NO. 14 REPERFORATOR-TRANSMITTER MAINTENANCE INSPECTION AND TESTS

1. GENERAL

1.01 This section specifies the procedures for carrying out the field maintenance of the No. 14 Reperforator-Transmitter.

1.02 The apparatus requirements and adjusting procedures for any particular item which may require adjusting either on a routine inspection or a trouble visit will be found in the section on "Requirements and Procedures," P35.633.

1.03 Studies consistently show that a high percentage of troubles occur shortly after a routine inspection. Some appear to be due to the methods of carrying out the maintenance work. These instructions have been prepared with the view of avoiding such troubles and it is important that the practices be carefully followed.

1.04 The frequency of routine inspections can best be determined locally. Factors to be considered include daily service hours, speed of service and other local conditions. In general the inspection interval should be the maximum consistent with adequate lubrication.

1.05 The periodic cleaning, lubrication and inspection should be carried out in the order shown. The work should be confined to the items specified except for the correction of any conditions obviously requiring attention. Some items do not require special attention on each routine inspection and are, therefore, not mentioned in this section.

1.06 The materials for carrying out the cleaning work are specified in the section on "Cleaning-General Requirements," P30.010, and the lubricants referred to are those specified in the section on "Lubrication-General Requirements," P30.011.

2. ROUTINE MAINTENANCE PROCEDURES

2.01 All work shall be done safely. Do not scatter tools or equipment so as to constitute a hazard. Special attention shall be given to avoiding damage to the customer's property.

(A) Preparation for Routine

2.02 Obtain release of equipment as follows:

(a) **Where Spare Units Are Not Provided,** obtain the local customer's permission to routine the apparatus, and wait until any accumulated tape has cleared before removing the unit from service. Advise the testroom that a routine inspection is being made and indicate the length of time the customer will be out of service. If unexpected delay is later encountered advise the testroom.

(b) **Where Spare Units Are Provided,** wait until any accumulated tape has cleared before removing the unit from service.

2.03 While waiting observe operation for any abnormal conditions which should be investigated during the routine.

2.04 Upon release of the machine remove it from service and proceed in accordance with the following:

(a) Disconnect the source of power.

(b) Remove the unit from the machine cabinet (or remove the cover), exercising care to avoid damaging parts in close proximity.

(c) Remove ribbon.

(d) Remove ribbon guide.

(e) Remove code punch block.

(f) Remove cover from sensing contacts.

(g) Remove and empty the chad box.

(h) Remove the base plate.

Note: After removing the base plate the mounting screws should be tightened to avoid scratching the top of the work table.

(B) Cleaning

2.05 During the inspection observe the condition of the machine but avoid unnecessary dismantling or disturbance of adjustments. In so far as possible operating tests should be used to determine the condition of the machine.

Caution: When it is necessary to make any adjustment, all adjustments that might be affected shall be checked and, if necessary, corrected in order to minimize the possibility of subsequent trouble.

(a) Bent, loose or missing parts, elongated springs and parts out of place or obviously out of adjustment should be investigated and corrective action taken, if necessary.

(b) Worn parts which in the opinion of the repairman will cause trouble before the next scheduled inspection should be replaced. Red or rust colored deposits indicate wear due to lack of lubrication. If on investigation it appears that the parts are not worn sufficiently to require replacement, special care should be taken in lubricating to see that the lubricant reaches the bearing surfaces.

2.06 Cleaning of items other than those listed should not be done unless it appears that whatever dirt may be present is likely to cause trouble by working into bearing surfaces or onto contacts before the next scheduled inspection. The following items should be cleaned during each routine inspection:

(a) The code punch block, giving special attention to the removal of dirt and paper dust packed around the feed roll and puncher.

(b) Clean the type.

(c) With a dry cloth, clean around the base and the code punch unit.

(C) Lubrication and Inspection

2.07 After all cleaning has been completed, lubricate the machine in the order given. Apply an amount of lubricant **just sufficient for the purpose** so that it will not be necessary to wipe off any excess oil or grease, as this tends to work dirt and grit into the bearing surfaces. Lubricant should not be added to points which are already adequately lubricated.

2.08 Unless otherwise specified, one or two drops of oil at each place indicated will be sufficient. Use oil for all lubrication except where the use of grease or oil-grease-oil is specified.

2.09 A small stiff brush similar to those used to spread mucilage should be used to apply the grease in a thin film at all places requiring grease.

2.10 Oil-grease-oil, when specified, shall be applied as three separate treatments in that order. Neither a lighter grease nor a pre-mixed combination of oil and grease is a satisfactory substitute for oil-grease-oil which takes full advantage of the characteristics of the specified lubricants. The oil furnishes the desired lubrication but the duration of its retention would be limited. The grease serves to hold the oil on the surfaces where it is needed and to replenish the supply as it is dissipated.

2.11 New felt washers and wicks, before being used, should be thoroughly saturated with oil and kneaded by hand. Before assembling wicks excess oil should be removed by

squeezing by hand. Care should be exercised to avoid getting dirt or metal chips on the felt washers.

