RHIC Accelerator Controls Section
Bldg. 1002A Wiring Diagrams
BNL Drawing Number 94028826

Brookhaven National Laboratory, Upton, New York 11973

Created By: Ed Koropsak
Last Updated 5/15/03

Power Distribution
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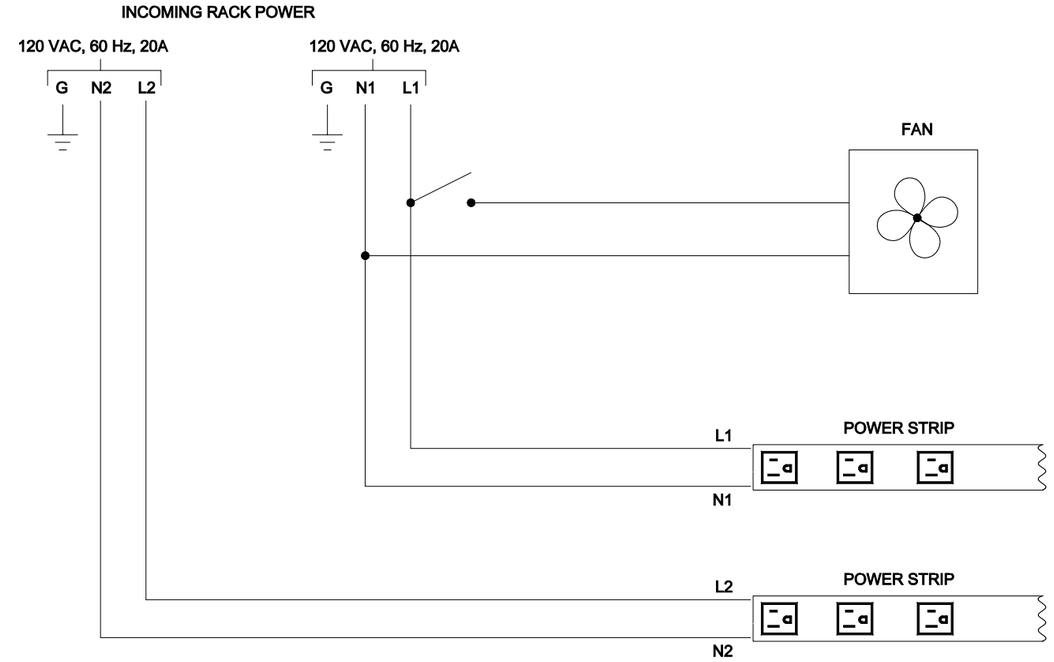
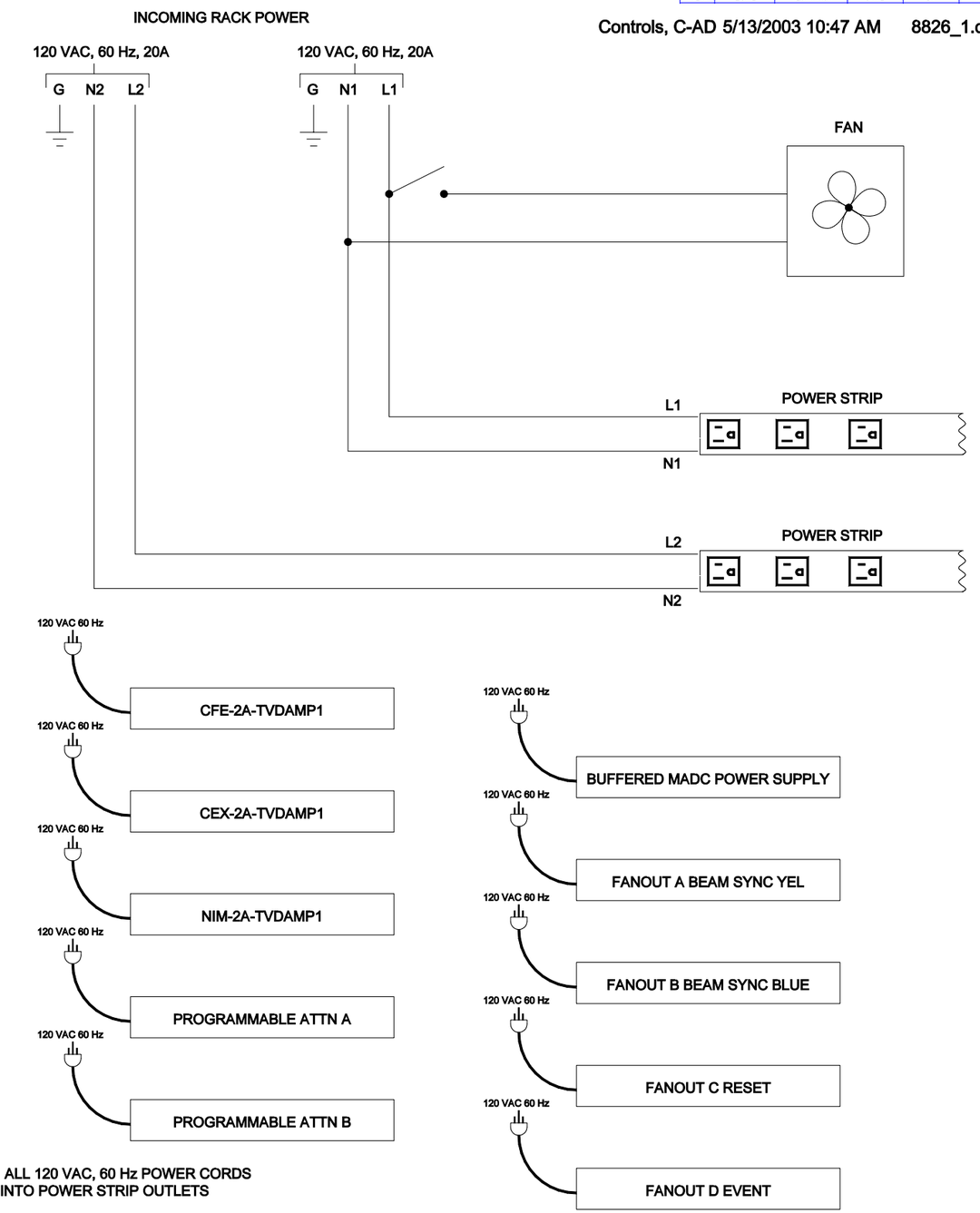
REV.	ZONE	ECN NO.	DATE	BY	CKR	APP.

Controls, C-AD 5/13/2003 10:47 AM 8826_1.dwg



NOTE: ALL 120 VAC, 60 Hz POWER CORDS
PLUG INTO POWER STRIP OUTLETS

RACK R029



NOTE: ALL 120 VAC, 60 Hz POWER CORDS
PLUG INTO POWER STRIP OUTLETS

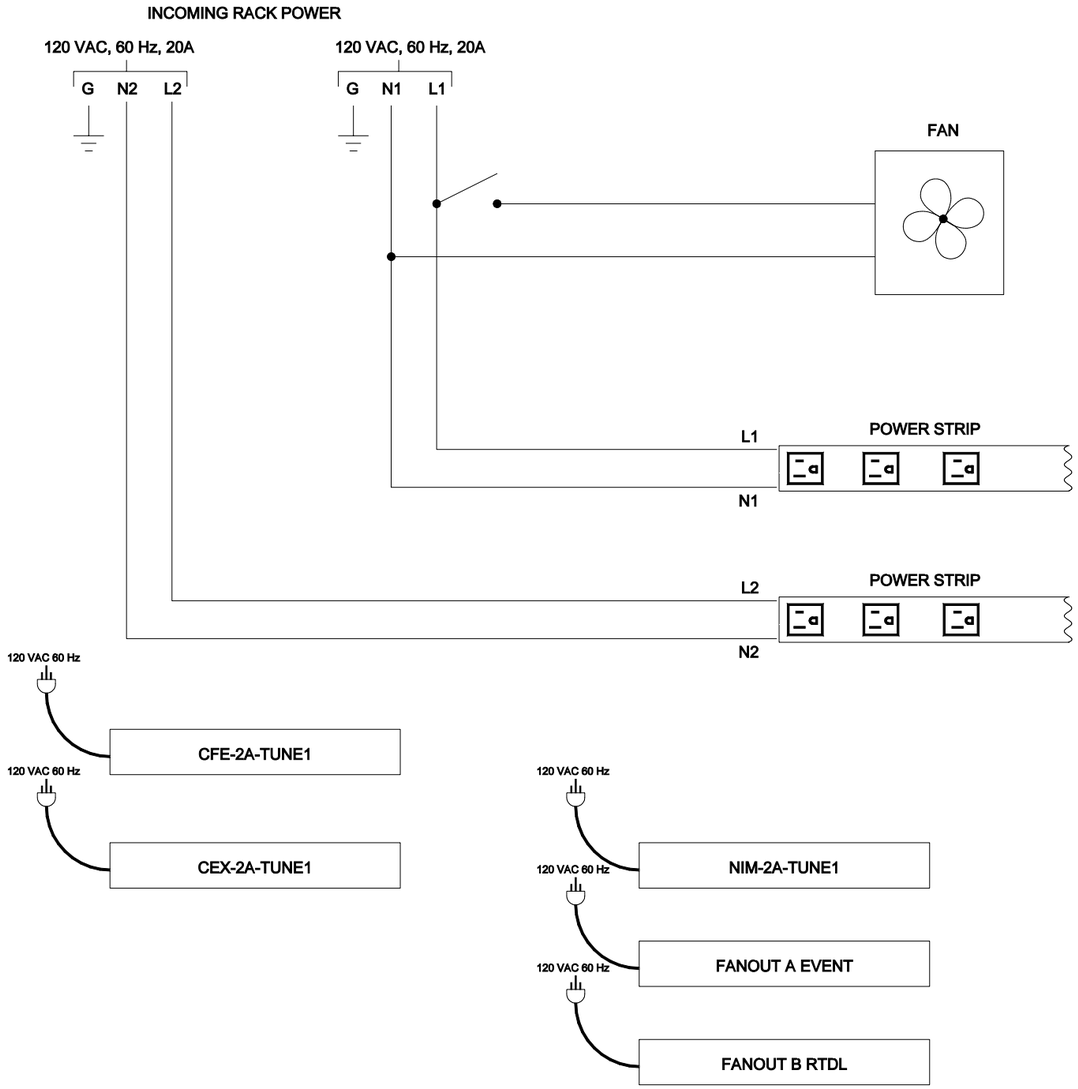
RACK R0210

-3 -2 -1 QTY REQD	REF DESIGNATOR	ITEM NO.	DESCRIPTION	MAT'L DWG NO./BNL NO.

INTERPRET IN GENERAL ACCORDANCE WITH ASME Y14.24M-1989	Q.A. CATEGORY A-3	DATE	BROOKHAVEN NATIONAL LABORATORY	
	DRAWN BY: Ed Koropsak	5/13/03	UPTON, N.Y. 11973	
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES	CHECKED BY:		RHIC CONTROLS WIRING DIAGRAM	
DECIMAL TOLERANCES .X ±.030 .XX ±.015 .XXX ±.005 ANGULAR TOLERANCE ± .5°	DESIGN APPROVAL:		SERVICE BLDG. 1002A TUNE METER	
	ENGINEER APPROVAL: Rob Michnoff		RACK R029, R0210	
	SUPVR. APPROVAL:		SIZE D / 94028826 / REV. A	
OUTSTANDING ECN	NA FINISH; BREAK SHARP EDGES MAX. XX MIN. XX	NEXT ASSEMBLY	DRAWING NUMBER	
			MATERIAL: SCALE: NA WEIGHT: SHEET 1	

REV.	ZONE	ECN NO.	DATE	BY	CKR	APP.

Controls, C-AD 5/13/2003 10:51 AM 8826_2.dwg



NOTE: ALL 120 VAC, 60 Hz POWER CORDS
PLUG INTO POWER STRIP OUTLETS

RACK R0211

-3 / -2 / -1 QTY REQD	REF DESIGNATOR	ITEM NO.	DESCRIPTION	MAT'L DWG NO./BNL NO.

INTERPRET IN GENERAL ACCORDANCE WITH ASME Y14.24M-1989	Q.A. CATEGORY A-3	DATE	BROOKHAVEN NATIONAL LABORATORY	
	DRAWN BY: Ed Koropsak	5/13/03	UPTON, N.Y. 11973	
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES	CHECKED BY		RHIC CONTROLS WIRING DIAGRAM	
DECIMAL TOLERANCES .X ±.030 .XX ±.015 .XXX ±.005 ANGULAR TOLERANCE ± .5°	DESIGN APPROVAL		SERVICE BLDG. 1002A TUNE METER	
	ENGINEER APPROVAL: Rob Michnoff		RACK R0211	
	SUPVR. APPROVAL		SIZE D / 94028826 / REV. A	
NA FINISH; BREAK SHARP EDGES MAX. XX MIN. XX	NEXT ASSEMBLY		DRAWING NUMBER	
OUTSTANDING ECN			MATERIAL: SCALE: NA WEIGHT: SHEET 2	

*AUTOCAD

REV.	ZONE	ECN NO.	DATE	BY	CKR	APP.

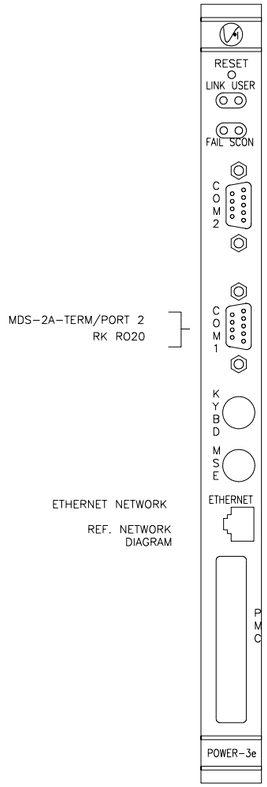
Controls, C-AD 5/27/2003 3:39 PM 8826_3.dwg

FRONT END COMPUTER

BLDG #: 1002A
RACK #: R0211
CHASSIS ID: CFE-2A-TUNE1
SLOT#: 1
FEC NAME: CFE-2A-TUNE1

MM-6702

BLDG #: 1002A
RACK #: R0211
CHASSIS ID: CFE-2A-TUNE1
SLOT #: 2
A32 BASE ADDRESS: 80000000



MDS-2A-TERM/PORT 2
RK R020

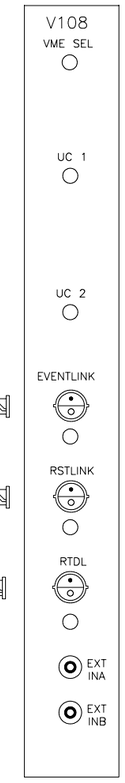
ETHERNET NETWORK

REF. NETWORK DIAGRAM

JUMPER LIST
1. REMOVE E1.
2. INSTALL E15.
3. SW3 CLOSE ALL POSITIONS. LOWER LIMIT=XX000000
4. SW2 CLOSE POSITIONS 7 AND 8. UPPER LIMIT=XX3FFFFE
5. SW1 CLOSE POSITION 1. BASE=80XXXXXX
6. INSTALL E14 AND E25 TO ENABLE BATTERIES
7. SW4 ALL OPEN.
8. SW5 ALL OPEN.
9. SW6 ALL OPEN.

V108 UTILITY MODULE

1002A
BLDG #: R0211
RACK #: CFE-2A-TUNE1
CHASSIS ID: 3
A24 SLOT #: 0X004000
BASE ADDRESS:



ASSY# 94028094

EVENT LINK

BLDG #: 1002A
RACK #: R0211
FANOUT #: A

OUTPUT J3

RESET LINK

BLDG #: 1002A
RACK #: R0211
FANOUT #: C

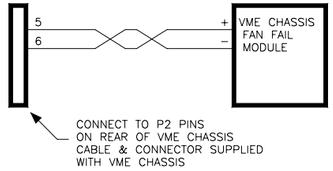
OUTPUT J3

REAL TIME DATA LINK

BLDG #: 1002A
RACK #: R0211
FANOUT #: B

OUTPUT J3

ASSY# 94028176
LENGTH AS REQUIRED
(TYP 3 PLACES)



JUMPER LIST

E25 through E50 are configured for remote reset address at the time of board acceptance test.
DO NOT MODIFY!

Remote reset pulls VME SYS Reset.
E58-E60, E59-E61

A24 BASE ADDRESS= 4000h
E57-E13, E2-E14, E3-E15, E4-E16, E5-E17, E6-E18
E7-E19, E8-E20, E9-E21, E10-E22, E11-E24, E57-E23
SW1=OPEN
SW2=CLOSED
SW3=OPEN
SW4=OPEN

-3	-2	-1	REF DESIGNATOR	ITEM NO.	DESCRIPTION	MAT'L DWG NO./BNL NO.
QTY REQD						

INTERPRET IN GENERAL ACCORDANCE WITH ASME Y14.24M-1989
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
DECIMAL TOLERANCES
.X ±.030
.XX ±.015
.XXX ±.005
ANGULAR TOLERANCE
± .5°
NA FINISH
BREAK SHARP EDGES
MAX. XX MIN. XX
OUTSTANDING ECN

Q.A. CATEGORY	A-3	DATE
DRAWN BY	Al Watson	3/9/00
CHECKED BY		
DESIGN APPROVAL		
ENGINEER APPROVAL	Rob Michnoff	
SUPVR. APPROVAL		

NEXT ASSEMBLY

BROOKHAVEN NATIONAL LABORATORY
UPTON, N.Y. 11973
RHIC CONTROLS
SERVICE BLDG. 1002A TUNE METER
FT END COMP/V108 UTIL MODULE

SIZE	DRAWING NUMBER	REV.
D	94028826	A

MATERIAL: SCALE: NA WEIGHT: SHEET 3

8 7 6 5 4 3 2 1 *AUTOCAD

REV.	ZONE	ECN NO.	DATE	BY	CKR	APP.

Controls, C-AD 5/27/2003 3:46 PM 8826_4.dwg

MADC MUX A/D IO PANEL
BLDG #: 1002A
RACK #: R0210
PANEL #: A

MADC CONTROLLER
RACK#: R0211
CHASSIS ID: CFE-2A-TUNE1
SLOT #: 4
A24 BASE ADDRESS: 540000
A32 BASE ADDRESS: 02400000

MADC A/D MODULE
RACK#: R0211
CHASSIS ID: CFE-2A-TUNE1
SLOT #: 5
CONFIGURATION: +/- 10V

EVENT LINK
BLDG #: 1002A
RACK #: R0211
FANOUT #: A

OUTPUT J17

ASSY# 94028176
LENGTH AS REQUIRED
(TYP 1 PLACE)

V113
VME SEL
SYS FAIL
CPU RUN
ADC ERR
EVENTLINK
RESET
0
1
2
3
EXT TRIG INPUTS
SCAN TRIG OUT0
SCAN TRIG OUT1

P2 INTERFACE RIBBON CABLE
ASSY# 94028218

ASSY# 94028138

V114
CHAN 0 - 15
CHAN 16 - 31
CHAN 32 - 47
CHAN 48 - 63

ASSY# 94028226

MADC A/D IO CABLE
ASSY# 94028216

ASSY# 9402xxxx
ANALOG OUTPUT

J16	
J15	
J13	CHAN 13, ???? RACK R0216
J12	CHAN 12, REF SH 15 YELLOW VERT COHERENCE
J11	CHAN 11, REF SH 15 YELLOW HORZ COHERENCE
J10	CHAN 10, ????? RACK R0216
J9	CHAN 9, REF SH 14 BLUE VERT COHERENCE
J8	CHAN 8, REF SH 14 BLUE HORZ COHERENCE
J7	
J6	
J5	
J4	
J3	
J2	
J1	CHAN 1, REF SH 17 HIGH VOLTAGE POWER SUPPLY CURRENT
J0	CHAN 0, REF SH 17 HIGH VOLTAGE POWER SUPPLY VOLTAGE

V113 JUMPERS INSTALLED

E3-E4

V113
BASE ADDRESS DIP SWITCHES

A24 BASE — A32 BASE

A18 A19 A20 A21 A22 A23 A22 A23 A24 A25 A26 A27 A28 A29 A30 A31

SW1 SW2

PUSH SWITCH IN DIRECTION SHOWN

V114 JUMPERS INSTALLED

J1, J2, J4, J5, J9
J19, J15, J21

ALL OTHER JUMPERS OUT

-3	-2	-1	QTY REQD	REF DESIGNATOR	ITEM NO.	DESCRIPTION	MAT'L DWG NO./BNL NO.

INTERPRET IN GENERAL ACCORDANCE WITH ASME Y14.24M-1989
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
DECIMAL TOLERANCES
.X ±.030
.XX ±.015
.XXX ±.005
ANGULAR TOLERANCE
± .5°
NA
FINISH
BREAK SHARP EDGES
MAX. XX MIN. XX
OUTSTANDING ECN

Q.A. CATEGORY A-3

DRAWN BY	Al Watson	3/9/00
CHECKED BY		
DESIGN APPROVAL		
ENGINEER APPROVAL	Rob Michnoff	
SUPVR. APPROVAL		

NEXT ASSEMBLY

BROOKHAVEN NATIONAL LABORATORY
UPTON, N.Y. 11973
RHIC CONTROLS
SERVICE BLDG. 1002A TUNE METER
MADC SYSTEM

SIZE D
94028826
REV. A
DRAWING NUMBER

MATERIAL:
SCALE: NA
WEIGHT:
SHEET 4

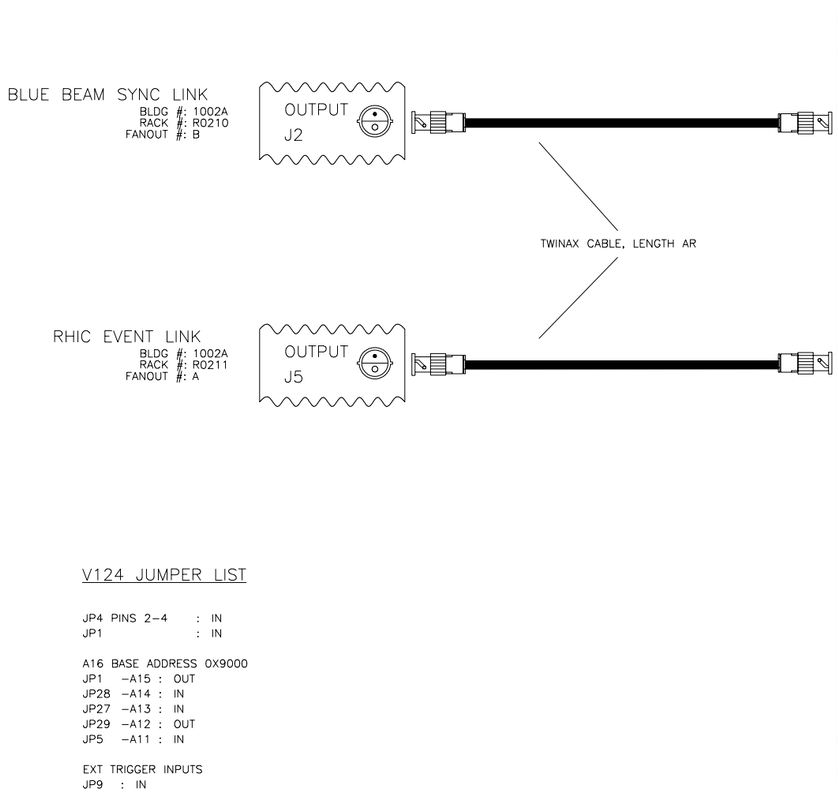
*AUTOCAD

REV.	ZONE	ECN NO.	DATE	BY	CKR	APP.

