HB11113-L1 RAPID PAIR TESTER (PR-50A AND PR-50B) DESCRIPTION AND OPERATION

1. GENERAL

1.001 This addendum supplements Section 634-300-900PT.

1.002 It is reissued to:

(a) Change the nomenclature of the set to the PR-50B Rapid Pair Tester Test Set. It supersedes the PR-50A and HB11113-L1 which are manufacture discontinued.

(b) Introduce the Range Setting Dial (PR-50B) for use when cables are less than 15,000 feet.

(c) Provide information for measuring punch-backs and splits.

(d) Change the title of the main section.

The following changes apply to Part 1 of the section:

(a) 1.05 (e) and Figure 13 — Added

1.05(e) The PR-60A Rapid Pair Tester Test Set is used to train personnel in the use of the HB11113-L1, PR-50A and PR-50B test sets. It simulates nonworking and working cables, as follows:

- In the nonworking cable mode, this set simulates a 25-pair cable 8000 feet long, containing shorts, crosses, grounds, opens, splits, punch-backs, and good pairs. In the working cable mode, it provides all of the above conditions, plus a cross with battery and working line in on-hook and off-hook positions.

- Operation of the set: As shown in Figure 13, connect PR-60A to a Rapid Pair Tester Test Set. Move toggle switch to desired mode. For a nonworking cable, move both toggle switches to the right position. For a working cable move the switches to the left. The following list of cable troubles are programmed into the set:

WORKING CABLE CONDITIONS SIMULATED WITH SWITCHES IN LEFT POSITION	PAIR NUMBER	NONWORKING CABLE CONDITIONS SIMULATED WITH SWITCHES IN RIGHT POSITION
CONDITION		CONDITION
WORKING LINE (IDLE)	1	GOOD PAIR
WORKING LINE (IDLE)	2	GOOD PAIR
WORKING LINE (IN USE)	3	GOOD PAIR
WORKING LINE (IDLE)	4	GOOD PAIR
GOOD VACANT PAIR	5	GOOD PAIR
WORKING LINE (IDLE)	6	GOOD PAIR
WORKING LINE (IDLE)	7	GOOD PAIR
WORKING LINE (IN USE)	8	GOOD PAIR
GOOD VACANT PAIR	9	GOOD PAIR
WORKING LINE (IDLE)	10	GOOD PAIR
SHORT & GROUND	11	SHORT & GROUND
GROUND (TIP)	12	GROUND (TIP)
SPLIT	13	SPLIT
LOW INSULATION (SHORT)	14	LOW INSULATION (SHORT)
CROSS	15	CROSS
GROUND (RING)	16	GROUND (RING)
SHORT	17	SHORT
SPLIT	18	SPLIT
PUNCH-BACK (LONG)	19	PUNCH-BACK (LONG)
CROSS	20	CROSS
OPEN (RING)	21	OPEN (RING)
PUNCH-BACK (SHORT)	22	PUNCH-BACK (SHORT)
CROSS TO BATTERY (TIP) (WET)	23	OPEN (TIP & RING)
PUNCH-BACK (LONG)	24	PUNCH-BACK (LONG)
PUNCH-BACK (SHORT)	25	PUNCH-BACK (SHORT)

- A 9-volt and a 45-volt battery are required to operate the set. In order to obtain maximum battery life, the set should be switched to the nonworking cable mode when not in use. The battery condition may be determined by setting the PR-60 to working cable, connecting to a Rapid Pair Tester Test Set, and observing the meter on pair number one. A reading of less than 45 indicates that the batteries need replacing. Batteries used for replacement purposes are:

	Burgess	RCA	Everready
45-volt	U 30	VS 086	415
9-volt	2 UG	VS 323	216

- Repairs: Use the local Service and Return Program when returning the set for repairs.

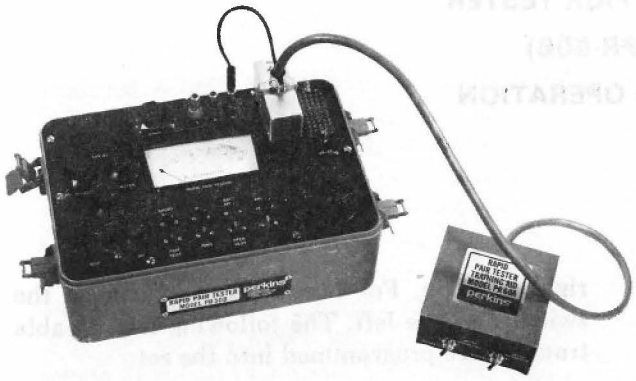


Fig. 13

4. TEST PROCEDURES — NEW OR NONWORKING CABLES

The following changes apply to Part 4 of the section:

(a) 4.02 (b) — Revised

(b) 4.02 (b).1 — Added

(c) 4.03 (d) — Revised

(d) 4.04 (b) — Revised

(e) 4.04 (c) — Revised

4.02(b) For HB11113-L1 and PR-50A Test Sets: Operate key #1 to the Pair Test position. If the cable length being tested is approximately 15,000 feet or more, adjust the METER control knob to obtain a meter reading of 70. On cables shorter than 15,000 feet, adjust the meter reading as high on the scale as possible. It will be something less than 70.

4.02(b).1 For the PR-50B: Operate key #1 to the Pair Test position. If the cable length being tested is approximately 15,000 feet or more, adjust the METER control knob to obtain a meter reading of 70. On cables shorter than 15,000 feet adjust the RANGE control knob to the A, B, C or D position. This provides increased sensitivity to the meter. A meter reading of 70 is possible in position D, even when the cable being tested is only 500 feet long.

4.03(d) Punch-back (beyond halfway point): If the readings in steps (a) and (b) are zero, operate key #1 to Pair Test and adjust the METER control knob so the meter reads 70 (or reference point selected when cable is less than 8,000). Operate key #2 to Tip and Ring. If both sides read 96 (or reference point) the pair is punched back. Look for another pair with a similar reading. Short or ground one of the pairs and test the other. If the test indicates a short or ground, the pairs are punched back. **To locate punch-backs:**

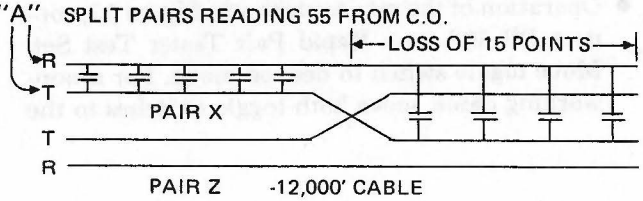
- Move key #11 to the PAIR TEST position.
- Move key #12 to the RING position. Record the meter reading obtained.
- Move key #13 to the OPEN TEST position. Adjust the build-out knobs until the meter reading equals the recorded meter reading (above). The distance to the punch-back is one-half (1/2) of the sum of the distances indicated on the build-out knobs. Compare the footage with the work print to identify the splice nearest to the distance calculated for the punch-back.

4.04(b) Punch-backs less than halfway out: A punch-back less than halfway out will look like an open. If two or more pairs appear to be open at the same location, short or ground one of the pairs and test the other.If the test shows a short or ground, the pairs are punched back. If the ground or short cannot be seen, the pair is open. **To locate punch-backs:** See 4.03(d).

NOTE: When one side of a cable pair is open, the opposite side will read lower than a normal pair.

