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DESCRIPTION

The 19D429082G1 Transmitter Control Board is used with the 19D416660 Transmitter Control Board for providing three or four-frequency transmit control functions in MASTR® II Tone Remote Control Base Stations. The 19D416660 Board provides two-frequency transmit control and the 19D429082 provides the third and fourth frequency control.

CIRCUIT ANALYSIS

When a function tone frequency of 1350 Hertz is applied to the audio pair at the remote control console, the tone is applied to LIMITED AUDIO lead A10 on the board. An LC filter, composed of L1-C1 is tuned to the 1350 Hz function tone and the resulting output voltage turns off diode CR1 on the positive peaks and allows Q1 to turn on through R2. Conduction of Q1 applies a low to the input of gate U1-D, pin 13.

The grounded Secur-it DET lead D7 is connected to inverter U3-C, applying a high to the input of U1-A. The low output of U1-A is connected back to U1-D (pin 12), latching the flip-flop. The low output of U1-A is also inverted by U1-C and applied to NAND gate U1-B. The inverted high Secur-it DET lead is also connected to the input of U1-B. The resultant output of U1-B (pin 6) is inverted by U3-B and this high turns on Q3.

Conduction of Q3 grounds the PTT path to key the station transmitter. The high output of U1-C turns on Q13, resetting the window one-shot on the Secur-it Tone Board as long as the flip-flop remains latched. Unkeying the transmitter removes the ground from DET lead D7, applying a low to pin 2 of U1-A. This unlatches the flip-flop. Operating the XMIT DISABLE switch S2 to the DISABLE position opens the PTT path and applies ground to the XMIT DISABLE Indicator LED CR8, turning on the light.

When TX F3 tone is detected, the high at pin 11 of U1-D is passed by CR14 to turn on Q4. Conduction of Q4 applies ground to the XMIT F3 lead C4 to select the F3 transmitter oscillator. The high from U1-D (pin 11) also operates Q10, turning on the XMIT F3 LED CR6.

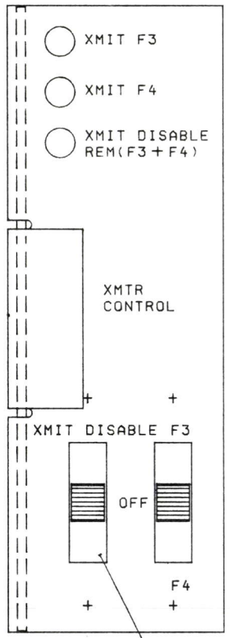
When Q4 conducts, the low from the collector is applied to the base of Q5, turning on the transistor. The resulting high at the collector of Q5 is connected to the TX F3 INTERCONNECT lead D4. The high on the AUDIO MUTE lead D2 (when the Secur-it tone DETECT function is active) turns on Q15 which, in turn, turns on Q16. Conduction of Q16 operates Q17, Q18 and Q19, muting the receiver 2, receiver 3 and receiver 4 audio.

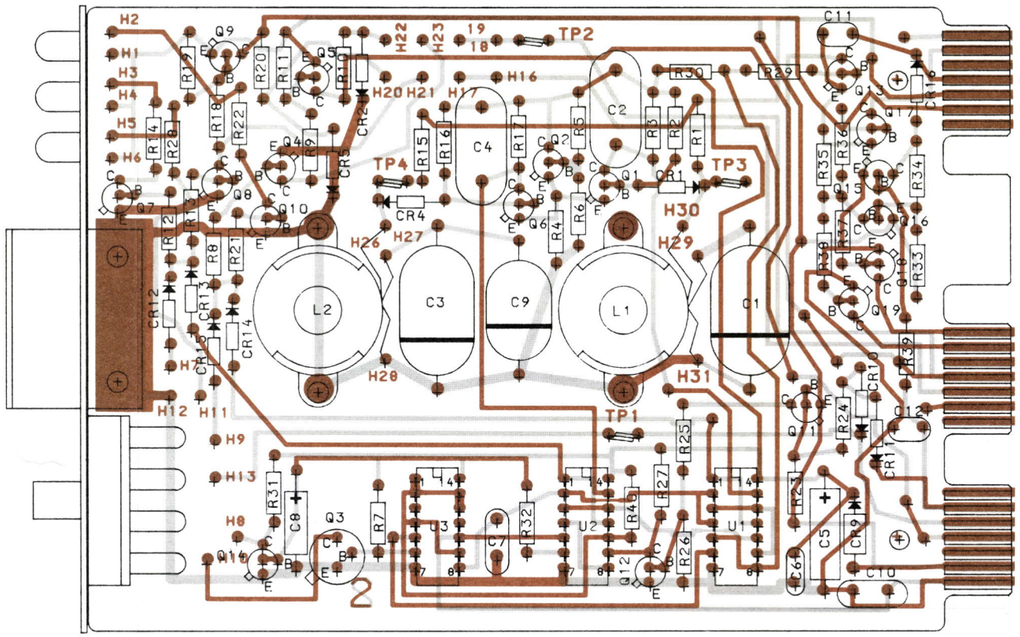
When TX F4 tone (1250 Hz) is selected at the remote control console, the tone is detected at the F4 filter (L2-C3), reverse biasing CR4 and turning on Q6. This latches flip-flop U2-A, U2-D and applies a low to gate U1-C (pin 10). The transmitter is keyed as previously described. The high output of U2-D turns on Q8 which, in turn, grounds the XMIT F4 lead C5 to select the transmit F4 oscillator. Conduction of Q8, also operates Q9, applying a high to the TX F4 INTERCONNECT lead A9. When the TX F4 is selected, the high from the output of U2-D also turns on Q7, applying a low to XMT F4 Indicator LED CRT to turn on the light.

