



# TECHNICAL DESCRIPTION

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**MODEL 6075A**  
**TIME CODE DISPLAY**

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**ITS MODEL 6075A  
TIME CODE DISPLAY**

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**ITS MODEL 6075A**  
**TIME CODE DISPLAY**

1.0 GENERAL

The ITS Model 6075A Time Code Display is a two function unit that decodes the NASA 36 or IRIG B Serial Time Code and also performs a counter function. The unit displays the time or alternatively the counter state as selected. Features include:

1. *Decodes NASA 36 or IRIG B Serial Time Code, selectable.*
2. *Nine digit time display, 2.3" high LED characters.*
3. *Internal crystal controlled clock maintains timing in the event of a loss of serial time code input.*
4. *Battery back up, maintains timing in the event of power failure.*
5. *Both parallel and serial control input.*
6. *Non-volatile memory retains set-up in the event of power failure.*
7. *Offset feature allows different time zones to be displayed from common time code input.*

The unit is housed in a 21-1/4" x 5" x 6" enclosure and is powered by 115VAC 50-60Hz.

## 2.0 CHARACTERISTICS

### 2.1 TIME DISPLAY MODE

When set to time display mode the 6075A displays the applied time code or in the absence of an applied signal, the internal clock. Display is nine digits, DDD:HH:MM:SS. The time display may be offset to display a time zone other than the applied time code (see 2.3,8).

If there is a loss of serial time code input, the displayed colons flash at a 1Hz rate to alert the operator that the 6075A is operating on the internal clock.

During power failure, if the 6075A is operating on the internal clock, ie., no serial time code signal applied, the clock will continue to increment, operating on an internal battery. The display will not be operating, however, until power is returned.

### 2.2 COUNTER DISPLAY MODE

When set to counter display mode the 6075A will display the state of an internal count. The counter is always active regardless of the display mode selected and functions as follows:

The 6075A will increment or decrement a preset time display as commanded by the operator. A preset value may be read into the 6075A via either the parallel or serial port. Once entered, the value is immediately displayed. Counting will start when a momentary contact closure occurs on either the "down" or "up" input on the parallel port. Alternatively a start command may be applied via the serial port.

If a "down" command is issued the 6075A will assume the preset value is negative and illuminate a "minus" sign to the left of the time display. The display will then began to decrement at a one count per second rate. The count is synchronized with an applied Serial Time Code. When the count reaches zero the sign will change to "plus" and the

## 2.2 COUNTER DISPLAY MODE (continued)

display will begin to increment at the one second rate. It will continue to increment until a new preset value is input or until the days display reaches 999.

Note that the maximum negative value that can be entered is 99 days. This limitation is due to the fact that the most significant digit is used to display the minus sign.

If a "up" command is issued the 6075A will assume that the preset value is positive and the display will begin to increment at a one second rate until one of the conditions described above occurs.

The counter will continue to operate in the event of a power failure, loss of serial time code or both.

## 2.3 SERIAL I/O OPERATION

The 6075A Serial interface provides the means of fully controlling the unit over a single 9600 baud asynchronous RS232C line. The following functions are implemented:

<u>Function</u>	<u>ASCIL Message</u>	<u>Parallel Equivalent.</u>
1. Load counter time (count hold)	CNTLB,DDDHHMMSS <CR >	Preset
2. Start counter up	+	Up
3. Start counter down	-	Down
4. Select Time Display	CNTL E	Display Mode Select (high)
5. Select Counter Display	CNTL F	Display Mode Select (low)
6. Load clock time (immediate)	CNTL A,DDDHHMMSS <CR >	None (Note 1,3)
7. Load year	CNTL Y,#,N,#	None (Note 2,3)
8. Load offset	CNTL O, HH +/-	None (Note 4)

NOTE 1: This function is not active when a time code is present. It is used only when the 6075A is acting as a stand alone time reference.

NOTE 2: The "Load year" command is used to reference the 6075A to leap year. N = 0 to 3 and represents the number of years between the current year and the last leap year. ie. 0 = leap year, 1 = one year past leap year, etc. The value has been factory set and should not be changed in normal operation. The only situation where the user might require access to the year setting is in conjunction with the "Load Clock Time" function when the set time is not in the current year.

WARNING: Incorrect year setting will cause an error at leap year roll over.

NOTE 3: Any alteration of the time display using "Load Clock Time" or "Load Year" will render any previously entered counter function preset time invalid.

NOTE 4: This function is used to offset the displayed time from the applied time code or manual time set. If the offset is followed by "-", the value is subtracted from the time, if it is "+" it is added.

