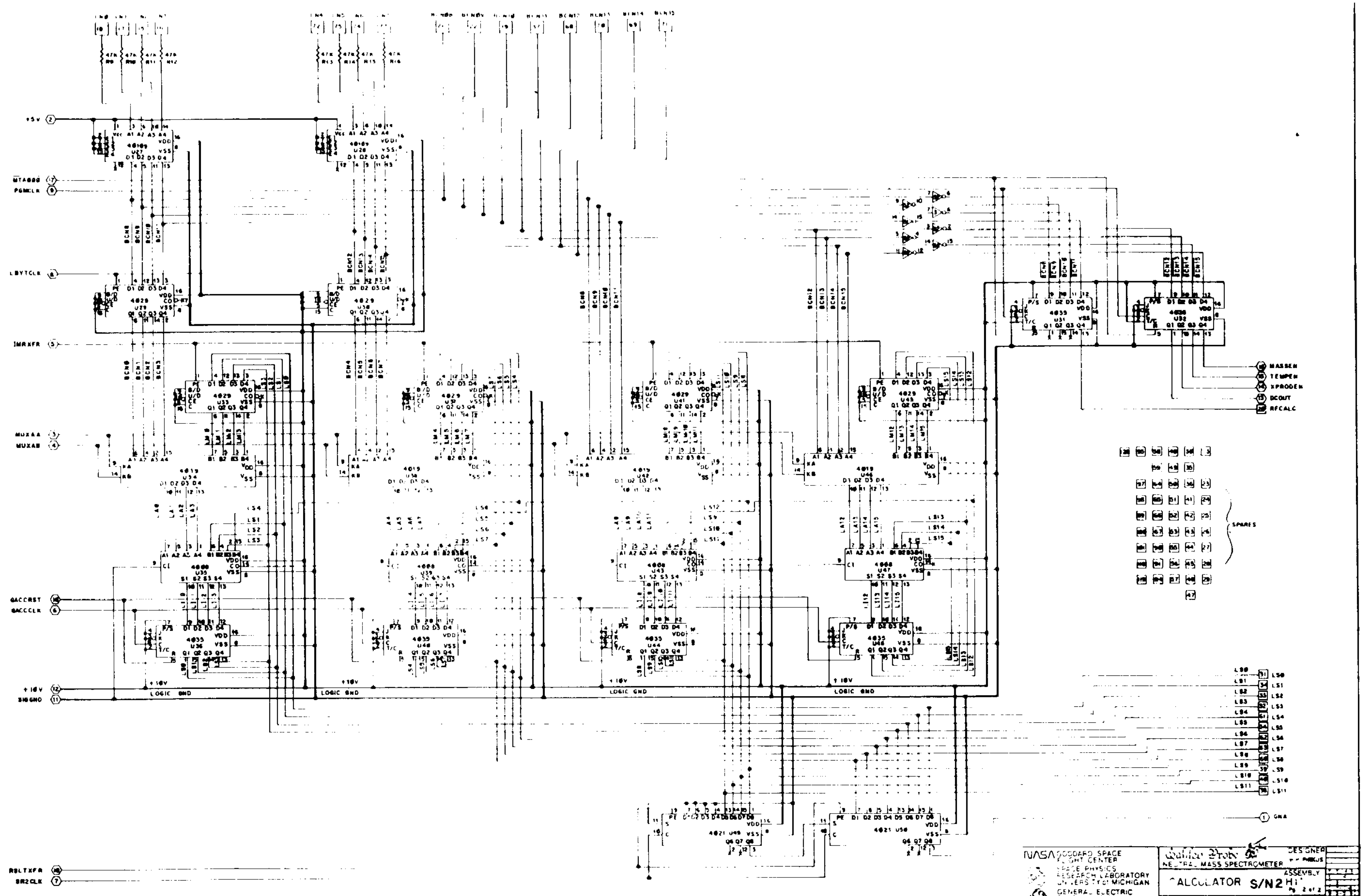


SEP 9 1982 15:8

ANAMUX
H8
S/N2
CONTROLLED



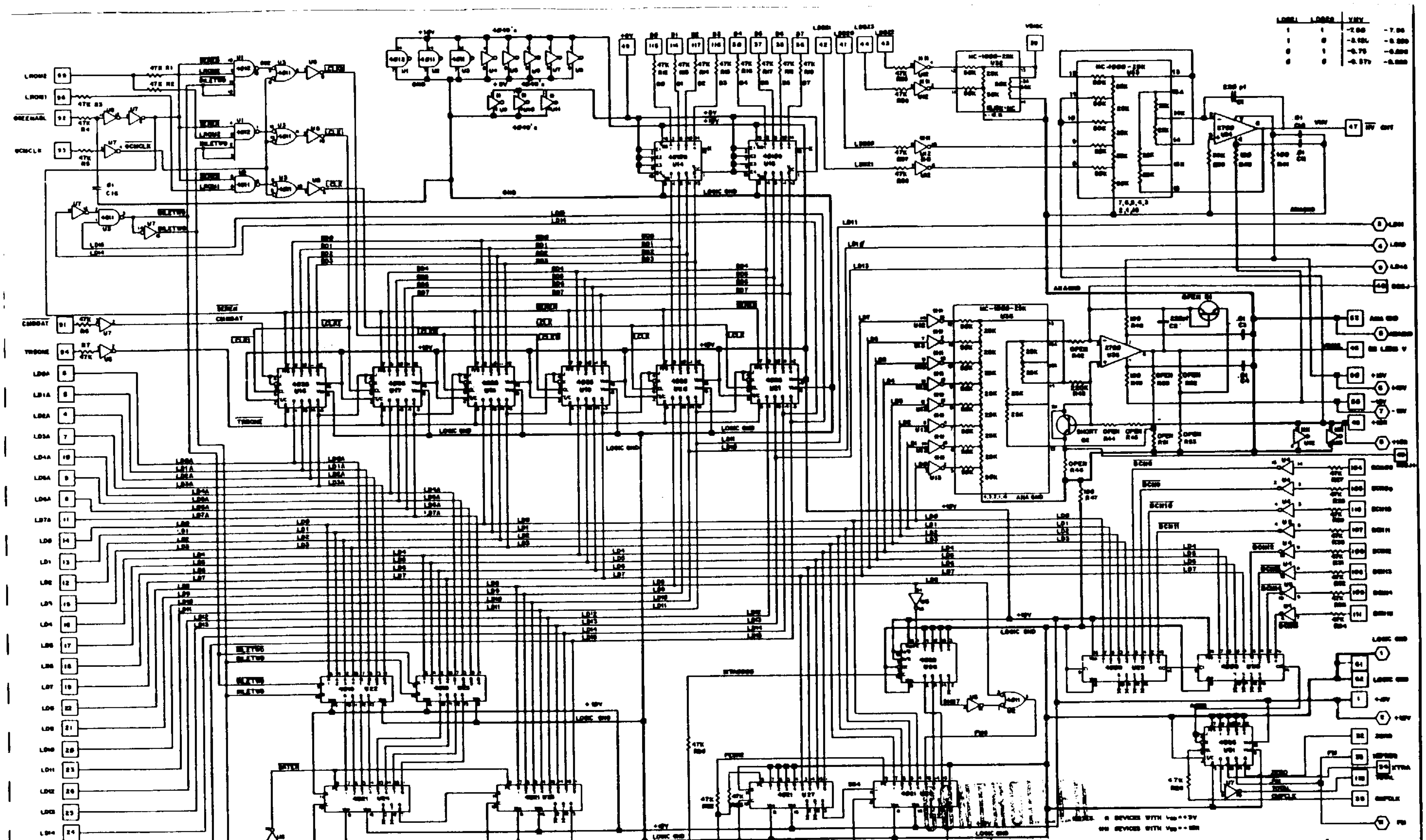
SEP 9 1982 CONTROLLED 15.12



NASA Goddard Space Flight Center
Space Physics Research Laboratory
University of Michigan
General Electric Space Division

Galileo Probe
Neutral Mass Spectrometer
CALCULATOR S/N 2 Hi
ASSEMBLY
D E5443F/47A254811 CONTROLLED

SEP 9 1982 15.13



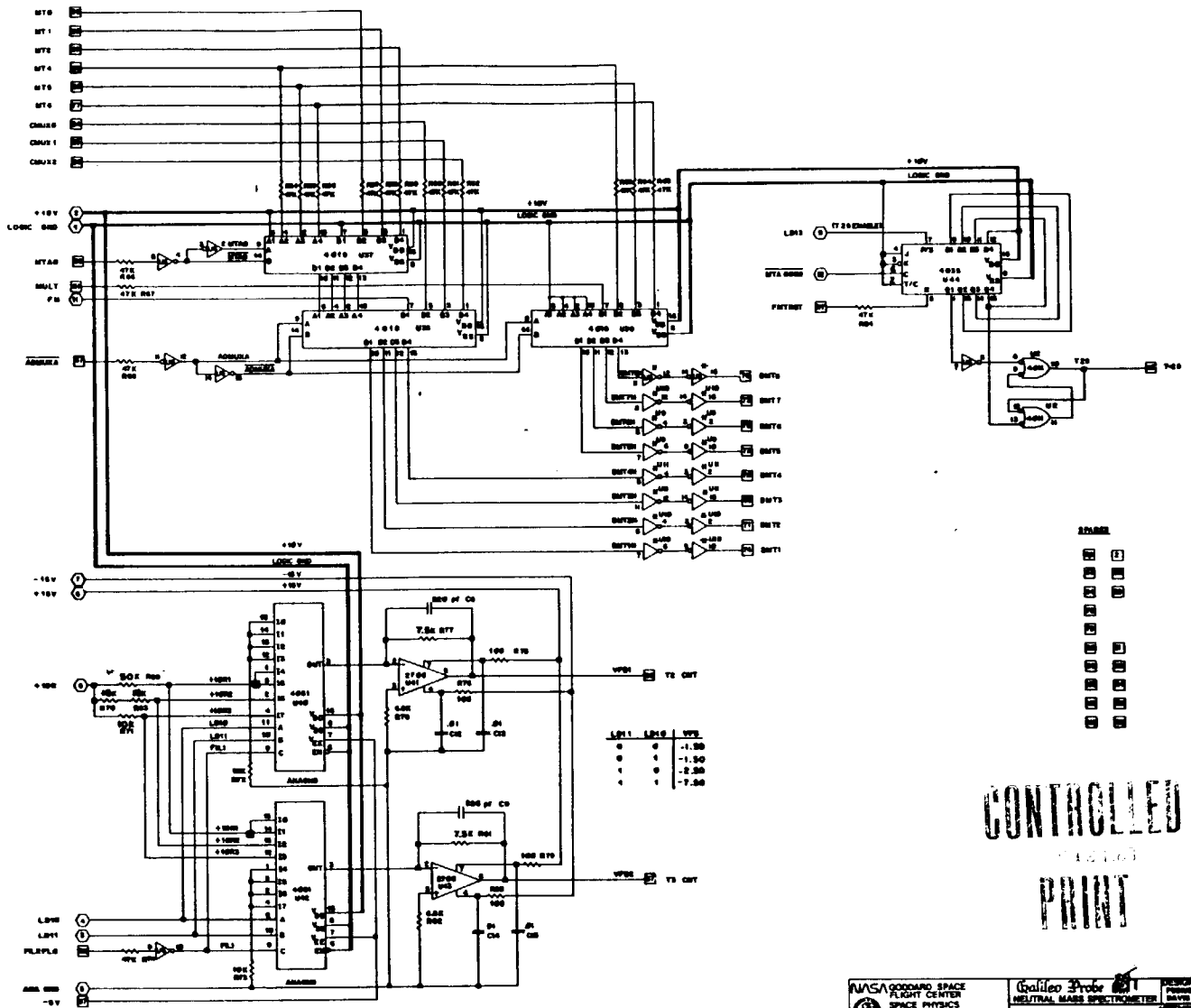
NASA GODDARD SPACE FLIGHT CENTER
SPACE PHYSICS RESEARCH LABORATORY UNIVERSITY of MICHIGAN
GENERAL ELECTRIC SPACE DIVISION

Galileo Probe
NEUTRAL MASS SPECTROMETER

FORMAT DATA BUFFER H13

D-E8625 J / 47A25 4 CONTROLLE

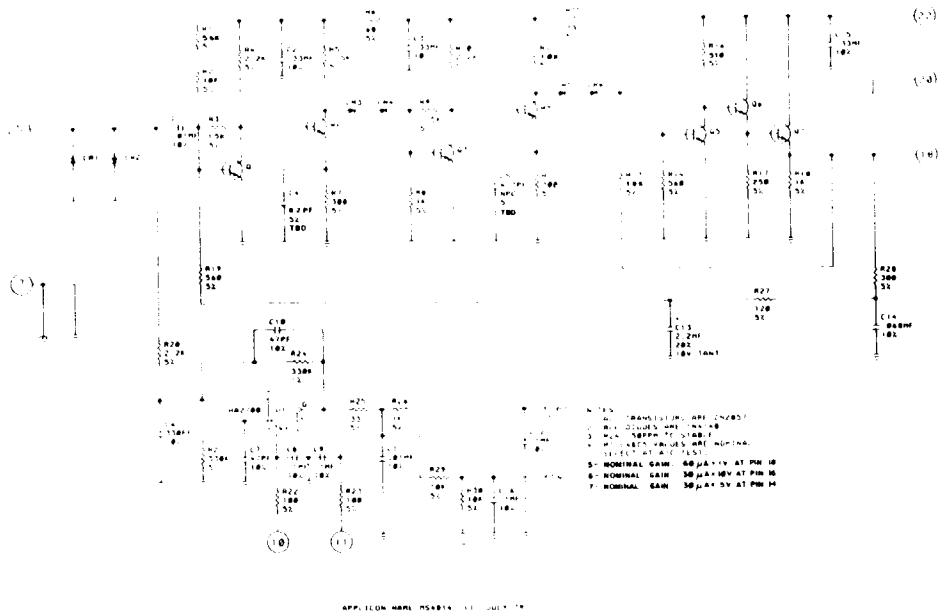
S/N2



CONTROLLED PRINT

NASA GODDARD SPACE FLIGHT CENTER SPACE PHYSICS RESEARCH LABORATORY UNIVERSITY of MICHIGAN GENERAL ELECTRIC SPACE DIVISION	Galileo Probe NEUTRAL MASS SPECTROMETER	
	FORMAT DATA BUFFER H:3	
	D E6155J / 47A2548 13	S/H 2

CONTROLLED



REV B CHANGE NOTE 5, ADD NOTES 6 & 7, CHANGE R16 TO 1.5KΩ
REV A CHANGE VALUES FOR LOW GAIN & USE STANDARD VALUES 7/27/79 PER ABM/JM

NASA/GODDARD SPACE FLIGHT CENTER
SPACE PHYSICS LABORATORY
ELECTRONICS TECHNICIAN SECTION

Goddard Code
NATIONAL SPACE SCIENCE DATA CENTER

DRAWN BY MAUREEN MACHEE

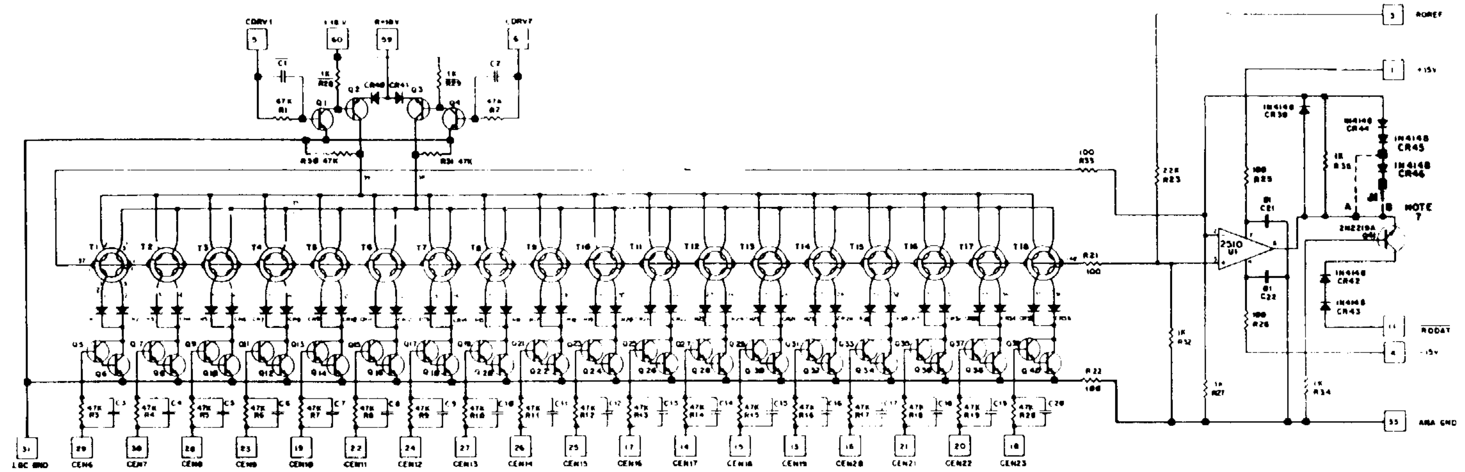
PULSE PRE AMP H14

D-E5435047A254814 S/N 2

LAST USED C16 CR6 Q7 R30 U1

CONTROLLED

15.18



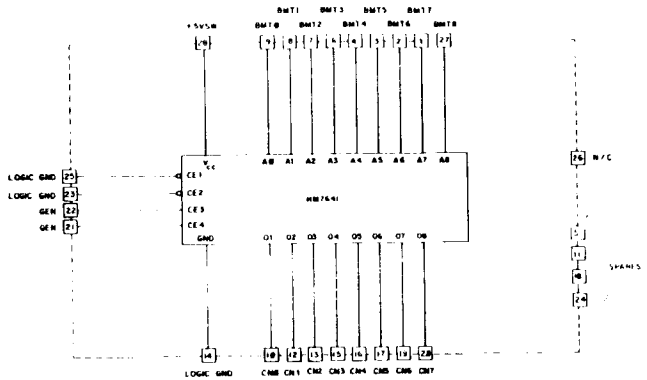
NOTE 1 ALL NPN TRANSISTORS 2N2219A
2 ALL PNP TRANSISTORS 2N2907A
3 ALL DIODES 1N4148
4 TOTAL LENGTH OF "SENSE" LEAD (FROM R27 / ANA GND, THROUGH ALL THE CORES, THROUGH R21, TO U1-3) SHOULD BE MINIMIZED
5 CORE WIRE SIZE / TYPE - # 46 HML
6 C1 - C20 470 PF
7. SELECT AND INSTALL JUMPER J1-A OR J1-B AT TEST.

CONTROLLED
SEP 14 19..
PRINT

LAST USED C22 CR46 Q41 R38 T18 U1   NOT USED CR37, CR38, R24

NASA GODDARD SPACE FLIGHT CENTER SPACE PHYSICS RESEARCH LABORATORY UNIVERSITY of MICHIGAN GENERAL ELECTRIC SPACE DIVISION	Galileo Probe NEUTRAL MASS SPECTROMETER	DESIGNER PINKUS DAVIS
	CORE MEMORY	ASSEMBLY H15
	D-E6124H/ 47A254815	S/N 2

CONTROLLED

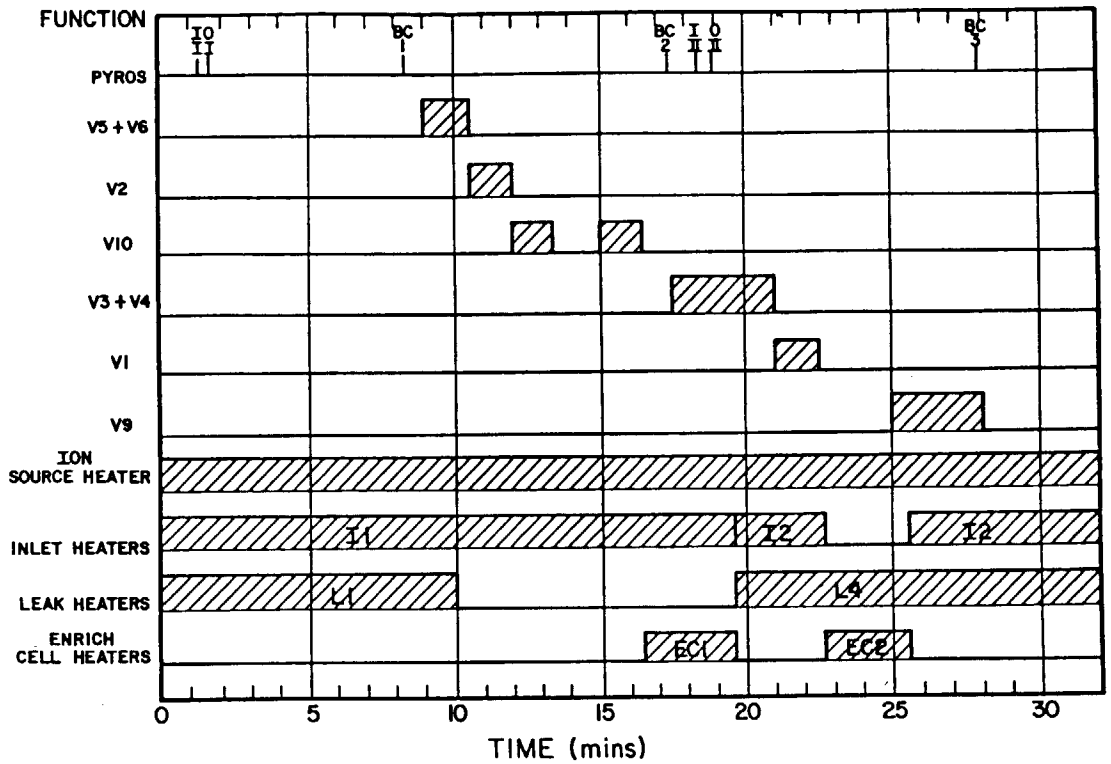


CONTROLLED

NASA GODDARD SPACE FLIGHT CENTER
SPACE PHYSICS RESEARCH LABORATORY UNIVERSITY of MICHIGAN
GENERAL ELECTRIC SPACE DIVISION

Galileo Probe
NEUTRAL MASS SPECTROMETER

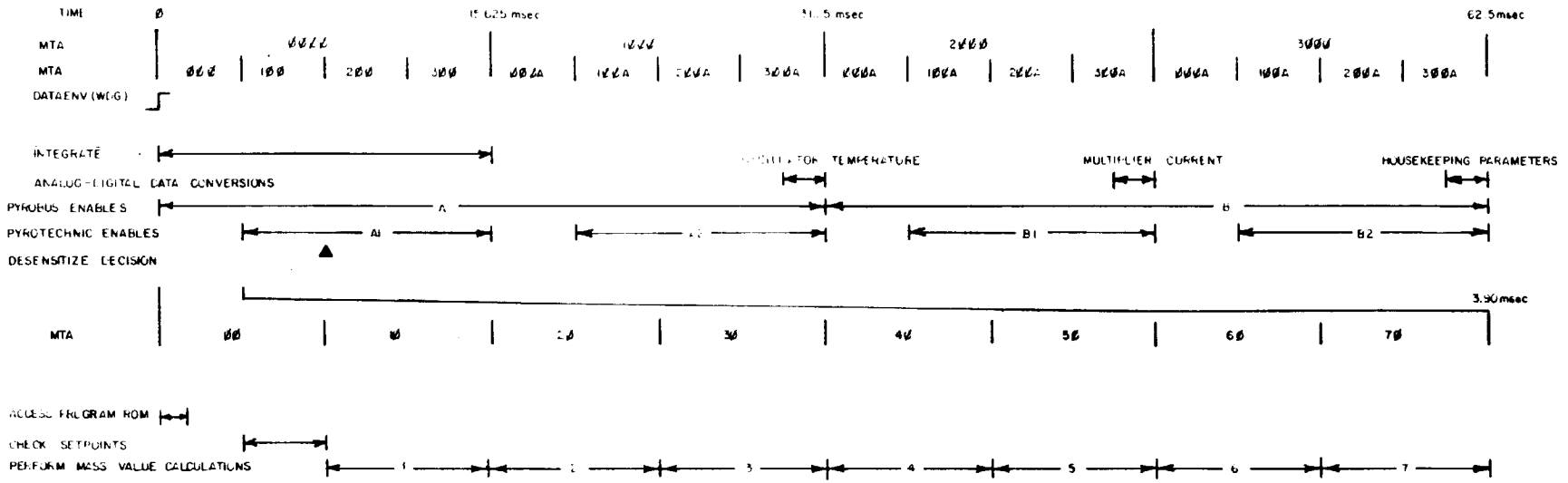
DESIGNED
ASSEMBLY
CALCULATOR PROM H16
D-E6126A S/N 2



ENGINEER J MAURER	DRAFTSMAN	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	INLET CONTROL TIMING GALILEO-NMS	
	B-E4914A	DATE

LAST USED R C D L

OCT 2 2 1982

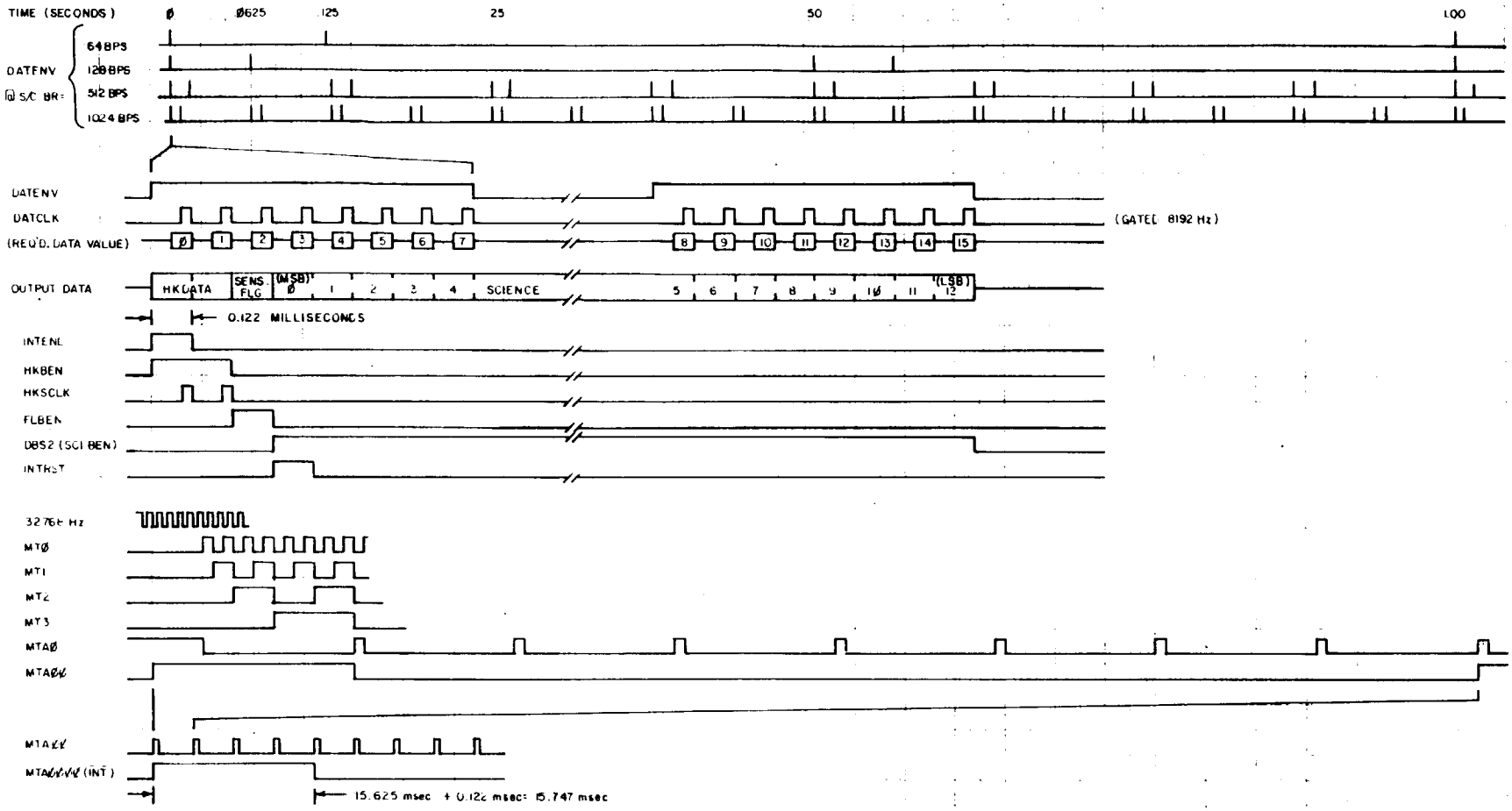


W.H. PINKUS 5/16/73	MSG 5/16/79
... RESEARCH LABORATORY ... ENGINEERING ... MICHIGAN	FORMAT CONTROL TIMING TIMING LOGIC GALILEO - NMS
	B-E4980A