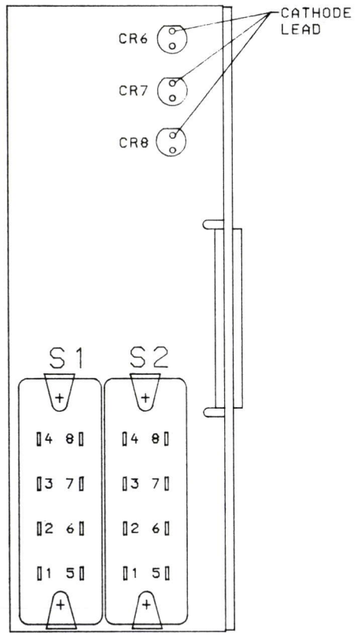
In local PTT operation, with no function tone present on the LIMITED AUDIO path, the Secur-it DET lead is high. Grounding the local PTT lead D13 using the local microphone PTT turns on Q11 and keys the transmitter. The low input to U2-C is inverted and applied to NAND gate U2-B. The Secur-it DET lead, which is high, is also connected to NAND gate U2-B. The resulting low output of U2-B turns Q14 off and allows the collector voltage to go high. This high forward biases either CR12 or CR15, depending on the position of S1. If F3 is selected by S1, CR15 is forward biased and turns on Q4 which grounds the F3 oscillator. If F4 is selected by S1, CR12 is forward biased and turns on Q8 which grounds the F4 oscillator. Switch S2 is used to disable remote PTT.

GENERAL ELECTRIC COMPANY • MOBILE COMMUNICATIONS DIVISION
WORLD HEADQUARTERS • LYNCHBURG, VIRGINIA 24502 U.S.A.

GENERAL ELECTRIC*
U.S.A.



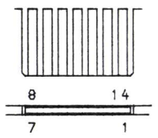




SECTION "B-B"

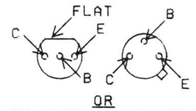
(19D429084, Rev. 2)
(19B232316, Sh. 1, Rev. 2)
(19B232316, Sh. 2, Rev. 2)

REFER TO WIRING DIAGRAM FOR THE FOLLOWING CONNECTIONS	
FROM	TO
CR6-ANODE	H1
CR6-CATHODE	H2
CR7-ANODE	H4
CR7-CATHODE	H3
CR8-ANODE	H6
CR8-CATHODE	H5
S1-1	H7
S1-2	H8
S1-2	S1-3
S1-4	H9
S2-3	H12
S2-3	S2-2
S2-4	H11
S2-5	H10
S2-6	H13
S2-7	S2-5
H23	H19
H21	H17
L1-Y	H29
L1-R OR GY	H30
L1-BK	H31
L2-Y	H26
L2-R OR GY	H27
L2-BK	H28



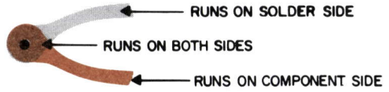
SOLDER SIDE
TYP. NUMBERING OF CONTACT FINGERS.
DETAIL "A"

