



Ramp Test Set ATC-600A-2

Operation Manual

**1002-0804-200
Issue-2**

OPERATION MANUAL

RAMP TEST SET

ATC-600A-2

PUBLISHED BY
Aeroflex

COPYRIGHT © Aeroflex 2004

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording or otherwise without the prior permission of the publisher.

Original Printing	Mar 1998
Issue-1	Mar 1999
Issue-2	Sep 2004

10200 West York / Wichita, Kansas 67215 U.S.A. / (316) 522-4981 / FAX (316) 524-2623



Cable Statements:

A double shielded and properly terminated external interface cable must be used with this equipment when interfacing with the ALTITUDE ENCODER INPUT Connector.

For continued EMC compliance, all external cables, except supplied Antenna coaxial cable, must be 3 meters or less in length.

Nomenclature Statement:

In this manual Test Set or Unit refers to the ATC-600A-2 Transponder and DME Test Set.

ESD Statement:

An Electrostatic Discharge (ESD) to either Front Panel Edge Meter may cause a momentary deflection of the Meter.



OPERATION MANUAL
ATC-600A-2

THIS PAGE INTENTIONALLY LEFT BLANK.



SAFETY FIRST: TO ALL OPERATIONS PERSONNEL

REFER ALL SERVICING OF UNIT TO QUALIFIED TECHNICAL PERSONNEL. this unit contains no operator serviceable parts.

WARNING: USING THIS EQUIPMENT IN A MANNER NOT SPECIFIED BY THE ACCOMPANYING DOCUMENTATION MAY IMPAIR THE SAFETY PROTECTION PROVIDED BY THE EQUIPMENT.

CASE, COVER OR PANEL REMOVAL

Removing the Chassis Assembly from the Case Assembly exposes the operator to electrical hazards that can result in electrical shock or equipment damage. Do not operate this Test Set with the Chassis Assembly removed from the Case Assembly.

SAFETY IDENTIFICATION IN TECHNICAL MANUAL

This manual uses the following terms to draw attention to possible safety hazards, that may exist when operating this equipment.

CAUTION: THIS TERM IDENTIFIES CONDITIONS OR ACTIVITIES THAT, IF IGNORED, CAN RESULT IN EQUIPMENT OR PROPERTY DAMAGE (E.G., FIRE).

WARNING: THIS TERM IDENTIFIES CONDITIONS OR ACTIVITIES THAT, IF IGNORED, CAN RESULT IN PERSONAL INJURY OR DEATH.

SAFETY SYMBOLS IN MANUALS AND ON UNITS



CAUTION: THIS SYMBOL REFERS TO SPECIFIC CAUTIONS REPRESENTED ON THE UNIT AND CLARIFIED IN THE TEXT.



AC OR DC TERMINAL: TERMINAL THAT MAY SUPPLY OR BE SUPPLIED WITH AC OR DC VOLTAGE.



DC TERMINAL: TERMINAL THAT MAY SUPPLY OR BE SUPPLIED WITH DC VOLTAGE.



AC TERMINAL: TERMINAL THAT MAY SUPPLY OR BE SUPPLIED WITH AC OR ALTERNATING VOLTAGE.



SWITCH ON/OFF (PUSH-PUSH): POWER TO THE DEVICE IS CONNECTED ON OR DISCONNECTED OFF.

EQUIPMENT GROUNDING PRECAUTION

Improper grounding of equipment can result in electrical shock.

USE OF PROBES

Check specifications for the maximum voltage, current and power ratings of any connector on the Test Set before connecting it with a probe from a terminal device. Be sure the terminal device performs within these specifications before using it for measurement, to prevent electrical shock or damage to the equipment.

POWER CORDS

Power cords must not be frayed, broken nor expose bare wiring when operating this equipment.

USE RECOMMENDED FUSES ONLY

Use only fuses specifically recommended for the equipment at the specified current and voltage ratings.

INTERNAL BATTERY

This unit contains a Sealed-Lead Battery, serviceable only by a qualified technician.

CAUTION: SIGNAL GENERATORS CAN BE A SOURCE OF ELECTROMAGNETIC INTERFERENCE (EMI) TO COMMUNICATION RECEIVERS. SOME TRANSMITTED SIGNALS CAN CAUSE DISRUPTION AND INTERFERENCE TO COMMUNICATION SERVICES OUT TO A DISTANCE OF SEVERAL MILES. USERS OF THIS EQUIPMENT SHOULD SCRUTINIZE ANY OPERATION THAT RESULTS IN RADIATION OF A SIGNAL (DIRECTLY OR INDIRECTLY) AND SHOULD TAKE NECESSARY PRECAUTIONS TO AVOID POTENTIAL COMMUNICATION INTERFERENCE PROBLEMS.



OPERATION MANUAL
ATC-600A-2

THIS PAGE INTENTIONALLY LEFT BLANK.



TABLE OF CONTENTS

Title	Chapter/Section
Title Page/Copyright Page	
Statements	
Safety Page	
Table of Contents	
Introduction	
Chapter 1	
Section 1 - Description	1-1
Section 2 - Operation	1-2
Section 3 - Specifications	1-3
Section 4 - Shipping	1-4
Section 5 - Storage	1-5
Appendix A - Connector Pin-Out Tables	
Appendix B - Altitude Transmission Code Chart	
Appendix C - ATCRBS Interrogation Modes and XPDR Reply Codes	
Appendix D - Metric/British Imperial Conversion Table with Nautical Distance Conversions	
Appendix E - Abbreviations	
Index	



THIS PAGE INTENTIONALLY LEFT BLANK.



INTRODUCTION - ATC-600A-2 TEST SET

This manual contains ATC-600A-2 operating instructions for Transponder and DME Test Systems. It is strongly recommended that personnel be thoroughly familiar with the contents of this manual before attempting to operate this equipment.

Refer all servicing of unit to qualified technical personnel.

ORGANIZATION

This manual is divided into the following Chapters and Sections:

CHAPTER 1 - OPERATION

- Section 1 - DESCRIPTION (description of the ATC-600A-2)
- Section 2 - OPERATION (installation; description of controls, connectors and indicators; and general operating procedures)
- Section 3 - SPECIFICATIONS
- Section 4 - SHIPPING
- Section 5 - STORAGE



THIS PAGE INTENTIONALLY LEFT BLANK.

CHAPTER ONE
ATC-600A-2 TEST SET
OPERATION MANUAL
TABLE OF CONTENTS

Title	Chapter/Section/Subject	Page
SECTION 1 – DESCRIPTION	1-1	
1. General Description and Capabilities	1-1-1	1
1.1 Description	1-1-1	1
1.2 Functional Capabilities	1-1-1	1
SECTION 2 – OPERATION	1-2	
1. Installation	1-2-1	1
1.1 General	1-2-1	1
1.2 Battery Operation	1-2-1	1
1.3 Battery Charging	1-2-1	1
1.4 Safety Precautions	1-2-1	1
1.4.1 Complying with Instructions	1-2-1	1
1.4.2 Grounding Power Cord	1-2-1	1
1.4.3 Operating Safety	1-2-1	1
1.4.4 CAUTION and WARNING Labels	1-2-1	1
1.5 AC Power Requirements	1-2-1	2
1.6 Battery Recharging	1-2-1	2
1.7 Bench Operation	1-2-1	3
1.8 External Cleaning	1-2-1	3
2. Controls, Connectors And Indicators	1-2-2	1
2.1 Front Panel	1-2-2	3
2.2 Rear Panel	1-2-2	7
3. General Operating Procedures	1-2-3	1
3.1 General	1-2-3	1
3.2 Ramp Operation Equipment	1-2-3	1
3.3 Bench Operation Equipment	1-2-3	1
3.4 Battery Parameters	1-2-3	1
3.5 Transponder Operation Test Equipment Setup	1-2-3	3
3.6 Transponder Operation Tests	1-2-3	3
3.6.1 Pilot's Code	1-2-3	3
3.6.2 Altitude Code	1-2-3	4
3.6.3 Peak Transponder Power	1-2-3	4
3.6.4 Transponder Frequency	1-2-3	5
3.6.5 Percent Reply	1-2-3	5
3.6.6 SLS Operation	1-2-3	6
3.6.7 IDENT (XPDR) Pulse Output	1-2-3	6
3.6.8 Invalid ALT Indicator	1-2-3	7
3.6.9 XPDR Receiver-Decoder Limits	1-2-3	7
3.6.10 Transponder Pulse Spacing	1-2-3	8
3.6.11 Receiver Sensitivity	1-2-3	8



Title	Chapter/Section/Subject	Page
3.7 DME Operation Test Equipment Setup	1-2-3	9
3.8 DME Operation Tests	1-2-3	9
3.8.1 DME Range or Distance Operation	1-2-3	9
3.8.2 DME Velocity Operation	1-2-3	10
3.8.3 DME Transmitted PRF	1-2-3	10
3.8.4 Transmitter Peak Power and Frequency	1-2-3	11
3.8.5 IDENT Tone	1-2-3	11
3.8.6 Percent Reply	1-2-3	12
3.8.7 Squitter Lock-Out	1-2-3	12
3.8.8 17Y Channel Operation	1-2-3	13
3.8.9 DME ILS Channel Operation	1-2-3	13
3.9 Encoding Altimeter Operation Test Equipment Setup	1-2-3	14
3.10 Encoding Altimeter Tests	1-2-3	15
3.10.1 Altitude Display	1-2-3	15
SECTION 3 – SPECIFICATIONS	1-3	
1. ATC-600A-2 Specifications	1-3-1	1
1.1 Transponder	1-3-1	1
1.2 DME	1-3-1	1
1.3 Battery Operation	1-3-1	2
1.4 ac Power Requirements	1-3-1	2
1.5 Fuse Requirements	1-3-1	2
1.6 Safety	1-3-1	3
1.7 Operational Environmental Conditions	1-3-1	3
1.8 Physical Characteristics	1-3-1	3
SECTION 4 – SHIPPING	1-4	
1. Shipping Test Sets	1-4-1	1
1.1 Information	1-4-1	1
1.2 Repacking Procedure	1-4-1	1
SECTION 5 – STORAGE	1-5	
1. Storing Test Sets	1-5-1	1



LIST OF ILLUSTRATIONS

Title	Chapter/Section/Subject	Page
Battery Recharging	1-2-1	2
ATC-600A-2 Front and Rear Panels	1-2-2	1
Altitude Pulse Position Assignment Chart (ARINC 532D)	1-2-2	8
Transponder Operation Test Equipment Setup	1-2-3	2
Repacking Procedure	1-4-1	2

LIST OF TABLES

Title	Chapter/Section/Subject	Page
Specified Fuse Ratings	1-2-1	2
DME Frequency/Spacing Assignments	1-2-2	5
Encoder Connector Pin Assignments	1-2-3	14



THIS PAGE INTENTIONALLY LEFT BLANK.

SECTION 1 - DESCRIPTION

1. GENERAL DESCRIPTION AND CAPABILITIES

1.1 DESCRIPTION

The ATC-600A-2 is a precision simulator that enables one person to functionality test airborne transponder (XPDR) and distance measuring equipment (DME) systems without removing the systems from the aircraft.

The Test Set contains built-in signal generators and modulators for XPDR and selected DME frequencies. For ramp operation, the RF output is coupled to the airborne equipment by a remote tripod mounted antenna system. For bench operation, coaxial cables are required between the Test Set and UUT.

- NICAD battery and built-in charging system permit completely portable operation for up to 2 hours continuous duty. Any time the Test Set is plugged to an ac line, the battery is being charged. In battery operation, an automatic timer turns the Test Set off after 7-10 minutes. The Test Set can be recycled by pressing the PWR/BAT Switch to the BAT position.

1.2 FUNCTIONAL CAPABILITIES

The ATC-600A-2 has the following features and capabilities:

- The type of transponder interrogation desired is selected from Modes A/C ALT and A/C CODE. The A/C ALT Mode displays the altitude code. The A/C CODE Mode displays the pilot's code. Code pulses and the numerical readout are displayed simultaneously in all modes.
- FREQ/PWR Meter indicates peak RF power and the transmitter frequency of the UUT. The XPDR % RPLY/DME PRF MTR indicates XPDR percent reply and DME interrogation pulse repetition frequency (PRF).
- The Interrogation Spacing Control allows precise checking of the XPDR input pulse decoder gate. The Framing Pulse Spacing Control allows checking of the F2 pulse width and position relative to F1. The Altitude Encoder Input Connector allows altitude display from an encoding altimeter without a transponder.
- The DME fixed range is variable from 0 to 399.0 NM, with velocity from 50 to 2400 knots. X Channel (108.00 or 108.10 MHz paired channel) and Y Channel (108.05 MHz paired channel) are provided.



THIS PAGE INTENTIONALLY LEFT BLANK.

SECTION 2 - OPERATION

1. INSTALLATION

1.1 GENERAL

The Test Set is powered by an internal battery. The Test Set contains a battery charging circuit which recharges the battery when the Test Set is connected to ac power.

NOTE: The Test Set can operate continuously on ac power for servicing and/or bench tests.

Refer to 1-2-2, Figure 2 for location of controls, connectors or indicators.

1.2 BATTERY OPERATION

The internal battery (NICAD) is equipped to power the Test Set for 2 hours of continuous use, after which time, the Test Set battery needs recharging.

When the BAT Test Switch is pressed, the XPDR % RPLY/DME PRF MTR displays the battery voltage. Normal battery charged condition is indicated as well within the white band. The left edge of the white band indicates 12.1 V. An automatic low voltage cutoff circuit turns the Test Set OFF when the battery voltage drops under approximately 11.4 V.

The Test Set contains an automatic time-out to conserve power. An automatic timer turns the Test Set OFF after 7-10 minutes (only when using battery power). The Test Set can be recycled by pressing the PWR/BAT Switch to the BAT position.

1.3 BATTERY CHARGING

The battery charger operates whenever ac power is applied to the Test Set. The battery should be charged every three months (minimum).

NOTE: Overnight charging is recommended.

1.4 SAFETY PRECAUTIONS

The following safety precautions must be observed during installation and operation. Aeroflex assumes no liability for failure to comply with any safety precaution outlined in this manual.

1.4.1 Complying with Instructions

Installation/operating personnel should attempt to install or operate the Test Set only after reading and complying with instructions contained in this manual. All procedures contained in this manual must be performed in exact sequence and manner described.

1.4.2 Grounding Power Cord



WARNING: USING A THREE-PRONG TO TWO-PRONG ADAPTER PLUG CREATES A SHOCK HAZARD BETWEEN THE CHASSIS AND ELECTRICAL GROUND.

For ac operation, the power cord, equipped with standard three-prong plug, must be connected to a properly grounded three-prong receptacle. It is the customer's responsibility to:

- Have a qualified electrician check receptacle(s) for proper grounding.
- Replace any standard two-prong receptacle(s) with properly grounded three-prong receptacle(s).

1.4.3 Operating Safety

Due to potential for electrical shock within test equipment, the Chassis Assembly must remain installed in the Case Assembly. Battery replacement must only be performed by qualified service technicians.

1.4.4 CAUTION and WARNING Labels

Exercise extreme care when performing operations preceded by a CAUTION or WARNING label. CAUTION labels appear where possibility of damage to equipment exists. WARNING labels denote conditions where bodily injury or death may result.

1.5 AC POWER REQUIREMENTS

The Test Set operates over a voltage range of 100 to 120 VAC at 60 Hz or 220 to 240 VAC at 50 Hz according to VOLTAGE SELECT Switch setting.

For specified fuse ratings see Table 1.

CAUTION: FOR CONTINUOUS PROTECTION AGAINST FIRE, REPLACE ONLY WITH FUSES OF THE SPECIFIED VOLTAGE AND CURRENT RATINGS.

INPUT VOLTAGE	F1 AND F2 FUSES
100 to 120 VAC	1.0 A, 250 V Fast Blo (Type F) (Aeroflex 5106-4501-000) (1.25in AGC Glass)
220 to 240 VAC	0.5 A, 250 V Fast Blo (Type F) (Aeroflex 5106-0000-016) (1.25in AGC Glass)

Specified Fuse Ratings
Table 1

1.6 BATTERY RECHARGING

Refer to Figure 1.

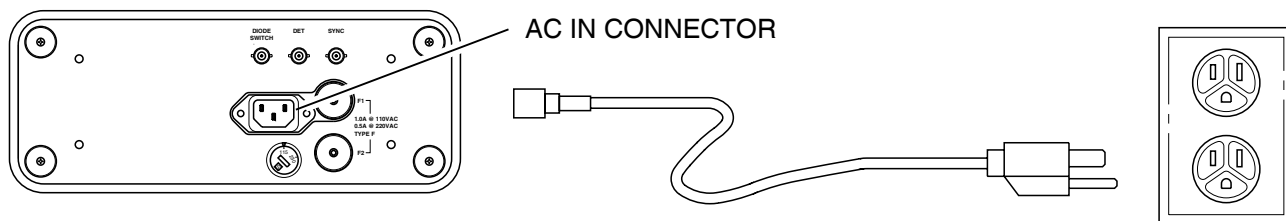
STEP	PROCEDURE
------	-----------

1. Verify FUSES are correct for normal operating voltage. Refer to para 1-2-1.5.
2. Verify VOLTAGE SELECT Switch is set to the setting (115 or 230 VAC) that matches the input AC power.
3. Connect ac power cable between AC Power Connector and normal operating voltage power source, according to Test Set configuration. Refer to para 1-2- 1.5.

NOTE: The battery charger operates whenever ac power is applied to the Test Set.

4. Allow several hours for battery charge or until the XPDR % RPLY/DME PRF MTR displays the battery voltage well within the white band.

NOTE: Overnight charging is recommended.



00807012

Battery Recharging
Figure 1

1.7 BENCH OPERATION

STEP	PROCEDURE
1.	Verify FUSES are correct for normal operating voltage. Refer to para 1-2-1.5.
2.	Verify VOLTAGE SELECT Switch is set to the setting (115 or 230 VAC) that matches the input ac power.
3.	Connect ac power cable between AC Power Connector and normal operating voltage power source according to Test Set configuration. Refer to para 1-2-1.5.
4.	Press PWR/BAT Switch to PWR position and verify PWR Indicator illuminates.
5.	Connect UUT to Test Set.

1.8 EXTERNAL CLEANING

The following procedure contains routine instructions for cleaning the outside of the Test Set.

CAUTION: DISCONNECT POWER FROM TEST SET TO AVOID POSSIBLE DAMAGE TO ELECTRONIC CIRCUITS.

STEP	PROCEDURE
1.	Clean front panel buttons and display face with soft lint-free cloth. If dirt is difficult to remove, dampen cloth with water and a mild liquid detergent.
2.	Remove grease, fungus and ground-in dirt from surfaces with soft lint-free cloth dampened with isopropyl alcohol.
3.	Remove dust and dirt from connectors with soft-bristled brush.
4.	Cover unused connectors with suitable dust covers to prevent tarnishing of connector contacts.
5.	Clean cables with soft lint-free cloth.
6.	Paint exposed metal surface to avoid corrosion.

1.8 EXTERNAL CLEANING

The following procedure contains routine instructions for cleaning the outside of the Test Set.

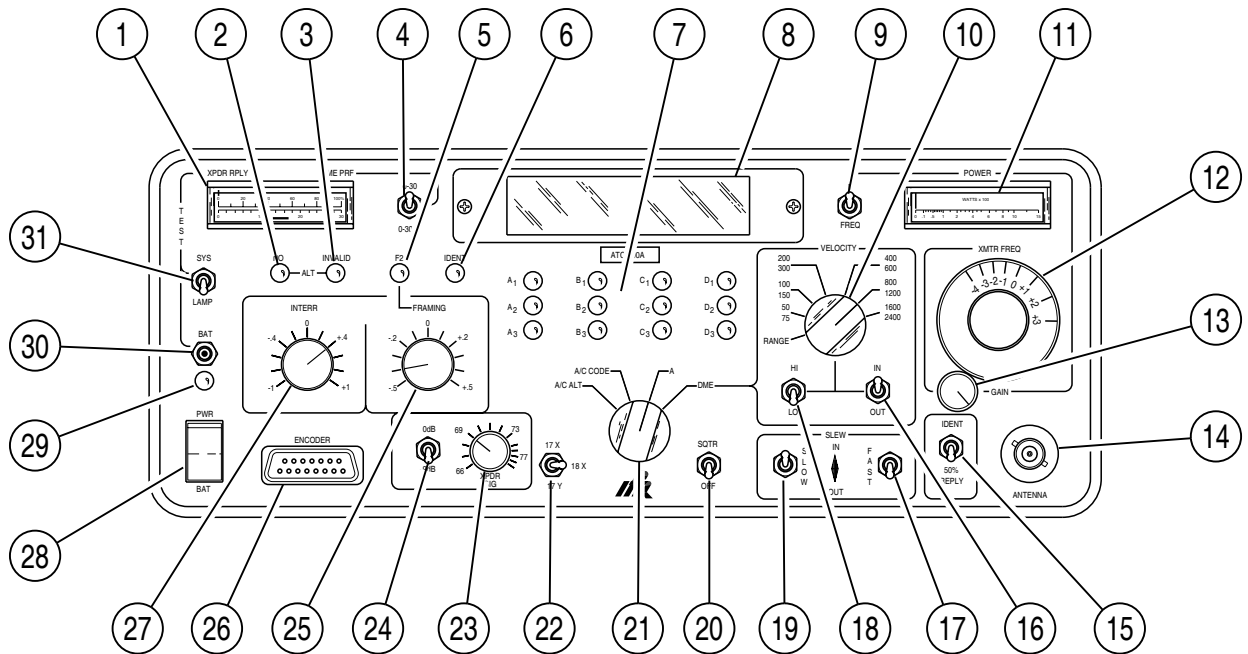
CAUTION: DISCONNECT POWER FROM TEST SET TO AVOID POSSIBLE DAMAGE TO ELECTRONIC CIRCUITS.

