MOBILE RADIO

LBI30715
(DF4098)

INSTRUCTIONS

FOR

CHANNEL GUARD FILTER & AUDIO ATTENUATOR BOARDS 19C328028G1 & G3

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DESCRIPTION

The 19C328028 Channel Guard Filter is used in MASTR® II Remote Control Base Stations to attenuate frequencies below 203.5 Hertz. This prevents the Channel Guard tone from being applied to the audio pair. The audio attenuator circuit is used only in systems utilizing separate receivers. When these separate receivers have Channel Guard, the 19C328028G1 board (which contains both the filter and the attenuator) is used. If the separate receivers are not equipped with Channel Guard, the 19C328028G3 board (which contains only the attenuator) is used. The boards plug into the station Audio Board at J3 and J4 or the Auxiliary Receiver System Board at P906 and P907.

AUDIO ATTENUATOR ADJUSTMENT

The audio attenuator may be adjusted for the desired attenuation (between -6 dB and -30 dB). To adjust the attenuation level:

1. Connect an audio oscillator between J1-1 and J2-2 on the board. Set the oscillator to 1 kHz at 1.0 volt rms.
2. Check output at J2-3. Adjust R23 for desired attenuation.
3. Ground J1-2. Full audio should be available at J2-3.

CIRCUIT ANALYSIS

Channel Guard Filter

Audio and tone are applied to the Channel Guard Filter input (J1-1) from the Audio or System board. The audio is coupled to the 187 Hertz NOTCH FILTER composed of Q1, Q2 and associated circuitry. Negative feedback for the NOTCH FILTER is connected from the collector of Q2 to the junction of C2-R2.

The NOTCH FILTER output is applied to a LOW-PASS FILTER consisting of Q3 and Q4. Negative feedback is developed across R12. The output of Q3 is coupled to the output lead J2-3 (in the 19C328082G2 board) or to the base of Q5 (in the 19C328082G1 board) and returned to the Audio or System Board.

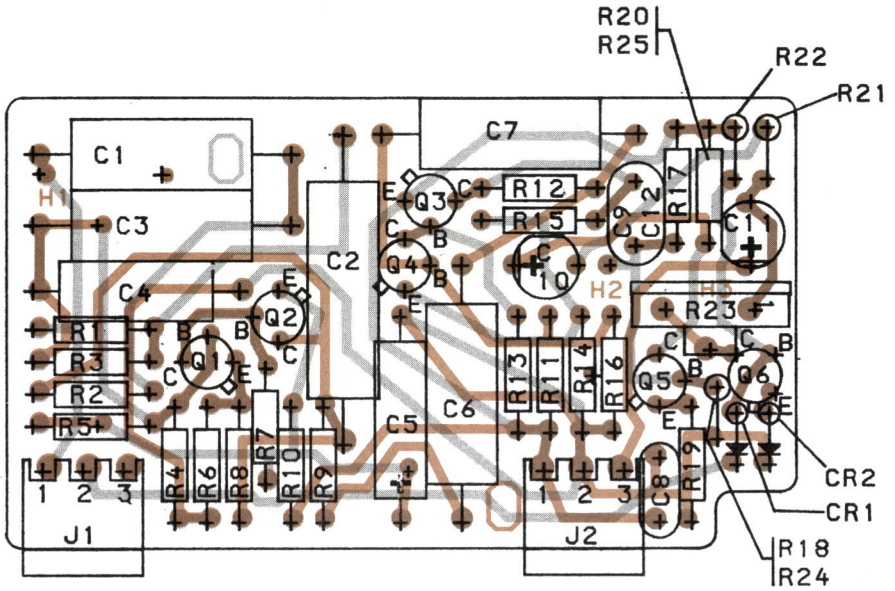
Audio Attenuator

Where separate receivers are used in the remote system, the pre-set attenuator output (adjustable from -6 dB to -30 dB minimum) keeps each of the receiver audio paths attenuated. When a transmit tone is detected (F1, for example), the RX F1 lead from the Receiver Control Board is grounded, disabling Q6 in the attenuator. This allows Q5 in the attenuator to pass the full audio level of the F1 receiver. The remaining attenuators hold their respective receiver audio outputs at the pre-set attenuated level.

MOBILE RADIO DEPARTMENT
GENERAL ELECTRIC COMPANY • LYNCHBURG, VIRGINIA 24502

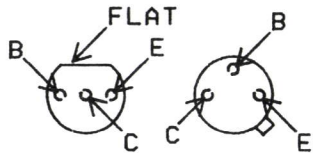
GENERAL ELECTRIC

CONNECTION CHART			
FROM	TO	WIRE	REMARKS
H1	H2	SF22-W	GP.3 ONLY
H2	H3	SF22-W	GP.2 ONLY



(19C328031, Rev. 0)
(19B232324, Sh. 1, Rev. 0)
(19B232324, Sh. 2, Rev. 0)

LEAD IDENTIFICATION
FOR Q2 AND Q3



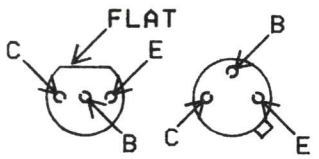
OR

IN-LINE TRIANGULAR

TOP VIEW

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

LEAD IDENTIFICATION
FOR Q1, Q4, Q5 AND Q6

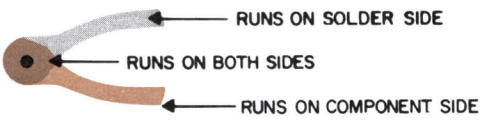


OR

IN-LINE TRIANGULAR

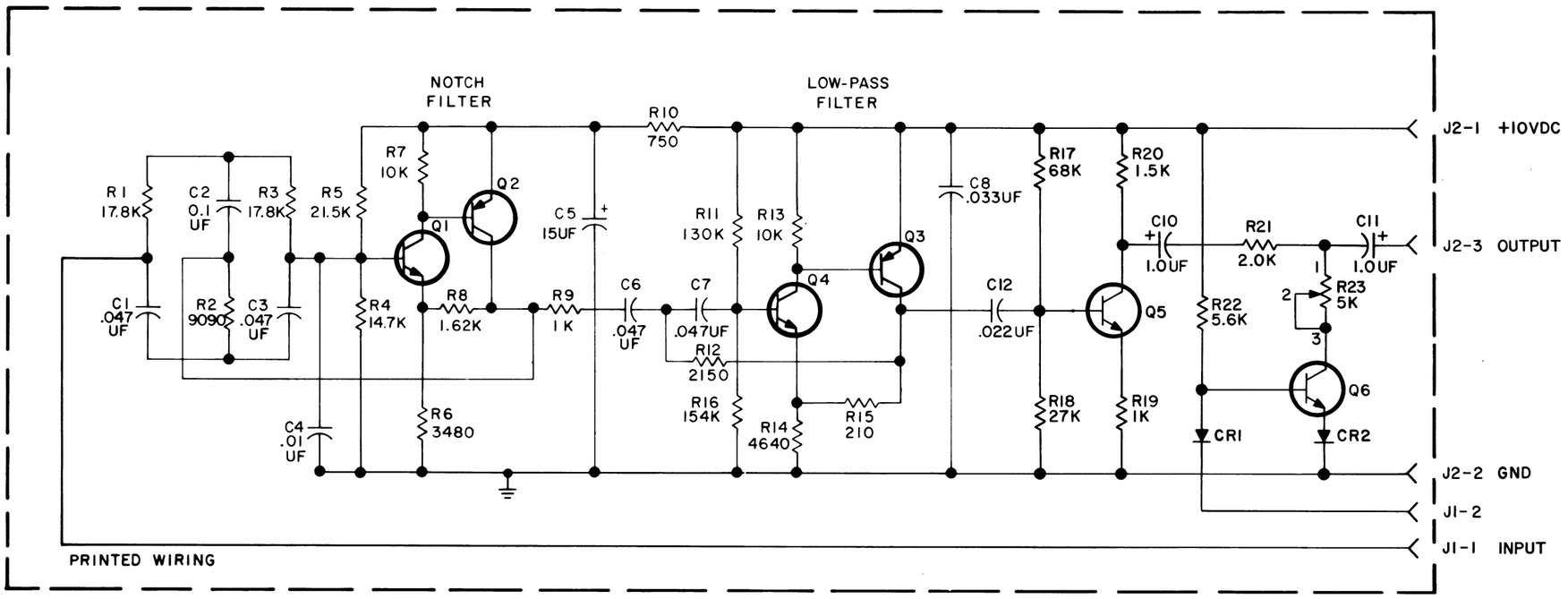
TOP VIEW

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



OUTLINE DIAGRAM

CHANNEL GUARD FILTER &
ATTENUATOR 19C328028



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.

(19C328030, Rev. 0)

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.

THIS ELEM DIAG APPLIES TO	
MODEL NO	REV LETTER
PL19C328028G1	

SCHEMATIC DIAGRAM

CHANNEL GUARD FILTER & ATTENUATOR 19C328028G1

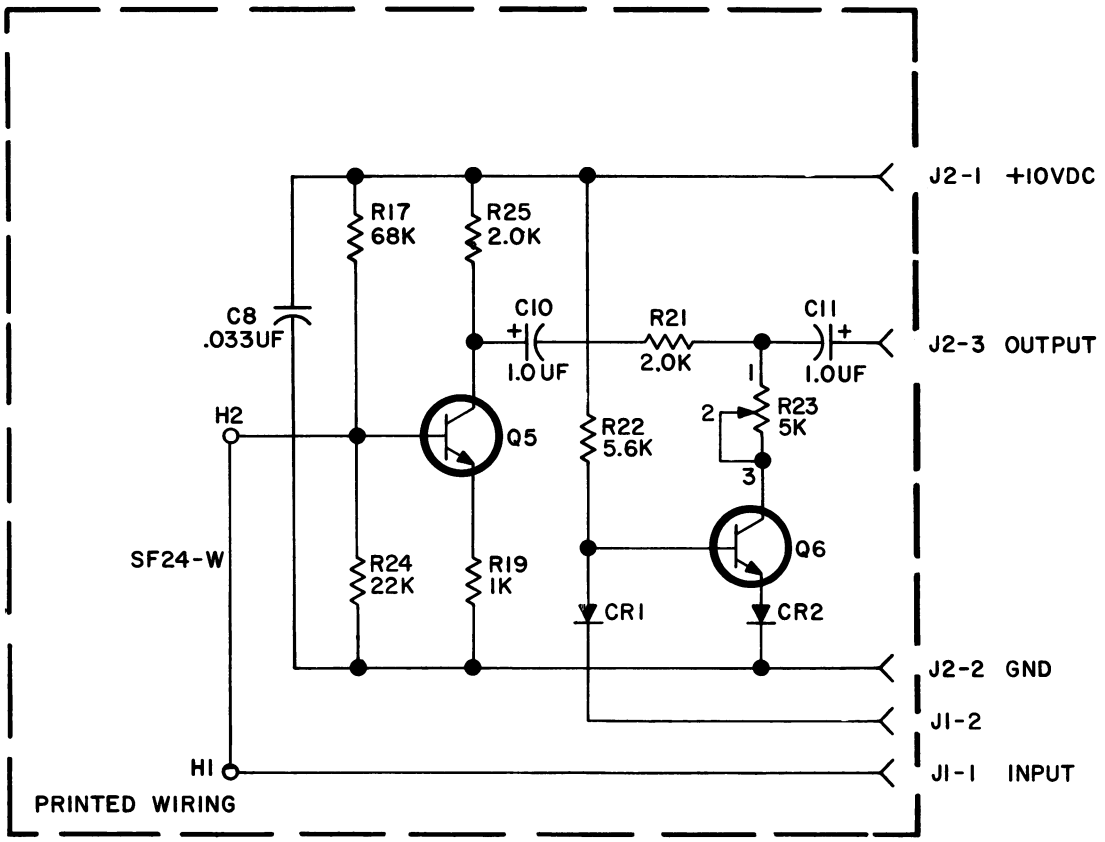
Issue 1

PARTS LIST

CHANNEL GUARD FILTER AND AUDIO ATTENUATOR
19C328028G1

SYMBOL	GE PART NO.	DESCRIPTION
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C1	19C300075P47001G	Polyester: 7500 pf ±2%, 100 VDCW; sim to GE Type 61F.
C2	19C300075P10002G	Polyester: 1000 pf ±2%, 100 VDCW; sim to GE Type 61F.
C3	19C300075P47001G	Polyester: 470 pf, ±2%, 100 VDCW; sim to GE Type 61F.
C4	19C300075P10001G	Polyester: 100 pf, ±2%, 100 VDCW; sim to GE Type 61F.
C5	5496267P14	Tantalum: 15 µf ±20%, 20 VDCW; sim to Sprague Type 150D.
C6 and C7	19C300075P47001G	Polyester: 470 pf, ±2%, 100 VDCW; sim to GE Type 61F.
C8	19A116080P4	Polyester: 0.033µf ±20%, 50 VDCW.
C10 and C11	19A134202P14	Tantalum: 1 µf ±20±, 35 VDCW.
C12	19A116080P103	Polyester: 0.022 µf ±10%, 50 VDCW.
		- - - - - - - - - - - - DIODES - - - - - - - - - -
CR1 and CR2	19A115250P1	Silicon, fast recovery, 225 mA, 50 PIV.
		- - - - - - - - - - - CONNECTORS - - - - - - - - -
J1 and J2	19A116659P5	Connector, printed wiring: 3 contacts; sim to Molex 09-52-3031.
		- - - - - - - - - - TRANSISTORS - - - - - - - - -
Q1	19A116774P1	Silicon, NPN.
Q2 and Q3	19A115768P1	Silicon, PNP; sim to Type 2N3702.
Q4	19A116774P1	Silicon, NPN,
Q5 and Q6	19A115910P1	Silicon, NPN; sim to Type 2N3904.
		- - - - - - - - - - - RESISTORS - - - - - - - - - -
R1	19C314256P21782	Metal film: 17.8K ohms ±1%, 1/4 w.
R2	19C314256P29091	Metal film: 9.09K ohms ±1%, 1/4 w.
R3	19C314256P21782	Metal film: 17.8K ohms ±1%, 1/4 w.
R4	19C314253P21472	Metal film: 14.7K ohms ±1%, 1/4 w.
R5	19C314256P22152	Metal film: 21.5K ohms ±1%, 1/4 w.
R6	19C314256P23481	Metal film: 3.48K ohms ±1%, 1/4 w.
R7	3R152P103J	Composition: 10K ohms ±5%, 1/4 w.
R8	19C314256P21621	Metal film: 1.62K ohms ±1%, 1/4 w.
R9	19C314256P21001	Metal film: 1K ohms ±1%, 1/4 w.
R10	3R152P751J	Composition: 750 ohms, ±5%, 1/4 w.
R11	19C314256P21303	Metal film: 130K ohms, ±1%, 1/4 w.
R12	19C314256P22151	Metal film: 2.15K ohms, ±1%, 1/4 w.
R13	3R152P103J	Composition: 10K ohms, ±5%, 1/4 w.
R14	19C314256P24641	Metal film: 4.64K ohms, ±1%, 1/4 w.
R15	19C314256P22100	Metal film: 210 ohms, ±1%, 1/4 w.
R16	19C314256P21543	Metal film: 154K ohms, ±1%, 1/4 w.
R17	3R152P683J	Composition: 68K ohms, ±5%, 1/4 w.
R18	3R152P273J	Composition: 73K ohms, ±5%, 1/4 w.
R19	3R152P102J	Composition: 1K ohms, ±5%, 1/4 w.
R20	3R152P152J	Composition: 1.5K ohms, ±5%, 1/4 w.
R21	3R152P202J	Composition: 2K ohms, ±5%, 1/4 w.
R22	3R152P562J	Composition: 5.6K ohms, ±5%, 1/4 w.
R23	19B209353P105	Variable, carbon film: approx 200 to 5K ohms ±10%, 0.25 w; sim to CTS Type U-201.

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES.



(19C328034, Rev. 0)

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.

THIS ELEM DIAG APPLIES TO	
MODEL NO	REV LETTER
PL19C328028G3	

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.

SCHEMATIC DIAGRAM

AUDIO ATTENUATOR
19C328028G3

PARTS LIST

AUDIO ATTENUATOR
19C328028G3

SYMBOL	GE PART NO.	DESCRIPTION
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C8	19A116080P4	Polyester: 0.033µf ±20%, 50 VDCW.
C10 and C11	19A134202P14	Tantalum: 1 µf ±20±, 35 VDCW.
		- - - - - - - - - - - - DIODES - - - - - - - - - -
CR1 and CR2	19A115250P1	Silicon, fast recovery, 225 mA, 50 PIV.
		- - - - - - - - - - - CONNECTORS - - - - - - - - -
J1 and J2	19A116659P5	Connector, printed wiring: 3 contacts; sim to Molex 09-52-3031.
		- - - - - - - - - - TRANSISTORS - - - - - - - - -
Q5 and Q6	19A115910P1	Silicon, NPN; sim to Type 2N3904.
		- - - - - - - - - - - RESISTORS - - - - - - - - -
R17	3R152P683J	Composition: 68K ohms, ±5%, 1/4 w.
R19	3R152P102J	Composition: 1K ohms, ±5%, 1/4 w.
R21	3R152P202J	Composition: 2K ohms, ±5%, 1/4 w.
R22	3R152P2562J	Composition: 5.6K ohms, ±5%, 1/4 w.
R23	19B209358P105	Variable, carbon film: approx 200 to 5K ohms ±10%, 0.25 w; sim to CTS Type U-201.
R24	3R152P223J	Composition: 22K ohms ±5%, 1/4 w.
R25	3R152P202J	Composition: 2K ohms ±5%, 1/4 w.

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES.