TM 11-6625-261-12

DEPARTMENT OF THE ARMY TECHNICAL MANUAL

OPERATOR'S AND
ORGANIZATIONAL MAINTENANCE MANUAL

AUDIO OSCILLATORS TS-382A/U, TS-382B/U, TS-382D/U, TS-382E/U, AND TS-382F/U

HEADQUARTERS, DEPARTMENT OF THE ARMY

12 APRIL 1961

WARNING

Be careful when working on the 450-volt plate and power supply circuits, or on the 115-volt ac line connections. Dangerous voltages exist at these points.

DON'T TAKE CHANCES!

Technical Manual
No. 11-6625-261-12

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON 25, D. C., *12 April 1961*

AUDIO OSCILLATORS TS-382A/U, TS-382B/U, TS-382D/U, TS-382E/U, AND TS-382F/U

			Paragraph	Page
CHAPTER	1.	INTRODUCTION		
Section	I.	General		3
		Scope	1	3
		Forms and records	2	3
	II.	Description and data		3
		Purpose and use	3	3
		Technical characteristics	4	5
		Components of Audio Oscillator TS-382(*)/U	5	5
		Common names	6	6
		Description of Audio Oscillator TS-382(*)/U	7	6
		Description of components	8	6
		Differences in models	9	6
CHAPTER	2.	INSTALLATION AND OPERATION		8
Section	I.	Service upon receipt of equipment		8
		Unpacking	10	8
		Checking unpacked equipment	11	9
	II.	Operator's controls and indicators		10
		Damage from improper settings	12	10
		Controls and indicators	13	10
	III.	Operation under usual conditions		10
		Starting procedure	14	10
		Operating procedure	15	11
		Stopping procedure	16	11
	IV.	Operation under unusual conditions		12
		General	17	12
		Operation in arctic climates	18	12
		Operation in tropical climates	19	12
		Operation in desert climates	20	12
CHAPTER	3.	MAINTENANCE INSTRUCTIONS		13
Section	I.	Operator's maintenance		13
		Scope of operator's maintenance	21	13
		Preventive maintenance	22	13
		Visual inspection	23	13
		Operational checklist	24	13
		Replacement of vacuum tubes	25	14
		Replacement of lamps and fuses	26	17

***This manual supersedes so much of TM 11-2684A/TO 16-35TS312-16, 9 May 1952, including C1, 13 December 1954, C2, 6 January 1956, and C3, 8 August 1960, as is applicable to operation and organizational maintenance of the equipment and so much of TM 11-6625-261-12P, 7 May 1959, as pertains to the first echelon functional parts list and maintenance allocation.**

			Paragraph	Page
	II.	Organizational maintenance		18
		Scope of unit repairman's maintenance	27	18
		Tools and materials required	28	18
		Preventive maintenance	29	18
		Visual inspection	30	18
		Equipment performance checklist	31	18
CHAPTER	4.	SHIPMENT, LIMITED STORAGE, AND DEMOLITION TO PREVENT ENEMY USE		21
Section	I.	Shipment and limited storage		21
		Removal from service	32	21
		Repackaging for shipment or limited storage	33	21
	II.	Demolition of material to prevent enemy use		22
		Authority for demolition	34	22
		Methods of destruction	35	22
APPENDIX	I.	REFERENCES		23
	II.	MAINTENANCE ALLOCATION		24
	III.	BASIC ISSUE ITEMS LIST		29

CHAPTER 1
INTRODUCTION

Section I. GENERAL

1. Scope

a. This manual describes Audio Oscillators TS-382A/U, TS-382B/U, TS-382D/U, TS-382E/U, and TS-382F/U (fig. 1) and covers their installation, operation, and first and second echelon maintenance. It includes instructions for operation, cleaning, and inspection of the equipment, and replacement of parts available to first and second echelon maintenance personnel.

b. Official nomenclature followed by (*) indicates all models of the equipment item covered in this manual. Thus, Audio Oscillator TS-382(*)/U represents Audio Oscillator TS-382(*)/U represents Audio Oscillators TS-382A/U, TS-382B/U, TS-D/U, TS-382E/U, and TS-382F/U. Cord CG-409(*)/U represents Cords CG-409A/U and CG-409E/U.

2. Forms and Records

a. Unsatisfactory Equipment Reports.

(1) Fill out and forward DA Form 468 (Unsatisfactory Equipment Report) to the Commanding Officer, U. S. Army Signal Materiel Support Agency, ATTN: SIGMS-ML, Fort Monmouth, N. J., as prescribed in AR 700-38.

(2) Fill out and forward AF TO Form 29 (Unsatisfactory Report) to the Commander, Air Materiel Command, Wright-Patterson Air Force Base, Ohio, as prescribed in AF TO 00-35D-54.

b. Report of Damaged or Improper Shipment. Fill out and forward DD Form 6 (Report of Damaged or Improper Shipment) as prescribed in AR 700-58 (Army), Navy Shipping Guide, Article 1850-4 (Navy), and AFR 71-4 (Air Force).

c. Preventive Maintenance Form. (fig. 5, 6, and 8. Prepare DA Form 11-266 (Maintenance Check List for Signal Equipment (Test Equipment)), in accordance with instructions on the form.

d. Parts List Form. Forward DA Form 2028 (Recommended Changes to DA Technical Manual Parts Lists or Supply Manual 7, 8, or 9) direct to the Commanding Officer, U. S. Army Signal Materiel Support Agency, ATTN: SIGMS-ML, Fort Monmouth, N. J.

e. Comments on Manual. Forward all other comments on this publication direct to the Commanding Officer, U. S. Army Signal Materiel Support Agency, ATTN: SIGMS-PA2d, Fort Monmouth, N. J.

Section II. DESCRIPTION AND DATA

3. Purpose and Use

a. Audio Oscillator TS-382(*)/U is a laboratory device which generates alternating-current (ac) voltages at frequencies ranging from 20 to 200,000 cycles per second (cps) at amplitudes which may be varied continuously from 0 to 10 volts. The generated signal is accurate with respect to frequency and voltage level and is low in harmonic distortion.

b. The equipment may be used as follows:

(1) Making voltage gain tests in wideband audio amplifiers.
(2) Checking frequency response of wideband audio amplifiers.
(3) Measuring distortion in wideband audio amplifiers.
(4) Modulating radiofrequency oscillators.
(5) Checking equipment operating at supersonic frequencies.

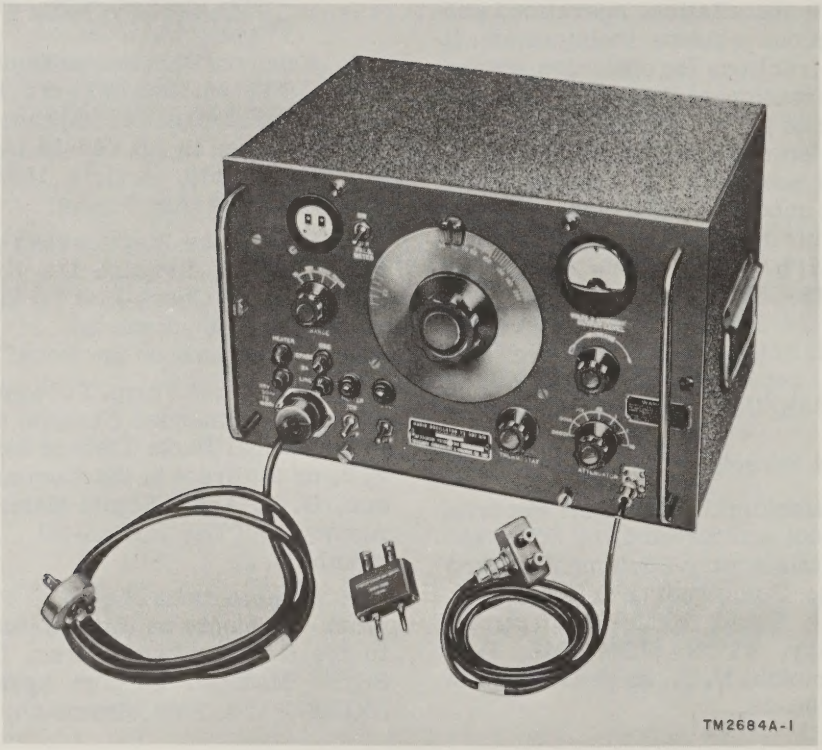


Figure 1. Audio Oscillator TS-382A/U, less Case CY-688/U, technical manuals, and running spares.

4. Technical Characteristics

Frequency range:
Band X1 . . . 20 to 200 cps.
Band X10 . . . 200 to 2,000 cps.
Band X100 . . 2,000 to 20,000 cps.
Band X1000 . 20,000 to 200,000 cps.
Output impedance . . . . . 1,000 ohms.
Frequency response (reference level 400 cps, 10 volts into 1,000-ohm load):
20 cps . . . . . Approx ±1 db.
150,000 cps . Approx ±1 db.
Frequency accuracy . . . . Within ±2%.
Frequency stability . . . . . Within ±2%.
Distortion (rated output) . . . . . Less than 3%.
Hum . . . . . 60 db below rated output.
Attenuator accuracy . . . . Within ±3% (except 10 microvolt range where accuracy is within +2 or -3 microvolts).
Power output . . . 100 mw.
Power input:
TS-382A/U, TS-382B/U, and TS-382D/U (serial No. 1231 and above) . . . 115 volts, 50 to 1,600 cps.
TS-382D/U (serial No. 1 through 1230), TS-382E/U and TS-382F/U . . . 115 volts, 50 to 1,000 cps.
Fuse rating . . . . 2 amp.
Number of tubes . . . . . 9.

