DEPARTMENT OF THE ARMY TECHNICAL MANUAL

OPERATOR'S MANUAL
TEST SET, IGNITION COIL CAPACITOR RESISTOR
SUN ELECTRIC CORP. (MODEL CCT-20) (4910-300-1305)

Headquarters, Department of the Army, Washington, D.C.
23 June 1969

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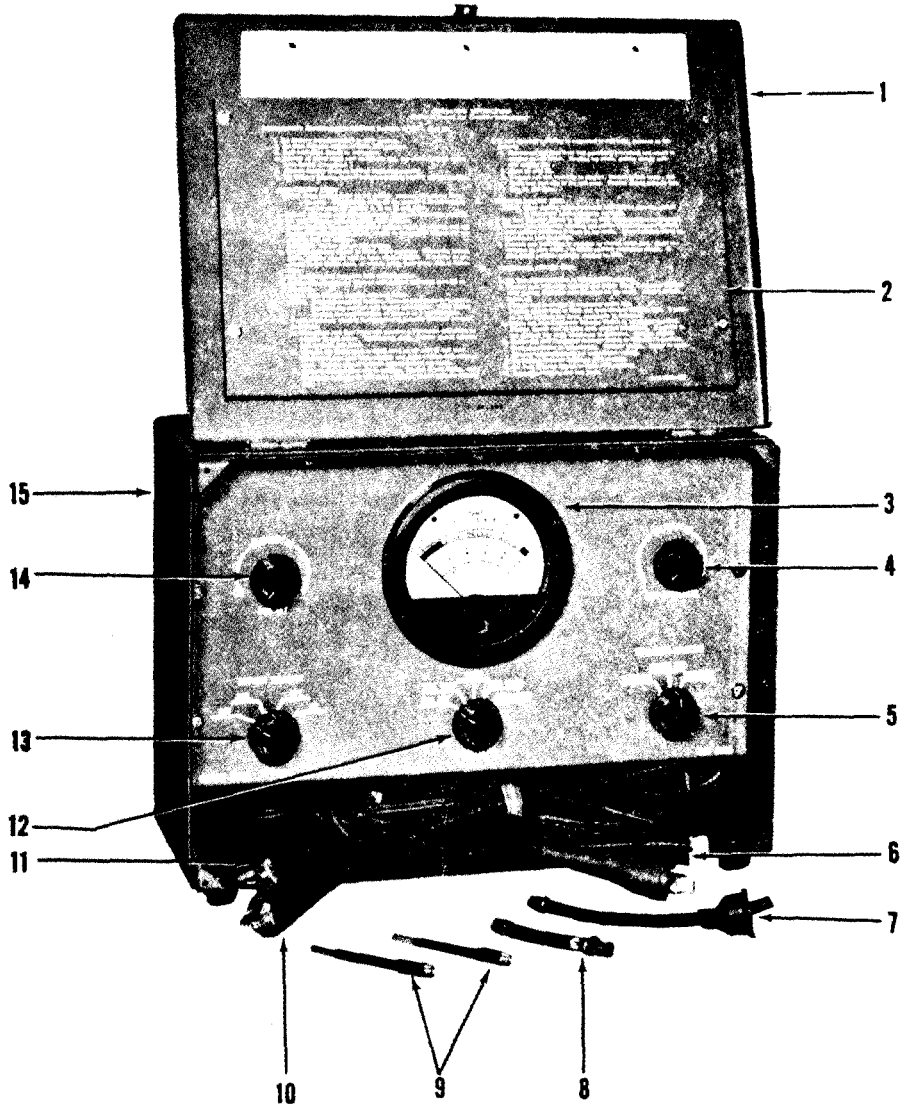

1. Cover Assembly
2. Instruction Plate
3. Meter
4. Ohm-Condenser Control
5. Condenser Selector Switch
6. Test Leads
7. Coil Tower Adapter
8. Coil Tower Adapter
9. Coil Primary Adapter
10. Battery Lead (Red Boot)
11. Battery Lead (Black Boot)
12. Test Selector Switch
13. Battery Selector Switch
14. Coil Set Control
15. Case Assembly

Figure 1. Ignition Coil Test Set

CHANGE
No. 1

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D. C., *5 January 1973*

Operator's Manual

TEST SET, IGNITION COIL CAPACITOR RESISTOR, SUN ELECTRIC CORP. (MODEL CCT-20)(4910-300-1305)

This change is current as of 7 December 1972

TM 9-4910-488-10, 23 June 1969, is changed as follows

1. This change identifies the type of catalog maintenance action taken in connection with the updating of previously published data.

2. This change is separated by additions, deletions, and changes, and is a list of items added, deleted, and/or changed since the last previously published data.

3. All Federal stock numbers and reference numbers, additions, deletions, and changes should be made to the indexes.

4. Parts Included With End Item. Parts included with end item and considered a component or part of the item configuration are listed on the following table. The part number listed is for (Sun Electric Corp. Model CCT-20).

Part	Part No.
ADAPTER, COIL, TOWER:	82386:6168-002
ADAPTER, COIL, TOWER:	82386:4728
ADAPTER, COIL, PRIMARY:	82386:6168-001

By Order of the Secretary of the Army:

CREIGHTON W. ABRAMS
General, United States Army
Chief of Staff.

Official:

VERNE L. BOWERS
Major General, United States Amry
The Adjutant General

Distribution:

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CNGB (1)
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CONARC (2)
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AMC (12)
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MUCOM (2)
OS Maj Comd (2)
LOGCOMD (2)
USACDCEC (10)
USAIB (1)
Armies (3) except
  Seventh USA (5)
  Eighth USA (5)
Corps (2)
Instl (2) except
  Ft Monmouth (5)
  USAECFB (4)
YPG (1)
APG (1)
Army Dep (3) except
  LEAD (5)
  LBAD (5)
  TEAD (19)
Arsenals (3)
COMZEUR (5)
Ft Knox FLDMS (10)
4th USASA Fld Sta (1)
Units org under fol TOE: - 2 ea.
  7
  9-7
  9-9
  9-127
  9-197
  9-247
  9-500 (CA, CC, DA)
  10-349
  10-445
  10-448
  17
  17-100
  29-1
  29-11
  29-15
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  29-75
  29-79
  29-105
  29-137
  29-138
  29-205
  29-206
  29-207

ARNG: State AG (3)

USAR: None.

For explanation of abbreviations used, see AR 310-50.

GPO 891-824

SECTION I

1-1. INT0RODUCTION.

1-2. This manual contains operation and maintenance instructions with a recommended spare parts list for the Ignition Coil Test Set, Model No. CCT-20, Federal Stock Number 4910-300-1305. This equipment will be referred to throughout this manual as the coil tester.

1-3. DESCRIPTION AND PURPOSE.

1-4. The coil tester, Model CCT-20, is self contained requiring only external electrical power for operation. This unit will operate on 6, 12, or 24 volt dc power. When battery leads have been connected to a battery, proper voltage is applied to the coi1 tester by a manual battery selector switch **(13. figure 1).** All components are mounted directly to the instrument panel which enables the operator to remove the coil tester from the case, which includes permanently screened operating instructions and electrical schematic diagram. The battery leads, test leads and adapters are stored in the case compartment when not in use.

1-5. The meter, controls and switches are marked for quick identification and easy operation. (Refer to figure 1 for identification of all controls).

1-6. The coil tester is designed to functionally test ignition coil, capacitor and resistor components used in 6, 12 and 24 vdc waterproof and nonwaterproof ignition systems of automotive vehicles. Adapters for waterproof ignition systems are furnished with the coil tester. (See figure 1 for identification of adapters).

1-7. The coil tester indicates whether an ignition coil is good or bad. The condition of a coil is determined by testing for output, insulation breakdown, grounds and flash overs. The coil tester also provides a means to measure circuit continuity and resistance. The third function of the coil tester is to check battery ignition capacitors for capacitance, series resistance and leakage resistance.

1-8. Set line numbers for standard equipment coils not shown in TABLE 1, may be established by first making Coil Capacity Tests on 3 or more new coils of the same model. While in COIL TEST position, rotate coil set control until meter pointer indicates in the GOOD area (bottom scale), then rotate Test Selector Switch to COIL SET position. The average reading shown on the meter will be the proper COIL SET number.

1-9. Table 2 lists the functions of all major components and controls of the coil tester.

TABLE 1 (Sheet 1 of 2)

COIL TESTER SPECIFICATIONS
FOR SUN COIL TESTER MODEL CCT-20

COIL MAKE	MODEL OR PART NO.	PRIMARY RES. OHMS	SECONDARY RES. OHMS	TEST VOLTAGE	COIL SET NUMBER
AUTOLITE - PRESTOLITE	CR, IG, CAL, 200488, 200575, 200576, 200577	1.25 - 1.40	6600 - 7700	6	7
	CAD, CAH, 200567, 200571, 1688212, 200759, 2444242, 2495531	1.65 - 1.79	8000 - 9200	12	7
	CAF, 200565, 200572, 200636	4.19 - 4.55	6500 - 7600	12	4.5
	CAG, 200574, 200562, 1688210	4.25 - 4.60	6600 - 7700	12	4.5
	CAJ	2.25 - 2.55	8000 - 9200	12	6
	CAM, 200615	0.77 - 0.87	8000 - 9200	6	8
	200564, 200571, 200567, 200759	1.65 - 1.79	9400 - 11,700	12	6.6
	1115032, 1115034, 1115042, 1115043, 1115044, 1115045, 1115046, 1115047, 1115049, 1115050, 1115051, 1115052, 1115053, 1115054, 1115055, 1115056, 1115057, 1115058, 1115060, 1115061, 1115064, 1115075, 1115223	3.90 - 4.80	3000 - 20,000	12	5
	1115033, 1115062, 1115066, 1115074	3.20 - 4.00	3000 - 20,000	12	4.5
	1115035, 1115037, 1115131, 1115132, 1115133, 1115134, 1115152, 1115174, 1115187, 1115190, 1115191, 1115192, 1115193, 1115214, 1115216, 1115219, 1115220, 1115221, 1115229, 1115235, 1115238, 1115244, 1115266, 1115267, 1115269, 1115270	1.77 - 2.01	3000 - 20,000	12	6.4
DELCO - REMY	1115036, 1115039, 1115040, 1115081, 1115082, 1115083, 1115084, 1115085, 1115086, 1115087, 1115088, 1115094, 1115095, 1115096, 1115097, 1115098, 1115100, 1115104, 1115105, 1115109, 1115110, 1115111, 1115112, 1115115, 1115116, 1115117, 1115118, 1115119, 1115120, 1115121, 1115122, 1115123, 1115124, 1115135, 1115136, 1115137, 1115139, 1115154, 1115155, 1115156, 1115158, 1115161, 1115162, 1115163, 1115165, 1115166, 1115167, 1115168, 1115173, 1115175 1115178, 1115179, 1115181, 1115182, 1115184, 1115194, 1115198, 1115200, 1115201, 1115202, 1115204, 1115205, 1115206, 1115208, 1115212, 1115217, 1115218, 1115224, 1115230, 1115232, 1115233, 1115234, 1115236, 1115239, 1115242, 1115243, 1115247, 1115249, 1115262, 1115264	1.24 - 1.46	3000 - 20,000	12	7
	1115065, 1115066, 1115067, 1115250	3.30 - 4.10	3000 - 20,000	12	4.5

TABLE 1 (Sheet 2 of 2)

COIL MAKE	MODEL OR PART NO.	PRIMARY RES. OHMS	SECONDARY RES. OHMS	TEST VOLTAGE	COIL SET NUMBER
	1115068, 1115069, 1115070, 1115072, 1115222	3.40 - 4.20	3000 - 20,000	12	5
	1115086, 1115091, 1115099, 1115106, 1115107, 1115114, 1115125, 1115157, 1115159, 1115160, 1115164, 1115170, 1115172, 1115177, 1115183, 1115185, 1115188, 1115203	1.00 - 1.16	3000 - 20,000	12	7
	1115251, 1115252, 1115254, 1115255, 1115258, 1115259	2.60 - 3.20	3000 - 20,000	12V HD*	6.4
	1115260, 1115276, 1115277, 1115284, 1115285,	2.60 - 3.20	3000 - 20,000	12, 24, 32V HD*	6
DELCO-REMY	1115278, 1115279, 1115280, 1115282, 1115286	2.22 - 2.42	3000 - 20,000	12, 24V HD*	5
	1115326, 1115327, 1115328, 1115329, 1115333, 1115334, 1115335, 1115338, 1115339	1.15 - 1.37	3000 - 20,000	6	9
	1115376, 1115378, 1115379, 1115380, 1115385, 1115386, 1115387, 1115389, 1115390, 1115391, 1115392, 1115393, 1115397, 1115401	1.15 - 1.35	3000 - 20,000	6	8
	1915992	1.20 - 1.40	3000 - 20,000	24	6
ESSEX	62-160-2, 67-160-2, 244241	1.41 - 1.55	9200 - 10,600	12	6
FORD	FAC12029A, FAB12029B, FAY12029A, BCA12029A	1.40 - 1.54	8000 - 8800	12	7
P AND D	UC2X	3.90 - 4.80	8000 - 10,500	12	5

* HD = Heavy Duty

NOTE A non-standard coil should be tested with the same "SET LINE" as the original factory equipment and should also have the same primary draw and secondary resistance.

NOTE: SET LINE specifications for standard equipment coils not shown above may be established by making Coil Capacity Tests first, on 3 or more new coils of the same model. While in COIL TEST position, turn COIL SET CALIBRATOR until meter pointer reads in the GOOD BAND, then turn TEST SELECTOR switch to COIL SET position. The average reading shown on the meter will be the proper COIL SET specification.

NOTE: Underlined part numbers are those coils to be tested in accordance with Contract DAAF01-67-D-0197. All other coil part numbers have been included to assist the user.

TABLE 2

COMPONENT	FUNCTION
Meter, Multiple useage	Top Scale - indicates OHMS, (0 to 100 Scale and 0 to 100,000 Scale.) Center Scale - indicates capacity in microfarads and condition of condenser. Bottom Scale - indicates coil condition and Coil Set Number.
Battery Selector	4 position switch to select proper input voltage. (OFF, 24v, 12v, 6v).
Test Selector Switch	5 position switch to select individual tests. (COIL SET, COIL TEST, OHMS, 1000 OHMS, CONDENSER).
Condenser Selector Switch	3 position switch for testing condensers, (LEAKAGE, SERIES RES., CAPACITY).
Coil Set Control	Calibrating control.
OHM/Condenser Control	Calibrating control.
Battery Leads	Two; 9 feet long, single-conductor, conforming to MIL-C-13486.
Test Leads	One; 9 feet long, two conductor, AWG No. 18 (minimum) copper conductors with heavy rubber insulation.

SECTION II

2-1. OPERATION.

Before placing the coil tester in operation, the oper-sting personnel should thoroughly familiarize themselves with the nature, location and function of all switches and controls. To insure accurate meter indications make sure the pointer rests on the infinity (∞) symbol when the tester if OFF. To zero the meter, adjust the zero button located on the face of the meter.

NOTE

To remove cover assembly (1, figure 1) from the case assembly(l5,figure 1), grasp the two sides of the cover and slide it to the right. Reverse this procedure to replace the cover assembly.

2-2. COIL CIRCUIT TEST. Proceed as follows:

NOTE

When testing ignition coils mounted on the vehicle, remove coil high tension lead and disconnect wires from coil primary terminals.

a. Open coil tester case.
b. Remove battery and test leads.
c. Set Battery Selector Switch (13, figure 1) to OFF position.
d. Connect battery leads (10 and 11, figure 1). to battery or power supply, observing polarity. Red clip to positive (+) post, black clip to negative (-) post.

NOTE

For testing 6v ignition coils, a 6v or 12v battery may be used. For testing 24v coils, either a 12v or 24v battery may be used.

e. Set Battery Selector Switch(13,figure 1) to corresponding battery voltage position.
f. Connect test lead clips (6, figure 1) to coil primary terminals, observing polarity, Red clip to positive (+) terminal, black clip to negative (-) terminal.
g. Set Test Selector Switch (12, figure 1) to COIL SET position.

CAUTION

During step h, do not excede the coil set number specified in table 1. Exceeding the specified coil set number may result in damage to the coil.

NOTE

Refer to table 1 for applicable coil set numbers.

h. Rotate Coil Set Control (14, figure 1) until pointer rests on the correct coil set number on the bottom scale, (0-10).

CAUTION

After connections have been made as specified in step i, keep hands and body away from the coil under test.

i. Set Test Selector Switch (12, figure 1) to COIL TEST position. Observing the bottom scale, pointer should come to rest in the area marked GOOD. If the pointer rests in the area marked bad or is drifting or unsteady in the GOOD area, coil is defective and no further testing is required.
j. Set Test Selector Switch to 1000 OHMS position.
k. Rotate Ohm / Condenser Control (4, figure 1) until pointer indicates zero (0) on top scale.
l. Insert High Tension Adapter (7 or 8, figure 1), into coil tower.

NOTE

Before proceeding further, refer to manufacturer's specifications for correct coil circuit grounding. Coils failing to meet the requirements of steps m or n are defective.

n. If coil secondary winding is connected to primary terminal proceed as follows:

(1) Disconnect test lead from coil positive (+) terminal and attach to High Tension Adapter in coil tower. Reading top scale, pointer should indicate less than 20,000 ohms.
(2) Remove the finish from a small area on the side of coil case. Disconnect test lead from adapter and make contact with cleaned area. Pointer should indicate (∞) on top scale.
(3) Connect red test lead clip to adapter, located in coil tower, and black test lead clip to coil case. Pointer should indicate infinity (∞).

n. If coil secondary "winding is connected to coil case, proceed as follows:

(1) Disconnect test lead from coil positive (+) terminal and attach to adapter in coil tower, Reading top scale, pointer should indicate infinity (m).
(2) Same as step m. (2).
(3) Connect red test lead clip to adapter, located in coil tower, and black test lead clip to the coil case. Pointer should indicate less than 20,000 ohms.

o. This completes testing of ignition coils.

2-3. RESISTOR CIRCUIT TEST.

2-4. In addition to complete testing of ignition coils, the coil tester may be used for measuring resistance values which fall within the range of zero (0) to one hundred thousand (100, 000) ohms, To measure resistance, proceed as follows:

a. Set Test Selector Switch to OHMS or 1000 OHMS position depending on resistance value of resistor or circuit under test.

NOTE

When making resistance tests always be sure the circuit is free from live voltages or currents.

b. Connect battery leads to battery, observing polarity. Set Battery Selector Switch to corresponding battery voltage position.
c. Connect test lead clips together and allow approximately two minutes warm-up time. Rotate Ohm / Condenser Control (4, figure 1) until pointer indicates zero (0) on top scale,
d. Connect test lead clips to resistor or circuit under test and read ohms on top scale. When Test Selector Switch is in OHMS position read ohms direct. When in the 1000 OHMS position read ohms multiplied by 1000.
e. Disconnect test leads.
f. Set Battery Selector Switch to OFF position.
g. Set Test Selector Switch to COIL SET position.
h. Disconnect battery leads.

2-5. CONDENSER CIRCUIT TEST.

a. Connect battery leads to battery observing polarity. For Off-Vehicle condenser tests, a 6, 12 or 24 volt battery may be used.
b. Set Test Selector Switch to COND. position and allow one minute warm-up time.

c. Connect test lead clips together and rotate Ohm/Condenser Control until pointer indicates zero(0) ohms on top scale.

(1) SERIES RESISTANCE TEST.

(a) Connect test lead clips to condenser under test. Observing center scale, the pointer should rest in the black bar area marked SERIES RES. If pointer is out of the black bar area, condenser is defective.

NOTE

If the condenser under test has a pig-tail lead, move pig-tail. If a deflection of the pointer is observed during step c. (1) (a), the pig-tail lead is making poor contact and condenser is defective.

NOTE

When testing condensers on the vehicle, disconnect the wire from the distributor primary terminal and block open the breaker points by inserting a piece of fiber between the rubbing block and cam.

(b) If the pointer is out of the black bar area, marked SERIES RES., move the condenser ground lead to the body of the condenser. If the pointer indication improves, the condenser is not properly grounded to the distributor housing.

(2) LEAKAGE TEST.

(a) Rotate and hold the Condenser Selector Switch to LEAKAGE position. Observing the center scale, the pointer should rest in the black bar area marked GOOD.

(b) Release Condenser Selector Switch.

NOTE

The Condenser Selector Switch (5, figure 1) is spring loaded and remains in the SERIES RES. position until rotated.

CAUTION

500 volts are applied to the test leads during the leakage test. Therefore, release the spring loaded Condenser Selector Switch before disconnecting test lead clips from the condenser under test.

(3) CAPACITY TEST.

(a) Rotate the Battery Selector Switch to the CAPACITY position.

(b) Read the center scale of the meter for the microfarad capacity of the condenser being tested.

(c) Refer to manufacturer's specifications for condenser capacity in microfarads. If the tester indication in microfarads does not fall within tolerances specified for condenser being tested, the condenser should be replaced.

(d) Disconnect and remove Test Leads from condenser.

(e) Turn Battery Selector Switch to OFF position.

(f) Set Test Selector Switch to COIL SET position.

(g) Disconnect and remove Battery Leads.

SECTION III

3-1. MAINTENANCE.

3-2. Maintenance of the coil tester is confined primari1y to periodic inspection and replacement of defective or worn components, and adjustment as may be performed by operating personnel without the use of special tools or equipment.

3-3. Clean test leads and battery leads with a cleaning solvent. Do not use gasoline as it will deteriorate the rubber. Inspect cables periodically for breaks, cuts or defective insulation.

3-4. Repair or replace any component if found to be mechanically or electrically defective.

SECTION IV

4-1. LUBRICATION.

4-2. No lubrication is required.

SECTION V

5-1. RECOMMENDED PARTS LIST.

5-2. This parts list includes those components and piece parts recommended as replaceable parts for the coil tester, Model No. CCT-20.

5-3. INSTRUCTIONS FOR REQUISITIONING PARTS NOT IDENTIFIED BY FSN.

A. When requisitioning parts not identified by Federal Stock Number, it is mandatory that the following information be furnished the supply officer:

1. Manufacturer's Federal Supply code number. (82386)
2. Manufacturer's part number exactly as listed herein.
3. Nomenclature exactly as listed herein, including dimensions if necessary.
4. Manufacturer's model number (end item).
5. Manufacturer's serial number (end item).
6. Any other information such as type frame number, and electrical characteristics, if applicable.
7. If DD Form 1348 is used, fill in all blocks except 4, 5, 6 and Remarks field in accordance with AR-725-50.

Complete form as follows:

a. In blocks 4, 5 and 6, list manufacturer's Federal Supply code number (82386) followed by a colon and manufacturer's part number for the repair part.
b. Complete Remarks field as follows:

Noun: (nomenclature of repair part).

For: (FSN of end item).

Mfr: (of end item).

Model: (of end item).

Serial: (of end item).

(Any other pertinent information such as frame number, type, dimensions, etc.).

5-4. A spare vibrator (6, figure 2) is included with the coil tester. To gain access to the spare vibrator, remove seven hexagon head screws and washers from bottom of case. Lift instrument panel from the case. Remove vibrator from mounting bracket by removing spring clip.

5-5. RECOMMENDED PUBLICATION IMPROVEMENTS

5-6. Reports 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 DA publications) and forwarded direct to Commanding General, Headquarters, U.S. Army Weapons Command, ATTN: AMSWE-SMM-P Rock Island, Illinois 61201.

