

*6/30/83 per Rosie parts are obsolete*

## MC6860 (MOTOROLA) INTERFACE AND RECEIVE FILTER CIRCUIT

(300 BAUD MODEM/ACOUSTIC COUPLER APPLICATION.)

### GENERAL DESCRIPTION

The CH1230 is designed to interface with the Motorola MC6860 providing the user with a low cost modem. The system can be used with or without an acoustic coupler, depending on the users application. When used without an acoustic coupler we recommend using a CH1262 Transmit Filter between the TX carrier output of the MC6860 and the telephone to meet FCC regulations.

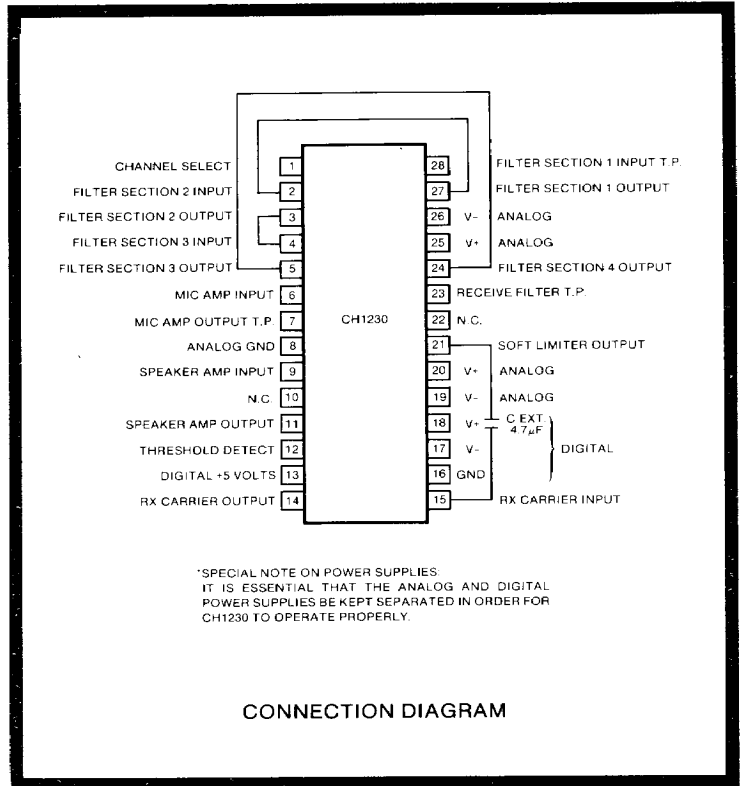
### MC6860

The MC6860 is an N-MOS device, using single power supplies up to +7.0V. Compatible with TTL or low-voltage MOS, the MC6860 contains all supervisory control (hand-shaking) functions for compatibility with 1001 A/B series data couplers and is frequency compatible with 100 series data sets.

The FSK output of the MC6860 is a digitally synthesized sinusoid of high harmonic content and requires filtering for virtually all applications. The demodulator FSK input requires a hard-limited carrier but is relatively level insensitive. Received data typically exhibits a minimum 12% P-P jitter-like variation due to digital low-pass filtering.

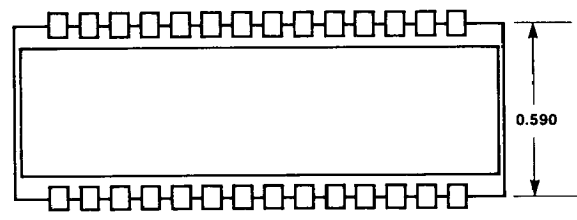
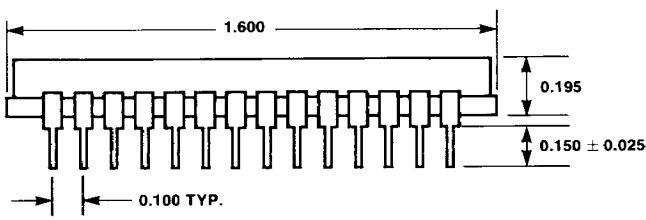
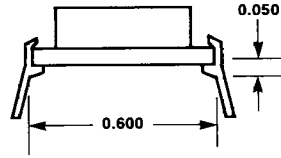
For additional information on the MC6860 device, refer to Motorola Semiconductor's MC6860 application note (ADI-300R1).