5. Components of Audio Oscillator TS-382(*)/U

(fig. 2)

a. Components.

Quantity	Item	Height (in.)	Depth (in.)	Width (in.)	Unit weight (lb)
1	Audio Oscillator TS-382(*)/U	10	12-3/4	18-3/4	45
1	Cord CG-409(*)/U (5 ft)[a]				
1	Cord CX-237A/U (5 ft)[b]				
1	Adapter Connector UG-514/U				
1	Dummy Load DA-35/U				
1	Case CY-688/U	17	17-1/2	19	33
1	Case CY-688A/U[c]	15-5/8	13-3/4	20	26
2	TM 11-6625-261-12				
1 set	Running spares (*b* below)				

[a] Cord CG-409E/U replaces Cord CG-409A/U when Cord CG-409A/U is damaged.
[b] Cord CX-237A/U is not supplied with TS-382F/U; the power cord is permanently attached.
[c] Case CY-688A/U is supplied with Audio Oscillator TS-382E/U. However, this case will replace Case CY-688/U if the CY-688/U is damaged.

b. Running Spares.

Quantity	Item
1	Electron tube, 6V6GTY
1	Electron tube, 6J5WGT
1	Electron tube, 6SJ7Y
1	Electron tube, OA3
10	Fuse cartridge: MIL type FO2G2ROOA, 2 amperes
1	Lamp LM-52, incandescent, type 47

6. Common Names

Nomenclature	Common name
Audio Oscillator TS-382 (*)/U.	Audio oscillator
Case CY-688/U or Case CY-688A/U.	Case
Cord CG-409E/U	Output cord
Cord CX-237A/U	Power cord
Dummy Load DA-35/U ..	Dummy load
Adapter Connector UG-514/U.	Adapter connector

7. Description of Audio Oscillator TS-382(*)/U

(fig. 1)

The nine-tube audio oscillator covers a frequency range from 20 to 200,000 cps. The built-in frequency meter is used to check the calibration of the instrument and the built-in output level meter is used to monitor the output voltage. The equipment cabinet is rugged and all connectors and operating controls are on the front panel.

8. Description of Components

(fig. 2)

a. Case CY-688/U or CY-688A/U is used to carry the audio oscillator. Compartments are provided for small components and running spares. Blocks are installed to prevent shifting of the equipment during transit. The case is provided with eight latches to secure the lid during transit.

b. Cord CX-237A/U is 5 feet long and is fitted with a female plug which connects to the power input jack on the equipment. The other end is fitted with a male plug to connect to the ac power source.

c. Dummy Load DA-35/U and Adapter Connector UG-514/U are identical externally and are for use with Cord CG-409(*)/U. Dummy Load DA-35/U has a 1,000-ohm resistor mounted internally. Adaptor connector UG-514/U has no resistor.

d. Cord CG-409(*)/U is a 5-foot shielded cable and is fitted on both ends with a Plug UG-260/U. One end connects to either Dummy Load DA-35/U or Adapter Connector UG-514/U and the other end connects to the OUTPUT jack.

9. Differences in Models

Audio Oscillators TS-382A/U, TS-382B/U, TS-382D/U, TS-382E/U, and TS-382F/U are similar in purpose, operation, and appearance. Cord CG-409E/U replaces CG-409A/U. These cords are interchangeable. The panel markings on the audio oscillator for the ATTENUATOR switch vary and are shown in *a* below; other external differences are shown in *b* below.

a. ATTENUATOR Switch Markings.

Switch position	TS-382A/U and TS-382B/U	TS-382D/U, TS-382E/U, and TS-382F/U
1	.00001	X10[a]
2	.0001	X100[a]
3	.001	X1000[a]
4	.01	X.01
5	.1	X.1
6	1	X1
7	10	X10

[a]Represents microvolts.

b. Other External Differences.

Item	TS-382A/U	TS-382B/U	TS-382D/U	TS-382E/U	TS-382F/U
THERMOSTAT control	External	External	Internal	Internal	Internal
Power cord	Detachable	Detachable	Detachable	Detachable	Permanently attached
Power input	115 v, 50 to 1,600 cps	115 v, 50 to 1,600 cps	Serial No. 1 through 1230 are 115 v 50 to 1,000 cps; on later models, 50 to 1,600 cps	115 v, 50 to 1,000 cps	115 v, 50 to 1,000 cps
Case CY-688/U[a]	Used	Used	Used	Not used	Used
Case CY-688A/U[a]	Not used	Not used	Not Used	Used	Not used

[a]Case CY-688A/U is used to replace Case CY-688/U if CY-688/U is damaged. These cases are interchangeable.

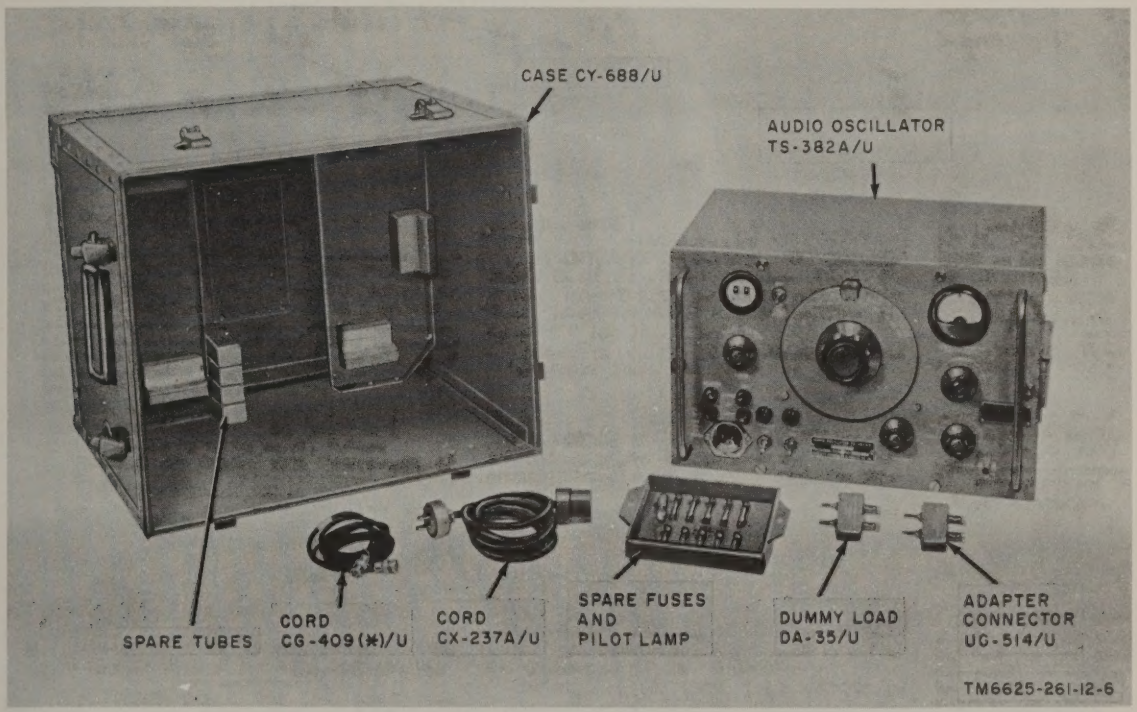


Figure 2. Audio Oscillator TS-382A/U, components, less technical manuals.

CHAPTER 2

INSTALLATION AND OPERATION

Section I. SERVICE UPON RECEIPT OF EQUIPMENT

10. Unpacking

a. Packaging Data (fig. 3). When packed for shipment, the audio oscillator and its components are placed in its case. The unit (Case CY-688/U with Audio Oscillator TS-382(*)/U inside) is placed in a water-resistant, fiberboard box with all joints and seams sealed with water-resistant, pressure-sensitive tape. The water-resistant, fiberboard box is placed within a wooden box and strapped for oversea shipment.

b. Removing Contents.

(1) Cut and fold back the metal straps (when used).

