

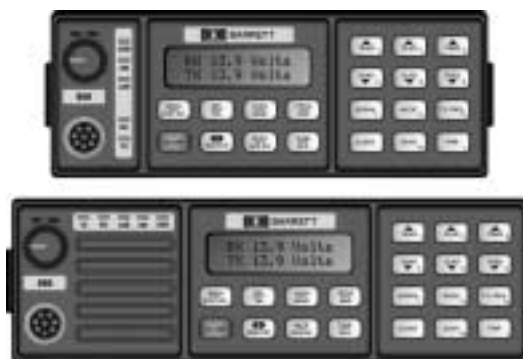
Technical manual

Barrett 900 series HF transceivers and receivers

BARRETT 930, 950, 980 local control HF transceivers
 BARRETT 930, 950 remote control (trunk mount) HF transceivers
 BARRETT 950M HF transceiver module
 BARRETT 950MR HF receiver
 BARRETT 940 HF portable transceiver

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1.0 Specifications

1.1 General Specifications

Equipment	BARRETT 980 GMDSS transceiver. BARRETT 950 transceiver local and remote control models BARRETT 930 transceiver local and remote control models BARRETT 950M transceiver module BARRETT 950MR receiver module (disregard references to transmit specifications and descriptions) BARRETT 940 man-pack transceiver (power output limited to 10 - 35 W (adjustable))	
Transmit frequency range	1.6 MHz to 30 MHz (continuous)	
Receive frequency range	500 kHz to 30 MHz (continuous)	
Channel capacity	980 local and remote control models, 950 local and remote control models, 950R and 950MR1 receivers and 940 man-pack model - Up to 450 programmable channels (simplex or semi-duplex) 930 local and remote control models - Up to 20 programmable channels (simplex or semi-duplex)	
Frequency resolution	10 Hz program mode 1 Hz tuneable receiver (940, 950 and 980 transceivers)	
Frequency stability	Standard	±50 Hz (0° to +55° C)
	Optional	±10 Hz (-15° C to +55° C)(Standard 980)
Intermediate frequencies	45 MHz and 455 kHz (double conversion)	
Operating modes	J3E (USB, LSB) H3E (AM) J2A (CW) J2B (AFSK) standard filter (980, 950 local and remote control models only) J2B (AFSK) narrow filter option (980, 950 local and remote control models only)	
Operating temperature	-15° C to +55° C	
Humidity	95% relative, non condensing	
Display system	Supertwist backlit LCD matrix, 16 character x 2 line	
Controls	20 key keypad (illuminated), analogue power/volume	
Supply voltage	930, 940, 950 - 13.8 VDC + 20% / - 10% (negative ground) Polarity protected. Over voltage protected 980 - 24 VDC +20% / -10% galvanically isolated from transceiver (using matching, switch mode power supply)	
Current consumption receive.	930, 950 local control models 930, 950 remote control models 980 (24V) 940	840 mA receive 860 mA receive 450 mA receive 595 mA receive
Antenna Impedance	50 unbalanced	
Compass Safe Distance	980 GMDSS transceiver	2 metres

Weight	930, 950 and 980	3.6 Kg.
	950MR1	3.2Kg.
	940 portable transceiver	3.9 Kg.
	940 13 Ah NiMH battery pack	2.7 Kg
	Optional 940 automatic antenna tuner	1.8 Kg.
Dimensions	930 - 950 - 980	250 mm x 75 mm x 300 mm
	940 transceiver - no battery	275 mm x 97 mm x 210 mm
	940 transceiver and battery	275 mm x 97 mm x 310 mm
	940 transceiver, battery and top case	275 mm x 97mm x 405mm
	Optional 940 automatic antenna tuner	275 mm x 53 mm x 210 mm
Selcall System	Based on CCIR 493-4	
Scan Types	Selcall, Voice(syllabic), AGC derived signal level.	
Scan Channels	Two tables, programmable by channel.	
Scan Rate	Selcall Scan - Fixed at 500 ms.	
	Non Selcall scan - Adjustable from 100 ms to 5 secs.	

1.2 Receiver Specifications

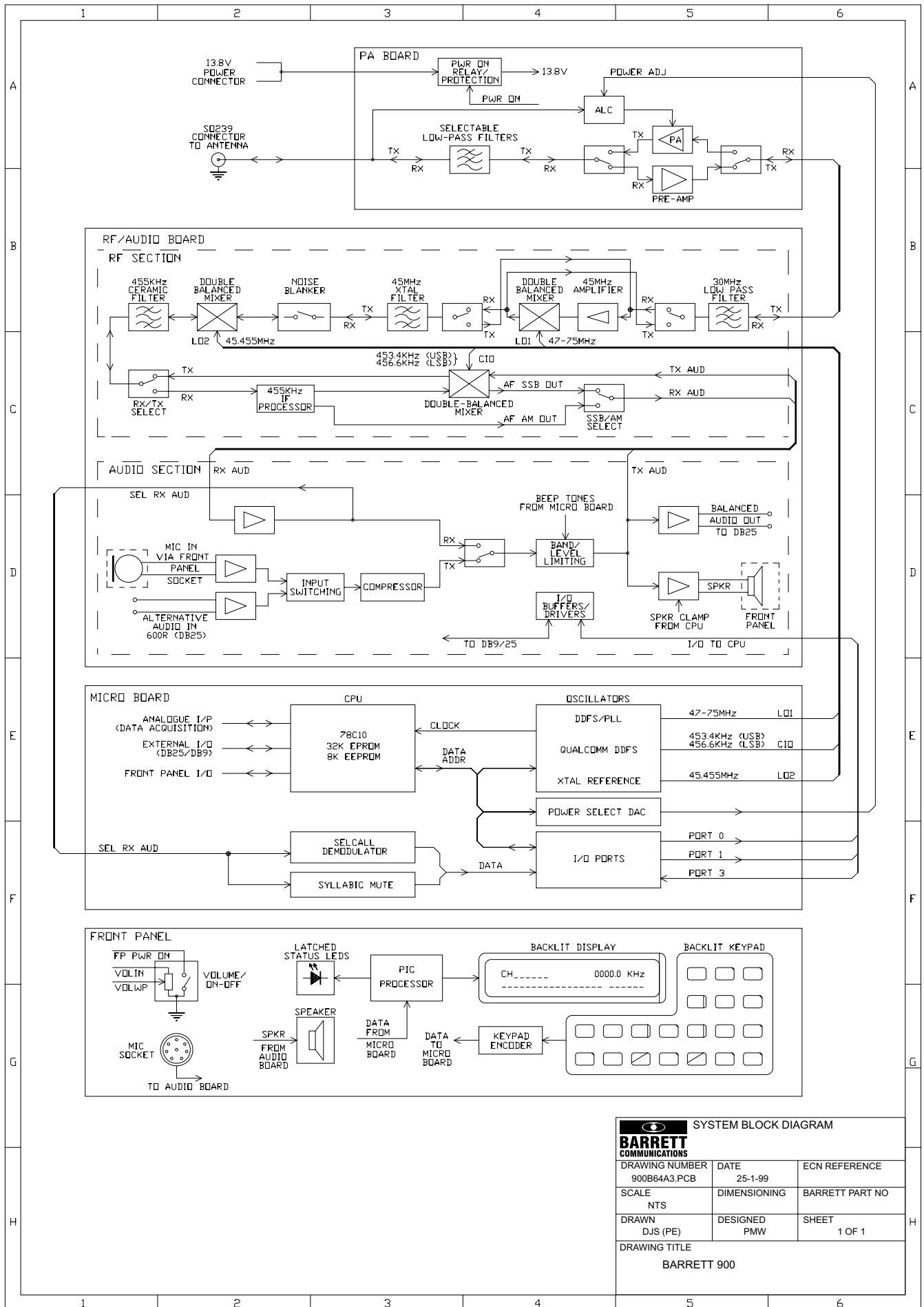
Sensitivity	0.256uV (-119dBm) for 10dB SINAD - J3E Mode (With RF pre-amp on)	
Selectivity J3E	-1kHz and + 4kHz better than 60dB	
Selectivity F1B (optional)	-500Hz and + 500Hz better than 45dB	
Desensitisation	-1kHz and + 4kHz	better than 60dB
	-10kHz and +10kHz	better than 71dB
	-20kHz and +20kHz	better than 80dB
	-50kHz and +50kHz	better than 87dB
	The level of an unwanted signal above the level of a wanted signal that will reduce the SINAD of the wanted signal producing 10dB SINAD to 7dB SINAD	
Image rejection	Better than 76dB	
Spurious response ratio	Better than 70dB	
Cross modulation	-20kHz and +20kHz	better than 82dB
	The level of an unwanted signal that is 30% AM modulated and at 20kHz above the level of a wanted signal that is producing 10dB SINAD that will cause this wanted signal SINAD to reduce by 3dB	
Blocking	-20kHz and +20kHz	better than 80dB
	The level of an unwanted signal above the level of a wanted signal that will reduce the SINAD of the wanted signal producing 10dB SINAD to 7dB SINAD	
Intermodulation	85dB - the level of an unwanted signal in relation to a wanted signal.	
Inband IMD	Greater than 34dB	
Clarifier range	Receive only 1Hz steps up to ± 1 kHz (dependant on configuration).	
AGC efficiency	Less than 6.0 dB variation with an input signal of 6uV(-91.4dBm) to 3V(+22.5dBm).	
Signal to noise improvement	Increasing the input signal level 20dB above an input signal of 108dBm that produces a SINAD of 20dB, increases the SINAD by at least 15dB to greater than 35dB.	
Audio Output	4W into 4 Ohms, 2W into 8 Ohms at less than 5% distortion	
Audio output impedance	2 to 80 Ohms	
Audio response	Less than 6dB variation from 350Hz to 2750Hz	
Audio distortion	Less than 5% at rated power J3E mode	
Input protection	Better than 30V RMS from a 50 ohm source	

1.3 Transmitter Specifications

RF Output Power	930 - 950	100 W PEP two tone ± 1 dB 125 W PEP voice ± 1 dB or 10 W PEP two tone ± 1 dB 12 W PEP voice ± 1 dB	
	980	100 W PEP two tone ±1.5 dB	
	940 (portable)	25 W two tone 10 - 35 W PEP (factory set to user requirement)	
Duty Cycle	930, 950, 980 940(portable)	100% two-tone input signal with fan option 25% voice duty cycle	
Protection	Safe under all load conditions, thermal protection against excessive power transistor temperatures.		
Sideband suppression	Better than -65dB below PEP		
Harmonic suppression	Better than -60dB below PEP		
Carrier suppression	Better than -60dB below PEP		
Spurious emission	Better than -60dB below PEP		
Intermodulation products	Better than -31dB below PEP (25dB below two tone peak)		
Audio frequency response	Less than 6 dB variation 350 Hz to 2750 Hz		
Current consumption	930, 950, 980	Voice average Two tone	less than 9Amps typical less than 15Amps typical
	940	Voice average Two tone	less than 5Amps typical. less than 9Amps typical.

2.0 Introduction

This technical manual covers the Barrett 950 local and remote control transceiver, the Barrett 980 GMDSS transceiver, the Barrett 940 man-pack transceiver, the Barrett 930 local and remote control transceiver, the Barrett 950M transceiver module and the 950MR receivers. They have largely identical hardware and only vary by key function and operational software and in the case of the 940 the mounting hardware and enclosure.



SYSTEM BLOCK DIAGRAM

BARRETT COMMUNICATIONS

DRAWING NUMBER 900B64A3.PCB	DATE 25-1-99	ECN REFERENCE
SCALE NTS	DIMENSIONING	BARRETT PART NO
DRAWN DJS (PE)	DESIGNED PMW	SHEET 1 OF 1

DRAWING TITLE
BARRETT 900

3.0 Overview

All 900 series transceivers and receivers are made up of several common building blocks. Apart from the 940 man-pack transceiver they are all constructed with a common chassis. This manual deals with each module and has a separate section describing sections of transceivers and receivers that are unique to that transceiver or receiver.

The 980/950/930/ local control transceivers are comprised of the following four modules:-

*Front Panel	*Microprocessor PCB
*PA PCB	*RF/Audio PCB

The 950/930 remote control transceivers are comprised of the following four modules:-

*Microprocessor PCB	*PA PCB
*RF/Audio PCB	*Remote control head and interface cable

The 940 man-pack comprises the following six modules:-

*Microprocessor PCB	*PA PCB
*RF/Audio PCB	*Front panel
*Connector transition PCB	

3.1 Front Panel

The backlit keypad allows entry of channel number, transmit frequency, receive frequency, mode, Selcall, power, scan, ATU option and customer specific information. A 2 line x 16 character backlit LCD display annunciates the channel frequency and indicates which functions have been selected on this channel.

Numerous other status displays are optionally available. On the left hand side of the display 5 status LED's indicate the current mode of the transceiver. A red LED is illuminated in transmit, a green LED in receive and three yellow LED's indicate which of the three modes, USB, LSB or AM has been selected (J3E, H3E, F1B on the 980 transceiver). A rotary volume control and on/off switch and a Mylar cone speaker are also included on the front panel. The microphone which incorporates press to talk and channel up/down buttons, plugs into an 8 pin socket on the front panel. Note:- The standard microphone has a jumper in it (refer to the microphone diagrams) that enables the front panel speaker, the handset does not have this jumper thus disabling the speaker.

3.2 Microprocessor PCB

The Microprocessor PCB is the central control of the transceiver. This PCB also contains the Direct Digital Frequency Synthesis (DDFS) system which generates all local oscillator injection frequencies, the Selcall demodulator and the audio syllabic mute sensing circuit.

3.3 RF/Audio PCB

The RF/Audio PCB contains the receiver and transmitter exciter, the audio processor section and general interface to the outside of the transceiver. The receiver employs a double conversion superhet design with a high dynamic range. All receiver signals are processed through either a single sideband filter which has a passband of 2.4KHz or in the case of AFSK (J2B) signals, through a narrow sideband filter with a passband of 500Hz. A product detector is used to demodulate all single sideband signals, whilst an envelope detector is used to demodulate AM signals. An effective noise blanker, employing a separate pulse receiver, is provided which may be switched on or off as required.

There is a great deal of commonality between receive and transmit paths in both the R.F. and audio circuits.

In transmit, audio from the microphone, the auxiliary input or the remote head is passed to an automatic level control circuit which amplifies and maintains a constant modulating signal with considerable variations in input signal level. This maintains an adequate modulation level in all circumstances.

On receive, the signal is amplified and fed to a mute circuit. Both receive and transmit audio share a common path up to the volume control. The RS-232 computer interface is located on the RF/Audio PCB.

3.4 PA PCB

The PA PCB raises the power level to 25 W, 100 or 125 W PEP depending on the setup of the power amplifier and the model. Seven low pass filters provide harmonic rejection over the full frequency range, reduce receiver LO radiation and enhance image rejection of the receiver. Also resident on the PA PCB is power protection circuitry guarding against over-voltage, reverse voltage and low voltage supplies.

ALC protection and regulation of the transmitter power output will protect the transceiver from reactive loads plus open and short circuit antenna connections.

3.5 Remote Control Head

The remote head can be operated up to 20 metres from any 900 series transceiver (three remote head interface cables joined together).

The control cable is connected to the remote head via a 9 pin "D" connector. The loudspeaker output being by a 3.5 mm jack socket.

The remote head contains its own microprocessor to drive the display, but otherwise contains no controlling intelligence. The remote head firmware is the same for 930, 950 and 980 transceivers - the only difference, in the heads, being the front panel membrane and key functions.

3.6 940 front panel

The 940 front panel is a Barrett 900 series remote head fitted into an "O" ringed aluminium front panel. The front half of the remote head plastic front panel is retained the rear half is removed. A special loom is fitted to the remote head PCB to connect to the RF/Audio PCB. Also fitted to the front panel is a connector transition PCB described below. In addition to the normal commercial microphone connector on the remote control head panel there are two military connectors. The 5 pin panel socket provides a handset connection while the other 8 pin panel plug provides interface signals to the 940 auto tuner, serial communications for programming and cloning, CW key and power connections.

3.7 940 connector transition PCB

The connector transition PCB provides a microphone amplifier for the handset and transition from the IDC connector to the military connectors.

4.0 Technical description

4.1 Microprocessor PCB

The Microprocessor PCB incorporates the microprocessor unit which controls the transceiver system, the synthesiser, which provides three stable local oscillator sources, the selcall encoder/decoder which generates and demodulates selcall signals, and the audio syllabic mute and transmitter power control.

4.1.2 Power supplies

The transceiver has several internal voltage regulators to obtain +5 volt and +10 volt supplies used throughout the transceiver. Where lowest power consumption is required, as in the 940 man-pack, some of these have a switch mode regulator to replace the normally fitted linear regulators.

On the microprocessor PCB, U19 and U20 can be replaced by a single switch-mode regulator U36. Other minor components that need to be added are L3, L6 C118, C119, C117, and C121.

4.1.3 Reference oscillator (Standard)

The reference oscillator at 45.455 MHz is the master clock which determines the frequency and timing of all other synchronous events in the transceiver. It consists of active devices Q13 and Q14 configured as a Butler oscillator. L16 is set to cancel the crystal stray capacitance and L15 resonates with C132, C133 and C137, C146 to provide fine frequency trimming. The oscillator is trimmed to 1ppm and an oven maintains a constant crystal temperature. The output of the reference oscillator is fed direct to the second mixer on the RF/Audio PCB via TP35 and is buffered prior to routing to the digital section by Q10 and Q11. These are configured in cascode to minimise reverse coupling. Further buffering is obtained from inverter U31:A prior to feeding the cascade flip flops U32:A and U32:B. These devices provide a 1:1 duty cycle clock for the DDFS chip U7 at 22.72 MHz and the microprocessor U1 at 11.36 MHz. A further divider U13 yields 2.84 MHz clock for the Carrier Insertion Oscillator generation by the DDFS. Link LK2 must be IN and LK1 must be OUT for the standard oscillator.

4.1.4 Reference oscillator (High stability option)

The reference oscillator at 45.455 MHz is the master clock which determines the frequency and timing of all other synchronous events in the transceiver. It consists of either a modular TXCO or DCXO oscillating at 45.455 MHz. The oscillator frequency is trimmed using the adjustment on the top of the can. The output of the TCXO is buffered by Q20, then fed direct to the second mixer on the RF/Audio PCB via TP35 and is buffered prior to routing to the digital section by Q10 and Q11. These are configured in cascode to minimise reverse coupling. Further buffering is obtained from inverter U31:A prior to feeding the cascade flip flops U32:A and U32:B. These devices provide a 1:1 duty cycle clock for the DDFS chip U7 at 22.72 MHz and the microprocessor U1 at 11.36 MHz. A further divider U13 yields 2.84 MHz clock for the Carrier Insertion Oscillator generation in the DDFS. Link LK2 must be OUT and LK1 must be IN for the high stability oscillator option.

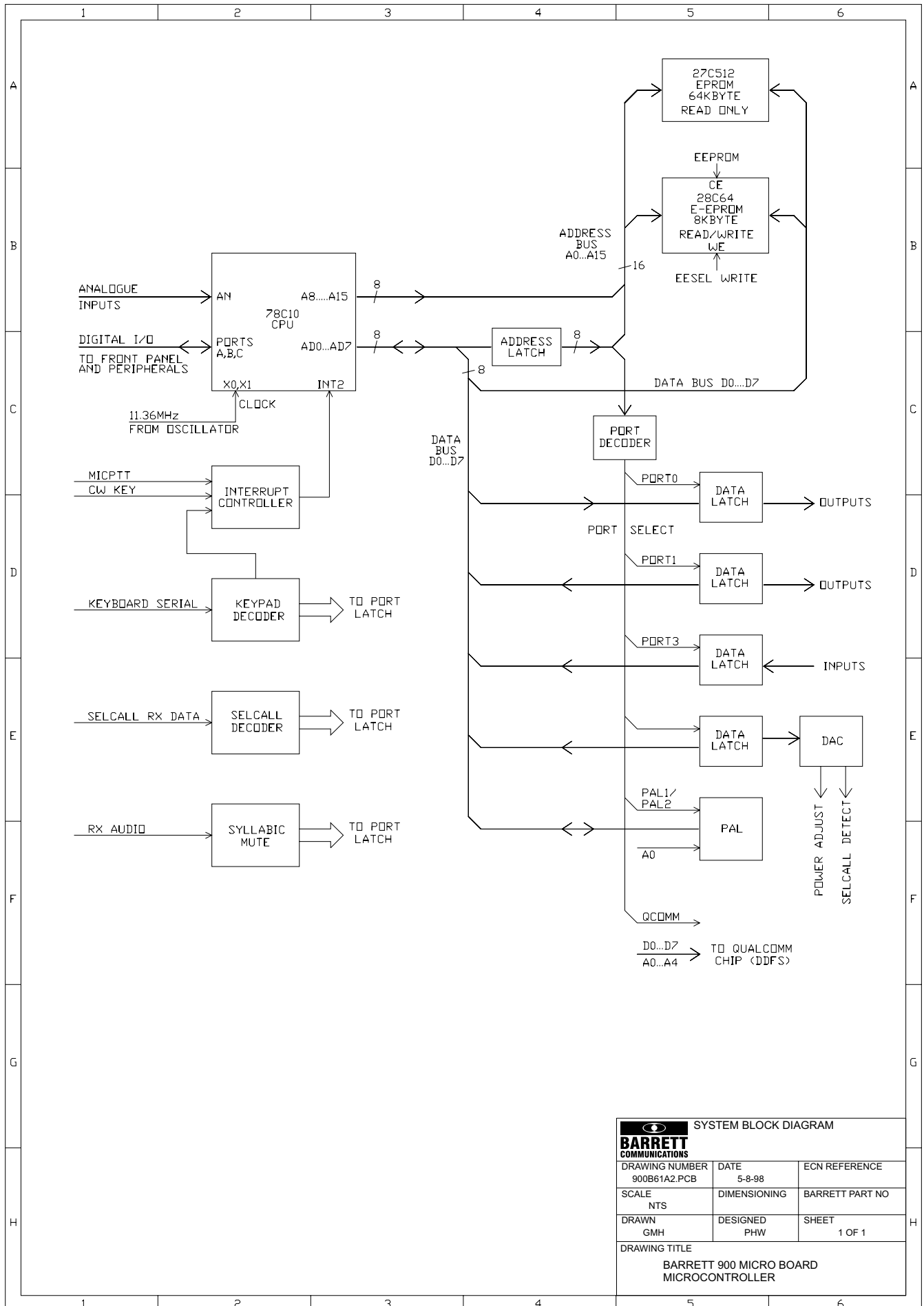
4.1.5 Microprocessor

The microprocessor U1 is the device which executes the control program for the transceiver. It executes instructions stored in EPROM U4 and stores and reads non-volatile data from EEPROM U5. These are connected via a sixteen line bus which has low order address and data multiplexed on the same eight lines. The low address is de-multiplexed using octal latch U2. A security PAL U40 is also fitted on the data bus to permit configuration security.

Two parallel output ports U15 (I/O Port 1) and U16 (I/O Port 0) handle static and slow logic signals from microprocessor. These include PA filter select lines, Audio / IF control signals such as PTT, AM on and NB on, Mic Disable, Speaker clamp and Mute and ATU control signals Tune Clock and Scan Data.

U14 (I/O port 3) is used to input parallel data from U35, a PWM decoder used to input key PCB data from the front panel and remote head.

Decoding for all these peripheral devices is provided by 3 to 8 decoder U6 along with U3 and U11. Shift register U17 ensures that the timing for the EEPROM operation is correct.



The microprocessor has four sets of ports of its own used as follows:-

AN0 to AN7. These analogue input ports monitor transmit VSWR using voltages SWR+ and SWR-, receive signal strength using voltage AGC, synthesiser lock state using voltage VCO Lock and battery voltage utilising a voltage derived from a voltage divider consisting of R2 and R35. AN5 and AN6 are used to measure voltages used to set up the selcall VCO tuning during the startup sequence. AN7 is used for internal chassis temperature measurement, provided by sensor TS1, which is used for PA ALC trimming at high temperatures.

CO1, CO0, CI, TO, INT2, SCK, RXD, TXD, PTTIN, CW KEY, ALESEN, GPSEN

CO1 and CO0 are counter/timer ports used to generate selcall transmit and alarm tones. CI and TO combine to decode the received selcall pre-amble and data stream. INT2 is the main interrupt processing PTTIN and CW KEY, SCK is unused. RXD and TXD are the external RS-232 serial ports. RXD and TXD are routed by U44 and combinations of signals ALESEN and GPSEN to input and output data to and from an internally fitted ALE controller option, as well as inputting data from either an external or internal GPS receiver. RESET ALE is used to reset the ALE controller option when fitted.

PB0 to PB7 is bi-directional and handles various slow speed input and output requirements such as Scan Stop and Mute state.

PA0 to PA7 handles further low speed signals including generation of annunciation beeps via signal ALARM DATA.

Interrupts are processed by the Interrupt Controller consisting of U18, U25 and U26. Lines PTTIN and CW KEY are latched by signal ICP from the microprocessor. A magnitude comparator U25 compares the lines with their previous state and requests an interrupt via INT2 if there is a state change.

4.1.6 DDFS and VCO

The synthesiser employs a Direct Digital Frequency Synthesiser integrated circuit U7 which takes in frequency data over the data bus with registers accessed by the 5 bit address field. The synthesiser is a dual unit, half of which is used to generate 1/10 of the VCO frequency. The other half is the Carrier Insertion Oscillator, the frequency of which is dependant on the type of I.F. filter used, and the mode of operation chosen but is in the region of 455 kHz. The outputs of U7 are digitized sine waves which are decoded by Digital to analog converters U8, U9, and U12. U8 and U9 are used to decode the VCO reference, and U12 decodes the carrier insertion output. T1 is a resonant transformer which yields a clean sine wave for the carrier insertion signal.

In order to achieve a spurious free, low phase noise local oscillator, a high level(+13dBm) push pull VCO operating at 10 times the DAC reference frequency is coupled to the DAC reference signal via a tracking PLL.

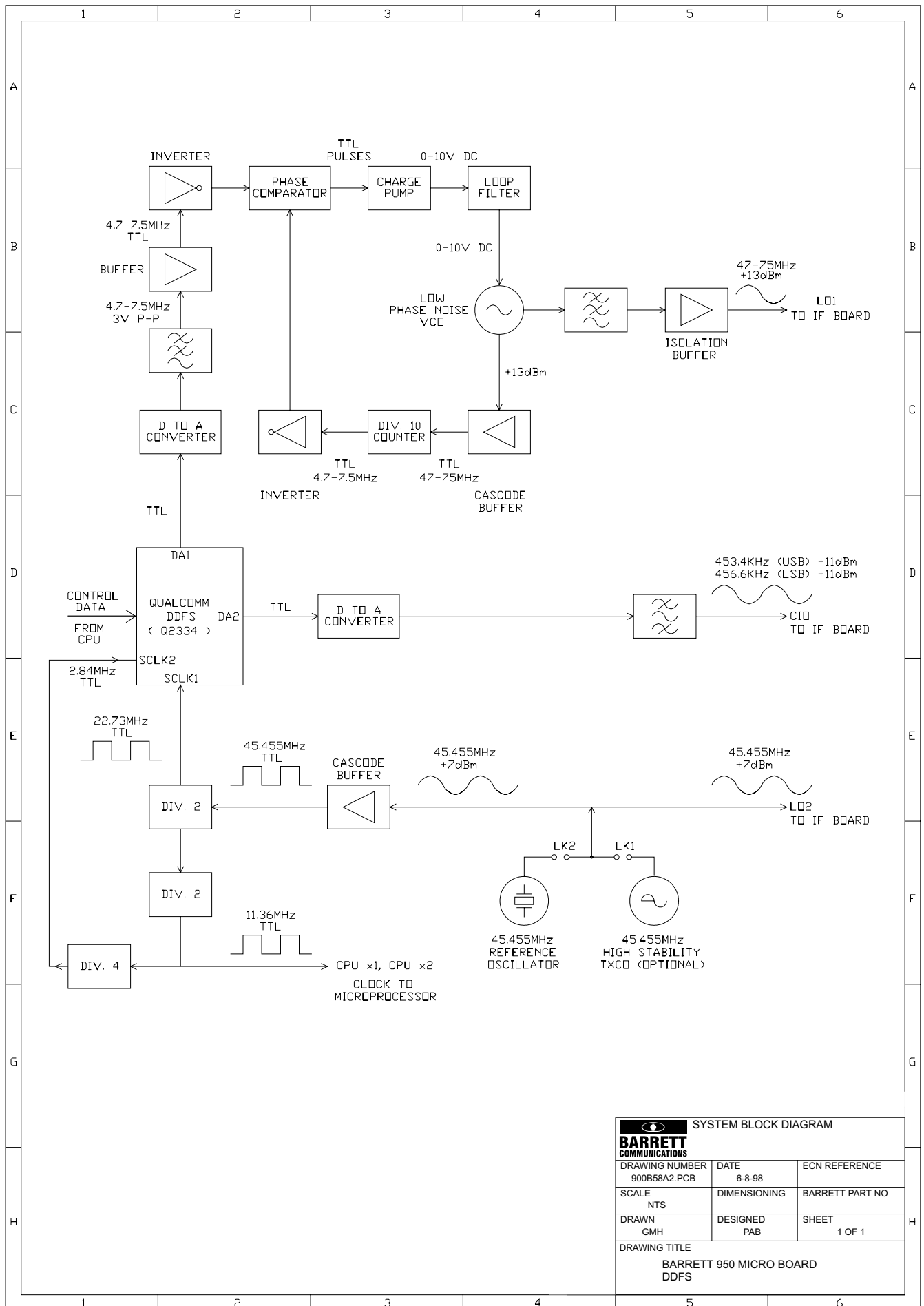
Diodes D9, D10, D11, D12, D15, D16, D18, limit the voltage excursions on the FET gates maintaining constant amplitude and low noise. The green LED's D15, D16 will be illuminated in normal operation above a display frequency of 8000 kHz and are a useful indicator of VCO activity. An attenuator formed by resistors R187 to R189 and amplifier Q16 are used to isolate the VCO from the low pass filter and first mixer circuits.

The VCO feeds the first mixer via a buffer amplifier comprising Q16 and T4 and a 76 MHz LPF consisting of L10, L11, this provides some gain to present the mixer with a final LO1 level of 17 dBm and high reverse isolation. It also feeds a cascade pre-scaler buffer consisting of Q8 and Q15 which has high reverse isolation preventing unwanted sidebands on the VCO. U21 provides a further buffer for the divide by 10 pre-scaler. This pre-scaler is a Johnson counter employing U23, U24 and U28. It is reset at power up by U29 which uses the same reset feed as the microprocessor. This ensures true counting.

The reference signal from the DACs at 1/10 VCO frequency is fed through an anti-aliasing filter L1, L2 and through a common emitter buffer Q1 to the phase comparator.

A digital phase comparator using U21:B and U22 generates positive going differential error pulses at TP23, TP24 according to the phase relationship of the DACs waveform and VCO/10. Charge balancing is performed by the Charge Pump Q2, Q3, Q4 Q5 which integrates the error signal in a lead-lag loop filter C82, C83, R58. This control or error signal can swing over the entire 0 to 10V range according to selected frequency. It is fed to varactors D2, D6, D7 and D8 controlling the VCO frequency. The VCO frequency range is 45 to 75 MHz being 45 MHz above the indicated frequency on the LCD display.

An out of lock red LED is driven by the phase comparator to provide fault indication. This signal also generates a displayed error message and is used by the microprocessor to inhibit transmission if the VCO is unlocked.



SYSTEM BLOCK DIAGRAM		
BARRETT COMMUNICATIONS		
DRAWING NUMBER 900B58A2.PCB	DATE 6-8-98	ECN REFERENCE
SCALE NTS	DIMENSIONING	BARRETT PART NO
DRAWN GMH	DESIGNED PAB	SHEET 1 OF 1
DRAWING TITLE BARRETT 950 MICRO BOARD DDFS		

4.1.7 Selcall (if enabled)

The selective system utilises Frequency Shift Keying (FSK) as the modulation technique. The design of the encoder/decoder allows individual channels to be set for operation on either the Australian Standard Selcall format (Codan compatible, based on CCIR 493-4) or the true CCIR493-4 format and its associated tones. Tones used are as follows:-

Australian Standard Selcall format (Codan compatible):-

High tone:- 1870 Hz Low tone:- 1700 Hz Centre tone:- 1785 Hz

CCIR 493-4 International Standard format:-

High tone:- 1785 Hz Low tone:- 1615 Hz Centre tone:- 1700 Hz

Selcall (and other on air status tones) are generated by the microprocessor U1 and output on pins 26 (SEL TX DATA1) and 27 (SEL TX DATA2). Transistors Q21 and Q22 combine the signals as necessary and this signal is output to the RF/Audio PCB to be fed into the transmitted audio path.

Received Selcall signals are filtered by dual bandpass filter U41 A and B. The bandpass filters have sufficient bandwidth to accommodate both tone sets as above. The audio from the filter output is fed into the input of the FSK decoder chip XR2211, U27. The VCO within U27 is automatically set to the centre frequency of the required selcall format. Calibration is performed each time the transceiver is powered up.

This is achieved by routing a single tone (Sel TX data 2) via U43 to the input bandpass filter and subsequently to the FSK decoder U27. The tone is set to one of the centre frequencies referred to above. Whilst injecting the tone the calibrating voltage PWR ADJ (see note below), generated by the DAC U38 and buffered by U10, is varied until the voltage 2211 REF (TP40) and voltage FSK SET V, measured by the microprocessor on analogue to digital inputs AN6 (U1 Pin 43) and AN5 (U1 Pin 42), are equal. At this point the FSK centre frequency is set to that of the injected tone.

Note:- The signal PWR ADJ referred to above is the calibrating voltage for the selcall phase lock in receive but changes to the PA ALC power adjustment control in transmit.

When FSK signals are detected the lock detect (U27 pin 6) on the FSK decoder goes high. This causes the output of the comparator (U27 pin 7) to also go high, reverse biasing D31 and thus causing data to be output by U42:B. The presence of data (SEL RX DATA) on the microprocessor (U1 pins 24 and 25) causes an interrupt and the subsequent processing of the digital selcall data by the microprocessor.

4.1.8 Audio mute

The Rx audio from the Audio / IF PCB is fed into U34:A which operates as a squaring amplifier. The squared audio then feeds a charge pump consisting of D40, Q24 and surrounding components. This produces a DC voltage which is proportional to the frequency of the audio (i.e. voltage rises as frequency increases).

IC33:B acts as a low pass filter with a cut-off frequency of approximately 10 Hz. The output from IC33:B is a DC voltage which varies at the syllabic rate of the speech received. The absolute output level is also proportional to the frequency content of the incoming signal as described above.

IC34:C and IC34:D make up a window comparator. The window width is adjusted by the mute sensitivity pot VR2. The divider network R119 and R120 together with C190, averages the output of IC33:B to provide the reference voltage for the window comparator. If the output from IC33:B rises or falls below this reference by the amount set by VR2, then the open collector outputs of IC34:C and IC34:D will discharge C191 and apply a low to the input of comparator IC34:B pin 6.

The second input of comparator, IC34:B, pin 7 is set to approx. 4 volts by resistor divider R123 and R124. When input pin 6 falls below 4 volts, the comparator output, pin 1 goes high, this signal, MUTE STATE, is the indication to the microprocessor that speech has been detected and, if the audio mute is selected, the mute should be opened. The signal used to control the actual audio mute gate from the microprocessor is RX MUTE which comes from U1 Pin 6. MUTE STATE is input to the microprocessor U1 on pin 14.

When receiving no signal, the mute is held closed by noise coming from both the antenna and that generated internally by the receiver. This noise has considerable high frequency content, which causes sufficient output from charge pump mentioned above to hold the mute closed.

Mute attack timing is controlled by C191 and R121. Release timing is set by C191 and R122 and microprocessor introduced delays.

4.1.9 PA ALC control voltage PWR ADJ

The signal PWR ADJ from the DAC U38 via buffer U10B is the calibrating voltage for the selcall phase lock in receive but changes to the PA ALC power adjustment control in transmit. This voltage is varied by the microprocessor to produce low and high RF power levels from the PA and is also used to trim the PA RF power output at high temperature. (AN7 on the microprocessor has a temperature sensor on it for this purpose)

4.2 RF / Audio PCB

4.2.1 RF section

The RF section of the RF / Audio PCB provides the complete exciter and receiver for the transceiver. It includes:-

First mixer	Roofing filter at 45 MHz
45 MHz IF amplifier with AGC	45 MHz Noise blanker receiver
Second mixer	Noise blanker gate
SSB filter and narrow filter for AFSK	Envelope detector for AM
Product detector for SSB,FSK and CW signals	AGC detector

The RF section has a common RF input and output port and separate audio input for Tx and output for Rx. A double superheterodyne system is used, with a first IF of 45MHz and second IF at 455 kHz. Three oscillator injection frequencies are taken from the synthesiser, LO1 at (Carrier frequency + 45 MHz), LO2 at 45.455 MHz and LO3 or the Carrier Insertion Oscillator at 453.3kHz on USB and 456.6kHz on LSB. There is a separate 45 MHz receiver to generate gating pulses for the noise blanker.

The audio section of the RF/Audio PCB handles the routing of audio signals in the transceiver and implements audio processing and frequency tailoring. It also handles the extensive I/O with the outside world such as Auxiliary 600 input and output (950, 980 only), computer Interface (950,980 only), ATU Interface and external alarm. The audio power amplifiers for both the local and remote head speaker outputs are also fitted on the RF/Audio PCB.

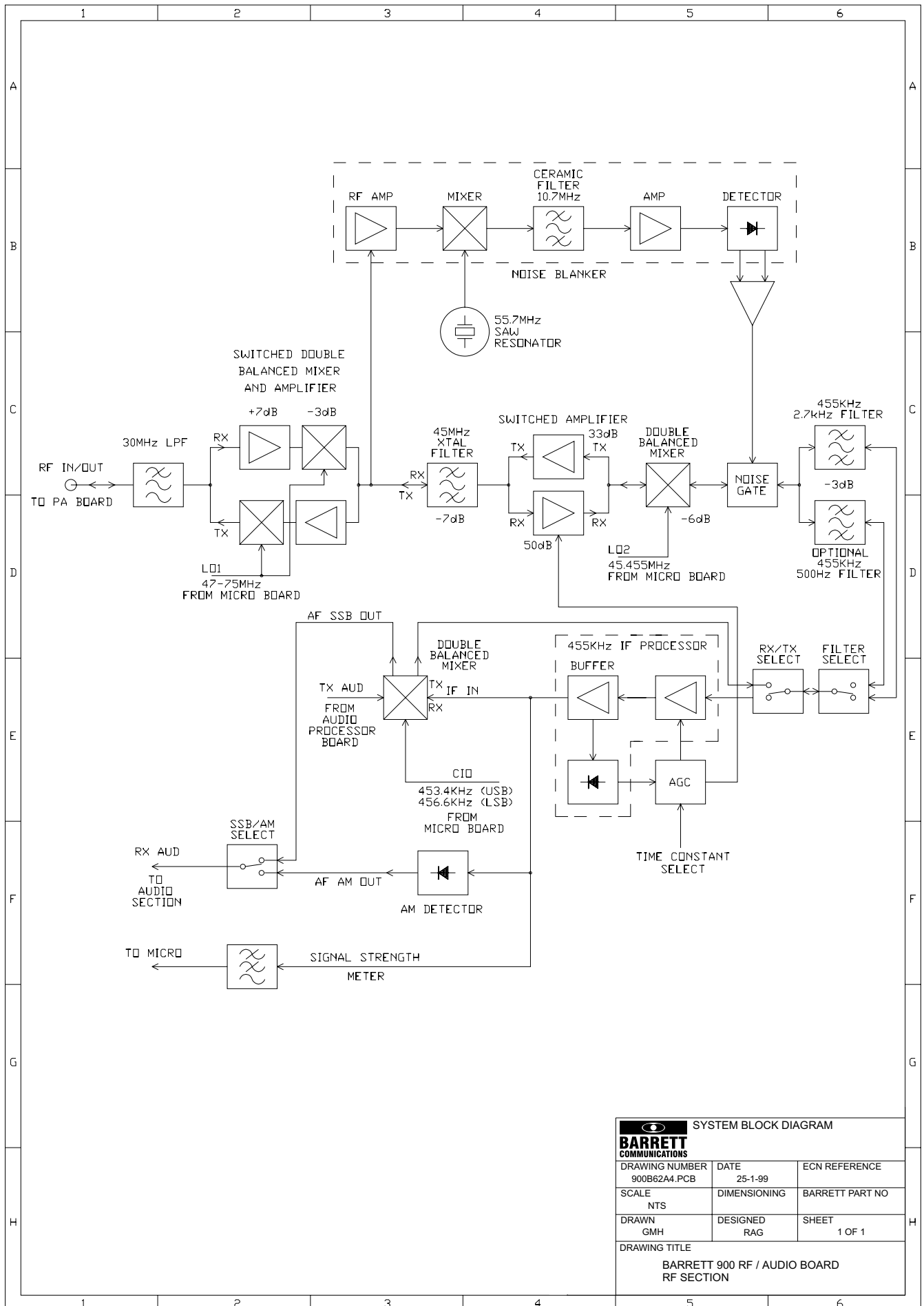
4.2.1.1 30 MHz Low pass filter, first mixer and 45 MHz IF amplifier.

Receive

The 30 MHz low pass filter, L16, L20 and associated capacitors, minimises the image response of the receiver. It also serves to control LO1 breakthrough on both Rx and Tx. The first mixer U29 and post mixer amplifier Q1 is switched as a block between receive and transmit by relay RL1. The local oscillator level for this mixer is +13dBm. The amplifier achieves the best possible broadband termination for the mixer IF port, important to maintain low intermodulation distortion. The post mixer amplifier then feeds into the noise blanker receiver via an isolation amplifier Q20, and also into the main receiver IF section via a dual section 45 MHz roofing filter giving medium selectivity of approximately +/- 3 kHz @ -3dB and +/-25 kHz @ 60dB. The roofing filter feeds or is fed by the dual gate FET 45 MHz IF amplifier consisting of Q4 and Q5. The input of this IF amplifier is matched to 50 by L1 and C21. The output is matched to 50 by the L network L9, C37. AGC is applied to the 45 MHz IF amplifier via the second gates on Q4 and Q5. RL2 and RL3 control the Tx/Rx turn around of this IF amplifier.

Transmit

In transmit the 45MHz IF amplifier is reversed in its direction by relay RL2 and RL3, the output from the second mixer is amplified by this 45MHz amplifier which in the transmit direction is gain controlled by a voltage switched in place of the AGC signal. This voltage is adjusted by VR2 which sets the drive of the exciter. The output of the 45MHz IF amplifier is then passed through the 45MHz roofing filter consisting of F2 and F2A and into the first mixer U29 and its associated post mixer pad and amplifier. The whole mixer, pad and amplifier is reversed in the direction used in receive by relay RL1. The output of the mixer is fed into low pass filter consisting of L16, L20 and associated capacitors.



4.2.1.2 Second mixer and bandpass crystal filter.

The 45 MHz signal from the IF is converted to 455 kHz by the second mixer U13 which is a double balanced ring mixer, and is fed with a +7 dBm oscillator signal at 45.455 MHz from the master oscillator on the microprocessor PCB. T6 (and T4, if the narrow filter option is fitted) provides the necessary impedance matching into the second IF ceramic filter F1 (second IF crystal filter F6, if the narrow filter option is fitted). This filter gives the final selectivity for the system of 2.3 kHz @ 3 dB and 4 kHz @ 60 dB. (500 Hz @ 3 dB and 1 kHz @ 60 dB if the narrow option is fitted)

4.2.1.3 Noise blanker

The noise blanker receiver is fed from the first mixer output via FET Q28 which acts as a buffer and prevents the noise blanker receiver local oscillator generating intermodulation products in the main receiver. An FM superheterodyne chip NE615D, U2 is used with wide ceramic filters F4, F5 to detect impulse noise. The RSSI output on pin 7 produces a DC level which responds rapidly to noise. A comparator U9 with threshold adjustment employs an integrator and differentiator on input pins 4 and 5 respectively so that noise blanking occurs only on rapidly changing signals such as noise spikes.

4.2.1.4 Noise gate

The noise gate uses RF switch NE630, U12. This is a high speed switch that when enabled allows the receive signal from the second mixer to pass directly to the 455 kHz filter. When a blanking pulse from the noise blanker receiver is present the NE630 U12 switches the RF signal containing the noise pulse away from the mixer thus blanking the noise pulse from further processing.

4.2.1.5 Second IF, AGC and demodulator

Following the noise blanker RF switch U12, RF switch U8, switches in the narrow or standard filter as required. Following the filter(s) on receive, a transmission gate U7 routes the 455 kHz signal into the 455 kHz IF amplifier consisting of U4 and transistors Q11 and Q13. U4 is a wide-band amplifier, the output being applied to the base of Q11. The output in turn is further amplified by Q13 which is tuned to 455 kHz by T8. In SSB modes the output of the 455 kHz IF amplifier is fed into the double-balanced mixer U6 which is the product detector for receive, and the balanced modulator for generating the first I.F. on transmit. The double balanced mixer is fed by the carrier insertion oscillator, generated on the microprocessor PCB, which has frequencies as follows 453.3 kHz for USB, 456.6 kHz for LSB, 453.00 kHz for CW and 456.56 kHz when the 500 Hz filter is in use. When receiving AM, the injection oscillator is switched off. The audio output from U6 pin 6 passes through a switch U20:C to the audio section described below. U20:C switches the output of AM detector Q18 to the audio section, when AM is selected. The IF signal from Q13 is also fed into Q14 and U5 which comprise the AGC voltage generator. Q14 rectifies the IF signal to charge C53. The voltage on C53 is thus proportional to the level of the received signal. This level is amplified by U5A to provide the final AGC voltage for U4. This AGC voltage is also inverted and level shifted by U33:A, and is applied to the two 455 MHz IF amplifiers Q4 and Q5. These devices need to have AGC applied in the opposite sense to that required by U4. Q13 also feeds the "S" meter rectifier Q10, which sends the DC proportional to signal strength to the microprocessor board for processing and display.

4.2.1.6 Transmit and receive switching

Switching transistors Q8 and Q12 control the Tx/Rx relays and the noise blanker power supply.

4.2.2 Audio section

The audio section handles the routing of audio signals in the transceiver and implements audio processing and frequency tailoring. It also handles the extensive I/O with the outside world such as Auxiliary 600 input and output (950 only), Computer Interface (950 only), ATU Interface and external alarm. Audio muting and the Loudspeaker drive amplifier are also fitted on the PCB.

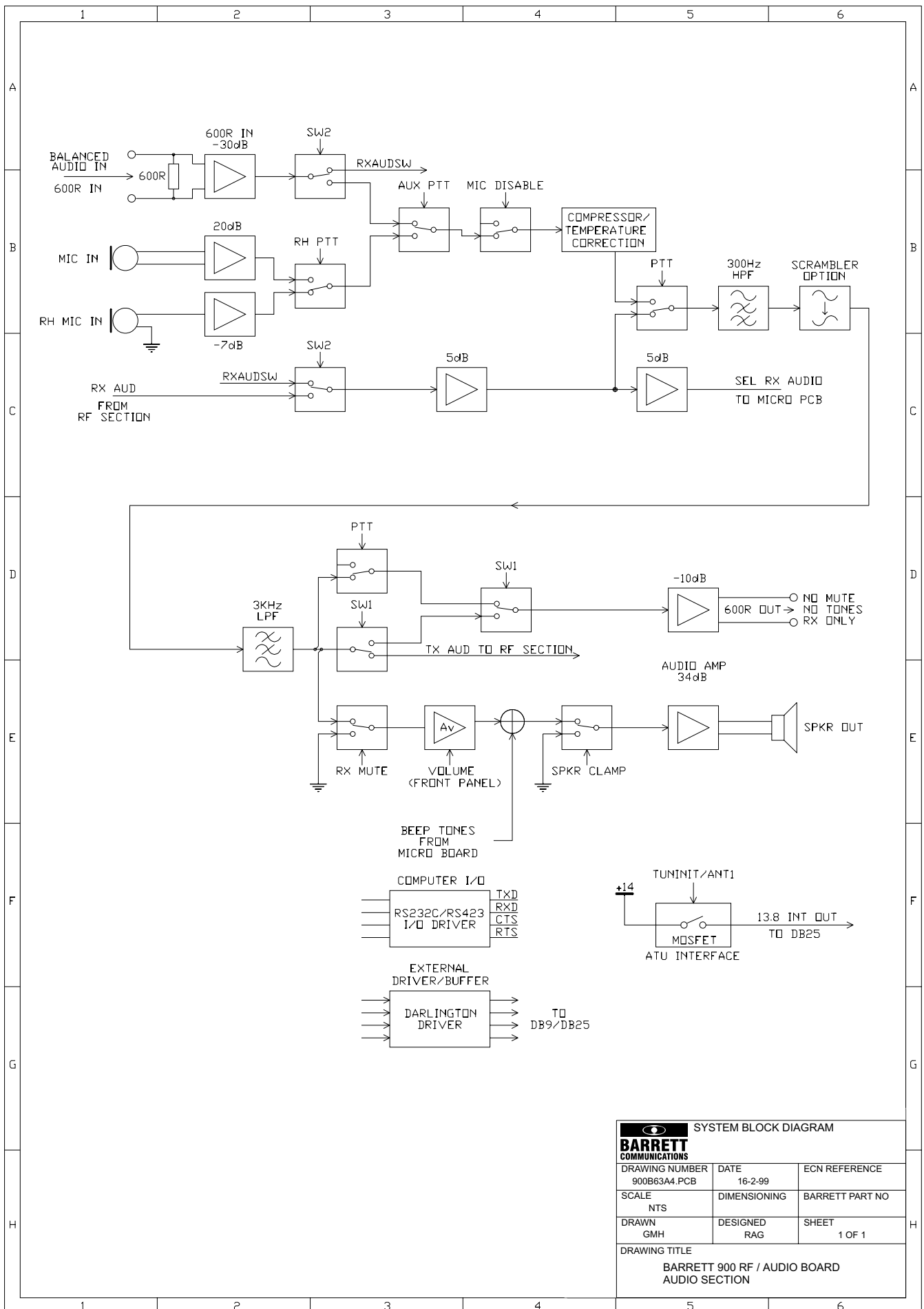
4.2.2.1 Audio path

In **receive** the demodulated Rx audio signal at a level of 50 mV P-P is fed into amplifier U22:B which raises this level by 5dB. This signal is then split and fed to the main signal path and to the microprocessor PCB via U22:A, where it is used in the mute and selcall system. Bilateral switch U14:C performs Tx/Rx changeover for the main audio path and the signal then follows a common path through scrambler jumper J1, voltage follower, U17:A, and 3kHz LPF U17:B. Bilateral switch U21:A is the mute gate which couples the received audio to the voltage controlled amplifier (the volume control IC) IC's U28 and U32 via buffer U24:B. U27:B is used to disable the audio to the 600 Ω balanced audio output port during transmit i.e. when PTT PA is active. U20A and U20B switch the control voltage on the voltage controlled amplifiers to +5V in transmit, achieving maximum attenuation and plop suppression during the transition between transmit and receive.

U27:A and U27:C direct the transmit audio TX AUD to the 600 Ω balanced audio output when SW1 is active. This is for use when remote control functions are required.

The voltage controlled amplifiers IC's U28 and U32 are controlled by voltages from the volume potentiometers from the remote head (when fitted) and the front panel (when fitted), respectively. The receive audio signals from the volume control IC's are then combined with audio beeps and alarms (AUD ALARM) from the Microprocessor PCB and fed to the speaker clamps Q22 and Q23 respectively, which suppress the audio on transmit. The power amplifier U23 raises both the audio signals to 2 W maximum in order to drive the loudspeaker in either the remote head or front panel (which ever or both of which may be fitted). Auxiliary muted Rx audio is available via balanced output amplifier U19 delivering 0dBm into 600 Ω .

In **transmit** a balanced op-amp U15:B provides 20 dB of mic gain for the local microphone. When the auxiliary input is in use the auxiliary balanced amplifier U15:A receives signals at 0 dBm (600 Ω) input. When the remote head microphone is in use the high level single ended mic audio from the remote head is buffered by U24:A. The selected Tx audio signal in use at the time passes through the bilateral switches U11:B, U16:A or U16:B to the Tx audio compressor circuit consisting of U18:B, Q27 and U18:A which maintains a constant audio output over a large input range. Q27 acts as a variable resistor, controlled by the output of the rectifier U18:B and D22. C107 is the timing capacitor. R217 controls attack time, and R141 controls release time. Transmit audio temperature compensation is provided by the network consisting of TH1, R219 and R221. On transmit the signal is routed through the bilateral switch U14:C and on through the common path of J1 and LPF. Jumper J1 is an ideal point to measure both transmit and receive audio. The signal then passes directly to the IF section where it is used to modulate the exciter.



SYSTEM BLOCK DIAGRAM		
BARRETT COMMUNICATIONS		
DRAWING NUMBER 900B63A4.PCB	DATE 16-2-99	ECN REFERENCE
SCALE NTS	DIMENSIONING	BARRETT PART NO
DRAWN GMH	DESIGNED RAG	SHEET 1 OF 1
DRAWING TITLE BARRETT 900 RF / AUDIO BOARD AUDIO SECTION		

4.3 PA PCB

The Power Amplifier raises the power from the exciter to specified output power. It also provides harmonic filtering for the transmitter, and band filtering and a 8 dB RF pre-amp for the receiver.

4.3.1 Gain control amp

The signal from the exciter at a level of approx. 35 mV P-P is fed to a gain controlled amplifier U1. This stage gives a gain variation of 13 dB. Transistor Q1 is configured as an emitter follower to provide buffering, gain stage Q2 raises the signal level suitable to drive the first of two push pull power amplifiers. This pre-driver stage employs RF negative feedback via T1, R12 and C4 to achieve low distortion.

A push-pull drive stage Q3 and Q4 is employed to raise the power to a level suitable to drive the 100 W - 125 W power amplifier stage. Transistor Q19 provides the bias reference for the driver stage. Final amplification to the output level is achieved using Q5 and Q6 in push-pull. This final amplifier stage has an active bias circuit using U4:A and Q7 with Q21 providing a bias reference which thermally tracks the power devices due to physical contact.

4.3.2 Low pass filters

Sub-octave harmonic filtering is provided by seven Cauer-Chebyshev filters with bands of 1.6 to 2.48 MHz, 2.48 to 3.84 MHz, 3.84 to 6.0 MHz, 6.0 to 9.3 MHz, 9.3 to 14.5 MHz, 14.5 to 22.48 MHz and 22.48 to 30.0 MHz. These are selected by a 3 to 8 decoder U9 which drives a Darlington driver U8 to select the relevant LPF relays.

4.3.3 ALC control

Forward and reverse power sampling for the ALC system is implemented using current transformer T4 and detector diodes D5 and D4. A dual time constant system is used in the ALC detector which feeds the main ALC amplifier U3. This amplifier compares the incoming combination of forward and reverse power with a reference voltage and generates a control voltage which is fed through the emitter follower buffer Q12 to the gain controlled amplifier. Both forward and reverse power DC levels are buffered by U7 and fed to the Micro PCB. When optional external linear amplifiers are used, U3B buffers an external current sourced ALC signal from these linear amplifiers to control the power output of the PA. Output power is preset by a DC voltage generated by the microprocessor PCB and fed to the ALC circuit via pin 19 of the 26 way connector P2.

4.3.4 Over-voltage and reverse voltage protection

Overvoltage and reverse voltage protection is incorporated on the PA PCB (Q10, Q11, D2, D14 and SCR1) and transorb. diode D3 absorbs any instantaneous voltage peaks over 18 volt.

4.3.5 Auxiliary antenna socket

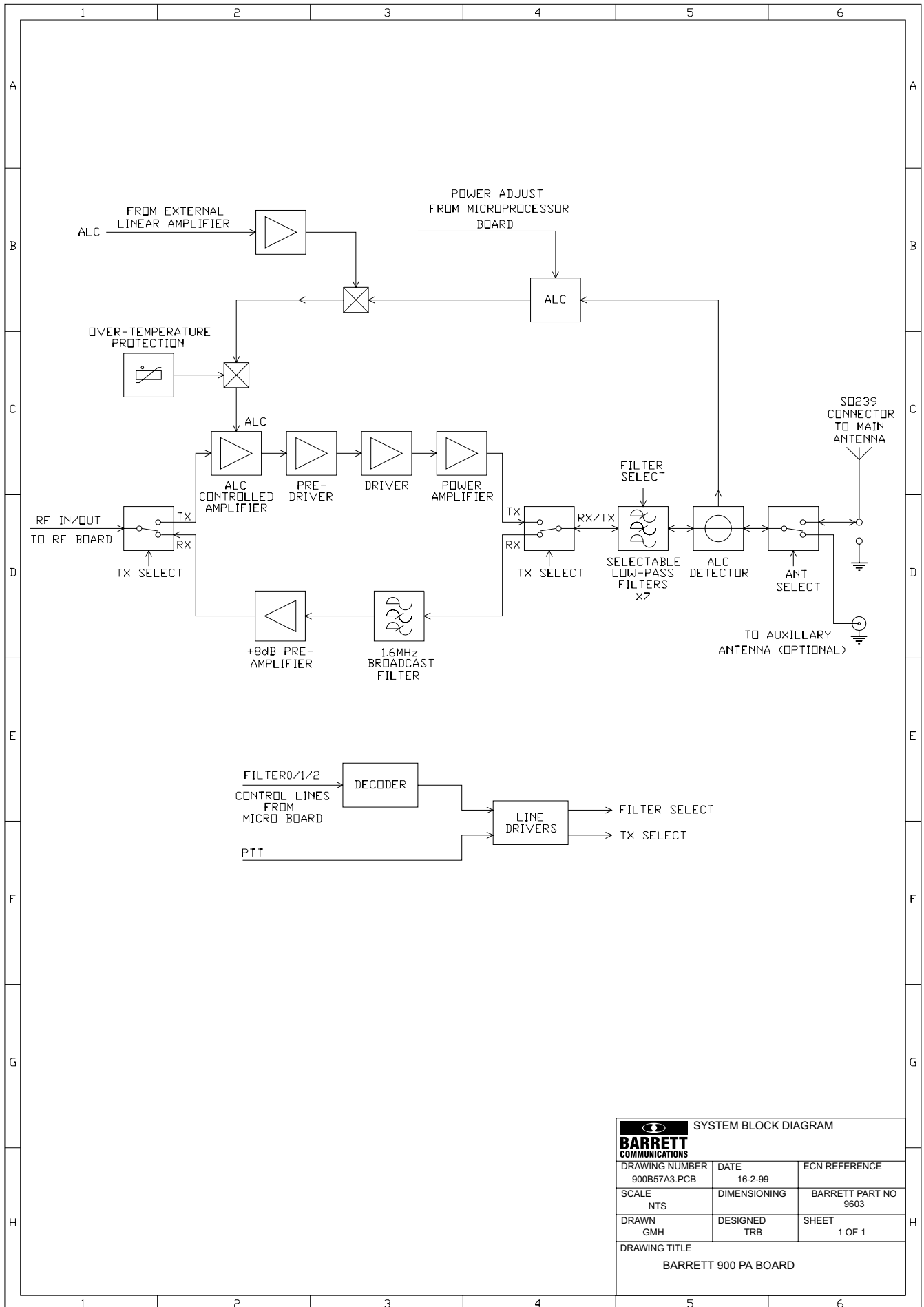
A switching system on the PA PCB, configured using J2, enables an optional UHF connector to be fitted on the rear of the transceiver. Once fitted the two UHF connectors are configured as described in section 7 of this manual. The second antenna socket position in the chassis can also be used to locate the GPS BNC antenna socket when the internal GPS receiver option is fitted.

4.3.6 Receiver RF amplifier

The receive RF pre-amplifier consisting of Q22, T5 and associated components provide 8 dB gain at the front end of the receiver. This amplifier is preceded by a high pass filter L12, L13, and associated capacitors to prevent strong broadcast band transmissions from interfering with the wanted signal.

4.3.7 Power supply regulators

Regulator U5 provides the +10 V power rail for use in all sections of the transceiver. Q8 switches the +10 V power rail to provide +10TX on the PA during transmit mode. U2 provides the +5 V rail, again used in many sections of the transceiver. Q16 switches the +5 V power rail to provide 5VTX used on the PA during transmit mode.



4.4 Front panel

The Front Panel PCB allows user control of the transceiver. An integral rubber keypad provides functional control. The LCD display presents channel, frequency and status information and the five status LED's indicate mode and Tx / Rx state. Backlighting for the LCD and keys is provided and a volume control varies the audio level from the loudspeaker. A microphone socket allows the use of a three button microphone, providing PTT and channel Up/Down functions. Note:- The standard microphone has a jumper in it (refer to the microphone diagrams) that enables the front panel speaker, the handset does not have this jumper thus disabling the speaker.

4.4.1 LCD and status LED's

Data to refresh the front panel LCD is sent from the microprocessor PCB, via the Audio / IF PCB on one serial data line. This serial data is processed on the front panel by embedded microprocessor U1, and converted to parallel data for use by the LCD and mode and operational state status display LED's. Q8 provides buffering of the serial data line from the main body of the transceiver.

4.4.2 Keypad

Data from the 20 function keypad matrix is PWM encoded by the keyboard encoder U2. This is buffered by Q9, and sent via the control cable and the RF/Audio PCB to the microprocessor PCB. The microphone channel up and down buttons are also handled by U2. Channel up and channel down functions come from the microphone socket pins 3 and 2 respectively.

4.4.3 Backlighting

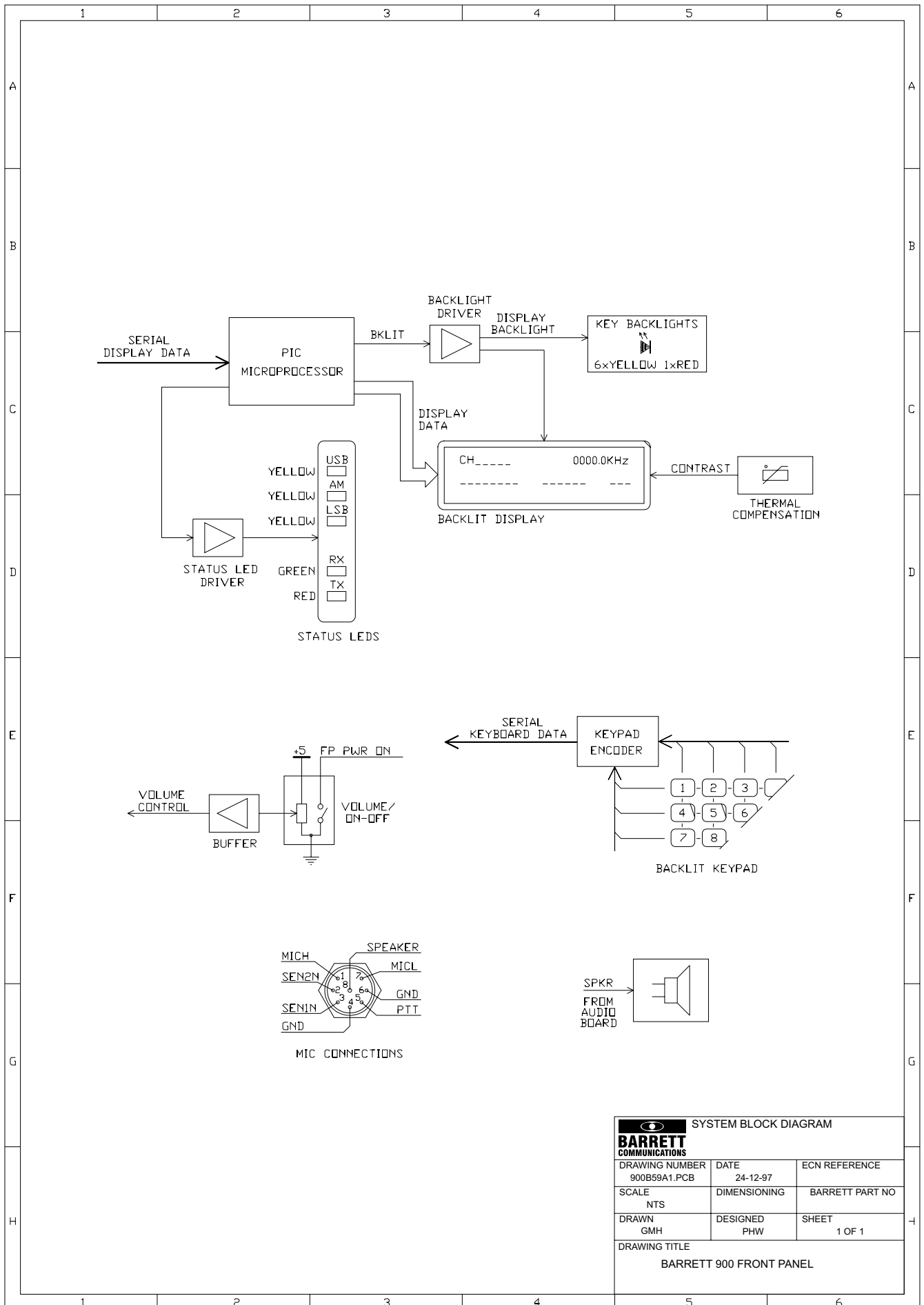
Backlighting for the keys is provided by parallel LED's D6-D12 which are in series with the LCD display's internal backlight diodes. Port RB7 and RB6 are used to provide intensity control of the LCD via Q1. Extended temperature range on the LCD display is achieved by controlling the polarising voltage on pin 3 using a thermistor TH1.

4.4.4 Microphone

The microphone socket has EMC filters to prevent pick up of RF by the balanced microphone leads. Two lines allow the channel up/down key function on the microphone as described above.

4.4.5 Volume control and On/Off switch

The volume control VR1 provides a voltage that controls the voltage controlled amplifier located on the RF/Audio PCB. The lower the voltage output from VR1's wiper the higher the volume. The On / Off switch provides a ground to the main body of the transceiver to switch the transceiver on. This ground is also used to apply the 13.8 VDC to the front panel, this in turn switching on the +5V DC supply for the front panel logic.



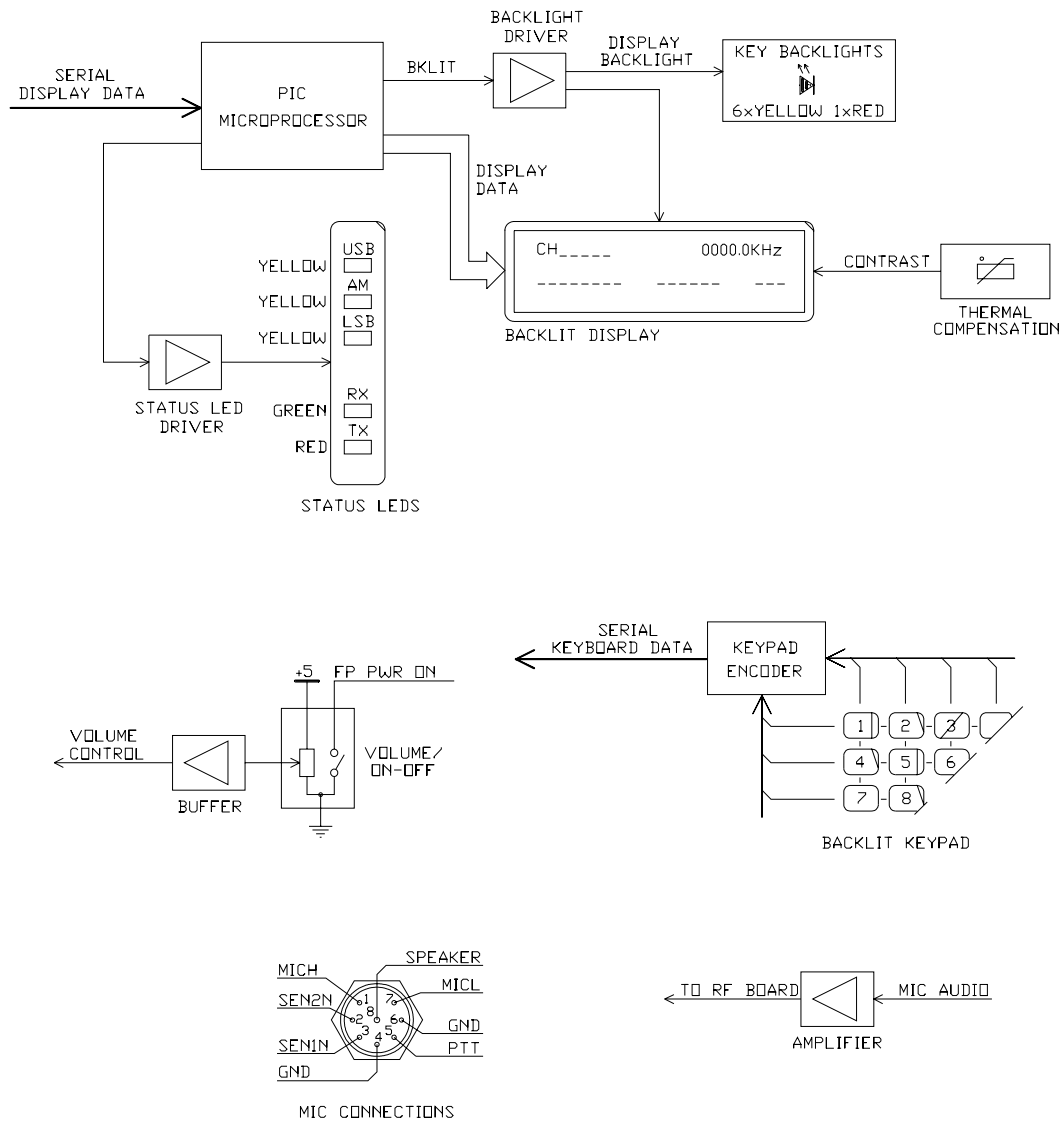
4.5 Remote control head

The on/off switch on the volume control potentiometer completes the circuit to ground and activates the power relay on the PA in the transceiver's main body through the remote control cable via line RH PWR SW.

In addition the on/off switch turns on Q6 allowing +14 V power feed to the regulators U7 and U6. The 5 V regulator U6 supplies the digital ICs and the second 5 V regulator U7 is stacked on the first to obtain 10 V for the analogue circuit.

Keyboard encoding is handled by U2, a matrix encoder chip that provides a PWM coded output only when a key is depressed. The microphone up and down buttons are also handled by U2. The serial output from U2 is buffered by FET Q8 and emerges at connector P1 as RH SKB OUT for eventual decoding by the microprocessor.

Serial data from the transceiver's main body is sent to the remote head on line RH SD INB via the remote head interface cable. This serially coded data is decoded by embedded microprocessor U1 and distributed in parallel form to either the LCD or mode and status LED's as required. LCD contrast is temperature compensated by thermistor TH1. Q1 switches the LCD and keypad back-lighting on and off by computer control.



SYSTEM BLOCK DIAGRAM		
BARRETT COMMUNICATIONS		
DRAWING NUMBER 900B60A1.PCB	DATE 24-12-97	ECN REFERENCE
SCALE NTS	DIMENSIONING	BARRETT PART NO
DRAWN GMH	DESIGNED PHW	SHEET 1 OF 1
DRAWING TITLE BARRETT 900 REMOTE HEAD		

5.0 Maintenance

5.1 Introduction

This section provides maintenance and fault finding procedures that can be carried out on Barrett 900 series transceivers.

5.2 Printed Circuit Board (PCB) maintenance

Barrett 900 series transceivers use four layer PCB's for the microprocessor and RF/Audio sections and two layer PCB's, for the PA , front panel and remote head. When working on these PCB's observe the following precautions:-

Excessive heat could lift a track from the circuit boards, resulting in serious damage. Avoid the use of high-powered soldering irons. A soldering iron rated at a maximum of 60W and temperature controlled to approximately 370 C is suitable for most tasks. For removal or installation of heavier components such as PA transistors and main power leads a soldering iron rated at a higher temperature of 425 C is required. When unsoldering, use a solder-sucker or Solder wick to remove the solder.

Burned or broken sections of printed circuit track may be repaired by bridging the damaged section with tinned copper wire. Care must be taken to remove the PCB solder mask covering the track either side of the burn or break to allow it to be tinned before making the repair. Also in the case of a burn, the fibreglass area that has been burnt must be cleaned to remove any carbon deposits.

5.3 Component replacement

When replacing defective diodes, transistors, electrolytic capacitors or integrated circuits, observe any marking that indicate polarity or orientation. It is essential that these types of components are installed correctly.

Components with leads that are soldered into plated through holes in the PCB such as integrated circuits, diodes, resistors and capacitors, can often be replaced with the minimum of risk by clipping its leads as close to the component as possible. The leads left in the PCB can then be removed by carefully heating the solder joint on each remaining lead individually, then carefully withdrawing the lead from the PCB using a pair of pliers. Avoid pulling on the lead before the solder has fully melted around the lead as damage to plated through holes or layers of the PCB may occur. Once the component has been removed use solder wick or a solder sucker to clear the remaining solder from the hole.

When replacing heat sensitive components to the circuit board, if possible use long-nosed pliers or similar to conduct heat away from the component.

When replacing PA output transistors and drivers ensure that the thermal conduction paste between the heatsink and the component is replaced. This can be achieved by cleaning the mounting surfaces, and re-coating them with a thermal conduction compound. Only use a small amount of thermal compound but enough to make a light cover on the surface.

Extensive use of surface mounted components is made on all PCB's in 900 series transceivers. It is essential that surface mount work stations be used for removal and replacement of these components.

Note that there are some capacitors on the Microprocessor board which require special low temperature solder and soldering equipment. These capacitors can be recognized by their silvery appearance. They are C8, C9, C34, C35, C194, C173.

5.4 CMOS devices

A number of Complementary Metal Oxide Semiconductor (CMOS) devices are used in the transceiver and most of them have built-in protection. However, their extremely high open-circuit impedance makes them susceptible to damage from static charges. Care must be used when handling these devices during servicing. By observing the following precautions, the risk of damage to CMOS devices will be minimised:-

Replacement CMOS devices are supplied in special conductive packaging. They should remain in this packaging until required for use.

Ensure that power supplies are switched off before making connection or disconnections between circuit boards.

Handle circuit boards and touch conductive parts as little as possible.

Anything connected to or touching the circuit board tracks should be grounded.

Make sure test equipment being used has a correct earth on its mains lead.

Before and during work on PCB's or handling CMOS devices, discharge static charges, which may build up on a person, by touching a grounded metal surface with both hands. If possible wear a suitably grounded conductive wrist strap.

5.5 Transmitter power amplifier maintenance precautions

When making measurements of the low level stages of the exciter, it is advisable to remove the drive to the PA and Filter PCB, this can be achieved by removing the coaxial cable from the RF/Audio PCB to the PA PCB by carefully unsoldering it. If working on the whole system with the power amplifier connected, caution should be exercised when connecting probes in the area of the MC1350 gain controlled amplifier as a probe can cause instability which can drive the power amplifier to full power without ALC action being available resulting in damage to the power amplifier. When connecting probes to the PA assembly, the earth clip lead should be wound around the body of the probe and the earth clip should be connected to the ground plane, adjacent to the point of measurement to which the probe tip is connected, thus reducing any stray RF pick-up.

5.6 PCB access

5.6.1 930 - 950 - 980 transceivers

Removing the top cover gives access to the microprocessor PCB.

Removing the bottom covers gives access to the RF/Audio PCB and PA PCB. The RF/Audio PCB is mounted under a separate RF shield plate held in place with two screws and a slot behind the front panel.

5.6.2 940 transceivers

Referring to figure 940 chassis explosion diagram remove the battery pack from the transceiver, remove the six hex head screws from the rear of the transceiver, carefully remove the back plate to the extent the power cable will enable then rotate and slide the aluminum extruded cover by sliding it upwards, allowing the back plate to pass through the centre of the cover extrusion.

5.6.3 930 - 950 remote control head

Remove the two screws on the rear panel of the remote control head allowing the front panel and rear shell to be separated.

5.7 Fault diagnosis

5.7.1 General

The circuit diagrams show both DC and signal voltage points to enable a faulty section to be located. It should be noted that given voltages are typical and allowance should be made for variations between transceivers. The following diagnostic sequences are general guides only. The use of normal trouble shooting principles and reference to the technical description, circuit diagrams and overlays will be required when diagnosing faults.

The removal and substitution of components may damage the components and/or the printed circuit boards. In some cases, it is impossible to remove components without destroying them. It is important therefore to carry out as much diagnosis as possible without removing components. The following general points should also be of assistance:

Replacement boards spare boards - if replacement spare boards are held in stock, they may be substituted to localise the fault to one board.

Transistor tests - static, transistor failures are most often due to open - circuit base- emitter or base collector junctions, or a short circuit between emitter and collector.

These types of faults can usually be detected without removing the transistor, using the ohms range of an analogue multimeter or diode test on a digital multimeter.

The two junctions should both give the appearance of a diode, that is high resistance with the multimeter leads one way round and low resistance when the leads are reversed. Polarity depends on whether a PNP or NPN transistor is being tested. The resistance between collector and emitter should be high with the multimeter leads either way round. The circuit diagram should be examined for parallel paths across these junctions caused by low resistance devices such as inductors before you remove a transistor that fails these tests.

Transistor tests - dynamic, some transistor faults can be diagnosed by measuring voltages within the circuit. One of the most significant voltage measurements is the base-emitter voltage. The polarity of this will depend on the type of the transistor (PNP or NPN). A base emitter voltage of between 0.6V and 0.8V should be measured on a forward-biased base-emitter junction. 1.2V to 1.6V for a Darlington transistor. With its base emitter junction forward-biased the transistor should conduct. Some indication of satisfactory operation of the transistor can be obtained by measuring the voltage drop across its collector or emitter resistor and short circuiting its base to the emitter. The short circuit removes the forward bias cutting off the transistor, so that the voltage across the resistor is considerably reduced.

Integrated circuits, if there appears to be no output from an integrated circuit, before replacing the device, it should be ascertained whether the failure is due to the IC itself or the load it is driving into. As a general rule, if changes in the input cause absolutely no changes in the corresponding output, the IC should be suspected. If however, a very small change in output can be detected, the load is more likely to be the cause. Depending upon the circuit, make further tests by disconnecting resistors, capacitors, etc to verify the diagnosis before removing the IC.

If a fault can be traced to one PCB but no further then consider using Barrett Communications' PCB and module exchange service.

5.7.2 Transceiver will not power up

Plug the transceiver into a 13.8 VDC power supply, switch the transceiver on, if the transceiver is totally inactive:-

- Check voltage on the input power cable on the PA PCB is between 11.8 VDC and 14.5 VDC.
- If using a remote control head, check the cable between the head and the main body of the transceiver
- Check the 26 way cable between the PA and the RF/Audio PCB's.
- Check the 14 way cable between the Front Panel and the RF/Audio PCB's.
- Check the 50 way connectors are mated between the RF/Audio and the microprocessor PCB.
- Check the Cathode of D1 on the PA PCB is > 10 V when the transceiver is off and low when it is switched on.
- If a single relay click is audible on switch on but the transceiver is otherwise inactive the 3.15A fuse on the PA PCB is probably blown. Check for obvious damage or short circuits prior to replacement.
- Check all the voltages as indicated in the table next page.

Voltage table

Location	Drawing No.	Supply rail name	Test point	Voltage Receive	Voltage Transmit	Source PCB and regulator or transistor
PA	900S18##.PCB	14	TP7	+13.8 V nominal	+13.8 V nominal	external source
PA	900S18##.PCB	+10	-	+10V +/- 0.2V	+10V +/- 0.2V	PA - U5
PA	900S18##.PCB	+5	-	+5V +/- 0.2V	+5V +/- 0.2V	PA - U2
PA	900S18##.PCB	+5TX	-	0V	+5V +/- 0.2V	PA Q16
PA	900S18##.PCB	+10TX	-	0V	+10V +/- 0.2V	PA - Q8
PA	900S18##.PCB	+12TX	-	0V	+12V nominal	PA - Q9
RF/Audio	900S15##.PCB 900S27##.PCB	+14	-	+13.8 V nominal	+13.8 V nominal	PA - external source
RF/Audio	900S15##.PCB 900S27##.PCB	+10	-	+10V +/- 0.2V	+10V +/- 0.2V	PA - U5
RF/Audio	900S15##.PCB 900S27##.PCB	+5	-	+5V +/- 0.2V	+5V +/- 0.2V	PA - U2
RF/Audio	900S15##.PCB 900S27##.PCB	BIAS	TP12	+5V +/- 0.2V	+5V +/- 0.2V	RF/Audio - U5:B
Micro.	900S14##.PCB	+14	-	+13.8 V nominal	+13.8 V nominal	PA -external source
Micro.	900S14##.PCB	+10	-	+10V +/- 0.2V	+10V +/- 0.2V	PA - U5
Micro.	900S14##.PCB	+5	TP14	+5V +/- 0.2V	+5V +/- 0.2V	PA - U2
Micro.	900S14##.PCB	+5D	TP4	+5V +/- 0.2V	+5V +/- 0.2V	Micro - U19*
Micro.	900S14##.PCB	+5VA	TP3	+5V +/- 0.2V	+5V +/- 0.2V	Micro -U20*
Fr. Panel	900S16##.PCB	+14	-	+13.8 V nominal	+13.8 V nominal	PA - via RF/Audio
Fr. Panel	900S16##.PCB	+5	-	+5V +/- 0.2V	+5V +/- 0.2V	Fr. Panel - Q6
Rem. Head	900S17##.PCB	+14	-	+13.8 V nominal	+13.8 V nominal	PA - via RF/Audio
Rem. Head	900S17##.PCB	+10	-	+10V +/- 0.2V	+10V +/- 0.2V	Rem. Head - U7
Rem. Head	900S17##.PCB	+5	-	+5V +/- 0.2V	+5V +/- 0.2V	Rem. Head -U6

Note :- ## denotes the rev number, this may change

5.7.3 Transceiver will not receive but displays OK

It is assumed in this section that, the transceiver turns on and displays are normal.

5.7.3.1 No receiver noise at all

- If using a remote control head check the speaker is plugged in.
- Check that the audio mute, selcall mute or signal strength mute is switched off
- Check the audio path from the product detector
- Ensure jumper J1 on the RF/Audio PCB is in place, no receiver audio will be heard if it is not.
- With the volume control at full and mute off, and USB mode selected, inject a reasonably high level audio signal starting at TP17, on the output of the product detector, and progress up the audio chain via J1, TP24, TP21 in the case of the local control front panel and TP13 in the case of the remote control head, eliminating sections of the audio path as you go. If the audio signal could be heard at TP17 then the fault lies further back in the receiver and you should proceed to the section 5.7.3.2 - "Receiver noise present but no receive".

5.7.3.2 Receive noise present, but does not receive

- The next steps assume audio injection can be heard back to TP17, as in section 5.7.3.3.
- Set mode to upper or lower sideband.
- Check that the carrier injection oscillator is present on the coax from the microprocessor PCB going to U6 pin 8 via C74 and R71. It should have a frequency of approx. 453kHz and a level of 1V P-P. If not present or correct go to section 5.7.3.6 - VCO faults.
- Check the second local oscillator LO2 is present on pin 2 of the second mixer U13. It should have a frequency of 45.455MHz and a level of approx. 1.4V P-P (+7dBm). If not present or correct go to section 5.7.6 - VCO faults.
- Check the first local oscillator LO1, generated by a phase locked loop on the microprocessor PCB, is "locked", indicated by the red LED on the microprocessor PCB being extinguished (off). Then with a channel frequency programmed to 2.000 MHz the frequency if the LO1 should be 47.455MHz (SCF + 45.455MHz) with a level of approx 2.8V P-P (+13dBm). If the VCO is unlocked or the LO1 is not present or correct go to section 5.7.6 - VCO faults.
- Check the receiver AGC voltage on TP31 is 3.8V under no signal condition. If not investigate the AGC generator and all supply voltages in the area.
- Now inject signals of correct frequency and levels as per the tables on the relevant RF/Audio PCB schematics moving back up the receiver path towards the antenna progressively eliminating check points and eventually locating the faulty section.

5.7.3.4 Transceiver turns on but displays "Barrett 900 Transceiver" only.

- On power on the front panel LCD display or remote head LCD display will initially show a banner "Barrett 900 Transceiver" and the RX and AM LEDs will be lit. This is generated, as a power on message, by the front panel and remote head micro, before the main microprocessor in the transceiver starts communicating with it. When the main microprocessor communicates with the front panel or remote head the display will change to the current channel and the LED's will indicate the channel mode.
- If the front panel or remote head remains displaying only the banner "Barrett 900 transceiver, and does not progress to the channel information, either the main microprocessor is inactive, in which case refer to the section on main microprocessor faults, or the path carrying the serial data from the microprocessor to the front panel is faulty. The serial signal that updates the front panel and remote head displays is SD out. On the RF/Audio PCB this becomes SER DISP. SER DISP is split into two signals by two inverters U25 D and U25 E becoming FP SD for the front panel and RH SD for the remote head.

5.7.4 Transceiver turns on, internal voltages are normal, but no LCD display.

- In the case of the remote control head check the remote control head microprocessor for activity or an LCD module fault.
- In the case of the front panel check the front panel microprocessor for activity or an LCD module fault.

5.7.5 Main microprocessor faults

- Check that the transceiver firmware EPROM U4 and option GAL U30 are fitted, without these the transceiver will not operate.
- Observe the LED's on the Microprocessor PCB. Check that all the yellow LED's are illuminated at the same intensity. The LED's check the +5V, +5V DIGITAL, +5V ANALOG and +10V rails. If any of these LED's are extinguished there is a problem on the corresponding rail and the rail should be checked for shorting to ground.
- Check for a 2.7MHz logic level square wave at pin 1 of U13 74HC4040 on Microprocessor PCB. If the 2.7MHz is present, then the reference oscillator is active, otherwise there is a fault in the reference oscillator chain. A fault in the reference oscillator chain can be localised by examining microprocessor PCB test points TP31, TP30, TP33 and TP32 in turn. By comparing the waveforms obtained, with those on the schematic diagram table it should be possible to isolate the problem.
- If with the standard reference oscillator fitted the crystal oscillator comprising Q13, Q14, L15, L16, X3 etc is not running, then check that the crystal oven is hot and that the DC levels are appropriate.
- If the high stability reference oscillator is fitted check for output. If no output is present check the DC level into the TCXO/DCXO is correct. If it is and no output is evident then replace the TCXO/DCXO. Incorrect DC levels generally indicate a failed transistor. As Q13 and Q14 are not DC coupled the faulty device should be obvious.
- If the reference chain is working up to pin 1 of U13 then check for 22.7MHz logic clock at TP34 and 11.3MHz logic clocks at pin 33 of the microprocessor U1. Absence of clocks at either point indicates a problem with U31, 74AC74 or U32, 741C74.
- If both clocks are present the next step is to check address latch enable at TP6 as in the table on the schematic, and then check for microprocessor bus activity. This can be monitored on a CRO, and it should be possible to see continuous bus activity on the address and data pins of the EPROM.
- If no bus activity is evident check that TP38, the reset line is high and that the stop line, pin 68 of U1, is also high. Also check that TP5 the interrupt line is normally high with brief pulses low.
- Erratic bus activity with no sensible display on the LCD indicates a possible bus problem. The only way in which this can readily be isolated apart from checking for bus shorts, with a multimeter, is by fitting a CHECK EPROM Barrett P/N BCS90100 which has been programmed entirely with OOH data at each address. With such an EPROM fitted the microprocessor will simply step through each address without stopping or jumping and the waveform on each address bit from A0 to A14 on the EPROM should be a square wave at successively half the frequency for each successive bit.
- Normal accessing of EPROM and EEPROM can be checked by comparing the waveforms obtained at TP6 and TP1 against those in the schematic table.

5.7.6 VCO faults

- If the transceiver beeps satisfactorily, the status LED's are correct and receiver noise is present but the display indicates HARDWARE FAILURE VCO LOCK LOST, then there is a problem with the frequency synthesiser. The red LED on the microprocessor should be illuminated under these circumstances. Select a channel in the range 8 - 20MHz.
- To localise the PLL failure carry out the following checks: Check for square wave at TP22. If this is present then the DDFS, DAC, LPF and buffer can be assumed to be operating. If there is no square wave then work back through TP21 and TP20 with reference to the schematic waveforms until the problem is located. Absence of a sine wave at TP21 probably indicates a DAC or QUALCOMM chip fault. The DACs U8 and U9 have very short pins and should be checked for connection faults.
- Next check for a square wave at TP28. If this is present then the VCO, LPF, buffer and ± 10 pre-scaler are probably functioning. If no square wave is present then check TP39. This should be high, otherwise the pre-scalar is held in reset. Check for large swing of RF at pin 8 of U21:C. If this is not present then check TP36 to ensure that 3V P-P RF is being generated by the VCO.
- If square waves are evident at TP22 and TP28 and the PLL is not in lock then the square waves will be at different frequencies. Check the DC level at TP26. If this level is low (0V) then there is possibly a fault with the charge pump transistors Q4, Q5 BFT92 whereas if the level is high (10V) then Q2, Q3 BFR92 should be checked.
- When the VCO is in lock and the red LED is extinguished and the channel frequency is above 8MHz then the two green LED's on the Microprocessor PCB should be illuminated. These indicate that the VCO is delivering the correct RF level.

5.7.7 Transmitter faulty

If the transceiver will not transmit, it is first necessary to determine which of the modules is at fault. First disconnect the coaxial cable between the RF/Audio PCB output and the PA PCB input. Do this at the RF/audio PCB end. Connect a coaxial cable from the RF/Audio PCB output to an oscilloscope. Terminate the oscilloscope input in 50 ohms. Set the transceiver frequency to 10 MHz. Either inject a two-tone test signal into the mic socket or whistle into the mic with the PTT activated. A signal of approx. 35 mV P-P should be observed. If this signal is absent or very low then the fault is likely to lie in the RF/Audio PCB, if not, re-connect the cable between the two PCBs.

Now check the two fuse links LK1 and LK2 on the PA. If either have blown, then investigate the possibility of driver or PA transistor failure before reconnecting the power. If it is not these transistors then a relay fault could exist in the output filter circuit this causing high collector current in the PA transistors, due to the ALC being disabled in this condition, and as a result of the load mismatch caused by the faulty relays.

If the fuse links are intact, measure the bias voltage at the bases of the driver and PA transistors with PTT activated but with no two tone or speech input. The voltage should be between 0.5V and 0.7V. If correct then check the DC voltage on the driver and PA collectors. These should be between 12V and 14V. If these voltages are within limits, then it is likely that the driver or PA transistors are faulty. Again inject a two tone signal or whistle into the microphone with the PTT activated and observe the RF voltage on the driver transistor collectors (Q3, Q4). The swing should be at least 3V P-P. If correct then the fault is likely to be in the final power amplifier stage. If no voltage swing was observed on the driver collectors then check the driver base voltage swing, this should be approximately 1V P-P using a two tone input or a whistle into the microphone. If this is not correct then the fault could be the driver transistors, or in U1, Q1, or Q2.

5.7.8 Replacement of PA output and driver transistors

Under normal operating conditions PA and Driver transistors will last indefinitely. The ALC circuit will fully protect these transistors from incorrect antenna loads.

In data mode, if the cooling fan fails for any reason, a high temperature power reducing circuit will protect these devices from overheating.

Damage to power transistors is rare and the reasons for failure should be properly investigated if a failed transistor is found. Reasons for failure include lightning damage, power supply surges, and incorrect adjustment of bias and power control circuits by users.

The driver transistors are either Philips type BLV11 or Motorola MRF433.

The PA transistors are Motorola type MRF455.

The procedure for replacement of driver and PA transistors is identical, so only the replacement of PA transistors will be described in detail:-

- Disconnect 12V power feed at rear of transceiver.
- Prior to removing the PA transistors, the base emitter and base collector junctions should be checked for forward conduction and reverse leakage using a test meter. In order to do this, the base leads must be desoldered using a large tipped iron preferably with a No. 8 (800 F) tip. The tab is bent up to facilitate removal. The tab should be prized up clear of the PCB taking care not to damage the transistor package. Forward and reverse junction resistance's can then be checked.
- Carefully remove all four M3 crosshead screws which hold the PA transistors in place. Store them safely.
- Desolder the large 100R resistors and 10nF greencaps across the MRF455's.
- Desolder all the solder lugs connecting the flange to ground. Keep these safely. There should be 4 for a pair of transistors. Remove 2 spring washers from under the solder tags.
- Desolder the leads of the BD139 transistor which sits on top of the power transistor flange. Remove this transistor for later use.
- Prize up the collector leads carefully until they are clear of the PCB. The collectors have a bevelled tab.
- Prize up both opposed emitter tabs carefully. Extra heat is required here as they are connected to the ground plane. Remove the transistors through the PCB access hole.
- Remove excess solder from the four PCB pads and clean them with isopropyl alcohol or methylated spirits.
- Clean all traces of heatsink compound from chassis heatsink area under the transistor being changed. Ensure that no dirt, swarf or other foreign matter is located where the transistors will sit.
- Clean the thermal contact surface of the replacement device. Smear a thin layer of heatsink compound evenly onto the transistor seat. Push the transistor into place and "wiggle" it in-situ. Remove the transistor and inspect the heatsink area to check that heatsink compound has coated the seating area of the transistor. A thin but complete smear of compound should be present. Do not apply too much or too little as poor thermal conductivity will result.
- Seat replacement PA transistors carefully in place having bent up collector and base tabs 3mm from their ends. The bevelled collector tab should face the large PA transformer.
- Position BD139 transistor with metal face down on PA transistor flange.

- Place solder tags and spring washers back in position and fit all four screws in place.
- Go around all four screws in turn, gradually increasing torque until the transistors are firmly seated.
- Solder the BD139 leads.
- Readjust bias before use.

5.8 Adjustments

Following PCB repair, it may be necessary to realign or recheck adjustable components on the relevant PCBs.

This section describes the methods employed to ensure that the reinstated PCB's conform to the original specification.

5.8.1 Front panel

There are no adjustments on the front panel. If the LCD display is damaged or a key is non functional the front panel should be replaced as a complete assembly by removing the two retaining screws and unplugging the 14 way IDC connector. Should the ON/OFF, volume potentiometer sustain damage, this is easily replaced by unsoldering the connections to the PCB and undoing the knob collet and retaining nut.

5.8.2 Microprocessor PCB

There are a number of adjustable components on this PCB which under normal circumstances should be left untouched.

5.8.2.1 Reference oscillator setup (Standard oscillator)

The 45.455MHz reference oscillator is the internal frequency standard for the transceiver. It must be adjusted to within a few cycles of declared frequency for reliable operation. It has a PTC thermistor heating element which stabilises the reference crystal. Before making any adjustment the transceiver should be left switched on for 5 minutes to allow thermal stabilisation. The core of L16 should be flush with the top of the can.

A frequency counter should be connected to TP34 using an oscilloscope, probe set to 10M . Then using a non metallic trimming tool, L15 should be carefully adjusted to obtain a frequency of $22.72750\text{MHz} \pm 2\text{Hz}$.

5.8.2.2 Reference oscillator setup (High stability oscillator)

The 45.455MHz reference oscillator is the internal frequency standard for the transceiver. The high stability oscillator option replaces the standard oscillator components described above with a modular 45.455 MHz TCXO/DCXO. Unlike the standard oscillator the high stability oscillator can be adjusted straight after turn on.

A frequency counter should be connected to TP34 using an oscilloscope probe set to 10M . Then using a trimming tool or small Philips screw driver, the pot in the top of the TCXO/DCXO should be carefully adjusted to obtain a frequency of $22.72750\text{MHz} \pm 1\text{Hz}$.

5.8.2.3 VCO frequency adjustment

Program the transceiver to 30MHz, measure voltage on TP26. Using a non-metallic trimming tool adjust the core of L8 to 9.5V. In most case's, the core of L8 will not be required. The red out of lock light should be extinguished.

5.8.2.4 Carrier Insertion oscillator peaking

Set the transceiver to any USB channel. Monitor TP37 with a CRO probe on sensitivity 0.5 V/div, 0.5 us/div. Adjust T1 for maximum amplitude on the CRO.

5.8.2.5 VCO Low pass filter

If a spectrum analyzer with tracking generator is available, this filter can easily be adjusted by setting the two notch frequencies of 119 MHz and 178 MHz. Turn the transceiver off for this adjustment. Connect the tracking generator to TP27 and the spectrum analyzer input to TP36. Adjust L10 for a notch at 178 MHz, and L11 for a notch at 119 MHz. The filter response should be flat to 76 MHz.

This 50 low pass filter has been factory set to be flat to 75 MHz and **should not be adjusted in the field**. In an emergency, satisfactory operation can be obtained by setting L10 core flush with the top and L11 core 5 mm inside can.

5.8.2.6 DAC Low pass filter

If a spectrum analyzer with tracking generator is available, this filter can easily be adjusted by adjusting the two notch frequencies of 12MHz and 18MHz. The transceiver should be turned off while performing this adjustment. Connect the tracking generator to TP20, and the spectrum analyzer input to TP21. Adjust L1 for a notch at 18 MHz, and L2 for a notch at 12 MHz. There is no requirement here to check that the filter response is flat.

This low pass filter has been factory set and **should not be adjusted in the field**. In an emergency, satisfactory operation can be obtained by setting both L1 and L2, 3mm into the coil can. There are four yellow LED's which are lit showing correct operation of the +5, +5D, +5A and +10 supply rails. The two green LED's illuminate above 8MHz due to local oscillator RF energy.

5.8.3 RF/Audio PCB

There are 11 adjustable components on the RF/Audio PCB. **The adjustment of each of these is critical and should not be undertaken unless the critical components have been replaced.**

5.8.3.1 Input low pass filter

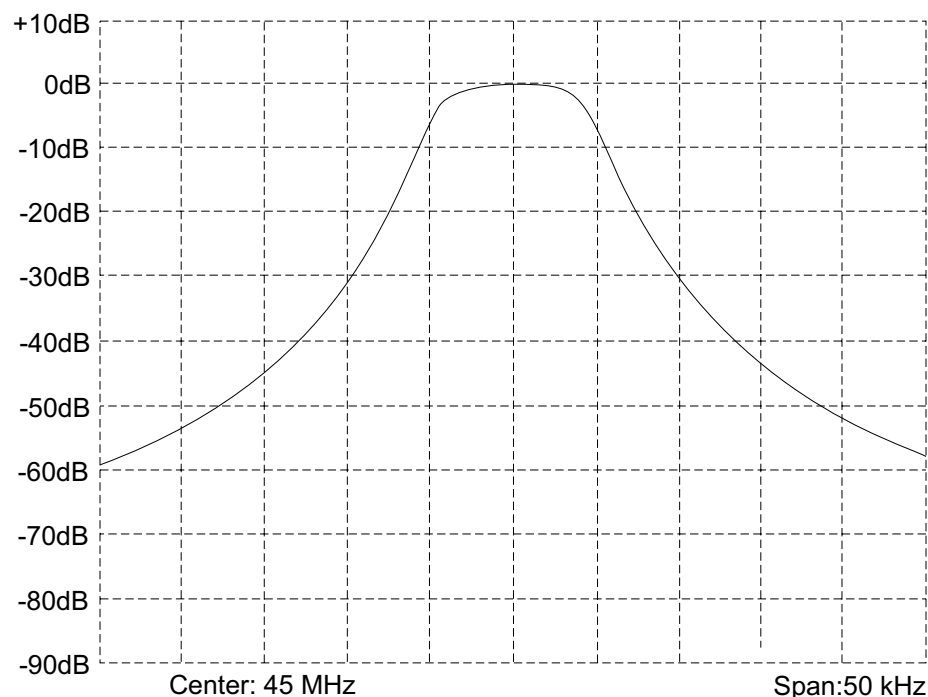
If a spectrum analyser with tracking generator is available, this filter can be adjusted by adjusting the two notch frequencies of 69MHz and 47MHz. The transceiver should be turned off for this adjustment. Unsolder SP3 and connect the tracking generator to TP30, and the spectrum analyzer input to TP14. Adjust L16 for a notch at 69MHz, and L20 for a notch at 47MHz. The frequency response should be flat from 1MHz to 30MHz.

