

(USAF) T.O. 12P4-2APX-202
(NAVY) NAVAIR 16-35TS1843-2
(ARMY) TM 11-6625-1646-24-1

TECHNICAL MANUAL

**ORGANIZATIONAL
INTERMEDIATE AND DEPOT
MAINTENANCE INSTRUCTIONS
WITH
ILLUSTRATED PARTS BREAKDOWN**

**TEST SET, TRANSPONDER SET
TS-1843B/APX**

ASC Systems Corporation
F33657-71-C-0175

PUBLISHED BY DIRECTION OF SECRETARIES OF THE AIR FORCE, NAVY AND ARMY

24 NOVEMBER 1976

TABLE OF CONTENTS

Section	Page	Section	Page
LIST OF ILLUSTRATIONS	iii		
I DESCRIPTION	1-1	5-10. Presetting TS-1843B/APX	
1-1. Scope of Technical Manual	1-1	External Controls	5-7
1-3. Purpose of Equipment	1-1	5-11. General	5-7
1-7. Description of Equipment	1-1	5-12. R-F IN (A3R46)	5-7
1-8. Physical Description	1-1	5-13. R-F OUT (A2R21)	5-7
1-10. Functional Description	1-2	5-14. VSWR (A6R6)	5-7
1-14. Installation	1-2	VI DEPOT MAINTENANCE	6-1
1-16. Reference Data	1-2	6-1. General	6-1
1-18. Indexes of Publications (Army)	1-2	6-3. Disassembly and Reassembly	6-1
1-21. Forms and Records (Army)	1-2	6-5. Checkout Procedures	6-1
1-26. Demolition of Equipment to		General	6-1
Prevent Enemy Use (Army)	1-3	6-7. Overall Checkout Using	
1-27. Administrative Storage (Army)	1-3	AN/APM-362	6-1
II TEST EQUIPMENT AND TOOLS	2-1	6-8. Overall Checkout Using	
2-1. General	2-1	Transponder	6-5
2-3. Test Equipment Required	2-1	6-9. Bracket Discrimination Check	6-5
III THEORY OF OPERATION	3-1	6-10. Test Set Interrogation	
3-1. Introduction	3-1	Frequency Check	6-6
3-3. Overall Functional Description	3-1	6-11. Test Set Interrogation Power	
3-13. Test Mode Switch Circuits	3-2	Check	6-6
3-14. Monitor Switch Circuits	3-2	6-12. Checkout of Assemblies	6-6
3-15. Lamp Switch Circuits	3-5	6-13. General	6-6
3-16. Timing Circuits	3-5	6-14. Checkout of Timing Assembly	
3-22. Directional Coupler	3-6	A2	6-6
3-23. Receiver/Signal Generator		6-15. Checkout of Evaluator Assembly	
Circuits	3-6	A	6-9
3-26. VSWR Circuits	3-6	6-16. Checkout of Regulator Assembly	
3-28. Evaluation Circuits	3-10	A4	6-9
3-29. Timing Sequence	3-10	6-17. Checkout of Power and Control	
3-39. Detailed Circuit Description	3-11	Assembly A1	6-9
3-40. Power and Control Assembly A1	3-11	6-18. Checkout of Signal Generator/	
3-42. Timing Assembly A2	3-11	Receiver Assembly A5	6-10
3-51. Evaluator Assembly A3	3-19	6-19. Checkout of VSWR Adjust	
3-63. Voltage Regulator A4	3-23	Assembly A6	6-10
3-70. Receiver/Signal Generator A5	3-24	6-20. Checkout of Directional Probe	
3-77. VSWR Adjust Assembly A6	3-27	Assembly A7	6-10
3-78. Directional Coupler Assembly A7	3-27	6-21. Troubleshooting Assemblies	6-11
IV DESCRIPTION OF SYSTEM TIE-IN	4-1	6-22. Calibration and Alignment	6-11
4-1. General	4-1	6-23. R-F IN Control A3R46	6-11
4-3. Equipment Tie-In	4-1	6-24. R-F OUT Control A2R21	6-12
V INTERMEDIATE MAINTENANCE	5-1	6-25. PRF Adjustment A3R2	6-12
5-1. General	5-1	6-26. VSWR Control A6R6	6-12
5-3. Operational Checkout	5-1	6-27. Adjustment and Alignment of	
5-4. Checkout Procedure	5-1	Signal Generator/Receiver A5	6-13
5-5. Troubleshooting	5-6	6-28. Repair Procedures	6-15
5-8. Removal and Replacement of		6-29. General	6-15
Assemblies	5-7	6-30. Replacement of Parts on Printed	
		Circuit Boards	6-15
		6-31. Repairing Foil Breaks	6-16
		6-32. Maintenance Allocation (Army)	6-16

TABLE OF CONTENTS (Cont.)