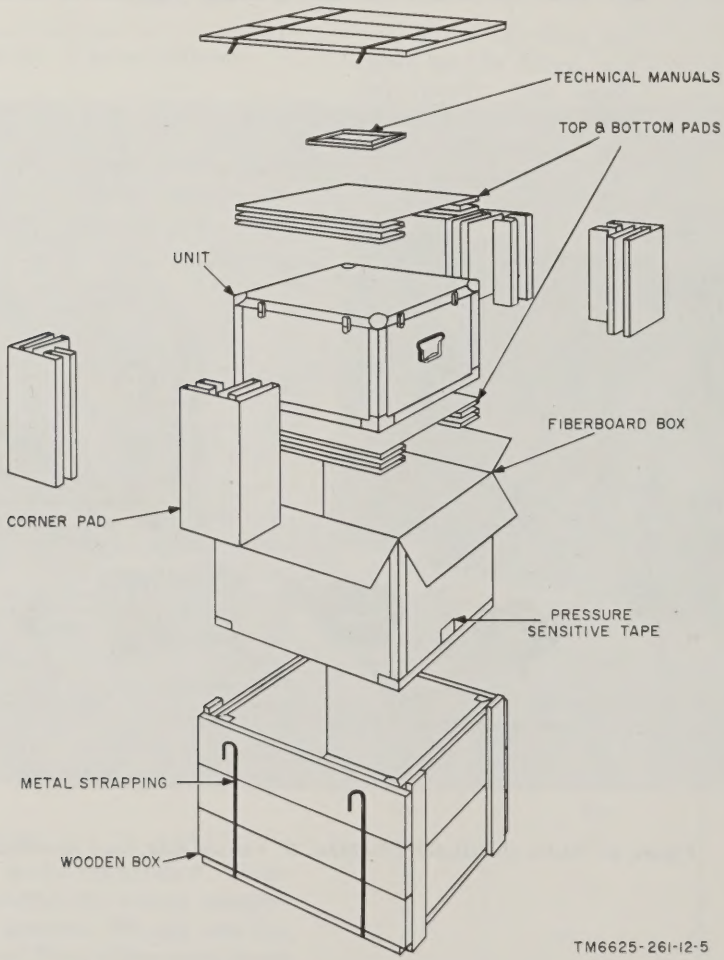


Figure 3. Typical packaging.

(2) Remove the nails from the top and one side of the box with a nailpuller. Remove the top and one side. Do not attempt to pry off the top and side; prying may damage the equipment.
(3) Remove the envelope that contains the technical manuals.
(4) Remove the box that is wrapped in a waterproof barrier.
(5) Remove the unit from the box.
(6) Remove the audio oscillator and components from the unit.

11. Checking Unpacked Equipment

Caution: **The chassis of the audio oscillator has been moistureproofed and fungiproofed.** ***Do not remove any of the protective coating.***

a. Check the contents of the case against the table of components (para 5).

b. Thoroughly inspect the exterior of the audio oscillator and other components for damage incurred in shipment.

c. Loosen the six knurled screws on the front panel and, with the handles on either side of the panel, lift the oscillator chassis from its cabinet.

d. Inspect the audio oscillator chassis for broken or improperly seated tubes.

e. Inspect the wiring for loose connections and defective parts.

f. Inspect the unit subassemblies to make certain they are securely fastened in place.

g. Check the rating and condition of the OSC. and HEATER fuses (both 2 amperes).

h. Replace the audio oscillator chassis in its cabinet and tighten the knurled screws.

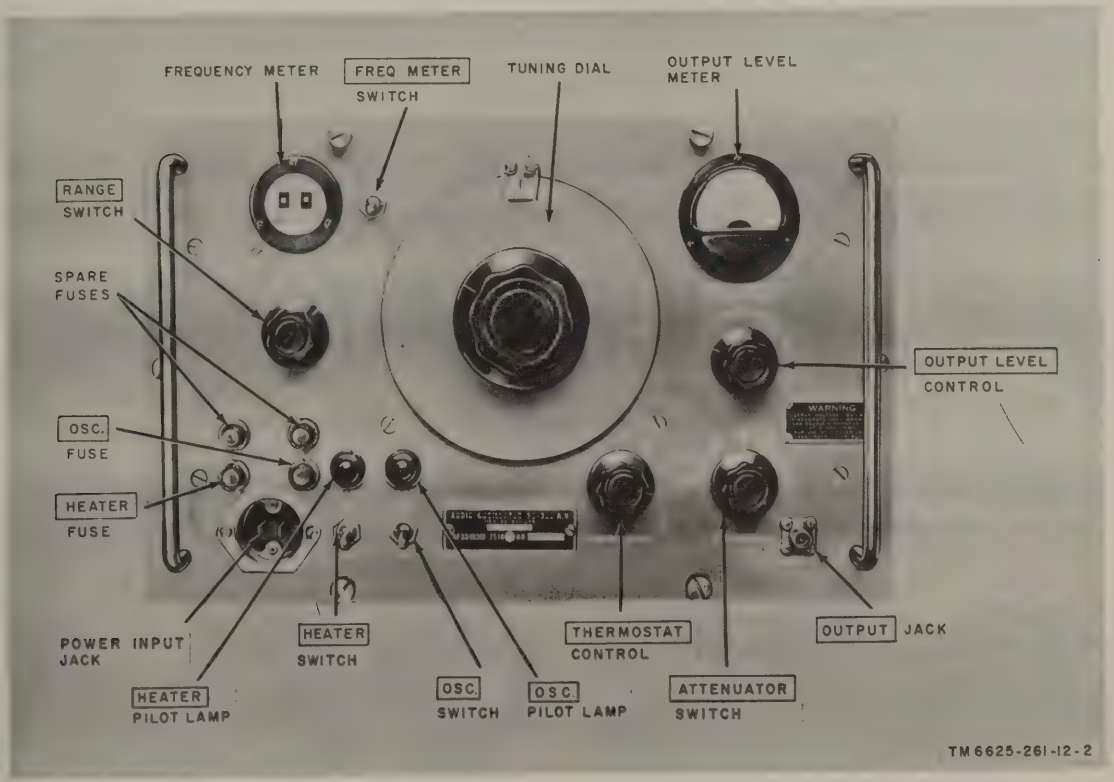


Figure 4. Audio Oscillator TS-382A/U, controls and indicators.

Section II. OPERATOR'S CONTROLS AND INDICATORS

12. Damage from Improper Settings

The following precaution should be taken when setting the controls: On models TS-382A/U and TS-382B/U, be sure that the THERMOSTAT control is not left in the full clockwise position. If this is done, the heat generated may damage the parts.

13. Controls and Indicators (fig. 4).

a. Controls.

Control	Function
RANGE switch	Determines the output frequency range.
FREQ. METER switch	In ON position, applies oscillator signal to the frequency meter. In OFF position, removes signal from the frequency meter.
Tuning dial	The dial reading multiplied by the RANGE switch setting indicates the frequency of the oscillator output.
OUTPUT LEVEL control	Clockwise direction increases the amplitude of the output signal from zero to the maximum permitted by the setting of the ATTENUATOR switch.
ATTENUATOR switch	Determines the range over which the amplitude of the output signal may be varied by the OUTPUT LEVEL control.
HEATER switch	In ON position, applies power to heating elements. In OFF position, removes power from heating elements.
OSC. switch	In ON position, applies power to the oscillator. In OFF position, removes power from the oscillator.
THERMOSTAT control (TS-382A/U and TS-382B/U only).	Clockwise direction increases the temperature at which the heating elements will maintain the audio oscillator.

b. Indicators.

Indicator	Function
Output level meter	Indicates the voltage of the oscillator output signal when the meter reading is multiplied by the ATTENUATOR switch.
Frequency meter	Checks calibration of the tuning dial and/or the frequency of the output signal at 60 and 400 cps.
HEATER pilot lamp	Indicates when the heating elements are energized.
OSC. pilot lamp	Indicates when power is applied to the oscillator.

Section III. OPERATION UNDER USUAL CONDITIONS

14. Starting Procedure

Note. If an abnormal indication is obtained during the starting procedure, refer to the operational checklist (para 24).

Perform the starting procedure given below before using the operating procedure described in paragraph 15.

a. Plug the power cord into power input jack.

Note. The power cord is permanently attached to the TS–382F/U.

b. Attach the output cord to OUTPUT jack.

c. Set the HEATER switch to OFF.

d. Set the OSC. switch to OFF.

e. Plug the audio oscillator into the power receptacle.

f. Set the OSC. switch to ON; the OSC. pilot lamp should light.

g. Allow the audio oscillator to warm up for 15 minutes.

h. At low air temperatures, proceed as follows:

(1) Set the HEATER switch to ON.

Note. On TS–382D/U, TS–382E/U, and TS–382F/U, disregard steps 2 through 4. The thermostat control is mounted internally and will automatically maintain the correct temperature.

(2) Turn the THERMOSTAT control fully clockwise; the HEATER pilot lamp should light.
(3) When the case of the audio oscillator feels warm to the touch, turn the THERMOSTAT control counterclockwise until the HEATER pilot lamp just goes out; leave it in this position.
(4) Leave the HEATER switch at ON.

i. Check to see that the audio oscillator is operating properly as follows:
(1) Set the tuning dial at 60.
(2) Set the RANGE switch at X1.
(3) Set the FREQ. METER switch to ON.
(4) Rotate the tuning dial back and forth slightly until the 60 CYCLES frequency meter reed vibrates with maximum amplitude. The setting of the tuning dial at this point will be within 1 division of 60.
(5) Make the same check at 400 cycles. The main tuning dial will be within 1-1/2 divisions of 40 (with the RANGE switch set at X10) when the 400 CYCLES frequency meter reed vibrates with maximum amplitude.
(6) If the dial settings for maximum reed vibration do not fall within the tolerances indicated above, refer to higher echelon for corrective measures.
(7) Set the FREQ. switch to OFF.

15. Operating Procedure

a. General. Follow the instructions in paragraph 14 for starting, warming, and checking the audio oscillator.

b. Output Connections. Take the output signal from the audio oscillator at the OUTPUT jack. When the input connection to the load has a connector which can not be used with Plug UG-260/U, and the input impedances is approximately 1,000 ohms, use the adapter-connector. When the input impedance of the load is over 1,000 ohms, the dummy load must be used. Use of the dummy load with high-impedance loads maintains the accuracy of the metering circuit calibration.

***Caution:* Do not force the tuning dial beyond its normal travel; this will destroy the calibration of the equipment.**

c. Selecting Frequency. Select any frequency from 20 to 200,000 cps by setting the tuning dial and the RANGE switch so that the two settings, when multiplied by each other, equal the desired output frequency. For example, select an output frequency of 52,000 cps by setting the tuning dial to 52 and the RANGE switch to X1000.

Note. The calibration of the attenuator network is accurate only when the audio oscillator is working into its rated load of 1,000 ohms. Always use the dummy load when working into high impedances.

d. Selecting Output Voltage. Select voltage from 0 to 10 by using the OUTPUT LEVEL control in conjunction with the ATTENUATOR switch. The attenuator is calibrated in seven decade steps so that with the output level meter set at 1 volt by the OUTPUT LEVEL control, output voltages from 10 volts to 10 microvolts can be obtained by switching the ATTENUATOR switch settings. For intermediate values of output voltage, the OUTPUT LEVEL control is varied so that the output level meter reads the desired voltage. The ATTENUATOR switch is then set so that its value, multiplied by the meter reading, gives the desired output voltage level. For example, to obtain an output voltage of 0.04 volt, set the meter by means of the OUTPUT LEVEL control to read .4 volt, and set the ATTENUATOR switch to .1. The output voltage then will be the meter reading multiplied by the ATTENUATOR switch setting or 0.04 volt.

16. Stopping Procedure

a. Set the OSC. and HEATER switches to OFF.
b. Disconnect the output cord.
c. Disconnect the power cord from the 115-volt source and then from the front panel power input jack.
d. Place the cords, dummy load, adapter connector, and the audio oscillator in the case for storage.

Section IV. OPERATION UNDER UNUSUAL CONDITIONS

17. General

The operation of the audio oscillator may be difficult where extreme cold, heat, humidity and moisture, sand conditions, etc prevail. Instructions for minimizing the effect of these unusual operating conditions are given in paragraphs 18, 19, and 20.

18. Operation in Arctic Climates

Subzero temperatures and climatic conditions associated with cold weather affect the efficient operation of the equipment. Handle the equipment carefully and keep the equipment warm and dry. If the audio oscillator is not in a heated enclosure, keep the heating elements turned on.

19. Operation in Tropical Climates

Moisture conditions are more acute than normal in the tropics. When the audio oscillator is in a poorly ventilated location, the high humidity causes condensation of moisture on the equipment whenever the temperature of the equipment becomes lower than that of the surrounding air. To minimize this condition, keep the HEATER switch turned to ON with the THERMOSTAT control set at a point that keeps the oscillator warm to the touch. (On the TS-382D/U, TS-382E/U, and TS-382F/U, leave the HEATER switch at ON.)

20. Operation in Desert Climates

The main problem which arises with equipment operation in desert areas is the large amount of sand or dust and dirt which enters the moving parts of electronic equipment. Keep the equipment as free from dust as possible. Make frequent preventive maintenance checks.

CHAPTER 3
MAINTENANCE INSTRUCTIONS

Section I. OPERATOR'S MAINTENANCE

21. Scope of Operator's Maintenance

The following is a list of maintenance duties normally performed by the operator of Audio Oscillator TS-382(*)/U. These procedures do not require special tools or test equipment.

a. Preventive maintenance (para 22).
b. Visual inspection (para 23).
c. Operational checklist (para 24).
d. Replacement of vacuum tubes V103, V104, V108, and V109 (para 25).
e. Replacement of fuses and lamps (para 26).

22. Preventive Maintenance

a. DA Form 11-266. DA Form 11-266 (fig. 5 and 6) is a preventive maintenance checklist to be used by the operator. Items not applicable to the audio oscillator are lined out. References in the ITEM block in figure 6 are to paragraphs that contain additional maintenance information pertinent to the particular item. Follow the instructions on the form.

b. Items. The information in this subparagraph is supplementary to DA Form 11-266. The item numbers correspond to the ITEM numbers on the form.

Item	Maintenance procedures
1	Use a clean cloth to remove dust, dirt, moisture, and grease from the housing and the front panel. If necessary, wet the cloth with Cleaning compound (Federal stock No. 7930-395-9542) and then wipe the parts dry with a dry, clean cloth.
3	All control knobs should work smoothly, be tight on the shafts, and should not bind. If any knob rubs against the panel, loosen the setscrew and pull the knob away from the front panel approximately 1/8 inch and retighten the setscrew.
5	Repair any cuts in the power-cord insulation by covering them with rubber tape and then with friction tape.
11	Check the two meters for broken or cracked glass. See that the mounting screws are not loose. See that the meter cases are not cracked or broken.

Warning: Cleaning compound is flammable and its fumes are toxic. Do not use it near a flame; provide adequate ventilation.

23. Visual Inspection

a. When the equipment fails to perform properly, turn off the power and check all the items listed below. *Do not check any item with the power on.*

(1) Wrong settings of switches and controls (para 13).
(2) Burned-out fuses (usually indicates some other fault).
(3) Poor or improper connection between audio oscillator and equipment under test.

b. If the above checks do not locate the trouble, proceed to the operational checklist (para 24).

24. Operational Checklist

a. General. The operational checklist will help the operator to locate trouble quickly. The corrective measures are used to repair this trouble. If the measures suggested do not restore normal equipment performance, troubleshooting is required by an instrument repairman. Note on the repair tag what corrective measures were taken and how the equipment performed at the time of failure.

b. Procedure. Place the equipment in operation (para 15). After the equipment has had time to warm up, perform the steps

in *c* below, in the order given. Observe the equipment operation and perform any corrective measures necessary.

c. Checklist.

Step	Action	Normal indication	Corrective measure
1	Set the RANGE switch to X1.		
2	Turn the tuning dial to 20.		
3	Turn the OUTPUT LEVEL control fully counterclockwise.		
4	Set the ATTENUATOR switch to X1.		
5	On models with external THERMOSTAT control:		
	Turn the THERMOSTAT control fully clockwise.		
	Set the HEATER switch to ON. Allow 15-minute warmup.	HEATER pilot lamp lights.	Check power cord for proper seating. Check pilot lamp; replace if necessary. Check fuse F102; replace if necessary. Higher echelon repair required.
	Turn the THERMOSTAT control fully counterclockwise.	HEATER pilot lamp goes out.	Higher echelon repair required.
	On models without external thermostat control:		
	Set the HEATER switch to ON.	HEATER pilot lamp lights.[a]	Check power cord for proper seating. Check pilot lamp; replace if necessary. Check fuse F102; replace if necessary.
	Allow 1/2-hour warmup.	HEATER pilot lamp goes out within 1/2 hour.[a]	Higher echelon repair required.
6	Set the FREQ. METER switch to ON.		
7	Set the OSC. switch to ON.	OSC. pilot lamp lights.	Check fuse F101; replace if necessary. Check pilot lamp; replace if necessary. Higher echelon repair required.
8	Vary the tuning dial around 60.	Frequency meter 60 cycles reed vibrates.	Replace V108 or V109. Higher echelon repair required.
9	Set the RANGE switch to X10.		
10	Vary the tuning dial around 40.	Frequency meter 400 cycles reed vibrates.	Replace V108 or V109. Higher echelon repair required.
11	Vary the OUTPUT LEVEL control.	OUTPUT LEVEL meter indicates rise and fall of oscillator output.	Replace V103 or V104. Higher echelon repair required.
12	Set the OSC. switch to OFF.	OSC. pilot lamp goes out	Higher echelon repair required.
13	Set the HEATER switch to OFF.	HEATER pilot lamp goes out.	Higher echelon repair required.

[a] Lamp does not go on if temperature of the room is above 80° F.

25. Replacement of Vacuum Tubes (fig. 7)

a. When trouble occurs, check all wiring and connections before replacing any tubes. Try to isolate the trouble to a component or stage. If tube failure is suspected, use the procedure in *b* below to check the tubes. Replacement of tubes other than V103, V104, V108, and V109 is not authorized at the operator's and organizational level and will affect the calibration of the equipment.

Caution: **Do not rock or rotate a tube when removing it from a socket; pull it straight out with a tube puller.**

MAINTENANCE CHECK LIST FOR SIGNAL EQUIPMENT
TEST EQUIPMENT
(AR 750-625)

EQUIPMENT NOMENCLATURE
AUDIO OSCILLATOR TS-382A/U

EQUIPMENT SERIAL NUMBER
273

INSTRUCTIONS

This form may be used for a period of one month by using the correct dates and weeks of the month. It is to be used as a Preventive Maintenance check list for Signal equipment in actual use, or for a check on equipment prior to issue.

1. For detailed Preventive Maintenance instructions see:
   a. The Technical Manual *(in TM 11 series)* for the equipment. *(See DA Pamphlet Number 310-4)*
   b. The Supply Bulletin *(SB 11-100 series)* for the equipment. *(See DA Pamphlet Number 310-4)*
   c. The Department of the Army Lubrication Order. *(See DA Pamphlet Number 310-4)*

2. The following action will be taken by either the Communications Officer/ Chief for 1st echelon, or the Inspector for higher echelon
   a. Enter Equipment Nomenclature and Serial Number.
   b. Strike out items that do not apply to the equipment.

3. Operator/Inspector will enter in the columns entitled CONDITION, on the proper line, a notation regarding the condition, using symbols specified under LEGEND.

4. After operator completes each daily inspection he will initial over the appropriate dates under "Daily Condition for Month", then return form to his supervisor.

FOLD

TYPE OF INSPECTION
PREVENTIVE MAINTENANCE (1ST ECHELON)

OPERATOR	2/3 ECHELON	DATE	SIGNATURE
✓		7 May 61	J.P. Smith

DA FORM 1 MAY 57 11-266

Figure 5. DA Form 11-266, pages 1 and 4 (operator).

LEGEND for marking conditions:
Satisfactory, ✓.
Adjustment, Repair or Replacement required, X.
Defect corrected, (X).

DAILY CONDITION FOR MONTH OF MAY 61

NO.	DAILY ITEM	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	~~2D 3D ECH~~ ECHELON
		17	18	19	20	21	22	23	24	25	26	27	28	29	30	31		
1.	CLEAN DIRT AND MOISTURE FROM EXPOSED SURFACES OF ~~HOUSINGS~~, CASES, CABINETS, CONTROL PANELS, INTERCONNECTING PLUGS, CABLES, ~~HEADSETS~~, METER WINDOWS, ETC. PARA 22	✓	✓	✓	✓	✓	✓	✓										
2.	INSPECT FOR LOOSENESS OF EXTERIOR ITEMS SUCH AS SWITCHES, KNOBS, JACKS, CONNECTORS AND PILOT LIGHTS.	✓	✓	✓	✓	(X)	✓	✓										
3.	INSPECT CONTROLS FOR BINDING, SCRAPING. TAP CONTROLS LIGHTLY FOR CUT-OUT DUE TO LOOSE CONTACTS. PARA 22	✓	✓	✓	✓	✓	✓	✓										
4.	DURING OPERATION BE ALERT FOR ANY UNUSUAL PERFORMANCE OR CONDITION.	✓	✓	✓	✓	✓	✓	✓										

WEEKLY	CONDITION EACH WEEK 1ST	2D	3D	4TH	5TH	~~2D 3D ECH~~ ECHELON
5. INSPECT CORDS, CABLES, ~~WIRE AND SHOCK MOUNTS~~ FOR BREAKS, CUTS, KINKS, DETERIORATION, STRAIN AND FRAYING. PARA 22	✓					
6. ~~INSPECT CANVAS AND LEATHER ITEMS FOR FUNGUS, FRAYING, TEARS, BROKEN ZIPPERS AND SNAP FASTENERS.~~						
7. HAND CHECK FOR LOOSENESS OF EXTERIOR ITEMS SUCH AS HANDLES, LATCHES, HINGES.	✓					
8. ~~INSPECT FOR LUBRICATION IN ACCORDANCE WITH APPLICABLE LUBRICATION ORDER.~~						
9. ~~INSPECT DRY BATTERIES FOR DIRT, LOOSE TERMINALS AND LEAKAGE.~~						
10. INSPECT EXPOSED METAL SURFACES FOR RUST AND CORROSION.	✓					
11. INSPECT METERS FOR DAMAGED GLASS AND CASES. PARA 22	X					

ADDITIONAL ITEMS FOR 2D AND 3D ECHELON INSPECTIONS	CONDITION
12. ~~INSPECT SEATING OF READILY ACCESSIBLE ITEMS OF A PLUCK OUT NATURE; CRYSTALS, FUSES, CONNECTORS, PLUG-IN COILS, LAMPS, ETC. DO NOT REMOVE, ROCK OR TWIST TO INSPECT. USE ONLY A DIRECT PRESSURE TO INSURE THE ITEM IS FULLY SEATED.~~	
13. ~~INSPECT FOR CLEANLINESS AND TIGHTNESS OF SUCH ITEMS AS SHOCK MOUNTS, ANTENNA, ANTENNA MOUNTS AND WAVE GUIDES.~~	
14. ~~INSPECT RELAY AND CIRCUIT BREAKER ASSEMBLIES FOR DIRT, CORROSION, WORN OR BURNED CONTACTS.~~	

ADDITIONAL ITEMS FOR 2D AND 3D ECHELON INSPECTIONS	CONDITION
15. ~~INSPECT RESISTORS, BUSHINGS, INSULATORS FOR CRACKS, CHIPPING, BLISTERING, DISCOLORATION AND MOISTURE.~~	
16. ~~INSPECT JACKS AND CONNECTORS FOR SNUG FIT AND GOOD CONTACTS.~~	
17. ~~INSPECT VARIABLE CAPACITORS FOR DIRT AND MOISTURE.~~	
18. ~~INSPECT AIR FILTERS FOR CLEANLINESS.~~	
19. ~~INSPECT SOLDERLESS TYPE TERMINALS OF TRANSFORMERS, FIXED CAPACITORS, RESISTORS, CHOKES, POTENTIOMETERS AND RHEOSTATS FOR CORROSION, DIRT AND LOOSE CONTACTS.~~	
20. ~~CLEAN AND TIGHTEN SWITCHES, BLOWERS, RELAY CASES. CLEAN INTERIOR OF CHASSIS AND CABINETS.~~	
21. ~~INSPECT GENERATORS, MOTORS AND DYNAMOTORS FOR BRUSH WEAR, SPRING TENSION, ARCING AND COMMUTATOR WEAR.~~	
22. ~~INSPECT TERMINAL BLOCKS FOR LOOSE CONNECTIONS, CRACKS AND BREAKS.~~	
23. ~~INSPECT GASKETS AND BUSHINGS FOR WEAR AND DAMAGE.~~	
24. ~~INSPECT CATHODE RAY TUBES FOR BURNED SCREEN SPOTS.~~	
25. ~~BEFORE STORING OR SHIPPING REMOVE ALL BATTERIES.~~	

IF DEFICIENCIES NOTED ARE NOT CORRECTED DURING THE INSPECTION, INDICATE ACTION TAKEN FOR CORRECTION. *(Continue on page 4, if more space is needed)*

ITEM 11. FREQUENCY METER GLASS BROKEN; REFERRED TO HIGHER ECHELON FOR REPAIR.

2 3

Figure 6. DA Form 11–266, pages 2 and 3 (operator).

b. Replace a suspected tube with a new one. If the equipment still does not work, remove the new tube and put back the original tube. Repeat this procedure with each suspected tube until the defective tube is located.

26. Replacement of Lamps and Fuses

a. Replacement of HEATER and OSC. Pilot Lamps.

(1) Turn the lens counterclockwise and remove it from the lampholder.
(2) Press in on the defective lamp and turn it counterclockwise to unlock it from the lampholder.
(3) Insert the new lamp into the lampholder. Press in on the lamp and turn it clockwise to lock it in place.
(4) Replace the lens on the lampholder and turn it clockwise to tighten.

b. Replacement of Fuses.

(1) Turn the fuseholder cap counterclockwise and remove it from the body of the fuseholder.
(2) Remove the defective fuse from the fuseholder cap.
(3) Insert a new fuse in the fuseholder

Note. Be sure the fuse is of the proper rating (2 amperes, 115 volts).

(4) Replace fuseholder cap in the body of the fuseholder.

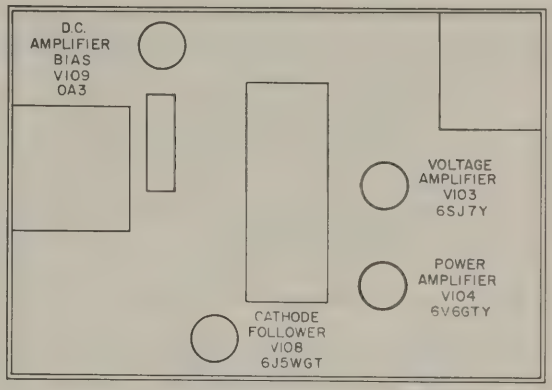


Figure 7. Tube location diagram.

27. Scope of Unit Repairman's Maintenance

a. The following is a list of maintenance duties normally performed by the second echelon repairman. The scope of the unit repairman's maintenance is determined by the tools, material, test equipment, and spare parts available.

b. Second echelon maintenance of Audio Oscillator TS-383(*)/U consists of the following:

(1) Preventive maintenance (para 29).
(2) Visual inspection (para 30).
(3) Equipment performance check (para 31).
(4) Replacement and repair of Cord CX-237A/U.

28. Tools and Materials Required

a. Tools. Tool equipment normally available to second echelon.

b. Materials.

(1) Cleaning compound.
(2) Cleaning cloth.

29. Preventive Maintenance

a. DA Form 11-266. DA Form 11-266 (fig. 8) is a preventive maintenance checklist to be used at second echelon. Items not applicable to the equipment are lined out. References in the ITEM block in the figure are to paragraphs that contain additional maintenance information pertinent to the particular item. Additional preventive maintenance information concerning items 1, 3, 5, and 11 on DA Form 11-266 is given in paragraph 22. Follow the instructions on the form.

b. Items. The information in this subparagraph is supplementary to DA Form 11-266. The item numbers correspond to the ITEM numbers on the form.

Warning: **Disconnect all power before performing the following operations. After power is disconnected, some capacitors still may retain dangerous voltages. Before touching exposed electrical parts, short-circuit the parts to ground.**

Item	Maintenance procedure
17	***Caution:*** **Do not touch the capacitor plates during cleaning. Do not use a cloth or scraping tool. Use only a gentle airstream from a hose.** Inspect the variable capacitor for dirt, moisture, or loose mountings. If any dirt or dust is present, blow it out with a gentle airstream.
19	Inspect fixed capacitors on the underside of the oscillator chassis for leaks, bulges, or discoloration.

30. Visual Inspection

Before operating the audio oscillator, inspect it. Inspection will save repair time and may also avoid further damage. Inspect the following for obvious defects:

a. The seating of all tubes in their sockets.

b. Wiring connections on the terminal boards.

c. Wiring connections to the switches and meters on the front panel.

31. Equipment Performance Checklist

a. General. The equipment performance checklist provides a procedure for systematically checking equipment performance. All corrective measures that the second echelon repairman can perform are given in the *Corrective measure* column. When using the checklist, start at the beginning and follow each step in order. If the corrective measures indicated do not fix the equipment, troubleshooting is required by higher echelon. Note on the repair tag how the equipment performed and the corrective measures that were taken.

b. Procedure. Place the audio oscillator in operation as instructed in the checklist in *c* following.

c. *Checklist.*

Step	Action	Normal indication	Corrective measure
1	Set the RANGE switch to X1.		
2	Turn the tuning dial to 60.		
3	Turn the OUTPUT LEVEL control fully counterclockwise.		
4	On models with external THERMOSTAT control:		
	Turn the THERMOSTAT control fully clockwise.		
	Set the HEATER switch to ON. All a 15-minute to warmup.	HEATER pilot lamp lights.	Check plugs at either end of power cord; replace if necessary.
	Turn THERMOSTAT control fully counterclockwise.	HEATER pilot lamp goes out.	Refer to higher echelon.
	On models without external thermostat control:		
	Set the HEATER switch to ON.	HEATER pilot lamp lights.	Check plugs at either end of power cord; replace if necessary.
	Allow 1/2-hour warmup.[a]	HEATER pilot lamp goes out after 1/2 hour.	Refer to higher echelon.
5	Set the FREQ. METER switch to ON.		
6	Set the OSC. switch to ON.	OSC. pilot lamp lights.	Check fuse F101; replace if necessary. Check pilot lamp; replace if necessary. Higher echelon repair required.
7	Vary the tuning dial around 60.	Frequency meter 60-cycles reed vibrates. Tuning dial must be within 1 division of the 60 mark.	Replace V108 or V109. Higher echelon repair required.
8	Set the RANGE switch to X10.		
9	Vary the tuning dial around 40.	Frequency meter 400-cycles reed vibrates. Tuning dial must be within 1-1/2 divisions oft the 40 mark.	Replace V108 or V109. Higher echelon repair required.
10	Vary the OUTPUT LEVEL control	Output level meter indicates rise and fall of audio oscillator output.	Higher echelon repair required.
11	Set the OSC. switch to OFF.		
12	Set the HEATER switch to OFF.		

[a]This test must be conducted with the temperature of the room between 60° and 80° F.

LEGEND for marking conditions:
Satisfactory, ✓
Adjustment, Repair or Replacement required, X.
Defect corrected, (X).

DAILY CONDITION FOR MONTH OF MAY '61

NO.	DAILY ITEM	1 17	2 18	3 19	4 20	5 21	6 22	7 23	8 24	9 25	10 26	11 27	12 28	13 29	14 30	15 31	16	2D 3D ECHELON
1.	CLEAN DIRT AND MOISTURE FROM EXPOSED SURFACES OF ~~HOUSINGS~~, CASES, CABINETS, CONTROL PANELS, INTERCONNECTING PLUGS, CABLES, ~~HEADSETS~~, METER WINDOWS, ETC. PARA 22																	✓
2.	INSPECT FOR LOOSENESS OF EXTERIOR ITEMS SUCH AS SWITCHES, KNOBS, JACKS, CONNECTORS AND PILOT LIGHTS.																	✓
3.	INSPECT CONTROLS FOR BINDING, SCRAPING. TAP CONTROLS LIGHTLY FOR CUT-OUT DUE TO LOOSE CONTACTS. PARA 22																	✓
4.	DURING OPERATION BE ALERT FOR ANY UNUSUAL PERFORMANCE OR CONDITION.																	✓

WEEKLY	CONDITION EACH WEEK 1ST	2D	3D	4TH	5TH	2D 3D ECH
5. INSPECT CORDS, CABLES, ~~WIRE AND SHOCK MOUNTS~~ FOR BREAKS, CUTS, KINKS, DETERIORATION, STRAIN AND FRAYING. PARA 22						✓
6. ~~INSPECT CANVAS AND LEATHER ITEMS FOR FUNGUS, FRAYING, TEARS, BROKEN ZIPPERS AND SNAP FASTENERS.~~						
7. HAND CHECK FOR LOOSENESS OF EXTERIOR ITEMS SUCH AS HANDLES, LATCHES, HINGES.						✓
8. ~~INSPECT FOR LUBRICATION IN ACCORDANCE WITH APPLICABLE LUBRICATION ORDER.~~						
9. ~~INSPECT DRY BATTERIES FOR DIRT, LOOSE TERMINALS AND LEAKAGE.~~						
10. INSPECT EXPOSED METAL SURFACES FOR RUST AND CORROSION.						✓
11. INSPECT METERS FOR DAMAGED GLASS AND CASES. PARA 22						X

ADDITIONAL ITEMS FOR 2D AND 3D ECHELON INSPECTIONS	CONDITION
12. INSPECT SEATING OF READILY ACCESSIBLE ITEMS OF A PLUCK-OUT NATURE: ~~CRYSTALS~~, FUSES, CONNECTORS, ~~PLUG-IN COILS~~, LAMPS, ETC. DO NOT REMOVE, ROCK OR TWIST TO INSPECT. USE ONLY A DIRECT PRESSURE TO INSURE THE ITEM IS FULLY SEATED.	✓
13. ~~INSPECT FOR CLEANLINESS AND TIGHTNESS OF SUCH ITEMS AS SHOCK MOUNTS, ANTENNA, ANTENNA MOUNTS AND WAVE GUIDES.~~	
14. ~~INSPECT RELAY AND CIRCUIT BREAKER ASSEMBLIES FOR DIRT, CORROSION, WORN OR BURNED CONTACTS.~~	

ADDITIONAL ITEMS FOR 2D AND 3D ECHELON INSPECTIONS	CONDITION
15. INSPECT RESISTORS, BUSHINGS, INSULATORS FOR CRACKS, CHIPPING, BLISTERING, DISCOLORATION AND MOISTURE.	✓
16. INSPECT ~~JACKS~~ AND CONNECTORS FOR SNUG FIT AND GOOD CONTACTS.	✓
17. INSPECT VARIABLE CAPACITORS FOR DIRT AND MOISTURE. PARA 29	✓
18. ~~INSPECT AIR FILTERS FOR CLEANLINESS.~~	
19. INSPECT ~~SCREWTYPE TERMINALS OF~~ TRANSFORMERS, FIXED CAPACITORS, RESISTORS, CHOKES, POTENTIOMETERS AND RHEOSTATS FOR CORROSION, DIRT AND LOOSE CONTACTS. PARA 29	✓
20. CLEAN AND TIGHTEN SWITCHES, ~~BLOWERS, RELAY CASES.~~ CLEAN INTERIOR OF CHASSIS AND CABINETS.	(X)
21. ~~INSPECT GENERATORS, MOTORS AND DYNAMOTORS FOR BRUSH WEAR, SPRING TENSION, ARCING AND COMMUTATOR WEAR.~~	
22. INSPECT TERMINAL BLOCKS FOR LOOSE CONNECTIONS, CRACKS AND BREAKS.	✓
23. INSPECT GASKETS AND BUSHINGS FOR WEAR AND DAMAGE.	✓
24. ~~INSPECT CATHODE RAY TUBES FOR BURNED SCREEN SPOTS.~~	
25. ~~BEFORE STORING OR SHIPPING REMOVE ALL BATTERIES.~~	

IF DEFICIENCIES NOTED ARE NOT CORRECTED DURING THE INSPECTION, INDICATE ACTION TAKEN FOR CORRECTION. *(Continue on page 4, if more space is needed)*

ITEM 11. FREQUENCY METER GLASS BROKEN; REFERRED TO HIGHER ECHELON FOR REPAIR

Figure 8. DA Form 11–266, pages 2 and 3 (second echelon).

CHAPTER 4
SHIPMENT, LIMITED STORAGE, AND DEMOLITION TO PREVENT ENEMY USE

Section I. SHIPMENT AND LIMITED STORAGE

32. Removal From Service

a. Set the HEATER switch to OFF.
b. Set the OSC. switch to OFF.
c. Remove the power cord plug from the ac power source.
d. Remove the power cord and the output cord from the audio oscillator. (Model TS-382F/U has the power cord permanently attached.)
e. Wind the power cable into a coil 6 inches in diameter, and secure it with masking tape.
f. Remove the adapter connector or the dummy load from the output cord and wind the output cord into a coil approximately 6 inches in diameter, and secure it with masking tape.

