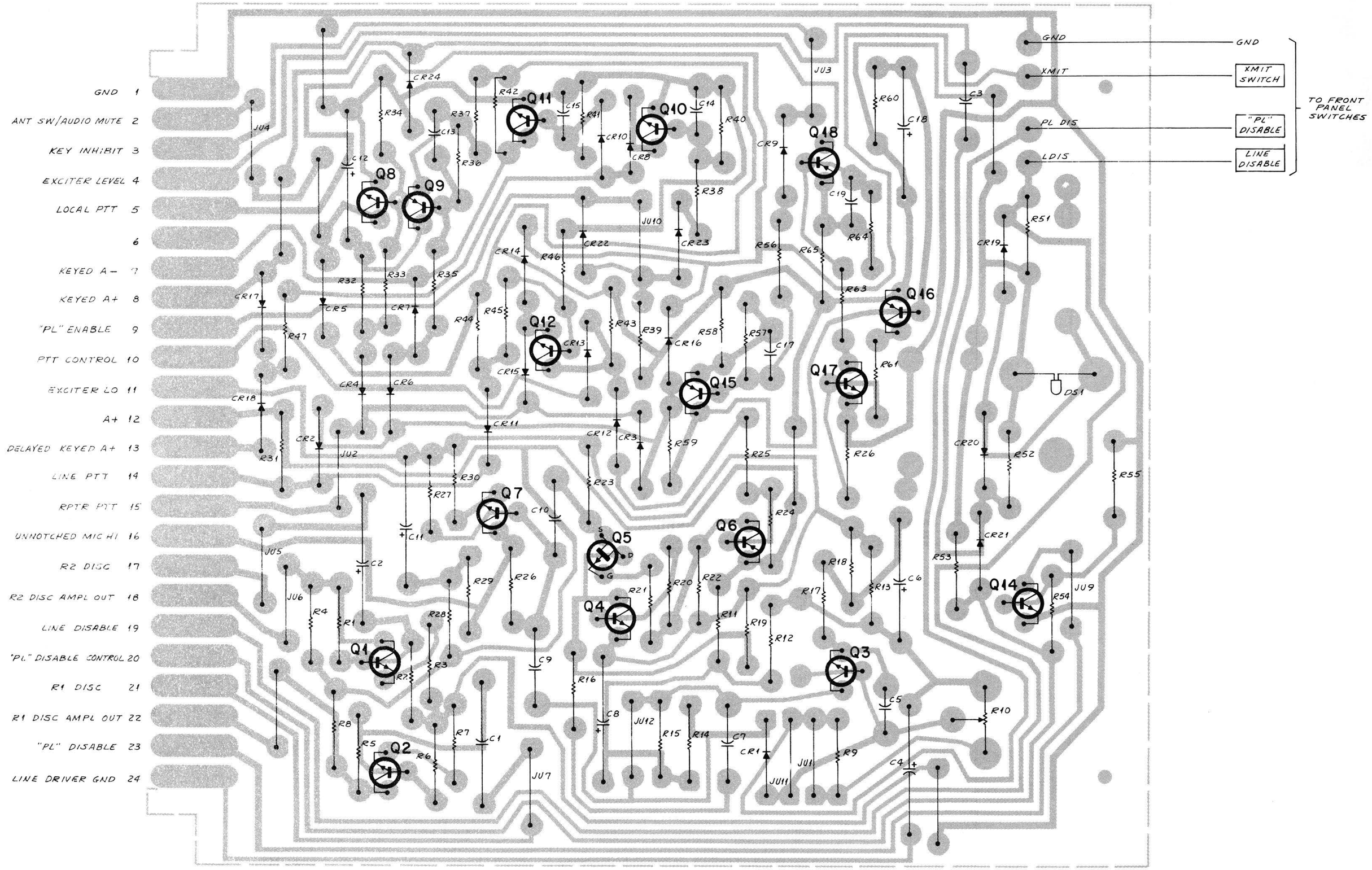


SHOWN FROM SOLDER SIDE

BD-DEPS-16750-A
OL-DEPS-16751-A

STATION CONTROL MODULE

MODEL TLN4635B

FUNCTION

--Integrates control functions from other modules to key the station transmitter.

--Adjusts exciter audio level.

--Amplifies receiver discriminator signals which are used externally.