1/23/60

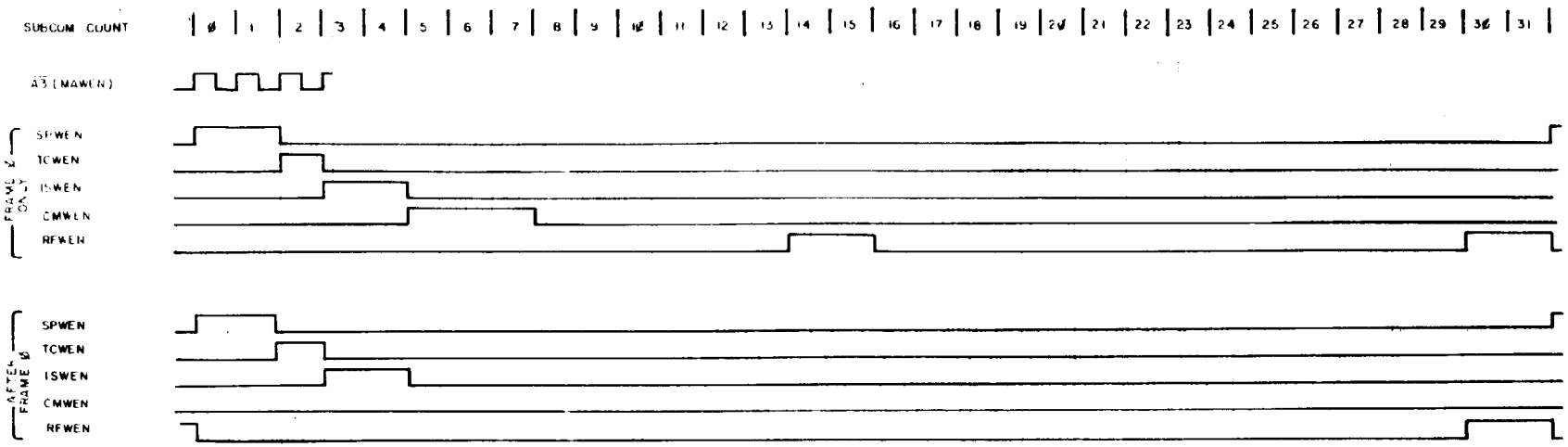
OCT 22 1982

17.2



WH P.NKUS 4/20/79		MSG 4/20/79	
		DATA TRANSMISSION TIMING	
		GALILEO - NMS	1/23/80
		13-E 4981 A	

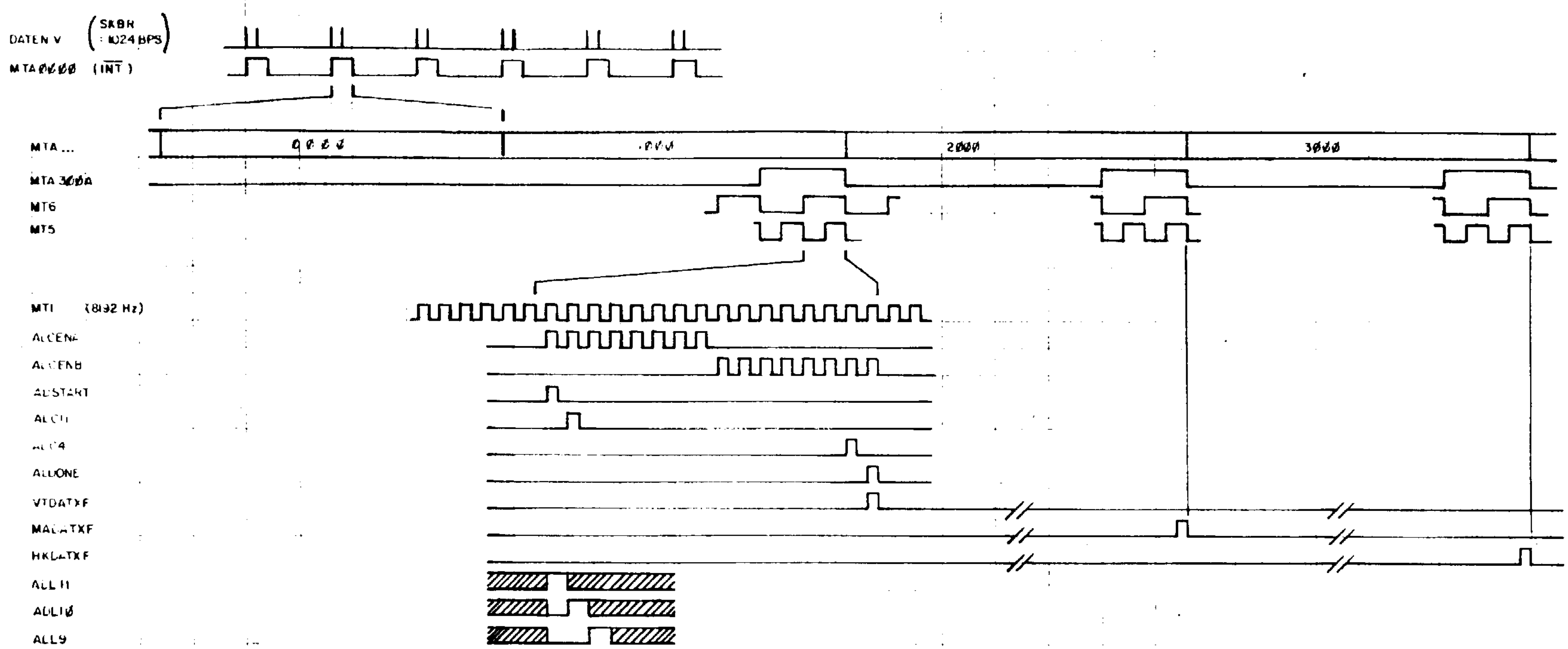
OCT 22 1982 17.3



A. R. PINKUS 5/16/79	MSJ 5/16/79	
	SUBCOM FORMAT TIMING TIMING LOGIC GALILEO – NMS E4982A	1/23/80

OCT 22 1982

17.4



W. R. FINKUS 4/20/79
RESEARCH LABORATORY

MSG 4/20/79

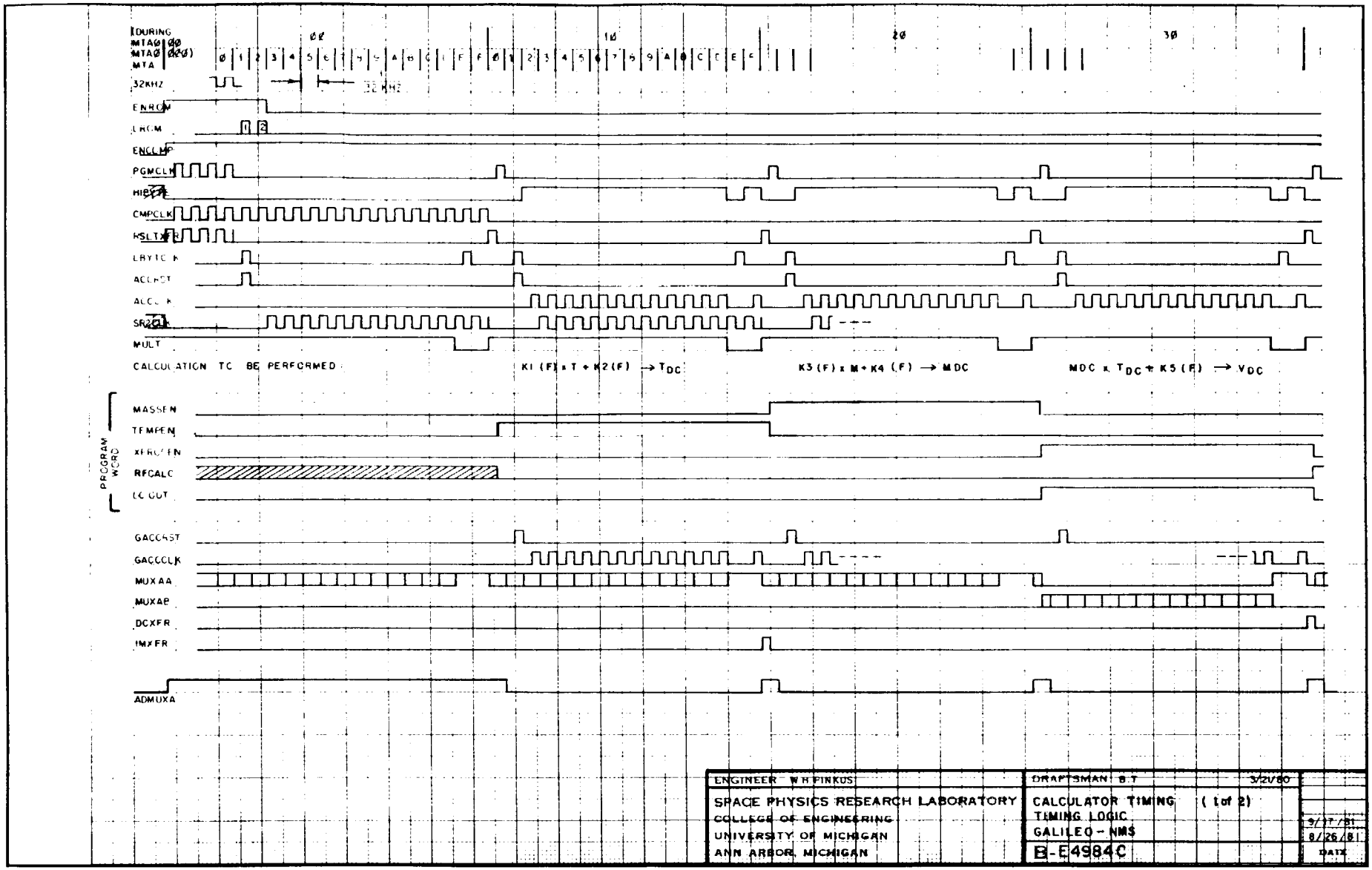
A/D CONVERTER TIMING

GALILEO - NMS

B-E4983A

9/24/80

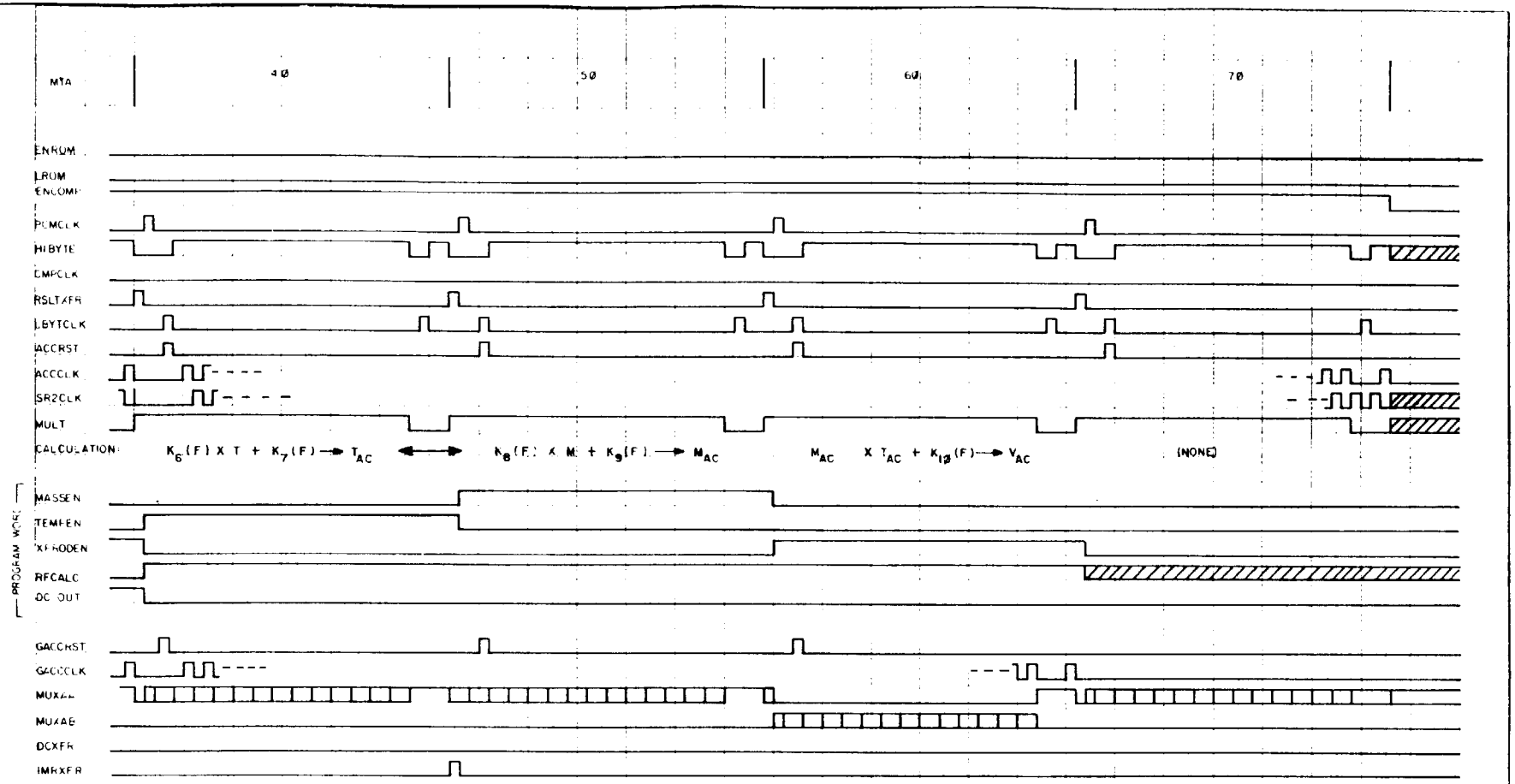
OCT 22 1982 17.5



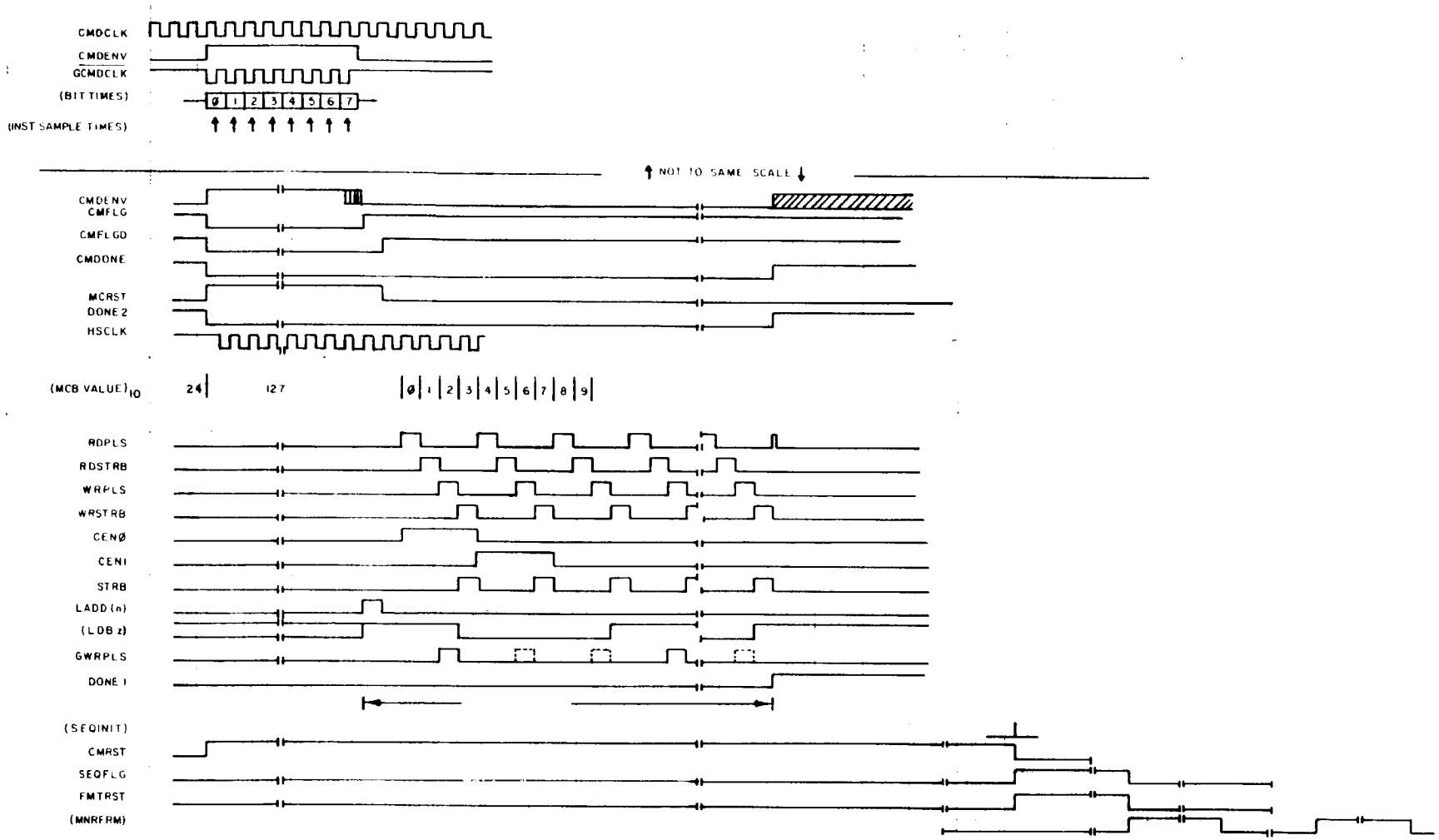
LAST USED R C D L

OCT 22 1982

17.6



ENGINEER W.H.PINKUS 3/21/80	DRAFTSMAN MSG 5/23/80		
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	CALCULATOR TIMING (2 of 2) TIMING LOGIC GALILEO - NMS B-E4985B	9/17/81 8/26/81 3/25/80	

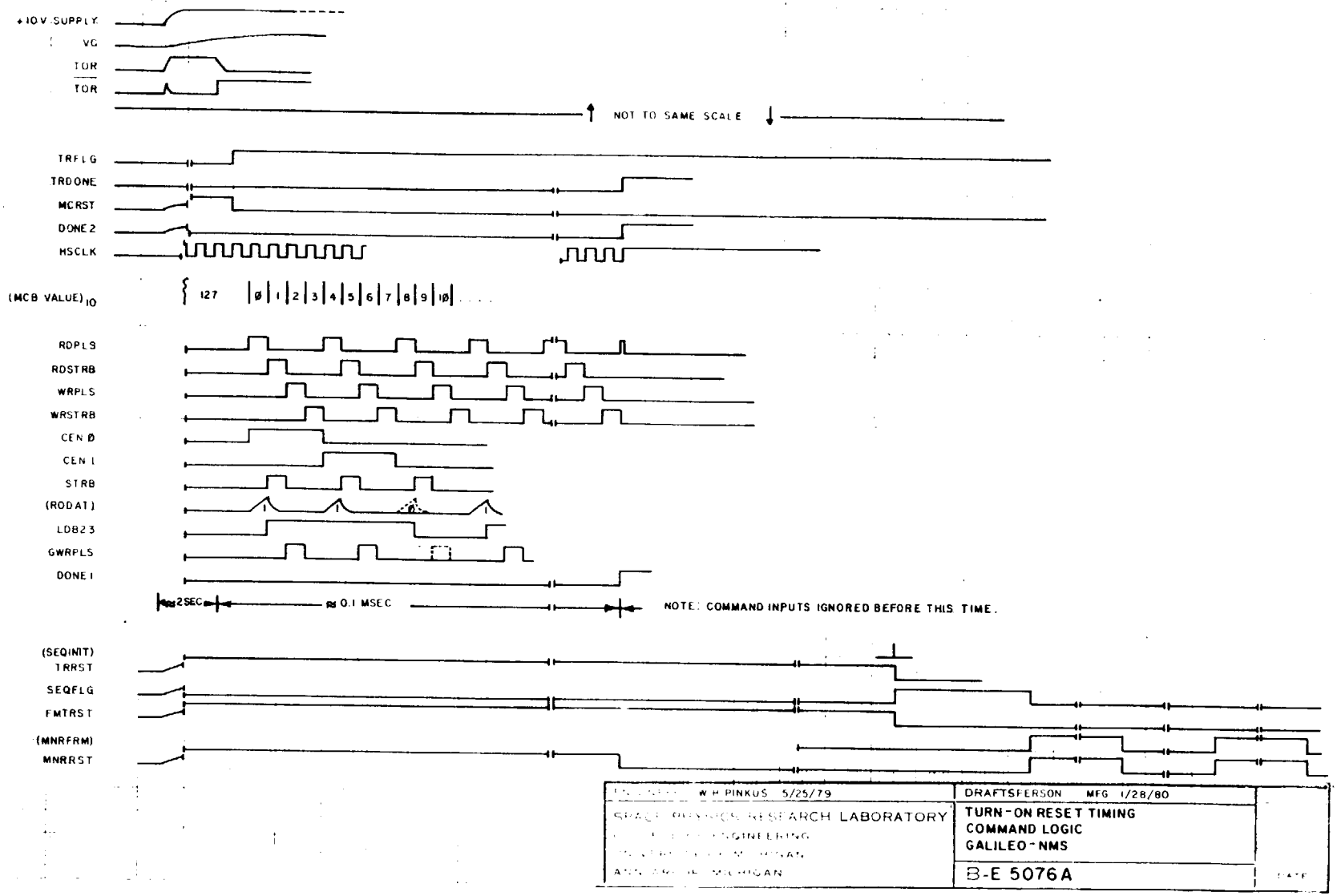


NOTE: INDICATES STATE UNKNOWN BEFORE TRANSITION

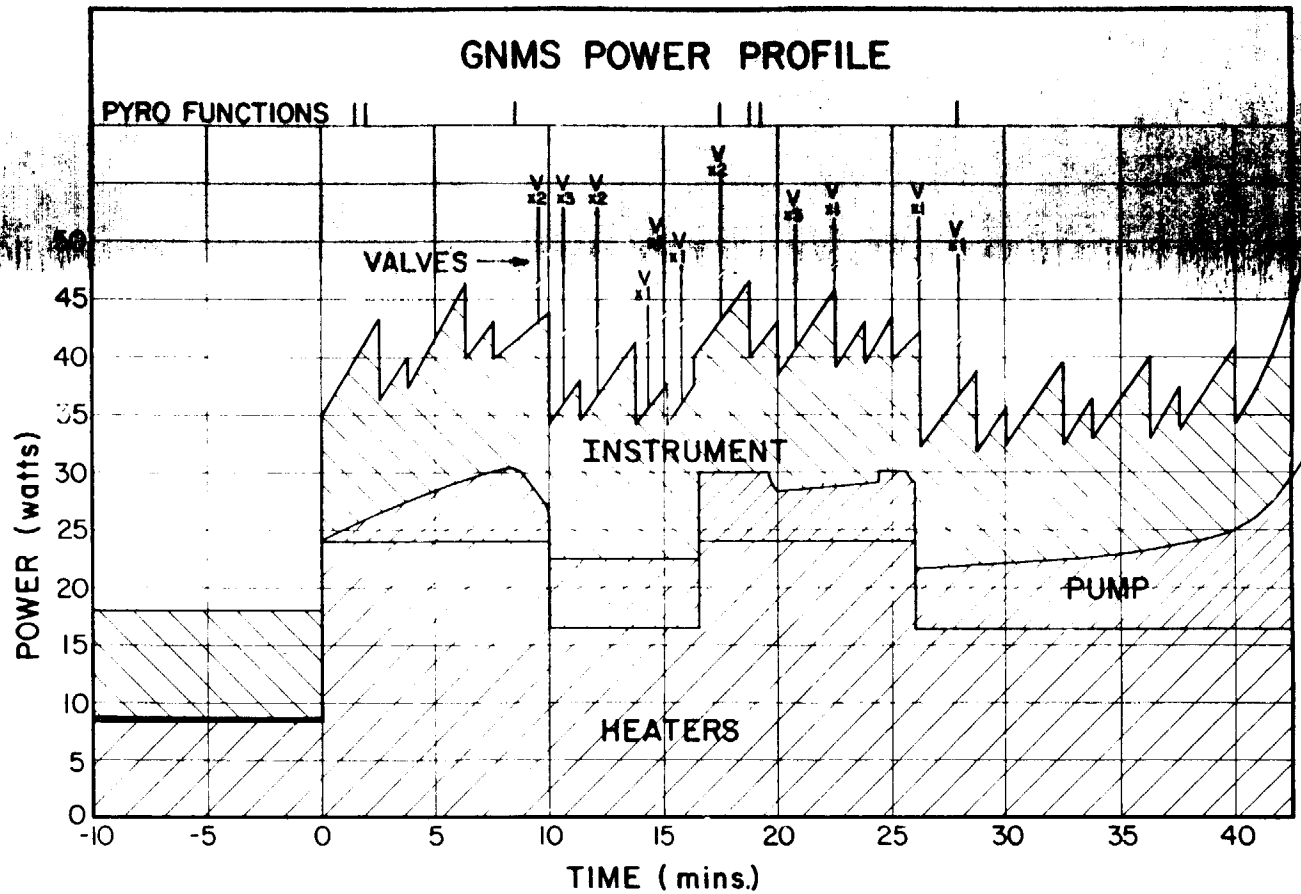
INDICATES DON'T-CARE CONDITION

ER W H PINKUS 5/25/79	DRAFTSPERSON 1/24/80 MFG	
ACE PHYSICS RESEARCH LABORATORY LEGE OF ENGINEERING ERSITY OF MICHIGAN ANN ARBOR MICHIGAN	COMMAND INPUT TIMING COMMAND LOGIC GALILEO-NMS	
	B-E 5075 A	DATE

OCT 22 1982



W H PINKUS 5/25/79	DRAFTSPERSON MFG 1/28/80	
SPACE PHYSICS RESEARCH LABORATORY ENGINEERING ANN ARBOR MICHIGAN	TURN-ON RESET TIMING COMMAND LOGIC GALILEO-NMS	
	B-E 5076A	DATE
SIZE C D L		OCT 22 1982

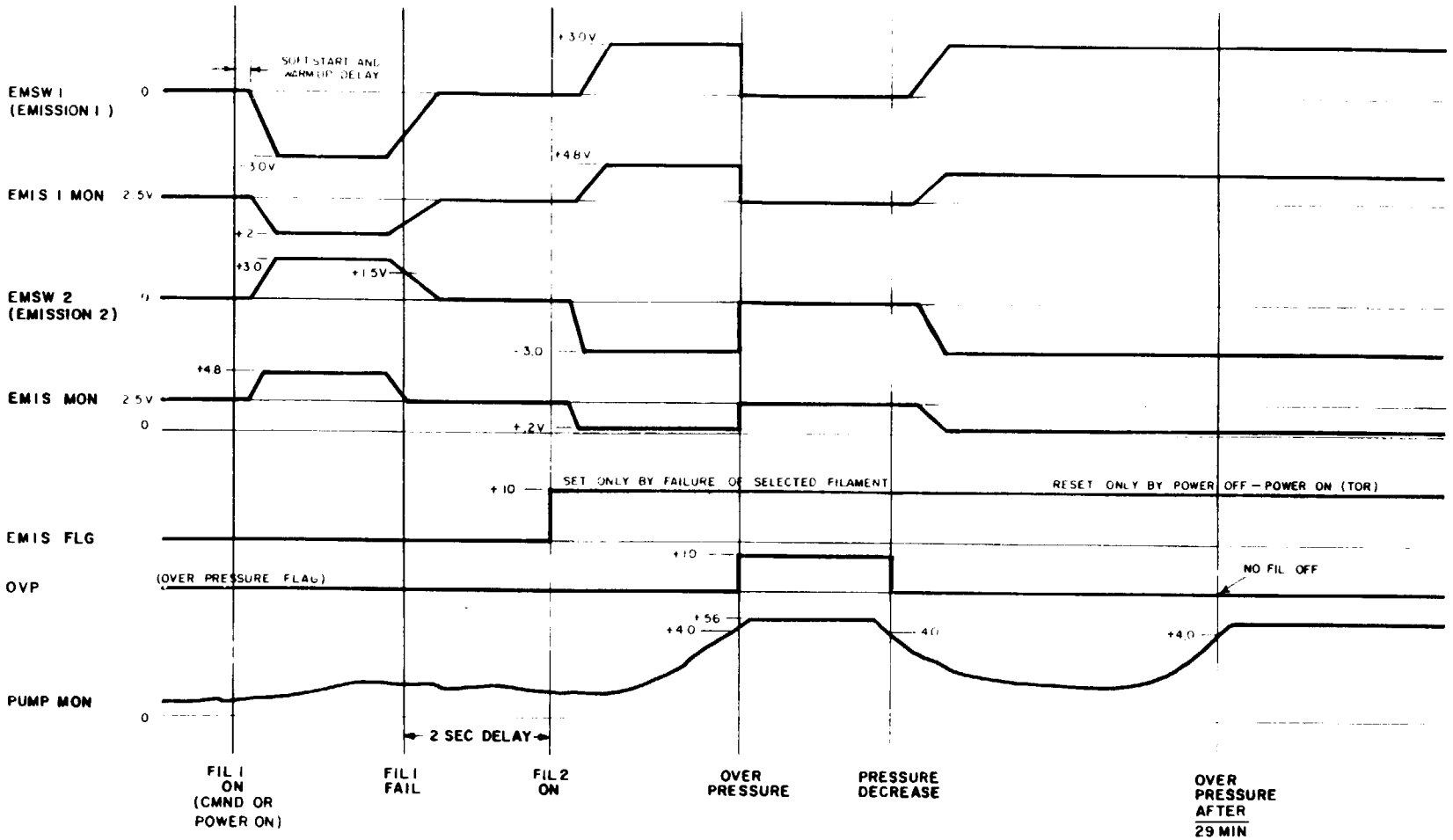


ENGINEER J. CARLSON	DRAFTSMAN C DAVIS 2-16-79	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR MICHIGAN	POWER PROFILE GNMS B-E5094	DATE

LAST USED R C D L

OCT 2 2 1982

17.10



ENGINEER J MAURER	DRAFTSMAN TS 4-6-79	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR MICHIGAN	FILAMENT CONTROL TIMING H2 GNMS	1/30/81 4-10-79
	B-E 5201	DATE

LA ISED R C D L

OCT 22 1982

17.11

[illegible]

[illegible]

[illegible]	[illegible]	HEAT [illegible]	ON
	[illegible]	HEAT [illegible]	ON
	[illegible]	HEAT INLET 1	ON
1.[illegible]	[illegible]	INLET [illegible]	[illegible]
	1[illegible]	OUTLET [illegible]	[illegible]
[illegible]	10[illegible]	[illegible]	[illegible]
	1024	HEAT L1	OFF
10.0	1208	VALVE 1	ON
	1209	VALVE 3	ON
	1210	HEAT L2	ON
11.5	1388	VALVE 1	OFF
	1389	VALVE 3	OFF
	1390	VALVE 2	ON
13.0	1540	VALVE 2	OFF
	1549	VALVE 4	ON
14.5	1748	VALVE 4	OFF
	1749	HEAT [illegible] 1	ON
[illegible]	1928	HEAT [illegible]	OFF
	1929	VALVE 4	ON
17.[illegible]	2108	VALVE 4	OFF
	2109	[illegible] PYRO	P4
	2110	HEAT L2	OFF
	2111	HEAT INLET 1	OFF
	2112	HEAT L3	ON
	2113	HEAT L4	ON
	2114	HEAT INLET 2	ON
	2115	VALVE 5	ON
	2116	VALVE 7	ON
19.0	2288	INLET 2 PYRO	P2
	2289	OUTLET 2 PYRO	P4
[illegible]	[illegible]	VALVE 5	[illegible]
	[illegible]	VALVE 7	[illegible]
	[illegible]	VALVE [illegible]	[illegible]
	[illegible]	VALVE [illegible]	[illegible]
	[illegible]	HEAT EC2	ON
[illegible]	3008	HEAT EC2	OFF
	3009	VALVE 8	ON
20.0	3368	VALVE 8	OFF
	3369	RC3 PYRO	P7
	3370	HEAT L3	OFF

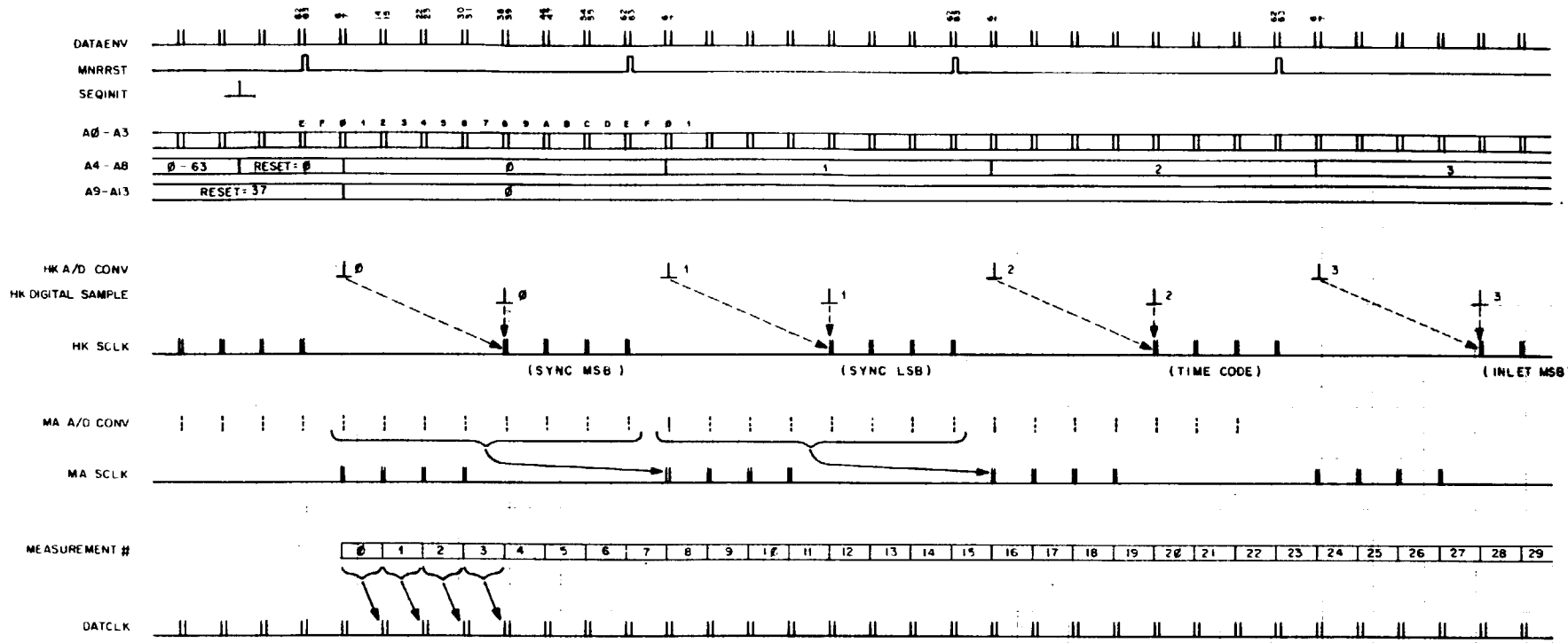
END OF FILE:PROMSO.TXT

ENGINEER PINKUS/ MAURER	DRAFTSMAN TS 5-14-79	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	PROM INLET TIMING FUNCTION GNMS	6-6-79
	B-E 5300	DATE

LAST USED R C D L

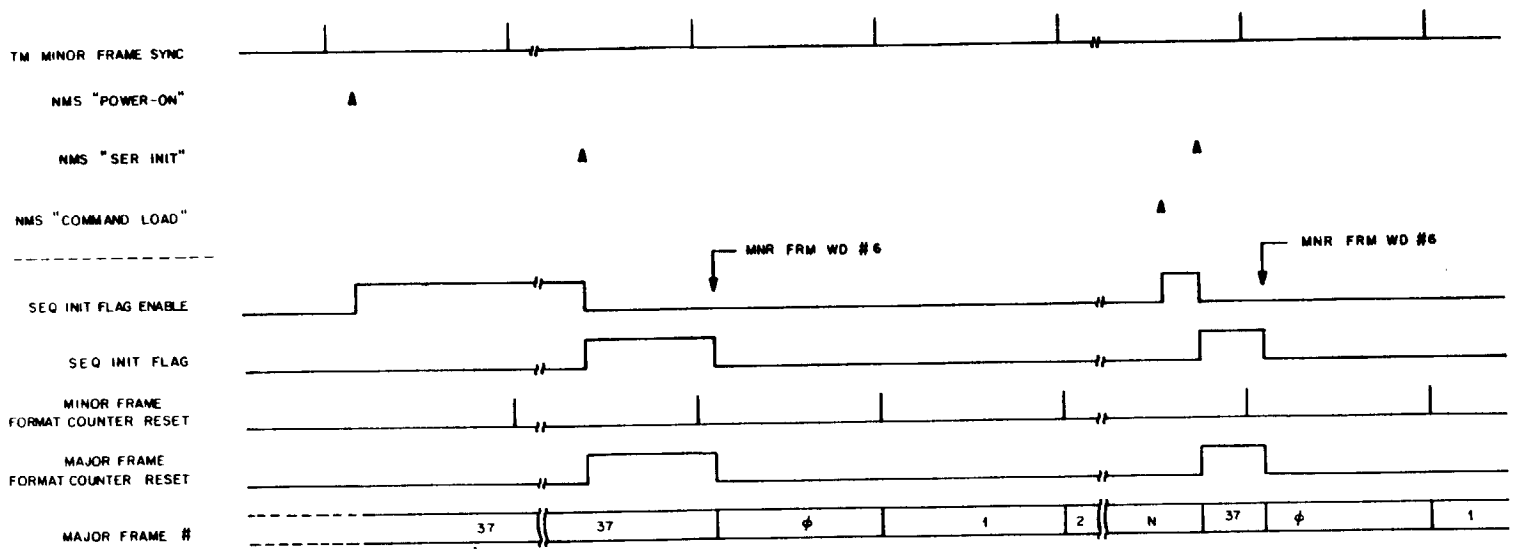
OCT 2 2 1982

17.12



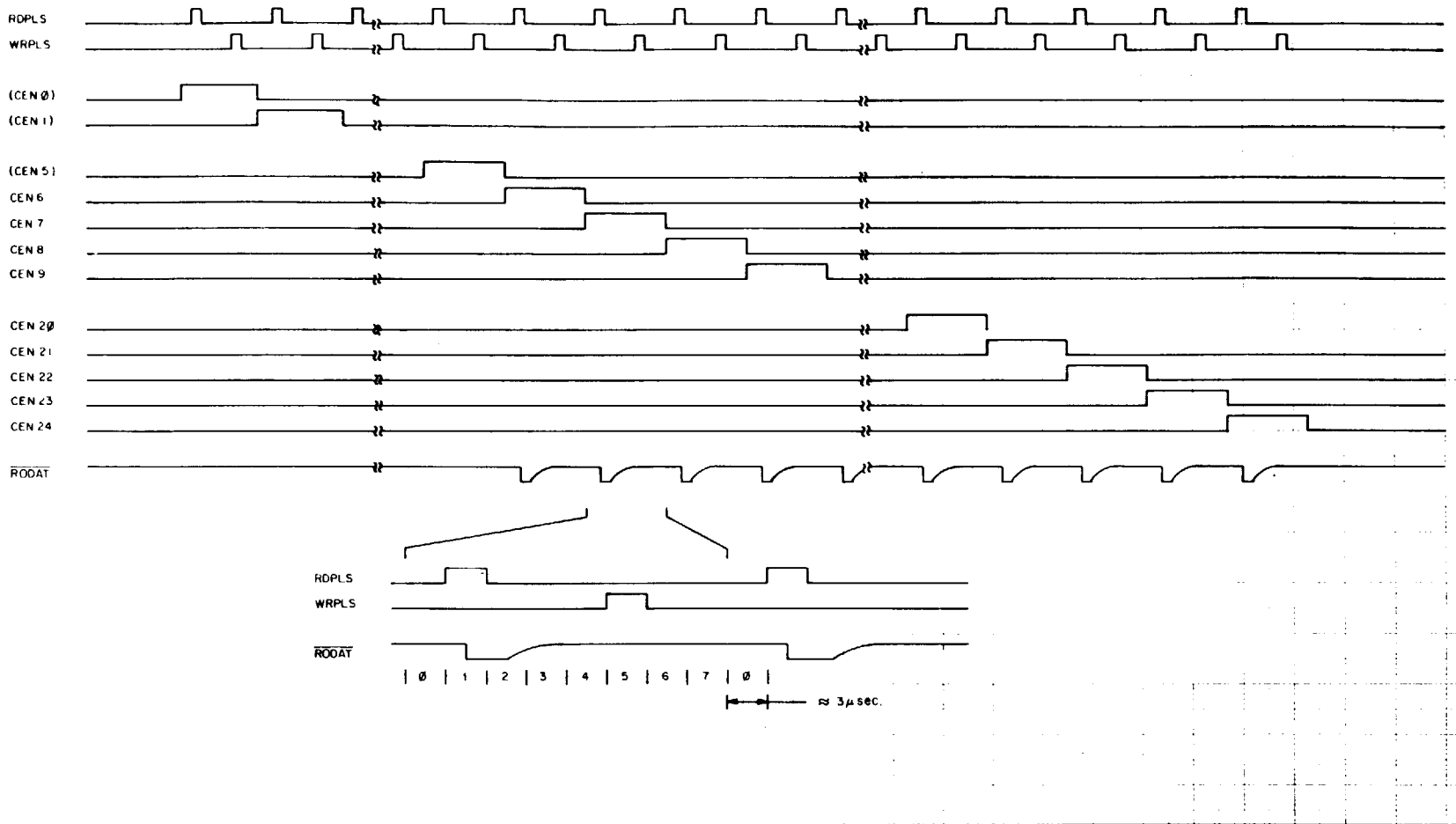
W.H.PINKUS	B.T 10/22/80
	TELEMETRY DATA FORMAT ASSEMBLY TIMING RELATIONSHIPS GALILEO – NMS
	B-E6319

OCT 22 1982 17.13



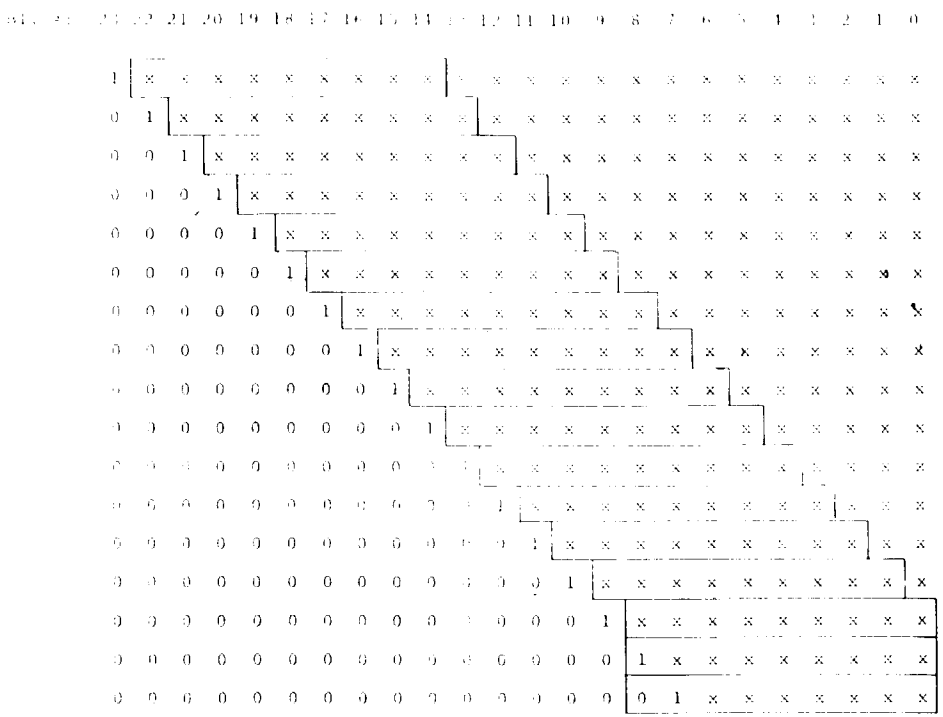
W. H. PINKUS 9/24/80		B T 10/21/80	
		PROGRAM COUNTER TIMELINE	
		GALILEO – NMS	10/24/80
		B-E 5043A	

OCT 22 1982 17.14



W.H.PINKUS	B.T. 12/4/80
SPACE PHYSICS RESEARCH LABORATORY ENGINEERING MICHIGAN MICHIGAN	H15 CORE MEMORY TIMING DIAGRAM GALILEO-NMS
	B-E6388

OCT 22 1982 17.15



EXPONENT				FRACTION									
3	2	1	0	(9)	8	7	6	5	4	3	2	1	0
1	1	1	1	(1)	22	21	20	19	18	17	16	15	14
1	1	1	0	(1)	21	20	19	18	17	16	15	14	13
1	1	0	1	(1)	20	19	18	17	16	15	14	13	12
1	1	0	0	(1)	19	18	17	16	15	14	13	12	11
1	0	1	1	(1)	18	17	16	15	14	13	12	11	10
1	0	1	0	(1)	17	16	15	14	13	12	11	10	9
1	0	0	1	(1)	16	15	14	13	12	11	10	9	8
1	0	0	0	(1)	15	14	13	12	11	10	9	8	7
0	1	1	1	(1)	14	13	12	11	10	9	8	7	6
0	1	1	0	(1)	13	12	11	10	9	8	7	6	5
0	1	0	1	(1)	12	11	10	9	8	7	6	5	4
0	1	0	0	(1)	11	10	9	8	7	6	5	4	3
0	0	1	1	(1)	10	9	8	7	6	5	4	3	2
0	0	1	0	(1)	9	8	7	6	5	4	3	2	1
0	0	0	1	(1)	8	7	6	5	4	3	2	1	0
0	0	0	0	(0)	8	7	6	5	4	3	2	1	0
0	0	0	0	(0)	8	7	6	5	4	3	2	1	0

DECODING TRANSFER FUNCTION

IF E = 0: $V = F - 1 \pm 0.5$

IF E ≠ 0: $V = (F + 512.5 \pm 0.5) \times 2^{(E-1)} - 1$

WHERE: E - EXPONENT
F = FRACTION
V = RECONSTRUCTION OF THE ORIGINAL ACCUMULATED SUM.

