

A17

REMOTE CONTROL ASSEMBLY

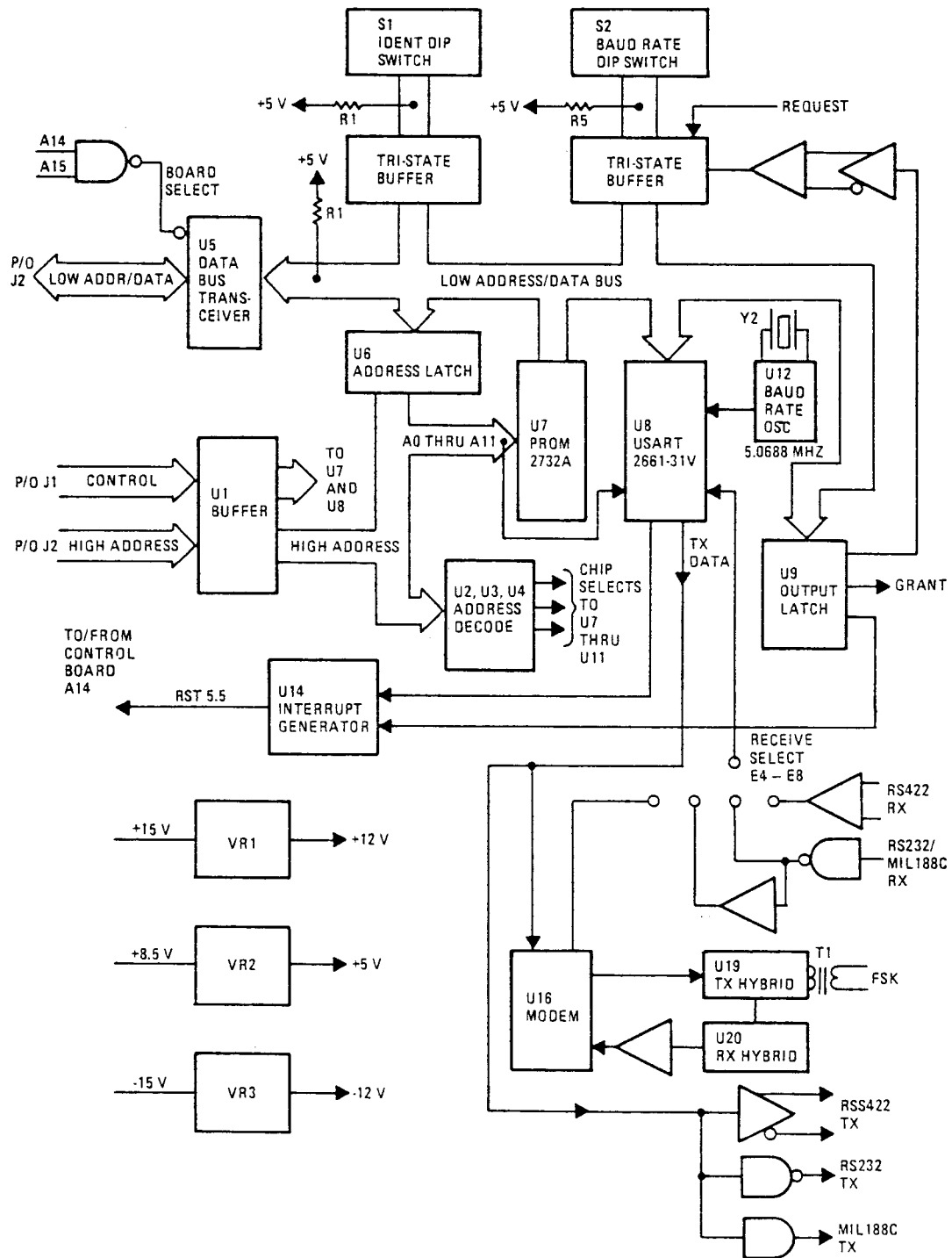


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REMOTE CONTROL ASSEMBLY A17

1. GENERAL DESCRIPTION

Remote Control Assembly (LCU) A17 permits control of the RF-1310 Exciter from a remote site. Connected to the microprocessor controlling the RF-1310, this assembly contains interface buffering to Control Board Assembly A14, additional program memory, and circuits for parallel I/O, serial I/O controls, and modem. It works like a local control unit (LCU) for the exciter, providing RS-232C, MIL-STD-188C, RS-422, and FSK interface options to a distant remote control unit (RCU). The software programming using one, 4K byte EPROM interfaces the A17 assembly control and provides communications to the main control software on the A14 assembly. Electrical connection to the exciter from the A17 assembly is through ribbon cables to the A14 assembly and to interface connectors J8 and J9 on the RF-1310 rear panel.

2. INTERFACE CONNECTIONS

LCU Assembly A17 interface connections are listed in table 1.

Table 1. LCU Assembly A17 Interface Summary

Connector	Function	To	From
A17J1-1	+ 5 V Unreg.	----	A14J15-1
A17J1-2	+ 5 V Unreg.	----	A14J15-2
A17J1-3	Reset Out	----	A15J15-3
A17J1-4	HOLD	A14J15-4	----
A17J1-5	Line Audio	A14J15-5	----
A17J1-6	HLDA	----	A14J15-6
A17J1-7	Line Audio Gnd	A14J15-7	----
A17J1-8	CPU Clk Out	----	A14J15-8
A17J1-9	+ 15 V	----	A14J15-9
A17J1-10	Gnd	----	A14J15-10
A17J1-11	Ready	A14J15-11	----
A17J1-12	-15 V	----	A14J15-12
A17J1-13	RST 5.5	A14J15-13	----
A17J1-14	IO/M	----	A14J15-14
A17J1-15	INTR	A14J15-15	----
A17J1-16	S1	----	A14J15-16
A17J1-17	WR	----	A14J15-17
A17J1-18	RD	----	A14J15-18
A17J1-19	INTA	----	A14J15-19
A17J1-20	ALE	----	A14J15-20
A17J2-1	N/C	----	----
A17J2-2	N/C	----	----
A17J2-3	AD0	BIDIRECTIONAL	A14J15-23
A17J2-4	N/C	----	----
A17J2-5	AD1	BIDIRECTIONAL	A14J15-25
A17J2-6	A15	----	A14J15-26
A17J2-7	AD2	BIDIRECTIONAL	A14J15-27

Table 1. LCU Assembly A17 Interface Summary (Cont.)