Controls, C-AD 5/13/2003 11:05 AM 8826_5.dwg

V124 BEAM SYNC TRIGGER MODULE-A (BLUE)

BLDG #: 1002A
RACK #: R0211
CHASSIS ID: CFE-2A-TUNE1
SLOT #: 6
A16 BASE ADDRESS: 0X9000



V124 JUMPER LIST

JP4 PINS 2-4 : IN
JP1 : IN

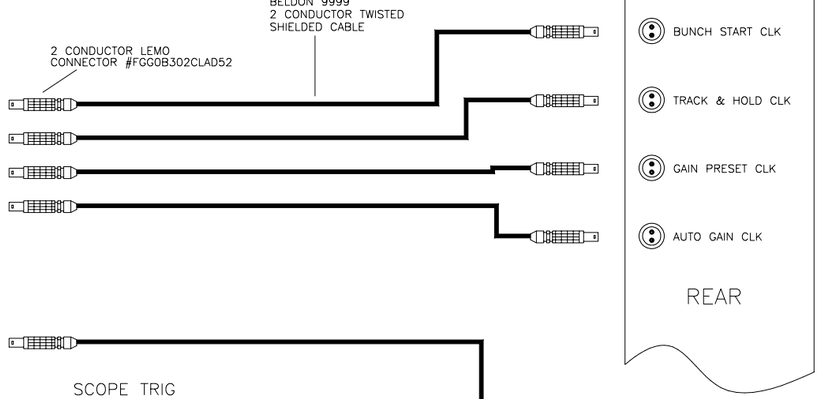
A16 BASE ADDRESS 0X9000
JP1 -A15 : OUT
JP28 -A14 : IN
JP27 -A13 : IN
JP29 -A12 : OUT
JP5 -A11 : IN

EXT TRIGGER INPUTS
JP9 : IN
JP8 : OUT
JP14 : IN
JP10 : IN
JP11 : OUT
JP15 : IN
JP16 : IN
JP17 : OUT
JP18 : IN
JP21 : IN
JP22 : OUT
JP23 : IN

TRIGGER OUTPUTS
ALL : IN

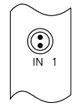
BLUE HORZ

BUNCH SIGNAL CONDITIONING NIM MODULE
1002A
R0211
NIM-2A-TUNE1
2



V189 ECL TO TTL CONVERTER

BLDG #: 1002A
RACK #: R0211
CHASSIS ID: CEX-2A-TUNE1
SLOT#: 21



SHEET 19

-3	-2	-1	REF DESIGNATOR	ITEM NO.	DESCRIPTION	MAT'L DWG NO./BNL NO.
QTY REQD						

INTERPRET IN GENERAL ACCORDANCE WITH ASME Y14.24M-1989
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
DECIMAL TOLERANCES .X ±.030 .XX ±.015 .XXX ±.005
ANGULAR TOLERANCE ± .5°
FINISH: NA
BREAK SHARP EDGES MAX. XX MIN. XX
OUTSTANDING ECN

Q.A. CATEGORY A-3

DRAWN BY	Ed Koropsak	5/6/03
CHECKED BY		
DESIGN APPROVAL		
ENGINEER APPROVAL	Rob Michnoff	
SUPVR. APPROVAL		

NEXT ASSEMBLY

BROOKHAVEN NATIONAL LABORATORY
UPTON, N.Y. 11973
RHIC CONTROLS
SERVICE BLDG. 1002A TUNE METER
V124_BLUE (A MODULE)

SIZE D | 94028826 | REV. A
DRAWING NUMBER

MATERIAL: | SCALE: NA | WEIGHT: | SHEET 5

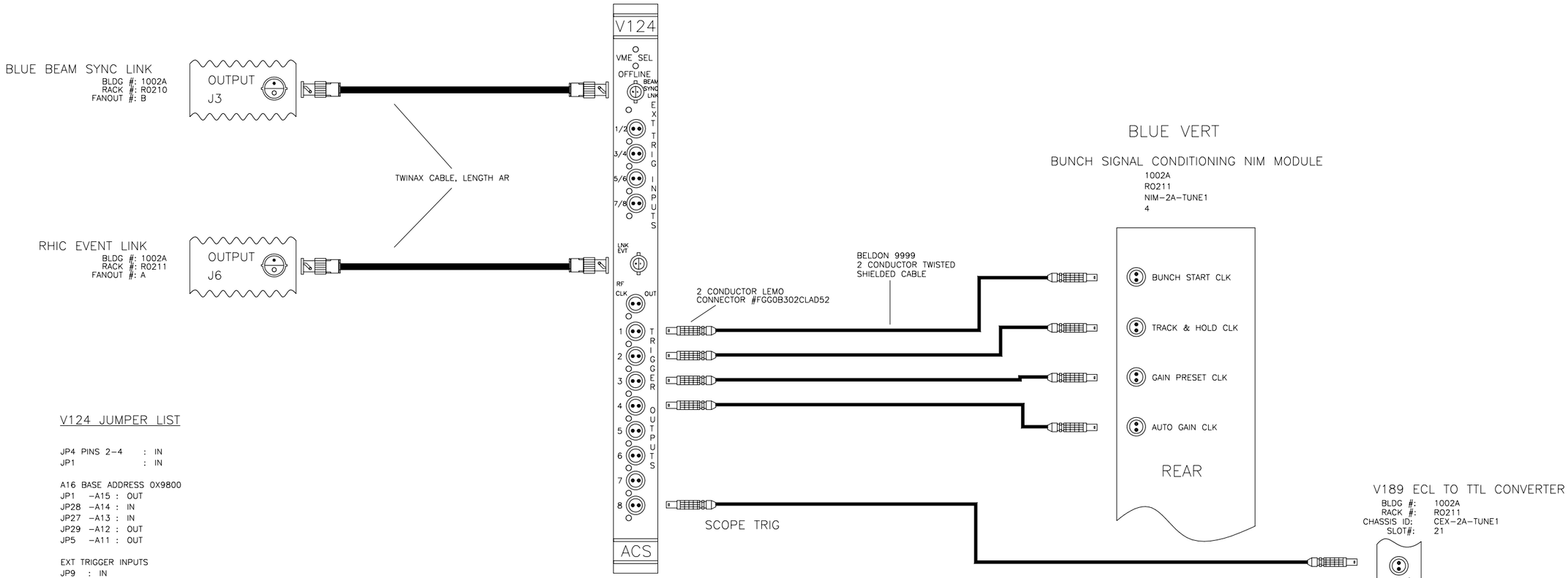
*AUTOCAD

REV.	ZONE	ECN NO.	DATE	BY	CKR	APP.

Controls, C-AD 5/27/2003 3:48 PM 8826_6.dwg

V124 BEAM SYNC TRIGGER MODULE-B (BLUE)

BLDG #: 1002A
RACK #: R0211
CHASSIS ID: CFE-2A-TUNE1
SLOT #: 7
A16 BASE ADDRESS: 0X9800



SHEET 19

V124 JUMPER LIST

JP4 PINS 2-4 : IN
JP1 : IN

A16 BASE ADDRESS 0X9800
JP1 -A15 : OUT
JP28 -A14 : IN
JP27 -A13 : IN
JP29 -A12 : OUT
JP5 -A11 : OUT

EXT TRIGGER INPUTS
JP9 : IN
JP8 : OUT
JP14 : IN
JP10 : IN
JP11 : OUT
JP15 : IN
JP16 : IN
JP17 : OUT
JP18 : IN
JP21 : IN
JP22 : OUT
JP23 : IN

TRIGGER OUTPUTS
ALL : IN

-3	-2	-1	REF DESIGNATOR	ITEM NO.	DESCRIPTION	MAT'L DWG NO./BNL NO.
QTY REQD						

INTERPRET IN GENERAL ACCORDANCE WITH ASME Y14.24M-1989
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
DECIMAL TOLERANCES .X ±.030 .XX ±.015 .XXX ±.005
ANGULAR TOLERANCE ± .5°
FINISH: NA
BREAK SHARP EDGES MAX. XX MIN. XX
OUTSTANDING ECN
NEXT ASSEMBLY

Q.A. CATEGORY A-3		DATE	
DRAWN BY	Ed Koropsak	5/7/03	
CHECKED BY			
DESIGN APPROVAL			
ENGINEER APPROVAL	Rob Michnoff		
SUPVR. APPROVAL			

BROOKHAVEN NATIONAL LABORATORY
UPTON, N.Y. 11973
RHIC CONTROLS
SERVICE BLDG. 1002A TUNE METER
V124_BLUE (B MODULE)
SIZE D
94028826
REV. A
DRAWING NUMBER
MATERIAL:
SCALE: NA
WEIGHT:
SHEET 6

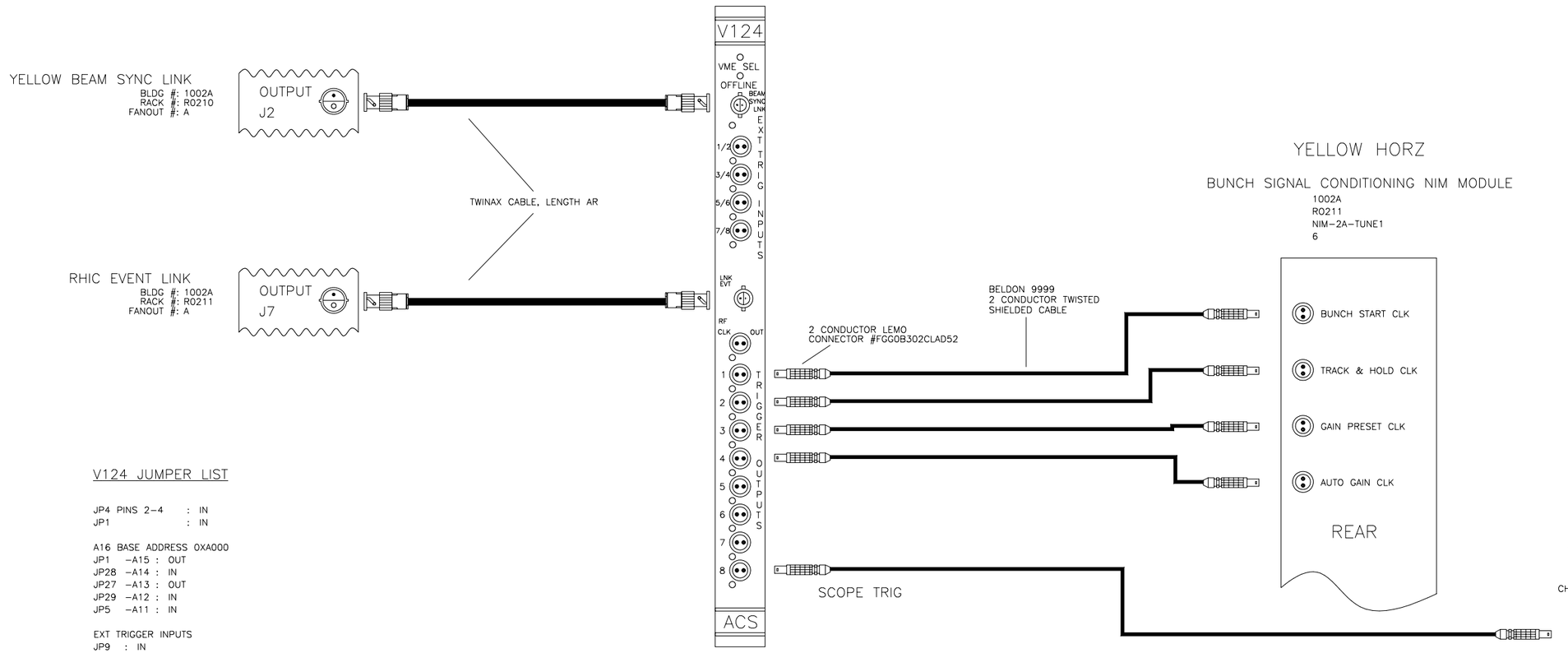
*AUTOCAD

REV.	ZONE	ECN NO.	DATE	BY	CKR	APP.

Controls, C-AD 5/13/2003 11:18 AM 8826_7.dwg

V124 BEAM SYNC TRIGGER MODULE-C (YELLOW)

BLDG #: 1002A
RACK #: R0211
CHASSIS ID: CFE-2A-TUNE1
SLOT #: 8
A16 BASE ADDRESS: 0XA000



SHEET 19

V124 JUMPER LIST

JP4 PINS 2-4 : IN
JP1 : IN

A16 BASE ADDRESS 0XA000
JP1 -A15 : OUT
JP28 -A14 : IN
JP27 -A13 : OUT
JP29 -A12 : IN
JP5 -A11 : IN

EXT TRIGGER INPUTS
JP9 : IN
JP8 : OUT
JP14 : IN
JP10 : IN
JP11 : OUT
JP15 : IN
JP16 : IN
JP17 : OUT
JP18 : IN
JP21 : IN
JP22 : OUT
JP23 : IN

TRIGGER OUTPUTS
ALL : IN

-3	-2	-1	REF DESIGNATOR	ITEM NO.	DESCRIPTION	MAT'L DWG NO./BNL NO.
QTY REQD						

INTERPRET IN GENERAL ACCORDANCE WITH ASME Y14.24M-1989
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
DECIMAL TOLERANCES .X ±.030 .XX ±.015 .XXX ±.005
ANGULAR TOLERANCE ± .5°
FINISH: NA
BREAK SHARP EDGES MAX. XX MIN. XX
OUTSTANDING ECN
NEXT ASSEMBLY

Q.A. CATEGORY A-3

DRAWN BY	Ed Koropsak	5/7/03
CHECKED BY		
DESIGN APPROVAL		
ENGINEER APPROVAL	Rob Michnoff	
SUPVR. APPROVAL		

DATE

BROOKHAVEN NATIONAL LABORATORY
UPTON, N.Y. 11973
RHIC CONTROLS
SERVICE BLDG. 1002A TUNE METER
V124_YELLOW (C MODULE)

SIZE D | 94028826 | REV. A
DRAWING NUMBER
MATERIAL: | SCALE: NA | WEIGHT: | SHEET 7

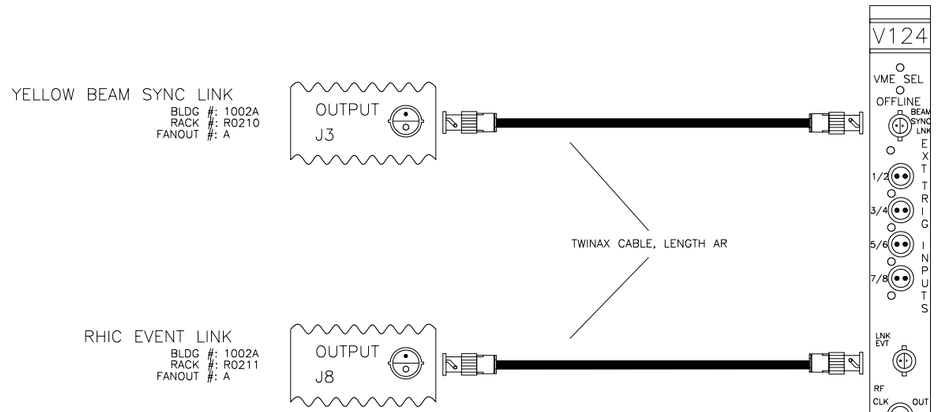
*AUTOCAD

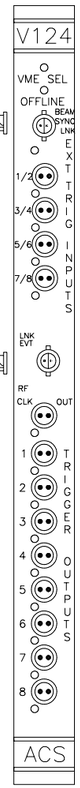
REV.	ZONE	ECN NO.	DATE	BY	CKR	APP.

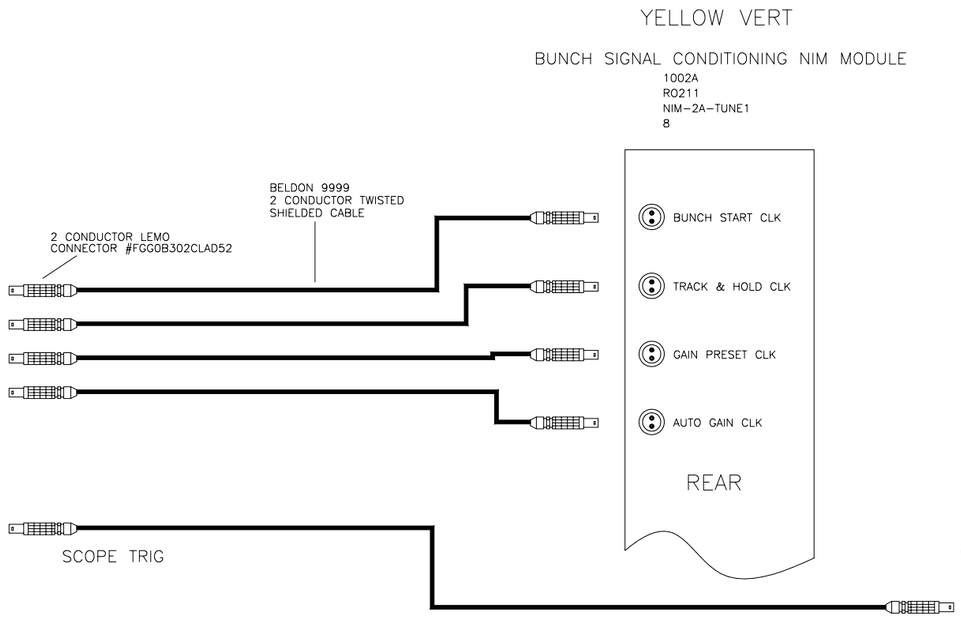
Controls, C-AD 5/13/2003 11:19 AM 8826_8.dwg

V124 BEAM SYNC TRIGGER MODULE-D (YELLOW)

BLDG #: 1002A
RACK #: R0211
CHASSIS ID: CFE-2A-TUNE1
SLOT #: 9
A16 BASE ADDRESS: 0XA800





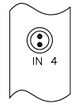


YELLOW VERT

BUNCH SIGNAL CONDITIONING NIM MODULE
1002A
R0211
NIM-2A-TUNE1
8

V189 ECL TO TTL CONVERTER

BLDG #: 1002A
RACK #: R0211
CHASSIS ID: CEX-2A-TUNE1
SLOT#: 21



V124 JUMPER LIST

JP4 PINS 2-4 : IN
JP1 : IN

A16 BASE ADDRESS 0XA800
JP1 -A15 : OUT
JP28 -A14 : IN
JP27 -A13 : OUT
JP29 -A12 : IN
JP5 -A11 : OUT

EXT TRIGGER INPUTS
JP9 : IN
JP8 : OUT
JP14 : IN
JP10 : IN
JP11 : OUT
JP15 : IN
JP16 : IN
JP17 : OUT
JP18 : IN
JP21 : IN
JP22 : OUT
JP23 : IN

TRIGGER OUTPUTS
ALL : IN

SHEET 19

-3	-2	-1	REF DESIGNATOR	ITEM NO.	DESCRIPTION	MAT'L DWG NO./BNL NO.
QTY REQD						

INTERPRET IN GENERAL ACCORDANCE WITH ASME Y14.24M-1989
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
DECIMAL TOLERANCES
.X ±.030
.XX ±.015
.XXX ±.005
ANGULAR TOLERANCE
± .5°
NA FINISH
BREAK SHARP EDGES
MAX. XX MIN. XX
OUTSTANDING ECN

Q.A. CATEGORY A-3

DRAWN BY	Ed Koropsak	5/7/03
CHECKED BY		
DESIGN APPROVAL		
ENGINEER APPROVAL	Rob Michnoff	
SUPVR. APPROVAL		

NEXT ASSEMBLY

BROOKHAVEN NATIONAL LABORATORY
UPTON, N.Y. 11973
RHIC CONTROLS
SERVICE BLDG. 1002A TUNE METER
V124_YELLOW (D MODULE)

SIZE	DRAWING NUMBER	REV.
D	94028826	A

MATERIAL:	SCALE: NA	WEIGHT:	SHEET 8

8 7 6 5 4 3 2 1 *AUTOCAD

REV.	ZONE	ECN NO.	DATE	BY	CKR	APP.