MAINTENANCE & TROUBLESHOOTING

THIS MODULE MAY BE SERVICED EITHER WHILE CONNECTED TO THE UNIFIED CHASSIS INTERCONNECT BOARD OR WHILE CONNECTED TO SEPARATE EXTERNAL TEST EQUIPMENT. REFER TO THE UNIFIED CHASSIS INTERCONNECT BOARD SERVICING INFORMATION IN THIS MANUAL FOR "SET-UP" DETAILS.

STEP 1. CHECK JUMPERS AS APPLICABLE FOR THE MODE OF OPERATION OF THIS MODULE.

STEP 2. CONNECT POWER AND SIGNAL SOURCES TO THE MODULE AS INDICATED IN THE FOLLOWING CHART.

PIN NO.	CONNECT
1, 11, 24	GROUND
4	AUDIO OSCILLATOR
12	+12 VOLTS DC
16	AC VOLTMETER TO GROUND
2	10 KILOHMS TO 12 VOLTS DC
10	10 KILOHMS TO 12 VOLTS DC
23	10 KILOHMS TO 12 VOLTS DC

NOTE: LEVEL ADJUST CONTROL SHOULD BE FULL CLOCKWISE.

STEP 3. ADJUST AUDIO OSCILLATOR OUTPUT FOR -25 dBm AT PIN 4. PIN 16 SHOULD MEASURE APPROXIMATELY -10 dBm WITH JU1 CONNECTED. IF THIS LEVEL CANNOT BE ACHIEVED CHECK STAGES Q3 AND Q7. IF THE LEVEL IS CORRECT, GROUND PIN 5 OR PIN 15 AND NOTE THAT THE READING DROPS TO 0. IF THIS DOES NOT OCCUR CHECK STAGES Q4 & Q5 AND THEIR ASSOCIATED DRIVER STAGES.

STEP 4. GROUND PINS 14 AND 9. MEASURE THE DC VOLTAGE AT PINS 10 AND 8. EACH SHOULD READ +12 VOLTS. PINS 7 AND 2 SHOULD READ ZERO. IF A VOLTAGE OR GROUND DOES NOT APPEAR AT THE PRESCRIBED LOCATION, CHECK EACH STAGE ASSOCIATED WITH THAT LOCATION.

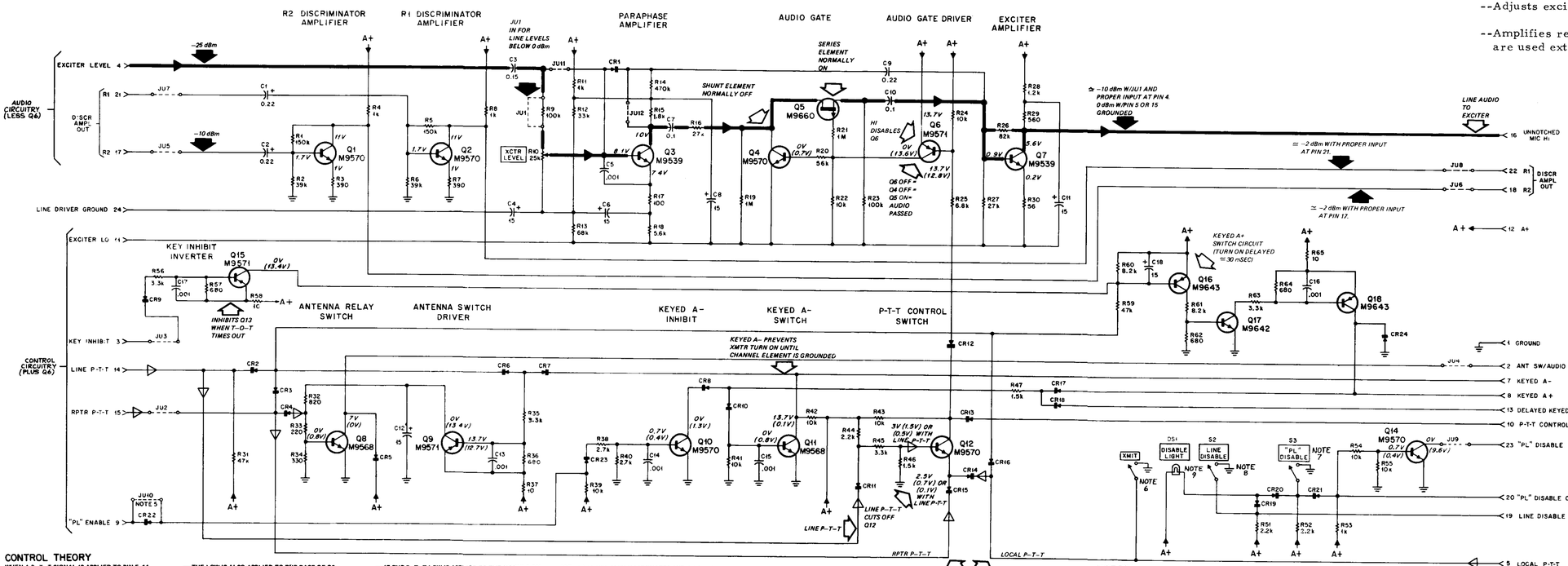
STEP 5. GROUND PIN 15. MEASURE THE DC VOLTAGE AT PINS 7 AND 2. EACH SHOULD READ +12 VOLTS. PIN 10 SHOULD READ ZERO VOLTS.