2.12 Oil both loops of all helical springs that exert a nominal tension of less than 2-1/2 lbs.

2.13 Apply grease to both loops of all helical springs that exert a nominal tension of 2-1/2 lbs. or more.

2.14 Selector Mechanism:

(a) Stop lever—bearing and point of contact with stop arm.
(b) Trip latch—bearing and point of contact.
(c) Bell crank—bearing.
(d) Trip latch plunger—bearing and 2 points of contact.
(e) Armature lever—2 pivot screws.
(f) Selector Arm—2 pivot screws, 2 sword contact points, locking tip, and point of contact with operating screw.
(g) Selector arm detent—bearing and point of contact with selector arm.
(h) Selector levers—at bearing post and at sword pivots—apply between separator plates.
(i) Selector "T" levers—at bearing post and at points of contact with swords and code bars.
(j) Selector Arm locking lever—at pivot. (Check locking lever—locking wedge for adequate minimum clearance.)
(k) Tape feed out lever—4 bearings and point of contact with trip latch plunger.

2.15 Main Shaft.

(a) Remove the range scale rear mounting screw and swing scale to expose top of main shaft. Fill shaft through hole in center of retaining disc. Replace range scale and its rear mounting screw. (Check armature trip-off screw adjustment.)
(b) Locking lever cam felt oiler—saturate.
(c) Selector cam peaks—one drop on each peak.
(d) Selector cam friction washers—saturate by separating the friction discs with a screwdriver and applying oil at several points around the washers.
(e) Main Cam friction washer—saturate.
(f) Main clutch bushing felt wicks—oil through two oil holes on bushing below punch cam.
(g) Main-shaft ball bearings (2)—oil top bearing—grease bottom bearing.
(h) Clutch throwout lever—2 bearings.

(i) Clutch—oil freely, also cam on driven clutch at point of contact with throwout lever.
(j) Compression springs (3)—flow oil into prongs under springs.
(k) Main shaft gear—grease.
(l) Subshaft drive gear—grease.
(m) Motor pinion—grease.
(n) Main bail cam—grease.
(o) Punch-arm cam—grease.

2.16 Main Bail.
(a) Main Bail roller—oil-grease-oil.
(b) Main Bail plunger—fill oil cup and saturate oil wick.
(c) Main Bail lever—fill oil cup just above terminal block, also oil end of lever in main bail plunger.
(d) Main Bail—fill groove with oil.
(e) Main Bail roller guides (2) and main bail guide rollers (2) oil-grease-oil.
(f) Main Bail adjusting screw—grease end of screw.
(g) Main Bail spring anchor—grease.
(h) Main Bail lever spring post felt washers—saturate.

2.17 Pull Bars, Type Bars, and Code Bars.
(a) Pull bars—one drop of oil on top of each bar.
(b) Type bar gears—pull each type bar down against platen, and put one drop of oil on top of type bar gear at rear of segment slot.
(c) Code bar locking lever—grease lever at point of contact with main bail.
(d) Code bars—slots and posts, one drop to each code bar.

2.18 Ribbon Mechanism.
(a) Ribbon feed ratchet and feed gears—oil teeth.
(b) Ribbon feed shaft detent plunger.
(c) Ribbon feed shaft—2 oil holes.
(d) Ribbon feed lever—oil hole.
(e) Ribbon feed lever roller—bearing.
(f) Ribbon spool shaft (right)—2 bearings.
(g) Ribbon spool shaft (left)—4 bearings, oil teeth on gears (3).
(h) Ribbon reverse pawls and links—4 bearings on each side.

(i) Ribbon reverse shafts—2 bearings each.
(j) Ribbon feed shaft detent—grease.

2.19 Platen Shift Mechanism.
(a) Platen shafts (2)—thin film of oil. (Check platen for wear and replace if necessary.)
(b) Shift lever—bearings (2), and point of contact with pull bar and platen frame.
(c) Shift latch—bearing and points of contact with pull bars and shift bail.
(d) Shift bail—bearing, and at platen frame extension.
(e) Shift bail stop screw—grease.
(f) Intermediate ball-bearing, grease at points of contact with shift bail and plunger extension bracket.

2.20 Prepunch Mechanism.
(a) Prepunch arm—bearings (2).
(b) Feed roll—bearings (2) and feed notches.
(c) Feed pawl—bearing.
(d) Prepunch operating ball-bearings (2), grease at eccentric and extension.
(e) Star wheel—grease.
(f) Feed roll detent—bearing and roller.
(g) Feed hole punch—also at point of contact with prepunch arm.

2.21 Reperforating Mechanism.
(a) Punch arm casting roller—oil-grease-oil.
(b) Punch arm casting bearing—fill oil cup.
(c) Punch arm extension—bearing, also at adjusting screw extension.
(d) Code bar bell cranks—at pivot post, drop of oil between separator plates, point of contact at vertical links, and code bar locking lever.
(e) Vertical links—at pivot, and comb.
(f) Vertical link bell cranks—at pivot and point of contact with vertical link, and selector finger bell cranks.
(g) Selector finger bell crank—2 places each.
(h) Selector fingers—guide comb and point of contact with code punches.
(i) Punch bail pivot screws—2 bearings.
(j) Feed pawl bearing.
(k) Feed roll—2 bearings.

(l) Feed roll detent wheel—grease.
(m) Feed roll detent—bearing and roller.
(n) Code punches.
(o) Code punch retracting bail—bearings (2), and points of contact with code punches.
(p) Code punch retaining levers—at pivot and point of contact with code punches.
(q) Tape depressing bail—2 bearings.

2.22 Pivoted Transmitter and Transfer Mechanism.
(a) Transmitter lid—2 bearings.
(b) Sensing fingers—bearings, and point of contact with guide plate.
(c) Transmitter yoke—2 bearings.
(d) Tape feed lever—2 bearings.
(e) Tape feed pin lever bearing.
(f) Feed pin oscillator—bearing and points of contact with feed pin lever and guide.
(g) Feed pin oscillator lever—bearing and guide comb.
(h) Selector levers—bearing, and at guide comb 2 places.
(i) Contact lever—bearing.
(j) Transmitter stop contact operating plunger.

2.23 Transfer and Slide Lever Mechanism.
(a) T levers—bearings, and at points of contact with selector levers and transfer slide levers.
(b) T lever operating bail—2 bearings.
(c) Transfer slide levers—2 bearings each.
(d) Contact operating levers—bearings, and grease at point of contact with transfer slide levers.

2.24 Sensing Shaft.
(a) Sensing shaft bearings—ball bearing in front, fill oil cup in rear.
(b) Sensing shaft—remove thumb screw from front end of shaft and fill shaft with oil.
(c) Sensing shaft gear—grease.
(d) Clutch assembly—oil freely.
(e) Detent lever—bearing and roller.
(f) Oscillator lever roller.
(g) T lever operating bail roller.
(h) Clutch lever—2 bearings.
(i) Thin film of grease on bearing surface of all cams.

2.25 Distributor shaft.

(a) Distributor shaft bearings—ball bearings in front, fill oil cup in rear.

Note: Oil cup should be set at a 45 degree angle with open end toward front.

(b) Distributor shaft—remove thumb screw from front end of shaft and fill shaft with oil.

(c) Distributor shaft gear—grease.

(d) Clutch assembly—oil freely.

(e) Detent lever—bearing and roller.

(f) Clutch contact operating levers—at bearing and thin film of grease at point of contact with contact insulator.

(g) Clutch lever—2 bearings.

(h) Distributing contact levers—bearing, grease point of contact with cams, thin film of grease on point of contact with contact insulator.

(i) Thin film of grease on bearing surface of all cams.

Note: Remove all oil and grease from distributor contacts and excess oil from associated parts.

2.26 Subshaft.

(a) Subshaft gears—(2) grease.

(b) Subshaft bearings—(2) fill oil cups.

(c) Universal contact operating lever—at bearing and apply a thin film of grease to camming surface on main bail plunger.

2.27 Contact Insulators.

(a) Apply a thin film of grease on the insulators of the following contacts at point of contact with their operating levers.

1. Universal contact.
2. Transmitter stop contact.
3. Tape-out contact.
4. Distributing shaft clutch magnet contact.
5. Clutch magnet auxiliary contact.
6. Switching contacts.
7. Tape feed indicator contact arm—bearing points.

2.28 Lubricate the motor at yearly intervals and tag the motor to indicate the date of lubrication.

Caution: Experience indicates that far more trouble has been caused by excessive lubrication of motor bearings than by under lubrication. Therefore, care should be taken that the bearings are not over lubricated.

(a) To lubricate a motor bearing, press the KS-8319 (or the KS-7461 modified for short stroke) grease gun against the ball oiler and force grease into the oiler by pushing on the plunger of the gun. One stroke of the plunger will deliver sufficient grease (a 1/2-inch strip) to keep the bearing adequately lubricated for a period of from six months to one year depending on local conditions.

2.29 After the lubrication has been completed carefully clean the selecting, sensing and distributor magnet pole faces and their associated armatures with a strip of KS Bond paper or other hard surfaced paper to remove any dirt or lubricant that may be present.

2.30 Check all contacts and clean if necessary.

2.31 Replace the following parts which previously had been removed.

(a) Sensing contact cover.

(b) Code punch block.

(c) Ribbon and ribbon guide.

(d) Base plate and chad box.

2.32 Connect power to the unit and after it has run at least 10 minutes check the tensions of the main and selector clutches.

(D) Tests

2.33 Make tests in accordance with either of the following, as applicable:

(a) At 81 type switching centers the reperforator-transmitter tests covered in Section P31.155.

(b) For units not associated with 81 type switching centers the tests covered in Section P31.156, except that the round robin test should be made only when a need is indicated.

2.34 During the course of the testing, observe the unit for:

(a) Satisfactory type alignment and legibility of copy.

(b) Normal operation of all mechanical functions.

2.35 Return the machine to its service position, reconnect and advise the attendant that the machine is again ready for service or, if out of hours, place the machine in normal condition for the usual start of service. If service has been interrupted for the inspection period or the inspection has been completed out of hours, advise the testroom that the machine is again ready for service.