Controls, C-AD 5/28/2003 8:33 AM 8826_9.dwg

V124 BEAM SYNC TRIGGER MODULE-E (BLUE)

BLDG #: 1002A
RACK #: R0211
CHASSIS ID: CFE-2A-TUNE1
SLOT #: 14
A16 BASE ADDRESS: 0XB000

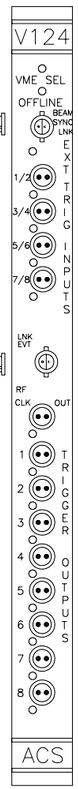
BLUE BEAM SYNC LINK
BLDG #: 1002A
RACK #: R0210
FANOUT #: B

OUTPUT J4

TWINAX CABLE, LENGTH AR

RHIC EVENT LINK
BLDG #: 1002A
RACK #: R0211
FANOUT #: A

OUTPUT J9



BLUE A/D CONVERTOR CLOCK

CHAN 3, REF SH 12, BLUE VERTICLE TRIGGER, TO CFE-2A-TUNE1, NCO, SLOT 16

CHAN 4, REF SH 12, BLUE VERTICLE RESET, TO CFE-2A-TUNE1, NCO, SLOT 16

CHAN 5, REF SH 12, BLUE HORIZONTAL TRIGGER, TO CFE-2A-TUNE1, NCO, SLOT 16

CHAN 6, REF SH 12, BLUE HORIZONTAL RESET, TO CFE-2A-TUNE1, NCO,SLOT 16

V124 JUMPER LIST

JP4 PINS 2-4 : IN
JP1 : IN

A16 BASE ADDRESS 0XB000
JP1 -A15 : OUT
JP28 -A14 : IN
JP27 -A13 : OUT
JP29 -A12 : OUT
JP5 -A11 : IN

EXT TRIGGER INPUTS
JP9 : IN
JP8 : OUT
JP14 : IN
JP10 : IN
JP11 : OUT
JP15 : IN
JP16 : IN
JP17 : OUT
JP18 : IN
JP21 : IN
JP22 : OUT
JP23 : IN

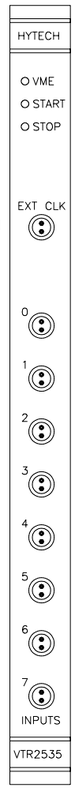
TRIGGER OUTPUTS
ALL : IN

HYTECH VTR2535 (BLUE) 8 CHAN 10MS/SEC A/D CONVERTOR MODULE

BLDG #: 1002A
RACK #: R0211
CHASSIS ID: CFE-2A-TUNE1
SLOT #: 18
A16 BASE ADDRESS: 0XC200
A32 BASE ADDRESS: 0X10000000

2 CONDUCTOR LEMO CONNECTOR #FGG0B302CLAD52

BELDON 9999
2 CONDUCTOR TWISTED SHIELDED CABLE



CHAN 0, REF SH 14
BLUE VERTICLE BPM DIFFERENCE

CHAN 1, REF SH 14
BLUE HORIZONTAL BPM DIFFERENCE

CHAN 2, REF SH 14
BLUE VERTICLE BPM SUM

CHAN 3, REF SH 14
BLUE HORIZONTAL BPM SUM

ADDR

J25=OUT
J26=IN
J27=IN
J28=IN
J29=IN
J30=OUT
J31=IN
J32=IN
J33=IN
J34=IN
J35=IN
J36=IN

CHAN 0 & 1=2V FS

J2=IN
J3=OUT
J4=1 & 2

CHAN 2 & 3=5V FS

J2=OUT
J3=IN
J4=1 & 2

ALL CHAN

J5=2 & 3--BIPOLAR
J1=IN
J39=IN
J40=IN
LK2=IN
LK3=IN
J8=IN
J53=IN
J50=IN

-3	-2	-1	REF DESIGNATOR	ITEM NO.	DESCRIPTION	MAT'L DWG NO./BNL NO.
QTY REQD						

INTERPRET IN GENERAL ACCORDANCE WITH ASME Y14.24M-1989
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
DECIMAL TOLERANCES .X ±.030 .XX ±.015 .XXX ±.005
ANGULAR TOLERANCE ± .5°
NA FINISH
BREAK SHARP EDGES MAX. XX MIN. XX
OUTSTANDING ECN
NEXT ASSEMBLY

Q.A. CATEGORY A-3		DATE
DRAWN BY	Ed Koropsak	5/7/03
CHECKED BY		
DESIGN APPROVAL		
ENGINEER APPROVAL	Rob Michnoff	
SUPVR. APPROVAL		

BROOKHAVEN NATIONAL LABORATORY
UPTON, N.Y. 11973
RHIC CONTROLS
SERVICE BLDG. 1002A TUNE METER
V124_BLUE (E MODULE)

SIZE D | 94028826 | REV. A
DRAWING NUMBER

MATERIAL: | SCALE: NA | WEIGHT: | SHEET 9

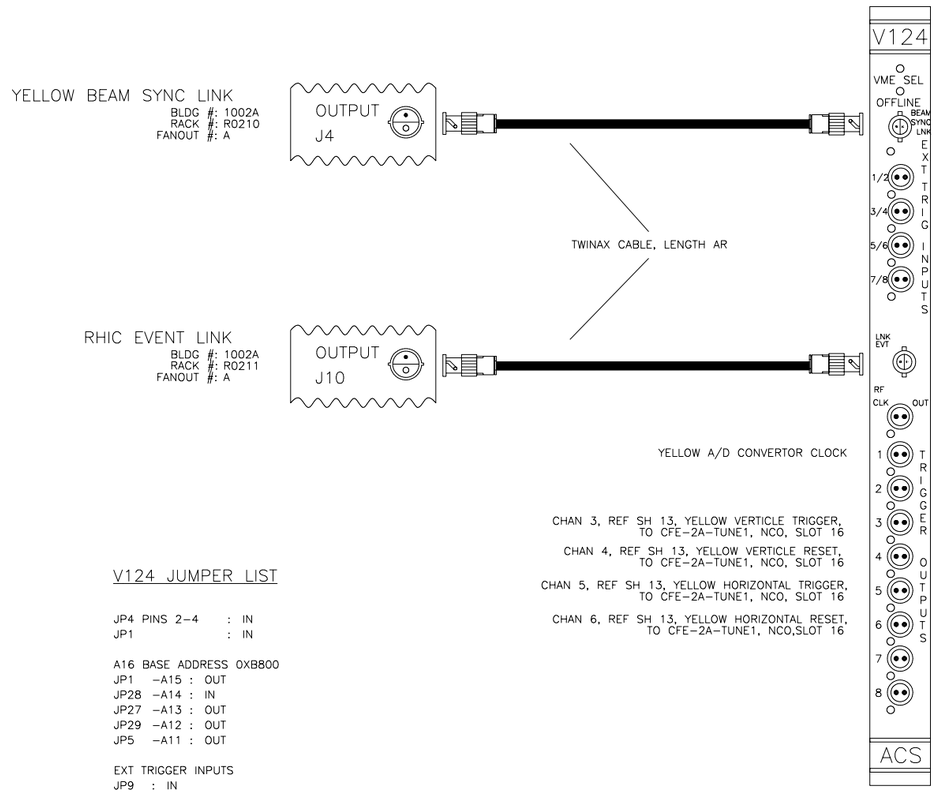
1 *AUTOCAD

REV.	ZONE	ECN NO.	DATE	BY	CKR	APP.

Controls, C-AD 5/28/2003 8:35 AM 8826_10.dwg

V124 BEAM SYNC TRIGGER MODULE-F (YELLOW)

BLDG #: 1002A
RACK #: R0211
CHASSIS ID: CFE-2A-TUNE1
SLOT #: 15
A16 BASE ADDRESS: 0XB800



CHAN 3, REF SH 13, YELLOW VERTICLE TRIGGER, TO CFE-2A-TUNE1, NCO, SLOT 16

CHAN 4, REF SH 13, YELLOW VERTICLE RESET, TO CFE-2A-TUNE1, NCO, SLOT 16

CHAN 5, REF SH 13, YELLOW HORIZONTAL TRIGGER, TO CFE-2A-TUNE1, NCO, SLOT 16

CHAN 6, REF SH 13, YELLOW HORIZONTAL RESET, TO CFE-2A-TUNE1, NCO,SLOT 16

V124 JUMPER LIST

JP4 PINS 2-4 : IN
JP1 : IN

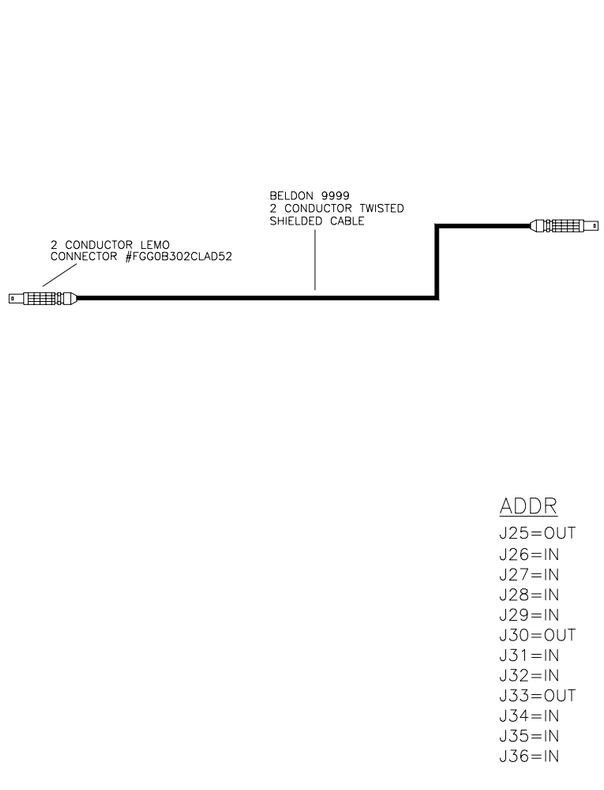
A16 BASE ADDRESS 0XB800
JP1 -A15 : OUT
JP28 -A14 : IN
JP27 -A13 : OUT
JP29 -A12 : OUT
JP5 -A11 : OUT

EXT TRIGGER INPUTS
JP9 : IN
JP8 : OUT
JP14 : IN
JP10 : IN
JP11 : OUT
JP15 : IN
JP16 : IN
JP17 : OUT
JP18 : IN
JP21 : IN
JP22 : OUT
JP23 : IN

TRIGGER OUTPUTS
ALL : IN

HYTECH VTR2535 (YELLOW) 8 CHAN 10MS/SEC A/D CONVERTOR MODULE

BLDG #: 1002A
RACK #: R0211
CHASSIS ID: CFE-2A-TUNE1
SLOT #: 19
A16 BASE ADDRESS: 0XC240
A32 BASE ADDRESS: 0X10200000



CHAN 0, REF SH 15
YELLOW VERTICLE BPM DIFFERENCE

CHAN 1, REF SH 15
YELLOW HORIZONTAL BPM DIFFERENCE

CHAN 2, REF SH 15
YELLOW VERTICLE BPM SUM

CHAN 3, REF SH 15
YELLOW HORIZONTAL BPM SUM

ADDR

J25=OUT
J26=IN
J27=IN
J28=IN
J29=IN
J30=OUT
J31=IN
J32=IN
J33=OUT
J34=IN
J35=IN
J36=IN

CHAN 0 & 1=2V FS

J2=IN
J3=OUT
J4=1 & 2

CHAN 2 & 3=5V FS

J2=OUT
J3=IN
J4=1 & 2

ALL CHAN

J5=2 & 3--BIPOLAR
J1=IN
J39=IN
J40=IN
LK2=IN
LK3=IN
J8=IN
J53=IN
J50=IN

-3	-2	-1	REF DESIGNATOR	ITEM NO.	DESCRIPTION	MAT'L DWG NO./BNL NO.
QTY REQD						

INTERPRET IN GENERAL ACCORDANCE WITH ASME Y14.24M-1989
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
DECIMAL TOLERANCES .X ±.030 .XX ±.015 .XXX ±.005
ANGULAR TOLERANCE ± .5°
NA FINISH
BREAK SHARP EDGES MAX. XX MIN. XX
OUTSTANDING ECN
NEXT ASSEMBLY

Q.A. CATEGORY A-3		DATE
DRAWN BY	Ed Koropsak	5/7/03
CHECKED BY		
DESIGN APPROVAL		
ENGINEER APPROVAL	Rob Michnoff	
SUPVR. APPROVAL		

BROOKHAVEN NATIONAL LABORATORY
UPTON, N.Y. 11973
RHIC CONTROLS
SERVICE BLDG. 1002A TUNE METER
V124_YELLOW (F MODULE)
SIZE D
94028826
REV. A
DRAWING NUMBER
MATERIAL:
SCALE: NA
WEIGHT:
SHEET 10

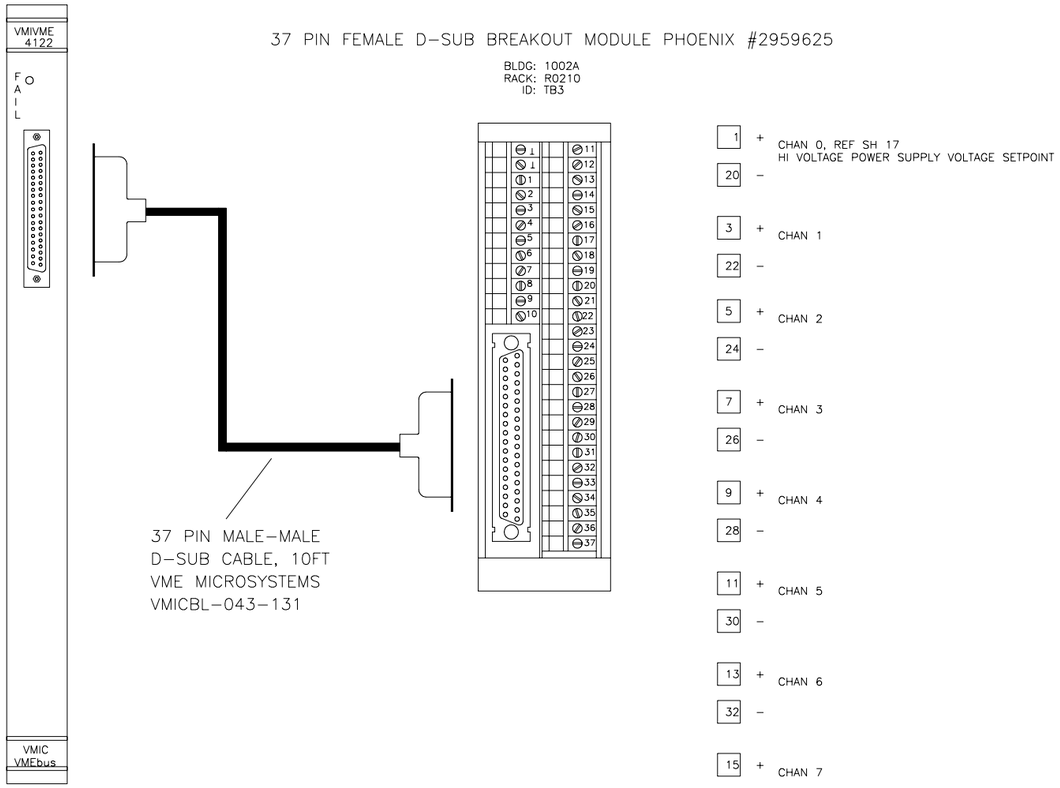
*AUTOCAD

REV.	ZONE	ECN NO.	DATE	BY	CKR	APP.

Controls, C-AD 5/28/2003 8:39 AM 8826_11.dwg

VMIVME 4122 (8 CHAN 12 BIT ANOLOG OUTPUT MODULE)

BLDG #: 1002A
RACK #: R0211
CHASSIS ID: CFE-2A-TUNE1
SLOT #: 10
A16 BASE ADDRESS: 0X0200



37 PIN FEMALE D-SUB BREAKOUT MODULE PHOENIX #2959625

BLDG: 1002A
RACK: R0210
ID: TB3

1	+	CHAN 0, REF SH 17 HI VOLTAGE POWER SUPPLY VOLTAGE SETPOINT
20	-	
3	+	CHAN 1
22	-	
5	+	CHAN 2
24	-	
7	+	CHAN 3
26	-	
9	+	CHAN 4
28	-	
11	+	CHAN 5
30	-	
13	+	CHAN 6
32	-	
15	+	CHAN 7
34	-	

JUMPER SETTINGS

ADDRESS BITS		0 TO +10V	
E11	(A7) IN	E1	2-3
E12	(A8) IN	E3	1-2
E13	(A9) OUT	E4	OUT
E14	(A10) IN	E5	OUT
E15	(A11) IN	E6	1-2
E16	(A12) IN	E7	1-2
E17	(A13) IN	E8	2-3
E18	(A14) IN	E9	OUT
E19	(A15) IN	E10	OUT

NOTE: PIN 1 OF JUMPERS IS DESIGNATED BY A SQUARE PAD ON THE SOLDER SIDE OF THE BOARD.

-3	-2	-1	REF DESIGNATOR	ITEM NO.	DESCRIPTION	MAT'L DWG NO./BNL NO.
QTY REQD						

INTERPRET IN GENERAL ACCORDANCE WITH ASME Y14.24M-1989
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
DECIMAL TOLERANCES .X ±.030 .XX ±.015 .XXX ±.005
ANGULAR TOLERANCE ± .5°
NA FINISH
BREAK SHARP EDGES MAX. XX MIN. XX
OUTSTANDING ECN

Q.A. CATEGORY A-3

DRAWN BY	Ed Koropsak	5/8/03
CHECKED BY		
DESIGN APPROVAL		
ENGINEER APPROVAL	Rob Michnoff	
SUPVR. APPROVAL		

NEXT ASSEMBLY

BROOKHAVEN NATIONAL LABORATORY
UPTON, N.Y. 11973
RHIC CONTROLS
SERVICE BLDG. 1002A TUNE METER
4122

SIZE D | 94028826_11 | REV. A
DRAWING NUMBER
MATERIAL: | SCALE: NA | WEIGHT: | SHEET 11

*AUTOCAD

REV.	ZONE	ECN NO.	DATE	BY	CKR	APP.

Controls, C-AD 5/28/2003 10:14 AM 8826_12.dwg

5V POWER SUPPLY

5V OUT

HIGH VOLTAGE POWER SUPPLY LAMBDA EMI 402L 5KV

BLDG: 1002A
RACK: R029

OUT

REF SH 17

BLUE TOP KICKER HV SWITCH BOX

BLDG: 1002A
RACK: R029

5V IN
HIGH VOLTAGE IN
HIGH VOLTAGE OUT
PULSE IN

HIGH VOLTAGE KICKERS

TOP
OUTSIDE
INSIDE
BOTTOM

REF SH 16

NUMERICALLY CONTROLLED OSCILLATOR MODULE

BLDG #: 1002A
RACK #: R0211
CHASSIS ID: CFE-2A-TUNE1
SLOT #: 16
A32 BASE ADDRESS: 0x01F00020/0x01F00030

From CFE-2A-TVDAMP1, V128, SL 10, OUT 5
REF DWG. x

TUNED METER NCO

YELLOW VERTICLE
RESET FREQ
KICK
TRIG KICK'

YELLOW HORIZ
RESET FREQ
KICK
TRIG KICK'

BLUE VERTICLE
RESET FREQ
KICK
TRIG KICK'

BLUE HORIZ
RESET FREQ
KICK
TRIG KICK'

BLUE BOTTOM KICKER HV SWITCH BOX

BLDG: 1002A
RACK: R029

5V IN
HIGH VOLTAGE IN
HIGH VOLTAGE OUT
PULSE IN

From CFE-2A-TVDAMP1, V128, SL 10, OUT 7
REF DWG. x

BLUE V124-E BEAM SYNC TRIGGER MODULE

BLDG #: 1002A
RACK #: R0211
CHASSIS ID: CFE-2A-TUNE1
SLOT #: 14
A16 BASE ADDRESS: 0XB000

CH4

SHEET 9

BLUE INSIDE KICKER HV SWITCH BOX

BLDG: 1002A
RACK: R029

5V IN
HIGH VOLTAGE IN
HIGH VOLTAGE OUT
PULSE IN

To CFE-2A-TVDAMP1, V128, SL 10, I/O 2
REF DWG. x

To CFE-2A-TVDAMP1, V128, SL 10, I/O 4
REF DWG. x

From CFE-2A-TVDAMP1, V128, SL 10, OUT 1
REF DWG. x

To CFE-2A-TVDAMP1, V128, SL 10, IN 2
REF DWG. x

To CFE-2A-TVDAMP1, V128, SL 10, IN 4
REF DWG. x

BLUE V124-E BEAM SYNC TRIGGER MODULE

BLDG #: 1002A
RACK #: R0211
CHASSIS ID: CFE-2A-TUNE1
SLOT #: 14
A16 BASE ADDRESS: 0XB000

CH3

SHEET 9

BLUE OUTSIDE KICKER HV SWITCH BOX

BLDG: 1002A
RACK: R029

5V IN
HIGH VOLTAGE IN
HIGH VOLTAGE OUT
PULSE IN

From CFE-2A-TVDAMP1, V128, SL 10, OUT 3
REF DWG. x

BLUE V124-E BEAM SYNC TRIGGER MODULE

BLDG #: 1002A
RACK #: R0211
CHASSIS ID: CFE-2A-TUNE1
SLOT #: 14
A16 BASE ADDRESS: 0XB000

CH6

SHEET 9

ADDR. DEFINED IN ADO FILE!

BLUE V124-E BEAM SYNC TRIGGER MODULE

BLDG #: 1002A
RACK #: R0211
CHASSIS ID: CFE-2A-TUNE1
SLOT #: 14
A16 BASE ADDRESS: 0XB000

CH5

SHEET 9

-3 / -2 / -1 QTY REQD	REF DESIGNATOR	ITEM NO.	DESCRIPTION	MAT'L DWG NO./BNL NO.

INTERPRET IN GENERAL ACCORDANCE WITH ASME Y14.24M-1989

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES

DECIMAL TOLERANCES
.X ±.030
.XX ±.015
.XXX ±.005
ANGULAR TOLERANCE ± .5°

NA FINISH

BREAK SHARP EDGES
MAX. XX MIN. XX

OUTSTANDING ECN

Q.A. CATEGORY A-3

DRAWN BY	Ed Koropsak	5/8/03
CHECKED BY		
DESIGN APPROVAL		
ENGINEER APPROVAL	Rob Michnoff	
SUPVR. APPROVAL		

NEXT ASSEMBLY

BROOKHAVEN NATIONAL LABORATORY
UPTON, N.Y. 11973

RHIC CONTROLS

SERVICE BLDG. 1002A TUNE METER

NCO_BLUE

SIZE D | 94028826 | REV. A

DRAWING NUMBER

MATERIAL: | SCALE: NA | WEIGHT: | SHEET 12

*AUTOCAD

REV.	ZONE	ECN NO.	DATE	BY	CKR	APP.

