

## Master Frequency Generator/Top Octave Generator

### FEATURES

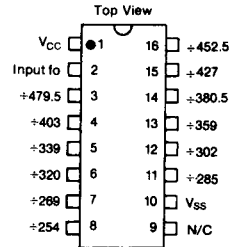
- Wide input frequency range: 100kHz to 4.5MHz
- Single power supply
- Full musical scale on one chip
- Low impedance push-pull outputs
- Zener protected input
- AY-3-0214: 12 outputs — 50% Duty Cycle (Highest accuracy)
- AY-3-0215: 13 outputs — 50% Duty Cycle

### DESCRIPTION

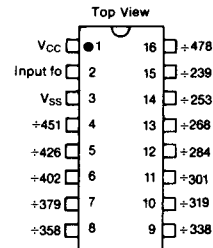
The General Instrument M.F.G./T.O.G. is a digital tone generator which produces, from a single input frequency, 12 or 13 semitone outputs fully spanning the equal tempered scale. When used in conjunction with an oscillator and frequency dividers such as the General Instrument AY-1-5050, a system may be configured which generates all the frequencies required by an electronic music synthesizer.

### PIN CONFIGURATION

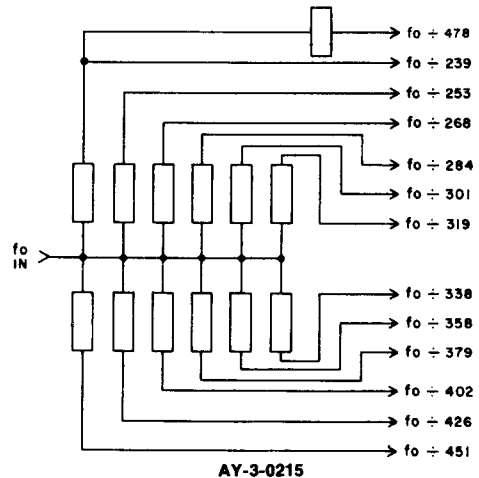
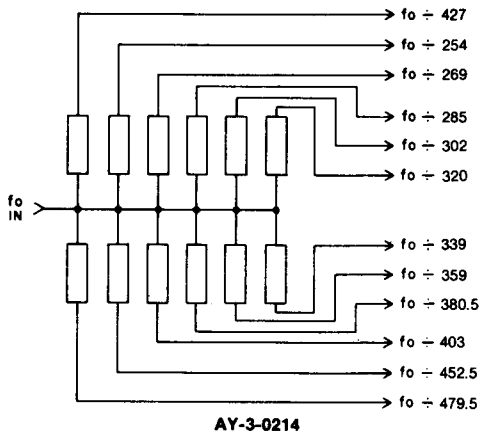
16 LEAD DUAL IN LINE  
AY-3-0214



16 LEAD DUAL IN LINE  
AY-3-0215



### BLOCK DIAGRAMS





**ELECTRICAL CHARACTERISTICS**

**Maximum Ratings\***

Voltage on any pin with respect to  $V_{SS}$  ..... +20 to -0.3  
 Storage Temperature ..... -55°C to +150°C  
 Operating Temperature ( $T_A$ ) ..... 0°C to +50°C

\*Exceeding these ratings could cause permanent damage. Functional operation of these devices at these conditions is not implied—operating ranges are specified below.

**Standard Conditions** (unless otherwise noted)

$V_{SS}$  = GND  
 $V_{CC}$  = +10V to +16V

Characteristic	Min	Typ**	Max	Units	Conditions
<b>Clock Input</b>					
Low	0.0	—	0.8	V	
High	$V_{CC} - 3.0$	$V_{CC}$	$V_{CC}$	V	
Frequency	100	—	4500	kHz	
Rise Time	—	—	30	ns	4.5MHz
Fall Time	—	—	30	ns	4.5MHz
Duty Cycle	40	50	60	%	
Capacitance	—	—	10	pF	
<b>Outputs</b>					
High	$V_{CC} - 1.5$	—	$V_{CC}$	V	0.25mA
Low	0.0	—	0.5	V	0.7mA
Fall Time	—	—	2.5	$\mu$ s	20K & 500 pF to 16V
Rise Time	—	—	2.5	$\mu$ s	20K & 500 pF to $V_{SS}$ when $V_{CC} \leq 16V$
Duty Cycle	—	50	—	%	
<b>Supply current</b>	—	—	120	mA	16V, 4.5MHz, 25°C

\*\*Typical values are at +25°C and nominal voltages.

**TIMING DIAGRAMS**



Fig. 1 TYPICAL EVEN DIVISOR N = 404



Fig. 2 TYPICAL ODD DIVISOR N = 403

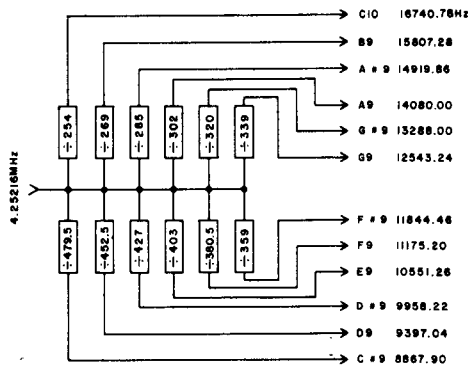


Fig. 3 TYPICAL EVEN PLUS 0.5 DIVISOR N = 452.5

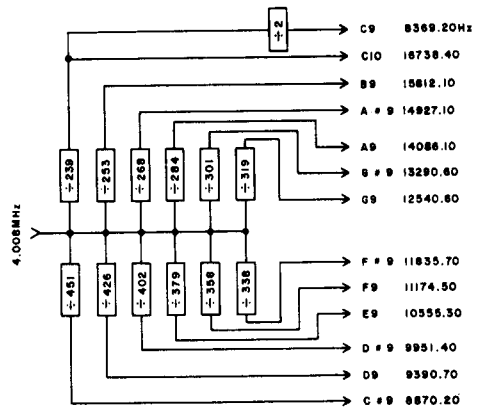


Fig. 4 TYPICAL ODD PLUS 0.5 DIVISOR N = 479.5

**TYPICAL APPLICATIONS**



AY-3-0214



AY-3-0215

ENTER-TAINMENT