MAINTENANCE MANUAL

150.8—174 MHz OSCILLATOR-MULTIPLIER BOARD 19C328281G1

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DESCRIPTION

The oscillator-multiplier board (osc/mult) for MASTR® Executive II RCC high-band receivers contains two multiplier stages and an amplifier. The crystal frequency output of the multi-frequency board is multiplied twelve times by the osc/mult board and amplified to provide a low side injection frequency to the mixer.

CIRCUIT ANALYSIS

With the radio turned on and the PTT switch released, the selected oscillator on the multi-frequency board applied an input to the osc/mult board at P2301 (via cable W402) to the base of the Class C multiplier Q401. The collector tank circuit of Q401 (L401, C406 and C407) is tuned to four times the crystal frequency.

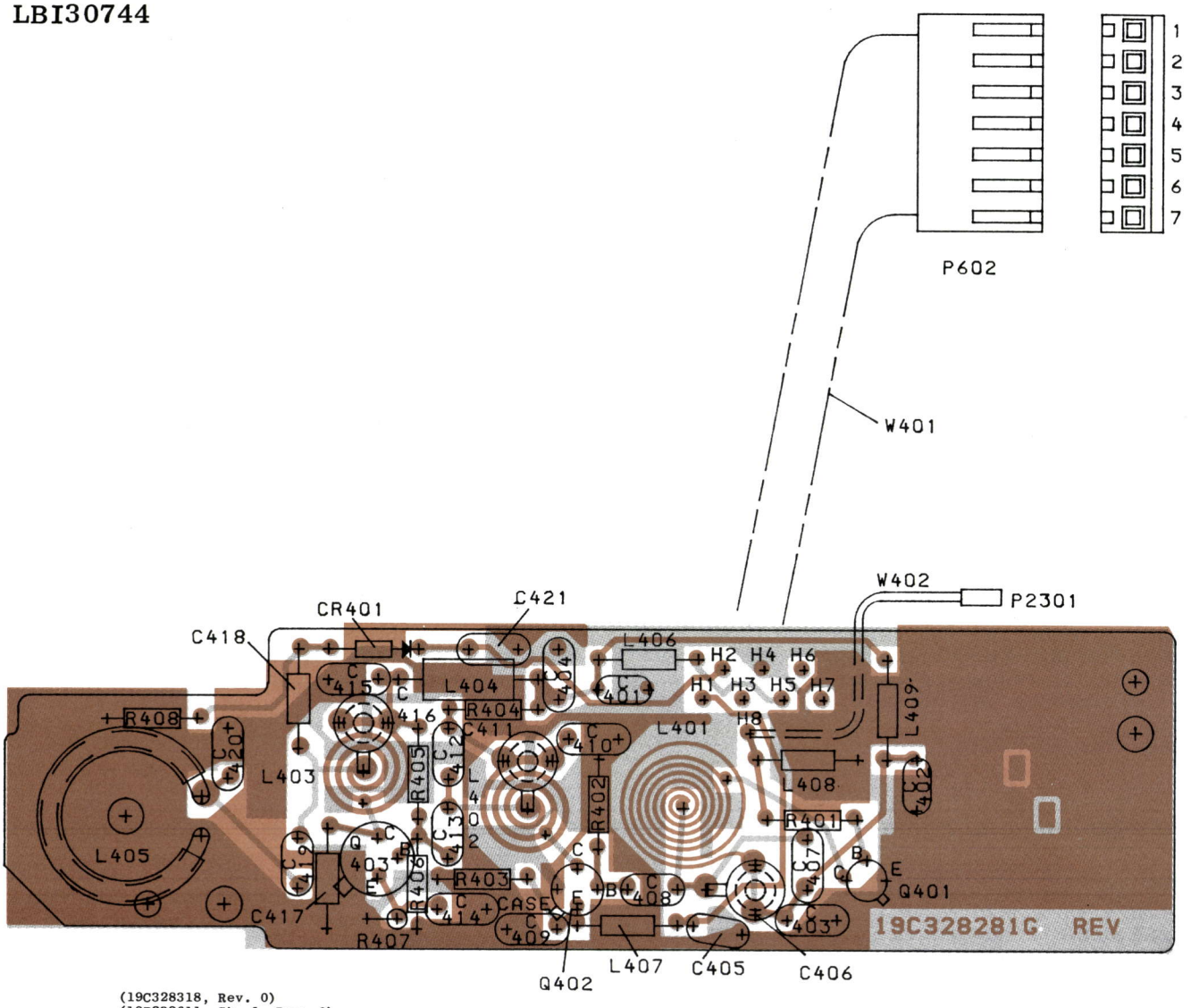
The output of the multiplier stage is coupled to the base of Class C multiplier Q402. The collector tank circuit of Q402 (L402, C411 and C412) is tuned to twelve times the crystal frequency. The output of the multiplier stage is metered across R403 and applied to receiver metering jack J601 through P602-3.