Controls, C-AD 5/28/2003 10:13 AM 8826_13.dwg

5V POWER SUPPLY

5V OUT (+ / −)

HIGH VOLTAGE POWER SUPPLY LAMBDA EMI 402L 5KV

BLDG: 1002A
RACK: R029

OUT

REF SH 17

NUMERICALLY CONTROLLED OSCILLATOR MODULE

BLDG #: 1002A
RACK #: R0211
CHASSIS ID: CFE-2A-TUNE1
SLOT #: 16
A32 BASE ADDRESS: 0x01F00000/0x01F00010

From CFE-2A-TVDAMP1, V128, SL 17, OUT 5
REF DWG. x

YELLOW V124-F BEAM SYNC TRIGGER MODULE

BLDG #: 1002A
RACK #: R0211
CHASSIS ID: CFE-2A-TUNE1
SLOT #: 15
A16 BASE ADDRESS: 0XB800

CH4

SHEET 10

YELLOW V124-F BEAM SYNC TRIGGER MODULE

BLDG #: 1002A
RACK #: R0211
CHASSIS ID: CFE-2A-TUNE1
SLOT #: 15
A16 BASE ADDRESS: 0XB800

CH3

SHEET 10

YELLOW V124-F BEAM SYNC TRIGGER MODULE

BLDG #: 1002A
RACK #: R0211
CHASSIS ID: CFE-2A-TUNE1
SLOT #: 15
A16 BASE ADDRESS: 0XB800

CH6

SHEET 10

YELLOW V124-F BEAM SYNC TRIGGER MODULE

BLDG #: 1002A
RACK #: R0211
CHASSIS ID: CFE-2A-TUNE1
SLOT #: 15
A16 BASE ADDRESS: 0XB800

CH5

SHEET 10

TUNED METER NCO

YELLOW VERTICLE
RESET — FREQ
KICK
TRIG — KICK'

To CFE-2A-TVDAMP1, V128, SL 17, I/O 2
REF DWG. x

To CFE-2A-TVDAMP1, V128, SL 17, I/O 4
REF DWG. x

From CFE-2A-TVDAMP1, V128, SL 17, OUT 7
REF DWG. x

YELLOW HORIZ
RESET — FREQ
KICK
TRIG — KICK'

To CFE-2A-TVDAMP1, V128, SL 17, IN 2
REF DWG. x

To CFE-2A-TVDAMP1, V128, SL 17, IN 4
REF DWG. x

BLUE VERTICLE
RESET — FREQ
KICK
TRIG — KICK'

From CFE-2A-TVDAMP1, V128, SL 17, OUT 1
REF DWG. x

BLUE HORIZ
RESET — FREQ
KICK
TRIG — KICK'

From CFE-2A-TVDAMP1, V128, SL 17, OUT 3
REF DWG. x

ADDR. DEFINED IN ADO!

YELLOW TOP KICKER HV SWITCH BOX

BLDG: 1002A
RACK: R029

5V IN
HIGH VOLTAGE IN
HIGH VOLTAGE OUT
PULSE IN

YELLOW BOTTOM KICKER HV SWITCH BOX

BLDG: 1002A
RACK: R029

5V IN
HIGH VOLTAGE IN
HIGH VOLTAGE OUT
PULSE IN

YELLOW INSIDE KICKER HV SWITCH BOX

BLDG: 1002A
RACK: R029

5V IN
HIGH VOLTAGE IN
HIGH VOLTAGE OUT
PULSE IN

YELLOW OUTSIDE KICKER HV SWITCH BOX

BLDG: 1002A
RACK: R029

5V IN
HIGH VOLTAGE IN
HIGH VOLTAGE OUT
PULSE IN

HIGH VOLTAGE KICKERS

TOP
OUTSIDE
INSIDE
BOTTOM

REF SH 16

-3	-2	-1	REF DESIGNATOR	ITEM NO.	DESCRIPTION	MAT'L DWG NO./BNL NO.
QTY REQD						

INTERPRET IN GENERAL ACCORDANCE WITH ASME Y14.24M-1989

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES

DECIMAL TOLERANCES
.X ±.030
.XX ±.015
.XXX ±.005
ANGULAR TOLERANCE
± .5°

NA FINISH

BREAK SHARP EDGES

MAX. XX MIN. XX

OUTSTANDING ECN

Q.A. CATEGORY A-3

DRAWN BY	Ed Koropsak	5/8/03
CHECKED BY		
DESIGN APPROVAL		
ENGINEER APPROVAL	Rob Michnoff	
SUPVR. APPROVAL		

NEXT ASSEMBLY

BROOKHAVEN NATIONAL LABORATORY
UPTON, N.Y. 11973

RHIC CONTROLS

SERVICE BLDG. 1002A TUNE METER

NCO_YELLOW

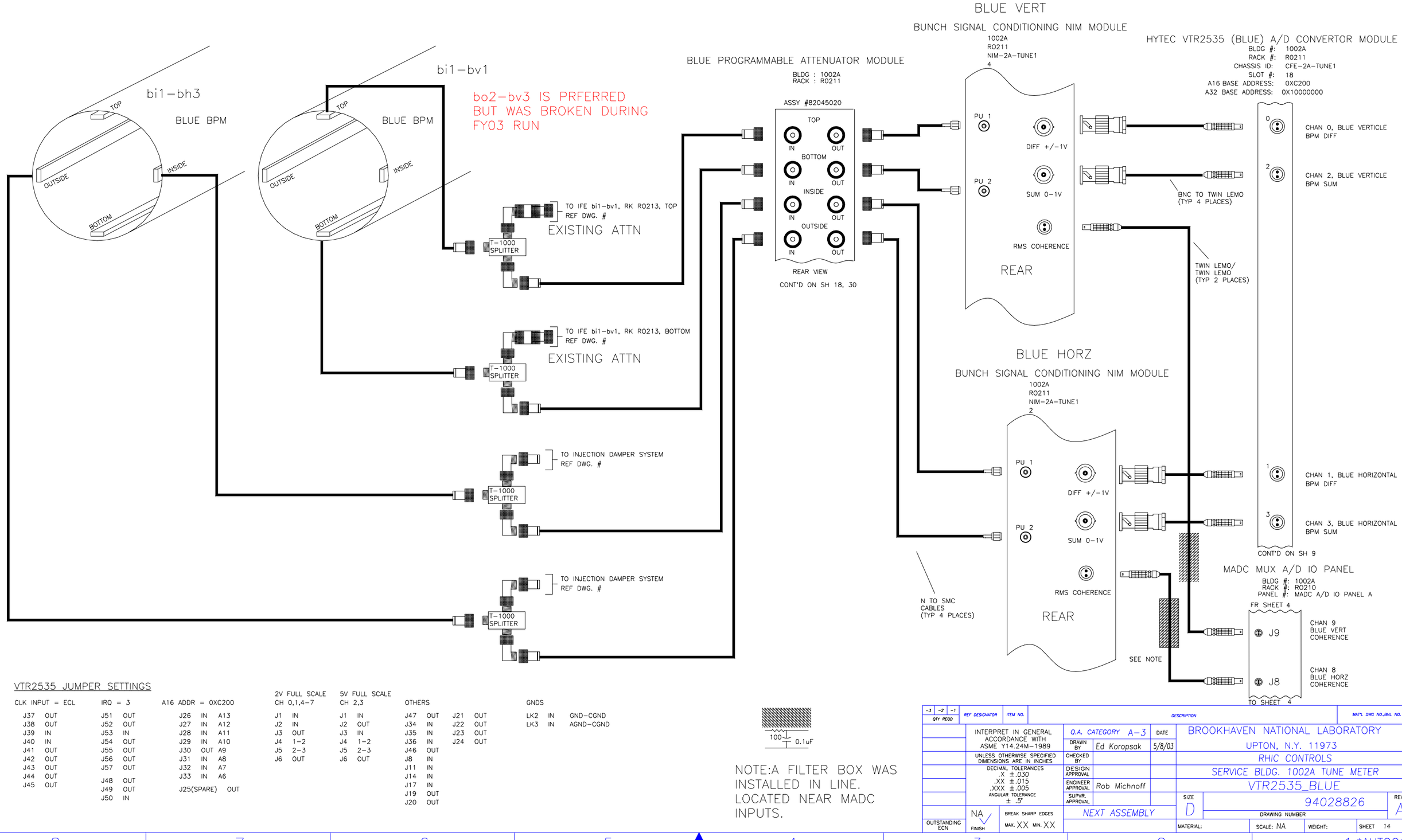
SIZE D — 94028826 — REV. A
DRAWING NUMBER

MATERIAL: SCALE: NA WEIGHT: SHEET 13

*AUTOCAD

REV.	ZONE	ECN NO.	DATE	BY	CKR	APP.

Controls, C-AD 5/28/2003 10:34 AM 8826_14.dwg



VTR2535 JUMPER SETTINGS

CLK INPUT = ECL

J37	OUT	
J38	OUT	
J39	IN	
J40	IN	
J41	OUT	
J42	OUT	
J43	OUT	
J44	OUT	
J45	OUT	

IRQ = 3

J51	OUT	
J52	OUT	
J53	IN	
J54	OUT	
J55	OUT	
J56	OUT	
J57	OUT	
J48	OUT	
J49	OUT	
J50	IN	

A16 ADDR = 0XC200

J26	IN	A13
J27	IN	A12
J28	IN	A11
J29	IN	A10
J30	OUT	A9
J31	IN	A8
J32	IN	A7
J33	IN	A6
J25(SPARE)	OUT	

2V FULL SCALE
CH 0,1,4-7

J1	IN	
J2	IN	
J3	OUT	
J4	1-2	
J5	2-3	
J6	OUT	

5V FULL SCALE
CH 2,3

J1	IN	
J2	OUT	
J3	IN	
J4	1-2	
J5	2-3	
J6	OUT	

OTHERS

J47	OUT	
J34	IN	
J35	IN	
J36	IN	
J46	OUT	
J8	IN	
J11	IN	
J14	IN	
J17	IN	
J19	OUT	
J20	OUT	
J21	OUT	
J22	OUT	
J23	OUT	
J24	OUT	

GNDS

LK2	IN	GND-CGND
LK3	IN	AGND-CGND

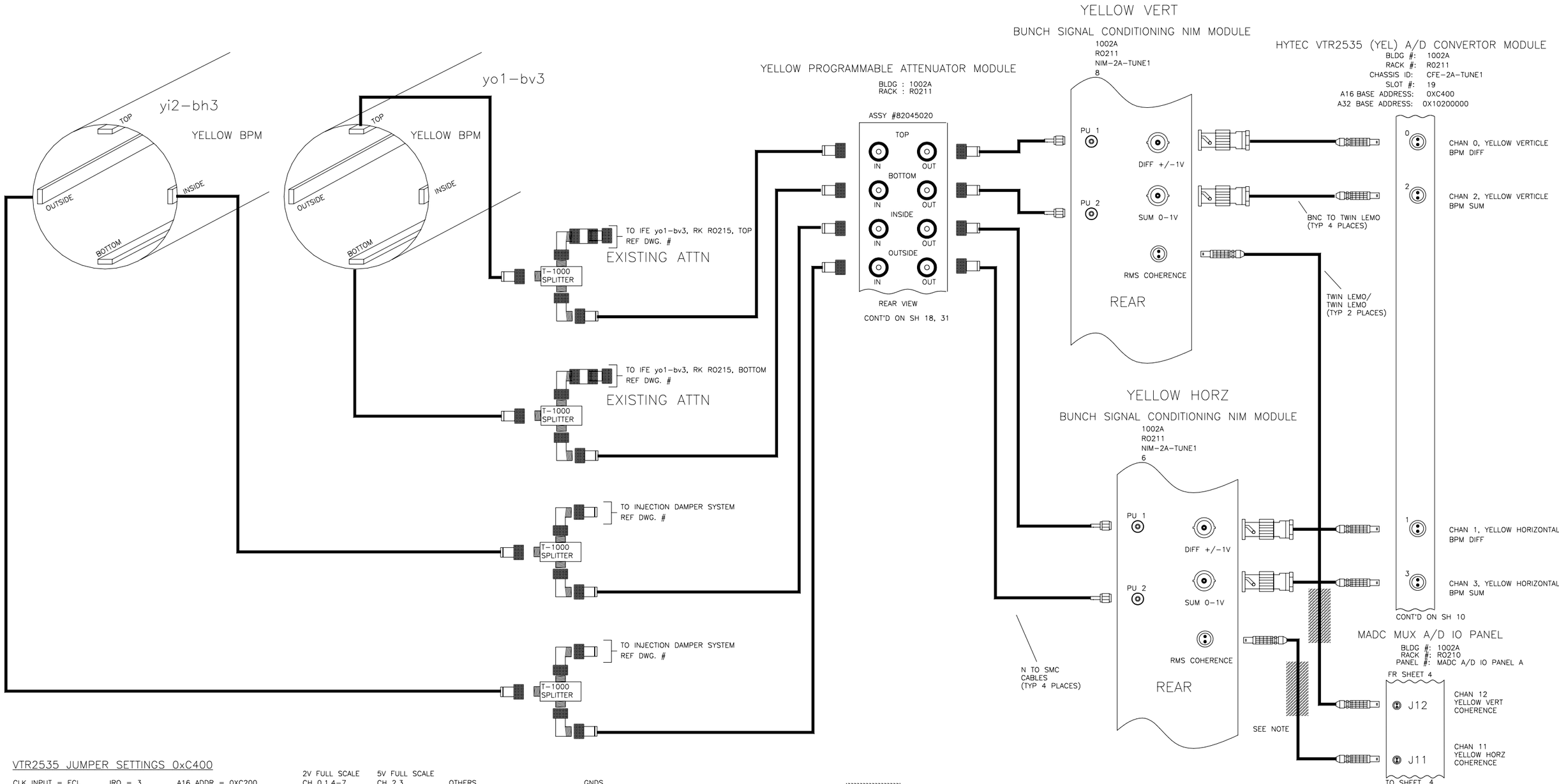
NOTE:A FILTER BOX WAS INSTALLED IN LINE. LOCATED NEAR MADC INPUTS.

-3	-2	-1	QTY REQD	REF DESIGNATOR	ITEM NO.	DESCRIPTION	MAT'L DWG NO./BNL NO.

INTERPRET IN GENERAL ACCORDANCE WITH ASME Y14.24M-1989	Q.A. CATEGORY A-3	DATE	BROOKHAVEN NATIONAL LABORATORY
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES	DRAWN BY: Ed Koropsak	5/8/03	UPTON, N.Y. 11973
DECIMAL TOLERANCES .X ±.030 .XX ±.015 .XXX ±.005 ANGULAR TOLERANCE ± .5°	CHECKED BY		RHIC CONTROLS
	DESIGN APPROVAL		SERVICE BLDG. 1002A TUNE METER
	ENGINEER APPROVAL: Rob Michnoff		VTR2535_BLUE
	SUPVR. APPROVAL		SIZE D — 94028826 — REV. A
OUTSTANDING ECN	NA FINISH	BREAK SHARP EDGES MAX. XX MIN. XX	NEXT ASSEMBLY — DRAWING NUMBER
			MATERIAL: — SCALE: NA — WEIGHT: — SHEET 14

REV.	ZONE	ECN NO.	DATE	BY	CKR	APP.

Controls, C-AD 5/28/2003 10:37 AM 8826_15.dwg



VTR2535 JUMPER SETTINGS 0xC400

CLK INPUT = ECL

J37	OUT	
J38	OUT	
J39	IN	
J40	IN	
J41	OUT	
J42	OUT	
J43	OUT	
J44	OUT	
J45	OUT	

IRQ = 3

J51	OUT	
J52	OUT	
J53	IN	
J54	OUT	
J55	OUT	
J56	OUT	
J57	OUT	
J48	OUT	
J49	OUT	
J50	IN	

A16 ADDR = 0XC200

J26	IN	A13
J27	IN	A12
J28	IN	A11
J29	OUT	A10
J30	IN	A9
J31	IN	A8
J32	IN	A7
J33	IN	A6
J25(SPARE)		OUT

2V FULL SCALE
CH 0,1,4-7

J1	IN	
J2	IN	
J3	OUT	
J4	1-2	
J5	2-3	
J6	OUT	

5V FULL SCALE
CH 2,3

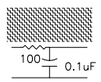
J1	IN	
J2	OUT	
J3	IN	
J4	1-2	
J5	2-3	
J6	OUT	

OTHERS

J47	OUT	
J34	IN	
J35	IN	
J36	IN	
J46	OUT	
J8	IN	
J11	IN	
J14	IN	
J17	IN	
J19	OUT	
J20	OUT	
J21	OUT	
J22	OUT	
J23	OUT	
J24	OUT	

GNDS

LK2	IN	GND-CGND
LK3	IN	AGND-CGND



NOTE:A FILTER BOX WAS INSTALLED IN LINE. LOCATED NEAR MADC INPUTS.

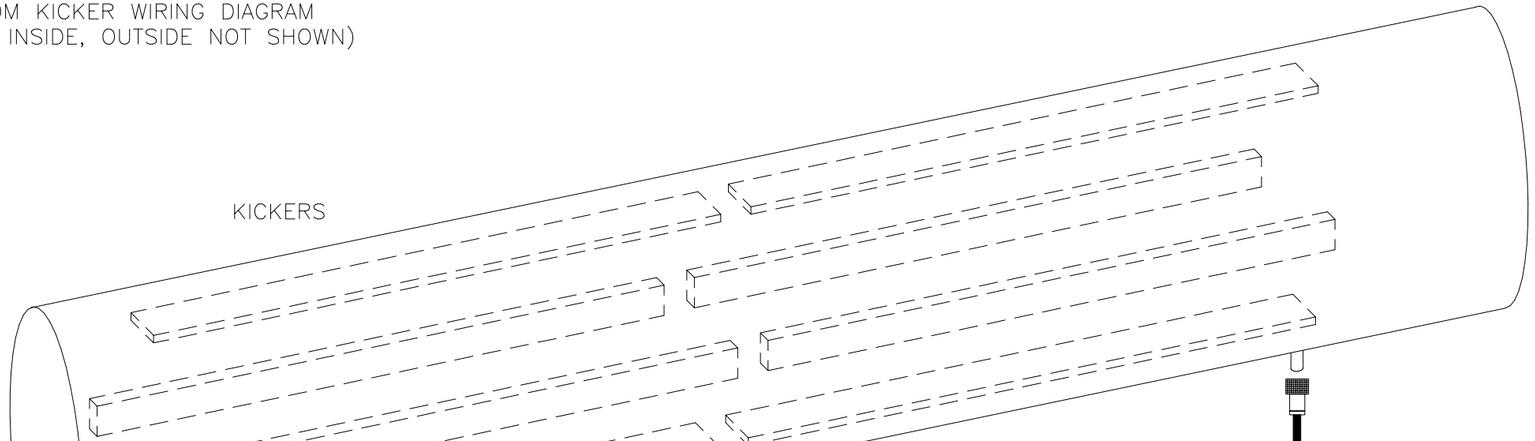
-3	-2	-1	QTY REQD	REF DESIGNATOR	ITEM NO.	DESCRIPTION	MAT'L DWG NO.,BNL NO.

INTERPRET IN GENERAL ACCORDANCE WITH ASME Y14.24M-1989	Q.A. CATEGORY A-3	DATE	BROOKHAVEN NATIONAL LABORATORY
	DRAWN Ed Koropsak	5/8/03	UPTON, N.Y. 11973
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES	CHECKED BY		RHIC CONTROLS
DECIMAL TOLERANCES .X ±.030 .XX ±.015 .XXX ±.005 ANGULAR TOLERANCE ± .5°	DESIGN APPROVAL		SERVICE BLDG. 1002A TUNE METER
	ENGINEER APPROVAL Rob Michnoff		VTR2535_YELLOW
	SUPVR. APPROVAL		SIZE D / 94028826 / REV. A
OUTSTANDING ECN	NA FINISH / BREAK SHARP EDGES MAX. XX MIN. XX	NEXT ASSEMBLY	DRAWING NUMBER / MATERIAL: / SCALE: NA / WEIGHT: / SHEET 15

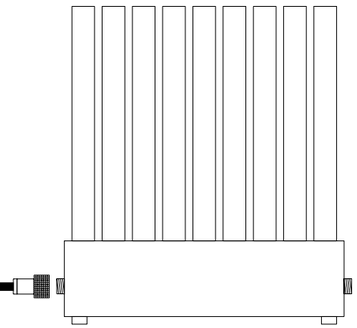
REV.	ZONE	ECN NO.	DATE	BY	CKR	APP.

Controls, C-AD 5/12/2003 3:56 PM 8826_16.dwg

BOTTOM KICKER WIRING DIAGRAM
(TOP, INSIDE, OUTSIDE NOT SHOWN)



30db HIGH POWER ATTENUATOR
BLDG : 1002A
RACK : IN ALCOVE BY
BPM EQUIP BELOW
BEAM PIPE



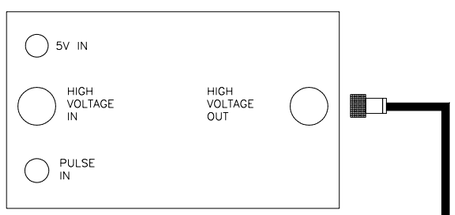
7/8" HELIAX CABLE WITH HN CONNECTORS

3/8" HELIAX CABLE WITH N CONNECTORS

7/8" HELIAX CABLE WITH HN CONNECTORS

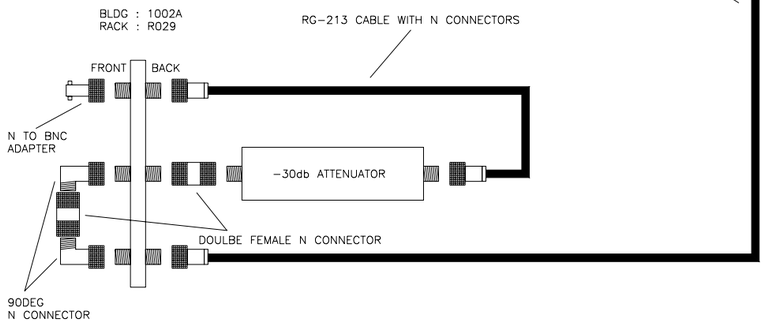
KICKER HIGH VOLTAGE SWITCH BOXES

BLDG : 1002A
RACK : R029 (BACK)



RACK PATCH PANEL

BLDG : 1002A
RACK : R029



-3	-2	-1	REF DESIGNATOR	ITEM NO.	DESCRIPTION	MAT'L DWG NO.-BNL NO.
QTY REQD						

INTERPRET IN GENERAL ACCORDANCE WITH ASME Y14.24M-1989

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES

DECIMAL TOLERANCES
.X ±.030
.XX ±.015
.XXX ±.005
ANGULAR TOLERANCE ± .5°

OUTSTANDING ECN

NA FINISH

BREAK SHARP EDGES
MAX. XX MIN. XX

Q.A. CATEGORY A-3		DATE
DRAWN BY	Al Watson	3/24/00
CHECKED BY		
DESIGN APPROVAL		
ENGINEER APPROVAL		
SUPVR. APPROVAL		

NEXT ASSEMBLY

BROOKHAVEN NATIONAL LABORATORY
UPTON, N.Y. 11973
RHIC CONTROLS
SERVICE BLDG. 1002A TUNE METER
KICKERS

SIZE D | 94028826 DRAWING NUMBER | REV. A

MATERIAL: | SCALE: NA | WEIGHT: | SHEET 16

1 *AUTOCAD

REV.	ZONE	ECN NO.	DATE	BY	CKR	APP.

