

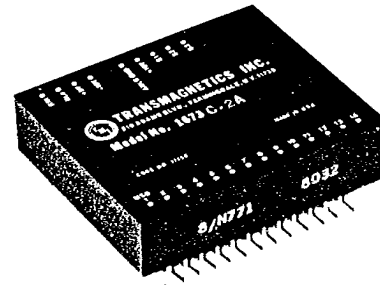
**SERIES  
1673**

Revised March 1985

## 14 BIT DIGITAL TO SYNCHRO or RESOLVER CONVERTER

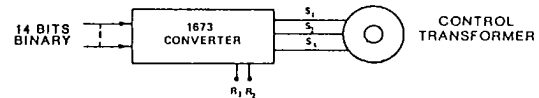
### FEATURES:

- 14 Bit Resolution and  $\pm 4$  arc minutes accuracy
- 0.03% max. magnitude variation
- Low power Schottky inputs eliminate the need for special precautions against static electricity
- Reverse polarity protected
- Short circuit protected output
- Reference and output are transformer isolated
- No calibration, adjustments or warmup
- Dual output (synchro/resolver) units available
- Available for either  $0^{\circ}\text{C}$  to  $+70^{\circ}\text{C}$ , or  $-55^{\circ}\text{C}$  to  $+105^{\circ}\text{C}$
- Low power units available. Request Model 1673
- Hermetically sealed units on request
- Meets MIL-STD-202D, Methods 101C,105B,106C, 107C,202D,204B,and 205D
- High reliability 883B or MIL-M-38510 units on request
- Input registers are available



### DESCRIPTION:

These miniaturized, all solid state units continuously convert a 14 bit parallel binary coded angle into a 3 wire synchro or a 4 wire resolver output. These low cost converters offer high resolution and high accuracy over the temperature range of  $-55^{\circ}\text{C}$  to  $+105^{\circ}\text{C}$  and are suitable for industrial, commercial, military and avionics applications. To assemble a 1:36 two-speed system use our scaler SC1673.



### SPECIFICATIONS:

	Code A	Code B
RESOLUTION:	14 Bits (1LSB = 1.3 arc minutes)	12 Bits (1LSB = 5.27 arc minutes)
ACCURACY:**	$\pm 4$ arc minutes	$\pm 8$ arc minutes
LOGIC:	Parallel, positive logic, TTL levels, binary coded angle	
FAN IN:	1 LSTTL LOAD	

\*\*Accuracy applies over the operating temperature range, 10% harmonic distortion of the reference,  $\pm 5\%$  power supply,  $\pm 10\%$  frequency and reference amplitude variation, for any balanced load from no load to full load. (Measured across the 3 wire output with a synchro-bridge and phase sensitive nullmeter with the unit fully loaded)

Output Code	Output	* Freq. $\pm 10\%$	* Ref. V rms $\pm 10\%$	Ref. Current (mA)	L-L V rms	Output Load $Z_{L-Lmin}$	Output VA	Transformers
1	Synchro	400Hz	26	2	11.8	100 ohms	1.5	Internal
2	Synchro	400Hz	115	1.2	90	6K ohms	1.5	Internal
3	Synchro	50/400Hz	115	1.2	90	6K ohms	1.5	External, # ST1673
4	Resolver	400Hz	115	1.2	90	6K ohms	1.5	Internal
5	Resolver	400Hz	26	2	12.5	100 ohms	1.5	Internal
6	Resolver	400Hz	115	1.2	12.5	100 ohms	1.5	Internal
7	Synchro	400Hz	115	1.2	11.8	100 ohms	1.5	Internal
10	Synchro/Resolver	400Hz	26	1.2	11.8/11.8	115/130 ohms	1.5	Internal
11	Synchro/Resolver	400Hz	26	1.2	11.8/26	115/2000 ohms	1.5	Internal

\*Other reference voltages and frequencies are available.

**OUTPUT CHARACTERISTICS:**

The AC output of each channel is internally limited and thus protected against short circuit conditions.

**PROTECTION:**

Unit is protected against reverse polarity and will not latch up or be damaged by loss of power, reference or signal. The LPTTL inputs used in our units eliminate the need for special precautions against static electricity.

**SETTLING TIME (to 1 LSB):**

50µs, with resistive load.

**AMPLITUDE VARIATION: (TRANSFORMATION RATIO)**

Both sine and cosine outputs have their magnitude vs. angle variation corrected to less than 0.03%. Thus, when used with PPI indicators, the resultant display will be distortion free. However, the output magnitude will vary directly with reference variation.

**OUTPUT VOLTAGE REGULATION:**

5% from no-load to full load.

**PHASE SHIFT:**

5° max between synchro output and reference input. Other values are available.

**NULL:** 30 mV rms at 11.8 VL-L, 110 mV at 90 VL-L

**HARMONIC DISTORTION:** 1%

**ISOLATION:**

AC reference and line-to-line outputs are transformer isolated from each other and from DC common. Insulation resistance from any AC input to output is greater than 100 megohms at 200VDC.

**POWER REQUIREMENTS:**

	+5V DC (±5%)	+15V DC <sup>(1)</sup> (±5%)	-15V DC <sup>(1)</sup> (±5%)
No Load	40mA	40mA	40mA
Average with Full Load	40mA	150mA	150mA
Peak with Full Load	40mA	200mA	200mA

Power supplies should be able to supply the peak currents indicated without current limiting.

(1) ±12V DC operation available. See Part Number Designation.

**LOW POWER:**

When regulated power is limited, Model 1678 requires but 40mA of +5V DC. All output power is derived from unregulated +28V DC (22-30V DC). Model 1680 operates from ±15V DC only. No +5V DC required.

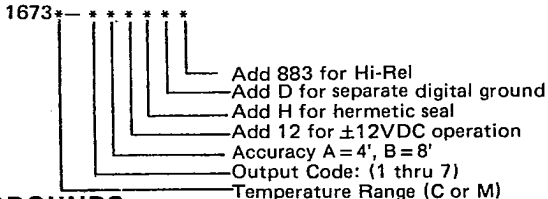
**OPERATING TEMP:** Model C: 0°C to +70°C  
Model M: -55°C to +105°C (95° max. base temp.)

**STORAGE TEMP:** -65°C to 125°C

**POTTING:** All units are potted.

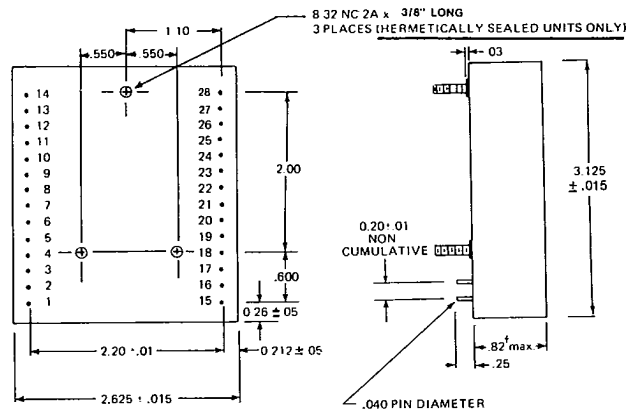
**WEIGHT:** 5.5 oz.

**PART NUMBER DESIGNATION**



**GROUNDING:**

Logic and Analog grounds are common internally. A separate logic ground is available on request. See part number designation.



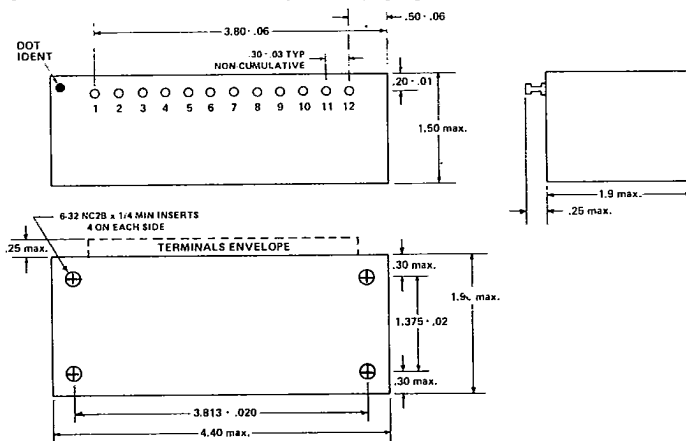
† 1" for hermetically sealed. All dimensions in inches.

**PIN ASSIGNMENTS**

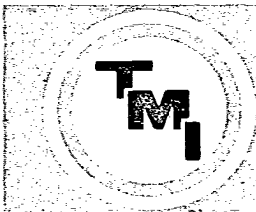
Pin No.	Internal Transformer	External Transformer
1	MSB (180°)	15 R HI
2		16 R LO
3		17 +5VDC
4		18 -15VDC
5		19 Logic GND* (+5VDC return)
6		20 Analog GND (±15VDC return)
7	BINARY	21 +15VDC
8	INPUTS	22 S1
9		23 S2
10		24 S3 (SS3)**
11		25 S4
12		26 (RS3)**
13		27 (A)**
14	LSB (.02197)	28 (B)**

Note: Connect unused input bits to logic ground.  
\* When specified. Otherwise, Logic and Analog grounds are connected internally to pin 20 with pin 19 omitted.  
\*\* Pin designation for Synchro/Resolver unit. Connect A & B for Synchro mode only.

**ST1673 TRANSFORMER CONNECTIONS**



	ST1673 Transformer Pin No.	Converter Pin No.	ST1673 Transformer Pin No.	Converter Pin No.
SYNCHRO OUT	S1	1	7	connect to 23
	S2	2	Ref. Hi.	8
	S3	3	Ref. Lo.	9
		4	10	connect to 15
		5	11	connect to 16
		6	12	connect to 22



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