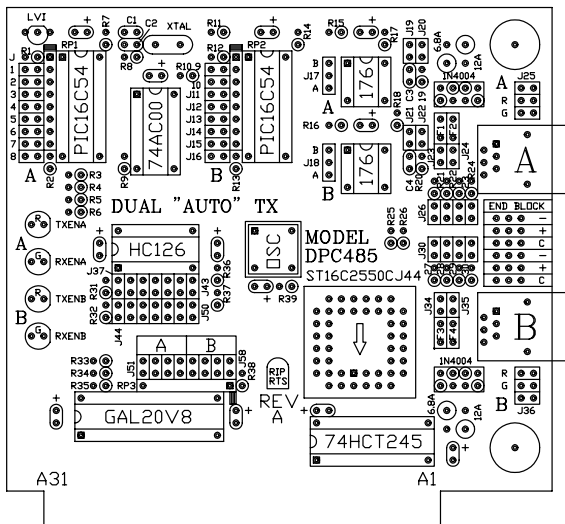


High Speed RS-485 Dual Serial Card

Model DPC485

HIGHLIGHTS

R.E. Smith's high speed, ISA compatible dual serial card, Model DPC485, makes RS-485 a breeze. In most cases your programs treat the two sides of the card, UARTs A and B, as though they were standard, independent RS-232 ports. Jumpers let you easily and independently assign each UART its own communication port, COM1 through COM8; interrupt, IRQ 3, 4, 5, 6, 7, 9, or none; baud rate, 300 to 115.2K; & word length, 5 to 8 data bits. Specially customized versions are available with baud rates to 460.8K, and arbitrary I/O addresses from 0000H to 0FFFH.



R. E. Smith's ISA-compatible dual RS-485 serial card

Model DPC485

“This card solves problems I never knew I had!”

Many products work well on the bench, only to drive you crazy in the real world. Problems like lost data, data collisions, improper termination, electrical noise, and transients, can be disastrous.

This card was designed to be “bullet proof.” No, it won't survive a direct lightning hit, but it was designed, from the very start, to work beautifully, reliably, and consistently, in the real world.

High speed 16550A UARTs with 16 byte Transmit and Receive FIFO, (First In First Out) buffers, and dedicated microprocessors, avoid data collisions and the loss of your data; while a crystal oscillator ensures precise timing over a wide range of operating conditions. The card also offers an ingenious transient suppression bridge, common mode protection, four biasing options, AC or DC termination, fuses that automatically reset themselves when the fault goes away, and technical support second to none.

Most RS-485 cards depend on your software to explicitly set and clear RTS, (Request to Send) in order to control the direction of data. If it's not done perfectly you get data collisions, and lost information. With R.E. Smith's card the microprocessors handle data direction for you, making data collisions a thing of the past.

In fact, the RS-485 ports on this card look to your software like simple, standard, full duplex, RS-232. So say good-bye to RTS, and hello to reliable high speed RS-485 communications, with R.E. Smith's high speed RS-485 dual serial card.

DPC485 ISA BUS DUAL RS485 AUTO TX ENABLE SERIAL CARD (ACTUAL SIZE)
 AUTOMATIC DATA DIRECTION CONTROL FOR HALF-DUPLEX SYSTEMS, NO DELAYS!!!

J25, J36 INSTALL FOR RJ11 PINS 1&6 TO DIGITAL COMMON
 J20, J22 INSTALL TO ENABLE TERMINATION
 J19, J21 INSTALL FOR DC TERMINATION, REMOVE FOR AC TERMINATION