ENGINEER W H PINKUS	DRAFTSMAN CRR 5/15/78	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	FLOATING - POINT CONVERSION TABLE DATA PROCESSING LOGIC GALILEO - NMS	6-16-82 9-20-78
	B- E 4513	DATE

USER CODE

OCT 22 1982

FILE:GCOMM.TXT SJ 2 E4989 PG 17.2 1-15-79 JM

GNMS COMMUTATOR ASSIGNMENTS

1.	PWR MON	+29 CURRENT
2.	ANAMASS	V CONTROL
3.	MULTANA	MULTIPLIER ANALOG OUTPUT
4.	EMIS 1	2.5V OFF, +5 GUN, 0 TARGET
5.	EMIS 2	2.5V OFF, +5 GUN, 0 TARGET
6.	REP MON	1 UA/V 5VOLT FULL SCALE
7.	ACC MON	1 UA/V
8.	HV MON	0 TO 5 VOLTS
9.	FIL I	FIL 1 CURRENT (PRI)
10.	FIL 2	FIL 2 CURRENT (PRI)
11.	T1 BIAS	FB OF 30V OUT
12.	T2 BIAS	FB OF 70V OUT
13.	T3 BIAS	FB OF 70V OUT
14.	T4 BIAS	FB OF -350V OUT
15.	OSC AGC	RF OSC AGC VOLTAGE
16.	PUMP I	ION PUMP CURRENT (PRESSURE)
17.	OSC TMP	OSC TRANSFORMER TEMPERATURE
18.	ELEC TMP	TYPICAL ELECTRONICS TEMPERATURE
19.	CELL 1 TMP	
20.	CELL 2 TMP	
21.	CELL 3 TMP	
22.	LEAK 1 TMP	
23.	LEAK 2 TMP	
24.	SHELL PRS	
25.	H2 PRS	
26.	HE PRS	
27.	TERM PRS	THERMISTOR PRESSURE GAGE
28.	RF FREQ	RF COUNT FROM OSC
29.	CMND STAT	
30.	PGM STEP	SEQUENCE STEP
31.	VALVE STAT	VALVE STATUS
32.	HEATER	HEATER STATUS

ENGINEER J MAUER 1/15/79	DRAFTSMAN KS 1/16/79		
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	COMMUTATOR ASSIGNMENTS GALILEO NMS		
	B-E 4989	DATE	

LAST USED R C D L

OCT 2 2 1982

DEVICE	AREA	
CD4001	.023	x4
CD4002	.024	
CD4008	.032	
CD4011	.026	x4
CD4012	.026	
CD4013		x2
CD4016	.023	
CD4019	.027	
CD4021	.036	x
CD4024	.034	
CD4027	.027	
CD4028	.027	
CD4029	.030	
CD4035	.032	
CD4049	.029	x6
CD4051	.036	
CD4532	.032	
CD40109	.032	
2N2907	.010	
2N2222	.010	
SMALL D	.010	
2N4150	.050	
1N4148	.0055	
1N5610	.010	
HL-1000	.040	
HA2700	.027	
7641	.064	
54LS113	.034	
54S113	.034	
RESIST	.0055	
1750	.027	
200F	.009	

GNMS HYBRID PACKAGES (DISCRETE PARTS ... [illegible])
LOGIC HYBRID PACKAGE

			LOGIC AREA	HYBRID TOTAL AREA
H1		MAIN POWER SUPPLY		
3.1	4873	MAIN SUPPLY (CHASSIS) PG 1		
3.2	4874	MAIN SUPPLY (CHASSIS) PG 2	1.100	
3.3	4882	PUMP CURRENT MONITOR	[illegible]	1.4[illegible]
H2		FILAMENT SUPPLY		
4.1	4760A	EMIS 1 REGULATOR	.700	
4.2	4760B	EMIS 2 REGULATOR	.700	
4.3	4978	FILAMENT CONTROL LOGIC	.278	1.[illegible]
H3		BIAS SUPPLIES		
12.1	4987	BIAS SUPPLIES PG 1		
12.2	4988	BIAS SUPPLIES PG 2	1.120	1.120
H4		PYRO DRIVE		
10.12	5088	PYRO DRIVE CIRCUIT	1.666	
10.13	5089	PYRO DECODER LOGIC-1	.317	
10.14	5090	PYRO DECODER LOGIC-2	.393	2.376
H5		VALVE DRIVE		
10.5	5081	VALVE DRIVE CIRCUIT	1.725	1.725
H6		HEATER DRIVE (+2 VALVE DR)	.434	
10.7	5083	HEATER DRIVE CIRCUIT	.726	
10.8	5084	VALVE/HEATER DECODE-1	.373	
10.9	5085	VALVE/HEATER DECODE-2	.261	
10.10	5086	VALVE/HEATER DECODE-3	.207	2.011
H7		TIMING AND COUNTER LOGIC		
5.1	4976	INSTRUMENT TIMEBASES	.306	
5.2	4977	TIMEBASE DECODERS	.381	
5.3	4835	DIGITAL DATA OUTPUT CONTROL	.125	
5.4	4840	FORMAT & COLCULATOR TIMING	.219	
5.5	4833	COMPARATOR & ECL COUNTER	.652	
5.6	4834	TTL & CMOS COUNTERS	.480	
5.7	4856	FLOATING POINT CONVERTER	.239	
5.8	4836	DIGITAL DATA MULTIPLEXER	.084	2.485

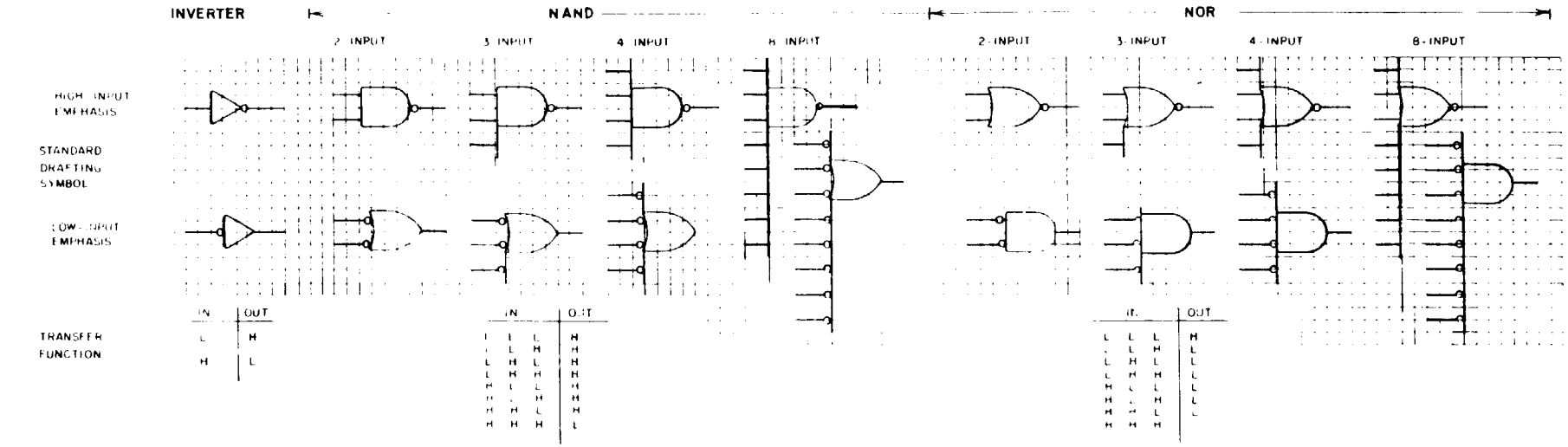
H8		ANALOG I/O		
6.1	4962	ANALOG MUX-1	.24[illegible]	
6.2	4975	ANALOG MUX-2	.52[illegible]	
6.3	4831	A/D TIMING	.248	
6.4	4967	ADC LADDER & COMPARATORS	.374	
6.5	4832	ADC DATA BUFFERS	.288	2.[illegible]
H9		COMMAND MEMORY		
7.1	4837	COMMAND INPUT	.289	
7.2	4838	COMMAND MEMORY CONTROL	.[illegible]	
7.3	4839	COMMAND BUFFER	.[illegible]	
7.4	4472	COMMAND MEMORY	1.473	2.4[illegible]
H10		PROGRAM MEMORY		
8.1	4467B	ROM ADDRESS DRIVE	.240	
8.2	4964A	PROGRAM MEMORY 1 OF 2	.991	
8.3	4965A	PROGRAM MEMORY 2 OF 2	.991	
8.4	4841A	PROGRAM WORD BUFFER	.273	2.495
H11		MASS CALCULATOR		
9.1	4842	MASS VALUE CALCULATOR-1	.482	
9.2	4843	MASS VALUE CALCULATOR-2	.515	
9.3	4844	MASS VALUE CALCULATOR-3	.335	
9.4	4969	MASS VALUE CALCULATOR-4	.128	
9.5	4845	CONTROL OUTPUTS	.178	
9.6	4979	MASS CALC FROM ADDRESS MUX	.275	
9.7	4990	BSH LENS SUPPLY	.225	2.1[illegible]
H12		ROD DC CONTROL		
12.1	4744A	ROD DC SUPPLY	.888	
12.2	4971	VDC D/A SWITCH CKTS	.864	1.752
H13		ROD AC CONTROL		
11.3	5073	DATA REGISTER	.433	
11.4	4972	VAC D/A SWITCH CKTS	.864	
11.5	4961	CONTROL AMPLIFIERS	.163	
11.6	4858	RF CAL COUNTER	.197	
11.7	4846	RF OSCILLATOR DRIVE CIRCUITRY	.065	1.7[illegible]
11.8	4847	RF OSCILLATOR SEC. & AGC (NO HYBRID PARTS)		
H14		PULSE AMPLIFIER		.8

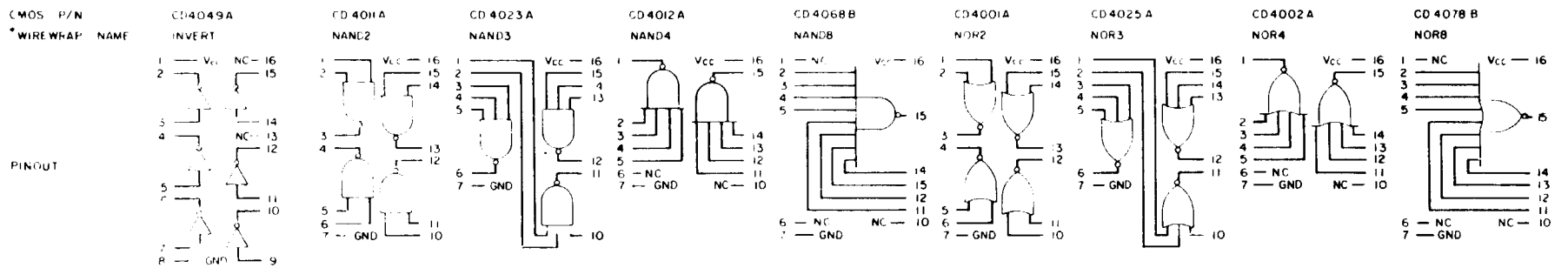
ENGINEER MAURER	DRAFTSMAN MAURER 2-18-79
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	HYBRID PACKAGES GNMS B-E5093

DATE

OCT 22 1982

18.3





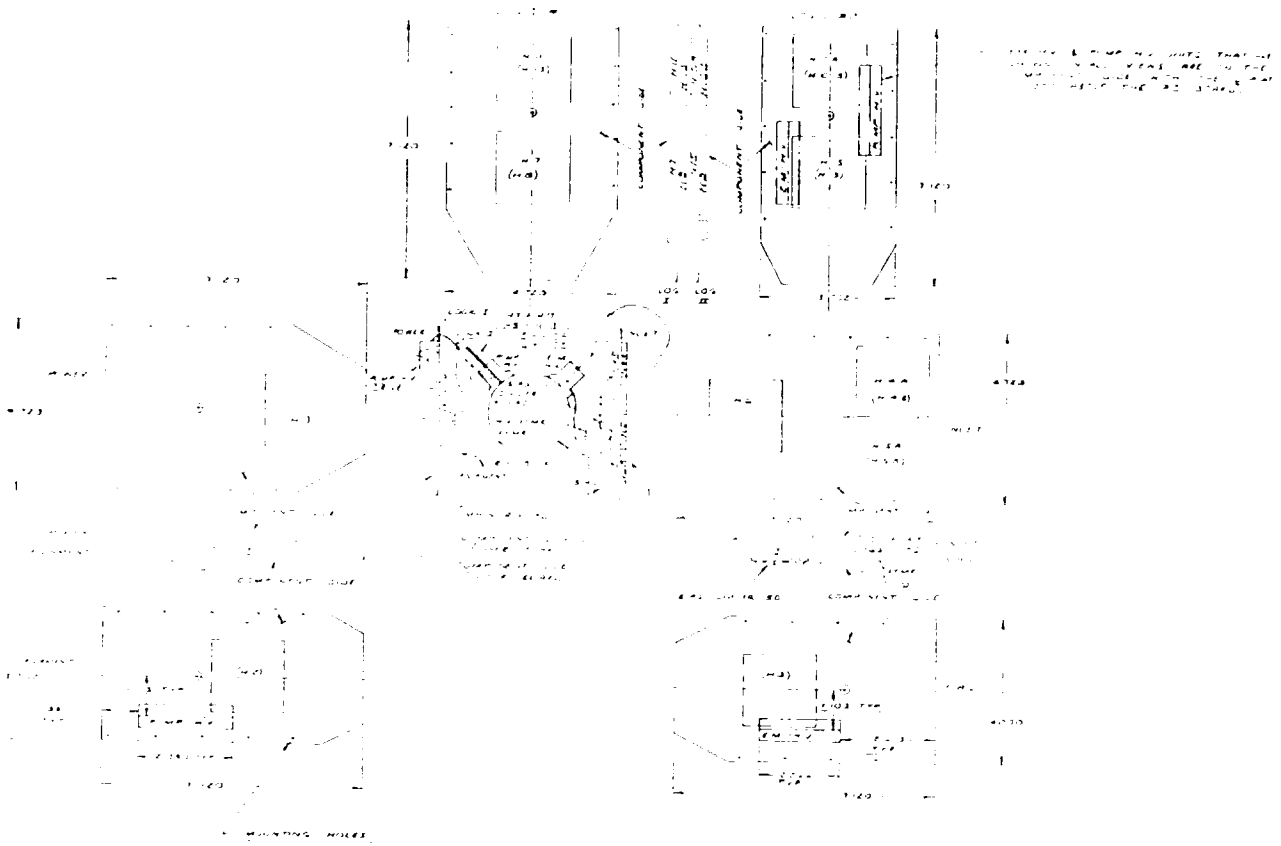
NOTE THIS DRAWING GENERALLY CONFORMS TO MIL STD 806C AND ANSI STD Y32.14 (1973)
THE "STANDARD DRAFTING SYMBOL" CONSISTS OF THE DISTINCTIVE SHAPE AND IS TAKEN FROM THE RAPIDESIGN #542 (HALF SIZE) TEMPLATE

ENGINEER W.H. PINKUS 12-8-77	DRAFTSMAN T.S. 3-17-79
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR MICHIGAN	CD 4000-SERIES GATES LOGIC DEVICE DESCRIPTIONS GALILEO
	B-E 5151

6/5/79 DATE

LAST USED R C D L

OCT 22 1982



ENGINEER J BLEDSOE / J MAURER	DRAFTSMAN G WIGGINS 12/10/80	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	PC BOARD RELATIONSHIPS GNMS	
	B-E6390	DATE

LAST USED R C D L

OCT 22 1982 18.5

FILE:MECH.CNT DISK:GNMS-1

MECHANICAL DWG INDEX 1/8/82

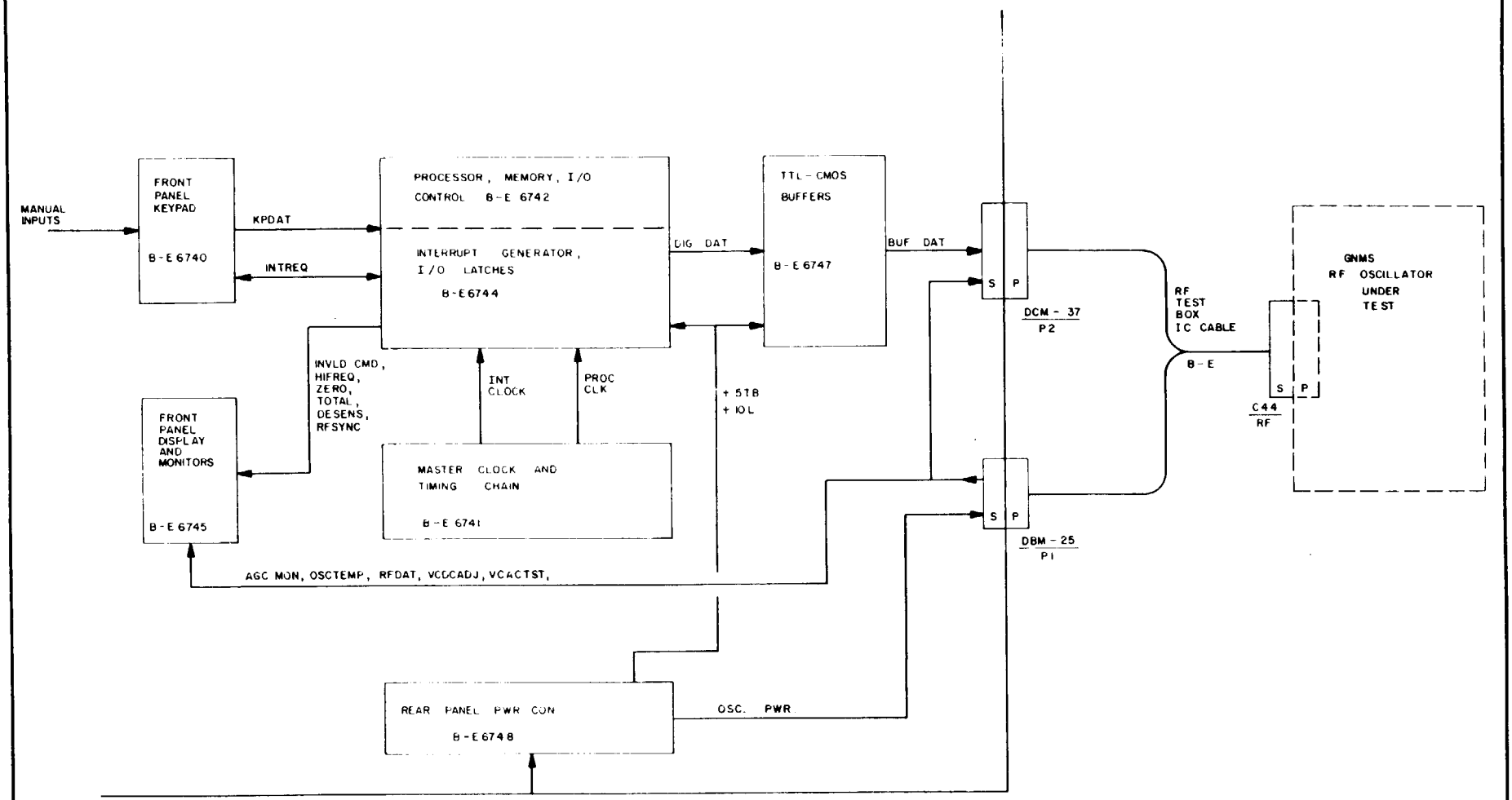
DWG	NAME
C-037-001	PRELIMINARY INLET PC BRD
C-037-002	PRELIMINARY LOGIC PC BRD
C-037-003	CLEARANCE CHECKER
C-037-004	WEB#1 CENTER TUBE
C-037-005	WEB #2 CENTER TUBE
C-037-006	WEB #3 CENTER TUBE
C-037-007	WEB #4 CENTER TUBE
D-037-008	MOCK-UP FIXTURE
C-037-009	RING SUPPORT
B-037-010	SUPPORT BLOCK
C-037-011	CENTER TUBE MODIFICATIONS
A-037-012	PC BOARD SPACERS
A-037-013	PLUG BRACKET SPACERS
B-037-014	PC BOARD PULSE AMP ASMB
A-037-015	SPACER - PA ASMB
A-037-016	PULSE AMP ASMB
C-037-017	T1 MAIN TRANS. POTTING MOLD
C-037-018	FABRICATION FIXTURE
C-037-019	PROFILE GAUGE/MAIN HARNESS
C-037-020	
C-037-021	
C-037-022	
C-037-023	
C-037-024	
B-037-025	

DWG NO.	NAME
D-037-100	ELECTRONIC HOUSING LAYOUT
C-037-101	LOGIC PC BOARD #1
C-037-102	LOGIC PC BOARD #2
C-037-103	RF PC BOARD
C-037-104	POWER SUPPLY PC BOARD
C-037-105	INLET PC BOARD
C-037-106	FILAMENT PC BOARD
C-037-107	BIAS PC BOARD
C-037-108	PLUG BRACKT
C-037-109	RF SHIELD
B-037-110	34 PIN PLUG BRACKET
C-037-111	FILTER MOUNTING BRACKET
A-037-112	BERYLLIUM HEAT SINK
D-037-113	R.F. ASSEMBLY
D-037-114	R.F. HOUSING
C-037-115	R.F. COVER
B-037-116	GROMMET FEEDTHRU #3
B-037-117	GROMMET FEEDTHRU #1 & #2
B-037-118	FEEDTHRU PLATE
A-037-119	SPACER - TANK P.C. BD
A-037-120	TRANSFORMER SLEEVE
B-037-121	RETAINER BOARD
B-037-122	MOUNTING BOSS
B-037-123	20 PIN PLUG BRACKET
B-037-124	SINGLE SOLID TURRET TERMINAL
A-037-125	TRANSFORMER TIE DOWN FIL SUP.
A-037-126	TRANSFORMER TIE DOUN DRIVER BD.
B-037-127	TRANSISTOR HEAT SINK-PUMP SUPPLY
B-037-128	CHOKE TIE DOUN L-2/LOU VOLT
B-037-129	CHOKE L-1 & L-3 TIE DOWN/LVPS
B-037-130	CHOKE L-4, L-5 & L-6 TIE DOWN
B-037-131	T2-TRANSFORMER TRAP
A-037-132	INSULATOR WASHER
B-037-133	TRANSISTOR HEAT SINK

ENGINEER	DRAFTSMAN	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	MECHANICAL INDEX GNMS B-E6315	DATE

LAST USED R C D L

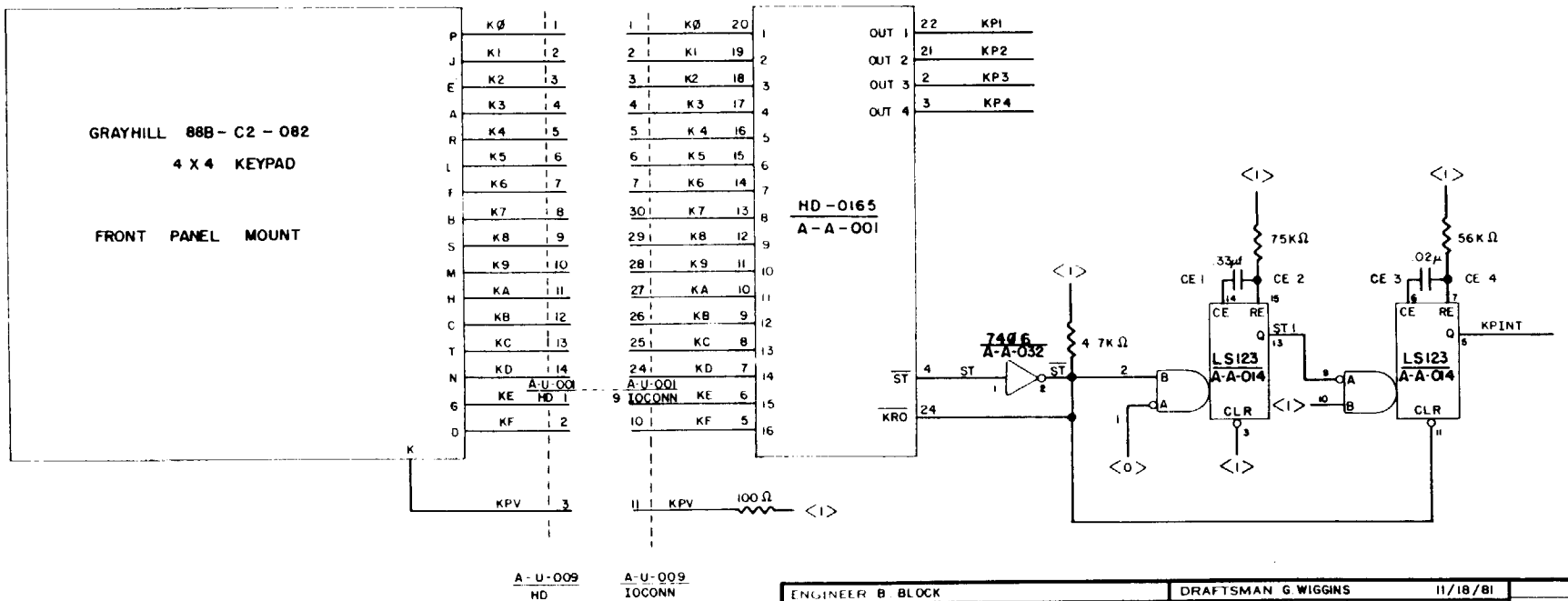
OCT 2 2 1982



ENGINEER BLOCK	DRAFTSMAN G. WIGGINS 11/17/81	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR MICHIGAN	BLOCK DIAGRAM R.F. OSC. TEST BOX GALILEO	
	B-E 6739	DATE

LAST USED R C D L

OCT 22 1982

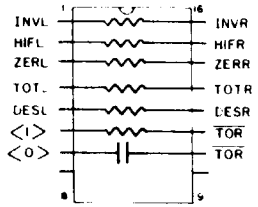


ENGINEER B. BLOCK	DRAFTSMAN G. WIGGINS 11/18/81
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	FRONT PANEL KEYPAD R.F. OSC. TEST BOX GALILEO
	B-E 6740

LAST USED R C D L

OCT 22 1982 19.2

DSCLED
A-A-040



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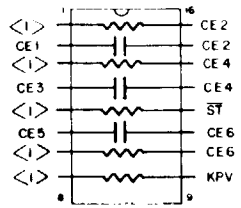
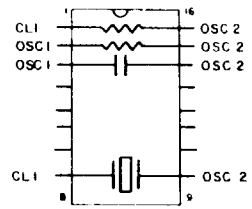
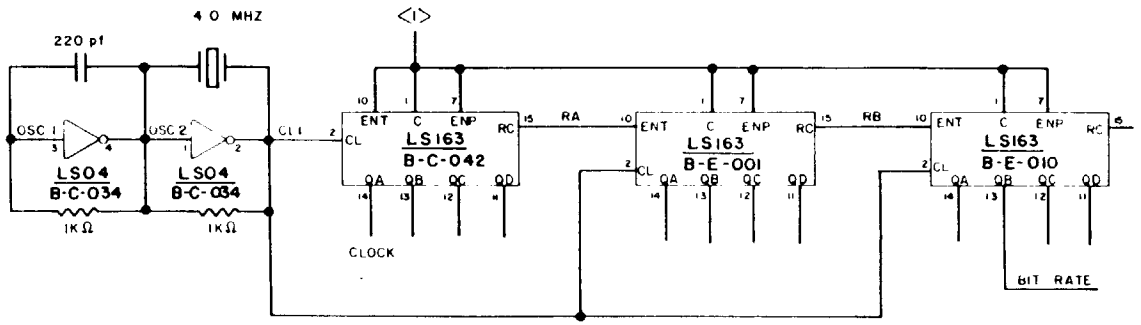
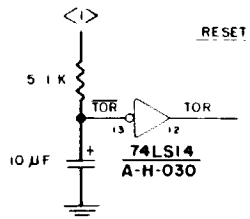
A-A-023



DSCXTL
B-E-019



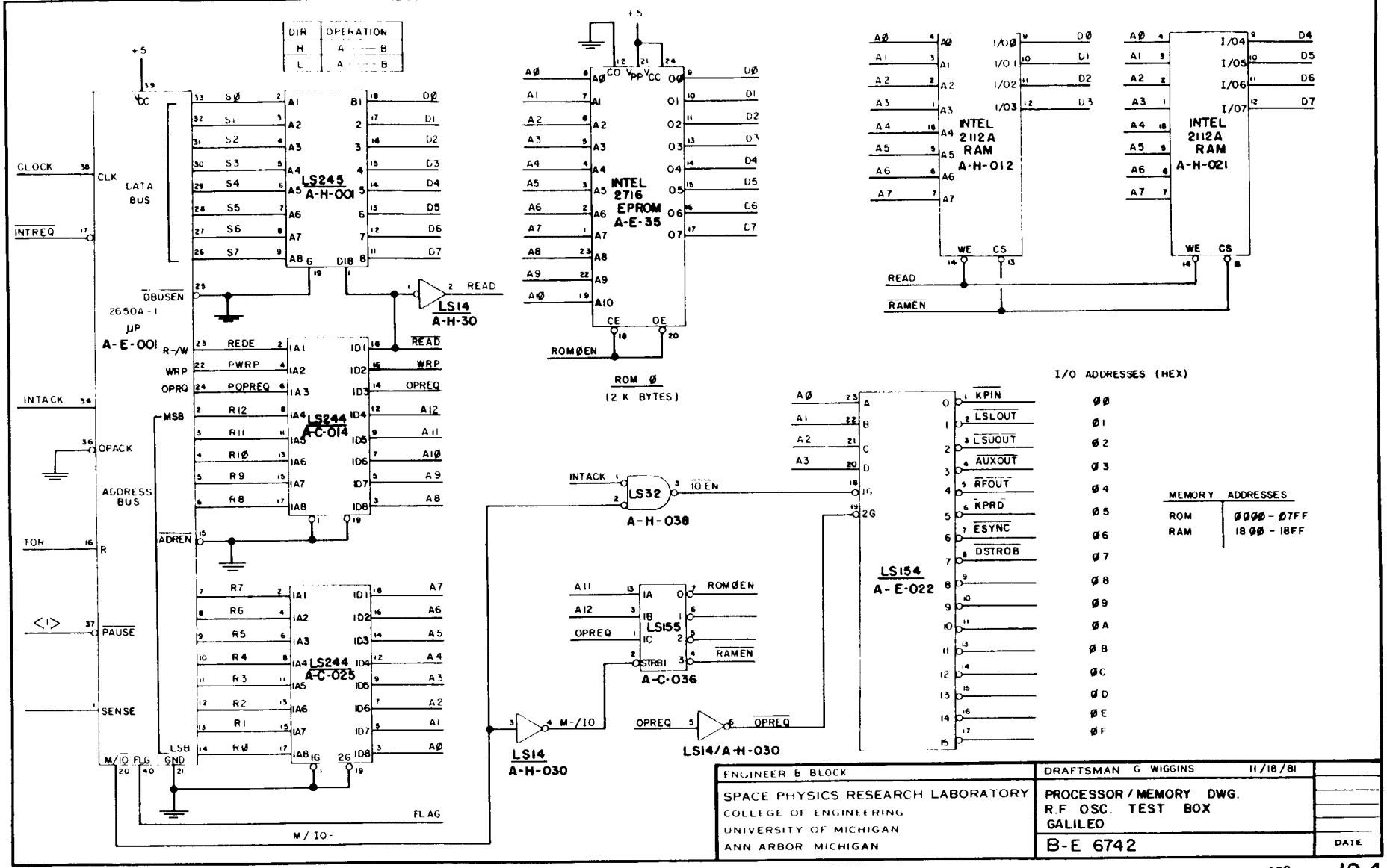


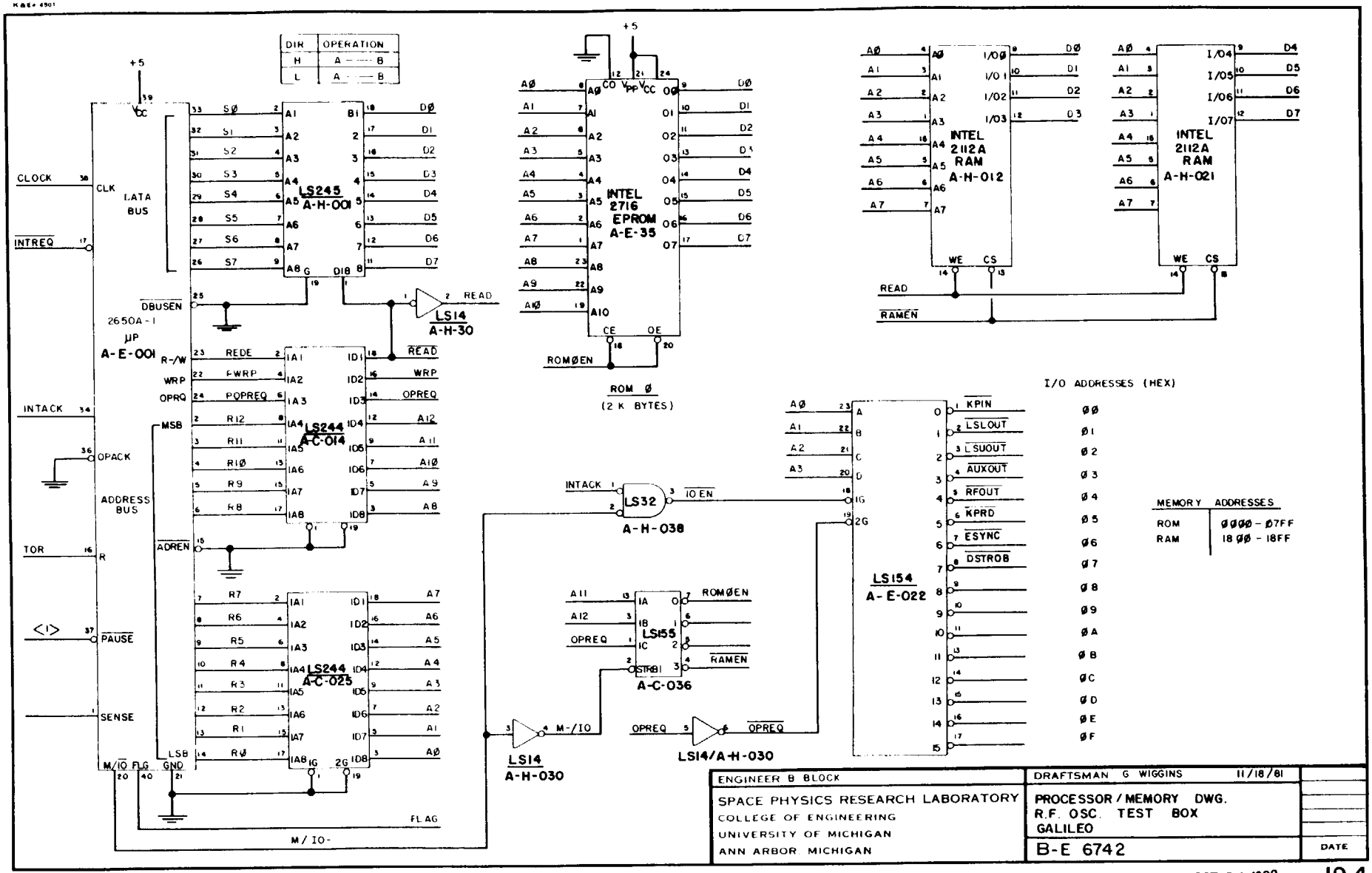


ENGINEER B BLOCK	DRAFTSMAN G WIGGINS 11/18/81	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR MICHIGAN	MASTER CLK. AND TIMING CHAIN RF OSC. TEST BOX GALILEO	
	B-E 6741	DATE

LAST USED R C D L

OCT 22 1982 19.3

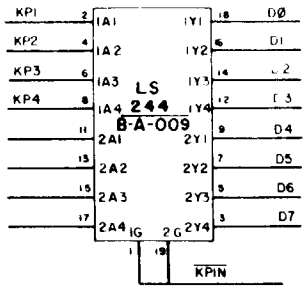

DIR
OPERATION
H
A → B
L
A ← B
+5
CLOCK
INTREQ
INTACK
OPACK
ADDRESS BUS
TOR
<I>
PAUSE
SENSE
M/IO FLG
GND
DATA BUS
CLK
R
LSB
MSB
LS245
A-H-001
DBUSEN
8650A-1
μP
A-E-001
R-/W
WRP
OPRQ
REDE
PWRP
POPREQ
R12
R11
R10
R9
R8
ADREN
LS244
A-C-014
R7
R6
R5
R4
R3
R2
R1
R0
LS244
A-C-025
FLAG
M/IO-
LS14
A-H-030
READ
INTEL
2716
EPROM
A-E-35
ROMØEN
ROM Ø
(2 K BYTES)
INTEL
2112A
RAM
A-H-012
INTEL
2112A
RAM
A-H-021
WE
CS
RAMEN
INTACK
LS32
A-H-038
IOEN
LS14/A-H-030
OPREQ
LS155
A-C-036
LS154
A-E-022
KPIN
LSLOUT
LSUOUT
AUXOUT
RFOUT
KPRD
ESYNC
DSTROB
I/O ADDRESSES (HEX)
MEMORY ADDRESSES
ROM ØØØØ - Ø7FF
RAM 18ØØ - 18FF
ENGINEER B BLOCK
SPACE PHYSICS RESEARCH LABORATORY
COLLEGE OF ENGINEERING
UNIVERSITY OF MICHIGAN
ANN ARBOR MICHIGAN
DRAFTSMAN G WIGGINS 11/18/81
PROCESSOR / MEMORY DWG.
R.F OSC. TEST BOX
GALILEO
B-E 6742
DATE
LAST USED R C D L
OCT 22 1982
19.4

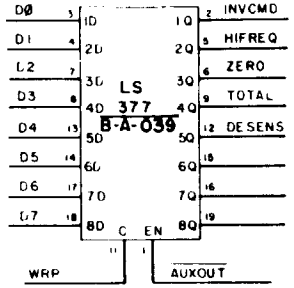


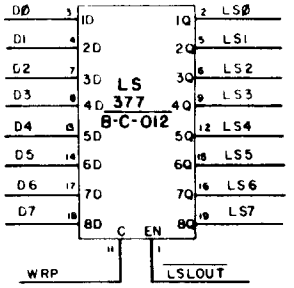
ENGINEER B BLOCK	DRAFTSMAN G WIGGINS 11/18/81
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR MICHIGAN	PROCESSOR / MEMORY DWG. R.F. OSC. TEST BOX GALILEO B-E 6742