Controls, C-AD 5/28/2003 11:29 AM 8826_17.dwg

HIGH VOLTAGE POWER SUPPLY
LAMBDA EMI MODEL 402L 5KV

BLDG : 1002A
RACK : R029

REMOTE

REF SH 12 & 13

MALE-MALE 25 PIN D-SUB
CABLE, 10 FT, GLOBAL #C4003B

25 PIN FEMALE DSUB BREAKOUT MODULE PHOENIX 2959609

BLDG : 1002A
RACK : R0210
PANEL : TB4

14
8
24
22
12 GND
1 +
13 +

10 K
ON/OFF
15V = ON

64 PIN TRANSITION MODULE VMIVME-BT01-000

BLDG : 1002A
RACK : R0210
NAME : TB2

CHAN 0
+ A1
- C1

REF SH 29

BELDON 9999 CABLE

0-10V VOLTAGE MEASUREMENT

0-10V CURRENT MEASUREMENT

BELDON 9999 CABLE

MADC MUX A/D IO PANEL

BLDG #: 1002A
RACK #: R0210
PANEL #: A

J0 CHAN 0 VOLTAGE

J1 CHAN 1 CURRENT

REF SH 4

37 PIN FEMALE D-SUB BREAKOUT MODULE PHOENIX 2959625

BLDG : 1002A
RACK : R0210
NAME : TB3

CHAN 0
+ 1
- 20

REF SH 11

LEMO 2 CONDUCTOR CONNECTOR
#FGG0B302CLAD52

NOTE: TWIN LEMO CONNECTOR PIN CLOSEST TO RED KEY MARKER IS POSITIVE.

-3	-2	-1	QTY REQD	REF DESIGNATOR	ITEM NO.	DESCRIPTION	MAT'L DWG NO./BNL NO.

INTERPRET IN GENERAL ACCORDANCE WITH ASME Y14.24M-1989	Q.A. CATEGORY A-3	DATE	BROOKHAVEN NATIONAL LABORATORY
	DRAWN BY: Al Watson	3/27/00	UPTON, N.Y. 11973
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES	CHECKED BY		RHIC CONTROLS
DECIMAL TOLERANCES .X ±.030 .XX ±.015 .XXX ±.005 ANGULAR TOLERANCE ± .5°	DESIGN APPROVAL		SERVICE BLDG. 1002A TUNE METER
	ENGINEER APPROVAL: Rob Michnoff		WIRING
	SUPVR. APPROVAL		SIZE D — 94028826 — REV. A
NA ✓ FINISH — BREAK SHARP EDGES MAX. XX MIN. XX	NEXT ASSEMBLY		DRAWING NUMBER
OUTSTANDING ECN			MATERIAL: — SCALE: NA — WEIGHT: — SHEET 17

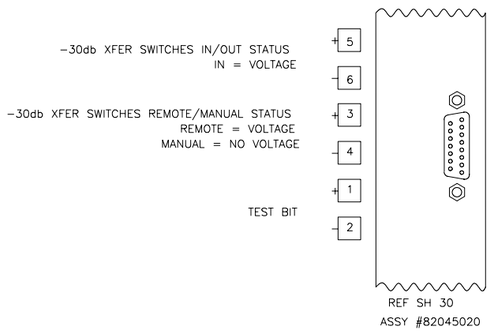
1 *AUTOCAD

REV.	ZONE	ECN NO.	DATE	BY	CKR	APP.

Controls, C-AD 5/28/2003 1:02 PM 8826_18.dwg

RHIC TUNE METER PROGRAMMABLE ATTENUATOR

BLDG : 1002A
RACK : R0211
NAME : BLUE

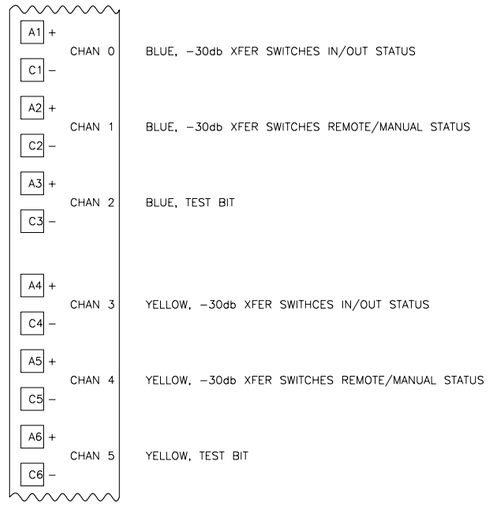


REF SH 30
ASSY #82045020

15 PIN D-SUB

64 PIN TRANSITION MODULE VMIVME-BT01-000

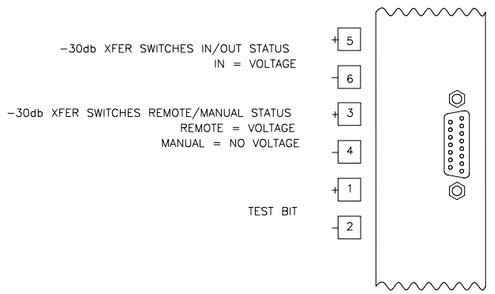
BLDG : 1002A
RACK : R0210
NAME : TB1



CONT'D ON SH 28

RHIC TUNE METER PROGRAMMABLE ATTENUATOR

BLDG : 1002A
RACK : R0211
NAME : YELLOW



REF SH 31
ASSY #82045020

15 PIN D-SUB

-3	-2	-1	QTY REQD	REF DESIGNATOR	ITEM NO.	DESCRIPTION	MAT'L DWG NO./BNL NO.

INTERPRET IN GENERAL ACCORDANCE WITH ASME Y14.24M-1989	Q.A. CATEGORY A-3	DATE	BROOKHAVEN NATIONAL LABORATORY
	DRAWN BY: Al Watson	3/27/00	UPTON, N.Y. 11973
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES	CHECKED BY		RHIC CONTROLS
DECIMAL TOLERANCES .X ±.030 .XX ±.015 .XXX ±.005 ANGULAR TOLERANCE ± .5°	DESIGN APPROVAL		SERVICE BLDG. 1002A TUNE METER
	ENGINEER APPROVAL: Rob Michnoff		WIRING_1
	SUPVR. APPROVAL		SIZE D — 94028826 — REV. A
OUTSTANDING ECN	NA FINISH	BREAK SHARP EDGES MAX. XX MIN. XX	NEXT ASSEMBLY — DRAWING NUMBER
			MATERIAL: — SCALE: NA — WEIGHT: — SHEET 18

*AUTOCAD

REV.	ZONE	ECN NO.	DATE	BY	CKR	APP.

Controls, C-AD 5/28/2003 1:03 PM 8826_19.dwg

V124-A
BLDG #: 1002A
RACK #: RO211
CHASSIS ID: CFE-2A-TUNE1
SLOT #: 6
A16 BASE ADDRESS: 0X9000
FR SH 5
BLUE HORZ
CH 8

V124-B
BLDG #: 1002A
RACK #: RO211
CHASSIS ID: CFE-2A-TUNE1
SLOT #: 7
A16 BASE ADDRESS: 0X9B00
FR SH 6
BLUE VERT
CH 8

V124-C
BLDG #: 1002A
RACK #: RO211
CHASSIS ID: CFE-2A-TUNE1
SLOT #: 8
A16 BASE ADDRESS: 0XA000
FR SH 7
YEL HORZ
CH 8

V124-D
BLDG #: 1002A
RACK #: RO211
CHASSIS ID: CFE-2A-TUNE1
SLOT #: 9
A16 BASE ADDRESS: 0XA800
FR SH 8
YEL VERT
CH 8

TWIN LEML TO TWIN LEMO CABLE
BELDEN 9999 CABLE, LEMO FGOB302CLAD52
(TYP 4 PLACES)

V189 ECL TO TTL
BLDG #: 1002A
RACK #: RO211
CHASSIS ID: CEX-2A-TUNE1
SLOT #: 21
AXX BASE ADDRESS: N/A

BLUE HORZ
BLUE VERT
YEL HORZ
YEL VERT

OUT 1
OUT 2
OUT 3
OUT 4
OUT 5
OUT 6
OUT 7
OUT 8

IN 1
IN 2
IN 3
IN 4
IN 5
IN 6
IN 7
IN 8

V189 JUMPERS

IN	OUT
JP1 & 3	2
JP4 & 6	5
JP7 & 9	8
JP10 & 12	11
JP13 & 15	14
JP17 & 18	16
JP19 & 20	20
JP22 & 24	23

K-LOC TO TO K-LOC
RG 316 CABLE
TO BNC ADAPTER
(TYP 4 PLACES)

HP E1366A DUAL 4 TO 1 MUX
BLDG #: 1002A
RACK #: RO211
CHASSIS ID: CEX-2A-TUNE1
SLOT #: 17

10
11
COM 10
12
13

BNC TO BNC
RG 58 CABLE

DEVICE: LECROY SCOPE LT374M
BLDG #: 1002A
RACK #: RO212
POSITION: EXT TRIGGER INPUT
INPUT

-3	-2	-1	REF DESIGNATOR	ITEM NO.	DESCRIPTION	MAT'L DWG NO./BNL NO.
QTY REQD						

INTERPRET IN GENERAL ACCORDANCE WITH ASME Y14.24M-1989
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
DECIMAL TOLERANCES
.X ±.030
.XX ±.015
.XXX ±.005
ANGULAR TOLERANCE
± .5°

NA
FINISH
BREAK SHARP EDGES
MAX. XX MIN. XX

OUTSTANDING ECN

Q.A. CATEGORY A-3

DRAWN BY	Al Watson	3/27/00
CHECKED BY		
DESIGN APPROVAL		
ENGINEER APPROVAL	Rob Michnoff	
SUPVR. APPROVAL		

NEXT ASSEMBLY

BROOKHAVEN NATIONAL LABORATORY
UPTON, N.Y. 11973
RHIC CONTROLS
SERVICE BLDG. 1002A TUNE METER
WIRING_1

SIZE D
94028826
REV. A
DRAWING NUMBER

MATERIAL: SCALE: NA WEIGHT: SHEET 19

*AUTOCAD

REV.	ZONE	ECN NO.	DATE	BY	CKR	APP.

Controls, C-AD 5/14/2003 8:19 AM 8826_20.dwg

HP E1366A DUAL 4 TO 1 MUX (A)

BLDG #: 1002A
RACK #: RO211
CHASSIS ID: CEX-2A-TUNE1
SLOT #: 12

HP E1366A DUAL 4 TO 1 MUX (B)

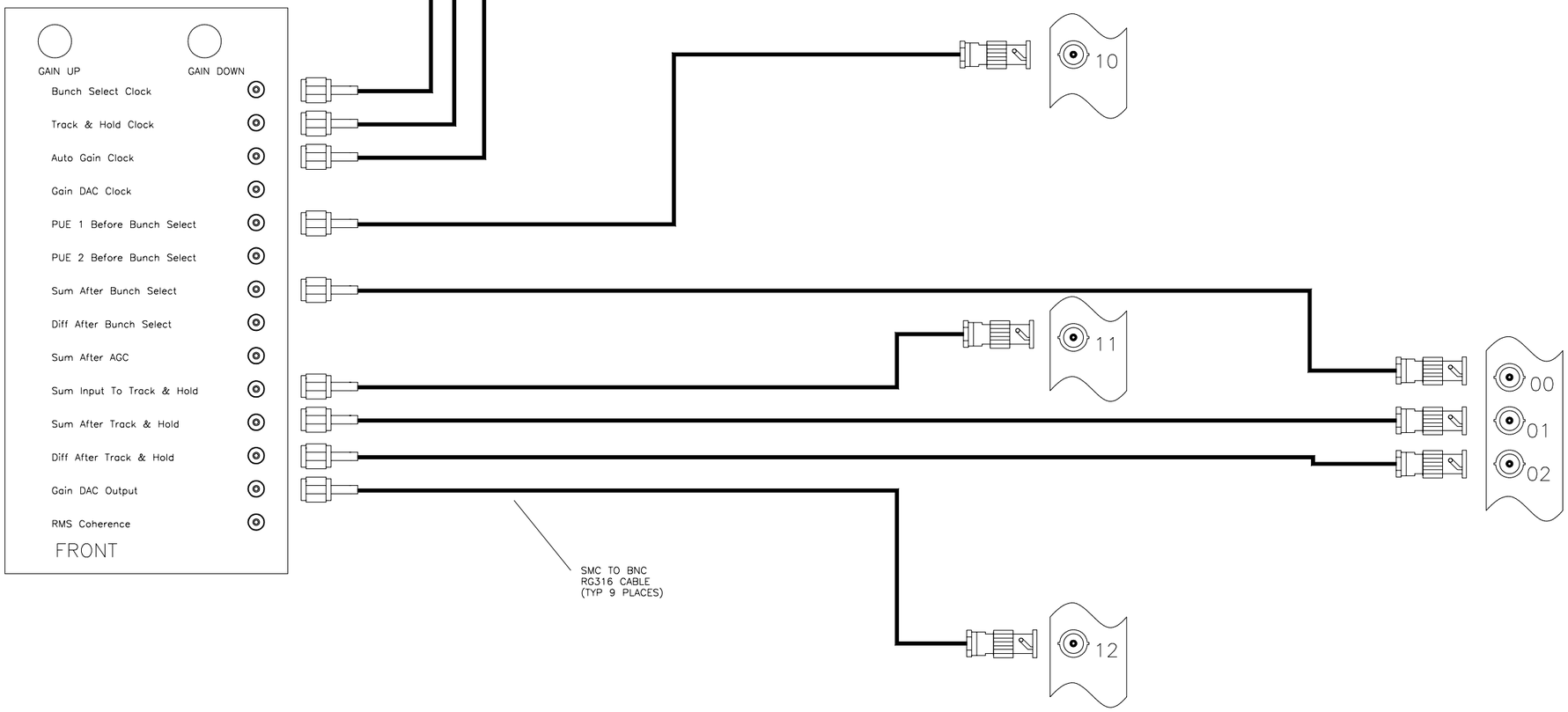
BLDG #: 1002A
RACK #: RO211
CHASSIS ID: CEX-2A-TUNE1
SLOT #: 13

HP E1366A DUAL 4 TO 1 MUX (D)

BLDG #: 1002A
RACK #: RO211
CHASSIS ID: CEX-2A-TUNE1
SLOT #: 15

BUNCH SIGNAL CONDITIONER MODULE BLUE HORZ

BLDG #: 1002A
RACK #: RO211
CHASSIS ID: NIM-2A-TUNE1
SLOT #: 2



-3	-2	-1	REF DESIGNATOR	ITEM NO.	DESCRIPTION	MAT'L DWG NO./BNL NO.
QTY REQD						

INTERPRET IN GENERAL ACCORDANCE WITH ASME Y14.24M-1989
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
DECIMAL TOLERANCES
.X ±.030
.XX ±.015
.XXX ±.005
ANGULAR TOLERANCE
± .5°

NA
FINISH
BREAK SHARP EDGES
MAX. XX MIN. XX

OUTSTANDING ECN

Q.A. CATEGORY A-3		DATE
DRAWN BY	Ed Koropsak	5/13/03
CHECKED BY		
DESIGN APPROVAL		
ENGINEER APPROVAL	Rob Michnoff	
SUPVR. APPROVAL		

NEXT ASSEMBLY

BROOKHAVEN NATIONAL LABORATORY
UPTON, N.Y. 11973
RHIC CONTROLS
SERVICE BLDG. 1002A TUNE METER
MUX CONNECTIONS

SIZE D
94028826
REV. A
DRAWING NUMBER

MATERIAL:
SCALE: NA
WEIGHT:
SHEET 20

*AUTOCAD

REV.	ZONE	ECN NO.	DATE	BY	CKR	APP.

Controls, C-AD 5/14/2003 8:32 AM 8826_21.dwg

HP E1366A DUAL 4 TO 1 MUX (A)
BLDG #: 1002A
RACK #: RO211
CHASSIS ID: CEX-2A-TUNE1
SLOT #: 12

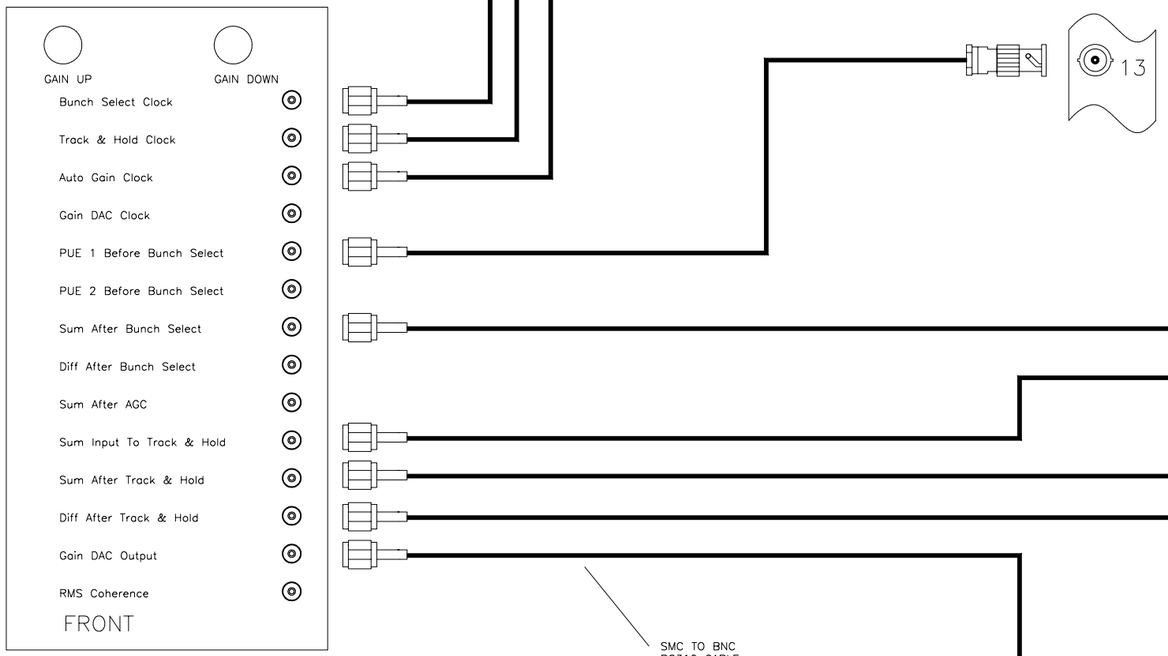
HP E1366A DUAL 4 TO 1 MUX (B)
BLDG #: 1002A
RACK #: RO211
CHASSIS ID: CEX-2A-TUNE1
SLOT #: 13

HP E1366A DUAL 4 TO 1 MUX (C)
BLDG #: 1002A
RACK #: RO211
CHASSIS ID: CEX-2A-TUNE1
SLOT #: 14

HP E1366A DUAL 4 TO 1 MUX (D)
BLDG #: 1002A
RACK #: RO211
CHASSIS ID: CEX-2A-TUNE1
SLOT #: 15

HP E1366A DUAL 4 TO 1 MUX (E)
BLDG #: 1002A
RACK #: RO211
CHASSIS ID: CEX-2A-TUNE1
SLOT #: 16

BUNCH SIGNAL CONDITIONER MODULE
BLUE VERT
BLDG #: 1002A
RACK #: RO211
CHASSIS ID: NIM-2A-TUNE1
SLOT #: 4



-3	-2	-1	REF DESIGNATOR	ITEM NO.	DESCRIPTION	MAT'L DWG NO./BNL NO.
QTY REQD						

INTERPRET IN GENERAL ACCORDANCE WITH ASME Y14.24M-1989
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
DECIMAL TOLERANCES .X ±.030 .XX ±.015 .XXX ±.005
ANGULAR TOLERANCE ± .5°
NA FINISH
BREAK SHARP EDGES MAX. XX MIN. XX
OUTSTANDING ECN

Q.A. CATEGORY A-3		DATE
DRAWN BY	Ed Koropsak	5/13/03
CHECKED BY		
DESIGN APPROVAL		
ENGINEER APPROVAL	Rob Michnoff	
SUPVR. APPROVAL		
NEXT ASSEMBLY		

BROOKHAVEN NATIONAL LABORATORY
UPTON, N.Y. 11973
RHIC CONTROLS
SERVICE BLDG. 1002A TUNE METER
MUX CONNECTIONS

SIZE D | 94028826 | REV. A
DRAWING NUMBER
MATERIAL: | SCALE: NA | WEIGHT: | SHEET 21

*AUTOCAD

REV.	ZONE	ECN NO.	DATE	BY	CKR	APP.

