

NAVSHIPS 94200.4-2 Directory of Electronics Test  
Equipment

Section 4.13 Calibrating Test Equipment

24 November 1964

TEST SET, RADAR AN/APM-18

Cog Service: USN FSN:

Functional Class:

USA

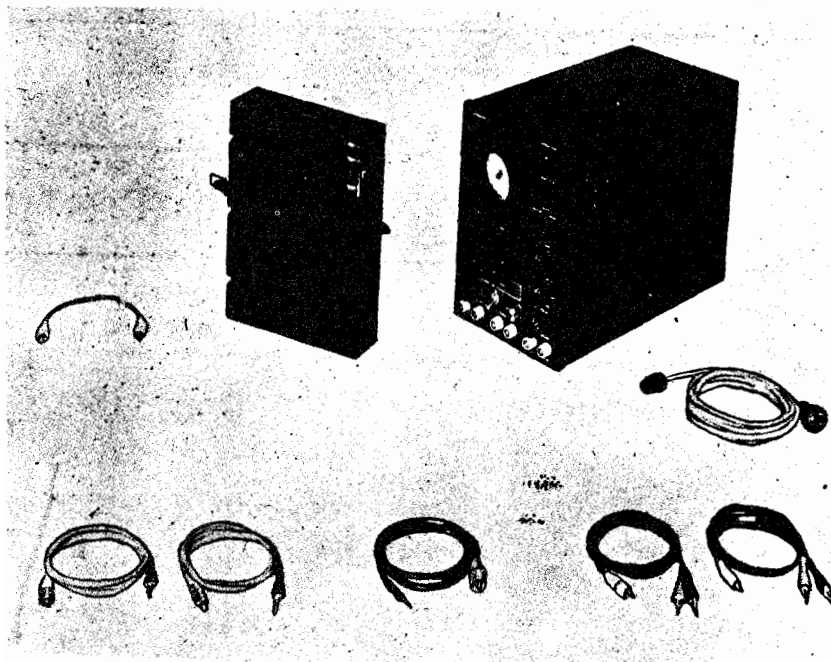
USN

USAF

TYPE CLASS:

Used by

MANUFACTURER'S NAME/CODE NUMBER:



TEST SET, RADAR AN/APM-18

**FUNCTIONAL DESCRIPTION:**

Test Set, Radar AN/APM-18 is a portable, general purpose equipment used for viewing short video pulses and for measuring the time intervals between pulses when testing radar equipment.

No field changes in effect at time of preparation (13 November 1964).

**RELATION TO OTHER EQUIPMENT:**

**EQUIPMENT REQUIRED BUT NOT SUPPLIED:**

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## AN/APM-18 TEST SET, RADAR

### TECHNICAL CHARACTERISTICS:

FREQUENCY RANGE: 250 cps to 2.8 mc.

POWER INPUT: 105 to 125 v ac or 210 to 250 v ac, 50 to 1200 cps, single ph, 110 W.

#### TYPES OF SWEEPS

A: Linear, triggered only.

J: Circular, triggered or continuous.

R: Delayed linear, triggered only.

X: Delayed circular, triggered only.

#### GATE AND SWEEP SYNCHRONIZING CHARACTERISTICS

PULSE AMPLITUDE: 15 to 150 v pos; 25 to 150 v neg.

FREQUENCY: Approx 100 to 3000 pps for 1, 30, and 350 mi undelayed sweeps.

WAVEFORM: 0.25 usec at 90% amplitude points, to 30 usec w/10% amplitude point used to measure width to trailing edge.

RISE TIME: 100 v per usec.

INPUT IMPEDANCE TO NEGATIVE TRIGGER: 27,000 ohms shunted by 38 uuf.

INPUT IMPEDANCE TO POSITIVE TRIGGER: 240,000 ohms shunted by 38 uuf.

#### LINEAR AND CIRCULAR SWEEP LENGTHS

1 MILE: 12.36 usec duration.

30 MILE: 370.8 usec duration.

350 MILE: 4326 usec duration.

#### DELAY CIRCUIT FOR CIRCULAR AND LINEAR SWEEPS

MAXIMUM DELAY: Variable to 50 mi.

MINIMUM DELAY: 0.9 mi.