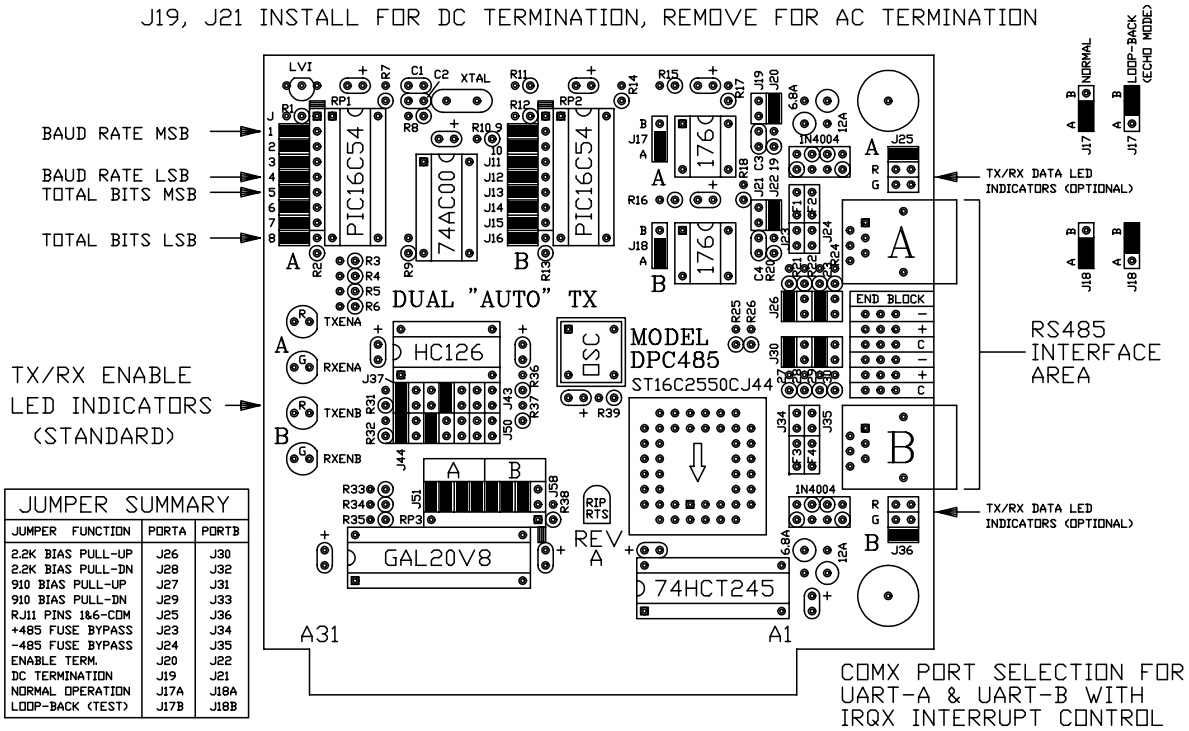


Figure 1

Defaults

Port A is configured as COM1, (3F8H on IRQ 4).
 Port B is configured as COM2, (2F8H on IRQ 3).
 Both ports are configured at 9,600 baud, one start bit, eight data bits, no parity, & one stop bit.

The 1K interrupt pull down resistors are installed, pins 1 & 6 on the RJ-11 connectors are tied to common, the resettable fuses are enabled.

Termination is on. AC termination is selected, (by disabling DC termination.) Light biasing is enabled through the selection of 2.2K pull up and pull down resistors, and the loop back test option is disabled.

General Information.

Options are set by installing or removing jumpers, then powering up the system. A connection is made when a jumper is installed to connect two adjacent pins. This is shown as a black rectangle. No connection is made, shown by two empty pins, when the jumper is removed. There are two ways to remove a jumper. The first is to remove it completely, the second is to move the jumper so it hangs on just one pin. Hang the jumper from one pin if you anticipate changing the configuration, otherwise we suggest you remove the jumper completely.

Remember you're working with two serial ports, UART-A and UART-B, on a single card. You must set the options for each of them. Also remember to cycle power after changing your jumpers.

Select Your Comm. Port.

Eight Communication ports are available, COM1 through COM8, as shown in figure 2. Only one physical device should be assigned to any one of these ports.

Assign UART-A to a specific communication port by first finding the row in figure 2 associated with that port, COM1 - COM8, then setting your jumpers, J51-J54, to match the settings under UART-A for that row. Repeat the process for UART-B, jumpers J55-J58. Use the settings in the ninth row, labeled NONE, to disable either UART.

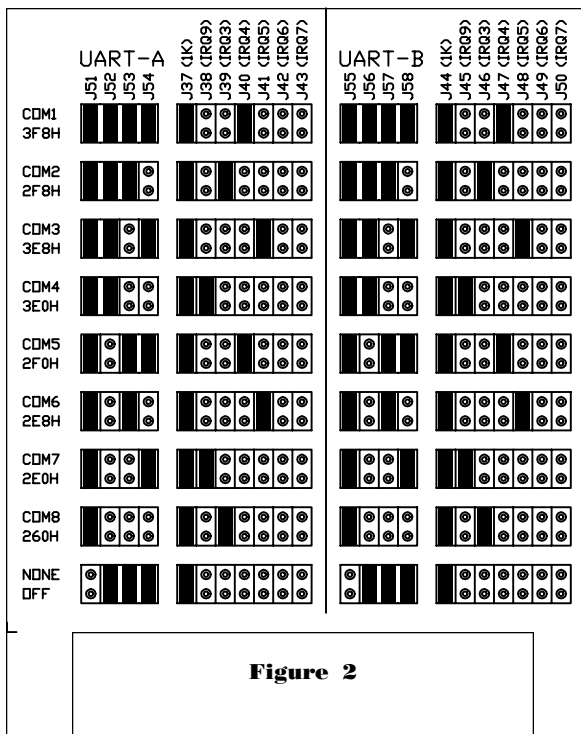


Figure 2

Select Your IRQ, (Interrupt)

Also on figure 2 you'll see two sets of IRQ jumpers, J37-J43 for UART-A, J44-J50 for UART-B. These are labeled 1K, IRQ9, IRQ7, IRQ6, IRQ5, IRQ4, and IRQ3. Install a jumper to select one IRQ for UART-A, and one for UART-B. Install no jumpers if you do not want the UART to generate interrupts.