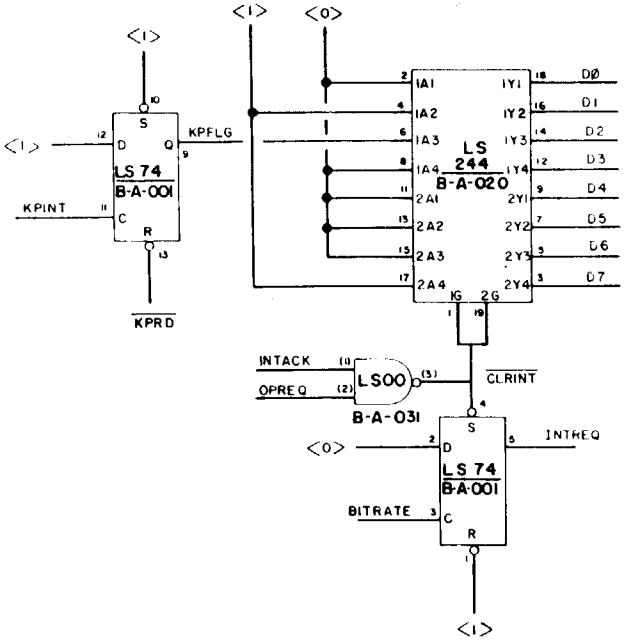
LAST USED R C D L

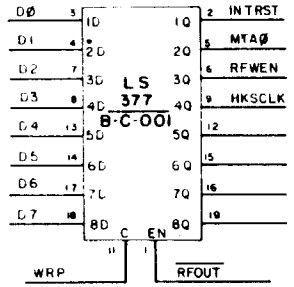
OCT 2 2 1982

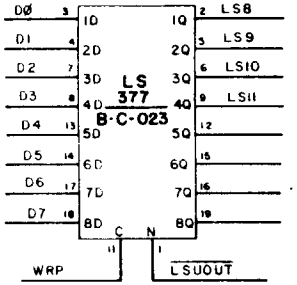








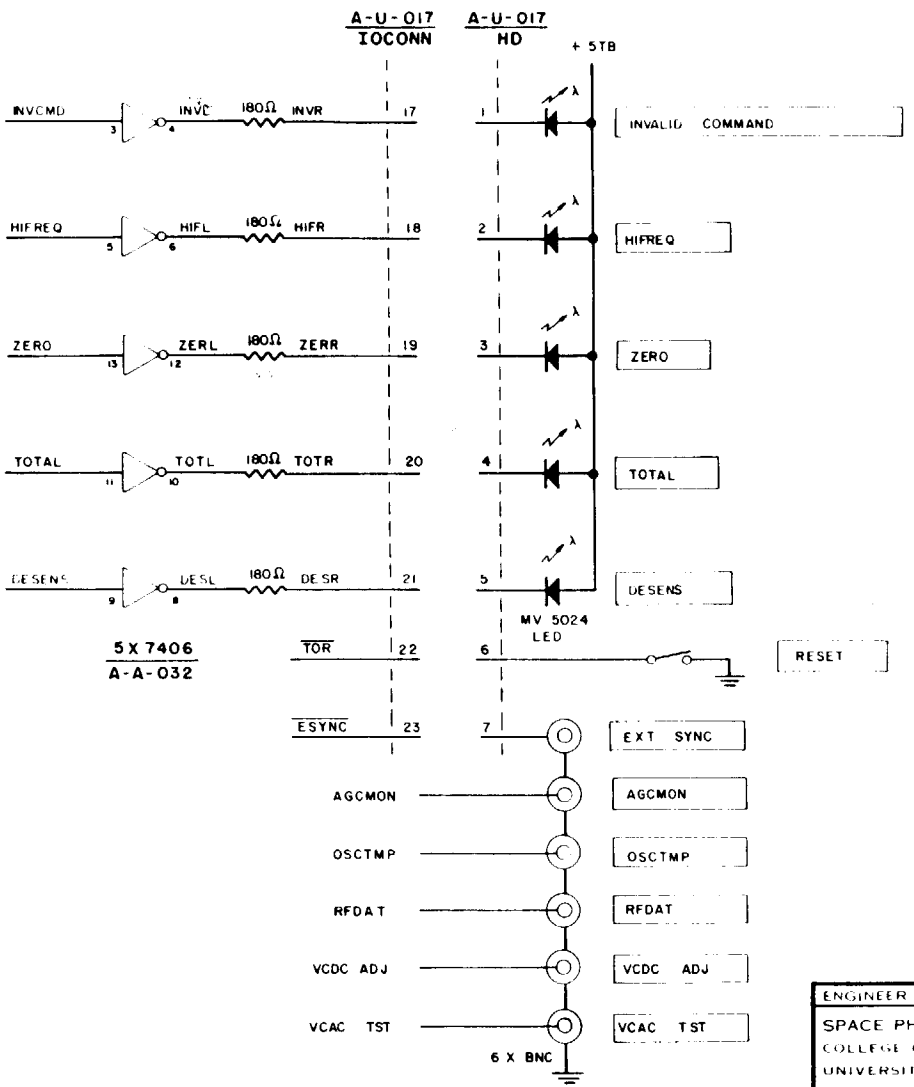




ENGINEER B BLOCK	DRAFTSMAN G WIGGINS 11/19/81	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	INTERUPPT GEN, I/O R.F. OSC. TEST BOX GALILEO	
	B-E 6744	DATE

LAST USED R C D L

OCT 22 1982

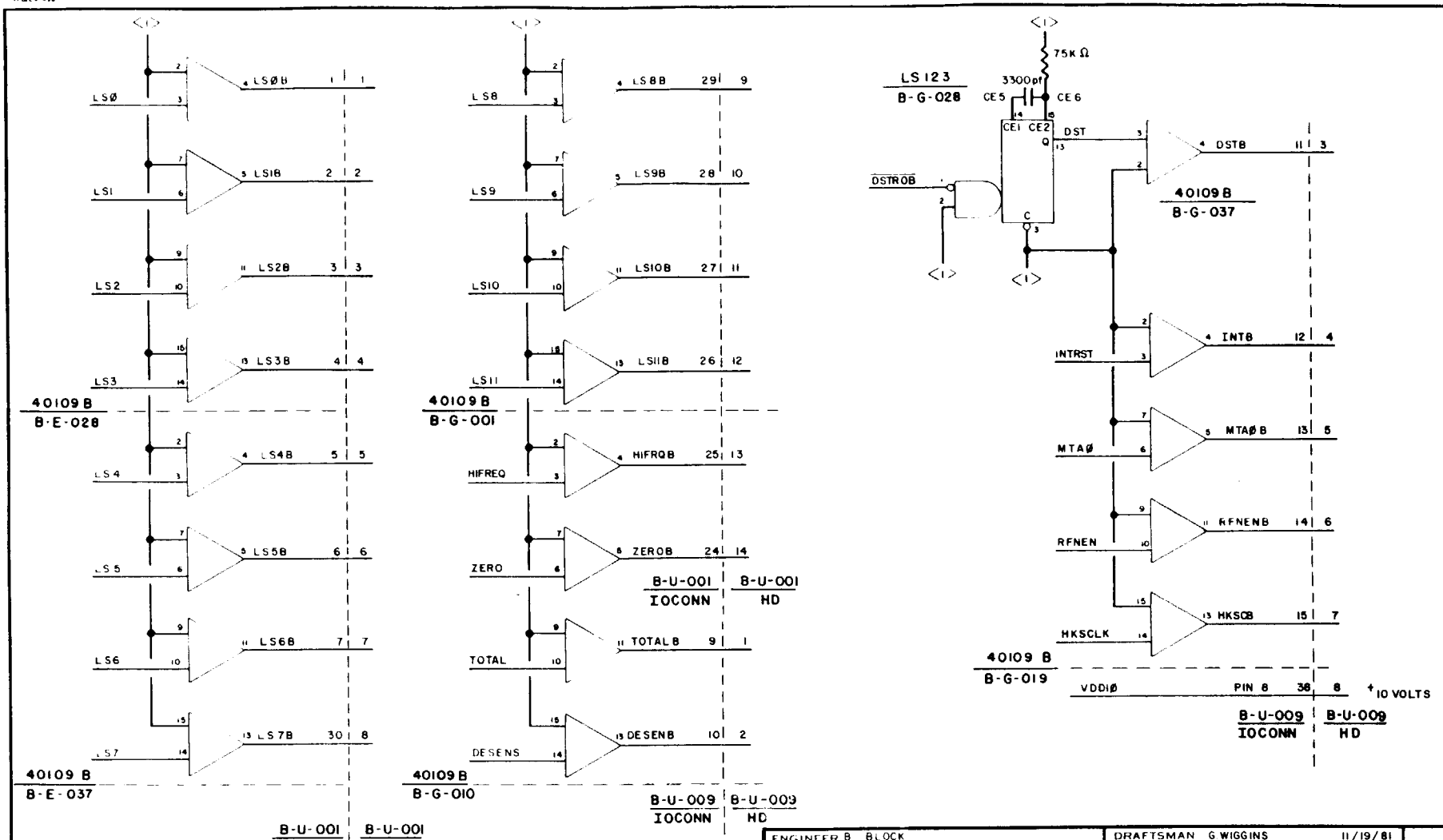


ENGINEER B BLOCK	DRAFTSMAN G WIGGINS 11/19/81	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR MICHIGAN	FRONT PANEL FUNCTIONS R.F. OSC. TEST BOX GALILEO	
	B-E 6745	DATE

LAST USED R C D L

OCT 22 1982

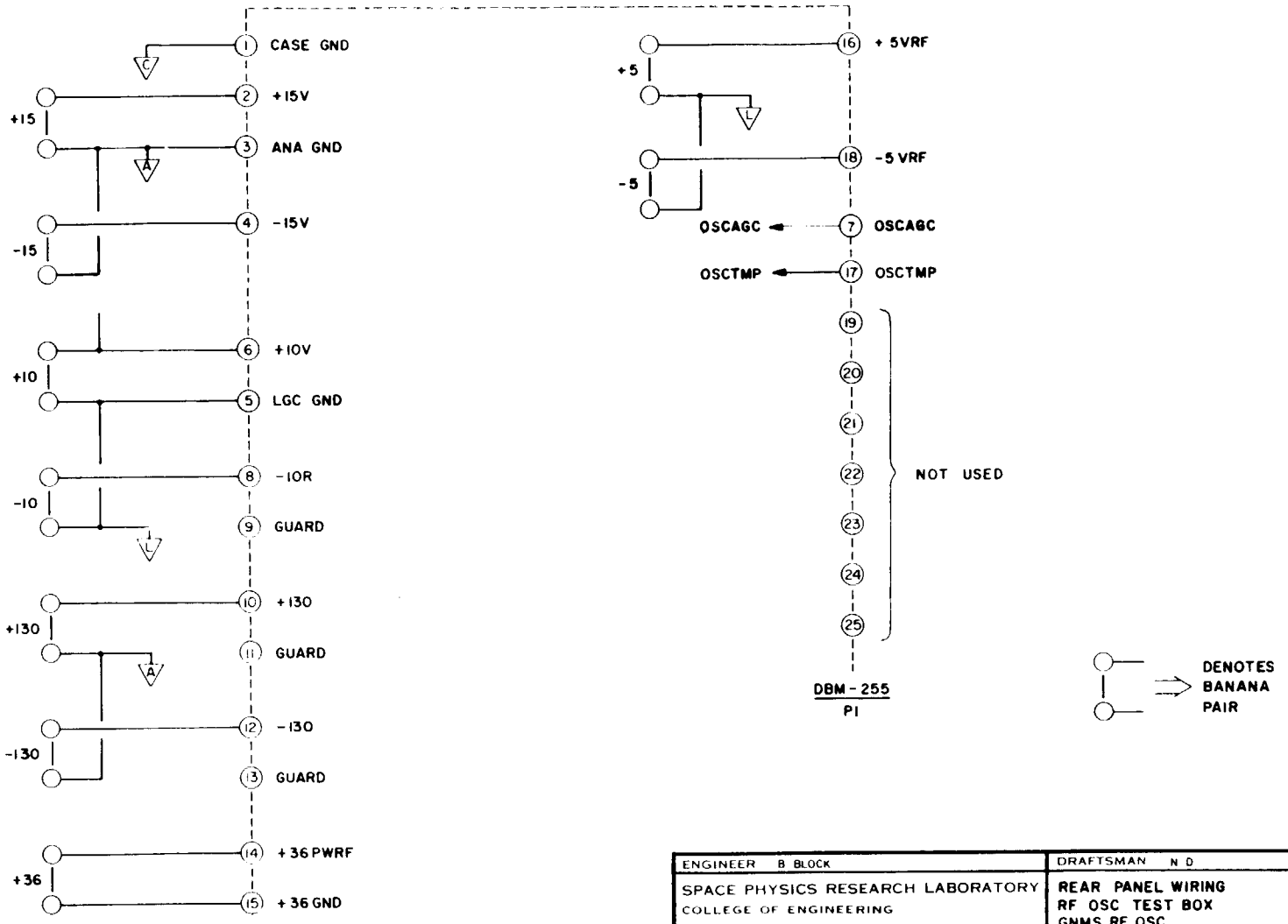
19.6



ENGINEER B BLOCK	DRAFTSMAN G WIGGINS 11/19/81
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR MICHIGAN	TTL - CMOS BUFFERS R.F. OSC. TEST BOX GALILEO
	B-E 6747

LAST USED F C D L

OCT 2 2 1982



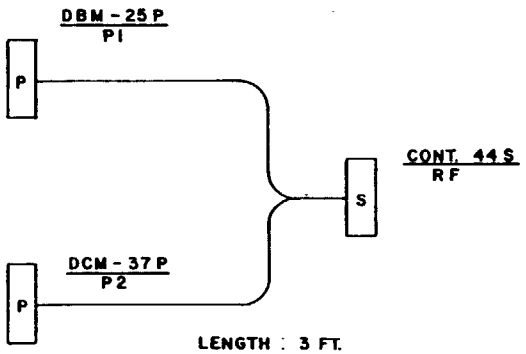
ENGINEER B BLOCK	DRAFTSMAN N D	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR MICHIGAN	REAR PANEL WIRING RF OSC TEST BOX GNMS RF OSC	11/13/81 DATE
	B-E 6748	

LAST USED R C D L

OCT 22 1982

SIGNAL NAME	TEST BOX P1 (DBM-25P)	RF OSCILLATOR RF (44S)
CASE	1	N/C
+15V	2	A
ANAGND	3	F
-15V	4	L
LGCGND	5	C
+10V	6	B
OSCACC	7	F
-10R	8	K
GUARD	9	N/C
+13O	10	YY
GUARD	11	N/C
-13O	12	ZZ
N/C	13	N/C
+36PWRF	14	H
+36GND	15	M
+5	16	S
OSCTMP	17	D
-5VRF	18	N
N/C	19	N/C
N/C	20	N/C
N/C	21	N/C
N/C	22	N/C
N/C	23	N/C
N/C	24	N/C
N/C	25	N/C

SIGNAL NAME	TEST BOX P2 (DCM-37P)	RF OSCILLATOR RF (44S)
LS0	1	U
LS1	2	V
LS2	3	W
LS3	4	X
LS4	5	Y
LS5	6	Z
LS6	7	AA
LS7	8	BB
LS8	9	CC
LS9	10	DD
LS10	11	EE
LS11	12	FF
N/C	13	N/C
DCSTR	14	HH
HIFREQ	15	JJ
ZERO	16	KK
TOTAL	17	LL
DESENS	18	MM
N/C	19	N/C
MTA0000	20	NN
INTRST	21	PP
RFWEN	22	RR
RFDAT	23	SS
HKSCLK	24	TT
N/C	25	N/C
VCDC ADJ	26	R
VCAC TST	27	T

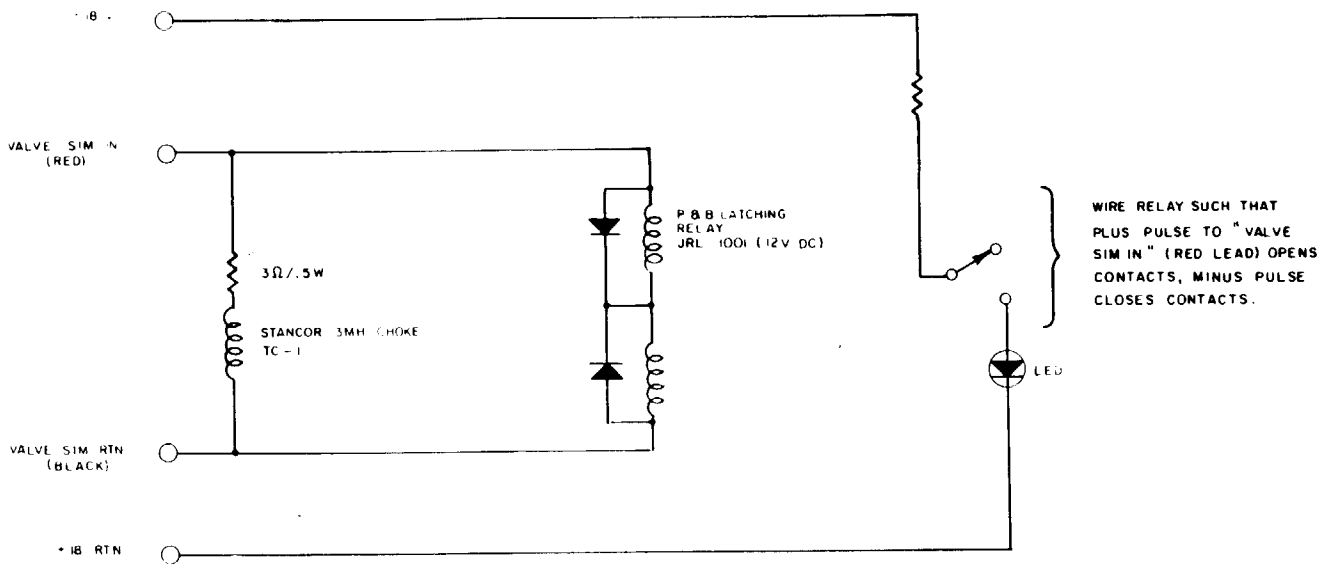


LENGTH : 3 FT.

ENGINEER B. BLOCK	DRAFTSMAN D.B.J.
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	RF IC CABLE RF OSC. TEST BOX GALILEO NMS B-E 6760
	1/8/82 DATE

LAST USED R C D L

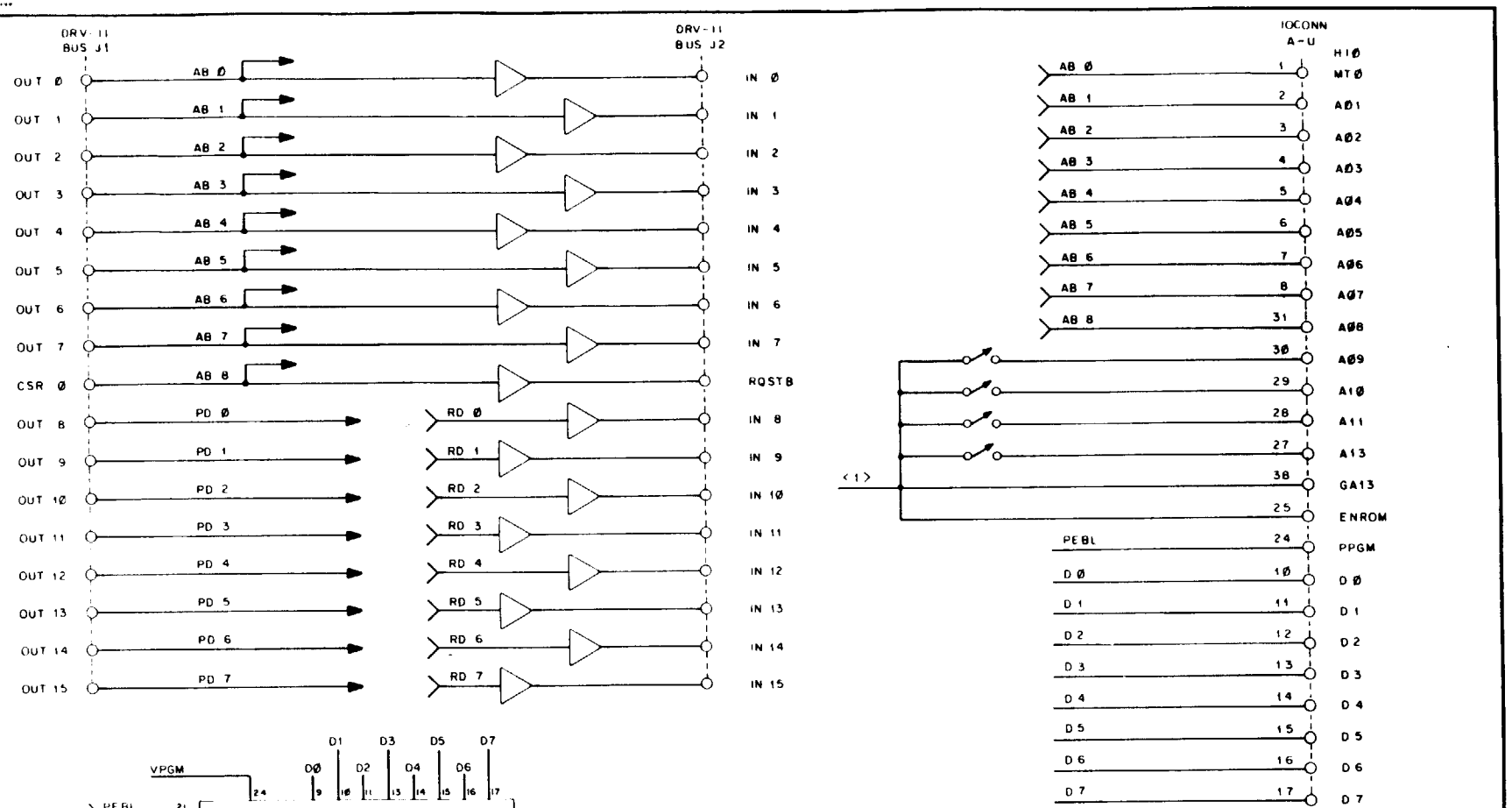
OCT 22 1982



ENGINEER CALDWELL / GALLAGHER 9/4/80	DRAFTSMAN AGK 9/4/80
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	GNMS VALVE SIMULATOR GNMS B-E 6281

LAST USED [illegible] C D L

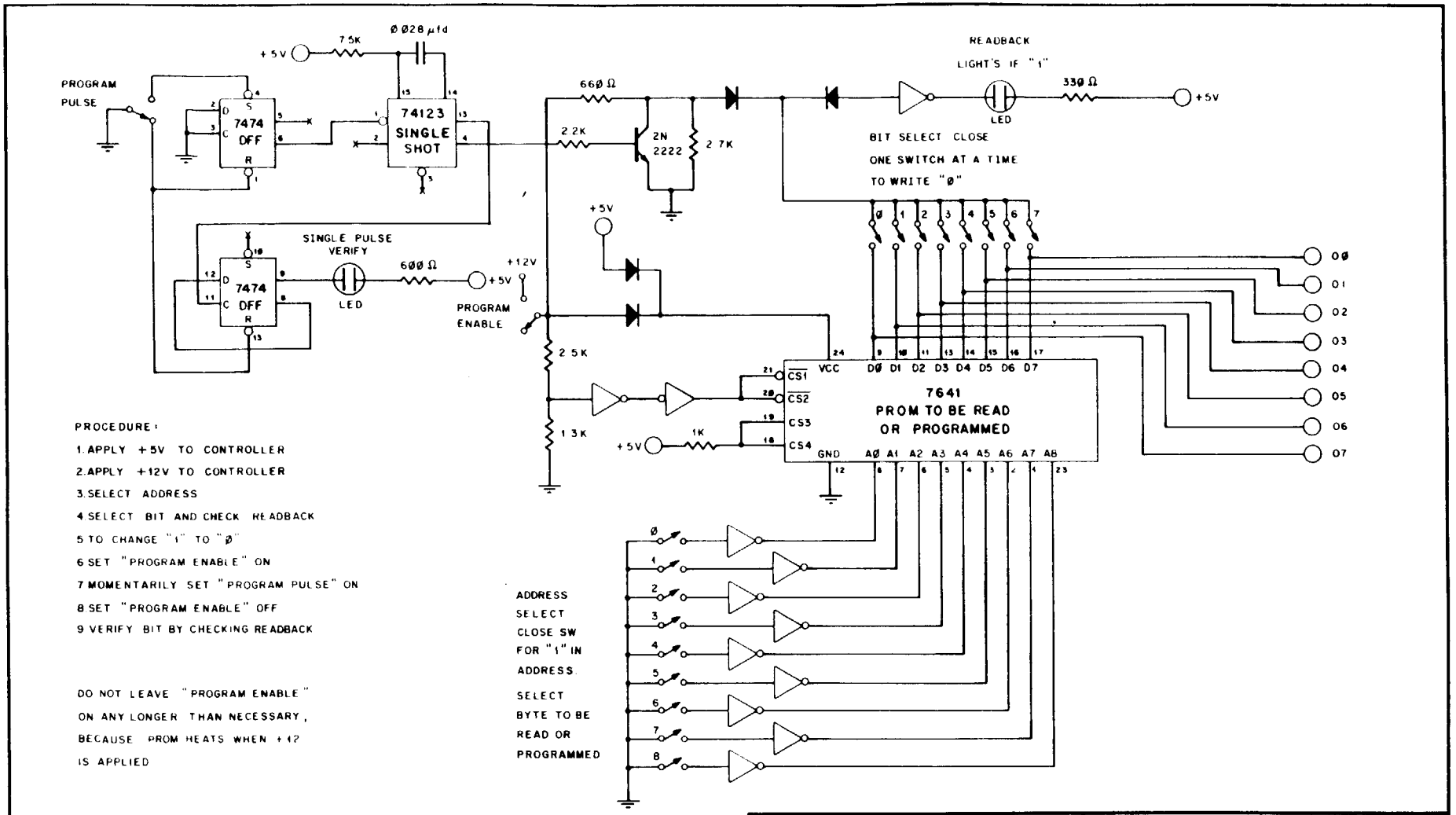
OCT 22 1982 19.10



ENGINEER B POTTER	DRAFTSMAN B.T 9/10/80
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	INTERFACES SEMI-MANUAL PROGRAMMER FOR 7641 PROM GALILEO NMS
	B-E6282 DATE

LAST USED R C D L

OCT 2 2 1982 19.11



PROCEDURE:

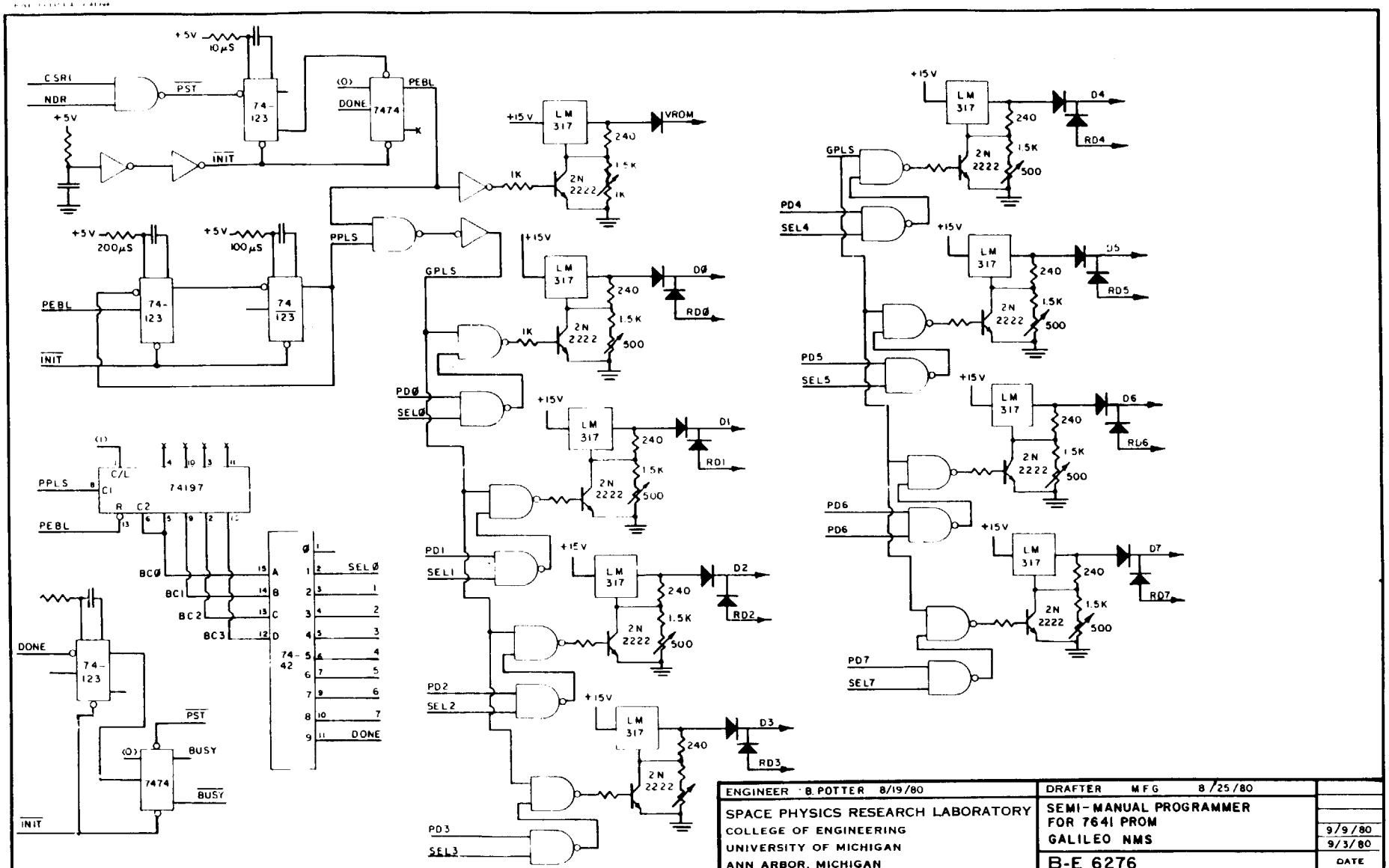
1. APPLY +5V TO CONTROLLER
2. APPLY +12V TO CONTROLLER
3. SELECT ADDRESS
4. SELECT BIT AND CHECK READBACK
5. TO CHANGE "1" TO "0"
6. SET "PROGRAM ENABLE" ON
7. MOMENTARILY SET "PROGRAM PULSE" ON
8. SET "PROGRAM ENABLE" OFF
9. VERIFY BIT BY CHECKING READBACK

DO NOT LEAVE "PROGRAM ENABLE" ON ANY LONGER THAN NECESSARY, BECAUSE PROM HEATS WHEN +12 IS APPLIED

ENGINEER W.H. POTTER	DRAFTSMAN B.T 8/6/80
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	MANUAL PROGRAMMER FOR TYPE 7641 PROM GALILEO - NMS B-E6272

LAST USED R C D L

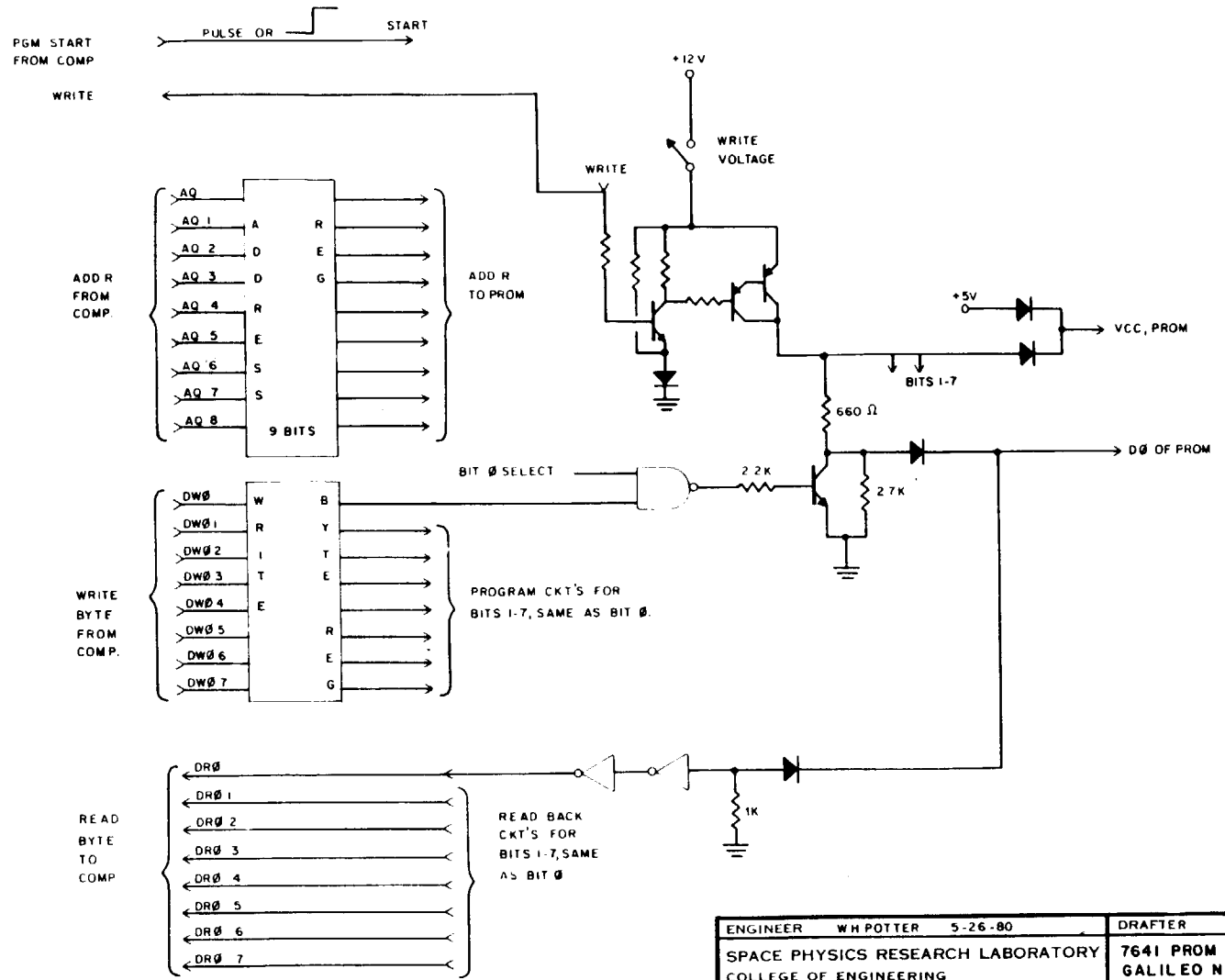
OCT 22 1982 19.12



ENGINEER B.POTTER 8/19/80	DRAFTER MFG 8/25/80	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	SEMI-MANUAL PROGRAMMER FOR 7641 PROM GALILEO NMS	9/9/80 9/3/80
	B-E 6276	DATE

LAST USED R C D L

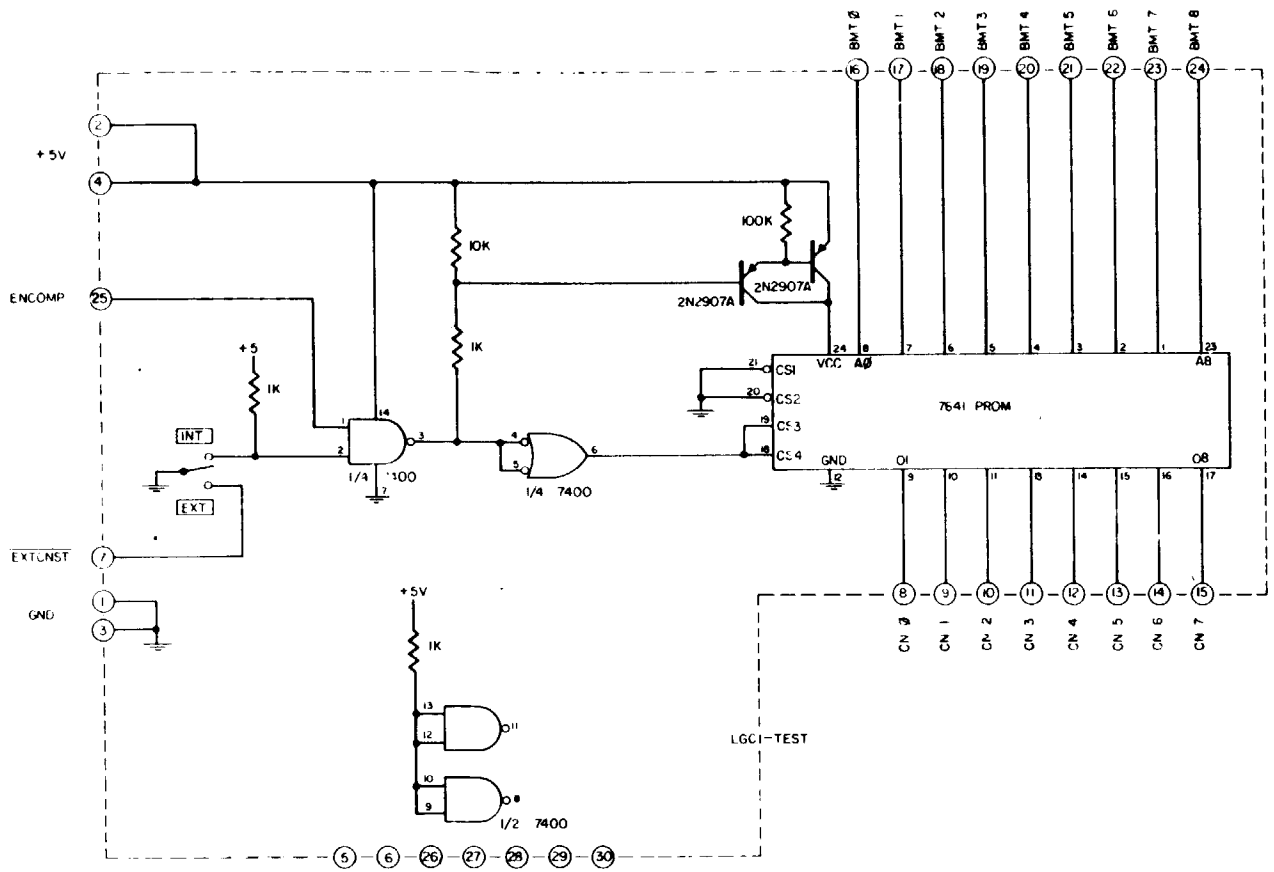
OCT 22 1982 19.13



ENGINEER WH POTTER 5-26-80	DRAFTER MFG 8-6-80	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	7641 PROM PROGRAMMER GALILEO NMS	
	B-E 6273	DATE

LAST USED R C D L

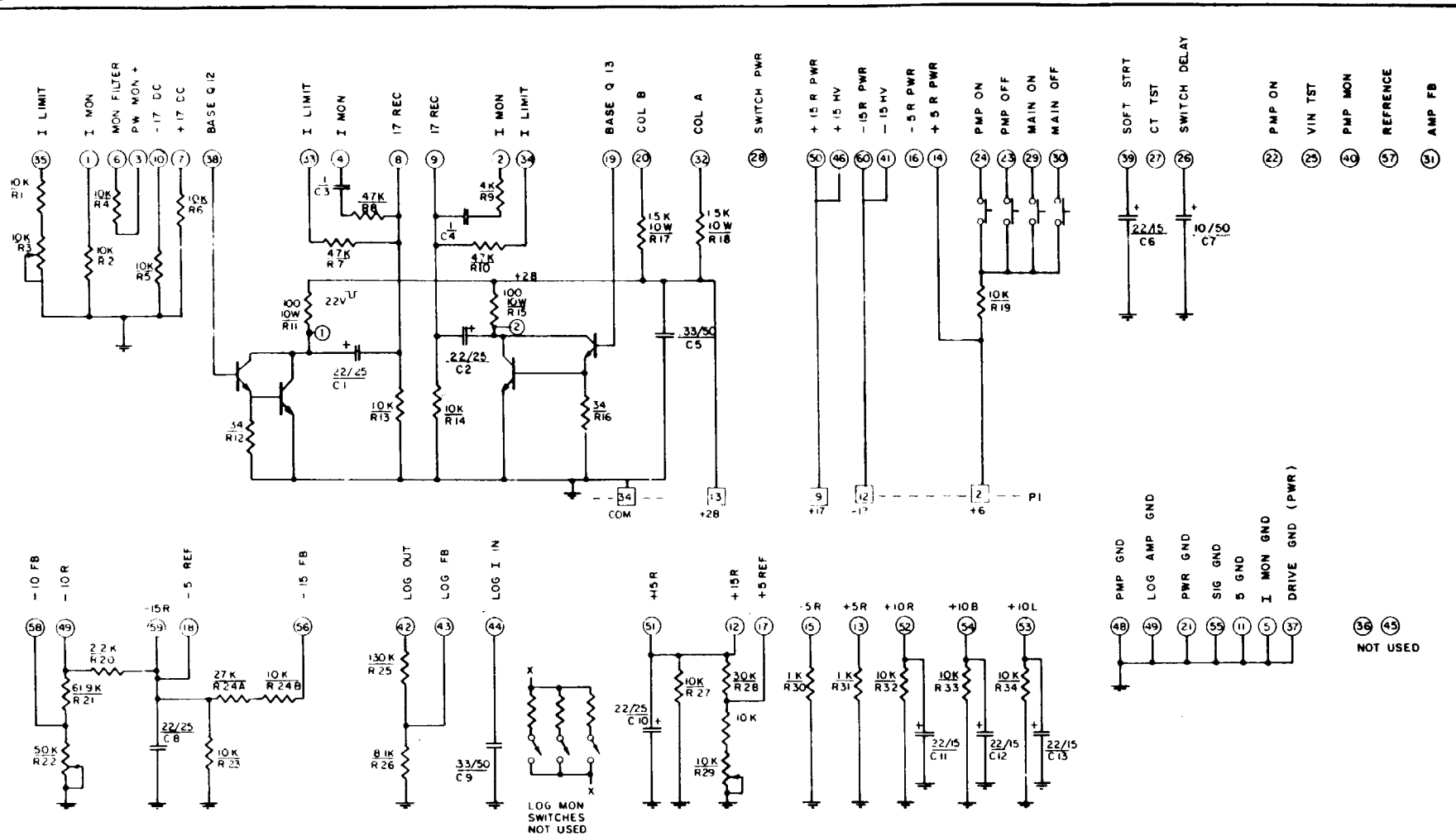
OCT 22 1982 19.14



ENGINEER W. PINKUS	DRAFTSMAN D.R. 4/15/81	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	CALCULATOR PROM H16 TEST JIG GALILEO NMS	
	B-E6490	DATE

LAST USED R C D L

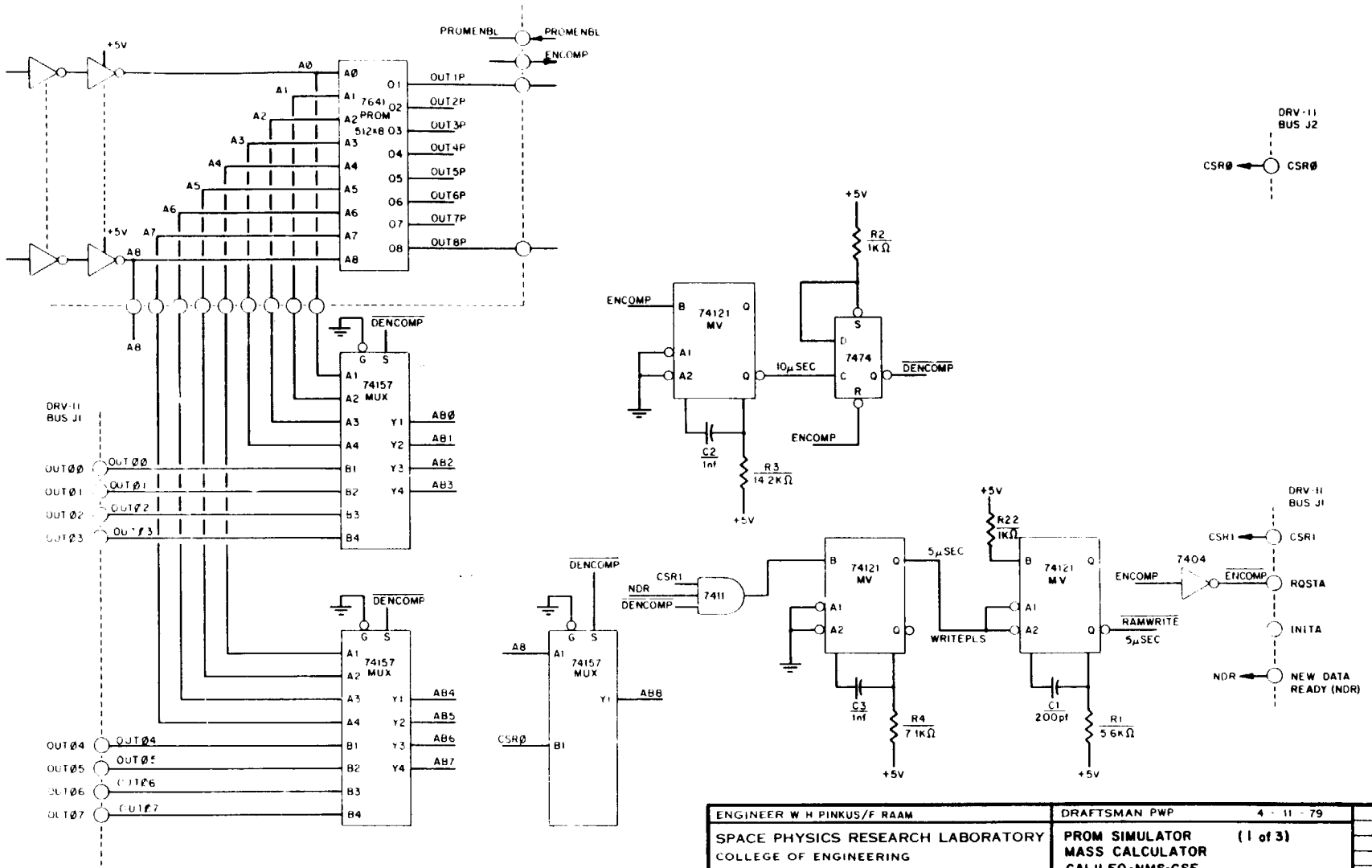
OCT 22 1982 19.16



ENGINEER J MAURER	DRAFTSMAN D JONES/G WIGGINS 1/14/82	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR MICHIGAN	REVISED TEST BOX HYBRID HI GNMS	
	B-E 6755	DATE

LAST USED R 34 C 13 D L

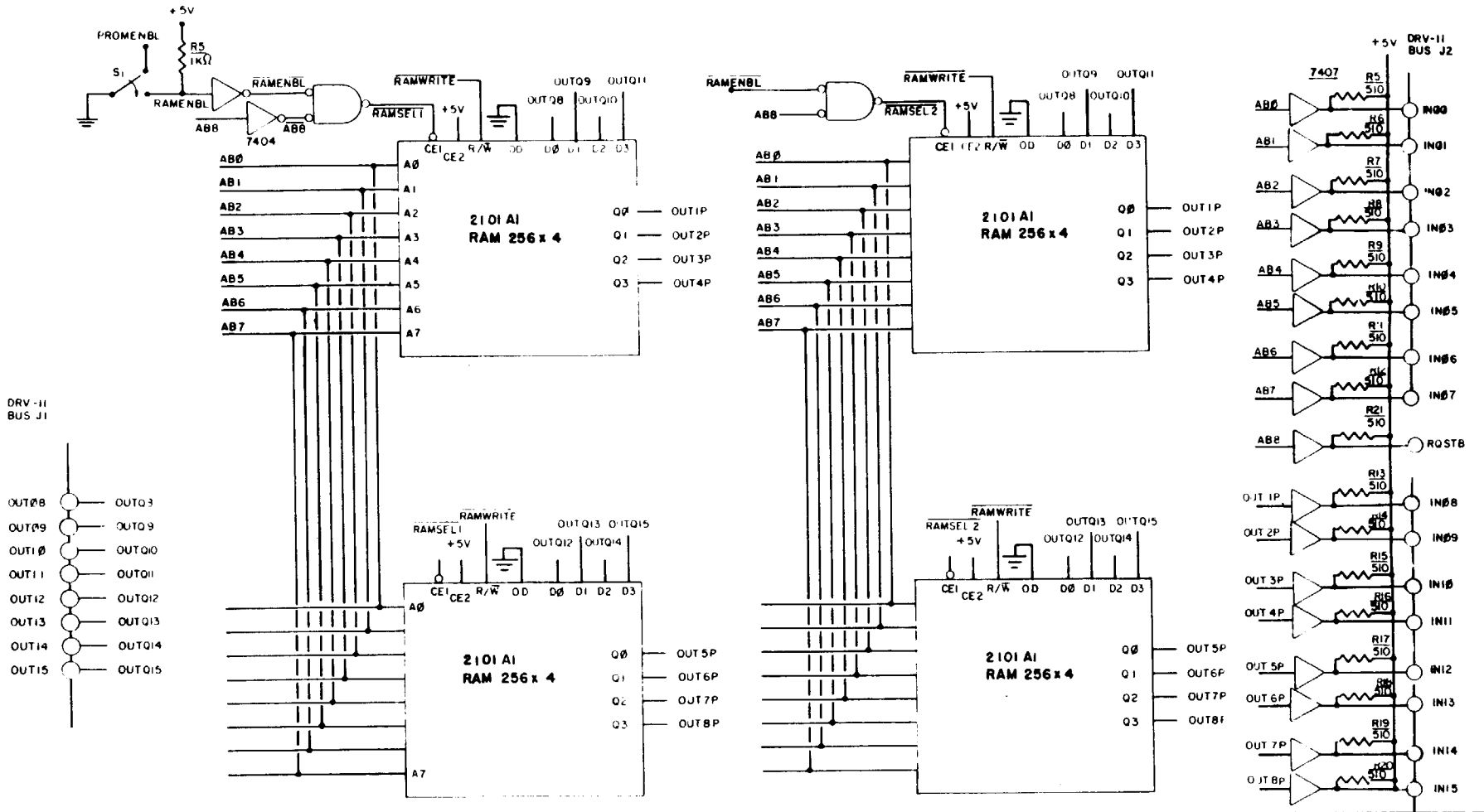
OCT 22 1982 19.17



ENGINEER W H PINKUS/F RAAM	DRAFTSMAN PWP 4 - 11 - 79	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	PROM SIMULATOR (1 of 3) MASS CALCULATOR GALILEO-NMS-GSE	5/18/79
	B-E5210	DATE

LAST USED R C D L

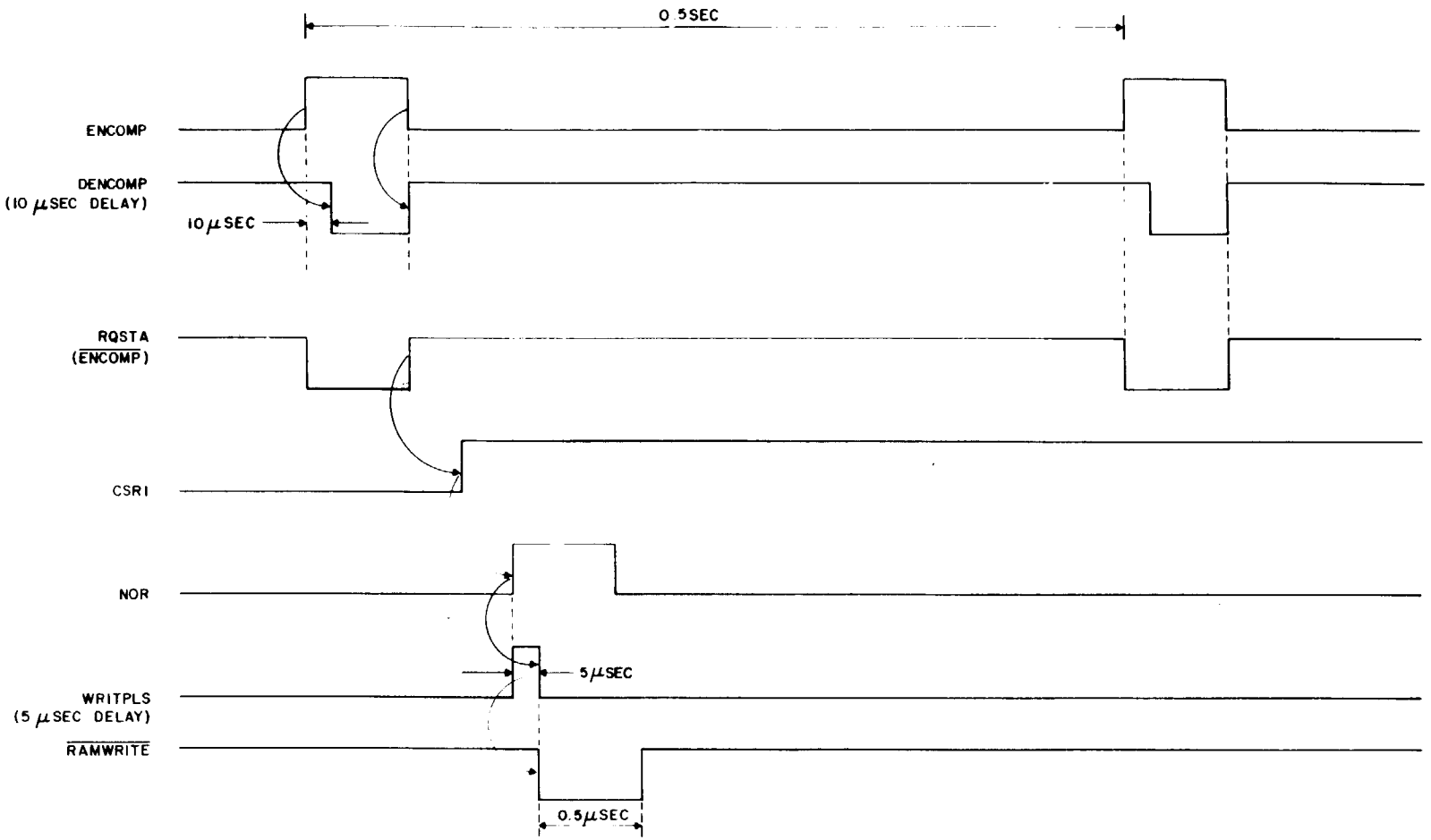
OCT 22 1982 19.16



ENGINEER W. PINKUS / F. RAAM	DRAFTSMAN TS 4-11-79	1/7/81
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR MICHIGAN	PROM SIMULATOR (2 of 3) MASS CALCULATOR GALILEO - NMS - GSE	10-18-79 9-18-79 8-17-79 5-3-79
	B-E 5212	DATE

LAST USED R C D L

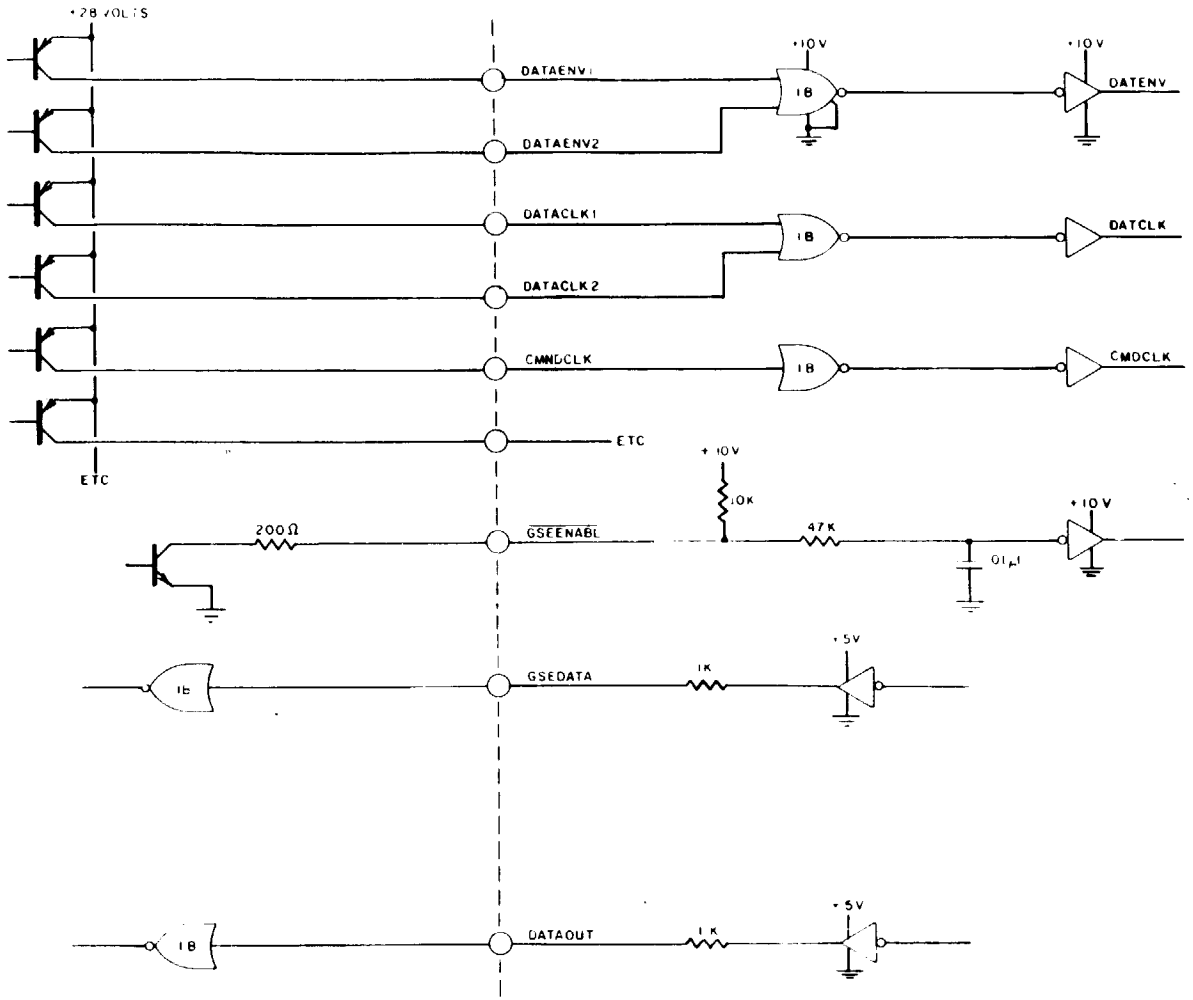
OCT 22 1982 19.19



ENGINEER F RAAM	DRAFTSMAN TS 10-15-79	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	H II PROM SIMULATOR TIMING DIAGRAM GALILEO-NMS	1/7/81 11/5/79
	B-E 5682	DATE

LAST USED R C D L

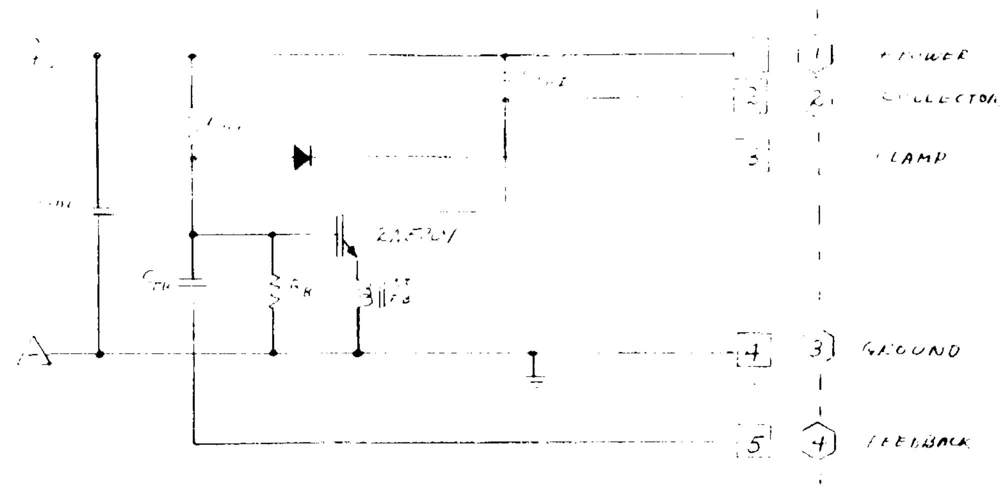
OCT 22 1982 19.20



ENGINEER PINKUS 5/14/79	DRAFTSMAN E.T. 5/15/79		
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	GSE - INSTRUMENT LOGIC INTERFACE GALILEO — NMS	5/22/79 5/14/79	
	B-E5307	DATE	

LAST USED R C D L

OCT 22 1982 19.21

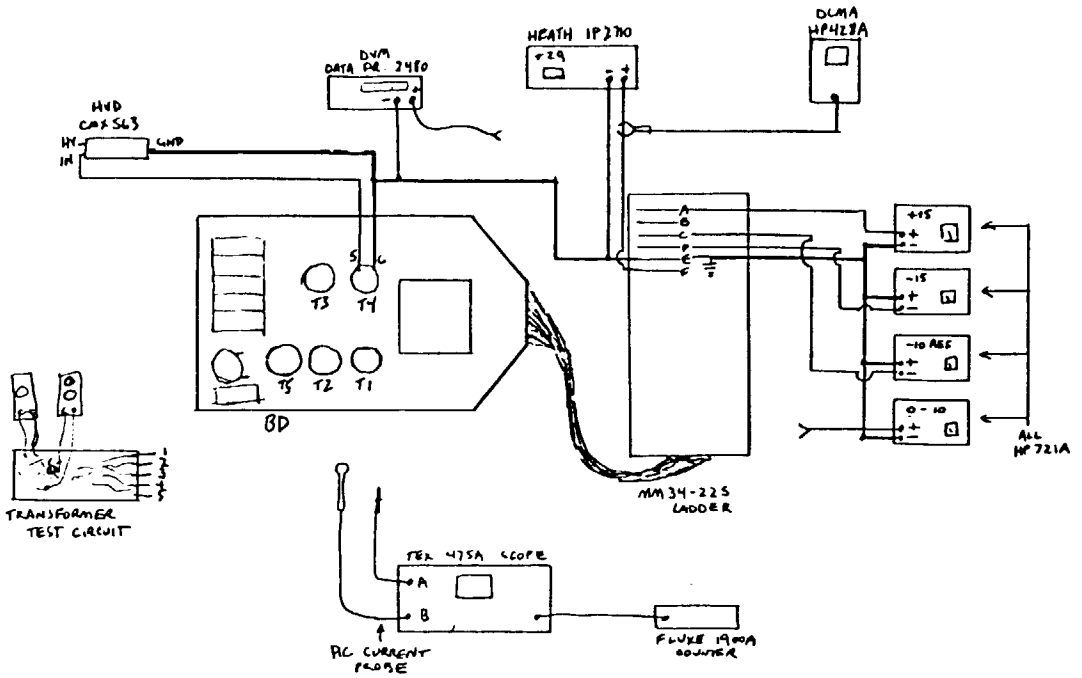


ENGINEER	DRAFTSMAN	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR MICHIGAN	TRANSFORMER TEST CIRCUIT	12-17-51
	B-E 6756	DATE

LAST USED R C D L

OCT 22 1982

19.22

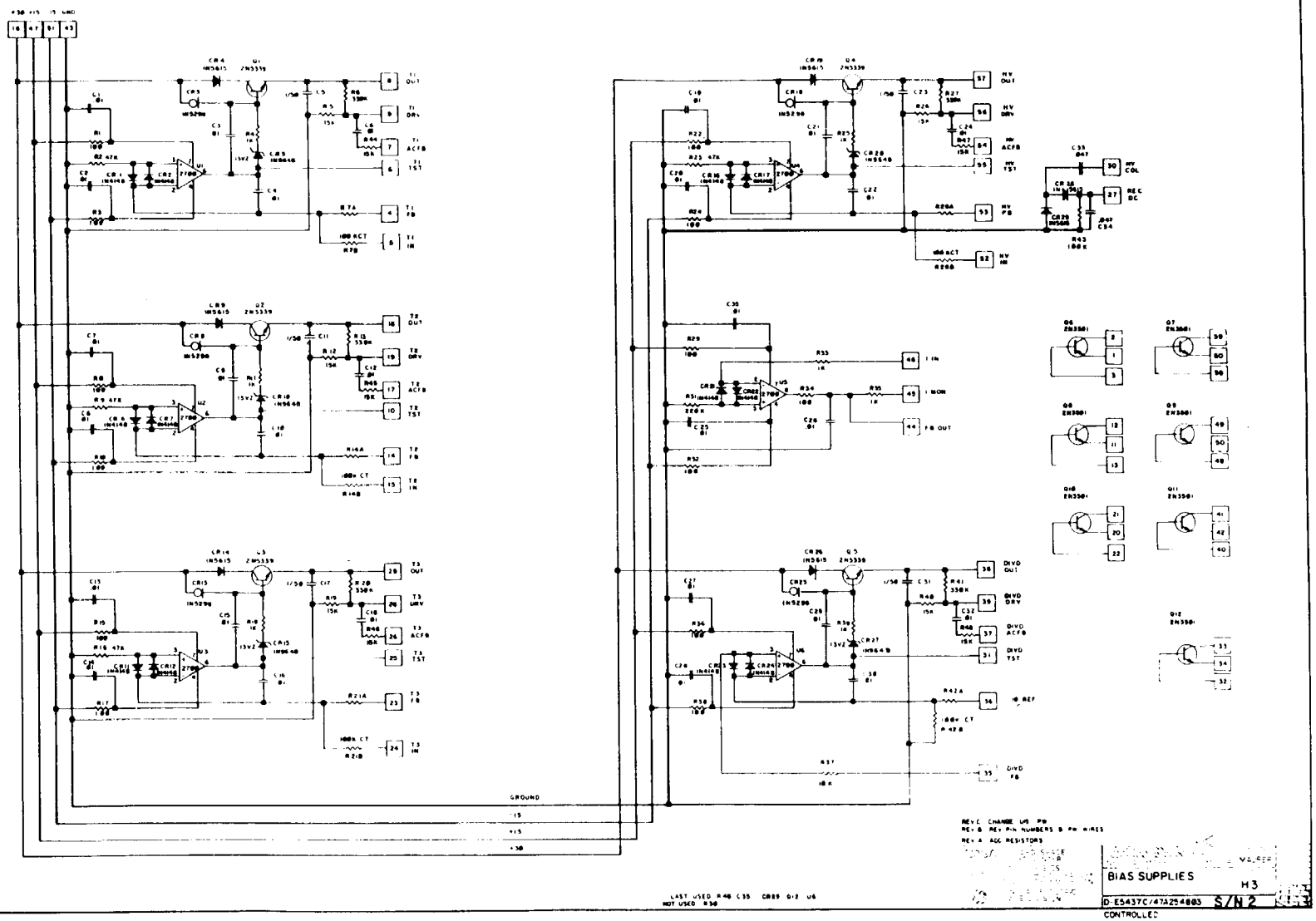


ENGINEER	DRAFTSMAN	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	BIAS SUPPLY GENERAL TEST SETUP GNMS B- E6757	12-27-81 DATE

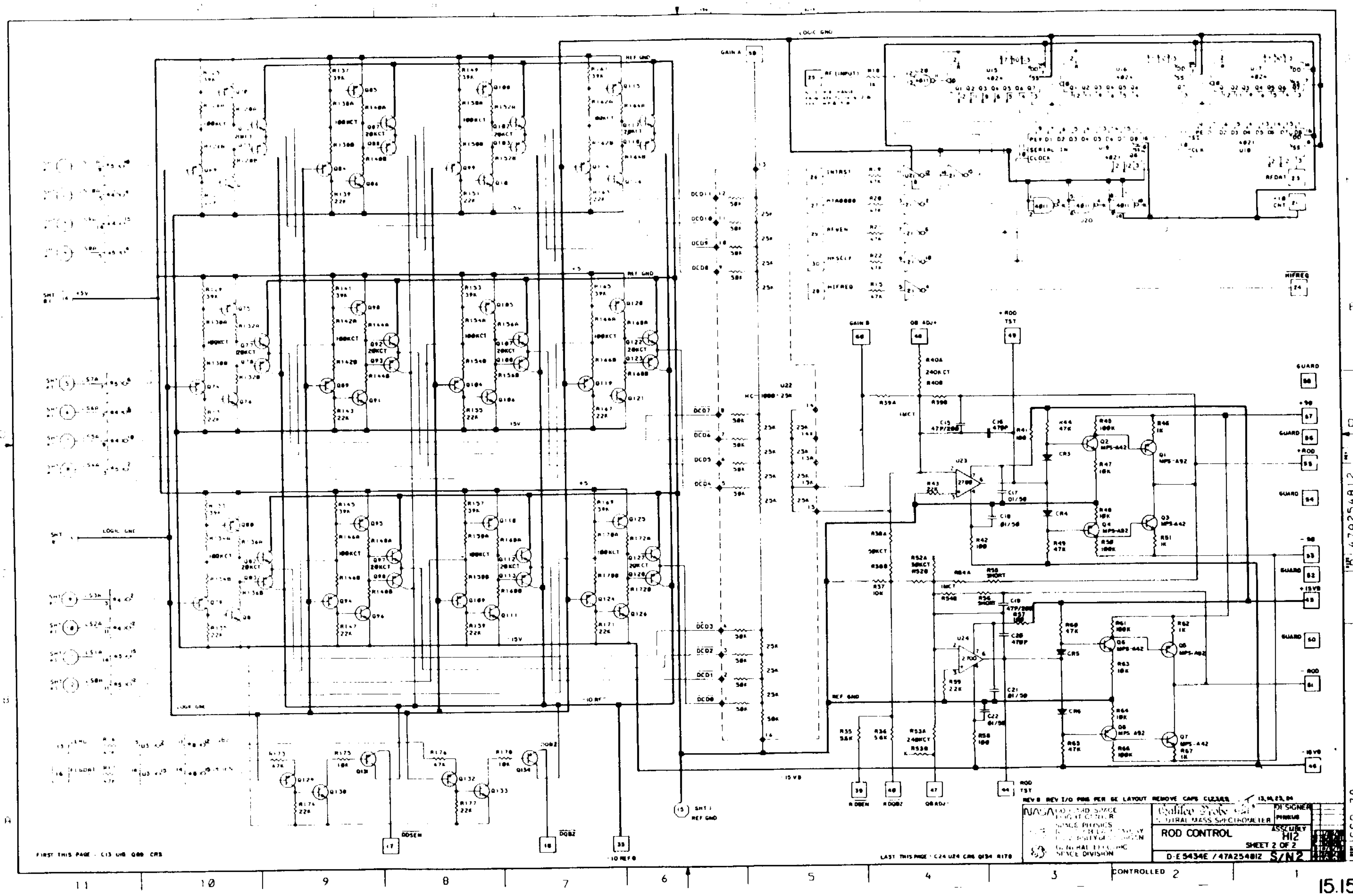
LAST USED R C D L

OCT 22 1982

19.23



SEP 9 1982 15.4



ROD CONTROL
SHEET 2 OF 2
D-E5434E / 47A254812
S/N2
GENERAL ELECTRIC
SPACE DIVISION
CONTROLLED
FIRST THIS PAGE - C13 U16 Q80 CR5
LAST THIS PAGE - C24 U24 CR6 Q134 R178
SSD-79-

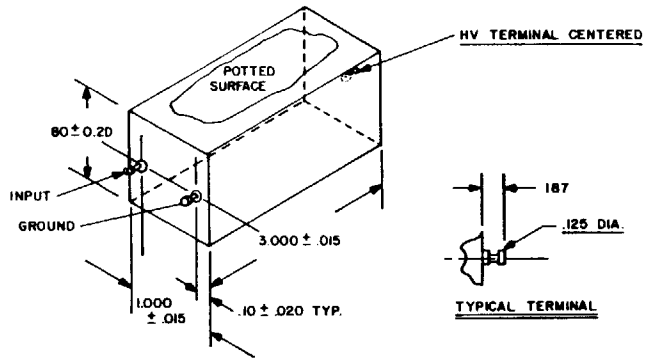
15.15

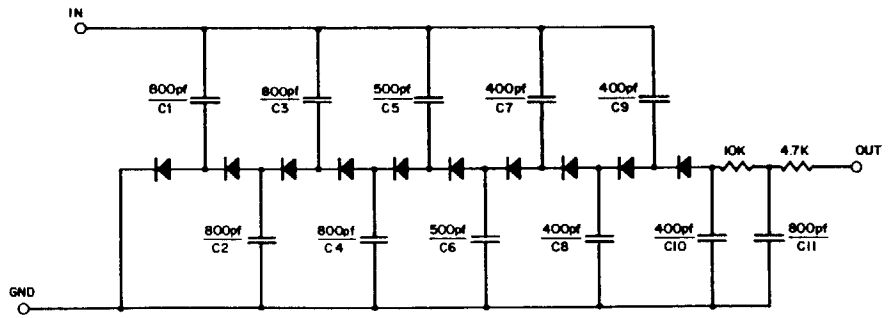
CMX 563 C

ION PUMP HV SUPPLY

1.	INPUT POWER	- UNREGULATED (± 5%)
2.	TYPE	- PARALLEL
3.	STAGES	- 5
4.	INPUT	- TBD (SQUARE)
		- 30KHZ
		- 1000V $_{P-P}$ NORMAL
		- 2000V $_{P-P}$ TEST
5.	OUTPUT	- POSITIVE
		- 5KV AT .5MA NOMINAL
		- 1KV AT 5MA CONTINUOUS POSSIBLE
		- 10KV AT NO LOAD TEST
		- LESS THAN 50V $_{P-P}$ RIPPLE AT 5MA
6.	SIZE	- SEE DRAWING AT RIGHT
7.	ENVIRONMENTAL	- 30 TO +50°C OPERATING
		- 40 TO +60°C NON-OPERATING
		- 30PSIA TO VACUUM
		- LAUNCH VIBRATION SPECIFICATIONS (18G @ 100HZ SINE, 400 G ACCELERATION)
8.	MISC.	- 10K R-C FILTER
		- 4.7K OUTPUT CURRENT LIMIT
		- +/- 20% TEMPERATURE CO-EFFICIENT
		- R&QA REQUIREMENT SPECIFICATION 79/113
		- HIGH VOLTAGE DEVICES #CMX563C

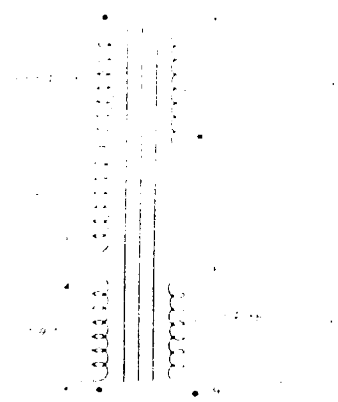
POTTING: E & C 2850 FT. BLACK WITH CAT II

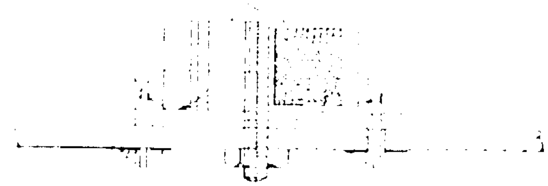


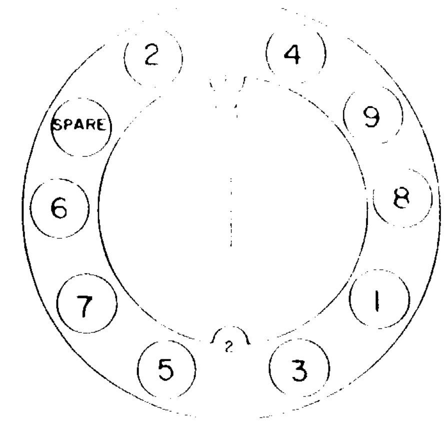


ENGINEER J. STEVENS	DRAFTSMAN EL 6/16/83	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	VOLTAGE MULTIPLIER ION PUMP SUPPLY GNMS	6/16/83 7/6/81
	B-E 5343 CONTROLLED	DATE

LAST USED R C D L







BOTTOM VIEW

[illegible] MAGNETICS [illegible] DELRIN [illegible]

WINDING PROCEDURE

1. [illegible] AS REQUIRED FOR T2 OR T3.