### 2.3 SERIAL I/O OPERATION (Continued)

If an invalid message or character is received, the 6075A returns an ASCII "BELL" character. Valid message returns ASCII "\*". Invalid messages include:

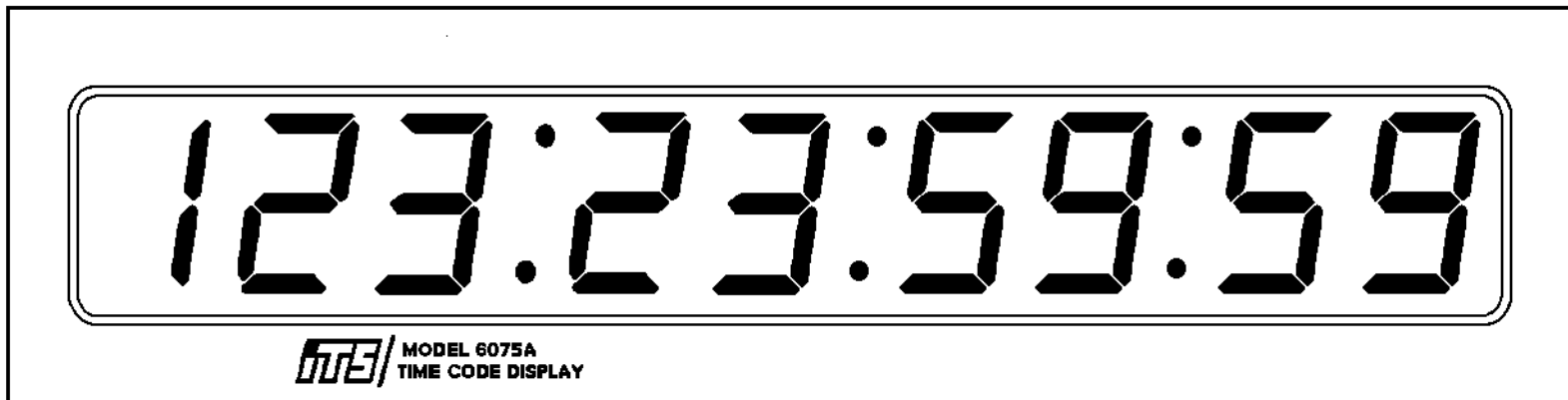
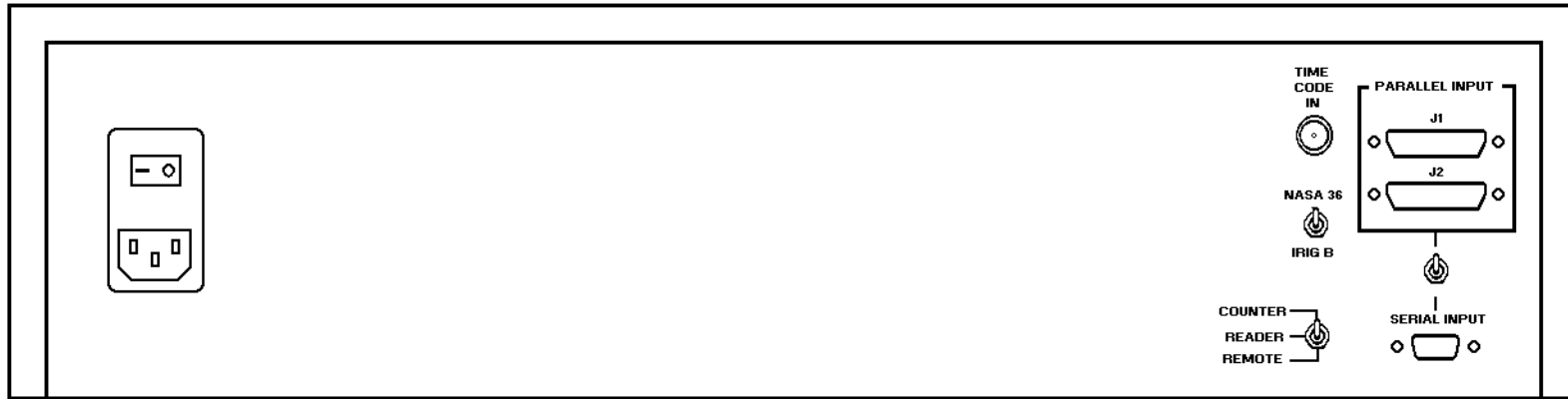
1. Invalid time value ie. more than 365 days (366 in leap year) in clock Time load or more than 999 days in counter time load or more than 24 hours, 59 min, 59 seconds, etc.
2. Attempt to initiate a down count with a preset value of more than 99 days.
3. Too long or too short a message where a carriage return (<CR>) is used as a terminator.
4. Any unused characters.
5. Attempt to set clock time with time code applied.