The jumper labeled 1K connects a pull down resistor for the selected interrupt. Remove this jumper only if the associated UART is sharing an IRQ with one or more other devices, not generally advised on ISA systems, and the pull down resistor on one of those other devices has been enabled.

Data Bits, Parity, Baud Rate, Bit Counts, & Timing

Things like data bits, parity, & baud rate must be set in two places. Your communication software must program the UARTs appropriately, but there's more to be done. Installing jumpers J1-J4 for UART-A, or J9-J12 for UART-B, see figure 4 on the following page, will finish the job if you go with the default of 8 data bits, no parity, one stop bit and 9600 baud. In this case the jumpers in figure 3 are ignored, and you can skip ahead to the, "RJ-11, pins 1 & 6," heading.

Otherwise, you must also set jumpers to provide this card's onboard microprocessor the information required to control data direction timing, and those jumper settings must be consistent with the information your software stores in the UARTs.

These UARTs support five to eight data bits. To calculate your total bit count simply start with the number of data bits. There is always one start bit, so add that to the number of data bits. If you are using Odd or Even parity you must add one for the parity bit. Then add the number of stop bits, 0.5, 1.0, 1.5, or 2.0. This is your total bit count.

For example 6 data bits, Even parity & 1 stop bit yields a total bit count of 9. 6 data bits, No parity and one stop bit yields 8 bits. 8 data bits, No parity and one stop bit yields 10 bits, while 8 data bits, No parity and 1.5 stop bits yield 10.5 bits.

See figure 3 to determine the appropriate jumper settings for your configuration. Remember to configure both UART-A, jumpers J5-J8, and UART-B, jumpers J13-J16.

TOTAL BITS: START, PARITY, DATA, STOP					
UART-A	J5	J6	J7	J8	EXAMPLES
UART-B	J13	J14	J15	J16	
6	REMOVE	REMOVE	REMOVE	REMOVE	
6-1/2	REMOVE	REMOVE	REMOVE	INSTALL	
7	REMOVE	REMOVE	INSTALL	REMOVE	
7-1/2	REMOVE	REMOVE	INSTALL	INSTALL	
8	REMOVE	INSTALL	REMOVE	REMOVE	
8-1/2	REMOVE	INSTALL	REMOVE	INSTALL	
9	REMOVE	INSTALL	INSTALL	REMOVE	N,7,1
9-1/2	REMOVE	INSTALL	INSTALL	INSTALL	N,8,1/2 (UP)
10	INSTALL	REMOVE	REMOVE	REMOVE	N,8,1 E,7,1
10-1/2	INSTALL	REMOVE	REMOVE	INSTALL	N,8,1-1/2
11	INSTALL	REMOVE	INSTALL	REMOVE	N,8,2 E,8,1 E,7,2
11-1/2	INSTALL	REMOVE	INSTALL	INSTALL	
12	INSTALL	INSTALL	REMOVE	REMOVE	
12-1/2	INSTALL	INSTALL	REMOVE	INSTALL	
13	INSTALL	INSTALL	INSTALL	REMOVE	
13-1/2	INSTALL	INSTALL	INSTALL	INSTALL	

* NOTES: N = NO PARITY AND DOES NOT COUNT AS A BIT.
E = EVEN, O = ODD PARITY AND COUNTS AS A BIT
ADD TOTAL OF START, PARITY, DATA AND STOP BITS

Figure 3

RJ-11, pins 1 & 6

If you've chosen the default of 9600 baud, 1 start bit, 8 data bits, no parity, and one stop bit, then the default setting, the last row of figure 4 with all four jumpers installed, is perfect. Otherwise change the jumpers shown in figure four to select the desired baud rate. Remember that even if you use 9600 baud, but use it with a number of data bits, parity bits, or stop bits other than the default, you must select the sixth row of figure 4, in the chart, not the last row. The last row is used only for the default.

Pins 1 and 6 of the RJ-11 connectors are normally tied to common. Remove jumper J-25 to eliminate this connection for UART-A. Remove jumper J-36 to eliminate this connection for UART-B.

Resettable Fuses

These are normally enabled. Install jumpers at J-23 & J-24 to disable the resettable fuse for UART-A. Install jumpers at J-34 & J-35 to disable the resettable fuse for UART-B.

Termination

Remember that only the two UARTs at the ends of the line should be terminated. Termination is enabled on UART-A by installing jumper J20. To terminate UART-B install Jumper J22.

If termination is enabled, it can be enabled as AC or DC termination. AC is generally recommended. To change termination to DC, install jumper J19 for UART-A, or install jumper J21 for UART-B. This has no effect unless termination is enabled.

Biasing

Pull up and pull down resistors can be enabled independently. For light biasing enable 2.2K pull up and pull down resistors by installing jumpers J26 & J28 for UART-A, jumpers J30 & J32 for UART-B. For medium biasing enable 910 Ohm pull up and pull down resistors by installing jumpers J27 & J29 for UART-A, jumpers J31 & J33 for UART-B. For heavy biasing enable both, for no bias enable neither. In most applications light biasing is recommended.

Loop Back

For testing purposes you may wish to enable the loop back option. Under normal operation you will not want the loop back option enabled. This is controlled by jumper J17 for UART-A, jumper J18 for UART-B. These jumpers differ, in that they must be installed, and can be installed in one of two positions. For normal operation connect the center pin to pin A, for loop-back operation connect the center pin to pin B.

BAUD RATE JUMPERS FOR UART-A/UART-B				
UART-A	J1	J2	J3	J4
UART-B	J9	J10	J11	J12
300	REMOVE	REMOVE	REMOVE	REMOVE
600	REMOVE	REMOVE	REMOVE	INSTALL
1200	REMOVE	REMOVE	INSTALL	REMOVE
2400	REMOVE	REMOVE	INSTALL	INSTALL
4800	REMOVE	INSTALL	REMOVE	REMOVE
9600	REMOVE	INSTALL	REMOVE	INSTALL
19200	REMOVE	INSTALL	INSTALL	REMOVE
38400	REMOVE	INSTALL	INSTALL	INSTALL
57600	INSTALL	REMOVE	REMOVE	REMOVE
76800	INSTALL	REMOVE	REMOVE	INSTALL
115200	INSTALL	REMOVE	INSTALL	REMOVE
RESVD	INSTALL	REMOVE	INSTALL	INSTALL
RESVD	INSTALL	INSTALL	REMOVE	REMOVE
RESVD	INSTALL	INSTALL	REMOVE	INSTALL
RESVD	INSTALL	INSTALL	INSTALL	REMOVE
9600*	INSTALL	INSTALL	INSTALL	INSTALL

* FACTORY SETTING FOR 9600, N, 8, 1 WITH ALL BIT JUMPERS IGNORED. REMOVE JUMPERS AS REQUIRED FOR ALL OTHER BAUD RATES.

Figure 4

Specifications

Connections to the real world.

NEVER plug a telephone line into the RJ-11 jacks as the voltages used by the phone company could destroy both this card and your computer!!!

The RJ-11 connectors are ideal for many applications, but in some environments you may choose to use the more reliable contact blocks with 22 to 28 gauge twisted pair wire, remembering to connect plus to plus, and minus to minus. When running your data line through a card you can use both types of connector, going into one type and coming out of the other. Alternately, short pig tails, 6 inches or less, can be used to tap off the line in such cases. Twisted pair is always recommend, but non reversing telephone cable can often be used for short runs.

Installing your board in the system

Now that the board is configured it's time to actually put it into your system. Turn off system power and open the case. Find an empty ISA slot, remove the screw holding the metal blank in place, remove the metal blank, and insert the DPC485 card making certain that it is properly seated in the connector. Then take the screw you removed earlier and use it to secure this card in the slot. The DPC485 is an ISA card, and can be used in a standard eight or 16 bit ISA slot, an EISA slot, or the ISA portion of a VESA slot.

When installing the card please make certain that the openings in the case line up with the connectors for your data lines. In some cases you may want to run your wires through the hole in the computer's case and connect the data lines while the case is still open. Once finished, please close the case and restore power to the system.

Indicators

At the back of the card there are two pair of LEDs, one pair for each UART, indicating that the receive, green, and transmit, red, functions are enabled, (on) or disabled, (off) for that UART. On some cards two optional sets of LEDs are included next to the RJ-11 connectors. These, if present, indicate the data being transmitted, red, or received, green, for that UART. UART A is on top, UART B is on the bottom.

This card will operate from zero to sixty five degrees Centigrade, with a relative humidity from ten to ninety percent, non condensing.

Five volts at 150 milliamps is typical. Maximum current will not exceed 350 milliamps.