LEAD IDENTIFICATION FOR Q1-Q18



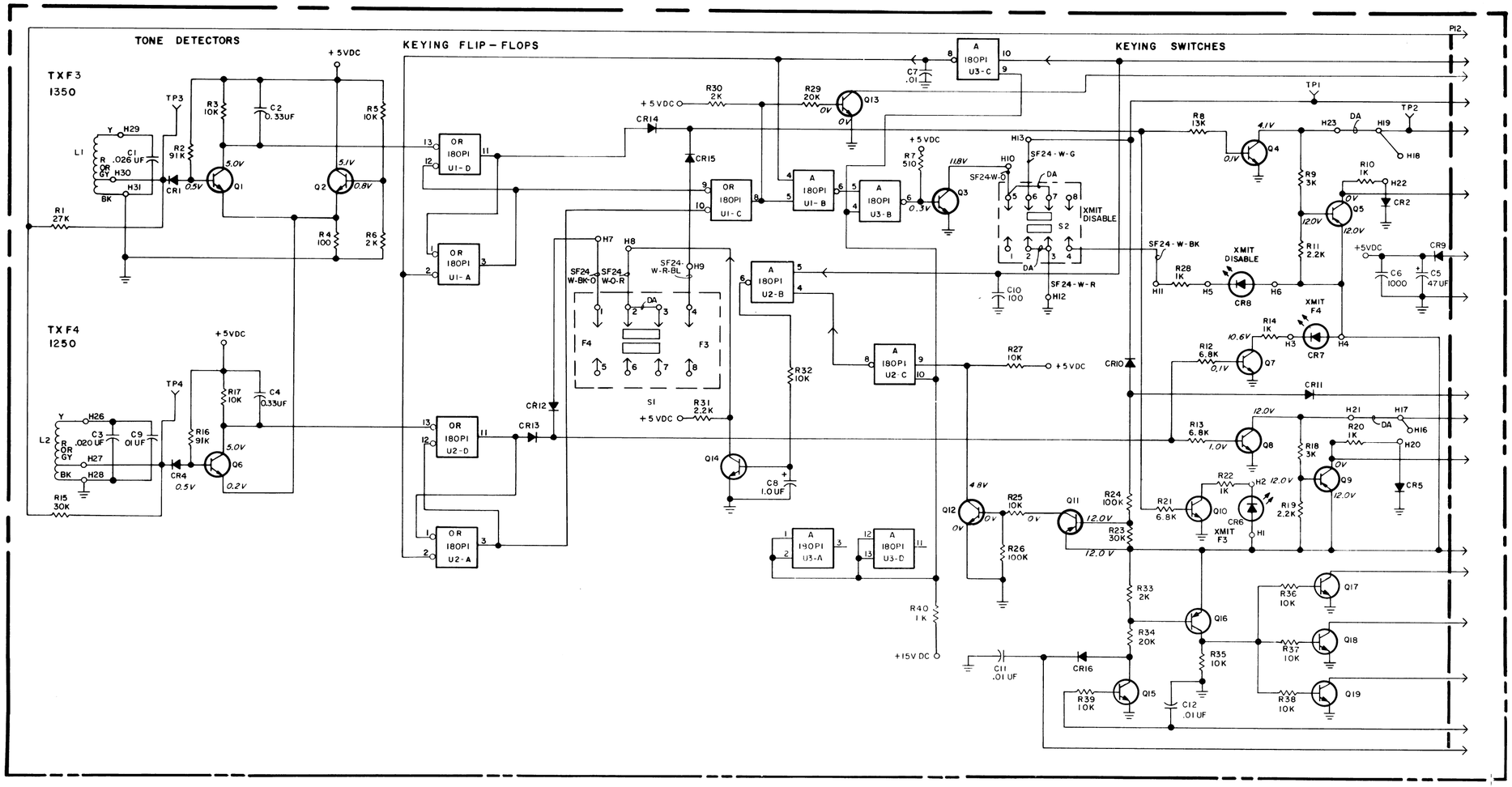
OR
IN-LINE TRIANGULAR
TOP VIEW

NOTE: LEAD ARRANGEMENT, AND NOT CASE SHAPE, IS DETERMINING FACTOR FOR LEAD IDENTIFICATION.



OUTLINE DIAGRAM

TRANSMITTER CONTROL BOARD 19D429082G1



NOTES:
1. PIN 7 OF ALL IC'S ARE CONNECTED TO GRD.
   PIN 14 OF ALL IC'S ARE CONNECTED TO +5VDC.
2. ALL VOLTAGE READINGS MEASURED WITH SECUR-IT TONE UNDETECTED.

ALL RESISTORS ARE 1/4 WATT UNLESS OTHERWISE SPECIFIED AND RESISTOR VALUES IN OHMS UNLESS FOLLOWED BY K=1000 OHMS OR MEG=1,000,000 OHMS. CAPACITOR VALUES IN PICOFARADS (EQUAL TO MICROMICROFARADS) UNLESS FOLLOWED BY UF=MICROFARADS. INDUCTANCE VALUES IN MICROHENRYS UNLESS FOLLOWED BY MH=MILLIHENRYS OR H=HENRYS.

(19R622328, Rev. 1)

IN ORDER TO RETAIN RATED EQUIPMENT PERFORMANCE, REPLACEMENT OF ANY SERVICE PART SHOULD BE MADE ONLY WITH A COMPONENT HAVING THE SPECIFICATIONS SHOWN ON THE PARTS LIST FOR THAT PART.

SEE APPLICABLE PRODUCTION CHANGE SHEETS IN INSTRUCTION BOOK SECTION DEALING WITH THIS UNIT, FOR DESCRIPTION OF CHANGES UNDER EACH REVISION LETTER.

THIS ELEM DIAG APPLIES TO

MODEL NO	REV LETTER
19D429082G1	A

SCHEMATIC DIAGRAM

TRANSMITTER CONTROL BOARD 19D429082G1

Issue 2

PARTS LIST

TRANSMITTER CONTROL BOARD
19D429082G1

ISSUE 3

SYMBOL	GE PART NO.	DESCRIPTION
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C1	19A116738P15	Polystyrene: 0.026 uF ±2.5%, 33 VDCW; sim to Mial Series 617.
C2	19A116080P10	Polyester: 0.33 uF ±20%, 50 VDCW.
C3	19A116738P14	Polystyrene: 0.020 uF ±20%, 50 VDCW.
C4	19A116080P10	Polyester: 0.33 uF ±20%, 50 VDCW.
C5	5496267P2	Tantalum: 47 uF ±20%, 6 VDCW; sim to Sprague Type 150D.
C6	5494481P111	Ceramic disc: 1000 pF ±20%, 1000 VDCW; sim to RMC Type JF Discap.
C7	7491827P102	Ceramic: 0.01 uF -30 +80%, 50 VDCW, sim to Sprague 19C180.
C8	5496267P17	Tantalum: 1.0 uF ±20%, 35 VDCW; sim to Sprague Type 150D.
C9	19A116738P3	Polystrene: 10,000 pF ±2.5%, 33 VDCW
C10	5490008P127	Silver mica: 100 pF ±10%, 500 VDCW, sim. to Electro Motive Type DM-15.
C11 and C12	19A116080P1	Polyester: 0.01 uF ±20%, 50 VDCW.
		- - - - - - - - - - DIODES - - - - - - - - - -
CR1 and CR2	19A115250P1	Silicon, fast recovery, 225 mA, 50 PIV.
CR4 and CR5	19A115250P1	Silicon, fast recovery, 225 mA, 50 PIV.
CR6 thru CR8	162B3011P0002	Diode, optoelectronic: red; sim to Hew. Packard 5082-4650.
CR9	T324ADP1041	Rectifier, silicon; general purpose.
CR10 thru CR16	19A115250P1	Silicon, fast recovery, 225 mA, 50 PIV.
		- - - - - - - - - - INDUCTORS - - - - - - - - - -
L1 and L2	19B205354G6	Coil. Includes:
	19B209407P4	Tuning slug.
	19B209407P101	Tuning slug.
		- - - - - - - - - PRINTED BOARDS - - - - - - - - -
P12		Part of printed board 19D429083P1.
		- - - - - - - - - - TRANSISTORS - - - - - - - - - -
Q1 and Q2	19A700023P1	Silicon, NPN; sim to Type 2N3904.
Q3	19A115300P4	Silicon, NPN.
Q4	19A700023P1	Silicon, NPN; sim to Type 2N3904.
Q5	19A700022P1	Silicon, PNP; sim to Type 2N3906.
Q6 thru Q8	19A700023P1	Silicon, NPN; sim to Type 2N3904.
Q9	19A700022P1	Silicon, PNP; sim to Type 2N3906.
Q10	19A700023P1	Silicon, NPN; sim to Type 2N3904.
Q11	19A700022P1	Silicon, PNP; sim to Type 2N3906.
Q12	19A700023P1	Silicon, NPN; sim to Type 2N3904.
Q13	19A116774P1	Silicon, NPN; sim to Type 2N5210.
Q14 and Q15	19A700023P1	Silicon, NPN; sim to Type 2N3904.
Q16	19A700022P1	Silicon, PNP; sim to Type 2N3906.
Q17 thru Q19	19A700023P1	Silicon, NPN; sim to Type 2N3904.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R1	19A700106P97	Composition: 27K ohms ±5%, 1/4 w.
R2	3R152P913J	Composition: 91K ohms ±5%, 1/4 w.
R3	19A700106P87	Composition: 10K ohms ±5%, 1/4 w.
R4	19A700106P39	Composition: 100 ohms ±5%, 1/4 w.
R5	19A700106P87	Composition: 10K ohms ±5%, 1/4 w.
R6	3R152P202J	Composition: 2K ohms ±5%, 1/4 w.
R7	3R152P511J	Composition: 510 ohms ±5%, 1/4 w.
R8	3R152P133J	Composition: 13K ohms ±5%, 1/4 w.
R9	3R152P302J	Composition: 3K ohms ±5%, 1/4 w.
R10	19A700106P63	Composition: 1K ohms ±5%, 1/4 w.
R11	19A700106P71	Composition: 2.2K ohms ±5%, 1/4 w.
R12 and R13	19A700106P83	Composition: 6.8K ohms ±5%, 1/4 w.
R14	19A700106P63	Composition: 1K ohms ±5%, 1/4 w.
R15	3R152P303J	Composition: 30K ohms ±5%, 1/4 w.
R16	3R152P913J	Composition: 91K ohms ±5%, 1/4 w.
R17	19A700106P87	Composition: 10K ohms ±5%, 1/4 w.
R18	3R152P302J	Composition: 3K ohms ±5%, 1/4 w.
R19	19A700106P71	Composition: 2.2K ohms ±5%, 1/4 w.
R20	19A700106P63	Composition: 1K ohms ±5%, 1/4 w.
R21	19A700106P83	Composition: 6.8K ohms ±5%, 1/4 w.
R22	19A700106P63	Composition: 1K ohms ±5%, 1/4 w.
R23	3R152P303J	Composition: 30K ohms ±5%, 1/4 w.
R24	19A700106P111	Composition: 100K ohms ±5%, 1/4 w.
R25	19A700106P87	Composition: 10K ohms ±5%, 1/4 w.
R26	19A700106P111	Composition: 100K ohms ±5%, 1/4 w.
R27	19A700106P87	Composition: 10K ohms ±5%, 1/4 w.
R28	19A700106P63	Composition: 1K ohms ±5%, 1/4 w.
R29	3R152P203J	Composition: 20K ohms ±5%, 1/4 w.
R30	3R152P202J	Composition: 2K ohms ±5%, 1/4 w.
R31	19A700106P71	Composition: 2.2K ohms ±5%, 1/4 w.
R32	19A700106P87	Composition: 10K ohms ±5%, 1/4 w.
R33	3R152P202J	Composition: 2K ohms ±5%, 1/4 w.
R34	3R152P203J	Composition: 20K ohms ±5%, 1/4 w.
R35 thru R39	19A700106P87	Composition: 10K ohms ±5%, 1/4 w.
R40	19A700106P63	Composition: 1K ohms ±5%, 1/4 w.
		- - - - - - - - - - SWITCHES - - - - - - - - - -
S1	19B209261P26	Slide: 2PTT, sim. to Switchcraft 46313LDH.
S2	19B209261P17	Slide: 2 PTT, sim. to Switchcraft 46313-TD4.
		- - - - - - - - - - TEST POINTS - - - - - - - - - -
TP1 thru TP4	19B211379P1	Spring (Test Point).
		- - - - - - - - - - INTEGRATED CIRCUITS - - - - - - - - - -
U1 thru U3	19A116180P1	Digital: QUAD 2-INPUT NAND GATE
		- - - - - - - - - - MISCELLANEOUS - - - - - - - - - -
	19B219702P4	Face panel.
	19B219690G1	Handle assembly.
	4036555P1	Insulator, washer: Nylon. (Used with Q3).
	19B201074P204	Tap screw, phillips POZIDRIV®: No. 4-40 x 1/4. (Secures S1 and S2).
	4032480P1	Nut, sheet spring: sim to Vector Electronic Co. No. 440. (Secures S1 and S2).

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

PRODUCTION CHANGES

Changes in the equipment to improve performance or to simplify circuits are identified by a "Revision Letter," which is stamped after the model number of the unit. The revision stamped on the unit includes all previous revisions. Refer to the Parts List for descriptions of parts affected by these revisions.

REV. A - To prevent control falsing. Changed printed pattern board to allow Q13 to disable the window one-shot.