KLN 94/89 SERIAL TO ARINC 429 CONVERTER

P/N: 933705-01

INSTALLATION MANUAL

REV C

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MANUAL P/N: IM3705-01

PAGE CONTROL CHART

REVISION LOG

REV.	DATE	APP'D	CHANGE
–	06-24-02	ZK	Baseline Release
A	03-18-04	ZK	Removed A-429 labels 300, 236 and 237.
B	02-18-05	ZK	Changed Company Name
C	5-25-07	ZK	Changed Company Name and updated IK9337

The information in this manual is subject to change without notification. To ensure complete and current updates, note the Revision Log above and call Technical Assistance for updated information.

1. OVERVIEW

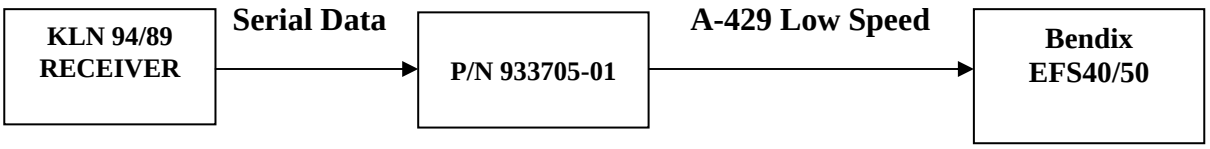
1.1 THE MANUAL

This manual is intended to facilitate the proper installation of the KLN 94/89 Serial to ARINC 429 Converter. Installation instructions should be read and followed.

1.2 PRODUCT DESCRIPTION

The converter accepts serial data from a KLN 94/89 Nav. Receiver and converts to ARINC 429 Low Speed output data.

The block diagram below depicts the intended use of the converter in the aircraft installation.



1.3 SPECIFICATIONS

Physical

Dimensions:	3.230H x 3.175L x 3.175W (inches)
Weight:	0.6 lbs.

Electrical

Input Voltage:	+28VDC
Input Current:	100mA

Input Data	RX RS-232 Serial Data (KLN 94/89 Receiver)
Output Data	ARINC 429 Low Speed (EFS 40/50)

Environmental

Operating Temperature:	-20°C to +55°C
Storage Temperature:	-55°C to +85°C
Altitude:	Up to 55,000 ft.
In-Flight loss of Cooling:	Equipment can run indefinitely with no cooling.

1.4 INPUTS

This section specifies the interfaces for the Shadin KLN 94/89 Serial to ARINC 429 Converter.

RX RS-232 Serial Data (9600 baud)

1.5 OUTPUTS

ARINC 429 LABEL LOW SPEED	DESCRIPTION	TYPE	TRANSMITT INTERVAL
114	*True Desired Track*	*BNR*	*50msec*
115	*True Waypoint Bearing*	*BNR*	*50msec*
116	*Cross Track Distance*	*BNR*	*50msec*
312	*Ground Speed*	*BNR*	*50msec*
074	*Flight Plan Header*	*DSC*	*100msec*
075	*Active Waypoint from/to*	*DSC*	*100msec*
303	*Waypoint Group Header*	*BNR*	*100msec*
304	*ID chars 1-3*	*BNR*	*100msec*
305	*ID chars 4-6*	*BNR*	*100msec*
306	*Waypoint Latitude*	*BNR*	*100msec*
307	*Waypoint Longitude*	*BNR*	*100msec*
113	*Message Checksum*	*BNR*	*100msec*
100	*Selected Course*	*BNR*	*200msec*
147	*Magnetic Variation*	*BNR*	*200msec*
251	*Distance to Go*	*BNR*	*200msec*
252	*Time to Go*	*BNR*	*200msec*
275	*LRN Status Word*	*DSC*	*200msec*
310	*Latitude*	*BNR*	*200msec*
311	*Longitude*	*BNR*	*200msec*
313	*True Track*	*BNR*	*200msec*