Warranty

This product is guaranteed against defects in material and workmanship for a period of one year from date of shipment, when operated within our specifications. Defective product must be returned to the factory with an explanation of the defect and with freight prepaid. We will repair, replace, exchange and/or adjust at our option. No responsibility is accepted for damages, loss or other expenses incurred through the sale or use of the product. Under no conditions will we be liable for any special, incidental or consequential damages. No warranty of merchantability is expressed or implied. Driver chip replacement is limited to five percent, due to the nature of communications applications.

Notice

All statements, technical information and recommendations related to the Seller's product are based on information believed to be reliable, but the accuracy or completeness thereof is not guaranteed. Before utilizing the product, the user should determine the suitability of the product for its intended use. The user assumes all risks and liability whatsoever in connection such use.

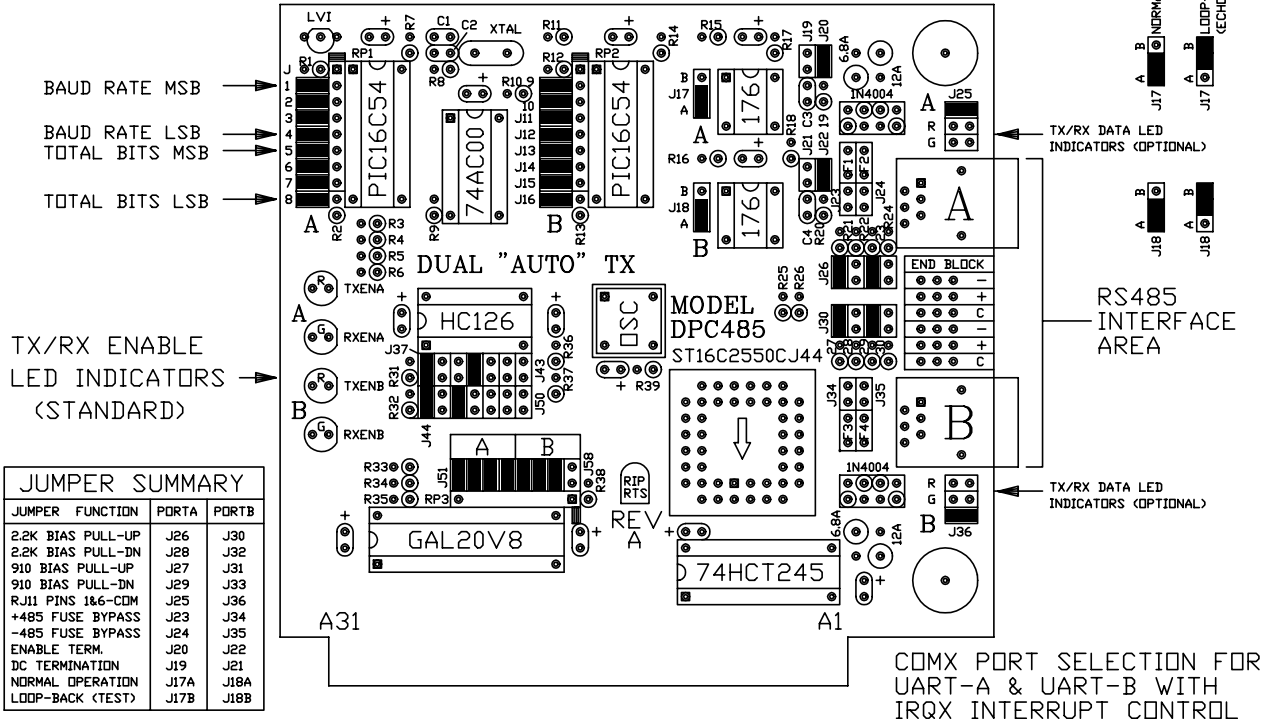
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MODEL DPC485 HIGH SPEED DUAL SERIAL CARD WITH FIFO

DPC485 ISA BUS DUAL RS485 AUTO TX ENABLE SERIAL CARD (ACTUAL SIZE)
 AUTOMATIC DATA DIRECTION CONTROL FOR HALF-DUPLEX SYSTEMS, NO DELAYS!!!