Section	Page	Section	Page
VII ILLUSTRATED PARTS BREAKDOWN . . .	7-1	7-18. "P" Series - Purchased Items . . .	7-3
7-1. Introduction	7-1	7-19. "M" Series - Manufactured Items Which Are Not Purchased or Stock Numbered	7-4
7-3. Group Assembly Parts List	7-1	7-20. "A" Series - Assemble - Assem- bly Not Purchased.	7-4
7-6. Numerical Index	7-1	7-21. "N" Series - Not Stocked Nor- mally - Will Be Purchased on Demand	7-4
7-8. Provisioning Codes	7-1	7-22. "X" Series - Not Procured, Nor- mally Impractical for Stocking, Maintenance or Manufacture . . .	7-4
7-10. Air Force Source Codes and Definitions	7-1	7-23. "U" Series - "U" Applied When Not of Supply or Maintenance Stocking Significance	7-4
7-11. "P" Series - Parts Procured and Under Inventory Stock Control	7-1	7-24. Material Accountability Recoverability Codes (MARC)	7-4
7-12. "M" Series - Manufacture, Parts not Procured	7-2	7-25. How To Use This Parts List	7-5
7-13. "A" Series - Assemble, Assembly not Procured	7-2		
7-14. "X" Series - Parts Considered Impractical for Service Manufacture	7-2		
7-15. Code "U" - Parts Not Procured, Manufactured, or Stocked	7-3		
7-16. Maintenance Repair Level Codes.	7-3		
7-17. Navy Source Codes and Defini- tions	7-3		

LIST OF ILLUSTRATIONS

Number	Title	Page	Number	Title	Page
1-1.	Test Set, Transponder Set TS-1843B/ APX and Mounting MT-3513/APX	1-0	5-4.	Troubleshooting Chart	5-3
1-2.	Outline Dimensional Drawing	1-5	5-5.	RG-58 Cable Length vs VSWR.	5-8
2-1.	Circuit Card Extenders.	2-1	6-1.	Equipment Setup for Checkout of TS-1843B/APX Using Transponder Test Set AN/UPM-362	6-2
3-1.	Overall Functional Block Diagram TS-1843B/APX	3-3	6-2.	Bracket Discrimination Test Setup	6-5
3-2.	Timing Sequence Chart	3-7	6-3.	Test Set Interrogation Frequency and Power Test Setup	6-7
3-3.	Time Base Generator Output Potential Chart	3-9	6-4.	Evaluator Assembly A3 Test Setup	6-8
3-4.	Power and Control Assembly A1 and Regulator Assembly A4, Schematic Diagram	3-13	6-5.	R-F IN Control Calibration Setup	6-11
3-5.	Timing Assembly A2, Schematic Diagram (Ser. Nos. Below 5000)	3-15	6-6.	Test Setup for Oscillator, Pulse Amplifier, and IF Gain Adjustment	6-13
3-6.	Timing Assembly A2, Schematic Diagram (Ser. Nos. 5000 and Higher)	3-17	6-7.	Signal Generator/Receiver Adjustment Setup	6-15
3-7.	Evaluator Assembly A3, Schematic Diagram	3-21	7-1.	TS-1843B/APX, Overall Assembly	7-6
3-8.	Receiver/ Signal Generator A5, VSWR Adjust Assembly A6, and Directional Coupler Assembly A7, Schematic Diagram	3-25	7-2.	Timing Assembly A2	7-8
4-1.	System Installation Diagram.	4-1	7-3.	Timing Board Assembly A2	7-9
4-2.	TS-1843B/APX Interconnection Diagram	4-2	7-3A.	Timing Board Assembly	7-13
5-1.	Intermediate Level (Bench) Test Setup	5-1	7-4.	Evaluator Assembly A3	7-16
5-2.	Assembly and External Adjustment Locations	5-2	7-5.	Evaluator Board Assembly A3	7-17
5-3.	Test Point and Internal Adjustment Locations	5-2	7-6.	Regulator Assembly A4	7-21
			7-7.	Signal Generator and Receiver Assembly A5	7-23
			7-8.	Receiver-Generator Board A5A1.	7-25
			7-9.	VSWR Adjust Assembly A6.	7-28
			7-10.	Housing Assembly	7-30
			7-11.	Power and Control Board Assembly A1	7-32

LIST OF TABLES

Number	Title	Page
1-1.	Reference Data	1-3
1-2.	Transistor Complement	1-4
1-3.	Integrated Circuit Complement	1-4
1-4.	Identification of Assemblies and Subassemblies.	1-6
2-1.	Test Equipment Required	2-1
3-1.	Inputs to Pulse Select Matrix Required for Outputs.	3-5
5-1.	List of Test Points	5-5
5-2.	AN/APM-239A Control Settings (C-6280)	5-6
6-1.	Adjustment and Alignment Controls	6-1
6-2.	Overall Checkout Using AN/APM-362	6-2
	Group Assembly Parts List	7-7
	Numerical Index	7-34
	Reference Designation Index	7-37

APPENDIX

Number	Title	Page
A	Maintenance Allocation (Army)	A-1

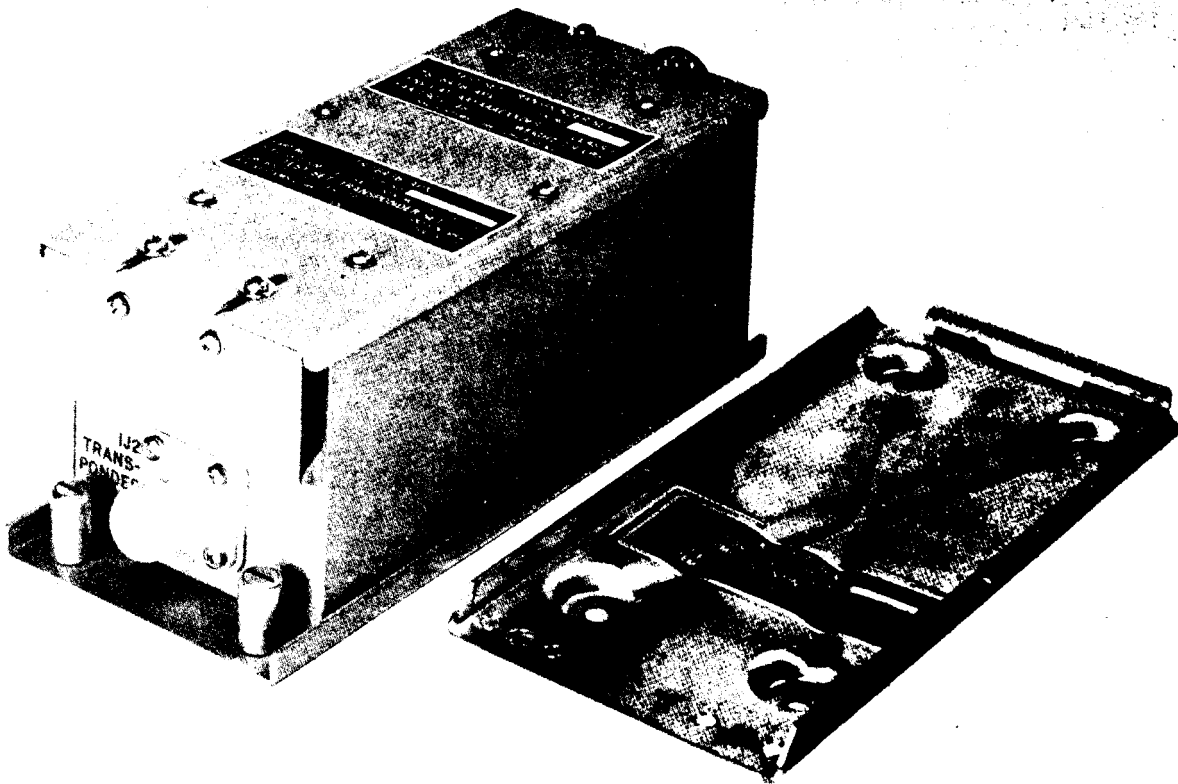


Figure 1-1. Test Set, Transponder Set TS-1843 B/APX and Mounting MT-3513/APX

SECTION 1

DESCRIPTION

1-1. SCOPE OF TECHNICAL MANUAL.

1-2. This technical manual contains instructions and procedures to be used by Intermediate and Depot activities in the maintenance and repair of Test Set, Transponder Set TS-1843B/APX, designed and manufactured by ASC Systems Corporation, Chicago, Illinois under contract F33657-71-C-0175. The equipment covered herein is configured for inter-service DOD AIMS System use. Any changes affecting form, fit, or function shall be by Configuration Control Board Directive only. The technical manual may be revised by or for the procuring activity without approval of the DOD AIMS Configuration Control Board in the following instances, providing form, fit, or function is not affected:

a. When the changes consist of clarifying, expanding, connecting or updating existing information in the technical manual.

b. When the item described in the technical manual is no longer available, and a substitute item must be used.

NOTE

When empty parentheses are used in the nomenclature of equipment used (as in C-6280()/APX) this means that any model of the equipment may be used.

1-3. PURPOSE OF EQUIPMENT.

1-4. Test Set, Transponder Set TS-1843B/APX is an in-flight GO/NO-GO test device, designed for installation in airborne IFF/SIF (Identification Friend or Foe/Selective Identification Feature) transponder systems. The test set has two operational modes: Test and Monitor. The TS-1843B/APX provides an operating voltage to an indicator lamp on the associated Transponder Set Control C-6280()/APX (or equivalent) to give a visual GO/NO-GO indication of the status of the transponder.

1-5. In the Test mode of operation, the TS-1843B/APX generates, upon command, rf interrogation test signals at a preset power level which enable the interrogator to check the response of his transponder set in the absence of external interrogation signals.

1-6. In the Monitor mode of operation, the test set continuously and automatically evaluates the SIF replies being transmitted by the associated transponder on a reply-by-reply basis when it receives IFF interrogation signals from an interrogator set.

1-7. DESCRIPTION OF EQUIPMENT.

1-8. **PHYSICAL DESCRIPTION.** The Test Set TS-1843B/APX (figure 1-1) is a single unit of 2-7/8 by 3 by 7-3/4 inch dimensions. It weighs approximately 2 lbs 15 oz (including mounting). At each end of the unit an rf receptacle is located for connecting the test set into the line between the transponder and its antenna. On the ANTENNA end is located the multiple-pin POWER receptacle (1J1) for power and control connections. On the other end are mounted three service adjustments which are protected during operation by a hinged cover plate. These adjustments are in the form of small control dials which are coupled to variable resistors inside the equipment. Each dial is provided with a locking device. The TS-1843B/APX is installed in the aircraft on Mounting MT-3513()/APX (figure 1-2). This mounting plate is permanently attached to the aircraft by four screws. The TS-1843B/APX is secured to the mounting by two fast-action screw-driver-operated Dzus fasteners. Although the mounting plate MT-3513()/APX is permanently attached to the aircraft, design of the TS-1843B/APX permits the Test Set to be installed in either direction within the mounting plate. This is accomplished by removing the bottom plate from the TS-1843B/APX, rotating the plate 180° and replacing the plate on the TS-1843B/APX. The test set may then be installed in the mounting in the reverse direction from that shown in figure 1-1.



Make sure the antenna cable is connected (1J3) and the transponder cable is connected to the TRANSPONDER connector (1J2). Reversing these connections may result in damage to the TS-1843B/APX.

1-9. The TS-1843B/APX consists of a cast aluminum case with an integral directional coupler channel enclosing the main conductor rod between the rf receptacles at each end of the box. The electronic circuitry is contained in seven assemblies: Power and Control Assembly (A1), Timing Assembly (A2), Evaluator Assembly (A3), Regulator Assembly (A4), Receiver/Signal Generator Assembly (A5), VSWR Adjust Assembly (A6), and Directional Coupler Assembly (A7). The A1 assembly contains printed wiring and electrical contacts that receive the mating connectors of assemblies A2, A3, A4, and A6, each of which is readily detachable for maintenance or replacement.