01-08 (LABEL)	09-28 (BINARY ANGLE)	29 (SIGN)	30-31 (SSM)	32 (PARITY)
PRESENT POSITION LATITUDE (BNR) Label 310	Binary Angle (*180/1048576)	0=North 1=South	00=Failure Warning 01=No Computed Data 10=Functional Test 11=Normal Operation	(ODD)

01-08 (LABEL)	09-28 (BINARY ANGLE)	29 (SIGN)	30-31 (SSM)	32 (PARITY)
PRESENT POSITION LONGITUDE (BNR) Label 311	Binary Angle (*180/1048576)	0=East 1=West	00=Failure Warning 01=No Computed Data 10=Functional Test 11=Normal Operation	(ODD)

01-08 (LABEL)	09-10 (SDI)	11-13	14-28 (BINARY KNOTS)	29 (SIGN)	30-31 (SSM)	32 (PARITY)
GROUND SPEED (BNR) Label 312	ZEROs	SPARES PAD ZERO	Binary Knots (4096/32768)	Always ZERO	00=Failure Warning 01=No Computed Data 10=Functional Test 11=Normal Operation	(ODD)

01-08 (LABEL)	09-10 (SDI)	11-16	17-28 (BINARY ANGLE)	29 (SIGN)	30-31 (SSM)	32 (PARITY)
TRACK ANGLE (TRUE) (BNR) Label 313	ZEROs	SPARES PAD ZERO	Binary Angle (*180/4096)	1=180-360 0=0-180DEG	00=Failure Warning 01=No Computed Data 10=Functional Test 11=Normal Operation	(ODD)

01-08 (LABEL)	09-10 (SDI)	11-16	17-28 (BINARY ANGLE)	29 (SIGN)	30-31 (SSM)	32 (PARITY)
DESIRED TRACK (TRUE) (BNR) Label 114	ZEROs	SPARES PAD ZERO	Binary Angle (*180/4096)	1=180-360 0=0-180DEG	00=Failure Warning 01=No Computed Data 10=Functional Test 11=Normal Operation	(ODD)

01-08 (LABEL)	09-10 (SDI)	11-16	17-28 (BINARY ANGLE)	29 (SIGN)	30-31 (SSM)	32 (PARITY)
WAYPOINT BEARING TRACK (TRUE) (BNR) Label 115	ZEROs	SPARES PAD ZERO	Binary Angle (*180/4096)	1=180-360 0=0-180DEG	00=Failure Warning 01=No Computed Data 10=Functional Test 11=Normal Operation	(ODD)

01-08 (LABEL)	09-10 (SDI)	11-13	14-28 (BINARY NM)	29 (SIGN)	30-31 (SSM)	32 (PARITY)
CROSS TRACK DISTANCE (TRUE) (BNR) Label 116	ZEROs	RESERVED NAUT MI (128/32,768)	Binary NAUT MI (128/32,768)	1=Fly Right 0=Fly Left	00=Failure Warning 01=No Computed Data 10=Functional Test 11=Normal Operation	(ODD)

01-08 (LABEL)	09-10 (SDI)	11-16	17-28 (BINARY ANGLE)	29 (SIGN)	30-31 (SSM)	32 (PARITY)
SELECTED COURSE (BNR) Label 100	ZEROs	SPARES PAD ZERO	Binary Angle (*180/4096)	1=180-360 0=0-180DEG	00=Failure Warning 01=No Computed Data 10=Functional Test 11=Normal Operation	(ODD)

01-08 (LABEL)	09-29	30-31 (SSM)	32 (PARITY)
MESSAGE CHECKSUM (BNR) Label 113	Binary Message Checksum 2's complement 21 bit	00=Failure Warning 01=No Computed Data 10=Functional Test 11=Normal Operation	(ODD)

01-08 (LABEL)	09-10 (SDI)	11-16	17-28 (BINARY ANGLE)	29 (SIGN)	30-31 (SSM)	32 (PARITY)
MAGNETIC VARIATION (BNR) Label 147	ZEROs	11=Source of Data 12-16=SPARES PAD ZERO	Binary Angle (*180/4096)	1=West 0=East	00=Failure Warning 01=No Computed Data 10=Functional Test 11=Normal Operation	(ODD)

01-08 (LABEL)	09-10 (SDI)	11-13	14-28 (BINARY NM)	29 (SIGN)	30-31 (SSM)	32 (PARITY)
DISTANCE TO GO (BNR) Label 251	ZEROs	SPARES PAD ZERO	Binary NAUT MI (128/32,768)	Always Zero	00=Failure Warning 01=No Computed Data 10=Functional Test 11=Normal Operation	(ODD)

01-08 (LABEL)	09-10 (SDI)	11-19	20-28 (BINARY MIN)	29 (SIGN)	30-31 (SSM)	32 (PARITY)
TIME TO GO (BNR) Label 252	ZEROs	SPARES PAD ZERO	Binary Minutes (512/512)	Always Zero	00=Failure Warning 01=No Computed Data 10=Functional Test 11=Normal Operation	(ODD)

Label 303 MESSAGE LENGTH/TYPE/NUMBER (BNR)

01-08	LABEL		
09-12	WORDS IN MESSAGE		
13-15	WAYPOINT/STATION TYPE		
	15(0) & 14(0) & 13(0)-WAYPOINT		
	15(0) & 14(0) & 13(1)-NAV AID		
	15(0) & 14(1) & 13(0)-AIRPORT		
	15(0) & 14(1) & 13(1)-NDB		
	15(1) & 14(0) & 13(0)-ALTITUDE PROFILE		
	15(1) & 14(0) & 13(1)-NO SYMBOL		
	15(1) & 14(1) & 13(0)-VOR		
	15(1) & 14(1) & 13(1)-INTERSECTION		
16	DATA RECORD	1=OFF ROUTE	0=ON ROUTE
17-23	BINARY WAYPOINT NUMBER		
24	FMS PLAN MODE	1=SELECT	0=NOT SELECT
25	WAYPOINT AT PLAN CENTER	1=CENTER	0=NOT CENTER
26	FLIGHT PLAN GAP FOLLOWS	1=GAP	0=NO GAP (PAD ZERO)
27-29	SPARES (PAD ZERO)		
30-31	SSM		
32	PARITY (ODD)		

01-08 (LABEL)	09-15	16-22	23-29	30-31 (SSM)	32 (PARITY)
MESSAGE CHARACTERS 1-3 (BNR) Label 304	Character 1	Character 2	Character 3	00=Failure Warning 01=No Computed Data 10=Functional Test 11=Normal Operation	(ODD)

01-08 (LABEL)	09-15	16-22	23-29	30-31 (SSM)	32 (PARITY)
MESSAGE CHARACTERS 4-6 (BNR) Label 305	Character 4	Character 5	Character 6	00=Failure Warning 01=No Computed Data 10=Functional Test 11=Normal Operation	(ODD)

01-08 (LABEL)	09-28	29	30-31 (SSM)	32 (PARITY)
NAV/WPT/AP LATITUDE (BNR) Label 306	Binary Angle (*180/1048576)	SIGN 1=South 0=North	00=Failure Warning 01=No Computed Data 10=Functional Test 11=Normal Operation	(ODD)

01-08 (LABEL)	09-28	29	30-31 (SSM)	32 (PARITY)
NAV/WPT/AP LONGITUDE (BNR) Label 307	Binary Angle (*180/1048576)	SIGN 1=West 0=East	00=Failure Warning 01=No Computed Data 10=Functional Test 11=Normal Operation	(ODD)

Label 074 DATA RECORD HEADER (DSC)

01-08	LABEL		
09-15	TOTAL BNR NUMBER OF RECORDS (127)		
16-20	SPARES (PAD ZERO)		
21	PRIOR RECORD CHANGE (Note)	1=CHANGED	0=UNCHANGED
22-29	SPARES (PAD ZERO)		
30-31	SSM		
32	PARITY (ODD)		

Note: PRIOR RECORD CHANGE INDICATES THAT DATA IN AT LEAST ONE RECORD OF THE PRIOR BLOCK OF RECORDS HAS BEEN CHANGED.