J25, J36 INSTALL FOR RJ11 PINS 1&6 TO DIGITAL COMMON
 J20, J22 INSTALL TO ENABLE TERMINATION
 J19, J21 INSTALL FOR DC TERMINATION, REMOVE FOR AC TERMINATION



JUMPER SUMMARY			
JUMPER	FUNCTION	PORTA	PORTB
J26	2.2K BIAS PULL-UP	J26	J30
J28	2.2K BIAS PULL-DN	J28	J32
J27	910 BIAS PULL-UP	J27	J31
J29	910 BIAS PULL-DN	J29	J33
J25	RJ11 PINS 1&6-COM	J25	J36
J23	+485 FUSE BYPASS	J23	J34
J24	-485 FUSE BYPASS	J24	J35
J20	ENABLE TERM.	J20	J22
J19	DC TERMINATION	J19	J21
J17A	NORMAL OPERATION	J17A	J18A
J17B	LOOP-BACK (TEST)	J17B	J18B

300-115.2K BAUD STANDARD (SPECIAL UNITS TO 460.8K)

BAUD RATE JUMPERS FOR UART-A/UART-B				
UART-A	J1	J2	J3	J4
UART-B	J9	J10	J11	J12
300	REMOVE	REMOVE	REMOVE	REMOVE
600	REMOVE	REMOVE	REMOVE	INSTALL
1200	REMOVE	REMOVE	INSTALL	REMOVE
2400	REMOVE	REMOVE	INSTALL	INSTALL
4800	REMOVE	INSTALL	REMOVE	REMOVE
9600	REMOVE	INSTALL	REMOVE	INSTALL
19200	REMOVE	INSTALL	INSTALL	REMOVE
38400	REMOVE	INSTALL	INSTALL	INSTALL
57600	INSTALL	REMOVE	REMOVE	REMOVE
76800	INSTALL	REMOVE	REMOVE	INSTALL
115200	INSTALL	REMOVE	INSTALL	REMOVE
RESVD	INSTALL	REMOVE	INSTALL	INSTALL
RESVD	INSTALL	INSTALL	REMOVE	REMOVE
RESVD	INSTALL	INSTALL	REMOVE	INSTALL
RESVD	INSTALL	INSTALL	INSTALL	REMOVE
9600*	INSTALL	INSTALL	INSTALL	INSTALL

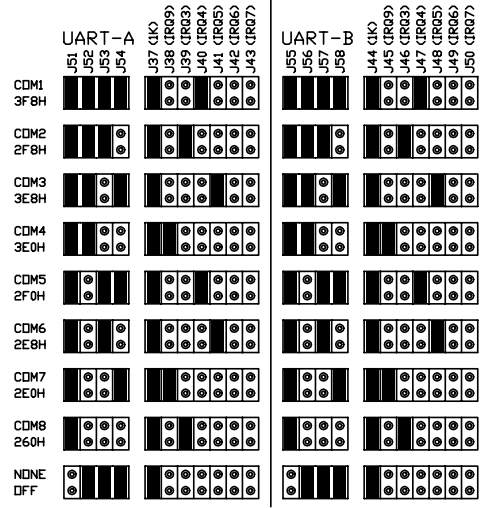
* FACTORY SETTING FOR 9600, N, 8, 1 WITH ALL BIT JUMPERS IGNORED. REMOVE JUMPERS AS REQUIRED FOR ALL OTHER BAUD RATES.

TOTAL BITS: START, PARITY, DATA, STOP				
UART-A	J5	J6	J7	J8
UART-B	J13	J14	J15	J16
6	REMOVE	REMOVE	REMOVE	REMOVE
6-1/2	REMOVE	REMOVE	REMOVE	INSTALL
7	REMOVE	REMOVE	INSTALL	REMOVE
7-1/2	REMOVE	REMOVE	INSTALL	INSTALL
8	REMOVE	INSTALL	REMOVE	REMOVE
8-1/2	REMOVE	INSTALL	REMOVE	INSTALL
9	REMOVE	INSTALL	INSTALL	REMOVE
9-1/2	REMOVE	INSTALL	INSTALL	INSTALL
10	INSTALL	REMOVE	REMOVE	REMOVE
10-1/2	INSTALL	REMOVE	REMOVE	INSTALL
11	INSTALL	REMOVE	INSTALL	REMOVE
11-1/2	INSTALL	REMOVE	INSTALL	INSTALL
12	INSTALL	INSTALL	REMOVE	REMOVE
12-1/2	INSTALL	INSTALL	REMOVE	INSTALL
13	INSTALL	INSTALL	INSTALL	REMOVE
13-1/2	INSTALL	INSTALL	INSTALL	INSTALL

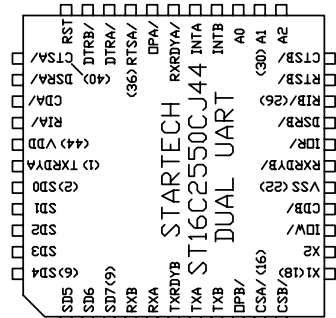
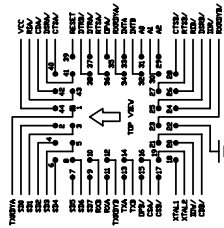
* NOTES: N = NO PARITY AND DOES NOT COUNT AS A BIT.
 E = EVEN, O = ODD PARITY AND COUNTS AS A BIT
 ADD TOTAL OF START, PARITY, DATA AND STOP BITS

NOTE: REMOVE POWER TO CHANGE BAUD/BIT JUMPERS

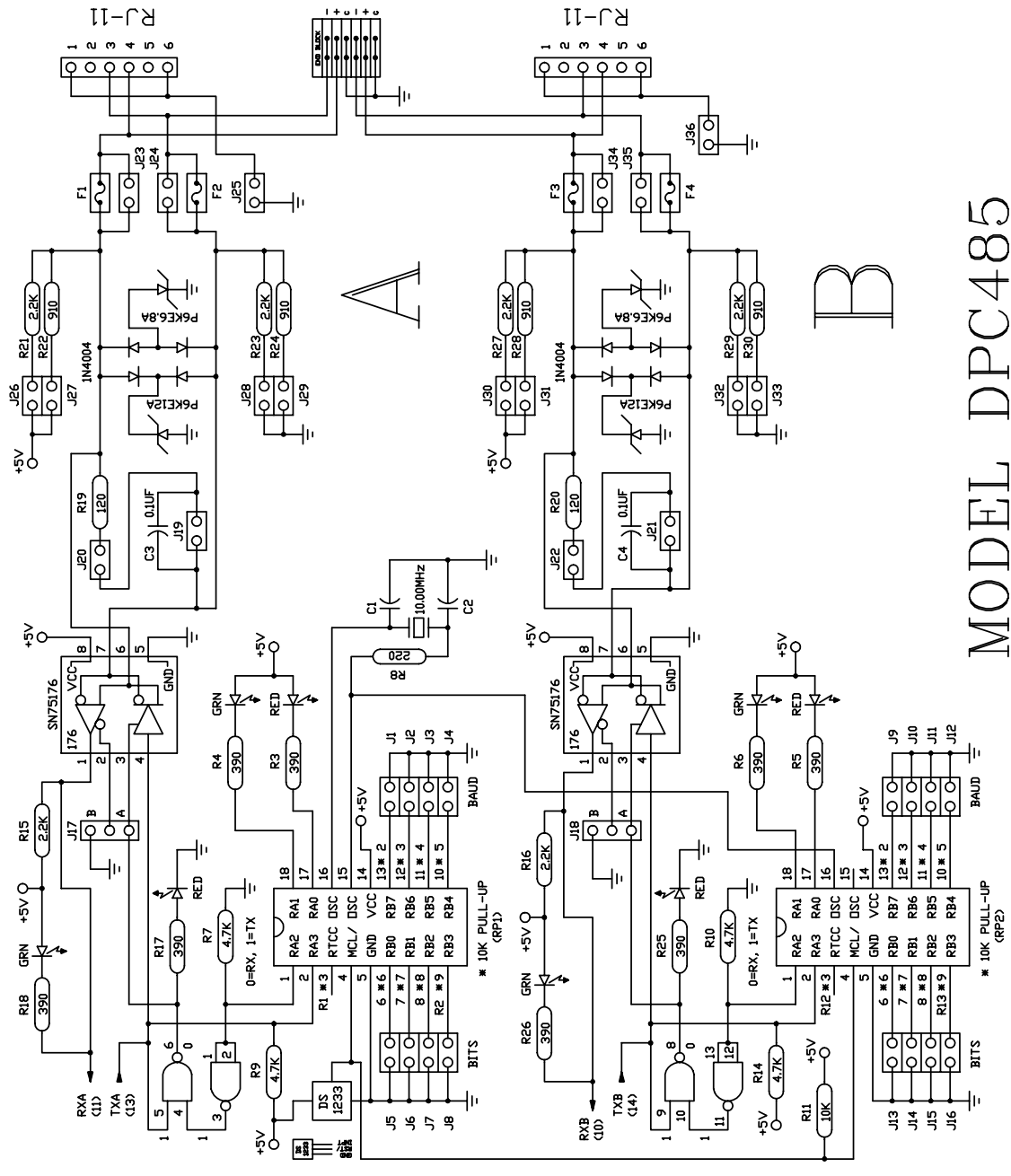
COMX PORT SELECTION FOR UART-A & UART-B WITH IRQX INTERRUPT CONTROL



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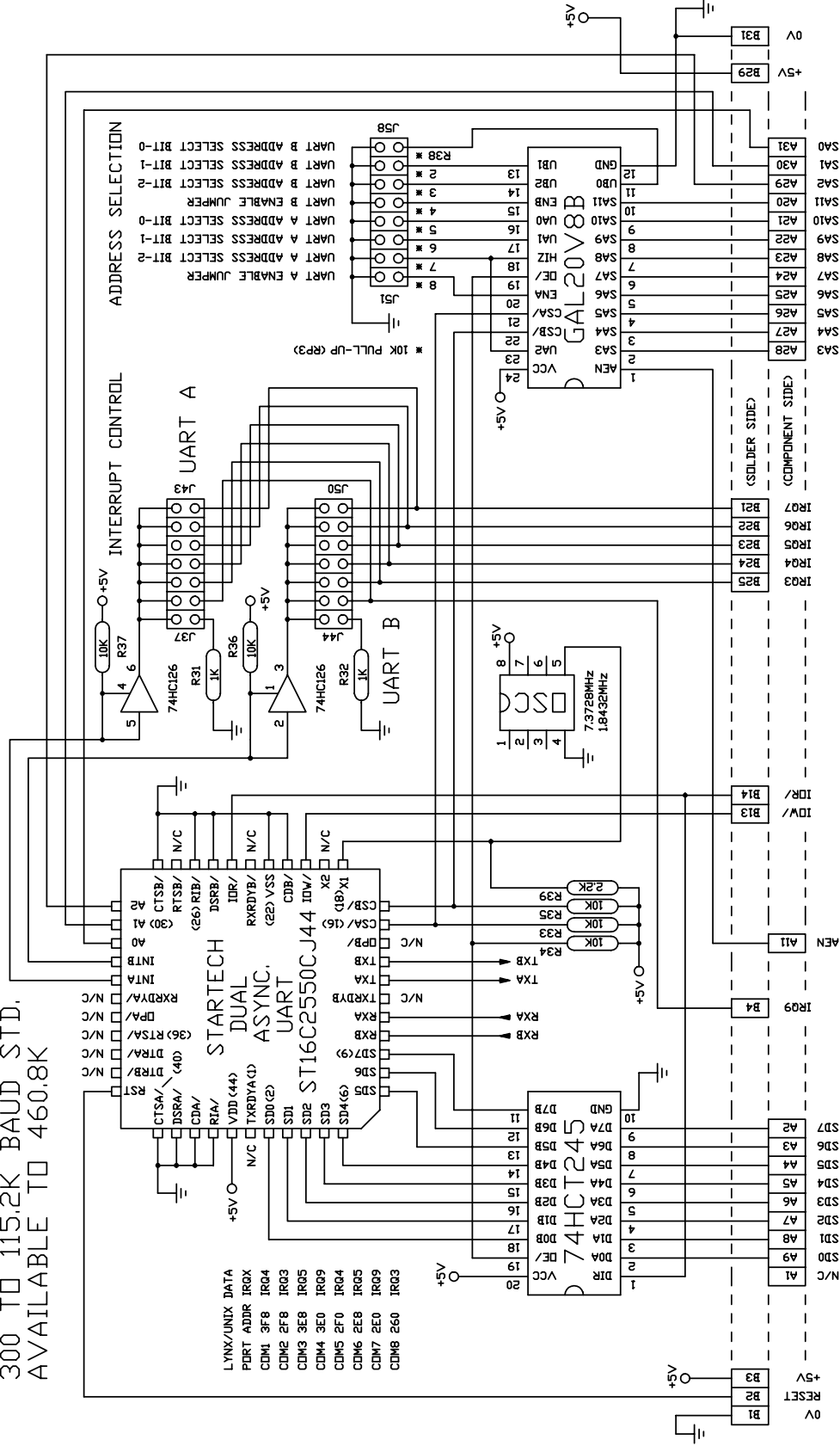
MODEL DPC485

DRAWN BY RES		SUBJECT "AUTO" RS485 COM.	
DATE 3-17-96		FOR PC/ISA INTERFACE	
SCALE NONE		REV. NO. DPC485A	
CHKD. BY RES		R. E. SMITH 4311 TYLERSVILLE RD HAMILTON, OHIO 45011	
SHEET 1 OF 1		DPC485A	

DPC485A = AUTO CONV.
 DPC485B = BUS INT.
 DPC485S = SILK SCR.N.

MODEL DPC485 PC ISA BUS INTERFACE

DUAL AUTOMATIC RS-485
300 TO 115.2K BAUD STD.
AVAILABLE TO 460.8K



/ = LOW TRUE SIGNAL

DPC485A = AUTO CONV.
DPC485B = BUS INT.
DPC485S = SILK SCRN.

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SHEET 1 OF 1

DPC485B

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SCALE NONE

DATE 3-16-96

DRAWN BY RES

SUBJECT DUAL ASYNC. UART

PUR PC BUS INTERFACE

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