

LIMITED WARRANTY

THIS ALTITUDE ENCODER IS GUARANTEED BY ACK TECHNOLOGIES INC. AGAINST DEFECTS IN MATERIALS AND WORKMANSHIP FOR A PERIOD OF ONE YEAR FROM DATE OF PURCHASE. THIS WARRANTY IS VOID UNLESS THE ENCLOSED WARRANTY CARD HAS BEEN COMPLETED AND RETURNED TO ACK TECHNOLOGIES INC. WITHIN 15 DAYS OF ITS INSTALLATION. THIS WARRANTY IS LIMITED EXCLUSIVELY TO REPAIR OR REPLACEMENT OF THE A-30 ENCODER UNIT WHEN RETURNED FREIGHT PREPAID TO OUR MANUFACTURING FACILITY. THIS WARRANTY DOES NOT INCLUDE REPAIR OR REPLACEMENT OF ANY UNIT WHICH HAS BEEN IMPROPERLY USED, INSTALLED OR WHICH IS PHYSICALLY DAMAGED. EXCEPT AS PROVIDED HEREIN ACK TECHNOLOGIES INC. MAKES NO EXPRESS WARRANTIES, AND ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE IS LIMITED IN ITS DURATION TO THE DURATION OF THE WRITTEN LIMITED WARRANTIES SET FORTH HEREIN. ACK TECHNOLOGIES INC. SHALL NOT BE LIABLE FOR ANY DIRECT, INDIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OR MISUSE OF THIS PRODUCT. EXCEPT AS PROVIDED HEREIN NO EMPLOYEE, AGENT, DEALER OR OTHER PERSON IS AUTHORIZED TO GIVE ANY WARRANTIES OF ANY NATURE ON BEHALF OF ACK TECHNOLOGIES INC.

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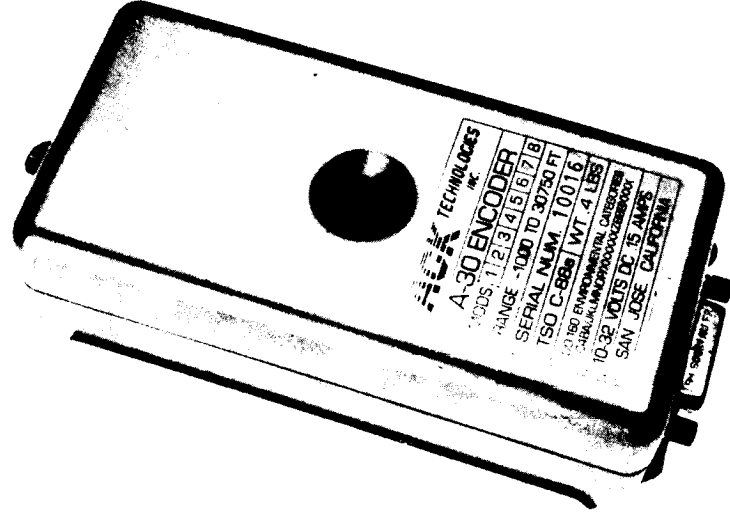
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ACK TECHNOLOGIES
INC.

A-30 ALTITUDE ENCODER OPERATION MANUAL INSTALLATION MANUAL

THE INSTALLATION AND CALIBRATION INFORMATION CONTAINED IN THIS MANUAL (PAGES 2 THROUGH 14) IS INTENDED ONLY FOR FAA LICENSED PERSONS OR FACILITIES INSTALLATION. CALIBRATION AND CORRESPONDENCE ADJUSTMENT MAY ONLY BE DONE BY PERSONS AUTHORIZED BY THE FEDERAL AVIATION REGULATIONS.

A-30 ALTITUDE ENCODER SPECIFICATIONS
MANUFACTURED TO THE REQUIREMENTS OF TSO-C88a

RANGE:
-1000 TO +30,750 FEET (-304.8 TO +9372.7 METERS)

SIZE L X W X H:
6" X 2.65" X 1.7" (152 mm X 67.5 mm X 43 mm)

WEIGHT:
7.1 OZ (204 GRAMS)

OPERATING VOLTAGE:
10 TO 32 VOLTS DC

CURRENT DRAW WARM-UP:
0.3 AMPS AT 13.8 VOLTS SUPPLY VOLTAGE
0.28 AMPS AT 27.5 VOLTS SUPPLY VOLTAGE

CURRENT DRAW OPERATING:
0.18 AMPS AT 13.8 VOLTS SUPPLY VOLTAGE
0.15 AMPS AT 27.5 VOLTS SUPPLY VOLTAGE

WARM-UP TIME:
FROM 70 DEGREES FAHRENHEIT AMBIENT TEMPERATURE 6 MINUTES
FROM 0 DEGREES FAHRENHEIT AMBIENT TEMPERATURE 10 MINUTES

OPERATING TEMPERATURE:
-4 TO +131 DEGREES FAHRENHEIT (-20 TO +55 CENTIGRADE)

SHORT TIME HIGH OPERATING TEMPERATURE:
+140 DEGREES FAHRENHEIT (+60 CENTIGRADE)

GROUND SURVIVAL TEMPERATURES:
LOW -67 DEGREES FAHRENHEIT (-55 CENTIGRADE)
HIGH +185 DEGREES FAHRENHEIT (+85 CENTIGRADE)

DO-160B ENVIRONMENTAL CATEGORIES:
C4BA/JKLMNOPS/XXXXXXXXZBBBXXXX

OPERATION

THE OPERATION OF THE A-30 ENCODER IS CONTROLLED BY THE ATC TRANSPONDER INSTALLED IN THE AIRCRAFT.

PLACE THE TRANSPONDER IN TO THE ALTITUDE REPORTING MODE (MODE C) TO TRANSMIT ALTITUDE DATA.

IF POWER TO THE ENCODER IS PROVIDED BY SWITCHED A+ FROM THE TRANSPONDER, THE TRANSPONDER SHOULD BE PLACED IN THE STANDBY MODE IMMEDIATELY AFTER ENGINE START.

IF POWER IS PROVIDED TO THE ENCODER DIRECTLY FROM THE AIRCRAFT BUSS, THE POWER UP PROCEDURE RECOMMENDED BY THE TRANSPONDER MANUFACTURER SHOULD BE FOLLOWED.

THE WARM-UP TIMES LISTED IN THE SPECIFICATIONS ARE FOR INITIAL POWER UP OF THE ENCODER. AMBIENT TEMPERATURE IS THE TEMPERATURE TO WHICH THE ENCODER HAS BEEN SUBJECTED, PRIOR TO POWER UP.

INPUT POWER INTERRUPTIONS TO THE ENCODER EXCEEDING 10 SECONDS DURING NORMAL OPERATION, WILL REQUIRE A STABILIZATION PERIOD FROM 10 TO 60 SECONDS AFTER POWER IS RESTORED, BEFORE VALID ALTITUDE DATA TO THE TRANSPONDER WILL BE RESTORED.

***** IMPORTANT *****

THE FOLLOWING INSTALLATION AND CALIBRATION INFORMATION (PAGES 2 THROUGH 14) IS INTENDED ONLY FOR FAA LICENSED PERSONS OR FACILITIES. CALIBRATION AND CORRESPONDENCE ADJUSTMENT MAY ONLY BE DONE BY PERSONS AUTHORIZED BY THE FEDERAL AVIATION REGULATIONS

INSTALLATION INSTRUCTIONS

THE ENCODER IS SUPPLIED WITH A 4 FOOT LONG PREWIRED HARNESS. FIGURE 3 ON PAGE 7 SHOWS THE PIN AND COLOR CODE ASSIGNMENT USED FOR CONNECTION OF INPUT POWER AND CODE OUTPUT.

MOUNTING

THE ENCODER MUST BE MOUNTED WITHIN THE SAME ENVIRONMENTAL AREA AND CONDITIONS AS THE PRIMARY ALTIMETER USED FOR FLIGHT REFERENCE. DO NOT MOUNT THE ENCODER IN THE DIRECT AIRSTREAM OF EITHER HOT OR COLD AIR DUCTS. THE BOTTOM, SIDE, OR BACK OF THE GLOVE COMPARTMENT IS A GOOD LOCATION IN MOST LIGHT AIRCRAFT.

THE ENCODER MAY BE MOUNTED IN ANY POSITION WITHIN THE AIRCRAFT. USE 8 6-32 SCREWS OR POP RIVETS TO ATTACH THE MOUNTING TRAY TO THE AIRCRAFT. NY-LOCK NUTS OR SPLIT LOCK WASHERS SHOULD BE USED TO PREVENT LOOSENING FROM VIBRATION. MAKE SURE THE HEAD OF THE SCREWS SELECTED DO NOT PROTRUDE ABOVE THE RECESSED PORTION OF THE MOUNTING TRAY.

THE ENCODER SHOULD BE LOCATED SUCH THAT IT IS EASILY ACCESSIBLE FOR ALTIMETER CORRESPONDENCE ADJUSTMENT. THE ENCODER MAY BE REMOVED FROM ITS MOUNTING TRAY DURING CALIBRATION.

POWER INPUT

POWER SHOULD BE PROVIDED FROM THE A+ SWITCH POWER, PROVIDED BY MOST TRANSPONDERS. POWER INPUT MAY BE EITHER FROM 13.75 DC VOLTS OR 27.5 DC VOLTS SYSTEMS.

IF TRANSPONDER SWITCHED POWER IS NOT AVAILABLE, THEN POWER SHOULD BE PROVIDED FROM THE AIRCRAFT BUSS (AVIONICS BUSS IF A SPLIT BUSS SYSTEM) AND PROTECTED BY A 2 AMP CIRCUIT BREAKER. NO SWITCH IS NECESSARY BETWEEN THE ENCODER AND CIRCUIT BREAKER.

PITOT-STATIC CONNECTION

PITOT-STATIC HOOKUP IS ACCOMPLISHED BY MEANS OF THE 4 FOOT LENGTH OF EPDM TUBING SUPPLIED WITH THE UNIT. RE: FAR 23.1325

1. IDENTIFY THE STATIC SOURCE LINE WHICH IS CONNECTED TO THE PRIMARY FLIGHT ALTIMETER USED FOR FLIGHT REFERENCE. (NO STATIC SYSTEM AIRCRAFT SEE Pg. 8)
2. CHOSE A LOCATION IN THIS STATIC LINE THAT IS ACCESSIBLE AND IS AS CLOSE TO THE ENCODER AS POSSIBLE. PROVIDE FOR POSITIVE DRAINAGE OF MOISTURE AND ROUTING OF LINE AS PER FAR 23.1325 PAR (b) (1) 8 (11) (SEE FIG 2 PAGE 5)
3. CUT THE STATIC LINE AT THIS LOCATION. IF THE STATIC LINE IS OF PLASTIC OR RUBBER CONSTRUCTION, USE A KNIFE OR RAZOR BLADE TO ACCOMPLISH THIS. IF THE STATIC LINE IS OF METAL CONSTRUCTION, USE A TUBING CUTTER OR SOME OTHER MEANS THAT WILL NOT CONTAMINATE THE STATIC LINE WITH METAL CHIPS.
4. USE THE PLASTIC "T" FITTING SUPPLIED. INSTALL THIS "T" FITTING IN THE STATIC LINE USING EITHER THE TWO 1" LENGTHS OF 1/4 ID HOSE SUPPLIED WITH THE UNIT OR TWO PIECES OF HOSE 1" LONG CUT FROM THE 4 FOOT EPDM STATIC HOOKUP HOSE SUPPLIED WITH THE UNIT. SECURE THE "T" FITTING AND RUBBER HOSES BY MEANS OF THE SPRING CLAMPS PROVIDED. (SEE FIG 2 PAGE 5)
5. SECURE ONE END OF THE EPDM STATIC HOOKUP HOSE SUPPLIED TO THE ENCODER TRANSDUCER PORT LOCATED ON THE TOP OF THE UNIT BY MEANS OF THE WIRE SPRING CLIP PROVIDED. ATTACH THE OTHER END OF THE STATIC HOOKUP LINE TO THE "T" FITTING WHICH YOU INSTALLED IN STEP 4 ABOVE. SECURE TO THE "T" FITTING WITH ONE OF THE SPRING CLIPS PROVIDED. SEE FIGURE 2

DATA CONNECTION

ALTITUDE DATA IS TRANSMITTED TO THE AIRCRAFT TRANSPONDER VIA MEANS OF THE PREWIRED 15 PIN DATA PLUG AND WIRING HARNESS PROVIDED WITH THE UNIT.

IMPORTANT

AFTER THE ENCODER IS INSTALLED IT MUST BE CALIBRATED TO COMPLY WITH FAR PART 91.36 AND 91.172. FAA ADVISORY CIRCULAR 43-6A OUTLINES ACCEPTABLE METHODS FOR PERFORMING THIS PROCEDURE. PLEASE SEE THE CALIBRATION SECTION FOR DETAILED INSTRUCTIONS AND REQUIREMENTS FOR PLACARDING THE ALTIMETER.

CALIBRATION PROCEDURE

IMPORTANT SEE SERVICE BULLETIN A-30-1 ON PAGE NINE

RE: FAR 91.36, 91.172, FAA ADVISORY CIRCULAR 43-6A

1. CALIBRATION MUST BE DONE WITH THE ENCODER AND ALTIMETER BOTH AT AMBIENT TEMPERATURE WITHIN THE RANGE OF +55 TO +95 DEGREES FAHRENHEIT (+13 TO +35 DEGREES CENTIGRADE).
POWER SUPPLIED TO THE UNIT MUST BE OF THE SAME NOMINAL VOLTAGE AS THE AIRCRAFT BUSS IN WHICH IT IS INSTALLED.
 2. TURN ON POWER TO THE ENCODER AND ALLOW TO WARM UP FOR A MINIMUM PERIOD OF 10 MINUTES.
IF INPUT POWER IS MOMENTARILY INTERRUPTED TO THE ENCODER DURING CALIBRATION WAIT A MINIMUM OF 3 MINUTES BEFORE CONTINUING WITH CALIBRATION.
 3. DETERMINE THE ALTITUDE TO WHICH YOU WILL BE CALIBRATING THE ENCODER. SUPPLIED WITH THE ENCODER ARE ALTIMETER PLACARDS FOR 15,000, 20,000, 25,000 AND 30,750 FT MAXIMUM CALIBRATION ALTITUDES. WE SUGGEST THAT YOU SELECT ONE OF THE ABOVE MAXIMUM ALTITUDE CALIBRATION POINTS, WHICH IS ABOVE THE SERVICE CEILING OF THE AIRCRAFT IN WHICH IT IS BEING INSTALLED.
 4. WITH THE PRIMARY FLIGHT ALTIMETER BAROMETRIC PRESSURE SET TO 29.92 IN HG. DECREASE PRESSURE SUPPLIED FROM THE PITOT-STATIC TEST SET UNTIL THE READING OF THE PRIMARY ALTIMETER INDICATES AN ALTITUDE WHICH IS 90 FEET LESS THAN THE SELECTED MAXIMUM CALIBRATING ALTITUDE.
- EXAMPLE:
IF CALIBRATING TO 25,000 FT MAXIMUM ALTITUDE SET PRESSURE TO 24.950 FT.
5. CHECK THE CODE TRANSITION POINT AT THIS PRESSURE (SEE TABLE 1). IF NECESSARY, ADJUST THE TRIM POT MARKED "H", LOCATED ON THE SIDE OF THE ENCODER, UNTIL THE TRANSITION POINT IS WITHIN 20 FEET OF THE PRIMARY FLIGHT ALTIMETER AT ITS HIGH CALIBRATION POINT. SEE FIGURE # 1
 6. INCREASE PRESSURE UNTIL THE PRIMARY FLIGHT ALTIMETER INDICATES +50 FT. IF NECESSARY, ADJUST THE LOW TRIM POT MARKED "L", LOCATED ON THE SIDE OF ENCODER UNTIL THIS TRANSITION POINT IS WITHIN 10 FEET OF THE PRIMARY FLIGHT ALTIMETER WHEN IT INDICATES +50 FEET. SEE FIGURE # 1
 7. REPEAT STEPS 4 THROUGH 6 UNTIL AN ACCURACY OF + - 50 FEET IS OBTAINED FOR BOTH INCREASING AND DECREASING PRESSURE AT BOTH MAXIMUM CALIBRATING ALTITUDE AND 0 FT ALTITUDE.

CORRESPONDENCE CHECK

AFTER CALIBRATION A CORRESPONDENCE CHECK MUST BE PERFORMED AS REQUIRED BY FAR 91.36b. AC 43-6A PROVIDES APPROVED METHODS FOR PERFORMING THIS CHECK.

CORRESPONDENCE AND TRANSITION ACCURACY IS DEFINED AS FOLLOWS BY TSO-C88a.

THE PRESSURE ALTITUDE GENERATED ENCODED OUTPUT SHALL CORRESPOND TO THE DISPLAYED PRESSURE ALTITUDE INDICATION USED TO MAINTAIN FLIGHT ALTITUDE WITHIN + 125 FEET (38.1 METERS) WHEN THE PRESSURE DATUM IS SET FOR 29.921 INCHES OF MERCURY ABSOLUTE (1013.25 MILLIBARS OR 760 mm HG ABSOLUTE).

EXAMPLE: IF THE ENCODED OUTPUT IS 10,000 FT. THE PRESSURE ALTITUDE DISPLAY SHALL INDICATE 10,000 + 125 FEET DURING THE WHOLE INTERVAL THAT THE ENCODED OUTPUT REMAINS AT 10,000 FEET.

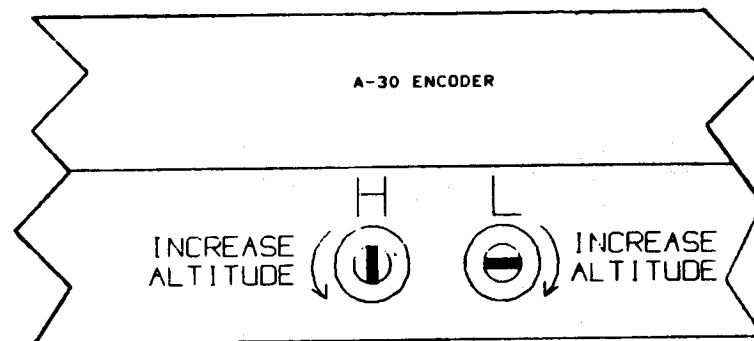
TRANSITION ACCURACY: WHEN A TRANSITION FROM ONE ENCODED OUTPUT TO THE NEXT ENCODED OUTPUT OCCURS, FOR BOTH INCREASING AND DECREASING ALTITUDE CHANGES, THE DISPLAYED PRESSURE ALTITUDE SHALL BE WITHIN + 75 FEET (22.86 METERS) OF THE NOMINAL PRESSURE ALTITUDE FOR THAT TRANSITION POINT, CORRECTED FOR THE DIFFERENCES IN FEET AS A RESULT OF THE APPLIED BAROMETRIC SETTING AND VALUE OF THE DISPLAYED PRESSURE ALTITUDE BASED ON THE PRESSURE DATUM OF 29.921 INCHES OF MERCURY ABSOLUTE (1013.25 MILLIBARS OR 760 MM HG ABSOLUTE)

ALTIMETER PLACARDING

ON THE FRONT GLASS FACE OF THE PRIMARY FLIGHT ALTIMETER, INSTALL ONE OF THE PLACARDS PROVIDED, WHICH CORRESPONDS TO THE ALTITUDE TO WHICH THE SYSTEM HAS BEEN CALIBRATED.

FIGURE # 1

CORRESPONDENCE ADJUSTMENT MAY ONLY BE DONE BY PERSONS AUTHORIZED BY THE FEDERAL AVIATION REGULATIONS



CORRESPONDENCE ADJUSTMENTS

HIGH CLOCKWISE DECREASES ALTITUDE LOW CLOCKWISE INCREASES ALTITUDE

NOTE: ALWAYS ADJUST HIGH ALTITUDE FIRST

DO NOT INDISCRIMINATELY TURN THE HIGH AND LOW CORRESPONDENCE ADJUSTMENT POT: THESE NEED ONLY MINUTE CHANGES TO ADJUST FOR CORRESPONDENCE. IF INDISCRIMINATELY ADJUSTED, RE-CALIBRATION BECOMES A TEDIIOUS AND TIME CONSUMING PROCESS.

TABLE 1

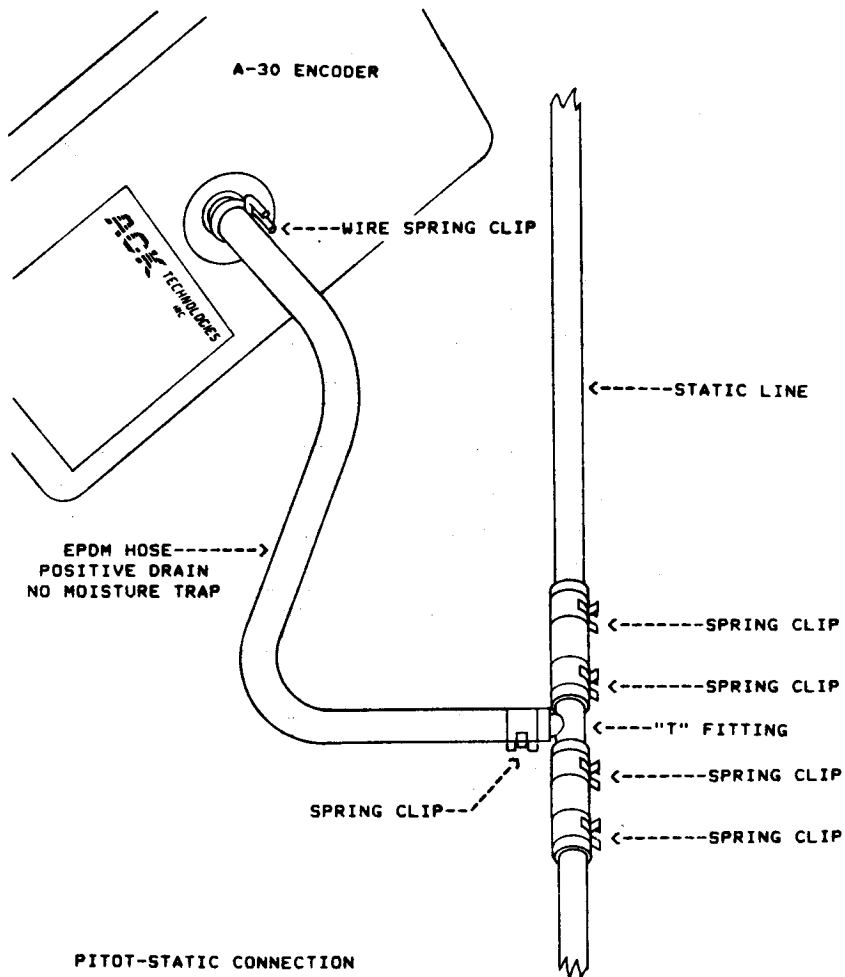
ICAO STANDARD CODE FOR S.S.R PRESURE ALTITUDE TRANSMISSION

ALTITUDE FEET	A1	A2	A4	B1	B2	B4	C1	C2	C4
-1050 TO -950	0	0	0	0	0	0	0	1	0
-50 TO +50	0	0	0	0	1	1	0	1	0
450 TO 550	0	0	0	0	1	0	0	1	0
950 TO 1050	0	0	0	1	1	0	0	1	0
1050 TO 1150	0	0	0	1	1	0	1	1	0
1250 TO 1350	0	0	0	1	1	1	1	0	0
1450 TO 1550	0	0	0	1	1	1	0	1	0
1750 TO 1850	0	0	0	1	0	1	0	0	1
1950 TO 2050	0	0	0	1	0	1	0	1	0
2550 TO 2650	0	0	0	1	0	0	0	1	1
2650 TO 2750	0	0	0	1	0	0	0	0	1
2950 TO 3050	0	0	1	1	0	0	0	1	0
3950 TO 4050	0	0	1	1	1	1	0	1	0
5950 TO 6050	0	0	1	0	0	1	0	1	0
6750 TO 8850	0	1	1	0	0	0	0	0	1
7950 TO 8050	0	1	1	0	1	1	0	1	0
9950 TO 10,050	0	1	1	1	0	1	0	1	0
11,950 TO 12,050	0	1	0	1	1	1	0	1	0
13,950 TO 14,050	0	1	0	0	0	1	0	1	0
14,750 TO 14,850	1	1	0	0	0	0	0	0	1
15,950 TO 16,050	1	1	0	0	1	1	0	1	0
17,950 TO 18,050	1	1	0	1	0	1	0	1	0
17,950 TO 18,050	1	1	1	1	1	1	0	1	0
19,950 TO 20,050	1	1	1	1	1	1	0	1	0
21,950 TO 22,050	1	1	1	0	0	1	0	1	0
24,950 TO 25,050	1	0	1	1	1	0	0	1	0
29,950 TO 30,050	1	0	0	0	0	1	0	1	0
30,650 TO 30,750	1	0	0	0	0	0	0	0	1

0 = NO PULSE

1 = PULSE PRESENT

FIGURE # 2



***** AIRCRAFT WITHOUT STATIC LINES *****

ON AIRCRAFT WHICH DO NOT HAVE STATIC LINES INSTALLATION IS AS FOLLOWS:

1. DETERMINE THE SOURCE OF STATIC PRESSURE THAT IS USED BY THE PRIMARY FLIGHT ALTIMETER WHICH IS USED FOR FLIGHT REFERENCE.
2. AT THE SOURCE OF STATIC PRESSURE INSTALL AN APPROPRIATE "T" OR "Y" CONNECTION WHICH WILL ALLOW YOU TO CONNECT THE EPDM HOSE FROM THE A-30 ENCODER TO A COMMON SOURCE OF STATIC PRESSURE.
3. CONNECT THE EPDM STATIC LINE PROVIDED WITH THE A-30 TO THIS STATIC SOURCE, MAKING SURE TO PROVIDE FOR POSITIVE DRAINAGE OF MOISTURE AND ROUTING OF LINE AS PER FAR 23.1325 PAR (b) (1) & (11)
4. PERFORM CALIBRATION AND CORRESPONDENCE CHECK AS REQUIRED (SEE PAGE 3)

IMPORTANT NOTES

THE A-30 WILL NOT OUTPUT DATA UNTIL IT HAS REACHED ITS PROPER OPERATING TEMPERATURE, APPROXIMATELY 7 MINUTES.

THE UNITS ARE CALIBRATED AT OUR FACTORY AT A NOMINAL CALIBRATION VOLTAGE OF 14 VOLTS. IF INSTALLED IN AN AIRCRAFT WITH A 28 VOLT ELECTRICAL SYSTEM THE INITIAL CALIBRATION WILL BE OFF APPROXIMATELY 100 FEET AT 30,000 FT.

DO NOT INDISCRIMINATELY TURN THE HIGH AND LOW CORRESPONDENCE ADJUSTMENT POTS THESE NEED ONLY MINUTE CHANGES TO ADJUST FOR CORRESPONDENCE. IF INDISCRIMINATELY ADJUSTED, RE-CALIBRATION BECOMES A TEDIOUS AND TIME CONSUMING PROCESS.

THE WIRING HARNESS WHICH WE SUPPLY WITH THE UNIT IS NOT TESTED OR INSPECTED BY US AND IS NOT PART OF THE TSO APPROVED PART. PLEASE VERIFY PROPER COLOR CODE BEFORE USING SEE FIGURE # 3. THE WIRE USED WITH THIS HARNESS IS CSA TYPE TR-64 HIGH TEMP PVC COATED WIRE. THIS WIRE TYPE IS SUITABLE FOR INSTALLATION IN ALL AIRCRAFT CERTIFIED UNDER FAR PART 23 (12,500 LBS OR LESS)

CONNECTING THE A-30 WITH THE POLARITY REVERSED FOR ANY SUSTAINED PERIOD OF TIME WILL INTERNALLY DAMAGE THE UNIT AND VOID THE WARRANTY. PLEASE BE CERTAIN THAT THE POLARITY IS CORRECT BEFORE APPLYING POWER TO THE UNIT.

WE DO NOT OFFER TECHNICAL SUPPORT OR INSTALLATION INSTRUCTIONS TO INDIVIDUALS DOING THEIR OWN INSTALLATION. WE STRONGLY RECOMMEND THAT THE UNIT BE INSTALLED BY A LICENSED AVIONICS SHOP OR FACILITY WHICH IS FAMILIAR WITH THE INSTALLATION AND REPAIR OF TRANSPONDER AND ENCODER SYSTEMS. INSTALLING AVIONIC DEALERS SHOULD CONTACT THEIR DISTRIBUTOR FOR TECHNICAL ASSISTANCE.

WARRANTY OR REPAIR

AFTER INSTALLATION A CORRESPONDENCE CHECK AS REQUIRED BY FAR 91.36b MUST BE PERFORMED BY A LICENSED FACILITY BEFORE THE AIRCRAFT MAY BE RETURNED TO SERVICE. THIS INFORMATION MUST BE INCLUDED ON THE ENCLOSED WARRANTY CARD FOR THE WARRANTY TO BE VALID.

YOU WILL FIND THE COMPLETE WRITTEN LIMITED WARRANTY ON THE BACK OF THIS MANUAL. PLEASE FILL OUT THE ENCLOSED WARRANTY CARD AND RETURN IT TO US WITHIN 15 DAYS OF THE INSTALLATION. RECORD THE SERIAL NUMBER OF THE UNIT AND THE INSTALLATION DATE BELOW FOR YOUR REFERENCE.

EACH A-30 IS SUBJECTED TO A RIGOROUS 24 HOUR BURN-IN AND TESTING PROCEDURE DURING OUR MANUFACTURING PROCESS. EACH UNIT IS SUBJECTED TO OVER 5000 FULL PRESSURE CYCLES AND VARYING POWER CYCLES DURING THIS PROCEDURE. IF YOU ARE EXPERIENCING DIFFICULTY OR IMPROPER OPERATION PLEASE MAKE SURE TO CHECK ALL COMPONENTS OF THE SYSTEM SUCH AS THE TRANSPONDER, INNERCONNECT WIRING, ETC BEFORE RETURNING THE UNIT TO US FOR REPAIR.

IF IT BECOMES NECESSARY TO RETURN THE UNIT TO US YOU WILL FIND THE RETURN ADDRESS ON THE BACK COVER OF THIS MANUAL. PACK THE UNIT CAREFULLY PREFERABLY IN ITS ORIGINAL SHIPPING BOX AND RETURN IT TO US.

INCLUDE THE FOLLOWING INFORMATION WITH ANY UNIT RETURNED FOR REPAIR

1. NAME AND RETURN ADDRESS SUITABLE FOR UPS SHIPMENT (NO P.O. BOX)
2. NATURE OF PROBLEM
3. TYPE OF TRANSPONDER UNIT IS BEING USED WITH
4. PHONE NUMBER
5. SERIAL NUMBER OF UNIT

SERIAL NUMBER _____ DATE INSTALLED _____

REPLACEMENT OF OTHER ENCODERS WITH THE A-30 (MOD 1)

***** BEGINNING WITH SERIAL NUMBER 04400 THE A-30 IS DIRECTLY PIN COMPATIBLE WITH THE ENCODERS LISTED BELOW. NO JUMPER IS NECESSARY.

BEGINNING WITH SERIAL # 2400 THROUGH SERIAL # 04399 THE A-30 ENCODER USES A MALE (15 PIN DP) CONNECTOR. THIS ALLOWS THE A-30 TO BE PLUG COMPATIBLE WITH MANY EXISTING ENCODERS WHEN INPUT POWER IS 28 V NOMINAL. WHEN INPUT POWER IS 14 V NOMINAL THE POWER INPUT LINE MUST BE MOVED AS EXPLAINED BELOW.

ENCODERS WHICH THE A-30 (MOD 1) IS PIN COMPATIBLE

MAKE	MODEL	DIRECTLY PIN COMPATIBLE		JUMPER REQUIRED
		14 V INPUT	28 V INPUT	14 V INPUT
TCI	ALL MODELS	NO	YES	YES
EVERGREEN	ALL MODELS	NO	YES	YES
TERRA	AT 3000	YES (NOTE 1)	YES (NOTE 1)	NO (NOTE 1)

TCI AND EVERGREEN ENCODERS USE PIN 8 FOR 28 V INPUT AND PIN 14 FOR 14 V INPUT. WHEN INTERCHANGING THE A-30 (MOD 1) WITH TCI OR EVERGREEN ENCODERS WHICH HAVE 14 VOLT INPUT POWER GOING TO THEM YOU MUST CHANGE THE POWER INPUT (A+) WIRE FROM PIN 14 TO PIN 8 OR JUMPER PIN 8 AND PIN 14.