STEP 6. WITH PIN 15 STILL GROUNDED, APPLY A GROUND TO PIN 14. CHECK FOR +12 VOLTS DC AT PIN 10.

STEP 7. GROUND PIN 20 AND CHECK THE DC VOLTAGE AT PIN 23. THE METER INDICATION SHOULD BE +12 VOLTS. REMOVE THE GROUND FROM PIN 20 AND THE VOLTAGE SHOULD DROP TO ZERO.

STEP 8. APPLY A -10 dBm SIGNAL FROM THE AUDIO OSCILLATOR TO PIN 17 AND MEASURE THE AC VOLTAGE AT PIN 18. THE VOLTMETER SHOULD INDICATE APPROXIMATELY -2 dBm.

STEP 9. APPLY A -10 dBm SIGNAL FROM THE AUDIO OSCILLATOR TO PIN 21 AND CHECK THE AC VOLTAGE ON PIN 22. THE INDICATION SHOULD BE APPROXIMATELY -2 dBm.



CONTROL THEORY

WHEN A P-T-T SIGNAL IS APPLIED TO PIN 5, 14, OR 15 THE FOLLOWING FUNCTIONS OCCUR:

--A LOW IS APPLIED TO THE BASE OF Q16. AFTER A 30 MILLISECOND DELAY, THIS PROVIDES A HIGH OUTPUT TO PIN 8 AND TO Q11 FROM Q17 AND Q18.

--THE DRIVE TO Q11 WILL BE INHIBITED BY Q10 UNTIL A LOW IS APPLIED TO PIN 9, INDICATING AN OSCILLATOR CHANNEL ELEMENT GROUND. THIS PREVENTS A-- FROM ENERGIZING THE TRANSMITTER CIRCUITS UNTIL AFTER THE CHANNEL ELEMENT HAS BEEN GROUNDED. Q11 CAN ALSO BE INHIBITED BY A LOW ENTERING ON PIN 3 FROM THE TIME-OUT-TIMER MODULE AT THE END OF A PRE-SET TIME LIMIT.

--THE LOW IS ALSO APPLIED TO THE BASE OF Q9 WHERE IT IS INVERTED AND APPLIED AS A HIGH TO THE BASE OF Q8. IF A LOW IS APPLIED AS REPEATER P-T-T ON PIN 15, Q8 WILL BE INHIBITED. HOWEVER, IF THE LOW IS APPLIED TO EITHER PIN 5 OR 14, Q8 WILL SATURATE AND PROVIDE A LOW TO OPERATE THE ANTENNA SWITCH. SWITCH Q8 DOES NOT TURN OFF THE INSTANT P-T-T LOW IS REMOVED. INSTEAD IT IS KEPT ON FOR THE TIME REQUIRED FOR C12 TO DISCHARGE THROUGH R32 AND R33. THIS ALLOWS THE HIGH LEVEL RF ENERGY TO DECAY BEFORE THE ANTENNA SWITCH REVERTS TO THE RECEIVE CONDITION.

--IF THE P-T-T LOW IS APPLIED TO THE MODULE ON PIN 5 OR 15, A CONDUCTION PATH IS PROVIDED FOR Q12. WHEN Q12 CONDUCTS, A LOW IS APPLIED TO PIN 10. THIS CONTROL CAN BE OVERRIDDEN BY A LINE P-T-T SIGNAL APPLIED TO PIN 14. THIS SIGNAL REACHES THE BASE OF Q12 CAUSING IT TO CUT OFF AND REMOVE THE LOW FROM PIN 10.

WHEN XMIT SWITCH S1 IS ACTUATED, A GROUND IS SUPPLIED TO THE EMITTER OF Q12 WITH THE SAME RESULT AS A LOW APPLIED TO PIN 5 OR 15. ACTUATING LINE DISABLE SWITCH S2 APPLIES A GROUND OUTPUT TO PIN 19. S2 ALSO PROVIDES A GROUND TO THE DISABLE LIGHT DS1, WHICH CAUSES IT TO ILLUMINATE. WHEN "PL" DISABLE SWITCH S3 IS ACTUATED, DS1 ALSO ILLUMINATES AND A LOW IS APPLIED TO THE BASE OF "PL" DISABLE INVERTER Q14. THIS LOW CAUSES Q14 (WHICH IS NORMALLY CONDUCTING) TO CUT OFF AND REMOVES THE "PL" DISABLE SWITCHED GROUND FROM PIN 23. THE STATION SHOULD NOT BE LEFT IN THE LINE OR "PL" DISABLE MODE UNDER NORMAL OPERATING CONDITIONS.

IN "PRIVATE-LINE" APPLICATIONS, KEYED A- RELEASE IS DELAYED AT THE END OF A TRANSMISSION BY AN INPUT TO PIN 13 FROM THE EXTERNAL "PRIVATE-LINE" REVERSE BURST CIRCUITRY. THIS INPUT MAINTAINS TRANSMITTER KEYING FOR THE DURATION OF THE REVERSE BURST TONE.

NOTES:

1. JU1 IS IN FOR LINE LEVELS BELOW 0 dBm AND REMOVED FOR LINE LEVELS ABOVE 0 dBm.
2. JU2 THRU JU8 IS IN FOR ALL WIRE LINE CONTROL BASE STATIONS AND (RT) REPEATERS.
3. JU9 IS IN FOR "PL" OPERATION AND REMOVED FOR CARRIER SQUELCH OPERATION.
4. VOLTAGES SHOWN IN PARENTHESES ARE NORMALLY MEASURED WHEN FUNCTION IS ACTIVATED. VOLTAGES NOT IN PARENTHESES ARE NORMALLY MEASURED WHEN FUNCTION IS DEACTIVATED.
5. JU10 OUT FOR NON-WIRE LINE REPEATERS.
6. TO KEY THE TRANSMITTER, SLIDE THE XMIT SWITCH TO THE RIGHT (CLOSED) AND HOLD IN THIS POSITION. TO UNKEY THE TRANSMITTER, RELEASE THE SWITCH.
7. WHEN THE PL DISABLE SWITCH IS IN THE (NORMAL) POSITION (TO THE LEFT), THE "PRIVATE-LINE" FUNCTION OF THE STATION IS OPERATIONAL. IN THE ACTUATED POSITION (TO THE RIGHT), THE RECEIVER "PRIVATE-LINE" TONE-CODED SQUELCH CIRCUIT IS DISABLED SO THAT ALL ON-FREQUENCY SIGNALS MAY BE MONITORED.
8. WHEN THE LINE DISABLE SWITCH IS IN THE NORMAL POSITION (TO THE LEFT, OPEN), STATION OPERATION CAN BE INITIATED BY REMOTE CONTROL. IN THE ACTUATED POSITION (TO THE RIGHT, CLOSED), REMOTE CONTROLS ARE DISABLED AND THE STATION CAN ONLY BE OPERATED VIA LOCAL CONTROLS.
9. THE DISABLE LIGHT IS ILLUMINATED WHEN EITHER THE PL OR LINE DISABLE SWITCHES ARE ACTUATED.

EEPS-16749-D

LEGEND
= THEORY OF OPERATION DATA
= MAINTENANCE DATA
= PRIMARY SIGNAL FLOW
= SECONDARY SIGNAL FLOW