STEP	PROCEDURE
1.	Clean front panel buttons and display face with soft lint-free cloth. If dirt is difficult to remove, dampen cloth with water and a mild liquid detergent.
2.	Remove grease, fungus and ground-in dirt from surfaces with soft lint-free cloth dampened with isopropyl alcohol.
3.	Remove dust and dirt from connectors with soft-bristled brush.
4.	Cover unused connectors with suitable dust covers to prevent tarnishing of connector contacts.
5.	Clean cables with soft lint-free cloth.
6.	Paint exposed metal surface to avoid corrosion.

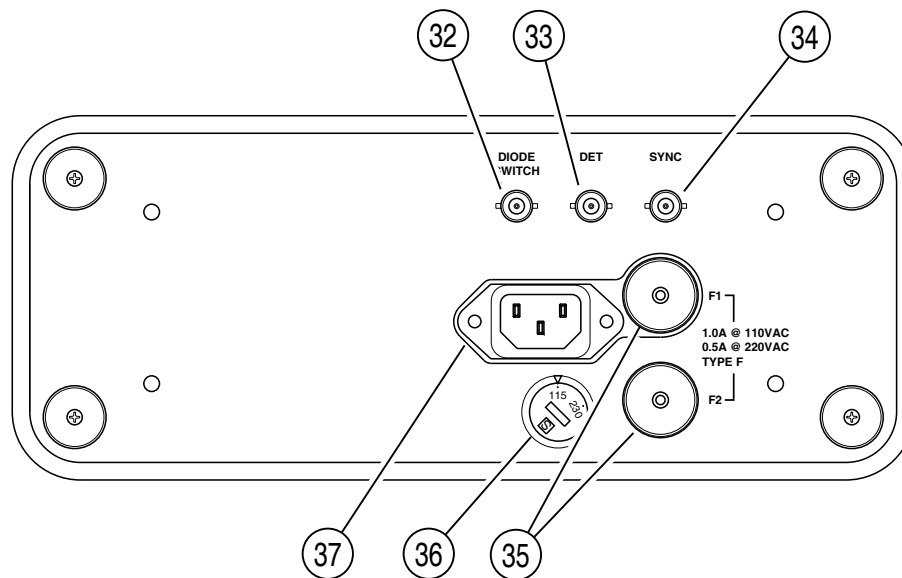


THIS PAGE INTENTIONALLY LEFT BLANK.

2. CONTROLS, CONNECTORS AND INDICATORS



00807011



00807010

ATC-600A-2 Front and Rear Panels
Figure 2



CONTROLS, CONNECTORS AND INDICATORS IN NUMERIC ORDER		CONTROLS, CONNECTORS AND INDICATORS IN ALPHABETICAL ORDER	
XPDR % RPLY/DME PRF Meter	1	0/OFF/-9 dB SLS Switch	24
NO ALT Indicator	2	AC POWER Connector	37
INVALID ALT Indicator	3	ALTITUDE ENCODER INPUT Connector	26
DME PRF Switch	4	BAT TEST Switch	30
F ₂ PULSE SPACING Indicator	5	OCTAL READOUT Indicators	7
IDENT PULSE Indicator (SPI)	6	DETECTED RF VIDEO OUTPUT Connector	33
OCTAL READOUT Indicators	7	DIODE SWITCH INPUT Connector	32
NUMERICAL READOUT	8	DME CHANNEL Switch	22
FREQ/PWR Switch	9	DME PRF Switch	4
DME RANGE/VELOCITY Switch	10	DME RANGE/VELOCITY Switch	10
FREQ/PWR Meter	11	F ₂ PULSE SPACING Indicator	5
XMTR FREQ Control	12	FAST SLEW Switch	17
FREQ GAIN CONTROL	13	FRAMING PULSE SPACING Control	25
RF INPUT/OUTPUT Connector	14	FREQ GAIN CONTROL	13
IDENT/50% RPLY Switch	15	FREQ/PWR Meter	11
VELOCITY IN/OUT Switch	16	FREQ/PWR Switch	9
FAST SLEW Switch	17	FUSES	35
VELOCITY HI/LO RANGE Switch	18	IDENT/50% RPLY Switch	15
SLOW SLEW Switch	19	IDENT PULSE Indicator (SPI)	6
SQUITTER ON/OFF Switch	20	INTERROGATION SPACING Control	27
MODE Switch	21	INVALID ALT Indicator	3
DME CHANNEL Switch	22	MODE Switch	21
XPDR SIGNAL LEVEL Control	23	NO ALT Indicator	2
0/OFF/-9 dB SLS Switch	24	NUMERICAL READOUT	8
FRAMING PULSE SPACING Control	25	PWR/BAT Switch	28
ALTITUDE ENCODER INPUT Connector	26	PWR Indicator	29
INTERROGATION SPACING Control	27	RF INPUT/OUTPUT Connector	14
PWR/BAT Switch	28	SLOW SLEW Switch	19
PWR Indicator	29	SQUITTER ON/OFF Switch	20
BAT TEST Switch	30	SYNC OUTPUT Connector	34
SYS/LAMP TEST Switch	31	SYS/LAMP TEST Switch	31
DIODE SWITCH INPUT Connector	32	VELOCITY HI/LO RANGE Switch	18
DETECTED RF VIDEO OUTPUT Connector	33	VELOCITY IN/OUT Switch	16
SYNC OUTPUT Connector	34	VOLTAGE SELECT Switch	36
FUSES	35	XMTR FREQ Control	12
VOLTAGE SELECT Switch	36	XPDR % RPLY/DME PRF Meter	1
AC POWER Connector	37	XPDR SIGNAL LEVEL Control	23

2.1 FRONT PANEL

Refer to 1-2-2, Figure 2.

ITEM	DESCRIPTION	ITEM	DESCRIPTION
1.	<p>XPDR % RPLY/DME PRF Meter</p> <p>In Transponder Modes (A/C ALT, A/C CODE and A settings of MODE Switch), indicates the percent reply of the Transponder (in the operation mode selected).</p> <p>In DME Mode (DME setting of MODE Switch), indicates the Pulse Repetition Frequency (PRF) of the DME under test.</p>	5.	<p>DME PRF Switch</p> <p>Selects the full scale range (in PRF) of the XPDR % RPLY/DME PRF Meter:</p> <ul style="list-style-type: none"> ● 0-30 is used for track rates. ● 0-300 is used for search rates. <p>NOTE: The interrogation Pulse Repetition Frequency (PRF) is fixed at 235 pps. (Only in Transponder Mode.)</p>
2.	<p>NO ALT Indicator</p> <p>When lit, indicates No Altitude pulses are present between F1 and F2 of the Transponder's altitude reply.</p>	6.	<p>IDENT PULSE Indicator</p> <p>When lit, indicates the Ident Pulse (SPI) is present in the reply.</p> <p>When the Test Set is in A/C ALT Mode, the Ident Pulse is paired with the D4 pulse.</p> <p>NOTE: Active in Transponder Modes only.</p>
3.	<p>INVALID ALT Indicator</p> <p>When lit, indicates a received altitude code has an unassigned combination of codes.</p> <p>The conditions to VALID Altitude information are the presence of at least one of the C Pulses (C1, C2 or C4) and never C1 and C4 ON at the same time.</p>	7.	<p>NUMERICAL Readout</p> <p>Displays pilot's code (as set into the Control Head) when the MODE Switch is set to A/C CODE.</p> <p>Displays altitude from -1.0 thousand to +126.7 thousand feet when the MODE Switch is set to A/C ALT.</p> <p>Displays altitude of Encoding Altimeter when an Encoding Altimeter is connected to the ALTITUDE ENCODER INPUT Connector.</p> <p>Displays range in nautical miles when the MODE Switch is set to DME.</p>
4.	<p>F2 PULSE SPACING Indicator</p> <p>When lit, the FRAMING PULSE SPACING Control is positioned to a time when no part of the F2 pulse is present. If the FRAMING PULSE SPACING Control is at or near zero, and the F2 PULSE SPACING Indicator is lit, the 2nd framing pulse in the Transponder reply is improperly spaced, is too narrow for normal operation or is absent altogether.</p> <p>NOTE: If F2 is out of position, all other reply pulses between F1 and F2 may be skewed out of position.</p>		

ITEM	DESCRIPTION	ITEM	DESCRIPTION
8.	<p>OCTAL READOUT Indicators</p> <p>Indicates which pulses are activating the NUMERICAL Readout when the MODE Switch is set to A/C ALT.</p> <p>NOTE: The altitude code is a Gray Daytex code.</p> <p>Indicates pilot's code (set in the Transponder Control Head) in binary form when MODE Switch is set to A/C CODE or A.</p> <p>NOTE: Active in Transponder Modes only.</p>	11.	<p>FREQ/PWR Meter</p> <p>When the FREQ/PWR Switch is set to PWR, FREQ/PWR Meter displays peak power from 0 to 1.5 kW (if test antenna spacing from the aircraft is correct or a 34 dB pad and coaxial cable are used).</p> <p>NOTE: The 34 dB pad and coaxial cable are not supplied with the unit.</p> <p>When the FREQ/PWR Switch is set to FREQ, FREQ/PWR Meter displays frequency deviation of the UUT from desired frequency.</p>
9.	<p>DME RANGE/VELOCITY Switch</p> <p>RANGE yields fixed range replies. (Starting range is set with the FAST SLEW Switch and/or SLOW SLEW Switch.)</p> <p>VELOCITY is divided into two crystal-controlled steps (50/75, 100/150, etc.). (The VELOCITY HI/LO RANGE Switch determines which of the two values to be selected in VELOCITY mode.) (Starting range is set with the FAST SLEW Switch and/or SLOW SLEW Switch.)</p> <p>NOTE: The FAST SLEW Switch and SLOW SLEW Switch operate in VELOCITY Mode in actual system range increments of approximately 0.025 NM. However, the velocity range is displayed on the NUMERICAL Readout in 0.1 NM steps only.</p>	12.	<p>XMTR FREQ Control</p> <p>Used to tune the FREQ/PWR Meter needle for maximum deflection.</p> <p>In Transponder operation, frequency deviation (from 1090 MHz) of the UUT is read directly from the XMTR FREQ Control in MHz.</p> <p>In DME operation, frequency deviation (from 1041 MHz) of the UUT is read directly from the XMTR FREQ Control in MHz.</p> <p>NOTE: The Plus (+) and minus (-) signs on the XMTR FREQ Control are reversed in DME operation (positive values are left of zero and negative values are right of zero).</p>
10.	<p>FREQ/PWR Switch</p> <ul style="list-style-type: none"> ● FREQ switches FREQ/PWR Meter to display frequency deviation. ● PWR switches FREQ/PWR Meter to display peak power. 	13.	<p>FREQ GAIN CONTROL</p> <p>Regulates amount of current to the FREQ/PWR Meter to enable all signals (weak and powerful) to display equally.</p>
		14.	<p>RF INPUT/OUTPUT Connector</p> <p>Used to connect up a remote test antenna (ramp operation) or a 34 dB pad and coaxial cable (bench operation).</p> <p>NOTE: The 34 dB pad and coaxial cable are not supplied with the unit.</p>

ITEM	DESCRIPTION
15. IDENT/50% RPLY Switch	<ul style="list-style-type: none"> ● IDENT sends a 1350 Hz tone to the DME. ● 50% RPLY deletes 50% of the replies to a DME on a 50-50 basis.
16. VELOCITY IN/OUT Switch	<p>Selects the direction of the replied range in VELOCITY Mode:</p> <ul style="list-style-type: none"> ● IN - towards the ground station. ● OUT - away from the ground station. <p>NOTE: When the inbound range reaches 0.0 NM, the range instantly changes to 399.0 NM and continues inbound. When the outbound range reaches 399.0 NM, the range instantly changes to 0.0 NM and continues outbound.</p>
17. FAST SLEW Switch	<p>Sets DME replied distance or range approximately 10 times faster than the SLOW SLEW Switch. Range is slewed from 0.0 to 399.0 NM in approximately 10.0 NM steps (inbound or outbound).</p>
18. VELOCITY HI/LO RANGE Switch	<p>Determines which of the two crystal-controlled increments (50/75, 100/150, etc.) selected by the DME RANGE/VELOCITY Switch to implement:</p> <ul style="list-style-type: none"> ● HI selects the greater of the two values. ● LO selects the lesser of the two values.
19. SLOW SLEW Switch	<p>Sets DME replied distance or range approximately 10 times slower than the SLOW SLEW Switch. Range is slewed from 0.0 to 399.0 NM in 1.0 NM steps (inbound or outbound).</p>

ITEM	DESCRIPTION
20. SQUITTER ON/OFF Switch	<ul style="list-style-type: none"> ● SQTR turns squitter ON in DME Operation. ● OFF turns squitter OFF in DME Operation. <p>NOTE: Squitter is fixed to an average of 2700 PRF at a random rate.</p>
21. MODE Switch	<p>Determines which Transponder Mode (AC ALT, A/C CODE or A) or DME Mode is active.</p>
22. DME CHANNEL Switch	<p>Selects one of three DME channels (17X, 17Y or 18X).</p> <p>Refer to Table 2 for appropriate reply frequency and pulse spacing.</p>

CHANNEL	VOR-PAIRED FREQUENCY
17X	108.00 MHz
18X	108.10 MHz
17Y	108.05 MHz

GROUND TO AIR		
CHANNEL	FREQUENCY	SPACING
17X	978 MHz	12 μ s
18X	979 MHz	12 μ s
17Y	1104 MHz	30 μ s

AIR TO GROUND		
CHANNEL	FREQUENCY	SPACING
17X	1041 MHz	12 μ s
18X	1042 MHz	12 μ s
17Y	1041 MHz	36 μ s

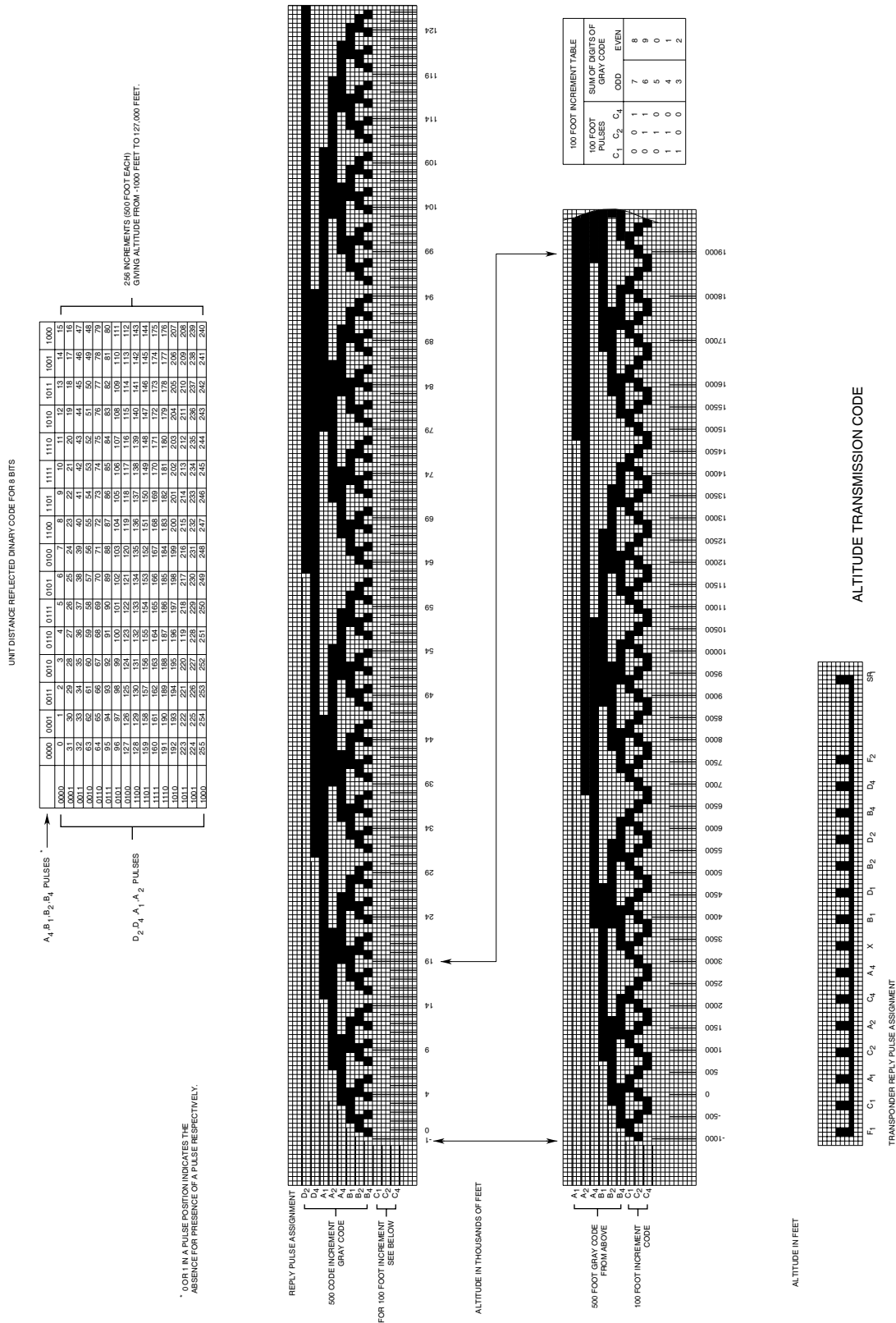
DME Frequency/Spacing Assignments
Table 2

ITEM	DESCRIPTION	ITEM	DESCRIPTION
23.	<p>XPDR SIGNAL LEVEL Control</p> <p>Varies the Transponder output signal level at the receiver antenna from -66 to -79 dBm (± 1.5 dBm). (Valid with the remote test antenna or 34 dB pad and coaxial cable.)</p> <p>NOTE: The 34 dB pad and coaxial cable are not supplied with the unit.</p>		<p>The INTERROGATION SPACING Control moves P2 and P3 ± 1.0 μs relative to P1. P2 and P3 spacing remains constant. (Refer to 1-2-2, Figure 3.)</p>
24.	<p>0/OFF/-9 dB SLS Switch</p> <ul style="list-style-type: none"> ● OFF - P1 and P3 of the Transponder interrogation are transmitted. ● 0dB - P2 is added at the same level as P1. ● -9dB - P2 is added at -9 dB amplitude, relative to P1. 	28.	<p>PWR/BAT Switch</p> <p>Two position switch controls power to the Test Set:</p> <ul style="list-style-type: none"> ● PWR connects Test Set to ac line power connected to AC IN Connector. ● BAT connects or disconnects Test Set from internal Battery. Connecting the Test Set to the Battery activates an internal battery timer. Test Set operation disconnects from the internal Battery after reaching the internal battery timer limit (≈ 6 to 10 mins) or by pressing the PWR/BAT Switch to BAT to disconnect.
25.	<p>FRAMING PULSE SPACING Control</p> <p>Used to calculate the position and width of the the F2 pulse by rotating cw or ccw until the F2 PULSE SPACING Indicator is lit (indicating the exact leading and trailing edges of the F2 pulse).</p> <p>NOTE: The approximate width of the F2 pulse equals the difference between the lowest and highest FRAMING PULSE SPACING Control settings at which the F2 PULSE SPACING Indicator is lit.</p>	29.	<p>PWR Indicator</p> <p>Is lit when applying ac or battery power to the Test Set.</p>
26.	<p>ALTITUDE ENCODER INPUT Connector</p> <p>Used for direct connection of altimeter output for encoding altimeter testing. (MODE Switch must be set to A/C ALT for altimeter testing and input pulse must be per ARINC 532D [Figure 3].)</p> <p>NOTE: ALTITUDE ENCODER INPUT Connector Pin-Out is shown in Appendix A.</p>	30.	<p>BAT TEST Switch</p> <p>When pressed, indicates battery voltage on XPDR % RPLY/DME PRF Meter. (Left edge of white band indicates 12.1 V.)</p>
27.	<p>INTERROGATION SPACING Control</p> <p>Used to adjust the interrogation spacing from P1 to P2 and P3 in Transponder operation.</p> <p>P1 and P3 interrogation spacing is set at 8 and 21 μs. P2 interrogation spacing is 2 μs.</p>	31.	<p>SYS/LAMP TEST Switch</p> <ul style="list-style-type: none"> ● LAMP - all OCTAL READOUT Indicators are lit. ● SYS - F2 PULSE SPACING Indicator and the BINARY READOUT Indicators (C4 and D2) are lit; internal circuits are checked in Transponder Modes: <ul style="list-style-type: none"> ● AC ALT - NUMERICAL Readout displays 126.7 thousand feet. ● A/C CODE - NUMERICAL Readout displays 0042. <p>NOTE: Center position is OFF.</p>

2.2 REAR PANEL

Refer to Figure 2.

ITEM	DESCRIPTION
32.	<p>DIODE SWITCH INPUT Connector</p> <p>Used with an high impedance probe to monitor all modulator pulses sent to the internal diode switch.</p>
33.	<p>DETECTED RF VIDEO OUTPUT Connector</p> <p>Used with an high impedance probe to monitor detected RF Video from the UUT.</p>
34.	<p>SYNC OUTPUT Connector</p> <p>Used with an high impedance probe to monitor the positive going TTL level pulse (present during Transponder operation).</p> <p>NOTE: Pulse should be coincident with the leading edge of P1 of the Transponder interrogation.</p> <p>Used, with a coaxial cable connected to an external Oscilloscope Sync/Trigger Connector, for viewing XPDR Interrogation and/or Reply Pulses.</p> <p>NOTE: The coaxial cable is not supplied with the unit.</p>
35.	<p>FUSES</p> <p>Fuses input power to the Test Set. Refer to Table 1 for correct fuse size and type.</p>
36.	<p>VOLTAGE SELECT Switch</p> <p>Selects 115 or 230 VAC to match input ac power.</p>
37.	<p>AC POWER Connector</p> <p>Provides input for external ac power. Refer to para 1.5 for Power Requirements.</p>



Altitude Pulse Position Assignment Chart (ARINC 532D)
Figure 3

00807006



3. GENERAL OPERATING PROCEDURES

3.1 GENERAL

The ATC-600A-2 is a bench and ramp test instrument for Transponder and DME Test Systems.

This section contains operating instructions for the ATC-600A-2. The operating instructions contain general procedures, identifying the controls, connectors, indicators used for the individual test functions. For specific Unit Under Test (UUT) Procedures, refer to the appropriate UUT Manual.

CAUTION: WHEN OPERATING THE TEST SET IN A VERTICAL POSITION, REMOVE THE LID TO PREVENT THE TEST SET FROM TIPPING OVER.

Refer to 1-2-2, Figure 2 for location of controls, connectors and indicators.

3.2 RAMP OPERATION EQUIPMENT

Ramp testing requires the use of a remote test antenna and tripod.

3.3 BENCH OPERATION EQUIPMENT

Bench testing requires the use of a 34 dB pad and direct coaxial cable connections between the Test Set and UUT.

NOTE: The 34 dB pad and coaxial cable are not supplied with the unit.

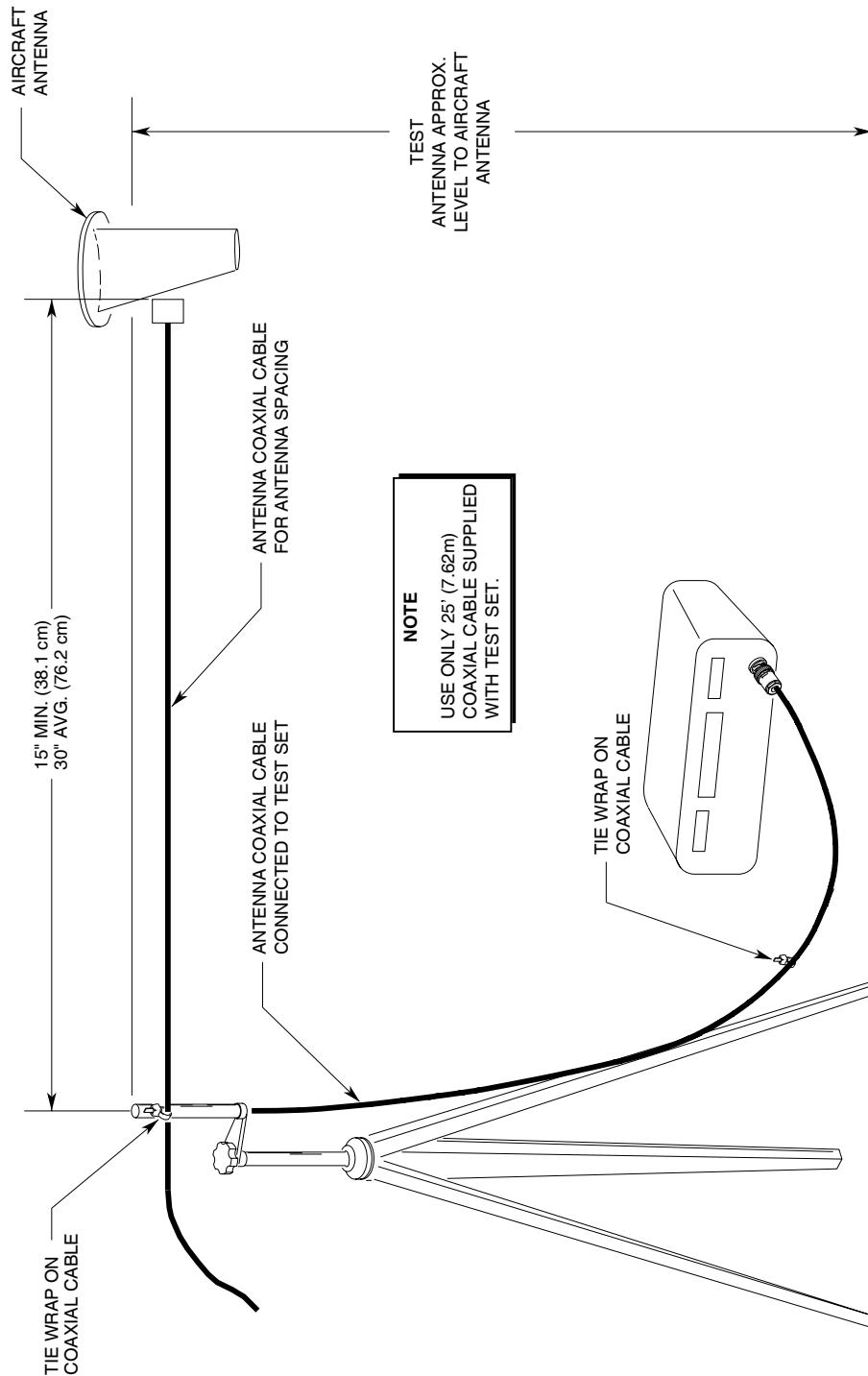
3.4 BATTERY PARAMETERS

The battery permits completely portable ramp operation for up to two hours.

In battery operation, an automatic timer turns the Test Set OFF after 7-10 minutes. The Test Set can be recycled by pressing the PWR/BAT Switch to the **BAT** position.

When the BAT Test Switch is pressed, the XPDR % RPLY/DME PRF MTR displays the battery voltage. Normal battery charged condition is indicated as well within the white band. The left edge of the white band indicates 12.1 V). An automatic low voltage cutoff circuit turns the Test Set OFF when the battery voltage drops under 11.7 V.

NOTE: If the Test Set is used only for bench operation, the battery can lose storage ability. The Test Set should be operated periodically on battery power to allow the battery to partially discharge.



Ramp Operation Test Equipment Setup
Figure 4



3.5 TRANSPONDER OPERATION TEST EQUIPMENT SETUP

Refer to Figure 4.

STEP	PROCEDURE
1.	Set up the remote test antenna on the tripod. Adjust test antenna height to be equal to aircraft Transponder antenna. (Test antenna is usually positioned for convenience.)
2.	Horizontally position test antenna the distance from the aircraft antenna indicated on the test antenna's coaxial cable, approximately 21 in (53.34 cm).
3.	Route loose end of coaxial cable into the aircraft via a vent window, door or other opening.
CAUTION:	DAMAGE TO THE TEST SET COULD RESULT WHEN THE REMOTE TEST ANTENNA IS POSITIONED CLOSER THAN 15 IN (38.1 CM) TO THE AIRCRAFT ANTENNA WHEN THE TEST SET IS ON.

3.6 TRANSPONDER OPERATION TESTS

3.6.1 Pilot's Code

STEP	PROCEDURE
1.	Press PWR/BAT Switch to BAT .
2.	Connect remote test antenna coaxial cable to RF INPUT/OUTPUT Connector.
3.	Set MODE Switch to A/C CODE .
4.	Power-up aircraft Transponder; let run in "standby" for several minutes. Set Transponder Control Head to A/C Mode. Set pilot's code into Control Head.
5.	Verify NUMERICAL Readout displays pilot's code.
6.	Verify appropriate OCTAL READOUT Indicators are lit.



3.6.2 Altitude Code

STEP	PROCEDURE
1.	Set MODE Switch to A/C ALT .
2.	Verify NUMERICAL Readout displays output of encoding altimeter in thousands of feet (if the Baro Knob on the encoding altimeter is set to 29.92 in [76.0 cm] Hg).
3.	Verify appropriate OCTAL READOUT Indicators are lit.
NOTE: The encoding altimeter code output is unaffected by changing the Baro Knob setting and always indicates altitude referenced to 29.92 in (76.0 cm) Hg.	

3.6.3 Peak Transponder Power

STEP	PROCEDURE
1.	Set MODE Switch to A/C ALT, ALT CODE or A .
2.	Set FREQ/PWR Switch to PWR .
3.	Verify FREQ/PWR Meter displays the Transponder's peak transmitting power.

3.6.4 Transponder Frequency

STEP	PROCEDURE
1.	Set FREQ/PWR Switch to PWR .
2.	Set Pilot's Code of 0000 into Transponder Control Head and remove all attitude code pulses.
3.	Adjust FREQ GAIN Control for a mid-scale FREQ/PWR Meter indication.
4.	Rotate XMTR FREQ Control for a peak FREQ/PWR Meter indication.
5.	At the peak indication, read deviation (in MHz) (from 1090 MHz) directly from XMTR FREQ Control.

3.6.5 Percent Reply

STEP	PROCEDURE
NOTE:	The XPDR % RPLY/DME PRF Meter displays the percent reply of the Transponder to interrogations from the Test Set.
NOTE:	The XPDR % RPLY/DME PRF Meter should display 100% for normal operating conditions.

3.6.6 SLS Operation

STEP	PROCEDURE
1.	Set MODE Switch to A/C ALT or A/C CODE .
2.	Using XPDR SIGNAL LEVEL Control, set RF level output to 3 dB above minimum trigger level (MTL). CAUTION: DAMAGE TO THE TEST SET COULD RESULT WHEN THE REMOTE TEST ANTENNA IS POSITIONED CLOSER THAN 15 IN (38.1 CM) TO THE AIRCRAFT ANTENNA WHEN THE TEST SET IS ON.
3.	Set 0/OFF/-9 dB SLS Switch to 0dB .
4.	Verify Transponder maintains $\leq 3\%$ reply on XPDR % RPLY/DME PRF Meter.
5.	Set 0/OFF/-9 dB SLS Switch to -9dB .
6.	Verify Transponder maintains $>90\%$ reply on XPDR % RPLY/DME PRF Meter.

3.6.7 IDENT (XPDR) Pulse Output

STEP	PROCEDURE
1.	Press Ident Button on the Transponder Control Head.
2.	Verify IDENT PULSE Indicator is lit. (IDENT PULSE Indicator stays lit for duration of IDENT pulse - approximately 30 seconds.) NOTE: When the Test Set is in A/C ALT Mode, the Ident Pulse is paired with the D4 pulse.

3.6.8 Invalid ALT Indicator

STEP	PROCEDURE
NOTE:	When lit, indicates a received altitude code has an unassigned combination of codes.
NOTE:	The conditions to VALID Altitude information are the presence of at least one of the C Pulses (C1, C2 or C4) and never C1 and C4 ON at the same time.

3.6.9 XPDR Receiver-Decoder Limits

STEP	PROCEDURE
1.	Adjust INTERROGATION SPACING Control left of 0 until the XPDR % RPLY/DME PRF Meter falls to 0. (Transponder decoder input limits are exceeded.) Note reading.
2.	Adjust INTERROGATION SPACING Control right of 0 until the XPDR % RPLY/DME PRF Meter falls to 0. (Transponder decoder input limits are exceeded.) Note reading.
NOTE:	The INTERROGATION SPACING Control is normally set to 0.
NOTE:	Transponder Decoder limits should be symetrical above the "0" setting on the INTERROGATION SPACING Control.

3.6.10 Transponder Pulse Spacing

STEP	PROCEDURE
NOTE:	If the F2 PULSE SPACING Indicator is lit, the F2 pulse of the reply is either missing or is improperly spaced.
1.	Adjust FRAMING PULSE SPACING Control left of zero until the F2 PULSE SPACING Indicator is lit. Note position of FRAMING PULSE SPACING Control.
2.	Adjust FRAMING PULSE SPACING Control right of zero until the F2 PULSE SPACING Indicator is lit. Note position of FRAMING PULSE SPACING Control.
3.	Calculate difference between position in Step 1 and position in Step 2 - this is the approximate width of the F2 pulse.
NOTE:	If the F2 pulse is displaced, the other reply pulses may be skewed out of position proportionally.
NOTE:	Transponder Decoder limits should be symmetrical above the "0" setting on the INTERROGATION SPACING Control.

3.6.11 Receiver Sensitivity

STEP	PROCEDURE
1.	Set MODE Switch to A/C CODE .
2.	Adjust XPDR SIG LEVEL Control fully ccw.
3.	Verify XPDR % RPLY/DME PRF Meter displays 100% reply.
4.	Adjust XPDR SIG LEVEL Control cw until XPDR % RPLY/DME PRF Meter displays 90% reply.
5.	Note position on XPDR SIG LEVEL Control. (This is the minimum trigger level [MTL] of the Transponder in - dBm.)
6.	Verify MTL is -69 dBm to -77 dBm (± 1.5 dBm) with a 34 dB pad. Record MTL.
7.	Set MODE Switch to A/C ALT .
8.	Repeat Steps 2-6.
9.	Verify receiver sensitivity (difference in MTL of A/C CODE and A/C ALT) is ≤ 1.0 dBm.
10.	Adjust XPDR SIG LEVEL Control fully ccw.



3.7 DME OPERATION TEST EQUIPMENT SETUP

Refer to 1-2-2, Figure 4.

STEP	PROCEDURE
1.	Set up the remote test antenna on the tripod. Adjust test antenna height to be equal to aircraft Transponder antenna. (Test antenna is usually positioned for convenience.)
2.	Horizontally position test antenna the distance from the aircraft antenna indicated on the test antenna's coaxial cable, approximately 21 in (53.34 cm).
3.	Route loose end of coaxial cable into the aircraft via a vent window, door or other opening.
CAUTION:	DAMAGE TO THE TEST SET COULD RESULT WHEN THE REMOTE TEST ANTENNA IS POSITIONED CLOSER THAN 15 IN (38.1 CM) TO THE AIRCRAFT ANTENNA WHEN THE TEST SET IS ON.

3.8 DME OPERATION TESTS

3.8.1 DME Range or Distance Operation

STEP	PROCEDURE
1.	Press PWR/BAT Switch to BAT .
2.	Power-up airborne DME and allow several minutes for warm-up.
3.	Set DME to Distance Display Mode in desired range scale.
4.	Set DME Frequency to 108.00 .
5.	Set MODE Switch to DME .
6.	Set DME RANGE/VELOCITY Switch to RANGE .
7.	Set DME CHANNEL Switch to 17X .
8.	Set SQUITTER ON/OFF Switch to SQTR .
9.	Set FAST SLEW Switch and SLOW SLEW Switch to IN then to OUT (to obtain a desired distance in nautical miles).
10.	Verify DME locks on at the precise range programmed.
NOTE:	Any number of different distances from 0 to 399 NM may be similarly checked in 1 NM increments.

3.8.2 DME Velocity Operation

STEP	PROCEDURE
1.	Press PWR/BAT Switch to BAT .
2.	Power-up airborne DME and allow several minutes for warm-up.
3.	Set DME to Distance Display Mode in desired range scale.
4.	Set DME Frequency to 108.00 .
5.	Set MODE Switch to DME .
6.	Set DME RANGE/VELOCITY Switch to desired velocity setting.
7.	Set VELOCITY HI/LO RANGE Switch to HI (selects upper value) or to LO (select lower value).
8.	Set FAST SLEW Switch and SLOW SLEW Switch to IN then to OUT (to set a desired starting range).
9.	Set VELOCITY IN/OUT Switch to IN then to OUT (to track the distance toward or away from the ground station).
10.	Verify DME locks on and displays the correct range and velocity.
<p>NOTE: If the DME is set to display distance in nautical miles (NM), the distance should equal the instantaneous range indicated on the Test Set NUMERICAL Readout in 0.1 NM.</p> <p>NOTE: Any number of velocities and instantaneous distances may be similarly checked.</p>	

3.8.3 DME Transmitted PRF

STEP	PROCEDURE
1.	Lock DME to desired range or velocity.
2.	Set Test Set DME PRF Switch to 0-30 .
3.	Verify XPDR % RPLY/DME PRF Meter indicates Track PRF .
4.	Increase Test Set range by 50 Miles.
5.	Set Test Set DME PRF Switch to 0-300 .
6.	Verify XPDR % RPLY/DME PRF Meter indicates Search PRF as DME searches for the new range or velocity.
<p>NOTE: DME "memory time" should hold the last displayed range for 8 to 10 seconds before unlocking the the range and searching for the new range.</p>	

3.8.4 Transmitter Peak Power and Frequency

STEP	PROCEDURE
1.	Connect DME to Test Set.
2.	Set FREQ/PWR Switch to PWR .
3.	Verify RF peak power is displayed on FREQ/PWR Meter in kW.
4.	To check crystal tolerance: <ul style="list-style-type: none"> ● Set FREQ/PWR Switch to FREQ. ● Adjust FREQ GAIN Control for mid-scale deflection on FREQ/PWR Meter. ● Adjust XMTR FREQ Control for peak reading on FREQ/PWR Meter.
NOTE: The Plus (+) and minus (-) signs on the XMTR FREQ Control are reversed in DME operation (positive values are left of zero and negative values are right of zero).	

3.8.5 IDENT Tone

STEP	PROCEDURE
1.	Set IDENT/50% RPLY Switch to IDENT .
2.	Verify 1350 Hz tone is heard through the audio system.
NOTE: Addition of the IDENT Tone is a good check of memory time, as the IDENT Tone supersedes all range and squitter pulses.	

3.8.6 Percent Reply

STEP	PROCEDURE
1.	Set IDENT/50% RPLY Switch to 50% RPLY .
2.	Verify 50% of all replies to the DME are deleted.
NOTE: Deleting half of all replies to the DME checks the ability of the DME to lock-on or to track under poor signal conditions.	

3.8.7 Squitter Lock-Out

STEP	PROCEDURE
1.	Set SQUITTER ON/OFF Switch to OFF .
2.	Slew range to desired position.
3.	Set DME to appropriate channel:
	17X 108.00
	18X 108.10
	17Y 108.05
4.	Verify after DME memory time, the DME drops out without searching.
NOTE: Most DME Systems are equipped with a Squitter Lock-Out to prevent searching until the Squitter is received.	
5.	Set SQUITTER ON/OFF Switch to SQTR .
6.	Verify DME begins searching.



3.8.8 17Y Channel Operation

STEP	PROCEDURE
1.	Set Aircraft Frequency Control to 108.05.
2.	Set Test Set DME CHANNEL Switch to 17Y .
3.	Perform tests in para 1-2-3.8.1 through 1-2-3.8.7.

3.8.9 DME ILS Channel Operation

STEP	PROCEDURE
1.	Set Aircraft Frequency Control to 108.10.
2.	Set Test Set DME CHANNEL Switch to 18X .
3.	Perform tests in para 1-2-3.8.1 through 1-2-3.8.7.

NOTE: The nominal transmitter frequency control reading should be -1. the DME transmitter frequency should increment by 1 MHz when channeled from 108.00 to 108.10.

3.9 ENCODING ALTIMETER OPERATION TEST EQUIPMENT SET UP

STEP	PROCEDURE
------	-----------

1. Ensure test cable is wired according to 1-2-3, Table 3.

PIN	FUNCTION
1	A1
2	A2
3	A4
4	B1
5	B2
6	B4
7	C1
8	C2
9	C4
10	Blank
11	D2
12	D4
13	GND
14	+5 V
15	Test Input

Encoder Connector Pin Assignments
Table 3

2. Operational considerations are as follows:
 - Open circuit voltage on Pins 1-12 (except Pin 10) is +5 Vdc.
 - Input impedance is 33 k Ω .
 - To gain correct altitude information transfer when testing, information lines must be pulled to GND (Pin 13) or within 1 V of GND.
 - Maximum allowable altimeter leakage current is 50 μ A.
 - Altimeter strobe must be grounded.

STEP	PROCEDURE
------	-----------

- Pins 14 and 15 of Test Set ALTITUDE ENCODER INPUT Connector must be jumpered for proper readings during Encoding Altimeter tests.
 - The Encoding Altimeter signal common must be connected to the Test Set chassis ground.
 - The dc power source for the Encoding Altimeter must be from an external dc power source.
 - The dc power ground and signal ground must be common to Pin 13 of the Test Set ALTITUDE ENCODER INPUT Connector.
 - Check Encoding Altimeter specifications to ensure the Encoding Altimeter can handle the current (+5 Vdc through the 33 k Ω input impedance) on the information lines.
2. Connect test cable between Encoding Altimeter and Test Set ALTITUDE ENCODER INPUT Connector.



3.10 ENCODING ALTIMETER TESTS

3.10.1 Altitude Display

STEP	PROCEDURE
1.	Verify NUMERICAL Readout displays altitude information from -1.0 to _126.7 thousand feet. (Refer to 1-2-3, Figure 3 for attitude code information.)
2.	Verify OCTAL READOUT Indicators display proper pulse position.



THIS PAGE INTENTIONALLY LEFT BLANK.

SECTION 3 - SPECIFICATIONS

1. ATC-600A-2 SPECIFICATIONS

1.1 TRANSPONDER

Interrogations Output:

Mode:	A/C, Altitude or Pilot code, 2:1 interlace, or mode A (B mode available upon request)
Pulse Spacing:	P2 and P3 variable with respect to P1 ($\pm 1 \mu\text{s}$) from nominal for input decoder tests
PRF:	235 Hz Nominal
SLS Test:	$\pm 1.0 \text{ dB}$ P2 inserted at 0 dB or -9 dB relative to P1
Power:	-66 to -79 dBm direct with 34 dB pad ($\pm 1.5 \text{ dB}$)

Reply Measurements:

Power (UUT):	10 W to 1.5 kW peak ($\pm 20\%$), direct with 34 dB pad
Accuracy:	$\pm 3 \text{ dB}$ radiated with properly spaced antenna
Frequency Check:	1086 to 1093 MHz ($\pm 0.3 \text{ MHz}$)
Altitude Code:	Binary and Numerical Readout, -1.0 to +126.7 thousand feet
Pilot Code:	Binary and Numerical Readout, 0000 to 7777
Percent Reply:	0 to 100%, either A/C or A(B) modes
F2 Pulse Position:	Measurement of rising and falling edge ($\pm 0.5 \mu\text{s}$) from nominal
Status Lamps:	Ident Pulses, Invalid Altitude Code and No Altitude Code
Encoder Test:	Direct connection accepts altitude encoder

1.2 DME

Interrogations Measurements:

PRF:	0 to 30 and 0 to 300 Hz
Power (UUT):	10 W to 1.5 kW ($\pm 20\%$), direct with 34 dB pad
Accuracy:	$\pm 3 \text{ dB}$ radiated with properly spaced antenna
Frequency Check:	1038 to 1045 MHz ($\pm 0.3 \text{ MHz}$)

1.2 DME (cont)

Reply Output:

Frequency:

Paired with VOR:

108.00 MHz (17X channel) or
108.05 MHz (17y channel) standard;
108.10 MHz (18X channel) standard

Output Power:

≈-45 dBm direct with 34 dB pad or radiated with
properly spaced antenna

Range:

0 to 399 NM in 1 NM steps

Accuracy:

±0.07 NM (±0.02%)

Velocity:

Crystal controlled digital velocity with rates of
50, 75, 100, 150, 200, 300, 400, 600, 800, 1200,
1600 and 2400 knots (±0.02% of setting);
Inbound or outbound starting from any selected
range

Range Steps:

0.025 NM (system), 0.1 NM displayed

Percent Reply:

100% or 50%

Ident Tone:

1350 Hz (±8 Hz) with equalizing pulses

1.3 BATTERY OPERATION

Type:

2.0 AH NiCad

Duration:

≈2 hours continuous operation

1.4 ac POWER REQUIREMENTS

Source Voltage and Frequency:

100 to 120 VAC at 60 Hz
220 to 240 VAC at 50 Hz

Power Consumption:

Maximum: 24 W for 100 to 120VAC at 60 Hz
16 W for 220 to 240 VAC at 50 Hz
Nominal: 19 W for 115 VAC at 60 Hz
13 W for 230 VAC at 50 Hz

Nominal Input Current:

0.26 A at 115 VAC
0.14 A at 230 VAC

1.5 FUSE REQUIREMENTS

F1 and F2:

1.0 A, Type F, 100 to 120 VAC
0.5 A, Type F, 220 to 240 VAC

Internal
(Not Servicable by Operator)

10.0 A, Type F, 32V



1.6 SAFETY

This instrument is designed to comply with the requirements of EN61010-1/IEC1010-1, for Class 1 portable equipment and is for use in a pollution degree 2 environment. The equipment is designed to operate from an installation category II supply, to environmental conditions specified in paragraph 1.4 of EN61010-1.

1.7 OPERATIONAL ENVIRONMENTAL CONDITIONS

This instrument operates over temperature extremes of -20° to +50° C.

1.8 PHYSICAL CHARACTERISTICS

Weight:	≈18 lbs. (8.18 kg)
Width:	≈11.5 in (29.21 cm)
Height:	≈5.0 in (12.7 cm)
Depth:	≈16.25 in (41.275 cm)



THIS PAGE INTENTIONALLY LEFT BLANK.

SECTION 4 - SHIPPING

1. SHIPPING TEST SETS

1.1 INFORMATION

Aeroflex Test Sets returned to factory for calibration, service or repair must be repackaged and shipped according to the following conditions:

Authorization

Only return products to factory after first receiving authorization from Aeroflex Customer Service Department.

CONTACT: Aeroflex
Customer Service

Telephone: (800) 835-2350
FAX: (316) 524-2623
email: service@aeroflex.com

Tagging Test Sets

All Test Sets must be tagged with:

- Identification and address of owner
- Nature of service or repair required
- Model Number
- Serial Number

Shipping Containers

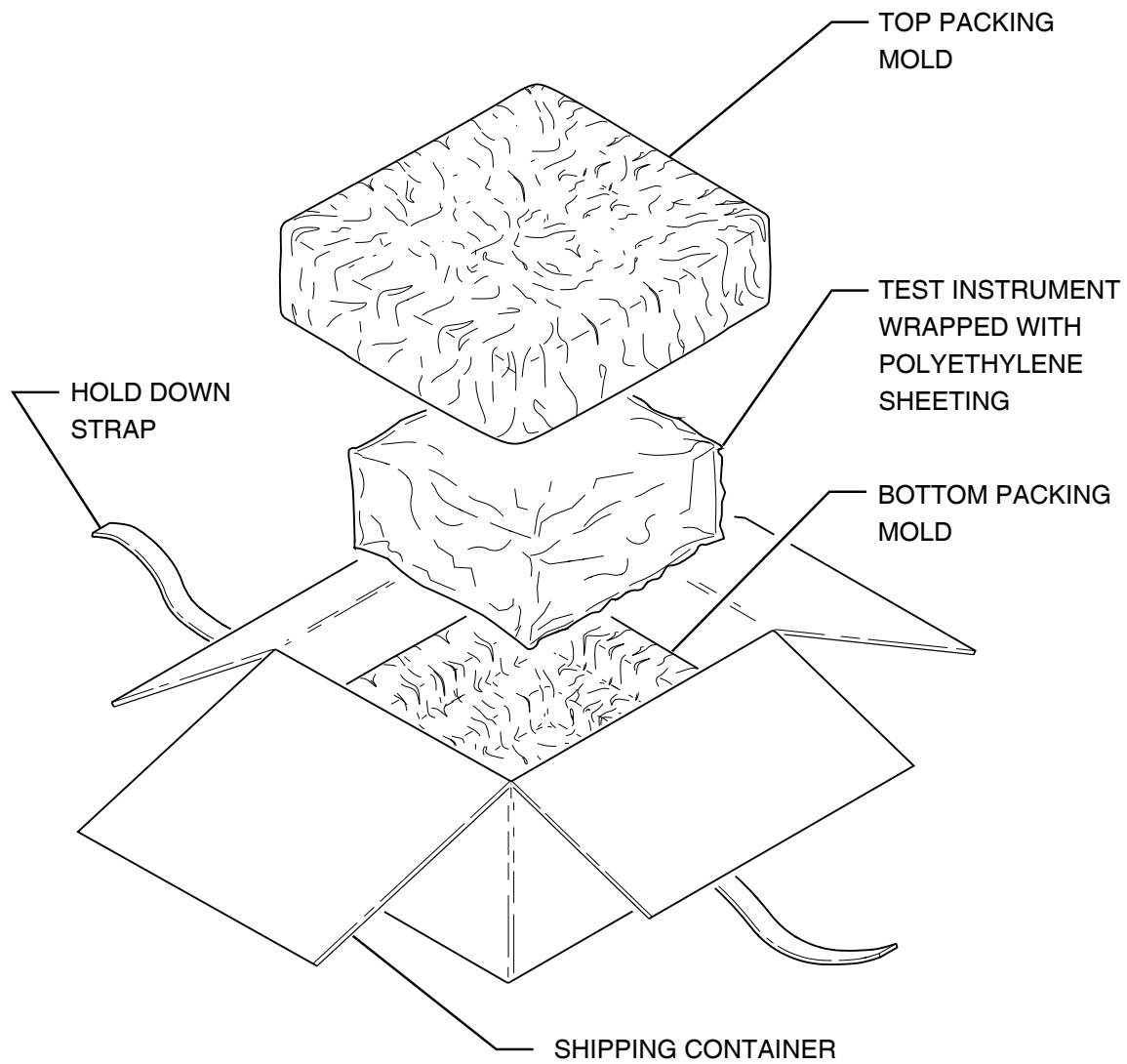
Test Sets must be repackaged in original shipping containers using Aeroflex packing molds. If original shipping containers and materials are unavailable, contact Aeroflex Customer Service for shipping instructions.

Freight Costs

All freight costs on non-warranty shipments are assumed by the customer. (See "Warranty Packet" for freight charge policy on warranty claims.)

1.2 REPACKING PROCEDURE

- Make sure bottom packing mold is seated on floor of shipping container.
- Carefully wrap Test Set with polyethylene sheeting to protect finish.
- Place Test Set into shipping container, making sure Test Set is securely seated in bottom packing mold.
- Place top packing mold over top of Test Set and press down until mold rests solidly in bottom packing mold.
- Close shipping container lids and seal with shipping tape or an industrial stapler. Tie all sides of container with break resistant rope, twine or equivalent.



Repacking Procedure
Figure 1

SECTION 5 - STORAGE

1. STORING TEST SETS

Perform the following storage precautions whenever the Test Set is stored for extended periods:

- Disconnect Test Set from any electrical power source.
- Disconnect and store ac power cable and other accessories with Test Set.
- Cover Test Set to prevent dust and debris from covering and entering Test Set.



THIS PAGE INTENTIONALLY LEFT BLANK.

APPENDIX A - CONNECTOR PIN-OUT TABLES

1. TABLE OF I/O CONNECTORS

CONNECTOR	TYPE	SIGNAL TYPE	INPUT/OUTPUT
AC POWER	IEC320	ac Line Power	INPUT
RF	BNC	RF	INPUT/OUTPUT
DETECTED RF VIDEO	BNC	Video	INPUT/OUTPUT
DIODE SWITCH INPUT SIGNAL	BNC	Video	INPUT/OUTPUT
SYNC	BNC	TTL	OUTPUT

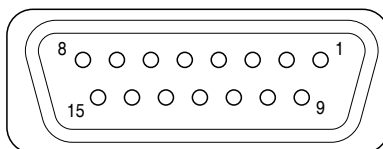
I/O Connectors
Table 1

2. ALTITUDE ENCODER INPUT CONNECTOR PIN-OUT TABLE

PIN NO.	SIGNAL TYPE	PIN NO.	SIGNAL TYPE
1	A1	9	C4
2	A2	10	N/C
3	A4	11	D2
4	B1	12	D4
5	B2	13	GND
6	B4	14	+5 V SUPPLY
7	C1	15	+5 V ENCODER
8	C2		

Pin-Out for Altitude Encoder Input Connector
Table 1

ENCODER



00820007



THIS PAGE INTENTIONALLY LEFT BLANK.



APPENDIX B - ALTITUDE TRANSMISSION CODE CHART

RANGE	PULSE POSITION										
(Altitude in Thousands)	D ₂	D ₄ and SPI	A ₁	A ₂	A ₄	B ₁	B ₂	B ₄	C ₁	C ₂	C ₄
-1.0	0	0	0	0	0	0	0	0	0	1	0
-0.9	0	0	0	0	0	0	0	0	1	1	0
-0.8	0	0	0	0	0	0	0	0	1	0	0
-0.7	0	0	0	0	0	0	0	1	1	0	0
-0.6	0	0	0	0	0	0	0	1	1	1	0
-0.5	0	0	0	0	0	0	0	1	0	1	0
-0.4	0	0	0	0	0	0	0	1	0	1	1
-0.3	0	0	0	0	0	0	0	1	0	0	1
-0.2	0	0	0	0	0	0	1	1	0	0	1
-0.1	0	0	0	0	0	0	1	1	0	1	1
0.0	0	0	0	0	0	0	1	1	0	1	0
0.1	0	0	0	0	0	0	1	1	1	1	0
0.2	0	0	0	0	0	0	1	1	1	0	0
0.3	0	0	0	0	0	0	1	0	1	0	0
0.4	0	0	0	0	0	0	1	0	1	1	0
0.5	0	0	0	0	0	0	1	0	0	1	0
0.6	0	0	0	0	0	0	1	0	0	1	1
0.7	0	0	0	0	0	0	1	0	0	0	1
0.8	0	0	0	0	0	1	1	0	0	0	1
0.9	0	0	0	0	0	1	1	0	0	1	1
1.0	0	0	0	0	0	1	1	0	0	1	0
1.1	0	0	0	0	0	1	1	0	1	1	0
1.2	0	0	0	0	0	1	1	0	1	0	0
1.3	0	0	0	0	0	1	1	1	1	0	0
1.4	0	0	0	0	0	1	1	1	1	1	0
1.5	0	0	0	0	0	1	1	1	0	1	0
1.6	0	0	0	0	0	1	1	1	0	1	1
1.7	0	0	0	0	0	1	1	1	0	0	1
1.8	0	0	0	0	0	1	0	1	0	0	1
1.9	0	0	0	0	0	1	0	1	0	1	1
2.0	0	0	0	0	0	1	0	1	0	1	0
2.1	0	0	0	0	0	1	0	1	1	1	0
2.2	0	0	0	0	0	1	0	1	1	0	0
2.3	0	0	0	0	0	1	0	0	1	0	0
2.4	0	0	0	0	0	1	0	0	1	1	0



RANGE	PULSE POSITION										
(Altitude in Thousands)	D ₂	D ₄ and SPI	A ₁	A ₂	A ₄	B ₁	B ₂	B ₄	C ₁	C ₂	C ₄
2.5	0	0	0	0	0	1	0	0	0	1	0
2.6	0	0	0	0	0	1	0	0	0	1	1
2.7	0	0	0	0	0	1	0	0	0	0	1
2.8	0	0	0	0	1	1	0	0	0	0	1
2.9	0	0	0	0	1	1	0	0	0	1	1
3.0	0	0	0	0	1	1	0	0	0	1	0
3.1	0	0	0	0	1	1	0	0	1	1	0
3.2	0	0	0	0	1	1	0	0	1	0	0
3.3	0	0	0	0	1	1	0	1	1	0	0
3.4	0	0	0	0	1	1	0	1	1	1	0
3.5	0	0	0	0	1	1	0	1	0	1	0
3.6	0	0	0	0	1	1	0	1	0	1	1
3.7	0	0	0	0	1	1	0	1	0	0	1
3.8	0	0	0	0	1	1	1	1	0	0	1
3.9	0	0	0	0	1	1	1	1	0	1	1
4.0	0	0	0	0	1	1	1	1	0	1	0
4.1	0	0	0	0	1	1	1	1	1	1	0
4.2	0	0	0	0	1	1	1	1	1	0	0
4.3	0	0	0	0	1	1	1	0	1	0	0
4.4	0	0	0	0	1	1	1	0	1	1	0
4.5	0	0	0	0	1	1	1	0	0	1	0
4.6	0	0	0	0	1	1	1	0	0	1	1
4.7	0	0	0	0	1	1	1	0	0	0	1
4.8	0	0	0	0	1	0	1	0	0	0	1
4.9	0	0	0	0	1	0	1	0	0	1	1
5.0	0	0	0	0	1	0	1	0	0	1	0
5.1	0	0	0	0	1	0	1	0	1	1	0
5.2	0	0	0	0	1	0	1	0	1	0	0
5.3	0	0	0	0	1	0	1	1	1	0	0
5.4	0	0	0	0	1	0	1	1	1	1	0
5.5	0	0	0	0	1	0	1	1	0	1	0
5.6	0	0	0	0	1	0	1	1	0	1	1
5.7	0	0	0	0	1	0	1	1	0	0	1
5.8	0	0	0	0	1	0	0	1	0	0	1
5.9	0	0	0	0	1	0	0	1	0	1	1



RANGE	PULSE POSITION										
(Altitude in Thousands)	D ₂	D ₄ and SPI	A ₁	A ₂	A ₄	B ₁	B ₂	B ₄	C ₁	C ₂	C ₄
6.0	0	0	0	0	1	0	0	1	0	1	0
6.1	0	0	0	0	1	0	0	1	1	1	0
6.2	0	0	0	0	1	0	0	1	1	0	0
6.3	0	0	0	0	1	0	0	0	1	0	0
6.4	0	0	0	0	1	0	0	0	1	1	0
6.5	0	0	0	0	1	0	0	0	0	1	0
6.6	0	0	0	0	1	0	0	0	0	1	1
6.7	0	0	0	0	1	0	0	0	0	0	1
6.8	0	0	0	1	1	0	0	0	0	0	1
6.9	0	0	0	1	1	0	0	0	0	1	1
7.0	0	0	0	1	1	0	0	0	0	1	0
7.1	0	0	0	1	1	0	0	0	1	1	0
7.2	0	0	0	1	1	0	0	0	1	0	0
7.3	0	0	0	1	1	0	0	1	1	0	0
7.4	0	0	0	1	1	0	0	1	1	1	0
7.5	0	0	0	1	1	0	0	1	0	1	0
7.6	0	0	0	1	1	0	0	1	0	1	1
7.7	0	0	0	1	1	0	0	1	0	0	1
7.8	0	0	0	1	1	0	1	1	0	0	1
7.9	0	0	0	1	1	0	1	1	0	1	1
8.0	0	0	0	1	1	0	1	1	0	1	0
8.1	0	0	0	1	1	0	1	1	1	1	0
8.2	0	0	0	1	1	0	1	1	1	0	0
8.3	0	0	0	1	1	0	1	0	1	0	0
8.4	0	0	0	1	1	0	1	0	1	1	0
8.5	0	0	0	1	1	0	1	0	0	1	0
8.6	0	0	0	1	1	0	1	0	0	1	1
8.7	0	0	0	1	1	0	1	0	0	0	1
8.8	0	0	0	1	1	1	1	0	0	0	1
8.9	0	0	0	1	1	1	1	0	0	1	1
9.0	0	0	0	1	1	1	1	0	0	1	0
9.1	0	0	0	1	1	1	1	0	1	1	0
9.2	0	0	0	1	1	1	1	0	1	0	0
9.3	0	0	0	1	1	1	1	1	1	0	0
9.4	0	0	0	1	1	1	1	1	1	1	0
9.5	0	0	0	1	1	1	1	1	0	1	0
9.6	0	0	0	1	1	1	1	1	0	1	1
9.7	0	0	0	1	1	1	1	1	0	0	1
9.8	0	0	0	1	1	1	0	1	0	0	1
9.9	0	0	0	1	1	1	0	1	0	1	1



RANGE	PULSE POSITION										
(Altitude in Thousands)	D ₂	D ₄ and SPI	A ₁	A ₂	A ₄	B ₁	B ₂	B ₄	C ₁	C ₂	C ₄
10.0	0	0	0	1	1	1	0	1	0	1	0
10.1	0	0	0	1	1	1	0	1	1	1	0
10.2	0	0	0	1	1	1	0	1	1	0	0
10.3	0	0	0	1	1	1	0	0	1	0	0
10.4	0	0	0	1	1	1	0	0	1	1	0
10.5	0	0	0	1	1	1	0	0	0	1	0
10.6	0	0	0	1	1	1	0	0	0	1	1
10.7	0	0	0	1	1	1	0	0	0	0	1
10.8	0	0	0	1	0	1	0	0	0	0	1
10.9	0	0	0	1	0	1	0	0	0	1	1
11.0	0	0	0	1	0	1	0	0	0	1	0
11.1	0	0	0	1	0	1	0	0	1	1	0
11.2	0	0	0	1	0	1	0	0	1	0	0
11.3	0	0	0	1	0	1	0	1	1	0	0
11.4	0	0	0	1	0	1	0	1	1	1	0
11.5	0	0	0	1	0	1	0	1	0	1	0
11.6	0	0	0	1	0	1	0	1	0	1	1
11.7	0	0	0	1	0	1	0	1	0	0	1
11.8	0	0	0	1	0	1	1	1	0	0	1
11.9	0	0	0	1	0	1	1	1	0	1	1
12.0	0	0	0	1	0	1	1	1	0	1	0
12.1	0	0	0	1	0	1	1	1	1	1	0
12.2	0	0	0	1	0	1	1	1	1	0	0
12.3	0	0	0	1	0	1	1	0	1	0	0
12.4	0	0	0	1	0	1	1	0	1	1	0
12.5	0	0	0	1	0	1	1	0	0	1	0
12.6	0	0	0	1	0	1	1	0	0	1	1
12.7	0	0	0	1	0	1	1	0	0	0	1
12.8	0	0	0	1	0	0	1	0	0	0	1
12.9	0	0	0	1	0	0	1	0	0	1	1
13.0	0	0	0	1	0	0	1	0	0	1	0
13.1	0	0	0	1	0	0	1	0	1	1	0
13.2	0	0	0	1	0	0	1	0	1	0	0
13.3	0	0	0	1	0	0	1	1	1	0	0
13.4	0	0	0	1	0	0	1	1	1	1	0
13.5	0	0	0	1	0	0	1	1	0	1	0
13.6	0	0	0	1	0	0	1	1	0	1	1
13.7	0	0	0	1	0	0	1	1	0	0	1
13.8	0	0	0	1	0	0	0	1	0	0	1
13.9	0	0	0	1	0	0	0	1	0	1	1



RANGE	PULSE POSITION										
(Altitude in Thousands)	D ₂	D ₄ and SPI	A ₁	A ₂	A ₄	B ₁	B ₂	B ₄	C ₁	C ₂	C ₄
14.0	0	0	0	1	0	0	0	1	0	1	0
14.1	0	0	0	1	0	0	0	1	1	1	0
14.2	0	0	0	1	0	0	0	1	1	0	0
14.3	0	0	0	1	0	0	0	0	1	0	0
14.4	0	0	0	1	0	0	0	0	1	1	0
14.5	0	0	0	1	0	0	0	0	0	1	0
14.6	0	0	0	1	0	0	0	0	0	1	1
14.7	0	0	0	1	0	0	0	0	0	0	1
14.8	0	0	1	1	0	0	0	0	0	0	1
14.9	0	0	1	1	0	0	0	0	0	1	1
15.0	0	0	1	1	0	0	0	0	0	1	0
15.1	0	0	1	1	0	0	0	0	1	1	0
15.2	0	0	1	1	0	0	0	0	1	0	0
15.3	0	0	1	1	0	0	0	1	1	0	0
15.4	0	0	1	1	0	0	0	1	1	1	0
15.5	0	0	1	1	0	0	0	1	0	1	0
15.6	0	0	1	1	0	0	0	1	0	1	1
15.7	0	0	1	1	0	0	0	1	0	0	1
15.8	0	0	1	1	0	0	1	1	0	0	1
15.9	0	0	1	1	0	0	1	1	0	1	1
16.0	0	0	1	1	0	0	1	1	0	1	0
16.1	0	0	1	1	0	0	1	1	1	1	0
16.2	0	0	1	1	0	0	1	1	1	0	0
16.3	0	0	1	1	0	0	1	0	1	0	0
16.4	0	0	1	1	0	0	1	0	1	1	0
16.5	0	0	1	1	0	0	1	0	0	1	0
16.6	0	0	1	1	0	0	1	0	0	1	1
16.7	0	0	1	1	0	0	1	0	0	0	1
16.8	0	0	1	1	0	1	1	0	0	0	1
16.9	0	0	1	1	0	1	1	0	0	1	1
17.0	0	0	1	1	0	1	1	0	0	1	0
17.1	0	0	1	1	0	1	1	0	1	1	0
17.2	0	0	1	1	0	1	1	0	1	0	0
17.3	0	0	1	1	0	1	1	1	1	0	0
17.4	0	0	1	1	0	1	1	1	1	1	0
17.5	0	0	1	1	0	1	1	1	0	1	0
17.6	0	0	1	1	0	1	1	1	0	1	1
17.7	0	0	1	1	0	1	1	1	0	0	1
17.8	0	0	1	1	0	1	0	1	0	0	1
17.9	0	0	1	1	0	1	0	1	0	1	1