MAXIMUM SYNCHRONIZING TRIGGER VOLTAGE FREQUENCY: 1000 cps for max delay of 50 mi.

#### INTERNAL CRYSTAL OSCILLATOR

FREQUENCY: 80.86 kc  $\pm$  10 cps, at 25° w/max drift of 25 cyc from actual freq between - 30° C and + 50° C.

PERIOD: 12.36 usec per cyc.

DISTANCE CONVERSION: One nautical mi (2026.7 yds) per cyc.

#### INTERNAL TRIGGER GENERATOR

FREQUENCY: 300 to 1500 cps.

MINIMUM AMPLITUDE: 100 v pos; 70 v neg.

MAXIMUM DURATION: 1.25 usec, as measured between half amplitude points.

RISE TIME: 100 v per 0.2 usec, as measured between 10% and 90% amplitude of wave front.

#### CATHODE-RAY TUBE DEFLECTION CHARACTERISTICS

VERTICAL PLATES INPUT IMPEDANCE: One meg shunted by 40 uuf for AUX VIDEO INPUT jack. ONE meg shunted by 60 uuf FOR MAIN VIDEO INPUT jack.

HORIZONTAL PLATES INPUT IMPEDANCE: No external connection.

#### VIDEO AMPLIFIER

FREQUENCY RESPONSE: Flat within 3 db from 250 cps to 2.8 mc.

INPUT IMPEDANCE: One meg shunted by 40 uuf.

GAIN: 12 min.

INPUT FOR UNDISTORTED WAVEFORM: 2 v max.

MAXIMUM DEFLECTION OF UNDISTORTED AMPLIFIED SIGNAL: 25 in.

#### PULSES AND OTHER WAVE FORMS OBSERVABLE

DURATION: 0.1 to 4300 usec.

POLARITY: Pos and neg.

AMPLITUDE: 1 to 300 v.

AMBIENT TEMPERATURE: - 30° C to + 50° C.

MAXIMUM RELATIVE HUMIDITY: 95%.

4.13 AN/APM-18: 2

MAJOR COMPONENTS

QTY	ITEM	STOCK NUMBERS	DIMENSIONS (INCHES)	WEIGHT (LBS)
1	Test Set, Radar AN/APM-18		10 x 14 x 18	45

REFERENCE DATA AND LITERATURE:

AN16-35TS100-2: Instruction Book for TS-100/AP.  
 AN16-35TS101-2: Instruction Book for TS-101/AP.  
 NAVAER 08-5S-78: Manual of Test Equipment.

TUBE, CRYSTAL AND/OR SEMI-CONDUCTOR DATA:

TUBES: (7) 6SN7 (1) 6AG7 (1) 5Y3GT (1) 2X2 (1) 3DP1

CRYSTALS: Not required.

SEMI-CONDUCTORS: Not required.

SHIPPING DATA

PKGS	VOLUME (CU FT)	WEIGHT (LBS)

PROCUREMENT DATA

PROCURING SERVICE: USN  
 SPEC &/OR DWG:

DESIGN COG: USN, BuWeps

CONTRACTOR	LOCATION	CONTRACT OR ORDER NO.	APPROX. UNIT COST
			\$723.00

476

12 October 1964

Cog Service: USN

FSN:

CALIBRATOR SET, RANGE AN/SPM-6B

Functional Class:

USA

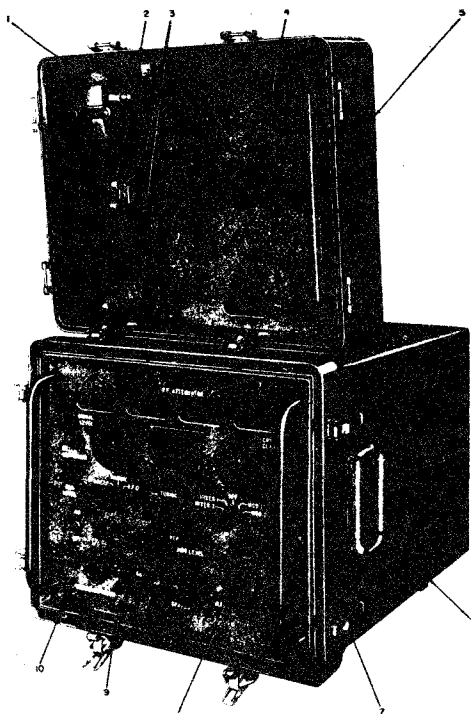
USN

USAF

TYPE CLASS:

Used by

MANUFACTURER'S NAME/CODE NUMBER: Sperry Gyroscope Co., Div. of Sperry Rand Corp., (56232).



CALIBRATOR SET, RANGE AN/SPM-6B

#### FUNCTIONAL DESCRIPTION:

Calibrator Set, Range AN/SPM-6B is a test equipment to check the accuracy of range indicator in range systems which operate in the 5400 to 5900 mc band. The range calibrator set may also be used to measure the delay of transmission lines in these systems.

When used with an operating radar, the range calibrator set produces a train of delayed echo pulses for each RF input pulse received from the radar. The echo pulses are at the same frequency as the RF input pulse, and are separated from each other by a fixed time delay nominally equivalent to 3600 yards of radar range. The only variance from this delay is found in the first echo pulse which is delayed from the radar RF pulse by a nominally equivalent radar range of approximately 1800 yards.

Calibrator Set Range AN/SPM-6B basically consists of an RF transponder loop, which produces the delayed echoes, and an AFC loop, which maintains the echoes at a fixed frequency.

No field changes in effect at time of preparation (5 October 1964).

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**AN/SPM-6B CALIBRATOR SET, RANGE**

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**RELATION TO OTHER EQUIPMENT:**

Calibrator Set, Range AN/SPM-6B is functionally interchangeable with AN/SPM-6 and has improved accuracy and includes ferrite isolator.

**EQUIPMENT REQUIRED BUT NOT SUPPLIED:****TECHNICAL CHARACTERISTICS:**

FREQUENCY RANGE: 5.4 to 5.9k mc.

POWER INPUT: 0.1 mw (peak first echo) nom.

INTERMEDIATE FREQUENCY: 40 mw-ctr freq.

POWER REQUIRED: 115 v ac  $\pm$  10%, 50 to 1000 cps, single ph, 250 W.

**RANGE CHARACTERISTICS**

ACCURACY:  $\pm$  5 yds.

INITIAL PULSE DELAY: 1800 yds.

SUBSEQUENT PULSE DELAY: Odd multiples of 1800 yds.

**RF POWER INPUT****VARIABLE**

MAX SIGNAL (RF ATTENUATOR SET TO MAX)

PEAK: 10 W.

AVERAGE: 10 W.

MIN SIGNAL (RF ATTENUATOR SET TO MIN)

RECOMMENDED NOMINAL: 200 mw peak.

ABSOLUTE: 10 mw peak.

DYNAMIC RANGE (RF ATTENUATOR SET TO MAX): 0.25 db.

**IF AMPLIFIER RESPONSE**

CENTER FREQUENCY: 40 mc.

BANDWIDTH: 8.0 mc nom.

HALF POWER POINTS: 36 mc and 44 mc.

GAIN: 40 db.

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**MAJOR COMPONENTS**

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QTY	ITEM	STOCK NUMBERS	DIMENSIONS (INCHES)	WEIGHT (LBS)
1	Calibrator Set, Range AN/SPM-6B includes:		13-5/8 x 16 x 20	95.5
1	Power Cord CX-337/U		72	0.75
1	Pick-Up Horn		2 x 3-1/8 x 4-1/8	0.25
1	Cable Assembly GG-92A/U		72	1
2	Matched Crystal Pair 1N23BM			
2	Allen Wrench			

4.13 AN/SPM-6B: 2

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**CALIBRATOR SET, RANGE AN/SPM-6B**

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**REFERENCE DATA AND LITERATURE:**

NAVWEPS OP 2858: Description, Operation, and Maintenance For Range Calibrator Set AN/SPM-68 and Range Calibrator Set AN/SPM-6C.

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**TUBE, CRYSTAL AND/OR SEMI-CONDUCTOR DATA:**

TUBES: (3) 60Q5/6A05W (1) X-26F (2) 5751WA (2) 0A2WA (1) 0A3 (1) 5814WA  
(1) 6080WA (1) 6AH6WA (7) 5654/6AK5W (3) 6AK6 (1) 12AT7WA (2) 5814A  
(2) 5829WA (1) 5865/TR-361

CRYSTALS: Not required.

SEMI-CONDUCTORS: (1) 1N646 (4) 1N254 (12) 1N649 (4) 1N1124 (1) 1N1775A (2) 1N1130  
(1) 1N748A (1) 1N538 (2) 1N251 (4) 1N23BM (1) 2N338 (1) 2N389  
(2) 2N657

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**SHIPPING DATA**

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PKGS VOLUME (CU FT) WEIGHT (LBS)

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**PROCUREMENT DATA**

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PROCURING SERVICE: USN  
SPEC &/OR DWG: MIL-R-18669

DESIGN COG: USN, BuWeps

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CONTRACTOR	LOCATION	CONTRACT OR ORDER NO.	APPROX. UNIT COST
Sperry Gyroscope Co., Div. of Sperry Rand Corp.	Great Neck, New York	N0rd 15924 N0rd 17759	\$701.00

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9 October 1964

Cog Service: USN FSN:

CALIBRATOR SET, RANGE AN/SPM-6C  
Functional Class:

USA

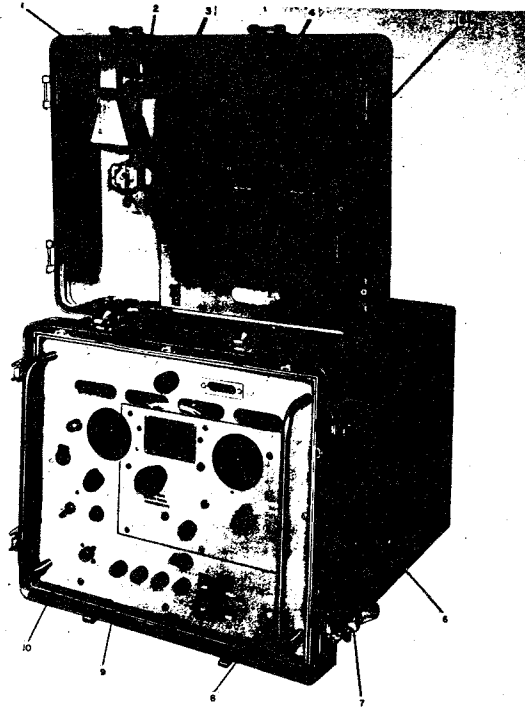
USN

USAF

TYPE CLASS:

Used by

MANUFACTURER'S NAME/CODE NUMBER: Sperry Gyroscope Co., Div. of Sperry Rand Corp., (56232),



CALIBRATOR SET, RANGE AN/SPM-6C

#### FUNCTIONAL DESCRIPTION:

Calibrator Set, Range AN/SPM-6C is a test equipment to check the accuracy of range indicator in range systems which operate in the 5400 to 5900 mc band. The range calibrator set may also be used to measure the delay of transmission lines in these systems.

When used with an operating radar, the range calibrator set produces a train of delayed echo pulses for each RF input pulse received from the radar. The echo pulses are at the same frequency as the RF input pulse, and are separated from each other by a fixed time delay nominally equivalent to 3600 yards of radar range. The only variance from this delay is found in the first echo pulse which is delayed from the radar R<sub>i</sub> pulse by a nominally equivalent radar range of approximately 1800 yards.

Calibrator Set Range AN/SPM-6C basically consist of an RF transponder loop, which produces the delayed echoes, and an AFC loop, which maintains the echoes at a fixed frequency.

No field changes in effect at time of preparation (5 October 1964).

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## AN/SPM-6C CALIBRATOR SET, RANGE

### RELATION TO OTHER EQUIPMENT:

Calibrator Set, Range AN/SPM-6C is functionally interchangeable with AN/SPM-6B except has improved accuracy and ferrite isolator built in.

### EQUIPMENT REQUIRED BUT NOT SUPPLIED:

### TECHNICAL CHARACTERISTICS:

FREQUENCY RANGE: 5.4 to 5.9k mc.  
POWER INPUT: 0.1 mw (peak first echo) nom.  
INTERMEDIATE FREQUENCY: 40 mw - ctr freq.  
POWER REQUIRED: 115 v ac  $\pm$  10%, 50 to 1000 cps, single ph, 250 W.

#### RANGE CHARACTERISTICS

ACCURACY:  $\pm$  5 yds.  
INITIAL PULSE DELAY: 1800 yds.  
SUBSEQUENT PULSE DELAY: Odd multiples of 1800 yds.

#### RF POWER INPUT

##### VARIABLE

MAX SIGNAL (RF ATTENUATOR SET TO MAX)

PEAK: 2500 W.

AVERAGE: 20 W.

MIN SIGNAL (RF ATTENUATOR SET TO MIN)

RECOMMENDED NOMINAL: 200 mw peak.

ABSOLUTE: 10 mw peak.

DYNAMIC RANGE (RF ATTENUATOR SET TO MAX): 0.25 db.

#### IF AMPLIFIER RESPONSE

CENTER FREQUENCY: 40 mc.

BANDWIDTH: 8.0 mc nom.

HALF POWER POINTS: 36 mc and 44 mc.

GAIN: 40 db.

### MAJOR COMPONENTS

QTY	ITEM	STOCK NUMBERS	DIMENSIONS (INCHES)	WEIGHT (LBS)
1	Calibrator Set, Range AN/SPM-6C includes:		13-5/8 x 16 x 20	95.5
1	Power Cord CX-3277/U		72	0.75
1	Pick-Up Horn		2 x 3-1/8 x 4-1/8	0.25
1	Cable Assembly CG-92A/U		72	1
2	Matched Crystal Pair 1N23B			
2	Allen Wrench			

4.13 AN/SPM-6C: 2

REFERENCE DATA AND LITERATURE:

NAVWEPS OP 2858: Description, Operation and Maintenance for Range Calibrator Set AN/SPM-6B and Range Calibrator Set AN/SPM-6C.

TUBE, CRYSTAL AND/OR SEMI-CONDUCTOR DATA:

TUBES: (3) 6005/6AQ5W (1) X-26F (2) 5751WA (2) 0A2WA (1) 0A3 (1) 5814WA  
 (1) 6080WA (1) 6AH6WA (7) 5654/6AK5W (3) 6AK6 (1) 12AT7WA (2) 5814A  
 (2) 5829WA (1) 5865/TR-361

CRYSTALS: Not required.

SEMI-CONDUCTORS: (1) 1N646 (4) 1N254 (12) 1N649 (4) 1N1124 (1) 1N1775A (2) 1N1130  
 (1) 1N748A (1) 1N538 (2) 1N251 (4) 1N23BM (1) 2N338 (1) 2N389  
 (2) 2N657

SHIPPING DATA

PKGS	VOLUME (CU FT)	WEIGHT (LBS)
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PROCUREMENT DATA

PROCURING SERVICE: USN DESIGN COG: USN, BuWeps  
 SPEC &/OR DWG: MIL-R-18669

CONTRACTOR	LOCATION	CONTRACT OR ORDER NO.	APPROX. UNIT COST
Sperry Gyroscope Co., Div. of Sperry Rand Corp.	Great Neck, New York	Nord-17759 Now 60-0356d	

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**ELECTRONIC EQUIPMENT - PRELIMINARY DATA****NAVSHIPS 4457 (Rev. 9-62) (CONT'D)**

DESIGNATION	ITEM NAME
AN/USM-150	Computer Test Set

FUNCTIONAL DESCRIPTION: SKETCH. MFG. DIMENSIONS. ETC.

The AN/USM-150 is used for particular tests and calibration of Computer Mk 100 Mod 2. It contains two separate test units housed in a single carrying case. The first unit is used to test the diode matrix of the fuze time delay system. The second test unit is used to make the balance of tests for which the test set has been designed. All power required to operate the test set is obtained from Computer Mk 100 Mod 2 over a power cable which is stored in the cover of the test set when not in use. A second test cable is also stored in the cover of the test set and is used to connect the test set to the circuit to be tested.

Types of tests: Fuze time delay system, dynamic calibration of the translational and rotational correction inputs, guidance director synchronizer circuits, and verification of command-coding signals for narrow-band search.

No unit cost available

Source of information: Request for Nomenclature  
 No contract (BuWeps)  
 Nomenclature correspondence

4.13 AN/USM-150: 2

UNCLASSIFIED

CLASSIFICATION

Rei 12/1/62

CHANGE 51/66 - BuWeps (RMG)  
2237

108

184