Figure 1 shows a function block diagram of the CH1230 and MC6860 interconnections for use with an acoustic coupler. Figure 2 shows the waveforms for the points indicated in Figure 1. Figure 3 shows the CH1230 and MC6860 using a CH1262 Transmit Filter/Line Hybrid for direct connect applications.



CONNECTION DIAGRAM

*105*  
*004553*  
*4553* *A*  
*ORIV*  
*CEA*



## MC6860 RECEIVE FILTER AND INTERCONNECT CIRCUITRY

The CH1230 consists of a microphone input amplifier, a speaker output amplifier, an eight-pole two-channel band-pass filter, a high gain soft limiter, and two LM311 voltage comparators.

The microphone input and speaker output amplifiers were designed to interface with an acoustic coupler. The microphone input is tied to an external 68pF capacitor and a 220kohm resistor in parallel to ground, to filter out high frequency noise spikes associated with acoustic couplers. The speaker output is tied through an external trim pot and 1.0μF capacitor to allow the input impedances to the acoustic coupler to be matched.

The bandpass section passes the received signal with extremely low distortion within the selected 300Hz bandwidth. Center frequency (1170Hz or 2125Hz) is chosen by application of the appropriate DC voltage to the channel select pin. Adjacent channel rejection at 1170Hz is greater than 60dB when measured at 2125Hz. The nominal midband gain of the filter section is 20dB.

The soft limiter provides 28.8dB additional gain for the threshold level and is useful when configuring a carrier detector.

The two LM311 voltage comparators are used in the threshold detect and receive carrier sections. The threshold detect section is designed to toggle from +5 volts to 0 volts at a level of -66dB. The receive carrier section has a TTL FSK'd squarewave output.

