



# COMPUTER CONVERSIONS CORPORATION

## QUOTATION

6 Dunton Court, East Northport, N.Y. 11731 \* Phone (631) 261-3300 Fax 3308

**TO:**

Jefferson Labs

**DATE** 10/25/2002

**QUOTE FIRM FOR  
YOUR REF. Request  
REP.**

Attn: Mr. Scott Windham

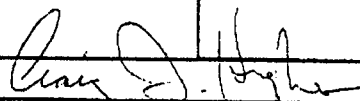
**TELEPHONE NO.** (757) 269-7324

**FAX:** (757) 269-7309

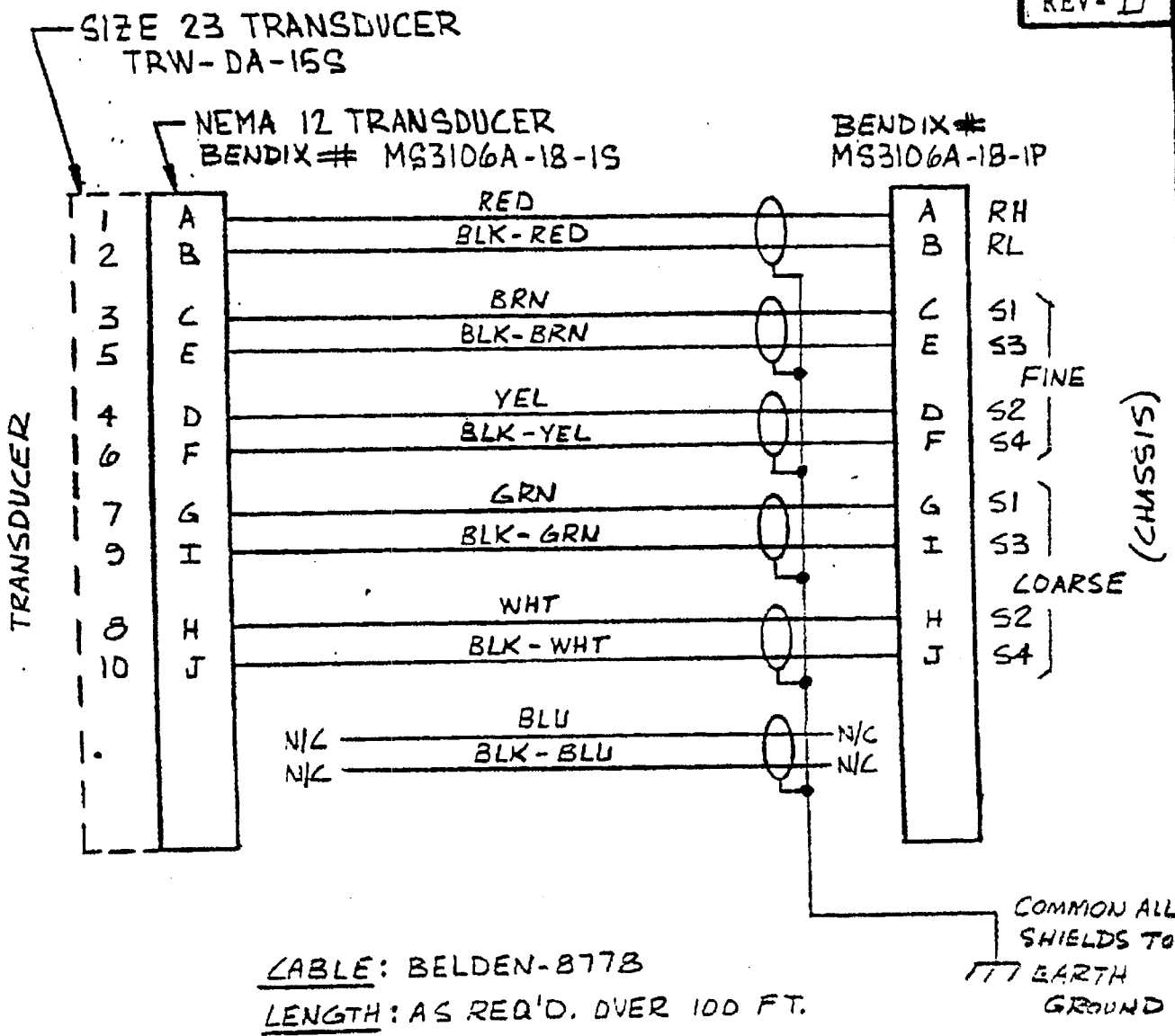
ITEM#	QTY.	DESCRIPTION	UNIT PRICE	UNIT
1	1	CCC Multiturn Readout Decopder Model: ETMDSR-64-262144-DB18-1P	\$5885.	ea.
	2		\$4885.	
	3	Compatible with Resolver MR90-64THB used on system model: TMDS-64-DB18-1PHR	\$3950.	
<ul style="list-style-type: none"> <li>* Size: 19" Rack Mount Vented Aluminum Chassis, 3.5"H x 13"D.</li> <li>* Internal Fused and Regulated DC Power Supplies with Line cord for direct 115VAC @ 60Hz. power input.</li> <li>* Built-in 6 Decade LED Readout, .56"H. charachters, scaled 4094 / 360°, 0 - 64 revolutions representing 0-262143</li> <li>* BCD output to compliment display/readout.</li> <li>* Binary output, 18 Bits, 4096 / 360°, 0 - 64 revolutions representing 0-262143, 1 part in 262144.</li> </ul>				

**TERMS:** Net 30 STCA      **DELIVERY:** 6-8 Weeks or sooner.

**F.O.B.** East Northport, NY. 11731

  
Craig J. Hughes Ind./COTS Sales Mgr.