2. [illegible] SINGLE LAYER OF KAPTON TAPE. [illegible]

3. [illegible] KAPTON TAPE [illegible] 133 PER POTTING [illegible]

5. [illegible] IN CORE. MOUNT ON TERMINAL BOARD, AND CONNECT [illegible] PER POTTING [illegible]

6. [illegible]

7. [illegible] FREQUENCY.

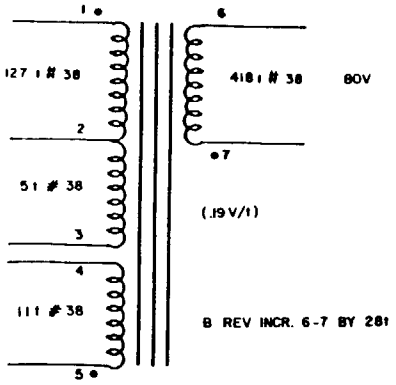
[illegible] CORE HALVES AS NECESSARY TO [illegible]

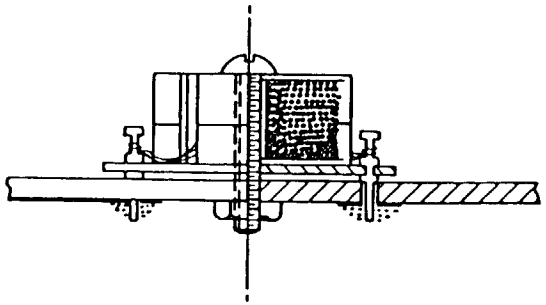
NOTES:

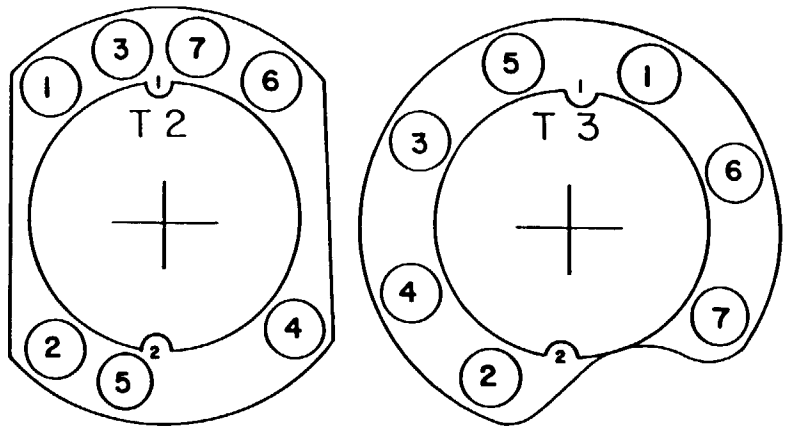
1. ◡ = CORE SLOTS WHERE WIRES EXIT TRANSFORMER
2. HAT BRIM IS [illegible] BOARD
3. SWAGE PINS CAMBION [illegible]
4. SWAGE TOOLS CAMBION # [illegible]
   AND # 435 (619) 01 00 00
5. DRILL SIZES A) # 5[illegible] IN HAT BRIM FOR SWAGING
   B) # 65 IN BIAS PC BOARD TO ACCEPT PINS
   C) # 33 IN BOTH FOR MOUNTING SCREW
6. MOUNTING SCREW IS # 4 40 NYLON
7. MAGNETICS INC F41408-UG POWER FERRITE CORE
   B1408-01 DELRIN BOBBIN

CONTROLLED
APR 5 1985
PRINT

ENGINEER MAURER / FRIEDMAN	DRAFTSMAN
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR MICHIGAN	TRANSFORMER T1 BIAS SUPPLY GALILEO NMS S/N 2
	B-E 57988 CONTROLLED







BOTTOM VIEW

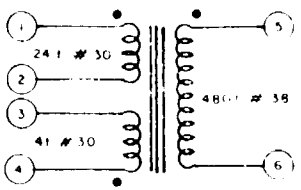
1. WIND FB 5-4.
2. WRAP SINGLE LAYER KAPTON OVER 5-4.
3. WIND SEC 7-6. DRESS ALL WIRES TO SAME SIDE OF BOBBIN. USE SLOT AS REQUIRED T2 ON T3.
4. WRAP SINGLE LARGER OF KAPTON TAPE OVER 7-6.
5. WIND 1-2-3.
6. "DIP COAT" WOUND BOBBIN IN SOLITHANE 113 PER POTTING PROCEDURE.
7. ASSEMBLE BOBBIN IN CORE. MOUNT ON TERMINAL BOARD, AND CONNECT WIRES TO TERMINAL. DRESS WIRES AS REQUIRED.
8. OPERATE TRANSFORMER IN TEST CIRCUIT.
9. SHIM CORE AS REQUIRED TO OBTAIN 35KHZ.

NOTES:

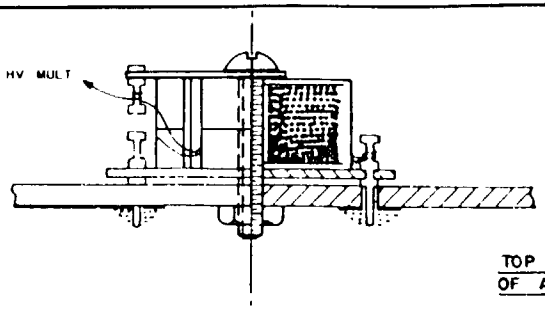
1. ◡ = CORE SLOTS WHERE WIRES EXIT TRANSFORMER
2. HAT BRIM IS 1/32 P.C. BOARD
3. SWAGE PINS – CAMBION # 120-1032-01-01-00
4. SWAGE TOOLS – CAMBION # 435-6462-01-00-00
   AND # 435-6619-01-00-00
5. DRILL SIZES A) # 52 IN HAT BRIM FOR SWAGING
   B) # 65 IN BIAS P.C. BOARD TO ACCEPT PINS
   C) # 33 IN BOTH FOR MOUNTING SCREW
6. MOUNTING SCREW IS # 4-40 NYLON
7. ADD BAND OF COPPER FOIL TAPE FOR MAGNETIC SHUNT AROUND CORE

ENGINEER MAURER / FRIEDMAN	DRAFTSMAN TS 5/28/81	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	TRANSFORMERS T2, T3 BIAS SUPPLY GALILEO - NMS S/N 2	12/8/83 11/9/83
	B-E 5799B CONTROLLED	DATE

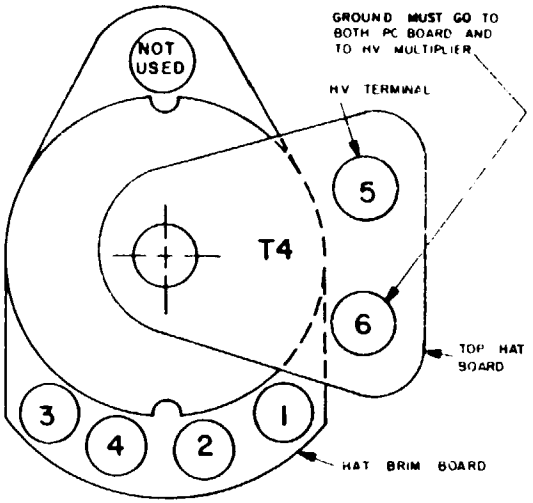
LAST USED R C D L

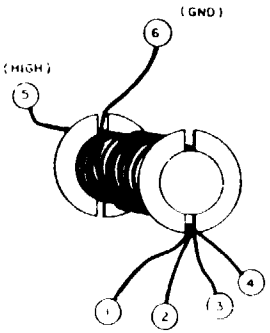


CORE F4181I-UG (POWER FERRITE)
BOBBIN B4181I-01 (DELRIN)
MAGNETICS INC



TOP VIEW OF ASSEMBLY





WINDING PROCEDURE

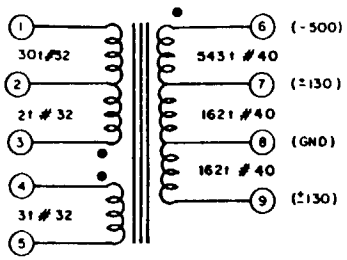
1. WIND SEC 5 6 START 5) AT LEFT EDGE DRESS 5) OUTSIDE OF BOBBIN FINISH 6) ON SAME SIDE SLOT, NEAR, BUT NOT AT, LEFT SIDE.
2. PLACE ONE LAYER KAPTON TAPE OVER 5-6 WINDING
3. WIND 1-2 NEXT START AND FINISH ON RIGHT SIDE IN OPPOSITE SLOT FROM 5) BANK WIND ON THE RIGHT HALF OF BOBBIN WRAP ONE LAYER KAPTON TAPE OVER PRIMARY TO HOLD BANK WINDING IN PLACE
4. WIND 3-4 NEXT START AND FINISH ON LEFT SIDE LEAVING APPROXIMATELY 0.075 GAP BETWEEN THIS WINDING AND 1-2 DRESS 3 & 4 OUT SAME SLOT AS 1 & 2 MAKE SURE WINDING DIRECTION, AS WELL AS ENDS, ARE PHASED CORRECTLY WRAP 3 & 4 WITH KAPTON TAPE TO HOLD IN PLACE
5. PLACE KAPTON TAPE OVER SLOT DRESS 5) OVER SLOT COVER WITH KAPTON TAPE CHECK CLEARANCE TO OTHER WIRES AND CORE
6. 6) ALSO GOES TO TOP BOARD DRESS WELL CLEAR OF 5)
7. "DIP COAT" BOBBIN ONLY IN SOLITHANE 113 PER POTTING PROCEDURE
8. ASSEMBLE BOBBIN IN CORE
9. OPERATE TRANSFORMER IN TEST CIRCUIT
10. SHIM CORE HALVES AS NECESSARY TO GET APPROXIMATELY 40 KHZ (FREQUENCY WILL DECREASE WITH MULTIPLIER LOAD)
11. EPOXY HAT BRIM TO BOTTOM CORE HALF WITH EPON 828 AND TOP HAT TO TOP CORE HALF WITH SAME
12. SECURE BOBBIN TO BOTTOM CORE HALF WITH SOLITHANE THICKENED WITH CABOSIL

NOTES:

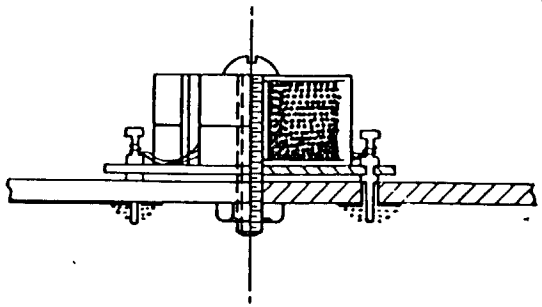
1. BOTH BOARDS 1/32 PC MATERIAL.
2. BOTTOM BOARD:
   SWAGE PINS - CAMBION #120-01-01-0
   HOLE SIZE - DRILL SIZE #52
   TOOL - #935-6462-01-00-00 AND
   #935-6619-01-00-00
3. TOP BOARD:
   SWAGE PINS - USECO #2520A
   HOLE SIZE - DRILL SIZE #49
   TOOL - #2520
4. DRILL #65 HOLE IN BIAS P.C. BOARD FOR PINS
5. DRILL #33 HOLE FOR MOUNTING SCREW
6. USE #4-40 -- NYLON MOUNTING SCREW

ENGINEER J MAURER	DRAFTSMAN TS 2/6/81	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	HV TRANSFORMER (T4) BIAS SUPPLY GNMS	4/16/85 3/16/82 5/27/81 4/27/81
	B-E 6422A CONTROLLED	DATE

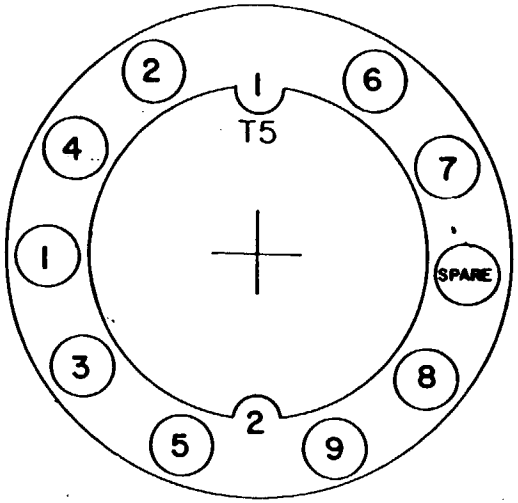
LAST USED R C D L



.833 V / TURN



BOTTOM VIEW



BOBBIN: MAGNETICS B-1811-01
CORE: MAGNETICS F41811-UG

WINDING PROCEDURE

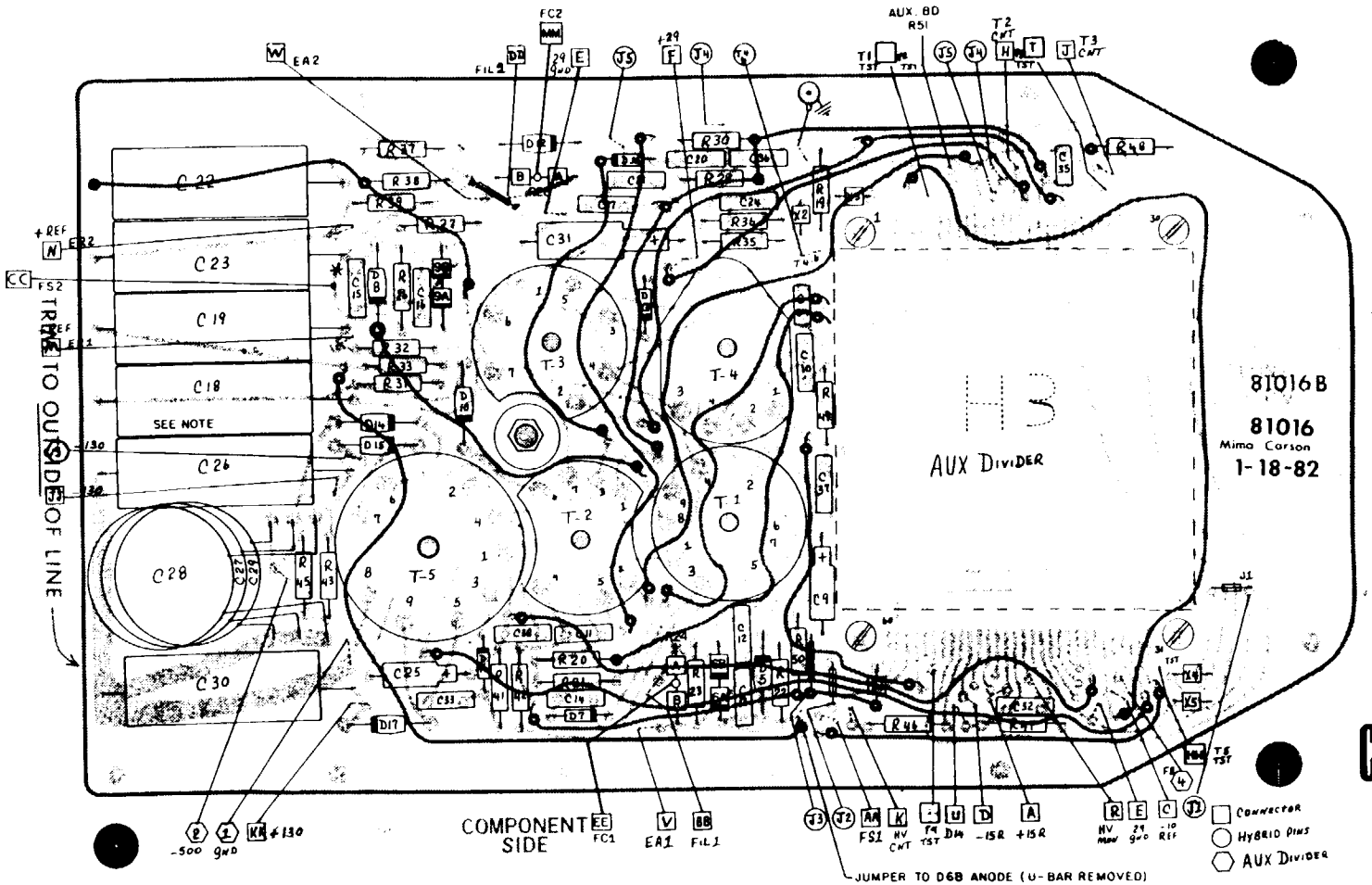
1. WIND 4-5, FIRST. END 4 THRU SLOT 1. AND 5 THRU SLOT 2.
2. WRAP SINGLE LAYER OF KAPTON TAPE.
3. WIND 6-7-8-9. DRESS (6) AND (7) THRU SLOT 1. WITH (8) AND (9) THRU SLOT 2.
4. WRAP SINGLE LAYER OF KAPTON TAPE.
5. WIND 3-2-1. END 1 AND 3 THRU SLOT 2. END 2 THRU SLOT 1.
6. PLACE KAPTON TAPE OVER SLOT. DRESS (6) AND (7) OVER SLOT. COVER WITH KAPTON TAPE. (6) IS AT 500 VOLTS. IT MUST BE SEPARATED FROM OTHER LEADS. ALSO, INSURE THAT (7) AND (9) ARE SEPARATED FROM OTHER LEADS.
7. "DIP COAT" (BOBBIN ONLY) IN SOLITHANE 113 PER POTTING PROCEDURE.
8. ASSEMBLE BOBBIN IN CORE. CONNECT LEADS TO PINS PER LAYOUT.
9. OPERATE TRANSFORMER WITHOUT LOAD IN TEST CIRCUIT.
10. SHIM CORE HALVES AS NECESSARY TO GET APPROXIMATELY 35 KHZ.

NOTES:

1. SWAGE PINS - CAMBION #120-1032-01-00
2. DRILL - #52
3. SWAGE TOOL - CAMBION #435-6462-01-00-00
   CAMBION #435-6619-01-00-00
4. DRILL BIAS P.C. BOARD #65 FOR PINS
5. DRILL #33 HOLE FOR #4-40 NYLON MOUNTING SCREW
6. THIS TRANSFORMER SIMILIAR TO WATS TI PG 11-6
7. ADD BAND OF COPPER FOIL TAPE FOR MAGNETIC SHUNT AROUND CORE

ENGINEER J. MAURER	DRAFTSMAN TS 2/6/81	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	TRANSFORMER T5 BIAS SUPPLY GNMS	12/8/83 12/14/81
	B- E 6421C CONTROLLED	DATE

LAST USED R C D L



CONTROLLED PRINT

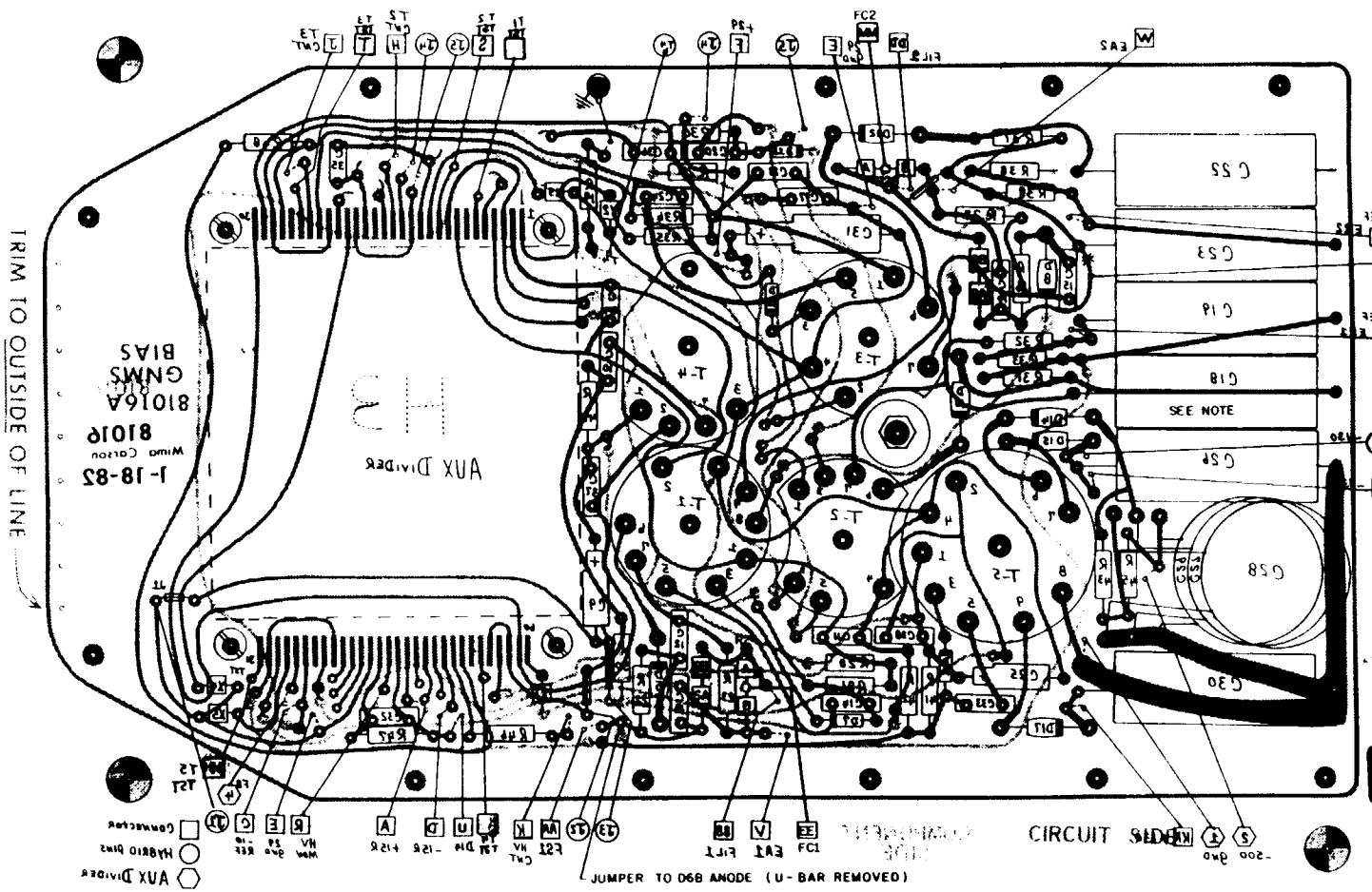
* = CUT RUN. RECONNECT CC TO R26, C16, D9A. ADD JUMPER FROM C23, R37, R39 END OF RUN TO DC RUN.

NOTE: NOT SHOWN ARE C7/R54 ON TERMINALS NEAR C18 CONNECTED PER PG 13.2, Q7X ON TERMINALS NEAR C18 CONNECTED PER PG 13.1

ENGINEER MAURER	DRAFTSMAN N.D	
SPACE PHYSICS RESEARCH LABORATORY	COMPONENT LAYOUT	4/18/85
COLLEGE OF ENGINEERING	BIAS SUPPLY	12/5/83
UNIVERSITY OF MICHIGAN	GNMS S/N2	6/9/83
ANN ARBOR, MICHIGAN	B-E 6777 CONTROLLED	3/12/82
		DATE

LAST USED R C D L

APR 23 1985 138



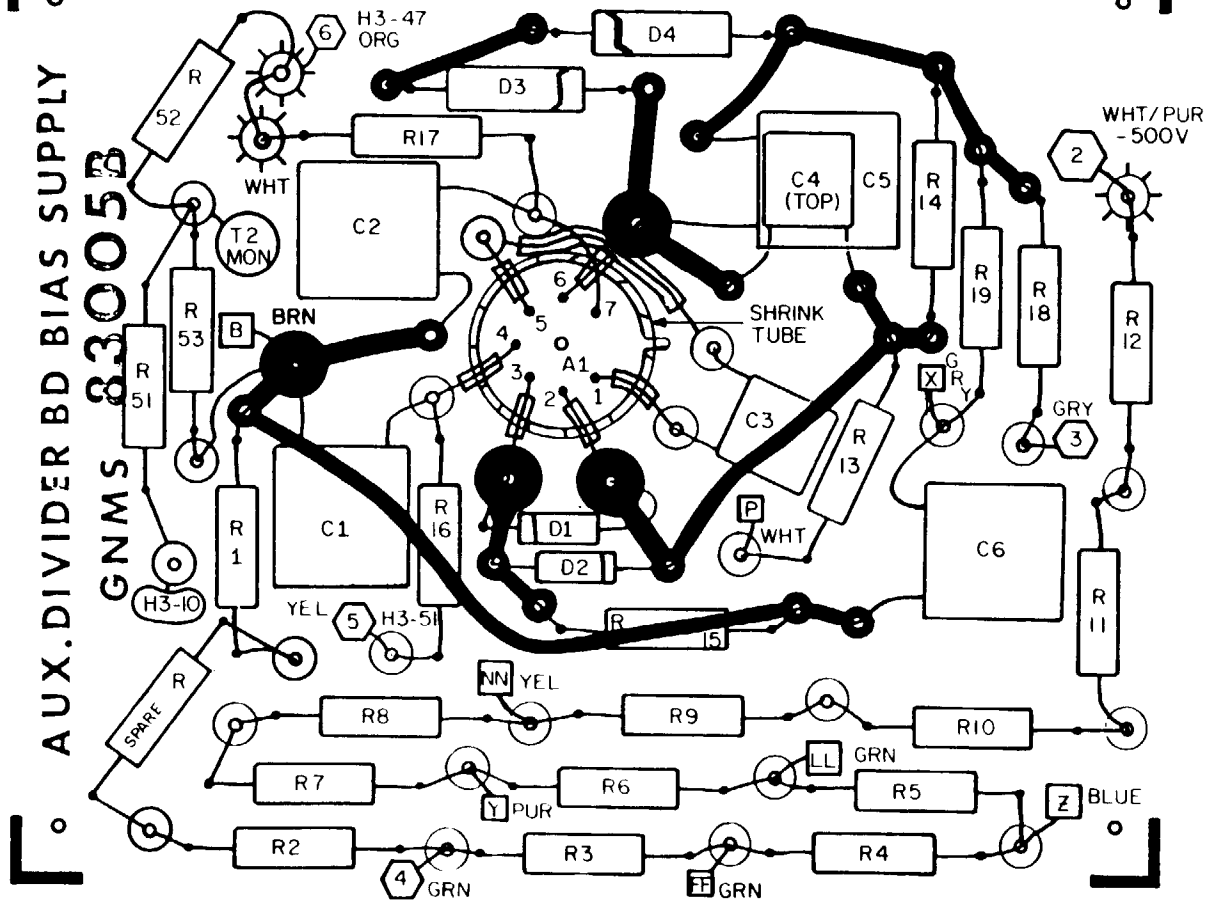
NOTE: NOT SHOWN ARE C7/R54 ON TERMINALS NEAR C18 CONNECTED PER PG.13.2,
Q7X ON TERMINALS NEAR C18 CONNECTED PER PG 13.1

ENGINEER MAURER	DRAFTSMAN N.D.	4/18/85
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	COMPONENT LAYOUT REVERSE BIAS SUPPLY GNMS S/N2	12/5/83 6/9/83 3/28/82
	B-E6778 CONTROLLED	DATE

LAST USED R C D L

APR 23 1985 13.9

COMPONENT SIDE



NOTES:
1. P.C BOARD 1/32 THICK
2. #2 MOUNTING SCREWS ATTACH TO MAIN BOARD. EPOXY DOWN AT LAST OPPORTUNITY.
3. ○ 2520A-4 TERMINALS. DRILL #49. SWAGES TO BE ON A SIDE OF BOARD.
   ⊙ 2520A-4 MODIFIED TERMINALS CUT TOP TURRET OFF, 3 PLS.
4. ⬡ CONNECTION TO MAIN BOARD.
   □ WIRES TO CONNECTOR.
5. A1 MOUNTS UPSIDE DOWN WITH SHRINK TUBE INSULATION ON TOS CASE. SOLDER A1 LEADS ON TOP TURRET OF SWAGE TERMINALS.
6. SEE LOGBOOK FOR OTHER ASSEMBLY NOTES.
7. CHECK FOR FIT AGAINST HARNESS EARLY AND OFTEN!

CONTROLLED
AUG 16 1983
PRINT

ENGINEER B BLOCK/MAH

SPACE PHYSICS RESEARCH LABORATORY
COLLEGE OF ENGINEERING
UNIVERSITY OF MICHIGAN
ANN ARBOR MICHIGAN

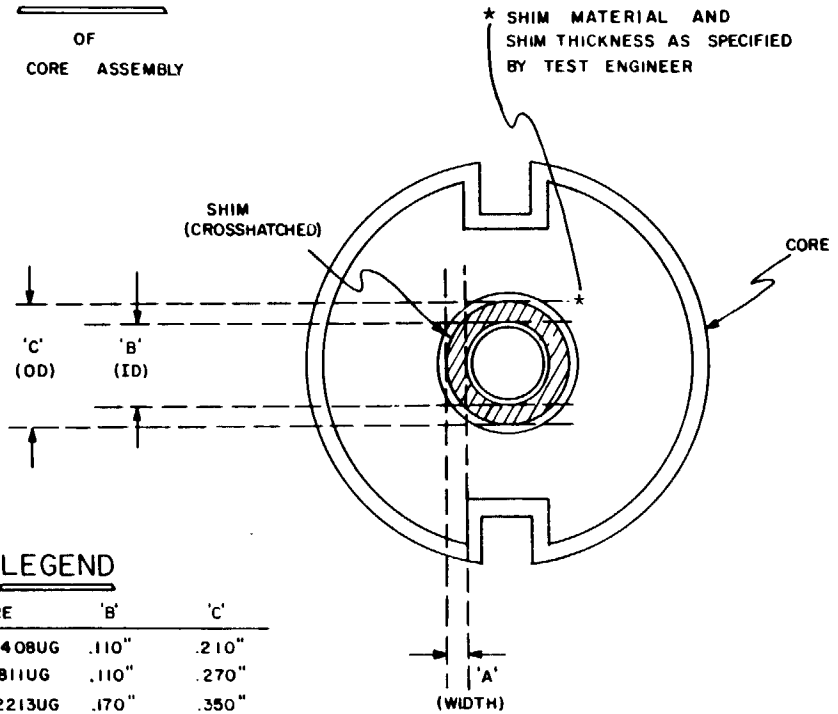
DRAFTSMAN JE/MK 7/19/83

COMPONENT LAYOUT AUXILIARY DIVIDER BOARD BIAS SUPPLY GNMS S/N2	8-4-83 7-.83
B-E7116 CONTROLLED	DATE

TOP VIEW

OF

CORE ASSEMBLY



NOTE: THIS DESIGN INITIALLY USED 7/81 IN GNMS BIAS SUPPLY T# 1 - T#5 TO ADJUST FREQUENCY.

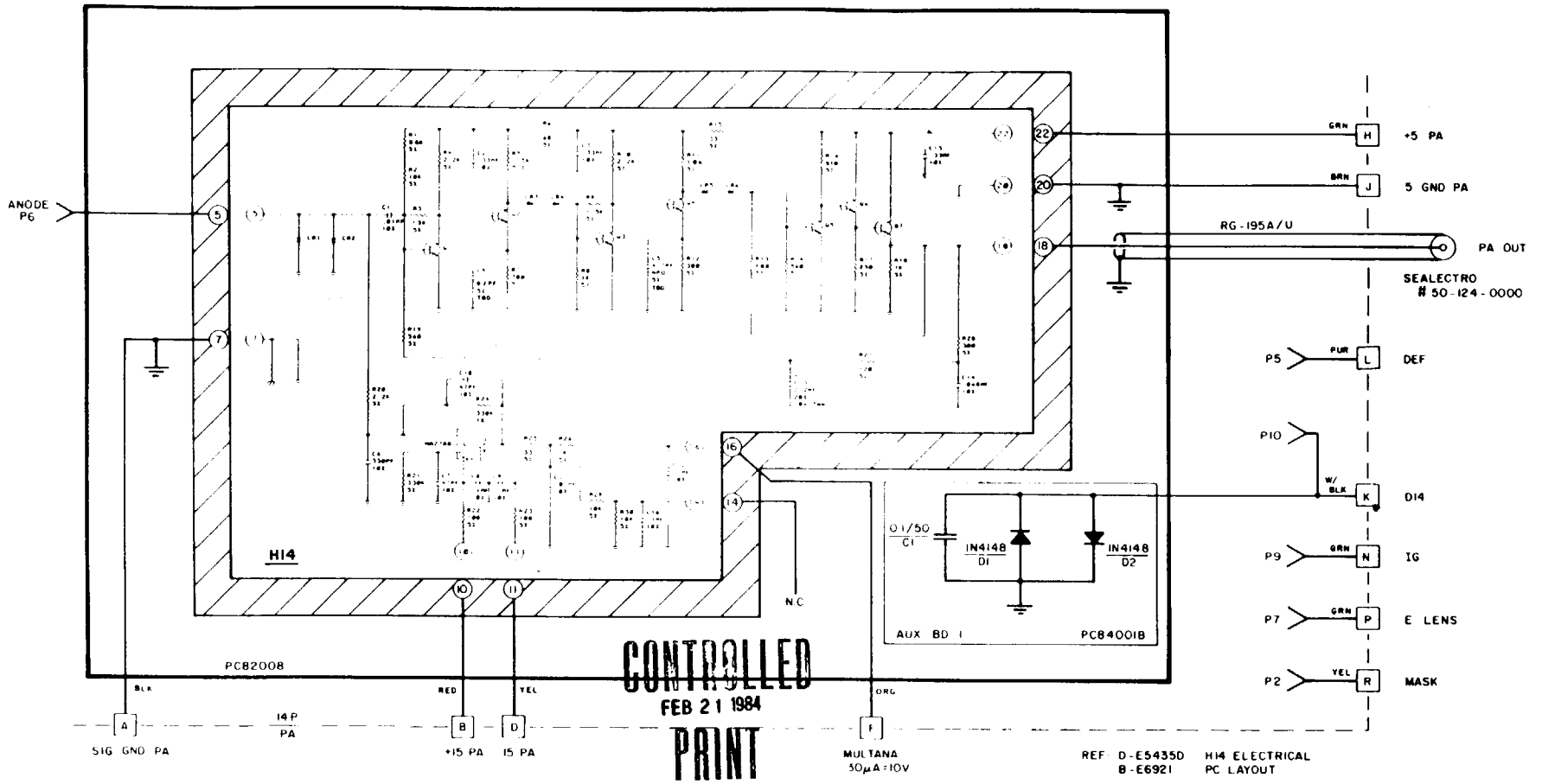
LEGEND

'A'	CORE	'B'	'C'
.050"	F41408UG	.110"	.210"
.075"	F41811UG	.110"	.270"
.085"	F42213UG	.170"	.350"

DESIGNATION T #	CORE USED	SHIM THICKNESS
1	1408	.004
2	1408	.004
3	1408	.004
4	1811	.004
5	1811	.003

ENGINEER J. BROOKS	DRAFTSMAN MN 8/03/81
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	TRANSFORMER, BIAS SHIM DESIGN GNMS
	B-E6665

LAST USED R C D L



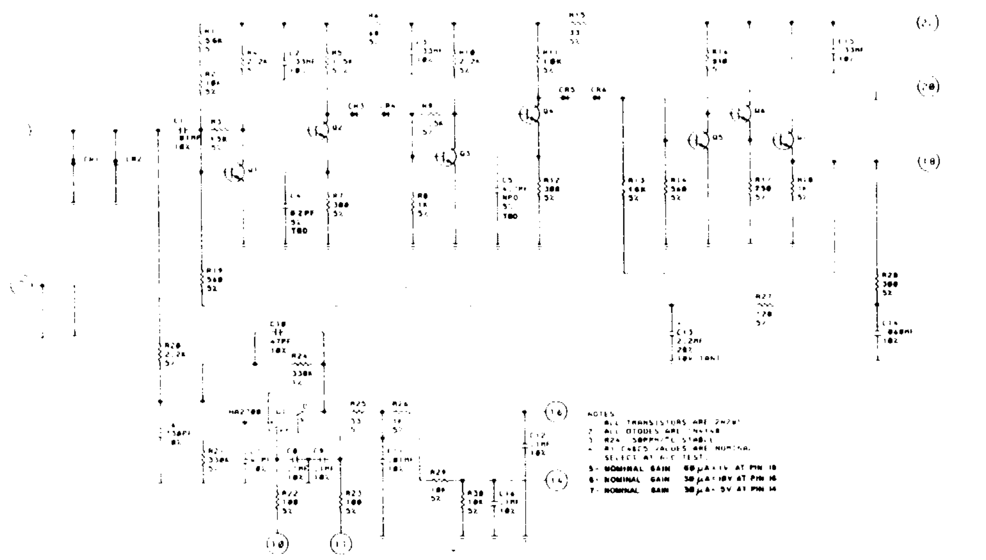
CONTROLLED
FEB 21 1984
PRINT

NOTES 1 ⟩— DENOTES MULT HEADER CONNECTION.
2 C1, D1, D2 BONDED TO UNDERSIDE OF PC BOARD.