Label 075 ACTIVE WAYPOINT FROM/TO DATA (DSC)

01-08	LABEL		
09	AUTO/LEG/MAN/OBS	1=MAN/OBS	0=AUTO/LEG
10	MAG/TRUE REFERENCE	1=TRUE	0=MAG
11	RADAR WPT DISPLAYED	1=NOT DISP	0=DISPLAYED
12	LAT/LON/ILS MODE	1=ILS	0=LAT/LON
13-16	TO WPT BCD MS BYTE		
17-20	FROM WPT BCD MS BYTE		
21-24	TO WPT BCD LS BYTE		
25-28	FROM WPT BCD LS BYTE		
29	SPARE (PAD ZERO)		
30-31	SSM		
32	PARITY (ODD)		

Label 275 LRN STATUS WORD (DSC)

01-08	LABEL
09-10	SDI
11	WAYPOINT ALERT
12	DEAD RECKON
13	DIRECT TO
14-15	MODE
16	VERT & LAT DEV SCALING
17	FMS CONTRL'HDG SUB-MODE
18	REMOTE FGS ARM FOR NAV. CAPT
19	FMS PLAN MODE
20	DISPLAY FINAL APPR COURSE
21	ANGULAR SCALING
22	INTEGRITY WARN
23	TO
24	FROM
25	PARALLEL XTK OFFSET
26	AIRPORT DISPLAY SELECTED
27	MESSAGE ALERT
28	TRUE/MAG
29	HIS VALID(NAV WARN)
30-31	SSM
32	PARITY (ODD)

2. INSTALLATION PROCEDURE

2.1 MOUNTING

The KLN 94/89 Serial to ARINC 429 Converter (P/N 933705-01) should be mounted in a dry location and the equipment may be installed in non-pressurized but controlled temperature locations.

Use installation drawing Code ID: 4037-254 to connect the KLN 94/89 Serial to ARINC 429 Converter to the system. Use # 6-32 screws for mounting.

2.2 ELECTRICAL CONNECTIONS

Connection to Power Supply +28 VDC

933705-01		**Description**
J1:8	To	+12 to +28 VDC Power IN
J1:15	To	Power GND

Inputs

933705-01		**Description**
J1:12	To	RX RS-232

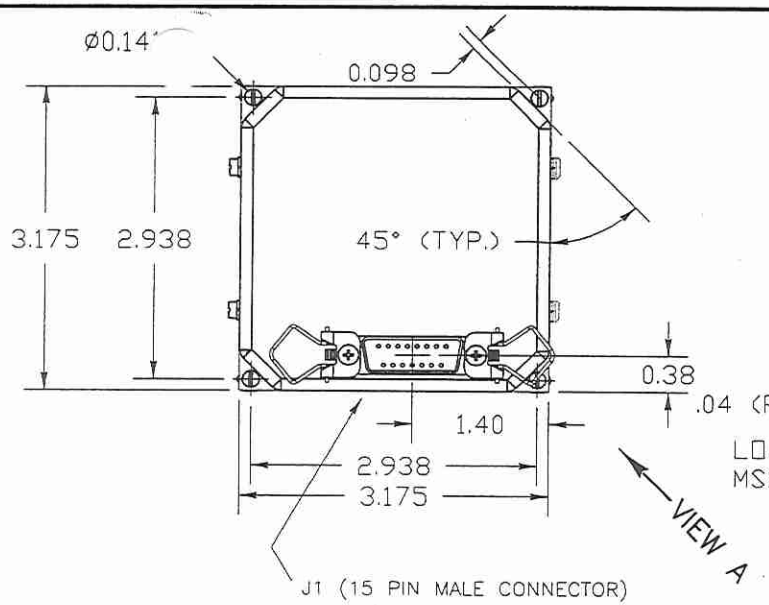
Outputs

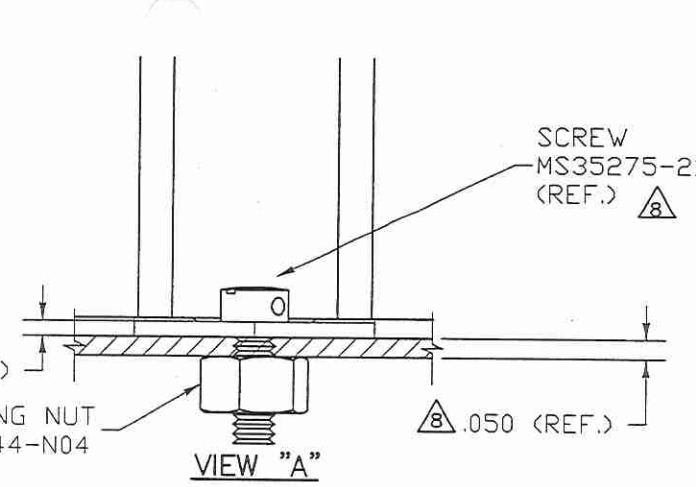
933705-01		**Description**
J1:6	To	ARINC 429 A
J1:7	To	ARINC 429 B

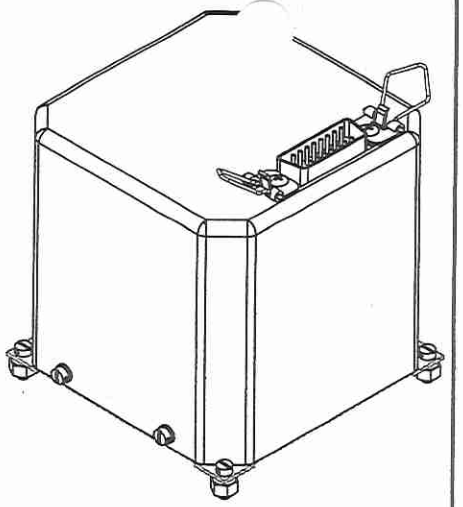
SECTION 3.0

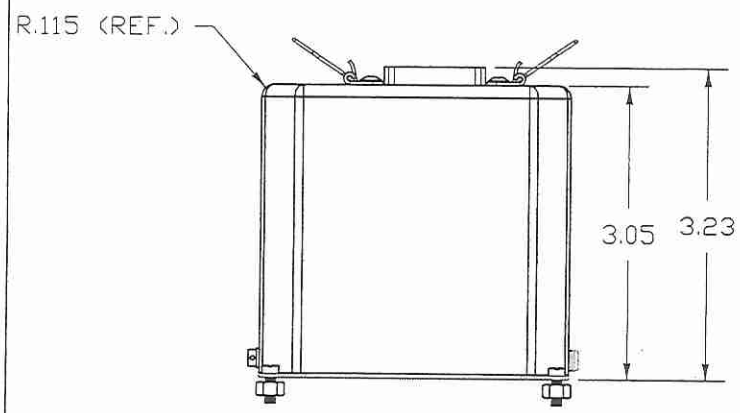
INSTALLATION DRAWINGS AND INSTALL KIT PARTS LISTS

The following drawings are arranged in the sequence specified on page i of the Page Control Chart.









SCREW TABLE (MS35275) 8		
LENGTH	SIZE	FULL P/N
1/4" (.250)	#4	MS35275-213
5/16" (.312)	#4	MS35275-214
3/8" (.375)	#4	MS35275-215
7/16" (.438)	#4	MS35275-216
1/2" (.500)	#4	MS35275-217
5/8" (.625)	#4	MS35275-218
3/4" (.750)	#4	MS35275-219
7/8" (.875)	#4	MS35275-220
1" (1.000)	#4	MS35275-221
1-1/4" (1.250)	#4	MS35275-222
1-1/2" (1.500)	#4	MS35275-223

CONNECTOR KEY	
PIN	FUNCTION
1	N.C.
2	N.C.
3	N.C.
4	N.C.
5	N.C.
6	ARINC 429 A
7	ARINC 429 B
8	+12 TO 28 V DC POWER IN
9	N.C.
10	N.C.
11	N.C.
12	RX, RS-232
13	N.C.
14	N.C.
15	POWER GND

NOTES:

1. THE CONVERTER CAN BE MOUNTED IN ANY ORIENTATION
2. 4" SPACING IS REQUIRED ABOVE CONNECTOR
3. NO COOLING IS REQUIRED
4. THE CONVERTER CAN BE INSTALLED IN A PRESSURIZED OR NON-PRESSURIZED AREA, PROVIDING TEMPERATURE DOES NOT DROP BELOW -20°C
5. 1 AMP CIRCUIT BREAKER IS REQUIRED
6. NO SHOCK MOUNT REQUIRED
7. WEIGHT: 8 oz.
   POWER CONSUMPTION: 210 ma. @ 28v DC
8. MOUNTING SURFACE THICKNESS AND MS SCREW SHOWN ARE FOR REFERENCE ONLY. TO SELECT MOUNTING SCREW LENGTH NECESSARY FOR YOUR SPECIFIC INSTALLATION ADD .238" & THE THICKNESS OF YOUR DESIRED MOUNTING SURFACE. ROUND THIS SUM UP TO THE NEXT LONGEST SCREW SIZE (SEE TABLE).
9. OUTPUT IS ARINC 429 LOW SPEED.

ECO #	REV.	DATE	BY	APP'D	DESCRIPTION
0206/015	-	6/24/02	JLH	ZK	BASELINE RELEASE

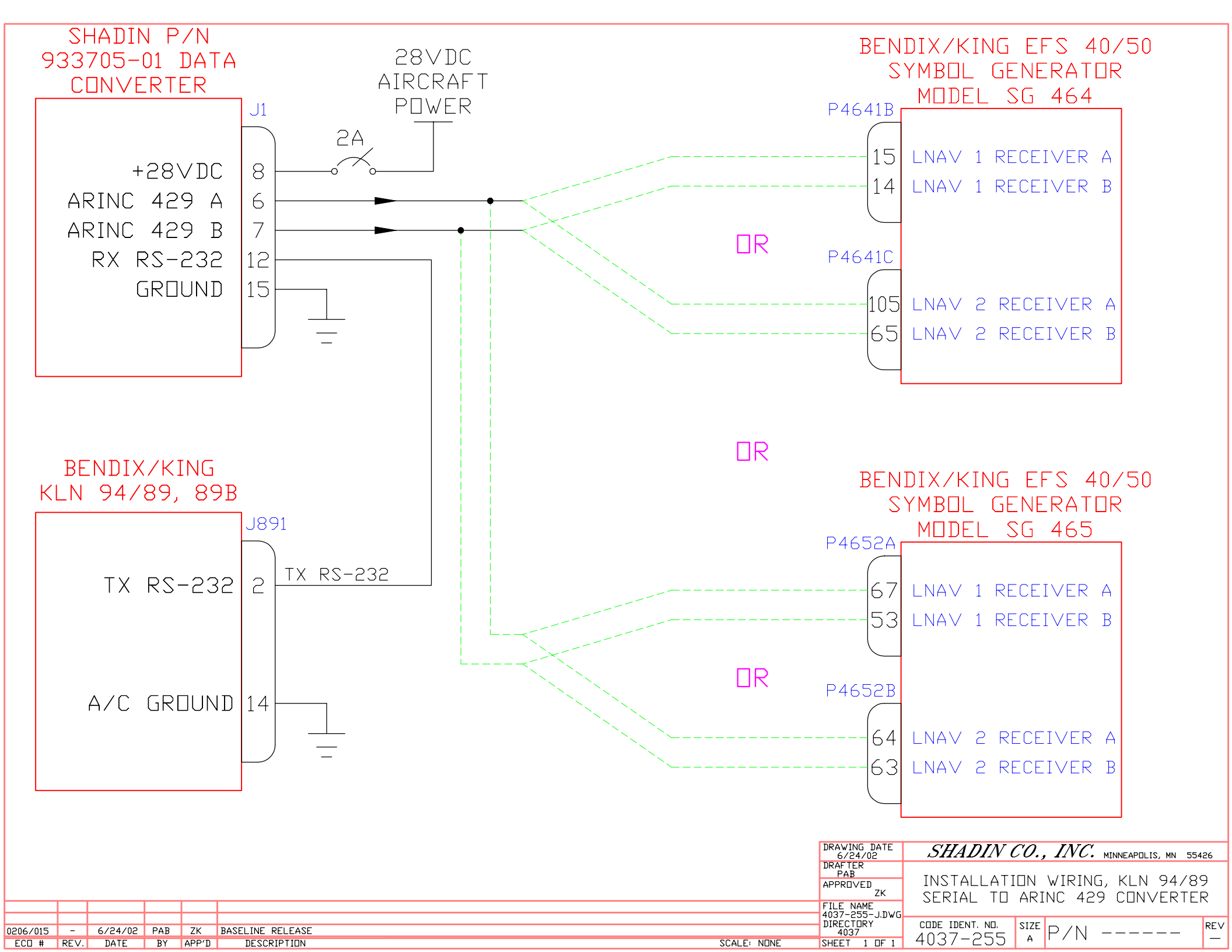
UNLESS OTHERWISE NOTED DIMENSIONS ARE IN INCHES
TOLERANCES: X.X - ±0.1
X/X ± 1/64 X.XX - ±0.01
∠- ±2° X.XXX - ±0.005
FINISH: N/A
MATERIAL: N/A
SCALE: 1 : 2

DRAWING DATE 6/21/02
DRAFTER JLH
APPROVED ZK
FILE NAME 933705-01-J.DWG
DIRECTORY 933705-01
SHEET 1 OF 1

SHADIN MINNEAPOLIS, MN 55426

INSTALLATION DWG, KLN 94/89 SERIAL TO ARINC 429 CONVERTER

DRAWING NO. 4037-254 | SIZE A | P/N 933705-01 | REV -



ECO #	REV.	DATE	BY	APP'D	DESCRIPTION
0206/015	-	6/24/02	PAB	ZK	BASELINE RELEASE

SCALE: NONE

DRAWING DATE 6/24/02
DRAFTER PAB
APPROVED ZK
FILE NAME 4037-255-J.DWG
DIRECTORY 4037
SHEET 1 OF 1

SHADIN CO., INC. MINNEAPOLIS, MN 55426

INSTALLATION WIRING, KLN 94/89
SERIAL TO ARINC 429 CONVERTER

CODE IDENT. NO. 4037-255 | SIZE A | P/N ------ | REV —

Shadin
IK9337FP.DOC
DIRECTORY: IKXXXX

Report: 4037
ECO Date: January 11, 2006
Rev: F
Sec.: IX

ECO # 0601/013
Release date: 1/11/06
Approved: CB

PARTS LIST

Part #: **IK9337**

Drawing #s: N/A

Description: **INSTALL KIT FOR 15PIN D-SUB**

FN	P/N	QTY.	DESCRIPTION	MFG.	MFG.#	DESIGNATION	COMMENTS
5	230019H-1	2	SPRING LATCH CLIP	SHA	4028-074		*
10	230050C	1	CONN, 15 Pin D-Sub F Crimp w/contacts	POS	M24308/2-2 (RD15F10000-50)		
15	230038	1	CONN HOOD, 15 Pin D-Sub	CIN	DA-24658		
20	511002	2	SCREW, 4-40 x 1/4 Phil Pan HD SS	MCM	91772A106		
25	512007	2	NUT, 4-40 3/16 x 1/16 SS	AFT	HNSP188 04C000		
27	512101	2	RETAINER CLIP, "Bow Tie" Style	KEY	2061K		*
30	541001	2	WASHER, #4 Split Lock, SS	MCM	92147A005		
32	753217	1	COMPUTER LABEL, 3.5"x 15/16"	AVR	4013		
35	PK1001	1	BAG, 2.5 x 3, 4 MIL Zip Lock				
45	PK1007	1	BAG, 6 x 8, 4 MIL				

15 items

* Use FN 5 Or FN 27, Not Both – Depending On D-Sub Connector Style Used.