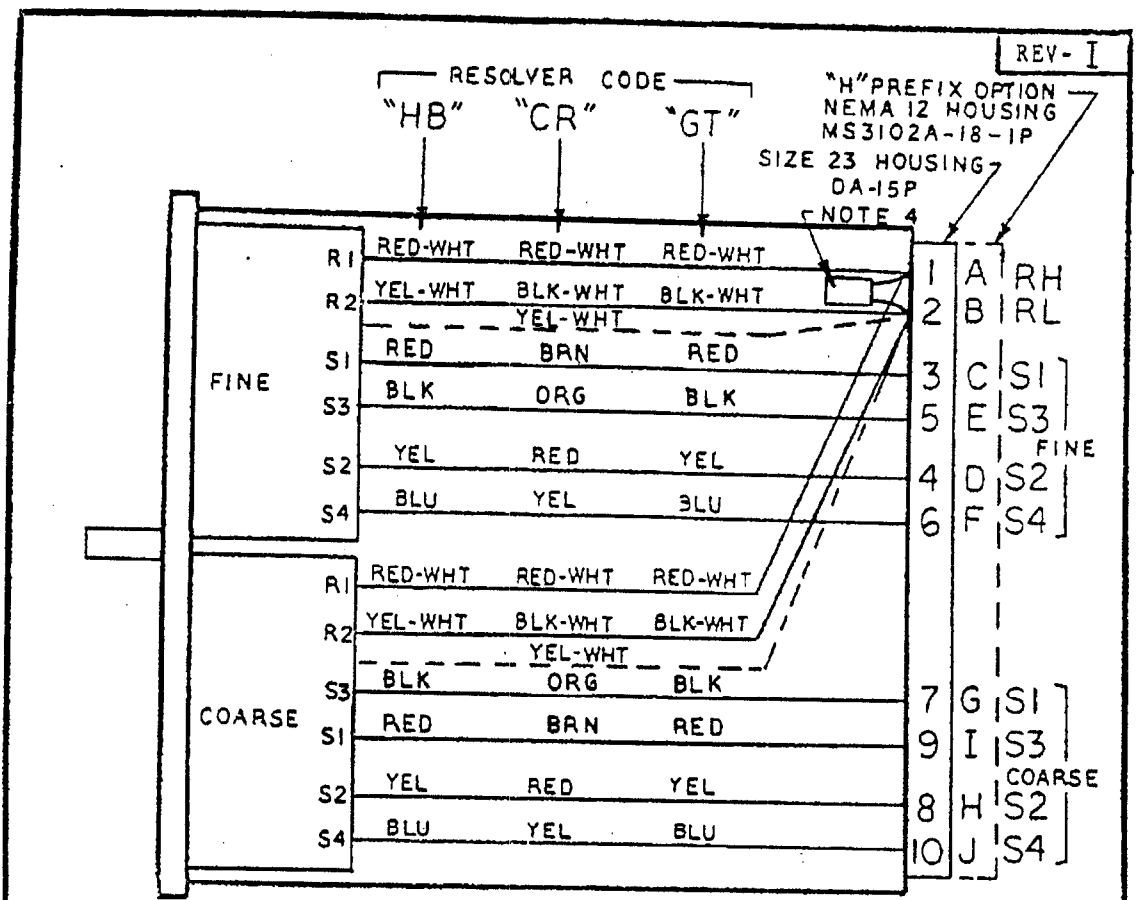
REV-D



- NOTES:
1. TO REVERSE DIRECTION OF ROTATION - INTERCHANGE S1 & S3 ON EACH FINE AND COARSE WIRES AT CHASSIS END OF CABLE.
  2. ALL SHIELDS UN-TERMINATED UNLESS REQ'D.

SEE SEPARATE L/M... A2546

<b>COMPUTER CONVERSIONS CORP</b>		
6 DUNTON COURT - EAST NORTHPORT, N.Y. 11731 - 516 261-3300		
SCALE: <i>1/2"</i>	APPROVED BY:	DRAWN BY <i>R. Figueroa</i>
DATE: 3-28-89		REVISED:
TRACKING MULTI-TURN ENCODER (GREATER THAN 100 FT)		
TRANSDUCER CABLE		DRAWING NUMBER A2546



NOTES:

1. CW / COUNT-UP OPERATION SHOWN (VIEWED FROM SHAFT END), FOR CCW / COUNT-UP OPERATION, SWAP S1 WITH S3 ON FINE AND COARSE. (THIS IS NORMALLY REWORKED IN THE CABLE AT THE ELECTRONICS END)
2. "CR" RESOLVERS THAT HAVE ADDITIONAL ROTOR WIRES (YEL-WHT & BLU-WHT), TIE ROTOR WIRES TOGETHER ON EACH RESOLVER AND DO NOT TERMINATE AT CONNECTOR.
3. REF. P/N: "HMR90-  T-  "  
GEAR RATIO CODE    RESOLVER CODE

4. "GT" UNITS ONLY:  
ADD CK06BX474K AS SHOWN,
5. ROTOR EXCITED.