ENGINEER B BLOCK	DRAFTSMAN EL 2-2-84	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	ELECTRICAL DWG. PULSE AMPLIFIER GNMS S/N 3	2/17/84 2/7/84
	B-E7235CONTROLLED	DATE

LAST USED R C1 D2 L

14.1



NOTES
1. ALL TRANSISTORS ARE 2N2857
2. ALL DIODES ARE 1N4148
3. R24 - 500PPM/°C STABLE
4. R1 C4&C5 VALUES ARE NOMINAL. SELECT AT A-C TEST.
5- NOMINAL GAIN 60 μA - 1V AT PIN 18
6- NOMINAL GAIN 30 μA - 10V AT PIN 16
7- NOMINAL GAIN 30 μA - 5V AT PIN 14

APPLICON NAME MS4814 (7) JULY 79

LAST USED C16 CR6 Q7 R30 U1

REV B CHANGE NOTE 5, ADD NOTES 6 & 7, CHANGE R16 TO 1.5 K Ω
REV A CHANGE VALUES FOR LOW GAIN & USE STANDARD VALUES 7/2/79 PER ABM/JM

PULSE PRE AMP	H14
D-E5435D47A254814	S/N 2

MAURER
MACHEE

CONTROLLED

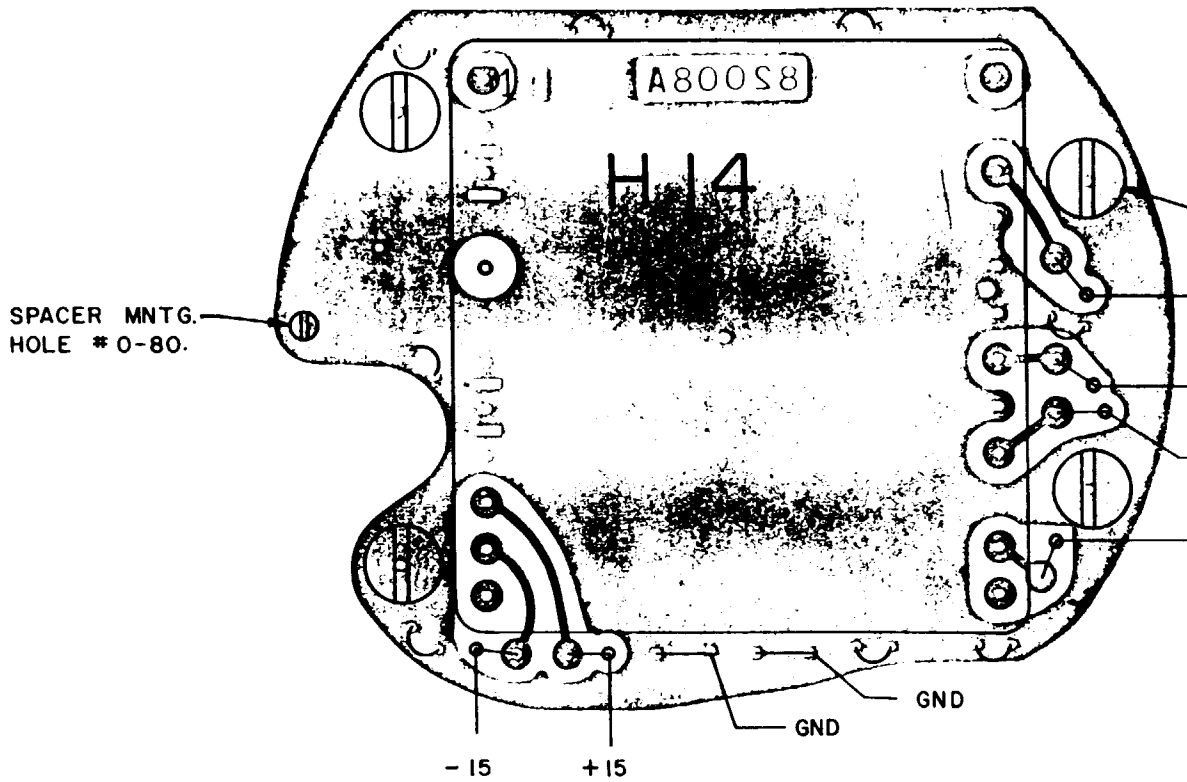
SEP 9 1982

15.18

D 47A254814

COMPONENT SIDE

NOTES: 1. H 14 - CUT OFF PINS 4,6,15,23.
2. INSTALL U-BARS ON A-SIDE.
3. GROUNDS OPTIONAL.



ENGINEER B. BLOCK - M A H	DRAFTSMAN G WIGGINS - M A H
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	COMPONENT LAYOUT PULSE AMPLIFIER BD # 82008A GNMS
	B-E 6921

LAST USED R C D L

9/12/84
Eder
Rev. rr

GPMS FLIGHT HYBRID REVISION STATUS

TITLE	DWG #	CURRENT REV. LETTER	REV. DATE
H1 - Main Power Hybrid -	D-E5441	I	8/2/82
H2 - Fil Supply -	D-E5433	D	5/15/82
H3 - Bias Supplies -	D-E5437	C	9/25/79
H4 - (A/B) - Pyro Drive -	D-E5440	F	11/6/80
H17- Valve Drive A -	D-E5431	F	3/10/83
H5 - Valve Drive B - (single ended)	D-E6904	A	3/10/83
H6 - Heater Drive -	D-E5436	H	7/14/82
H7 - Timer -	D-E5349	N	12/16/81
H8 - Anamux -	D-E5438	F	10/19/82
H9 - Command Hybrid -	D-E5442	K	6/11/82
H10- (A/B) - Program Memory -	D-E5444	F	10/31/80
H11- Calculator -	D-E5443,5445	F	5/14/81
H12- Rod Control -	D-E5432,5434	E	1/20/82
H13- Format Data Buffer -	D-E6125, 6155	J	11/22/83
H14- Pulse Pre Amp -	D-E5435	D	8/1/80
H15- Core Memory -	D-E6124	H	9/12/84
H16- PROM -	D-E6126	A	1/23/81

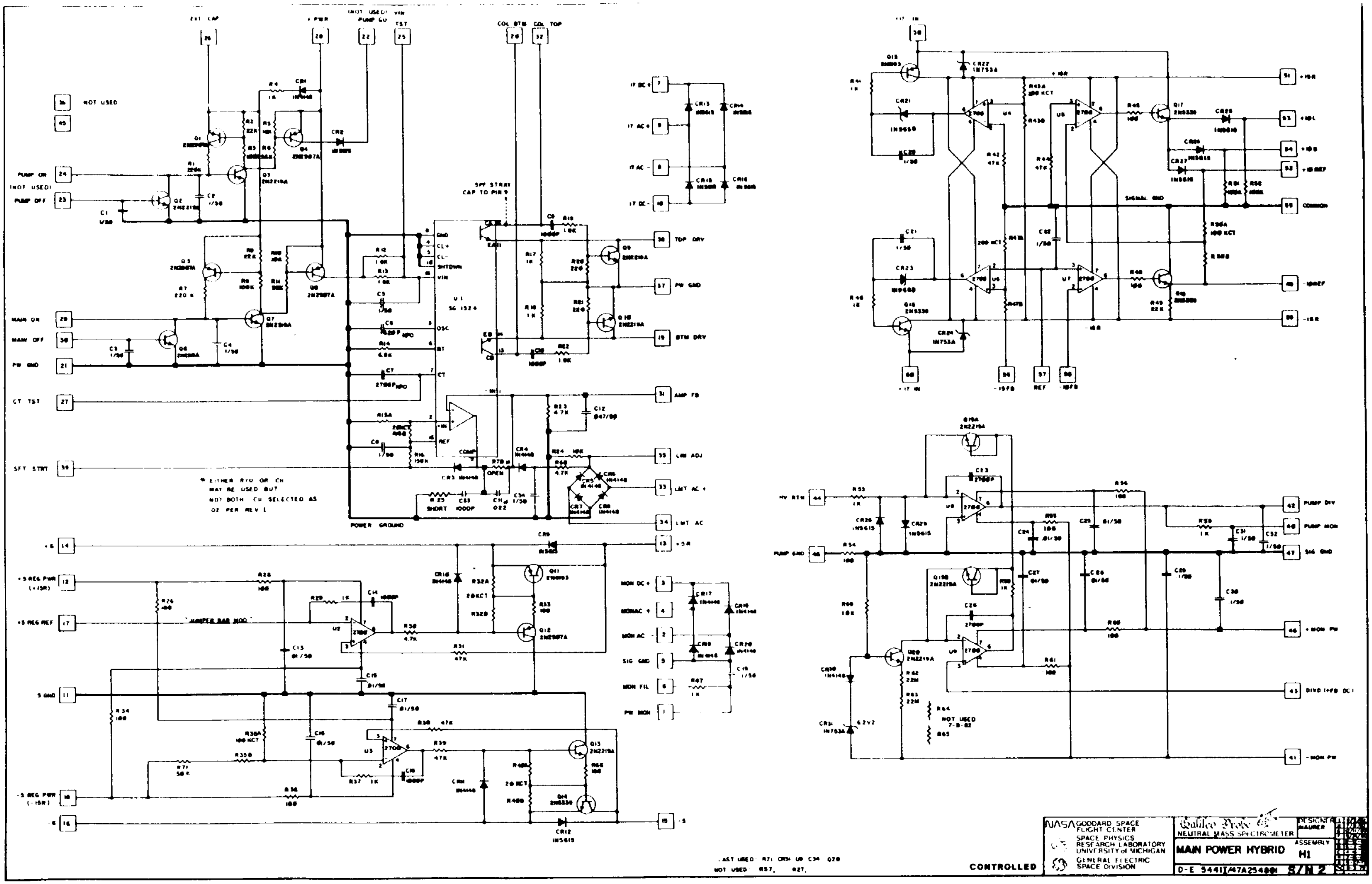
FILE: GNLIAN.LST
DISK: GNMS-2
BY: J. MAURER/B. P. ELERO, JR.
REV: 10/19/83 SCG

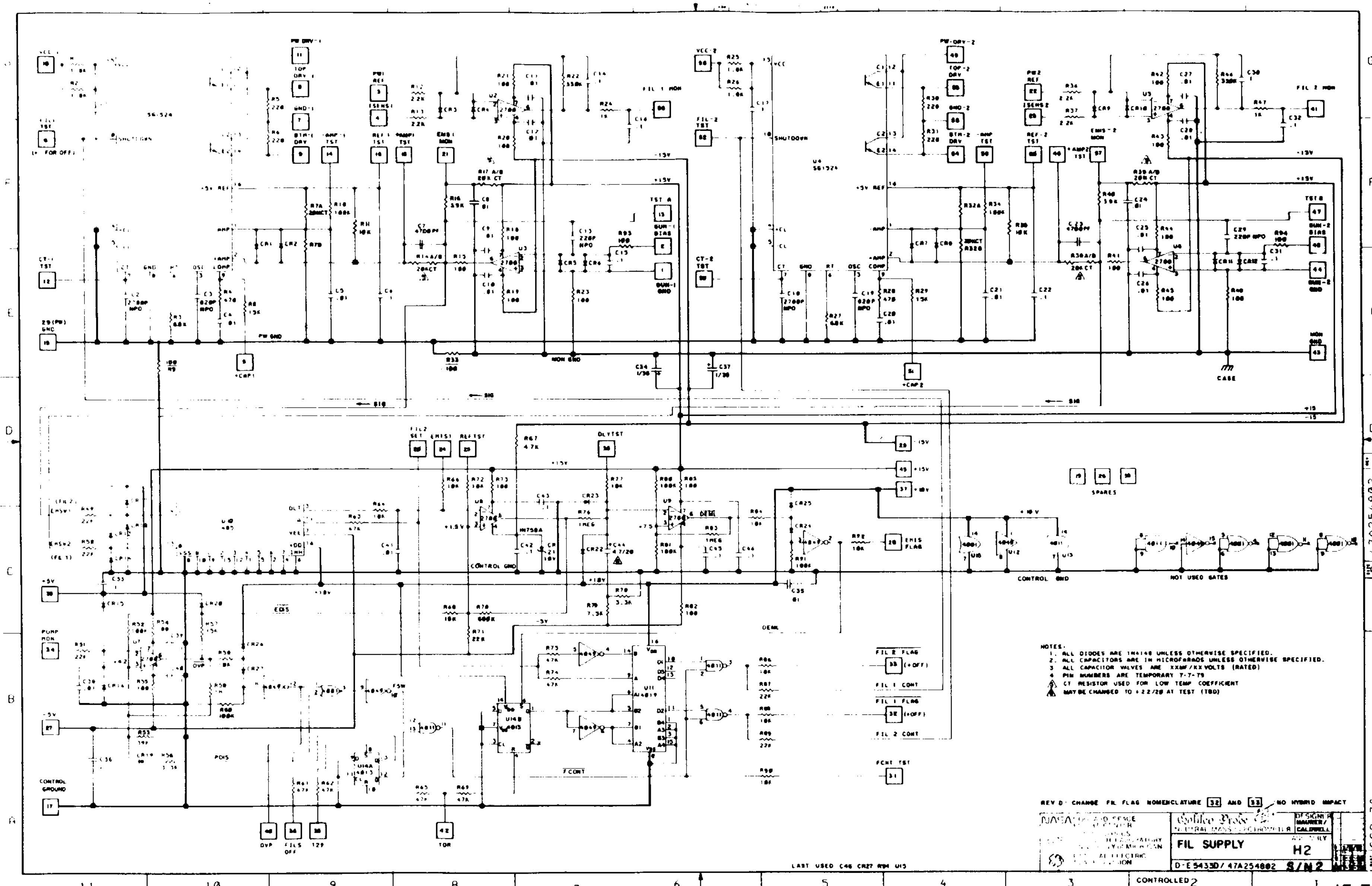
DATE	HYBRID	REV LETTER	CHANGE DESCRIPTION
07-02-79	H14	A	CHANGE VALUES FOR LOW GAIN (NO ECN)
07-18-79	H12	A	DRAFTING ERRORS (NO ECN)
07-23-79	H5	A	CHANGE Q58, Q63, R101, R111
07-31-79	H6	A	DELETE TIE BETWEEN PIN 56 AND 57
08-08-79	H7	A	ADD PINS 30 & 31, CHANGE CONNECTIONS ON V22 & V23
08-20-79	H4	A	CHANGED ALL INTERNAL VALUES (NO ECN)
08-27-79	H1	A	ADD C34, R68; CHANGE R65 CHANGE Q19 A&B
08-30-79	H8	A	ADD CHIP, CHANGE PIN NO'S
09-06-79	H5	B	CHANGE PIN NO'S PER GE SPEC.
09-07-79	H3	A	ADD R44, R45, R46, R47, R48
09-14-79	H3	B	CHANGE PIN NO'S PER GE SPEC. REDLINE POWER WIRING
09-18-79	H9	A	MODIFY TURN ON RESET
09-18-79	H11	A	ADD LOGIC TO GENERATE "PESRI"
09-25-79	H2	A	CHANGE PIN NO'S PER GE SPEC.
09-25-79	H3	C	CHANGE POWER WIRING TO U5
10-02-79	H7	B	CHANGE U37, U38 NOMENCLATURE ACCORDING TO MOTOROLA SPEC
10-02-79	H14	B	CHANGE VALUE OF R16, ADD NOTES
10-15-79	H4	B	ADD R2, R4, R6, R8; CHANGE PINS ON U2
11-05-79	H7	C	ADD *, ** NOTATION
11-08-79	H4	C	CHANGE PIN NO'S AND IC NUMBERING PER GE SPEC
11-08-79	H6	B	CHANGE PIN NO'S, IC NUMBERING AND "R" DESIGNATION PER GE SPEC
11-08-79	H12	B	CHANGE PIN NO'S PER GE SPEC, REMOVE C1, C2, C3, C8, C9, C13, C14, C23, C24
11-15-79	H7	D	REVISE VALUES FOR C3, C5, C17, ADD PIN 35
11-19-79	H10	A	ADD INVERTER, CHANGE INTERNAL WIRING FOR A/B SPLIT
12-02-79	H6	C	CHANGE "R" DESIGNATIONS FOR R2, R7, R9, R10
01-02-80	H8	B	CHANGE ANALOG COMPARATOR CIRCUIT - NEW DESIGN
02-04-80	H10	B	MOVE PORTION OF H10 TO H13
02-13-80	H1	B	ADD R69 (TBD), REMOVE WIRE ON BRIDGE
02-25-80	H6	D	CHANGE PIN NO'S ON V11, V12, V20
02-28-80	H9	B	MOVE PORTION OF H9 TO H13
03-14-80	H9	C	MOVE CORE MEMORY TO H15
04-04-80	H7	E	ADD RESISTORS & CHANGE SIGNAL NAMES
04-15-80	H4	D	CHANGE SIGNAL NAMES
04-15-90	H6	E	CHANGE SIGNAL NAMES
04-16-80	H1	C	CHANGE R69 FROM TBD TO 10K
04-18-80	H7	F	DRAFTING ERROR (OMITTED "R18")
04-18-80	H15	A	DRAFTING ERROR (OMITTED COMP. ID NO'S)
04-21-80	H9	D	CHANGE INPUTS TO 4011, CHANGE P/S INPUTS
04-28-80	H8	C	ADD BUFFERING, CORRECT ANALOG GNDS
04-28-80	H10	C	CHANGE SELECTION OF A/B TO EXTERNAL
04-29-80	H7	G	USE 4001 AS INVERTER
05-05-80	H11	B	MOVE PORTION TO H13 & H16; REDRAW
05-09-80	H7	H	USE SPARE INVERTER
06-02-80	H1	D	CHANGE PIN NO'S PER GE LAYOUT
06-02-80	H10	D	CHANGE PIN NO'S PER GE LAYOUT
06-10-80	H13	A	ADD FILTER CAPS, CLEAN UP DRAWING
07-01-80	H15	B	ADD CR40, CR41, R28, R29
07-03-80	H14	C	CHANGE R1, R3, R11, R13, R16, R17, C4
07-08-80	H11	C	DRAWING ERROR CLEAN UP
07-29-80	H4	E	CORRECTION OF U7 AND U13
08-01-80	H14	D	CHANGE R1 FROM 8.2K TO 5.6K
08-04-80	H7	I	CHANGE U42 TO 4029 FROM 4024
08-06-80	H7	J	CHANGE D1, D2, D3, D4 CONNECTORS OF U42 FROM +10 TO GND
08-12-80	H1	E	CHANGE DIREC. TO CR23; CHANGE CR22 & CR24 TO 1N753A
08-12-80	H2	B	CHANGE CR21 FROM 1N961B TO 1N758A
09-04-80	H13	B	CHANGE PIN #'S, ADD OUTPUT
09-08-80	H10	E	CHANGE POWER SUPPLY PIN #'S
09-08-80	H11	D	CHANGE NAME PIN #10 OF U24; CH'G J, K T/C OF U31 & U32
09-08-80	H15	C	CH'G R24 TO OPEN; CORRECT DRAW'G ERROR 2-R29'S
09-24-80	H1	F	CH'G C12 FROM .047/50 TO .1/50; REPLACE C11 WITH R70
10-17-80	H13	C	DELETE C5, C6, C7; CHANGE C3, C4, C10, C11, C12, C13, C14, C15
10-23-80	H15	D	ADD R30, R31, R32, R33; DELETE CR37, CR38, R24; HYBRID DESIGN CHG
11-06-80	H4	F	CHANGE POLARITY OF C1 DUE TO DRAWING ERROR
11-06-80*	H6	F	LABELS CHANGED ON U10, U12; PIN 31, 32, 33
10-31-80	H10	F	ADD POWER BUS, ELIMINATE JUMPERS
11-06-80	H8	D	CHANGE LOCATION OF R58, CHANGE R67 TO 120K
11-06-80	H9	F	CHANGE LABELS AND REWORK CIRCUITRY
11-06-80	H13	D	INTERCHANGE LABELS PINS 63, 64, 65, 66
11-10-80	H7	K	MAJOR REWORK, SEE DCN
11-14-80	H11	E	MAJOR REWORK, SEE DCN
11-13-80	H2	C	ADD INFORMATION TO DRAWING
01-16-81	H6	G	CHANGE BONDING TO PINS ON U20, U23, U24, U25, U27
01-23-81	H16	A	REVISE PIN #'S
05-14-81	H13	E	ADD INVRTR, C16; CORRECT LABELLING; CHANGE I/O PIN 3'S
05-14-81	H11	F	ADD PESR2 OUTPUT, CHANGE I/O PIN #'S
05-14-81	H9	G	CHANGE PIN 57, 32, B INPUT U24; CHANGE I/O PIN #'S
05-14-81	H8	E	DELETE C15, C16; CORRECT LABELLING; CHANGE I/O PIN #'S
04-01-81	H7	L	DELETE C15, C16; CHANGE I/O PIN #'S
05-14-81	H12	C	CHANGE I/O PIN #'S; ADD LOGIC ELEMENT PIN #'S
04-28-81	H15	E	REVISE SENSE AND OUTPUT, C1-C120 "OPEN"; CHANGE I/O PIN #'S
06-11-81	H12	D	CHANGE C7, R18
08-24-81	H5	C	DELETE SEVERAL PARTS FOR H5B ONLY. SEE DWG NOTE 2
09-24-81	H9	H	CONNECT RESET OF U22 TO TRDONE INSTEAD OF LGC GND
09-08-81	H5	D	MODIFY SPARE DRIVER SIMILAR TO REV C
11-06-81	H7	M	CHANGE OUTPUT PIN #'S OF 4013'S (U3, U40, U48)
12-11-81	H1	G	CONNECT U2-2 TO PIN 17; ADD R71, DELETE R27; CHANGE C6, R32, 40, 43, 47, 50, 62-65
12-16-81	H7	N	CONNECT "0" INPUT OF U27 TO S08, NOT S07
12-16-81	H9	I	CHANGE R52, R56; GATE TRDONE INTO SEQFLG; RENAME U33-1,2; CONNECT U34-5 TO U30-12
12-16-81	H13	F	CHANGE LABELS ON U22 & U23, R10, R42-46, R52, R53, Q1, Q2; CONNECT PINS 40 & 48
01-20-82	H12	E	MOVE PIN 60 TO U-22 PIN 15-K
03-23-82	H15	F	CHANGE R 23 TO 22K, C1-C20 TO 470PF
04-07-82	H13	G	CHANGE U40-1, U42-13 CONNECTION FROM GROUND TO +10R3 NODE
05-15-82	H2	D	FILFLG NAME CHANGE ONLY
06-02-82	H9	J	CORRECT WIRING: U1-11 TO U2-13 AND U1-14 TO U2-12
06-11-82	H9	K	CHANGE U42-11 TO CMDCLK. USE SPARE U32 GATE FOR CMDENVB BAR
07-08-82	H1	H	VALUE CORRECTIONS TO LAST DCN 12-11-81 REV G (C6,R43,47,62-65)
07-14-82	H5A	E	MODIFY ALL DRIVERS REMOVE TWO DIODES & RESISTORS AND REWIRE
07-14-82	H5B	-	NEW DWG. MAKE DRIVER #4 IDENTICAL TO ALL OTHERS
07-14-82	H6	H	MODIFY BOTH DRIVERS (SAME AS H5A)
08-02-82	H1	I	CHANGE R70 TO OPEN, R25 TO SHORT, ADD C11 (.022) ACROSS R70
10-19-82	H8	F	ADD R100 & R101 IN SERIES WITH U22-12,13 & U22-1,2
03-10-83	H5A(H17)	F	CHANGE ALL NOMENCLATURE FROM H5A TO H17
03-10-83	H5B	A	UPDATE NOTES
03-25-83	H13	H	CHANGE R69,70,71,77,81,83
10-12-83	H13	I	CHANGE CONNECTIONS ON U40 AND U42 TO CORRESPOND WITH EE'S
11-22-83	H13	J	ADD MISSING PIN 2 OF U44 CONNECTED TO LOGIC GND
7-23-84	H15	G	ADD CR46 AND JUMPER J1
9-12-84	H15	H	CHANGE U1 TO HA2510

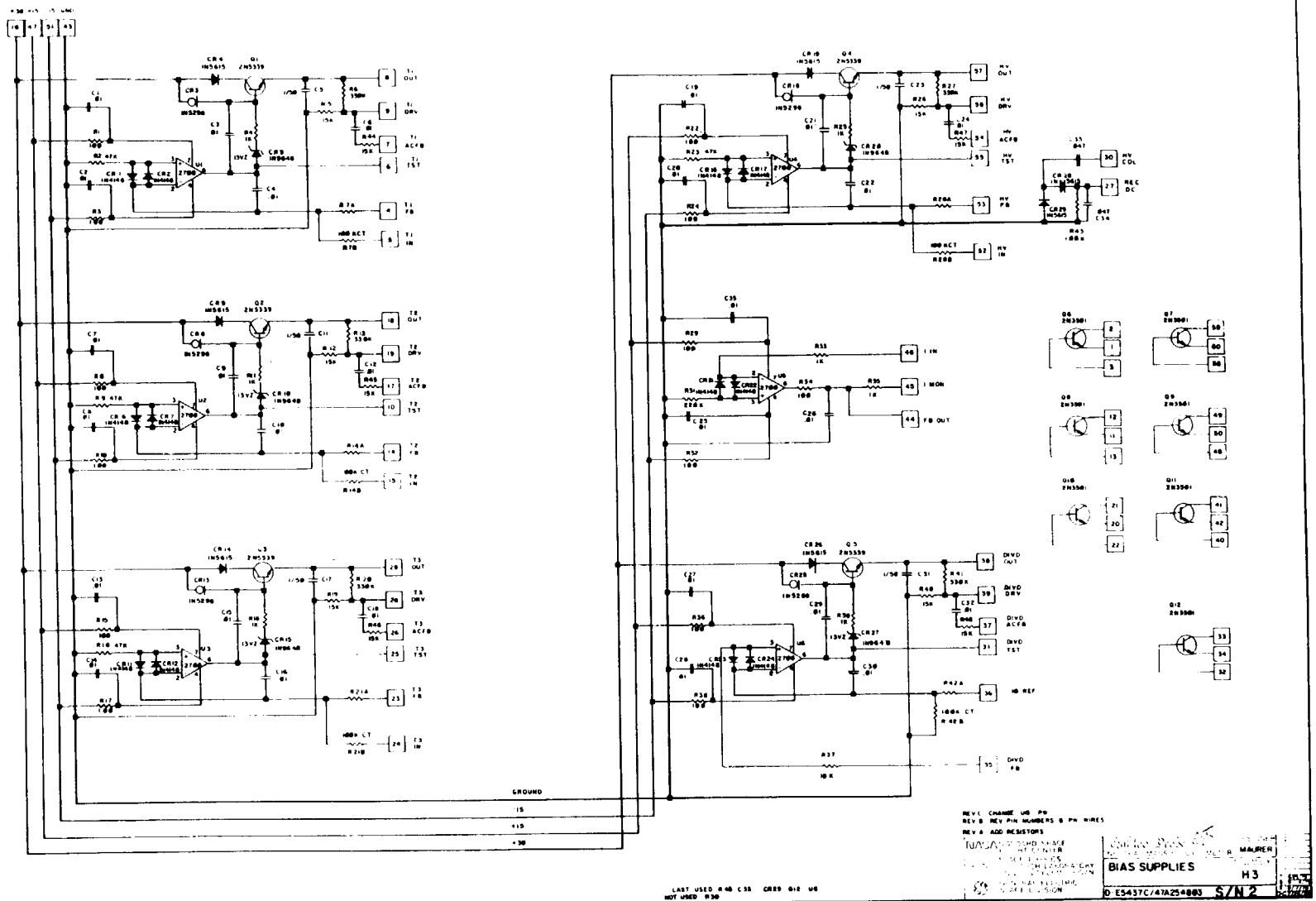
ENGINEER J.MAURER / B.P.ELERO JR.	DRAFTSMAN J.G	
SPACE PHYSICS RESEARCH LABORATORY COLLEGE OF ENGINEERING UNIVERSITY OF MICHIGAN ANN ARBOR, MICHIGAN	HYBRID DRAWING INDEX GNMS B-E5552	DATE

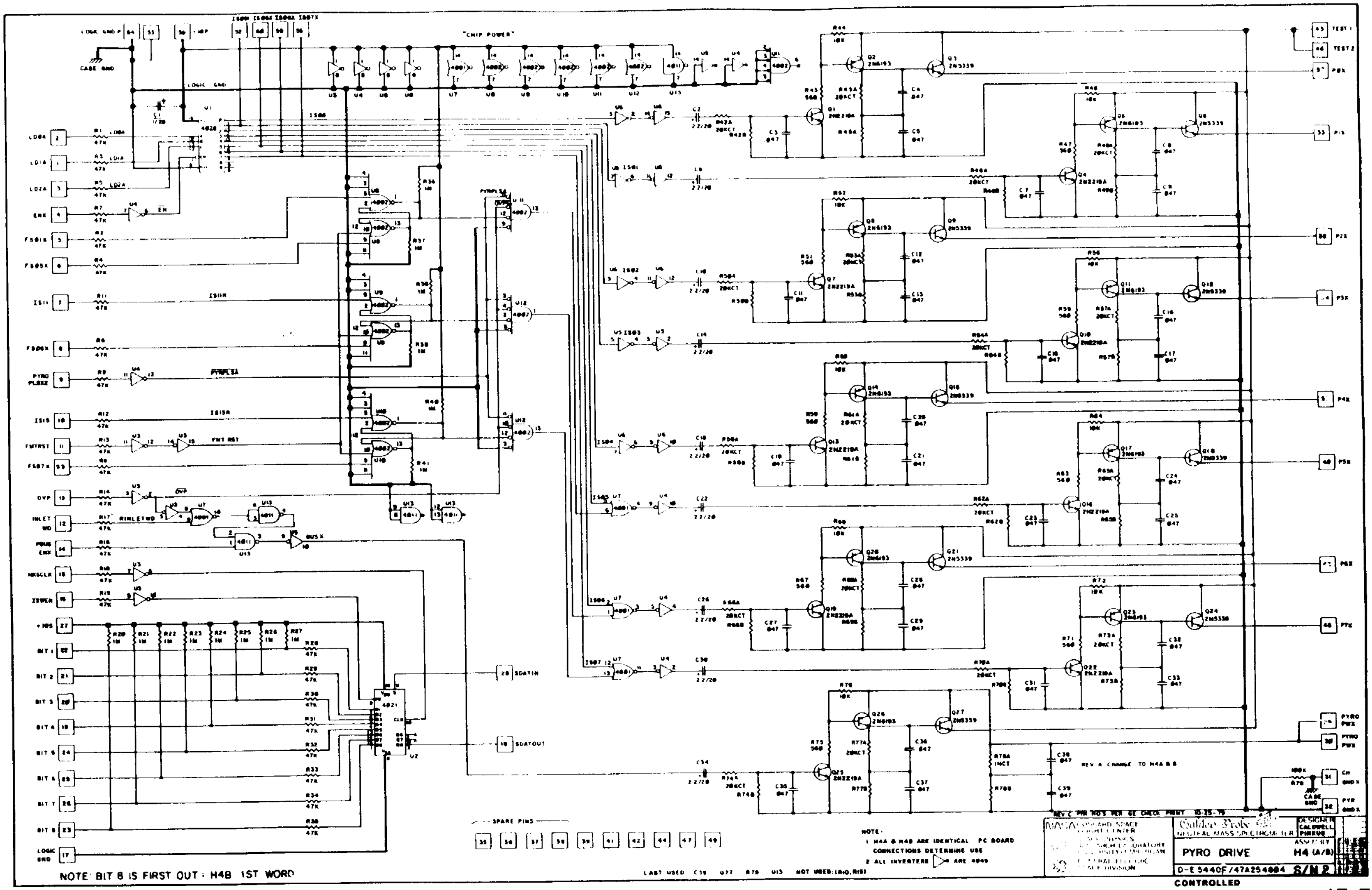
LAST USED R C D L

15.1

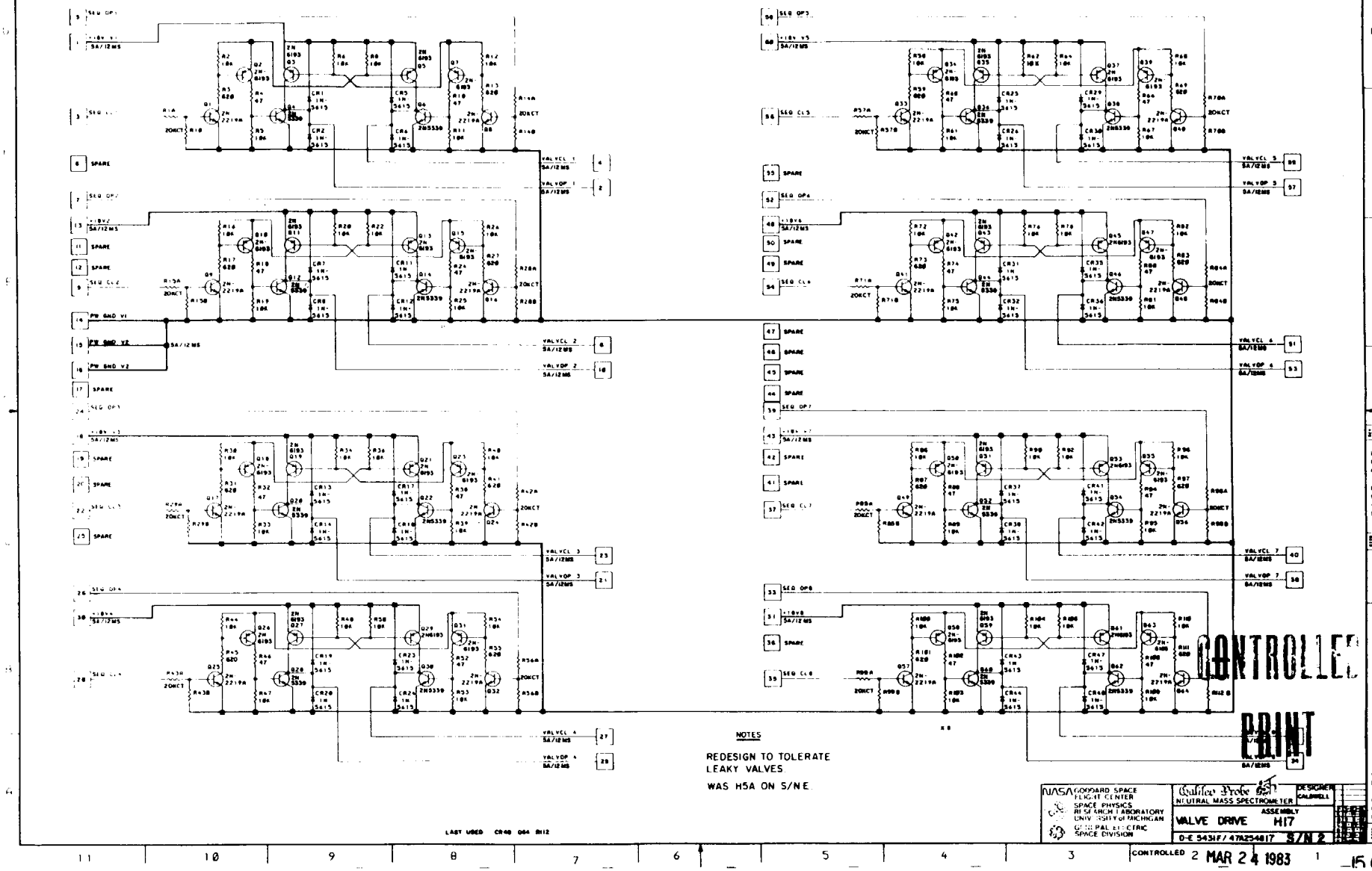

NASA GODDARD SPACE FLIGHT CENTER
SPACE PHYSICS RESEARCH LABORATORY UNIVERSITY of MICHIGAN
GENERAL ELECTRIC SPACE DIVISION
Galileo Probe
NEUTRAL MASS SPECTROMETER
MAIN POWER HYBRID
ASSEMBLY H1
D-E 5441I/47A254801 S/N 2
CONTROLLED
LAST USED: R71 CR31 U9 C34 Q20
NOT USED: R57, R27,
* EITHER R70 OR CH MAY BE USED BUT NOT BOTH. CH SELECTED AS O2 PER REV 1


NOTES:
1. ALL DIODES ARE 1N4148 UNLESS OTHERWISE SPECIFIED.
2. ALL CAPACITORS ARE IN MICROFARADS UNLESS OTHERWISE SPECIFIED.
3 ALL CAPACITOR VALVES ARE XXMF/KX VOLTS (RATED)
4 PIN NUMBERS ARE TEMPORARY 7-7-79
CT RESISTOR USED FOR LOW TEMP COEFFICIENT
MAY BE CHANGED TO +22/20 AT TEST (TBD)
REV D: CHANGE FIL FLAG NOMENCLATURE 32 AND 33 / NO HYBRID IMPACT
LAST USED C46 CR27 R94 U15
CONTROL GND
NOT USED GATES
SPARES
Galileo Probe
NEUTRAL MASS SPECTROMETER
DESIGNER MAURER/CALDWELL
FIL SUPPLY
H2
D-E5433D/47A254802 S/N2
CONTROLLED
SSO-79-


GROUND
-15
+15
+30
BIAS SUPPLIES
H3
D E5437C/47A254883 S/N 2
CONTROLLED


NOTE: BIT 8 IS FIRST OUT : H4B 1ST WORD
NOTE:
1 H4A & H4B ARE IDENTICAL PC BOARD CONNECTIONS DETERMINE USE
2 ALL INVERTERS ARE 4049
SPARE PINS
REV A CHANGE TO H4A & B
PYRO DRIVE
H4 (A/B)
D-E 5440F/47A254884
CONTROLLED

15.5



NOTES

REDESIGN TO TOLERATE LEAKY VALVES.

WAS H5A ON S/N E

LAST USED CR40 Q64 R112

CONTROLLED 2 MAR 24 1983

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Galileo Probe
NEUTRAL MASS SPECTROMETER

DESIGNER CALDWELL

VALVE DRIVE ASSEMBLY H17

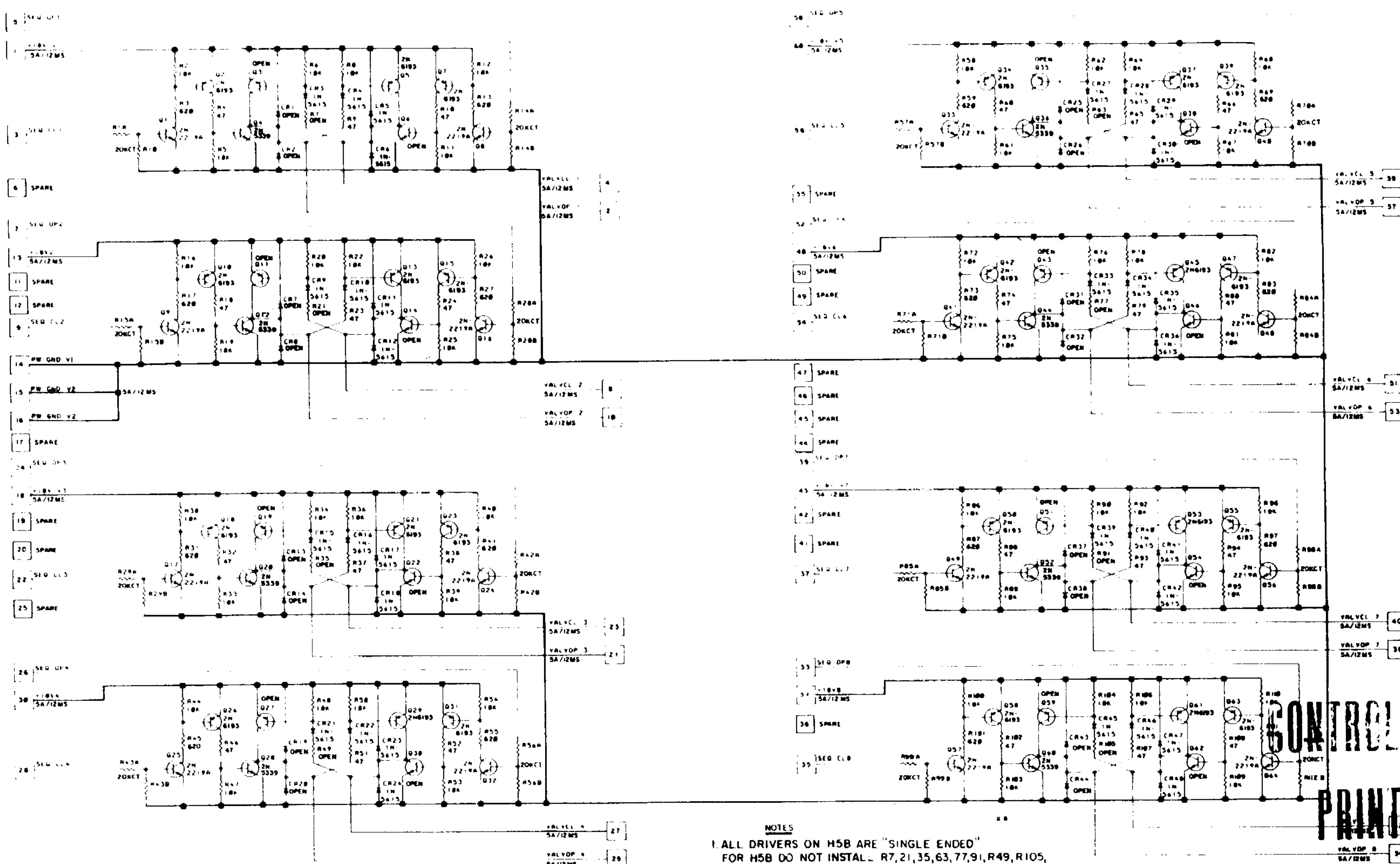
D-E 54316 / 47A254817 S/N 2

47A254805 SSO-79-

CONTROLLED COPY

PRINT

156A



NOTES

1. ALL DRIVERS ON H5B ARE "SINGLE ENDED"
   FOR H5B DO NOT INSTALL R7,21,35,63,77,91,R49,R105,
   Q3,6,11,14,19,22,35,38,43,46,51,54,Q27,Q30,Q59,Q62,
   CR19,20,43,44,CR1,2,7,8,13,14,25,26,31,32,37,38.

2. 7-14-82. H5B CREATED FROM H5.

LAST USED CR48 Q64 R112

VALVE DRIVE — H5B

DESIGNER: CALDWELL

ASSEMBLY

D-E 8904A/47A254805B S/N2

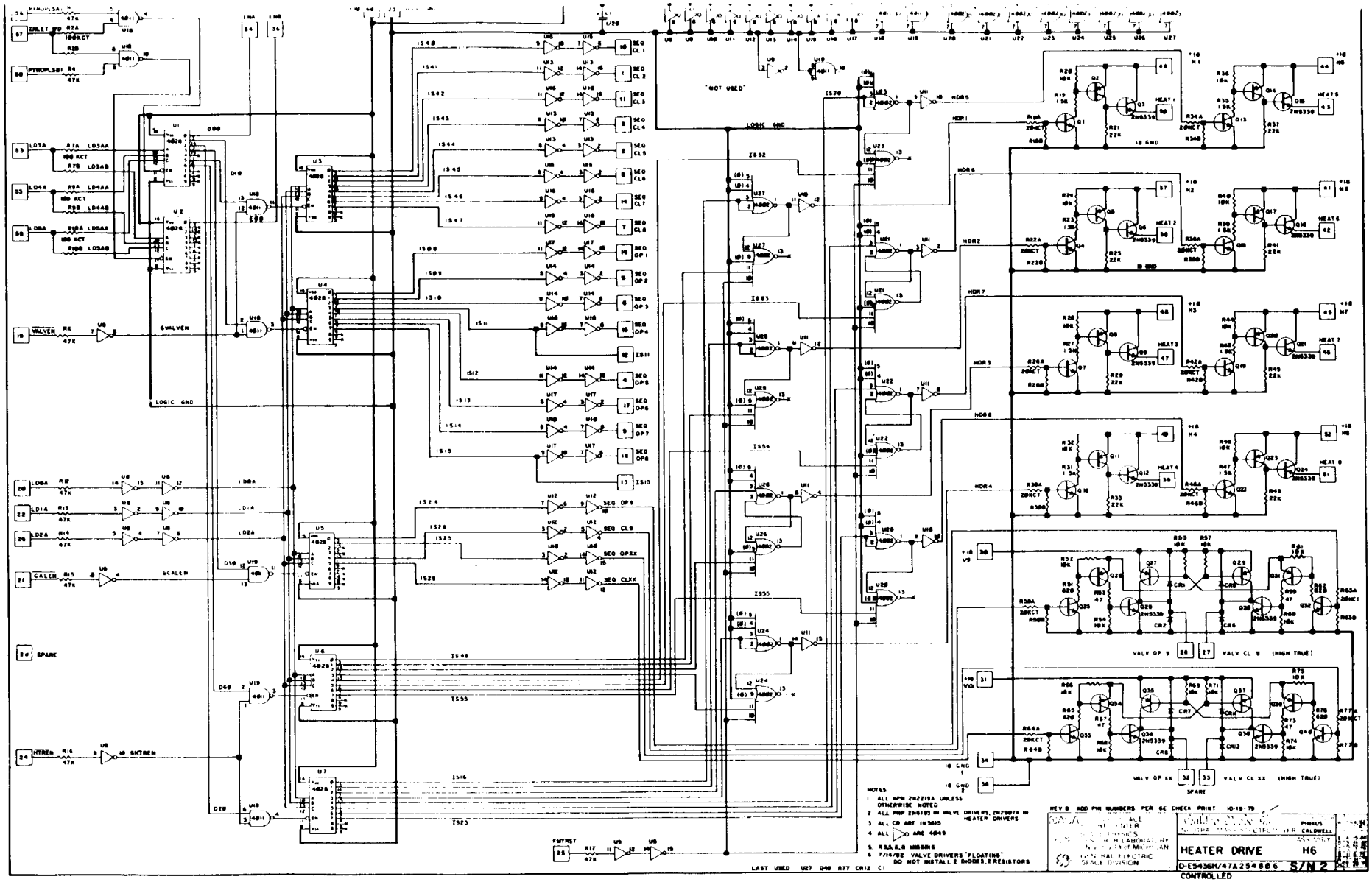
CONTROLLED PRINT

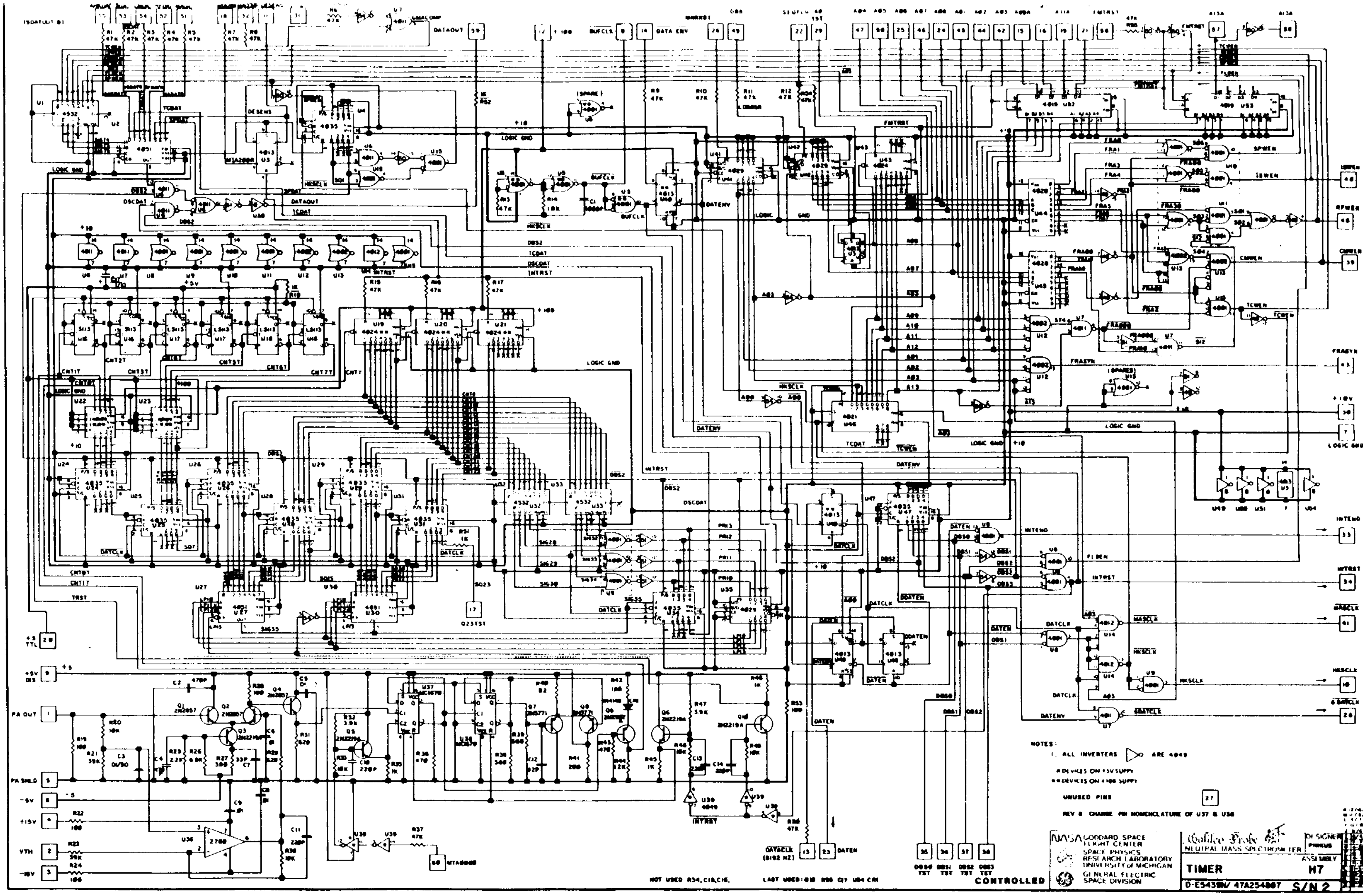
MAR 24 1983

15.68

47A254805

SSO-79-


HEATER DRIVE H6
D-E5436M/47A254806 S/N 2
CONTROLLED
NOTES
1 ALL NPN 2N2219A UNLESS OTHERWISE NOTED
2 ALL PNP 2N6190 IN VALVE DRIVERS, 2N3907A IN HEATER DRIVERS
3 ALL CR ARE IN5615
4 ALL ARE 4049
5 R34,6,8 MISSING
6 7/14/82 VALVE DRIVERS "FLOATING" DO NOT INSTALL 2 DIODES, 2 RESISTORS
REV B ADD PIN NUMBERS PER GE CHECK PRINT 10-19-79
"NOT USED"
LOGIC GND
VALV OP 9
VALV CL 9 (HIGH TRUE)
VALV OP XX
VALV CL XX (HIGH TRUE)
SPARE


NOTES:
1. ALL INVERTERS ARE 4049
UNUSED PINS
NOT USED R34, C15, C16,
CONTROLLED
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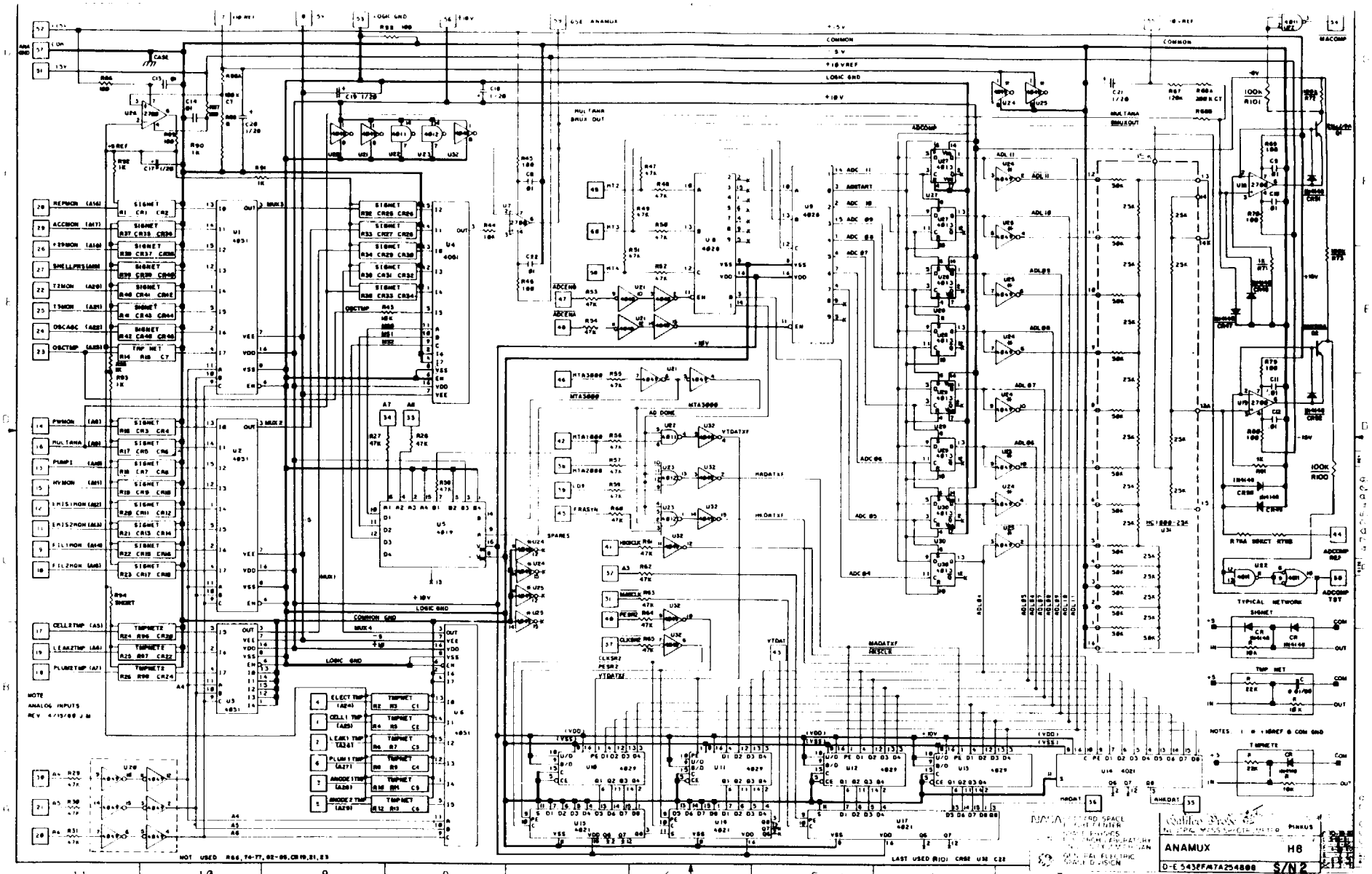
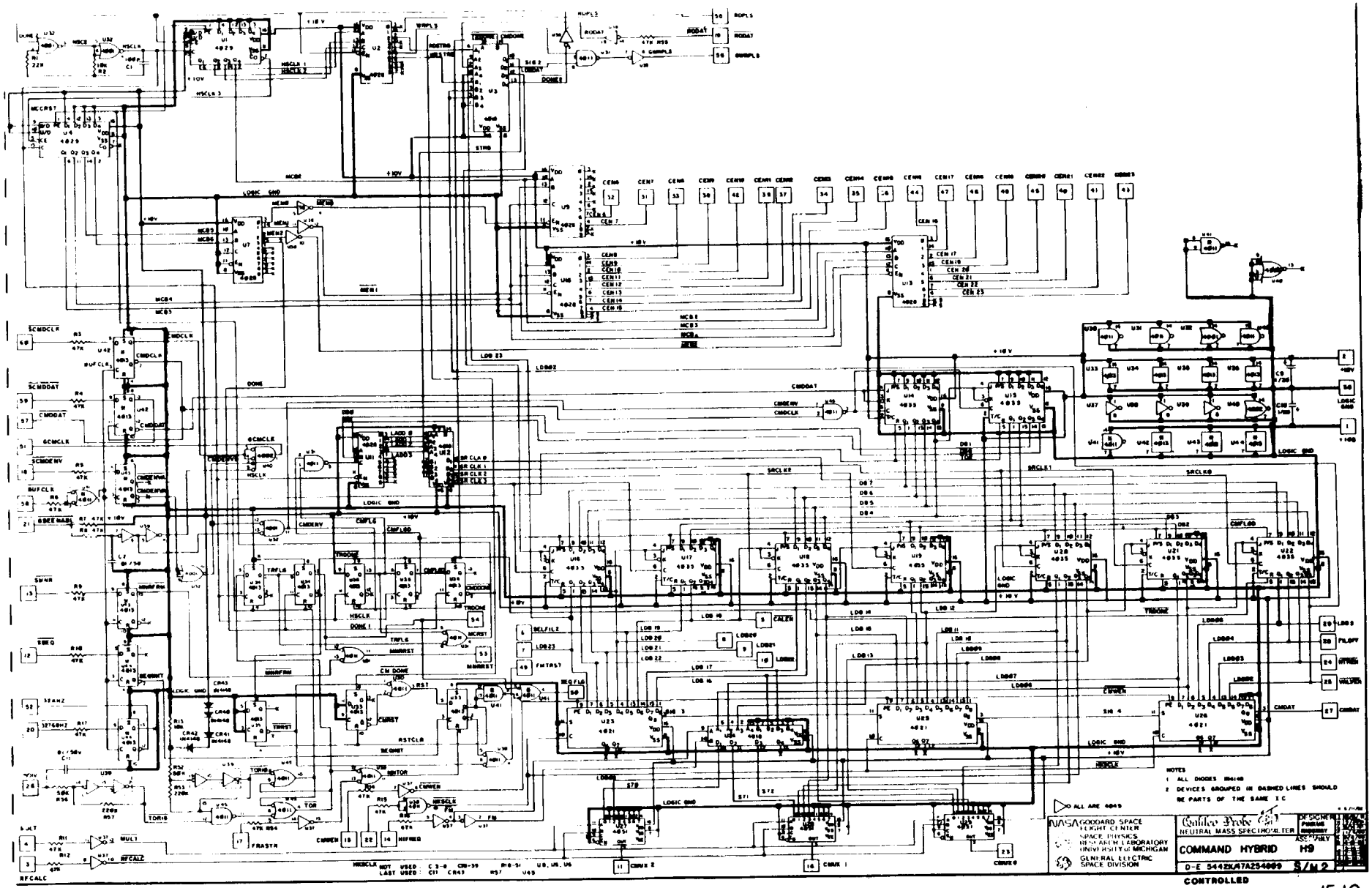
GENERAL ELECTRIC SPACE DIVISION
NEUTRAL MASS SPECTROMETER
TIMER
H7
S/N 2


ANAMUX
H8
D-E 5438FA7A254888 S/N2
OCT 27 1982
CONTROLLED
15.9


NOTES
1 ALL DIODES IN4148
2 DEVICES GROUPED IN DASHED LINES SHOULD BE PARTS OF THE SAME I C
ALL ARE 4049
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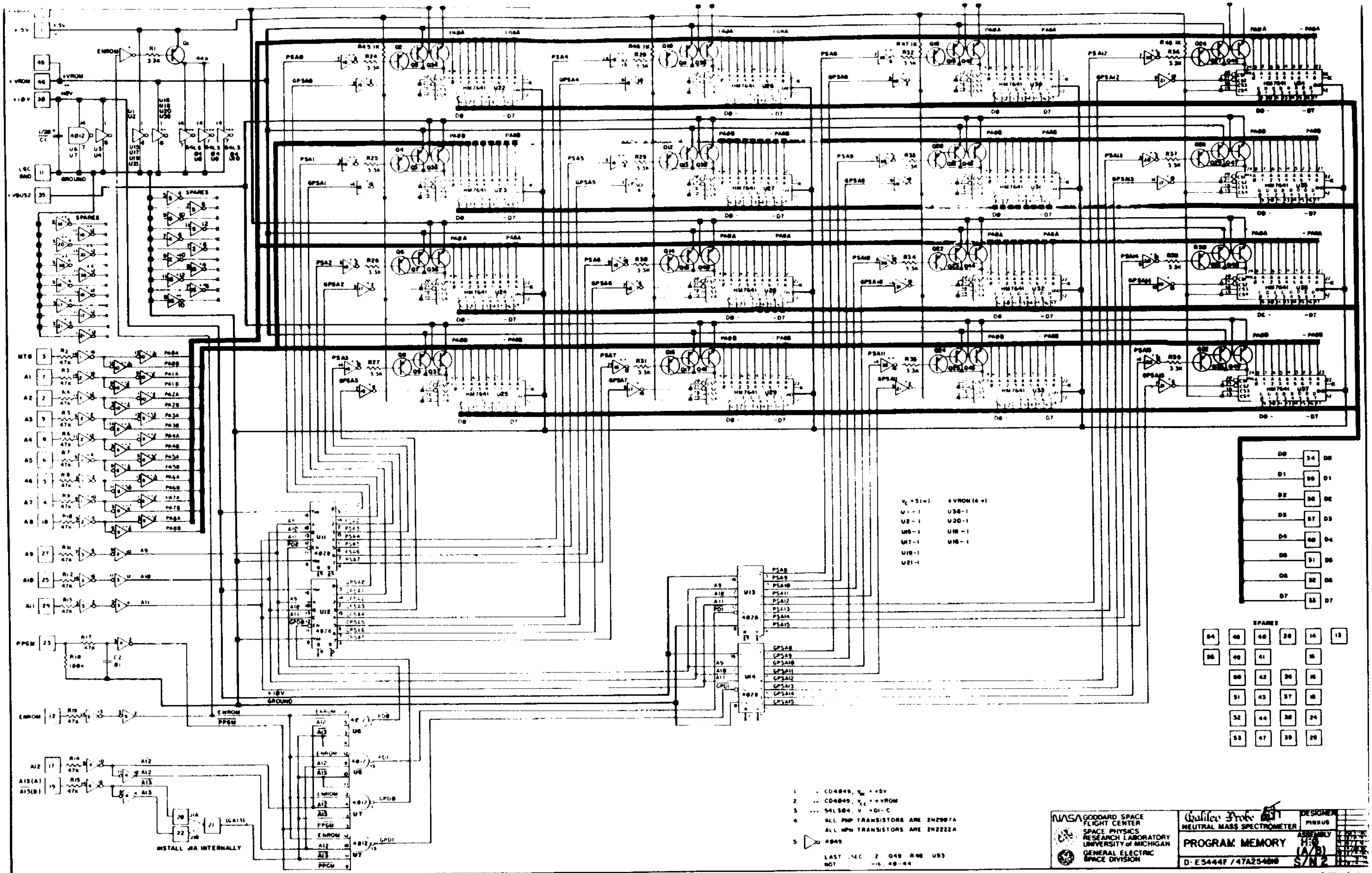
GENERAL ELECTRIC SPACE DIVISION
Galileo Probe
NEUTRAL MASS SPECTROMETER
COMMAND HYBRID H9
D-E 5442XA7A254009 S/M 2
CONTROLLED


1 • CD4049, V_cc = +5V
2 •• CD4049, V_cc = +VROM
3 ••• 54LS04, V = +01-C
4 ALL PNP TRANSISTORS ARE 2N2907A
ALL NPN TRANSISTORS ARE 2N2222A
5 4049
LAST USED 2 Q49 R48 U53
NOT USED 16, 40-44
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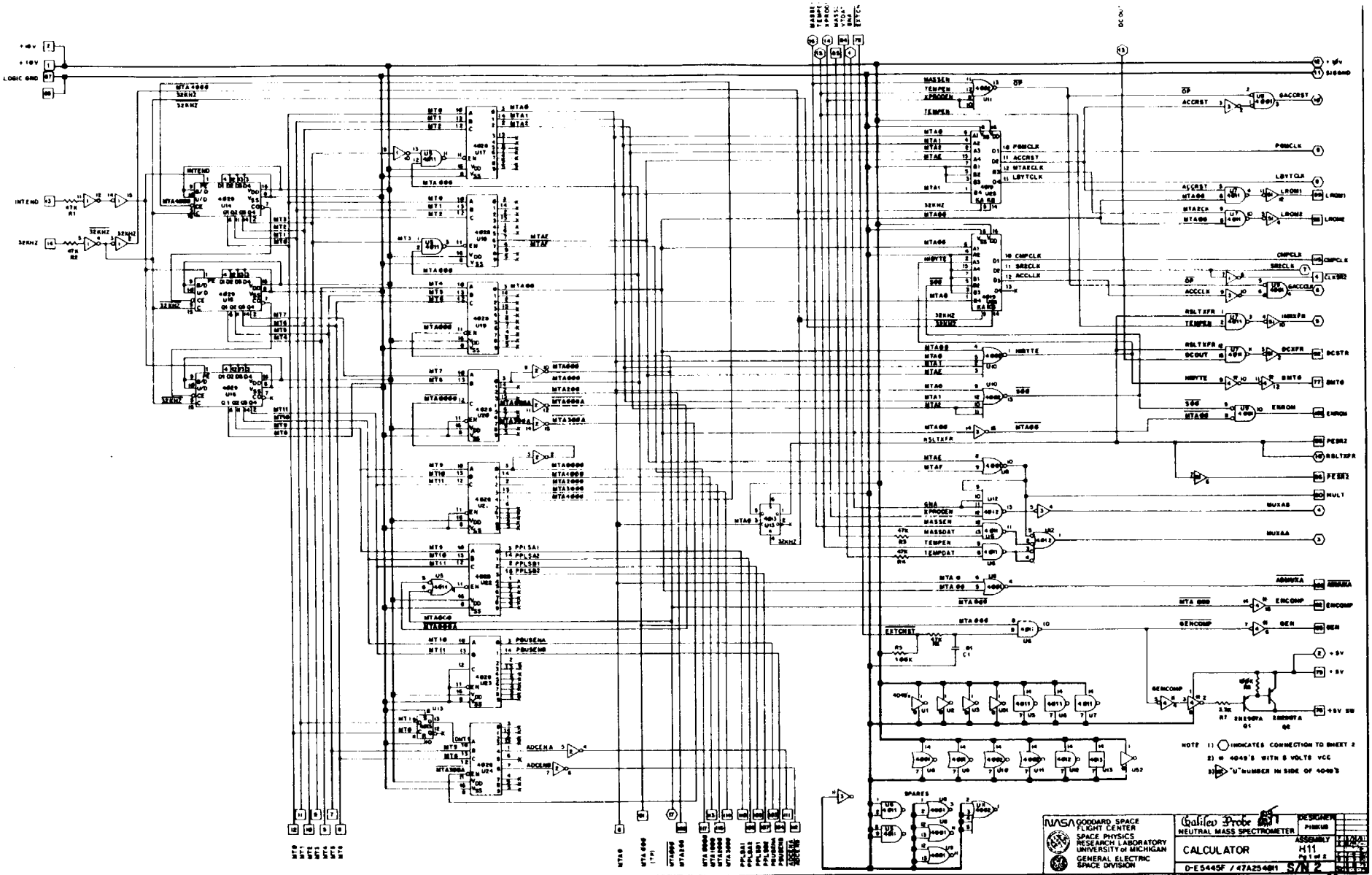
GENERAL ELECTRIC SPACE DIVISION
Galileo Probe
NEUTRAL MASS SPECTROMETER
DESIGNER PINKUS
PROGRAM MEMORY
ASSEMBLY H-9 (A/B)
D-E5444F / 47A254010
S/N 2
INSTALL JIA INTERNALLY
SPARES
GROUND
+VROM
ENROM
PPGM
HM7641
4028
4012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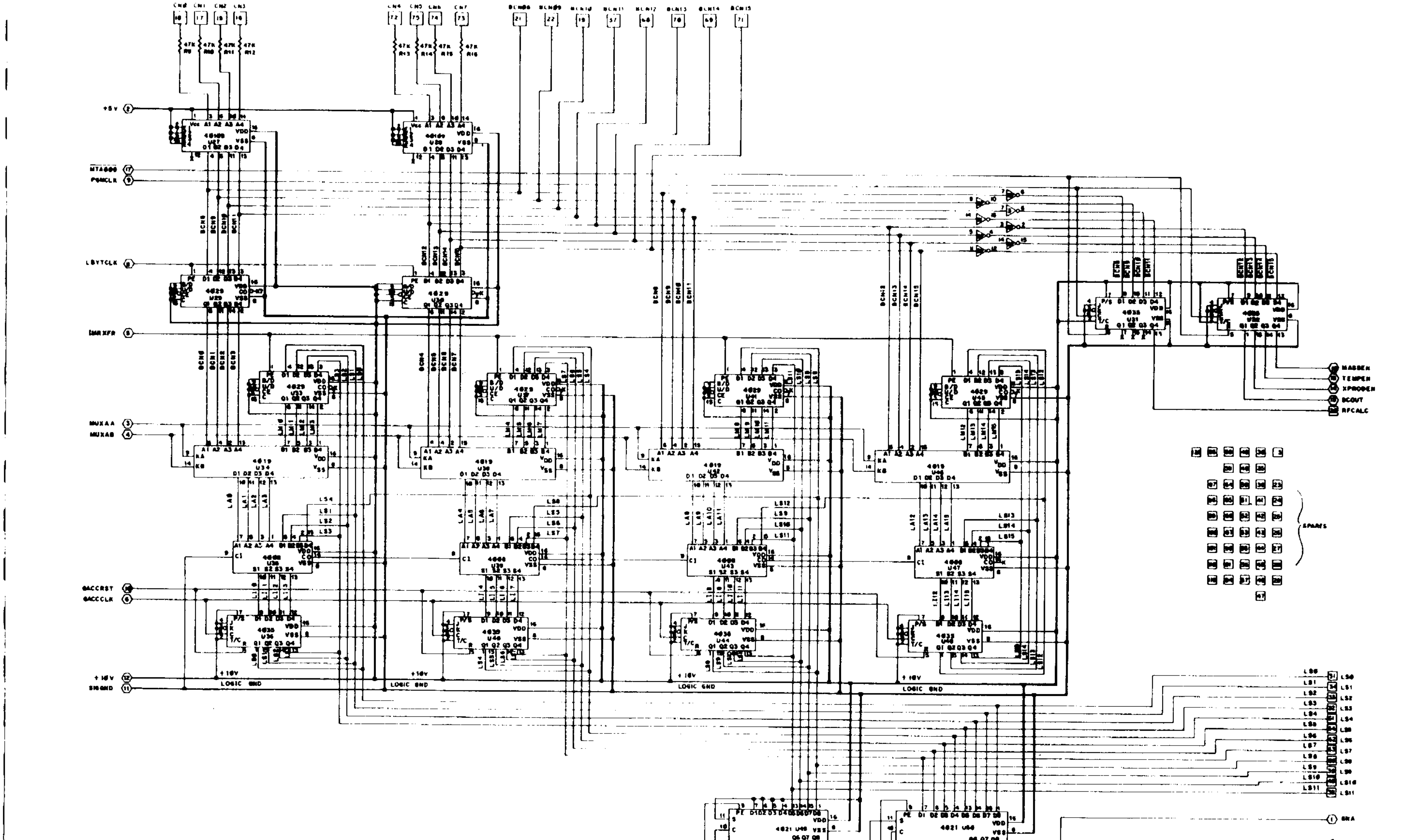
Galileo Probe
NEUTRAL MASS SPECTROMETER
CALCULATOR
H11
D-E5445F / 47A254911
S/N 2
CONTROLLED
15.12



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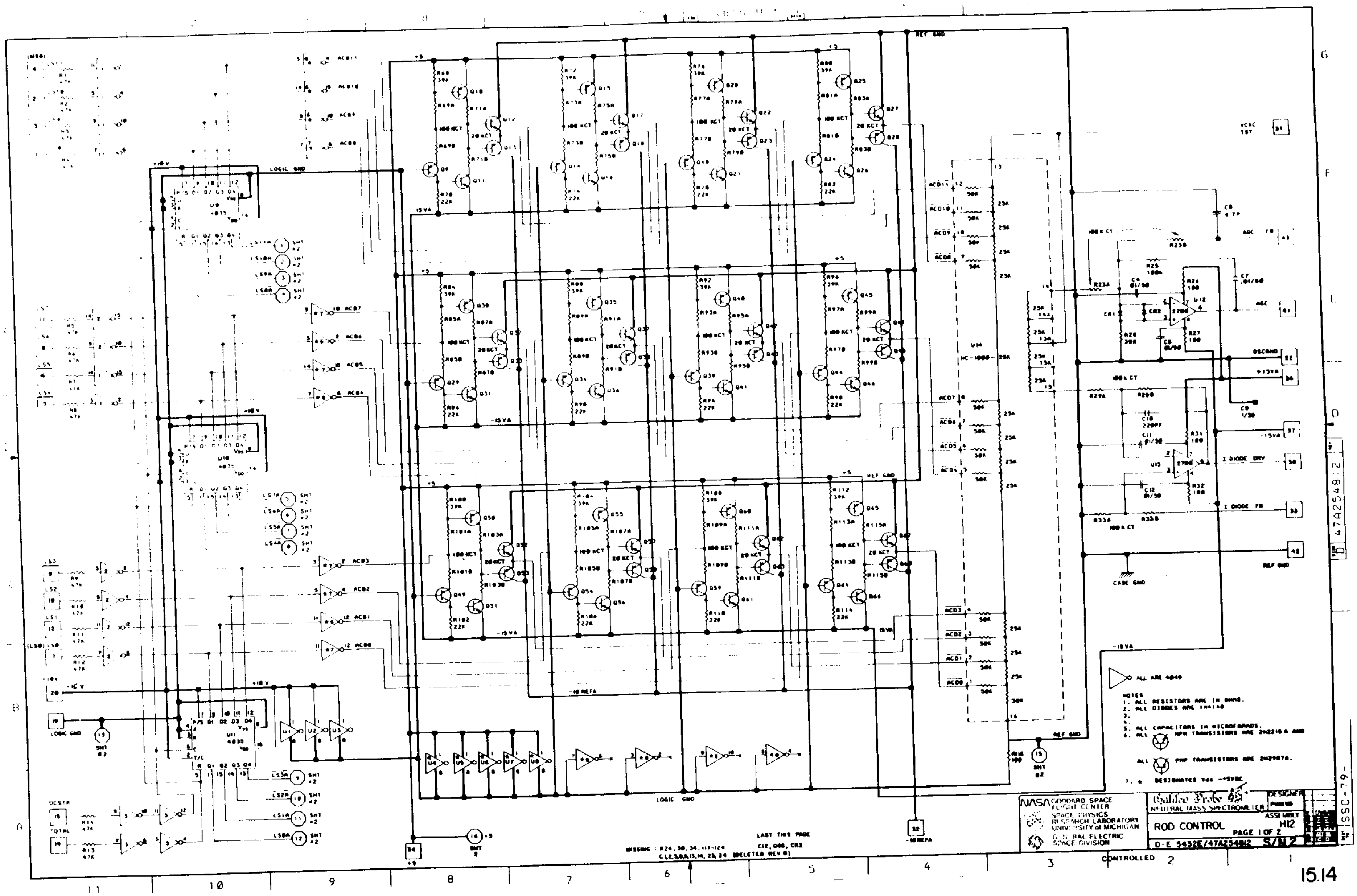
NEUTRAL MASS SPECTROMETER

CALCULATOR S/N2 H11

D-E5443F A7A254811 CONTROLLED

15.13


ALL ARE 4049
NOTES
1. ALL RESISTORS ARE IN OHMS.
2. ALL DIODES ARE 1N4148.
3.
4.
5. ALL CAPACITORS IN MICROFARADS.
6. ALL NPN TRANSISTORS ARE 2N2219A AND
ALL PNP TRANSISTORS ARE 2N2907A.
7. DESIGNATES Vcc = +5VDC
MISSING : R24, 30, 34, 117-124
C1,2,5,8,9,13,14,23,24 DELETED REV 01
LAST THIS PAGE
C12, 066, CR2
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DESIGNER
ASSEMBLY H12
ROD CONTROL
PAGE 1 OF 2
D-E 5432E/47A2548I2 S/N 2
CONTROLLED
47A2548 2
SSO-79-

15.14