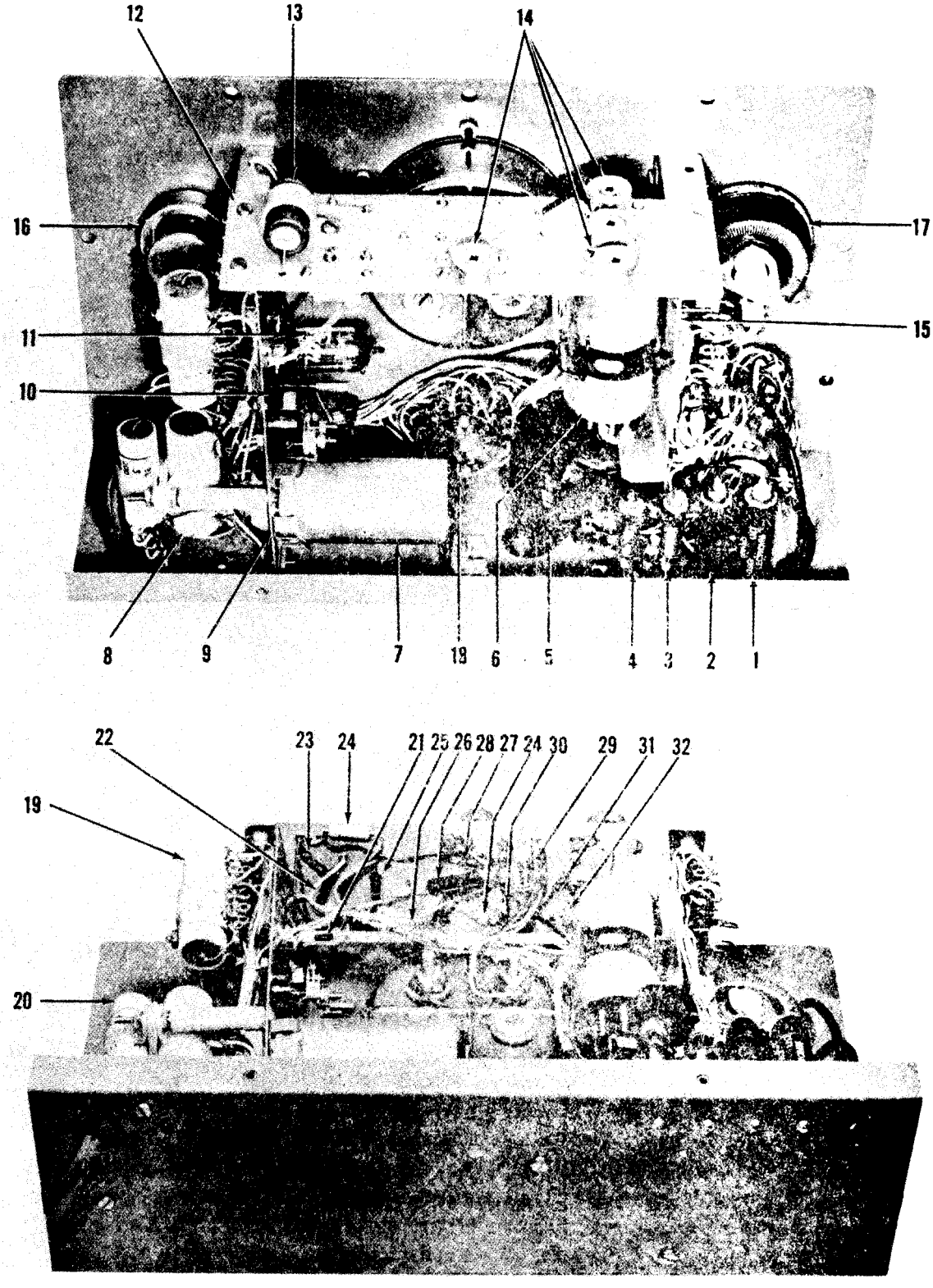

Figure 2. Internal Components (Rear View - Top and Bottom)

RECOMMENDED SPARE PARTS LIST

FIG. & ITEM NO.	PART NO.	DESCRIPTION	REF. DES.	QTY./ ASSY.
1-1	7020-804	COVER ASSEMBLY, CASE		1
1-2	7003-239	PLATE, INSTRUCTION		1
1-3	AFD3-40132	METER, MULTIPLE USE (94916) (82386 N0. 767-110)	M1	1
1-6	6004-116	TEST LEADS, TWO CONDUCTOR		1
1-7	6168-002	ADAPTER, COIL, TOWER		1
1-8	4728	ADAPTER, COIL, TOWER		1
1-9	6168-001	ADAPTER, COIL, PRIMARY		2
1-10	6002-166	BATTERY LEAD, SINGLE CONDUCTOR (RED BOOT)		1
1-11	6002-167	BATTERY LEAD, SINGLE CONDUCTOR (BLACK BOOT)		1
1-15	7020-805	CASE ASSEMBLY		1
2-1	684-153	RESISTOR, 2 OHM, 25 W	R8	1
2-2	684-079	RESISTOR, 4 OHM, 25 W	R7	1
2-3	684-232	RESISTOR, VARIABLE, 50 OHM, 10 W	R13	1
2-4	684-522	RESISTOR, VARIABLE, 200 OHM, 10 W	R12	1
2-5	778-324	TRANSFORMER, POWER	T1	1
2-6	1854	VIBRATOR, 6V, 6 PRONGS (76055) (SPARE) (82386 No. 817-022)	GI	2
2-7	1854	VIBRATOR, 6V, 6 PRONGS (76055) (82386 No. 817-022)	GI	REF
2-8	679-124	CAPACITOR, 0.25 MF, 600V	C8	1
2-9	7009-365	CHASSIS ASSEMBLY, COMPONENTS		1
2-10	482-511	RELAY, CAPACITY TEST	K2	1
2-11	12AU7A	ELECTRON TUBE, Miniature, 9 PIN (82386 No. 859-11)	VI	1
2-12	7009-366	TERMINAL BOARD ASSEMBLY		1
2-13	C437-AR-F-640	CAPACITOR, 640 MF, 25V (73445) (82386 No. 679-333)	C2	1
2-14	685-64	RESISTOR, VARIABLE, 4K, 20%	R2, R4, R5 R23	4
2-15	7009-364	CHASSIS ASSEMBLY, COMPONENTS		1

FIG. & ITEM NO.	PART NO.	DESCRIPTION	REF. DES.	QTY./ ASSY.
2-16	685-208	RESISTOR, VARIABLE DUAL , 30 OHM/60K, 4W	R14	1
2-17	389-060	RESISTOR, VARIABLE 22 OHM, 50 W	R19	1
2-18	762-51	SWITCH ROTARY, 5 POSITIONS	S2	1
2-19	679-124	CAPACITOR, 0. 25 MF, 600 V	C4	1
2-20	679-129	CAPACITOR, 0. 5 MF, 200 V	C9	1
2-21	66-8342	DIODE, SILICON, 200 V, (81483) (82386 No. 771 -215)	CR2	1
2-22	684-333	RESISTOR, 4. 5 OHM, 2 W, 1%	R17	1
2-23	684-291	RESISTOR, 50 OHM, 2. 5 W, 1%	R15	1
2-24	680-190	RESISTOR, 4. 87 K, 1/2 W, 1%	R6, R16	2
2-25	684-273	RESISTOR, 120 OHM, 1/2 W, 5%	R21	1
2-26	684-523	RESISTOR, 0. 72 OHM, 2 W, 5%	R22	1
2-27	680-201	RESISTOR, 450 OHM, 1/2 W, 1%	R24	1
2-28	684-339	RESISTOR, 75 OHM, 5 W, 5%	R29	1
2-29	679-122	CAPACITOR, 0. 005 MF, 600 V	C1	1
2-30	S1280	DIODE , SILICON, 800 V (81093) (82386 No. 771-205)	CR1	1
2-31	RC20GF272K	RESISTOR, 2. 7 K, 1/2 W, 10% (81349) (82386 No. 680-124)	R1	1
2-32	RC20GF332K	RESISTOR, 3. 3 K, 1/2 W, 10% (81349) (82386 No. 680-113)	R3	1
3-1	679-131	CAPACITOR, 0. 005 MF, 2000 V	C3	1
3-2	RC20GF681J	RESISTOR, 680 OHM, 1/2 W, 5% (81349) (82386 No. 680-67)	R25	1
3-3	680-62	RESISTOR, 465 K, 1W, 1%	R27	1
3-4	S1280	DIODE, SILICON, 800 V (81093) (82386 No. 771-205)	CR3, CR4	2
3-5	860-3	CAPACITOR, 0. 0005 MF, 600 V	C5	1
3-6	679-122	CAPACITOR, 0. 005 MF, 600 V	C6	1
3-7	RC20GF104K	RESISTOR, 100 K, 1/2 W, 10% (81349) (82386 No. 680-17)	R28	1
3-8	679-212	CAPACITOR, EL ECTROLYTIC , 0. 50 MF, 40 V	C7	1
3-9	RC20GF274K	RESISTOR, 270 K, 1/2 W, 10% (81349) (82386 No. 680-63)	R20	1
3-10	778-190	TRANSFORMER, RADIO FREQUENCY	T2	1

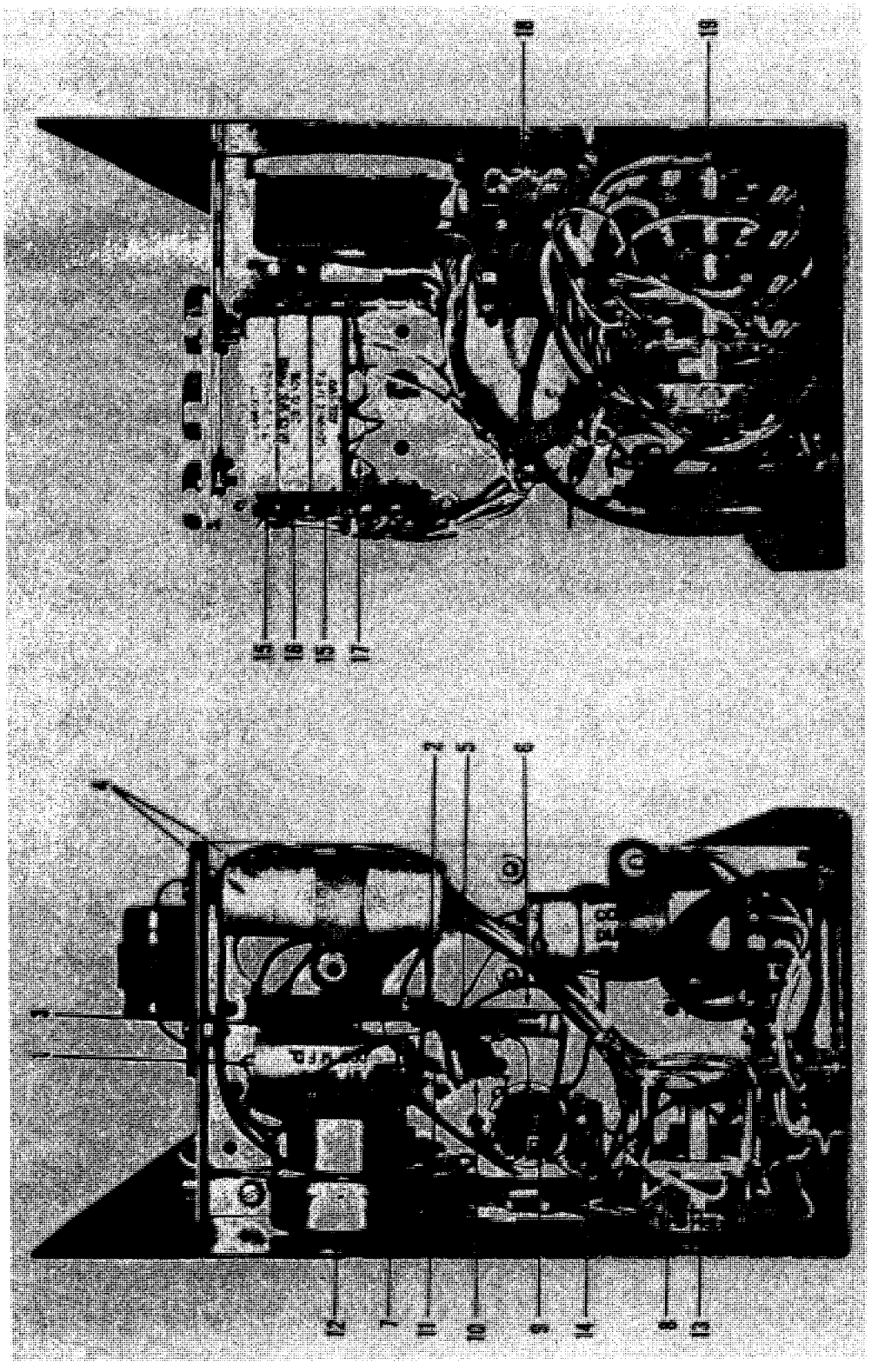

Figure 3. Internal Components (Left and Right Side Views)

Section V
Recommended Spare Parts List

FIG. & ITEM NO.	PART NO.	DESCRIPTION	REF. DES.	QTY./ ASSY.
3-11	RC20GF203J	RESISTOR, 20K, 1/2 W, 5% (81349) (82386 No. 680-151)	R26	1
3-12	685-208	RESISTOR, VARIABLE, DUAL, 30 OHM, 60K, 4W (NOTE: See figure 2-16).	R14	REF
3-13	762-61	SWITCH, ROTARY 3 POSITIONS	S3	1
3-14	771-229	DIODE, ZENER 8.2 V, 1 W	CR5	1
3-15	684-327	RESISTOR, 7.5 OHM, 10W	R9, R11	2
3-16	684-521	RESISTOR, 22 OHM, 10 W	R10	1
3-17	1380-002	RESISTOR, SHUNT, 2AMP	R18	1
3-18	KA11DY	RELAY, OVER VOLTAGE (77342) (82386 No. 783-242)	K1	1
3-19	762-167	SWITCH, ROTARY, 4 POSITIONS	S1	1
3-	1492-006	KNOB, 1-1/8 inch diameter, Black (not illustrated)		4
3-	782-112	KNOB, 1-1/8 inch diameter, Black (not illustrated)		1

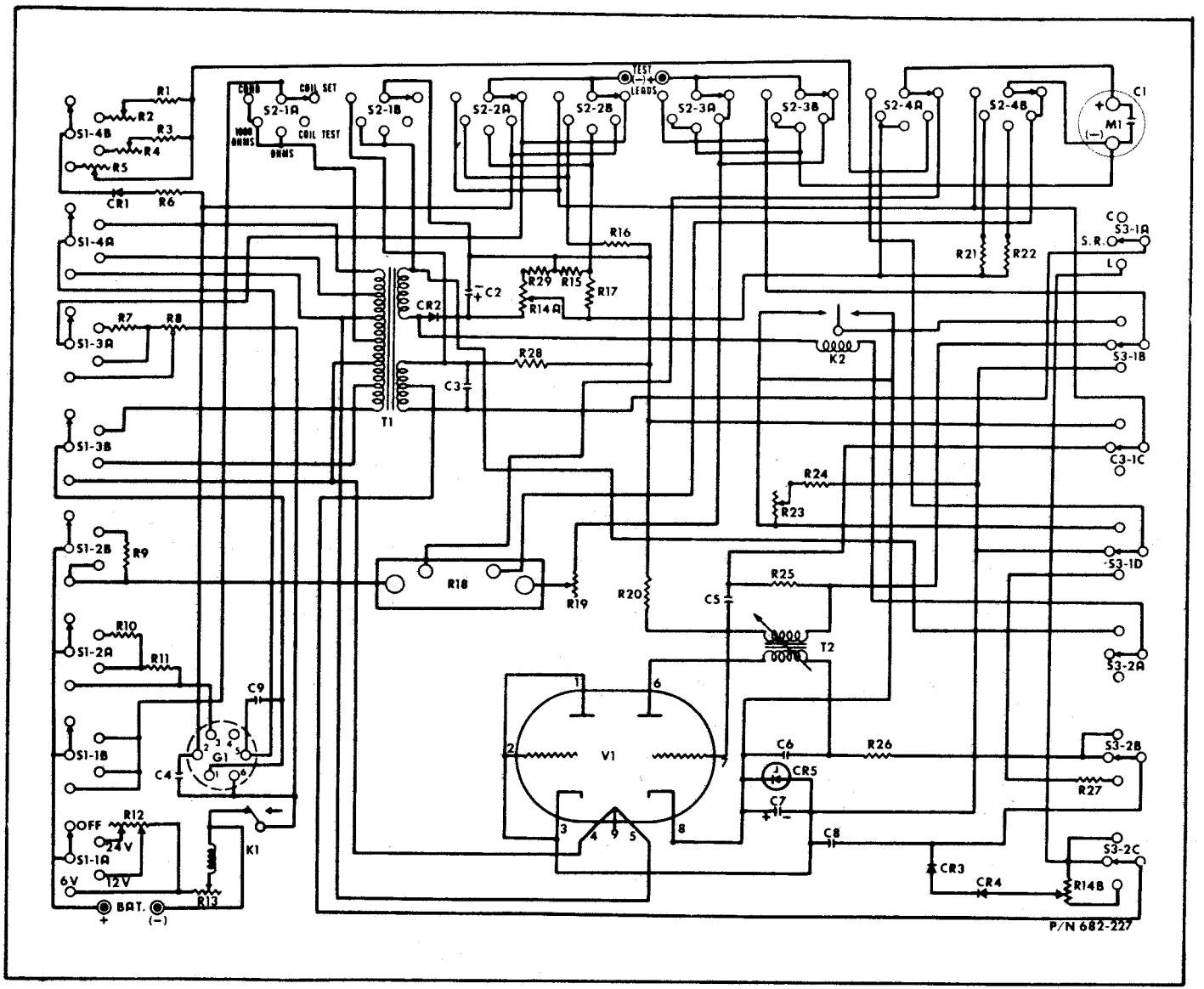

Figure 4. Electrical Schematic Diagram

By Order of the Secretary of the Army:

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Chief of Staff.

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YPG (1)	29-138
MOTBR (1)	29-205
4th USASA Fla Sta (1)	29-206
	29-207

NG: State AG (3)

USAR: None

For explanation of abbreviations used, see AR 320-50.

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