

APPENDIX 3  
FUNCTION OF DEVICES  
CBS-2100

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FUNCTION OF DEVICES  
FCC ID: MGPCBS2100  
APPENDIX 3

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## FUNCTIONAL DESCRIPTION OF ACTIVE COMPONENTS

| Ref. | Part Number | Description of Parts  | Functional Description of Parts                                      |
|------|-------------|-----------------------|----------------------------------------------------------------------|
| D001 | DDE2-1K60   | RF Diode (1N60)       | RF Detector for Noise Blanking circuit                               |
| D002 | DDE2-1K60   | RF Diode (1N60)       | RF Detector for Noise Blanking circuit                               |
| D003 | DDE1N4148   | Switch Diode (1N4148) | Switching Diode for NB noise shunting transistor TR7                 |
| D004 | DDE1N4148   | Switch Diode (1N4148) | Switching Diode - disable AM IF in SSB Mode                          |
| D005 | DDE1N4148   | Switch Diode (1N4148) | Switching Diode - disable 2nd Mixer in SSB Mode                      |
| D006 | DDE1N4148   | Switch Diode (1N4148) | Switching Diode - disable 2nd Mixer in TX mode                       |
| D007 | DDE1N4148   | Switch Diode (1N4148) | Switching Diode - voltage gating - Rx AGC                            |
| D008 | DDE1N4148   | Switch Diode (1N4148) | Switching Diode - SSB AGC attack time control                        |
| D009 | DDE1N4148   | Switch Diode (1N4148) | Switching Diode - AM AGC attack time control                         |
| D010 | DDE2-1K60   | RF Diode (1N60)       | IF Level Detector - for Rx Signal Meter and AGC                      |
| D011 | DDE2-1K60   | RF Diode (1N60)       | IF Level Detector - for Rx Signal Meter and AGC                      |
| D012 | DDE1N4148   | Switch Diode (1N4148) | Switching Diode - voltage gating for Signal Meter signal             |
| D013 | DDE1N4148   | Switch Diode (1N4148) | Switching Diode - voltage gating                                     |
| D014 | DDE1N4148   | Switch Diode (1N4148) | Switching Diode - voltage gating                                     |
| D015 | DDEM301     | Pin Diode             | Protect Receiver Front end from excessive signal                     |
| D016 | DDEM301     | Pin Diode             | Protect Receiver Front end from transmitter signal                   |
| D017 | DDE1N4148   | Switch Diode (1N4148) | Switching Diode - Enable SSB IF path in SSB Mode                     |
| D018 | DDE1N4148   | Switch Diode (1N4148) | Switching Diode - Provide 10.695MHz signal to TX mixer in AM Tx Mode |
| D019 | DDE1N4148   | Switch Diode (1N4148) | Switching Diode - Provide 10.695MHz signal to FL3 in AM Tx Mode      |
| D020 | DDE1N4148   | Switch Diode (1N4148) | Switching Diode - Disable AM receiving path in Tx Mode               |
| D021 | DDE1N4148   | Switch Diode (1N4148) | Switching Diode - Disable SSB receiving path in Tx Mode              |
| D022 | DDE1N4148   | Switch Diode (1N4148) | Switching Diode - Disable SSB IF amplifiers in Tx Mode               |
| D023 | DDE2-1K60   | RF Diode (1N60)       | AM Demodulator                                                       |
| D024 | DDE2-1K60   | RF Diode (1N60)       | AM Demodulator                                                       |
| D025 | DDE1N4148   | Switch Diode (1N4148) | Switching Diode - Enable SSB IF circuit in SSB Mode                  |
| D026 | DDE1N4148   | Switch Diode (1N4148) | ANL circuit                                                          |
| D027 | DDE1N4148   | Switch Diode (1N4148) | Switching Diode - Mute SSB Carrier re-insertion in AM Mode           |
| D028 | DDE1N4148   | Switch Diode (1N4148) | Switching Diode - Mute Rx audio in Tx Mode                           |
| D029 | DDE1N4007   | Power Diode           | Voltage Clamping                                                     |
| D030 | DDESVC251   | VC Diode              | PLL VCO                                                              |
| D033 | DDE1N4148   | Switch Diode (1N4148) | Switching Diode PLL VCO circuit                                      |
| D034 | DDE1N4148   | Switch Diode (1N4148) | Switching Diode - LSB mode                                           |
| D035 | DDE1N4148   | Switch Diode (1N4148) | Switching Diode - USB mode                                           |
| D036 | DDE1N4148   | Switch Diode (1N4148) | Switching Diode - AM mode                                            |
| D038 | DDE1N4148   | Switch Diode (1N4148) | Switching Diode - voltage gating                                     |
| D039 | DDE1N4148   | Switch Diode (1N4148) | Voltage Clamping                                                     |
| D040 | DDE1N4148   | Switch Diode (1N4148) | Switching Diode - enable 2nd offset oscillator in SSB Mode           |
| D057 | DDE1N4148   | Switch Diode (1N4148) | Switching Diode - AM mode                                            |

| Ref.  | Part Number | Description of Parts         | Functional Description of Parts                               |
|-------|-------------|------------------------------|---------------------------------------------------------------|
| D058  | DDE1N4148   | Switch Diode (1N4148)        | Switching Diode - USB mode                                    |
| D059  | DDE1N4148   | Switch Diode (1N4148)        | Switching Diode - disable SSB power control TR47 in AM mode   |
| D060  | DDE1N4148   | Switch Diode (1N4148)        | Switching Diode - LSB mode                                    |
| D061  | DDE1N4148   | Switch Diode (1N4148)        | Switching Diode - Mute Squelch when PLL is out of lock        |
| D062  | DDE1N4148   | Switch Diode (1N4148)        | Switching Diode - Disable balanced mixer output in Rx Mode    |
| D063  | DDE1N4148   | Switch Diode (1N4148)        | Switching Diode - Disable balanced mixer input in AM Mode     |
| D065  | DDE1N4148   | Switch Diode (1N4148)        | Voltage Clamping                                              |
| D066  | DDE1N4148   | Switch Diode (1N4148)        | Switching Diode - Disable PTT when PLL is out of lock         |
| D067  | DDE1N4148   | Switch Diode (1N4148)        | Audio Detector for automatic mic audio level control          |
| D068  | DDE1N4148   | Switch Diode (1N4148)        | Audio Detector for automatic mic audio level control          |
| D069  | DDE1N4148   | Switch Diode (1N4148)        | Audio Detector for automatic mic audio level control          |
| D070  | DDE1N4148   | Switch Diode (1N4148)        | Switching Diode - ALC operation                               |
| D071  | DDE1N4148   | Switch Diode (1N4148)        | Switching Diode - Mute Mic audio during receive mode          |
| D074  | DDE1N4148   | Switch Diode (1N4148)        | Switching Diode - AM mode                                     |
| D076  | DDE-C5V1G   | Zener 5.1v $\pm 2\%$ On S505 | Voltage offset for Rx active voltage switch TR36/TR38         |
| D077  | DDEMA29TA   | VR Diode (KB362)             | Switching Diode for Tx active voltage switch TR38             |
| D078  | DDE-C7V5G   | Zener 7.5V $\pm 2\%$         | Reference voltage source for 8V voltage regulator TR40/TR41   |
| D079  | DDEMA29WA   | VR Diode (KB262)             | Bias Diode for 8V voltage regulator TR40/TR41                 |
| D080  | DDE1N4148   | Switch Diode (1N4148)        | Switching Diode - Mute AF Power amplifier in Tx Mode          |
| D081  | DDE1N4148   | Switch Diode (1N4148)        | Switching Diode - PTT keying control                          |
| D082  | DDE1N4148   | Switch Diode (1N4148)        | Switching Diode - PTT keying control                          |
| D083  | DDE2-1K60   | RF Diode (1N60)              | Audio Detector for ALC operation                              |
| D084  | DDE1N4148   | Switch Diode (1N4148)        | Switching Diode - SSB mode                                    |
| D086  | DDE1N4148   | Switch Diode (1N4148)        | Transmit level detector for TX Power meter                    |
| D087  | DDE1N4148   | Switch Diode (1N4148)        | Transmit level detector for TX Power meter                    |
| D088  | DDEMA29A    | VR Diode (MV1Y)              | RF Power Transistor bias protection temperature sensor        |
| D089  | DDEMA29A    | VR Diode (MV1Y)              | RF Power Transistor bias protection temperature sensor        |
| D090  | DDE1N4148   | Switch Diode (1N4148)        | Voltage Clamping                                              |
| D091  | DDE1N4148   | Switch Diode (1N4148)        | Voltage Clamping                                              |
| D092  | DDE1N4148   | Switch Diode (1N4148)        | Bias Control for TR53                                         |
| D093  | DDE1N4004   | Power Diode                  | Secondary Power Supply polarity reversal protection           |
| D094  | DDE1N4148   | Switch Diode (1N4148)        | Switching Diode - enable 2nd offset oscillator in TX Mode     |
| D094a | DDESV251    | VC Diode                     | PLL VCO                                                       |
| D097  | DDE1N4148   | Switch Diode (1N4148)        | Switching Diode - PA Operation                                |
| D113  | DDE1N4148   | Switch Diode (1N4148)        | Switching Diode - Disable Rx audio during PA operation        |
| D114  | DDE1N4148   | Switch Diode (1N4148)        | Voltage Clamping                                              |
| D116  | DDE-C7V5G   | Zener 7.5V $\pm 2\%$         | Voltage regulator for PA circuit                              |
| D123  | DDE1N4148   | Switch Diode (1N4148)        | Switching Diode PLL VCO circuit                               |
| D124  | DDESV251    | VC Diode                     | PLL offset frequency oscillator - Clarifier frequency control |
| D125  | DDE1N4148   | Switch Diode (1N4148)        | Switching Diode - disable AM IF in SSB or TX Mode             |
| D401  | DDE2-1K60   | RF Diode (1N60)              | SWR signal detector                                           |

| Ref.  | Part Number    | Description of Parts      | Functional Description of Parts                                    |
|-------|----------------|---------------------------|--------------------------------------------------------------------|
| D402  | DDE2-1K60      | RF Diode (1N60)           | SWR signal detector                                                |
| D501  | DDE6A05        | Diode 6A60V On DC Socket  | Primary Power Supply polarity reversal protection                  |
| D601  | DDE-1N4148     | Switch Diode (1N4148)     | Logic Switch SSB Mode Switching                                    |
| D802  | DDE-1N4148     | Switch Diode (1N4148)     | Logic Switch SSB Mode Switching                                    |
| D701  | DSG-MEL-MM4148 | Switch Diode (1N4148) SMD | Clock Input Switch for IC706                                       |
| D901  | DDE-1N4148     | Switch Diode (1N4148)     | Super Clear Drive Switching                                        |
| D902  | DDE-1N4148     | Switch Diode (1N4148)     | Super Clear Drive Switching                                        |
| D801  | DDE-1N4148     | Switch Diode (1N4148)     | Logic Switch Switching                                             |
| D802  | DDE-1N4148     | Switch Diode (1N4148)     | Logic Switch Switching                                             |
| FL001 | FLR800M455A5   | Ceramic Filter 455KHz     | AM Second IF Filter                                                |
| FL002 | FLR810M700A1A  | Ceramic Filter 10.7MHz    | AM First IF Filter                                                 |
| FL003 | FLR810M695A3   | Crystal Filter 10.695MHz  | SSB IF filter, SSB Tx frequency filter                             |
| IC001 | ICT324N        | LM324N                    | Amplifier for : Signal Meter, Squelch Control, Receiver AGC        |
| IC003 | ICT612         | AN612                     | Balanced Modulator for SSB operation                               |
| IC004 | ICT4558D       | NUM4558D                  | Amplifier for : Microphone Audio, PTT control                      |
| IC008 | ICT7222AP      | TA7222AP                  | 4W Audio Power Amplifier IC                                        |
| IC009 | ICT6130-5      | TD6130-5                  | RF Mixer IC for Tx frequency generation                            |
| IC010 | ICT7310P       | TA7310P                   | RF Mixer with buffer amplifier for PLL offset frequency generation |
| IC601 | ICT2003        | ULN2003AN                 | Buffer Driver                                                      |
| IC602 | ICP20408       | Z86E0408                  | CPU - For Frequency Counting Application                           |
| IC603 | ICT12016       | MC12016P                  | Prescaler Frequency Divider                                        |
| IC604 | ICT14511BCP    | MC14511BCP                | BCD to 7 Segment Latch/Decoder/Driver                              |
| IC605 | ICT7805        | LM7805                    | 5V DC Regulator                                                    |
| IC701 | ICP20408       | Z86E0408P SMD             | CPU For Channel Switch and PLL Control                             |
| IC702 | ICT93LC46P-A   | HT93LC46 SMD              | EEPROM for CPU                                                     |
| IC703 | ICT7805        | LM7805                    | 5V DC Regulator IC                                                 |
| IC704 | ICT74LS164N    | SN74LS164N                | Channel display LED Latch Driver                                   |
| IC705 | ICT74LS164N    | SN74LS164N                | Channel display LED Latch Driver                                   |
| IC706 | ICT74HC164     | TC74HC164AP SMD           | Latch driver for PLL programmable divider                          |
| IC707 | ICT145106P     | MC145106P SMD             | PLL Synthesizer IC                                                 |
| IC901 | IC-DIP-KA8507  | KA8507                    | Clear Drive Compander Circuit                                      |
| Q261  | TTR2SC945Q     | 2SC945AQ                  | PA Tone Amplifier                                                  |
| Q701  | TTR9013H-A     | STS9013H                  | Driver for Channel display LED                                     |
| Q703  | KTC3876Y       | KTC3876Y                  | Driver for PLL programmable divider                                |
| TR001 | TTR2SC1675K    | 2SC1675K                  | Noise Blanker RF amplifier                                         |
| TR002 | TTR2SC1675K    | 2SC1675K                  | Noise Blanker RF amplifier                                         |
| TR003 | TTR2SC945Q     | 2SC945AQ                  | Noise Blanker RF amplifier                                         |
| TR004 | TTR2SC945Q     | 2SC945AQ                  | AGC Control for Noise Blanker RF amplifier                         |
| TR005 | TTR2SC945Q     | 2SC945AQ                  | Noise Blanker - Audio Noise amplifier                              |
| TR006 | TTR2SA733P     | 2SA733P                   | Noise Blanker - Audio Noise amplifier                              |
| TR007 | TTR2SC945Q     | 2SC945AQ                  | Noise Blanker - IF Shunting transistor                             |
| TR008 | TTR2SC1674L    | 2SC1674L                  | Second IF Mixer                                                    |

| Ref.  | Part Number  | Description of Parts | Functional Description of Parts                               |
|-------|--------------|----------------------|---------------------------------------------------------------|
| TR009 | TTR2SC1675K  | 2SC1675K             | 455KHz IF Amplifier                                           |
| TR010 | TTR2SC1675K  | 2SC1675K             | 455KHz IF Amplifier                                           |
| TR011 | TTR2SC1675K  | 2SC1675K             | 455KHz IF Amplifier                                           |
| TR012 | TTR2SC945Q   | 2SC945AQ             | AGC Attack time control in SSB Mode                           |
| TR013 | TTR2SC945Q   | 2SC945AQ             | Signal meter adjustment - AM Mode                             |
| TR014 | TTR2SC945Q   | 2SC945AQ             | Signal meter adjustment - SSB Mode                            |
| TR015 | TTR2SC945Q   | 2SC945AQ             | Audio amplifier for demodulated AM & Product detector for SSB |
| TR016 | TTR2SC945Q   | 2SC945AQ             | Switch - disable receiver audio                               |
| TR018 | FETJ310      | J310 (FET)           | First IF Mixer                                                |
| TR019 | TTR2SC1674L  | 2SC1674L             | SSB IF Amplifier                                              |
| TR020 | TTR2SC1675K  | 2SC1675K             | SSB IF Amplifier                                              |
| TR021 | TTR2SC1675K  | 2SC1675K             | SSB IF Amplifier                                              |
| TR022 | TTR2SC1906   | 2SC1906              | SSB IF Amplifier                                              |