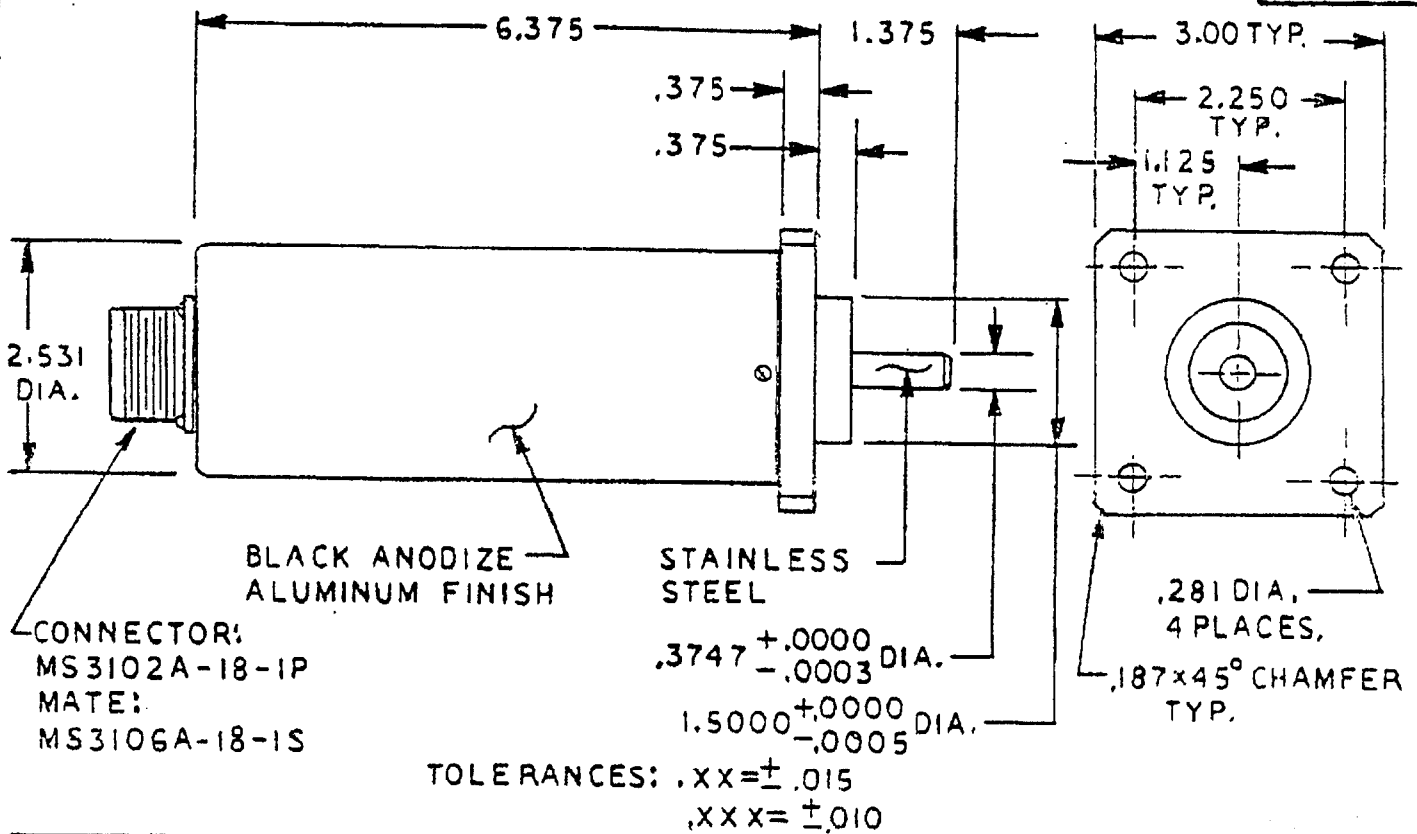
**COMPUTER CONVERSIONS CORP**  
 6 DUNTON COURT - EAST NORTHPORT, N.Y. 11731 - 516 261-3300

SCALE: NONE      APPROVED BY:      DRAWN BY: *D. VERGEL*  
 DATE: 11-3-89      REVISED:

1x18, 1x10 MULTI-TURN TRANSDUCER  
 "HMR90-10T" SERIES

WIRING DIAGRAM      DRAWING NUMBER: A2348-2

REV - C



SPECIFICATIONS

**MECHANICAL:**

MAX. STARTING TORQUE	-----	1.0 oz./in.
MOMENT OF INERTIA	-----	15 gm/cm <sup>2</sup>
MAX. SLEW SPEED	-----	3000 RPM
MAX. OPERATING SPEED	-----	1200 RPM*
MAX. SHAFT LOAD	-----	35 lbs. AXIAL 75 lbs. RADIAL
WEIGHT	-----	2 lbs.

**\* NOTE:**

"TCR"-----1200 RPM  
"GT"-----3000RPM

**\*\* NOTE:**

"HMR90" SERIES ARE DUAL RESOLVER UNITS.  
"HSMR90" SERIES ARE SINGLE RESOLVER UNITS.

**ENVIRONMENTAL:**

SHOCK	-----	50g FOR 11msec.
VIBRATION	-----	15g TO 2000 cps
OPERATING TEMPERATURE	-----	-20°C TO +125°C
RADIATION	-----	10 <sup>5</sup> RAD.