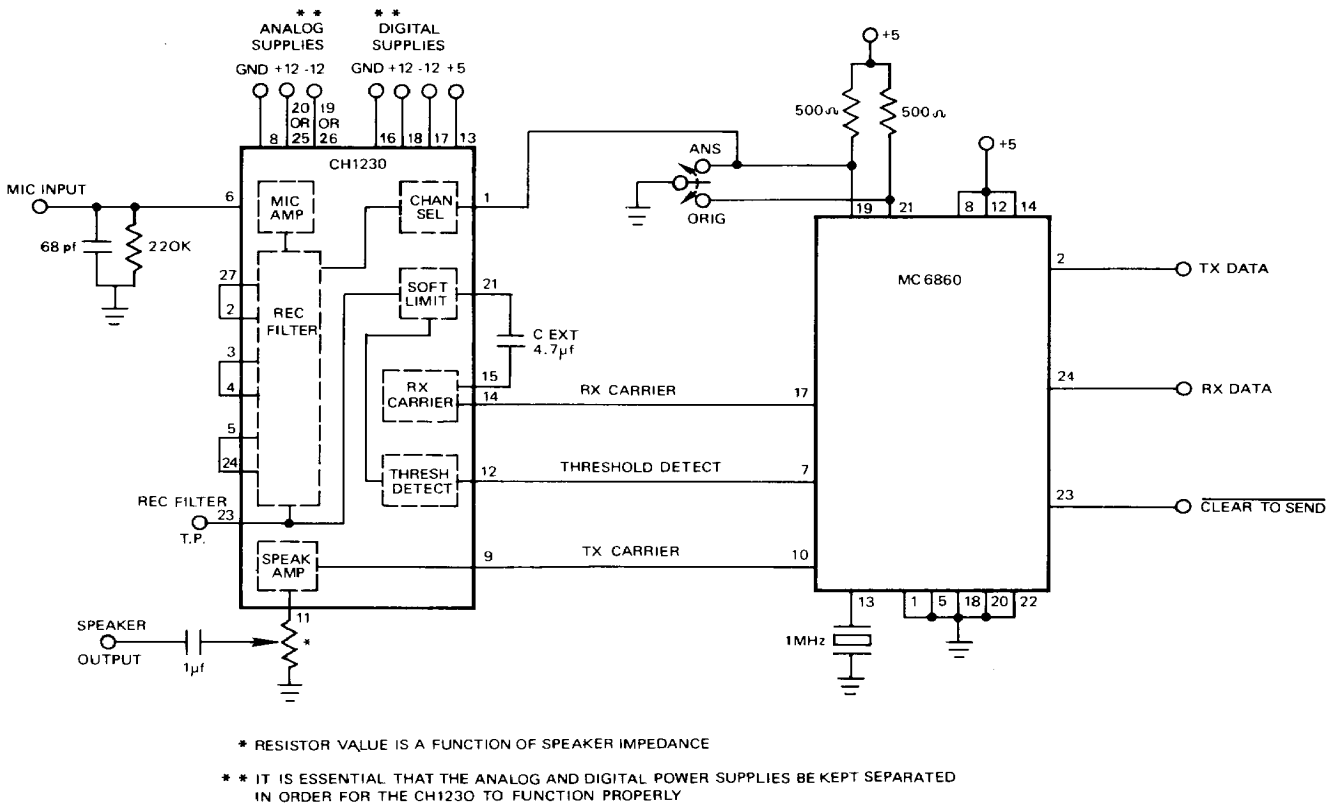
### ABSOLUTE MAXIMUM RATINGS

Supply Voltages	
Analog Supplies	±6Vdc to ±18Vdc
Digital Supplies	±6Vdc to ±18Vdc
+5 Volt Supply	+3Vdc to +7Vdc
Operating Temp. Range	0°C to +70°C
Storage Temp. Range	-25°C to +85°C

### OPERATING CHARACTERISTICS

Test Conditions: V+ = +12Vdc, V- = -12Vdc, +5 Volt Supply = +5Vdc, Ta = 25°C.

Parameter	Min.	Typ.	Max.	Units
<b>Filter Section</b>				
Center Frequency				
Originate Mode (V select = 5V)	1160	1170	1180	Hz
Answer Mode (V select = 0V)	2115	2125	2135	Hz
Voltage Gain		20		dB
Bandwidth (-3dB)	275	285	300	Hz
Gain Difference		0.5	1.5	dB
Adjacent Channel Attenuation				
Originate Mode (f = 2025)	48	50		dB
Answer Mode (f = 1270)	60	64		dB
Passband Ripple		0.5		dB
Channel Select Voltage				
Originate	+5		+V	Vdc
Answer	-V		0	Vdc
<b>Microphone Amplifier</b>				
Voltage Gain		14.7		dB
Input Impedance	.3	5		Mohm
<b>Speaker Amplifier</b>				
Voltage Gain		9.5		dB
Output Impedance		User adjustable with external resistor		
<b>Soft Limiter</b>				
Voltage Gain		28.8		dB
Output Swing (Clipping)		20		Vp-p
<b>Rx Carrier Section</b>				
Output Voltage				
High		+5		Vdc
Low		0		Vdc
<b>Threshold Detect Section</b>				
Dynamic Range		-66		dB
Output Voltage				
Above -66dB		+5		Vdc
Below -66dB		0		Vdc



CH1230 AND MC6860 EXTERNAL CONNECTIONS FOR INTERFACE WITH ACOUSTIC COUPLER.

