35 RECEIVE-ONLY TYPING REPERFORATOR SET

TROUBLE SHOOTING

CONTENTS PAGE

1. GENERAL

1.01 This section provides trouble shooting for the 35 Receive-Only Typing Reperforator (ROTR) Set. Refer to appropriate sections for additional servicing information (eg, adjustments and lubrication).

1.02 The trouble shooting procedure consists of operational and electrical checks which can be used to isolate troubles in the ROTR Set. A thorough understanding of the operating principles of the set and its components is important. Refer to the appropriate sections for this information.

1.03 The method used is to first identify the faulty component, then determine which mechanism or electrical part in the component has failed. The procedure below includes suggestions for isolating the faulty component and locating the defective part. A more detailed procedure is given in Table II.

2. TERMS

2.01 Terms used in the trouble shooting procedures are explained below:

2.02 An open condition refers to a circuit through which current will not flow because of a break, poor connection, or a defective contact mechanism. A closed condition is a normally- or intermittently-open circuit through which current will flow because of a short, sticky, dirty, or poorly adjusted contact mechanism.

2.03 Running open is a condition created by an open signal circuit which causes continuous operation of the printing and perforating mechanisms. With an open signal circuit there are no marking bits and the typing reperforator unit's function clutch does not latch.

2.04 Running closed is a condition created by a closed signal circuit and results in failure of the printing and perforating mechanisms to respond to a signal. The cause may be missing start and spacing bits in the signal, or mechanical failure.

2.05 Garbling is a condition in which the response of the printing and perforating mechanisms does not correspond with the signal input.

2.06 Blind is a condition in which the set is turned off or disconnected to assure non-response to various signal inputs.

3. VISUAL INSPECTION

3.01 Make a visual inspection of the equipment to determine if the trouble is caused by loose signal or power connections, improperly set switches, erratic motor speed, or improper range finder setting.

4. TEST CIRCUIT AND OPERATIONAL CHECKS

4.01 Arrange the equipment in a test circuit and perform the procedures listed in Table I. Although this procedure is usually performed after installation of new or repaired equipment, it is also useful in localizing troubles at other times. The test circuit must include a sending set (eg, ASR or KSR), for the ROTR has no sending facilities. References to depression of keys in Table I apply to this sending set.

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TABLE I - OPERATIONAL CHECKS

STEP	PROCEDURE	FUNCTION
1.	Turn the set's power ON.	Set's motor should operate.
2.	Sequentially depress each of the keys assigned to graphic characters (non-functions) - numerals, letters, and punctuation marks.	The corresponding symbols should be punched and printed on the tape.
3.	With SHIFT key depressed, depress each of the keys for graphic characters.	The corresponding symbols should be punched and printed on the tape.
4.	With the REPT key depressed, depress any graphic character key.	Repeated punching and printing of the selected character should occur.
5.	Depress the RETURN key.	Punching of the RETURN code should occur but printing should be suppressed.*
6.	Depress the LINE FEED key.	Punching of the LINE FEED code should occur but printing should be suppressed.*
7.	Depress the RUBOUT key.	The RUBOUT code should be punched but printing should be suppressed.*
8.	With the CTRL key depressed, depress the BELL key.	The signal bell should ring (if set is so equipped), the BELL code should be punched, but printing should be suppressed.*
9.	With the CTRL key depressed, depress the EOT key.	Private line sets with electrical motor control should turn off. Switched network sets should disconnect.
		* Printing should occur in red on sets equipped with two color ribbons.

5. ELECTRICAL CHECKS

5.01 Electrical Troubles: Most electrical troubles occur at the various contacts in the equipment. These include switch contacts, plug-in connector and pin contacts, wiring field terminals, soldered contacts (including spliced wires), and chassis ground contacts. The electrical circuits in the ROTR Set have terminal connections at the points where tests should be made. Do not disturb the wiring more than necessary when testing or inspecting. Use the appropriate schematic and actual wiring diagrams for point-to-point circuit checks.

5.02 Power Supply Checks: Check the input power and ac circuits before making other tests. This should include a check of the normal operation of the parts in these circuits and the requirements of all adjustments which may be affected by the trouble. When checking adjustments, do not disturb the adjustment or related adjustments. Check for interruptions in the ac power input by checking the power cord connections on the terminal board (usually in the electrical service unit). Check for open fuses. If the power fuse is open, rotate the associated motor by hand and check for excessive mechanical load before replacing the fuse. If a replaced fuse opens immediately after installation, check for shorted wiring in the motor unit, selector magnets, or copy light transformer.

5.03 Continuity Checks: The continuity check is used to locate suspected open circuits. When making continuity checks, be sure parallel

current paths are disconnected. Make the test by checking the continuity through the suspected faulty circuit. Be sure no other part is shunting the circuit being tested. If necessary, disconnect certain leads. Check all suspected circuits in this manner. If after all possible causes have been checked and the fault cannot be located, make a continuity check of the entire circuit. If continuity is indicated, test one-half of the circuit. Continue subdividing the circuit until the open point is definitely located.

5.04 Resistance Checks: The resistance check is used to locate suspected open or shorted coil windings, transformer windings, motor windings, fixed resistors and inductors. Make these checks following the same general procedures used in continuity checks (5.03).

5.05 Capacitor Checks: The capacitor check is used to locate shorted or partially shorted (leaky) capacitors. To make the test, first discharge the suspected capacitor with an insulated shorting jumper. Then disconnect one lead and connect the capacitor to an ohmmeter. Use the highest resistance range. A good capacitor is indicated when the ohmmeter pointer moves up the scale rapidly and then returns slowly toward the infinity mark. An open capacitor will indicate a constant reading of infinite ohms. A shorted capacitor will give a reading of constant value between zero and infinity, depending on the resistance of the short.

WARNING: BE EXCEPTIONALLY CAREFUL WHEN HANDLING CHARGED CAPACITORS. A SEVERE ELECTRICAL SHOCK MAY BE RECEIVED FROM THE CAPACITOR OR LEADS CONNECTED TO A POWER SUPPLY IN OPERATION. REMOVE THE AC POWER CORD FROM THE OUTLET BEFORE PERFORMING THE CONTINUITY, RESISTANCE, AND CAPACITOR CHECKS.

6. TROUBLE SHOOTING CHART

Equipment failures can be traced functionally with the trouble shooting chart, Table II. A step-by-step analysis of the equipment's behavior in response to the listed checks will indicate in which area the trouble exists. Since in most cases each step is conditioned by the procedures in preceding steps, note the condition of all controls before rechecking steps or performing checks out of sequence. Comprehensive electrical analysis is not usually required in trouble shooting this equipment.

Note: Refer to appropriate schematic and actual wiring diagrams when making electrical checks.

TABLE II - TROUBLE SHOOTING CHART FOR ROTR SETS

STEP	PROCEDURE AND NORMAL INDICATION	TROUBLE	CHECK
1.	Power switch off; motor off; reperforator selector mechanism energized.	Motor is on. Reperforator selector mechanism de-energized.	Check wiring at power switch. Check signal line continuity. Check output of selector magnet driver. Check for an open circuit between selector magnet coils and selector magnet driver. Check continuity and resistance of selector magnet coils.

TABLE II - TROUBLE SHOOTING CHART FOR ROTR SETS (Cont.)

STEP	PROCEDURE AND NORMAL INDICATION	TROUBLE	CHECK
1. Cont.			Check adjustment of selector mechanism armature spring. See appropriate section. Check adjustment of selector mechanism range finder. See appropriate section.
2.	Power switch on; motor on; reperforator selector mechanism energized. Set not equipped with electrical motor control (Step 5).	Motor is off.	Check power line connections. Check wiring at power switch. Check wiring between motor unit and electrical service unit. Check thermostatic cutout switch in motor unit (if so equipped).
		Synchronous motor unit runs at incorrect speed.	Check that power line frequency is correct (60 cps).
		Reperforator selector mechanism de-energized.	Check signal line continuity. Check output of selector magnet driver. Check for an open circuit between selector magnet coils and selector magnet driver. Check continuity and resistance of selector magnet coils. Check adjustment of selector mechanism armature spring. See appropriate section. Check adjustment of selector mechanism range finder. See appropriate section.
3.	ROTR Set properly prints and perforates all nonfunction characters received from sending equipment.	Reperforator runs closed - does not receive the transmitted information.	Check signal line to verify presence of marking and spacing bits. Check output of selector magnet driver. Check selector mechanism armature spring adjustment. See appropriate section.

TABLE II - TROUBLE SHOOTING CHART FOR ROTR SETS (Cont.)

STEP	PROCEDURE AND NORMAL INDICATION	TROUBLE	CHECK
3. Cont.			Check that selector magnet driver input is not shorted.
		Selector mechanism receiving margin is short.	Check output of selector magnet driver (0.500 amperes).
			Check selector mechanism for foreign matter or oil between magnets and armature.
			Check selector mechanism adjustments. See appropriate section.
			Check motor speed.
		Reperforator makes intermittent errors or garbles.	Check output of selector magnet driver (0.500 amperes).
			Check selector mechanism for foreign matter or oil between magnets and armature.
			Check selector mechanism adjustments. See appropriate section.
			Check motor speed.
			Check printing and perforator mechanism adjustments. See appropriate section.
4.	When signal code combination for signal bell is received from sending equipment, ROTR Set bell rings, the code combination is perforated, and printing of the function is suppressed.	Signal bell does not ring.	Check continuity of signal bell circuitry.
			Check signal bell function box contacts for an open condition. Contacts should be closed.
			Check that code combination has been set up properly in selector mechanism.
			Check that function box function lever has operated properly.
			Check that function box function lever is properly coded.

TABLE II - TROUBLE SHOOTING CHART FOR ROTR SETS (Cont.)

STEP	PROCEDURE AND NORMAL INDICATION	TROUBLE	CHECK
4. Cont.		Printing is not suppressed.	Check continuity of print suppression magnet circuitry. Check operation of print suppression contacts in reperforator. Check adjustment of print suppression lever (located under print suppression magnet). See appropriate section.
5.	ROTR Set equipped with electrical motor control; set is off; operation of BREAK key at sending equipment turns the set's motor on.	Motor remains off.	Check power contact and wiring in electrical motor control assembly for continuity. Check power line connections. Check wiring at power switch. Check wiring between motor unit and electrical service unit. Check thermostatic cutout switch in motor unit (if so equipped). Check motor start magnets in electrical motor control assembly for proper de-energize-energize sequence. This sequence must occur to close contacts and turn the set on.
		Reperforator selector mechanism is de-energized.	Check signal line continuity. Check output of selector magnet driver. Check for an open circuit between selector magnet coils and selector magnet driver. Check continuity and resistance of selector magnet coils. Check adjustment of selector mechanism armature spring. See appropriate section. Check adjustment of selector mechanism range finder. See appropriate section.

TABLE II - TROUBLE SHOOTING CHART FOR ROTR SETS (Cont.)

STEP	PROCEDURE AND NORMAL INDICATION	TROUBLE	CHECK
5. Cont.		Motor start magnets in electrical motor control assembly energize each time a marking bit is received.	Check continuity across motor start magnet shunt contacts. Check electrical motor control assembly internal wiring, specifically in area of motor start magnets and shunt contacts.
		ROTR Set does not turn off upon receipt of EOT (end of transmission) code combination from sending equipment.	Check continuity of motor stop magnets and related wiring. Check that EOT code combination has been set up properly in selector mechanism. Check operation of function box function lever. Check function box function bar coding. Check operation and continuity of function box contacts.