TECHNICAL MANUAL

ORGANIZATIONAL, DIRECT SUPPORT, GENERAL SUPPORT, AND DEPOT MAINTENANCE MANUAL

TEST SET, GYRO MAGNETIC COMPASS AN/ASM-61

(NSN 6625-00-885-5869)

This copy is a reprint which includes current pages from Changes 2 through 4.

H E A D Q U A R T E R S , D E P A R T M E N T O F T H E A R M Y
APRIL 1965

WARNING

Be careful when working on the 115-volt ac line connections. Serious injury or death may result from contact with these terminals.

DON'T TAKE CHANCES!

CHANGE
NO. 4

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, DC, *30 March 1979*

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GENERAL SUPPORT,
AND DEPOT MAINTENANCE MANUAL
TEST SET,
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AN/ASM-61
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TM 11-6625-247-15, 6 Sept. 1978 is changed as follows:

1. Remove old pages and insert new pages as indicated below.
2. New or changed material is indicated by a vertical bar in the margin of the page.
3. Title is changed as indicated above.

Remove Pages	*Insert Pages*
7 and 8	7 and 8

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To be distributed in accordance with DA Form 12-36A, Organizational maintenance requirements for AN/ASM-61.

TECHNICAL MANUAL
No. 11-6625-247-15

HEADQUARTERS,
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., *21 April 1965*

TEST SET, GYRO MAGNETIC COMPASS AN/ASM-61

*This manual supersedes TM 11-6625-247-15 dated 15 January 1959, including C1, 12 September 1962 and C2, 24 October 1963.

SECTION I
INTRODUCTION

1-1. Indexes of Publications

a. DA Pam 310-4. Refer to the latest issue of DA Pam 3104 to determine whether there are new editions, changes, or additional publications pertaining to the equipment.

b. DA Pam 310-7. Refer to DA Pam 310-7 to determine whether there are modification work orders (MWO's) pertaining to the equipment.

1-1.1. Forms and Records

a. Reports of Maintenance and Unsatisfactory Equipment. Maintenance forms, records, and reports which are to be used by maintenance personnel at all maintenance levels are listed in and prescribed by TM 38-750.

b. Report of Packaging and Handling Deficiencies. Fill out and forward DD Form 6 (Report of Packaging and Handling Deficiencies) as prescribed in AR 700-58/NAVSUP PUB 378/AFR 714/MCO P4030.29, and DSAR 4145.8.

c. Discrepancy in Shipment Report (DISREP) (SF 361). Fill out and forward Discrepancy in Shipment Report (DISREP)(SF 361)as prescribed in AR 55-38/NAVSUPINST 4610.33/AFM 7518/MCO P4610.19A, and DSAR 4500.15.

1-2. Reporting of Errors

The reporting of errors, omissions, and recommendations for improving this publication by the individual user is encouraged. Reports should be submitted on DA Form 2028 (Recommended Changes to Publications and Blank Forms) and forwarded direct to Commander, US Army Electronics Command, ATTN: AMSEL-MA-A Fort Monmouth, NJ 07703.

1-2.1. Items Comprising an Operable Equipment

(fig. 1-1)

FSN	*Qty*	*Nomenclature, part No., and mfr code*
		NOTE
		The part number is
		followed by the applicable 5-digit Federal supply code for manufacturers (FSCM) identified in SB 708-42 and used to identify manufacture, distributor, or Government agency, etc.
6625885-5869		Test Set, Gyro Magnetic Compass AN/ASM-61 which includes:
5995-808-8979	1	Cable Assembly, Special Purpose, Electrical: 10 cond; approx 5 ft 2 in. lg o/a; 349-25; 66150
5995-808-8978	1	Cable Assembly, Special Purpose, Electrical: 4 cond; approx 5 ft 2 in. lg o/a; :349-27; 66150
5995-857-9953	1	Cable Assembly, Special Purpose Electrical, Branched: 24 con(l; approx 9-12 in. lg o/a; 349-29; 66150.
5995-857-9950	1	Cable Assembly, Special Purpose, Electrical, Branched: 6 cond; approx 10-3/4 in. lg o/a; :349-39; 66150
5995-821-2591	1	Cable Assembly, Special Purpose. Electrical, Branched: 9 cond; approx 11-1/4 in. lg o/a; :349-33; 66150
5995-821-2592	1	Cable Assembly), Special Purpose. Electrical, Branched: 10 con(l; approx 11-1,2 in. lg o/a; :149 37; 66150
5995-821-2593	1	Cable Assembly, Special Purpose. Electrical, Branched: 10 cond; approx 12 in. lg o/a; :349-:31; 66150
5995-821-2594	1	Cable Assembly, Special Purpose, Electrical, Branched: 15 cond; approx 11-1/2 in lg o/a; 349-:35; 66150
5995-857-9954	1	Cable Assembly, Special Purpose, Electrical, Branched: 16 cond(; approx 11 in. lg o/a; 349-41; 66150
5995-855-7594	1	Lead Electrical: No. 18 AWG; approx .50 in. lg o/a; 349-43; 66150

1-3. PURPOSE.

1-4. The type P-1 tester is designed to make flux valve, slaving, power supply, and ground checks of various slaved gyro magnetic compasses. Power supply tests include the checking of the frequency and voltage of single-phase 120-volt, 400 cycle alternating current; the voltage of 28-volt direct current; and the phase rotation of three phase, 115-volt 400 cycle alternating current.

1-5. MAJOR COMPONENTS. (See figure 1-2.)

1-6. FREQUENCY METER. The frequency meter M-1 is a vibrating reed type instrument designed to read the frequency of the input voltage. Tests set with serial numbers 170 and above are furnished with an instrument which will indicate the frequency spectrum from 380 to 420 Hz in 4 Hz intervals. Earlier units with serial numbers up to 169 were supplied with an instrument with a range of 360 to 440 Hz with scale calibrations in steps of 8 HZ. The frequency meter is hooked directly across the power source to be checked when switch No. 1 is at position 1.

1-7. A-C MILLIAMMETER. The a-c milliammeter M-2 is a rectifier type instrument with a basic movement of 0 to 1.0 milliamperes and a scale specifically calibrated fur this equipment.

1-8. PHASE ROTATION LIGHT CIRCUIT. The pilot lights (marked ABC and CBA), indicating phase rotation, are connected in combination with the condenser, which shifts the phase at pin C of the four pin panel receptacle P-l to cancel the voltage at pin A or B, depending upon the phase rotation of the three phase supply. This cancellation removes the voltage from one light or the other, allowing determination of phase rotation from the illuminated light.

1-9. INSTALLATION COMPONENTS.

1-10. Three extension lead assemblies, and seven adapter assemblies, consisting of male and female electrical connectors are supplied with the P-1 tester. Each lead and adapter assembly is designed to accommodate a specific slaved gyro magnetic compass for testing. (See table 4-1.)

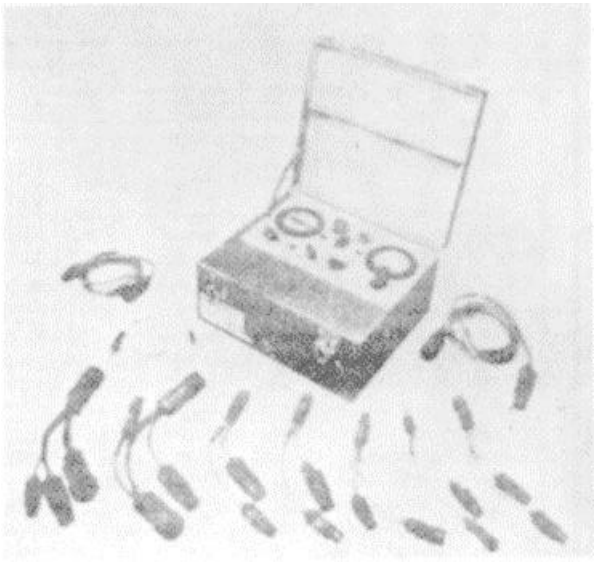


Figure 1-1. Slaved Gyro Magnetic Compass Field Tester. Type P-1.