### 3.0 MECHANICAL CONFIGURATION

The 6075A is housed in an aluminum sheet metal enclosure, 21-1/4 inches wide, 5 inches high and 6 inches deep. All circuitry is on two printed circuit assemblies. PCA interconnections are via mating connectors, no edge connectors are used.

All connectors and controls are on the rear panel. See figure 1.

**MODEL 6075A  
TIME CODE DISPLAY  
(Front and Rear)**



**FIGURE 1**

#### 4.0 CONTROLS, CONNECTORS, AND INDICATORS

- 4.1 Time Code In  
BNC Connector -  
Receives NASA 36 Serial Time Code or IRIG B time code.
- 4.2 Time and Control Parallel Input  
Two DB25S Connectors -  
Receives parallel TTL or contact closure input of preset time and control. (See Table 1)
- 4.3 Serial Input  
One DA9P Connector -  
Receives RS232 serial messages used to set time and message displays and provide count control. (See Table 2)
- 4.4 Time Code Select  
Two Position Toggle Switch -  
Selects NASA 36 or IRIG B time code input.
- 4.5 Counter/Reader/Remote  
Three Position Toggle Switch -  
Selects display of time code reader or counter. When in "REMOTE" position display selection is via Time and Control Input (4.2).
- 4.6 Serial/Parallel  
Two Position Toggle Switch -  
Selects serial or parallel data input mode.
- 4.7 Power  
Three pin detachable line cord. Connects to power module containing switch, fuse and line filter.

**TABLE 1**

**MODEL 6075A PARALLEL INPUT, TIME AND CONTROL**

<u>BC1</u>			<u>BC2</u>	
<u>PIN</u>	<u>FUNCTION</u>		<u>PIN</u>	<u>FUNCTION</u>
1	T1	} Unit	1	T1
2	T2		2	T2
3	T4		3	T4
4	T8	} Seconds	4	T8
5	T1		5	T1
6	T2	} 10 Seconds	6	T2
7	T4		7	T4
8	Not Used		8	T8
9	T1	} 10	9	T1
10	T2		10	T2
11	T4		11	T4
12	T8	} Day	12	T8
13	T1		13	Not Used
14	T2	} Minutes	14	Up
15	T4		15	Down
16	Not Used		16	Preset
17	T1	} 10 Minutes	17	Not Used
18	T2		18	Not Used
19	T4		19	Not Used
20	T8	} Hours	20	Load A/N, TIME
21	T1		21	Load A/N, COUNTER
22	T2	} 10 Hours	22	Not Used
23	Not Used		23	Display Mode Select
24	Ground		24	Ground
25	Ground		25	Ground

All signals are negative true. Inputs are pulled high (5 volts) and are activated by contact closure to ground or TTL low. Control inputs are momentary except for "Display Mode Select" where High = Time and Low = Counter.

**TABLE 2**  
**MODEL 6075 SERIAL INPUT**

1	DTR/DSR/DCD	6	DTR/DSR/DCD
2	TX	7	CTS
3	RX	8	RTS
4	DTR/DSR/DCD	9	NU
5	GND		

RS232C levels, see Section 2.3 for operation.

5.0	SPECIFICATIONS	
5.1	Time Code	NASA 36 serial time code or IRIG B serial time code (switch selectable).
5.2	Display	Segmented LED. Red. Numeric: 7 segment. Character height: 2.3 inches. Segment width 5.5mm
5.3	Parallel Inputs	
	Time	BCD (days, hours, minutes, seconds). TTL levels or contact closure to ground, negative true.
	Control	"Preset", "Up", "Down", "Display Mode Select", "Prefix load, Time", "Prefix load, Counter". All except "Display Mode Select" are momentary contact closures to ground. "Mode Select", when open or high is "Time Display" mode, when low (ground) is "Counter Display" mode.
5.4	Serial Input	RS232C, 9600 baud, ASCII message format. (See Par. 2.3 for message format details) (baud rate is internal selectable from 300 to 19.2K.
5.5	Internal Reference 1 (Active in absence of time code input)	Temperature compensated crystal oscillator (TCXO) $\pm 2 \times 10^{-6}$ .
5.6	Internal Reference 2 (Active in absence of power)	Lithium powered clock calendar. 10 year life.
5.7	Non-volatile Memory	Lithium powered RAM. 10 year life.
5.8	External Power	115VAC $\pm 10\%$ , 50/60Hz, 45 watts (max.).