

BU-1000 INSTALLATION

The BU-1000 has a 5 pin connector for hookup to the MRU(meter reading unit) modem and a BNC connector for connection to a half wave dipole. The Pin-out of the 5 pin connector is as follows.

- 1)PTT(push to talk)
- 2)12V(regulated 12 volt input)
- 3)mod in(modulation input)
- 4)RXA(receiver audio output)
- 5)GND(ground)

THEORY OF OPERATION

The BU-1000 is a low power data transceiver.

RECEIVER SECTION

The receiver is a double conversion superhetrodyne design. When in the receive mode, signal is allowed to pass to Q1 RF AMP where it is amplified and sent to U1 for the first mix. X2 is a 3rd overtone crystal which is tripled by Q2 to produce the first mix frequency. The first mixer is located in U1 and produces a 10.7MHZ first IF. X1 produces the 2nd mix frequency of 10.245MHZ. It is mixed in U1 to produce a 455KHZ 2nd IF frequency. Receiver audio is then detected in U1 to produce RXA out.

TRANSMIT SECTION

Modulation is applied to D3 varactor and is used to shift the frequency of X201 to produce FM modulation. X201 is a 3rd overtone crystal. Its frequency is tripled by Q241 to give the appropriate output frequency. It is then amplified by Q242 predriver and Q243 final. It is passed through D440/441 switching when in transmit mode and from there applied to the antenna.

BU-1000 SPECIFICATIONS

GENERAL

FREQUENCY COVERAGE: 1 CHANNEL

(173.20375/173.21/173.2375/173.2625/173.2875/173.3125/173.3375/173.3625/173.39/ OR 173.39625 MHZ)

TX CURRENT DRAW: 250MA

RX CURRENT DRAW: 120MA

RECEIVER

SENSITIVITY: 10DB SINAD AT .8UV

AUDIO OUTPUT LEVEL: 2VPP AT 3KHZ DEVIATION

1ST IF FREQUENCY: 10.7 MHZ

2ND IF FREQUENCY: 455 KHZ

TRANSMITTER

POWER: 250MW

BU-1000 DATA TRANSCEIVER BOARD PARTS LIST

VERSION 2

RECEIVER SECTION

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|-------------------------------------------|--------------------------------------------|
| <u>C2,8,10,11,13,16,17,18,19,20,23,24</u> | <u>.1UF NEWARK 07WX6808</u> |
| <u>C6</u> | <u>33PF DIGIKEY PCC330CCT-ND</u> |
| <u>C7</u> | <u>18PF DIGIKEY PCC180CCT-ND</u> |
| <u>C14</u> | <u>120PF DIGIKEY PCC121CCT-ND</u> |
| <u>C4</u> | <u>4.7PF DIGIKEY PCC4R7CCT-ND</u> |
| <u>C15</u> | <u>47PF DIGIKEY PCC470CCT-ND</u> |
| <u>C5</u> | <u>22PF DIGIKEY PCC220CCT-ND</u> |
| <u>C12</u> | <u>1UF TANTILUM NEWARK 93F2694</u> |
| <u>C3</u> | <u>100PF DIGIKEY PCC101CCT-ND</u> |
| <u>C25</u> | <u>1000PF DIGIKEY PCC102BCT-ND</u> |
| <u>C21</u> | <u>2200PF DIGIKEY PCC222BCT-ND</u> |
| <u>R6,2</u> | <u>470 NEWARK 07WX0214</u> |
| <u>R10,12</u> | <u>39K NEWARK 08WX8266</u> |
| <u>R3,7,8</u> | <u>1K NEWARK 07WX0211</u> |
| <u>R4</u> | <u>5.6K NEWARK 08WX8274</u> |
| <u>R5</u> | <u>15K NEWARK 08WX7826</u> |
| <u>R1</u> | <u>100K NEWARK 96F6995R100.0K</u> |
| <u>R9</u> | <u>10K NEWARK 08WX8237</u> |
| <u>R11,13</u> | <u>22K NEWARK 08WX8252</u> |
| <u>R14</u> | <u>330 OHM 1/2 WATT DIGIKEY 330H-ND</u> |
| <u>FL1</u> | <u>E10.7V NEWARK 87F2439</u> |
| <u>FL2</u> | <u>455KHZ NEWARK 90F2264</u> |
| <u>L1</u> | <u>43NH DIGIKEY DN4010-ND</u> |
| <u>L2</u> | <u>1.5UH DIGIKEY TK1412-ND</u> |
| <u>L3</u> | <u>.108UH DIGIKEY TK2713-ND</u> |
| <u>L4</u> | <u>.64MH DIGIKEY TK1302-ND</u> |
| <u>U1</u> | <u>MC13135DW NEWARK 07F2896</u> |
| <u>U2</u> | <u>78L05ACP NEWARK 07F7397</u> |
| <u>X1</u> | <u>10.245 MHZ BOMAR</u> |
| <u>X2</u> | <u>SELECTED BOMAR</u> |
| <u>Q1</u> | <u>MRF901 NEWARK 08F1298</u> |
| <u>Q2</u> | <u>2N3904 NEWARK 09F5663</u> |
| <u>ZD1</u> | <u>6.8 V 1/2 WATT ZENER NEWARK 09F4090</u> |