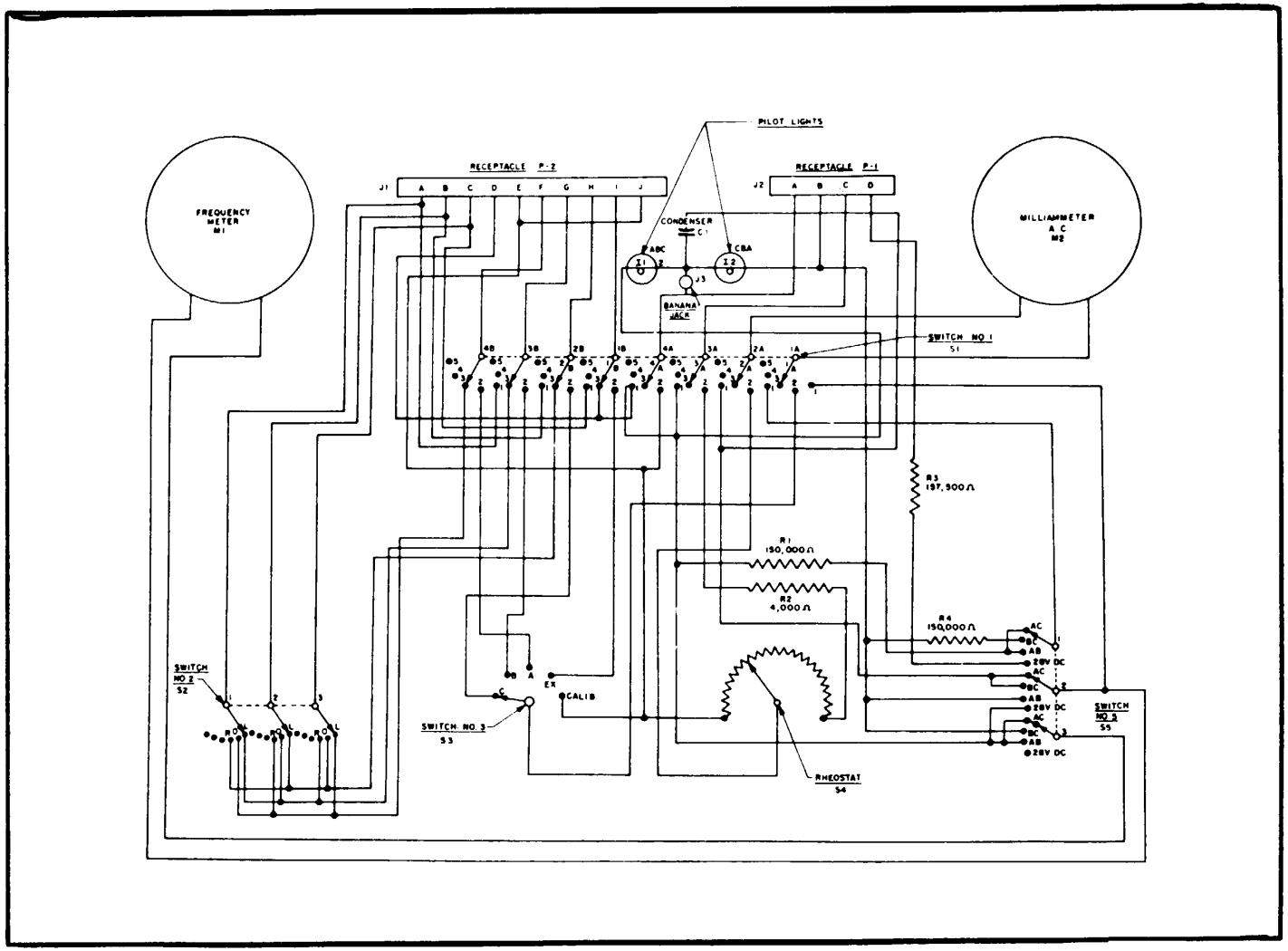


Figure 1-2. Schematic Wiring Diagram, Type P-1 Field Tester

*U.S. GOVERNMENT PRINTING OFFICE: 1979-665-012/1449

SECTION II

SPECIAL SERVICE TOOLS

2-1. SPECIAL SERVICE TOOLS.

2-2. No special service tools are required for the operation and service of this equipment.

SECTION III

PREPARATION FOR USE, STORAGE OR SHIPMENT

3-1. PREPARATION FOR USE.

a. Remove the tester from its packing and place on a horizontal surface.

b. Open cover of tester case. Rotate each of the four switches and the rheostat on the control panel through their complete travel at least five times.

c. With the control panel in a horizontal position, gently tap the panel and observe the “zero” position of the milliammeter. If the pointer of the milliammeter is not at the "zero" mark, change the setting of the adjusting screw on the lower part of the meter until the pointer is located at the “zero” mark.

d. Remove the ten extension lead or adapter assemblies from the storage compartment in the tester case and place them in a convenient location for selection to make the various tests.

3-2. STORAGE.

a. Place the ten extension lead or adapter assemblies in the storage compartment in the tester case. Close case cover and fasten securely with the two catches.

b. Stack the instrument in a storage bin to avoid mishandling.

3-3. SHIPMENT.

3-4. The tester is packed in domestic packing. Sufficient interior packing and cushioning must be employed to prevent damage to the tester as a result of excessive shock or impact encountered in shipping. Mark container with non-corrosive waterproof ink or paint. Do not use labels.

3-5. MARKINGS.

The following precautionary marking must be included on two opposite sides of the exterior shipping container.

FRAGILE
DELICATE INSTRUMENT
HANDLE WITH CARE

SECTION IV

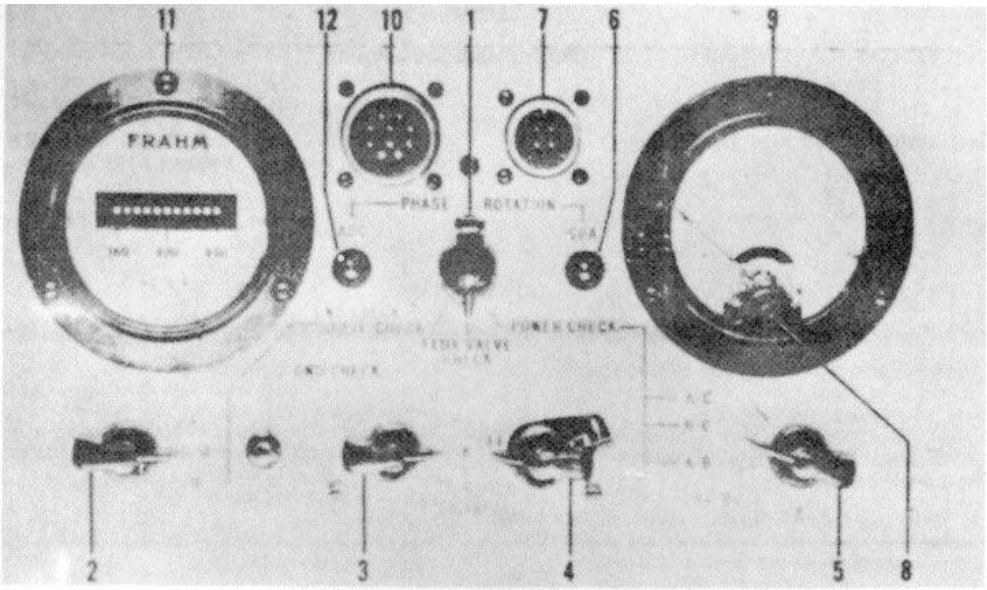
OPERATION INSTRUCTIONS

4-1. GENERAL.

4-2. The tester requires no special checks or warm-up prior to operation. Necessary instructions for connecting the tester to the compass and performing the tests will be found in the applicable maintenance handbook for the compass.

4-3. INSTALLATION PROCEDURE.

4-4. The extension lead or adapter assemblies provided to connect the tester to the compasses are listed in Table 1. Select proper cable assembly and connect tester to compass.



1. Switch No. 1
2. Switch No. 2
3. Switch No. 3
4. Rheostat
5. Switch No. 5
6. Red Indicator Light
7. Four-Pin Receptacle
8. Adjusting Screw
9. Milliammeter
10. Ten-Pin Receptacle
11. Frequency Meter
12. Green Indicator Light

Figure 4-1. Panel Assembly, Front View

TABLE 4-1. CONNECTING CABLE ASSEMBLIES

Description	Used For	Used With
Extension lead assy	Flux valve check	47B7488
Extension lead assy	Power supply check	47B7489
Adapter assy	Power supply check	47B7490
Adapter assy	Power supply check	47B7494
Adapter assy	Flux valve and slaving check	47B7491
Adapter assy	Power supply check	47B7492
Adapter assy	Flux valve and slaving check	47D7493
Adapter assy	Power supply check	47B7495
Extension lead assy	Ground test	50A7513
Adapter assy	Flux valve and slaving check J-1 Slaved Gyro Magnetic Compass Modification	50B7827

Table 4-2. Cross Reference Chart for Connecting Cable Assemblies

USAF part No.	Nomenclature	,Manufacture's part No.	FBN
47B7488 ----------	CX-11160/U----------	349-25	5995-808-8979
47B7489 ----------	CX-11161/U----------	349-27	5995-808-8978
47B7490 ----------	CX-11165/ASM-61 ----------	349-37	5995-821-2592
47B7494 ----------	CX-11164/ASM-61 ----------	349-33	5995-821-2591
47B7491 ----------	CX-11167/ASM-61 ----------	349-35	5995-821-2594
47B7492 ----------	CX-11166/ASM-61 ----------	349-31	5995-821-2593
47B7493 ----------	CX-11162/ASM-61 ----------	349-29	5995-857-9953
47B7495 ----------	CX-11183/ASM-61 ----------	349-39	5995-857-9950
50A7513 ----------	CX-11169/ASM-61 ----------	349-43	5995-855-7594
50B7827 ----------	CX-11168/ASM-61 ----------	349-41	5995-857-9954

4-4.1. Temperature Requirement For Test Procedures

DO NOT perform test procedures for Test Set, Gyro Magnetic Compass AN/ASM-61 at temperatures above 90° F because meter M2 voltage indications will not be valid.

4-5. TEST PROCEDURES.