Connector	Function	To	From
A17J2-8	A14	----	A14J15-28
A17J2-9	AD3	BIDIRECTIONAL	A14J15-29
A17J2-10	A13	----	A14J15-30
A17J2-11	AD4	BIDIRECTIONAL	A14J15-31
A17J2-12	A12	----	A14J15-32
A17J2-13	AD5	BIDIRECTIONAL	A14J15-33
A17J2-14	A11	----	A14J15-34
A17J2-15	AD6	BIDIRECTIONAL	A14J15-35
A17J2-16	A10	----	A14J15-36
A17J2-17	AD7	BIDIRECTIONAL	A14J15-37
A17J2-18	A9	----	A14J15-38
A17J2-19	Gnd	----	A14J15-39
A17J2-20	A8	----	A14J15-40
A17J3-1	Bus Available	----	J9-21
A17J3-2	RS-422 IN	----	J9-20
A17J3-3	Bus Request	J9-3	----
A17J3-4	N/C	----	----
A17J3-5	RS-422 OUT +	J9-4	----
A17J3-6	N/C	----	----
A17J3-7	RS-422 IN +	----	J9-6
A17J3-8	RS-422 OUT-	J9-37	----
A17J3-9	Gnd	J9-19	----
A17J3-10	Shield (Gnd)	J8-1	----
A17J3-11	N/C	----	----
A17J3-12	RS-232 TX	J8-2	----
A17J3-13	ID3	----	J8-15
A17J3-14	RS-232 RX	----	J8-3
A17J3-15	ID2	----	J8-17
A17J3-16	FSK Data OUT-	J8-4	----
A17J3-17	ID5	----	J8-5
A17J3-18	FSK Data IN +	----	J8-18
A17J3-19	ID6	----	J8-18
A17J3-20	ID0	----	J8-6
A17J3-21	Gnd	J8-19	----
A17J3-22	RS-232 Sig. Gnd	J8-7	----
A17J3-23	N/C	----	----
A17J3-24	ID1	----	J8-8
A17J3-25	N/C	----	----
A17J3-26	ID4	----	J8-9
A17J3-27	BR3	----	J8-22
A17J3-28	BR1	----	J8-10
A17J3-29	BR0	----	J8-23
A17J3-30	BR2	----	J8-11

3. FUNCTIONAL DESCRIPTION

3.1 Control and Data Transfer

The A17 assembly appears as an electrical extension of the address/data bus of the microprocessor on the A14 assembly. This bus is buffered by tristate bidirectional buffer U5 and high-order address and control inputs buffered by U1. Selection of IC devices on the LCU for data transfer to/from the CPU is done using three-to-eight decoder U3 with high-order address bits. Interface signals RD, WR, and S1 from the A14 assembly determine the direction of data flow after addresses have been loaded into latch U6 by ALE, the address latch enable.

The information stored in the EPROM is part of the system software and cannot be changed by the customer.

3.2 Serial Data Transmission/Reception

Upon power up reset, the controlling CPU (A14U24) detects the presence of the LCU option, and initializes all IC devices on the A17 assembly. Using the software in the LCU EPROM, the CPU conditions the USART U8 to receive incoming signals according to user-selected options. When response to a distant RCU is required by this RF-1310 LCU, the transmit interface is enabled. Appropriate parallel data sent via address/data bus AD0-AD7 from the CPU is converted to serial data by USART U8. Completed reception/transmission of message characters by U8 is signaled to the CPU by interrupt line RST 5.5, generated by U8 and U14. The BRCLK input to the USART is from the 5.0688 MHz crystal oscillator circuit using Y2.

3.3 Serial Interfaces

The A17 assembly provides all standard data communication interfaces (each is individually jumper selectable). For RS-232C/MIL-STD-188C interfaces, driver U15 and receiver U21 are used. The RS-422 interface utilizes tristate drivers of U13 and receiver in U18.

3.4 Parallel Data I/O

Parallel data I/O is accomplished by input buffers U10 and U11 reading user-selected options from DIP switches S1 and S2. Outputs from latch U9 select operating modes of modem U16 and the interface control functions. Data transfer to/from these parallel I/O elements, as well as USART U8, is managed by chip selects from U3 combined with appropriate RD and WR signals in U4.

3.5 Modem I/O

The TXD signal from USART U8 is presented in serial data format to the TXD input of universal low speed (0-600 bps) modem U16 for conversion to frequency shift keying (FSK) signals. The 1.0 MHz Y1 crystal is required to utilize the U16 on chip oscillator. The TXCND signal (transmit carrier), a digitally synthesized sine wave derived from the 1.0 MHz oscillator reference, is applied to the filter input of transmit filter/line hybrid U19. With the mode input from parallel data control U9 set to "1" and the type input from switch S1 set to "1", the US standard originate frequencies are used. A mark "1" is 1270 Hz while a SPACE "0" is 1070 Hz. The RX rate input to U16 selects a receive data rate of 0-600 bits per second (bps).

Transmit filter/line hybrid U19 lowpass filters the oscillator output to attenuate those modulation components which would interfere with the adjacent channel. The CHAN SELECT signal input of U19, via part of dual op amp U22, allows the filter to pass the originate frequencies $1170 \text{ Hz} \pm 100 \text{ Hz}$ when the CHAN SELECT signal is -12 V, and the answer frequencies $2125 \text{ Hz} \pm 100 \text{ Hz}$ when the CHAN SELECT signal is +12 V. U19 also contains an active line hybrid which couples the modem to the line. T1 provides a 600 ohm balanced audio output. LEVEL ADJ potentiometer R20 allows the operator to adjust the hybrid output level. The XMT FSK output signal is applied to the distant RCU via rear panel connector J8.

The RCV FSK input signal from the distant RCU via connector J8 passed through U19 to receive filter U20 as the RCV FSK signal. Receive filter U20 attenuates signals outside the channel passband and also limits noise energy from the line. The CHAN SELECT signal input to U20 allows the filter to pass the originate frequencies $1170 \text{ Hz} \pm 100 \text{ Hz}$ when the CHAN SELECT signal is -12 V, and the answer frequencies $2125 \text{ Hz} \pm 100 \text{ Hz}$ when the CHAN SELECT signal is +12 V. U20 also contains a soft limiter amplifier which limits the RXCND signal to supply the demodulator in U16 with a square wave FSK signal. The RXCND signal is demodulated and routed to serial I/O (USART) U8 as the RXD signal via jumper A17E8 to A17E4.

3.6 BITE (Self-Test)

When installed, the A17 LCU hardware is tested along with all other RF-1310 functions during execution of the built-in-test (BITE) feature of the exciter. These tests are performed if the exciter is in Local or Remote operation. Specifically, three LCU tests are made: a test of USART U8 function, a checksum test to ensure correct EPROM function, and a test of parallel I/O and RS-422 receivers. The corresponding BITE fault codes are:

- Fault 01 - EPROM (U7) fault
- Fault 02 - Communications (USART U8) fault
- Fault 03 - Interface (U9, U10, U17, U18) fault

3.7 Dc Distribution

The A17 assembly receives three supply voltages from the A14 assembly, each of which is converted by local regulators to provide voltages needed by the LCU circuits. The +8.5 volt input is regulated by VR2 to yield the +5 V logic supply. The +15 V and -15 V inputs are converted by regulators VR1 and VR3, respectively, to provide +12 V and -12 V levels for the modem and serial interface.

4. MAINTENANCE

4.1 Setup

4.1.1 Identification Number

For use in a remote control system consisting of many RF-1310 or other compatible units, each LCU must be setup to have a unique identification number. This number, an eight-bit binary code, is set up on DIP switch S1 and allows 255 individual unit codes (1 to 255) according to table 2.

Table 2. Identification Number Setup

Switch	Binary Weight
S1-1	128 (highest order bit)
S1-2	64
S1-3	32
S1-4	16

0 = switch closed
1 = switch open

Table 2. Identification Number Setup (Cont.)

Switch	Binary Weight
S1-5	8
S1-6	4
S1-7	2
S1-8	1 (lowest order bit)

0 = switch closed

1 = switch open

For example, leaving only S1-4 and S1-7 open and all other S1 switches closed forms the binary identification number 00010010, which is $16 + 2 = 18$ (in decimal format).

4.1.2 Baud Rate Selection

The RF-1310 LCU allows any of sixteen popular baud rates to be used in communication through the USART U8. The baud rate is selectable by setting switches on DIP switch S2 according to table 3. Users should change the baud rate switches only when the RF-1310 is turned off, so that the A17 assembly will be set up correctly when power is again applied. S2-2 and S2-6 are only functional in FSK modem mode. S2 positions 5 and 8 are always nonfunctional.

Table 3. Baud Rate Setup

S2-1	S2-3	S2-4	S2-7	Baud Rate
C	C	C	C	50
C	O	C	C	75
C	C	C	O	110
C	O	C	O	134.5
C	C	O	C	150
C	O	O	C	300
C	C	O	O	600
C	O	O	O	1200
O	C	C	C	1800
O	O	C	C	2000
O	C	C	O	2400
O	O	C	O	3600

O = switch open

C = switch closed

Table 3. Baud Rate Setup (Cont.)

S2-1	S2-3	S2-4	S2-7	Baud Rate
O	C	O	C	4800
O	O	O	C	7200
O	C	O	O	9600
O	O	O	O	19200

O = switch open
C = switch closed

4.1.3 Signaling Interface Selection

The RF-1310 LCU allows any one of four common signaling interfaces to be used. Typically, the desired interface will be set at the factory. If another interface is needed, configure jumpers as shown in table 4.

Table 4. Jumper Selection of Interface

Selected Interface	Jumper Configuration
RS-232C Interface RS-232C TX	E27 - E11 Jumpered E14 - E16 Jumpered E15 - E16 Open
RS-232C RX	E6 - E4 Jumpered E5 - E4 Open E7 - E4 Open E8 - E4 Open
MIL-188C Interface MIL-188C TX	E27 - E11 Jumpered E15 - E16 Jumpered E14 - E16 Open
MIL-188C RX	E7 - E4 Jumpered E6 - E4 Open E7 - E4 Open E8 - E4 Open
RS-422 Interface RS-422 RX and TX	E5 - E4 Jumpered E6 - E4 Open E7 - E4 Open E8 - E4 Open

Table 4. Jumper Selection of Interface (Cont.)

Selected Interface	Jumper Configuration
Modem (Refer to paragraph 4.1.4) Modem TX Modem RX	E27 - E12 Jumpered E8 - E4 Jumpered E5 - E4 Open E6 - E4 Open E7 - E4 Open

For normal operation, leave jumpers E1 - E2 open.

4.1.4 Modem Signaling Frequencies

The FSK modem may be operated using the US Answer or US Originate frequencies from the RF-1310 remote control. Typically, the RF-1310 remote control is configured for US Answer operation, and the distant controller for US Originate frequencies. Frequency pair selection is accomplished by the setup listed in table 6. The baud rates available in FSK modem operation are 300 and 600 baud. Once the baud rate has been determined, the baud rate select switch S2 can be set per table 5. The frequency pair, selected by S2-6, must coincide with the jumper installations shown in table 6. Setup for FSK modem is listed in table 4.

Table 5. Baud Rate Select Switch Settings for Modem Operation

Baud Rate	S2-1	S2-2	S2-3	S2-4	S2-5	S2-6	S2-7
300	C	O	O	O	--	see tbl 6	C
600	C	C	C	O	--	see tbl 6	O

O = open
C = closed

Table 6. US Answer and US Originate Frequencies

RF-1310 Option	Jumper Configuration	S2-6 Position
US Answer	E21 - E22 Jumpered E26 - E22 Open	Closed
	E26 - E24 Jumpered E24 - E21 Open	
US Originate	E21 - E22 Jumpered E26 - E22 Open	Open
	E26 - E24 Open E24 - E21 Jumpered	

In a typical system configuration, operating the A17 assembly in the FSK mode with a remote control, the A17 assembly would be configured for US Answer frequencies and 300 baud. The remote control would be configured for US Originate and 300 baud.

4.2 Hybrid Level Adjustment

The following adjustment is for the FSK modem output level, and has been completed at the factory prior to shipment. In the event a board needs repair or realignment, the following procedure has been included.

- a. Connect an HP-3400A Analog Voltmeter, or equivalent, between pins 16 and 27 of connector J8 on the RF-1310 rear panel.
- b. Connect an ac power cord on the RF-1310 rear panel.
- c. Jumper A17E1 to A17E3.
- d. Set the voltmeter RANGE control to the 1 volt, 0 dBm position.
- e. Turn on the RF-1310 using the ON/OFF function switch located on the front panel. Set switch to NORM.
- f. Adjust hybrid level adjustment A17R20 for a meter reading of 1 volt, 0 dBm.
- g. Turn off power and disconnect test equipment. Remove E1 - E2 jumper.

4.3 Troubleshooting

There are six test points located on LCU Assembly A17. Table 7, used together with the schematic diagram and component location drawing, should help in locating most A17 assembly problems.

Table 7. Test Point Indications

Test Point	Indicates
TP1	A17 address/data buffer enable A17U5
TP2	Chip enable for LCU EPROM A17U7
TP3	LCU activity signal from A17U9
TP4	RST 5.5 interrupt from A17U14
TP5	Modem Transmit carrier (MARK = 1270 Hz, SPACE = 1070 Hz)*
TP6	Modem Receive Carrier (MARK = 2225 Hz, SPACE = 2025 Hz)*

*Modem configured as US Standard Originate.

Data transfer to or from the microprocessor on Control Board Assembly A14 takes place when a logic low is seen at TP1. A simultaneous low at TP2 indicates the exchange is that of program steps from the EPROM containing software to manage the A17 assembly. Logic high pulses will be seen once per millisecond at TP3,

even if the RF-1310 is not in remote operation (with or without an attached, controlling unit). When a controlling unit is operating, its communication with the RF-1310 will result in intermittent active high pulses on the interrupt line (TP4), again regardless of the local or remote operation of the exciter.

Absence of activity on points TP1 - TP3 indicate a failure in the connection of A17 assembly to Control Board Assembly A14. If the A17 assembly is not properly installed, an operator placing the function switch to REMOTE will note that the front panel display blanks, then reads NO REMOTE. After 4 seconds, the displays will read the values last used in local operation, but the front panel will be locked out. The operator must return to NORM using the function switch. If activity is seen on TP1 - TP3 and the exciter can be placed into remote operation (but no activity is seen at TP4), the fault lies in the setup of the A17 assembly (baud rate or interface jumpering), or in the controller or link between controller and RF-1310.

If activity is seen on all four test points during operation with a controller, but the RF-1310 cannot be remotely commanded, check that the LCU identification number is properly selected. Also check that this LCU is the one being commanded from the controller. As an aid to checking desired baud rate and identification number setups, apply power to the exciter after the corresponding DIP switches S1 and S2 have been set on the A17 assembly. With the exciter selected to remote transmit operation, depress and hold in the front panel ENTER button. Within ten seconds, the lefthand display of the RF-1310 will show the identification number and baud rate selected on A17S1 and A17S2 in a format such as REMOTE # 04 2400 BPS. This is for LCU identification number 4, and a communication rate of 2400 bits per second (baud).

5. PARTS LIST, COMPONENT LOCATIONS, AND SCHEMATIC DIAGRAM

Table 8 lists the parts in Remote Control Assembly A17. Figure 1 shows the components in the A17 assembly, and figure 2 is the schematic diagram for the A17 assembly.

Table 8. Remote Control Assembly A17 Parts List

Ref. Desig.	Part Number	Description
A17	10121-6200	REMOTE CONTROL ASSEMBLY
C1	CK05BX103M	CAP .01UF 20% 100V CER
C2	CK05BX103M	CAP .01UF 20% 100V CER
C3	C26-0050-109	CAP 1.0UF 20% 50V TANT
C4	CK05BX103M	CAP .01UF 20% 100V CER
C5	C26-0050-109	CAP 1.0UF 20% 50V TANT
C6	C26-0050-109	CAP 1.0UF 20% 50V TANT
C7	CK05BX103M	CAP .01UF 20% 100V CER
C8	CK05BX103M	CAP .01UF 20% 100V CER
C9	CK05BX103M	CAP .01UF 20% 100V CER
C10	CK05BX103M	CAP .01UF 20% 100V CER
C11	CK05BX103M	CAP .01UF 20% 100V CER
C12	CK05BX103M	CAP .01UF 20% 100V CER
C13	CK05BX103M	CAP .01UF 20% 100V CER
C14	CK05BX103M	CAP .01UF 20% 100V CER
C15	CK05BX103M	CAP .01UF 20% 100V CER
C16	CK05BX103M	CAP .01UF 20% 100V CER
C17	CK05BX103M	CAP .01UF 20% 100V CER
C18	CK05BX103M	CAP .01UF 20% 100V CER
C19	CK05BX103M	CAP .01UF 20% 100V CER
C20	CK05BX103M	CAP .01UF 20% 100V CER
C21	CK05BX103M	CAP .01UF 20% 100V CER

Table 8. Remote Control Assembly A17 Parts List (Cont.)

Ref. Desig.	Part Number	Description
C22	CK05BX103M	CAP .01UF 20% 100V CER
C23	CK05BX103M	CAP .01UF 20% 100V CER
C24	CM04FD201J03	CAP 200PF 5% 500V MICA
C25	CK05BX103M	CAP .01UF 20% 100V CER
C26	CK05BX103M	CAP .01UF 20% 100V CER
C27	CK05BX103M	CAP .01UF 20% 100V CER
C28	C11-0009-225	CAP 2.2UF 20% 50V CER
C29	CK05BX103M	CAP .01UF 20% 100V CER
C30	10075-1003	CAP 510PF 5% 500V MICA
C31	C22-0005-001	CAP. 2.7UF 150 ETCH FOIL
C32	CM04ED330J03	CAP 33PF 5% 500V MICA
C33	CM04ED330J03	CAP 33PF 5% 500V MICA
CR1	1N5234B	DIODE 6.2V 5% .5W ZENER
CR2	1N5234B	DIODE 6.2V 5% .5W ZENER
CR3	1N4007	DIODE 1A 1000V RECT GP
CR4	1N4007	DIODE 1A 1000V RECT GP
E1	J46-0003-001	HEADER, 1 PIN
E2	J46-0003-001	HEADER, 1 PIN
E4	J46-0003-001	HEADER, 1 PIN
E5	J46-0003-001	HEADER, 1 PIN
E6	J46-0003-001	HEADER, 1 PIN
E7	J46-0003-001	HEADER, 1 PIN
E8	J46-0003-001	HEADER, 1 PIN
E11	J46-0003-001	HEADER, 1 PIN
E12	J46-0003-001	HEADER, 1 PIN
E13	J46-0003-001	HEADER, 1 PIN
E14	J46-0003-001	HEADER, 1 PIN
E15	J46-0003-001	HEADER, 1 PIN
E16	J46-0003-001	HEADER, 1 PIN
E17	J46-0003-001	HEADER, 1 PIN
E18	J46-0003-001	HEADER, 1 PIN
E19	J46-0003-001	HEADER, 1 PIN
E20	J46-0003-001	HEADER, 1 PIN
E21	J46-0003-001	HEADER, 1 PIN
E22	J46-0003-001	HEADER, 1 PIN
E24	J46-0003-001	HEADER, 1 PIN
E26	J46-0003-001	HEADER, 1 PIN
E27	J46-0003-001	HEADER, 1 PIN
J1	J46-0013-020	HEADER, PROTECTED, 20 PIN
J2	J46-0013-020	HEADER, PROTECTED, 20 PIN
J3	J46-0013-030	HEADER, PROTECTED, 30 PIN
R1	R50-0010-103	RES,10SIP, 10K,2.0%, 9RES
R2	R65-0003-103	RES,10K 5% 1/4W CAR FILM
R4	R65-0003-103	RES,10K 5% 1/4W CAR FILM
R5	R50-0010-103	RES,10SIP, 10K,2.0%, 9RES

Table 8. Remote Control Assembly A17 Parts List (Cont.)

Ref. Desig.	Part Number	Description
R6	R50-0010-103	RES,10SIP, 10K,2.0%, 9RES
R7	R65-0003-362	RES,3.6K 5% 1/4W CAR FILM
R8	R50-0010-103	RES,10SIP, 10K,2.0%, 9RES
R9	R65-0003-203	RES,20K 5% 1/4W CAR FILM
R11	R65-0003-473	RES,47K 5% 1/4W CAR FILM
R12	R65-0003-473	RES,47K 5% 1/4W CAR FILM
R14	R65-0003-103	RES,10K 5% 1/4W CAR FILM
R15	RCR07G156JM	RES,15M 5% 1/4W CAR MP
R16	R65-0003-361	RES,360 5% 1/4W CAR FILM
R17	R65-0003-361	RES,360 5% 1/4W CAR FILM
R18	R65-0003-102	RES,1.0K 5% 1/4W CAR FILM
R19	R65-0003-102	RES,1.0K 5% 1/4W CAR FILM
R20	R30-0008-204	RES,VAR,PCB 200K 1/2W 10%
R21	R65-0003-471	RES,470 5% 1/4W CAR FILM
R22	R65-0003-471	RES,470 5% 1/4W CAR FILM
S1	S50-0001-008	SW SPST 8SEC .1A SLD DIP
S2	S50-0001-008	SW SPST 8SEC .1A SLD DIP
T1	T30-0001-005	TRANSFORMER,AUDIO,600 OH
TP1	J-0071	TP PWB BRN TOP ACCS .080"
TP2	J-0066	TP PWB RED TOP ACCS .080"
TP3	J-0069	TP PWB ORN TOP ACCS .080"
TP4	J-0070	TP PWB YEL TOP ACCS .080"
TP5	J-0068	TP PWB GRN TOP ACCS .080"
TP6	J-0072	TP PWB BLU TOP ACCS .080"
U1	I05-0000-244	IC 74LS244 PLASTIC TTL
U2	I05-0000-008	IC 74LS08 PLASTIC TTL
U3	I05-0000-138	IC 74LS138 PLASTIC TTL
U4	I05-0000-032	IC 74LS32 PLASTIC TTL
U5	I05-0000-245	IC 74LS245 PLASTIC TTL
U6	I05-0000-373	IC 74LS373 PLASTIC TTL
U7	SEE NOTE	SOFTWARE KIT
U8	I59-0005-000	IC 2661 PLASTIC
U9	I05-0000-374	IC 74LS374 PLASTIC TTL
U10	I05-0000-244	IC 74LS244 PLASTIC TTL
U11	I05-0000-244	IC 74LS244 PLASTIC TTL
U12	I05-0000-004	IC 74LS04 PLASTIC TTL
U13	I16-0008-002	IC 75172 DRIVER PLASTIC
U14	I05-0000-000	IC 74LS00 PLASTIC TTL
U15	I16-0001-000	IC 1488 CERAMIC DTL
U16	10063-1215	IC, FSK MODEM
U17	I16-0008-002	IC 75172 DRIVER PLASTIC
U18	I17-0003-000	IC 26LS33 PLASTIC TTL
U19	10063-1214	IC, TRANSMIT HYBRID
U20	10063-1213	IC, RECEIVE HYBRID
U21	I17-0001-000	IC 1489 CERAMIC DTL

Table 8. Remote Control Assembly A17 Parts List (Cont.)

Ref. Desig.	Part Number	Description
U22	I30-0035-000	IC 072 OP AMP PLASTIC
VR1	I12-0006-012	IC VR 78L12A + 12V .10A 4%
VR2	I11-0001-001	IC VR 7805 + 5V 1.5A 4%
VR3	I12-0010-012	IC VR 79L12A -12V .10A 4%
XU7	J77-0008-005	SKT IC MACH 24 PIN
Y1	Y15-0004-010	CRYSTAL, 1 MHZ
Y2	Y15-0004-050	CRYSTAL, 5.0688 MHZ

NOTE

The part number for U7 is 10121-8XXX-X, where XXX-X is the four character software kit code found on the PROM label. For example, if the code is 501C, the part number for the programmed PROM is 10121-8501-C.

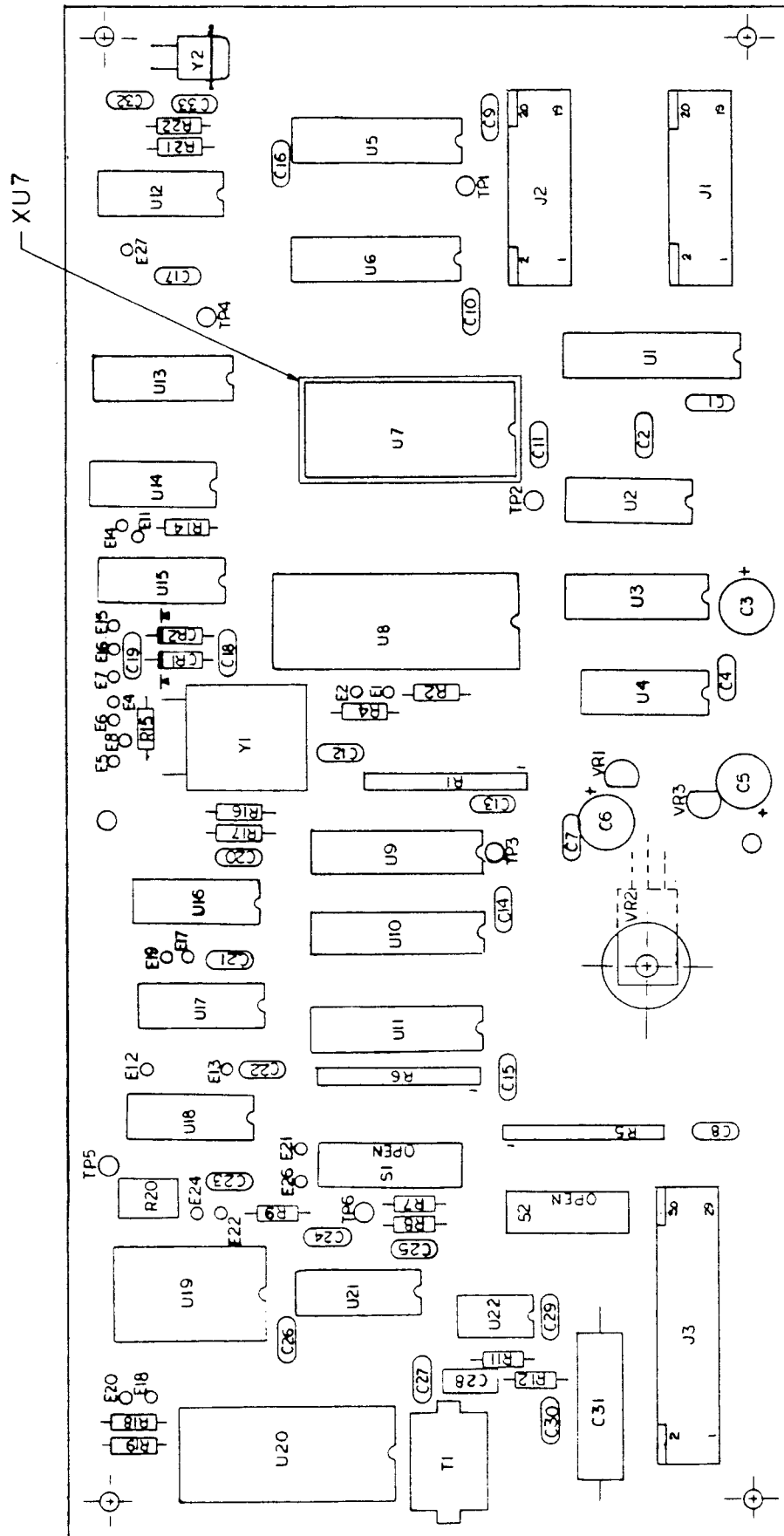


Figure 1. Remote Control Assembly A17 Component Location Diagram (10121-6200)

JUMPER SELECTION OF INTERFACE	
SELECTED INTERFACE	JUMPER CONFIGURATION
RS-422 INTERFACE RS-422 Tx	
RS-422 Rx	E5 TO E4 JUMPERED E6 TO E4 OPEN E7 TO E4 OPEN E8 TO E4 OPEN
FSK MODEM	
MODEM Tx	E27 TO E12 JUMPERED
MODEM Rx	E8 TO E4 JUMPERED E5 TO E4 OPEN E6 TO E4 OPEN E7 TO E4 OPEN

NOTE:
FOR NORMAL OPERATION
E1 TO E2 LEFT OPEN.
CONNECT E1 TO E2 FOR
MODEM OUTPUT ADJUSTMENT.

JUMPER SELECTION OF INTERFACE	
MODEM HYBRID	JUMPER CONFIGURATION
U.S. ANSWER	
TRANSMIT HYBRID	E21 TO E22 JUMPERED
RECEIVE HYBRID	E26 TO E24 JUMPERED
U.S. ORIGINATE	
TRANSMIT HYBRID	E26 TO E22 JUMPERED
RECEIVE HYBRID	E21 TO E24 JUMPERED

NOTE: UNLESS OTHERWISE SPECIFIED:

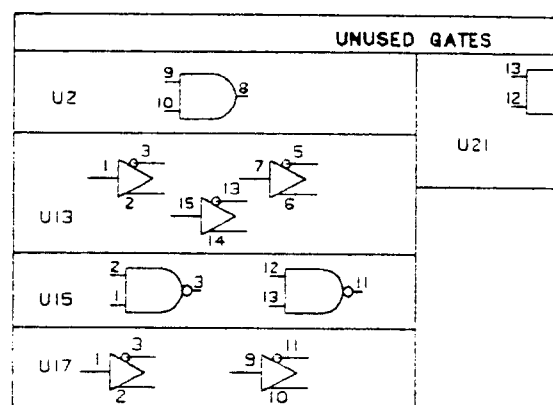
1. PARTIAL REFERENCE DESIGNATIONS ARE FOR A COMPLETE DESIGNATION, PREFIX, UNIT NO. AND/OR ASSEMBLY NO. DESIGN

2. ALL RESISTOR VALUES ARE IN OHMS, 1/

3. ALL CAPACITOR VALUES ARE IN MICROF

4. VENDOR PART NO. CALLOUTS ARE FOR R COMPONENTS ARE SUPPLIED PER PART

U2 74LS08
U4 74LS32
U12 74LS04
U13 26LS31
U14 74LS00
U15 MC1488
U17 26LS31
U18 26LS33
U21 MC1489
U22 TL072



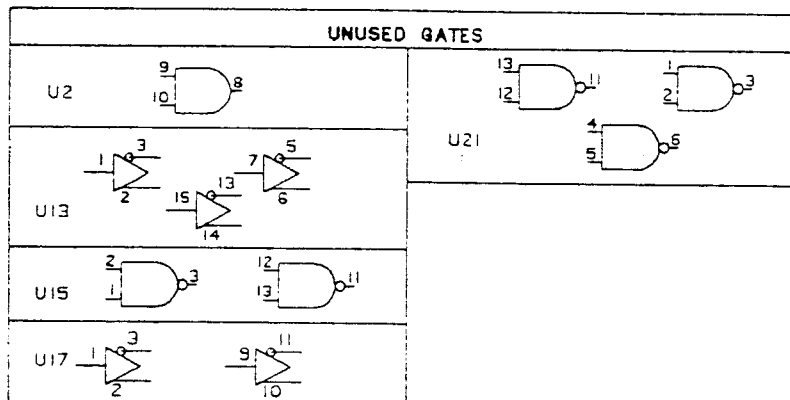
JUMPER SELECTION OF INTERFACE	
SELECTED INTERFACE	JUMPER CON
RS-232-C INTERFACE	
RS-232-C Tx	E27 TO E11 E14 TO E16 E15 TO E16
RS-232-C Rx	E6 TO E4 E5 TO E4 E7 TO E4 E8 TO E4
MIL-STD-188C INTERFACE	
MIL-STD-188C Tx	E15 TO E16 E14 TO E16 E27 TO E11
MIL-STD-188C Rx	E7 TO E4 E5 TO E4 E6 TO E4 E8 TO E4

NOTE: UNLESS OTHERWISE SPECIFIED:

1. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN. FOR A COMPLETE DESIGNATION, PREFIX WITH UNIT NO. AND/OR ASSEMBLY NO. DESIGNATION.
2. ALL RESISTOR VALUES ARE IN OHMS, 1/4W, ±5%.
3. ALL CAPACITOR VALUES ARE IN MICROFARADS.
4. VENDOR PART NO. CALLOUTS ARE FOR REFERENCE ONLY. COMPONENTS ARE SUPPLIED PER PART NO. IN PARTS LIST

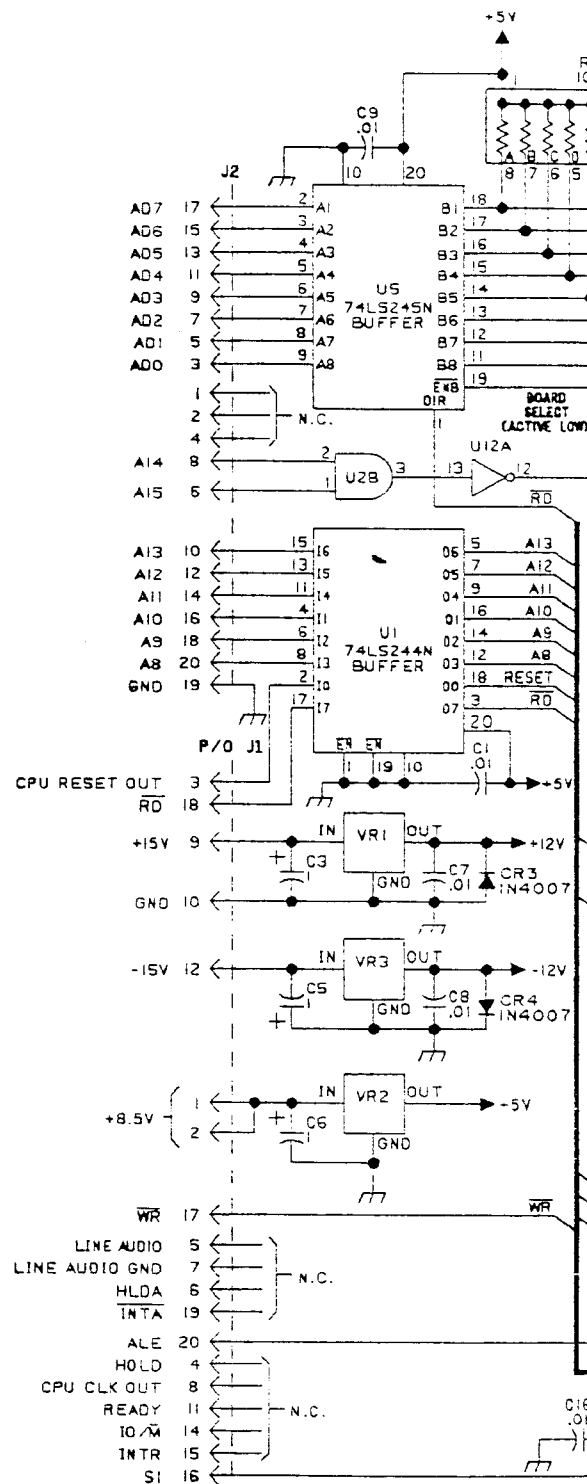
U2 74LS08
U4 74LS32
U12 74LS04
U13 26LS31
U14 74LS00
U15 MC1489
U17 26LS31
U18 26LS33
U21 MC1489
U22 TL072

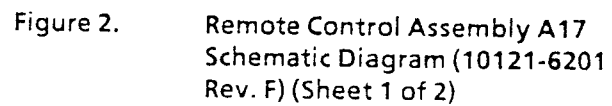
UNUSED GATES



JUMPER SELECTION OF INTERFACE

SELECTED INTERFACE	JUMPER CONFIGURATION
RS-232-C INTERFACE	
RS-232-C Tx	E27 TO E11 JUMPED E14 TO E16 JUMPED E15 TO E16 OPEN
RS-232-C Rx	E6 TO E4 JUMPED E5 TO E4 OPEN E7 TO E4 OPEN E8 TO E4 OPEN
MIL-STD-188C INTERFACE	
MIL-STD-188C Tx	E15 TO E16 JUMPED E14 TO E16 OPEN E27 TO E11 JUMPED
MIL-STD-188C Rx	E7 TO E4 JUMPED E5 TO E4 OPEN E6 TO E4 OPEN E8 TO E4 OPEN





RS232C/
MIL 188C IN

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P/O

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BAUD2
BAUD3

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+5V

C25

.01

14

7

U21

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C24

200PF

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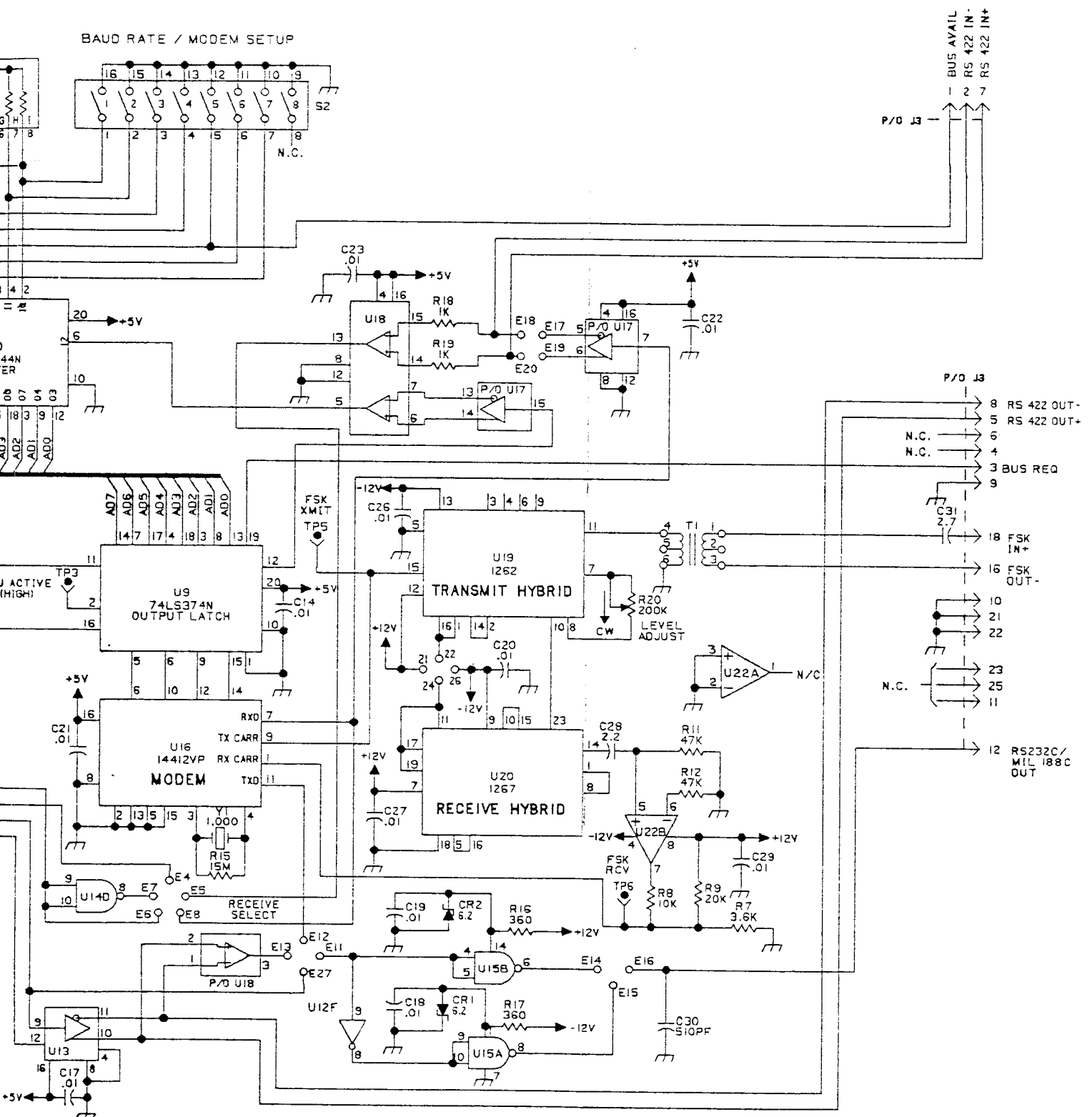


Figure 2. Remote Control Assembly A17
Schematic Diagram (10121-6201
Rev. F) (Sheet 2 of 2)