TRANSMITTER SECTION

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| <u>C265,252,259,260,261,263,272</u> | <u>.1UF NEWARK 07WX6808</u> |
| <u>C253,254</u> | <u>47PF DIGIKEY PCC470CCT-ND</u> |
| <u>C255</u> | <u>18PF DIGIKEY PCC180CCT-ND</u> |
| <u>C262,250</u> | <u>220PF DIGIKEY PCC221BCT-ND</u> |
| <u>C267</u> | <u>2.2PF DIGIKEY PCC2R2CCT-ND</u> |
| <u>C271,273</u> | <u>1000PF DIGIKEY PCC102BCT-ND</u> |
| <u>C268</u> | <u>.01UF DIGIKEY PCC103BCT-ND</u> |

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| <u>R210</u> | <u>470 OHM NEWARK 07WX0214</u> |
| <u>R212</u> | <u>15K NEWARK 08WX7826</u> |
| <u>R221,216,211,217</u> | <u>1K NEWARK 07WX0211</u> |
| <u>R214</u> | <u>5.6K NEWARK 08WX8274</u> |
| <u>R215,220</u> | <u>18K DIGIKEY P18KECT-ND</u> |
| <u>R219,223</u> | <u>100K NEWARK 96F6995R100.0K</u> |
| <u>R222,218</u> | <u>10 OHM DIGIKEY P10ECT-ND</u> |
| <u>R224</u> | <u>4.7K DIGIKEY P4.7KECT-ND</u> |
| <u>R225</u> | <u>330 OHM 1/2 WATT DIGIKEY 330H-ND</u> |

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| R226 | 150 OHM DIGIKEY P150ECT-ND |
| L290 | 1.5UH DIGIKEY TK1412-ND |
| L291 | .137UH DIGIKEY TK2714-ND |
| L292,296,297,299 | 43 NH DIGIKEY DN4010-ND |
| L294,300 | 1UH DIGIKEY PCD1131CT-ND |
| L295 | .241UH DIGIKEY TK2707-ND |
| L293 | .375UH DIGIKEY TK2729-ND |
| L298 | .211UH DIGIKEY TK2706-ND |
| Q242,241 | MRF901 NEWARK 08F1298 |
| Q243 | 2N4427 NEWARK 10WX2083 |
| X201 | SELECTED |
| ZD2 | 6.8V ZENER NEWARK 09F4090 |
| D3 | MV2105 VARACTOR NEWARK 08F2197 |

COMMON SECTION

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|-----------------------|------------------------------|
| R401,402,403,400 | 1K NEWARK 07WX0211 |
| C460,461 | .1UF NEWARK 07WX6808 |
| L475 | 56UH DIGIKEY PCD1106CT-ND |
| D440,441 | MPN3404 NEWARK 07F9506 |
| Q450 | 2N3906 DIGIKEY 2N3906DICT-ND |
| LED1 | GREEN LED DIGIKEY 67-1059-ND |
| LED2 | RED LED DIGIKEY 67-1065-ND |
| CN1 | 5 PIN JACK DIGIKEY H2097-ND |
| CN2 | BNC JACK DIGIKEY ARF1178-ND |
| 2 PIN JACK(OPTIONAL) | DIGIKEY H2094-ND |
| 5 PIN PLUG(ACCESSORY) | DIGIKEY H2086-ND |
| 2 PIN PLUG(OPTIONAL) | DIGIKEY H2083-ND |
| PINS(ACCESSORY) | DIGIKEY H2138-ND |

VERSION 2(173 MHZ)

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| C1 | 56PF DIGIKEY PCC560CT-ND |
| C258,221 | 3.9PF DIGIKEY PCC3R9CCT-ND |
| C9,222 | 2.2PF DIGIKEY PCC2R2CCT-ND |
| C224 | 3.3PF DIGIKEY PCC3R3CCT-ND |
| C257,251 | 33PF DIGIKEY PCC330CCT-ND |
| C256 | 8.2PF DIGIKEY PCC8R2CCT-ND |
| C269 | 6.8PF DIGIKEY PCC6R8CCT-ND |
| C264 | 18PF DIGIKEY PCC180CCT-ND |