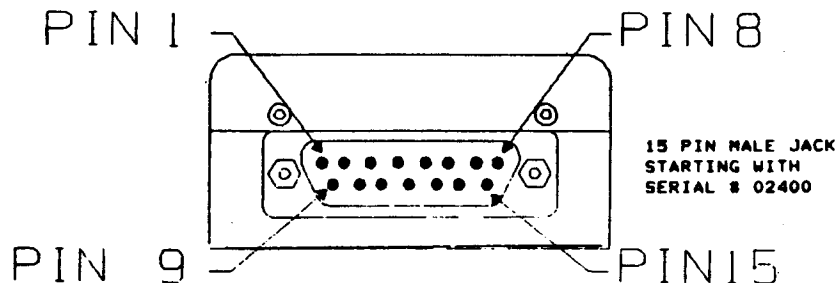
NOTE 1: TERRA ENCODERS MAY HAVE INPUT POWER PROVIDED TO EITHER PIN 8 OR PIN 14. THE A-30 REQUIRES POWER BE PROVIDED TO PIN 8 OR PIN 7. MAKE SURE A+ POWER WAS PROVIDED TO PIN 8 WHEN REPLACING TERRA ENCODERS. IF NOT MOVE POWER INPUT WIRE (A+) TO PIN 8 OR JUMPER PIN 8 AND 14.

THE FOLLOWING PIN OUT CONFIGURATION IS CORRECT WHEN LOOKING AT THE JACK ON THE END OF THE A-30 (MOD 1) ENCODER BEGINNING WITH SERIAL # 02400. THE COLOR CODES INDICATED ARE FOR THE PRE-WIRED HARNESS WHICH IS SUPPLIED WITH THE A-30 ENCODER.

FIGURE 3
COLOR CODE AND PIN OUT

PIN #	COLOR	FUNCTION	PIN #	COLOR	FUNCTION
8	RED	POWER INPUT (A+)	15	BLACK	A/C GROUND
7		SPARE (A+) INPUT	14		NO CONNECTION **
6	BROWN	STROBE *	13	VIOLET	C 2
5	LT BROWN	B 1	12	GRAY	C 4
4	BLUE	A 4	11	PINK	C 1
3	WHITE	A 2	10	ORANGE	B 4
2	GREEN	A 1	9	YELLOW	B 2
1		NO CONNECTION			

* CONNECT TO GROUND IF TRANSPONDER DOES NOT HAVE A STROBE CONNECTION.
** BEGINNING WITH SERIAL # 04400 PIN 14 IS SPARE A+ INPUT



***** PIN OUT FOR A-30 (MOD 1) STARTING WITH SERIAL NUMBER 02400 *****

TRANSPONDER CONNECTION

TO THE BEST OF OUR KNOWLEDGE, AS OF THIS MANUAL REVISION DATE, THE A-30 ENCODER WILL WORK WITH ALL TRANSPONDERS THAT ARE IN CURRENT PRODUCTION AND GENERALLY WITH MOST TRANSPONDERS PRODUCED SINCE 1974.

WE HAVE HAD SEVERAL REPORTS OF OLDER NARCO AT-50 AND AT-50A TRANSPONDERS NOT FUNCTIONING PROPERLY WITH OURS OR OTHER MANUFACTURERS ENCODERS. THESE PROBLEMS HAVE NEARLY ALWAYS BEEN TRACED TO THE TRANSPONDER NOT BEING MODIFIED FOR ENCODER OPERATION AS PER THE MANUFACTURERS SERVICE BULLETINS. ALWAYS CHECK MANUFACTURERS SERVICE BULLETINS FOR PROPER MODIFICATIONS.

THERE HAVE BEEN MANY REPORTS TO US OF NARCO AT5 AND AT6 TRANSPONDERS NOT FUNCTIONING PROPERLY WHEN USED WITH THE A-30 OR OTHER ENCODERS. IT IS OUR UNDERSTANDING THAT NARCO NO LONGER SUPPORTS THESE TRANSPONDERS AND RECOMMENDS THAT THEY NOT BE USED FOR MODE C OPERATION. WE HAVE INCLUDED A TRANSPONDER CONNECTION DIAGRAM FOR THESE TRANSPONDERS AND KNOW OF SEVERAL SUCCESSFUL INSTALLATIONS. HOWEVER WE MAKE NO RECOMMENDATION AS TO THE SUITABILITY OF THESE TRANSPONDERS FOR MODE C OPERATION WITH THE A-30.

THERE HAVE BEEN SEVERAL TRANSPONDERS PRODUCED IN THE PAST THAT THE A-30 WILL NOT DIRECTLY INTERFACE WITH. THREE OF THESE THAT WE KNOW OF ARE AS FOLLOWS:

NARCO UAT-1 KING KXP-750 WILCOX B14B

THESE REPORTEDLY MAY BE INTERFACED USING AN ARA-812 LOGIC ADAPTOR WHICH IS AVAILABLE FROM NARCO. HOWEVER NO FACTORY SUPPORT IS AVAILABLE FOR THESE TRANSPONDERS. WE MAKE NO REPRESENTATION AS TO THE COMPATIBILITY OR SUITABILITY OF SUCH INSTALLATIONS.

ALWAYS CONSULT THE MOST CURRENT INSTALLATION, OPERATION AND SERVICE BULLETINS FROM THE TRANSPONDER MANUFACTURER REGARDING MODE C OPERATION.

THE WIRING HARNESS PROVIDED IS SUITABLE FOR USE IN ANY AIRCRAFT WHICH IS CERTIFIED UNDER FAR PART 23 (12,500 LBS OR LESS).

STROBE OPERATION

THE A-30 STROBE LINE RECOGNIZES 1.2 VOLTS OR LESS AS LOGIC LOW. LOGIC LOW ENABLES OUTPUT TO THE TRANSPONDER.

NOTES

***** IMPORTANT *****

THE FOLLOWING CONNECTION DIAGRAMS ARE PROVIDED AS A QUICK REFERENCE GUIDE ONLY. ALWAYS CONSULT THE LATEST INSTALLATION, OPERATION AND SERVICE BULLETINS FROM THE TRANSPONDER MANUFACTURER.

TRANSPONDER CONNECTION CHART



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SERVICE BULLETIN A-30-1
AFFECTING A-30 ALTITUDE ENCODER ALL SERIAL NUMBERS
APRIL 10, 1989

TO: ACK A-30 ALTITUDE ENCODER DISTRIBUTORS
PLEASE PROVIDE COPIES OF THIS LETTER TO ALL
INSTALLING DEALERS.

RE: GROUNDING OF A-30 DURING CALIBRATION AND CORRESPONDENCE
TESTING.

RECENT FIELD SERVICE HISTORY HAS INDICATED THAT THE A-30 CALIBRATION MAY BE AFFECTED BY THE LOCATION OF ITS MOUNTING TRAY IN RELATION TO THE AIRCRAFT GROUND POINT SELECTED WHEN CORRESPONDENCE ADJUSTMENT IS MADE OR A FINAL CORRESPONDENCE CHECK IS DONE WITH THE ENCODER REMOVED FROM ITS MOUNTING TRAY.

THE A-30 WAS DESIGNED TO BE ESSENTIALLY RATIO-METRIC IN REGARD TO INPUT VOLTAGE AND IS VIRTUALLY NOT AFFECTED BY WIDE CHANGES IN INPUT VOLTAGE. HOWEVER A SLIGHT DIFFERENCE IN POTENTIAL BETWEEN A+ AND THE GROUND POINTS SELECTED FOR THE GROUND WIRE CONNECTION AND THE MOUNTING LOCATION OF THE ENCODER CAUSES A SLIGHT CHANGE IN THE INTERNAL REFERENCE VOLTAGE OF THE A-30. WE BELIEVE OLDER AIRFRAMES OR CORRODED AIRFRAMES WILL BE MORE SUBJECT TO THIS CONDITION. FOLLOWING THESE RECOMMENDED PROCEDURES WILL ASSURE THAT THIS CONDITION, IF PRESENT, DOES NOT AFFECT FINAL CALIBRATION OF THE ENCODER.

IF THE MOUNTING TRAY IS NOT CONNECTED TO THE AIRFRAME GROUND, e.g. MOUNTED ON THE NON-METALIC GLOVE BOX OF SOME AIRCRAFT OR MOUNTED TO A COMPOSITE MATERIAL COMPONENT OF THE AIRFRAME, THE GROUNDING REQUIREMENTS OF THIS SERVICE BULLETIN DO NOT APPLY.

OUR TWO RECOMMENDED METHODS OF COMPLYING WITH THIS SERVICE BULLETIN ARE AS FOLLOWS:

1. WHEN DOING FINAL CORRESPONDENCE VERIFICATION OF THE ENCODER AND ALTIMETER THE ENCODER SHOULD BE SECURELY FASTENED INTO ITS MOUNTING TRAY. THE MOUNTING TRAY MUST BE IN ITS FINAL MOUNTING LOCATION IN THE AIRCRAFT AND SECURELY TIGHTENED PRIOR TO TESTING.

OR

2. IF THE ENCODER IS REMOVED FROM ITS MOUNTING TRAY DURING FINAL CORRESPONDENCE ADJUSTMENT AND VERIFICATION, ATTACH A HEAVY JUMPER CABLE BETWEEN THE DIE CAST ENCODER CHASSIS AND ITS MOUNTING TRAY. THE MOUNTING TRAY MUST BE IN ITS FINAL MOUNTING LOCATION IN THE AIRCRAFT AND SECURELY TIGHTENED PRIOR TO TESTING. THE JUMPER SHOULD BE AWG 16 OR HEAVIER WIRE WITH HEAVY SPRING TYPE ALLIGATOR CLIPS ON EACH END ITS LENGTH SHOULD NOT EXCEED 3 FEET.

**** END ****

CESSNA
 RT 359A
 RT 459 A A-30 ENCODER
 RT 859 A

PIN #	PIN #	WIRE COLOR	INSTRUCTIONS
19 <----->	5	LT BROWN	
15 <----->	4	BLUE	
13 <----->	3	WHITE	
14 <----->	2	GREEN	
18 <----->	13	VIOLET	
20 <----->	12	GRAY	
21 <----->	11	PINK	
16 <----->	10	ORANGE	
17 <----->	9	YELLOW	
11 <----->	6	BROWN	
	15	BLACK	CONNECT TO AIRCRAFT GROUND
9 <----->	8	RED	

COLLINS A-30 ENCODER
 TDR-950/950L

PIN #	PIN #	WIRE COLOR	INSTRUCTIONS
6 <----->	5	LT BROWN	
7 <----->	4	BLUE	
10 <----->	3	WHITE	
12 <----->	2	GREEN	
11 <----->	13	VIOLET	
9 <----->	12	GRAY	
8 <----->	11	PINK	
4 <----->	10	ORANGE	
5 <----->	9	YELLOW	
	6	BROWN	CONNECT TO AIRCRAFT GROUND
	15	BLACK	CONNECT TO AIRCRAFT GROUND
	8	RED	CONNECT TO 2 AMP BREAKER ON A/C BUSS

TERRA A-30 ENCODER
 TRT 250

PIN #	PIN #	WIRE COLOR	INSTRUCTIONS
15 <----->	5	LT BROWN	
16 <----->	4	BLUE	
17 <----->	3	WHITE	
5 <----->	2	GREEN	
4 <----->	13	VIOLET	
18 <----->	12	GRAY	
3 <----->	11	PINK	
14 <----->	10	ORANGE	
2 <----->	9	YELLOW	
12 <----->	6	BROWN	
	15	BLACK	CONNECT TO AIRCRAFT GROUND
20 <----->	8	RED	

NOTES:

1. COLOR CODE IS FOR WIRING HARNESS WHICH IS SUPPLIED WITH UNIT.
2. WIRE SIZE FOR DATA LINES AND STROBE MINIMUM AWG # 24.
3. A+ AND GROUND WIRE SIZE MINIMUM AWG # 22.

TRANSPONDER CONNECTION CHART

KING
KT-76A/78A
KT-79

A-30 ENCODER

PIN #	PIN #	WIRE COLOR	INSTRUCTIONS
E <----->	5	LT BROWN	
J <----->	4	BLUE	
K <----->	3	WHITE	
M <----->	2	GREEN	
L <----->	13	VIOLET	
H <----->	12	GRAY	
D <----->	11	PINK	
B <----->	10	ORANGE	
C <----->	9	YELLOW	
	6	BROWN	CONNECT TO AIRCRAFT GROUND
	15	BLACK	CONNECT TO AIRCRAFT GROUND
	8	RED	CONNECT TO 2 AMP BREAKER ON A/C BUSS

KING
KT-76/78

A-30 ENCODER

PIN #	PIN #	WIRE COLOR	INSTRUCTIONS
4 <----->	5	LT BROWN	
9 <----->	4	BLUE	
7 <----->	3	WHITE	
6 <----->	2	GREEN	
8 <----->	13	VIOLET	
10 <----->	12	GRAY	
3 <----->	11	PINK	
2 <----->	10	ORANGE	
1 <----->	9	YELLOW	
	6	BROWN	CONNECT TO AIRCRAFT GROUND
	15	BLACK	CONNECT TO AIRCRAFT GROUND
	8	RED	CONNECT TO 2 AMP BREAKER ON A/C BUSS

KING
KXP 750A

A-30 ENCODER

PIN #	PIN #	WIRE COLOR	INSTRUCTIONS
K <----->	5	LT BROWN	
J <----->	4	BLUE	
H <----->	3	WHITE	
G <----->	2	GREEN	
R <----->	13	VIOLET	
S <----->	12	GRAY	
P <----->	11	PINK	
M <----->	10	ORANGE	
L <----->	9	YELLOW	
B <----->	6	BROWN	CONNECT TO AIRCRAFT GROUND
	15	BLACK	CONNECT TO AIRCRAFT GROUND
	8	RED	CONNECT TO 2 AMP BREAKER ON A/C BUSS

NOTES:

1. COLOR CODE IS FOR WIRING HARNESS WHICH IS SUPPLIED WITH UNIT.
2. WIRE SIZE FOR DATA LINES AND STROBE MINIMUM AWG # 24.
3. A+ AND GROUND WIRE SIZE MINIMUM AWG # 22.

TRANSPONDER CONNECTION CHART

KING
KT-75

A-30 ENCODER

PIN #	PIN #	WIRE COLOR	INSTRUCTIONS
9 <----->	5	LT BROWN	
8 <----->	4	BLUE	
7 <----->	3	WHITE	
6 <----->	2	GREEN	
13 <----->	13	VIOLET	
14 <----->	12	GRAY	
12 <----->	11	PINK	
11 <----->	10	ORANGE	
10 <----->	9	YELLOW	
5 <----->	6	BROWN	
	15	BLACK	CONNECT TO AIRCRAFT GROUND
	8	RED	CONNECT TO 2 AMP BREAKER ON A/C BUSS

NARCO
AT-50/50A
AT-150

A-30 ENCODER

PIN #	PIN #	WIRE COLOR	INSTRUCTIONS
12 <----->	5	LT BROWN	
8 <----->	4	BLUE	
6 <----->	3	WHITE	*** AT-50 AND AT-50 A *** SEE NARCO SERVICE BULLETIN AT 50A-4 9/27/74 AND AT-50A-5 2/19/75.
7 <----->	2	GREEN	
11 <----->	13	VIOLET	
13 <----->	12	GRAY	
14 <----->	11	PINK	
9 <----->	10	ORANGE	
10 <----->	9	YELLOW	
5 <----->	6	BROWN	
	15	BLACK	CONNECT TO AIRCRAFT GROUND
18 <----->	8	RED	

NARCO
AT5/6
AT6-A

A-30 ENCODER

PIN #	PIN #	WIRE COLOR	INSTRUCTIONS
9 <----->	5	LT BROWN	
8 <----->	4	BLUE	
4 <----->	3	WHITE	* SEE NARCO SERVICE BULLETIN AT-6A-11 2/22/73 AND AT-6A-14 1/27/75.
2 <----->	2	GREEN	
3 <----->	13	VIOLET	
5 <----->	12	GRAY	
1 <----->	11	PINK	NOTE: FACTORY SUPPORT IS NO LONGER AVAILABLE ON THESE TRANSPONDERS. WE HAVE RECEIVED NUMEROUS REPORTS OF THESE TRANSPONDERS NOT FUNCTIONING PROPERLY WHEN USED WITH OUR ENCODER OR OTHER MANUFACTURERS ENCODERS.
11 <----->	10	ORANGE	
10 <----->	9	YELLOW	
12 <----->	6	BROWN	
14 <----->	15	BLACK	
13 <----->	8	RED	
6 *			* CONNECT PINS 6 AND 7 ON TRANSPONDER FOR FOR ALTITUDE MODE ENABLE.
7 *			

NOTES:

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2. WIRE SIZE FOR DATA LINES AND STROBE MINIMUM AWG # 24.
3. A+ AND GROUND WIRE SIZE MINIMUM AWG # 22.

TRANSPONDER CONNECTION CHART

BENDIX
TPR-2060
TRP-660

A-30 ENCODER

PIN #	PIN #	WIRE COLOR	INSTRUCTIONS
9	5	LT BROWN	
8	4	BLUE	
6	3	WHITE	
4	2	GREEN	
5	13	VIOLET	
7	12	GRAY	
3	11	PINK	
11	10	ORANGE	
10	9	YELLOW	
	6	BROWN	CONNECT TO AIRCRAFT GROUND
	15	BLACK	CONNECT TO AIRCRAFT GROUND
	8	RED	CONNECT TO 2 AMP BREAKER ON A/C BUSS

BENDIX
TR641A/B

A-30 ENCODER

PIN #	PIN #	WIRE COLOR	INSTRUCTIONS
D	5	LT BROWN	
C	4	BLUE	
B	3	WHITE	
A	2	GREEN	
J	13	VIOLET	
K	12	GRAY	
H	11	PINK	
F	10	ORANGE	
E	9	YELLOW	
S	6	BROWN	CONNECT TO AIRCRAFT GROUND
S	15	BLACK	CONNECT TO AIRCRAFT GROUND
	8	RED	CONNECT TO 2 AMP BREAKER ON A/C BUSS

WILCOX
1014A

A-30 ENCODER

PIN #	PIN #	WIRE COLOR	INSTRUCTIONS
T	5	LT BROWN	
W	4	BLUE	
c	3	WHITE	
k	2	GREEN	
f	13	VIOLET	
Z	12	GRAY	
p	11	PINK	
D	10	ORANGE	
L	9	YELLOW	
	6	BROWN	CONNECT TO POWER GROUND ON TRANSPONDER
	15	BLACK	CONNECT TO POWER GROUND ON TRANSPONDER
	8	RED	CONNECT TO 2 AMP BREAKER ON A/C BUSS

NOTES:

- COLOR CODE IS FOR WIRING HARNESS WHICH IS SUPPLIED WITH UNIT.
- WIRE SIZE FOR DATA LINES AND STROBE MINIMUM AWG # 24.
- A+ AND GROUND WIRE SIZE MINIMUM AWG # 22.

TRANSPONDER CONNECTION CHART

EDO-AIRE
RT-777

A-30 ENCODER

PIN #	PIN #	WIRE COLOR	INSTRUCTIONS
12	5	LT BROWN	
3	4	BLUE	
5	3	WHITE	
7	2	GREEN	
6	13	VIOLET	
4	12	GRAY	
8	11	PINK	
14	10	ORANGE	
13	9	YELLOW	
2	6	BROWN	
2	15	BLACK	
	8	RED	CONNECT TO 2 AMP BREAKER ON A/C BUSS

GENAVE
BETA 5000

A-30 ENCODER

PIN #	PIN #	WIRE COLOR	INSTRUCTIONS
7	5	LT BROWN	
6	4	BLUE	
5	3	WHITE	
4	2	GREEN	
11	13	VIOLET	
12	12	GRAY	
10	11	PINK	
9	10	ORANGE	
8	9	YELLOW	
3	6	BROWN	
	15	BLACK	CONNECT TO AIRCRAFT GROUND
2	8	RED	

RADAIR
250

A-30 ENCODER

PIN #	PIN #	WIRE COLOR	INSTRUCTIONS
9	5	LT BROWN	
13	4	BLUE	
6	3	WHITE	
7	2	GREEN	
16	13	VIOLET	
12	12	GRAY	
14	11	PINK	
11	10	ORANGE	
10	9	YELLOW	
19	6	BROWN	
19	15	BLACK	
22	8	RED	

NOTES:

- COLOR CODE IS FOR WIRING HARNESS WHICH IS SUPPLIED WITH UNIT.
- WIRE SIZE FOR DATA LINES AND STROBE MINIMUM AWG # 24.
- A+ AND GROUND WIRE SIZE MINIMUM AWG # 22.