CAUTION

The following should be kept in mind during the operation of this tester in order not to force the switches which would damage the tester and probably cause damage to the instrument under test. When switch no. 4 is set in the "OFF"' position, switches no. 1 and 3 will operate freely. When switch no. 4 is rotated from the "OFF" position, switches no. 1 and 3 will be interlocked and impossible to turn. When switch no. 1 is set in the "GND CHECK," "SLAVE CHECK" or "POWER CHECK" positions, switch no. 3 will move freely, and switch no. 4 will be interlocked in the "OFF" position. Switch no. 4 must be returned to the "OFF" position before changing switch no. 3 during continuity check. Switch no. 4 should always be on "OFF" position except during continuity check of the flux valve. Switch no. 3 should be in "CALIBRATE" position except when otherwise directed. Never force these switches.

4-6. FIELD CHECKING THE SLAVED GYRO MAGNETIC COMPASS TYPE J-1.

a. POWER CHECK. The following procedure shall be followed in checking the power supplied to the instrument under test:

(1) LEAD CONNECTIONS.

(a) Connect lead 47B7488 to the 10-pin receptacle in the tester and the receptacle end of this lead shall be connected to the 10-pin plug of cable 47B7491.

(b) Remove the 5-pin plug from the back of the indicator case and connect this to the receptacle of cable 47B7491. The 5-pin plug of this cable shall be connected to the 5-pin receptacle In the back of the indicator.

NOTE

If a 6-pin connector is used substitute 50B7827 6-pin connector in lieu of the 47B7491 5-pin connector.

(c) Connect lead 47B7489, which is the power lead, t o the 4-pin receptacle of the tester. The receptacle end of this lead shall be connected to the 4-pin plug of lead 47B7490.

(d) Disconnect the 6-pin plug from the back of the indicator and connect to the receptacle of lead 47B7490. Connect the 6-pin plug of this lead to the back of the indicator.

(2) TEST PROCEDURES.

(a) Turn switch no. 1 of the tester to a POWER CHECK" position; switch no. 5 to the "28 v DC" position, and turn on the ship's power. After the rotor of the indicator has come up to speed, a reading of the voltmeter shall be taken. It shall be 28 v plus or minus 2.

(b) Switch no. 5 shall be rotated to three phases of the 115 volt, 400 cycle current, AB, BC and AC, respectively, and a reading of the voltmeter taken at each point. During this test, the pointer of the voltmeter in the tester shall fall at 115 v plus or minus 5. The frequency of the 115 volt current shall be 400 cycles plus or minus 16 cycles as indicated by the frequency meter of the tester. The phase rotation shall be ABC as indicated by the green panel light. If the red light comes on, the phase rotation is wrong. Also, in conjunction with phase rotation, the "A" leg of the 3-phase current should always be grounded on a J-1 installation. To check this, turn switch no. 1 to "GROUND CHECK" position, connect Test Lead no. 50A7513 to the ground test jack and connect the other end of this lead to aircraft structure. The green light shall not light. Should the green light come on, then "A" leg is not grounded. Disregard the red light as it has no bearing on this test.

b. SLAVE CHECK. The following procedure shall be followed in checking t he slaving of the J-1 Compass.

(1) LEAD CONNECTIONS. The lead connection is shall be t he same as those specified in paragraph 4-6a1.

(2) TEST PROCEDURE.

(a) Switch no. 1 of the tester shall be turned to the "SLAVE CHECK" position and switch no. 2 to the "ZERO" position. The letters 'L" and "R" of switch no. 2 have reference to slaving of the indicator to the clockwise or counterclockwise direction only when the ship is in a North heading. "L" signifies the planes' turn to the left; therefore, the slaving shall be in the clockwise rotation of the Master Indicator Compass dial. "R" position causes the dial to be slaved in the counterclockwise direction. When the ship is in any other heading, the letters "L" and "R" shall be used as reference accordingly.

(b) The indicator and the flux valve shall be aligned. This is indicated by the annunciator in the upper right face of the indicator. If the annunciator is blank, they are aligned.

(c) Turn switch no. 2 to the "L" position. The gyro shall precess clockwise at a rate of not less than 2 degrees nor more than 6 degrees per minute. Switch no. 2 shall then be returned to "0" position. The gyro shall precess back to null. Turn switch no. 2 to "R" position. The gyro shall precess counterclockwise at a rate of not less than 2 degrees nor more than 6 degrees per minute. Switch no. 2 shall then be returned to "O" position. The gyro shall precess back to null.

c. FLUX VALVE CHECK. The following procedure shall be followed in testing continuity of the Flux Valve.

(1) LEAD CONNECTION. Lead connections are the same as those specified in paragraph 4-6a1 except for connections to the Master Indicator. Disconnect both 5 and 6-pin plugs from the rear of the Master Indicator.

(2) TEST PROCEDURE.

(a) Turn switch no. 1 to the “FLUX VALVE CHECK” position; switch no. 3 to the “CALIBRATE” position, and bring the Adj. stop of switch no. 4 to bear on the knob in its extreme counterclockwise position.

(b) Turn switch no. 4 until the pointer of the milliammeter deflects to 150 volts. Return switch no. 4 to the "OFF” position leaving Adj. stop in the position established by the knob setting where it shall remain for the remainder of this test.

(c) To check the exciter coil of the transmitter, turn switch no. 3 to the “EXCITER" position and turn switch no. 4 against the stop. The pointer of the milliammeter shall fall within the portion of the scale arc marked "EXCITER.”

(d) Return switch no. 4 to the "OFF" position and turn switch no. 3 to the “A” position. In this position, one secondary coil of the Flux Valve will be checked. The pointer of the milliammeter shall fall within the portion of the scale arc marked “A-B-C.'

(e) The procedure referenced in the previous paragraph shall be repeated for positions B and C of switch no. 3 to check other secondary coils of the transmitter. Any openings or shorts in the transmitter will cause substantial changes in the meter readings and the pointer will fall outside of the crosshatched area.

4-7. FIELD CHECKING THE SLAVED GYRO MAGNETIC COMPASS TYPE 1-2.

a. POWER CHECK. The following procedure shall be followed in checking the power supplied to the amplifier under test.

(1) LEAD CONNECTIONS.

(a) Connect lead 47B7489 to the 4-pin receptacle In the tester and the receptacle end of this lead shall be connected to the 4-pin plug of lead 47B7492.

(b) Connect lead 47B7488 to the 10-pin receptacle in the tester and the receptacle end of this shall be connected to the 10-pin plug of lead 47B7492.

(c) Disconnect the planes' 14-pin plug from the A2 amplifier receptacle and connect the 14-pin plug of lead 47B7492 to this amplifier receptacle. Connect the planes' plug to 14-pin plug of lead 47B7492.

(2) TEST PROCEDURE.

(a) Turn switch no. 1 of the tester to 'POWER CHECK' position; switch no. 5 to the '28 v D-C' position, and turn on the ship's power. After the rotor of the indicator has come up to speed, a reading of the voltmeter shall be taken. It shall be 28 volts plus or minus 2 volts.

(b) Switch no. 5 shall be rotated to the three phases of the 115 volt, 400 cycle current, AB, BC, and AC respectively, and a reading of the voltmeter taken at each point. During this test, the pointer of the voltmeter in the tester shall fall at 115 volts plus or minus 5 volts. The frequency of the 115 volt (± 5 volts) current shall be 400 cycles (±16 cycles), as indicated by the frequency meter of this tester. The phase rotation shall be ABC as indicated by the green panel light. If the red light comes on, the phase rotation is wrong. Also in conjunction with phase rotation, the “A” leg of the three phase current should always be grounded, should the system have a ground. To check this, turn switch no. 1 to "GROUND CHECK" position, connect Test Lead no. 50A7513 to the ground test jack and connect the other end of this lead to the aircraft structure. The green light shall not light. Should the green light come on, then “A" leg is not grounded. Disregard the red light as it has no bearing on this test.

b. SLAVE CHECK. The following procedure shall be followed in checking the slaving of the J-2 Compass.

(1) LEAD CONNECTIONS.

(a) Connect lead 47B7488 to the 10-pin receptacle in the tester and the receptacle end of this shall be connected to the 10-pin plug of lead 47D7493.

(b) Disconnect the planes' 17-pin plug from the type S-3( ) Directional Gyro receptacle and connect the 17-pin plug of lead 47D7493 to the type S-3( ) Directional Gyro. Connect the planes' 17-pin plug to 17-pin plug of lead 47D7493.

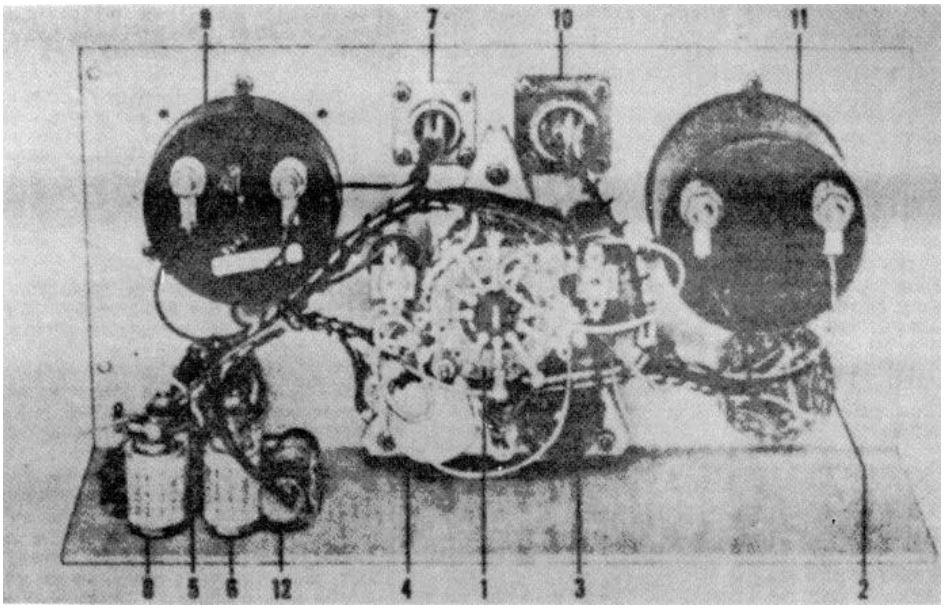
(2) TEST PROCEDURE.

(a) With the compass not running, switch no. 1 of the tester shall be turned to the “SLAVE CHECK" position and switch no. 2 to the ‘0" position. The letters "L” and 'R" of switch no. 2 have reference to slaving of the indicator clockwise and counterclockwise rotation only when the ship is in a North heading. When the ship is in any other position, the letters “L” and "R” shall be used as reference accordingly. “R" designates planes' direction of turn; therefore, the compass rotates counterclockwise while "L” position rotates compass clockwise.

(b) Turn on ship's power and observe the fast slaving. Turn switch no. 2 to the “L” or the “R” position to test for fast slaving clockwise position and counter clockwise rotation. After fast slaving completes its cycle, the gyro shall precess at a rate of not less than 1-1/2 degrees nor more than 6 degrees per minute. Switch no. 2 shall then be returned to “O". The gyro shall precess back to null. Turn switch no. 2 to "R" position. The gyro shall precess to right at a rate of not less than 1-1/2 degrees nor more than 6 degrees per minute. Switch no. 2 shall be returned to “O" position. The gyro shall precess back to null.

c. FLUX VALVE CHECK. The following procedure shall be followed in testing continuity of the Flux Valve.

(1) LEAD CONNECTIONS. Lead connections are same as those specified in paragraph 4-7, a, (1) except for connections to the amplifier. Disconnect the 14-pin plug from the amplifier.



1. Switch No. 1
2. Switch No. 2
3. Switch No. 3
4. Rheostat
5. Switch No. 5
6. Fixed Resistor
7. Four-Pin Receptacle
8. Fixed Resistor
9. Milliammeter
10. Ten-Pin Receptacle
11. Frequency Meter
12. Fixed Capacitor

Figure 4-2. Panel Assembly, Rear View

CAUTION

Amplifier connection must be disconnected to prevent short circuit.

(2) TEST PROCEDURE.

(a) Turn switch no. 1 to the “FLUX VALVE CHECK” position, switch no. 3 to the “CALIBRATE” position; and bring the adjusting stop of switch no. 4 to bear on the knob in its extreme counterclockwise position.

(b) Turn switch no. 4 until the pointer of the milliammeter deflects to 150 volts. Return switch no. 4 to the “OFF” position leaving adjusting stop in the position established by the knob where it shall remain for the remainder of this test.

(c) To check the exciter coil of the transmitter, turn switch no. 3 to the “EXCITER” position and turn switch no. 4 against the stop. The pointer of the milliammeter shall fall within the portion of the scale arc marked “EXCITER.” Return switch no. 4 to the “OFF” position.

(d) Disconnect cable 47B7492 from the system. Connect lead 47B7489 to the 4-pin receptacle in the tester and the receptacle end of the lead shall be connected to the 4-pin plug of lead 47D7493. Connect lead 47B7488 to the 10-pin receptacle in the tester and the receptacle end of this shall be connected to the 10-pin plug of lead 47D7493.

(e) Disconnect the planes 17-pin plug from the S-3 ( ) directional gyro receptacle and connect the 17-pin plug of 47D7493 to the S-3 ( ) directional gyro receptacle. Connect the planes' 17-pin plug to the 17-pin plug of lead 47D7493.

CAUTION

Do not connect amplifier.

(f) Turn switch no. 3 to “CALIBRATE” position and set the “adjusting” stop of switch no. 4 to a position where the pointer of the milliammeter deflects to 150 volts. Return switch no. 4 to the "OFF” position leaving the adjusting stop in the position established by the knob setting where it shall remain for the remainder of this test. Turn switch no. 3 to the “A” position and turn switch no. 4 against stop. Repeat this operation for positions “B” and “C.” The pointer of the milliammeter shall fall within the portion of the scale arc marked “A-B-C.” Any opens or shorts in the transmitter will cause

substantial changes in meter readings and the pointer will fall outside of the cross hatched area.

4-8. FIELD CHECKING THE UNIVERSAL ATTITUDE GYRO INDICATOR TYPE 1-1.

a. POWER CHECK. The following procedure shall be followed in checking the power supplied to the instrument under test:

(1) LEAD CONNECTIONS.

(a) Connect lead 47B7489, which is the power lead, to the 4-pin receptacle of the tester. The receptacle end of this lead shall be connected to the 4-pin plug of lead 47B7494.

(b) Disconnect the 5-pin plug from the back of the indicator and connect to the receptacle of lead 47B7494. Connect the 5-pin plug of this lead to the back of the indicator.

(2) TEST PROCEDURE.

(a) Turn switch no. 1 of the tester to "POWER CHECK" position; switch no. 5 to the “28 v D-C" position, and turn on the ship's power. After the rotor of the indicator has come up to speed; a reading of the voltmeter shall be taken. It shall be 28 volts plus or minus 2.

(b) Switch no. 5 shall be rotated to the three phases of the 115 volt, 400 cycle current, AB, BC and AC, respectively, and a reading of the voltmeter taken at each point. During this test, the pointer of the voltmeter in the tester shall fall at 115 v plus or minus 5. The frequency of the 115 volt current shall be 400 cycles plus or minus 16 cycles as indicated by the frequency meter of the tester. The phase rotation shall be ABC as indicated by the green panel light. If the red light comes on, the phase rotation is wrong. Also in conjunction with phase rotation, the "A” leg of the 3 - phase current should always be grounded on a J-1 installation. To check this, turn switch no. 1 to “GROUND CHECK” position, connect test lead no. 50A7513 to the ground test jack and connect the other end of this lead to the aircraft structure. The green light shall not light. Should the green light come on, then "A” lead is not grounded. Disregard the red light as it has no bearing on this test.

4-9. FIELD CHECKING THE ELECTRIC GYRO INDICATORS TYPE C-1, J-3,A-1, E-1,J-7, J-8, and C-5.

a. POWER CHECK. The following procedure shall be followed in checking the power supplied to the instrument under test.

(1) LEAD CONNECTIONS,

(a) Connect lead 47B7489, which is the power lead, to the 4-pin receptacle of the tester. The receptacle end of this lead shall be connected to the 4-pin plug of lead 47B7495.

(b) Disconnect the 3-pin plug from the back of the indicator and connect to the receptacle of lead 47B7495. Connect the 3-pin plug of this lead to the back of the indicator.

(2) TEST PROCEDURE. Turn switch no. 1 of the tester to "POWER CHECK” position; switch no. 5 to "AB” position, and turn on the ship's power. After the rotor of the indicator has come up to speed, a reading of the voltmeter shall be taken. It shall be 115 volts plus or minus 5. Switch no. 5 shall be rotated to the other two phases of the 115 volt, 400 cycle current, BC and AC respectively, and a reading of the voltmeter taken at each point. The reading shall be 115 volts plus or minus 5. The frequency of the 115 volt current shall be 400 cycles plus or minus 16 cycles as indicated by the frequency meter of the tester. The phase rotation shall be ABC as indicated by the green panel light. If the red light comes on, the phase rotation is wrong. Also in conjunction with phase rotation, the “A" leg of the three phase current should always be grounded, should the system have a ground. To check this turn switch no. 1 to “GROUND CHECK" position, connect test lead no. 50A7513 to the ground test jack and connect the other end of this lead to the aircraft structure. The green light shall not light. Should the green light come on, then “A” leg is not grounded. Disregard the red light as it has no bearing on this test.

SECTION V

OPERATOR AND ORGANIZATIONAL MAINTENANCE

5-1. PREVENTIVE MAINTENANCE.

Preventive maintenance is the systematic care, servicing, and inspection of equipment to prevent the occurrence of trouble, to reduce downtime, and to assure that the equipment is serviceable.

a. Systematic Care. The procedures given in paragraphs 5-2 through 5-7 over routine systematic care and cleaning essential to proper upkeep and operation of the equipment.

b. Preventive Maintenance Checks and Services. The preventive maintenance checks and services charts (para 5-3, 5-4 and 5-5) outline functions to be performed at a specific interval. These checks and services are to maintain Army electronic equipment in a combat serviceable condition; that is, in good general (physical) condition and in good operating condition. To assist operators in maintaining combat serviceability, the charts indicate what to check, how to check, and what the normal conditions are; the References column lists the illustrations, paragraphs, or manuals that contain detailed repair or replacement procedures. If the defect cannot be remedied by performing the corrective action indicated, higher level maintenance or repair is required. Records and reports of these checks and services must be made in accordance with the requirements set forth in TM 38-750.

5-2. PREVENTIVE MAINTENANCE CHECKS AND SERVICES PERIODS.

Preventive maintenance checks and services of Test Set, Gyro Magnetic Compass AN/ASM-61 are required daily, weekly, and quarterly. The operator ,ill perform operator and organizational maintenance.

a. Paragraph 5-3 specifies checks and services that must be accomplished daily and under the special conditions listed below.

(1) When the equipment is initially installed.

(2) When the equipment is reinstalled after removal of any reason.

(3) At least once each week if the equipment is maintained in standby condition.

b. Paragraphs 5-4 and 5-5 specify additional checks and services that must be performed on a weekly and quarterly basis, respectively.

5-3. DAILY PREVENTIVE MAINTENANCE CHECKS AND SERVICES CHART.

Sequence No.	Item	Procedure	References
1	Completeness.....	See that the equipment is complete.	Appx II.
2	Connectors	Check the tightness of all connectors.	
3	Meter glass and indicator lens.	Check the meter glass and indicator lenses for cracks.	
4	Exterior surfaces.	Clean the gyro magnetic compass test set and its transit case.	Para 5-6.
5	Controls and indicators.	While making the operating checks (item 6), observe that the mechanical action of each knob and switch is smooth and free of external or internal binding and no excessive looseness is apparent. Also check the meter for sticking or bent pointer.	
6	Operation.....	During operation (para 4-5 through 4-8), be alert for unusual conditions or performance.	

5-4. WEEKLY PREVENTIVE MAINTENANCE CHECKS AND SERVICES CHART

Sequence No	Item	Procedure	References
1	Cables	Inspect cables for chafed, cracked, or frayed insulation.	
2	Handles and latches.	Inspect handles, latches, and hinges for looseness.	
3	Metal surfaces	Inspect exposed metal surfaces for rust and corrosion. Clean and touchup paint as required.	Para 5-7.

5-5. QUARTERLY PREVENTIVE MAINTENANCE CHECKS AND SERVICES CHART.

Sequence No.	Item	Procedure	References
1	Publications	See that all publications are complete, serviceable, and current.	DA Pam 310-4.
2	Modifications.....	Check DA Pam 310-4 to determine if new applicable MWO's have been published. All URGENT MWO's must be applied immediately. All NORMAL MWO's must be scheduled.	TM 38-750 and DA Pam 310-4.
3	Spare parts	Check all spare parts (operator and Appx II. organizational) for general condition and method of storage. No overstock should be evident and all shortages must be on valid requisitions.	

5-6. CLEANING.

Inspect the exterior surfaces of Test Set, Gyro Magnetic Compass AN/ASM-61. The exterior surfaces should be free of dust, dirt, grease, and fungus.

a. Remove dust and loose dirt with a clean soft cloth.

Warning: Prolonged breathing of cleaning compound is dangerous. Make sure that adequate ventilation is provided. Cleaning compound is flammable; do not use near a flame. Avoid contact with the skin; wash off any that spills on your hands.

b. Remove grease, fungus, and ground-in dirt from the cases; use a cloth dampened (not wet) with Cleaning Compound (FSN 7930-395-9542).

c. Remove dust or dirt from plugs and Jacks with a brush.

Caution: Do not press on the meter face (glass) when cleaning; the meter may become damaged.

d. Clean the front panels, meter, and control knobs; use a soft clean cloth. If dirt is difficult to remove, dampen the cloth with water; use mild soap if necessary.

5-7. TOUCHUP PAINTING INSTRUCTIONS.

Remove rust and corrosion from metal surfaces by lightly sanding them with fine sandpaper. Brush two thin coats of paint on the bare metal to protect it from further corrosion. Refer to applicable cleaning and refinishing practices specified in TB SIG 364. For touchup painting, use Enamel, Lusterless, Olive Drab, FSN 8010-297-0560.

SECTION VI

MAINTENANCE

PART I. GENERAL MAINTENANCE INFORMATION

6-1. PURPOSE.

The information contained in this part of the manual is designed to aid the repairman in detecting abnormal operation, locating and correcting equipment trouble causing abnormal operation, and checking the service-ability of repaired equipment.

6-1.1. GENERAL TROUBLESHOOTING TECHNIQUES.

a. Organization. The first step in servicing Test Set, Gyro Magnetic Compass AN/ASM-61 is to sectionalize the fault. Sectionalization means tracing the fault to a major component. The second step is to localize the fault. Localization means tracing the fault to a defective part responsible for the abnormal condition. Some faults, such as burned-out resistors, can often be located by sight, smell, and hearing. The majority of faults, however, must be isolated by checking voltages and resistances.

b. Sectionalization. The troubleshooting procedures in table II provide sectionalization of a fault to a component. Listed below is a group of tests arranged to reduce unnecessary work and to aid in tracing trouble in Test Set, Gyro Magnetic Compass AN/ASM-61. The first step is to locate the component or components at fault by the following methods:

(1) Visual inspection. The purpose of visual inspection is to locate faults without testing or measuring circuits. All meter readings or other visual signs should be observed and an attempt made to sectionalize the fault to a particular component.

(2) Operational tests. Operational tests frequently indicate the general location of trouble. In many instances, the tests will help in determining the exact nature of the fault.

c. Localization. After the fault has been sectionalized to a major component or components, perform the maintenance procedures in the paragraph covering the defective component.

d. Isolation. After the trouble has been localized (c above), the methods listed below will aid in isolating the trouble to a defective circuit element.

(1) Resistance measurements. Use the appropriate ohmmeter range to obtain accurate readings or indication.

(2) Parts location. After a fault has been isolated to a circuit element, the repair parts and special tools list and illustrations are used for replacement part numbers and for location of the circuit element.

(3) Intermittent troubles. In all these tests, the possibility of intermittent troubles should not be overlooked. If present, this type of trouble often may be made to appear by tapping or Jarring the equipment. Make a visual inspection of the wiring and connections to the units of the component under test.

(4) Resistor and capacitor color code diagrams. Resistor and capacitor color code diagrams (fig 6-2 and 6-3) are provided to aid maintenance personnel in determining the value, voltage rating, and tolerance of capacitors and resistors.

PART II. TROUBLE SHOOTING

TABLE II. TROUBLE SHOOTING

TROUBLE	PROBABLE CAUSE	REMEDY
FREQUENCY METER FAILS TO INDICATE	Broken wires in leads or adapters	Repair wires
	Broken connections on terminals "A", "B" or "C" of four pin receptacle	Resolder broken connections
	Switch No. 1 faulty	Replace switch
	Switch No. 5 faulty	Replace switch
	Frequency meter damaged	Replace frequency meter
MILLIAMMETER FAILS TO INDICATE	Broken wires in leads or adapters	Repair wires
	Broken connections on receptacles	Resolder broken connections
	Resistors defective	Replace defective resistor
	Switch No. 1 faulty	Replace switch
	Switch No. 2 faulty	Replace switch
	Switch No. 3 faulty	Replace switch
	Rheostat faulty	Replace rheostat
	Switch No. 5 faulty	Replace switch
PHASE ROTATION INDICATORS FUNCTION IMPROPERLY	Lamp defective	Replace lamp
	Capacitor defective	Replace capacitor
	Switch No. 1 faulty	Replace switch

6-2. GENERAL.

Frequent troubles, probable causes, and recommended remedies will be found in Table U, Trouble Shooting Chart.

6-3. REPAIR OR REPLACEMENT. (See figure 6-1.)

6-4. REMOVAL OF TESTER PANEL ASSEMBLY. The panel assembly, confining all circuit and component parts, is removed from the case by taking out the four screws in the corners of the panel and lifting out of the entire assembly.

NOTE

In replacing electrical components, note the position and color code of the leads to be disconnected in order to facilitate reconnection. All wiring connections are shown in the schematic diagram, figure 1-2.

6-5. REPLACEMENT OF VOLTMETER.

a. Disconnect leads from terminals of meter (1).

b. Unscrew nuts (2) and remove screws (3).

c. Remove meter (1) from face of panel (64).

d. Slide new meter In place. Attach to panel (84) with screw (3) and nut (2).

e. Connect all leads to meter terminals.

6-6. REPLACEMENT OF FREQUENCY METER.

a. Disconnect leads from terminals of meter (4).

b. Unscrew nuts (5) and remove screws (6).

c. Remove meter (4) from face of panel (64).

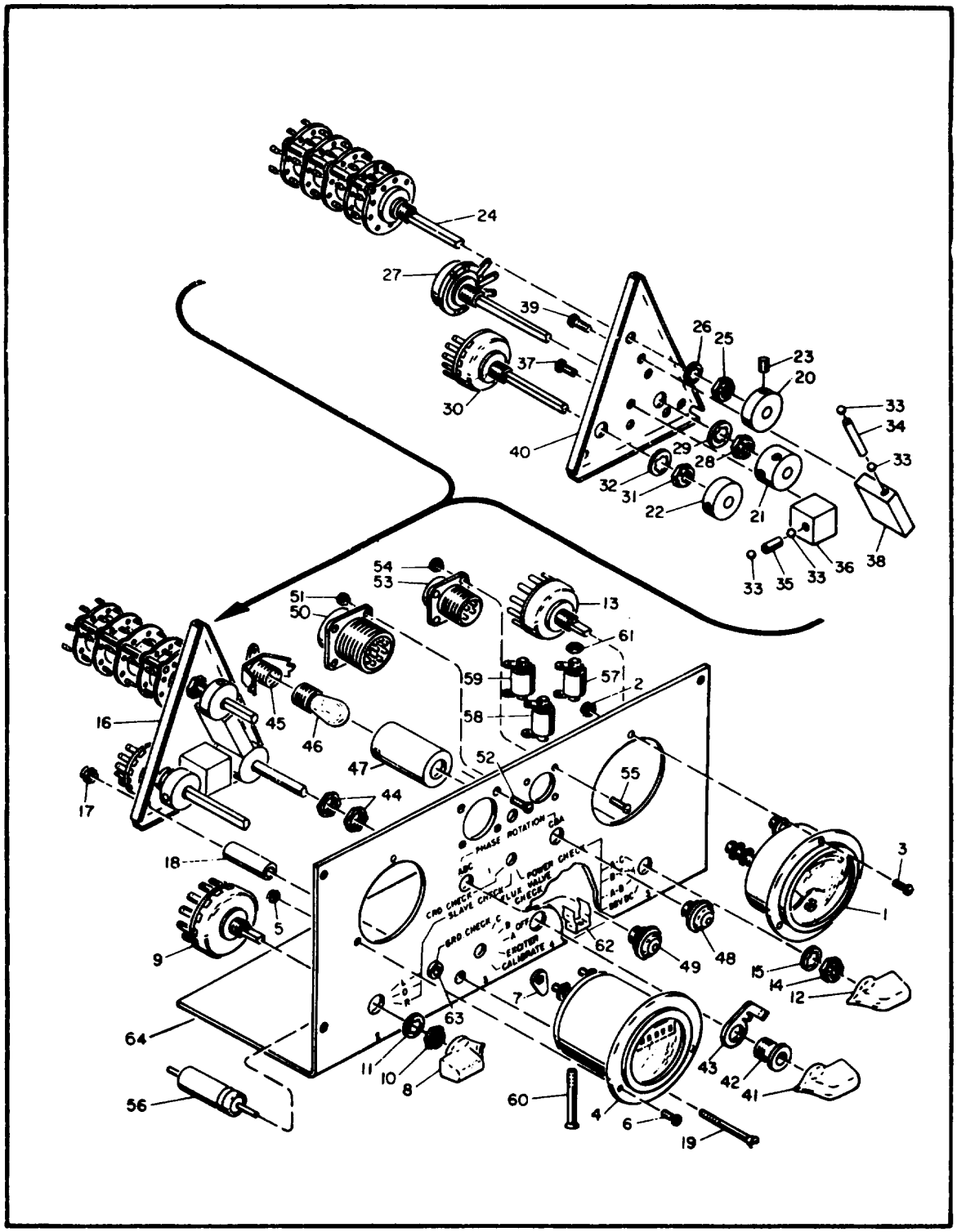


Figure 6-1. Panel Assembly

1. Milliameter
2. Self-locking Nut
3. Screw
4. Meter
5. Self-locking Nut
6. Screw
7. Terminal Lug
8. Knob
9. Switch
10. Nut
11. Lockwasher
12. Knob
13. Switch
14. Nut
15. Lockwasher
16. Panel Assembly (Switch)
17. Nut
18. Spacer
19. Screw
20. Cam
21. Cam
22. Cam
23. Set Screw
24. Switch
25. Nut
26. Lockwasher
27. Rheostat
28. Nut
29. Lockwasher
30. Switch
31. Nut
32. Lockwasher
33. Ball
34. Bar
35. Bar
36. Guide
37. Screw
38. Guide
39. Screw
40. Panel
41. Knob
42. Bushing
43. Stop
44. Nut
45. Socket
46. Lamp
47. Shield Assembly
48. Jewel, Red
49. Jewel, Green
50. Receptacle
51. Nut
52. Screw
53. Receptacle
54. Nut
55. Screw
56. Capacitor
57. Resistor
58. Resistor
59. Resistor
60. Screw
61. Nut
62. Clip
63. Banana Jack
64. Panel

Callouts for Figure 6-1. Panel Assembly

d. Slide new meter in place. Attach to panel (64) with screw (6) and nut (5).

e. Connect all leads to meter terminals.

6-7. REMOVAL OF SWITCH PANEL ASSEMBLY. (16, figure 6-1.)

a. Take off rheostat knob (41) and the knobs of all switches mounted on the switch panel (40).

b. Remove three self-locking nuts (17) and slide the assembly from the panel as far as the wiring will permit.

6-8. REPLACEMENT OF SWITCH NO. 1. (24, figure 6-1.)

a. With shaft of rheostat (27) in its extreme counterclockwise position loosen set screw (23) and remove cam (20) from shaft of switch no. 1 (24).

b. Remove the steel ball (33) from the recess in the locking bar guide (38) for safekeeping.

c. Disconnect the leads from the switch terminals.

d. Take off the nut (25) and lockwasher (26) and slide the switch from panel (40).

e. Rotate shaft of a new switch to its extreme counterclockwise position and then turn it one position in a clockwise direction.

f. Insert the switch in the panel opening and install the lockwasher (26) and nut (25). Place the switch so that the flat side of the shaft is horizontal facing upward and tighten the nut to hold the switch firmly.

g. Reconnect the leads to the terminals of the switch.

h. Rotate the shaft of the rheostat (27) to the “OFF" position and insert the steel ball (33) in the recess in the locking bar guide (38).

i. Slide the switch cam (20) on the switch shaft. Locate the recess in the cam over the steel ball and tighten the set screw (23).

6-9. REPLACEMENT OF SWITCH NO. 3. (30, figure 6-1.)

a. With shaft of rheostat (27) in its extreme counterclockwise position loosen set screw (23) and remove cam (22) from shaft of switch no. 3 (30).

b. Remove the steel ball (33) from the recess in the locking bar guide (36) for safekeeping.

c. Disconnect the leads from the switch terminals.

d. Remove the nut (31) and lockwasher (32). Slide the switch from panel (40).

e. Insert new switch into the panel opening and secure it with lockwasher (32) and nut (31). Rotate the switch shaft to bring the flat side vertical facing away from rheostat (27).

f. Reconnect leads to the terminals of switch.

g. Rotate the shaft of rheostat (27) to "OFF” position and insert the steel ball(33) in the recess in the locking bar guide (36).

h. Slide the switch cam (22) on the switch shaft. Locate the cam on the shaft so the recesses are in line with the steel ball, and tighten the set screw (23).

6-10. REPLACEMENT OF RHEOSTAT. (27, figure 6-1.)

a. Turn the shaft of rheostat to “OFF” position, the shaft of switch no. 1 (24) so that the flat side is horizontal facing upward and the shaft of switch no. 3 (30) so that the flat side is vertical facing away from rheostat (27).

b. Loosen the set screw (23). Remove the rheostat cam (21) and the two steel balls (33) from the recesses in the locking bar guides (36, 38).

c. Disconnect all leads.

d. Take off the nut (28) and lockwasher (29). Slide rheostat (27) from panel (40).

e. Rotate shaft of new rheostat to extreme counterclockwise position.

f. Insert the rheostat in the panel opening and install lockwasher (29) and nut (28). Place the rheostat so the flat side of the shaft is vertical facing away from switch (30) and tighten nut to hold rheostat firmly.

g. Reconnect terminal leads.

h. Rotate shaft of switch (24) until flat side is horizontal facing upward and the flat side of shaft on switch (30) is vertical facing away from rheostat (27).

i. Insert the two steel balls (33) in the recesses of the locking bar guides (36, 38) and slide rheostat cam (21) on shaft of rheostat (27).

j. Locate the cam on the shaft so the recesses will be in line with the steel balls. Tighten set screw (23).

6-11. REPLACEMENT OF SWITCH NO. 2. (9, figure 6-1.)

a. Remove switch knob (8).

b. Disconnect terminal leads.

c. Remove nut (10) and lockwasher (11). Slide switch (9) from panel (64).

d. Insert new switch and attach to panel (64) with nut (10) and lockwasher (11).

e. Replace knob (8) and reconnect terminal leads to switch (9).

6-12. REPLACEMENT OF SWITCH NO. 5. (13, figure 6-1.)

a. Remove switch knob (12).

b. Disconnect terminal leads.

c. Remove nut (14) and lockwasher (15). Slide switch (13) from panel (64).

d. Insert new switch and attach to panel (64) with nut (14) and lockwasher (15).

e. Replace knob (12) and reconnect terminal leads to switch (13).

6-13. REPLACEMENT OF INDICATOR LAMPS. (48, 49, figure 6-1.)

a. Squeeze spring sides of lamp socket (45) sufficiently to disengage from light shield (47). Withdraw socket (45).

b. Remove indicator lamp (46) and install new one.

c. Squeeze spring side of lamp socket sufficiently to allow socket (45) to be inserted into the shield (47). Release the sides, engaging the lugs with the holes in the shield.

SECTION VII

CALIBRATION

7-1. MILLIAMMETER. (See figures 4-1 and 4-2.)

7-2. ALTERNATING CURRENT VOLTAGE.

a. Apply 115-volts (2-volts); 400 cycles (±4 cycles); one phase alternating current to pins “A" - “B” of four pin receptacle (7).

b. Turn switch no. 1(1) to “Power Check.”

c. Turn switch no. 5(5) to “AB.”

d. Deflection of pointer on meter shall be 115-volts (±1/32 inch).

e. Apply same voltage across pins “B" - “C” and “A” - “C” with switch no. 5(5) on “B” - “C" and “A" - “C" respectively.

f. Pointer must deflect to 115-volts (±1/32 inch).

7-3. DIRECT CURRENT VOLTAGE.

a. Apply 30-volts (±one volt) direct current to pins “A” - “D” on four pin receptacle (7).

b. Turn switch no. 1(1) to “Power Check."

c. Turn switch no. 5(5) on “28 V.D.C.'”

d. Pointer must deflect to 30-volts (±1/32 inch).

7-4. MILLIAMMETER ADJUSTMENT. If the pointer deflection is not within the prescribed tolerances, remove and return the meter to the manufacturer for recalibration.

7-5. FREQUENCY METER.

7-6. During tests prescribed In the preceding paragraphs, observe the deflection of the reeds on the frequency meter. It shall indicate within ± four cycles of the rated value of the power source being applied.

7-7. PHASE ROTATION. (See figure 4-1.)

a. Apply 115-volts (+ 5-volts), 400 cycles (t20 cycles), 3 phase alternating current to pins “A-B-C” on the four pin receptacle (7).

b. Apply leading phase to terminal “A” second phase to terminal “B” and third phase to terminal “C."

c. If green indicator lamp (12) lights, phase indication is correct.

d. Apply leading phase to terminal “C” and third phase to terminal “A.” Terminal “B” remains unchanged.

e. Red indicator lamp (6) will light.

7-8. If the proper lamp does not light in the preceding phase rotation test, check the wiring and be sure all connections are as designated in figure 1-2. Should both lamps burn, replace the capacitor (12, figure 4-2).

7-9. GROUND CHECK.

a. Apply 115-volts (±5-volts), 400 cycles (±20 cycles), 3 phase alternating current to pins “A-B-C” on the four pin receptacle (7).

b. After phase rotation has been determined to be correct, (procedure is described in paragraph 7-7) set switch no. 1(1) to “GND Check."

c. Connect a lead from banana jack to the electrical ground.

d. If any other than “A” phase is at ground potential, the green panel light will operate. (Disregard operation of red panel light during this test.)

SECTION VIII

SHIPMENT, LIMITED STORAGE, AND DEMOLITION TO PREVENT ENEMY USE

8-1. SHIPMENT AND LIMITED STORAGE.

To prepare the AN/ASM-61 for shipment and storage:

a. Place the cables in the transit case.

b. Close the transit case cover and secure it with the latches.

c. Refer to paragraphs 3-3, 3-4, and 3-5 for additional shipping instructions.

8-2. DEMOLITION OF MATERIEL TO PREVENT ENEMY USE.

The demolition procedures will be used to prevent the enemy from using or salvaging this equipment. Demolition of the equipment will be accomplished only upon the order of the commander. The tactical situation and time available will determine the method to be used when destruction of equipment is ordered. In most cases, it is preferable to demolish completely some portions of the equipment rather than partially destroy all the equipment units.

a. Smash. Use sledges, axes, hammers, and similar tools to smash the interior units of the gyro magnetic compass test set, connectors, meters, and knobs.

b. Cut. Use axes, machetes, and similar tools to cut wiring, cording, and cabling.

Warning: Be extremely careful with explosives and incendiary devices. Use these items only when the need is urgent.

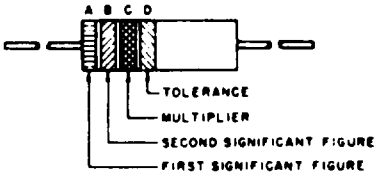
c. Burn. Burn the technical manuals first. Burn as much of the equipment as is flammable; use gasoline, oil, flame throwers, and similar materials. Pour gasoline on the cut cables and internal wiring and ignite it. Use a flame thrower to burn spare parts or pour gasoline on the spares and ignite them. Use incendiary grenades to complete the destruction of the unit.

d. Explode. Use explosives to complete demolition or to cause maximum damage, before burning, when time does not permit complete demolition by other means. Powder charges, fragmentation grenades, or incendiary grenades may be used. Incendiary grenades usually are most effective if destruction of small parts and wiring is desired.

e. Dispose. Bury or scatter destroyed parts or throw them into nearby waterways. This is particularly important if a number of parts have not been completely destroyed.

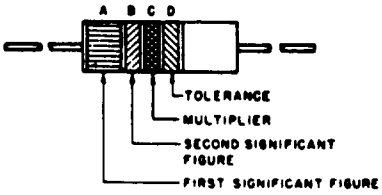
COLOR CODE MARKING FOR MILITARY STANDARD RESISTORS

COMPOSITION-TYPE RESISTORS



BAND A— Equal Width Band Signifies Composition-Type

WIREWOUND-TYPE RESISTORS

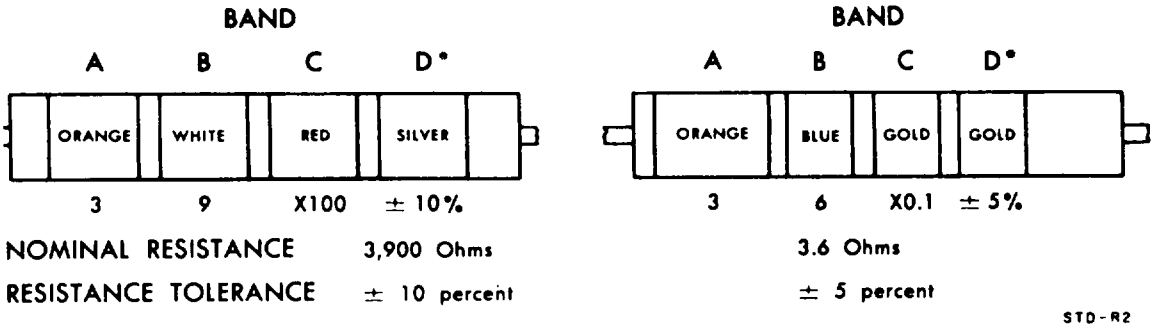


BAND A— Double Width Signifies Wire-wound Resistor

COLOR CODE TABLE

BAND A		BAND B		BAND C		BAND D*	
COLOR	FIRST SIGNIFICANT FIGURE	COLOR	SECOND SIGNIFICANT FIGURE	COLOR	MULTIPLIER	COLOR	RESISTANCE TOLERANCE (PERCENT)
BLACK	0	BLACK	0	BLACK	1		
BROWN	1	BROWN	1	BROWN	10		
RED	2	RED	2	RED	100		
ORANGE	3	ORANGE	3	ORANGE	1,000		
YELLOW	4	YELLOW	4	YELLOW	10,000	SILVER	± 10
GREEN	5	GREEN	5	GREEN	100,000	GOLD	± 5
BLUE	6	BLUE	6	BLUE	1,000,000		
PURPLE (VIOLET)	7	PURPLE (VIOLET)	7				
GRAY	8	GRAY	8	SILVER	0.01		
WHITE	9	WHITE	9	GOLD	0.1		

EXAMPLES OF COLOR CODING



*If Band D is omitted, the resistor tolerance is ± 20%, and the resistor is not Mil-Std.

Figure 6-2. Color code marking for MIL-STD resistors.

APPENDIX I
REFERENCES

Following is a list of references available to the users of Test Set, Gyro Magnetic Compass kN/ASM-1:

DA Pam 310-4	Index of Technical Manuals, Technical Bulletins, Supply Manuals (Types 7, 8, and 9) Supply Bulletins, and Lubrication Orders.
SB 11-573	Painting and Preservation Supplies Available for Field Use for Electronics Command Equipment.
SB 38100	Preservation, Packaging, and Packing Materials, Supplies, and Equipment Used by the Army
TB 74610	Field Instructions for Painting and Preserving Electronics Command Equipment
TM 9213	Painting Instructions for Field Use
TM 38750	Army Equipment Records Procedures

APPENDIX III

MAINTENANCE ALLOCATION

SECTION I. MAINTENANCE ALLOCATION

1. GENERAL

a. This appendix assigns maintenance functions to be performed on components, assemblies, and subassemblies by the lowest appropriate maintenance category.

b. Columns in the maintenance allocation chart are as follows:

(1) Part of component. This column shows only the nomenclature or standard item name. Additional descriptive data is included only where clarification is necessary to identify the component. Components, assemblies, and subassemblies are listed in top down order. That is, the assemblies which are part of a component are listed immediately below that component, and the subassemblies which are part of an assembly are listed immediately below that assembly. Each generation break-down (components, assemblies, or subassemblies) is listed in disassembly order or alphabetical order.

(2) Maintenance function. This column indicates the various maintenance functions allocated to the echelons.

(a) Service. To clean, to preserve, and to replenish lubricants.

(b) Adjust. To regulate periodically to prevent malfunction.

(c) Inspect. To verify serviceability and to detect incipient electrical or mechanical failure by scrutiny.

(d) Test. To verify serviceability and to detect incipient electrical or mechanical failure by use of special equipment such as gages, meters, etc.

(e) Replace. To substitute serviceable components, assemblies, or subassemblies, for unserviceable components, assemblies, or subassemblies.

(f) Repair. To restore an item to serviceable condition through correction of a specific failure or unserviceable condition. This function includes but is not limited to welding, grinding, riveting, straightening, and replacement of parts other than the trial and error replacement of running spare type items such as fuses, lamps, or electron tubes.

(Next printed page is 35.)

(g) Align. To adjust two or more components of an electrical system, so that their functions are properly synchronized.

(h) Calibrate. To determine, check, or rectify the graduation of an instrument, weapon, or weapons system, or components of a weapons system.

(i) Overhaul. To restore an item to completely serviceable condition as prescribed by serviceability standards developed and published by heads of technical services. This is accomplished through employment of the technique of "Inspect and Repair Only as Necessary" (IROAN). Maximum utilization of diagnostic and test equipment is combined with minimum disassembly of the item during the overhaul process.

(j) Rebuild. To restore an item to a standard as near as possible to original or new condition in appearance, performance, and life expectancy. This is accomplished through the maintenance technique of complete disassembly of the item, inspection of all parts or components, repair or replacement of worn or unserviceable elements using original manufacturing tolerances and/or specifications, and subsequent reassembly of the item.

(3) 1st, 2d, 3d, 4th, 5th echelons (operator, organizational, direct support, general support and depot). The symbol X in columns 3 through 7 indicates the categories responsible for performing that particular maintenance operation, but does not necessarily indicate that repair parts will be stocked at that level. Categories higher than those marked by X are authorized to perform the indicated operation.

(4) Tools required. This column indicates codes assigned to each individual tool equipment test equipment, and maintenance equipment referenced. The grouping of codes in this column of the maintenance allocation chart indicates the tool, test, and maintenance equipment required to perform the maintenance function.

(5) Remarks. Entries in this column are used to clarify any of the data cited in the preceding columns.

c. Columns in the allocation of tools for maintenance functions chart as follows:

(1) Tools required for maintenance functions. This column lists tools, test, and maintenance equipment required to perform the maintenance functions.

(2) 1st, 2d, 3d, 4th, and 5th echelons (operator, organizational, direct support, general support, and depot). The dagger ( ) symbol in these columns indicates the echelons normally allocated the facility.

(3) Tool code. This column lists the tool code assigned.

2. MAINTENANCE BY USING ORGANIZATIONS

When this equipment is used by signal services organizations organic to theater headquarters or communication zones to provide theater communications, those maintenance functions allocated up to and including fourth echelon are authorized to the organization operating this equipment.

SECTION II MAINTENANCE ALLOCATION CHART

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
PART OR COMPONENT	**MAINTENANCE FUNCTION**	**1ST ECH**	**2ND ECH**	**3RD ECH**	**4TH ECH**	**5TH ECH**	**TOOLS REQUIRED**	**REMARKS**
TEST SET, GYRO MAGNETIC COMPASS AN/ASM-6)								
	service		X				5	
	inspect		X					Visual only
	test				X		3	
						X	1,2,3	
	replace		X					
	repair		X					Cable Assembly, Knob, Lamp
					X			
	calibrate					X	1,2,4	
	overhaul				X			

SECTION III ALLOCATION OF TOOLS FOR MAINTENANCE FUNCTIONS

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
TOOLS REQUIRED FOR MAINTENANCE FUNCTIONS	**1ST ECH**	**2ND ECH**	**3RD ECH**	**4TH ECH**	**5TH ECH**	**TOOL CODE**	**REMARKS**
AN/ASM-61 (continued)							
FREQUENCY METER AN/USM-26					+	1	
METER TEST SET TS-682/GSM-1					+	2	
MULTIMETER TS-352/U				+	+	3	
TOOL KIT, RADAR AND RADIO REPAIRMAN TK-87/U				+	+	4	
TOOLS AND TEST EOUIPMENT AVAILABLE TO THE REPAIRMAN-USER BECAUSE OF HIS ASSIGNED MISSION		+				5	

By Order of the Secretary of the Army:

HAROLD K. JOHNSON,
General, United States Army,
Chief of Staff.

Official:

J. C. LAMBERT,
Major General, United States Army,
The Adjutant General.

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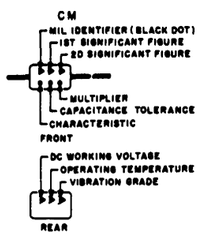
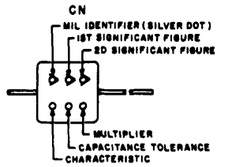
COLOR CODE MARKING FOR MILITARY STANDARD CAPACITORS

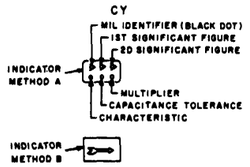
GROUP I Capacitors, Fixed, Various-Dielectrics, Styles CM, CN, CY, and CB



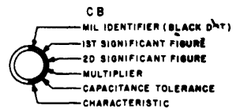
MICA-DIELECTRIC



PAPER-DIELECTRIC

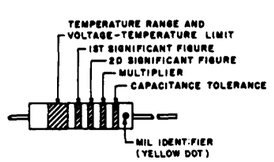


GLASS-DIELECTRIC, GLASS CASE

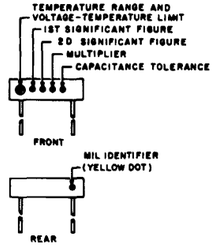


MICA, BUTTON TYPE

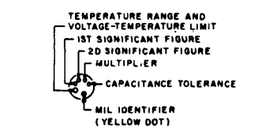
GROUP II Capacitors, Fixed Ceramic-Dielectric (General Purpose) Style CK



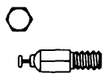
AXIAL LEAD



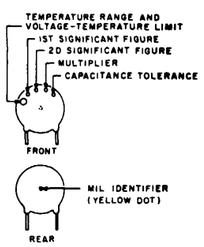
RADIAL LEAD



FEED-THROUGH

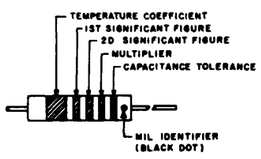


STAND-OFF

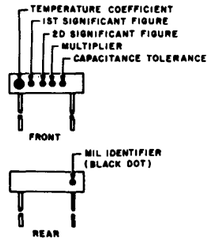


DISK-TYPE

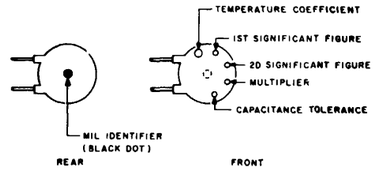
GROUP III Capacitors, Fixed, Ceramic-Dieletric (Temperature Compensating) Style CC



AXIAL LEAD



RADIAL LEAD



DISK-TYPE

COLOR CODE TABLES

TABLE I – For use with Group I, Styles CM, CN, CY and CB

COLOR	MIL ID	1st SIG FIG	2nd SIG FIG	MULTIPLIER[1]	CAPACITANCE TOLERANCE				CHARACTERISTIC[2]				DC WORKING VOLTAGE	OPERATING TEMP. RANGE	VIBRATION GRADE
					CM	CN	CY	CB	CM	CN	CY	CB	CM	CM	CM
BLACK	CM, CY CB	0	0	1			± 20%	± 20%		A				−55° to +70°C	10–55 cps
BROWN		1	1	10					B	E		B			
RED		2	2	100	± 2%		± 2%	± 2%	C		C			−55° to +85°C	
ORANGE		3	3	1,000		± 30%			D			D	300		
YELLOW		4	4	10,000					E					−55° to +125°C	10–2,000 cps
GREEN		5	5		± 5%				F				500		
BLUE		6	6											−55° to +150°C	
PURPLE (VIOLET)		7	7												
GREY		8	8												
WHITE		9	9												
GOLD				0.1			± 5%	± 5%							
SILVER	CN				± 10%	± 10%	± 10%	± 10%							

TABLE II – For use with Group II, General Purpose, Style CK

COLOR	TEMP. RANGE AND VOLTAGE – TEMP. LIMITS[3]	1st SIG FIG	2nd SIG FIG	MULTIPLIER[1]	CAPACITANCE TOLERANCE	MIL ID
BLACK		0	0	1	± 20%	
BROWN	AW	1	1	10	± 10%	
RED	AX	2	2	100		
ORANGE	BX	3	3	1,000		
YELLOW	AV	4	4	10,000		CK
GREEN	CZ	5	5			
BLUE	BV	6	6			
PURPLE (VIOLET)		7	7			
GREY		8	8			
WHITE		9	9			
GOLD						
SILVER						

TABLE III – For use with Group III, Temperature Compensating, Style CC

COLOR	TEMPERATURE COEFFICIENT[4]	1st SIG FIG	2nd SIG FIG	MULTIPLIER[1]	CAPACITANCE TOLERANCE		MIL ID
					Capacitances over 10uuf	Capacitances 10uuf or less	
BLACK	0	0	0	1		± 2.0uuf	CC
BROWN	−30	1	1	10	± 1%		
RED	−80	2	2	100	± 2%	± 0.25uuf	
ORANGE	−150	3	3	1,000			
YELLOW	−220	4	4				
GREEN	−330	5	5		± 5%	± 0.5uuf	
BLUE	−470	6	6				
PURPLE (VIOLET)	−750	7	7				
GREY		8	8	0.01			
WHITE		9	9	0.1	± 10%		
GOLD	+100					± 1.0uuf	
SILVER							

1. The multiplier is the number by which the two significant (SIG) figures are multiplied to obtain the capacitance in uuf.
2. Letters indicate the Characteristics designated in applicable specifications: MIL–C–5, MIL–C–91, MIL–C–11272, and MIL–C–10950 respectively.
3. Letters indicate the temperature range and voltage-temperature limits designated in MIL–C–11015.
4. Temperature coefficient in parts per million per degree centigrade.

STD–C2

Figure 6-3. Color code marking for MIL-STD capacitors.

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