RANGE	PULSE POSITION										
(Altitude in Thousands)	D ₂	D ₄ and SPI	A ₁	A ₂	A ₄	B ₁	B ₂	B ₄	C ₁	C ₂	C ₄
18.0	0	0	1	1	0	1	0	1	0	1	0
18.1	0	0	1	1	0	1	0	1	1	1	0
18.2	0	0	1	1	0	1	0	1	1	0	0
18.3	0	0	1	1	0	1	0	0	1	0	0
18.4	0	0	1	1	0	1	0	0	1	1	0
18.5	0	0	1	1	0	1	0	0	0	1	0
18.6	0	0	1	1	0	1	0	0	0	1	1
18.7	0	0	1	1	0	1	0	0	0	0	1
18.8	0	0	1	1	1	1	0	0	0	0	1
18.9	0	0	1	1	1	1	0	0	0	1	1
19.0	0	0	1	1	1	1	0	0	0	1	0
19.1	0	0	1	1	1	1	0	0	1	1	0
19.2	0	0	1	1	1	1	0	0	1	0	0
19.3	0	0	1	1	1	1	0	1	1	0	0
19.4	0	0	1	1	1	1	0	1	1	1	0
19.5	0	0	1	1	1	1	0	1	0	1	0
19.6	0	0	1	1	1	1	0	1	0	1	1
19.7	0	0	1	1	1	1	0	1	0	0	1
19.8	0	0	1	1	1	1	1	1	0	0	1
19.9	0	0	1	1	1	1	1	1	0	1	1
20.0	0	0	1	1	1	1	1	1	0	1	0
20.1	0	0	1	1	1	1	1	1	1	1	0
20.2	0	0	1	1	1	1	1	1	1	0	0
20.3	0	0	1	1	1	1	1	0	1	0	0
20.4	0	0	1	1	1	1	1	0	1	1	0
20.5	0	0	1	1	1	1	1	0	0	1	0
20.6	0	0	1	1	1	1	1	0	0	1	1
20.7	0	0	1	1	1	1	1	0	0	0	1
20.8	0	0	1	1	1	0	1	0	0	0	1
20.9	0	0	1	1	1	0	1	0	0	1	1
21.0	0	0	1	1	1	0	1	0	0	1	0
21.1	0	0	1	1	1	0	1	0	1	1	0
21.2	0	0	1	1	1	0	1	0	1	0	0
21.3	0	0	1	1	1	0	1	1	1	0	0
21.4	0	0	1	1	1	0	1	1	1	1	0
21.5	0	0	1	1	1	0	1	1	0	1	0
21.6	0	0	1	1	1	0	1	1	0	1	1
21.7	0	0	1	1	1	0	1	1	0	0	1
21.8	0	0	1	1	1	0	0	1	0	0	1
21.9	0	0	1	1	1	0	0	1	0	1	1



RANGE	PULSE POSITION										
(Altitude in Thousands)	D ₂	D ₄ and SPI	A ₁	A ₂	A ₄	B ₁	B ₂	B ₄	C ₁	C ₂	C ₄
22.0	0	0	1	1	1	0	0	1	0	1	0
22.1	0	0	1	1	1	0	0	1	1	1	0
22.2	0	0	1	1	1	0	0	1	1	0	0
22.3	0	0	1	1	1	0	0	0	1	0	0
22.4	0	0	1	1	1	0	0	0	1	1	0
22.5	0	0	1	1	1	0	0	0	0	1	0
22.6	0	0	1	1	1	0	0	0	0	1	1
22.7	0	0	1	1	1	0	0	0	0	0	1
22.8	0	0	1	0	1	0	0	0	0	0	1
22.9	0	0	1	0	1	0	0	0	0	1	1
23.0	0	0	1	0	1	0	0	0	0	1	0
23.1	0	0	1	0	1	0	0	0	1	1	0
23.2	0	0	1	0	1	0	0	0	1	0	0
23.3	0	0	1	0	1	0	0	1	1	0	0
23.4	0	0	1	0	1	0	0	1	1	1	0
23.5	0	0	1	0	1	0	0	1	0	1	0
23.6	0	0	1	0	1	0	0	1	0	1	1
23.7	0	0	1	0	1	0	0	1	0	0	1
23.8	0	0	1	0	1	0	1	1	0	0	1
23.9	0	0	1	0	1	0	1	1	0	1	1
24.0	0	0	1	0	1	0	1	1	0	1	0
24.1	0	0	1	0	1	0	1	1	1	1	0
24.2	0	0	1	0	1	0	1	1	1	0	0
24.3	0	0	1	0	1	0	1	0	1	0	0
24.4	0	0	1	0	1	0	1	0	1	1	0
24.5	0	0	1	0	1	0	1	0	0	1	0
24.6	0	0	1	0	1	0	1	0	0	1	1
24.7	0	0	1	0	1	0	1	0	0	0	1
24.8	0	0	1	0	1	1	1	0	0	0	1
24.9	0	0	1	0	1	1	1	0	0	1	1
25.0	0	0	1	0	1	1	1	0	0	1	0
25.1	0	0	1	0	1	1	1	0	1	1	0
25.2	0	0	1	0	1	1	1	0	1	0	0
25.3	0	0	1	0	1	1	1	1	1	0	0
25.4	0	0	1	0	1	1	1	1	1	1	0
25.5	0	0	1	0	1	1	1	1	0	1	0
25.6	0	0	1	0	1	1	1	1	0	1	1
25.7	0	0	1	0	1	1	1	1	0	0	1
25.8	0	0	1	0	1	1	0	1	0	0	1
25.9	0	0	1	0	1	1	0	1	0	1	1



RANGE	PULSE POSITION										
(Altitude in Thousands)	D ₂	D ₄ and SPI	A ₁	A ₂	A ₄	B ₁	B ₂	B ₄	C ₁	C ₂	C ₄
26.0	0	0	1	0	1	1	0	1	0	1	0
26.1	0	0	1	0	1	1	0	1	1	1	0
26.2	0	0	1	0	1	1	0	1	1	0	0
26.3	0	0	1	0	1	1	0	0	1	0	0
26.4	0	0	1	0	1	1	0	0	1	1	0
26.5	0	0	1	0	1	1	0	0	0	1	0
26.6	0	0	1	0	1	1	0	0	0	1	1
26.7	0	0	1	0	1	1	0	0	0	0	1
26.8	0	0	1	0	0	1	0	0	0	0	1
26.9	0	0	1	0	0	1	0	0	0	1	1
27.0	0	0	1	0	0	1	0	0	0	1	0
27.1	0	0	1	0	0	1	0	0	1	1	0
27.2	0	0	1	0	0	1	0	0	1	0	0
27.3	0	0	1	0	0	1	0	1	1	0	0
27.4	0	0	1	0	0	1	0	1	1	1	0
27.5	0	0	1	0	0	1	0	1	0	1	0
27.6	0	0	1	0	0	1	0	1	0	1	1
27.7	0	0	1	0	0	1	0	1	0	0	1
27.8	0	0	1	0	0	1	1	1	0	0	1
27.9	0	0	1	0	0	1	1	1	0	1	1
28.0	0	0	1	0	0	1	1	1	0	1	0
28.1	0	0	1	0	0	1	1	1	1	1	0
28.2	0	0	1	0	0	1	1	1	1	0	0
28.3	0	0	1	0	0	1	1	0	1	0	0
28.4	0	0	1	0	0	1	1	0	1	1	0
28.5	0	0	1	0	0	1	1	0	0	1	0
28.6	0	0	1	0	0	1	1	0	0	1	1
28.7	0	0	1	0	0	1	1	0	0	0	1
28.8	0	0	1	0	0	0	1	0	0	0	1
28.9	0	0	1	0	0	0	1	0	0	1	1
29.0	0	0	1	0	0	0	1	0	0	1	0
29.1	0	0	1	0	0	0	1	0	1	1	0
29.2	0	0	1	0	0	0	1	0	1	0	0
29.3	0	0	1	0	0	0	1	1	1	0	0
29.4	0	0	1	0	0	0	1	1	1	1	0
29.5	0	0	1	0	0	0	1	1	0	1	0
29.6	0	0	1	0	0	0	1	1	0	1	1
29.7	0	0	1	0	0	0	1	1	0	0	1
29.8	0	0	1	0	0	0	0	1	0	0	1
29.9	0	0	1	0	0	0	0	1	0	1	1



RANGE	PULSE POSITION										
(Altitude in Thousands)	D ₂	D ₄ and SPI	A ₁	A ₂	A ₄	B ₁	B ₂	B ₄	C ₁	C ₂	C ₄
30.0	0	0	1	0	0	0	0	1	0	1	0
30.1	0	0	1	0	0	0	0	1	1	1	0
30.2	0	0	1	0	0	0	0	1	1	0	0
30.3	0	0	1	0	0	0	0	0	1	0	0
30.4	0	0	1	0	0	0	0	0	1	1	0
30.5	0	0	1	0	0	0	0	0	0	1	0
30.6	0	0	1	0	0	0	0	0	0	1	1
30.7	0	0	1	0	0	0	0	0	0	0	1
30.8	0	1	1	0	0	0	0	0	0	0	1
30.9	0	1	1	0	0	0	0	0	0	1	1
31.0	0	1	1	0	0	0	0	0	0	1	0
31.1	0	1	1	0	0	0	0	0	1	1	0
31.2	0	1	1	0	0	0	0	0	1	0	0
31.3	0	1	1	0	0	0	0	1	1	0	0
31.4	0	1	1	0	0	0	0	1	1	1	0
31.5	0	1	1	0	0	0	0	1	0	1	0
31.6	0	1	1	0	0	0	0	1	0	1	1
31.7	0	1	1	0	0	0	0	1	0	0	1
31.8	0	1	1	0	0	0	1	1	0	0	1
31.9	0	1	1	0	0	0	1	1	0	1	1
32.0	0	1	1	0	0	0	1	1	0	1	0
32.1	0	1	1	0	0	0	1	1	1	1	0
32.2	0	1	1	0	0	0	1	1	1	0	0
32.3	0	1	1	0	0	0	1	0	1	0	0
32.4	0	1	1	0	0	0	1	0	1	1	0
32.5	0	1	1	0	0	0	1	0	0	1	0
32.6	0	1	1	0	0	0	1	0	0	1	1
32.7	0	1	1	0	0	0	1	0	0	0	1
32.8	0	1	1	0	0	1	1	0	0	0	1
32.9	0	1	1	0	0	1	1	0	0	1	1
33.0	0	1	1	0	0	1	1	0	0	1	0
33.1	0	1	1	0	0	1	1	0	1	1	0
33.2	0	1	1	0	0	1	1	0	1	0	0
33.3	0	1	1	0	0	1	1	1	1	0	0
33.4	0	1	1	0	0	1	1	1	1	1	0
33.5	0	1	1	0	0	1	1	1	0	1	0
33.6	0	1	1	0	0	1	1	1	0	1	1
33.7	0	1	1	0	0	1	1	1	0	0	1
33.8	0	1	1	0	0	1	0	1	0	0	1
33.9	0	1	1	0	0	1	0	1	0	1	1



RANGE	PULSE POSITION										
(Altitude in Thousands)	D ₂	D ₄ and SPI	A ₁	A ₂	A ₄	B ₁	B ₂	B ₄	C ₁	C ₂	C ₄
34.0	0	1	1	0	0	1	0	1	0	1	0
34.1	0	1	1	0	0	1	0	1	1	1	0
34.2	0	1	1	0	0	1	0	1	1	0	0
34.3	0	1	1	0	0	1	0	0	1	0	0
34.4	0	1	1	0	0	1	0	0	1	1	0
34.5	0	1	1	0	0	1	0	0	0	1	0
34.6	0	1	1	0	0	1	0	0	0	1	1
34.7	0	1	1	0	0	1	0	0	0	0	1
34.8	0	1	1	0	1	1	0	0	0	0	1
34.9	0	1	1	0	1	1	0	0	0	1	1
35.0	0	1	1	0	1	1	0	0	0	1	0
35.1	0	1	1	0	1	1	0	0	1	1	0
35.2	0	1	1	0	1	1	0	0	1	0	0
35.3	0	1	1	0	1	1	0	1	1	0	0
35.4	0	1	1	0	1	1	0	1	1	1	0
35.5	0	1	1	0	1	1	0	1	0	1	0
35.6	0	1	1	0	1	1	0	1	0	1	1
35.7	0	1	1	0	1	1	0	1	0	0	1
35.8	0	1	1	0	1	1	1	1	0	0	1
35.9	0	1	1	0	1	1	1	1	0	1	1
36.0	0	1	1	0	1	1	1	1	0	1	0
36.1	0	1	1	0	1	1	1	1	1	1	0
36.2	0	1	1	0	1	1	1	1	1	0	0
36.3	0	1	1	0	1	1	1	0	1	0	0
36.4	0	1	1	0	1	1	1	0	1	1	0
36.5	0	1	1	0	1	1	1	0	0	1	0
36.6	0	1	1	0	1	1	1	0	0	1	1
36.7	0	1	1	0	1	1	1	0	0	0	1
36.8	0	1	1	0	1	0	1	0	0	0	1
36.9	0	1	1	0	1	0	1	0	0	1	1
37.0	0	1	1	0	1	0	1	0	0	1	0
37.1	0	1	1	0	1	0	1	0	1	1	0
37.2	0	1	1	0	1	0	1	0	1	0	0
37.3	0	1	1	0	1	0	1	1	1	0	0
37.4	0	1	1	0	1	0	1	1	1	1	0
37.5	0	1	1	0	1	0	1	1	0	1	0
37.6	0	1	1	0	1	0	1	1	0	1	1
37.7	0	1	1	0	1	0	1	1	0	0	1
37.8	0	1	1	0	1	0	0	1	0	0	1
37.9	0	1	1	0	1	0	0	1	0	1	1



RANGE	PULSE POSITION										
(Altitude in Thousands)	D ₂	D ₄ and SPI	A ₁	A ₂	A ₄	B ₁	B ₂	B ₄	C ₁	C ₂	C ₄
38.0	0	1	1	0	1	0	0	1	0	1	0
38.1	0	1	1	0	1	0	0	1	1	1	0
38.2	0	1	1	0	1	0	0	1	1	0	0
38.3	0	1	1	0	1	0	0	0	1	0	0
38.4	0	1	1	0	1	0	0	0	1	1	0
38.5	0	1	1	0	1	0	0	0	0	1	0
38.6	0	1	1	0	1	0	0	0	0	1	1
38.7	0	1	1	0	1	0	0	0	0	0	1
38.8	0	1	1	1	1	0	0	0	0	0	1
38.9	0	1	1	1	1	0	0	0	0	1	1
39.0	0	1	1	1	1	0	0	0	0	1	0
39.1	0	1	1	1	1	0	0	0	1	1	0
39.2	0	1	1	1	1	0	0	0	1	0	0
39.3	0	1	1	1	1	0	0	1	1	0	0
39.4	0	1	1	1	1	0	0	1	1	1	0
39.5	0	1	1	1	1	0	0	1	0	1	0
39.6	0	1	1	1	1	0	0	1	0	1	1
39.7	0	1	1	1	1	0	0	1	0	0	1
39.8	0	1	1	1	1	0	1	1	0	0	1
39.9	0	1	1	1	1	0	1	1	0	1	1
40.0	0	1	1	1	1	0	1	1	0	1	0
40.1	0	1	1	1	1	0	1	1	1	1	0
40.2	0	1	1	1	1	0	1	1	1	0	0
40.3	0	1	1	1	1	0	1	0	1	0	0
40.4	0	1	1	1	1	0	1	0	1	1	0
40.5	0	1	1	1	1	0	1	0	0	1	0
40.6	0	1	1	1	1	0	1	0	0	1	1
40.7	0	1	1	1	1	0	1	0	0	0	1
40.8	0	1	1	1	1	1	1	0	0	0	1
40.9	0	1	1	1	1	1	1	0	0	1	1
41.0	0	1	1	1	1	1	1	0	0	1	0
41.1	0	1	1	1	1	1	1	0	1	1	0
41.2	0	1	1	1	1	1	1	0	1	0	0
41.3	0	1	1	1	1	1	1	1	1	0	0
41.4	0	1	1	1	1	1	1	1	1	1	0
41.5	0	1	1	1	1	1	1	1	0	1	0
41.6	0	1	1	1	1	1	1	1	0	1	1
41.7	0	1	1	1	1	1	1	1	0	0	1
41.8	0	1	1	1	1	1	0	1	0	0	1
41.9	0	1	1	1	1	1	0	1	0	1	1



RANGE	PULSE POSITION										
(Altitude in Thousands)	D ₂	D ₄ and SPI	A ₁	A ₂	A ₄	B ₁	B ₂	B ₄	C ₁	C ₂	C ₄
42.0	0	1	1	1	1	1	0	1	0	1	0
42.1	0	1	1	1	1	1	0	1	1	1	0
42.2	0	1	1	1	1	1	0	1	1	0	0
42.3	0	1	1	1	1	1	0	0	1	0	0
42.4	0	1	1	1	1	1	0	0	1	1	0
42.5	0	1	1	1	1	1	0	0	0	1	0
42.6	0	1	1	1	1	1	0	0	0	1	1
42.7	0	1	1	1	1	1	0	0	0	0	1
42.8	0	1	1	1	0	1	0	0	0	0	1
42.9	0	1	1	1	0	1	0	0	0	1	1
43.0	0	1	1	1	0	1	0	0	0	1	0
43.1	0	1	1	1	0	1	0	0	1	1	0
43.2	0	1	1	1	0	1	0	0	1	0	0
43.3	0	1	1	1	0	1	0	1	1	0	0
43.4	0	1	1	1	0	1	0	1	1	1	0
43.5	0	1	1	1	0	1	0	1	0	1	0
43.6	0	1	1	1	0	1	0	1	0	1	1
43.7	0	1	1	1	0	1	0	1	0	0	1
43.8	0	1	1	1	0	1	1	1	0	0	1
43.9	0	1	1	1	0	1	1	1	0	1	1
44.0	0	1	1	1	0	1	1	1	0	1	0
44.1	0	1	1	1	0	1	1	1	1	1	0
44.2	0	1	1	1	0	1	1	1	1	0	0
44.3	0	1	1	1	0	1	1	0	1	0	0
44.4	0	1	1	1	0	1	1	0	1	1	0
44.5	0	1	1	1	0	1	1	0	0	1	0
44.6	0	1	1	1	0	1	1	0	0	1	1
44.7	0	1	1	1	0	1	1	0	0	0	1
44.8	0	1	1	1	0	0	1	0	0	0	1
44.9	0	1	1	1	0	0	1	0	0	1	1
45.0	0	1	1	1	0	0	1	0	0	1	0
45.1	0	1	1	1	0	0	1	0	1	1	0
45.2	0	1	1	1	0	0	1	0	1	0	0
45.3	0	1	1	1	0	0	1	1	1	0	0
45.4	0	1	1	1	0	0	1	1	1	1	0
45.5	0	1	1	1	0	0	1	1	0	1	0
45.6	0	1	1	1	0	0	1	1	0	1	1
45.7	0	1	1	1	0	0	1	1	0	0	1
45.8	0	1	1	1	0	0	0	1	0	0	1
45.9	0	1	1	1	0	0	0	1	0	1	1



RANGE	PULSE POSITION										
(Altitude in Thousands)	D ₂	D ₄ and SPI	A ₁	A ₂	A ₄	B ₁	B ₂	B ₄	C ₁	C ₂	C ₄
46.0	0	1	1	1	0	0	0	1	0	1	0
46.1	0	1	1	1	0	0	0	1	1	1	0
46.2	0	1	1	1	0	0	0	1	1	0	0
46.3	0	1	1	1	0	0	0	0	1	0	0
46.4	0	1	1	1	0	0	0	0	1	1	0
46.5	0	1	1	1	0	0	0	0	0	1	0
46.6	0	1	1	1	0	0	0	0	0	1	1
46.7	0	1	1	1	0	0	0	0	0	0	1
46.8	0	1	0	1	0	0	0	0	0	0	1
46.9	0	1	0	1	0	0	0	0	0	1	1
47.0	0	1	0	1	0	0	0	0	0	1	0
47.1	0	1	0	1	0	0	0	0	1	1	0
47.2	0	1	0	1	0	0	0	0	1	0	0
47.3	0	1	0	1	0	0	0	1	1	0	0
47.4	0	1	0	1	0	0	0	1	1	1	0
47.5	0	1	0	1	0	0	0	1	0	1	0
47.6	0	1	0	1	0	0	0	1	0	1	1
47.7	0	1	0	1	0	0	0	1	0	0	1
47.8	0	1	0	1	0	0	1	1	0	0	1
47.9	0	1	0	1	0	0	1	1	0	1	1
48.0	0	1	0	1	0	0	1	1	0	1	0
48.1	0	1	0	1	0	0	1	1	1	1	0
48.2	0	1	0	1	0	0	1	1	1	0	0
48.3	0	1	0	1	0	0	1	0	1	0	0
48.4	0	1	0	1	0	0	1	0	1	1	0
48.5	0	1	0	1	0	0	1	0	0	1	0
48.6	0	1	0	1	0	0	1	0	0	1	1
48.7	0	1	0	1	0	0	1	0	0	0	1
48.8	0	1	0	1	0	1	1	0	0	0	1
48.9	0	1	0	1	0	1	1	0	0	1	1
49.0	0	1	0	1	0	1	1	0	0	1	0
49.1	0	1	0	1	0	1	1	0	1	1	0
49.2	0	1	0	1	0	1	1	0	1	0	0
49.3	0	1	0	1	0	1	1	1	1	0	0
49.4	0	1	0	1	0	1	1	1	1	1	0
49.5	0	1	0	1	0	1	1	1	0	1	0
49.6	0	1	0	1	0	1	1	1	0	1	1
49.7	0	1	0	1	0	1	1	1	0	0	1
49.8	0	1	0	1	0	1	0	1	0	0	1
49.9	0	1	0	1	0	1	0	1	0	1	1