Controls, C-AD 5/14/2003 8:41 AM 8826_22.dwg

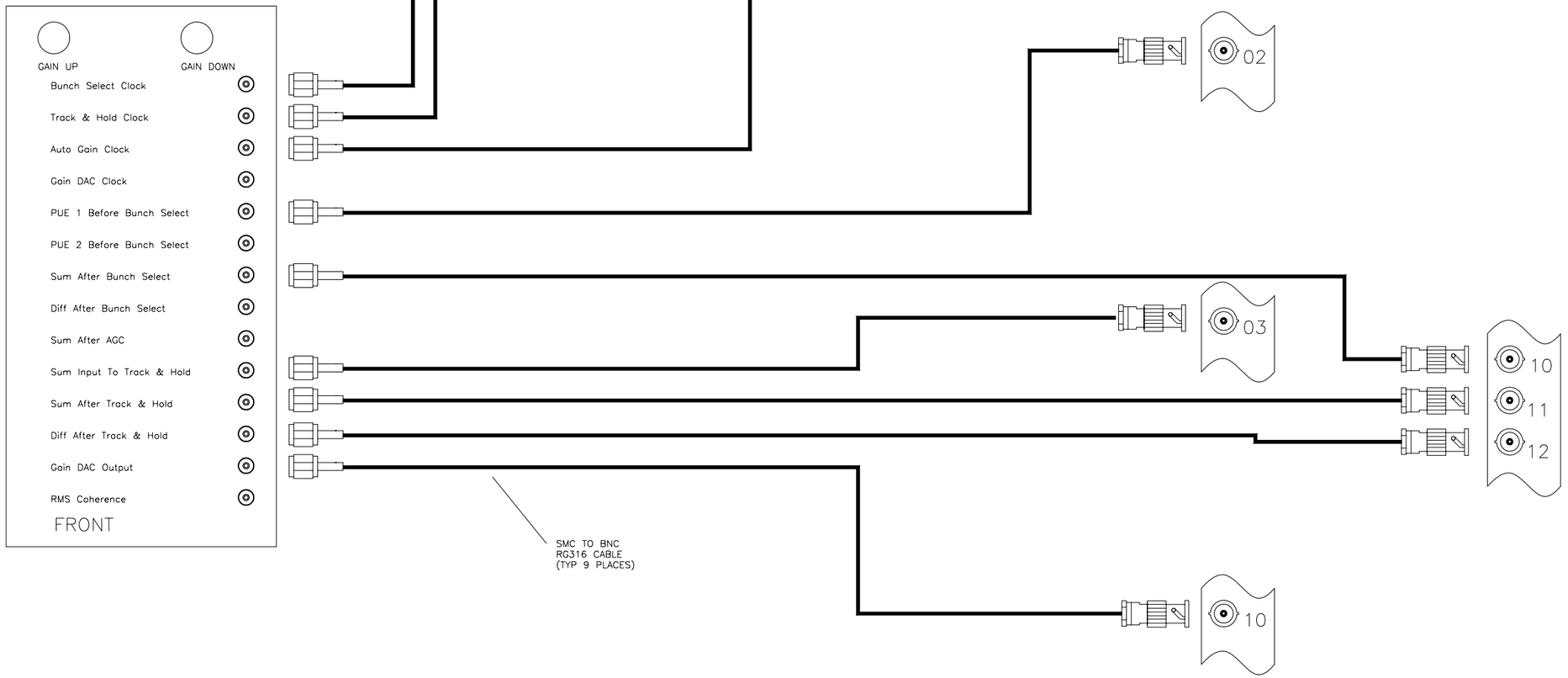
HP E1366A DUAL 4 TO 1 MUX (B)
BLDG #: 1002A
RACK #: RO211
CHASSIS ID: CEX-2A-TUNE1
SLOT #: 13

HP E1366A DUAL 4 TO 1 MUX (A)
BLDG #: 1002A
RACK #: RO211
CHASSIS ID: CEX-2A-TUNE1
SLOT #: 12

HP E1366A DUAL 4 TO 1 MUX (D)
BLDG #: 1002A
RACK #: RO211
CHASSIS ID: CEX-2A-TUNE1
SLOT #: 15

HP E1366A DUAL 4 TO 1 MUX (C)
BLDG #: 1002A
RACK #: RO211
CHASSIS ID: CEX-2A-TUNE1
SLOT #: 14

BUNCH SIGNAL CONDITIONER MODULE
YELLOW HORZ
BLDG #: 1002A
RACK #: RO211
CHASSIS ID: NIM-2A-TUNE1
SLOT #: 6



-3	-2	-1	REF DESIGNATOR	ITEM NO.	DESCRIPTION	MAT'L DWG NO./BNL NO.
QTY REQD						

INTERPRET IN GENERAL ACCORDANCE WITH ASME Y14.24M-1989
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
DECIMAL TOLERANCES
.X ±.030
.XX ±.015
.XXX ±.005
ANGULAR TOLERANCE
± .5°

NA FINISH
BREAK SHARP EDGES
MAX. XX MIN. XX
OUTSTANDING ECN

Q.A. CATEGORY A-3

DRAWN BY	Ed Koropsak	5/13/03
CHECKED BY		
DESIGN APPROVAL		
ENGINEER APPROVAL	Rob Michnoff	
SUPVR. APPROVAL		

NEXT ASSEMBLY

BROOKHAVEN NATIONAL LABORATORY
UPTON, N.Y. 11973
RHIC CONTROLS
SERVICE BLDG. 1002A TUNE METER
MUX CONNECTIONS

SIZE D
94028826
REV. A
DRAWING NUMBER
MATERIAL:
SCALE: NA
WEIGHT:
SHEET 22

8 7 6 5 4 3 2 1 *AUTOCAD

REV.	ZONE	ECN NO.	DATE	BY	CKR	APP.

Controls, C-AD 5/14/2003 8:51 AM 8826_23.dwg

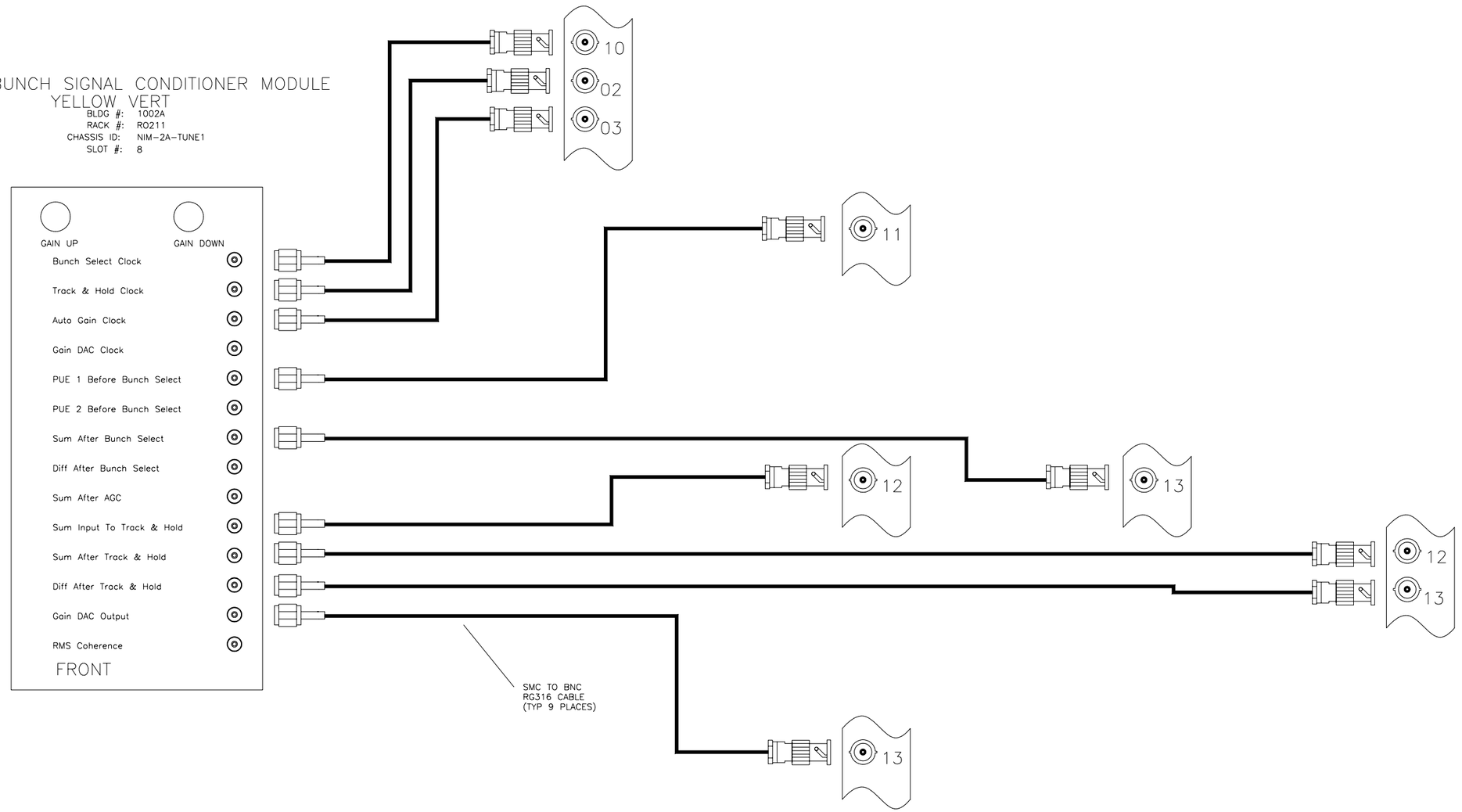
HP E1366A DUAL 4 TO 1 MUX (C)
BLDG #: 1002A
RACK #: RO211
CHASSIS ID: CEX-2A-TUNE1
SLOT #: 14

HP E1366A DUAL 4 TO 1 MUX (B)
BLDG #: 1002A
RACK #: RO211
CHASSIS ID: CEX-2A-TUNE1
SLOT #: 13

HP E1366A DUAL 4 TO 1 MUX (E)
BLDG #: 1002A
RACK #: RO211
CHASSIS ID: CEX-2A-TUNE1
SLOT #: 16

HP E1366A DUAL 4 TO 1 MUX (D)
BLDG #: 1002A
RACK #: RO211
CHASSIS ID: CEX-2A-TUNE1
SLOT #: 15

BUNCH SIGNAL CONDITIONER MODULE
YELLOW VERT
BLDG #: 1002A
RACK #: RO211
CHASSIS ID: NIM-2A-TUNE1
SLOT #: 8



-3	-2	-1	REF DESIGNATOR	ITEM NO.	DESCRIPTION	MAT'L DWG NO./BNL NO.
QTY REQD						

INTERPRET IN GENERAL ACCORDANCE WITH ASME Y14.24M-1989
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
DECIMAL TOLERANCES
.X ±.030
.XX ±.015
.XXX ±.005
ANGULAR TOLERANCE
± .5°

NA FINISH
BREAK SHARP EDGES
MAX. XX MIN. XX

OUTSTANDING ECN

Q.A. CATEGORY A-3

DRAWN BY	Ed Koropsak	5/13/03
CHECKED BY		
DESIGN APPROVAL		
ENGINEER APPROVAL	Rob Michnoff	
SUPVR. APPROVAL		

NEXT ASSEMBLY

BROOKHAVEN NATIONAL LABORATORY
UPTON, N.Y. 11973
RHIC CONTROLS
SERVICE BLDG. 1002A TUNE METER
MUX CONNECTIONS

SIZE D
94028826
DRAWING NUMBER
REV. A

MATERIAL:
SCALE: NA
WEIGHT:
SHEET 23

*AUTOCAD

REV.	ZONE	ECN NO.	DATE	BY	CKR	APP.

Controls, C-AD 5/14/2003 11:28 AM 8826_24.dwg

HP E1366A DUAL 4 TO 1 MUX (A)

BLDG #: 1002A
RACK #: RO211
CHASSIS ID: CEX-2A-TUNE1
SLOT #: 12
A16 BASE ADDR: 0xDE00
LOGICAL ADDR/INT VEC: 120 (0x78)

- BUNCH SELECT CLK NIM-2A-TUNE1, SLOT 2 FROM BLUE HORZ SIG COND REF SHEET 20 → 00
- TRACK & HOLD CLK NIM-2A-TUNE1, SLOT 2 FROM BLUE HORZ SIG COND REF SHEET 20 → 01
- COM 00
- AUTO GAIN CLK NIM-2A-TUNE1, SLOT 2 FROM BLUE HORZ SIG COND REF SHEET 20 → 02
- BUNCH SELECT CLK NIM-2A-TUNE1, SLOT 4 FROM BLUE VERT SIG COND REF SHEET 21 → 03
- TRACK & HOLD CLK NIM-2A-TUNE1, SLOT 4 FROM BLUE VERT SIG COND REF SHEET 21 → 10
- AUTO GAIN CLK NIM-2A-TUNE1, SLOT 4 FROM BLUE VERT SIG COND REF SHEET 21 → 11
- COM 10
- BUNCH SELECT CLK NIM-2A-TUNE1, SLOT 6 FROM YEL HORZ SIG COND REF SHEET 22 → 12
- TRACK & HOLD CLK NIM-2A-TUNE1, SLOT 6 FROM YEL HORZ SIG COND REF SHEET 22 → 13

HP E1366A DUAL 4 TO 1 MUX G

BLDG #: 1002A
RACK #: RO211
CHASSIS ID: CEX-2A-TUNE1
SLOT #: 18

00, 01, 02 → SCOPE CH1

10 → SCOPE CH2

SHEET 27

HP E1366A DUAL 4 TO 1 MUX (B)

BLDG #: 1002A
RACK #: RO211
CHASSIS ID: CEX-2A-TUNE1
SLOT #: 13
A16 BASE ADDR: 0xDE40
LOGICAL ADDR/INT VEC: 121 (0x79)

- AUTO GAIN CLK NIM-2A-TUNE1, SLOT 6 FROM YEL HORZ SIG COND REF SHEET 22 → 00
- BUNCH SELECT CLK NIM-2A-TUNE1, SLOT 8 FROM YEL VERT SIG COND REF SHEET 23 → 01
- COM 00
- TRACK & HOLD CLK NIM-2A-TUNE1, SLOT 8 FROM YEL VERT SIG COND REF SHEET 23 → 02
- AUTO GAIN CLK NIM-2A-TUNE1, SLOT 8 FROM YEL VERT SIG COND REF SHEET 23 → 03
- PUE 1 BEFORE BUNCH SELECT NIM-2A-TUNE1, SLOT 2 FROM BLUE HORZ SIG COND REF SHEET 20 → 10
- SUM INPUT TO TRACK & HOLD NIM-2A-TUNE1, SLOT 2 FROM BLUE HORZ SIG COND REF SHEET 20 → 11
- COM 10
- GAIN DAC OUTPUT NIM-2A-TUNE1, SLOT 2 FROM BLUE HORZ SIG COND REF SHEET 20 → 12
- PUE 1 BEFORE BUNCH SELECT NIM-2A-TUNE1, SLOT 4 FROM BLUE VERT SIG COND REF SHEET 21 → 13

PUSH DOWN INDICATED SIDE

PUSH DOWN INDICATED SIDE

-3	-2	-1	REF DESIGNATOR	ITEM NO.	DESCRIPTION	MAT'L DWG NO./BNL NO.
QTY REQD						

INTERPRET IN GENERAL ACCORDANCE WITH ASME Y14.24M-1989
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
DECIMAL TOLERANCES .X ±.030 .XX ±.015 .XXX ±.005
ANGULAR TOLERANCE ± .5°
NA FINISH
BREAK SHARP EDGES MAX. XX MIN. XX
OUTSTANDING ECN

Q.A. CATEGORY A-3

DRAWN BY	Ed Koropsak	5/13/03
CHECKED BY		
DESIGN APPROVAL		
ENGINEER APPROVAL	Rob Michnoff	
SUPVR. APPROVAL		

NEXT ASSEMBLY

BROOKHAVEN NATIONAL LABORATORY
UPTON, N.Y. 11973
RHIC CONTROLS
SERVICE BLDG. 1002A TUNE METER
MUX CONNECTIONS

SIZE D | 94028826 | REV. A
DRAWING NUMBER

MATERIAL: | SCALE: NA | WEIGHT: | SHEET 24

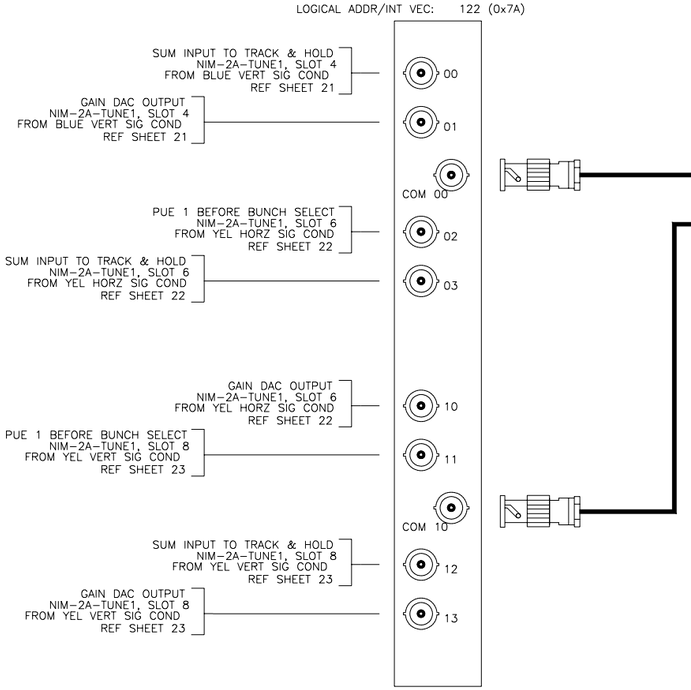
8 7 6 5 4 3 2 1 *AUTOCAD

REV.	ZONE	ECN NO.	DATE	BY	CKR	APP.

Controls, C-AD 5/14/2003 1:06 PM 8826_25.dwg

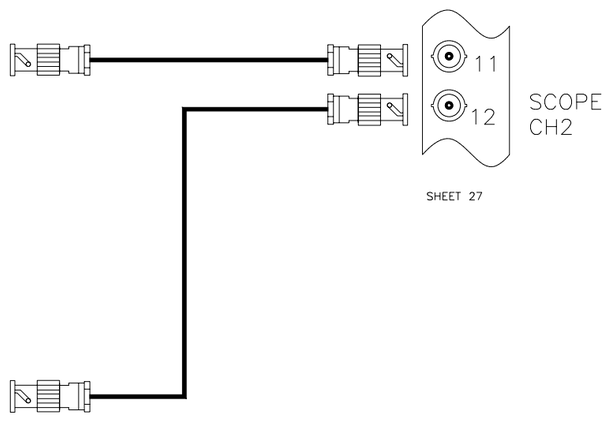
HP E1366A DUAL 4 TO 1 MUX (C)

BLDG #: 1002A
RACK #: RO211
CHASSIS ID: CEX-2A-TUNE1
SLOT #: 14
A16 BASE ADDR: 0xDE80
LOGICAL ADDR/INT VEC: 122 (0x7A)



HP E1366A DUAL 4 TO 1 MUX G

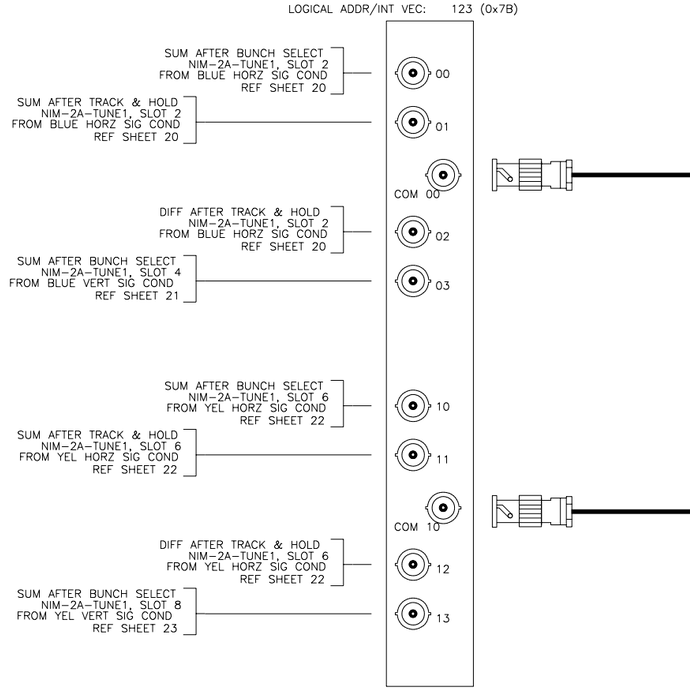
BLDG #: 1002A
RACK #: RO211
CHASSIS ID: CEX-2A-TUNE1
SLOT #: 18



PUSH DOWN INDICATED SIDE

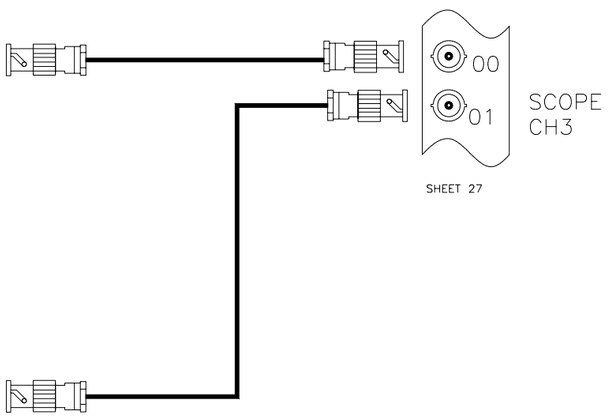
HP E1366A DUAL 4 TO 1 MUX (D)

BLDG #: 1002A
RACK #: RO211
CHASSIS ID: CEX-2A-TUNE1
SLOT #: 15
A16 BASE ADDR: 0xDEC0
LOGICAL ADDR/INT VEC: 123 (0x7B)



HP E1366A DUAL 4 TO 1 MUX H

BLDG #: 1002A
RACK #: RO211
CHASSIS ID: CEX-2A-TUNE1
SLOT #: 19



PUSH DOWN INDICATED SIDE

-3	-2	-1	REF DESIGNATOR	ITEM NO.	DESCRIPTION	MAT'L DWG NO./BNL NO.
QTY REQD						

INTERPRET IN GENERAL ACCORDANCE WITH ASME Y14.24M-1989
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
DECIMAL TOLERANCES .X ±.030 .XX ±.015 .XXX ±.005
ANGULAR TOLERANCE ± .5°
NA FINISH
BREAK SHARP EDGES MAX. XX MIN. XX
OUTSTANDING ECN

Q.A. CATEGORY A-3		DATE
DRAWN BY	Ed Koropsak	5/13/03
CHECKED BY		
DESIGN APPROVAL		
ENGINEER APPROVAL	Rob Michnoff	
SUPVR. APPROVAL		
NEXT ASSEMBLY		

BROOKHAVEN NATIONAL LABORATORY
UPTON, N.Y. 11973
RHIC CONTROLS
SERVICE BLDG. 1002A TUNE METER
MUX CONNECTIONS

SIZE D | 94028826 | REV. A
DRAWING NUMBER
MATERIAL: | SCALE: NA | WEIGHT: | SHEET 25

1 *AUTOCAD

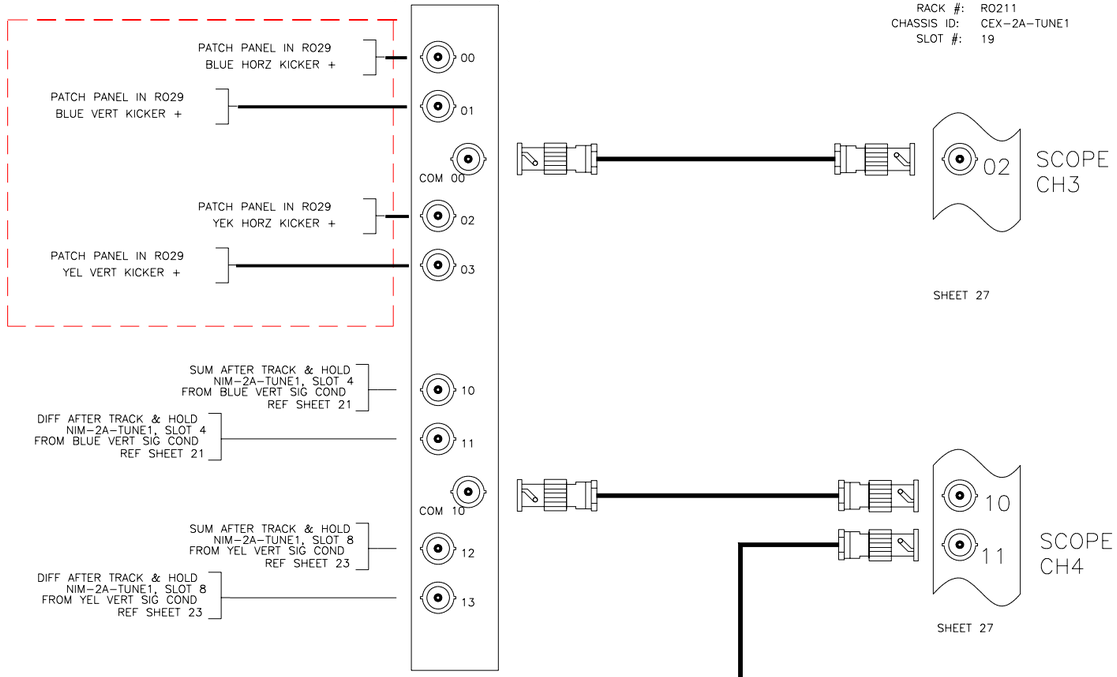
REV.	ZONE	ECN NO.	DATE	BY	CKR	APP.