The input low pass filter inductors L16 and L20 should have cores set approximately 5mm inside the cans in the event of replacement if the correct test equipment is not available.

5.8.3.2 45MHz IF Filter

This filter is the most critical filter in the transceiver. Its setting has a direct bearing on the transceiver dynamic performance. A spectrum analyser with tracking generator must be used to align this filter and it should be set with a centre frequency of 45MHz and a span of 50kHz. Solder bridge SP1 and SP2 should be unsoldered, the sweep signal should be injected at TP28, the spectrum analyser input should be connected to TP29. L7 and L8 should be adjusted to achieve the passband shape as indicated in Fig1.1, with particular attention being given to get the passband as flat as possible. If a spectrum analyser is not available and either L7 or L8 or the crystal filter has to be replaced, rough alignment can be achieved by peaking the coils for maximum output whilst injecting a weak signal. **Note:- Whilst the transceiver will operate using this method the filter shape could be incorrect and adjacent channel selectivity, blocking performance and transmit purity may be compromised.**

Fig 1.1



5.8.3.3 IF Inductors

Inductors L5 and L9 can be peaked on a weak signal. As there is a very slight interaction they should be re-peaked after initial setting. Leave L1 alone as this is part of the matching network from the crystal filter to the 45 MHz IF amplifier. L1 may be adjusted after the 45 MHz crystal filter has been adjusted as in paragraph 5.8.3.2 by reconnecting SP2, and transferring the spectrum analyzer input to TP4. Set the tracking generator output level to -60 dBm. Adjust L1 for flattest response. Reverse the spectrum analyzer and tracking generator connections, then go to Transmit by activating PTT with a microphone, and adjust L9 if necessary for flattest response. This should only need a very slight adjustment if any at all. This adjusts the input impedance of the crystal filter in the transmit direction.

5.8.3.4 Noise blanker potentiometer

VR1 should be set so that the voltage on the wiper of VR1 with a 1M ohm or greater input impedance meter or a CRO is 0.8V.

5.8.3.5 Carrier rejection potentiometer

The transceiver should be terminated in a 50 ohm, 30dB coaxial attenuator, capable of 100W PEP input, a spectrum analyser should be connected to the output. Program a channel with a frequency of 10MHz. The spectrum analyser centre frequency should be set to 10MHz with a span of 20KHz. VR4 should be adjusted to obtain a minimum carrier output level when transmitting in SSB mode by keying PTT or AUX PTT with no microphone or any audio inputs connected, as stray noise will mask any residual carrier.

Alternatively if no method of measuring the residual carrier level such as a spectrum analyser is available, the control can be set at its midway point. **Note :- If this method is used whilst the transmitter will operate normally, the transmitter carrier rejection level may not meet specifications.**

5.8.3.6 Transmit drive level set potentiometer

VR2 sets the transmit drive level and should not be adjusted in normal usage. If there is access to a two tone generator, the level can be set by applying a 50mV two tone signal at the mic socket. **Break the signal path at the RF input to the PA taking the signal from the RF/Audio PCB into an oscilloscope terminated in 50 .** At a frequency of 10MHz, set to 35mV P-P two tone by adjusting VR2. **The adjustment cannot be made with the feed to the PA in place. Do not set higher than 50mV p-p.**

5.8.3.7 455Khz IF

Tune the receiver to any convenient frequency, to a weak signal or use a signal generator set to 1uV. Peak coil T8 for maximum signal at TP11. This has a very broad response so tuning is not critical.

5.8.4 PA PCB

There are three potentiometers on the PA PCB. These control power set level (RV4), PA output bias (RV2) Driver bias (RV3). All PA potentiometers have been factory set and should only be adjusted in the event of PA or driver transistor replacement. No other adjustments are provided.

5.8.4.1 Driver bias setup

If the driver transistors have been replaced then both LK1 and LK2 the DC feed links to the PA and driver should be opened. RV3 should be set fully anticlockwise. Power can then be applied to the transceiver and PTT operated but with no audio input. RV3 should be carefully adjusted to obtain 0.63 V at TP08. LK1 DC feed to the driver can then be used to monitor driver current. With PTT active and no applied audio RV3 should be readjusted to obtain between 70 mA and 80 mA current feeding the driver. Close LK1.

5.8.4.2 PA bias setup

If the PA transistors have been replaced then LK2 should be opened. RV2 should be set fully anticlockwise. Power can then be applied to the transceiver and PTT operated but with no audio input. RV2 should be carefully adjusted to obtain 0.67 V on TP09. LK2 DC feed to the PA can then be used to monitor PA current. With PTT active and no applied audio RV2 should be readjusted to obtain 350 mA current feeding the PA stage.

5.8.4.3 Power level adjustment

The high power adjust set pot, RV4 sets the power level at 100 W. In the case of the 940 only low power is used and it is set between 10 W and 35 W. This should not be adjusted without access to a two-tone test source and a peak reading watt meter. High intermodulation levels can occur if the potentiometers are incorrectly set. Set frequency to 7MHz and SSB mode.

5.3.4.4 Programmable links

The only user selectable link on the PA PCB is normally left open. Where an auxiliary antenna socket is fitted, the link can be inserted to obtain separate Tx/Rx sockets or separate socket routing depending upon the channel programming.

(See Section 7.0 Internal Jumper Settings for details)

6.0 Software programming and options

To configure the transceiver options GAL keys are used. These keys are 20 pin dual in-line chips programmed for the options listed below. Note:- 980, 950, 930 GAL keys will only operate in the transceivers they are marked for. The operational software used in the transceiver, stored in EPROM, is unique to either the 980, 950 or 930 and like the GAL keys is not interchangeable. The GAL key is identified by the Pack Number as listed below:-

6.1 Barrett 930 transceivers

Pack 1 -----	No Selcall, default no options
Pack 2 BCO93002	Selcall with external alarm

930 transceivers can be programmed using the internal programmer within the transceiver, by using the Barrett 900 Series programming software or by cloning using cloning cable Barrett P/N BCA90024 from other 930 transceivers.

6.2 Barrett 940 transceivers

Pack 1 -----	All 940 features.
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940 transceivers can be programmed using the internal programmer within the transceiver, by using the Barrett 900 Series programming software or by cloning using cloning cable Barrett P/N BCA94014 from other 940 transceivers.

6.3 Barrett 950 transceivers

Pack 1 -----	no selcall, default no options.
Pack 2 BCO95002	Selcall, Telcall, GPS interface and external alarm.
Pack 3 BCO95003	RS-232 interface includes Telcall, Selcall, GPS interface.

950 transceivers can be programmed using the internal programmer within the transceiver, by using the Barrett 900 Series programming software or by cloning using cloning cable Barrett P/N BCA90024 from other 950 transceivers.

6.4 Barrett 980 transceivers

Pack 1 -----	Standard 980 configuration
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980 transceivers are delivered in a unlocked state with a standard international marine frequency pack fitted.

980 transceivers can be programmed using the internal programmer within the transceiver, by using the Barrett 900 Series programming software or by cloning using cloning cable Barrett P/N BCA90024 from other 980 transceivers.

7.0 Internal jumper settings

7.1 Standard jumpers locations (no options fitted)

The 900 series transceivers have only one jumper fitted in the standard configuration, this being jumper JP1 on the RF/Audio PCB. This jumper must be fitted if **noscrambler** option is fitted. (If this Jumper is removed no Rx audio will be heard in the receiver and there will be no RF output as the audio path is truncated).

7.2 Configuring antenna connectors (PA PCB) when optional antenna socket P/N BCA90029 is fitted - available on 930, 950 and 980 transceivers.

With reference to the following diagrams the table below describes the location of jumpers used to configure the antenna connector functions:-

Jumper	Antenna Socket 1	Antenna Socket 2
Not fitted	Tx/Rx	Not used
Position 1	Tx	Rx
Position 2	Selected by channel	Selected by channel

Position 2 options are active at all times and the antenna mode is selected during programming, each channel can be programmed to select either antenna socket 1 or 2. (Refer to the programming and operation manual).

8.0 Internal options

8.1 Internal scrambler option P/N BCA90031 - available for 940 and 950 transceivers

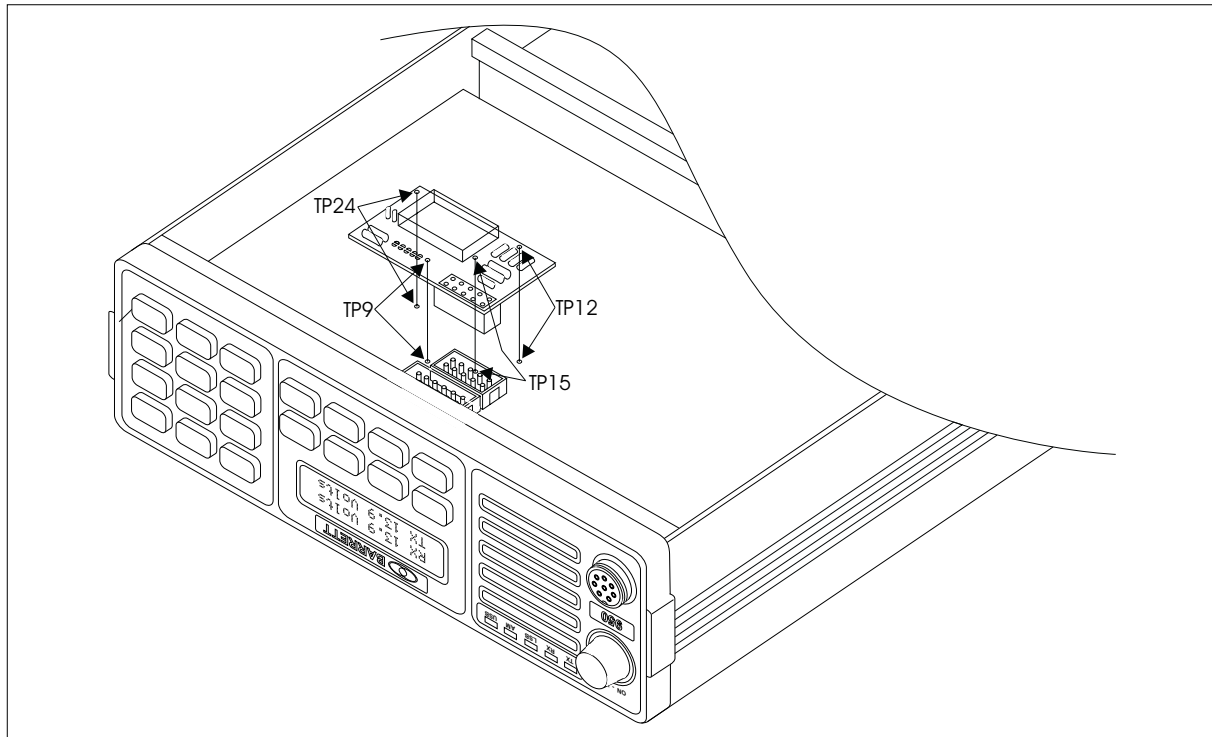
After removing the jumper JP1 on the RF/Audio PCB, solder the supplied PCB pins into test points TP9, 12, 15, and TP24 on the RF/Audio PCB. The optional scrambler PCB is then fitted, the connector on the scrambler PCB mating with the accessory connector P4 and the PCB pins fitted above mating with the marked holes. Once in place make sure the scrambler PCB is level and solder the PCB pins to the scrambler PCB. Note:- the PCB pins from TP9, 12, 15, and TP24 are only used to mechanically secure the scrambler PCB and make no electrical connection.

The scrambler option is enabled in the setup menu within the transceiver or during programming. Once enabled the scrambler can be turned off and on by holding down the key labelled "SCRAM". The scrambler has five solder able links marked A0, A1, A2, A3 and A4. These allow the scrambling code to be changed as detailed in the table below. Ensure all transceivers in a net have the same code set to enable reception of scrambled transmissions.

Note:- a zero means leave the solder link unsoldered, a one means solder the solder link.

Code Number	Address A ₄ - A ₀	Code Number	Address A ₄ - A ₀
0	00000	16	10000
1	00001	17	10001
2	00010	18	10010
3	00011	19	10011
4	00100	20	10100
5	00101	21	10101
6	00110	22	10110
7	00111	23	10111
8	01000	24	11000
9	01001	25	11001
10	01010	26	11010
11	01011	27	11011
12	01100	28	11100
13	01101	29	11101
14	01110	30	11110
15	01111	31	11111

Fitting internal scrambler option

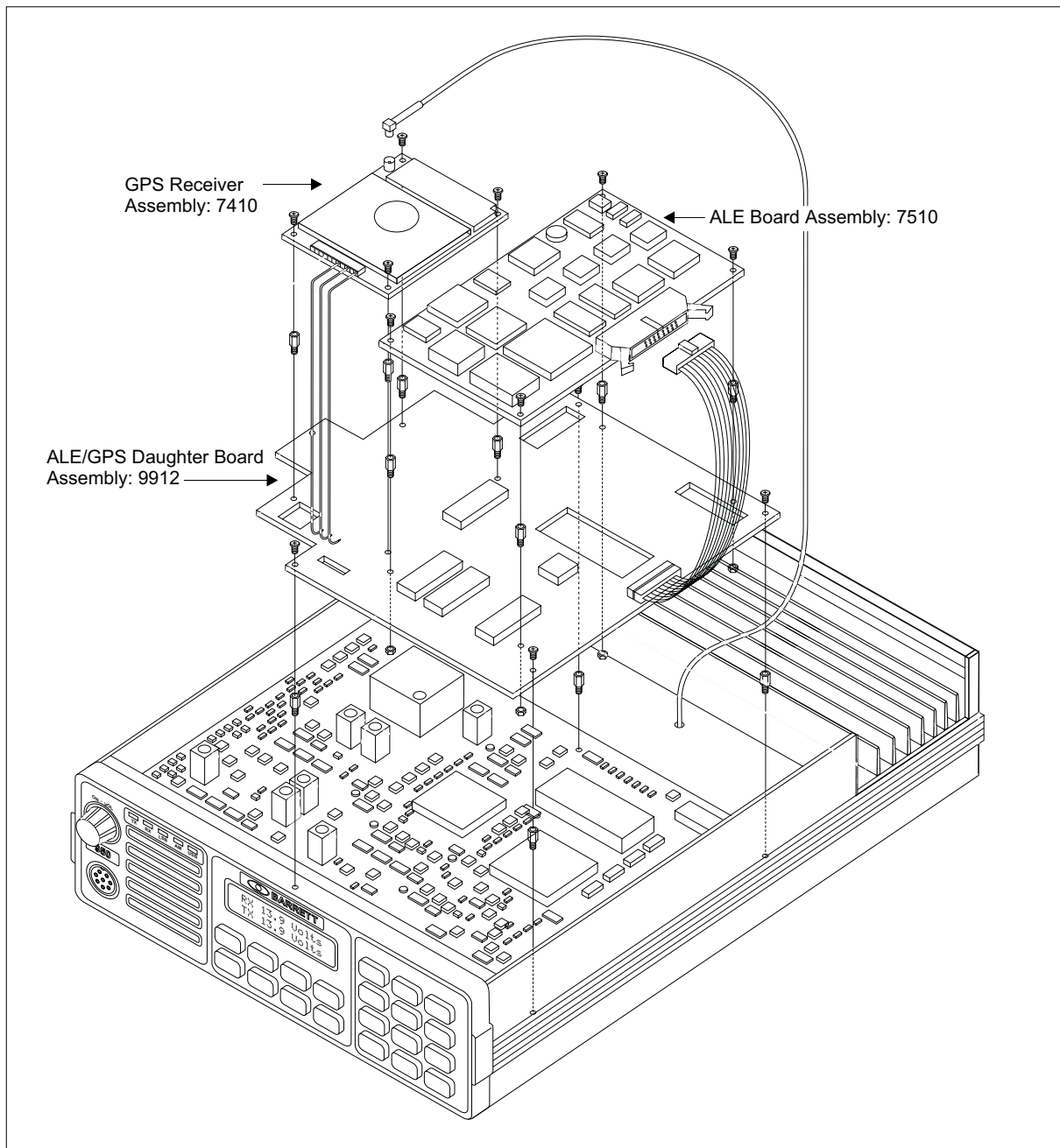


8.2 Internal GPS receiver option P/N BCA90030 - available for 950 and 980 transceivers

The GPS receiver is mounted on the ALE/GPS mother board which in turn is mounted on the microprocessor PCB, using the screws and stand-offs supplied, and plugged into the 14 way connector GPS1. The coaxial cable from the GPS receiver module is routed to the rear of the transceiver, as indicated in the attached diagram, and terminated on the BNC connector fitted in the normally blanked hole next to the RF connector on the rear of the transceiver. Note:- ALE option PCB is also fitted on this ALE/GPS motherboard if required.

8.3 Internal ALE option P/N BCA95001 and BCA95002 - available for 950 transceiver

The ALE option PCB is mounted on the ALE/GPS daughter board, which in turn is mounted on the microprocessor PCB, using the screws and stand-offs supplied, and plugged into the 14 way connector GPS1. Note:- GPS receiver option PCB is also fitted on this ALE/GPS daughter board if required.



9.0 Features and configurations unique to transceiver models

9.1 Barrett 950 transceivers fitted with high stability option - P/N BC95001 and BC95003

These transceivers are fitted with a high stability TCXO/DCXO but are otherwise identical to 950 transceivers. The high stability option is documented on the microprocessor schematic and PCB overlay.

9.2 Barrett 950M transceiver module - P/N BC95004

The Barrett 950M is technically identical to the Barrett 950 local control transceiver, without a front panel fitted. It is supplied standard with GAL Level 3 which enables RS-232 control and is fitted with a high stability TCXO/DCXO.

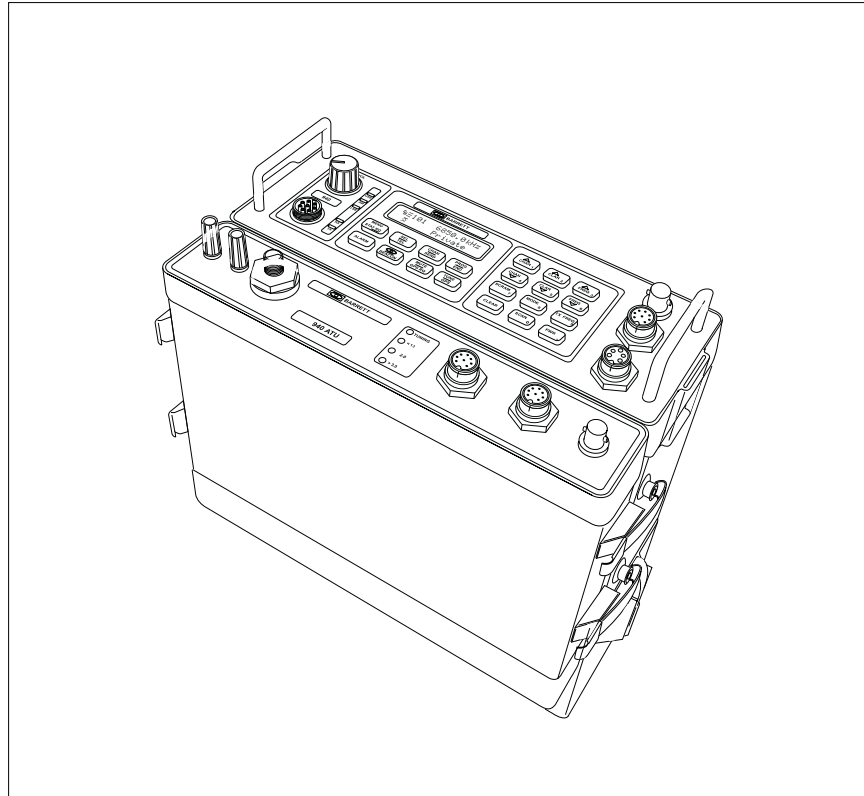
The Barrett 950M is primarily for use with the Barrett 960 telephone interconnect but can be used in a variety of remote control applications where a basic HF transceiver module is required.

9.3 Barrett 950MR receivers - P/N BC95005 / BC95006

The Barrett 950MR and Barrett 950MR1 are technically identical to the Barrett 950 local control transceiver, but have a PCB fitted in place of the PA PCB containing low pass filters, power relay circuitry and antenna switch components. The Barrett 950MR P/N BC95005 is fitted with a normal 950 local control front panel and can be programmed through this front panel or via the RS-232 port. The Barrett 950MR1 P/N BC95006 is housed in a 1U standard 19" rack mount cabinet. It has no control panel and is intended for control and programming via its RS-232 port. Both receivers are fitted with high stability TCXO/DCXO's.

9.4 Barrett 940 man-pack - P/N BC94001

The Barrett 940 man-pack is technically identical to the Barrett 950 but has the PA set between 10 and 35 W output. In addition it is fitted with the high stability TCXO/DCXO as standard and has a switch mode regulator fitted to the microprocessor PCB in place of the normal regulators for low power consumption purposes. A connector transition PCB provides a microphone amplifier for the handset connector and transition from the IDC cable to the military waterproof front panel connectors. The 940 is constructed in a water resistant case and has a battery pack that clips on the rear of the transceiver. In its portable form an accessory cover is provided that fits over the front panel when in transit.



9.4.1 940 ancillary components

9.4.1.1 110 to 240 VAC input charger supply Barrett P/N BCA94012

The BCA94012 Input Charger Supply is an AC/DC switch-mode power supply that provides a regulated 16V output from an AC power source of between 90V and 264V.

9.4.1.2 Charge regulator suit 13Ah NiMH battery 12V DC input Barrett P/N BCA94021

The BCA94021 NiMH 12V input charge regulator charges the BCA94008 battery with a constant current source of approximately 2.5A. This source is regulated by U4:A, Q9 and R30. The source is pulsed or switched off by the battery charge controller U3 using Q5. The current source is pulsed to look for a voltage drop which indicates the battery is fully charged. The current source is switched off if the battery is fully charged or a fault condition occurs. A fault condition is where the battery voltage is over 14.7V or under 7.4V or where battery temperature is over 54C or under -9C. This temperature is measured by a thermistor inside the battery pack.

The charging section is provided with power from two possible sources. The first is regulated external DC input of 16V provided, usually, by a charger supply Barrett P/N BCA94012. This input is over-voltage and reverse voltage protected by a relay. The second is unregulated DC input with an input range between 10.8V and 15.6V. This is over-voltage, under-voltage and reverse voltage protected by a relay and supplies a switch mode power supply to provide 16V to the charging section.

The switch mode power supply is of a standard design. The FET Q1, when switched on, pulls current through an inductor L2 to ground. When Q1 is switched off, this current then flows through the diode D3 and powers the output. The output voltage is higher than the input but to maintain continuity in the current through L2 the voltage must increase. Thus the voltage increase at the output of D3, when related to the input of L2, is defined by the duty cycle of Q1. This duty cycle is controlled by the switch mode controller U1. The input and output of this circuit are filtered to eliminate EMI.

9.4.1.3 940 multiple-use distribution unit Barrett P/N BCA94010

The BCA94010 multiple-use distribution unit provides simultaneous access for a CW key, headphones, 13.8V power input and programming function for the 940 transceiver.

9.4.1.4 940 automatic antenna tuner

The Barrett 940 automatic antenna tuner is a fully featured automatic antenna tuner designed for operation between 1.6 and 30MHz at power levels up to 25Watts with either a whip or long wire antenna. The tuner uses a switched "L" configuration with 256 capacitor, 256 inductor and Hi/Lo-Z settings to provide over 131,000 tuning combinations. An input balun with impedance ratio of 16 to 1 transforms the whip impedance to a range that can be handled by the L and C combinations. Tuning time is between 0.1 and 3.0 seconds with an average time of 1.5 seconds. The tuner will only tune when commanded to by the 940 transceiver with a low pulse appearing on pin 6 of the 8 pin connector.

Four LEDs provide an indication of SWR and status. The green LED marked "<1.5" indicates SWR of less than 1.5, the yellow LED marked "2.0" indicates the SWR is 1.5-2.0, the red LED marked ">3.0" indicates the SWR is greater than 3 and that a bad match has occurred. This happens occasionally with some combinations of antenna length and frequency. The red LED marked "TUNING" indicates the tuner is in a tune cycle.

The 940 antenna tuner front panel provides a stud for whip antenna mounting via a gooseneck. Next to this are binding posts for connection of an earth and a wire antenna. RF input to the tuner from a 940 transceiver is via a BNC connector. One 8 pin panel mounted plug provides connection to the 940 transceiver the other connector providing connection to auxiliary functions and power input etc.

The unit is fixed to capstans provided on the 940 transceiver with over-centre clips.

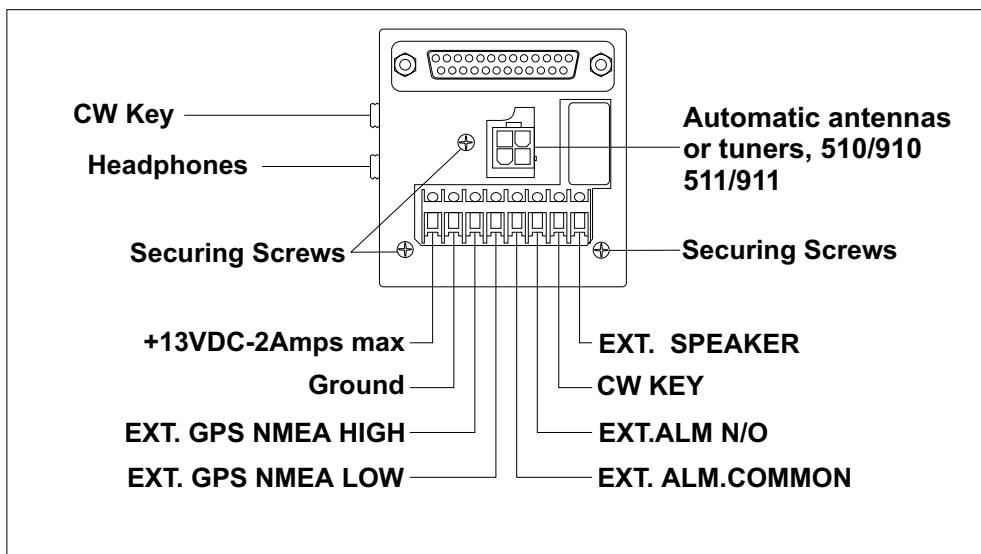
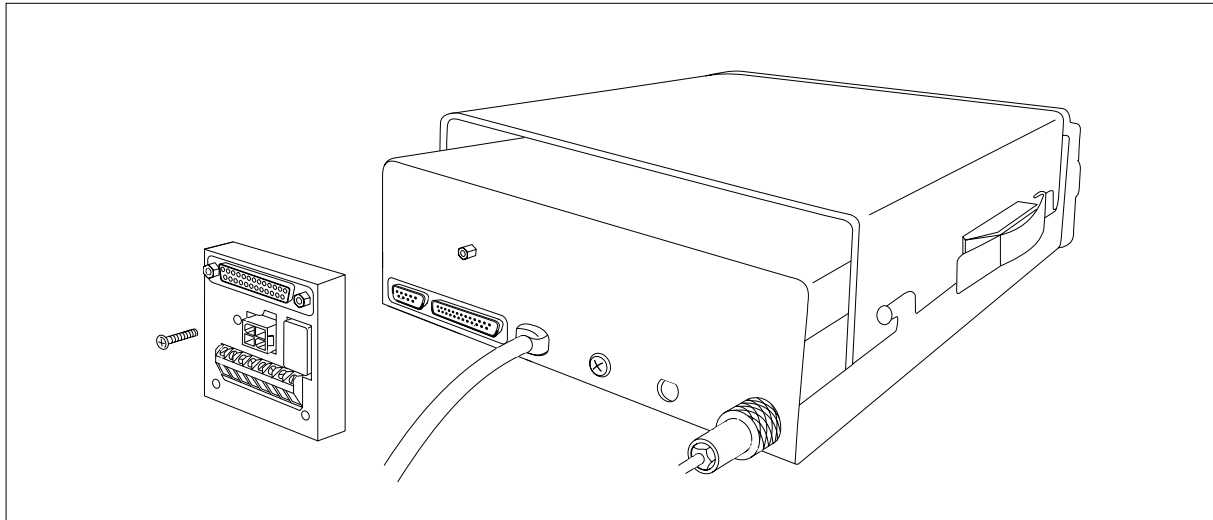
WARNING - Do not feed more than 25Watts PEP two tone RF power into the RF input connector.

9.5 Barrett 980 GMDSS transceiver - P/N BC98000

The Barrett 980 GMDSS transceiver is technically identical to the Barrett 950L but has a high stability oscillator and a 500Hz filter for F1B (AFSK) operation fitted as standard. It can also be supplied with a 300 W switch mode power supply fitted in a standard 900 series enclosure. This switch mode power supply has an input voltage of 24 VDC and provides galvanic isolation of the transceiver from the power as required by GMDSS regulations.

10.0 Accessory interface unit - P/N BCA90016

The accessory interface unit is used to enable easy access to various functions available on the rear accessory connector of 930, 950 and 980 series transceivers. The unit allows access to an external speaker or headphones and a CW key via standard 3.5 mm jack sockets. A 4 way "Minifit" socket is provided for the 910 Automatic tuning mobile antenna or 911 Automatic Antenna tuner. A set of screw terminals is provided to allow an external GPS to be connected as well as an external alarm and cross mute connection. The full 25 way accessory connector is duplicated by the connector on the accessory interface to enable data and other ancillary products to be connected using the standard Barrett 25 way cables (P/N BCA90021/22).



11.0 Auxiliary connector

11.1 Barrett 980 and Barrett 950 transceivers

Pin	Name	Description of function	Level	Option required to activate
1	Ground	Ground	0V	None
2	Rx Data	RS-232 data input	True RS-232	BCO95003
3	Tx Data	RS-232 data output	True RS-232	BCO95003
4	External Power On	For use with Barrett 960 or ancilliary equipment.	Low to activate	None
5	External Speaker	External speaker output	0-10V	None
6	Tuned In	Antenna tune cycle complete input from 910 / 911	Low going pulse	None
7	RS-232 Gnd.	RS-232 Ground	0V	None
8	ALC / Ext. GPS In	Ext. ALC from Linear Amp / Ext. GPS Input (with pin 20)	0-10V / NMEA 0183	BCO95002/3
9	Auxiliary PTT In	Auxiliary PTT input	Low to activate PTT	None
10	Scan Stop	Scan stop input from external modem	Low to stop scan	None
11	Bal. Tx Audio In	Balanced external Tx audio input (with pin 24)	600 Ohms 0dBm.	None
12	Bal. Rx Audio Out	Balanced un-muted Rx audio output (with pin 25)	600 Ohms 0dBm.	None
13	Ground	Ground	0V	None
14	Ant 0 / Pre-amp on	Channel no. output Octal bit 0 / 910 pre-amp on - Note 2	Active low	None
15	Ant 1	Channel no. output Octal bit 1 - Note 2	Active low	None
16	Ant 2	Channel no. output Octal bit 2 - Note 2	Active low	None
17	External Alarm Out / Ant 3	Horn / Latched alarm out (selcall activated) / Channel no. output Octal bit 3 - Note 2	Active low	BCO95002/3
18	13.8 V Int Out	Interrupted 13.8 V for 910 Auto. Antenna	13.8V-0V	None
19	Ant 0 / Pre-amp on	910 pre-amp on / Channel no. output Octal bit 0 - Note 2	Active low	None
20	FSK / Ext. GPS in	FSK digital input / Ext. GPS Input (with pin 8)	Active low / NMEA 0183	BCO95002/3
21	PTT / C-Mute Out	PTT Out / Receiver Cross Mute Out	Active low	None
22	CW Key	Input from CW Key	Low to activate	None
23	+13.8 V Fused Out	+13.8V Output to power auxilliary equipment	13.8V @ 2 Amp.	None
24	Bal. Tx Audio In	Balanced external Tx audio input (with pin 11)	600 Ohms 0dBm.	None
25	Bal. Rx Audio Out	Balanced un-muted Rx audio output (with pin 12)	600 Ohms 0dBm.	None

Note 1:- Pin 8 and Pin 20 - External GPS input is selected using a menu function or set during programming when the software option required is fitted.

Note 2:- These outputs provide channel information for use with antenna select units such as the BARRETT 916. The outputs are octal coded 0 to FF representing the least significant digit of the channel number selected. i.e. octal 0 for channel 1, octal 1 for channels 2, octal 3 for channels 2, to octal FF for channel 16/

11.2 Barrett 930 transceivers

Pin	Name	Description of function	Level	Option required to activate
1	Ground	Ground	0V	None
2	Rx Data	RS-232 data input(for cloning/programming function only)	True RS-232	None
3	Tx Data	RS-232 data output(for cloning/programming function only)	True RS-232	None
4	External Power On	For use with Barrett 960 or ancillary equipment.	Low to activate	None
5	External Speaker	External speaker output	0-10V	None
6	Tuned In	Antenna tune cycle complete input from 910 / 911	Low going pulse	None
7	RS-232 Gnd.	RS-232 Ground (for cloning function only)	0V	None
8	ALC	Ext. ALC from Linear Amp	0-10V	None
9	Auxiliary PTT In	Auxiliary PTT input	Low to activate PTT	None
10	Scan Stop	Scan stop input from external modem	Low to stop scan	None
11	Bal. Tx Audio In	Balanced external Tx audio input (with pin 24)	600 Ohms 0dBm.	None
12	Bal. Rx Audio Out	Balanced un-muted Rx audio output (with pin 25)	600 Ohms 0dBm.	None
13	Ground	Ground	0V	None
14	Ant 0 / Pre-amp on	Channel no. output Octal bit 0 / 910 pre-amp on	Active low	None
15	Ant 1	Channel no. output Octal bit 1	Active low	None
16	Ant 2	Channel no. output Octal bit 2	Active low	None
17	External Alarm Out	Horn / Latched alarm out (selcall activated)	Active low	BCO93002
18	13.8 V Int Out / Ant 3	Interrupted 13.8 V for 910 Auto. Antenna / Ant 3	13.8V-0V / Active Low	None
19	Ant 0 / Pre-amp on	910 pre-amp on / Channel no. output Octal bit 0	Active low	None
20	N/C	N/C	N/C	None
21	PTT / C-Mute Out	PTT Out / Receiver Cross Mute Out	Active low	None
22	CW Key	Input from CW Key	Low to activate	None
23	+13.8 V Fused Out	+13.8V Output to power auxilliary equipment	13.8V @ 2 Amp.	None
24	Bal. Tx Audio In	Balanced external Tx audio input (with pin 11)	600 Ohms 0dBm.	None
25	Bal. Rx Audio Out	Balanced un-muted Rx audio output (with pin 12)	600 Ohms 0dBm.	None

Note1:- These outputs provide channel information for use with antenna select units such as the BARRETT 916. The outputs are octal coded 0 to FF representing the least significant digit of the channel number selected. i.e. octal 0 for channel 1, octal 1 for channels 2, octal 3 for channels 2, to octal FF for channel 16.

11.3 Barrett 940 manpack transceivers

Barrett 940 manpack portable transceiver P/N BC94000 / BC94001

8 pin waterproof panel mounted plug

Pin	Name	Description of function	Level	Option required to activate
1	Ground	Ground	0V	None
2	Rx Data	RS-232 data input (for cloning/programming function only)	True RS-232	None
3	Tx Data	RS-232 data output (for cloning function only)	True RS-232	None
4	CW key	CW key input	Ground to activate	None
5	External Speaker	External speaker output	0-10V	None
6	Tune command	Antenna tune command to 940 automatic tuner option	Low going pulse	None
7	+13.8VDC	External power input - positive	+13.8 VDC	None
8	+13.8VDC	Power output to 940 tuner	+13.8 VDC	None

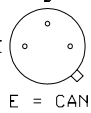
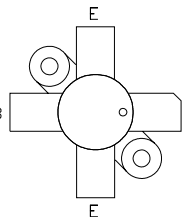
5 pin waterproof panel mounted socket

Pin	Name	Description of function	Level	Option required to activate
1	Ground	Ground	0 V	None
2	Speaker	Speaker output	0-10 V	None
3	PTT	Transmit key.	Ground to activate	None
4	Mic in	Microphone input	10mV	None
5	CW key	CW key input	Ground to activate	None

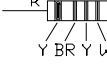
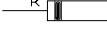
12.0 Circuit diagrams, overlays and parts lists

Active component outlines

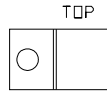
TRANSISTORS

TOP 	BC847 MARKED 1E or 1F or 1G or 1H BC807 MARKED 5A or 5B or 5C BFR92A MARKED P1 or P2 or R1 or R2 BFT92 MARKED W1 or X1	NPN PNP NPN PNP
TOP 	SST309 MARKED Z9AE or D9	JFET
TOP 	2N7002 MARKED 702	MOSFET
TOP 	BF990A MARKED M87	MOSFET
TOP 	BC556 BC328 BC548	PNP NPN
TOP 	BF494	NPN
TOP 	VN0106 VP0610	MOSFET
TOP 	BS170	JFET MOSFET
TOP 	2SK125	JFET
	BCP56	NPN
	BSP17	MOSFET
METAL FACE UNDER 	BD139 2N5192 BD434	NPN PNP
TOP 	MTP2955 MTP3055	MOSFET
TOP 	MRF237	NPN
	MRF433 MRF455	

DIODES

	BB909A
	1N4004 1.5KE18
	1N4148
	BZX85
TOP 	BAV99 MARKED A7 HSMP3822 MARKED F2L HSMP2802 MARKED A2
TOP 	BAV70 MARKED A4
TOP 	BAW56LTI MARKED A1

REGULATORS

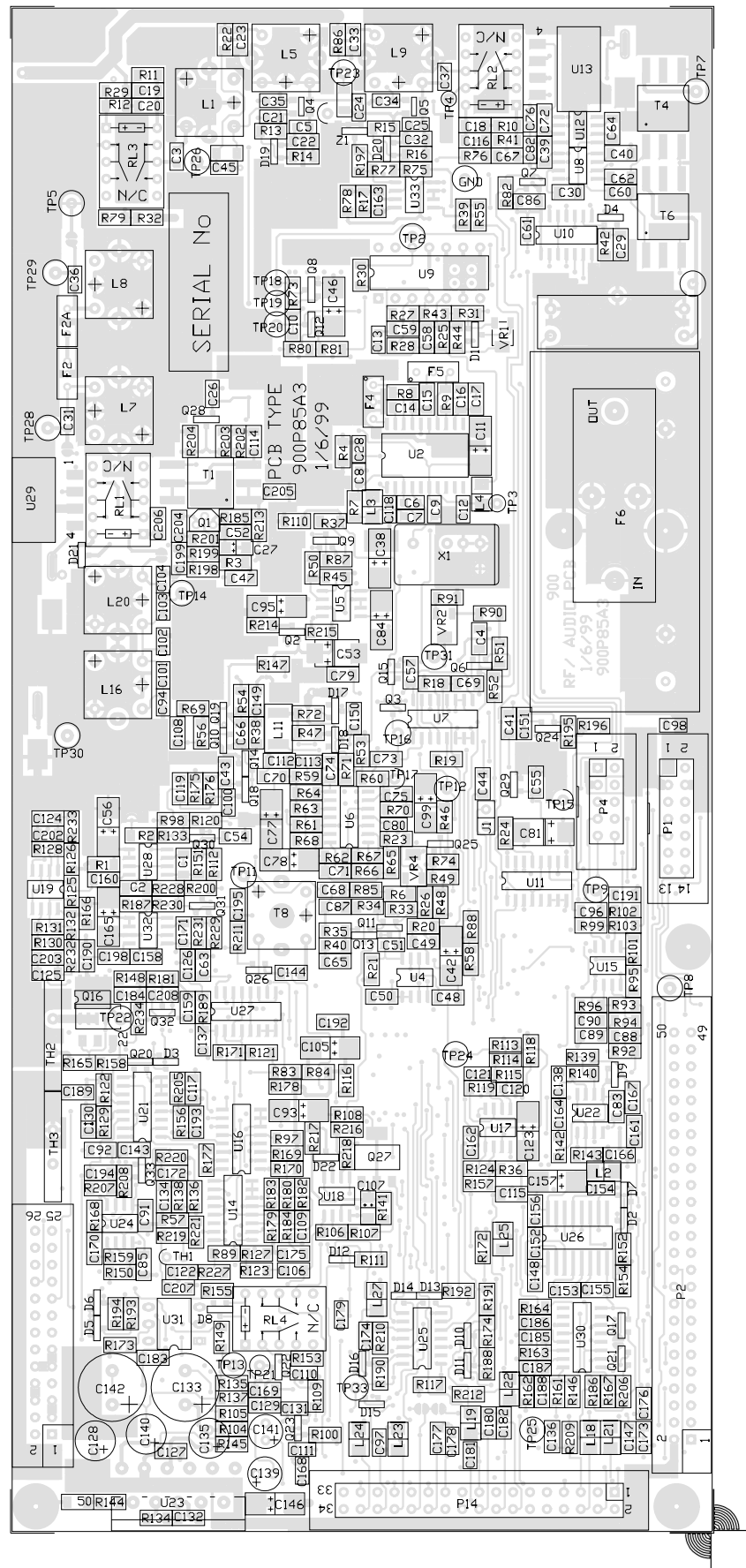
TOP 	7805 LM2940CT-50
TOP 	78L05

TEMP SENSOR

TOP 	LM335
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DRAWING NUMBER 900S109A0.PCB	DATE 3-2-99	ECN REFERENCE
SCALE NTS	DIMENSIONING	BARRETT PART NO
DRAWN DJS(PE)	DESIGNED RAG KAE	SHEET 1 OF 1
DRAWING TITLE DISCRETE SEMICONDUCTORS IN BARRETT 900 SERIES TRANSCEIVERS		

RF/Audio PCB overlay - showing optional narrow filter components.



RF-AUDIO Schematic - Showing optional narrow filter components.

See File: RF-AUDIO-BOARD-SCHEMATICS.pdf

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BARRETT 900 RF AUDIO PARTS LIST

900P85A4.PCB	Assembly P/N SA9933	Issue1	Sheet 1 of 11
Component Designator	Description	Barrett P/N	
C1	CAP SMD 1206 0.1uF	CP-00916	
C2	CAP SMD 1206 1.0uF CERAMIC	CP-00908	
C3	CAP SMD 0805 1nF	CP-00915	
C4	CAP SMD 1206 33nF	CP-00953	
C5	CAP SMD 0805 1nF	CP-00915	
C6	CAP SMD 0805 10pF	CP-00936	
C7	CAP SMD 0805 1nF	CP-00915	
C8	CAP SMD 0805 22pF	CP-00925	
C9	CAP SMD 0805 1nF	CP-00915	
C10	CAP SMD 1206 0.1uF	CP-00916	
C11	CAP SMD TANT 10uF 16V	CP-01580	
C12	CAP SMD 0805 12pF	CP-00923	
C13	CAP SMD 0805 12pF	CP-00923	
C14	CAP SMD 1206 0.1uF	CP-00916	
C15	CAP SMD 1206 0.1uF	CP-00916	
C16	CAP SMD 1206 0.1uF	CP-00916	
C17	CAP SMD 1206 0.1uF	CP-00916	
C18	CAP SMD 1206 0.1uF	CP-00916	
C19	CAP SMD 1206 0.1uF	CP-00916	
C20	CAP SMD 1206 0.1uF	CP-00916	
C21	CAP SMD 0805 15 pF	CP-00938	
C22	CAP SMD 1206 10nF	CP-00951	
C23	CAP SMD 1206 10nF	CP-00951	
C24	CAP SMD 0805 2p2F	CP-00918	
C25	CAP SMD 0805 1nF	CP-00915	
C26	CAP SMD 0805 1nF	CP-00915	
C27	CAP SMD TANT 1uF 16V	CP-01570	
C28	CAP SMD 0805 1nF	CP-00915	
C29	CAP SMD 1206 47nF	CP-00954	
C30	CAP SMD 1206 1.0uF CERAMIC	CP-00908	
C31	CAP SMD 0805 8p2F	CP-00935	
C32	CAP SMD 1206 10nF	CP-00951	
C33	CAP SMD 1206 10nF	CP-00951	
C34	CAP SMD 0805 1nF	CP-00915	
C35	CAP SMD 0805 1nF	CP-00915	
C36	CAP SMD 0805 8p2F	CP-00935	
C37	CAP SMD 0805 6p8F	CP-00919	
C38	CAP SMD TANT 10uF 16V	CP-01580	
C39	CAP SMD 1206 0.1uF	CP-00916	
C40	CAP SMD 1206 0.1uF	CP-00916	
C41	CAP SMD 1206 0.1uF	CP-00916	
C42	CAP SMD TANT 10uF	CP-01580	
C43	CAP SMD 1206 1.0uF CERAMIC	CP-00908	
C44	CAP SMD 1206 10nF	CP-00951	
C45	CAP SMD 0805 1nF	CP-00915	
C46	CAP SMD TANT 10uF 16V	CP-01580	
C47	CAP SMD 1206 0.1uF	CP-00916	
C48	CAP SMD 1206 10nF	CP-00951	
C49	CAP SMD 1206 10nF	CP-00951	
C50	CAP SMD 1206 0.1uF	CP-00916	
C51	CAP SMD 0805 1nF	CP-00915	
C52	CAP SMD 1206 10nF	CP-00951	
C53	CAP SMD TANT 22uF 20V	CP-01590	

BARRETT 900 RF AUDIO PARTS LIST

900P85A4.PCB	Assembly P/N SA9933	Issue1	Sheet 2 of 11
Component Designator	Description	Barrett P/N	
C54	CAP SMD 1206 0.1uF	CP-00916	
C55	CAP SMD 1206 10nF	CP-00951	
C56	CAP SMD 10uF TANT	CP-01580	
C57	CAP SMD 1206 0.1uF	CP-00916	
C58	CAP SMD 1206 0.1uF	CP-00916	
C59	CAP SMD 1206 0.1uF	CP-00916	
C60	CAP SMD 1206 1.0uF CERAMIC	CP-00908	
C61	CAP SMD 0805 1nF	CP-00915	
C62	CAP SMD 1206 1.0uF CERAMIC	CP-00908	
C63	CAP SMD 1206 0.1uF	CP-00916	
C64	CAP SMD 1206 0.1uF	CP-00916	
C65	CAP SMD 1206 0.1uF	CP-00916	
C66	CAP SMD 1206 0.1uF	CP-00916	
C67	CAP SMD 1206 0.1uF	CP-00916	
C68	CAP SMD 1206 0.1uF	CP-00916	
C69	CAP SMD 1206 0.1uF	CP-00916	
C70	CAP SMD 1206 0.1uF	CP-00916	
C71	CAP SMD 1206 0.1uF	CP-00916	
C72	CAP SMD 1206 1.0uF CERAMIC	CP-00908	
C73	CAP SMD 1206 0.1uF	CP-00916	
C74	CAP SMD 1206 0.1uF	CP-00916	
C75	CAP SMD 1206 0.1uF	CP-00916	
C76	CAP SMD 0805 1nF	CP-00915	
C77	CAP SMD TANT 10uF 16V	CP-01580	
C78	CAP SMD TANT 10uF 16V	CP-01580	
C79	CAP SMD 1206 0.1uF	CP-00916	
C80	CAP SMD 0805 1nF	CP-00915	
C81	CAP SMD TANT 22uF 20V	CP-01590	
C82	CAP SMD 0805 1nF	CP-00915	
C83	CAP SMD 1206 0.1uF	CP-00916	
C84	CAP SMD TANT 10uF 16V	CP-01580	
C85	CAP SMD 1206 0.1uF	CP-00916	
C86	CAP SMD 1206 0.1uF	CP-00916	
C87	CAP SMD 1206 10nF	CP-00951	
C88	CAP SMD 1206 1.0uF CERAMIC	CP-00908	
C89	CAP SMD 1206 1.0uF CERAMIC	CP-00908	
C90	CAP SMD 1206 2u2F CERAMIC	CP-00909	
C91	CAP SMD 1206 0.1uF	CP-00916	
C92	CAP SMD 1206 0.1uF	CP-00916	
C93	CAP SMD TANT 10uF 16V	CP-01580	
C94	CAP SMD 0805 120pF	CP-00939	
C95	CAP SMD TANT 10uF 16V	CP-01580	
C96	CAP SMD 1206 2u2F CERAMIC	CP-00909	
C97	CAP SMD 0805 1nF	CP-00915	
C98	CAP SMD 0805 27pF	CP-00926	
C99	CAP SMD TANT 10uF 16V	CP-01580	
C100	CAP SMD 0805 1nF	CP-00915	
C101	CAP SMD 0805 15pF	CP-00938	
C102	CAP SMD 0805 180pF	CP-00943	
C103	CAP SMD 0805 39pF	CP-00927	
C104	CAP SMD 0805 100pF	CP-00940	
C105	CAP SMD TANTALUM 10uF 16V	CP-01580	
C106	CAP SMD 1206 0.1uF	CP-00916	
C107	CAP SMD TANT 1uF 16V	CP-01570	

BARRETT 900 RF AUDIO PARTS LIST

900P85A4.PCB	Assembly P/N SA9933	Issue1	Sheet 3 of 11
Component Designator	Description	Barrett P/N	
C108	CAP SMD 1206 1uF CERAMIC	CP-00908	
C109	CAP SMD 1206 0.1uF	CP-00916	
C110	CAP SMD 0805 4n7	CP-10947	
C111	CAP SMD 0805 4n7	CP-10947	
C112	CAP SMD 1206 0.1uF	CP-00916	
C113	CAP SMD 0805 1nF	CP-00915	
C114	CAP SMD 1206 0.1uF	CP-00916	
C115	CAP SMD 1206 0.1uF	CP-00916	
C116	CAP SMD 1206 0.1uF	CP-00916	
C117	CAP SMD 1206 2n2	CP-00937	
C118	CAP SMD 0805 1nF	CP-00915	
C119	CAP SMD 1206 0.1uF	CP-00916	
C120	CAP SMD 0805 4n7	CP-10947	
C121	CAP SMD 0805 4n7	CP-10947	
C122	CAP SMD 1206 0.1uF	CP-0 0916	
C123	CAP SMD TANT 10uF 16V	CP-01580	
C124	CAP SMD 1206 1uF CERAMIC	CP-00908	
C125	CAP SMD 1206 1uF CERAMIC	CP-00908	
C126	CAP SMD 1206 0.1uF	CP-00916	
C127	CAP SMD 1206 0.1uF	CP-00916	
C128	CAP 100uF 25V RB	CP-01637	
C129	CAP SMD 1206 1uF CERAMIC	CP-00908	
C130	CAP SMD TANT 1.0uF 16V	CP-01570	
C131	CAP SMD 0805 1nF	CP-00915	
C132	CAP SMD 1206 0.1uF	CP-00916	
C133	CAP 470uF 16V RB	CP-01755	
C134	CAP SMD 1206 0.1uF	CP-00916	
C135	CAP 100uF 25V RB	CP-01637	
C136	CAP SMD 1206 1uF CERAMIC	CP-00908	
C137	CAP SMD 1206 0.1uF	CP-00916	
C138	CAP SMD 1206 0.1uF	CP-00916	
C139	CAP 100uF 25V RB	CP-01637	
C140	CAP 100uF 25V RB	CP-01637	
C141	CAP 100uF 25V RB	CP-01637	
C142	CAP 470uF 16V RB	CP-01755	
C143	CAP SMD 1206 0.1uF	CP-00916	
C144	CAP SMD 1206 1uF CERAMIC	CP-00908	
C145	CAP SMD 1206 0.1uF	CP-00916	
C146	CAP SMD TANT 10uF 16V	CP-01580	
C147	CAP SMD 1206 0.1uF	CP-00916	
C148	CAP SMD 1206 0.1uF	CP-00916	
C149	CAP SMD 1206 0.1uF	CP-00916	
C150	CAP SMD 1206 0.1uF	CP-00916	
C151	CAP SMD 1206 2n2F	CP-00937	
C152	CAP SMD 1206 0.1uF	CP-00916	
C153	CAP SMD 1206 0.1uF	CP-00916	
C154	CAP SMD 0805 1nF	CP-00915	
C155	CAP SMD 1206 0.1uF	CP-00916	
C156	CAP SMD 1206 0.1uF	CP-00916	
C157	CAP SMD TANT 10uF 16V	CP-01580	
C158	CAP SMD 1206 1.0uF CERAMIC	CP-00908	
C159	CAP SMD 1206 1uF CERAMIC	CP-00908	

BARRETT 900 RF AUDIO PARTS LIST

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**Component
Designator**
Description
Barrett P/N

C160	CAP SMD 1206 1uF CERAMIC	CP-00908
C161	CAP SMD 1206 1uF CERAMIC	CP-00908
C162	CAP SMD 1206 10nF	CP-00951
C163	CAP SMD 1206 1uF CERAMIC	CP-00908
C164	CAP SMD 1206 10nF	CP-00951
C165	CAP SMD 10uF TANT	CP-01580
C166	CAP SMD 1206 0.1uF	CP-00916
C167	CAP SMD 1206 0.1uF	CP-00916
C168	CAP SMD 0805 1nF	CP-00915
C169	CAP SMD 1206 1uF CERAMIC	CP-00908
C170	CAP SMD 1206 2u2F CERAMIC	CP-00909
C171	CAP SMD 1206 0.1uF	CP-00916
C173	CAP SMD 1206 10nF	CP-00951
C174	CAP SMD 1206 0.1uF	CP-00916
C175	CAP SMD 1206 0.1uF	CP-00916
C176	CAP SMD 1206 0.1uF	CP-00916
C177	CAP SMD 1206 0.1uF	CP-00916
C178	CAP SMD 0805 1nF	CP-00915
C179	CAP SMD 0805 1nF	CP-00915
C180	CAP SMD 1206 0.1uF	CP-00916
C181	CAP SMD 0805 1nF	CP-00915
C182	CAP SMD 1206 0.1uF	CP-00916
C183	CAP SMD 1206 0.1uF	CP-00916
C184	CAP SMD 1206 15nF	CP-00972
C185	CAP SMD 1206 0.1uF	CP-00916
C186	CAP SMD 1206 0.1uF	CP-00916
C187	CAP SMD 1206 0.1uF	CP-00916
C188	CAP SMD 1206 0.1uF	CP-00916
C189	CAP SMD 1206 0.1uF	CP-00916
C190	CAP SMD 1206 0.1uF	CP-00916
C191	CAP SMD 1206 0.1uF	CP-00916
C192	CAP SMD 1206 0.1uF	CP-00916
C193	CAP SMD 1206 15nF	CP-00972
C194	CAP SMD 1206 0.1uF	CP-00916
C195	CAP SMD 1206 0.1uF	CP-00916
C198	CAP SMD 1206 1uF CERAMIC	CP-00908
C199	CAP SMD 1206 0.1uF	CP-00916
C202	CAP SMD 1206 1uF CERAMIC	CP-00908
C203	CAP SMD 1206 1uF CERAMIC	CP-00908
C204	CAP SMD 1206 0.1uF	CP-00916
C205	CAP SMD 1206 0.1uF	CP-00916
C206	CAP SMD 1206 0.1uF	CP-00916
C207	CAP SMD 1206 1uF CERAMIC	CP-00908
C208	CAP SMD 1206 0.1uF	CP-00916
D1	DIODE SMD BAV 99	DI-03317
D2	DIODE SMD BAV 70	DI-03316
D3	DIODE SMD BAV 70	DI-03316
D4	DIODE SMD BAV 70	DI-03316
D5	DIODE SMD BAV 70	DI-03316
D6	DIODE SMD BAV 70	DI-03316
D7	DIODE SMD BAV 70	DI-03316
D8	DIODE SMD BAV 70	DI-03316
D9	DIODE SMD BAV99	DI-03317
D10	DIODE SMD BAW56	DI-03300

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900P85A4.PCB	Assembly P/N SA9933	Issue1	Sheet 5 of 11
Component Designator	Description	Barrett P/N	
D11	DIODE SMD BAW56	DI-03300	
D12	DIODE SMD BAV 70	DI-03316	
D13	DIODE SMD BAV 70	DI-03316	
D14	DIODE SMD BAV 99	DI-03317	
D15	DIODE SMD BAV 70	DI-03316	
D16	DIODE SMD BAV 99	DI-03317	
D17	DIODE SMD BAV 70	DI-03316	
D18	DIODE SMD BAV 70	DI-03316	
D19	DIODE SMD BAV 99	DI-03317	
D20	DIODE SMD BAV 99	DI-03317	
D21	DIODE SMD BAV 70	DI-03316	
D22	DIODE SMD BAV 70	DI-03316	
F1	CERAMIC FILTER CFJ455K5	FI-07604	
F2, F2A	CRYSTAL FILTER PAIR 45MHz	FI-07603	
F4	CERAMIC FILTER CFSFE 10.7	FI-07601	
F5	CERAMIC FILTER CFSFE 10.7	FI-07601	
F6 OPTIONAL FILTER	455 KHz 500Hz X00F05A	FI-07602	
J1	2 PIN PLUG POLARISED	CN-14101	
L1	COIL F747	IN-03217	
L2	CHOKE SMD 100 uH	IN-03601	
L3	CHOKE SMD 1uH	IN-03590	
L4	CHOKE SMD 10uH	IN-03600	
L5	COIL F772	IN-03215	
L7	COIL F772	IN-03215	
L8	COIL F772	IN-03215	
L9	COIL F772	IN-03215	
L11	CHOKE 1mH SMD	IN-03585	
L16	COIL A8120DL	IN-03218	
L18	CHOKE SMD 100 uH	IN-03601	
L19	CHOKE SMD 100 uH	IN-03601	
L20	COIL A8120DL	IN-03218	
L21	CHOKE SMD 100uH	IN-03601	
L22	CHOKE SMD 100uH	IN-03601	
L23	CHOKE SMD 100uH	IN-03601	
L24	CHOKE SMD 100uH	IN-03601	
L25	CHOKE SMD 100uH	IN-03601	
L27	CHOKE SMD 100uH	IN-03601	
P1	HEADER BOX 14 PIN	CN-04144	
P2	HEADER SOCKET 50 PIN	CN-04218	
P3	HEADER BOX 26 WAY	CN-04121	
P4	HEADER BOX 10 PIN	CN-04138	
P14	HEADER BOX 34 PIN	CN-04139	
Q1	MOS FET BS170	TR-02208	
Q2	FET SMD 2N7002 LT-1	TR-02282	
Q3	FET SMD 2N7002 LT-1	TR-02282	
Q4	FET SMD BF990A	TR-02219	
Q5	FET SMD BF990A	TR-02219	
Q6	TRANSISTOR SMD BC847	TR-02262	
Q7	FET SMD 2N7002 LT-1	TR-02282	
Q8	TRANSISTOR SMD BC847	TR-02262	
Q9	FET SMD 2N7002 LT-1	TR-02282	
Q10	TRANSISTOR SMD BC847	TR-02262	
Q11	TRANSISTOR SMD BC807	TR-02229	
Q12	TRANSISTOR SMD BC807	TR-02229	

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**Component
Designator**
Description
Barrett P/N

Q13	TRANSISTOR SMD BC807	TR-02229
Q14	TRANSISTOR SMD BC847	TR-02262
Q15	FET SMD 2N7002 LT-1	TR-02282
Q16	FET POWER IRF7404	TR-00001
Q17	TRANSISTOR SMD BC847	TR-02262
Q18	FET SMD MMBF545	TR-02238
Q19	TRANSISTOR SMD BC847	TR-02262
Q20	FET SMD 2N7002 LT-1	TR-02282
Q21	FET SMD 2N7002 LT-1	TR-02282
Q22	FET SMD 2N7002 LT-1	TR-02282
Q23	FET SMD 2N7002 LT-1	TR-02282
Q24	TRANSISTOR SMD BC807	TR-02229
Q25	TRANSISTOR SMD BC847	TR-02262
Q26	TRANSISTOR SMD BC807	TR-02229
Q27	FET SMD BSP17	TR-02207
Q28	TRANSISTOR SST309	TR-02259
Q29	FET SMD 2N7002 LT-1	TR-02282
Q30	TRANSISTOR SMD BC807	TR-02229
Q31	TRANSISTOR SMD BC807	TR-02229
Q32	FET SMD 2N7002 LT-1	TR-02282
Q33	FET SMD 2N7002 LT-1	TR-02282
R1	RES SMD 1206 10R	RE-00111
R2	RES SMD 1206 1K	RE-00122
R3	RES SMD 1206 33R	RE-00112
R4	RES SMD 1206 470R	RE-00121
R6	RES SMD 1206 47K	RE-00157
R7	RES SMD 1206 10K	RE-00150
R8	RES SMD 1206 470R	RE-00121
R9	RES SMD 1206 470R	RE-00121
R10	RES SMD 1206 10R	RE-00111
R11	RES SMD 1206 10R	RE-00111
R12	RES SMD 1206 10R	RE-00111
R13	RES SMD 1206 470R	RE-00121
R14	RES SMD 1206 1R0	RE-00090
R15	RES SMD 1206 100K	RE-00170
R16	RES SMD 1206 1R0	RE-00090
R17	RES SMD 1206 10K	RE-00150
R18	RES SMD 1206 2K2	RE-00125
R19	RES SMD 1206 1K5	RE-00124
R20	RES SMD 1206 5K6	RE-00129
R21	RES SMD 1206 1K0	RE-00122
R22	RES SMD 1206 10R	RE-00111
R23	RES SMD 1206 47K	RE-00157
R24	RES SMD 1206 4K7	RE-00128
R25	RES SMD 1206 100K	RE-00170
R26	RES SMD 1206 10K	RE-00150
R27	RES SMD 1206 47K	RE-00157
R28	RES SMD 1206 47K	RE-00157
R29	RES SMD 1206 10R	RE-00111
R30	RES SMD 1206 5M6	RE-00185
R31	RES SMD 1206 10K	RE-00150
R32	RES SMD 1206 100R	RE-00117
R33	RES SMD 1206 10K	RE-00150

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**Component
Designator**
Description
Barrett P/N

R34	RES SMD 1206 4K7	RE-00128
R35	RES SMD 1206 180R	RE-00118
R36	RES SMD 1206 47K	RE-00157
R37	RES SMD 1206 10K	RE-00150
R38	RES SMD 1206 100R	RE-00117
R39	RES SMD 1206 10K	RE-00150
R40	RES SMD 1206 22R	RE-00108
R41	RES SMD 1206 10R	RE-00111
R42	RES SMD 1206 18K	RE-00152
R43	RES SMD 1206 47K	RE-00157
R44	RES SMD 1206 22K	RE-00153
R45	RES SMD 1206 12K	RE-00149
R46	RES SMD 1206 470R	RE-00121
R47	RES SMD 1206 680R	RE-00101
R48	RES SMD 1206 470R	RE-00121
R49	RES SMD 1206 1 5K	RE-00151
R50	RES SMD 1206 10K	RE-00150
R51	RES SMD 1206 330K	RE-00176
R52	RES SMD 1206 10K	RE-00150
R53	RES SMD 1206 10K	RE-00150
R54	RES SMD 1206 100K	RE-00170
R55	RES SMD 1206 20K	RE-00010
R56	RES SMD 1206 100R	RE-00117
R57	RES SMD 1206 2K2	RE-00125
R58	RES SMD 1206 4K7	RE-00128
R59	RES SMD 1206 3K3	RE-00127
R60	RES SMD 1206 2K7	RE-00126
R61	RES SMD 1206 2K7	RE-00126
R62	RES SMD 1206 330R	RE-00107
R63	RES SMD 1206 56R	RE-00114
R64	RES SMD 1206 56R	RE-00114
R65	RES SMD 1206 220R	RE-00119
R66	RES SMD 1206 220R	RE-00119
R67	RES SMD 1206 150R	RE-00138
R68	RES SMD 1206 820R	RE-00102
R69	RES SMD 1206 33K	RE-00155
R70	RES SMD 1206 10K	RE-00150
R71	RES SMD 1206 100R	RE-00117
R72	RES SMD 1206 680R	RE-00101
R73	RES SMD 1206 10K	RE-00150
R74	RES SMD 1206 15K	RE-00151
R75	RES SMD 1206 10K	RE-00150
R76	RES SMD 1206 10R	RE-00111
R77	RES SMD 1206 6K8	RE-00259
R78	RES SMD 1206 22K	RE-00265
R79	RES SMD 1206 12R	RE-00070
R80	RES SMD 1206 10K	RE-00150
R81	RES SMD 1206 10K	RE-00150
R82	RES SMD 1206 10K	RE-00150
R83	RES SMD 1206 6K8	RE-00130

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Assembly P/N SA9933

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**Component
Designator**
Description
Barrett P/N

R84	RES SMD 1206 2K2	RE-00125
R85	RES SMD 1206 4K7	RE-00128
R86	RES SMD 1206 10R	RE-00111
R87	RES SMD 1206 10K	RE-00150
R88	RES SMD 1206 4K7	RE-00128
R89	RES SMD 1206 100K	RE-00170
R90	RES SMD 1206 2K2	RE-00125
R91	RES SMD 1206 1K5	RE-00124
R92	RES SMD 1206 560R	RE-00132
R93	RES SMD 1206 10K	RE-00261
R94	RES SMD 1206 10K	RE-00261
R95	RES SMD 1206 1K8	RE-00252
R96	RES SMD 1206 1K8	RE-00252
R97	RES SMD 1206 100K	RE-00170
R98	RES SMD 1206 22K	RE-00153
R99	RES SMD 1206 100K	RE-00170
R100	RES SMD 1206 1M0	RE-00178
R101	RES SMD 1206 100K	RE-00170
R102	RES SMD 1206 12K	RE-10261
R103	RES SMD 1206 12K	RE-10261
R104	RES SMD 1206 1K2	RE-00123
R105	RES SMD 1206 4R7	RE-00092
R106	RES SMD 1206 33K	RE-00267
R107	RES SMD 1206 100R	RE-00117
R108	RES SMD 1206 1K0	RE-00122
R109	RES SMD 1206 1M0	RE-00178
R110	RES SMD 1206 10K	RE-00150
R111	RES SMD 1206 1M0	RE-00178
R112	RES SMD 1206 10K	RE-00150
R113	RES SMD 1206 100R	RE-00117
R114	RES SMD 1206 10K	RE-00150
R115	RES SMD 1206 10K	RE-00150
R116	RES SMD 1206 100K	RE-00170
R117	RES SMD 1206 1M0	RE-00178
R118	RES SMD 1206 39K	RE-00156
R119	RES SMD 1206 22K	RE-00153
R120	RES SMD 1206 10K	RE-00150
R121	RES SMD 1206 68K	RE-00158
R122	RES SMD 1206 68K	RE-00158
R123	RES SMD 1206 47K	RE-00269
R124	RES SMD 1206 47K	RE-00157
R125	RES SMD 1206 10K	RE-00150
R126	RES SMD 1206 1K0	RE-00122
R127	RES SMD 1206 8K2	RE-00260
R128	RES SMD 1206 10K	RE-00150
R129	RES SMD 1206 1M0	RE-00178
R130	RES SMD 1206 10K	RE-00150
R131	RES SMD 1206 6K8	RE-00130
R132	RES SMD 1206 1K0	RE-00122
R133	RES SMD 1206 180K	RE-00173
R134	RES SMD 1206 2R7	RE-00103
R135	RES SMD 1206 4R7	RE-00092

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**Component
Designator**
Description
Barrett P/N

R136	RES SMD 1206 4K7	RE-00128
R137	RES SMD 1206 1K2	RE-00123
R138	RES SMD 1206 220K	RE-00174
R139	RES SMD 1206 10K	RE-00150
R140	RES SMD 1206 18K	RE-00152
R141	RES SMD 1206 2M2	RE-00187
R142	RES SMD 1206 330K	RE-00176
R143	RES SMD 1206 330K	RE-00176
R144	RES SMD 1206 2R7	RE-00103
R145	RES SMD 1206 120K	RE-00184
R146	RES SMD 1206 10K	RE-00150
R147	RES SMD 1206 10K	RE-00150
R148	RES SMD 1206 4K7	RE-00128
R149	RES SMD 1206 220K	RE-00174
R150	RES SMD 1206 39K	RE-00268
R151	RES SMD 1206 5K6	RE-00129
R152	RES SMD 1206 10K	RE-00150
R153	RES SMD 1206 680R	RE-00101
R154	RES SMD 1206 10K	RE-00150
R155	RES SMD 1206 680R	RE-00101
R156	RES SMD 1206 100K	RE-00170
R157	RES SMD 1206 1M0	RE-00178
R158	RES SMD 1206 100K	RE-00170
R159	RES SMD 1206 5K6	RE-00129
R161	RES SMD 1206 100R	RE-00117
R162	RES SMD 1206 100R	RE-00117
R163	RES SMD 1206 100R	RE-00117
R164	RES SMD 1206 100R	RE-00117
R165	RES SMD 1206 100K	RE-00170
R166	RES SMD 1206 10R	RE-00111
R167	RES SMD 1206 10K	RE-00150
R168	RES SMD 1206 10K	RE-00150
R169	RES SMD 1206 100K	RE-00170
R170	RES SMD 1206 100K	RE-00170
R171	RES SMD 1206 1M0	RE-00178
R172	RES SMD 1206 10K	RE-00150
R173	RES SMD 1206 4K7	RE-00128
R174	RES SMD 1206 10K	RE-00150
R175	RES SMD 1206 6K8	RE-00130
R176	RES SMD 1206 27K	RE-00154
R177	RES SMD 1206 10K	RE-00150
R178	RES SMD 1206 100K	RE-00170
R179	RES SMD 1206 68K	RE-00158
R180	RES SMD 1206 68K	RE-00158
R181	RES SMD 1206 4K7	RE-00128
R182	RES SMD 1206 1M0	RE-00178
R183	RES SMD 1206 1M0	RE-00178
R184	RES SMD 1206 100K	RE-00170
R185	RES SMD 1206 47R	RE-00113
R186	RES SMD 1206 4K7	RE-00128
R187	RES SMD 1206 1K	RE-00122
R188	RES SMD 1206 10K	RE-00150
R189	RES SMD 1206 1M0	RE-00178

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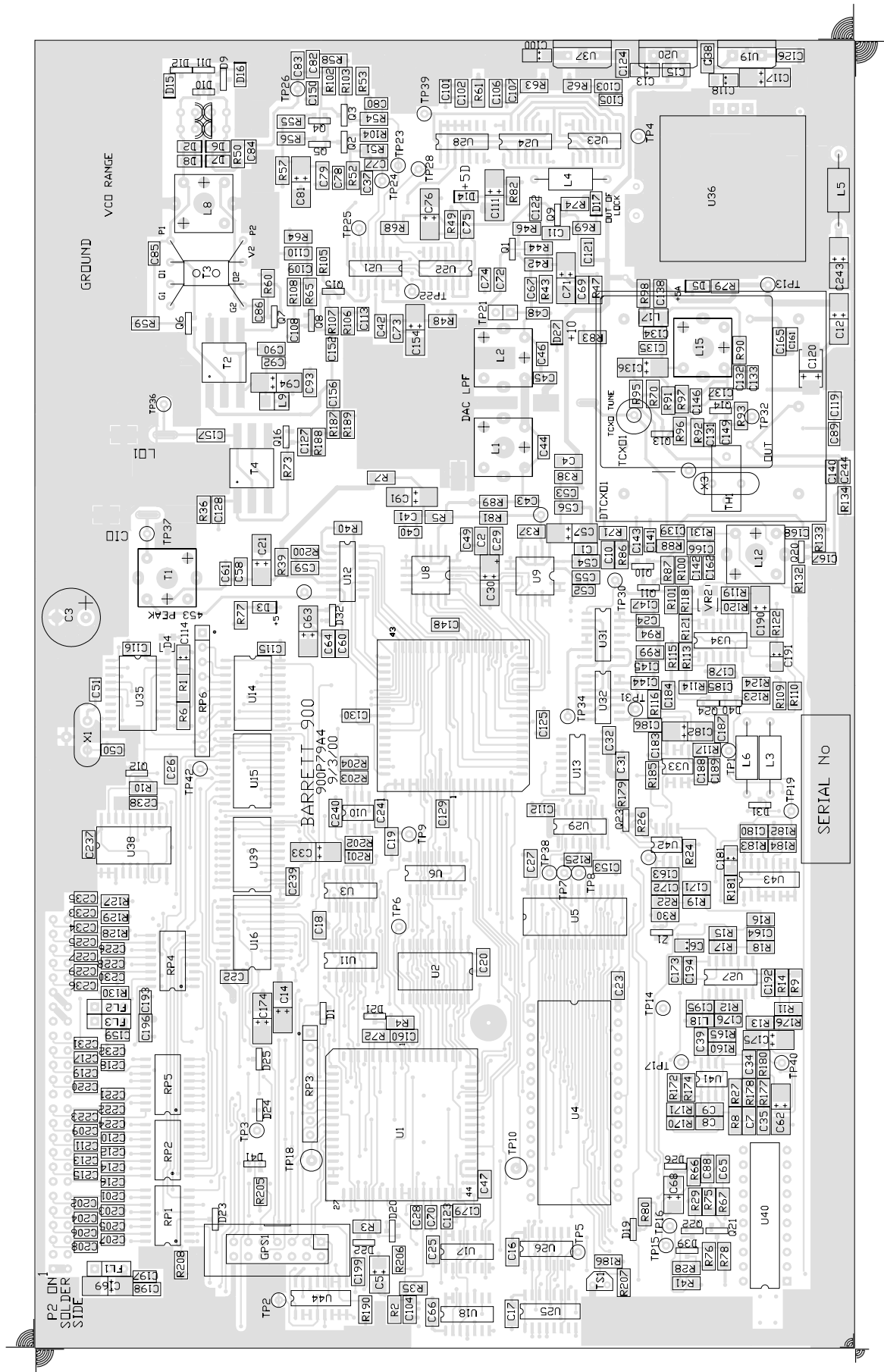
Component Designator	Description	Barrett P/N
R190	RES SMD 1206 10K	RE-00150
R191	RES SMD 1206 10K	RE-00150
R192	RES SMD 1206 10K	RE-00150
R193	RES SMD 1206 1K	RE-00122
R194	RES SMD 1206 1K	RE-00122
R195	RES SMD 1206 4K7	RE-00128
R196	RES SMD 1206 10K	RE-00150
R197	RES SMD 1206 1K0	RE-00122
R198	RES SMD 1206 4K7	RE-00128
R199	RES SMD 1206 4K7	RE-00128
R200	RES SMD 1206 10K	RE-00150
R201	RES SMD 1206 390R	RE-00120
R202	RES SMD 1206 130R	RE-00096
R203	RES SMD 1206 47R	RE-00113
R204	RES SMD 1206 130R	RE-00096
R205	RES SMD 1206 2K2	RE-00125
R206	RES SMD 1206 10K	RE-00150
R207	RES SMD 1206 1K	RE-00122
R208	RES SMD 1206 120K	RE-00184
R209	RES SMD 1206 10K	RE-00150
R210	RES SMD 1206 1K	RE-00122
R211	RES SMD 1206 1K	RE-00122
R212	RES SMD 1206 1K	RE-00122
R213	RES SMD 1206 10R	RE-00111
R214	RES SMD 1206 10K	RE-00150
R215	RES SMD 1206 330K	RE-00176
R216	RES SMD 1206 10K	RE-00150
R217	RES SMD 1206 5K6	RE-00129
R218	RES SMD 1206 270K	RE-00180
R219	RES SMD 1206 51K	RE-00011
R220	RES SMD 1206 4K7	RE-00128
R221	RES SMD 1206 3K6	RE-00012
R227	RES SMD 1206 100K	RE-00170
R228	RES SMD 1206 22K	RE-00153
R229	RES SMD 1206 10K	RE-00150
R230	RES SMD 1206 180K	RE-00173
R231	RES SMD 1206 5K6	RE-00129
R232	RES SMD 1206 47R	RE-00113
R233	RES SMD 1206 47R	RE-00113
R234	RES SMD 1206 1M0	RE-00178
RL1	RELAY EA2-12 NEC	RL-05013
RL2	RELAY EA2-12 NEC	RL-05013
RL3	RELAY EA2-12 NEC	RL-05013

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Component Designator	Description	Barrett P/N
RL4	RELAY EA2-12 NEC	RL-05013
T1	T/FORM SMD T-622-KK81	IC-02766
T4	OPTIONAL T/FORM SMD T36-1-KK81 MCL	IC-02768
T6	T/FORM SMD T36-1-KK81 MCL	IC-02768
T8	COIL RMC-41997N	IN-03219
TH1	THERMISTOR PHILIPS PTC	IC-02555
TH2	THERMISTOR PTC	C945
TH3	THERMISTOR PTC	C945
U2	IC SMD SA605D	IC-02713
U4	IC SMD MC1350	IC-02709
U5	IC SMD LM358M	IC-02706
U6	IC SMD MC1496D	IC-02718
U7	IC SMD 4053	IC-02720
U8	IC SMD NE630	IC-02734
U9	IC LM 319	IC-02715
U10	IC SMD 74HC132	IC-02708
U11	IC SMD 4053	IC-02720
U12	IC SMD NE630	IC-02734
U13	BAL MIXER SMD TUF1-SM	IC-02770
U14	IC SMD 4053	IC-02720
U15	IC SMD LMC6042	IC-02777
U16	IC SMD 4053	IC-02720
U17	IC SMD LMC6042	IC-02777
U18	IC SMD LMC6082	IC-02800
U19	IC SMD LM 358M	IC-02706
U21	IC SMD 4053	IC-02720
U22	IC SMD LMC6042	IC-02777
U23	IC TDA 2004	IC-02736
U24	IC SMD LMC6042	IC-02777
U25	IC SMD 74HC14	IC-02738
U26	IC SMD ST232ACT	IC-02732
U27	IC SMD 4053	IC-02720
U28	IC SMD MC1350	IC-02709
U29	BAL MIXER SMD TUF1-MHSM	IC-02762
U30	IC SMD ULN2003	IC-02717
U31	IC 4N35	IC-02460
U32	IC SMD MC1350	IC-02709
U33	IC LMC6082 SMD	IC-02800
VR1	TRIMPOT SMD 100K	IC-02515
VR2	TRIMPOT SMD 1K	IC-02513
VR4	TRIMPOT SMD 100K	IC-02515
X1	SAW RESONATOR 55.7MHz	FI-07621
Z1	ZENER 4.7V SMD SOT-23	DI-03304

Microprocessor PCB overlay - showing TCXO.



Microprocessor Schematic - Showing optional switch mode regulator (940) and TCXO.

See File: MICRO-BOARD SCHEMATIC.pdf

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BARRETT 900 MICRO BOARD PARTS LIST

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Assembly P/N: SA-09929 DTCXO/LinReg (DLR)
 SA-09931 XTAL/LinReg (XLR)
 SA-09932 DTCXO/SMPS (DSM)

COMPONENT DESIGNATOR	DESCRIPTION	BARRETT P/N
C1	CAP SMD 0805 1N	CP-00915
C2	CAP SMD 1206 0.1UF	CP-00916
C3	CAP 470UF 16V ELECTRO RB	CP-01755
C4	CAP SMD 1206 0.1UF	CP-00916
C5	CAP SMD 2.2UF 20V TANT	CP-01620
C6	CAP SMD 1UF 16V TANT	CP-01570
C7	CAP SMD 1206 0.1UF	CP-00916
C8	CAP SMD 1206 10N POLY	CP-00960
C9	CAP SMD 1206 10N POLY	CP-00960
C10	CAP SMD 1206 0.1UF	CP-00916
C11	CAP SMD 1206 0.1UF	CP-00916
C12	CAP SMD TANT 10UF 12V	CP-01580
C13	CAP SMD TANT 1UF	CP-01570
C14	CAP SMD TANT 10UF 12V	CP-01580
C15	CAP SMD 1206 0.1UF	CP-00916
C16	CAP SMD 1206 0.1UF	CP-00916
C17	CAP SMD 1206 0.1UF	CP-00916
C18	CAP SMD 1206 0.1UF	CP-00916
C19	CAP SMD 1206 0.1UF	CP-00916
C20	CAP SMD 1206 0.1UF	CP-00916
C21	CAP SMD TANT 10UF	CP-01580
C22	CAP SMD 1206 0.1UF	CP-00916
C23	CAP SMD 1206 0.1UF	CP-00916
C24	CAP SMD 0805 1N	CP-00915
C25	CAP SMD 1206 0.1UF	CP-00916
C26	CAP SMD 1206 0.1UF	CP-00916
C27	CAP SMD 1206 0.1UF	CP-00916
C28	CAP SMD 0805 1N	CP-00915
C29	CAP SMD 1206 0.1UF	CP-00916
C30	CAP SMD 10UF 16V TANT	CP-01580
C31	CAP SMD 1206 0.1UF	CP-00916
C32	CAP SMD 1206 10N	CP-00951
C33	CAP SMD 10UF 16V TANT	CP-01580
C34	CAP SMD 1206 10N POLY	CP-00960
C35	CAP SMD 1206 10N POLY	CP-00960
C37	CAP SMD 0805 1P5	CP-00920
C38	CAP SMD TANT 1U0	CP-01570
C39	CAP SMD 1206 0.1UF	CP-00916
C40	CAP SMD 0805 1N	CP-00915
C41	CAP SMD 1206 0.1UF	CP-00916
C42	CAP SMD 0805 1N	CP-00915
C43	CAP SMD 0805 100P	CP-00940
C44	CAP SMD 0805 56P	CP-00931
C45	CAP SMD 0805 330P	CP-00942

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Assembly P/N: SA-09929 DTCXO/LinReg (DLR)
 SA-09931 XTAL/LinReg (XLR)
 SA-09932 DTCXO/SMPS (DSM)

COMPONENT DESIGNATOR	DESCRIPTION	BARRETT P/N
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C46	CAP SMD 0805 100P	CP-00940
C47	CAP SMD 1206 0.1UF	CP-00916
C48	CAP SMD 0805 330P	CP-00942
C49	CAP SMD 0805 1N	CP-00915
C52	CAP SMD 0805 1N	CP-00915
C53	CAP SMD 0805 1N	CP-00915
C54	CAP SMD 1206 0.1UF	CP-00916
C55	CAP SMD 1206 0.1UF	CP-00916
C56	CAP SMD 1206 0.1UF	CP-00916
C57	CAP SMD 10UF TANT	CP-01580
C58	CAP SMD 1206 0.1UF	CP-00916
C59	CAP SMD 1206 10N	CP-00951
C60	CAP SMD 1206 0.1UF	CP-00916
C61	CAP SMD 0805 1N	CP-00915
C62	CAP SMD 10U 16V TANT	CP-01580
C63	CAP SMD 10U 16V TANT	CP-01580
C64	CAP SMD 1206 0.1UF	CP-00916
C65	CAP SMD 1206 0.1UF	CP-00916
C66	CAP SMD 1206 0.1UF	CP-00916
C67	CAP SMD 0805 150P	CP-00941
C68	CAP SMD 2U2 20V TANT	CP-01620
C69	CAP SMD 1206 0.1UF	CP-00916
C70	CAP SMD 0805 1N	CP-00915
C71	CAP SMD 10U 16V TANT	CP-01580
C72	CAP SMD 0805 39P	CP-00927
C73	CAP SMD 1206 0.1UF	CP-00916
C74	CAP SMD 0805 1N	CP-00915
C75	CAP SMD 1206 0.1UF	CP-00916
C76	CAP SMD 10U 16V TANT	CP-01580
C77	CAP SMD 0805 3P3	CP-00921
C78	CAP SMD 0805 1N	CP-00915
C79	CAP SMD 1206 0.1UF	CP-00916
C80	CAP SMD 0805 3P3	CP-00921
C81	CAP SMD 10U 16V TANT	CP-01580
C82	CAP SMD 1206 560N	CP-00913
C83	CAP SMD 1206 2U2	CP-00909
C84	CAP SMD 0805 1N	CP-00915
C85	CAP SMD 0805 56P	CP-00931
C86	CAP SMD 0805 56P	CP-00931
C88	CAP SMD 1206 0.1UF	CP-00916
C89	CAP SMD 0805 1N	CP-00915
C90	CAP SMD 1206 0.1UF	CP-00916
C91	CAP SMD 10U 16V TANT	CP-01580
C92	CAP SMD 0805 1N	CP-00915
C93	CAP SMD 1206 0.1UF	CP-00916

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Assembly P/N: SA-09929 DTCXO/LinReg (DLR)
 SA-09931 XTAL/LinReg (XLR)
 SA-09932 DTCXO/SMPS (DSM)

COMPONENT DESIGNATOR	DESCRIPTION	BARRETT P/N
C94	CAP SMD 10U 16V TANT	CP-01580
C100	CAP SMD 1U0 TANT	CP-01570
C101	CAP SMD 0805 1N	CP-00915
C102	CAP SMD 1206 0.1UF	CP-00916
C103	CAP SMD 1206 0.1UF	CP-00916
C104	CAP SMD 1206 0.1UF	CP-00916
C105	CAP SMD 0805 1N	CP-00915
C106	CAP SMD 1206 0.1UF	CP-00916
C107	CAP SMD 0805 1N	CP-00915
C108	CAP SMD 0805 1N	CP-00915
C109	CAP SMD 0805 1N	CP-00915
C110	CAP SMD 1206 0.1UF	CP-00916
C111	CAP SMD 10U 16V TANT	CP-01580
C112	CAP SMD 1206 0.1UF	CP-00916
C113	CAP SMD 0805 1N	CP-00915
C114	CAP SMD 1U0 TANT	CP-01570
C115	CAP SMD 1206 0.1UF	CP-00916
C116	CAP SMD 1206 0.1UF	CP-00916
C117	CAP SMD 10U 16V TANT	CP-01580
C118	CAP SMD 1U0 TANT	CP-01570
C119	CAP SMD 1206 0.1UF	CP-00916
C120	CAP 22UF 16V TANT	CP-01590 XLR
C121	CAP SMD 1206 0.1UF	CP-00916
C122	CAP SMD 0805 1N	CP-00915
C123	CAP SMD 0805 1N	CP-00915
C124	CAP SMD 1206 0.1UF	CP-00916
C125	CAP SMD 1206 0.1UF	CP-00916
C126	CAP SMD 1206 0.1UF	CP-00916
C127	CAP SMD 1206 10NF	CP-00951
C128	CAP SMD 1206 10NF	CP-00951
C129	CAP SMD 1206 0.1UF	CP-00916
C130	CAP SMD 1206 0.1UF	CP-00916
C131	CAP SMD 0805 1N	CP-00915
C132	CAP SMD 0805 6P8	CP-00919
C133	CAP SMD 0805 6P8	CP-00919
C134	CAP SMD 0805 1N	CP-00915
C135	CAP SMD 1206 0.1UF	CP-00916
C136	CAP SMD 10U 16V TANT	CP-01580
C137	CAP SMD 0805 6P8	CP-00919
C138	CAP SMD 1206 0.1UF	CP-00916
C139	CAP SMD 0805 1N	CP-00915
C140	CAP SMD 0805 1N	CP-00915
C141	CAP SMD 0805 1N	CP-00915
C142	CAP SMD 0805 1N	CP-00915
C143	CAP SMD 1206 0.1UF	CP-00916

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Assembly P/N: SA-09929 DTCXO/LinReg (DLR)
 SA-09931 XTAL/LinReg (XLR)
 SA-09932 DTCXO/SMPS (DSM)

COMPONENT DESIGNATOR	DESCRIPTION	BARRETT P/N
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C144	CAP SMD 1206 0.1UF	CP-00916
C145	CAP SMD 0805 1N	CP-00915
C146	CAP SMD 0805 6P8	CP-00919
C147	CAP SMD 1206 0.1UF	CP-00916
C148	CAP SMD 1206 0.1UF	CP-00916
C149	CAP SMD 0805 1N	CP-00915
C150	CAP SMD 0805 22N	CP-00904
C152	CAP SMD 0805 1N	CP-00915
C153	CAP SMD 1206 0.1UF	CP-00916
C154	CAP SMD 10U 16V TANT	CP-01580
C156	CAP SMD 1206 10N	CP-00951
C157	CAP SMD 1206 10N	CP-00951
C159	CAP SMD 0805 1N	CP-00915
C160	CAP SMD 1206 0.1UF	CP-00916
C161	CAP SMD 0805 1N	CP-00915
C162	CAP SMD 0805 1N	CP-00915
C163	CAP SMD 1206 68N	CP-00980
C164	CAP SMD 1206 6N8	CP-00949
C165	CAP SMD 1206 0.1UF	CP-00916
C166	CAP SMD 1206 0.1UF	CP-00916
C167	CAP SMD 0805 1N	CP-00915
C168	CAP SMD 0805 10PF	CP-00936
C169	CAP SMD 10U 16V TANT	CP-01580
C171	CAP SMD 1206 27N	CP-00955
C172	CAP SMD 1206 3N9	CP-00950
C173	CAP SMD 1206 4N7	CP-00947
C174	CAP SMD 10U 16V TANT	CP-01580
C175	CAP SMD 10U 16V TANT	CP-01580
C176	CAP SMD 1206 10N	CP-00951
C178	CAP SMD 1206 0.1UF	CP-00916
C179	CAP SMD 1206 0.1UF	CP-00916
C180	CAP SMD 1206 10N	CP-00951
C181	CAP SMD 1U0 TANT	CP-01570
C182	CAP SMD 10U 16V TANT	CP-01580
C183	CAP SMD 1206 0.1UF	CP-00916
C184	CAP SMD 1206 33N	CP-00953
C185	CAP SMD 0805 560P	CP-00945
C186	CAP SMD 1206 0.1UF	CP-00916
C187	CAP SMD 1206 0.1UF	CP-00916
C188	CAP SMD 1206 3N3	CP-00946
C189	CAP SMD 0805 1N	CP-00915
C190	CAP SMD 10U 16V TANT	CP-01580
C191	CAP SMD 1U TANT	CP-01570
C192	CAP SMD 1206 3N3	CP-00946
C193	CAP SMD 1N 0805	CP-00915

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Assembly P/N:	SA-09929	DTCXO/LinReg (DLR)
	SA-09931	XTAL/LinReg (XLR)
	SA-09932	DTCXO/SMPS (DSM)

COMPONENT DESIGNATOR	DESCRIPTION	BARRETT P/N
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C194	CAP SMD 22N 0805	CP-00904
C195	CAP SMD 1206 0.1UF	CP-00916
C196	CAP SMD 1206 0.1UF	CP-00916
C197	CAP SMD 1N 0805	CP-00915
C198	CAP SMD 1206 0.1UF	CP-00916
C199	CAP SMD 1206 0.1UF	CP-00916
C201	CAP SMD 1N 0805	CP-00915
C202	CAP SMD 1N 0805	CP-00915
C203	CAP SMD 1N 0805	CP-00915
C204	CAP SMD 1N 0805	CP-00915
C205	CAP SMD 1N 0805	CP-00915
C206	CAP SMD 1N 0805	CP-00915
C207	CAP SMD 1N 0805	CP-00915
C208	CAP SMD 100P 0805	CP-00940
C209	CAP SMD 1N 0805	CP-00915
C210	CAP SMD 1N 0805	CP-00915
C211	CAP SMD 1N 0805	CP-00915
C212	CAP SMD 1N 0805	CP-00915
C213	CAP SMD 1N 0805	CP-00915
C214	CAP SMD 1N 0805	CP-00915
C215	CAP SMD 1N 0805	CP-00915
C216	CAP SMD 1N 0805	CP-00915
C217	CAP SMD 1N 0805	CP-00915
C218	CAP SMD 1N 0805	CP-00915
C219	CAP SMD 1N 0805	CP-00915
C220	CAP SMD 1N 0805	CP-00915
C221	CAP SMD 1N 0805	CP-00915
C222	CAP SMD 1N 0805	CP-00915
C223	CAP SMD 1N 0805	CP-00915
C224	CAP SMD 1N 0805	CP-00915
C225	CAP SMD 1N 0805	CP-00915
C226	CAP SMD 1N 0805	CP-00915
C227	CAP SMD 1N 0805	CP-00915
C228	CAP SMD 1N 0805	CP-00915
C229	CAP SMD 1N 0805	CP-00915
C230	CAP SMD 1N 0805	CP-00915
C231	CAP SMD 1N 0805	CP-00915
C232	CAP SMD 1N 0805	CP-00915
C233	CAP SMD 1N 0805	CP-00915
C234	CAP SMD 1N 0805	CP-00915
C235	CAP SMD 1N 0805	CP-00915
C236	CAP SMD 1N 0805	CP-00915
C237	CAP SMD 1206 0.1UF	CP-00916
C238	CAP SMD 1206 0.1UF	CP-00916
C239	CAP SMD 1206 0.1UF	CP-00916

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Assembly P/N:	SA-09929	DTCXO/LinReg (DLR)
	SA-09931	XTAL/LinReg (XLR)
	SA-09932	DTCXO/SMPS (DSM)

COMPONENT DESIGNATOR	DESCRIPTION	BARRETT P/N	
C240	CAP SMD 1206 0.1UF	CP-00916	
C241	CAP SMD 1206 0.1UF	CP-00916	
C243	CAP SMD 10U 16V TANT	CP-01580	
C244	CAP SMD 1N 0805	CP-00916	
DTCXO1DSMDLR	OSC DTCXO 45.455MHz	CR-07613	
D1	DIODE SMD BAV70	DI-03316	
D2	DIODE SMD BB148	DI-03307	
D3	DIODE SMD LED YELLOW	LE-02921	
D4	DIODE SMD BAV70	DI-03316	
D5	DIODE SMD LED YELLOW	LE-02921	
D6	DIODE SMD BB148	DI-03307	
D7	DIODE SMD BB148	DI-03307	
D8	DIODE SMD BB148	DI-03307	
D9	DIODE SMD BAV99	DI-03317	
D10	DIODE SMD BAV70	DI-03316	
D11	DIODE SMD BAV70	DI-03316	
D12	DIODE SMD BAV99	DI-03317	
D14	DIODE SMD LED YELLOW	LE-02921	
D15	DIODE SMD LED GREEN	LE-02922	
D16	DIODE SMD LED GREEN	LE-02922	
D17	DIODE SMD LED RED	LE-02920	
D19	DIODE SMD BAV99	DI-03317	
D20	DIODE SMD BAV70	DI-03316	
D21	DIODE SMD BAV99	DI-03317	
D22	DIODE SMD BAV70	DI-03316	
D23	DIODE SMD BAV99	DI-03317	
D24	DIODE SMD BAV70	DI-03316	
D25	DIODE SMD BAV70	DI-03316	
D26	DIODE SMD BAV99	DI-03317	
D27	DIODE SMD LED YELLOW	LE-02921	
D31	DIODE SMD BAV99	DI-03317	
D32	DIODE SMD BAV99	DI-03317	
D39	DIODE SMD BAV70	DI-03316	
D40	DIODE SMD BAV99	DI-03317	
D41	DIODE SMD BAV70	DI-03316	
FL1	MURATA FILTER M103	FI-07618	
FL2	MURATA FILTER M103	FI-07618	
FL3	MURATA FILTER M103	FI-07618	
GPS1	CONN 14 PIN LOW PROFILE	CN-04014	
L1	COIL F747	IN-03217	
L2	COIL F747	IN-03217	
L3	DSM CHOKE 10UH	IN-03631	DSM
L4	DSM CHOKE 10UH	IN-03631	DSM
L5	CHOKE 100UH	IN-03605	
L6	DSM CHOKE 10UH	IN-03631	DSM

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Assembly P/N: SA-09929 DTCXO/LinReg (DLR)
 SA-09931 XTAL/LinReg (XLR)
 SA-09932 DTCXO/SMPS (DSM)

COMPONENT DESIGNATOR	DESCRIPTION	BARRETT P/N
L8	COIL A8120DL	IN-03218
L9	CHOKE 10UH SMD	IN-03600
L12	COIL F747	IN-03217
L15	XLR COIL F747	IN-03217
L17	CHOKE 10UH SMD	IN-03600
L18	CHOKE 100UH SMD	IN-03601
P2	CONN 50 WAY PLUG MALE	CN-04000
Q1	TRANSISTOR SMD BFR92A	TR-02260
Q2	TRANSISTOR SMD BFR92A	TR-02260
Q3	TRANSISTOR SMD BFR92A	TR-02260
Q4	TRANSISTOR SMD BFT92	TR-02280
Q5	TRANSISTOR SMD BFT92	TR-02280
Q6	TRANSISTOR SMD SST309	TR-02259
Q7	TRANSISTOR SMD SST309	TR-02259
Q8	TRANSISTOR SMD BFT92	TR-02280
Q9	TRANSISTOR SMD BC847	TR-02262
Q10	TRANSISTOR SMD BFT92	TR-02280
Q11	TRANSISTOR SMD BFT92	TR-02280
Q12	TRANSISTOR SMD BC847	TR-02262
Q13	TRANSISTOR SMD BC847	TR-02262
Q14	TRANSISTOR SMD BFR92A	TR-02260
Q15	TRANSISTOR SMD BFT92	TR-02280
Q16	TRANSISTOR SMD BFR92A	TR-02260
Q20	TRANSISTOR SMD BFR92A	TR-02260
Q21	TRANSISTOR SMD BC847	TR-02262
Q22	TRANSISTOR SMD BC847	TR-02262
Q23	TRANSISTOR SMD BC847	TR-02262
Q24	TRANSISTOR SMD BC807	TR-02229
R1	RESISTOR SMD 10K 1206	RE-00150
R2	RESISTOR SMD 100K 1206	RE-00170
R3	RESISTOR SMD 47K 1206	RE-00157
R4	RESISTOR SMD 10K 1206	RE-00150
R5	RESISTOR SMD 100R 1206	RE-00117
R6	RESISTOR SMD 68K 1206	RE-00158
R7	RESISTOR SMD 10R 1206	RE-00111
R8	RESISTOR SMD 47K 1% 1206	RE-00157
R9	RESISTOR SMD 1K 1206	RE-00122
R10	RESISTOR SMD 10K 1206	RE-00150
R11	RESISTOR SMD 10K 1206	RE-00150
R12	RESISTOR SMD 100K 1206	RE-00170
R13	RESISTOR SMD 560R 1206	RE-00132
R14	RESISTOR SMD 1M 1206	RE-00178
R15	RESISTOR SMD 10K 1206	RE-00150
R16	RESISTOR SMD 6K8 1206	RE-00130
R17	RESISTOR SMD 68K 1206	RE-00158

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Assembly P/N:	SA-09929	DTCXO/LinReg (DLR)
	SA-09931	XTAL/LinReg (XLR)
	SA-09932	DTCXO/SMPS (DSM)

COMPONENT DESIGNATOR	DESCRIPTION	BARRETT P/N
R18	RESISTOR SMD 150K 1206	RE-00171
R19	RESISTOR SMD 130K 1206	RE-00164
R22	RESISTOR SMD 130K 1206	RE-00164
R24	RESISTOR SMD 22K 1206	RE-00153
R26	RESISTOR SMD 47K 1206	RE-00157
R27	RESISTOR SMD 39K 1% 1206	RE-00005
R28	RESISTOR SMD 4K7 1206	RE-00128
R29	RESISTOR SMD 10K 1206	RE-00150
R30	RESISTOR SMD 2K2 1206	RE-00125
R35	RESISTOR SMD 47K 1206	RE-00157
R36	RESISTOR SMD 330R 1206	RE-00107
R37	RESISTOR SMD 100R 1206	RE-00117
R38	RESISTOR SMD 10R 1206	RE-00111
R39	RESISTOR SMD 10R 1206	RE-00111
R40	RESISTOR SMD 4K7 1206	RE-00128
R41	RESISTOR SMD 10K 1206	RE-00150
R42	RESISTOR SMD 33K 1206	RE-00155
R43	RESISTOR SMD 10K 1206	RE-00150
R44	RESISTOR SMD 470R 1206	RE-00121
R46	RESISTOR SMD 47R 1206	RE-00113
R47	RESISTOR SMD 10R 1206	RE-00111
R48	RESISTOR SMD 10R 1206	RE-00111
R49	RESISTOR SMD 10R 1206	RE-00111
R50	RESISTOR SMD 47R 1206	RE-00113
R51	RESISTOR SMD 2K7 1206	RE-00126
R52	RESISTOR SMD 1K 1206	RE-00122
R53	RESISTOR SMD 1K 1206	RE-00122
R54	RESISTOR SMD 2K7 1206	RE-00126
R55	RESISTOR SMD 10R 1206	RE-00111
R56	RESISTOR SMD 10R 1206	RE-00111
R57	RESISTOR SMD 10R 1206	RE-00111
R58	RESISTOR SMD 68R 1206	RE-00115
R59	RESISTOR SMD 47K 1206	RE-00157
R60	RESISTOR SMD 47K 1206	RE-00157
R61	RESISTOR SMD 10R 1206	RE-00111
R62	RESISTOR SMD 10R 1206	RE-00111
R63	RESISTOR SMD 10R 1206	RE-00111
R64	RESISTOR SMD 10R 1206	RE-00111
R65	RESISTOR SMD 1K2 1206	RE-00123
R66	RESISTOR SMD 2K2 1206	RE-00125
R67	RESISTOR SMD 56K 1206	RE-00159
R68	RESISTOR SMD 10K 1206	RE-00150
R69	RESISTOR SMD 180R 1206	RE-00118
R70	RESISTOR SMD 100R 1206	RE-00117
R71	RESISTOR SMD 10R 1206	RE-00111

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Assembly P/N: SA-09929 DTCXO/LinReg (DLR)
 SA-09931 XTAL/LinReg (XLR)
 SA-09932 DTCXO/SMPS (DSM)

COMPONENT DESIGNATOR	DESCRIPTION	BARRETT P/N
R72	RESISTOR SMD 1K 1206	RE-00122
R73	RESISTOR SMD 47K 1206	RE-00157
R74	RESISTOR SMD 10K 1206	RE-00150
R75	RESISTOR SMD 10K 1206	RE-00150
R76	RESISTOR SMD 4K7 1206	RE-00128
R77	RESISTOR SMD 1K5 1206	RE-00124
R78	RESISTOR SMD 10K 1206	RE-00150
R79	RESISTOR SMD 1K5 1206	RE-00124
R80	RESISTOR SMD 4K7 1206	RE-00128
R81	RESISTOR SMD 12K 1206	RE-00149
R82	RESISTOR SMD 1K5 1206	RE-00124
R83	RESISTOR SMD 3K9 1206	RE-00134
R86	RESISTOR SMD 47R 1206	RE-00113
R87	RESISTOR SMD 3K3 1206	RE-00127
R88	RESISTOR SMD 1K2 1206	RE-00123
R89	RESISTOR SMD 10R 1206	RE-00111
R90	RESISTOR SMD 1K8 1206	RE-00133
R91	RESISTOR SMD 22K 1206	RE-00153
R92	RESISTOR SMD 10K 1206	RE-00150
R93	RESISTOR SMD 56R 1206	RE-00114
R94	RESISTOR SMD 10R 1206	RE-00111
R95	RESISTOR SMD 10K 1206	RE-00150
R96	RESISTOR SMD 56R 1206	RE-00114
R97	RESISTOR SMD 22K 1206	RE-00153
R98	RESISTOR SMD 10R 1206	RE-00111
R99	RESISTOR SMD 10R 1206	RE-00111
R100	RESISTOR SMD 5K6 1206	RE-00129
R101	RESISTOR SMD 180R 1206	RE-00118
R102	RESISTOR SMD 220R 1206	RE-00119
R103	RESISTOR SMD 470R 1206	RE-00121
R104	RESISTOR SMD 470R 1206	RE-00121
R105	RESISTOR SMD 220R 1206	RE-00119
R106	RESISTOR SMD 5K6 1206	RE-00129
R107	RESISTOR SMD 3K3 1206	RE-00127
R108	RESISTOR SMD 22R 1206	RE-00108
R109	RESISTOR SMD 100K 1206	RE-00170
R110	RESISTOR SMD 100K 1206	RE-00170
R113	RESISTOR SMD 10K 1206	RE-00150
R114	RESISTOR SMD 68K 1206	RE-00158
R115	RESISTOR SMD 220K 1206	RE-00174
R116	RESISTOR SMD 680K 1206	RE-00175
R117	RESISTOR SMD 680K 1206	RE-00175
R118	RESISTOR SMD 10K 1206	RE-00150
R119	RESISTOR SMD 100K 1206	RE-00170
R120	RESISTOR SMD 100K 1206	RE-00170

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Assembly P/N:	SA-09929	DTCXO/LinReg (DLR)
	SA-09931	XTAL/LinReg (XLR)
	SA-09932	DTCXO/SMPS (DSM)

COMPONENT DESIGNATOR	DESCRIPTION	BARRETT P/N
R121	RESISTOR SMD 3K9 1206	RE-00134
R122	RESISTOR SMD 1M0 1206	RE-00178
R123	RESISTOR SMD 100K 1206	RE-00170
R124	RESISTOR SMD 68K 1206	RE-00158
R125	RESISTOR SMD 220K 1206	RE-00174
R127	RESISTOR SMD 100R 1206	RE-00117
R128	RESISTOR SMD 100R 1206	RE-00117
R129	RESISTOR SMD 100R 1206	RE-00117
R130	RESISTOR SMD 100R 1206	RE-00117
R131	RESISTOR SMD 2K2 1206	RE-00125
R132	RESISTOR SMD 270K 1206	RE-00180
R133	RESISTOR SMD 100R 1206	RE-00117
R134	RESISTOR SMD 68R 1206	RE-00115
R160	RESISTOR SMD 120K 1% 1206	RE-00007
R165	RESISTOR SMD 1Meg 1% 1206	RE-00178
R170	RESISTOR SMD 820R 1% 1206	RE-00004
R171	RESISTOR SMD 39K 1% 1206	RE-00005
R172	RESISTOR SMD 100K 1206	RE-00170
R174	RESISTOR SMD 680K 1% 1206	RE-10175
R176	RESISTOR SMD 33K 1206	RE-00155
R177	RESISTOR SMD 27K 1206	RE-00154
R178	RESISTOR SMD 1K 1% 1206	RE-00006
R179	RESISTOR SMD 3K3 1206	RE-00127
R180	RESISTOR SMD 10K 1206	RE-00150
R181	RESISTOR SMD 10K 1206	RE-00150
R182	RESISTOR SMD 10K 1206	RE-00150
R183	RESISTOR SMD 10K 1206	RE-00150
R184	RESISTOR SMD 220K 1206	RE-00174
R185	RESISTOR SMD 15K 1206	RE-00151
R186	RESISTOR SMD 10K 1206	RE-00150
R187	RESISTOR SMD 39R 1206	RE-00109
R188	RESISTOR SMD 39R 1206	RE-00109
R189	RESISTOR SMD 12R 1206	RE-00070
R190	RESISTOR SMD 10K 1206	RE-00150
R200	RESISTOR SMD 4K7 1206	RE-00128
R201	RESISTOR SMD 100K 1206	RE-00170
R202	RESISTOR SMD 10K 1206	RE-00150
R203	RESISTOR SMD 100K 1206	RE-00170
R204	RESISTOR SMD 15K 1206	RE-00151
R205	RESISTOR SMD 10K 1206	RE-00150
R206	RESISTOR SMD 10K 1206	RE-00150
R207	RESISTOR SMD 10K 1206	RE-00150
R208	RESISTOR SMD 1M0 1206	RE-00178
RP1	RESISTOR PACK 100R SMD	IC-02760
RP2	RESISTOR PACK 100R SMD	IC-02760

BARRETT 900 MICRO BOARD PARTS LIST

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Assembly P/N: SA-09929 DTCXO/LinReg (DLR)
 SA-09931 XTAL/LinReg (XLR)
 SA-09932 DTCXO/SMPS (DSM)

COMPONENT DESIGNATOR	DESCRIPTION	BARRETT P/N
RP3	RES NETWORK 10K 8PIN	RE-00710
RP4	RESISTOR PACK 100R SMD	IC-02760
RP5	RESISTOR PACK 100R SMD	IC-02760
RP6	RES NETWORK 10K 9PIN	RE-00711
T1	T/FORMER RMC41997	IN-03219
T2	T/FORMER T-622-KK81 SMD	IC-02766
T3	T/FORMER 4+4/4+4 MICRO	TF-03122
T4	T/FORMER T-622-KK81 SMD	IC-02766
TCXO1	45.455MHz TXCO	CR-07612
TH1	CERAMIC CRYSTAL HEATER	CR-07606 XLR
U1	I/C D78C10AL CPU	IC-02741
U2	I/C 74HC574 SMD	IC-02705
U3	I/C 74HC00 SMD	IC-02780
U4	I/C 27C512 EPROM	IC-02772
U5	I/C 28C64 EEPROM SMD	IC-02714
U6	I/C 74HC138 SMD	IC-02788
U7	I/C Q2334C-50N DDFS SMD	IC-02710
U8	I/C HA19510 SMD	IC-12346
U9	I/C HA19510 SMD	IC-12346
U10	I/C LM358 SMD	IC-02706
U11	I/C 74HC04 SMD	IC-02782
U12	I/C DAC0800 SMD	IC-02739
U13	I/C 74HC4040 SMD	IC-02725
U14	I/C 74HC574 SMD	IC-02705
U15	I/C 74HC574 SMD	IC-02705
U16	I/C 74HC574 SMD	IC-02705
U17	I/C 74HC74 SMD	IC-02786
U18	I/C 74HC74 SMD	IC-02786
U19	XLR DLR I/C 7805 TO-220	IC-02316
U20	XLR DLR I/C 7805 TO-220	IC-02316
U21	I/C 74AC00 SMD	IC-02700
U22	I/C 74AC74 SMD	IC-02702
U23	I/C 74AC74 SMD	IC-02702
U24	I/C 74AC74 SMD	IC-02702
U25	I/C 74HC85 SMD	IC-02704
U26	I/C 74HC74 SMD	IC-02786
U27	I/C XR2211 SMD	IC-02485
U28	I/C 74AC74 SMD	IC-02702
U29	I/C 74HC132 SMD	IC-02708
U31	I/C 74AC04 SMD	IC-02701
U32	I/C 74AC74 SMD	IC-02702
U33	I/C LMC6042 SMD	IC-02777
U34	I/C LM339 SMD	IC-02730
U35	I/C SAA3049 SMD	IC-02792
U36	DSM I/C PT5101 5V REG	IC-02315

BARRETT 900 MICRO BOARD PARTS LIST

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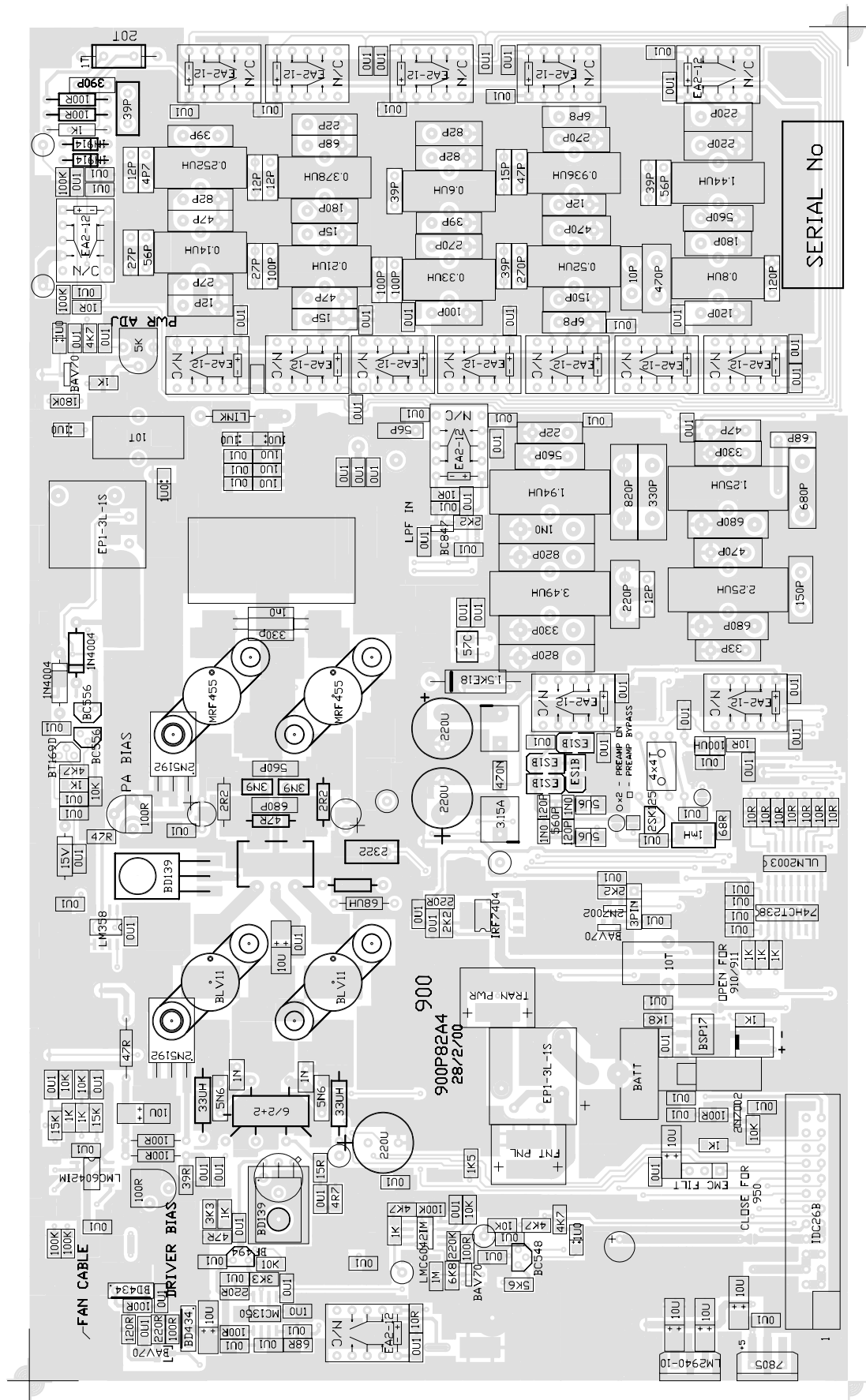
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Assembly P/N:	SA-09929	DTCXO/LinReg (DLR)
	SA-09931	XTAL/LinReg (XLR)
	SA-09932	DTCXO/SMPS (DSM)

COMPONENT DESIGNATOR		DESCRIPTION	BARRETT P/N
U37	XLR	I/C LM2940/10 TO-220	IC-02802
U38		DAC0832	IC-02742
U39		I/C 74HC574 SMD	IC-02705
U40		I/C PALC 16V8Q-25	IC-02750
U41		I/C LM358 SMD	IC-02706
U42		I/C LMC6042 SMD	IC-02777
U43		I/C 4053 SMD	IC-02720
U44		I/C 4053 SMD	IC-02720
VR2		T/POT 10K SMD	IC-02514
X1		CRYSTAL 4.00MHz	IC-07605
X3	XLR	CRYSTAL 45.455MHz	IC-07619
Z1		ZENER DIODE 5V6	DI-03311

PA PCB overlay



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PA schematic

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BARRETT 900 PA PARTS LIST

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Component Designator	Description	Barrett P/N
C1	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C2	CAP SMD TANTALUM 10uF 16V	CP-01580
C3	CAP GREEN 5n6 100V	CP-01507
C4	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C5	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C6	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C7	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C8	CAP SILVER MICA 1000pF 500V (DNF 940)	CP-02106
C10	CAP 1n0 CERAMIC 63V 0.1"	CP-01329
C11	CAP 1n0 CERAMIC 63V 0.1"	CP-01329
C12	CAP SMD TANTALUM 1uF 16V	CP-01570
C13	CAP ELECTRO RB 220uF 35V	CP-01793
C14	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C15	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C16	CAP GREEN 3n9 100V	CP-01505
C17	CAP GREEN 3n9 100V	CP-01505
C18	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C19	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C20	CAP SMD TANTALUM 10uF 16V	CP-01580
C21	CAP 330pF SILVER MICA (DNF 940)	CP-02147
C22	CAP 560pF CERAMIC	CP-00002
C23	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C24	CAP ELECTRO RB 220uF 35V	CP-01793
C25	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C26	CAP ELECTRO RB 220uF 35V	CP-01793
C27	CAP GREEN 5n6 100V	CP-01507
C28	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C29	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C30	CAP SMD TANTALUM 10uF 16V	CP-01580
C31	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C32	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C33	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C34	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C35	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C36	CAP ELECTRO RB 100uF 25V	CP-11676
C37	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C38	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C39	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C40	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C41	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C42	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C43	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C44	CAP SMD TANTALUM 1uF 16V	CP-01570
C45	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C46	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C47	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C48	CAP SMD 1206 1uF 10% 16V	CP-00908
C49	CAP SMD 1206 1uF 10% 16V	CP-00908
C50	CAP SMD 1206 0.1uF 5% 63V	CP-00916

BARRETT 900 PA PARTS LIST

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Component Designator	Description	Barrett P/N
C51	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C52	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C53	CAP SMD TANTALUM 1uF 16V	CP-01570
C230	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C61	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C62	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C63	CAP SILVER MICA 390 pf 500v	CP-02130
C64	CAP CERAMIC 39pF NP0 0.2"	CP-01417
C65	CAP TANTALUM 1uF SMD 16V	CP-01570
C66	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C67	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C68	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C69	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C74	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C75	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C76	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C77	CAP TANTALUM 1uF SMD 16V	CP-01570
C78	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C79	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C80	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C82	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C83	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C84	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C85	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C86	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C87	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C88	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C89	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C90	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C91	CAP SMD TANTALUM 10uF 16V	CP-01580
C92	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C93	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C95	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C96	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C97	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C98	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C99	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C100	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C101	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C102	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C103	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C104	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C105	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C106	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C107	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C108	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C109	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C110	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C111	CAP SMD 1206 0.1uF 5% 63V	CP-00916

BARRETT 900 PA PARTS LIST

900P82A4.PCB Assembly P/N 9935.002/9936.002/9937.002 Issue 1 Sheet 3 of 8

Component Designator	Description	Barrett P/N
C112	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C113	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C114	CAP SMD TANTALUM 1uF 16V	CP-01570
C115	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C116	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C117	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C118	CAP SMD TANTALUM 10uF 16V	CP-01580
C119	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C125	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C126	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C127	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C128	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C130	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C131	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C134	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C135	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C136	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C137	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C138	CAP SMD 1206 470nF 5% 63V	CP-00912
C139	CAP SMD TANTALUM 10uF 16V	CP-01580
C140	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C141	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C142	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C143	CAP SMD TANTALUM 10uF 25V	CP-01575
C144	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C145	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C146	CAP SMD 0805 1nF 5% 63V	CP-00915
C147	CAP SMD 0805 560pF 5% 63V	CP-00945
C148	CAP SMD 0805 120pF	CP-00939
C149	CAP SMD 0805 120pF	CP-00939
C150	CAP SMD 0805 1nF 5% 63V	CP-00915
C151	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C152	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C153	CAP SMD 1206 1uF 10% 16V	CP-00908
C154	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C156	CAP SILVER MICA 27pF 500V	CP-02119
C157	CAP SILVER MICA 12pF 500V	CP-02117
C158	CAP SILVER MICA 12pF 500V	CP-02117
C159	CAP SILVER MICA 4p7F 500V	CP-02148
C160	CAP SILVER MICA 82pF 500V	CP-02124
C161	CAP SILVER MICA 47pF 500V	CP-02121
C162	CAP SILVER MICA 39pF 500V	CP-02141
C164	CAP SILVER MICA 56pF 500V	CP-02142
C165	CAP SILVER MICA 27pF 500V	CP-02119
C166	CAP SILVER MICA 47pF 500V	CP-02121
C167	CAP SILVER MICA 15pF 500V	CP-02140
C168	CAP SILVER MICA 12pF 500V	CP-02117
C169	CAP SILVER MICA 12pF 500V	CP-02117
C170	CAP SILVER MICA 180pF 500V	CP-02146

BARRETT 900 PA PARTS LIST

900P82A4.PCB Assembly P/N 9935.002/9936.002/9937.002 Issue 1 Sheet 4 of 8

Component Designator	Description	Barrett P/N
C171	CAP SILVER MICA 15pF 500V	CP-02140
C172	CAP SILVER MICA 100pF 500V	CP-02125
C173	CAP SILVER MICA 27pF 500V	CP-02119
C174	CAP SILVER MICA 68pF 500V	CP-02123
C175	CAP SILVER MICA 22pF 500V	CP-02151
C177	CAP SILVER MICA 100pF 500V	CP-02125
C178	CAP SILVER MICA 39pF 500V	CP-02141
C180	CAP SILVER MICA 270pF 500V	CP-02129
C181	CAP SILVER MICA 39pF 500V	CP-02141
C182	CAP SILVER MICA 100pF 500V	CP-02125
C183	CAP SILVER MICA 100pF 500V	CP-02125
C184	CAP SILVER MICA 82pF 500V	CP-02124
C185	CAP SILVER MICA 82pF 500V	CP-02124
C186	CAP SILVER MICA 150pF 500V	CP-02127
C187	CAP SILVER MICA 6p8F 500V	CP-02149
C188	CAP SILVER MICA 47pF 500V	CP-02121
C189	CAP SILVER MICA 15pF 500V	CP-02140
C190	CAP SILVER MICA 470pF 500V	CP-02152
C191	CAP SILVER MICA 12pF 500V	CP-02117
C192	CAP S ILVER MICA 270pF 500V	CP-02129
C193	CAP SILVER MICA 39pF 500V	CP-02141
C194	CAP SILVER MICA 270pF 500V	CP-02129
C195	CAP SILVER MICA 6p8F 500V	CP-02149
C196	CAP SILVER MICA 120pF 500V	CP-02126
C197	CAP SILVER MICA 120pF 500V	CP-02126
C198	CAP SILVER MICA 470pF 500V	CP-02152
C199	CAP SILVER MICA 10pF 500V	CP-02150
C200	CAP SILVER MICA 180pF 500V	CP-02146
C201	CAP SILVER MICA 560pF 500V	CP-02132
C202	CAP SILVER MICA 56pF 500V	CP-02142
C203	CAP SILVER MICA 39pF 500V	CP-02141
C204	CAP SILVER MICA 220pF 500V	CP-02128
C205	CAP SILVER MICA 220pF 500V	CP-02128
C206	CAP SILVER MICA 330pF 500V	CP-02147
C207	CAP SILVER MICA 47pF 500V	CP-02121
C208	CAP SILVER MICA 680pF 500V	CP-02133
C209	CAP SILVER MICA 68pF 500V	CP-02123
C210	CAP SILVER MICA 150pF 500V	CP-02127
C211	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C212	CAP SILVER MICA 680pF 500V	CP-02133
C213	CAP SILVER MICA 470pF 500V	CP-02152
C214	CAP SILVER MICA 680pF 500V	CP-02133
C215	CAP SILVER MICA 33pF 500V	CP-02120
C216	CAP SILVER MICA 560pF 500V	CP-02132
C218	CAP SILVER MICA 22pF 500V	CP-02151
C219	CAP SILVER MICA 820pF 500V	CP-02134
C220	CAP SILVER MICA 330pF 500V	CP-02147
C222	CAP SILVER MICA 1000pF 500V	CP-02106
C223	CAP SILVER MICA 820pF 500V	CP-02134

BARRETT 900 PA PARTS LIST

900P82A4.PCB Assembly P/N 9935.002/9936.002/9937.002 Issue 1 Sheet 5 of 8

Component Designator	Description	Barrett P/N
C224	CAP SILVER MICA 220pF 500V	CP-02128
C225	CAP SILVER MICA 12pF 500V	CP-02117
C226	CAP SILVER MICA 330pF 500V	CP-02147
C227	CAP SILVER MICA 820pF 500V	CP-02134
C230	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C231	CAP SMD 1206 0.1uF 5% 63V	CP-00916
C232	CAP SILVER MICA 56pF 500V	CP-02142
D1	DIODE 1N4004	DI-03303
D2	DIODE 1N4004	DI-03303
D3	DIODE 1.5KE18	DI-03319
D4	DIODE 1N4148	DI-03302
D5	DIODE 1N4148	DI-03302
D6	DIODE SMD BAV70	DI-03316
D8	DIODE SMD BAV70	DI-03316
D9	DIODE SMD BAV70	DI-03316
D10	DIODE ULTRA FAST ES1B	DI-03312
D11	DIODE ULTRA FAST ES1B	DI-03312
D12	DIODE ULTRA FAST ES1B	DI-03312
D13	DIODE ULTRA FAST ES1B	DI-03312
D14	DIODE ZENER BZX85 15V	DI-03320
D15	DIODE SMD BAV70	DI-03316
F1	FUSE 3.15A M205	FU-04801
FL1	MURATA FILTER M103	FI-07618
J2	PLUG 3PIN	CN-14102
L1	CHOKE 33uH 5%	IN-03607
L2	CHOKE 33uH 5%	IN-03607
L3	CHOKE 68uH	IN-03104
L4	CHOKE 68uH	IN-03104
L5	CHOKE SMD 1mH	IN-03585
L6	COIL 0.8uH 12 TURN 3000A CORE	IN-13071
L7	COIL 1.44uH 17 TURN 3000A CORE	IN-03105
L8	CHOKE 50uH	NOT FITTED
L9	COIL 0.52uH 9 TURN 3000A CORE	IN-03126
L10	COIL 0.936uH 13 TURN 3000A CORE	IN-03107
L12	COIL 0.33uH 8 TURN 3000A CORE	IN-13111
L13	COIL 0.6uH 11 TURN 3000M CORE	IN-03109
L15	COIL 0.21uH 6 TURN 3000M CORE	IN-03125
L16	COIL 0.378uH 9 TURN 3000M CORE	IN-13109
L19	COIL 0.252uH 7 TURN 3000M CORE	IN-03111
L20	CHOKE 100uH SMD	IN-03601
L21	PART OF TRANSFORMER T4	
L22	CHOKE 10 TURN 3000D CORE	IN-03118
L23	COIL 0.14uH 5 TURN 3000M CORE	IN-03124
L24	COIL 2.25uH 20 TURN 3000B CORE	IN-03127
L25	COIL 1.25uH 14 TURN 3000B CORE	IN-03128
L26	COIL 1.94uH 18 TURN 3000B CORE	IN-03129
L27	COIL 3.49uH 24 TURN 3000B CORE	IN-03113
L29	CHOKE 5u6H SMD	IN-03606
L30	CHOKE 68uH	IN-03104

BARRETT 900 PA PARTS LIST

-900P82A4.PCB Assembly P/N 9935.002/9936.002/9937.002 Issue 1 Sheet 6 of 8

Component Designator	Description	Barrett P/N
L31	CHOKE 5u6H SMD	IN-03606
P2	CONN IDC SKT 26 WAY	CN-24121
P3	CONNECTOR 2 PIN POLARISED	CN-03950
Q1	TRANSISTOR BF494	TR-02210
Q2	TRANSISTOR BD139	TR-02205
Q3	TRANSISTOR BLV11	TR-02224
Q4	TRANSISTOR BLV11	TR-02224
Q5	TRANSISTOR MRF455	TR-02225
Q6	TRANSISTOR MRF455	TR-02225
Q7	TRANSISTOR BD139	TR-02205
Q8	TRANSISTOR BD434	TR-02234
Q9	FET IRF7404	TR-00001
Q10	TRANSISTOR BC556	TR-02231
Q11	TRANSISTOR BC556	TR-02231
Q12	TRANSISTOR BC548	TR-02204
Q16	TRANSISTOR BD434	TR-02234
Q19	TRANSISTOR 2N5192	TR-02212
Q21	TRANSISTOR 2N5192	TR-02212
Q22	FET 2SK125	TR-02245
Q23	FET SMD 2N7002 LT-1	TR-02282
Q24	TRANSISTOR BC847	TR-02262
Q25	TRANSISTOR BSP17	TR-02207
Q26	FET SMD 2N7002 LT-1	TR-02282
R1	RES 1/4 WATT 5% 100R	RE-00237
R2	RES SMD 1206 5% 68R	RE-00115
R4	RES SMD 1206 5% 10R	RE-00111
R5	RES SMD 1206 5% 3K3	RE-00127
R6	RES SMD 1206 5% 10K	RE-00150
R7	RES SMD 1206 5% 3K3	RE-00127
R8	RES SMD 1206 5% 1K	RE-00122
R9	RES SMD 1206 5% 47R	RE-00113
R10	RES SMD 1206 5% 4R7	RE-00092
R11	RES SMD 1206 5% 3R9	RE-00104
R12	RES SMD 1206 5% 15R	RE-00116
R13	RES SMD 1206 5% 4K7	RE-00128
R14	RES SMD 1206 5% 100R	RE-00117
R15	RES 1/4 WATT 5% 100R	RE-00237
R16	RES SMD 1206 5% 39R	RE-00109
R17	RES SMD 1206 5% 220R	RE-00119
R18	RES 1/4 WATT 5% 47R	RE-00233
R19	RES 1/2 WATT 5% 2R2 0.4 " SPACING	RE-00002
R20	RES 1/2 WATT 5% 2R2 0.4 " SPACING	RE-00002
R23	RES SMD 1206 5% 10R	RE-00111
R24	RES SMD 1206 5% 5K6	RE-00129
R25	RES 1 WATT 5% 100R	RE-00437
R26	RES SMD 1206 5% 2K2	RE-00125
R27	RES SMD 1206 5% 10K	RE-00150
R28	RES SMD 1206 5% 4K7	RE-00128
R30	RES 1/4 WATT 5% 100R	RE-00237

BARRETT 900 PA PARTS LIST

900P82A4.PCB Assembly P/N 9935.002/9936.002/9937.002 Issue 1 Sheet 7 of 8

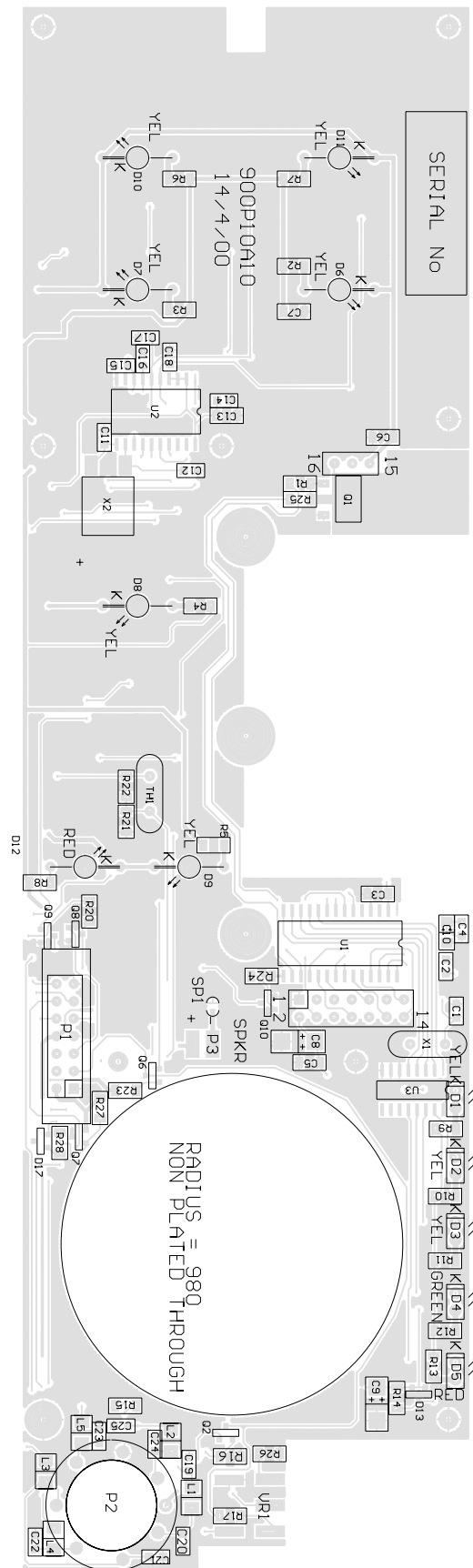
Component Designator	Description	Barrett P/N
R31	RES 1/4 WATT 5% 100R	RE-00237
R32	RES SMD 1206 5% 180K	RE-00173
R33	RES SMD 1206 5% 4K7	RE-00128
R34	RES SMD 1206 5% 1K	RE-00122
R35	RES SMD 1206 5% 100K	RE-00170
R36	RES SMD 1206 5% 1K	RE-00122
R37	RES SMD 1206 5% 4K7	RE-00128
R38	RES SMD 1206 5% 10K	RE-00150
R39	RES SMD 1206 5% 10R	RE-00111
R40	RES SMD 1206 5% 47R	RE-00113
R41	RES SMD 1206 5% 1M	RE-00178
R51	RES SMD 1206 5% 10K	RE-00150
R52	RES SMD 1206 5% 3K3	RE-00127
R53	RES SMD 1206 5% 100K	RE-00170
R54	RES SMD 1206 5% 100K	RE-00170
R55	RES SMD 1206 5% 15K	RE-00151
R56	RES SMD 1206 5% 15K	RE-00151
R57	RES SMD 1206 5% 1K	RE-00122
R58	RES SMD 1206 5% 1K5	RE-00124
R59	RES SMD 1206 5% 220R	RE-00119
R60	RES SMD 1206 5% 1K	RE-00122
R62	RES SMD 1206 5% 1K	RE-00122
R63	RES SMD 1206 5% 120R	RE-00095
R65	RES 1/4 WATT 5% 100R	RE-00237
R66	RES SMD 1206 5% 68R	RE-00115
R71	RES 1/4 WATT 5% 1K	RE-00249
R72	RES 2 WATT 5% 100R	RE-00438
R73	RES SMD 1206 5% 100R	RE-00117
R74	RES 2 WATT 5% 100R	RE-00438
R75	RES 1/4W 1206 5% 10R	RE-00225
R76	RES 1/4W 1206 5% 10R	RE-00225
R77	RES 1/4W 1206 5% 10R	RE-00225
R78	RES 1/4W 1206 5% 10R	RE-00225
R79	RES 1/4W 1206 5% 10R	RE-00225
R80	RES SMD 1206 5% 10K	RE-00150
R81	RES SMD 1206 5% 100R	RE-00117
R82	RES SMD 1206 5% 220R	RE-00119
R83	RES SMD 1206 5% 1K	RE-00122
R84	RES SMD 1206 5% 1K	RE-00122
R85	RES SMD 1206 5% 1K	RE-00122
R86	RES SMD 1206 5% 1K	RE-00122
R87	RES SMD 1206 5% 10R	RE-00111
R88	RES SMD 1206 5% 100K	RE-00170
R89	RES SMD 1206 5% 100K	RE-00170
R90	RES SMD 1206 5% 10K	RE-00150
R91	RES SMD 1206 5% 100R	RE-00117
R92	RES SMD 1206 5% 220K	RE-00174
R93	RES SMD 1206 5% 10K	RE-00150
R94	RES SMD 1206 5% 6K8	RE-00130

BARRETT 900 PA PARTS LIST

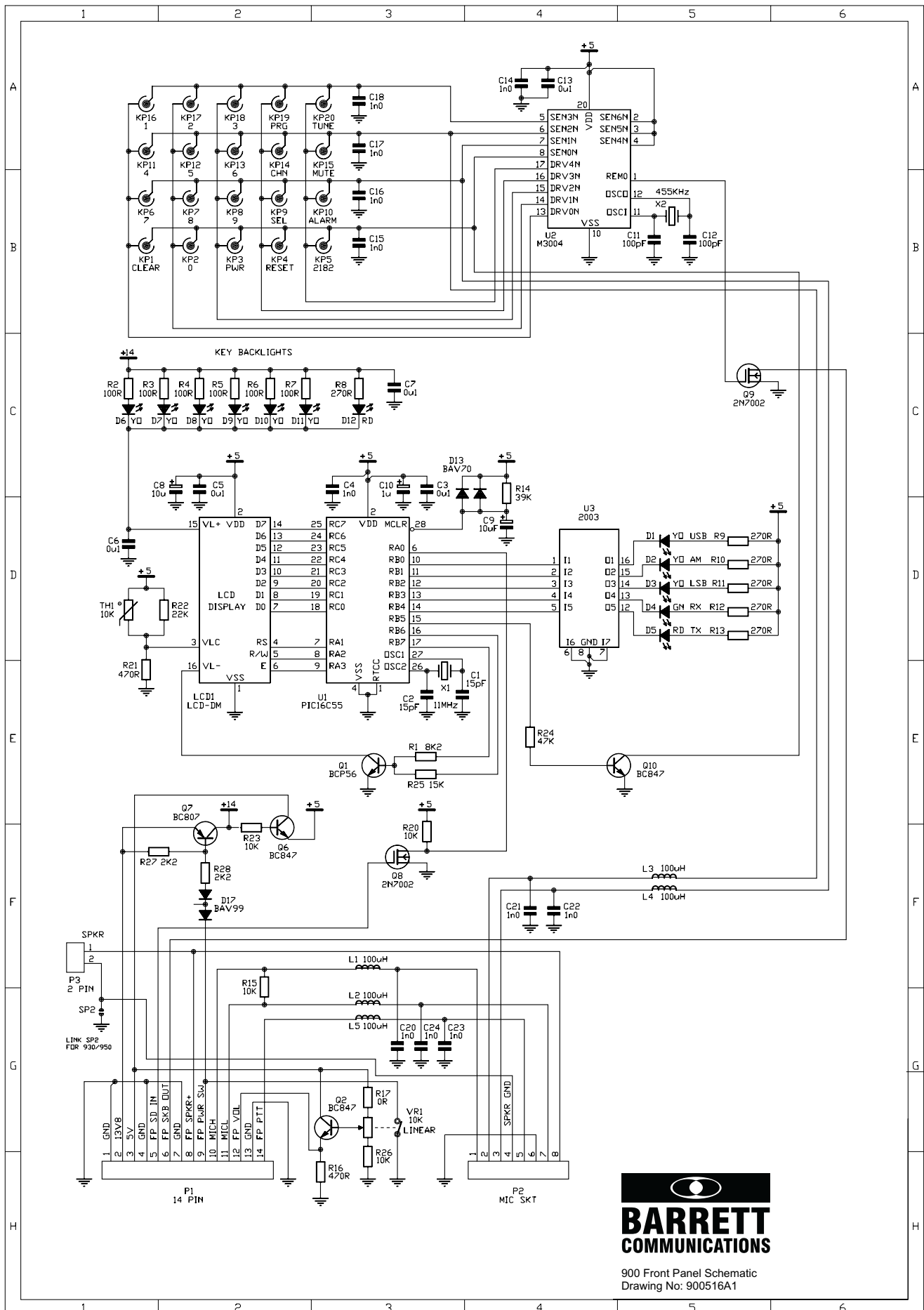
900P82A4.PCB Assembly P/N 9935.002/9936.002/9937.002 Issue 1 Sheet 8 of 8

Component Designator	Description	Barrett P/N
R95	RES SMD 1206 5% 1K	RE-00122
R96	RES SMD 1206 5% 1K8	RE-00133
R100	RES SMD 1206 5% 2K2	RE-00125
R101	RES 1/4W 1206 5% 10R	RE-00225
R103	RES SMD 1206 5% 100R	RE-00117
R105	RES SMD 1206 5% 10R	RE-00111
R106	RES SMD 1206 5% 2K2	RE-00125
RL1	RELAY EA2-12	RL-05013
RL2	RELAY EA2-12	RL-05013
RL3	RELAY EA2-12	RL-05013
RL4	RELAY EA2-12	RL-05013
RL5	RELAY EA2-12	RL-05013
RL6	RELAY EA2-12	RL-05013
RL7	RELAY EA2-12	RL-05013
RL8	RELAY EA2-12	RL-05013
RL9	RELAY EP1-3L1S NEC	RL-05020
RL10	RELAY EA2-12	RL-05013
RL11	RELAY EA2-12	RL-05013
RL12	RELAY EA2-12	RL-05013
RL13	RELAY EA2-12	RL-05013
RL14	RELAY EA2-12	RL-05013
RL15	RELAY EA2-12	RL-05013
RL16	RELAY EA2-12	RL-05013
RL18	RELAY EA2-12	RL-05013
RL19	RELAY EA2-12	RL-05013
RV2	TRIMPOT 500R	IC-02512
RV3	TRIMPOT 100R 5%	IC-02511
RV4	TRIMPOT CER 5K	IC-02501
SCR1	THYRISTOR BT169D	IC-02540
T1	TRANSFORMER P.A. 6/2+2 TURNS	TF-03119
T2	TRANSFORMER P.A. 2+2+2 TURNS	TF-03120
T3	OUTPUT TRANSFORMER FOR 900 SERIES	TF-03121
T3	OUTPUT TRANSFORMER FOR 940	TF-94003
T4	TRANSFORMER P.A. 20+1 TURNS	TF-30672
T5	TRANSFORMER P.A. 4+4+4 TURNS	TF-03102
TH1	THERMISTOR TYPE P.T.C	IC-02535
TH2 OPTIONAL	THERMAL SWITCH 57C	IC-02552
U1	I/C MC1350 SMD8	IC-02709
U2 OPTIONAL	I/C 7805 T0220	IC-02316
U3	I/C LMC6042 SMD	IC-02777
U4	I/C LM358 SMD	IC-02706
U5	I/C LM2940CT 10V T0220	IC-02802
U7	I/C LMC6042 SMD	IC-02777
U8	I/C ULN2003 SMD	IC-02717
U9	I/C 74HCT238 SMD	IC-02798

Front panel PCB overlay



Front Panel Schematic



900 Front Panel Schematic
Drawing No: 900516A1

BARRETT 900 Front Panel PCB

900P10A10.PCB

Assembly P/N 9907

Issue 1

Sheet 1 of 2

Component Designator	Description	Barrett P/N
C1	CAP SMD 0805 15pF	CP-00938
C2	CAP SMD 0805 15pF	CP-00938
C3	CAP SMD 1206 0.1uF	CP-00916
C4	CAP SMD 0805 1nF	CP-00915
C5	CAP SMD 1206 0.1uF	CP-00916
C6	CAP SMD 1206 0.1uF	CP-00916
C7	CAP SMD 1206 0.1uF	CP-00916
C8	CAP SMD TANT 10uF	CP-01580
C9	CAP SMD TANT 10uF	CP-01580
C10	CAP SMD TANT 1uF	CP-01570
C11	CAP SMD 0805 100pF	CP-00940
C12	CAP SMD 0805 100pF	CP-00940
C13	CAP SMD 1206 0.1uF	CP-00916
C14	CAP SMD 0805 1nF	CP-00915
C15	CAP SMD 0805 1nF	CP-00915
C16	CAP SMD 0805 1nF	CP-00915
C17	CAP SMD 0805 1nF	CP-00915
C18	CAP SMD 0805 1nF	CP-00915
C19	CAP SMD 0805 1nF	CP-00915
C20	CAP SMD 0805 1nF	CP-00915
C21	CAP SMD 0805 1nF	CP-00915
C22	CAP SMD 0805 1nF	CP-00915
C23	CAP SMD 0805 1nF	CP-00915
C24	CAP SMD 0805 1nF	CP-00915
C18	CAP SMD 0805 1nF	CP-00915
D1	LED YELLOW 5X2 RECT	LE-02908
D2	LED YELLOW 5X2 RECT	LE-02908
D3	LED YELLOW 5X2 RECT	LE-02908
D4	LED GREEN 5X2 RECT	LE-02909
D5	LED RED 5X2 RECT	LE-02910
D6	LED GREEN ROUND 3mm	LE-02913
D7	LED GREEN ROUND 3mm	LE-02913
D8	LED GREEN ROUND 3mm	LE-02913
D9	LED GREEN ROUND 3mm	LE-02913
D10	LED GREEN ROUND 3mm	LE-02913
D11	LED GREEN ROUND 3mm	LE-02913
D12	LED RED ROUND 3mm	LE-02915
D13	DIODE SMD BAV 70	DI-03316
D17	DIODE SMD BAV 99	DI-03317
L1	CHOKE SMD 100uH	IN-03601
L2	CHOKE SMD 100uH	IN-03601
L3	CHOKE SMD 100uH	IN-03601
L4	CHOKE SMD 100uH	IN-03601
L5	CHOKE SMD 100uH	IN-03601
LCD1	LCD DISPLAY LM162ASIB	LE-02902
P1	CONN 14 WAY CRIMP	CN-04038
P2	PLUG 8 PIN C/MNT MIC SOCKET	CN-04055
Q1	TRANSISTOR SMD BCP56-10	TR-02236

BARRETT 900 Front Panel PCB

900P10A10.PCB

Assembly P/N 9907

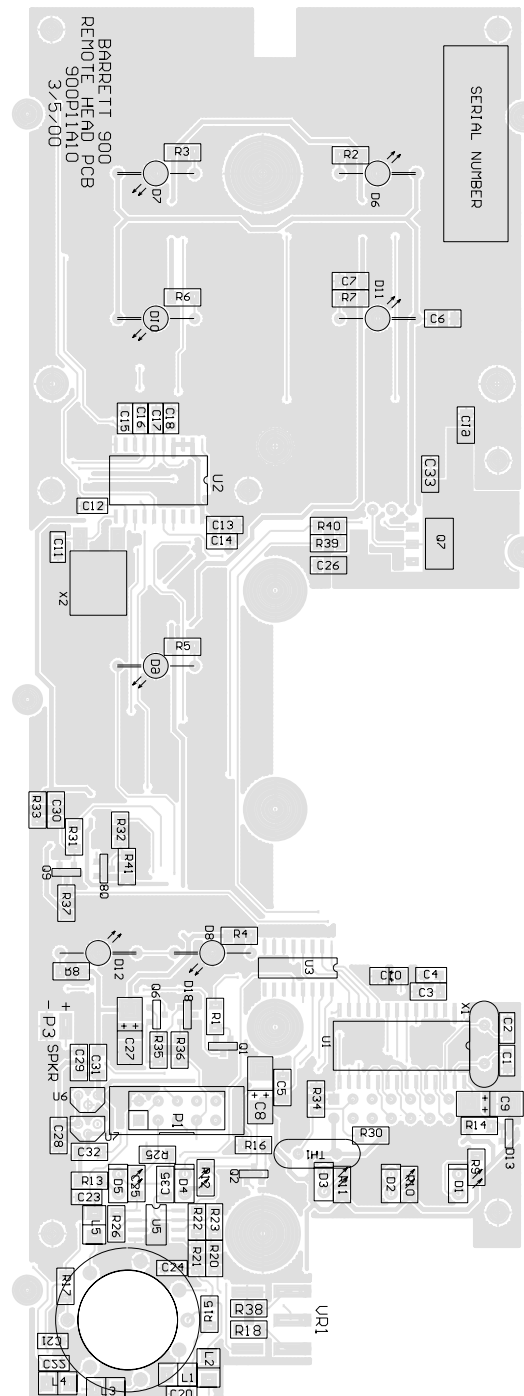
Issue 1

Sheet 2 of 2

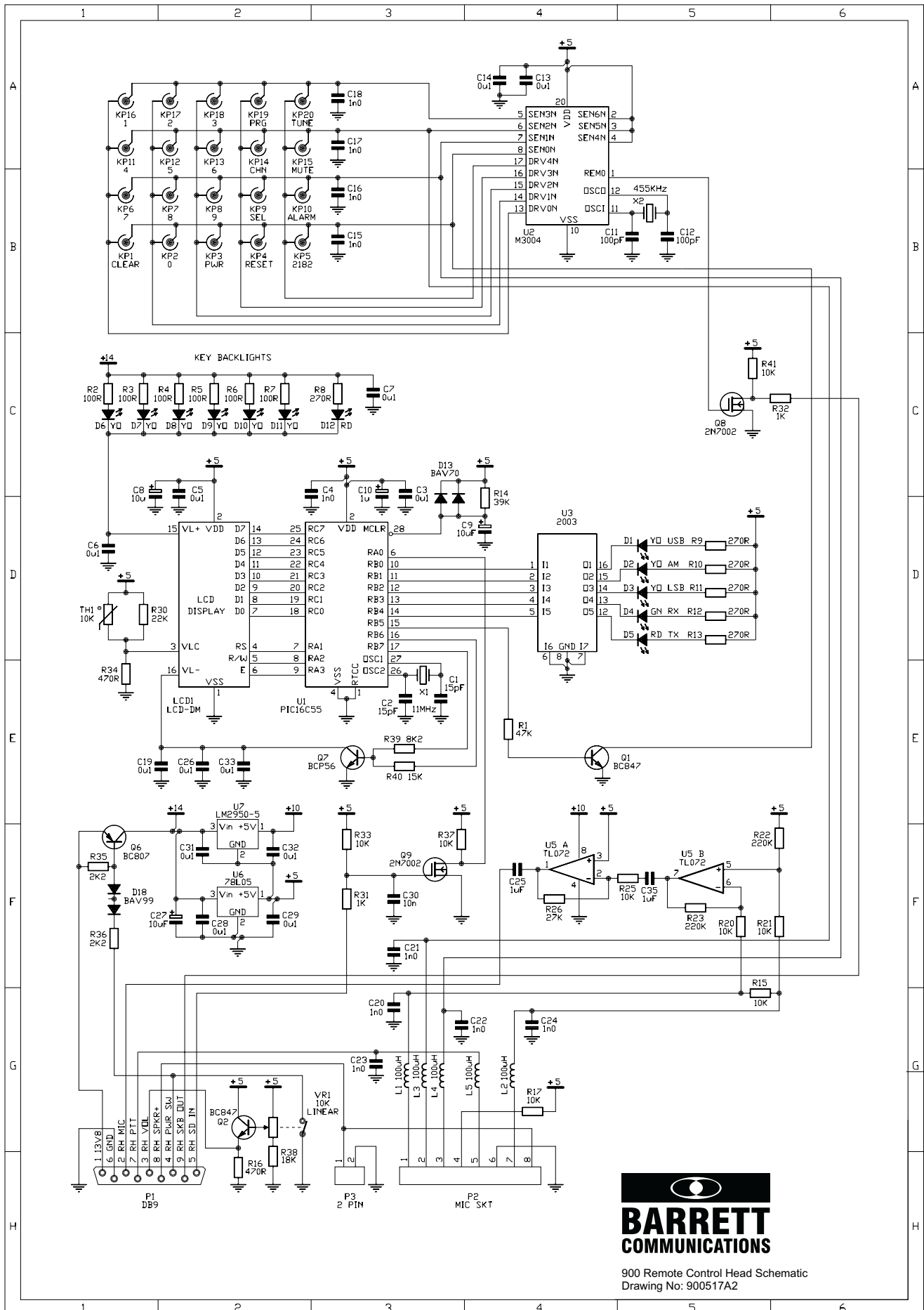
**Component
Designator**
Description
Barrett P/N

Q2	TRANSISTOR SMD BC847	TR-02262
Q6	TRANSISTOR SMD BC847	TR-02262
Q7	TRANSISTOR SMD BC807	TR-02229
Q8	FET SMD 2N7002 LT-1	TR-02282
Q9	FET SMD 2N7002 LT-1	TR-02282
Q10	TRANSISTOR SMD BC847	TR-02262
R1	RES SMD 1206 8K2	RE-00131
R2	RES SMD 1206 100R	RE-00117
R3	RES SMD 1206 100R	RE-00117
R4	RES SMD 1206 100R	RE-00117
R5	RES SMD 1206 100R	RE-00117
R6	RES SMD 1206 100R	RE-00117
R7	RES SMD 1206 100R	RE-00117
R8	RES SMD 1206 270R	RE-00106
R9	RES SMD 1206 270R	RE-00106
R10	RES SMD 1206 270R	RE-00106
R11	RES SMD 1206 270R	RE-00106
R12	RES SMD 1206 270R	RE-00106
R13	RES SMD 1206 270R	RE-00106
R14	RES SMD 1206 39K	RE-00156
R15	RES SMD 1206 10K	RE-00150
R16	RES SMD 1206 470R	RE-00121
R17	LINK OR 1206	RE-00080
R20	RES SMD 1206 10K	RE-00150
R21	RES SMD 1206 470R	RE-00121
R22	RES SMD 1206 22K	RE-00153
R23	RES SMD 1206 10K	RE-00150
R24	RES SMD 1206 47K	RE-00157
R25	RES SMD 1206 15K	RE-00151
R26	RES SMD 1206 10K	RE-00150
R27	RES SMD 1206 2K2	RE-00125
R28	RES SMD 1206 2K2	RE-00125
TH1	THERMISTOR 10K	IC-02532
U1	I/C PIC16C55 SMD	IC-02745
U2	I/C M3004 SMD	IC-02794
U3	I/C ULN2003 SMD	IC-02717
VR1	POT 10K LINEAR	RE-02810
X1	CERAMIC RESONATOR CSA11	FI-07620
X2	CERAMIC RESONATOR 455kHz SMD	FI-7604

Remote Control Head PCB overlay



Remote Control Head Schematic



900 Remote Control Head Schematic
Drawing No: 900517A2

BARRETT 900 Remote Head PCB

900P11A11.PCB

Assembly P/N 9926

Issue 1

Sheet 1 of 3

Component Designator	Description	Barrett P/N
C1	CAP SMD 0805 15pF	CP-00938
C2	CAP SMD 0805 15pF	CP-00938
C3	CAP SMD 1206 0.1uF	CP-00916
C4	CAP SMD 0805 1nF	CP-00915
C5	CAP SMD 1206 0.1uF	CP-00916
C6	CAP SMD 1206 0.1uF	CP-00916
C7	CAP SMD 1206 0.1uF	CP-00916
C8	CAP SMD TANT 10uF	CP-01580
C9	CAP SMD TANT 10uF	CP-01580
C10	CAP SMD TANT 1uF	CP-01570
C11	CAP SMD 0805 100pF	CP-00940
C12	CAP SMD 0805 100pF	CP-00940
C13	CAP SMD 1206 0.1uF	CP-00916
C14	CAP SMD 0805 1nF	CP-00915
C15	CAP SMD 0805 1nF	CP-00915
C16	CAP SMD 0805 1nF	CP-00915
C17	CAP SMD 0805 1nF	CP-00915
C18	CAP SMD 0805 1nF	CP-00915
C19	CAP SMD 1206 0.1uF	CP-00916
C20	CAP SMD 0805 1nF	CP-00915
C21	CAP SMD 0805 1nF	CP-00915
C22	CAP SMD 0805 1nF	CP-00915
C23	CAP SMD 0805 1nF	CP-00915
C24	CAP SMD 0805 1nF	CP-00915
C25	CAP SMD 1206 1uF	CP-00908
C26	CAP SMD 1206 0.1uF	CP-00916
C27	CAP SMD TANT 10uF	CP-01580
C28	CAP SMD 1206 0.1uF	CP-00916
C29	CAP SMD 1206 0.1uF	CP-00916
C30	CAP SMD 1206 10nF	CP-00951
C31	CAP SMD 1206 0.1uF	CP-00916
C32	CAP SMD 1206 0.1uF	CP-00916
C33	CAP SMD 1206 0.1uF	CP-00916
C35	CAP SMD 1206 1uF	CP-00908
D1	LED YELLOW 5X2 RECT	LE-02908
D2	LED YELLOW 5X2 RECT	LE-02908
D3	LED YELLOW 5X2 RECT	LE-02908
D4	LED GREEN 5X2 RECT	LE-02909
D5	LED RED 5X2 RECT	LE-02910
D6	LED YELLOW ROUND 3mm	LE-02913
D7	LED YELLOW ROUND 3mm	LE-02913
D8	LED YELLOW ROUND 3mm	LE-02913
D9	LED YELLOW ROUND 3mm	LE-02913
D10	LED YELLOW ROUND 3mm	LE-02913
D11	LED YELLOW ROUND 3mm	LE-02913
D12	LED RED ROUND 3mm	LE-02915
D13	DIODE BAV 70 SMD	DI-03316
D18	DIODE BAV 99 SMD	DI-03317
L1	CHOKE SMD 100uH	IN-03601

BARRETT 900 Remote Head PCB

900P11A11.PCB

Assembly P/N 9926

Issue 1

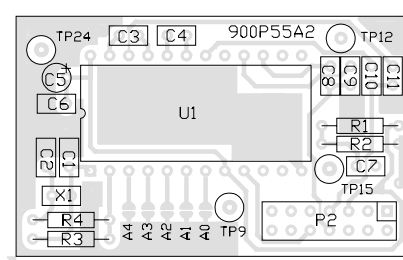
Sheet 2 of 3

Component Designator	Description	Barrett P/N
L2	CHOKE SMD 100uH	IN-03601
L3	CHOKE SMD 100uH	IN-03601
L4	CHOKE SMD 100uH	IN-03601
L5	CHOKE SMD 100uH	IN-03601
LCD1	LCD DISPLAY LM162ASIB	LE-02902
P1	CONN DB9 CHASSIS MNT	CN-04050
P2	CONN PLUG 8 PIN C/MNT MIC	CN-04055
P3	CONN SOCKET DC JACK 3.5mm	CN-04065
P4	CONN 10 WAY IDC LOW PROFILE	CN-04042
Q1	TRANSISTOR SMD BC847	TR-02262
Q2	TRANSISTOR SMD BC847	TR-02262
Q6	TRANSISTOR SMD BC807	TR-02229
Q7	TRANSISTOR SMD BCP56-10	TR-02236
Q8	FET SMD 2N7002 LT-1	TR-02282
Q9	FET SMD 2N7002 LT-1	TR-02282
R1	RES SMD 1206 47K	RE-00157
R2	RES SMD 1206 100R	RE-00117
R3	RES SMD 1206 100R	RE-00117
R4	RES SMD 1206 100R	RE-00117
R5	RES SMD 1206 100R	RE-00117
R6	RES SMD 1206 100R	RE-00117
R7	RES SMD 1206 100R	RE-00117
R8	RES SMD 1206 270R	RE-00106
R9	RES SMD 1206 270R	RE-00106
R10	RES SMD 1206 270R	RE-00106
R11	RES SMD 1206 270R	RE-00106
R12	RES SMD 1206 270R	RE-00106
R13	RES SMD 1206 270R	RE-00106
R14	RES SMD 1206 39K	RE-00156
R15	RES SMD 1206 10K	RE-00150
R16	RES SMD 1206 470R	RE-00121
R20	RES SMD 1206 10K	RE-00150
R21	RES SMD 1206 10K	RE-00150
R22	RES SMD 1206 220K	RE-00174
R23	RES SMD 1206 220K	RE-00174
R25	RES SMD 1206 10K	RE-00150
R26	RES SMD 1206 27K	RE-00154
R30	RES SMD 1206 22K	RE-00153
R31	RES SMD 1206 1K	RE-00122
R32	RES SMD 1206 1K	RE-00122
R33	RES SMD 1206 10K	RE-00150
R34	RES SMD 1206 470R	RE-00121
R35	RES SMD 1206 2K2	RE-00125
R36	RES SMD 1206 2K2	RE-00125
R37	RES SMD 1206 10K	RE-00150
R38	RES SMD 1206 10K	RE-00150
R39	RES SMD 1206 8K2	RE-00131
R40	RES SMD 1206 15K	RE-00151
R41	RES SMD 1206 10K	RE-00150

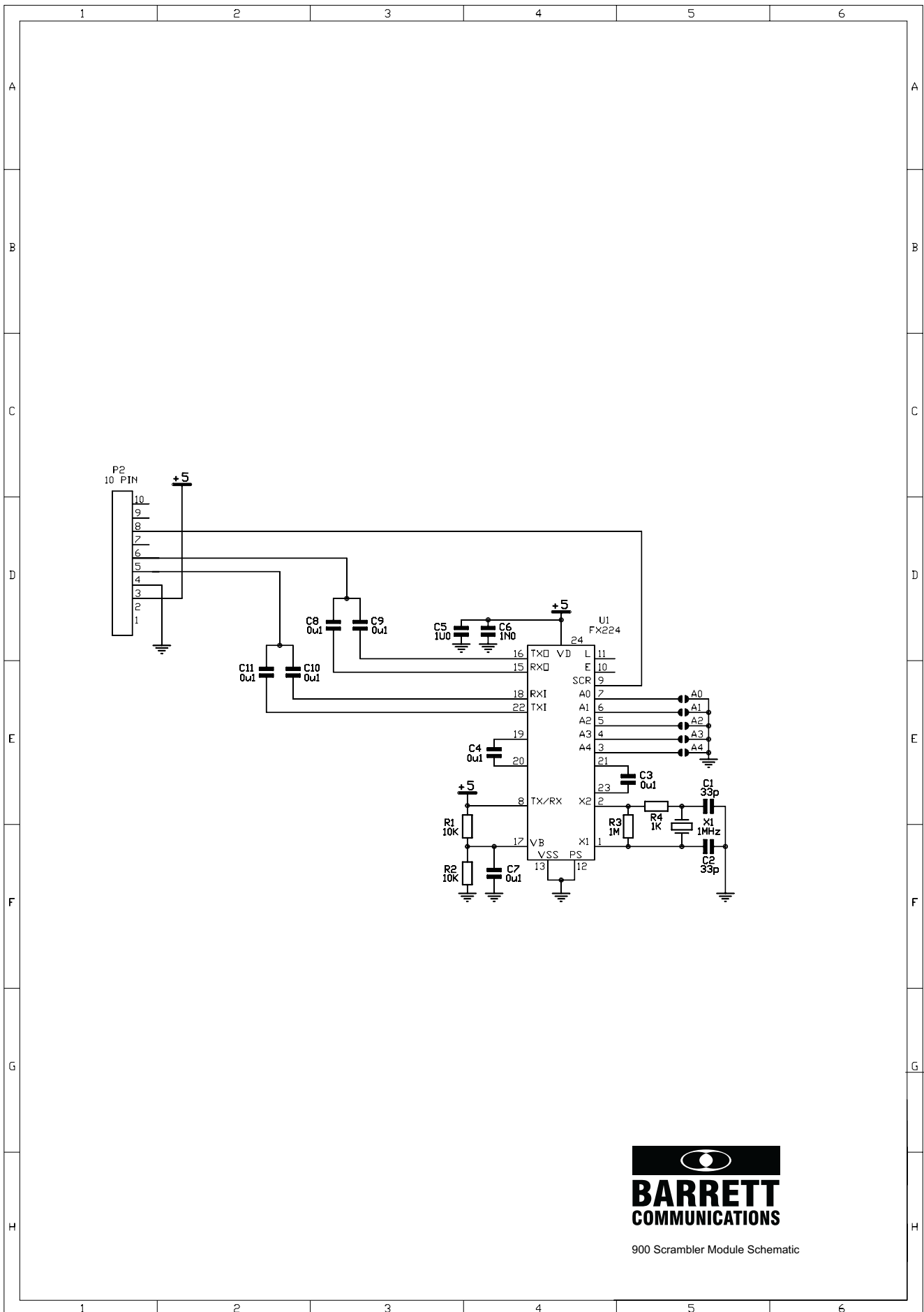
BARRETT 900 Remote Head PCB**900P11A11.PCB****Assembly P/N 9926****Issue 1****Sheet 3 of 3****Component
Designator****Description****Barrett P/N**

TH1	THERMISTOR 10K	IC-02532
U1	I/C PIC16C55 SMD	IC-02745
U2	I/C M3004 SMD	IC-02794
U3	I/C ULN2003 SMD	IC-02717
U5	I/C TL072 SMD	IC-02737
U6	I/C 78L05 TO-92	IC-02467
U7	I/C LM2950-5 TO-92	IC-02755
VR1	POT 10K LINEAR	RE-02805
X1	CRYSTAL 11 Mhz	FI-07620
X2	CERAMIC RESONATOR 455kHz	FI-07626

Scrambler PCB overlay



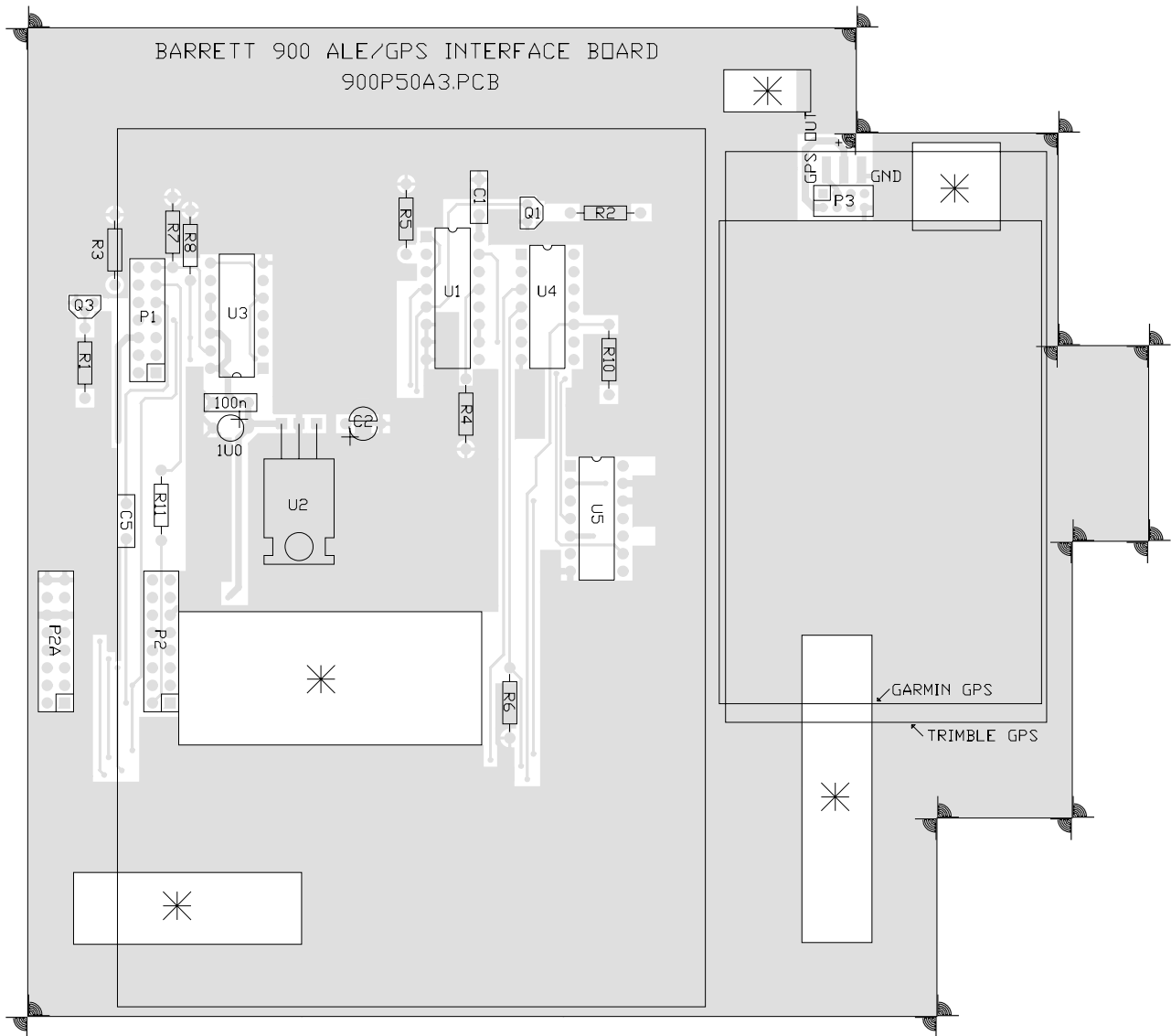
Scrambler Schematic



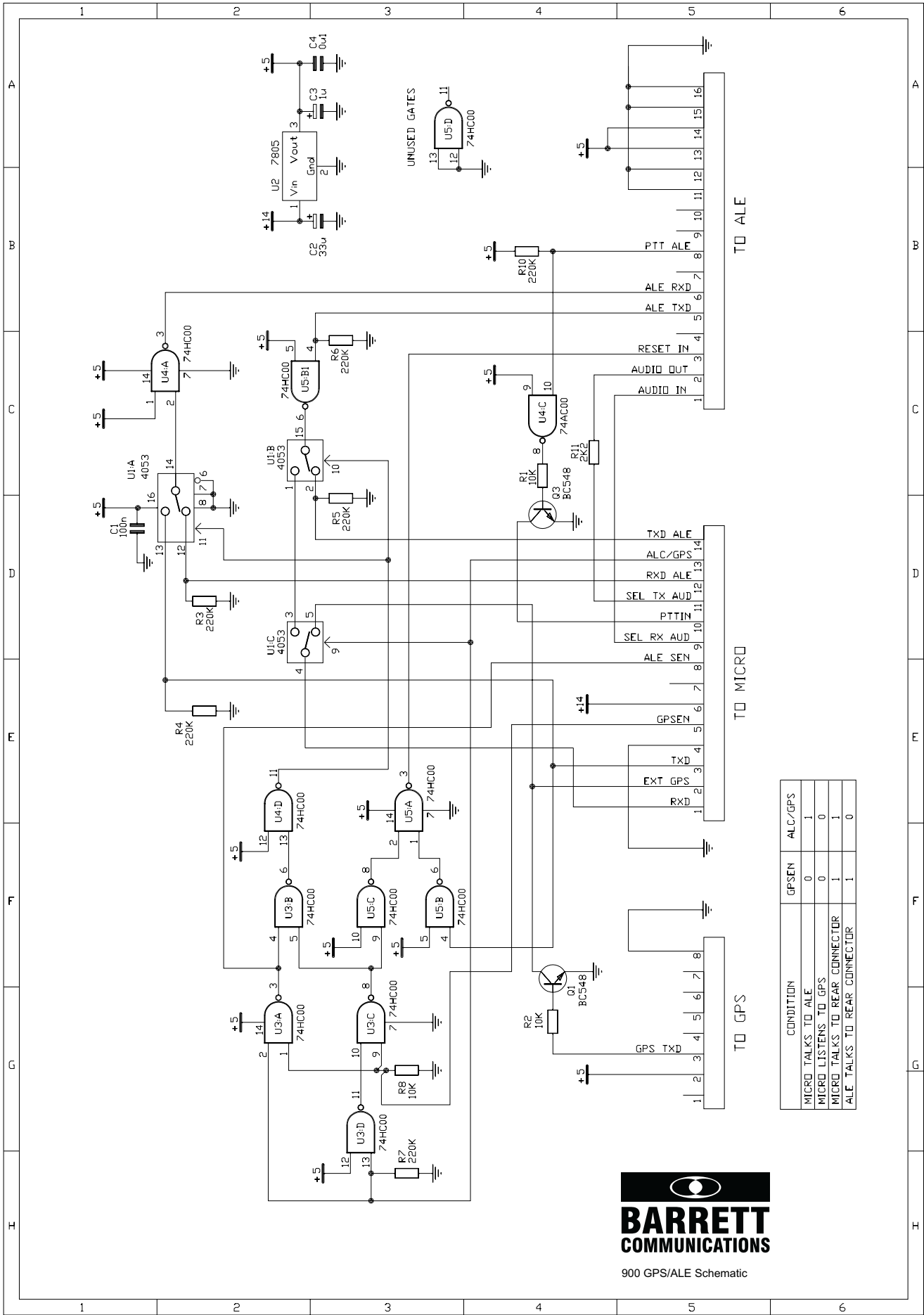
BARRETT 900 Scrambler PCB**900P55A1.PCB****Assembly P/N****Issue1****Sheet 1 of 1****Component
Designator****Description****Barrett P/N**

C1	Cap 33p ceramic 5%	1416
C2	Cap 33p ceramic 5%	1416
C3	Cap 100nF 5% 63V	1015
C4	Cap 100nF 5% 63V	1015
C5	Cap 1uF tant 5% 35V	1686
C6	Cap 1nF 5% 63V	0915
C7	Cap 100nF 5% 63V	1015
C8	Cap 100nF 5% 63V	1015
C9	Cap 100nF 5% 63V	1015
C10	Cap 100nF 5% 63V	1015
C11	Cap 100nF 5% 63V	1015
R1	Res 10K 1/4W	0261
R2	Res 10K 1/4W	0261
R3	Res 1M8 1/4W	0288
R4	Res 1K 1/4W	0249
P2	Header IDC PCB mount Socket	4126
U1	I/C FX224	2482
X1	11 MHz Crystal	7620

GPS/ALE Motherboard Overlay



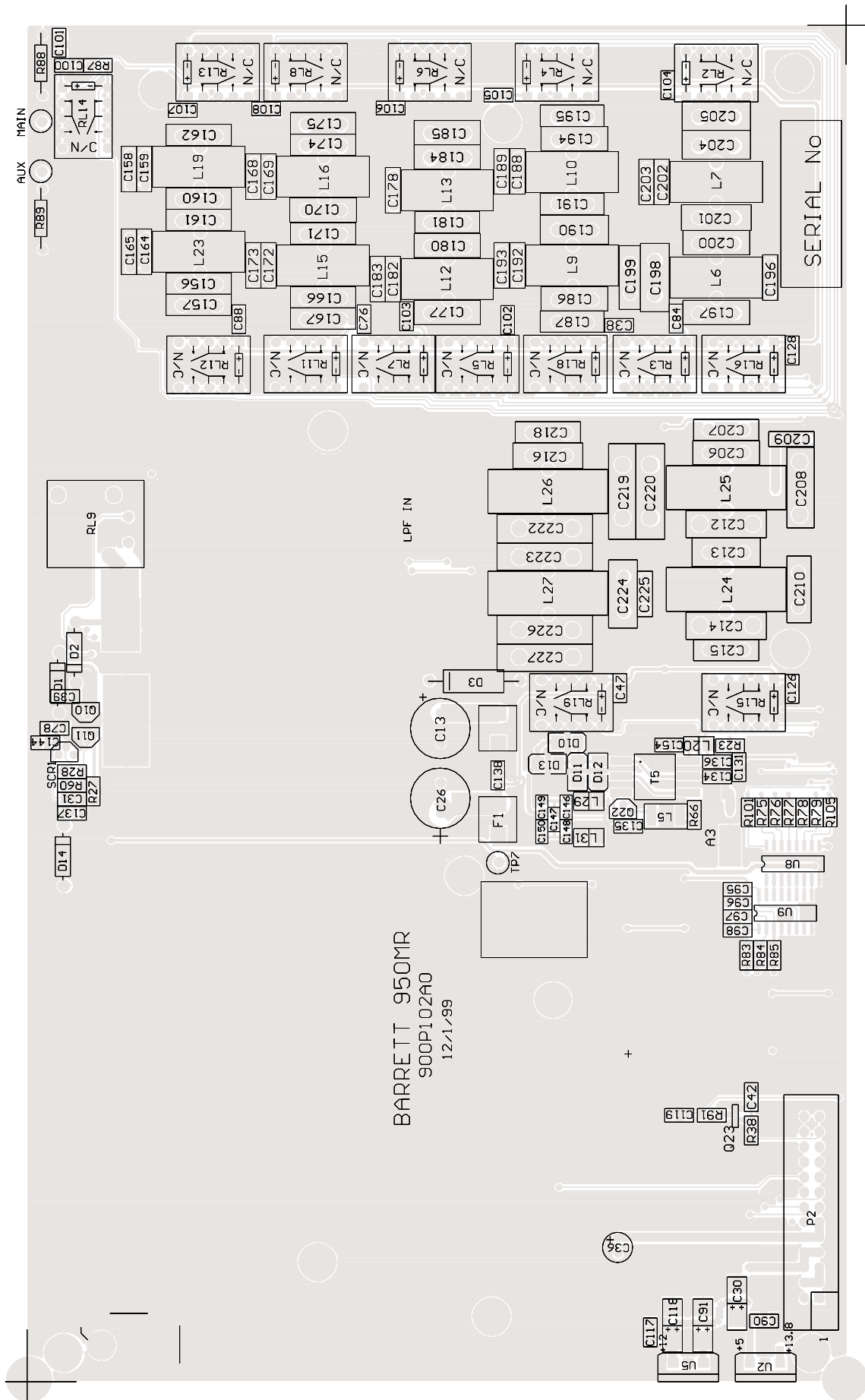
GPS/ALE Motherboard Schematic



BARRETT 900 ALE / GPS Interface PCB**900P50A3.PCB****Assembly P/N****Issue 1****Sheet 1 of 1****Component
Designator****Description****Barrett P/N**

C1	CAP 0.2" LS 0.1uF	1018
C2	CAP TANT 0.2" LS 33uF	1634A
C3	CAP TANT 0.2" LS 1uF	1645A
C4	CAP 0.2" LS 0.1uF	1018
P1	CONN 14 WAY LOW PROFILE SKT PCB MNT	4013
P2/P2A	CONN 16 WAY RIBBON PCB MNT	4008
P3	CONN 8 WAY SOCKET	4019
Q1	TRANSISTOR TO-92 BC548	2204
Q3	TRANSISTOR TO-92 BC548	2204
R1	RES 1/4W 10K	0261
R2	RES 1/4W 10K	0261
R3	RES 1/4W 220K	0277
R4	RES 1/4W 220K	0277
R5	RES 1/4W 220K	0277
R6	RES 1/4W 220K	0277
R7	RES 1/4W 220K	0277
R8	RES 1/4W 220K	0277
R10	RES 1/4W 220K	0277
R11	RES 1/4W 2K2	0253
U1	I/C 4053	2464
U2	I/C 7805 TO-220	2467
U3	I/C 74HC00	2300
U4	I/C 74HC00	2300
U5	I/C 74HC00	2300

950MR Low Pass Filter/Power PCB overlay



950MR Low Pass Filter/Power PCB schematic

See File: 900MR-FILTERBOARD-SCHEMATIC.pdf

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BARRETT 950MR LOW PASS FILTER PCB

900P102A0.PCB

Assembly P/N 9934

Issue 1

Sheet 1 of 4

**Component
Designator**
Description
Barrett P/N

C13	CAP ELECTRO RB 220uF 35V	1793
C26	CAP ELECTRO RB 220uF 35V	1793
C30	CAP SMD TANTALUM 10uF 16V	1580
C31	CAP SMD 1206 0.1uF 5% 63V	0916
C32	CAP SMD 1206 0.1uF 5% 63V	0916
C33	CAP SMD 1206 0.1uF 5% 63V	0916
C34	CAP SMD 1206 0.1uF 5% 63V	0916
C35	CAP SMD 1206 0.1uF 5% 63V	0916
C36	CAP ELECTRO RB 100uF 25V	1676A
C37	CAP SMD 1206 0.1uF 5% 63V	0916
C38	CAP SMD 1206 0.1uF 5% 63V	0916
C39	CAP SMD 1206 0.1uF 5% 63V	0916
C42	CAP SMD 1206 0.1uF 5% 63V	0916
C45	CAP SMD 1206 0.1uF 5% 63V	0916
C46	CAP SMD 1206 0.1uF 5% 63V	0916
C47	CAP SMD 1206 0.1uF 5% 63V	0916
C76	CAP SMD 1206 0.1uF 5% 63V	0916
C78	CAP SMD 1206 0.1uF 5% 63V	0916
C84	CAP SMD 1206 0.1uF 5% 63V	0916
C88	CAP SMD 1206 0.1uF 5% 63V	0916
C90	CAP SMD 1206 0.1uF 5% 63V	0916
C91	CAP SMD TANTALUM 10uF 16V	1580
C95	CAP SMD 1206 0.1uF 5% 63V	0916
C96	CAP SMD 1206 0.1uF 5% 63V	0916
C97	CAP SMD 1206 0.1uF 5% 63V	0916
C98	CAP SMD 1206 0.1uF 5% 63V	0916
C100	CAP SMD 1206 0.1uF 5% 63V	0916
C101	CAP SMD 1206 0.1uF 5% 63V	0916
C102	CAP SMD 1206 0.1uF 5% 63V	0916
C103	CAP SMD 1206 0.1uF 5% 63V	0916
C104	CAP SMD 1206 0.1uF 5% 63V	0916
C105	CAP SMD 1206 0.1uF 5% 63V	0916
C106	CAP SMD 1206 0.1uF 5% 63V	0916
C107	CAP SMD 1206 0.1uF 5% 63V	0916
C108	CAP SMD 1206 0.1uF 5% 63V	0916
C109	CAP SMD 1206 0.1uF 5% 63V	0916
C110	CAP SMD 1206 0.1uF 5% 63V	0916
C111	CAP SMD 1206 0.1uF 5% 63V	0916
C112	CAP SMD 1206 0.1uF 5% 63V	0916
C113	CAP SMD 1206 0.1uF 5% 63V	0916
C117	CAP SMD 1206 0.1uF 5% 63V	0916
C118	CAP SMD TANTALUM 10uF 16V	1580
C119	CAP SMD 1206 0.1uF 5% 63V	0916
C125	CAP SMD 1206 0.1uF 5% 63V	0916
C126	CAP SMD 1206 0.1uF 5% 63V	0916
C127	CAP SMD 1206 0.1uF 5% 63V	0916
C128	CAP SMD 1206 0.1uF 5% 63V	0916
C131	CAP SMD 1206 0.1uF 5% 63V	0916
C134	CAP SMD 1206 0.1uF 5% 63V	0916
C135	CAP SMD 1206 0.1uF 5% 63V	0916

BARRETT 950MR LOW PASS FILTER PCB

900P102A0.PCB

Assembly P/N 9934

Issue 1

Sheet 2 of 4

**Component
Designator**
Description
Barrett P/N

C136	CAP SMD 1206 0.1uF 5% 63V	0916
C137	CAP SMD 1206 0.1uF 5% 63V	0916
C138	CAP SMD 1206 470nF 5% 63V	0912
C144	CAP SMD 1206 0.1uF 5% 63V	0916
C146	CAP SMD 0805 1nF 5% 63V	0915
C147	CAP SMD 0805 560pF 5% 63V	0945
C148	CAP SMD 0805 120pF	0939
C149	CAP SMD 0805 120pF	0939
C150	CAP SMD 0805 1nF 5% 63V	0915
C154	CAP SMD 1206 0.1uF 5% 63V	0916
C156	CAP SILVER MICA 27pF 500V	2119
C157	CAP SILVER MICA 12pF 500V	2117
C158	CAP SILVER MICA 12pF 500V	2117
C159	CAP SILVER MICA 4p7F 500V	2148
C160	CAP SILVER MICA 82pF 500V	2124
C161	CAP SILVER MICA 47pF 500V	2121
C162	CAP SILVER MICA 39pF 500V	2141
C164	CAP SILVER MICA 56pF 500V	2142
C165	CAP SILVER MICA 27pF 500V	2119
C166	CAP SILVER MICA 47pF 500V	2121
C167	CAP SILVER MICA 15pF 500V	2140
C168	CAP SILVER MICA 12pF 500V	2117
C169	CAP SILVER MICA 12pF 500V	2117
C170	CAP SILVER MICA 180pF 500V	2146
C171	CAP SILVER MICA 15pF 500V	2140
C172	CAP SILVER MICA 100pF 500V	2125
C173	CAP SILVER MICA 27pF 500V	2119
C174	CAP SILVER MICA 68pF 500V	2123
C175	CAP SILVER MICA 22pF 500V	2151
C177	CAP SILVER MICA 100pF 500V	2125
C178	CAP SILVER MICA 39pF 500V	2141
C180	CAP SILVER MICA 270pF 500V	2129
C181	CAP SILVER MICA 39pF 500V	2141
C182	CAP SILVER MICA 100pF 500V	2125
C183	CAP SILVER MICA 100pF 500V	2125
C184	CAP SILVER MICA 82pF 500V	2124
C185	CAP SILVER MICA 82pF 500V	2124
C186	CAP SILVER MICA 150pF 500V	2127
C187	CAP SILVER MICA 6p8F 500V	2149
C188	CAP SILVER MICA 47pF 500V	2121
C189	CAP SILVER MICA 15pF 500V	2140
C190	CAP SILVER MICA 470pF 500V	2152
C191	CAP SILVER MICA 12pF 500V	2117
C192	CAP SILVER MICA 270pF 500V	2129
C193	CAP SILVER MICA 39pF 500V	2141
C194	CAP SILVER MICA 270pF 500V	2129
C195	CAP SILVER MICA 6p8F 500V	2149
C196	CAP SILVER MICA 120pF 500V	2126
C197	CAP SILVER MICA 120pF 500V	2126
C198	CAP SILVER MICA 470pF 500V	2152

BARRETT 950MR LOW PASS FILTER PCB

900P102A0.PCB

Assembly P/N 9934

Issue 1

Sheet 3 of 4

**Component
Designator**
Description
Barrett P/N

C199	CAP SILVER MICA 10pF 500V	2150
C200	CAP SILVER MICA 180pF 500V	2146
C201	CAP SILVER MICA 560pF 500V	2132
C202	CAP SILVER MICA 56pF 500V	2142
C203	CAP SILVER MICA 39pF 500V	2141
C204	CAP SILVER MICA 220pF 500V	2128
C205	CAP SILVER MICA 220pF 500V	2128
C206	CAP SILVER MICA 330pF 500V	2147
C207	CAP SILVER MICA 47pF 500V	2121
C208	CAP SILVER MICA 680pF 500V	2133
C209	CAP SILVER MICA 68pF 500V	2123
C210	CAP SILVER MICA 150pF 500V	2127
C211	CAP SMD 1206 0.1uF 5% 63V	0916
C212	CAP SILVER MICA 680pF 500V	2133
C213	CAP SILVER MICA 470pF 500V	2152
C214	CAP SILVER MICA 680pF 500V	2133
C215	CAP SILVER MICA 33pF 500V	2120
C216	CAP SILVER MICA 560pF 500V	2132
C218	CAP SILVER MICA 22pF 500V	2151
C219	CAP SILVER MICA 820pF 500V	2134
C220	CAP SILVER MICA 330pF 500V	2147
C222	CAP SILVER MICA 1000pF 500V	2106
C223	CAP SILVER MICA 820pF 500V	2134
C224	CAP SILVER MICA 220pF 500V	2128
C225	CAP SILVER MICA 12pF 500V	2117
C226	CAP SILVER MICA 330pF 500V	2147
C227	CAP SILVER MICA 820pF 500V	2134
D1	DIODE 1N4004	3303
D2	DIODE 1N4004	3303
D3	DIODE 1.5KE18	3319
D10	DIODE ULTRA FAST ES1B	3312
D11	DIODE ULTRA FAST ES1B	3312
D12	DIODE ULTRA FAST ES1B	3312
D13	DIODE ULTRA FAST ES1B	3312
D14	DIODE ZENER BZX85 15V	3320
F1	FUSE 3.15A M205	4801
L5	CHOKE SMD 1mH	3585
L6	COIL 0.8uH 12 TURN 3000A CORE	3071.1
L7	COIL 1.44uH 17 TURN 3000A CORE	3105
L9	COIL 0.52uH 9 TURN 3000A CORE	3126
L10	COIL 0.936uH 13 TURN 3000A CORE	3107
L12	COIL 0.33uH 8 TURN 3000A CORE	3111.1
L13	COIL 0.6uH 11 TURN 3000M CORE	3109
L15	COIL 0.21uH 6 TURN 3000M CORE	3125
L16	COIL 0.378uH 9 TURN 3000M CORE	3109.1
L19	COIL 0.252uH 7 TURN 3000M CORE	3111
L20	CHOKE 100uH SMD	3601
L23	COIL 0.14uH 5 TURN 3000M CORE	3124
L24	COIL 2.25uH 20 TURN 3000B CORE	3127
L25	COIL 1.25uH 14 TURN 3000B CORE	3128

BARRETT 950MR LOW PASS FILTER PCB

900P102A0.PCB

Assembly P/N 9934

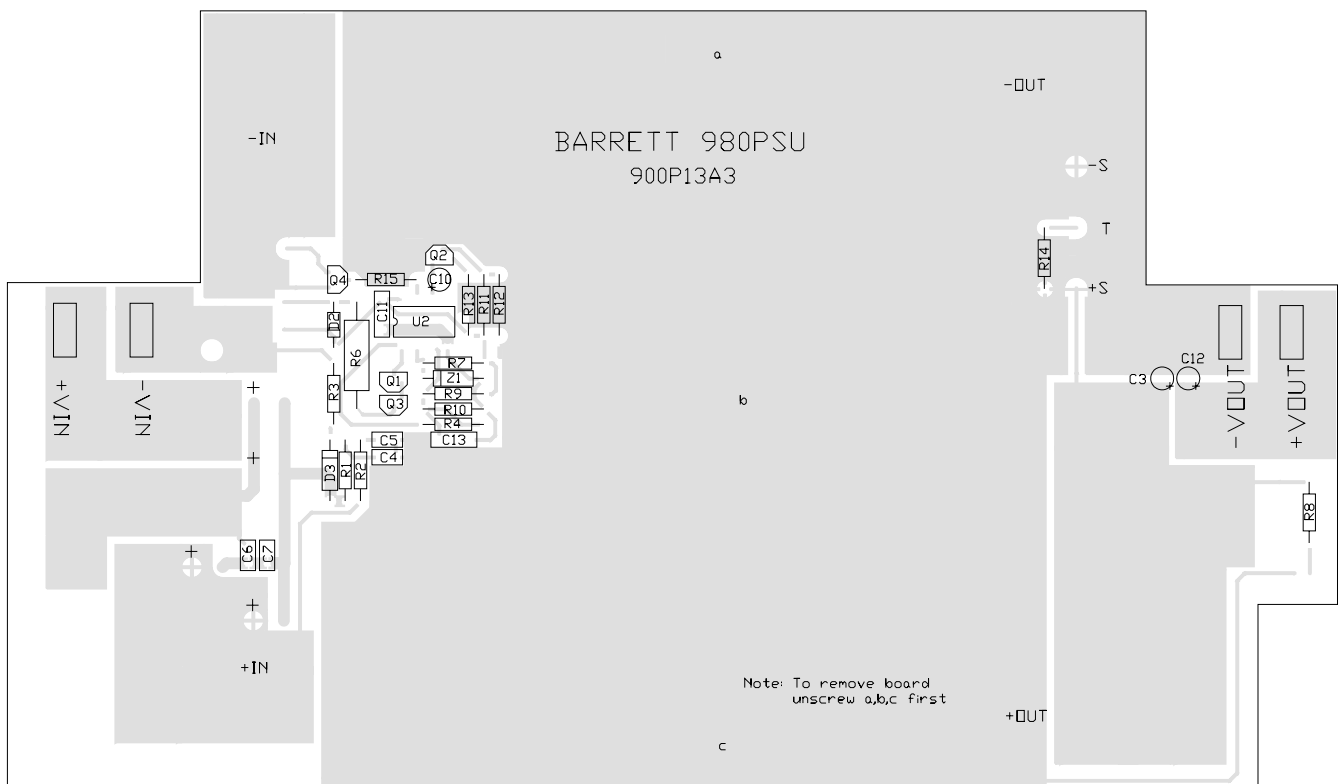
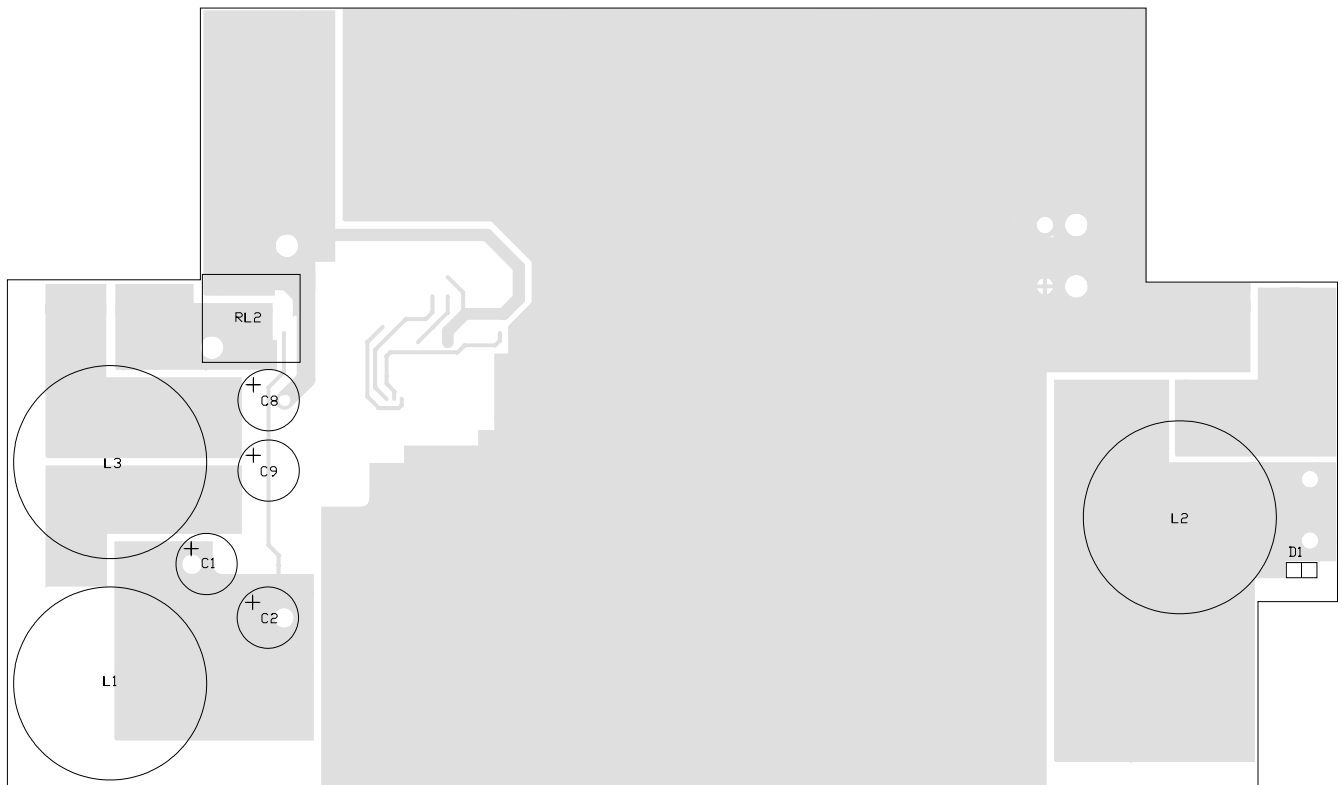
Issue 1

Sheet 4 of 4

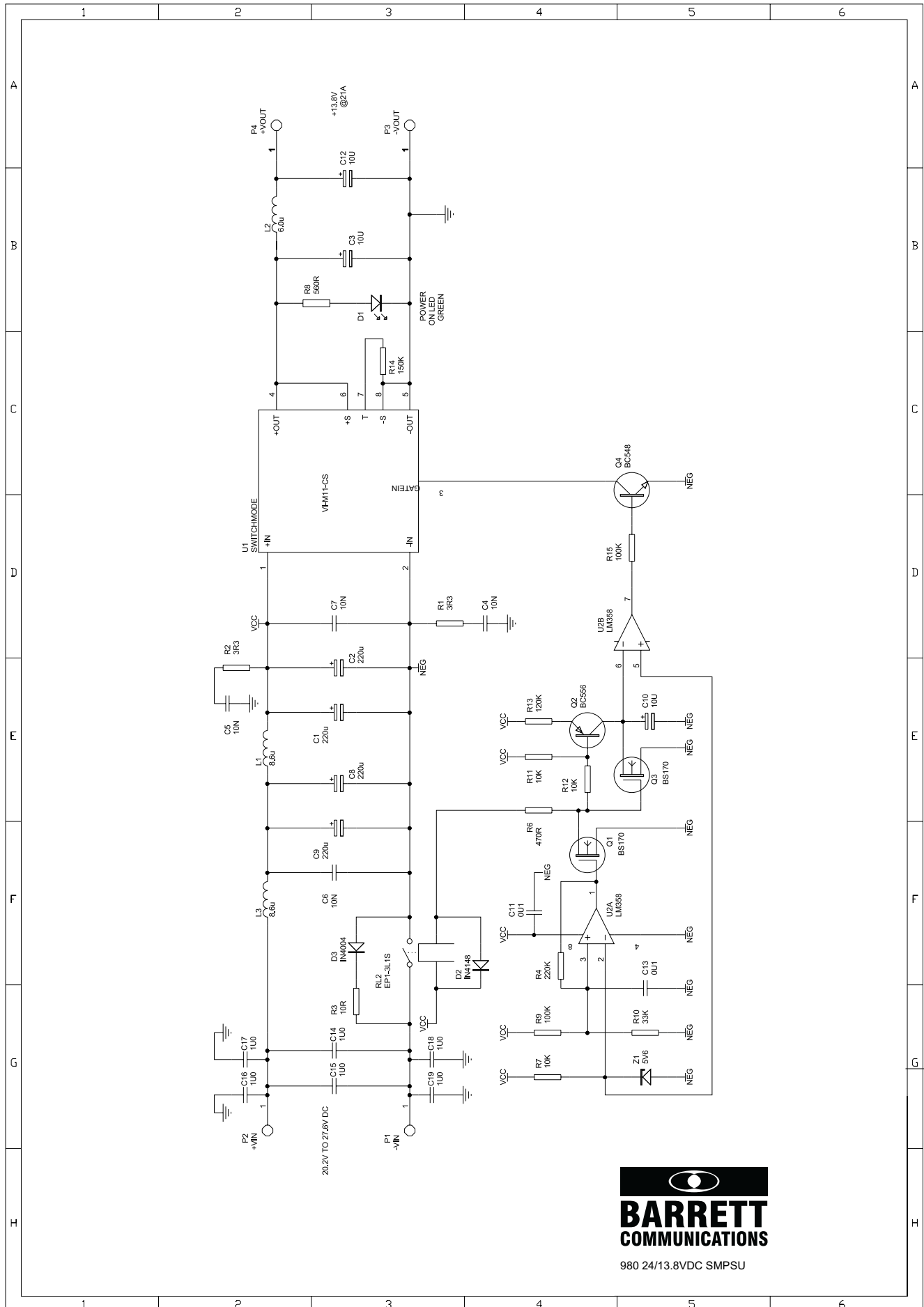
**Component
Designator**
Description
Barrett P/N

L26	COIL 1.94uH 18 TURN 3000B CORE	3129
L27	COIL 3.49uH 24 TURN 3000B CORE	3113
L29	CHOKE 5u6H SMD	3606
L31	CHOKE 5u6H SMD	3606
P2	CONN IDC SKT 26 WAY	4121A
Q10	TRANSISTOR BC556	2231
Q11	TRANSISTOR BC556	2231
Q22	FET 2SK125	2245
Q23	FET SMD 2N7002 LT-1	2282
R23	RES SMD 1206 5% 10R	0111
R27	RES SMD 1206 5% 10K	0150
R28	RES SMD 1206 5% 4K7	0128
R38	RES SMD 1206 5% 10K	0150
R60	RES SMD 1206 5% 1K	0122
R66	RES SMD 1206 5% 68R	0115
R75	RES 1/4W 1206 5% 10R	0225
R76	RES 1/4W 1206 5% 10R	0225
R77	RES 1/4W 1206 5% 10R	0225
R78	RES 1/4W 1206 5% 10R	0225
R79	RES 1/4W 1206 5% 10R	0225
R83	RES SMD 1206 5% 1K	0122
R84	RES SMD 1206 5% 1K	0122
R85	RES SMD 1206 5% 1K	0122
R87	RES SMD 1206 5% 10R	0111
R88	RES 1/4 WATT 5% 100K	0273
R89	RES 1/4 WATT 5% 100K	0273
R91	RES SMD 1206 5% 100R	0117
R101	RES 1/4W 1206 5% 10R	0225
R105	RES SMD 1206 5% 10R	0111
RL2	RELAY EA2-12	5013
RL3	RELAY EA2-12	5013
RL4	RELAY EA2-12	5013
RL5	RELAY EA2-12	5013
RL6	RELAY EA2-12	5013
RL7	RELAY EA2-12	5013
RL8	RELAY EA2-12	5013
RL9	RELAY EP1-3L1S NEC	5020
RL11	RELAY EA2-12	5013
RL12	RELAY EA2-12	5013
RL13	RELAY EA2-12	5013
RL14	RELAY EA2-12	5013
RL15	RELAY EA2-12	5013
RL16	RELAY EA2-12	5013
RL18	RELAY EA2-12	5013
RL19	RELAY EA2-12	5013
SCR1	THYRISTOR BT169D	2540
T5	TRANSFORMER P.A. 4+4+4 TURNS	3102
U2	OPTIONAL I/C 7805 T0220 I/C LM2940CT 10V T0220 I/C ULN2003 SMD I/C 74HCT238 SMD	2316
U5		2802
U8		2717
U9		2798

980PSU DC/DC Switch Mode Power Supply PCB Overlay



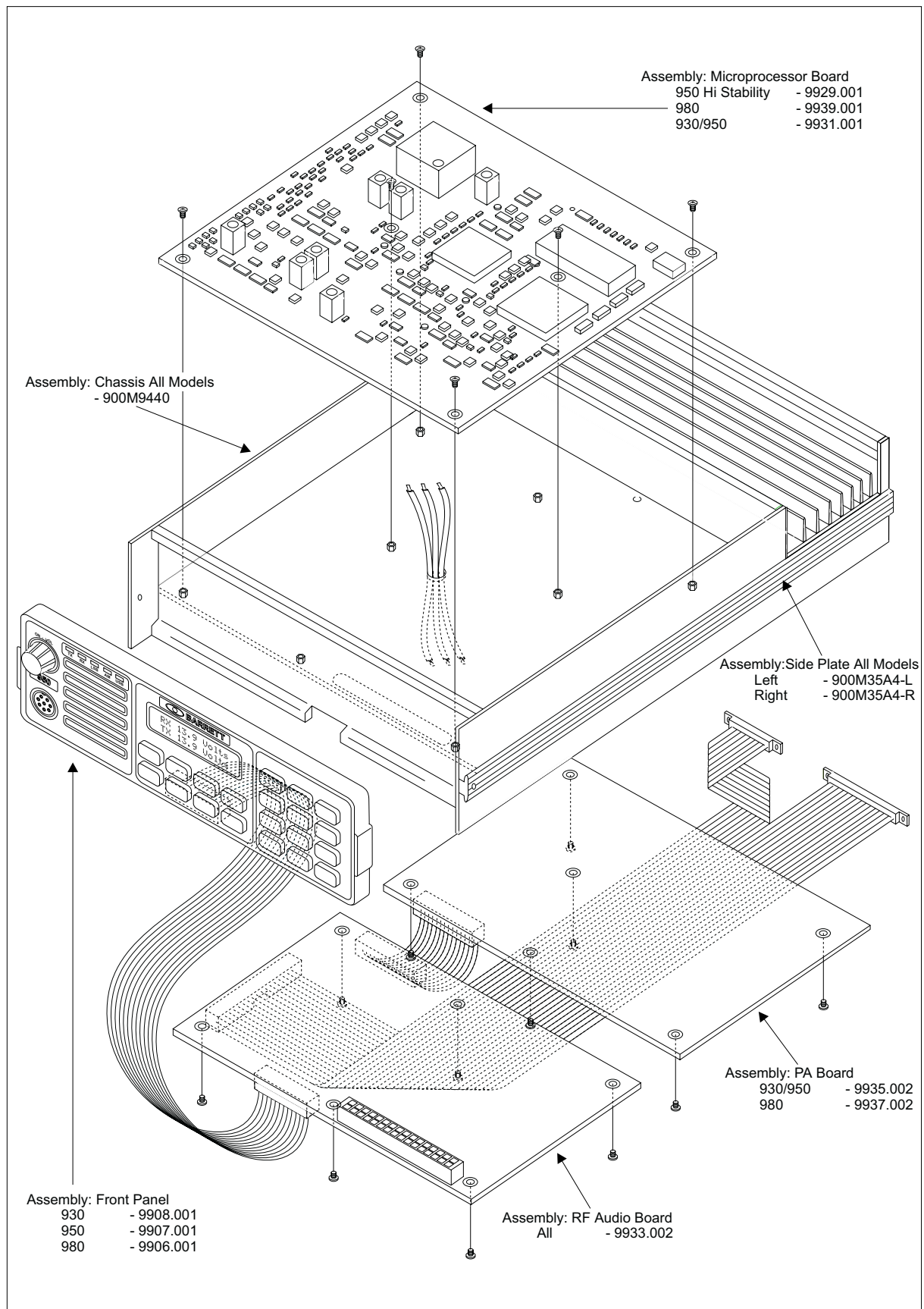
980PSU DC/DC Switch Mode Power Supply Schematic



BARRETT 900 Switch mode supply PCB**900 Switch mode supply PCB****Assembly P/N 9941 Issue1****Sheet 1 of 1****Component
Designator****Description****Barrett P/N**

C1	Cap Elect 35v 220Uf	1793
C2	Cap Elect 35v 220Uf	1793
C3	Cap Tant 16v 10uF (.1"LS) (T)	1651
C4	Cap Cer/disc .01uF .1ls	1009
C5	Cap Cer/disc .01uF .1ls	1009
C6	Cap Cer/disc .01uF .1ls	1009
C7	Cap Cer/disc .01uF .1ls	1009
C8	Cap Elect 35v 220Uf	1793
C9	Cap Elect 35v 220Uf	1793
C10	Cap Tant 16v 10uF (.1"LS) (T)	1651
C11	Cap Cer/disc .01uF .1ls	1018
C12	Cap Tant 16v 10uF (.1"LS) (T)	1651
C13	Cap Cer/disc .01uF .1ls	1018
C14	Cap Polyester 1U 63v 0.2 L/S	2115
C15	Cap Polyester 1U 63v 0.2 L/S	2115
C16	Cap Polyester 1U 63v 0.2 L/S	2115
C17	Cap Polyester 1U 63v 0.2 L/S	2115
C18	Cap Polyester 1U 63v 0.2 L/S	2115
C19	Cap Polyester 1U 63v 0.2 L/S	2115
D2	Diode 1N914/1N4148	3302
D3	Diode 1N4004	3303
L1	Inductor 8.6uH	3280
L2	Inductor 6uH	3290
L3	Inductor 8.6uH	3280
Q1	Trans BS170 Mosfet	2208
Q2	Trans BC556	2231
Q3	Trans BS170 Mosfet	2208
Q4	Trans BC548 (T)	2204
R1	Res 1/4w 5% 3R3	0220
R2	Res 1/4w 5% 3R3	0220
R3	Res 1/4w 5% 10R (T)	0225
R4	Res 1/4w 5% 220K (T)	0277
R6	Res 1w 5% 470R BC922	0440
R7	Res 1/4w 5% 10K (T)	0261
R8	Res 1/4w 5% 560R (T)	0246
R9	Res 1/4w 5% 100K (T) (S)	0273
R10	Res 1/4w 5% 33K (T)	0267
R11	Res 1/4w 5% 10K (T)	0261
R12	Res 1/4w 5% 10K (T)	0261
R13	Res 1/4w 5% 120K (T)	0274
R14	Res 1/4w 5% 150K (T)	0275
R15	Res 1/4w 5% 100K (T) (S)	0273
RL2	Relay NEC EP1-3LIS	5020
U1	SMPS 24VDC to 15VDC	7530
U2	I/C LM358 (Not Motorola)	2333
Z1	Diode BZY88 5v6 Zenner	3310

930, 950, 980 Chassis Explosion Diagram



**BARRETT 930 LOCAL CONTROL HF TRANSCEIVER
FINAL ASSEMBLY PARTS LIST**
Assembly No: BC93000
Issue1
Sheet 1 of 1
Description
Barrett P/N

LBL Microphone Hand Held	5928
Acc-Cable Power Lead	BCA50002
Acc-Microphone hand held	BCA50003
I/C PALCE 16V8Q-25PC	2750S
I/C 27 C 512	2772S
Screw M3x5 Pan 1A	4605
Screw M3x8 Black Pan Phillips	4637S
Washer M3 Nylon (S)	4649BS
Feet Rubber Push On 20m x 10mm	5955
M/Work Cover Plate RF/Audio	8422
Cover 900 Series Top Only	8390
Cover 900 Series Bottom Only	8390.1
Screw M3x8 Z/P CSK 1A	4602
Screw M3 x 4mm Pan 1A	4613
Nut M3 Hex Z/P	4621
Screw M6x12 Pan 1A (S)	4626S
Screw M4x8 Black C/Sunk R/H	4636
Washer M3 Shakeproof	4641
Loom RF/Audio To PA 26Way	9083
BC930 Front Panel Complete	9908.001
Screw 4Gx3/8 Selftap	4628T
Knob Black S151/250	5410
Knob Black Cap C151	5412
Membrane Keypad BC930 Only	5548
LBL - 930 F/P	5902
LBL - HORIZ. LED F/P	5906
LBL - BARRETT LOGO F/P	5960
Plastic Front Panel Local	8401
Loom RF/Audio To Frt/Pnl	9090
BC950/930 Front Panel PCB Assy	9904.001
900 Micro Xtal+LReg PCB Assy	9931.002
Coax Link Cbl 900MICRO-RFA L01	900C71A2-1
Coax Link Cbl 900MICRO-RFA L02	900C71A2-2
Coax Link Cbl 900MICRO-RFA CIO	900C71A2-C
BC900 RF/AUDIO PCB ASSY COMP	9933.002
930/950 PA PCB+Chassis Compl	9935.002
900 Common PA PCB Assy Ver2	9934.002
900 Xceiver Chassis Machined	900M94A1
Mwork 900 Mchd Side Plate Left	900M35A4-L
Mwork 900 Mchd Side Plate Right	900M35A4-R

**BARRETT 930 REMOTE CONTROL HF TRANSCEIVER
FINAL ASSEMBLY PARTS LIST**

-Assembly No: BC93001	Issue1	Sheet 1 of 1
Description	Barrett P/N	
LBL Microphone Hand Held	5928	
ManBill 930 Remote Head Complt	A93000.001	
Knob Black S151/250	5410	
Knob Black Cap C151	5412	
Membrane Keypad BC930 Only	5548	
LBL -930 F/P	5902	
LBL -VERT. LED F/P	5907	
LBL -BARRETT LOGO F/P	5960	
Plastic Front/Pnl Remote Head	8403	
Plastic Back Panel Remote Head	8404	
M/Work Bracket BC900 R/Head	8424	
M/work R/Head Knob Bracket	8426	
Loom DB9 Remote Head 930/950	9092	
900series Remote Head PCB Assy	9916.001	
Acc-Cable R/Head interface	BCA50000	
Acc-Cradle Suit 530/550	BCA50001	
Screw M4x14 Phillips/C/sunk	4599	
Capstan Cradle	5709	
M/work BC550/530 Cradle Main	8420	
M/work Cradle Clip BC550	8430	
Acc-Cable Power Lead	BCA50002	
Acc-Microphone hand held	BCA50003	
Acc-External Speaker	BCA50011	
I/C PALCE 16V8Q-25PC	2750S	
I/C 27 C 512	2772S	
Screw M3x5 Pan 1A	4605	
Screw M3x8 Black Pan Phillips	4637S	
Washer M3 Nylon (S)	4649BS	
Feet Rubber Push On 20m x 10mm	5955	
M/Work Cover Plate RF/Audio	8422	
Cover 900 Series Top Only	8390	
Cover 900 Series Bottom Only	8390.1	
Screw M3x8 Z/P CSK 1A	4602	
Screw M3 x 4mm Pan 1A	4613	
Nut M3 Hex Z/P	4621	
Screw M6x12 Pan 1A (S)	4626S	
Screw M4x8 Black C/Sunk R/H	4636	
Washer M3 Shakeproof	4641	
LBL -930 F/P	5902	
LBL -BARRETT LOGO F/P	5960	
Loom RF/Audio To PA 26Way	9083	
500/900series Rmt Front Panel	9640	
900 Micro Xtal+LReg PCB Assy	9931.002	
Coax Link Cbl 900MICRO-RFA L01	900C71A2-1	
Coax Link Cbl 900MICRO-RFA L02	900C71A2-2	
Coax Link Cbl 900MICRO-RFA CIO	900C71A2-C	
BC900 RF/AUDIO PCB ASSY COMP	9933.002	
Coax Link Cbl 900RFA-PA Rx/Tx	900C71A2-R	
930/950 PA PCB+Chassis Compl	9935.002	
900 Common PA PCB Assy Ver2	9934.002	
900 Xceiver Chassis Machined	900M94A1	
Mwork 900 Mchd Side Plate Left	900M35A4-L	
Mwork 900 Mchd Side Plate Rigt	900M35A4-R	

**BARRETT 950 LOCAL CONTROL HF TRANSCEIVER
FINAL ASSEMBLY PARTS LIST**
Assembly No: BC95000
Issue1
Sheet 1 of 1
Description
Barrett P/N

LBL Microphone Hand Held	5928
Acc-Cable Power Lead	BCA50002
Acc-Microphone hand held	BCA50003
I/C PALCE 16V8Q-25PC	2750S
I/C 27 C 512	2772S
Screw M3x5 Pan 1A	4605
Screw M3x8 Black Pan Phillips	4637S
Washer M3 Nylon (S)	4649BS
Feet Rubber Push On 20m x 10mm	5955
M/Work Cover Plate RF/Audio	8422
Cover 900 Series Top Only	8390
Cover 900 Series Bottom Only	8390.1
Screw M3x8 Z/P CSK 1A	4602
Screw M3 x 4mm Pan 1A	4613
Nut M3 Hex Z/P	4621
Screw M6x12 Pan 1A (S)	4626S
Screw M4x8 Black C/Sunk R/H	4636
Washer M3 Shakeproof	4641
Loom RF/Audio To PA 26Way	9083
BC950 Front Panel Complete	9907.001
Knob Black S151/250	5410
Knob Black Cap C151	5412
Membrane Keypad BC950 Only	5549
LBL -950 F/P	5903
LBL -HORIZ. LED F/P	5906
LBL -BARRETT LOGO F/P	5960
Plastic Front Panel Local	8401
Loom RF/Audio To Frt/Pnl	9090
BC950/930 Front Panel PCB Assy	9904.001
950 Micro Xtal+LReg PCB Assy	9931.002
Coax Link Cbl 900MICRO-RFA L01	900C71A2-1
Coax Link Cbl 900MICRO-RFA L02	900C71A2-2
Coax Link Cbl 900MICRO-RFA CIO	900C71A2-C
BC900 RF/AUDIO PCB ASSY COMP	9933.002
930/950 PA PCB+Chassis Compl	9935.002
900 Common PA PCB Assy Ver2	9934.002
900 Xceiver Chassis Machined	900M94A1
Mwork 900 Mchd Side Plate Left	900M35A4-L
Mwork 900 Mchd Side Plate Right	900M35A4-R

**BARRETT 950 LOCAL CONTROL HF TRANSCEIVER
FINAL ASSEMBLY PARTS LIST**
Assembly No: BC95001
Issue1
Sheet 1 of 1
Description
Barrett P/N

LBL Microphone Hand Held	5928
Acc-Cable Power Lead	BCA50002
Acc-Microphone hand held	BCA50003
I/C PALCE 16V8Q-25PC	2750S
I/C 27 C 512	2772S
Screw M3x5 Pan 1A	4605
Screw M3x8 Black Pan Phillips	4637S
Washer M3 Nylon (S)	4649BS
Feet Rubber Push On 20m x 10mm	5955
M/Work Cover Plate RF/Audio	8422
Cover 900 Series Top Only	8390
Cover 900 Series Bottom Only	8390.1
Screw M3x8 Z/P CSK 1A	4602
Screw M3 x 4mm Pan 1A	4613
Nut M3 Hex Z/P	4621
Screw M6x12 Pan 1A (S)	4626S
Screw M4x8 Black C/Sunk R/H	4636
Washer M3 Shakeproof	4641
Loom RF/Audio To PA 26Way	9083
BC950 Front Panel Complete	9907.001
Knob Black S151/250	5410
Knob Black Cap C151	5412
Membrane Keypad BC950 Only	5549
LBL -950 F/P	5903
LBL -HORIZ. LED F/P	5906
LBL -BARRETT LOGO F/P	5960
Plastic Front Panel Local	8401
Loom RF/Audio To Frt/Pnl	9090
BC950/930 Front Panel PCB Assy	9904.001
950 Micro TCXO PCB Assy Ver 1	9929.001
Coax Link Cbl 900MICRO-RFA L01	900C71A2-1
Coax Link Cbl 900MICRO-RFA L02	900C71A2-2
Coax Link Cbl 900MICRO-RFA CIO	900C71A2-C
BC900 RF/AUDIO PCB ASSY COMP	9933.002
930/950 PA PCB+Chassis Compl	9935.002
900 Common PA PCB Assy Ver2	9934.002
900 Xceiver Chassis Machined	900M94A1
Mwork 900 Mchd Side Plate Left	900M35A4-L
Mwork 900 Mchd Side Plate Right	900M35A4-R

**BARRETT 950 REMOTE CONTROL HF TRANSCEIVER
FINAL ASSEMBLY PARTS LIST**
Assembly No: BC95002**Issue1****Sheet 1 of 1****Description****Barrett P/N**

Knob R/Head BC Only	4681
LBL Microphone Hand Held	5928
M/work R/Head Cradle BC550/530	8425
Knob Black S151/250	5410
Knob Black Cap C151	5412
Membrane Keypad BC950 Only	5549
LBL -950 F/P	5903
LBL -VERT. LED F/P	5907
LBL -BARRETT LOGO F/P	5960
Plastic Front/Pnl Remote Head	8403
Plastic Back Panel Remote Head	8404
M/Work Bracket BC900 R/Head	8424
M/work R/Head Knob Bracket	8426
Loom DB9 Remote Head 930/950	9092
900series Remote Head PCB Assy	9916.001
Acc-Cable R/Head interface	BCA50000
Acc-Cradle Suit 530/550	BCA50001
Screw M4x14 Phillips/C/sunk	4599
Capstan Cradle	5709
M/work BC550/530 Cradle Main	8420
M/work Cradle Clip BC550	8430
Acc-Cable Power Lead	BCA50002
Acc-Microphone hand held	BCA50003
Acc-External Speaker	BCA50011
I/C PALCE 16V8Q-25PC	2750S
I/C 27 C 512	2772S
Screw M3x5 Pan 1A	4605
Screw M3x8 Black Pan Phillips	4637S
Washer M3 Nylon (S)	4649BS
Feet Rubber Push On 20m x 10mm	5955
M/Work Cover Plate RF/Audio	8422
Cover 900 Series Top Only	8390
Cover 900 Series Bottom Only	8390.1
LBL -950 F/P	5903
LBL -BARRETT LOGO F/P	5960
Loom RF/Audio To PA 26Way	9083
500/900series Rmt Front Panel	9640
Plastic Front Panel Blank	8402
900 Micro Xtal+LReg PCB Assy	9931.002
Coax Link Cbl 900MICRO-RFA L01	900C71A2-1
Coax Link Cbl 900MICRO-RFA L02	900C71A2-2
Coax Link Cbl 900MICRO-RFA CIO	900C71A2-C
BC900 RF/AUDIO PCB ASSY COMP	9933.002
Coax Link Cbl 900RFA-PA Rx/Tx	900C71A2-R
930/950 PA PCB+Chassis Compl	9935.002
900 Common PA PCB Assy Ver2	9934.002
900 Xceiver Chassis Machined	900M94A1
Mwork 900 Mchd Side Plate Left	900M35A4-L
Mwork 900 Mchd Side Plate Rigt	900M35A4-R

**BARRETT 950 REMOTE CONTROL HF TRANSCEIVER
FINAL ASSEMBLY PARTS LIST**
Assembly No: BC95003**Issue1****Sheet 1 of 1****Description****Barrett P/N**

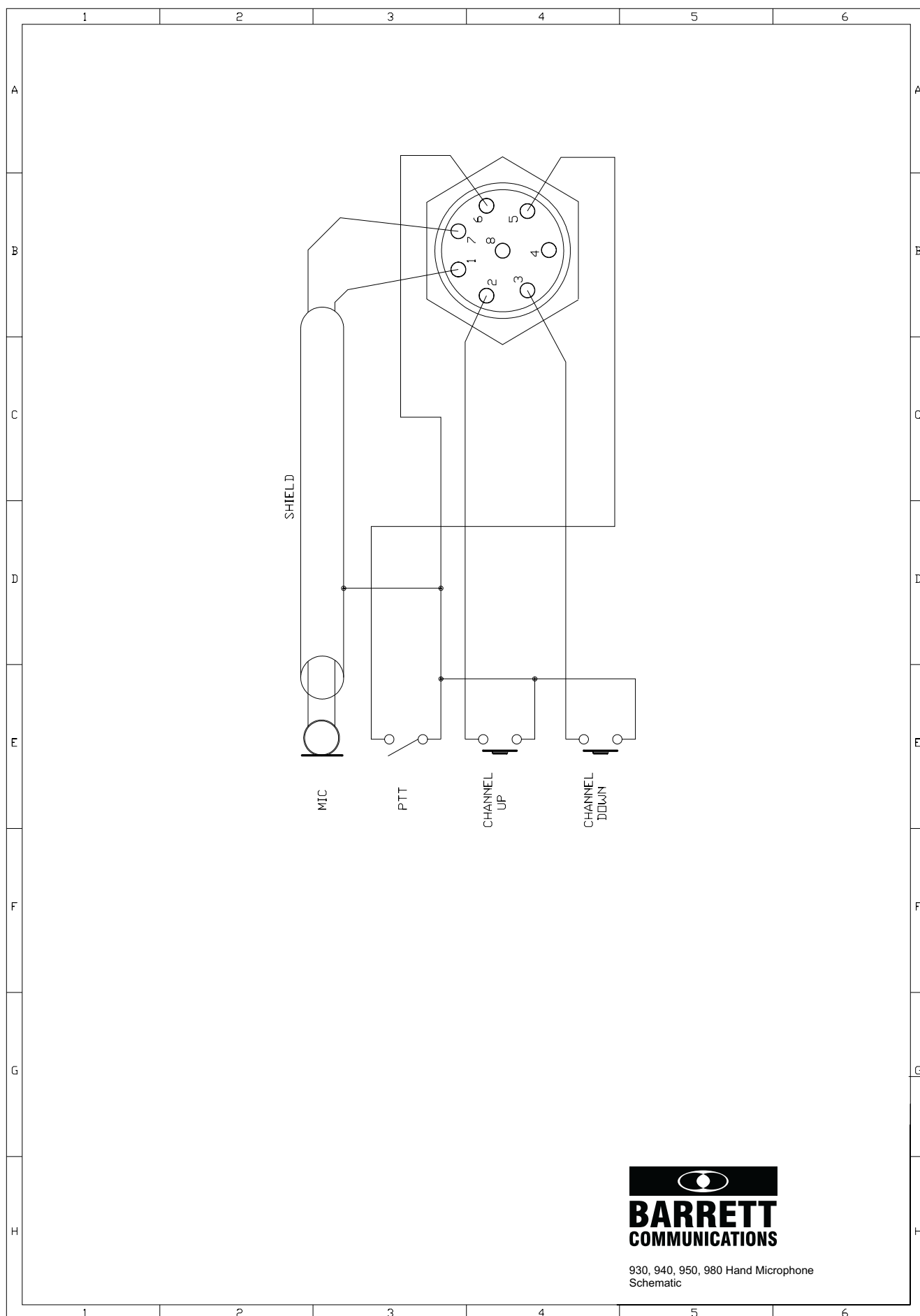
Knob R/Head BC Only	4681
LBL Microphone Hand Held	5928
M/work R/Head Cradle BC550/530	8425
Knob Black S151/250	5410
Knob Black Cap C151	5412
Membrane Keypad BC950 Only	5549
LBL -950 F/P	5903
LBL -VERT. LED F/P	5907
LBL -BARRETT LOGO F/P	5960
Plastic Front/Pnl Remote Head	8403
Plastic Back Panel Remote Head	8404
M/Work Bracket BC900 R/Head	8424
M/work R/Head Knob Bracket	8426
Loom DB9 Remote Head 930/950	9092
900series Remote Head PCB Assy	9916.001
Acc-Cable R/Head interface	BCA50000
Acc-Cradle Suit 530/550	BCA50001
Screw M4x14 Phillips/C/sunk	4599
Capstan Cradle	5709
M/work BC550/530 Cradle Main	8420
M/work Cradle Clip BC550	8430
Acc-Cable Power Lead	BCA50002
Acc-Microphone hand held	BCA50003
Acc-External Speaker	BCA50011
I/C PALCE 16V8Q-25PC	2750S
I/C 27 C 512	2772S
Screw M3x5 Pan 1A	4605
Screw M3x8 Black Pan Phillips	4637S
Washer M3 Nylon (S)	4649BS
Feet Rubber Push On 20m x 10mm	5955
M/Work Cover Plate RF/Audio	8422
Cover 900 Series Top Only	8390
Cover 900 Series Bottom Only	8390.1
LBL -950 F/P	5903
LBL -BARRETT LOGO F/P	5960
Loom RF/Audio To PA 26Way	9083
500/900series Rmt Front Panel	9640
Plastic Front Panel Blank	8402
950 Micro TCXO PCB Assy Ver 1	9929.001
Coax Link Cbl 900MICRO-RFA L01	900C71A2-1
Coax Link Cbl 900MICRO-RFA L02	900C71A2-2
Coax Link Cbl 900MICRO-RFA CIO	900C71A2-C
BC900 RF/AUDIO PCB ASSY COMP	9933.002
Coax Link Cbl 900RFA-PA Rx/Tx	900C71A2-R
930/950 PA PCB+Chassis Compl	9935.002
900 Common PA PCB Assy Ver2	9934.002
900 Xceiver Chassis Machined	900M94A1
Mwork 900 Mchd Side Plate Left	900M35A4-L
Mwork 900 Mchd Side Plate Rigt	900M35A4-R

BARRETT 950M HF TRANSCEIVER (HI STAB)
FINAL ASSEMBLY PARTS LIST

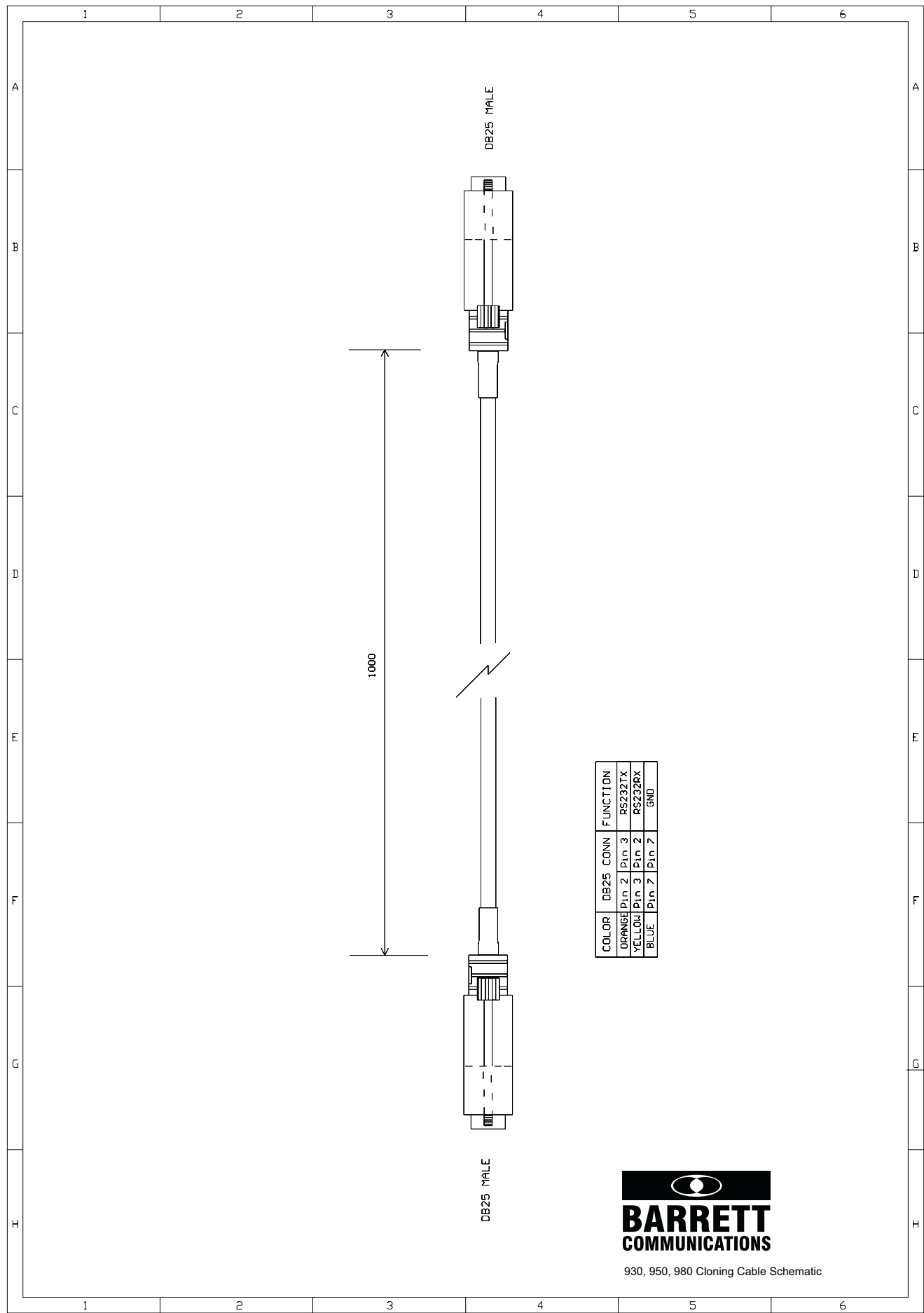
Assembly No: BC95004	Issue1	Sheet 1 of 1
Description	Barrett P/N	
Acc-Cable Power Lead	BCA50002	
I/C PALCE 16V8Q-25PC	2750S	
I/C 27 C 512	2772S	
Screw M3x5 Pan 1A	4605	
Screw M3x8 Black Pan Phillips	4637S	
Washer M3 Nylon (S)	4649BS	
Feet Rubber Push On 20m x 10mm	5955	
M/Work Cover Plate RF/Audio	8422	
Cover 900 Series Top Only	8390	
Cover 900 Series Bottom Only	8390.1	
Screw M3x8 Z/P CSK 1A	4602	
Screw M3 x 4mm Pan 1A	4613	
Nut M3 Hex Z/P	4621	
Screw M6x12 Pan 1A (S)	4626S	
Screw M4x8 Black C/Sunk R/H	4636	
Washer M3 Shakeproof	4641	
LBL -950 F/P	5903	
LBL -BARRETT LOGO F/P	5960	
500/900series Rmt Front Panel	9640	
Plastic Front Panel Blank	8402	
950 Micro TCXO PCB Assy Ver1	9929.001	
Coax Link Cbl 900MICRO-RFA L01	900C71A2-1	
Coax Link Cbl 900MICRO-RFA L02	900C71A2-2	
Coax Link Cbl 900MICRO-RFA CIO	900C71A2-C	
BC900 RF/AUDIO PCB ASSY COMP	9933.002	
Coax Link Cbl 900RFA-PA Rx/Tx	900C71A2-R	
930/950 PA PCB+Chassis Compl	9935.002	
900 Common PA PCB Assy Ver2	9934.002	
900 Xceiver Chassis Machined	900M94A1	
Mwork 900 Mchd Side Plate Left	900M35A4-L	
Mwork 900 Mchd Side Plate Rigt	900M35A4-R	

**BARRETT 980 GMDSS HF TRANSCEIVER
FINAL ASSEMBLY PARTS LIST**
Assembly No: BC98000
Issue1
Sheet 1 of 1
Description
Barrett P/N

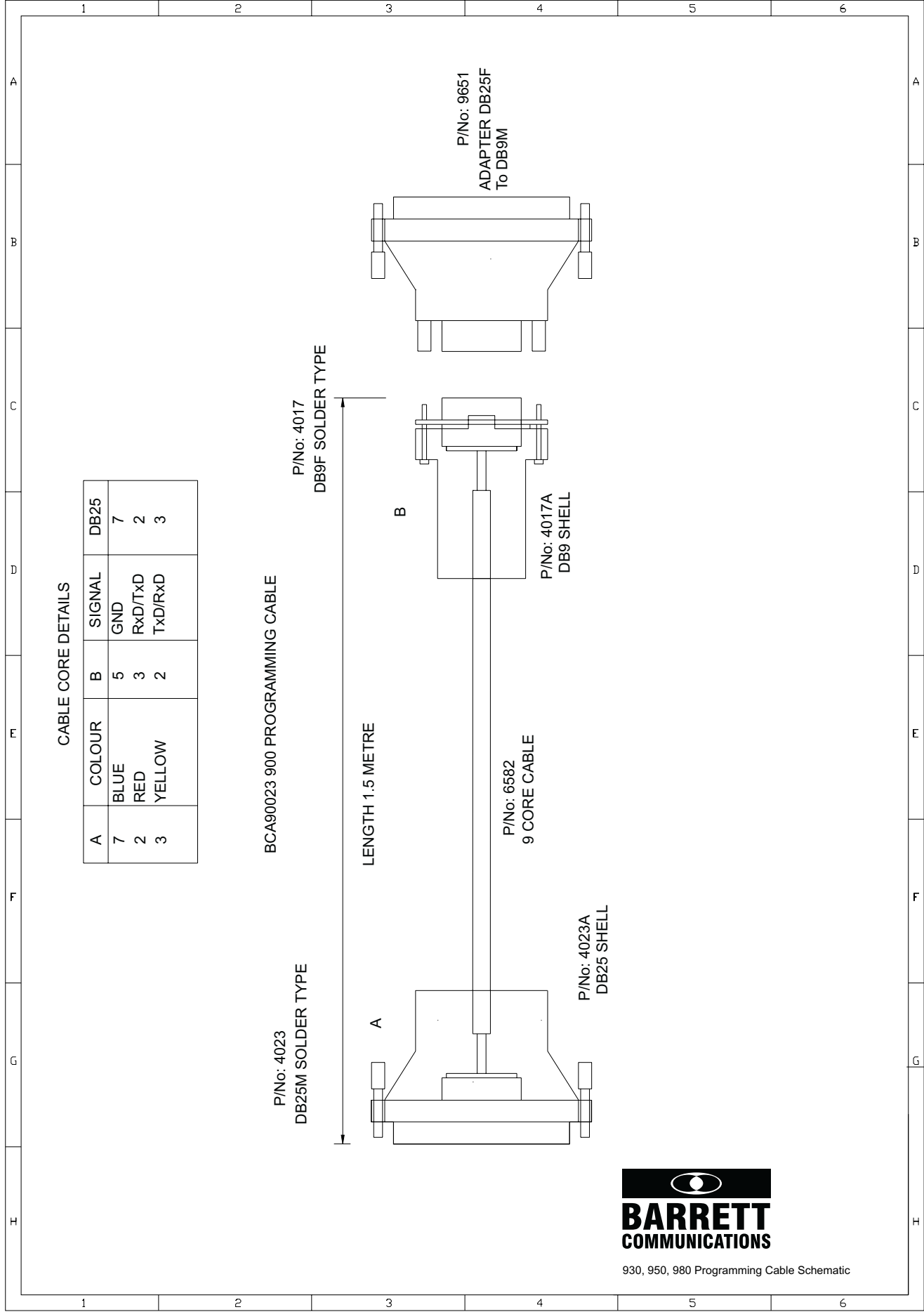
LBL Microphone Hand Held	5928
Acc-Cable Power Lead	BCA50002
Acc-Microphone hand held	BCA50003
I/C PALCE 16V8Q-25PC	2750S
I/C 27 C 512	2772S
Screw M3x5 Pan 1A	4605
Screw M3x8 Black Pan Phillips	4637S
Washer M3 Nylon (S)	4649BS
Feet Rubber Push On 20m x 10mm	5955
M/Work Cover Plate RF/Audio	8422
Cover 900 Series Top Only	8390
Cover 900 Series Bottom Only	8390.1
Screw M3x8 Z/P CSK 1A	4602
Screw M3 x 4mm Pan 1A	4613
Nut M3 Hex Z/P	4621
Screw M6x12 Pan 1A (S)	4626S
Screw M4x8 Black C/Sunk R/H	4636
Washer M3 Shakeproof	4641
Lbl Rear Main 980 Xceiver	5959
Loom RF/Audio To PA 26Way	9083
BC980 Front Panel Complete	9906.001
Knob Black S151/250	5410
Knob Black Cap C151	5412
Membrane Keypad BC980	5554
LBL -980 F/P	5904
LBL -HORIZ. LED F/P -980	5915
LBL -BARRETT LOGO F/P	5960
Plastic Front Panel Local	8401
Loom RF/Audio To Frt/Pnl	9090
BC950/930 Front Panel PCB Assy	9904.001
BC900 R/F/Audio 500hz Option	9919
980 Micro DTCXO PCB Assy Ver1	9939.001
Coax Link Cbl 900MICRO-RFA L01	900C71A2-1
Coax Link Cbl 900MICRO-RFA L02	900C71A2-2
Coax Link Cbl 900MICRO-RFA CIO	900C71A2-C
BC900 RF/AUDIO PCB ASSY COMP	9933.002
980 PA PCB+Chassis Compl Assy	9937.002
900 Common PA PCB Assy Ver2	9934.002
Fan Unit 900 Series 001	BCA90007

900 Hand Microphone Schematic

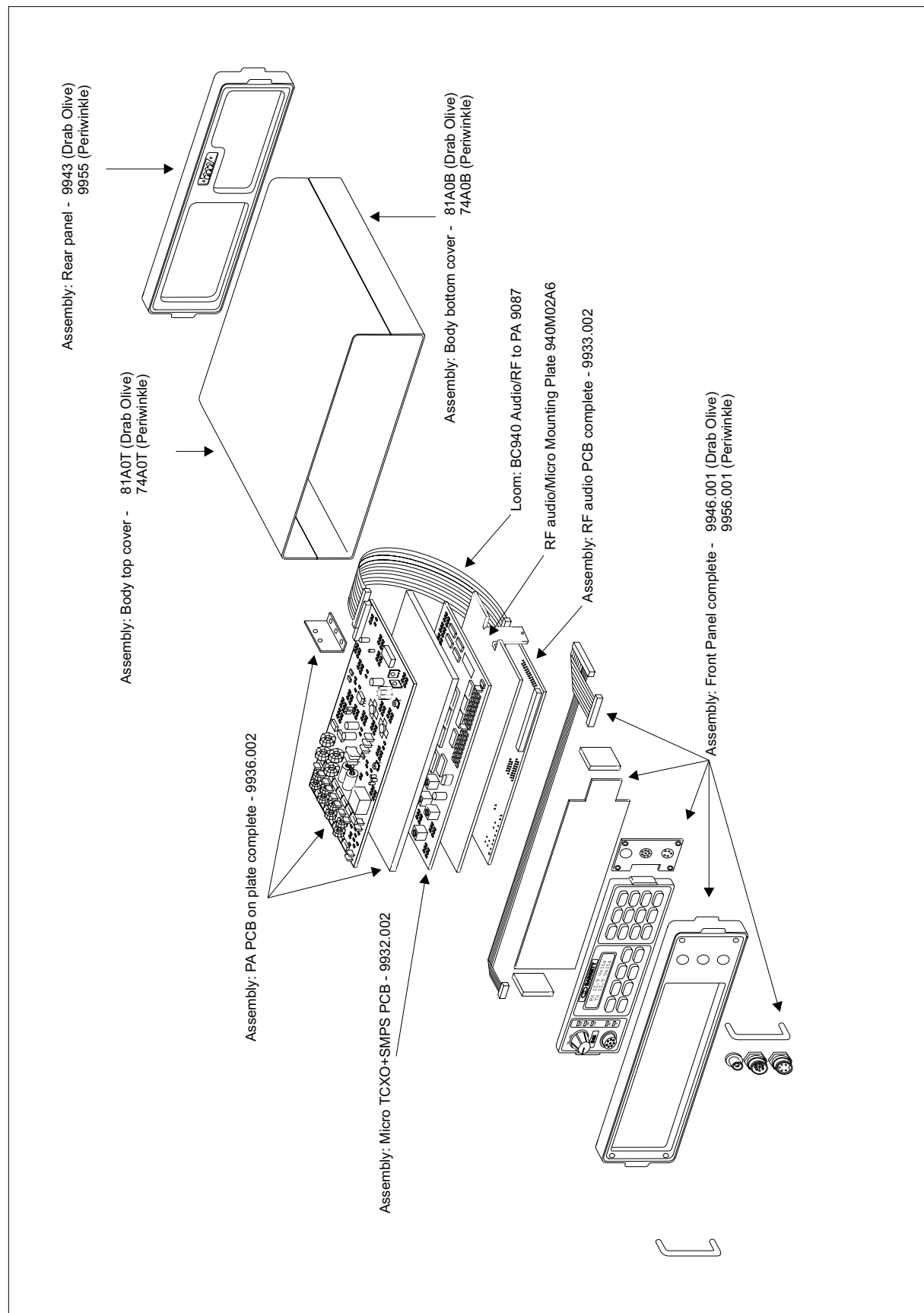
900 Cloning Cable Schematic



900 Programming Cable Schematic



940 Chassis Exploded Diagram

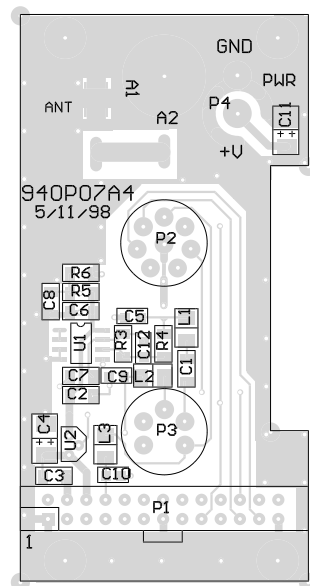


BARRETT 940 PORTABLE HF TRANSCEIVER (DRAB OLIVE)
FINAL ASSEMBLY PARTS LIST
Assembly No: BC94000
Issue1
Sheet 1 of 1
Description
Barrett P/N

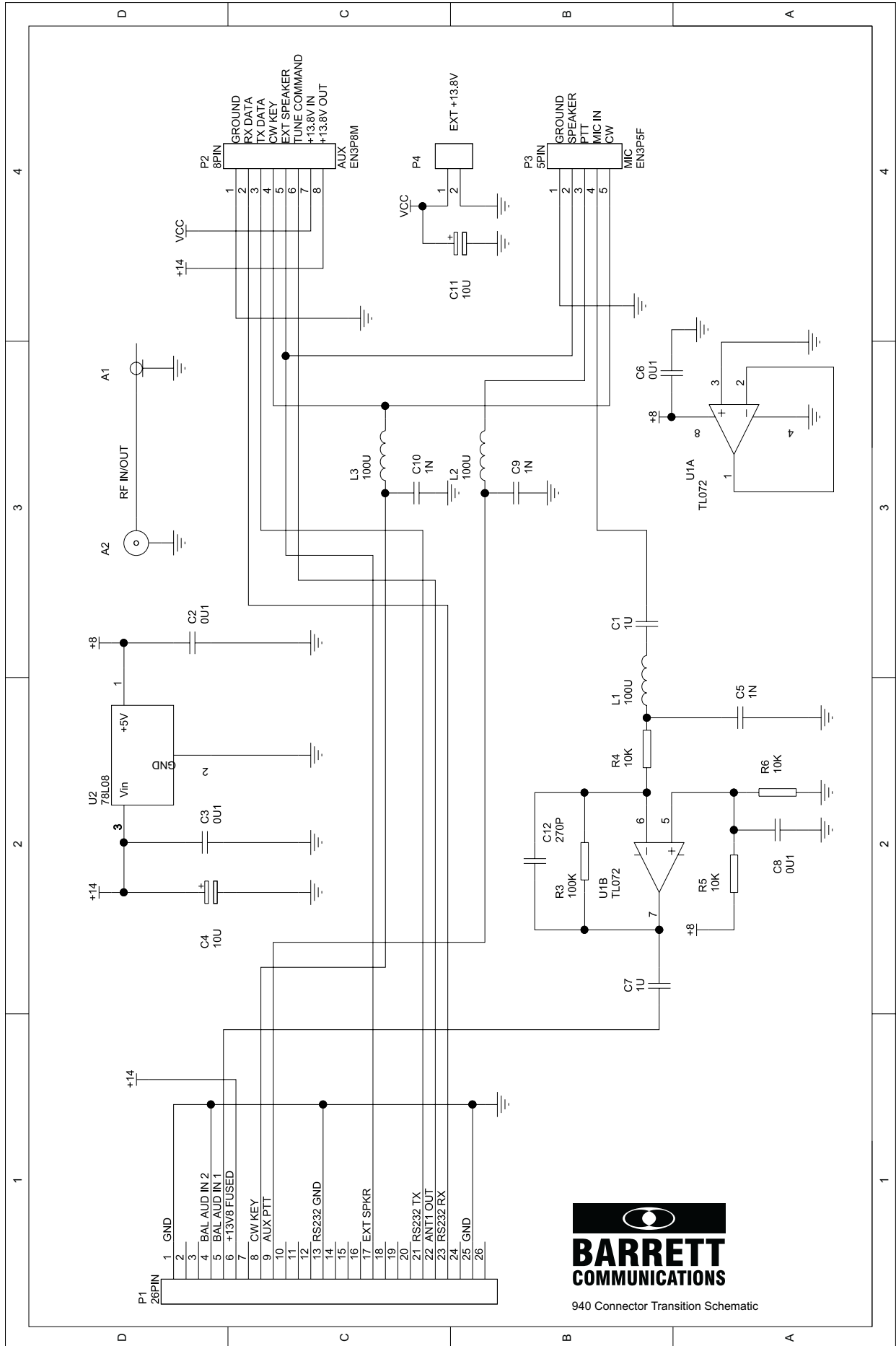
Washer Seal O Ring BC940	4596
Screw M4x14 Phillips/C/sunk	4599
Screw M4 x 173mm BC940 Only	4619
Capstan Cradle	5709
940 Cover Set (Drab Olive) - Top	940M81A0T
940 Cover Set (Drab Olive) - Bottom	940M81A0B
I/C PALCE 16V8Q-25PC	2750S
I/C 27 C 512	2772S
Screw M3x12 Pan 1A	4607
Coax Link Cbl 900MICRO-RFA CIO	900C71A2-C3
Loom BC940 Audio/RF To P.A.	9087
940 Micro TCXO+SMPS PCB Assy	9932.002
Coax Link Cbl 900MICRO-RFA L01	900C71A2-14
Coax Link Cbl 900MICRO-RFA CIO	900C71A2-C4
BC900 RF/Audio PCB Assy Complete	9933.002
Coax Link Cbl 900RFA-PA Rx/Tx	900C71A2-R4
940 PA PCB on Plate Assy Complete	9936.002
940 PA Mounting Plate	940M03A6
900 Common PA PCB Assy Ver2	9934.002
BC940 Rear Panel Assy (Drab Olive)	9943
BC940 Front Panel Assy Complete (Drab Olive)	9946.001
Knob Black S151/250	5410
Knob Black Cap C151	5412
940 Mounting Plate RF/Micro V2	940M02A6

**BARRETT 940 PORTABLE HF TRANSCEIVER (PERIWINKLE)
FINAL ASSEMBLY PARTS LIST**
Assembly No: BC94001
Issue1
Sheet 1 of 1
Description
Barrett P/N