RANGE	PULSE POSITION										
(Altitude in Thousands)	D ₂	D ₄ and SPI	A ₁	A ₂	A ₄	B ₁	B ₂	B ₄	C ₁	C ₂	C ₄
50.0	0	1	0	1	0	1	0	1	0	1	0
50.1	0	1	0	1	0	1	0	1	1	1	0
50.2	0	1	0	1	0	1	0	1	1	0	0
50.3	0	1	0	1	0	1	0	0	1	0	0
50.4	0	1	0	1	0	1	0	0	1	1	0
50.5	0	1	0	1	0	1	0	0	0	1	0
50.6	0	1	0	1	0	1	0	0	0	1	1
50.7	0	1	0	1	0	1	0	0	0	0	1
50.8	0	1	0	1	1	1	0	0	0	0	1
50.9	0	1	0	1	1	1	0	0	0	1	1
51.0	0	1	0	1	1	1	0	0	0	1	0
51.1	0	1	0	1	1	1	0	0	1	1	0
51.2	0	1	0	1	1	1	0	0	1	0	0
51.3	0	1	0	1	1	1	0	1	1	0	0
51.4	0	1	0	1	1	1	0	1	1	1	0
51.5	0	1	0	1	1	1	0	1	0	1	0
51.6	0	1	0	1	1	1	0	1	0	1	1
51.7	0	1	0	1	1	1	0	1	0	0	1
51.8	0	1	0	1	1	1	1	1	0	0	1
51.9	0	1	0	1	1	1	1	1	0	1	1
52.0	0	1	0	1	1	1	1	1	0	1	0
52.1	0	1	0	1	1	1	1	1	1	1	0
52.2	0	1	0	1	1	1	1	1	1	0	0
52.3	0	1	0	1	1	1	1	0	1	0	0
52.4	0	1	0	1	1	1	1	0	1	1	0
52.5	0	1	0	1	1	1	1	0	0	1	0
52.6	0	1	0	1	1	1	1	0	0	1	1
52.7	0	1	0	1	1	1	1	0	0	0	1
52.8	0	1	0	1	1	0	1	0	0	0	1
52.9	0	1	0	1	1	0	1	0	0	1	1
53.0	0	1	0	1	1	0	1	0	0	1	0
53.1	0	1	0	1	1	0	1	0	1	1	0
53.2	0	1	0	1	1	0	1	0	1	0	0
53.3	0	1	0	1	1	0	1	1	1	0	0
53.4	0	1	0	1	1	0	1	1	1	1	0
53.5	0	1	0	1	1	0	1	1	0	1	0
53.6	0	1	0	1	1	0	1	1	0	1	1
53.7	0	1	0	1	1	0	1	1	0	0	1
53.8	0	1	0	1	1	0	0	1	0	0	1
53.9	0	1	0	1	1	0	0	1	0	1	1



RANGE	PULSE POSITION										
(Altitude in Thousands)	D ₂	D ₄ and SPI	A ₁	A ₂	A ₄	B ₁	B ₂	B ₄	C ₁	C ₂	C ₄
54.0	0	1	0	1	1	0	0	1	0	1	0
54.1	0	1	0	1	1	0	0	1	1	1	0
54.2	0	1	0	1	1	0	0	1	1	0	0
54.3	0	1	0	1	1	0	0	0	1	0	0
54.4	0	1	0	1	1	0	0	0	1	1	0
54.5	0	1	0	1	1	0	0	0	0	1	0
54.6	0	1	0	1	1	0	0	0	0	1	1
54.7	0	1	0	1	1	0	0	0	0	0	1
54.8	0	1	0	0	1	0	0	0	0	0	1
54.9	0	1	0	0	1	0	0	0	0	1	1
55.0	0	1	0	0	1	0	0	0	0	1	0
55.1	0	1	0	0	1	0	0	0	1	1	0
55.2	0	1	0	0	1	0	0	0	1	0	0
55.3	0	1	0	0	1	0	0	1	1	0	0
55.4	0	1	0	0	1	0	0	1	1	1	0
55.5	0	1	0	0	1	0	0	1	0	1	0
55.6	0	1	0	0	1	0	0	1	0	1	1
55.7	0	1	0	0	1	0	0	1	0	0	1
55.8	0	1	0	0	1	0	1	1	0	0	1
55.9	0	1	0	0	1	0	1	1	0	1	1
56.0	0	1	0	0	1	0	1	1	0	1	0
56.1	0	1	0	0	1	0	1	1	1	1	0
56.2	0	1	0	0	1	0	1	1	1	0	0
56.3	0	1	0	0	1	0	1	0	1	0	0
56.4	0	1	0	0	1	0	1	0	1	1	0
56.5	0	1	0	0	1	0	1	0	0	1	0
56.6	0	1	0	0	1	0	1	0	0	1	1
56.7	0	1	0	0	1	0	1	0	0	0	1
56.8	0	1	0	0	1	1	1	0	0	0	1
56.9	0	1	0	0	1	1	1	0	0	1	1
57.0	0	1	0	0	1	1	1	0	0	1	0
57.1	0	1	0	0	1	1	1	0	1	1	0
57.2	0	1	0	0	1	1	1	0	1	0	0
57.3	0	1	0	0	1	1	1	1	1	0	0
57.4	0	1	0	0	1	1	1	1	1	1	0
57.5	0	1	0	0	1	1	1	1	0	1	0
57.6	0	1	0	0	1	1	1	1	0	1	1
57.7	0	1	0	0	1	1	1	1	0	0	1
57.8	0	1	0	0	1	1	0	1	0	0	1
57.9	0	1	0	0	1	1	0	1	0	1	1



RANGE	PULSE POSITION										
(Altitude in Thousands)	D ₂	D ₄ and SPI	A ₁	A ₂	A ₄	B ₁	B ₂	B ₄	C ₁	C ₂	C ₄
58.0	0	1	0	0	1	1	0	1	0	1	0
58.1	0	1	0	0	1	1	0	1	1	1	0
58.2	0	1	0	0	1	1	0	1	1	0	0
58.3	0	1	0	0	1	1	0	0	1	0	0
58.4	0	1	0	0	1	1	0	0	1	1	0
58.5	0	1	0	0	1	1	0	0	0	1	0
58.6	0	1	0	0	1	1	0	0	0	1	1
58.7	0	1	0	0	1	1	0	0	0	0	1
58.8	0	1	0	0	0	1	0	0	0	0	1
58.9	0	1	0	0	0	1	0	0	0	1	1
59.0	0	1	0	0	0	1	0	0	0	1	0
59.1	0	1	0	0	0	1	0	0	1	1	0
59.2	0	1	0	0	0	1	0	0	1	0	0
59.3	0	1	0	0	0	1	0	1	1	0	0
59.4	0	1	0	0	0	1	0	1	1	1	0
59.5	0	1	0	0	0	1	0	1	0	1	0
59.6	0	1	0	0	0	1	0	1	0	1	1
59.7	0	1	0	0	0	1	0	1	0	0	1
59.8	0	1	0	0	0	1	1	1	0	0	1
59.9	0	1	0	0	0	1	1	1	0	1	1
60.0	0	1	0	0	0	1	1	1	0	1	0
60.1	0	1	0	0	0	1	1	1	1	1	0
60.2	0	1	0	0	0	1	1	1	1	0	0
60.3	0	1	0	0	0	1	1	0	1	0	0
60.4	0	1	0	0	0	1	1	0	1	1	0
60.5	0	1	0	0	0	1	1	0	0	1	0
60.6	0	1	0	0	0	1	1	0	0	1	1
60.7	0	1	0	0	0	1	1	0	0	0	1
60.8	0	1	0	0	0	0	1	0	0	0	1
60.9	0	1	0	0	0	0	1	0	0	1	1
61.0	0	1	0	0	0	0	1	0	0	1	0
61.1	0	1	0	0	0	0	1	0	1	1	0
61.2	0	1	0	0	0	0	1	0	1	0	0
61.3	0	1	0	0	0	0	1	1	1	0	0
61.4	0	1	0	0	0	0	1	1	1	1	0
61.5	0	1	0	0	0	0	1	1	0	1	0
61.6	0	1	0	0	0	0	1	1	0	1	1
61.7	0	1	0	0	0	0	1	1	0	0	1
61.8	0	1	0	0	0	0	0	1	0	0	1
61.9	0	1	0	0	0	0	0	1	0	1	1



RANGE	PULSE POSITION										
(Altitude in Thousands)	D ₂	D ₄ and SPI	A ₁	A ₂	A ₄	B ₁	B ₂	B ₄	C ₁	C ₂	C ₄
62.0	0	1	0	0	0	0	0	1	0	1	0
62.1	0	1	0	0	0	0	0	1	1	1	0
62.2	0	1	0	0	0	0	0	1	1	0	0
62.3	0	1	0	0	0	0	0	0	1	0	0
62.4	0	1	0	0	0	0	0	0	1	1	0
62.5	0	1	0	0	0	0	0	0	0	1	0
62.6	0	1	0	0	0	0	0	0	0	1	1
62.7	0	1	0	0	0	0	0	0	0	0	1
62.8	1	1	0	0	0	0	0	0	0	0	1
62.9	1	1	0	0	0	0	0	0	0	1	1
63.0	1	1	0	0	0	0	0	0	0	1	0
63.1	1	1	0	0	0	0	0	0	1	1	0
63.2	1	1	0	0	0	0	0	0	1	0	0
63.3	1	1	0	0	0	0	0	1	1	0	0
63.4	1	1	0	0	0	0	0	1	1	1	0
63.5	1	1	0	0	0	0	0	1	0	1	0
63.6	1	1	0	0	0	0	0	1	0	1	1
63.7	1	1	0	0	0	0	0	1	0	0	1
63.8	1	1	0	0	0	0	1	1	0	0	1
63.9	1	1	0	0	0	0	1	1	0	1	1
64.0	1	1	0	0	0	0	1	1	0	1	0
64.1	1	1	0	0	0	0	1	1	1	1	0
64.2	1	1	0	0	0	0	1	1	1	0	0
64.3	1	1	0	0	0	0	1	0	1	0	0
64.4	1	1	0	0	0	0	1	0	1	1	0
64.5	1	1	0	0	0	0	1	0	0	1	0
64.6	1	1	0	0	0	0	1	0	0	1	1
64.7	1	1	0	0	0	0	1	0	0	0	1
64.8	1	1	0	0	0	1	1	0	0	0	1
64.9	1	1	0	0	0	1	1	0	0	1	1
65.0	1	1	0	0	0	1	1	0	0	1	0
65.1	1	1	0	0	0	1	1	0	1	1	0
65.2	1	1	0	0	0	1	1	0	1	0	0
65.3	1	1	0	0	0	1	1	1	1	0	0
65.4	1	1	0	0	0	1	1	1	1	1	0
65.5	1	1	0	0	0	1	1	1	0	1	0
65.6	1	1	0	0	0	1	1	1	0	1	1
65.7	1	1	0	0	0	1	1	1	0	0	1
65.8	1	1	0	0	0	1	0	1	0	0	1
65.9	1	1	0	0	0	1	0	1	0	1	1



RANGE	PULSE POSITION										
(Altitude in Thousands)	D ₂	D ₄ and SPI	A ₁	A ₂	A ₄	B ₁	B ₂	B ₄	C ₁	C ₂	C ₄
66.0	1	1	0	0	0	1	0	1	0	1	0
66.1	1	1	0	0	0	1	0	1	1	1	0
66.2	1	1	0	0	0	1	0	1	1	0	0
66.3	1	1	0	0	0	1	0	0	1	0	0
66.4	1	1	0	0	0	1	0	0	1	1	0
66.5	1	1	0	0	0	1	0	0	0	1	0
66.6	1	1	0	0	0	1	0	0	0	1	1
66.7	1	1	0	0	0	1	0	0	0	0	1
66.8	1	1	0	0	1	1	0	0	0	0	1
66.9	1	1	0	0	1	1	0	0	0	1	1
67.0	1	1	0	0	1	1	0	0	0	1	0
67.1	1	1	0	0	1	1	0	0	1	1	0
67.2	1	1	0	0	1	1	0	0	1	0	0
67.3	1	1	0	0	1	1	0	1	1	0	0
67.4	1	1	0	0	1	1	0	1	1	1	0
67.5	1	1	0	0	1	1	0	1	0	1	0
67.6	1	1	0	0	1	1	0	1	0	1	1
67.7	1	1	0	0	1	1	0	1	0	0	1
67.8	1	1	0	0	1	1	1	1	0	0	1
67.9	1	1	0	0	1	1	1	1	0	1	1
68.0	1	1	0	0	1	1	1	1	0	1	0
68.1	1	1	0	0	1	1	1	1	1	1	0
68.2	1	1	0	0	1	1	1	1	1	0	0
68.3	1	1	0	0	1	1	1	0	1	0	0
68.4	1	1	0	0	1	1	1	0	1	1	0
68.5	1	1	0	0	1	1	1	0	0	1	0
68.6	1	1	0	0	1	1	1	0	0	1	1
68.7	1	1	0	0	1	1	1	0	0	0	1
68.8	1	1	0	0	1	0	1	0	0	0	1
68.9	1	1	0	0	1	0	1	0	0	1	1
69.0	1	1	0	0	1	0	1	0	0	1	0
69.1	1	1	0	0	1	0	1	0	1	1	0
69.2	1	1	0	0	1	0	1	0	1	0	0
69.3	1	1	0	0	1	0	1	1	1	0	0
69.4	1	1	0	0	1	0	1	1	1	1	0
69.5	1	1	0	0	1	0	1	1	0	1	0
69.6	1	1	0	0	1	0	1	1	0	1	1
69.7	1	1	0	0	1	0	1	1	0	0	1
69.8	1	1	0	0	1	0	0	1	0	0	1
69.9	1	1	0	0	1	0	0	1	0	1	1



RANGE	PULSE POSITION										
(Altitude in Thousands)	D ₂	D ₄ and SPI	A ₁	A ₂	A ₄	B ₁	B ₂	B ₄	C ₁	C ₂	C ₄
70.0	1	1	0	0	1	0	0	1	0	1	0
70.1	1	1	0	0	1	0	0	1	1	1	0
70.2	1	1	0	0	1	0	0	1	1	0	0
70.3	1	1	0	0	1	0	0	0	1	0	0
70.4	1	1	0	0	1	0	0	0	1	1	0
70.5	1	1	0	0	1	0	0	0	0	1	0
70.6	1	1	0	0	1	0	0	0	0	1	1
70.7	1	1	0	0	1	0	0	0	0	0	1
70.8	1	1	0	1	1	0	0	0	0	0	1
70.9	1	1	0	1	1	0	0	0	0	1	1
71.0	1	1	0	1	1	0	0	0	0	1	0
71.1	1	1	0	1	1	0	0	0	1	1	0
71.2	1	1	0	1	1	0	0	0	1	0	0
71.3	1	1	0	1	1	0	0	1	1	0	0
71.4	1	1	0	1	1	0	0	1	1	1	0
71.5	1	1	0	1	1	0	0	1	0	1	0
71.6	1	1	0	1	1	0	0	1	0	1	1
71.7	1	1	0	1	1	0	0	1	0	0	1
71.8	1	1	0	1	1	0	1	1	0	0	1
71.9	1	1	0	1	1	0	1	1	0	1	1
72.0	1	1	0	1	1	0	1	1	0	1	0
72.1	1	1	0	1	1	0	1	1	1	1	0
72.2	1	1	0	1	1	0	1	1	1	0	0
72.3	1	1	0	1	1	0	1	0	1	0	0
72.4	1	1	0	1	1	0	1	0	1	1	0
72.5	1	1	0	1	1	0	1	0	0	1	0
72.6	1	1	0	1	1	0	1	0	0	1	1
72.7	1	1	0	1	1	0	1	0	0	0	1
72.8	1	1	0	1	1	1	1	0	0	0	1
72.9	1	1	0	1	1	1	1	0	0	1	1
73.0	1	1	0	1	1	1	1	0	0	1	0
73.1	1	1	0	1	1	1	1	0	1	1	0
73.2	1	1	0	1	1	1	1	0	1	0	0
73.3	1	1	0	1	1	1	1	1	1	0	0
73.4	1	1	0	1	1	1	1	1	1	1	0
73.5	1	1	0	1	1	1	1	1	0	1	0
73.6	1	1	0	1	1	1	1	1	0	1	1
73.7	1	1	0	1	1	1	1	1	0	0	1
73.8	1	1	0	1	1	1	0	1	0	0	1
73.9	1	1	0	1	1	1	0	1	0	1	1



RANGE	PULSE POSITION										
(Altitude in Thousands)	D ₂	D ₄ and SPI	A ₁	A ₂	A ₄	B ₁	B ₂	B ₄	C ₁	C ₂	C ₄
74.0	1	1	0	1	1	1	0	1	0	1	0
74.1	1	1	0	1	1	1	0	1	1	1	0
74.2	1	1	0	1	1	1	0	1	1	0	0
74.3	1	1	0	1	1	1	0	0	1	0	0
74.4	1	1	0	1	1	1	0	0	1	1	0
74.5	1	1	0	1	1	1	0	0	0	1	0
74.6	1	1	0	1	1	1	0	0	0	1	1
74.7	1	1	0	1	1	1	0	0	0	0	1
74.8	1	1	0	1	0	1	0	0	0	0	1
74.9	1	1	0	1	0	1	0	0	0	1	1
75.0	1	1	0	1	0	1	0	0	0	1	0
75.1	1	1	0	1	0	1	0	0	1	1	0
75.2	1	1	0	1	0	1	0	0	1	0	0
75.3	1	1	0	1	0	1	0	1	1	0	0
75.4	1	1	0	1	0	1	0	1	1	1	0
75.5	1	1	0	1	0	1	0	1	0	1	0
75.6	1	1	0	1	0	1	0	1	0	1	1
75.7	1	1	0	1	0	1	0	1	0	0	1
75.8	1	1	0	1	0	1	1	1	0	0	1
75.9	1	1	0	1	0	1	1	1	0	1	1
76.0	1	1	0	1	0	1	1	1	0	1	0
76.1	1	1	0	1	0	1	1	1	1	1	0
76.2	1	1	0	1	0	1	1	1	1	0	0
76.3	1	1	0	1	0	1	1	0	1	0	0
76.4	1	1	0	1	0	1	1	0	1	1	0
76.5	1	1	0	1	0	1	1	0	0	1	0
76.6	1	1	0	1	0	1	1	0	0	1	1
76.7	1	1	0	1	0	1	1	0	0	0	1
76.8	1	1	0	1	0	0	1	0	0	0	1
76.9	1	1	0	1	0	0	1	0	0	1	1
77.0	1	1	0	1	0	0	1	0	0	1	0
77.1	1	1	0	1	0	0	1	0	1	1	0
77.2	1	1	0	1	0	0	1	0	1	0	0
77.3	1	1	0	1	0	0	1	1	1	0	0
77.4	1	1	0	1	0	0	1	1	1	1	0
77.5	1	1	0	1	0	0	1	1	0	1	0
77.6	1	1	0	1	0	0	1	1	0	1	1
77.7	1	1	0	1	0	0	1	1	0	0	1
77.8	1	1	0	1	0	0	0	1	0	0	1
77.9	1	1	0	1	0	0	0	1	0	1	1



RANGE	PULSE POSITION										
(Altitude in Thousands)	D ₂	D ₄ and SPI	A ₁	A ₂	A ₄	B ₁	B ₂	B ₄	C ₁	C ₂	C ₄
78.0	1	1	0	1	0	0	0	1	0	1	0
78.1	1	1	0	1	0	0	0	1	1	1	0
78.2	1	1	0	1	0	0	0	1	1	0	0
78.3	1	1	0	1	0	0	0	0	1	0	0
78.4	1	1	0	1	0	0	0	0	1	1	0
78.5	1	1	0	1	0	0	0	0	0	1	0
78.6	1	1	0	1	0	0	0	0	0	1	1
78.7	1	1	0	1	0	0	0	0	0	0	1
78.8	1	1	1	1	0	0	0	0	0	0	1
78.9	1	1	1	1	0	0	0	0	0	1	1
79.0	1	1	1	1	0	0	0	0	0	1	0
79.1	1	1	1	1	0	0	0	0	1	1	0
79.2	1	1	1	1	0	0	0	0	1	0	0
79.3	1	1	1	1	0	0	0	1	1	0	0
79.4	1	1	1	1	0	0	0	1	1	1	0
79.5	1	1	1	1	0	0	0	1	0	1	0
79.6	1	1	1	1	0	0	0	1	0	1	1
79.7	1	1	1	1	0	0	0	1	0	0	1
79.8	1	1	1	1	0	0	1	1	0	0	1
79.9	1	1	1	1	0	0	1	1	0	1	1
80.0	1	1	1	1	0	0	1	1	0	1	0
80.1	1	1	1	1	0	0	1	1	1	1	0
80.2	1	1	1	1	0	0	1	1	1	0	0
80.3	1	1	1	1	0	0	1	0	1	0	0
80.4	1	1	1	1	0	0	1	0	1	1	0
80.5	1	1	1	1	0	0	1	0	0	1	0
80.6	1	1	1	1	0	0	1	0	0	1	1
80.7	1	1	1	1	0	0	1	0	0	0	1
80.8	1	1	1	1	0	1	1	0	0	0	1
80.9	1	1	1	1	0	1	1	0	0	1	1
81.0	1	1	1	1	0	1	1	0	0	1	0
81.1	1	1	1	1	0	1	1	0	1	1	0
81.2	1	1	1	1	0	1	1	0	1	0	0
81.3	1	1	1	1	0	1	1	1	1	0	0
81.4	1	1	1	1	0	1	1	1	1	1	0
81.5	1	1	1	1	0	1	1	1	0	1	0
81.6	1	1	1	1	0	1	1	1	0	1	1
81.7	1	1	1	1	0	1	1	1	0	0	1
81.8	1	1	1	1	0	1	0	1	0	0	1
81.9	1	1	1	1	0	1	0	1	0	1	1



RANGE	PULSE POSITION										
(Altitude in Thousands)	D ₂	D ₄ and SPI	A ₁	A ₂	A ₄	B ₁	B ₂	B ₄	C ₁	C ₂	C ₄
82.0	1	1	1	1	0	1	0	1	0	1	0
82.1	1	1	1	1	0	1	0	1	1	1	0
82.2	1	1	1	1	0	1	0	1	1	0	0
82.3	1	1	1	1	0	1	0	0	1	0	0
82.4	1	1	1	1	0	1	0	0	1	1	0
82.5	1	1	1	1	0	1	0	0	0	1	0
82.6	1	1	1	1	0	1	0	0	0	1	1
82.7	1	1	1	1	0	1	0	0	0	0	1
82.8	1	1	1	1	1	1	0	0	0	0	1
82.9	1	1	1	1	1	1	0	0	0	1	1
83.0	1	1	1	1	1	1	0	0	0	1	0
83.1	1	1	1	1	1	1	0	0	1	1	0
83.2	1	1	1	1	1	1	0	0	1	0	0
83.3	1	1	1	1	1	1	0	1	1	0	0
83.4	1	1	1	1	1	1	0	1	1	1	0
83.5	1	1	1	1	1	1	0	1	0	1	0
83.6	1	1	1	1	1	1	0	1	0	1	1
83.7	1	1	1	1	1	1	0	1	0	0	1
83.8	1	1	1	1	1	1	1	1	0	0	1
83.9	1	1	1	1	1	1	1	1	0	1	1
84.0	1	1	1	1	1	1	1	1	0	1	0
84.1	1	1	1	1	1	1	1	1	1	1	0
84.2	1	1	1	1	1	1	1	1	1	0	0
84.3	1	1	1	1	1	1	1	0	1	0	0
84.4	1	1	1	1	1	1	1	0	1	1	0
84.5	1	1	1	1	1	1	1	0	0	1	0
84.6	1	1	1	1	1	1	1	0	0	1	1
84.7	1	1	1	1	1	1	1	0	0	0	1
84.8	1	1	1	1	1	0	1	0	0	0	1
84.9	1	1	1	1	1	0	1	0	0	1	1
85.0	1	1	1	1	1	0	1	0	0	1	0
85.1	1	1	1	1	1	0	1	0	1	1	0
85.2	1	1	1	1	1	0	1	0	1	0	0
85.3	1	1	1	1	1	0	1	1	1	0	0
85.4	1	1	1	1	1	0	1	1	1	1	0
85.5	1	1	1	1	1	0	1	1	0	1	0
85.6	1	1	1	1	1	0	1	1	0	1	1
85.7	1	1	1	1	1	0	1	1	0	0	1
85.8	1	1	1	1	1	0	0	1	0	0	1
85.9	1	1	1	1	1	0	0	1	0	1	1



RANGE	PULSE POSITION										
(Altitude in Thousands)	D ₂	D ₄ and SPI	A ₁	A ₂	A ₄	B ₁	B ₂	B ₄	C ₁	C ₂	C ₄
86.0	1	1	1	1	1	0	0	1	0	1	0
86.1	1	1	1	1	1	0	0	1	1	1	0
86.2	1	1	1	1	1	0	0	1	1	0	0
86.3	1	1	1	1	1	0	0	0	1	0	0
86.4	1	1	1	1	1	0	0	0	1	1	0
86.5	1	1	1	1	1	0	0	0	0	1	0
86.6	1	1	1	1	1	0	0	0	0	1	1
86.7	1	1	1	1	1	0	0	0	0	0	1
86.8	1	1	1	0	1	0	0	0	0	0	1
86.9	1	1	1	0	1	0	0	0	0	1	1
87.0	1	1	1	0	1	0	0	0	0	1	0
87.1	1	1	1	0	1	0	0	0	1	1	0
87.2	1	1	1	0	1	0	0	0	1	0	0
87.3	1	1	1	0	1	0	0	1	1	0	0
87.4	1	1	1	0	1	0	0	1	1	1	0
87.5	1	1	1	0	1	0	0	1	0	1	0
87.6	1	1	1	0	1	0	0	1	0	1	1
87.7	1	1	1	0	1	0	0	1	0	0	1
87.8	1	1	1	0	1	0	1	1	0	0	1
87.9	1	1	1	0	1	0	1	1	0	1	1
88.0	1	1	1	0	1	0	1	1	0	1	0
88.1	1	1	1	0	1	0	1	1	1	1	0
88.2	1	1	1	0	1	0	1	1	1	0	0
88.3	1	1	1	0	1	0	1	0	1	0	0
88.4	1	1	1	0	1	0	1	0	1	1	0
88.5	1	1	1	0	1	1	1	0	0	1	0
88.6	1	1	1	0	1	1	1	0	1	1	0
88.7	1	1	1	0	1	1	1	0	1	0	0
88.8	1	1	1	0	1	1	1	1	1	0	0
88.9	1	1	1	0	1	1	1	1	1	1	0
89.0	1	1	1	0	1	1	1	1	0	1	0
89.1	1	1	1	0	1	1	1	1	0	1	1
89.2	1	1	1	0	1	1	1	1	0	0	1
89.3	1	1	1	0	1	1	0	1	0	0	1
89.4	1	1	1	0	1	1	0	1	0	1	1
89.5	1	1	1	0	1	1	0	1	0	1	0
89.6	1	1	1	0	1	1	0	1	1	1	0
89.7	1	1	1	0	1	1	0	1	1	0	0
89.8	1	1	1	0	1	1	0	0	1	0	0
89.9	1	1	1	0	1	1	0	0	1	1	0



RANGE	PULSE POSITION										
(Altitude in Thousands)	D ₂	D ₄ and SPI	A ₁	A ₂	A ₄	B ₁	B ₂	B ₄	C ₁	C ₂	C ₄
90.0	1	1	1	0	1	1	0	0	0	1	0
90.1	1	1	1	0	1	1	0	0	0	1	1
90.2	1	1	1	0	1	1	0	0	0	0	1
90.3	1	1	1	0	0	1	0	0	0	0	1
90.4	1	1	1	0	0	1	0	0	0	1	1
90.5	1	1	1	0	0	1	0	0	0	1	0
90.6	1	1	1	0	0	1	0	0	1	1	0
90.7	1	1	1	0	0	1	0	0	1	0	0
90.8	1	1	1	0	0	1	0	1	1	0	0
90.9	1	1	1	0	0	1	0	1	1	1	0
91.0	1	1	1	0	0	1	0	1	0	1	0
91.1	1	1	1	0	0	1	0	1	0	1	1
91.2	1	1	1	0	0	1	0	1	0	0	1
91.3	1	1	1	0	0	1	1	1	0	0	1
91.4	1	1	1	0	0	1	1	1	0	1	1
91.5	1	1	1	0	0	1	1	1	0	1	0
91.6	1	1	1	0	0	1	1	1	1	1	0
91.7	1	1	1	0	0	1	1	1	1	0	0
91.8	1	1	1	0	0	1	1	0	1	0	0
91.9	1	1	1	0	0	1	1	0	1	1	0
92.0	1	1	1	0	0	1	1	0	0	1	0
92.1	1	1	1	0	0	1	1	0	0	1	1
92.2	1	1	1	0	0	1	1	0	0	0	1
92.3	1	1	1	0	0	0	1	0	0	0	1
92.4	1	1	1	0	0	0	1	0	0	1	1
92.5	1	1	1	0	1	0	1	0	0	1	0
92.6	1	1	1	0	1	0	1	0	0	1	1
92.7	1	1	1	0	1	0	1	0	0	0	1
92.8	1	1	1	0	1	1	1	0	0	0	1
92.9	1	1	1	0	1	1	1	0	0	1	1
93.0	1	1	1	0	0	0	1	0	0	1	0
93.1	1	1	1	0	0	0	1	0	1	1	0
93.2	1	1	1	0	0	0	1	0	1	0	0
93.3	1	1	1	0	0	0	1	1	1	0	0
93.4	1	1	1	0	0	0	1	1	1	1	0
93.5	1	1	1	0	0	0	1	1	0	1	0
93.6	1	1	1	0	0	0	1	1	0	1	1
93.7	1	1	1	0	0	0	1	1	0	0	1
93.8	1	1	1	0	0	0	0	1	0	0	1
93.9	1	1	1	0	0	0	0	1	0	1	1



RANGE	PULSE POSITION										
(Altitude in Thousands)	D ₂	D ₄ and SPI	A ₁	A ₂	A ₄	B ₁	B ₂	B ₄	C ₁	C ₂	C ₄
94.0	1	1	1	0	0	0	0	1	0	1	0
94.1	1	1	1	0	0	0	0	1	1	1	0
94.2	1	1	1	0	0	0	0	1	1	0	0
94.3	1	1	1	0	0	0	0	0	1	0	0
94.4	1	1	1	0	0	0	0	0	1	1	0
94.5	1	1	1	0	0	0	0	0	0	1	0
94.6	1	1	1	0	0	0	0	0	0	1	1
94.7	1	1	1	0	0	0	0	0	0	0	1
94.8	1	0	1	0	0	0	0	0	0	0	1
94.9	1	0	1	0	0	0	0	0	0	1	1
95.0	1	0	1	0	0	0	0	0	0	1	0
95.1	1	0	1	0	0	0	0	0	1	1	0
95.2	1	0	1	0	0	0	0	0	1	0	0
95.3	1	0	1	0	0	0	0	1	1	0	0
95.4	1	0	1	0	0	0	0	1	1	1	0
95.5	1	0	1	0	0	0	0	1	0	1	0
95.6	1	0	1	0	0	0	0	1	0	1	1
95.7	1	0	1	0	0	0	0	1	0	0	1
95.8	1	0	1	0	0	0	1	1	0	0	1
95.9	1	0	1	0	0	0	1	1	0	1	1
96.0	1	0	1	0	0	0	1	1	0	1	0
96.1	1	0	1	0	0	0	1	1	1	1	0
96.2	1	0	1	0	0	0	1	1	1	0	0
96.3	1	0	1	0	0	0	1	0	1	0	0
96.4	1	0	1	0	0	0	1	0	1	1	0
96.5	1	0	1	0	0	0	1	0	0	1	0
96.6	1	0	1	0	0	0	1	0	0	1	1
96.7	1	0	1	0	0	0	1	0	0	0	1
96.8	1	0	1	0	0	1	1	0	0	0	1
96.9	1	0	1	0	0	1	1	0	0	1	1
97.0	1	0	1	0	0	1	1	0	0	1	0
97.1	1	0	1	0	0	1	1	0	1	1	0
97.2	1	0	1	0	0	1	1	0	1	0	0
97.3	1	0	1	0	0	1	1	1	1	0	0
97.4	1	0	1	0	0	1	1	1	1	1	0
97.5	1	0	1	0	0	1	1	1	0	1	0
97.6	1	0	1	0	0	1	1	1	0	1	1
97.7	1	0	1	0	0	1	1	1	0	0	1
97.8	1	0	1	0	0	1	0	1	0	0	1
97.9	1	0	1	0	0	1	0	1	0	1	1



RANGE	PULSE POSITION										
(Altitude in Thousands)	D ₂	D ₄ and SPI	A ₁	A ₂	A ₄	B ₁	B ₂	B ₄	C ₁	C ₂	C ₄
98.0	1	0	1	0	0	1	0	1	0	1	0
98.1	1	0	1	0	0	1	0	1	1	1	0
98.2	1	0	1	0	0	1	0	1	1	0	0
98.3	1	0	1	0	0	1	0	0	1	0	0
98.4	1	0	1	0	0	1	0	0	1	1	0
98.5	1	0	1	0	0	1	0	0	0	1	0
98.6	1	0	1	0	0	1	0	0	0	1	1
98.7	1	0	1	0	0	1	0	0	0	0	1
98.8	1	0	1	0	1	1	0	0	0	0	1
98.9	1	0	1	0	1	1	0	0	0	1	1
99.0	1	0	1	0	1	1	0	0	0	1	0
99.1	1	0	1	0	1	1	0	0	1	1	0
99.2	1	0	1	0	1	1	0	0	1	0	0
99.3	1	0	1	0	1	1	0	1	1	0	0
99.4	1	0	1	0	1	1	0	1	1	1	0
99.5	1	0	1	0	1	1	0	1	0	1	0
99.6	1	0	1	0	1	1	0	1	0	1	1
99.7	1	0	1	0	1	1	0	1	0	0	1
99.8	1	0	1	0	1	1	1	1	0	0	1
99.9	1	0	1	0	1	1	1	1	0	1	1
100.0	1	0	1	0	1	1	1	1	0	1	0
100.1	1	0	1	0	1	1	1	1	1	1	0
100.2	1	0	1	0	1	1	1	1	1	0	0
100.3	1	0	1	0	1	1	1	0	1	0	0
100.4	1	0	1	0	1	1	1	0	1	1	0
100.5	1	0	1	0	1	1	1	0	0	1	0
100.6	1	0	1	0	1	1	1	0	0	1	1
100.7	1	0	1	0	1	1	1	0	0	0	1
100.8	1	0	1	0	1	0	1	0	0	0	1
100.9	1	0	1	0	1	0	1	0	0	1	1
101.0	1	0	1	0	1	0	1	0	0	1	0
101.1	1	0	1	0	1	0	1	0	1	1	0
101.2	1	0	1	0	1	0	1	0	1	0	0
101.3	1	0	1	0	1	0	1	1	1	0	0
101.4	1	0	1	0	1	0	1	1	1	1	0
101.5	1	0	1	0	1	0	1	1	0	1	0
101.6	1	0	1	0	1	0	1	1	0	1	1
101.7	1	0	1	0	1	0	1	1	0	0	1
101.8	1	0	1	0	1	0	0	1	0	0	1
101.9	1	0	1	0	1	0	0	1	0	1	1



RANGE	PULSE POSITION										
(Altitude in Thousands)	D ₂	D ₄ and SPI	A ₁	A ₂	A ₄	B ₁	B ₂	B ₄	C ₁	C ₂	C ₄
102.0	1	0	1	0	1	0	0	1	0	1	0
102.1	1	0	1	0	1	0	0	1	1	1	0
102.2	1	0	1	0	1	0	0	1	1	0	0
102.3	1	0	1	0	1	0	0	0	1	0	0
102.4	1	0	1	0	1	0	0	0	1	1	0
102.5	1	0	1	0	1	0	0	0	0	1	0
102.6	1	0	1	0	1	0	0	0	0	1	1
102.7	1	0	1	0	1	0	0	0	0	0	1
102.8	1	0	1	1	1	0	0	0	0	0	1
102.9	1	0	1	1	1	0	0	0	0	1	1
103.0	1	0	1	1	1	0	0	0	0	1	0
103.1	1	0	1	1	1	0	0	0	1	1	0
103.2	1	0	1	1	1	0	0	0	1	0	0
103.3	1	0	1	1	1	0	0	1	1	0	0
103.4	1	0	1	1	1	0	0	1	1	1	0
103.5	1	0	1	1	1	0	0	1	0	1	0
103.6	1	0	1	1	1	0	0	1	0	1	1
103.7	1	0	1	1	1	0	0	1	0	0	1
103.8	1	0	1	1	1	0	1	1	0	0	1
103.9	1	0	1	1	1	0	1	1	0	1	1
104.0	1	0	1	1	1	0	1	1	0	1	0
104.1	1	0	1	1	1	0	1	1	1	1	0
104.2	1	0	1	1	1	0	1	1	1	0	0
104.3	1	0	1	1	1	0	1	0	1	0	0
104.4	1	0	1	1	1	0	1	0	1	1	0
104.5	1	0	1	1	1	0	1	0	0	1	0
104.6	1	0	1	1	1	0	1	0	0	1	1
104.7	1	0	1	1	1	0	1	0	0	0	1
104.8	1	0	1	1	1	0	1	0	0	0	1
104.9	1	0	1	1	1	1	1	0	0	1	1
105.0	1	0	1	1	1	1	1	0	0	1	0
105.1	1	0	1	1	1	1	1	0	1	1	0
105.2	1	0	1	1	1	1	1	0	1	0	0
105.3	1	0	1	1	1	1	1	1	1	0	0
105.4	1	0	1	1	1	1	1	1	1	1	0
105.5	1	0	1	1	1	1	1	1	0	1	0
105.6	1	0	1	1	1	1	1	1	0	1	1
105.7	1	0	1	1	1	1	1	1	0	0	1
105.8	1	0	1	1	1	1	0	1	0	0	1
105.9	1	0	1	1	1	1	0	1	0	1	1



RANGE	PULSE POSITION										
(Altitude in Thousands)	D ₂	D ₄ and SPI	A ₁	A ₂	A ₄	B ₁	B ₂	B ₄	C ₁	C ₂	C ₄
106.0	1	0	1	1	1	1	0	1	0	1	0
106.1	1	0	1	1	1	1	0	1	1	1	0
106.2	1	0	1	1	1	1	0	1	1	0	0
106.3	1	0	1	1	1	1	0	0	1	0	0
106.4	1	0	1	1	1	1	0	0	1	1	0
106.5	1	0	1	1	1	1	0	0	0	1	0
106.6	1	0	1	1	1	1	0	0	0	1	1
106.7	1	0	1	1	1	1	0	0	0	0	1
106.8	1	0	1	1	0	1	0	0	0	0	1
106.9	1	0	1	1	0	1	0	0	0	1	1
107.0	1	0	1	1	0	1	0	0	0	1	0
107.1	1	0	1	1	0	1	0	0	1	1	0
107.2	1	0	1	1	0	1	0	0	1	0	0
107.3	1	0	1	1	0	1	0	1	1	0	0
107.4	1	0	1	1	0	1	0	1	1	1	0
107.5	1	0	1	1	0	1	0	1	0	1	0
107.6	1	0	1	1	0	1	0	1	0	1	1
107.7	1	0	1	1	0	1	0	1	0	0	1
107.8	1	0	1	1	0	1	1	1	0	0	1
107.9	1	0	1	1	0	1	1	1	0	1	1
108.0	1	0	1	1	0	1	1	1	0	1	0
108.1	1	0	1	1	0	1	1	1	1	1	0
108.2	1	0	1	1	0	1	1	1	1	0	0
108.3	1	0	1	1	0	1	1	0	1	0	0
108.4	1	0	1	1	0	1	1	0	1	1	0
108.5	1	0	1	1	0	1	1	0	0	1	0
108.6	1	0	1	1	0	1	1	0	0	1	1
108.7	1	0	1	1	0	1	1	0	0	0	1
108.8	1	0	1	1	0	0	1	0	0	0	1
108.9	1	0	1	1	0	0	1	0	0	1	1
109.0	1	0	1	1	0	0	1	0	0	1	0
109.1	1	0	1	1	0	0	1	0	1	1	0
109.2	1	0	1	1	0	0	1	0	1	0	0
109.3	1	0	1	1	0	0	1	1	1	0	0
109.4	1	0	1	1	0	0	1	1	1	1	0
109.5	1	0	1	1	0	0	1	1	0	1	0
109.6	1	0	1	1	0	0	1	1	0	1	1
109.7	1	0	1	1	0	0	1	1	0	0	1
109.8	1	0	1	1	0	0	0	1	0	0	1
109.9	1	0	1	1	0	0	0	1	0	1	1



RANGE (Altitude in Thousands)	PULSE POSITION										
	D ₂	D ₄ and SPI	A ₁	A ₂	A ₄	B ₁	B ₂	B ₄	C ₁	C ₂	C ₄
110.0	1	0	1	1	0	0	0	1	0	1	0
110.1	1	0	1	1	0	0	0	1	1	1	0
110.2	1	0	1	1	0	0	0	1	1	0	0
110.3	1	0	1	1	0	0	0	0	1	0	0
110.4	1	0	1	1	0	0	0	0	1	1	0
110.5	1	0	1	1	0	0	0	0	0	1	0
110.6	1	0	1	1	0	0	0	0	0	1	1
110.7	1	0	1	1	0	0	0	0	0	0	1
110.8	1	0	0	1	0	0	0	0	0	0	1
110.9	1	0	0	1	0	0	0	0	0	1	1
111.0	1	0	0	1	0	0	0	0	0	1	0
111.1	1	0	0	1	0	0	0	0	1	1	0
111.2	1	0	0	1	0	0	0	0	1	0	0
111.3	1	0	0	1	0	0	0	1	1	0	0
111.4	1	0	0	1	0	0	0	1	1	1	0
111.5	1	0	0	1	0	0	0	1	0	1	0
111.6	1	0	0	1	0	0	0	1	0	1	1
111.7	1	0	0	1	0	0	0	1	0	0	1
111.8	1	0	0	1	0	0	1	1	0	0	1
111.9	1	0	0	1	0	0	1	1	0	1	1
112.0	1	0	0	1	0	0	1	1	0	1	0
112.1	1	0	0	1	0	0	1	1	1	1	0
112.2	1	0	0	1	0	0	1	1	1	0	0
112.3	1	0	0	1	0	0	1	0	1	0	0
112.4	1	0	0	1	0	0	1	0	1	1	0
112.5	1	0	0	1	0	0	1	0	0	1	0
112.6	1	0	0	1	0	0	1	0	0	1	1
112.7	1	0	0	1	0	0	1	0	0	0	1
112.8	1	0	0	1	0	1	1	0	0	0	1
112.9	1	0	0	1	0	1	1	0	0	1	1
113.0	1	0	0	1	0	1	1	0	0	1	0
113.1	1	0	0	1	0	1	1	0	1	1	0
113.2	1	0	0	1	0	1	1	0	1	0	0
113.3	1	0	0	1	0	1	1	1	1	0	0
113.4	1	0	0	1	0	1	1	1	1	1	0
113.5	1	0	0	1	0	1	1	1	0	1	0
113.6	1	0	0	1	0	1	1	1	0	1	1
113.7	1	0	0	1	0	1	1	1	0	0	1
113.8	1	0	0	1	0	1	0	1	0	0	1
113.9	1	0	0	1	0	1	0	1	0	1	1