| TR023 | TTR2SC945Q   | 2SC945AQ             | Switch - AM Demodulator control                               |
| TR024 | TTR2SC1675K  | 2SC1675K             | 10.24MHz Reference Frequency crystal oscillator               |
| TR025 | TTR2SC1675K  | 2SC1675K             | PLL VCO                                                       |
| TR026 | TTR2SC1675K  | 2SC1675K             | PLL VCO                                                       |
| TR030 | TTR2SC1675K  | 2SC1675K             | Second offset frequency crystal oscillator                    |
| TR031 | TTR2SC945Q   | 2SC945AQ             | Switch - disable balanced modulator input in AM Mode          |
| TR032 | TTR2SC945Q   | 2SC945AQ             | ALC audio shunting transistor                                 |
| TR034 | TTR2SA733P   | 2SA733P              | Audio Detector for ALC operation                              |
| TR036 | TTR2SA1282   | 2SA1282              | Rx Active voltage control                                     |
| TR037 | TTR2SC945Q   | 2SC945AQ             | Rx Active voltage control                                     |
| TR038 | TTR2SA1282   | 2SA1282              | TX Active voltage control                                     |
| TR040 | TTR2SC945Q   | 2SC945AQ             | 8V Power supply regulator                                     |
| TR041 | TTR2SB1566E  | 2SB1566E             | 8V Power supply regulator                                     |
| TR042 | TTR2SC945Q   | 2SC945AQ             | Audio pre-amplifier for received audio                        |
| TR043 | TTR2SC1969   | 2SC1969              | RF Power Transistor                                           |
| TR044 | TTR2SC2166C  | 2SC2166C             | RF Power Driver                                               |
| TR045 | TTR2SC1973   | 2SC1973              | RF Power Pre-Driver                                           |
| TR046 | TTR2SC1906   | 2SC1906              | RF amplifier                                                  |
| TR047 | TTR2SC1675K  | 2SC1675K             | SSB Power level control                                       |
| TR049 | TTR2SC945Q   | 2SC945AQ             | AM RF Power control and AM Modulator                          |
| TR050 | TTR2SA1282AE | 2SA1282              | AM RF Power control and AM Modulator                          |
| TR051 | TTR2SB754Y   | 2SB754Y              | AM RF Power control and AM Modulator                          |
| TR052 | TTR2SC945Q   | 2SC945AQ             | Switch - disable AM Modulator for SSB operation               |
| TR053 | TTR2SC945Q   | 2SC945AQ             | AM Modulation Control                                         |
| TR060 | TTR2SC945Q   | 2SC945AQ             | Frequency-Temperature Compensation Amplifier                  |
| TR061 | FET3SK77GR   | 3SK77GR              | Receiver front end amplifier                                  |
| TR351 | TTR2SC945Q   | 2SC945AQ             | E.L. Lamp Inverter Driver                                     |
| TR401 | TTR2SC945P   | 2SC945P              | Inverter/LED Driver                                           |

| Ref.  | Part Number   | Description of Parts      | Functional Description of Parts                   |
|-------|---------------|---------------------------|---------------------------------------------------|
| TR801 | TTR2SD467     | 2SD467                    | Logic Switch                                      |
| TR802 | TTR2SD467     | 2SD467                    | Logic Switch                                      |
| TR803 | TTR2SC945P    | 2SC945P                   | Logic Switch                                      |
| TR804 | TTR2SA562Y    | 2SA562                    | Logic Switch                                      |
| TR901 | TTR2SC945P    | 2SC945P                   | PA Bridge Amplifier                               |
| X001  | XTLB10M2400A2 | Crystal 10.2400MHz (YUWA) | Crystal for PLL reference frequency oscillator    |
| X002  | XTLB14M0100A1 | Crystal 14.0100MHz (YUWA) | Crystal for PLL offset frequency mixer oscillator |
| X004  | XTLB10M6975A1 | Crystal 10.6975MHz (YUWA) | Crystal for second offset frequency oscillator    |
| X701  | XTLC08M0000A1 | Crystal 8.0MHz            | Clock Crystal for Channel Switch CPU              |