STD. UNITS

<u>TURNS</u>	<u>MODEL</u>
10	HMR90-10
36	HMR90-36
64	HMR90-64
100	HMR90-100
128	HMR90-128

OTHER RATIOS  
OPTIONAL

<b>COMPUTER CONVERSIONS CORP</b>		
6 DUNTON COURT - EAST NORTHPORT, N.Y. 11731 - 516 261-3300		
SCALE: HALF	APPROVED BY:	DRAWN BY MB
DATE: 12-14-89		REVISED
<b>NEMA 12 MULTI-TURN TRANSDUCER</b> "HMR90-_____" SERIES		
<b>MECHANICAL OUTLINE</b>		DRAWING NUMBER <b>A841-4</b>

REV- D

1. PC INTERFACE (WATCHDOG TIMER): SEE FIGURE I (Optional w/S.F.)
  - A. Connect E.D. (Edge Detector) Output to INH (Inhibit) Input.
  - B. The P.C. (Programmable Controller) input requires a positive or negative going edge (TTL Level, 0 - +5V).
  - C. The output data will update within 2 usec after a negative (+5V to 0V) or positive (0V to +5V) transition and will be held in the output latches until the next transition.
  
2. SAFE FREEZE (INHIBIT): See Figure II (Standard)
  - A. No connection should be made to P.C. or E.D.
  - B. The safe freeze (INH) requires a Logic "0" or GND to Freeze Data.
  - C. The output data will be frozen within 2 usec after a Logic "0" is applied to the safe freeze. The output will remain frozen until the Logic "0" is released.

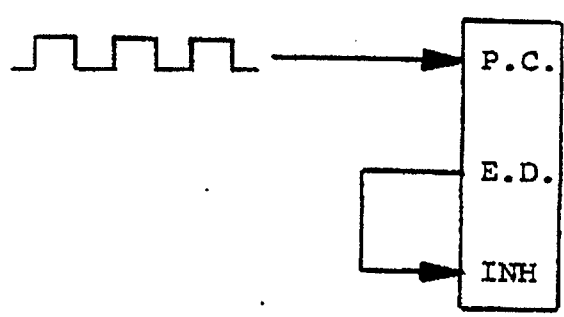


FIGURE I

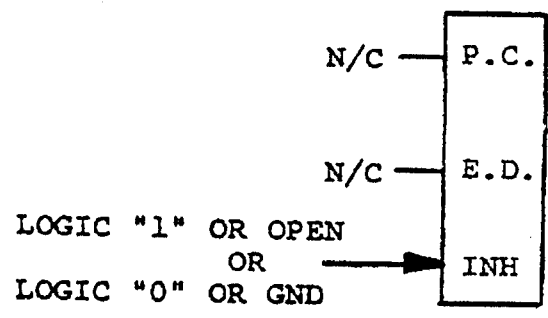


FIGURE II

<b>COMPUTER CONVERSIONS CORP</b>		
6 DUNTON COURT - EAST NORTHPORT, N.Y. 11731 - 516 261-3300		
SCALE: <i>H</i>	APPROVED BY:	DRAWN BY: <i>D. VARRONE</i>
DATE: 5-8-84		REVISED:
"WATCHDOG TIMER" PROGRAMMABLE CONTROLLER INTERFACE		
INTEFACING	DRAWING NUMBER A 3100	

REV -

INPUT..... 16 TURN MULTI-TURN RESOLVER SHAFT ANGLE INPUT  
 COUPLED TO THE ENCODER SYSTEMS (J1).  
 CCC TRANSDUCER P/N: HMR90-16HB.

TURNS FOR FULL COUNT..... 16

COUNTS..... TOTAL COUNTS = 262,144  
 COUNTS/TURN = 16,384  
 FIRST 4 BITS = TURN COUNTING.

ACCURACY..... ±1 PART IN 65,563

TRACKING RATE..... ±10RPS (TRANSDUCER SHAFT) FULL ACCURACY

DISPLAY..... 6 DIGIT L.E.D. TYPE, .56"H CHARACTER, FRONT PANEL HOLD  
 SWITCH. RANGE: 000000 TO 262144

DIGITAL OUTPUTS:

BCD DATA (J3)..... 6 DIGIT BCD, 3-STATE. TTL/DTL COMPATIBLE, 15 LSTTL  
 LOAD FAN-OUT. RANGE: 000000 TO 262144

BINARY DATA (J2)..... 18 BIT PARALLEL BINARY, 3-STATE, TTL/DTL COMPATIBLE,  
 15 LSTTL LOAD FAN-OUT.

3-STATE ENABLE INPUT..... 3 ACTIVE LOW INPUTS (2 DIGITS OR 8 BITS EACH)  
 .5 LSTTL LOAD FAN-IN W/INT. 22K +5V PULL-UP

WATCHDOG TIMER I/O..... INTERFACING CIRCUIT FOR TIMING TO AN ASYNCHRONOUS  
 CONTROLLER, TTL COMPATIBLE. (SEE DWG. A3100)

INHIBIT INPUT..... LOGIC "1" OR OPEN = DATA UPDATE  
 LOGIC "0" OR GND = DATA FREEZE  
 SAFE FREEZE TYPE CIRCUIT, TTL/DTL COMPATIBLE,  
 .5 LSTTL LOAD FAN-IN w/ INT. 22K +5V PULL-UP.

CONVERTER BUSY OUTPUT..... POSITIVE PULSE .5 TO 1.5 Usec DURATION DURING  
 CONVERTER DATA UPDATE. NORMALLY NOT USED.

ANALOG OUTPUT:

VELOCITY..... ±10V DC ±30% @ MAX TRACKING RATE,  
 5ma DRIVE FROM LOW IMPEDANCE OP-AMP.

AC SUPPLY INPUT..... 115V, 47-400Hz, REAR PANEL FUSED WITH LINE CORD.

TEMPERATURE RANGE..... 0°C TO +70°C (OPERATING)  
 -55°C TO +85°C (STORAGE)

ADJUSTMENTS..... ALL ADJUSTMENTS ARE FACTORY TRIMMED  
 AND SHOULD NOT NEED RE-ADJUSTING.

MECHANICAL..... (CHASSIS) SEE DWG # C4660-2  
 (TRANSDUCER) SEE DWG # A841-4

<b>COMPUTER CONVERSIONS CORP</b>		
6 DUNTON COURT - EAST NORTHPORT, N.Y. 11731 - 516 261-3300		
SCALE: <i>1/16"</i>	FSCM: 51086	DRAWN BY <i>V. Adams</i>
DATE: 2/28/89		REVISED
TRACKING 1 x 16 MULTI-TURN ENCODER w/ DISPLAY & DIGITAL DATA HTMDSR-16-262144-DB18-1P		
SPECIFICATIONS		DRAWING NUMBER A4662-2

REV-

J1 TRANSDUCER

PIN	FUNCTION
A	RH
B	RL
} FINE & COARSE	
C	S1
D	S2
E	S3
F	S4
} FINE	
G	S1
H	S2
I	S3
J	S4
} COARSE	

J1=BENDIX #MS3102A-18-1S  
 MATE=BENDIX #MS3106A-18-1P

NOTES:

- 1. SEE TIMING DWG.#A3100
- 2. SEE SPECIFICATIONS  
DWG #A4662 -2

J2 BINARY DATA

PIN	FUNCTION
2	1 (MSB)
21	2
3	3
22	4
4	5
23	6
25	7
6	8
16	EN-1
24	9
5	10
28	11
8	12
26	13
7	14
30	15
11	16
17	EN-2
29	17
10	18
1	LOGIC "0"
20	LOGIC "0"
33	LOGIC "0"
14	LOGIC "0"
15	LOGIC "0"
34	LOGIC "0"
18	EN-3
32	D.C. VEL
37	—
36	P.C.
35	E.D. NOTE 1
27	INH
9	C/B
31	+5V
12	GND
13	GND
19	N/C

J2=ANSLEY #609-37S  
 MATE=TRW #DC-37P

J3 BCD DATA

PIN	FUNCTION
1	800
20	400
2	200
21	100
3	80
22	40
4	20
23	10
16	EN-1
25	8
6	4
24	2
5	1
28	.8
8	.4
26	.2
7	.1
17	EN-2
30	.08
11	.04
29	.02
10	.01
34	.008
33	.004
15	.002
14	.001
18	EN-3
32	D.C.VEL
37	—
36	—
35	—
27	INH
9	C/B
31	+5V
12	GND
13	GND
19	N/C

J3=BURNDY #107-103-4A  
 MATE=TRW/CINCH #DC37P

COMPUTER CONVERSIONS CORP

6 DUNTON COURT - EAST NORTHPORT, N.Y. 11731 - 516 261-3300

SCALE: *H*  
 DATE: 2-25-98

APPROVED BY:

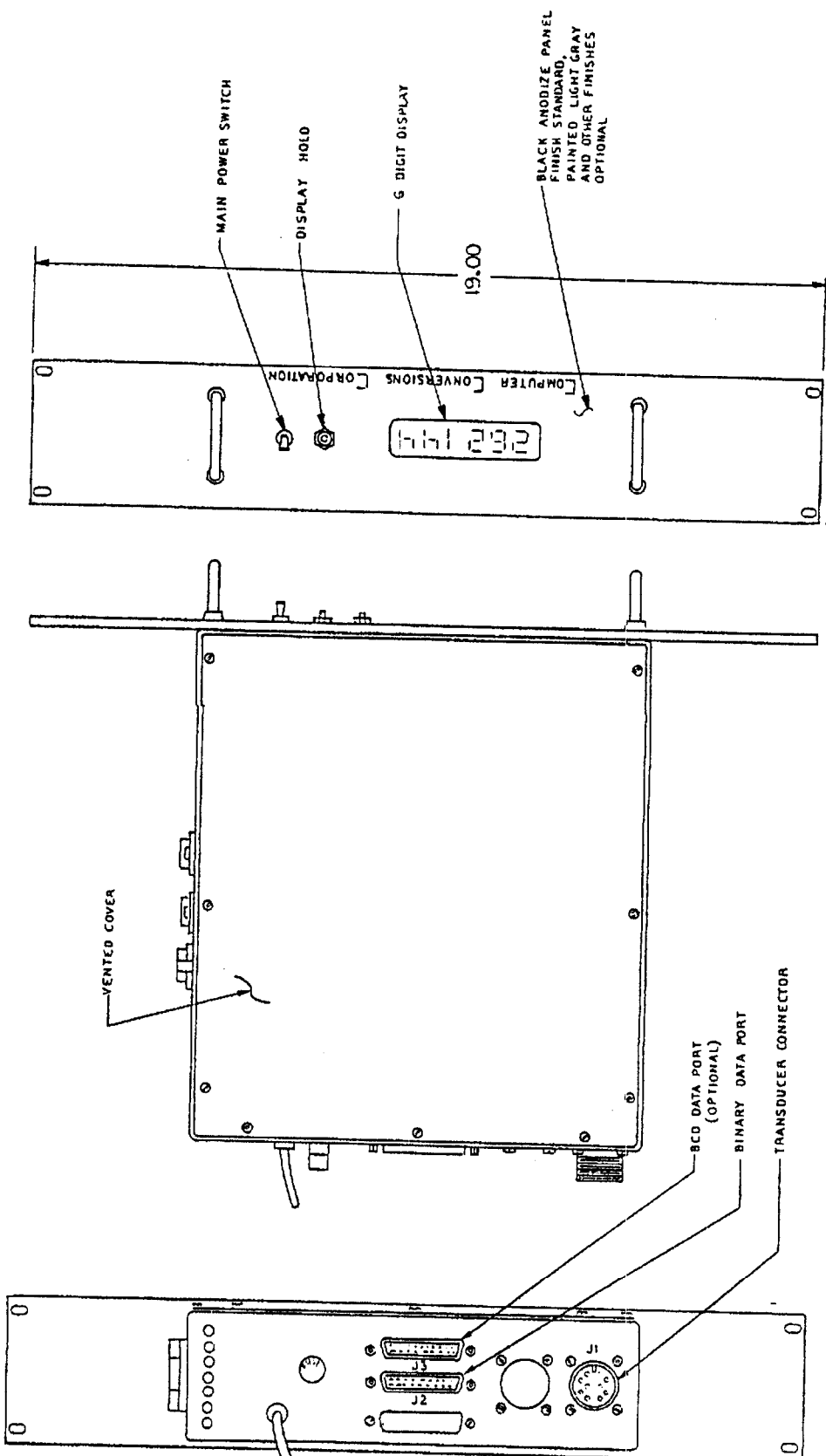
DRAWN BY: *WARRONE*  
 REVISED:

TRACKING 1 x 16 MULTI-TURN ENCODER  
 W/ DISPLAY & DIGITAL DATA  
 "HTMDSR-16-262144-DB18-1P"

PIN CONNECTIONS

DRAWING NUMBER  
 A4661 - 2

REVISIONS	
DATE	DESCRIPTION
2-25-98	ORIGINAL RELEASE
REV	



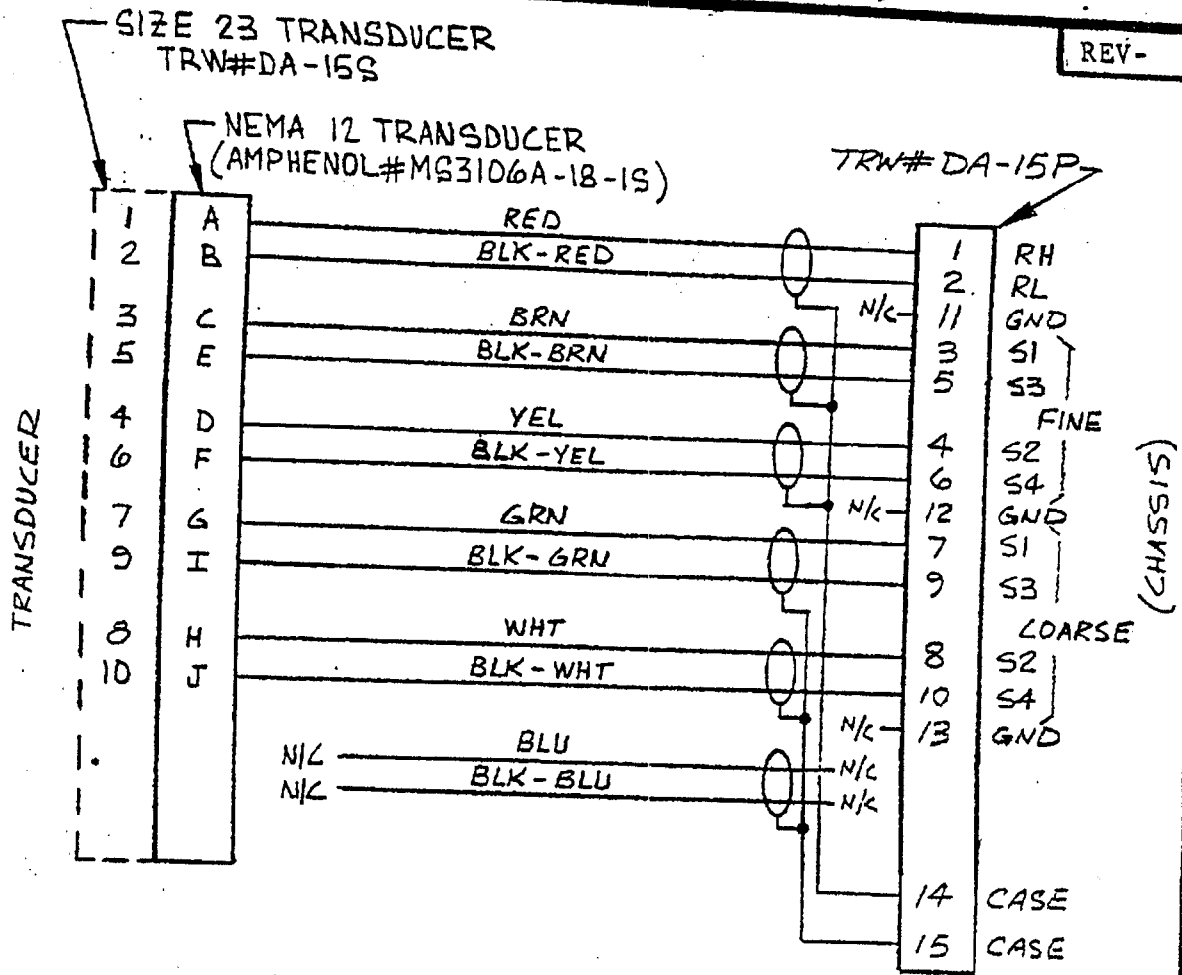
NOTE  
SEE PIN CONNECTIONS DWG A4661-2

**COMPUTER CONVERSIONS CORP**  
 6 DUNTON COURT - EAST HARTFORD, N.Y. 11731 - 516 761-3300  
 SCALE: 1/2  
 DATE: 2-25-98  
 APPROVED BY: [Signature]  
 DRAWN BY: M.B.2  
 REVISED BY: [Signature]  
**TRACKING 1x16 MULTI TURN ENCODER**  
 "HIMDSIX-16-262144-DB18-1P"  
**MECHANICAL OUTLINE**  
 DRAWING NUMBER: C4660-2

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115V, 60HZ  
 ("EP" UNITS)  
 230V, 60HZ  
 ("EP" UNITS)





CABLE: BELDEN-8778  
LENGTH: AS REQ'D.

To  
TMD5-64-DB-1P40  
DECODEX

NOTES:

1. TO REVERSE DIRECTION OF ROTATION - INTERCHANGE S1 WITH S3 FINE AND S1 WITH S3 COARSE AT CHASSIS END OF CABLE.

SEE SEPARATE L/M... A4819

<b>COMPUTER CONVERSIONS CORP</b>		
6 DUNTON COURT - EAST NORTHPORT, N.Y. 11731 - 516 281-3300		
SCALE: <i>H</i>	APPROVED BY:	DRAWN BY: <i>R. Figueroa</i>
DATE: 3-28-89		REVISED:
TRACKING MULTI-TURN ENCODER		
TRANS-DUCER CABLE		DRAWING NUMBER A4819

REV-

INPUT..... 64 TURN NEMA 12 TRANSDUCER.  
 ANY SHAFT POSITION COUPLED TO THE  
 TRACKING ENCODER SYSTEM.

TURNS FOR FULL COUNT.. 64

COUNTS PER TURN..... 212

REPEATABILITY..... ±1 LSB

ACCURACY..... ±1 PART IN 65536

DIGITAL OUTPUT:

ANGLE DATA..... PARALLEL BINARY, 18 BIT RESOLUTION  
 TTL/DTL COMPATIBLE, 10 LSTTL LOAD FAN-OUT

INHIBIT/ENABLE..... ACTIVE LOW INPUT (NORMALLY NOT USED)  
 (INH/EN) TO USE TRI-STATE OUTPUT OPTION, CUT  
 JP3 & INSTALL JP4.

CONVERTER BUSY(C/B). POSITIVE PULSE, .5 to 1.5uSEC DURATION  
 DURING OUTPUT UPDATE.

INTERFACING... SYNCHRONOUS- Data is ready on the positive edge of the C/B pulse.  
 Data can be taken .5uSEC after the positive edge.  
 Data is valid until the next C/B pulse.

ASYNCHRONOUS- (Preferred) Apply inhibit, wait .5 uSEC min.,  
 transfer data, release inhibit.

ANALOG OUTPUT: (OPTIONAL ON J2 PIN 25) JUMPER SELECTABLE

VELOCITY..... +10V DC AT MAX. TRACKING RATE  
 JP6 NORMALLY INSTALLED FOR "FINE" VELOCITY  
 JP7 OPTIONALLY INSTALLED FOR "COARSE" VELOCITY

STATUS..... +5V DC (NORMALLY NOT USED)  
 JP5 INSTALLED AT FACTORY FOR THIS OUTPUT

POWER SUPPLY INPUT.... 115V, 47-63Hz  
 REAR PANEL FUSED (½ AMP, SLOW BLOW)

OPERATING TEMPERATURE. 0°C to +70°C

MECHANICAL..... ELECTRONICS - B4811-2  
 TRANSDUCER- A841-4

<b>COMPUTER CONVERSIONS CORP</b>		
6 DUNTON COURT - EAST NORTHPORT, N.Y. 11731 - 516 261-3300		
SCALE: <i>1/16"</i>	APPROVED BY:	DRAWN BY: <i>D. VARRONE</i>
DATE: 10-20-89		REVISED
TRACKING 1x64 MULTI-TURN ENCODER w/BINARY DATA "MTMDS90-64-DB18-1P" SERIES		
SPECIFICATIONS		DRAWING NUMBER
		A4813-1

REV-

J1 TRANSDUCER I/O

PIN FUNCTION

1	RH
2	RL
11	GND
3	S1
5	S3
4	S2 FINE
6	S4
12	GND
7	S1
9	S3
8	S2 COARSE
10	S4
13	GND
14	CASE
15	CASE

CONNECTOR:  
BURNDY #107-103-2A  
MATE:  
TRW/Cinch #DA-15P

J2 DATA OUTPUT

PIN FUNCTION

2	1 (MSB)
15	2
3	3
16	4
4	5
17	6
19	7
6	8
18	9
5	10
22	11
8	12
20	13
7	14
24	15
11	16
23	17
10	18
1	19 (SEE NOTE 2)
14	20 (LSB)
12	GND
13	GND
9	C/B
21	INH/EN (SEE NOTE 3)
25	+5V/VEL(SEE NOTE 3)

CONNECTOR: BURNDY #107-103-3A  
MATE: TRW/CINCH #DB-25P

NOTE:

- TO REVERSE DIRECTION OF ROTATION/COUNT:  
SWAP S1 with S3 FINE & S1 with S3 COARSE.  
SEE DWG. #A3257-1.
- OUTPUT BITS 19 & 20: USED ON "HTMDS90-64-DB20-1"  
NOT USED ON "HTMDS90-64-DB18-1"(BITS 19&20 ARE LOGIC "0")
- SPECIFICATIONS & OPTIONAL INTERFACING: SEE DWG. A4813

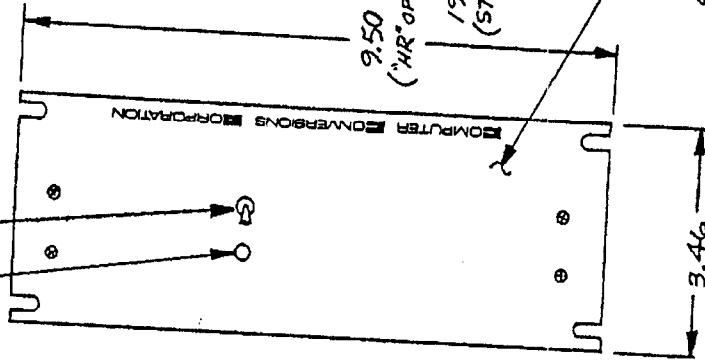
<b>COMPUTER CONVERSIONS CORP</b>		
6 DUNTON COURT - EAST NORTHPORT, N.Y. 11731 - 516 261-3300		
SCALE: <i>H</i>	APPROVED BY:	DRAWN BY <i>D. HARRONS</i>
DATE: 10-20-89		REVISED
TRACKING 1x64 MULTI-TURN ENCODER w/BINARY DATA		
"BTMDS90-64-DB18-1P" SERIES		
PIN CONNECTIONS	<i>HR</i>	DRAWING NUMBER A4812-1

REVISIONS

DATE	DESCRIPTION	REV
7-16-90	ORIGINAL RELEASE	-

POWER ON L.E.D. INDICATOR

MAIN POWER SWITCH



BLACK ANODIZE PANEL FINISH

SEE PIN CONNECTIONS... A4812-1 SPECIFICATIONS... A4813-1

COMPUTER CONVERSIONS CORPORATION

SCALE: 1/2

DATE: 7-16-90

TRACKING 1X64 MULTI-TURN ENCODER W/BINARY DATA

HTMS90 GA DBEQ-1PHR SERIES

MECHANICAL OUTLINE

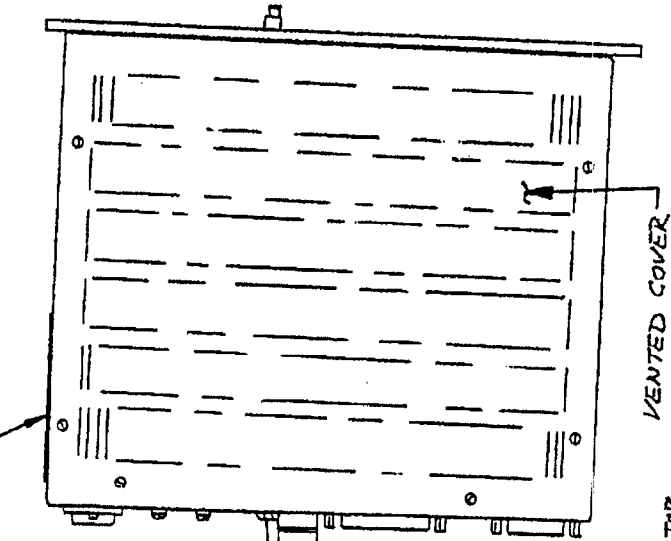
DRAWING NUMBER

B4811-2

SHEET 1 OF 1

INDS 64-DB 18-1PHR

IDENTIFICATION LABEL THIS SURFACE



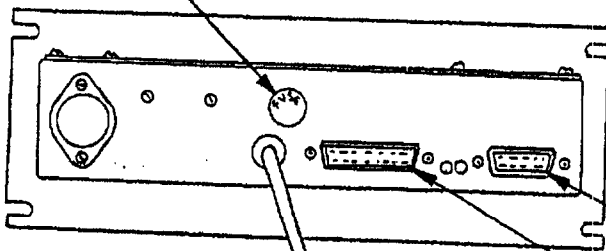
VENTED COVER

GOLD ANODINE CHASSIS FINISH

8.37

.125

FUSE 1/2 AMP SLO-BLO



J1 TRANSDUCER CONNECTOR

J2 DATA CONNECTOR

2.05

FK 11A.

0/120V -63HZ

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