FIGURE 1

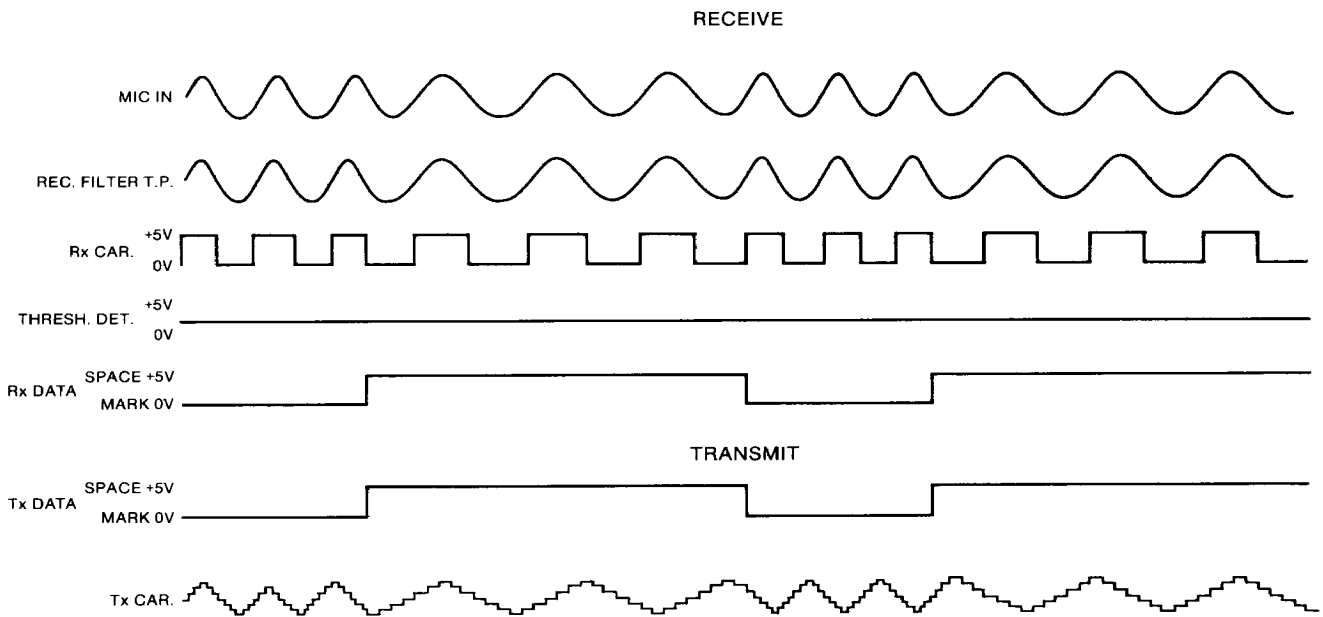
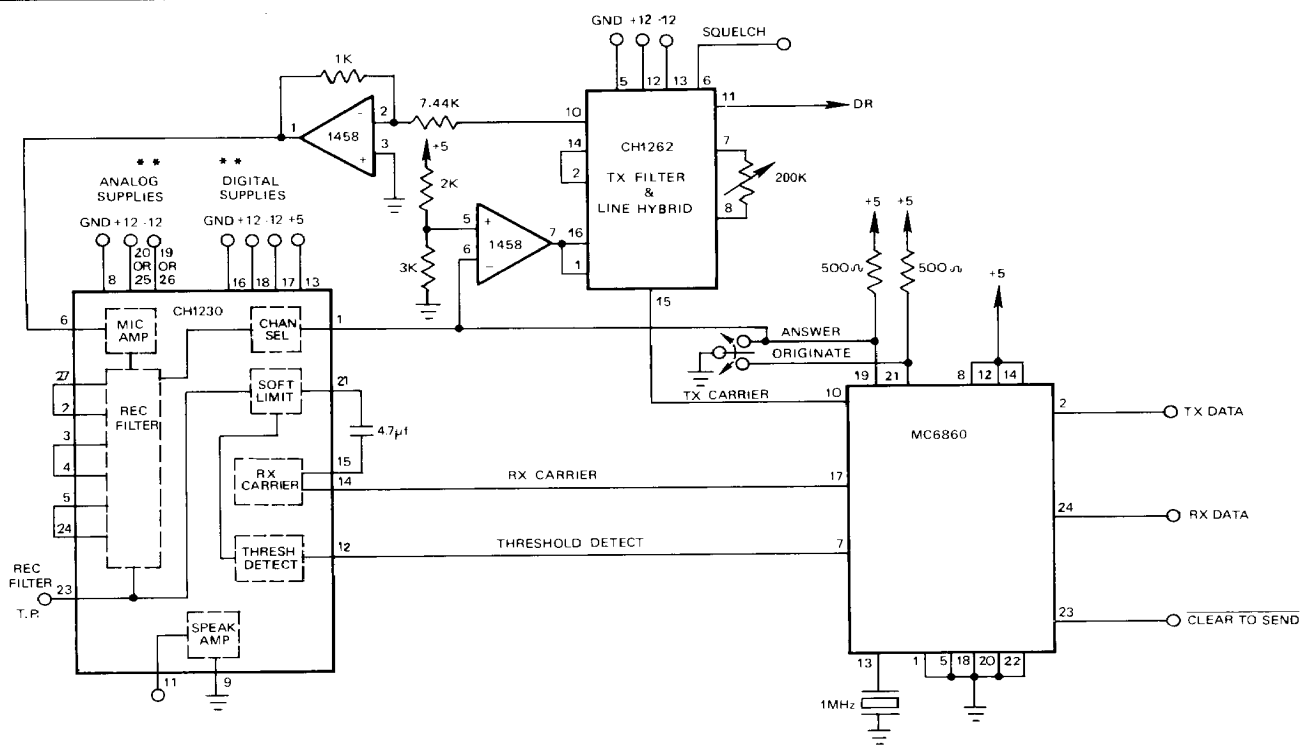


FIGURE 2

3A255A

CH1230 INTERFACE/RECEIVE FILTER CIRCUIT

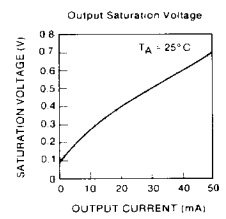
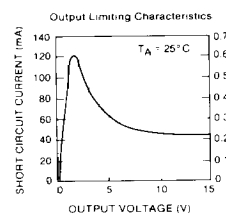
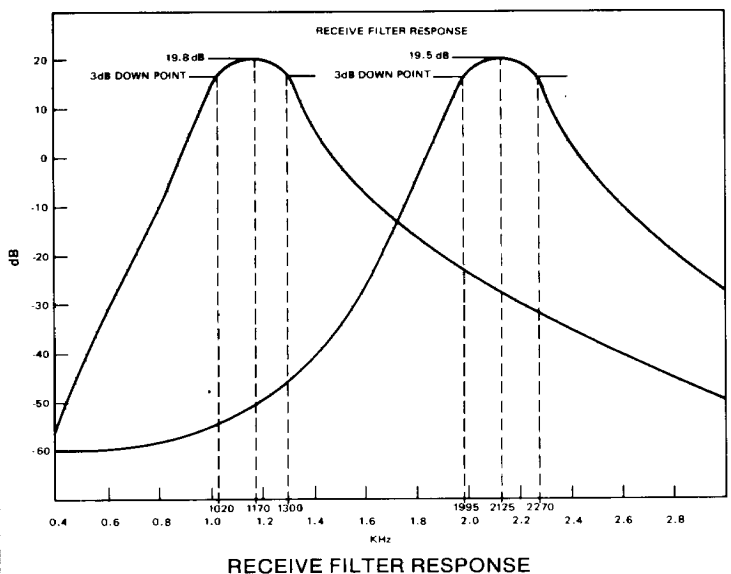


\*\* IT IS ESSENTIAL THAT THE ANALOG AND DIGITAL POWER SUPPLIES BE KEPT SEPARATED IN ORDER FOR THE CH1230 TO FUNCTION PROPERLY

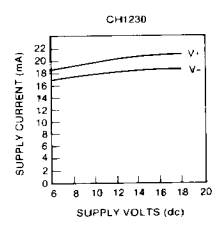
CH1230 AND MC6860 USING CH1262 TRANSMIT FILTER FOR DIRECT CONNECT APPLICATION.

FIGURE 3

TYPICAL PERFORMANCE CHARACTERISTICS



PLOTS FOR LM311'S USED IN Rx CARRIER & THRESHOLD DETECT SECTIONS OF CH1230



1308 BORREGAS AVENUE • SUNNYVALE, CALIFORNIA 94086 • TEL: (408) 734-8150 • TWX: 910-379-6931

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