Following the multiplier is a Class A amplifier stage Q403. The output of Q403 is metered through a metering network consisting of C418, C421, CR401 and R408 and applied to receiver metering jack J601 through P602-4. The amplifier output of Q403 is applied to a tuned circuit (L403 and C416) that is tuned to twelve times the crystal frequency. The tuned circuit provides additional selectivity in the oscillator-multiplier chain.

The output of the oscillator-multiplier board is inductively coupled through L405 and two helical resonators on the RF assembly to the input of the mixer stage.

MOBILE RADIO DEPARTMENT
GENERAL ELECTRIC COMPANY • LYNCHBURG, VIRGINIA 24502

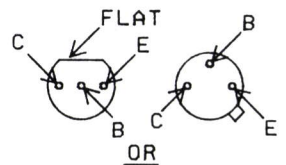
GENERAL ELECTRIC



(19C328318, Rev. 0)
(19B232611, Sh. 1, Rev. 0)
(19B232611, Sh. 2, Rev. 0)

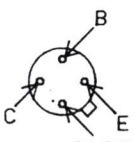
LEAD IDENTIFICATION

FOR Q401 AND Q403



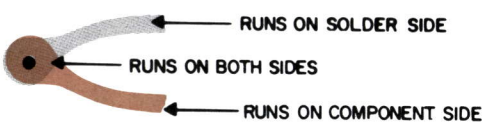
IN-LINE OR TRIANGULAR

FOR Q402



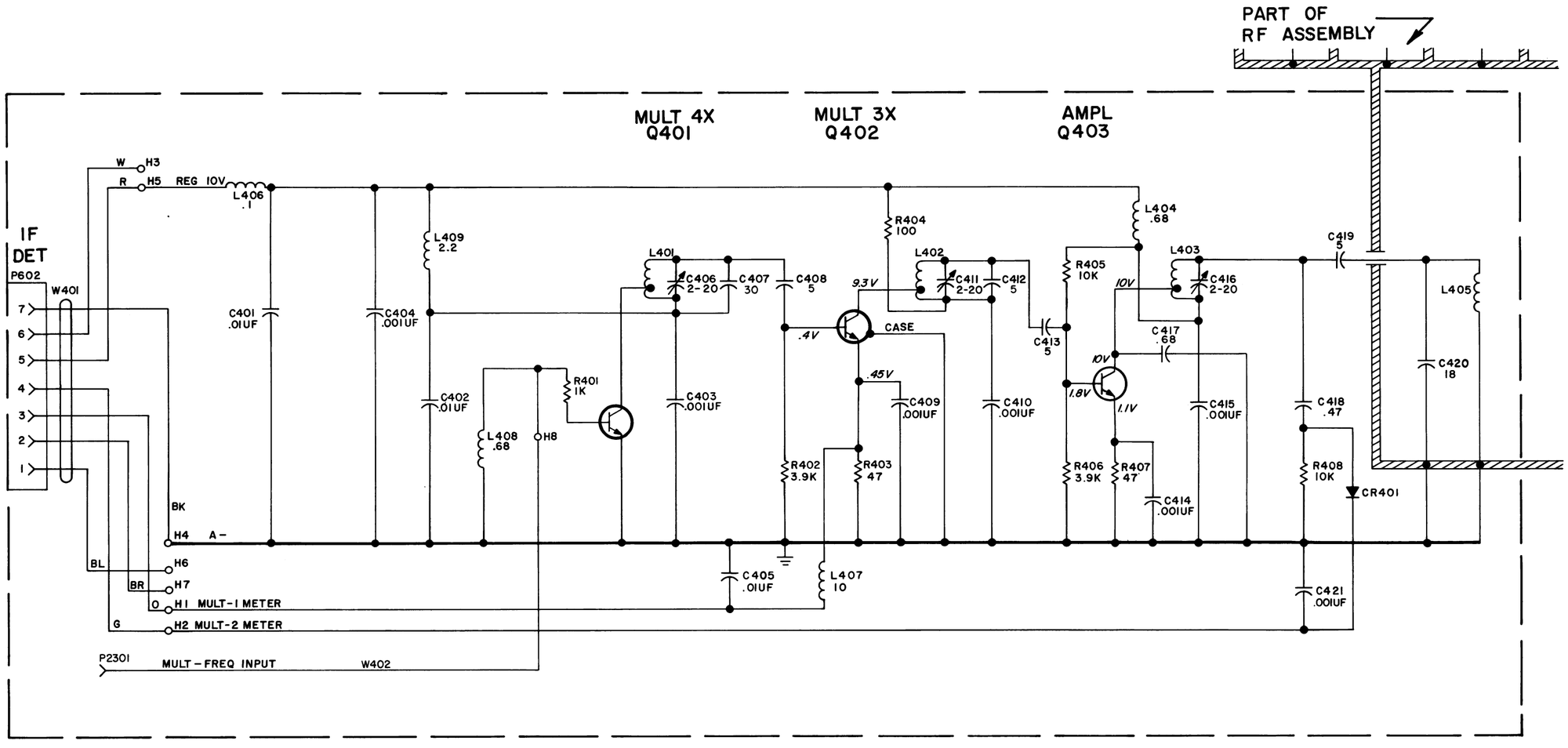
TOP VIEW

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



OUTLINE DIAGRAM

OSCILLATOR/MULTIPLIER
BOARD 19C328281G1



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.

(19D429384, Rev. 0)

OSC / MULT	REV LETTER	FREQ RANGE (MHz)
19C328281G1		

VOLTAGE READINGS

VOLTAGE READING ARE TYPICAL READINGS MEASURED TO SYSTEM NEGATIVE (P903-10) WITH TEST SET MODEL 4EX3A11 OR A 20,000 OHM-PER-VOLT METER.

SCHEMATIC DIAGRAM

OSCILLATOR/MULTIPLIER BOARD 19C328281G1

PARTS LIST

150.8-174 MHz OSCILLATOR-MULTIPLIER BOARD
19C328281G1

SYMBOL	GE PART NO.	DESCRIPTION
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C402 and C402	19A116080P101	Polyester: 0.01 µf ±10%, 50 VDCW.
C403 and C404	19A116655P19	Ceramic disc: 1000 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
C405	19A116080P101	Polyester: 0.01 µf ±10%, 50 VDCW.
C406	19B209351P2	Variable, ceramic: 2.5 to 20 pf, 200 VDCW, temp coef -250 +700 PPM/°C; sim to Matshushita ECV-1ZW20P32.
C407	19A116656P30J8	Ceramic disc: 0.5 pf ±5%, 500 VDCW; temp coef 80 PPM.
C408	19A116656P5J0	Ceramic disc: 0.5 pf ±5%, 500 VDCW; temp coef 0 PPM.
C409 and C410	19A116655P19	Ceramic disc: 1000 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
C411	19B209351P2	Variable, ceramic: 2.5 to 20 pf, 200 VDCW, temp coef -250 +700 PPM/°C; sim to Matshushita ECV-1ZW20P32.
C412	19A116656P5J0	Ceramic disc: 0.5 pf ±5%, 500 VDCW; temp coef 0 PPM.
C413	19A116656P5K0	Ceramic disc: 5 pf ±10%, 500 VDCW; temp coef 0 PPM.
C414 and C415	19A116655P19	Ceramic disc: 1000 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
C416	19B209351P2	Variable, ceramic: 2.5 to 20 pf, 200 VDCW, temp coef -250 +700 PPM/°C; sim to Matshushita ECV-1ZW20P32.
C417	5491601P117	Phenolic: 0.68 pf ±5%, 500 VDCW.
C418	5491601P13	Phenolic: 0.47 pf ±10%, 500 VDCW.
C419	19A116656P5J0	Ceramic disc: 0.5 pf ±5%, 500 VDCW, temp coef 0 PPM.
C420	19A116656P18J0	Ceramic disc: 180 pf ±5%, 500 VDCW, temp coef 0 PPM.
C421	19A116655P19	Ceramic disc: 1000 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
		- - - - - - - - - DIODES AND RECTIFIERS - - - - -
CR401	19A116052P5	Silicon, capacitive.
		- - - - - - - - - - - INDUCTORS - - - - - - - - -
L401 thru L403		Part of printed board 19D429382P1.
L404	7488079P5	Choke, RF: 0.68 µh ±10%, 0.15 ohms DC res max; sim to Jeffers 4411-5.
L405	19A129280P1	Coil, hi-band.
L406	19B209420P101	Coil, RF: 0.10 µh ±10%, 0.08 ohms DC res max; sim to Jeffers 4416-1.
L407	19B209420P125	Coil, RF: 10.0 µh ±10%, 3.10 ohms DC res max; sim to Jeffers 4446-4.
L408	19B209420P111	Coil, RF: 0.68 µh ±10%, 0.54 ohms DC res max; sim to Jeffers 4426-4.
L409	19B209420P117	Coil, RF: 2.20 µh ±10%, 0.38 ohms DC res max; sim to Jeffers 4436-4.
		- - - - - - - - - - - PLUGS - - - - - - - - - - -
P602		Part of W401.
P2301		Part of W402.
		- - - - - - - - - - TRANSISTORS - - - - - - - - - -
Q401	19A116860P1	Silicon, NPN; sim to Type 2N4996.
Q402	19A115440P1	Germanium, PNP.
Q403	19A115329P2	Silicon, NPN.
		- - - - - - - - - - RESISTORS - - - - - - - - - - -
R401	3R152P102J	Composition: 1K ohms ±5%, 1/4 w.
R402	3R152P392J	Composition: 3.9K ohms ±5%, 1/4 w.
R403	3R152P470J	Composition: 47 ohms ±5%, 1/4 w.
R404	3R152P101J	Composition: 100 ohms ±5%, 1/4 w.
R405	3R152P103J	Composition: 10K ohms ±5%, 1/4 w.
R406	3R152P392J	Composition: 3.9K ohms ±5%, 1/4 w.
R407	3R152P470J	Composition: 470 ohms ±5%, 1/4 w.
R408	3R152P103J	Composition: 10K ohms ±5%, 1/4 w.
		- - - - - - - - - - CABLES - - - - - - - - - - -
W401		CABLE ASSEMBLY 19B226965G1
P602		Connector. Includes:
	19A116659P82	Shell.
	19A116781P6	Contact, electrical: wire range No. 22-26 AWG; sim to Molex 08-50-0108. (Quantity 7).
W402	19A129947G2	Approx. 3 inches long. (Includes 19A127042P2 plug P2301).
		- - - - - - - - - MISCELLANEOUS - - - - - - - - -
	4031594P1	Insulator. (Used with C406, C411, C416).
	4036555P1	Insulator. (Used with Q403).

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES