CMC 705-B TRUNK SKAN I

OPERATIONAL INFORMATION

1. GENERAL - SELECTORS

1.01 Section 1 thru 7 describes a method of testing trunks from selector banks to the next selector in the switch train. The CMC 705-B TRUNK SKAN I checks, in less than a minute, all the trunks on the switch bank for opens, reversals, crosses, and busy conditions. It also monitors the "SP" (EC) leads on four-wire trunks. It tests all busy trunks for either a valid or false busy condition. It also current flows the "A" relays associated with the switch. A voltage sensing circuit keeps the loop open on busy trunks causing no interference with conversation or data transmission.

1.02 Tests Covered - Selectors

A. Operation: Checks the ability of the succeeding selector to meet the "A" relay requirements. If the "A" relay does not meet operational requirements, the switch stepping stops.

B. Open Trunks: Automatically stops on opens. Lights identify continuity.

C. Reversed Trunks: This test checks from the wiper forward for any reversed tip and ring conditions, stopping on any reversed trunk. The trouble is identified by a lighted "REVERSE" lamp.

D. All Trunks Busy: Checks the eleventh rotary terminal for the overflow signal, giving the 120 I. P. M. tone thru the set's monitoring circuit.

E. False Busies: Checks for false busies on straight or reversed trunks, and on crossed sleeves.

F. Side Crosses: Checks the tip ring and sleeve leads for side crosses giving identifying characteristics.

G. "SP" Lead: Monitors "SP" (EC) lead for foreign battery and ground, causing switch to stop on an abnormal condition.

1.03 These tests should be performed following rearrangements, transitions, or performed as Preventive Maintenance as described in the Controlled Maintenance Plan for Central Office Equipment. In all cases a Test and Inspection Work Order and Record or other appropriate record as outlined in the Controlled Maintenance Plan should be prepared.

1.04 Tests should be made during periods of light traffic.

1.05 Tests should be performed on the first switch in each shelf per the DTA trunking.

2. APPARATUS - ALL TESTS

2.01 CMC 705-B TRUNK SKAN I is equipped with:

A. Power Cords:

1. 2P9A Battery and ground cord (310 plug).

2. 2W12A Battery and ground cord (alligator clips).

B. CMC Test Cord:
One end is equipped with a 6-conductor plug; the other end with a 240H plug and four 360 terminations equipped with 419A tools.

C. 419A tools.
Four (4).

2.02 KS 16887 Blocking Tool or toothpicks.

3. PREPARATION - TRUNK SKAN I

3.01 Selector under test should be idle. If possible, use the first selector in the shelf.

3.02 Prepare the CMC TRUNK SKAN I as follows:

A. POWER CORD:
Insert the 310 plug of the 2P9A or 2W12A cord into the "BATT" jack of the TRUNK SKAN. Connect the other end of the central office 48V battery source.

B. TEST CORD:
Attach the 6-conductor plug into the "TEST" jack of the TRUNK SKAN I. Connect the 240H plug to the selector test jack. Operate "SCAN - OFF - F. B. VERIFY" switch on the TRUNK SKAN to the "SCAN" position, busying out the selector. Connect the 419A tools to the wiper terminals as follows:

TIP	White 360 tool.
RING	Black 360 tool. - back of terminal assembly.
SLEEVE	Red 360 tool.
SP-LEAD	Green 360 tool - 4-wire circuits only. Attach to SP or Supervision terminal.

4. PREPARATION - SELECTORS

4.01 Remove switch cover.

4.02 Block the cut-thru relay (normally D or F) with a KS 16887 blocking tool in non-operative position. (CMC 705-B TRUNK SKAN "FUNCTION SWITCH" should be in "SCAN" position.) This isolates the input of the switch from the output.

4.03 Turn "A ADJ" control counter-clockwise cutting in all resistance.

4.04 Dial desired level. Switch steps to pre-selected level and cuts into the first idle trunk, looking at the next switch in the train.

4.05 "A" RELAY CURRENT ADJUSTMENT" - METHOD 1
Open the rotary interruptor springs with the KS wedge and remove the sleeve lead (red) from the wiper assembly terminal. Adjust the current flow of the "A" relay to the readjust (14. 9), test (15. 1) or other locally prescribed value by using the " ADJ" knob. While current flowing the "A" relay under test, it can be seized by a subscriber causing the switch selector to step to the next rotary position.

4.06 Operate the "RLS" button. Switch will release.

4.07 Remove the KS wedge from the interruptor springs and reconnect the sleeve lead of the test cord to the sleeve wiper terminal.

4.08 Set is now ready for trunk testing.

4.09 "A" RELAY CURRENT ADJUSTMENT" - METHOD 2
Turn the "A ADJ" knob counter-clockwise cutting in all resistance. Dial the desired level. The wipers will stop

on the first idle trunk. Operate "A ADJ" control clockwise until (1) the switch steps, or (2) the desired current value of the "A" relay is obtained. If the switch steps before the desired current value is reached, repeat step (1) when the rotary action of the wiper stops on subsequent terminals (because of the failure of the "A" relay to operate) until the desired value is reached. In no case should the current value be set at a higher value than local practices permit; if the switch steps at considerably less current than is prescribed in the practice, a possible trouble condition is indicated.

5. METHOD

5.01 Using the dial on the TRUNK SKAN I, dial the selector to the first working level. The selector will cut in and will step to the eleventh rotary position. The 120 I. P. M. signal should be heard over the TRUNK SKAN's monitor circuit. The "S" lamp will light each time the wiper tests a trunk indicating that the succeeding switch has been seized and that ground has been returned on the SLEEVE of the trunk. The TIP and RING lamps will flash as the wiper lands each idle trunk.

The switch will stop its rotary action if a nonoperative "A" relay is encountered or an open, reverse, side-cross or a foreign potential (on SP leads only) exists.

Dirty banks or poor wiper adjustment will be indicated by a "T" or "R" lamp burning momentarily, by touching the wipers while either lamp is burning, the switch should then continue to scan.

If a false busy condition is detected, the switch will continue to hunt rotary and the "FB" lamp will burn continuously during the remainder of the scan. When the wipers pass over a trunk which is being dial pulsed, or when the particular switch train is employing certain types of loop extenders or voice repeaters, a false busy signal may be displayed even though a legitimate call is in progress. However, the "F. B. VERIFY" and "MONITOR CUT THRU" circuits will allow rapid verification of the false busy condition without interfering with the conversation on the line. (See Step 6, in section 6 of these instructions.)

5.02 Operate the "SCAN - OFF - F. B. VERIFY" switch to the off position. The switch releases.

5.03 Repeat steps 5.01 and 5.02 until all working levels have been tested.

5.04 SLEEVE (C or S) & SUPERVISORY (EC or SP) LEAD VERIFICATION THRU THE CONNECTOR. This test is made independent of the tests described in paragraph 5.01. Remove the 360 tools from the Tip and Ring wiper terminals.

With the TRUNK SKAN set up as described in the above paragraph and section 3.01, dial the toll intermediate selector to the first working level. The wiper will cut through to the first idle trunk. Then dial 99 or any other test number, landing the connector, and stepping it both vertical and rotary. The ground which has been sent forward on the sleeve lead to the connector will supply ground to the SP lead, back to the selector, lighting the "SP-GND" lamp on the test set.

The first ring will split the S and SP leads and the "SP-GND" goes dark indicating that the leads have been split. To verify the control of the ringing of the trunk, touch the 360 tools (with the red and green leads)

together while connected. This grounds the "SP" lead. Ringing will stop, bringing on the "SP-GND" lamp again.

Manually step the wipers to the next idle trunk and repeat the test, dialing the 99 or other test number. Continue until all trunks have been tested.

Release the switch by removing the 240 plug, dial up the next working level and continue the test until all trunks and levels have been tested.

6. TALK-MONITOR CIRCUITS

The TRUNK SKAN operator has the capability of talking to either the input or output sides of the switch with subscribers, operators or others testing on circuit. He may also monitor for specific tones.

6.01 PRIMARY TALK-MONITORING: (Dial tone, 120 I. P. M., subscribers, etc.) The "MON CUT THRU" switch is a locking push-button type. When the switch wiper is on the 11th rotary step and the 120 I. P. M. tone or a recorded announcement is heard, the TALK-MONITOR feature is operating on the primary side of the switch. In order to converse, push the "TALK" button.

6.02 SECONDARY TALK-MONITORING: (Verifying busy circuits, noting wiper noise, talking with operators or others testing on the line.) The function of the circuit can be changed from the primary to the secondary by pressing the "MON CUT THRU" button once, locking it is the secondary function. When in the secondary, the Set's operator has the capability of verifying false busies (See section 7, step 6) and talking forward from the switch.

6.03 To transfer from the SECONDARY to the PRIMARY or vice versa, push the "MON CUT THRU" button. When the circuit is in the primary position, the appropriate tone should be heard on the 11th rotary step.

6.04 The switch being used in the testing procedure can be seized from behind under certain conditions - such as an unguarded incoming selector. Should such a seizure occur, advise the calling party that you are testing on that line and that they should hang up and re-dial their number. The "RLS" button should be held in the operate position for sufficient time to allow the subscriber to be released from the switch train.

7. TROUBLE INDICATIONS

7A. THREE AND FOUR WIRE CIRCUITS

STEP	INDICATION	POSSIBLE TROUBLE	ACTION
1	Switch Stops Meter reads desired current. No lamps burning.	Stiff "A" Relay	Push "A SEIZURE" button. Switch steps.
		Dirty "B" Relay Contacts. or Two Tips Reversed or Two Rings Reversed or	Push "A SEIZURE" button. Switch DOES NOT STEP. Push "ROT STEP" button to resume rotary action.

STEP	INDICATION	POSSIBLE TROUBLE	ACTION
1 cont.		Two Sleeves Reversed or Open Sleeve	(If the "ROT STEP" button must be pushed to stop the switch to the next terminal, this indicates a service affecting trouble.)
2	Switch Stops "T" lamp on. No meter reading.	Open Ring or Ring-Sleeve Reversed	Push "ROT STEP" to resume rotary action.
3	Switch Stops "R" lamp on. No meter reading.	Open Tip	Push "ROT STEP" to resume rotary action.
3A	No lamps on No meter reading	Open Trunk	Push "ROT STEP" to resume rotary action.
4	Switch Stops "REV" lamp on	Tip and Ring Reversed	Push "ROT STEP" to resume rotary action.
5	Switch Stops Meter reads higher than desired current. No lamps burning.	Tip Grounded or Double Trunk or Tip - Tip Cross or Ring - Ring Cross	Push "A SEIZURE". Set remains on trunk indicating it is not a stiff "A" relay. Operate "ROT STEP". Switch steps.
6	"FB" False Busy Lamp Burning during Scan		Operate the "RLS" button and redial the level, observing as closely as possible the terminal where the false busy lamp first burns. If it fails to burn during the second scan, dialing was taking place on the terminal as it was tested and no trouble exists.
6A	"FB" lamp burning during Verification	Grounded Sleeve	"FB" lamp burns during the second scan. Release switch. Block the rotary interrupter springs, operate FUNCTION SWITCH to "F.B. VERIFY". Dial the level.

STEP	INDICATION	POSSIBLE TROUBLE	ACTION
6A cont.			Manually step the wiper across the bank until the F. B. lamp burns. Normally, the T. R. &S. lamps will burn. Press "MON CUT THRU" button, monitor the circuit and check for conversation. Continue to manually step wiper across the rest of the level.
		Grounded Ring (Normally would show up as permanent.) or Ring Sleeve Cross	Follow procedure as for Grounded Sleeve. When the terminal at fault is tested, the following condition will appear during the F. B. VERIFY test. T - Light on R - Light off S - Light on FB - Light on - No Conversation
		Tip and Sleeve Reversed	Verify as in Grounded Sleeve T - Light on R - Light on S - Light - Dim light (No FB Lamp) - No Conversation
		Tip and Sleeve Crossed	Verify as in Grounded Sleeve T R S-Lights Flash On and Off FB
		Split Tip Ring Crossed	Normally, a permanent signal alarm will have indicated this condition FB - On S - On

STEP	INDICATION	POSSIBLE TROUBLE	ACTION
6A cont.			Verify as in Grounded Sleeve. Lead in trouble will have a dark lamp.
6B	"FB" lamp does not burn during Verification	Crossed Sleeves	If the "FB" lamp fails to burn during the above test, it could indicate a crossed sleeves condition. In order to isolate the cross, the following procedure should be followed: 1. Place a ground cord on the first sleeve of the level in question at the DTA. 2. Dial the level on the CMC 705 TRUNK SKAN I and follow the procedure for "FB" virification (6A), noting that the "T, R, S, & FB" lamps burn when the grounded sleeve is selected. (The same condition will exist on the crossed sleeve.) Continue manually stepping the switch rotary observing for the same condition. Continue steps one and two moving the ground cord on the sleeve sequentially 2 through 10 until the cross is located.

7B. FOUR-WIRE CIRCUITS - SCAN TESTS

In addition to these indications, possible troubles and actions described in paragraph 7A, four-wire circuits may have the following trouble indications.

12. METHOD - GROUNDED SLEEVE AND ASSOCIATED CROSSES

12.01 "SCAN - OFF - FB VERIFY" switch should be in the "VERIFY" position.

12.02 Remove the relay covers. Block the "SL" relay operated. The ROTS can now be stepped one terminal at a time.

12.03 Push the "MON CUT THRU" button to monitor the wipers. Manually operate the "ST" relay. Switch should step. Verify any busy condition on the trunks with a grounded sleeve condition ("S" lamp on). Any false busy condition will be indicated by the "FB" lamp on the TRUNK SKAN. Tip and ring lamps will indicate continuity.

12.04 When the rotary switch is setting on terminal 22, the trouble alarm should ring after about 45 seconds. Upon completion of this test, step the switch off the home position. Remove the blocking wedge.

13. TROUBLE INDICATIONS

(As described in paragraph 8.02A.)

13.01 Any trouble indications will correspond to those described in paragraph 7, steps 1 through 5, no "FB" lamp will burn during the rapid scanning. False busy conditions will be detected while making the tests described in paragraph 12.03.

14. TROUBLE INDICATIONS - FALSE BUSIES

(As described in paragraph 8.02B.)

14.01 Troubles found will correspond to those shown in paragraph 7A, step 6A.

15. CALIBRATION CHECKS

This covers the calibration of the TRUNK SKAN TEST SET. Calibration should be done annually, or if the set has been exposed to exceptionally rough handling.

All calibration checks can be made with the set in its case.

15.01 Dial Speed - The dial speed can be checked by plugging the 240 plug of the "TEST" cord into a "FIRST" selector that accesses a "DIAL SPEED" test number, with power to the set and the monitor set for primary. (Check to see is dial tone is heard.) Place "SCAN" switch in scan position and dial appropriate test number. Resultant tone will indicate dial speed.

15.02 Meter Calibration - The accuracy of the meter can be checked by using a known standard milliammeter in series with a -48V battery and ground source. Turn "A ADJ" full clockwise. This circuit will be through the test cord, using the white (+) and black (-) 360 tools. Scan switch in scan position. If necessary, adjust meter screw, check at center scale.

15.03 Loop Closing - The loop closing circuit can be checked during normal testing, with the 705 TRUNK SKAN set up for selectors and the "D" relay blocked. At the D. T. A. insert a 1400-ohm resistance across an idle line. Dial the level after also blocking the "C" relay non operated. With the set in "SCAN" manually rotate the wipers to the choice which has the 1400-ohm resistor. The T&R lamps should be off and the sleeve lamp on. Remove the red 360 tool (sleeve) from the wiper terminal. The "S" lamp will go out. The T&R lamp should remain off, and there should be no meter reading.

15.04 Tip, Ring, Rev, SP, and Lamps -- With the Scan set up on a selector in the normal manner, remove the black 360 tool from the wiper terminal, dial a working level; when the switch stops on a vacant choice, the "T" lamp should be on, remove the white 360 tool, and replace the black 360 tool on the ring wiper terminal. The "R" lamp should now light.

Now disconnect the black 360 tool, and place it on the tip wiper terminal. Place the white 360 tool on the ring terminal, the REV lamp should now be on.

The EC (SP) circuit can be tested by touching the green 360 tool to either -48V and bringing on the BATT lamp or ground and lighting the GROUND lamp.

All of the 705B TRUNK SKAN sensing circuitry is factory calibrated and due to its solid state calibration will not vary once it is set. All circuitry is designed to operate from -47 to -52 volts C. O. battery. Any repair other than lamp replacement should be made at the factory.

15.05 Calibration At CMC - One (1) day repair and calibration service is available. On air express shipments each way no more than 3 or 4 days' use of the set is lost.

Test sets should be shipped direct to:

Communications Mfg. Company
33 East Spring Street
Long Beach, California 90806

NUMERICAL INDEX - DIVISION 100
TEST EQUIPMENT, ELECTRICAL INDICATING INSTRUMENTS AND METERS (COMMON USAGE) MAINTENANCE, SELECTION AND USE

1. GENERAL

1.01 This addendum provides an index of Mountain Bell issued practiced in Division 100.

1.02 A bullet (●) indicates an item that has been added or changed since the previous issue of the index.

1.03 A square (□) indicates a canceled item.

1.04 "Add." is the abbreviation for Addendum and "App." is the abbreviation for Appendix.

2. LAYERS

2.01 This division is arranged in layers as follows: (see subdivisions)

	SECTION NUMBER	ISSUE	SUBJECT
100-0 INDEXES			
● Add.	100-000-000MB	D	Numerical Index - Division 100 Test Equipment, Electrical Indicating Instruments and Meters (Common Usage) - Maintenance, Selection and Use.
100-1 MISCELLANEOUS TEST SETS			
	100-100-900MB	A	Equipment Calibration Sticker MB Form 3501.
	100-120-901MB	A	Hand Test Sets
	100-130-900MB	A	Quick-Check Test Set CMC707
●	100-130-901MB	A	CMC 705-B Trunk Skan I Operational Information

NOTE: "Four Digit Only - Not Applicable to Coded Volume Holders."