RANGE	PULSE POSITION										
(Altitude in Thousands)	D ₂	D ₄ and SPI	A ₁	A ₂	A ₄	B ₁	B ₂	B ₄	C ₁	C ₂	C ₄
114.0	1	0	0	1	0	1	0	1	0	1	0
114.1	1	0	0	1	0	1	0	1	1	1	0
114.2	1	0	0	1	0	1	0	1	1	0	0
114.3	1	0	0	1	0	1	0	0	1	0	0
114.4	1	0	0	1	0	1	0	0	1	1	0
114.5	1	0	0	1	0	1	0	0	0	1	0
114.6	1	0	0	1	0	1	0	0	0	1	1
114.7	1	0	0	1	0	1	0	0	0	0	1
114.8	1	0	0	1	1	1	0	0	0	0	1
114.9	1	0	0	1	1	1	0	0	0	1	1
115.0	1	0	0	1	1	1	0	0	0	1	0
115.1	1	0	0	1	1	1	0	0	1	1	0
115.2	1	0	0	1	1	1	0	0	1	0	0
115.3	1	0	0	1	1	1	0	1	1	0	0
115.4	1	0	0	1	1	1	0	1	1	1	0
115.5	1	0	0	1	1	1	0	1	0	1	0
115.6	1	0	0	1	1	1	0	1	0	1	1
115.7	1	0	0	1	1	1	0	1	0	0	1
115.8	1	0	0	1	1	1	1	1	0	0	1
115.9	1	0	0	1	1	1	1	1	0	1	1
116.0	1	0	0	1	1	1	1	1	0	1	0
116.1	1	0	0	1	1	1	1	1	1	1	0
116.2	1	0	0	1	1	1	1	1	1	0	0
116.3	1	0	0	1	1	1	1	0	1	0	0
116.4	1	0	0	1	1	1	1	0	1	1	0
116.5	1	0	0	1	1	1	1	0	0	1	0
116.6	1	0	0	1	1	1	1	0	0	1	1
116.7	1	0	0	1	1	1	1	0	0	0	1
116.8	1	0	0	1	1	0	1	0	0	0	1
116.9	1	0	0	1	1	0	1	0	0	1	1
117.0	1	0	0	1	1	0	1	0	0	1	0
117.1	1	0	0	1	1	0	1	0	1	1	0
117.2	1	0	0	1	1	0	1	0	1	0	0
117.3	1	0	0	1	1	0	1	1	1	0	0
117.4	1	0	0	1	1	0	1	1	1	1	0
117.5	1	0	0	1	1	0	1	1	0	1	0
117.6	1	0	0	1	1	0	1	1	0	1	1
117.7	1	0	0	1	1	0	1	1	0	0	1
117.8	1	0	0	1	1	0	0	1	0	0	1
117.9	1	0	0	1	1	0	0	1	0	1	1



RANGE	PULSE POSITION										
(Altitude in Thousands)	D ₂	D ₄ and SPI	A ₁	A ₂	A ₄	B ₁	B ₂	B ₄	C ₁	C ₂	C ₄
118.0	1	0	0	1	1	0	0	1	0	1	0
118.1	1	0	0	1	1	0	0	1	1	1	0
118.2	1	0	0	1	1	0	0	1	1	0	0
118.3	1	0	0	1	1	0	0	0	1	0	0
118.4	1	0	0	1	1	0	0	0	1	1	0
118.5	1	0	0	1	1	0	0	0	0	1	0
118.6	1	0	0	1	1	0	0	0	0	1	1
118.7	1	0	0	1	1	0	0	0	0	0	1
118.8	1	0	0	0	1	0	0	0	0	0	1
118.9	1	0	0	0	1	0	0	0	0	1	1
119.0	1	0	0	0	1	0	0	0	0	1	0
119.1	1	0	0	0	1	0	0	0	1	1	0
119.2	1	0	0	0	1	0	0	0	1	0	0
119.3	1	0	0	0	1	0	0	1	1	0	0
119.4	1	0	0	0	1	0	0	1	1	1	0
119.5	1	0	0	0	1	0	0	1	0	1	0
119.6	1	0	0	0	1	0	0	1	0	1	1
119.7	1	0	0	0	1	0	0	1	0	0	1
119.8	1	0	0	0	1	0	1	1	0	0	1
119.9	1	0	0	0	1	0	1	1	0	1	1
120.0	1	0	0	0	1	0	1	1	0	1	0
120.1	1	0	0	0	1	0	1	1	1	1	0
120.2	1	0	0	0	1	0	1	1	1	0	0
120.3	1	0	0	0	1	0	1	0	1	0	0
120.4	1	0	0	0	1	0	1	0	1	1	0
120.5	1	0	0	0	1	0	1	0	0	1	0
120.6	1	0	0	0	1	0	1	0	0	1	1
120.7	1	0	0	0	1	0	1	0	0	0	1
120.8	1	0	0	0	1	1	1	0	0	0	1
120.9	1	0	0	0	1	1	1	0	0	1	1
121.0	1	0	0	0	1	1	1	0	0	1	0
121.1	1	0	0	0	1	1	1	0	1	1	0
121.2	1	0	0	0	1	1	1	0	1	0	0
121.3	1	0	0	0	1	1	1	1	1	0	0
121.4	1	0	0	0	1	1	1	1	1	1	0
121.5	1	0	0	0	1	1	1	1	0	1	0
121.6	1	0	0	0	1	1	1	1	0	1	1
121.7	1	0	0	0	1	1	1	1	0	0	1
121.8	1	0	0	0	1	1	0	1	0	0	1
121.9	1	0	0	0	1	1	0	1	0	1	1



RANGE	PULSE POSITION										
(Altitude in Thousands)	D ₂	D ₄ and SPI	A ₁	A ₂	A ₄	B ₁	B ₂	B ₄	C ₁	C ₂	C ₄
122.0	1	0	0	0	1	1	0	1	0	1	0
122.1	1	0	0	0	1	1	0	1	1	1	0
122.2	1	0	0	0	1	1	0	1	1	0	0
122.3	1	0	0	0	1	1	0	0	1	0	0
122.4	1	0	0	0	1	1	0	0	1	1	0
122.5	1	0	0	0	1	1	0	0	0	1	0
122.6	1	0	0	0	1	1	0	0	0	1	1
122.7	1	0	0	0	1	1	0	0	0	0	1
122.8	1	0	0	0	0	1	0	0	0	0	1
122.9	1	0	0	0	0	1	0	0	0	1	1
123.0	1	0	0	0	0	1	0	0	0	1	0
123.1	1	0	0	0	0	1	0	0	1	1	0
123.2	1	0	0	0	0	1	0	0	1	0	0
123.3	1	0	0	0	0	1	0	1	1	0	0
123.4	1	0	0	0	0	1	0	1	1	1	0
123.5	1	0	0	0	0	1	0	1	0	1	0
123.6	1	0	0	0	0	1	0	1	0	1	1
123.7	1	0	0	0	0	1	0	1	0	0	1
123.8	1	0	0	0	0	1	1	1	0	0	1
123.9	1	0	0	0	0	1	1	1	0	1	1
124.0	1	0	0	0	0	1	1	1	0	1	0
124.1	1	0	0	0	0	1	1	1	1	1	0
124.2	1	0	0	0	0	1	1	1	1	0	0
124.3	1	0	0	0	0	1	1	0	1	0	0
124.4	1	0	0	0	0	1	1	0	1	1	0
124.5	1	0	0	0	0	1	1	0	0	1	0
124.6	1	0	0	0	0	1	1	0	0	1	1
124.7	1	0	0	0	0	1	1	0	0	0	1
124.8	1	0	0	0	0	0	1	0	0	0	1
124.9	1	0	0	0	0	0	1	0	0	1	1
125.0	1	0	0	0	0	0	1	0	0	1	0
125.1	1	0	0	0	0	0	1	0	1	1	0
125.2	1	0	0	0	0	0	1	0	1	0	0
125.3	1	0	0	0	0	0	1	1	1	0	0
125.4	1	0	0	0	0	0	1	1	1	1	0
125.5	1	0	0	0	0	0	1	1	0	1	0
125.6	1	0	0	0	0	0	1	1	0	1	1
125.7	1	0	0	0	0	0	1	1	0	0	1
125.8	1	0	0	0	0	0	0	1	0	0	1
125.9	1	0	0	0	0	0	0	1	0	1	1



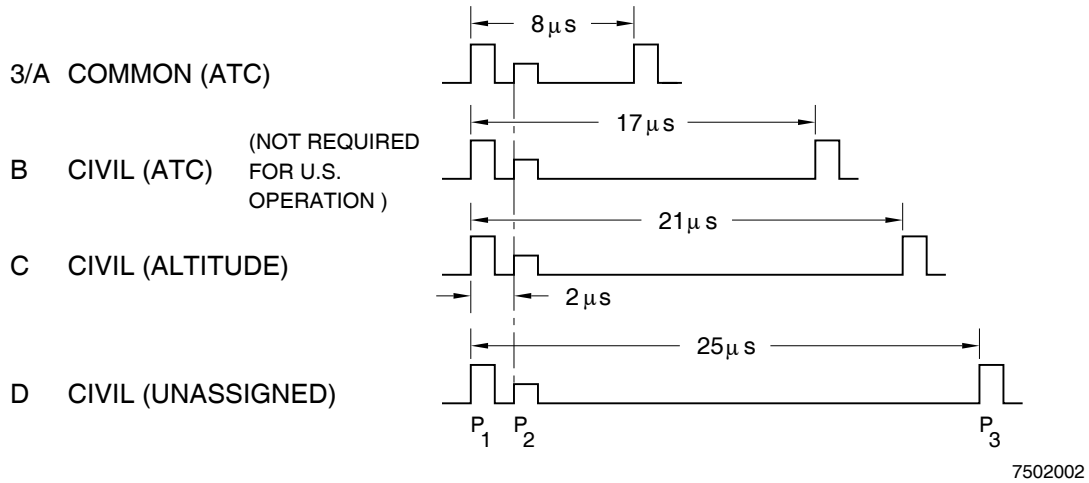
RANGE	PULSE POSITION										
(Altitude in Thousands)	D ₂	D ₄ and SPI	A ₁	A ₂	A ₄	B ₁	B ₂	B ₄	C ₁	C ₂	C ₄
126.0	1	0	0	0	0	0	0	1	0	1	0
126.1	1	0	0	0	0	0	0	1	1	1	0
126.2	1	0	0	0	0	0	0	1	1	0	0
126.3	1	0	0	0	0	0	0	0	1	0	0
126.4	1	0	0	0	0	0	0	0	1	1	0
126.5	1	0	0	0	0	0	0	0	0	1	0
126.6	1	0	0	0	0	0	0	0	0	1	1
126.7	1	0	0	0	0	0	0	0	0	0	1



THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX C - ATCRBS INTERROGATION MODES AND XPDR REPLY CODES

1. ATCRBS INTERROGATION MODES



2. XPDR REPLY CODES



SPACING (μ s) LEADING EDGE TO LEADING EDGE

0	1.45	2.9	4.35	5.8	7.25	8.7	10.15	11.6	13.06	14.5	15.95	17.4	18.85	20.3
---	------	-----	------	-----	------	-----	-------	------	-------	------	-------	------	-------	------

PULSE NOMENCLATURE

F ₁	C ₁	A ₁	C ₂	A ₂	C ₄	A ₄	X	B ₁	D ₁	B ₂	D ₂	B ₄	D ₄	F ₂
----------------	----------------	----------------	----------------	----------------	----------------	----------------	---	----------------	----------------	----------------	----------------	----------------	----------------	----------------

7502003



THIS PAGE INTENTIONALLY LEFT BLANK.



APPENDIX D - METRIC/BRITISH IMPERIAL CONVERSION TABLE WITH NAUTICAL DISTANCE CONVERSIONS

TO CONVERT:	INTO:	MULTIPLY BY:	TO CONVERT:	INTO:	MULTIPLY BY:
cm	feet	0.03281	meters	feet	3.281
cm	inches	0.3937	meters	inches	39.37
feet	cm	30.48	m/sec	ft/sec	3.281
feet	meters	0.3048	m/sec	km/hr	3.6
ft/sec	km/hr	1.097	m/sec	miles/hr	2.237
ft/sec	knots	0.5921	miles	feet	5280
ft/sec	miles/hr	0.6818	miles	km	1.609
ft/sec ²	cm/sec ²	30.48	miles	meters	1609
ft/sec ²	m/sec ²	0.3048	miles	nmi	0.8684
grams	ounces	0.03527	miles/hr	ft/sec	1.467
inches	cm	2.54	miles/hr	km/hr	1.609
kg	pounds	2.205	miles/hr	knots	0.8684
kg/cm ²	psi	0.0703	nmi	feet	6080.27
km	feet	3281	nmi	km	1.8532
km	miles	0.6214	nmi	meters	1853.2
km	nmi	0.5396	nmi	miles	1.1516
km/hr	ft/sec	0.9113	ounces	grams	28.34953
km/hr	knots	0.5396	pounds	kg	0.4536
km/hr	miles/hr	0.6214	psi	kg/cm ²	0.0703
knots	ft/sec	1.689	100 ft	km	3.048
knots	km/hr	1.8532	100 ft	miles	1.894
knots	miles/hr	1.1516	100 ft	nmi	1.645



THIS PAGE INTENTIONALLY LEFT BLANK.



APPENDIX E - ABBREVIATIONS

A		M	
A	Ampere	m	Meter
AC, ac	Alternating Current	MHz	Megahertz
AH	Ampere Hour	MTL	Minimum Trigger Level
ALT	Altimeter	MTR	Meter
B		N	
BAT	Battery	NiCad	Nickel Cadmium
		NM, nmi	Nautical Miles
C		O	
cm	Centimeter		
cw	Clockwise	OUT, out	Output
ccw	Counterclockwise		
D		P	
DC, dc	Direct Current	para	Paragraph
dB	Decibel	pps	Pulses per Second
dBm	Decibel above one Milliwatt	PRF	Pulse Repetition Frequency
DME	Distance Measuring Equipment	psi	Pounds per Square Inch
		PWR	Power
F		R	
FREQ	Frequency	RF	Radio Frequency
ft	Feet	rms	Root Mean Square
		RPLY	Reply
G		S	
GND	Ground		
H		STDBY	Standby
		sec	Second
HI	High	U	
hr	Hour		
Hz	Hertz	UUT	Unit Under Test
I		V	
IDENT	Identification	V	Volt
ILS	Instrument Landing System	VAC	Volts Alternating Current
IN, in	Input	Vdc	Volts Direct Current
in	Inch		
I/O	Input/Output	W	
K			
		W	Watt
kg	Kilogram	X	
k Ω	Kilohm		
kW	Kilowatt	XPDR	Transponder
L			
		μ s	Microsecond
lbs	Pounds	μ A	Microampere
LO	Local Oscillator		



THIS PAGE INTENTIONALLY LEFT BLANK.

INDEX

Abbreviations	App E	Functional Capabilities	1-1-1, p 1
AC Power Requirements	1-2-1, p 2	Fuse Ratings, Specified	1-2-1, p 2
	1-3-1, p 2	Fuse Requirements (Specifications)	1-3-1, p 2
Altitude Pulse Position Assignment Chart (ARINC 532D)	1-2-2, p 8		
Altitude Transmission Code Chart	App B	General Description and Capabilities	1-1-1, p 1
ATCRBS Interrogation Modes and XPDR Reply Codes	App C	General Operating Procedures	1-2-3, p 1
		Grounding Power Cord	1-2-1, p 1
Battery		Installation	1-2-1, p 1
Charging	1-2-1, p 1	I/O Connectors, Table of	App A
Operation	1-2-1, p 1		
	1-3-1, p 2		
Parameters	1-2-3, p 1	Metric/British Conversion Table	App D
Recharging	1-2-1, p 2		
Bench Operation	1-2-1, p 3		
Bench Operation Equipment	1-2-3, p 1	Operating Safety	1-2-1, p 1
		Operation	1-2-1, p 1
		Bench	1-2-1, p 3
CAUTION and WARNING Labels	1-2-1, p 1	DME	1-2-3, p 9
Complying with Instructions	1-2-1, p 1	17Y Channel Operation	1-2-3, p 13
Connector Pin-Out Tables	App A	DME ILS Channel Operation	1-2-3, p 13
Altitude Encoder Input Connector	App A	DME Range or Distance Operation	1-2-3, p 10
Controls, Connectors and Indicators	1-2-2, p 2	DME Transmitted PRF	1-2-3, p 10
Front Panel	1-2-2, p 3	DME Velocity Operation	1-2-3, p 10
Rear Panel	1-2-2, p 7	IDENT Tone	1-2-3, p 11
		Percent Reply	1-2-3, p 12
Description	1-1-1, p 1	Squitter Lock-Out	1-2-3, p 12
DME Frequency/Spacing Assignments	1-2-2, p 5	Transmitter Peak Power and Frequency	1-2-3, p 11
DME Operation Tests	1-2-3, p 9	Encoding Altimeter	1-2-3, p 14
17Y Channel Operation	1-2-3, p 13	Ramp	1-2-3, p 1
DME ILS Channel Operation	1-2-3, p 13	Transponder Operation Tests	1-2-3, p 3
DME Range or Distance Operation	1-2-3, p 9	Altitude Code	1-2-3, p 4
DME Transmitted PRF	1-2-3, p 10	IDENT (XPDR) Pulse Output	1-2-3, p 6
DME Velocity Operation	1-2-3, p 10	Invalid ALT Indicator	1-2-3, p 7
IDENT Tone	1-2-3, p 11	Peak Transponder Power	1-2-3, p 4
Percent Reply	1-2-3, p 12	Percent Reply	1-2-3, p 5
Squitter Lock-Out	1-2-3, p 12	Pilot's Code	1-2-3, p 3
Transmitter Peak Power and Frequency	1-2-3, p 11	Receiver Sensitivity	1-2-3, p 8
DME Operation Test Equipment		SLS Operation	1-2-3, p 6
Setup	1-2-3, p 9	Transponder Frequency	1-2-3, p 5
DME Specifications	1-3-1, p 1	Transponder Pulse Spacing	1-2-3, p 8
		XPDR Receiver-Decoder Limits	1-2-3, p 7
Encoder Connector Pin Assignments	1-2-3, p 14	Physical Characteristics	1-3-1, p 3
Encoding Altimeter Operation Test Equipment Setup	1-2-3, p 14		
Encoding Altimeter Tests	1-2-3, p 15	Ramp Operation Equipment	1-2-3, p 1
Altitude Display	1-2-3, p 15	Repacking Procedure	1-4-1, p 1
Equipment Setup			
Bench Operation	1-2-3, p 1		
DME Operation	1-2-3, p 9		
Encoding Altimeter	1-2-3, p 14		
Ramp	1-2-3, p 1		
Transponder	1-2-3, p 3		
External Cleaning	1-2-1, p 3		



Safety Precautions	1-2-1, p 1
Shipping	1-4-1, p 1
Shipping Test Sets	1-4-1, p 1
Specifications	1-3-1, p 1
AC Power Requirements	1-3-1, p 2
Battery Operation	1-3-1, p 2
DME	1-3-1, p 1
Fuse Requirements	1-3-1, p 2
Operational Environmental Conditions	1-3-1, p 3
Physical Characteristics	1-3-1, p 3
Safety	1-3-1, p 3
Transponder	1-3-1, p 1
Specified Fuse Ratings	1-2-1, p 2
Storage	1-5-1, p 1

Table of I/O Connectors	App A
Transponder Operation Tests	1-2-3, p 3
Altitude Code	1-2-3, p 4
IDENT (XPDR) Pulse Output	1-2-3, p 6
Invalid ALT Indicator	1-2-3, p 7
Peak Transponder Power	1-2-3, p 4
Percent Reply	1-2-3, p 5
Pilot's Code	1-2-3, p 3
Receiver Sensitivity	1-2-3, p 8
SLS Operation	1-2-3, p 6
Transponder Frequency	1-2-3, p 5
Transponder Pulse Spacing	1-2-3, p 8
XPDR Receiver-Decoder Limits	1-2-3, p 7
Transponder Operation	
Test Equipment Setup	1-2-3, p 3
Transponder Specifications	1-3-1, p 1

WARNING Labels, CAUTION and	1-2-1, p 1
-----------------------------	------------

As we are always seeking to improve our products, the information in this document gives only a general indication of the product capacity, performance and suitability, none of which shall form part of any contract. We reserve the right to make design changes without notice.

CHINA	Tel: [+86] (10) 6467 2716	Fax: [+86] (10) 6467 2821
FRANCE	Tel: [+33] 1 60 79 96 00	Fax: [+33] 1 60 0177 69 22
HONG KONG	Tel: [+852] 2832 7988	Fax: [+852] 2834 5364
SCANDINAVIA	Tel: [+45] 9614 0045	Fax: [+45] 9614 0047
SPAIN	Tel: [+34] (91) 640 11 34	Fax: [+34] (91) 640 06 40
UNITED KINGDOM	Tel: [+44] (0) 1438 742200	Fax: [+44] (0) 1438 7276
	Toll Free: 0800 282388 (UK only)	
USA	Tel: [+1] (316) 522 4981	Fax: [+1] (316) 522 1360
	Toll Free: 800 835 2352 (US only)	

The Aeroflex logo features a stylized 'A' icon composed of two overlapping curved lines, followed by the word 'AEROFLEX' in a bold, sans-serif, uppercase font.

Our passion for performance is defined by three attributes represented by these three icons: solution-minded, performance-driven, customer-focused.