33. Repackaging for Shipment or Limited Storage

(fig. 9)

The exact procedure for repackaging depends on the material available and the conditions under which the equipment is to be shipped or stored. Adapt the procedures below whenever possible. The information concerning the original packaging (para 10) will also be helpful.

a. Material Requirements. The following estimated materials are required for packaging. For stock numbers of materials, consult SB 38-100.

Material	Quantity
Waterproof wrapping paper	32 sq feet
Fiberboard, corrugated, single-faced, flexible	32 sq feet
Tape, pressure-sensitive, adhesive, waterproof, 3 in.	20 feet
Tape, paper, gummed (sealing and securing)	16 feet
Strapping, flat, steel (5/8 by 0.020)	15 feet
Wooden shipping box (1)	17 x 19 x 17-1/2 in.

b. Prepackaging.
(1) *Audio oscillator.*
(a) Wrap fuses, spare tubes, lamps, dummy loads, adapter connector, and cords in corrugated fiberboard. Place them in the space provided in the case.
(b) Place the audio oscillator in the case and secure the lid to the case.
(c) Cushion the case by wrapping it with corrugated fiberboard. Secure the cushioning with gummed paper tape.
(d) Overwrap the cushioned case with waterproof wrapping paper. Secure it with water-resistant, pressure-sensitive tape.
(2) *Technical manuals.*
(a) Place the two technical manuals in two bags prepared of the waterproofed barrier material.
(b) Seal the bags with gummed tape.

c. Packaging.
(1) Place the audio oscillator within the nailed wooden box.
(2) Place the two technical manuals in the box and secure it with tape.
(3) Place the cover on the wooden box and nail securely.
(4) Place steel strapping around the box and nail it securely if this packaging is for intertheater operation.

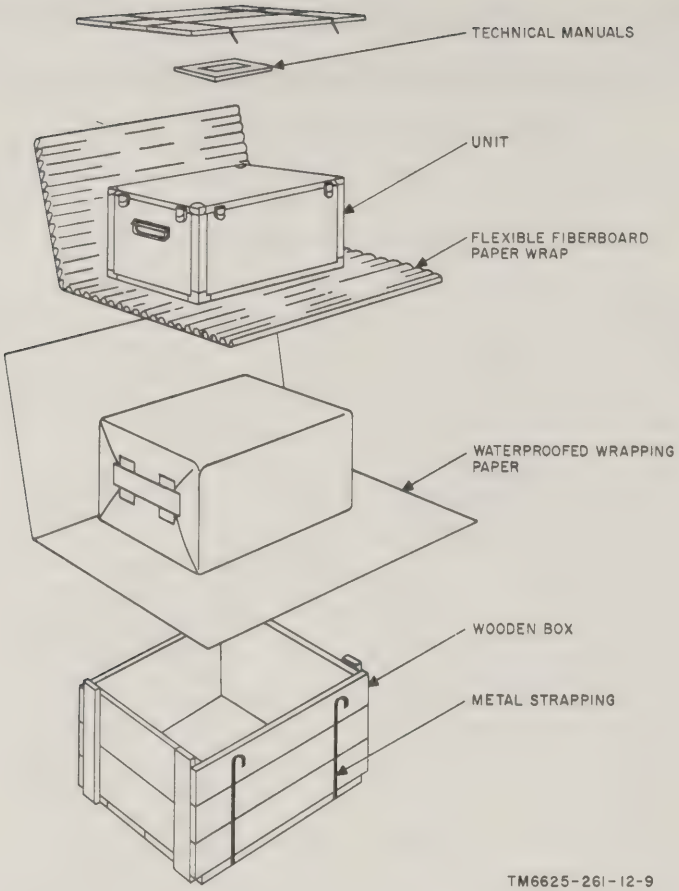


Figure 9. Repackaging diagram.

Section II. DEMOLITION OF MATERIEL TO PREVENT ENEMY USE

34. Authority for Demolition

The destruction procedures in paragraph 35 will be used to prevent enemy use of the equipment. Demolition of the audio oscillator will be accomplished only upon order of the commander.

35. Methods of Destruction

Use any or all of the following methods to destroy the equipment:

a. Smash. Smash the controls, tubes, switches, capacitors, transformers, and meter; use sledges, axes, handaxes, pickaxes, hammers, or crowbars.

b. Cut. Cut the power cord and output cord; use axes, handaxes, or machetes.

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

c. Burn. Burn cords and technical manuals; use gasoline, kerosene, oil, flamethrowers, or incendiary grenades.

d. Explode. Use firearms, grenades, or TNT if explosives are necessary.

e. Dispose. Bury or scatter the destroyed parts in slit trenches, foxholes, or throw them into nearby waterways.

APPENDIX I
REFERENCES

Following is a list of applicable references available to the operator and organizational maintenance man of Audio Oscillator TS-382(*)/U.

SB 38-100	Preservation, Packaging, and Packing Materials, Supplies, Equipment used in the Army
TM 11-6625-261-20P	Organizational Maintenance Repair Parts and Special Tools List for Audio Oscillator TS-382A, B, D, E, F/U

APPENDIX II
MAINTENANCE ALLOCATION

Section I. INTRODUCTION

1. General

a. This appendix assigns maintenance functions and repair operations to be performed by the lowest appropriate maintenance echelon. It also specifies the tools and other equipment authorized at each echelon to perform the assigned maintenance functions.

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

(1) *Part or component.* This column shows only the nomenclature or standard item name. Additional descriptive data are included only where clarification is necessary to identify the part. Components and parts comprising a major end item are listed alphabetically. Assemblies and subassemblies are in alphabetical sequence with their components listed alphabetically immediately below the assembly listing.

(2) *Maintenance function.* This column indicates the various maintenance functions allocated to the echelon capable of performing the operations.

(a) Service. To clean, to preserve, and to replenish fuel and 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 assemblies, subassemblies, and parts for unserviceable components.

(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, inspecting, cleaning, preserving, adjusting, replacing, welding, riveting, and straightening.

(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) 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.

(j) Overlay. 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.

(3) *1st, 2nd, 3d, 4th, 5th echelon.* The symbol X indicates the echelon responsible for performing that particular maintenance operation, but does not necessarily indicate that repair parts will be stocked at that level. Echelons higher than the echelon 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 will be utilized when necessary to clarify any of the data cited in the preceding columns.

c. Columns in the allocation of tools for maintenance functions are 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, 5th echelon.* The dagger (†) symbol indicates the echelons 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 the 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.

3. Mounting Hardware

The basic entries of the maintenance allocation chart do not include mounting hardware such as screws, nuts, bolts, washers, brackets, clamps, etc.

Section II. MAINTENANCE ALLOCATION CHART

(1) PART OR COMPONENT	(2) MAINTENANCE FUNCTION	(3) 1ST ECH.	(4) 2ND ECH.	(5) 3RD ECH.	(6) 4TH ECH.	(7) 5TH ECH.	(8) TOOLS REQUIRED	(9) REMARKS
AUDIO OSCILLATOR TS-382A, B, D, E, F/U	service	X						
	adjust				X		1,10	
	inspect		X					Visual only
	test				X		2,3,4,5,6,7,8	
	replace				X		9,11	
	repair				X		9,10	
	align				X		1,9	
	calibrate				X	X	1,12	
	rebuild					X	9,10	
ADAPTER CONNECTOR UG-514/U	replace		X					
BRACKETS	replace				X			Fabricate if required
BEAR, DIAL DRIVE	replace					X		
BUSHING (0140)	replace		X					
CABLE ASSEMBLY, POWER, ELECTRICAL	repair		X					
CABLE, POWER, ELECTRICAL	replace		X					
CABLE, POWER, ELECTRICAL ("F" MODEL ONLY)	replace				X			
CONNECTORS, PLUG, ELECTRICAL	replace		X					
CABLE ASSEMBLY, RADIO FREQUENCY	repair				X			
CABLE, RADIO FREQUENCY	replace				X			
CONNECTORS, PLUG, ELECTRICAL	replace				X			
CAPACITORS	replace				X			
CASE CY-688/U; CY-688A/U	repair				X			
CASE, TEST SET (LESS COVER)	replace					X		Obtain from salvage if required
CATCH, LUGGAGE	replace				X			Obtain from salvage if required
COVER, TEST SET CASE	replace					X		Obtain from salvage if required
HANDLE, TEST SET CASE	replace				X			Fabricate if required
CLAMPS, ELECTRICAL	replace				X			
CONNECTOR	replace		X					
CONNECTORS, RECEPTACLE, ELECTRICAL	replace				X			
COUPLING SHAFT, FLEXIBLE	replace				X			
DIAL, CONTROL	replace				X			
DUMMY LOAD DA-35/U	replace		X					
ELECTRON TUBES (V103, V104, V108, V109)	replace	X						
ELECTRON TUBES (V101, V102, V105, V106, V107)	replace				X			
FUSE, CARTRIDGE	replace	X						
FUSEHOLDER	replace				X			
CAP, ELECTRICAL (FOR FUSEHOLDER)	replace		X					

(1) PART OR COMPONENT	(2) MAINTENANCE FUNCTION	(3) 1ST ECH.	(4) 2ND ECH.	(5) 3RD ECH.	(6) 4TH ECH.	(7) 5TH ECH.	(8) TOOLS REQUIRED	(9) REMARKS
TS 382A,B,D,E,F/U (continued)								
GROMMETS	replace				X			
HANDLE PANEL	replace				X			Fabricate if required
INSULATORS, STANDOFF	replace				X			
INSULATORS, WASHER	replace				X			Fabricate if required
KNOBS	replace		X					
LAMPS (EXCEPT R115)	replace	X						
LAMP (R115)	replace				X			
LAMPHOLDERS	replace				X			
LAMPHOLDERS	replace				X			
LIGHT INDICATOR (LESS LENS)	replace				X			
LENS, INDICATOR LIGHT	replace		X					
METER, ELECTRICAL FREQUENCY	replace repair				X	 X		
MOUNTINGS, CAPACITOR	replace				X			
NUTS, PLAIN, HEXAGON (COMMON HARDWARE)	replace				X			Available in Maintenance Equipment ME-9 and Hardware Kit MK-41/U
NUTS, SELF-LOCKING, HEXAGON	replace				X			
PLUG, TIP	replace				X			
POST, BINDING	replace				X			
REACTOR (L101)	replace				X			
RESISTORS	replace				X			
SCREWS, MACHINE (COMMON HARDWARE)	replace				X			Available in Maintenance Equipment ME-9 and Hardware Kit MK-41/U
SEMI-CONDUCTOR DEVICE, DIODE	replace				X			
SOCKETS, ELECTRON TUBE	replace				X			
SWITCHES	replace				X			
TERMINALS, LUG	replace				X			Available in Maintenance Equipment ME-9 if required
TERMINAL BOARDS	replace				X			Fabricate if required. Material available in Maintenance Equipment ME-9
THUMBSCREWS	replace		X					
TRANSFORMER, POWER, STEP-DOWN AND STEP-UP	replace				X			
VOLTMETER	replace repair				X	 X		
WASHERS, FLAT (COMMON HARDWARE)	replace				X			Available in Maintenance Equipment ME-9 and Hardware Kit MK-41/U
WASHERS, LOCK (COMMON HARDWARE)	replace				X			Available in Maintenance Equipment ME-9 and Hardware Kit MK-41/U

Section III. ALLOCATION OF TOOLS FOR MAINTENANCE FUNCTIONS

(1) TOOLS REQUIRED FOR MAINTENANCE FUNCTIONS	(2) 1ST ECH	(3) 2ND ECH	(4) 3RD ECH	(5) 4TH ECH	(6) 5TH ECH	(7) TOOL CODE	(8) REMARKS
TS 382A, B, D, E, F/U (continued)							
FREQUENCY METER AN/TSM-16				†	†	1	
MULTIMETER TS 352/U				†	†	2	
OSCILLOSCOPE OS-8A/U					†	3	
SPECTRUM ANALYZER TS-723/U				†	†	4	
STANDING WAVE INDICATOR IM-157/U				†		5	
TEST SET, ELECTRON TUBE TV-2/U					†	6	
TEST SET, ELECTRON TUBE TV-7/U				†		7	
THERMOMETER PH-660/U				†		8	
TOOL KIT TK-87/U				†	†	9	
TOOL KIT TK-88/U				†	†	10	
TOOLS AND TEST EQUIPMENT NORMALLY AVAILABLE TO THE REPAIRMAN USER BECAUSE OF HIS ASSIGNED MISSION		†				11	
VOLTMETER, METER ME-30A/U				†	†	12	

END

APPENDIX III
BASIC ISSUE ITEMS LIST

Section I. INTRODUCTION

1. General

a. This appendix lists items supplied for initial operation and for running spares. The list includes parts and material issued as *part of* the major end item, and all items authorized for basic operator maintenance of the equipment. End items of the equipment are issued on the basis of allowances prescribed in equipment authorization tables and other documents that are a basis for requisitioning.

b. The columns in section II are as follows:

(1) *Source, maintenance, and recoverability code.* Not used.

(2) *Federal stock number.* This column lists the 11-digit Federal stock number.

(3) *Designation by model.* Not used.

(4) *Description.* Nomenclature or the standard item name and brief identifying data for each item are listed in this column. When requisitioning, enter the nomenclature and description.

(5) *Unit of issue.* The unit of issue is the supply term by which the individual item is counted for procurement, storage, requisitioning, allowances, and issue purposes.

(6) *Expendability.* Expendable items are indicated by the letter X; nonexpendable items are indicated by NX.

(7) *Quantity authorized.* Under "Items Comprising an Operable Equipment," the column lists the quantity of items supplied for the initial operation of the equipment. Under "Running Spares and Accessory Items," the quantities listed are those issued initially with the equipment as spare parts. The quantities are authorized to be kept on hand by the operator for maintenance of the equipment.

(8) *Illustration.* The "Item No." column lists the reference symbols used for identification of the items in the illustration or text of the manual.

2. Critical Items

A zero slash (Ø) in the "Description" column indicates items that are expected to fail during the first year or also items that will make the equipment inoperative if they fail.

Section II. FUNCTIONAL PARTS LIST

(1) SOURCE MAINTENANCE AND RECOVERABILITY CODE	(2) FEDERAL STOCK NUMBER	(3) DESIGNATION BY MODEL	(4) DESCRIPTION	(5) UNIT OF ISSUE	(6) EXPENDABILITY	(7) QUANTITY AUTHORIZED	(8) ILLUSTRATIONS FIGURE NO	(9) ILLUSTRATIONS ITEM NO
		1 2 3 4 5 6	ITEMS COMPRISING AN OPERABLE EQUIPMENT					
			AUDIO OSCILLATOR TS-382 A,B,D,E,F/U					
			NOTE: Model Column 1 refers to TS-382A/U; Column 2 refers to TS-382B/U; Column 3 refers to TS-382D/U procured under Contract AF33(604)29558; Column 4 refers to TS-382D/U procured under Contract AF33(604)10907; Column 5 refers to TS-382E/U; Column 6 refers to TS-382F/U					
	6625-091 9489		AUDIO OSCILLATOR TS-382A,B,D,E,F/U	ea	NX			
	Ord thru AGC	† † † † † †	TECHNICAL MANUAL TM 11-6625-261-12	ea	X	2		
	6625-502-6079	† † † † †	CABLE ASSEMBLY, POWER ELECTRICAL CX-237A/U	ea	X	1		W201
	5995-752-2057	† † † † † †	CABLE ASSEMBLY, RADIO FREQUENCY CG-409E/U	ea	X	1		W301
	6625-378-5195	† † † †	CASE CY-688/U	ea	X	1		
	6625-831 4033	† †	CASE CY-688A/U	ea	X	1		
	5935 351-4620	† † † † † †	CONNECTOR, ADAPTER: Adapter Connector UG-514/U	ea	X	1		A101
	5935-433 9938	† † † † † †	DUMMY LOAD DA-35/U	ea	X	1		E113
			RUNNING SPARES AND ACCESSORY ITEMS					
			AUDIO OSCILLATOR TS-382A,B,D,E,F/U					
	5960-116-9927	† † † † † †	ELECTRON TUBE: JAN type 6V6GTY	ea	X	1		V104
	5960-228-3765	† † † † † †	ELECTRON TUBE: JAN type 6J5WGT	ea	X	1		V108
	5960-100 5268	† † † † † †	ELECTRON TUBE: JAN type 6SJ7Y	ea	X	1		V103
	5960-188-3565	† † † † † †	ELECTRON TUBE: JAN type 0A3	ea	X	1		V109
	5920-280-4466	† † † † † †	FUSE, CARTRIDGE: 2 amp MIL type FO262R00A	ea	X	10		F102 F102
	6240-155-8706	† † † † † †	LAMP, INCANDESCENT LM-52 GE type No. 47 6-8 volt, 0.15 amp, min bay base MIL MS90287-4 Item Nos: I101, I102, E110, E111	ea	X	1		See desc column

By Order of the Secretary of the Army:

G. H. DECKER,
General, United States Army,
Chief of Staff.

Official:

R. V. LEE,
Major General, United States Army,
The Adjutant General.

Distribution:

Active Army:

To be distributed in accordance with DA Form 12–7 requirements for TM 11 Series (UNCLAS) Plus the following:

USASA (2)
CNGB (1)
Tech Stf, DA (1) except
CSigO (18)
ARADCOM (2)
ARADCOM Rgn (2)
MDW (1)
Seventh US Army (2)
EUSA (2)
Units org under fol TOE: (2 copies UNOINDC)
1–7
1–17
1–37
1–67
1–107
5–15
5–16
5–600
5–605
6–630
7
8–137
9–217
9–500 (AA–AC)
11–5
11–6
11–7
11–15
11–16
11–38
11–55
11–56
11–57
11–95
11–98
11–117
11–155
11–156
11–500 (AA–AE,RA–RT) (4)
11–557
11–587
11–592
11–597
11–608
17
17–51
29–51
29–55
29–56
32–51
32–56
32–57
32–67
32–500
33–56
33–500 (AC)
33–600 (AA–AC)
39–51
39–52
39–61
44–8
44–435
44–436
44–437
44–445
44–446
44–447
44–448
44–535
44–536
44–537
44–544
44–545
44–546
44–547
44–548
55–157
57

NG: State AG (3); Units Same as Active Army except allowance is one copy to each unit.
USAR: None.
For explanation of abbreviations used, see AR 320–50.

U.S. GOVERNMENT PRINTING OFFICE : 0–1970–816–796