Controls, C-AD 6/4/2003 3:24 PM 8826_26.dwg

HP E1366A DUAL 4 TO 1 MUX (E)

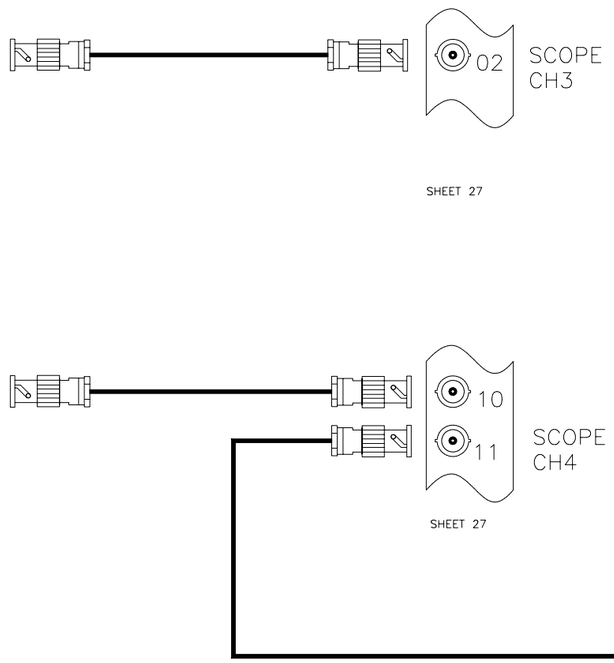
BLDG #: 1002A
RACK #: RO211
CHASSIS ID: CEX-2A-TUNE1
SLOT #: 16
A16 BASE ADDR: 0xDF00
LOGICAL ADDR/INT VEC: 124 (0x7C)

THESE OUTPUTS ARE SHARED WITH THE DAMPER. THEY HAVE TO BE MOVED BY HAND TO ONE SYSTEM OR THE OTHER.



HP E1366A DUAL 4 TO 1 MUX H

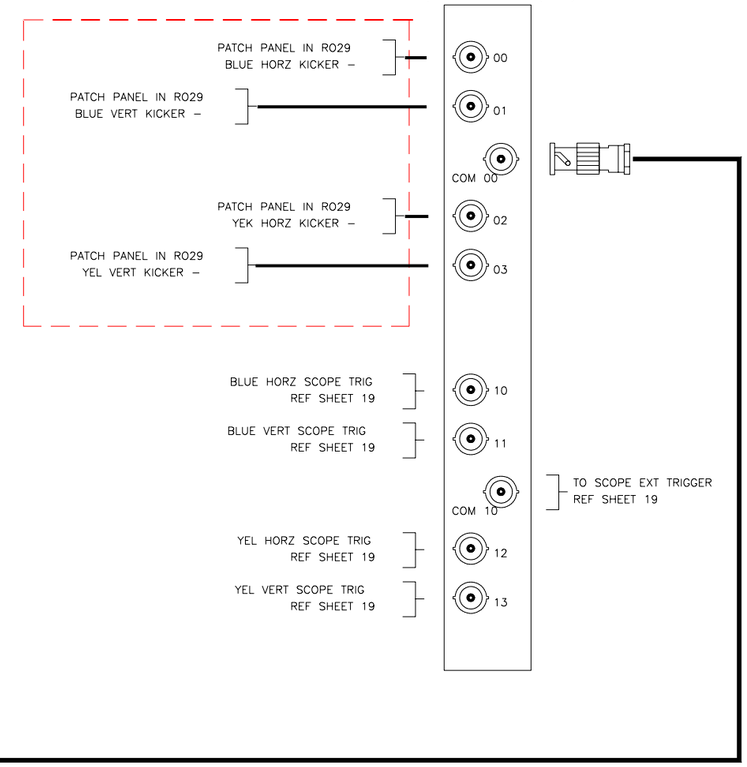
BLDG #: 1002A
RACK #: RO211
CHASSIS ID: CEX-2A-TUNE1
SLOT #: 19



HP E1366A DUAL 4 TO 1 MUX (F)

BLDG #: 1002A
RACK #: RO211
CHASSIS ID: CEX-2A-TUNE1
SLOT #: 17
A16 BASE ADDR: 0xDF40
LOGICAL ADDR/INT VEC: 125 (0x7D)

THESE OUTPUTS ARE SHARED WITH THE DAMPER. THEY HAVE TO BE MOVED BY HAND TO ONE SYSTEM OR THE OTHER.



PUSH DOWN INDICATED SIDE

PUSH DOWN INDICATED SIDE

-3	-2	-1	REF DESIGNATOR	ITEM NO.	DESCRIPTION	MAT'L DWG NO./BNL NO.
QTY REQD						

INTERPRET IN GENERAL ACCORDANCE WITH ASME Y14.24M-1989
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
DECIMAL TOLERANCES .X ±.030 .XX ±.015 .XXX ±.005
ANGULAR TOLERANCE ± .5°
OUTSTANDING ECN
NA FINISH
BREAK SHARP EDGES
MAX. XX MIN. XX

Q.A. CATEGORY A-3 DATE
DRAWN BY Ed Koropsak 5/13/03
CHECKED BY
DESIGN APPROVAL
ENGINEER APPROVAL Rob Michnoff
SUPVR. APPROVAL
NEXT ASSEMBLY

BROOKHAVEN NATIONAL LABORATORY
UPTON, N.Y. 11973
RHIC CONTROLS
SERVICE BLDG. 1002A TUNE METER
MUX CONNECTIONS

SIZE D | 94028826 | REV. A
DRAWING NUMBER

MATERIAL: SCALE: NA WEIGHT: SHEET 26

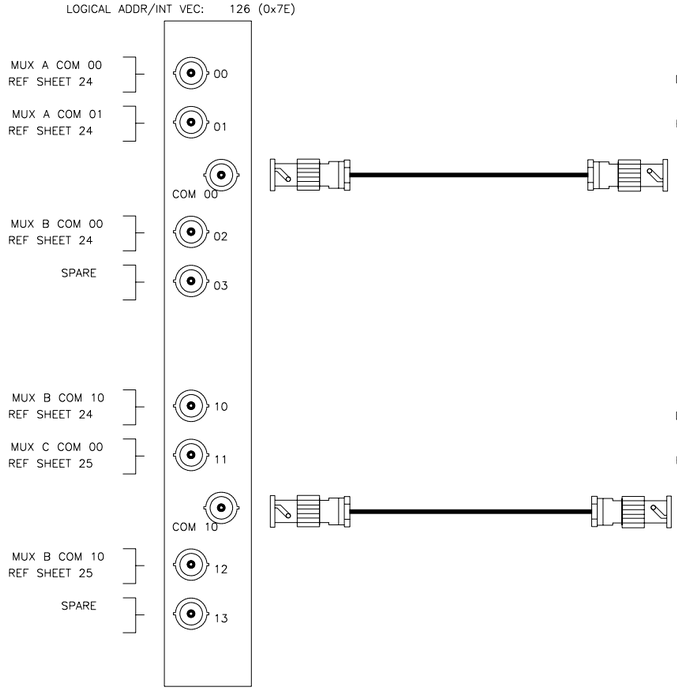
8 7 6 5 4 3 2 1 *AUTOCAD

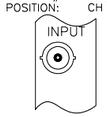
REV.	ZONE	ECN NO.	DATE	BY	CKR	APP.

Controls, C-AD 5/14/2003 2:57 PM 8826_27.dwg

HP E1366A DUAL 4 TO 1 MUX (G)

BLDG #: 1002A
RACK #: RO211
CHASSIS ID: CEX-2A-TUNE1
SLOT #: 18
A16 BASE ADDR: 0xDF80
LOGICAL ADDR/INT VEC: 126 (0x7E)

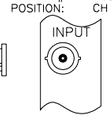




DEVICE: LECROY SCOPE LT374M
BLDG #: 1002A
RACK #: RO212
POSITION: CH 1 INPUT

CHANNEL 1 MULTIPLEXER CHANNELS

1-BLUE HORZ BUNCH SELECT CLK
2-BLUE HORZ TRACK & HOLD CLK
3-BLUE HORZ AUTO GAIN CLK
4-BLUE VERT BUNCH SELECT CLK
5-BLUE VERT TRACK & HOLD CLK
6-BLUE VERT AUTO GAIN CLK
7-YEL HORZ BUNCH SELECT CLK
8-YEL HORZ TRACK & HOLD CLK
9-YEL HORZ AUTO GAIN CLK
10-YEL VERT BUNCH SELECT CLK
11-YEL VERT TRACK & HOLD CLK
12-YEL VERT AUTO GAIN CLK



DEVICE: LECROY SCOPE LT374M
BLDG #: 1002A
RACK #: RO212
POSITION: CH 2 INPUT

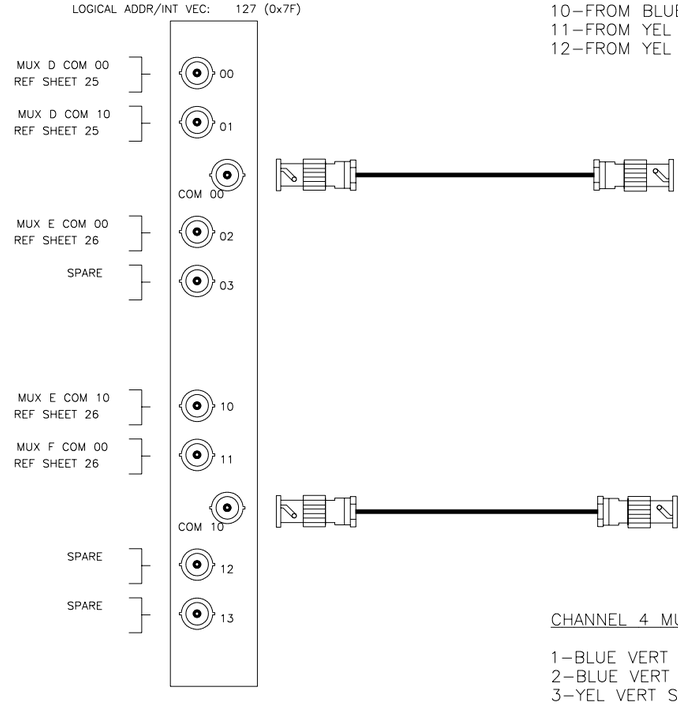
CHANNEL 2 MULTIPLEXER CHANNELS

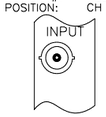
1-BLUE HORZ PUE 1 BEFORE BUNCH SELECT
2-BLUE HORZ SUM INPUT TO TRACK & HOLD
3-BLUE HORZ GAIN DAC OUTPUT
4-BLUE VERT PUE 1 BEFORE BUNCH SELECT
5-BLUE VERT SUM INPUT TO TRACK & HOLD
6-BLUE VERT GAIN DAC OUTPUT
7-YEL HORZ PUE 1 BEFORE BUNCH SELECT
8-YEL HORZ SUM INPUT TO TRACK & HOLD
9-YEL HORZ GAIN DAC OUTPUT
10-YEL VERT PUE 1 BEFORE BUNCH SELECT
11-YEL VERT SUM INPUT TO TRACK & HOLD
12-YEL VERT GAIN DAC OUTPUT

PUSH DOWN INDICATED SIDE

HP E1366A DUAL 4 TO 1 MUX (H)

BLDG #: 1002A
RACK #: RO211
CHASSIS ID: CEX-2A-TUNE1
SLOT #: 19
A16 BASE ADDR: 0xDFC0
LOGICAL ADDR/INT VEC: 127 (0x7F)

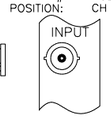




DEVICE: LECROY SCOPE LT374M
BLDG #: 1002A
RACK #: RO212
POSITION: CH 3 INPUT

CHANNEL 3 MULTIPLEXER CHANNELS

1-BLUE HORZ SUM AFTER BUNCH SELECT
2-BLUE HORZ SUM AFTER TRACK & HOLD
3-BLUE HORZ DIFF AFTER TRACK & HOLD
4-BLUE VERT SUM AFTER BUNCH SELECT
5-YEL HORZ SUM AFTER BUNCH SELECT
6-YEL HORZ SUM AFTER TRACH & HOLD
7-YEL HORZ DIFF AFTER TRACK & HOLD
8-YEL VERT SUM AFTER BUNCH SELECT
9-FROM BLUE HORZ KICKER +
10-FROM BLUE VERT KICKER +
11-FROM YEL HORZ KICKER +
12-FROM YEL VERT KICKER +



DEVICE: LECROY SCOPE LT374M
BLDG #: 1002A
RACK #: RO212
POSITION: CH 4 INPUT

CHANNEL 4 MULTIPLEXER CHANNELS

1-BLUE VERT SUM AFTER TRACK & HOLD
2-BLUE VERT DIFF AFTER TRACK & HOLD
3-YEL VERT SUM AFTER TRACK & HOLD
4-YEL VERT DIFF AFTER TRACK & HOLD
5-FROM BLUE HORZ KICKER -
6-FROM BLUE VERT KICKER -
7-FROM YEL HORZ KICKER -
8-FROM YEL VERT KICKER -

PUSH DOWN INDICATED SIDE

-3	-2	-1	REF DESIGNATOR	ITEM NO.	DESCRIPTION	MAT'L DWG NO./BNL NO.
QTY REQD						

INTERPRET IN GENERAL ACCORDANCE WITH ASME Y14.24M-1989
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
DECIMAL TOLERANCES .X ±.030 .XX ±.015 .XXX ±.005
ANGULAR TOLERANCE ± .5°
OUTSTANDING ECN
NA
FINISH
BREAK SHARP EDGES
MAX. XX MIN. XX

Q.A. CATEGORY A-3

		DATE
DRAWN BY	Ed Koropsak	5/13/03
CHECKED BY		
DESIGN APPROVAL		
ENGINEER APPROVAL	Rob Michnoff	
SUPVR. APPROVAL		

NEXT ASSEMBLY

BROOKHAVEN NATIONAL LABORATORY
UPTON, N.Y. 11973
RHIC CONTROLS
SERVICE BLDG. 1002A TUNE METER
MUX CONNECTIONS

SIZE D
94028826
DRAWING NUMBER
REV. A

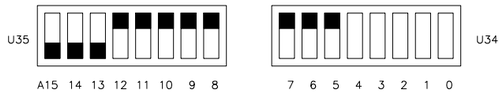
MATERIAL:
SCALE: NA
WEIGHT:
SHEET 27

*AUTOCAD

REV.	ZONE	ECN NO.	DATE	BY	CKR	APP.

Controls, C-AD 5/14/2003 3:16 PM 8826_28.dwg

VMIVME 1160A-200
BASE ADDRESS SWITCH SETTINGS

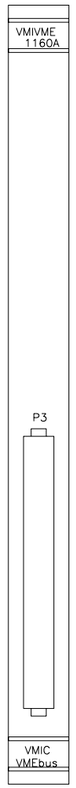


VMIVME 1160A-200
JUMPER SETTINGS

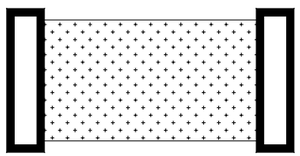
J1:	IN	J33:	IN
J3:	IN	J35:	IN
J5:	IN	J37:	IN
J7:	IN	J39:	IN
J9:	IN	J41:	IN
J11:	IN	J43:	IN
J13:	IN	J45:	IN
J15:	IN	J47:	IN
J17:	IN	J49:	IN
J19:	IN	J51:	IN
J21:	IN	J53:	IN
J23:	IN	J55:	IN
J25:	IN	J57:	IN
J27:	IN	J59:	IN
J29:	IN	J61:	IN
J31:	IN	J63:	IN

DIGITAL INPUT MODULE 1160A-200

BLDG #: 1002A
RACK #: R0211
CHASSIS ID: CEX-2A-TUNE1
SLOT #: 4
A16 BASE ADDRESS: 0XE000



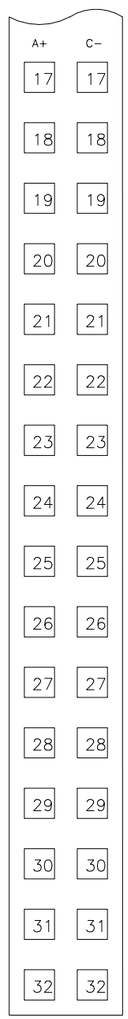
64 PIN RIBBON CABLE



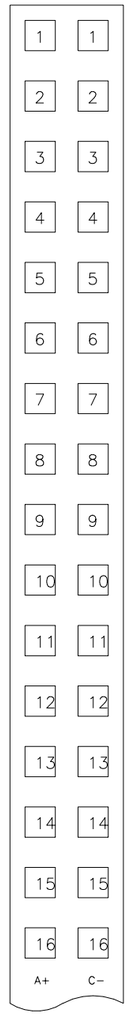
ASSY #
VMIVME-000-64-010

64 PIN TRANSITION PANEL

BLDG: 1002A
RACK: R0210
ID: TB1



ASSY #
VMIVME-BT01-000



1 1 CHAN 0, REF SH 18
BLUE -30db XFER SWITCHES IN/OUT

2 2 CHAN 1, REF SH 18
BLUE -30db XFER SWITCHES REMOTE/MANUAL IN

3 3 CHAN 2, REF SH 18
BLUE PROGRAMMABLE ATTENUATOR TEST BIT

4 4 CHAN 3, REF SH 18
YELLOW -30db XFER SWITCHES IN/OUT

5 5 CHAN 4, REF SH 18
YELLOW -30db XFER SWITCHES REMOTE/MANUAL IN

6 6 CHAN 5, REF SH 18
YELLOW PROGRAMMABLE ATTENUATOR TEST BIT

-3	-2	-1	REF DESIGNATOR	ITEM NO.	DESCRIPTION	MAT'L DWG NO./BNL NO.
QTY REQD						

INTERPRET IN GENERAL ACCORDANCE WITH ASME Y14.24M-1989	Q.A. CATEGORY A-3	DATE	BROOKHAVEN NATIONAL LABORATORY	
	DRAWN BY: Al Watson	3/9/00	UPTON, N.Y. 11973	
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES	CHECKED BY		RHIC CONTROLS	
DECIMAL TOLERANCES .X ±.030 .XX ±.015 .XXX ±.005 ANGULAR TOLERANCE ± .5°	DESIGN APPROVAL		SERVICE BLDG. 1002A TUNE METER	
	ENGINEER APPROVAL: Rob Michnoff		1160A-201	
	SUPVR. APPROVAL		SIZE D	94028826 REV. A
NA FINISH; BREAK SHARP EDGES MAX. XX MIN. XX	NEXT ASSEMBLY		DRAWING NUMBER	
OUTSTANDING ECN			MATERIAL:	SCALE: NA WEIGHT: SHEET 28

8 7 6 5 4 3 2 1 *AUTOCAD

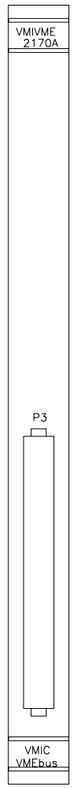
REV.	ZONE	ECN NO.	DATE	BY	CKR	APP.