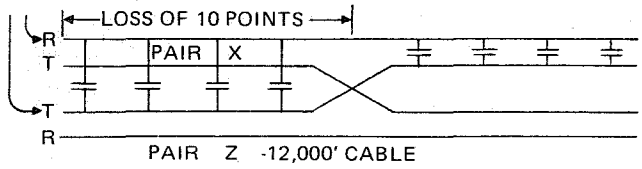
4.04(c) Splits: With key #1 in the Pair Test position, the meter will read lower than normal. (See Figure 12.) The Tip and Ring readings will also be lower than normal. The first impression will be that the pair is open. To verify whether it is open or split, leave key #1 in Pair Test and operate key #2 to the Ring position. Hold key #3 in the Split Test position and record the reading. While holding key #3 in the Split Test position, rotate the pair selector switch back to the last good pair. Record that reading. If the readings are the same, the pair is split. If the defective pair reads lower, it is open. **To locate a split:**

- STEP 1. Determine a good average pair and record the reading obtained.
- STEP 2. Read split pairs per Sketch "A" and record.



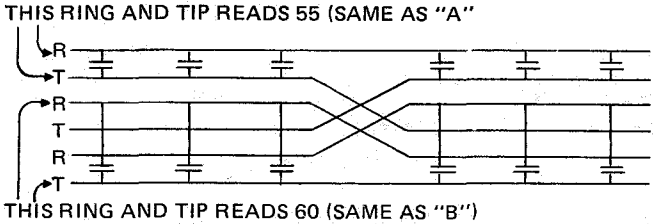
- STEP 3. Read split pairs per Sketch "B" and record.

"B" SAME SPLIT PAIR' READING 60 FROM C.O.



NOTE: If there are more than two pairs involved (such as a three-way split) refer to Sketch "C."

"C" SPLIT PAIRS IN SAME LOCATION AS "A" AND "B"
THIS RING AND TIP READS 55 (SAME AS "A"



THIS RING AND TIP READS 60 (SAME AS "B")

- STEP 4. After completion of steps 1, 2, and 3, subtract the split pair readings from the good average pair to obtain the Total Loss capacitance.

EXAMPLE — Good Pair 70
Drawing "A" Pair X 55
Total Loss 15 from split to field (end)

Good Pair 70
Drawing "B" 60 Ring of X Tip of Z
Total Loss 10 from C.O. to split

- STEP 5. Now add these two losses (Step 4) together and divide the total into the cable footage (12,000'). This will determine the average footage per point of loss.

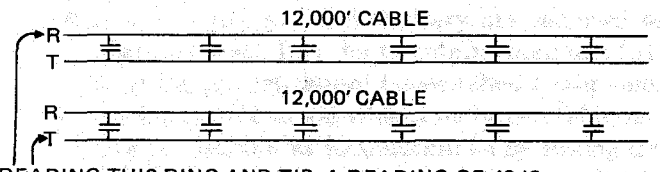
EXAMPLE
Drawing "A" 15 points of loss
Drawing "B" 10 points of loss
Total 25 points of loss

Cable footage 12,000' ÷ 25 points = 480'
Each point of loss is equal to 480' of cable (in the example).

- STEP 6. After completion of Step 5, measure out to the location of the split pairs. Refer to the reading on Drawing "B," which shows the loss from the C.O. to the split pairs. That loss is 10 points or 10 x 480' = 4800' to location of splits from C.O. To measure from the field, refer to drawing "A" which gives the loss from the cable end to the split pairs. That reading or loss is 15 points or 15 x 480' = 7200' to location of split pairs from the cable end (field side).

- STEP 7. In order to determine if a relationship exists between one split pair in a cable and another split pair in the same cable, it is necessary to first know the total loss which can be incurred in the cable being tested. To find this loss, two good average pairs must be measured per sketch "D" below. The total loss (in this example) is 22 points. While split pair relationship is being attempted and while following instructions in items 1 through 4, if a reading of more than 48 points is obtained, this proves a definite relationship between the pairs being tested. If the reading is 48 points, there is no relationship between pairs.

"D" TWO GOOD AVERAGE PAIRS READING 70



READING THIS RING AND TIP, A READING OF 48 IS OBTAINED (IN THIS EXAMPLE) WHICH REPRESENTS A TOTAL LOSS OF 22 POINTS. (70 – 48 = 22)