Controls, C-AD 5/14/2003 3:27 PM 8826_29.dwg

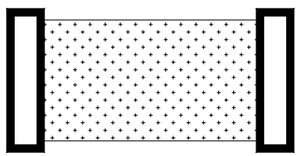
VMIVME 2170A-210
JUMPER SETTINGS

A2: IN
A3: IN
A4: IN
A5: IN
A6: IN
A7: IN
A8: OUT
A9: IN
A10: IN
A11: IN
A12: IN
A13: OUT
A14: OUT
A15: OUT

DIGITAL OUTPUT MODULE 2170A-210
BLDG #: 1002A
RACK #: R0211
CHASSIS ID: CEX-2A-TUNE1
SLOT #: 5
A16 BASE ADDRESS: 0XE100

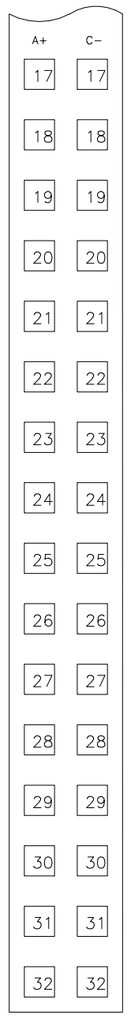


64 PIN RIBBON CABLE

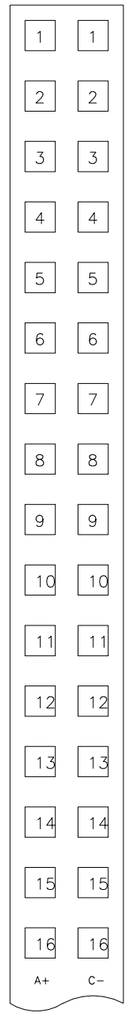


ASSY #
VMIVME-000-64-010

64 PIN TRANSITION PANEL
BLDG: 1002A
RACK: R0210
ID: TB2



ASSY #
VMIVME-BT01-000



CHAN 0, REF SH 17
HI VOLTAGE POWER SUPPLY ON/OFF

-3	-2	-1	QTY REQD	REF DESIGNATOR	ITEM NO.	DESCRIPTION	MAT'L DWG NO./BNL NO.

INTERPRET IN GENERAL ACCORDANCE WITH ASME Y14.24M-1989	Q.A. CATEGORY A-3	DATE	BROOKHAVEN NATIONAL LABORATORY
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES	DRAWN BY Al Watson	3/10/00	UPTON, N.Y. 11973
DECIMAL TOLERANCES .X ±.030 .XX ±.015 .XXX ±.005 ANGULAR TOLERANCE ± .5°	CHECKED BY		RHIC CONTROLS
	DESIGN APPROVAL		SERVICE BLDG. 1002A TUNE METER
	ENGINEER APPROVAL Rob Michnoff		2170A_1
	SUPVR. APPROVAL		SIZE D — 94028826 — REV. A
NA FINISH — BREAK SHARP EDGES MAX. XX MIN. XX	NEXT ASSEMBLY		DRAWING NUMBER
OUTSTANDING ECN			MATERIAL: SCALE: NA WEIGHT: SHEET 29

REV.	ZONE	ECN NO.	DATE	BY	CKR	APP.

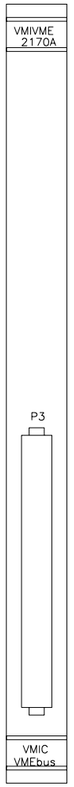
Controls, C-AD 5/14/2003 3:31 PM 8826_30.dwg

VMIVME 2170A-210
JUMPER SETTINGS

A2: OUT
A3: IN
A4: IN
A5: IN
A6: IN
A7: IN
A8: OUT
A9: IN
A10: IN
A11: IN
A12: IN
A13: OUT
A14: OUT
A15: OUT

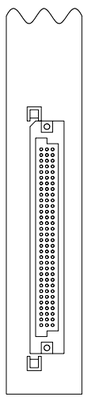
DIGITAL OUTPUT MODULE 2170A-210

BLDG #: 1002A
RACK #: R0211
CHASSIS ID: CEX-2A-TUNE1
SLOT #: 6
A16 BASE ADDRESS: 0XE104



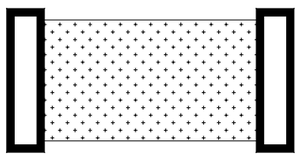
RHIC TUNE METER PROGRAMMABLE ATTENUATOR

BLDG: 1002A
RACK: R0211
ID: BLUE



CONT'D ON SH 14, 18

64 PIN RIBBON CABLE



ASSY #
VMIVME-000-64-010

REAR VIEW

ASSY #82045020

CHANNEL DEFINITIONS

	CHAN	DESCRIPTION
TOP POSITION MONITOR PROGRAMMABLE ATTENUATOR	0	.5 db
	1	1 db
	2	2 db
	3	4 db
	4	8 db
	5	16 db
BOTTOM POSITION MONITOR PROGRAMMABLE ATTENUATOR	6	.5 db
	7	1 db
	8	2 db
	9	4 db
	10	8 db
	11	16 db
INSIDE POSITION MONITOR PROGRAMMABLE ATTENUATOR	12	.5 db
	13	1 db
	14	2 db
	15	4 db
	16	8 db
	17	16 db
OUTSIDE POSITION MONITOR PROGRAMMABLE ATTENUATOR	18	.5 db
	19	1 db
	20	2 db
	21	4 db
	22	8 db
	23	16 db
	24	-30 db XFER SWITCHES IN/OUT CONTROL(1 BIT CONTROLS ALL 4 SWITCHES)
	25	TEST BIT, LED ON/OFF
	26	
	27	
	28	
	29	
	30	
	31	

-3	-2	-1	REF DESIGNATOR	ITEM NO.	DESCRIPTION	MAT'L DWG NO./BNL NO.
QTY REQD						

INTERPRET IN GENERAL ACCORDANCE WITH ASME Y14.24M-1989
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
DECIMAL TOLERANCES .X ±.030 .XX ±.015 .XXX ±.005
ANGULAR TOLERANCE ± .5°
NA FINISH
BREAK SHARP EDGES MAX. XX MIN. XX
OUTSTANDING ECN

Q.A. CATEGORY A-3		DATE
DRAWN BY	Al Watson	3/13/00
CHECKED BY		
DESIGN APPROVAL		
ENGINEER APPROVAL	Rob Michnoff	
SUPVR. APPROVAL		
NEXT ASSEMBLY		

BROOKHAVEN NATIONAL LABORATORY
UPTON, N.Y. 11973
RHIC CONTROLS
SERVICE BLDG. 1002A TUNE METER
2170A_2

SIZE D | 94028826 DRAWING NUMBER | REV. A

MATERIAL: | SCALE: NA | WEIGHT: | SHEET 30

*AUTOCAD

REV.	ZONE	ECN NO.	DATE	BY	CKR	APP.

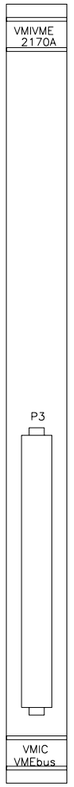
Controls, C-AD 5/14/2003 3:46 PM 8826_31.dwg

VMIVME 2170A-210
JUMPER SETTINGS

A2: IN
A3: OUT
A4: IN
A5: IN
A6: IN
A7: IN
A8: OUT
A9: IN
A10: IN
A11: IN
A12: IN
A13: OUT
A14: OUT
A15: OUT

DIGITAL OUTPUT MODULE 2170A-210

BLDG #: 1002A
RACK #: R0211
CHASSIS ID: CEX-2A-TUNE1
SLOT #: 7
A16 BASE ADDRESS: 0XE108

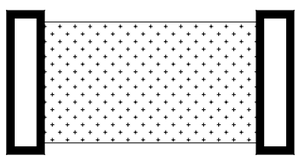


RHIC TUNE METER PROGRAMMABLE ATTENUATOR

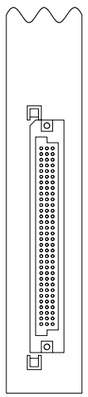
BLDG: 1002A
RACK: R0211
ID: YELLOW

CONT'D ON SH 15, 18

64 PIN RIBBON CABLE



ASSY #
VMIVME-000-64-010



REAR VIEW

ASSY #82045020

CHANNEL DEFINITIONS

	CHAN	DESCRIPTION
TOP POSITION MONITOR PROGRAMMABLE ATTENUATOR	0	.5 db
	1	1 db
	2	2 db
	3	4 db
	4	8 db
	5	16 db
BOTTOM POSITION MONITOR PROGRAMMABLE ATTENUATOR	6	.5 db
	7	1 db
	8	2 db
	9	4 db
	10	8 db
	11	16 db
INSIDE POSITION MONITOR PROGRAMMABLE ATTENUATOR	12	.5 db
	13	1 db
	14	2 db
	15	4 db
	16	8 db
	17	16 db
OUTSIDE POSITION MONITOR PROGRAMMABLE ATTENUATOR	18	.5 db
	19	1 db
	20	2 db
	21	4 db
	22	8 db
	23	16 db
	24	-30 db XFER SWITCHES IN/OUT CONTROL(1 BIT CONTROLS ALL 4 SWITCHES)
	25	TEST BIT, LED ON/OFF
	26	
	27	
	28	
	29	
	30	
	31	

-3 -2 -1 QTY REQD	REF DESIGNATOR	ITEM NO.	DESCRIPTION	MAT'L DWG NO./BNL NO.

INTERPRET IN GENERAL ACCORDANCE WITH ASME Y14.24M-1989
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
DECIMAL TOLERANCES .X ±.030 .XX ±.015 .XXX ±.005
ANGULAR TOLERANCE ± .5°
NA FINISH
BREAK SHARP EDGES MAX. XX MIN. XX
OUTSTANDING ECN

Q.A. CATEGORY A-3 DATE
DRAWN BY Al Watson 3/13/00
CHECKED BY
DESIGN APPROVAL
ENGINEER APPROVAL Rob Michnoff
SUPVR. APPROVAL
NEXT ASSEMBLY

BROOKHAVEN NATIONAL LABORATORY
UPTON, N.Y. 11973
RHIC CONTROLS
SERVICE BLDG. 1002A TUNE METER
2170A_3
SIZE D
94028826
DRAWING NUMBER
REV. A
MATERIAL:
SCALE: NA
WEIGHT:
SHEET 31

*AUTOCAD

REV.	ZONE	ECN NO.	DATE	BY	CKR	APP.

Controls, C-AD 5/28/2003 1:07 PM 8826_32.dwg

DIGITAL INPUT MODULE 1160A-200
BLDG #: 1002A
RACK #: R0211
CHASSIS ID: CEX-2A-TUNE1
SLOT #: 9
A16 BASE ADDRESS: 0XE020

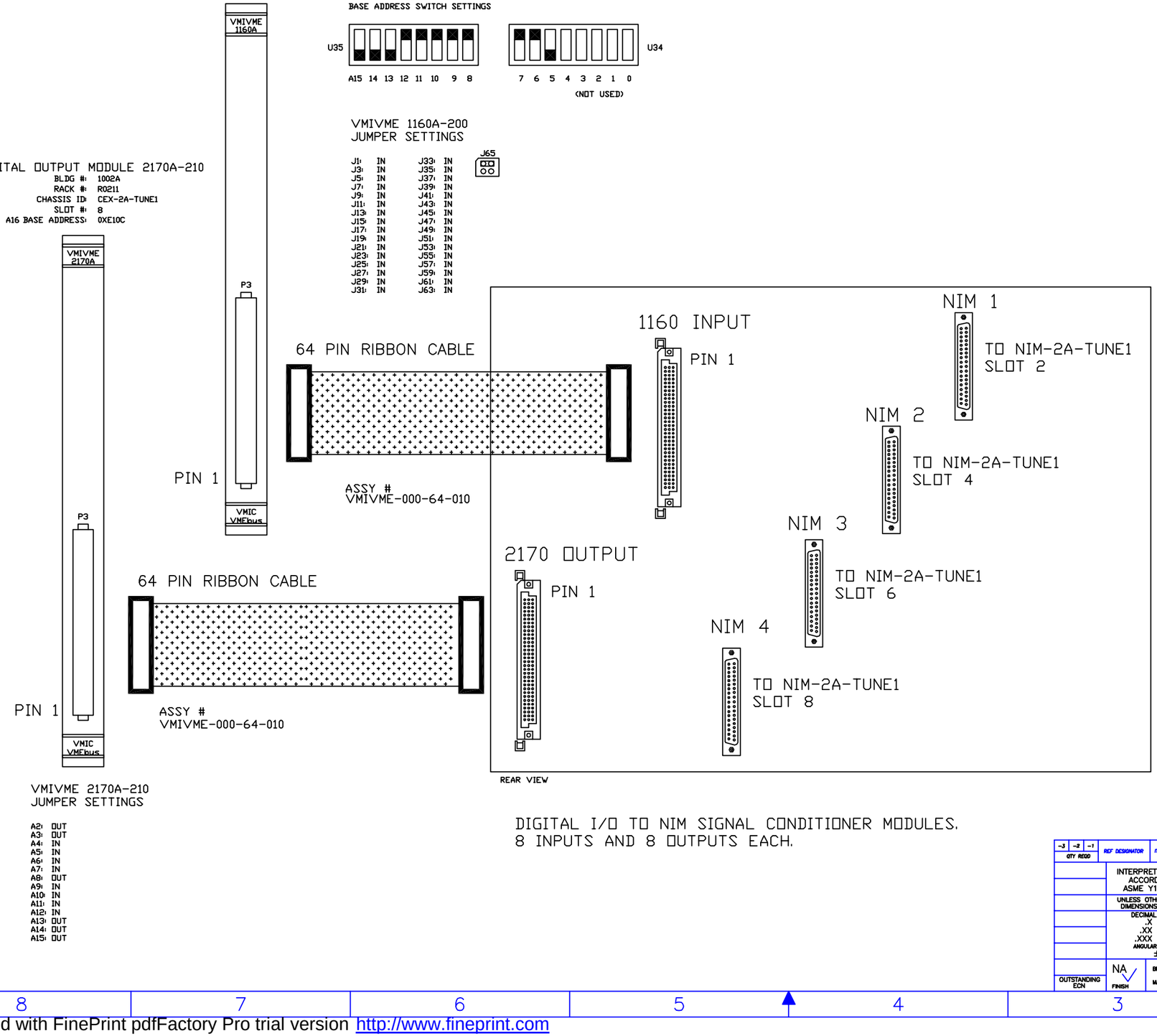
VMIVME 1160A-200
BASE ADDRESS SWITCH SETTINGS

VMIVME 1160A-200
JUMPER SETTINGS

J1:	IN	J33:	IN
J3:	IN	J35:	IN
J5:	IN	J37:	IN
J7:	IN	J39:	IN
J9:	IN	J41:	IN
J11:	IN	J43:	IN
J13:	IN	J45:	IN
J15:	IN	J47:	IN
J17:	IN	J49:	IN
J19:	IN	J51:	IN
J21:	IN	J53:	IN
J23:	IN	J55:	IN
J25:	IN	J57:	IN
J27:	IN	J59:	IN
J29:	IN	J61:	IN
J31:	IN	J63:	IN

J65

DIGITAL OUTPUT MODULE 2170A-210
BLDG #: 1002A
RACK #: R0211
CHASSIS ID: CEX-2A-TUNE1
SLOT #: 8
A16 BASE ADDRESS: 0XE10C



VMIVME 2170A-210
JUMPER SETTINGS

A2:	OUT
A3:	OUT
A4:	IN
A5:	IN
A6:	IN
A7:	IN
A8:	OUT
A9:	IN
A10:	IN
A11:	IN
A12:	IN
A13:	OUT
A14:	OUT
A15:	OUT

Patch Panel Breakout.

VME OUTPUT CH #	64 PIN CONN	37 PIN 'D'	#1 NIM INPUT	VME INPUT CH#	64 PIN CONN	37 PIN 'D'	#1 NIM OUTPUT
0	C1	GRD	1	0	C1	GRD	9
	A1	SIG	20 LSB		A1	SIG	28 LSB
1	C2		2	1	C2		10
	A2		21		A2		29
2	C3		3	2	C3		11
	A3		22		A3		30
3	C4		4	3	C4		12
	A4		23		A4		31
4	C5		5	4	C5		13
	A5		24		A5		32
5	C6		6	5	C6		14
	A6		25		A6		33
6	C7		7	6	C7		15
	A7		26		A7		34
7	C8	GRD	8	7	C8	GRD	16
	A8	SIG	27 MSB		A8	SIG	35 MSB
			#2 NIM INPUT				#2 NIM OUTPUT
8	C9	GRD	1	8	C9	GRD	9
	A9	SIG	20 LSB		A9	SIG	28 LSB
9	C10		2	9	C10		10
	A10		21		A10		29
10	C11		3	10	C11		11
	A11		22		A11		30
11	C12		4	11	C12		12
	A12		23		A12		31
12	C13		5	12	C13		13
	A13		24		A13		32
13	C14		6	13	C14		14
	A14		25		A14		33
14	C15		7	14	C15		15
	A15		26		A15		34
15	C16	GRD	8	15	C16	GRD	16
	A16	SIG	27 MSB		A16	SIG	35 MSB
			#3 NIM INPUT				#3 NIM OUTPUT
16	C17	GRD	1	16	C17	GRD	9
	A17	SIG	20 LSB		A17	SIG	28 LSB
17	C18		2	17	C18		10
	A18		21		A18		29
18	C19		3	18	C19		11
	A19		22		A19		30
19	C20		4	19	C20		12
	A20		23		A20		31
20	C21		5	20	C21		13
	A21		24		A21		32
21	C22		6	21	C22		14
	A22		25		A22		33
22	C23		7	22	C23		15
	A23		26		A23		34
23	C24	GRD	8	23	C24		16
	A24	SIG	27 MSB		A24		35 MSB
			#4 NIM INPUT				#4 NIM OUTPUT
24	C25	GRD	1	24	C25	GRD	9
	A25	SIG	20		A25	SIG	28 LSB
25	C26		2	25	C26		10
	A26		21		A26		29
26	C27		3	26	C27		11
	A27		22		A27		30
27	C28		4	27	C28		12
	A28		23		A28		31
28	C29		5	28	C29		13
	A29		24		A29		32
29	C30		6	29	C30		14
	A30		25		A30		33
30	C31		7	30	C31		15
	A31		26		A31		34
31	C32	GRD	8	31	C32	GRD	16 "N/C 17,18.19,36,37"
	A32	SIG	27 MSB		A32	SIG	35 MSB

BUNCH TRACKER VME/NIM PINOUT 9/9/02 F.D.

DIGITAL I/O TO NIM SIGNAL CONDITIONER MODULES.
8 INPUTS AND 8 OUTPUTS EACH.

-3	-2	-1	REF DESIGNATOR	ITEM NO.	DESCRIPTION	MAT'L SPEC NO./DWG NO.
QTY REQD						

INTERPRET IN GENERAL ACCORDANCE WITH ASME Y14.24M-1989
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
DECIMAL TOLERANCES .X ±.030 .XX ±.015 .XXX ±.005
ANGULAR TOLERANCE ± .5°
NA FINISH
BREAK SHARP EDGES MAX. XX MIN. XX
OUTSTANDING ECN

Q.A. CATEGORY	A-3	DATE	
DRAWN BY	Ed Koropsak	5/14/03	
CHECKED BY			
DESIGN APPROVAL			
ENGINEER APPROVAL	Rob Michnoff		
SUPVR. APPROVAL			
NEXT ASSEMBLY			

BROOKHAVEN NATIONAL LABORATORY
UPTON, N.Y. 11973
RHIC CONTROLS
SERVICE BLDG. 1002A TUNE METER
I/O TO NIM MODULES

SIZE D 94028826 REV. A
DRAWING NUMBER
MATERIAL: SCALE: NA WEIGHT: SHEET 32

*AUTOCAD

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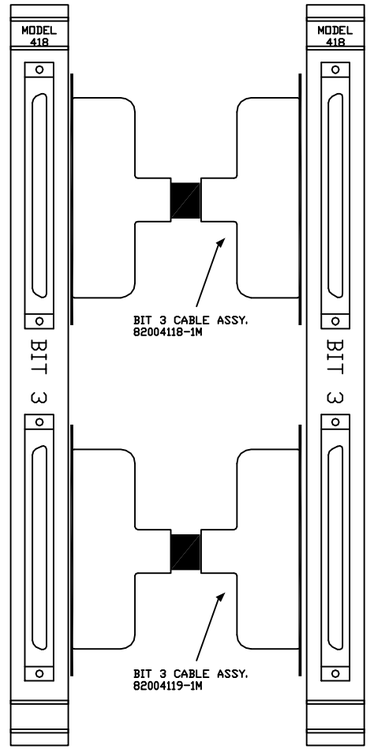
REV.	ZONE	ECN NO.	DATE	BY	CKR	APP.

Controls, C-AD 6/9/2003 1:30 PM 8826_33.dwg

DEVICE: BUS EXTENDER
BLDG #: 1002A
RACK #: R0211
CHASSIS ID: CFE-2A-TUNE1
SLOT #: 21
A24 BASE ADDRESS: NA



JUMPER LIST

C/S OUT
P/S IN
SYS IN
I/O 8-15 NOT USED

DEVICE: BUS EXTENDER
BLDG #: 1002A
RACK #: R0211
CHASSIS ID: CEX-2A-TUNE1
SLOT #: 1
A24 BASE ADDRESS: NA

JUMPER LIST

C/S OUT
P/S OUT
SYS IN
I/O 8-15 NOT USED

DEVICE: V109
BLDG #: 1002A
RACK #: R0211
CHASSIS ID: CEX-2A-TUNE1
SLOT #: 3
A24 BASE ADDRESS: 0x008000

V109 JUMPER LIST

E2-E13
E3-E14
E4-E15
E5-E16
E6-E17
E7-E18
E8-E19
E9-E20
E10-E23
E11-E21
E12-E25
E22-E25
SW1=OPEN
SW2=CLOSED
SW3=OPEN
SW4=OPEN

-3 -2 -1 QTY REQD	REF DESIGNATOR	ITEM NO.	DESCRIPTION	MAT'L DWG NO./DWG NO.

INTERPRET IN GENERAL ACCORDANCE WITH ASME Y14.24M-1989
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
DECIMAL TOLERANCES
X ±.030
.XX ±.015
.XXX ±.005
ANGULAR TOLERANCE ± .5°
NA FINISH
BREAK SHARP EDGES MAX. XX MIN. XX
OUTSTANDING ECN

Q.A. CATEGORY A-3		DATE
DRAWN BY	Ed Koropsak	5/16/03
CHECKED BY		
DESIGN APPROVAL		
ENGINEER APPROVAL	Rob Michnoff	
SUPVR. APPROVAL		
NEXT ASSEMBLY		

BROOKHAVEN NATIONAL LABORATORY
UPTON, N.Y. 11973
RHIC CONTROLS
SERVICE BLDG. 1002A TUNE METER
BIT 3 MODULE & V109

SIZE	DRAWING NUMBER	REV.
D	94028826	A

MATERIAL: ——— SCALE: FULL WEIGHT: — SHEET 33

*AUTOCAD

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