Washer Seal O Ring BC940	4596
Screw M4x14 Phillips/C/sunk	4599
Screw M4 x 173mm BC940 Only	4619
Capstan Cradle	5709
940 Cover Set (Drab Olive) - Top	940M74A0T
940 Cover Set (Drab Olive) - Bottom	940M74A0B
I/C PALCE 16V8Q-25PC	2750S
I/C 27 C 512	2772S
Screw M3x12 Pan 1A	4607
Coax Link Cbl 900MICRO-RFA CIO	900C71A2-C3
Loom BC940 Audio/RF To P.A.	9087
940 Micro TCXO+SMPS PCB Assy	9932.002
Coax Link Cbl 900MICRO-RFA L01	900C71A2-14
Coax Link Cbl 900MICRO-RFA CIO	900C71A2-C4
BC900 RF/Audio PCB Assy Complete	9933.002
Coax Link Cbl 900RFA-PA Rx/Tx	900C71A2-R4
940 PA PCB on Plate Assy Complete	9936.002
940 PA Mounting Plate	940M03A6
900 Common PA PCB Assy Ver2	9934.002
BC940 Rear Panel Assy (Periwinkle)	9943
BC940 Front Panel Assy Complete (Periwinkle)	9946.001
Knob Black S151/250	5410
Knob Black Cap C151	5412
940 Mounting Plate RF/Micro V2	940M02A6

940 Connector Transition PCB Overlay

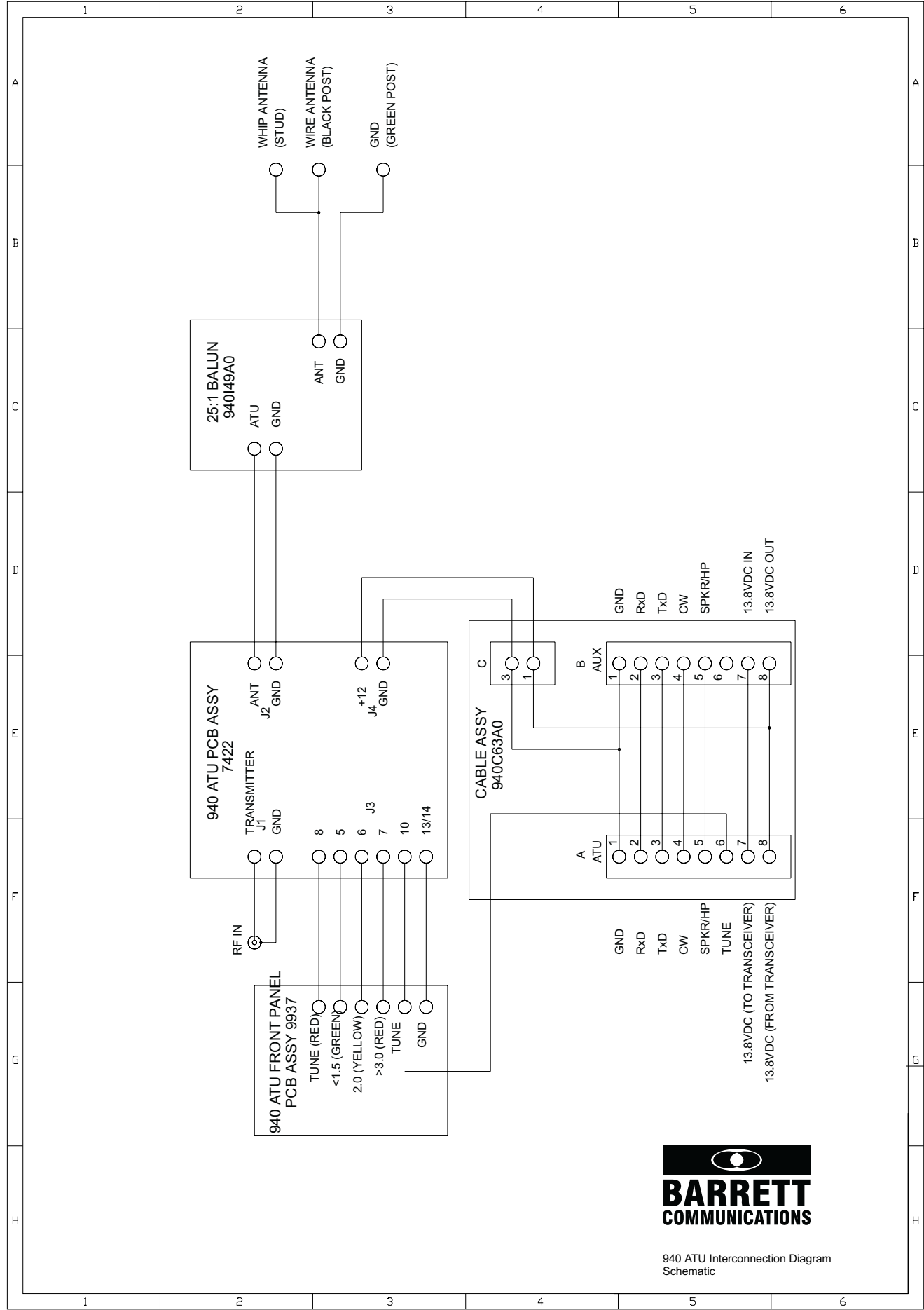
940 Connector Transition Schematic



BC 940 TRANSITION PCB ASSY**940P07A4.PCB****Assembly P/N 9945****Issue 1****Sheet 1 of 1****Component
Designator****Description****Barrett P/N**

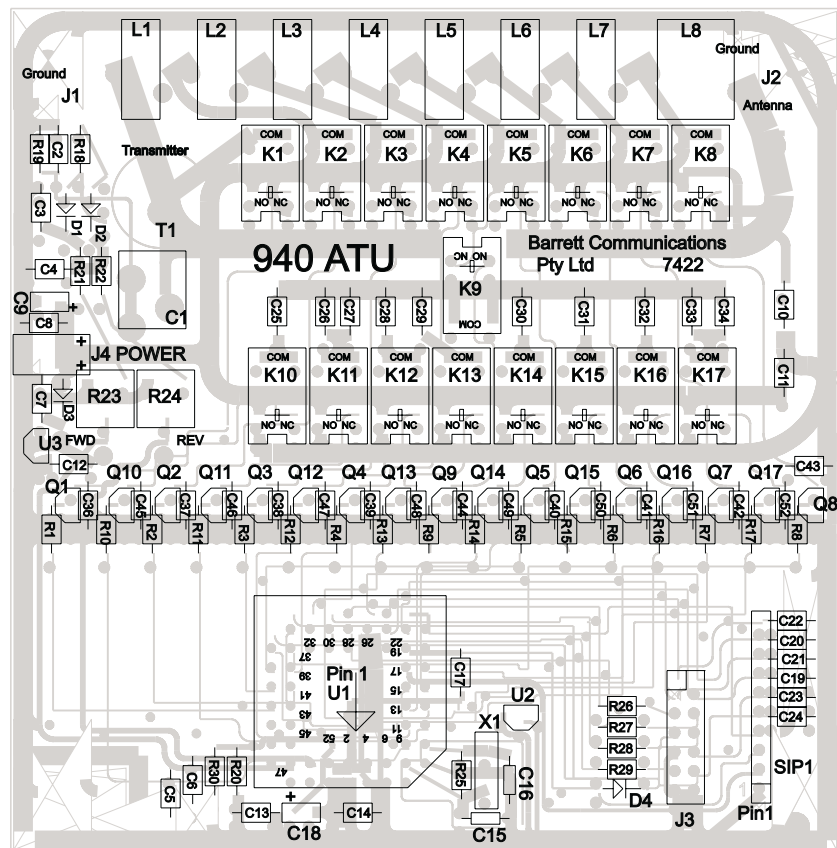
C1	Chip Cap 1uF	0908T
C2	Chip Cap 100nf	0916T
C3	Chip Cap 100nf	0916T
C4	CAP SMD TANT 10uF	1580T
C5	CAP SMD 0805 1nF	0915T
C6	CAP SMD 1206 0.1uF	0916T
C7	Chip Cap 1uF	0908T
C8	Chip Cap 100nf Smd	0916T
C9	CAP SMD 0805 1nF	0915T
C10	CAP SMD 0805 1nF	0915T
C11	Cap Tant 10uf 16v	1580T
C12	Chip Cap 270pf	0911T
R3	Res 100K Smd	0170T
R4	RES SMD 1206 10K	0150T
R5	RES SMD 1206 10K	0150T
R6	RES SMD 1206 10K	0150T
L1	CHOKE SMD 100uH	3601T
L2	CHOKE SMD 100uH	3601T
L3	CHOKE SMD 100uH	3601T
P1	Plug 13 Pin Double Row	4108
P2	Plug panel mnt 8pin	4165
P3	Socket panel mnt 5pin	4167
U1	I/C TL072 Smd	2737
U2	I/C 78L08 TO92 Voltage Reg	2477
	940 Front Panel Transition PCB	940P07A4
	Cap for panel mnt connectors	4169

940 ATU Interconnection Diagram



940 ATU Interconnection Diagram
Schematic

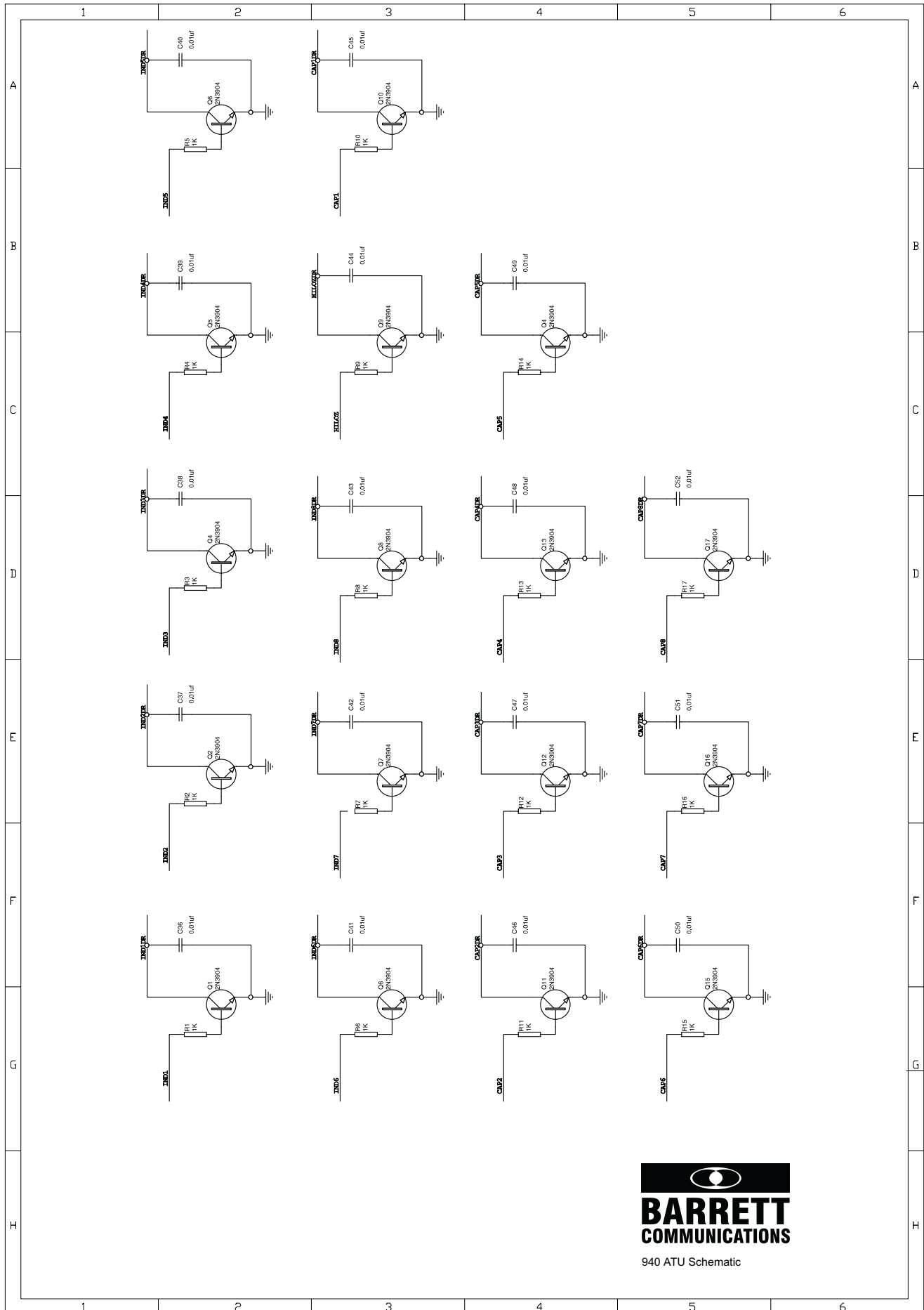
940 Automatic Antenna Tuner PCB Overlay Barrett P/N BCA94009





940 automatic antenna tuner PCB schematic

Barrett P/N BCA94009

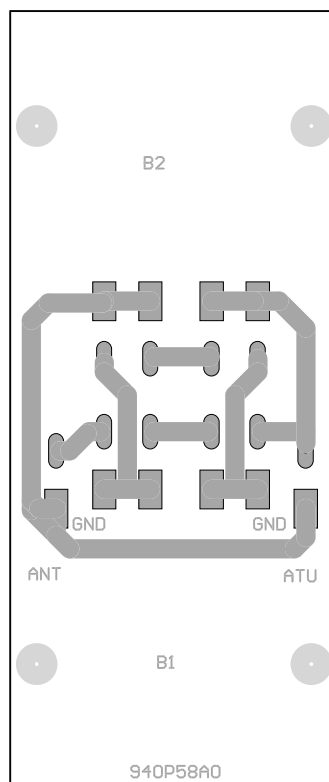


**BARRETT 940 AUTOMATIC ANTENNA TUNER (DRAB OLIVE)
FINAL ASSEMBLY PARTS LIST**

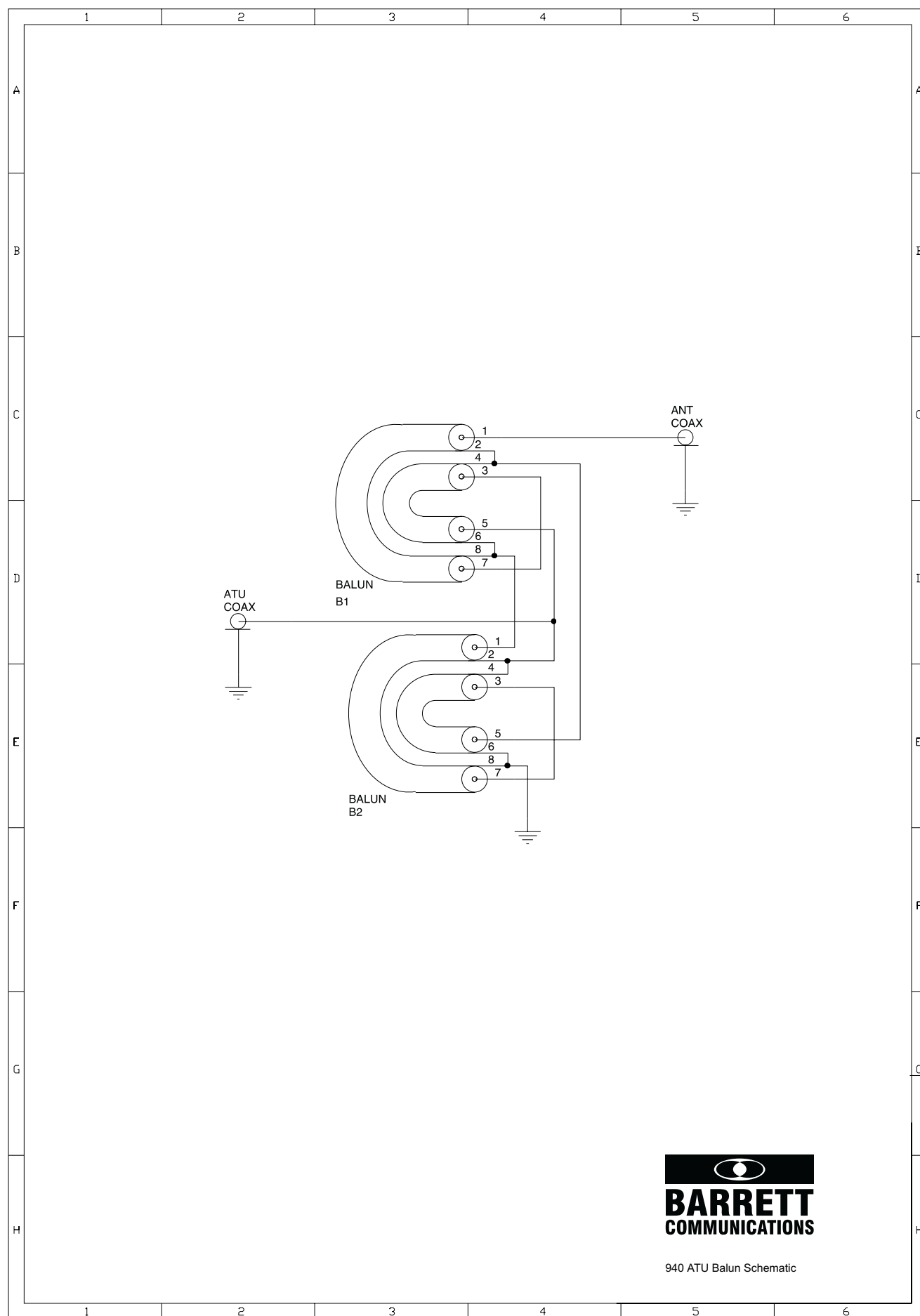
Assembly No: BCA94009	Issue1	Sheet 1 of 1
Description	Barrett P/N	
10m Wire Antenna Kit 940 Manpk	7350	
Cable Assy 940ATU Control	9094	
Cable Assy 940ATU RF	9095	
Screw M4 x 173mm BC940 Only	4619	
940 ATU Main Housing Assy (Drab Olive)	9100	
940 ATU Rear Panel Assy (Drab Olive)	9938	
940 ATU PCB Assy	7423	
940 ATU Front Panel Assy (Drab Olive)	9101	
LBL 940ATU LED (Drab Olive)	5922	
940 ATU Front Panel PCB assy	9937	
Cable Assy 940ATU Front Panel	940C63A0	
940 ATU Machined Front Panel (Drab Olive)	940M82A1	
940 ATU Chassis Ver 2	940M85A0	
940 ATU Whip Ant Mount Base	940M48A1	
940 ATU Balun 25:1	940I49A0	
940 ATU Balun 25:1	940I49A0	

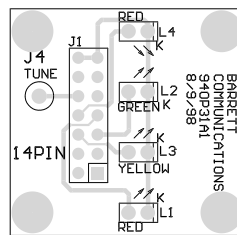
**BARRETT 940 AUTOMATIC ANTENNA TUNER (PERIWINKLE)
FINAL ASSEMBLY PARTS LIST**

Assembly No: BCA94024		Issue1	Sheet 1 of 1
Description		Barrett P/N	
10m Wire Antenna Kit 940 Manpk		7350	
Cable Assy 940ATU Control		9094	
Cable Assy 940ATU RF		9095	
Screw M4 x 173mm BC940 Only		4619	
940 ATU Main Housing Assy (Periwinkle)		9102	
940 ATU Rear Panel Assy (Periwinkle)		9957	
940 ATU PCB Assy		7423	
940 ATU Front Panel Assy (Periwinkle)		9103	
LBL 940ATU LED (Periwinkle)		5923	
940 ATU Front Panel PCB assy		9937	
Cable Assy 940ATU Front Panel		940C63A0	
940 ATU Machined Front Panel (Periwinkle)		940M75A1	
940 ATU Chassis Ver 2		940M85A0	
940 ATU Whip Ant Mount Base		940M48A1	
940 ATU Balun 25:1		940I49A0	

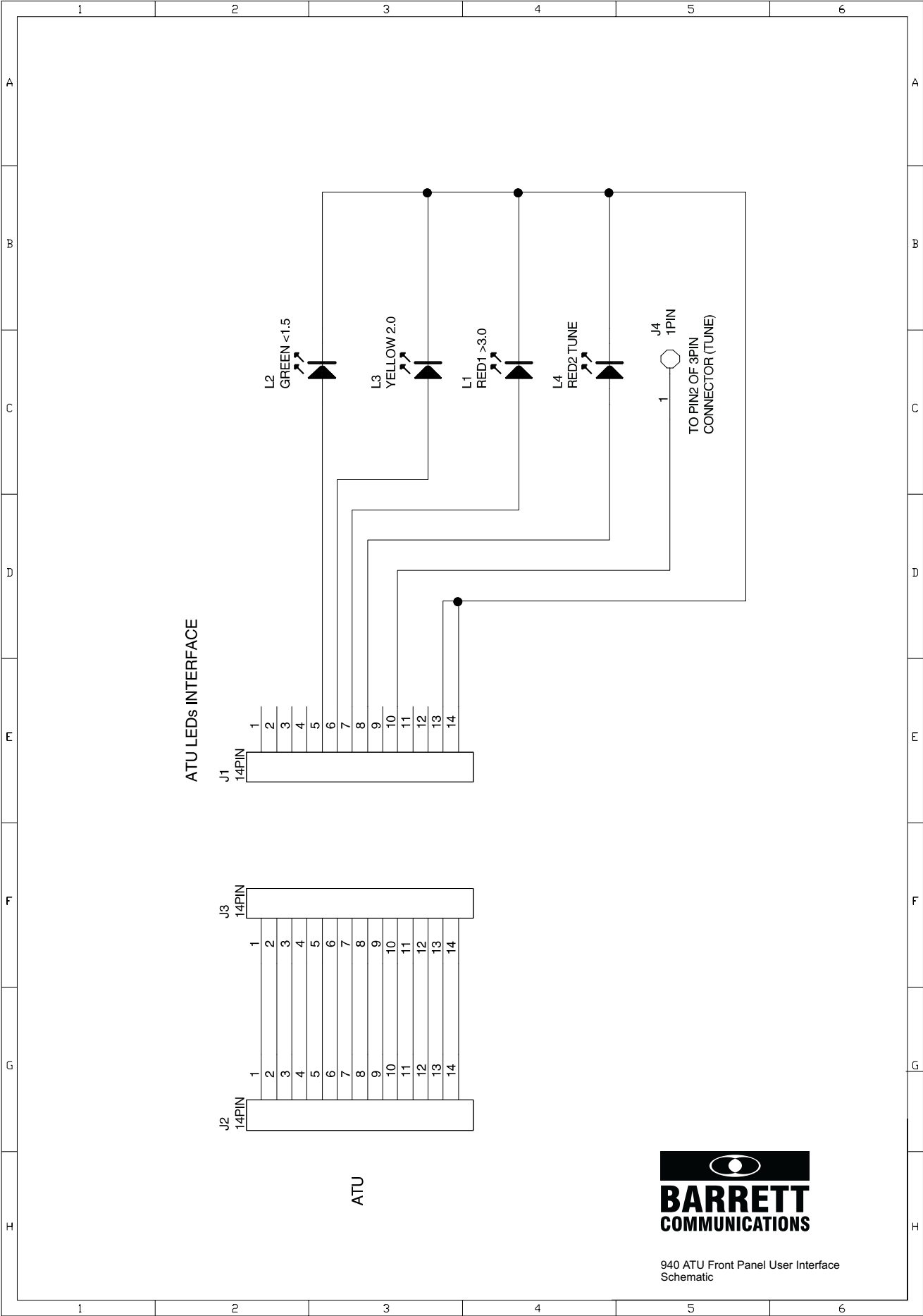
940 ATU 25:1 Balun Mounting PCB Overlay

940 ATU 25:1 Balun Schematic



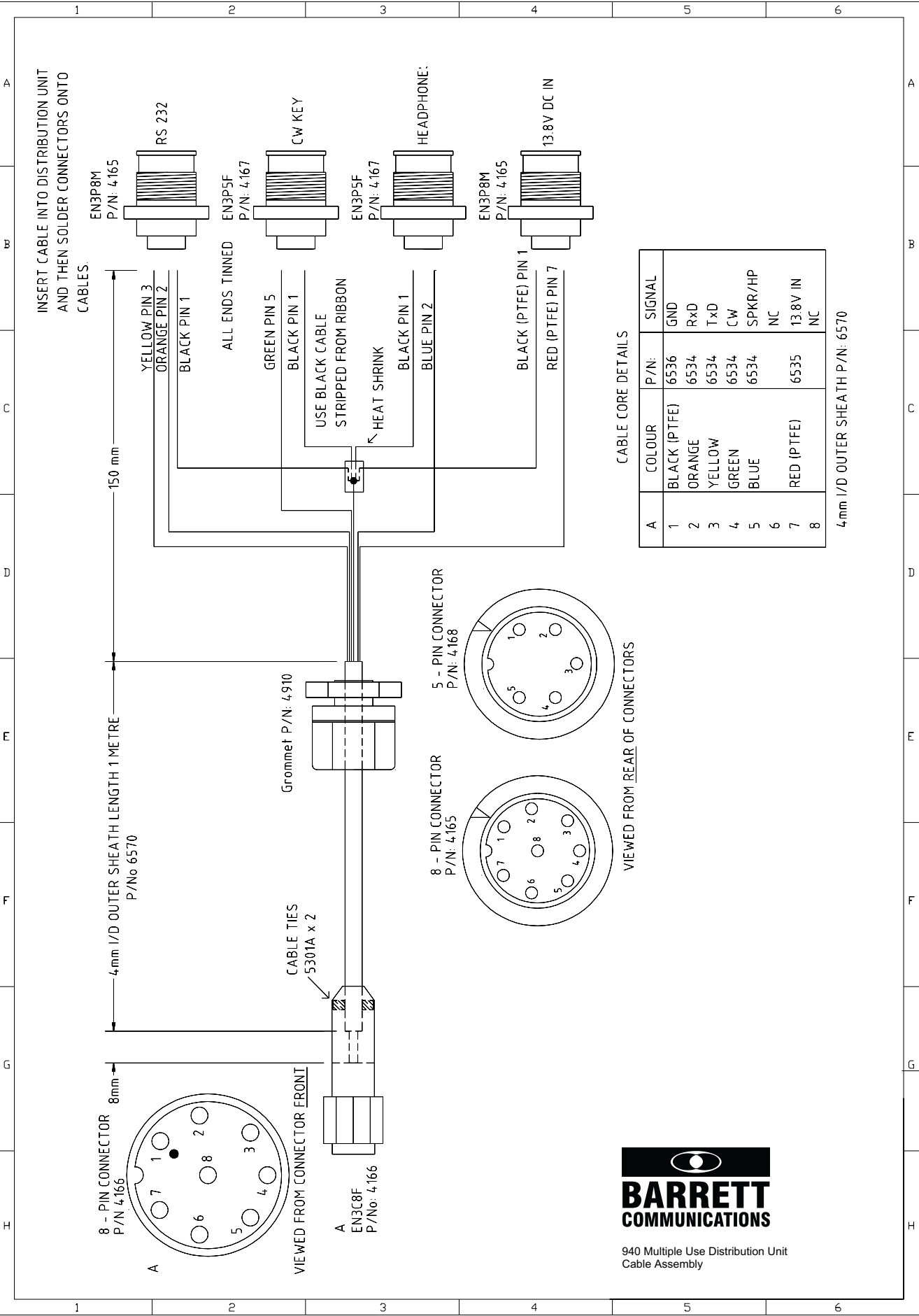
940 ATU Front Panel User Interface PCB Overlay

940 ATU Front Panel User Interface Schematic



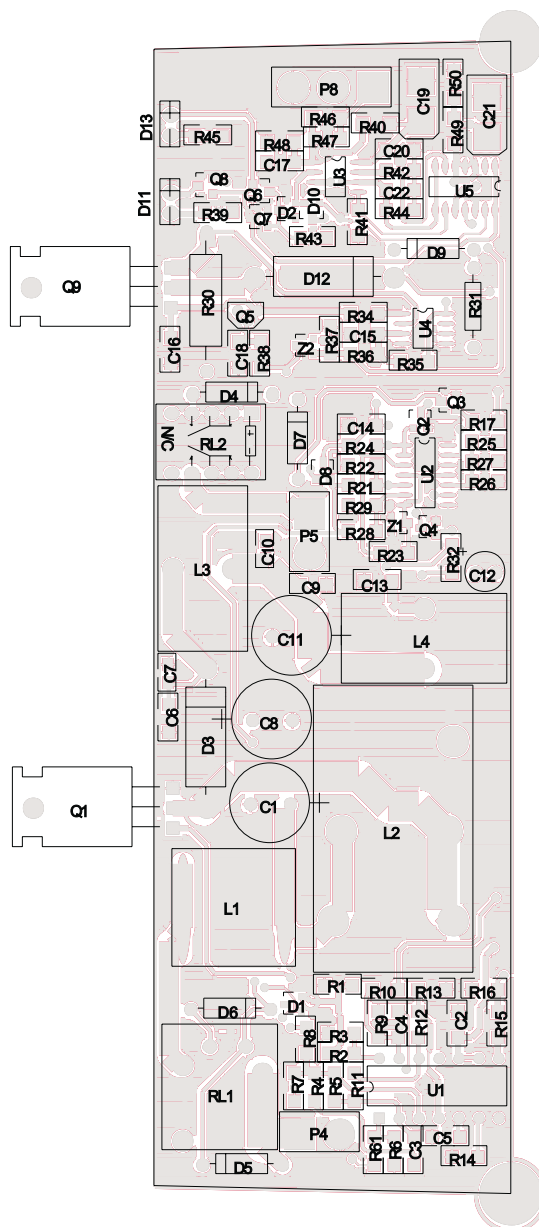
940 Multiple-Use Distribution Unit Schematic

Barrett P/N BCA94010



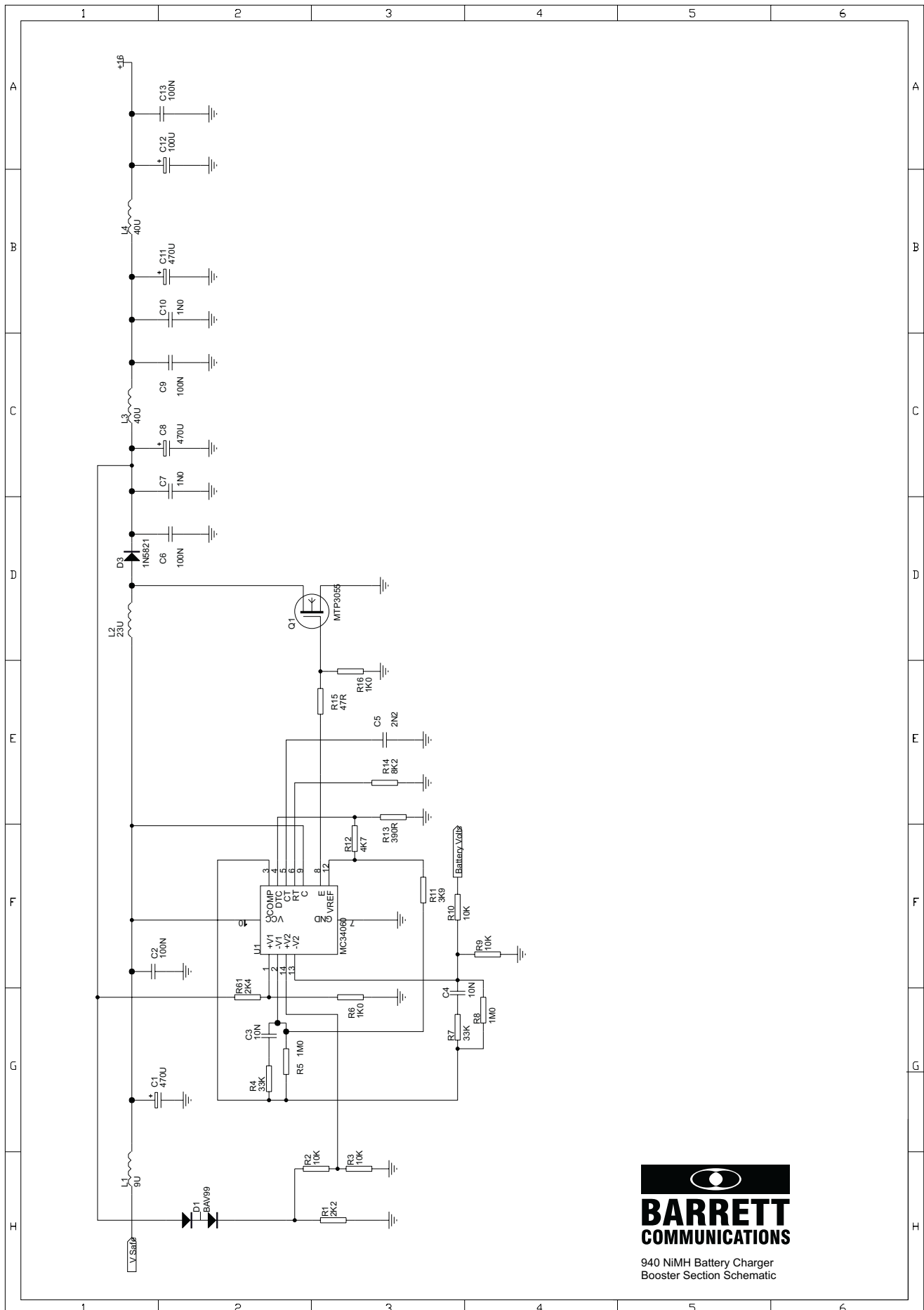
BARRETT 940 MULTIPLE-USE DISTRIBUTION UNIT PARTS LIST**Assembly P/N BCA94010****Issue 1****Sheet 1 of 1****Description****Barrett P/N**

Plug panel mnt 8pin	4165
Socket panel mnt 5pin	4167
Cap for panel mnt connectors	4169
Screw M3x6 CSK POZI BLACK	4609
LBL 940 Break-out Box	5994
Mwork Enclosure 940 BrkoutBox	940M60A0
Cable Assy 940 Dist Unit	940C64A0
Socket cable mnt 8pin	4166
Grommet Straight Thro	4910
Cable Tie Black 100mm	5301A
Cable 10-way	6534
Wire PTFE Black 19/0.16mm	6536
Cable Wire 7/.2mm Black	6559
Sleeving 4mm ID	6570



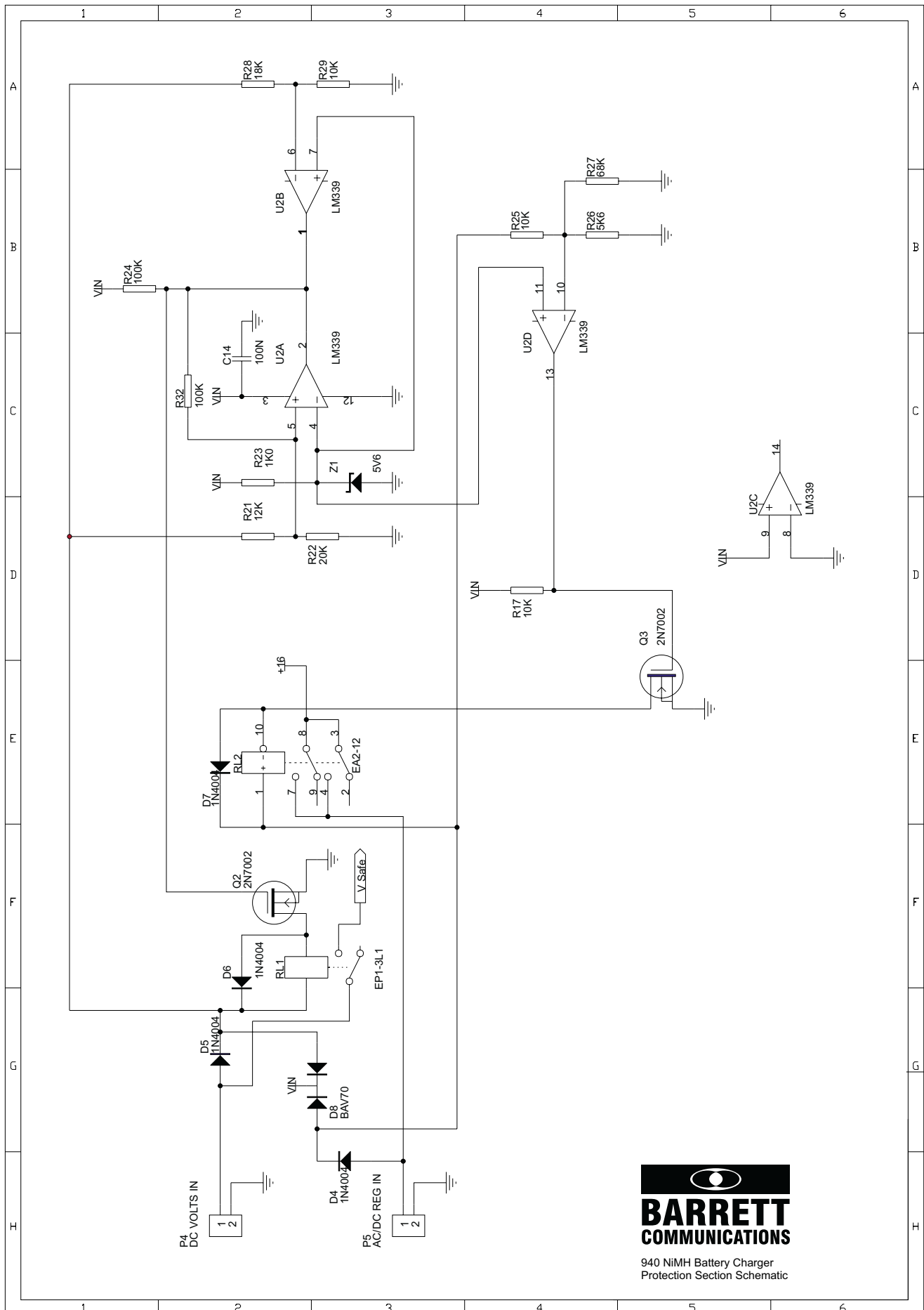
940 Charge reg. 13Ah/12V DC input PCB Schematic

Barrett P/N BCA94021



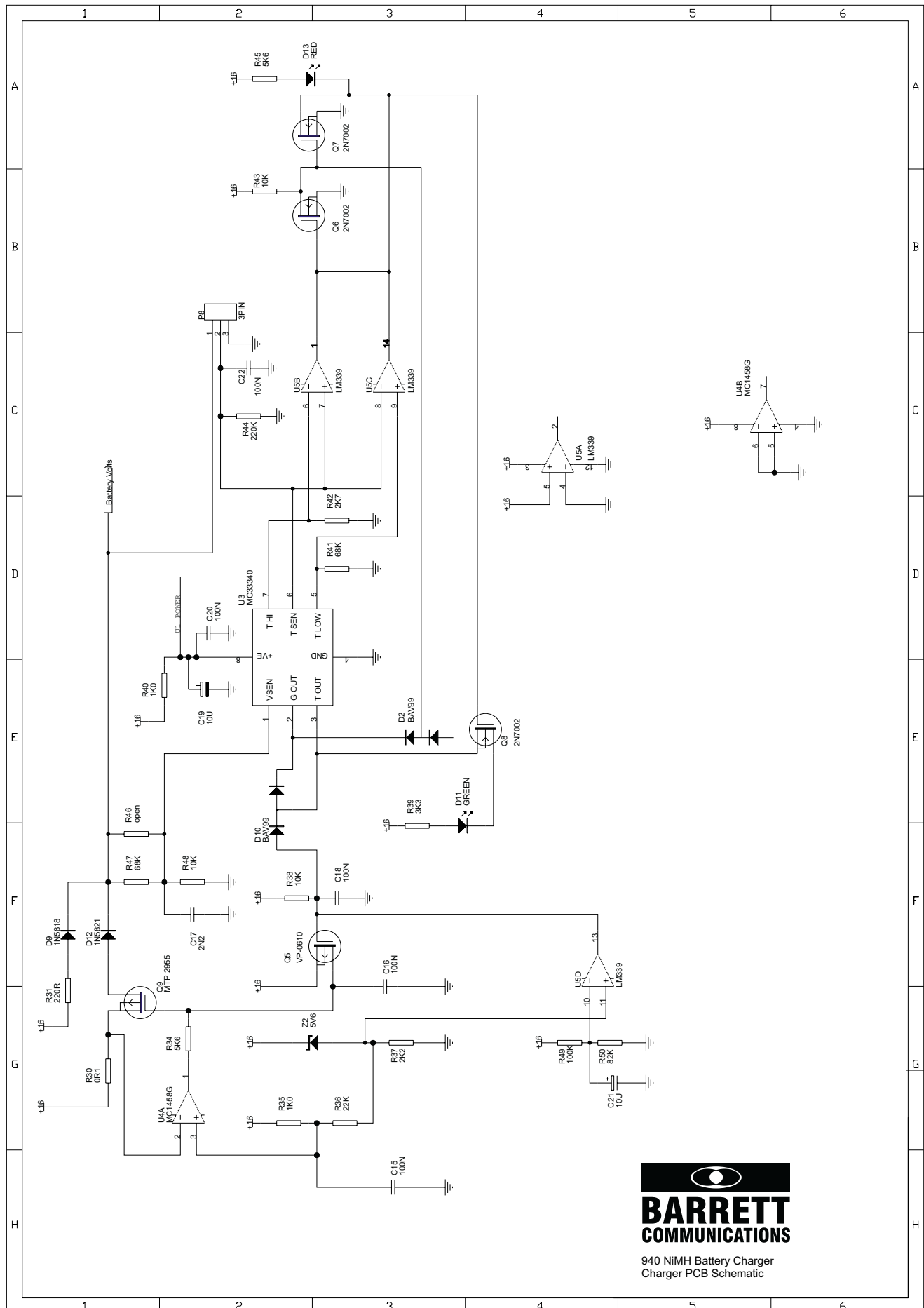
940 Charge Reg. 13Ah/12V DC input PCB Schematic

Barrett P/N BCA94021



940 Charge Reg. 13Ah/12V DC input PCB Schematic

Barrett P/N BCA94021



BARRETT 940 NiMH Battery Charger PCB**900P52A1.PCB****Assembly P/N 9954****Issue 1****Sheet 1 of 3****Component
Designator****Description****Barrett P/N**

C1	CAP ELECTRO 470U 25V	1756
C2	CAP SMD 1206 0U1	0916
C3	CAP SMD 1206 10N	0951
C4	CAP SMD 1206 10N	0951
C5	CAP SMD 1206 2N2	0937
C6	CAP SMD 1206 0U1	0916
C7	CAP SMD 0805 1N0	0915
C8	CAP ELECTRO 470U 25V	1756
C9	CAP SMD 1206 0U1	0916
C10	CAP SMD 0805 1N0	0915
C11	CAP ELECTRO 470U 25V	1756
C12	CAP ELECTRO 100U 25V	1637
C13	CAP SMD 1206 0U1	0916
C14	CAP SMD 1206 0U1	0916
C15	CAP SMD 1206 0U1	0916
C16	CAP SMD 1206 0U1	0916
C17	CAP SMD 1206 2N2	0951
C18	CAP SMD 1206 0U1	0916
C19	CAP SMD TANT 10U	1580
C20	CAP SMD 1206 0U1	0916
C21	CAP SMD TANT 10U	1580
C22	CAP SMD 1206 0U1	0916
D1	DIODE BAV99 SMD	3317
D2	DIODE BAV99 SMD	3317
D3	DIODE 1N5821	3322
D4	DIODE 1N4004	3303
D5	DIODE 1N4004	3303
D6	DIODE 1N4004	3303
D7	DIODE 1N4004	3303
D8	DIODE BAV70 SMD	3316
D9	DIODE 1N5818	3314
D10	DIODE BAV99 SMD	3317
D11	LED GREEN 5X2 RECT	2910
D12	DIODE 1N5821	3322
D13	LED RED 5X2 RECT	2910
L1	COIL 9U	3240
L2	COIL 23U	3230
L3	COIL 40U	3270
L4	COIL 40U	3270
Q1	FET MTP3055	2266
Q2	FET 2N7002 SMD	2282
Q3	FET 2N7002 SMD	2282

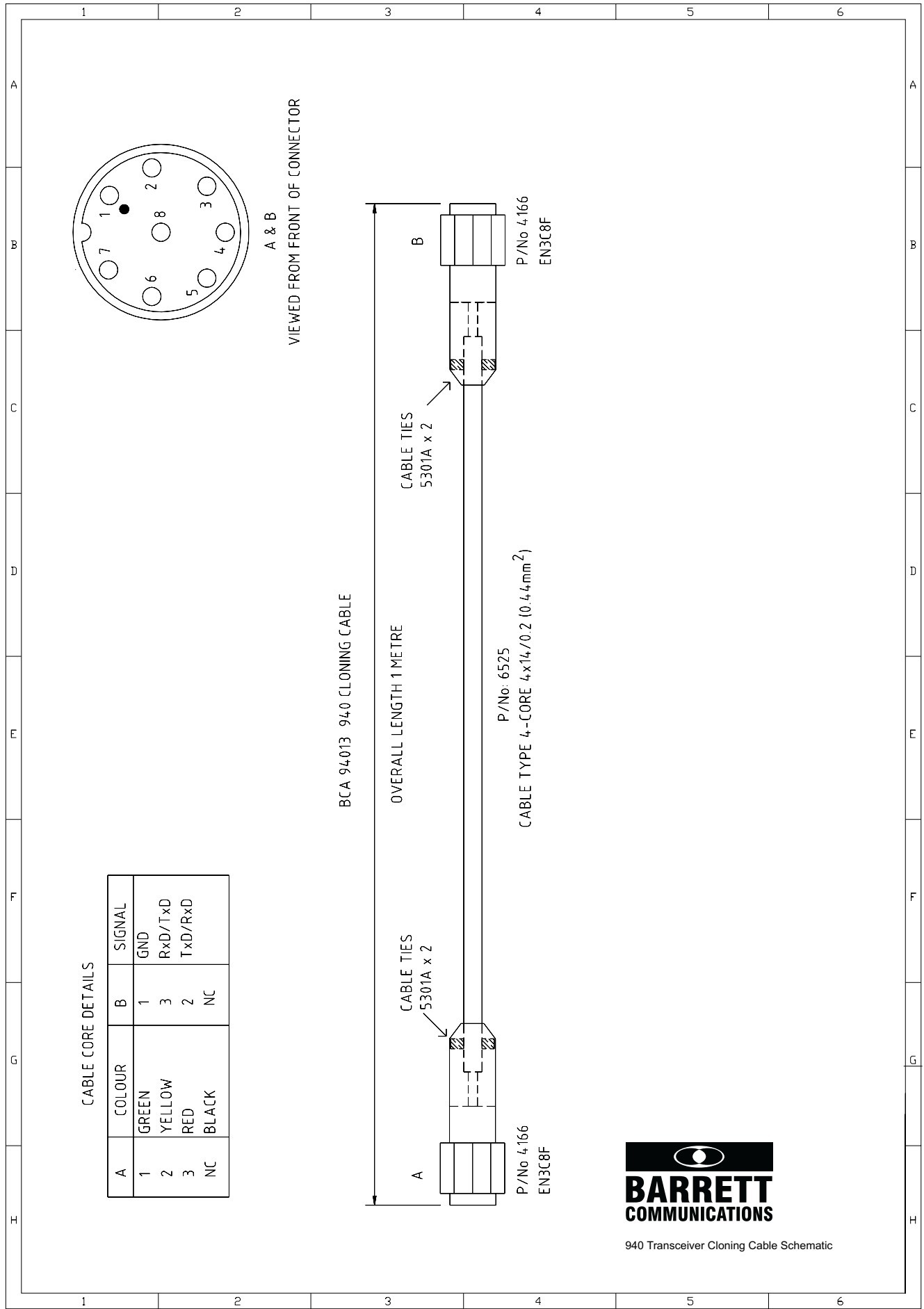
BARRETT 940 NiMH Battery Charger PCB**900P52A1.PCB****Assembly P/N 9954****Issue 1****Sheet 2 of 3****Component
Designator****Description****Barrett P/N**

Q5	FET VP-0610	2200
Q6	FET 2N7002 SMD	2282
Q7	FET 2N7002 SMD	2282
Q8	FET 2N7002 SMD	2282
Q9	FET MTP 2955	2265
R1	RES SMD 1206 2K2	0125
R2	RES SMD 1206 10K	0150
R3	RES SMD 1206 10K	0150
R4	RES SMD 1206 33K	0155
R5	RES SMD 1206 1M0	0178
R6	RES SMD 1206 1K0	0122
R7	RES SMD 1206 33K	0155
R8	RES SMD 1206 1M0	0178
R9	RES SMD 1206 10K	0150
R10	RES SMD 1206 10K	0150
R11	RES SMD 1206 3K9	0134
R12	RES SMD 1206 4K7	0128
R13	RES SMD 1206 390R	0120
R14	RES SMD 1206 8K2	0131
R15	RES SMD 1206 47R	0113
R16	RES SMD 1206 1K0	0122
R17	RES SMD 1206 10K	0150
R21	RES SMD 1206 12K	0149
R22	RES SMD 1206 20K	0010
R23	RES SMD 1206 1K0	0122
R24	RES SMD 1206 100K	0127
R25	RES SMD 1206 10K	0150
R26	RES SMD 1206 5K6	0129
R27	RES SMD 1206 68K	0158
R28	RES SMD 1206 18K	0152
R29	RES SMD 1206 10K	0150
R30	RES SMD 1206 0R1	0754
R31	RES SMD 1206 220R	0441
R32	RES SMD 1206 100K	0170
R34	RES SMD 1206 5K6	0129
R35	RES SMD 1206 1K0	0122
R36	RES SMD 1206 22K	0153
R37	RES SMD 1206 2K2	0125
R38	RES SMD 1206 10K	0150
R39	RES SMD 1206 3K3	0127
R40	RES SMD 1206 1K0	0122
R41	RES SMD 1206 68K	0158
R42	RES SMD 1206 2K7	0126

BARRETT 940 NiMH Battery Charger PCB**900P52A1.PCB****Assembly P/N 9954****Issue 1****Sheet 3 of 3****Component
Designator****Description****Barrett P/N**

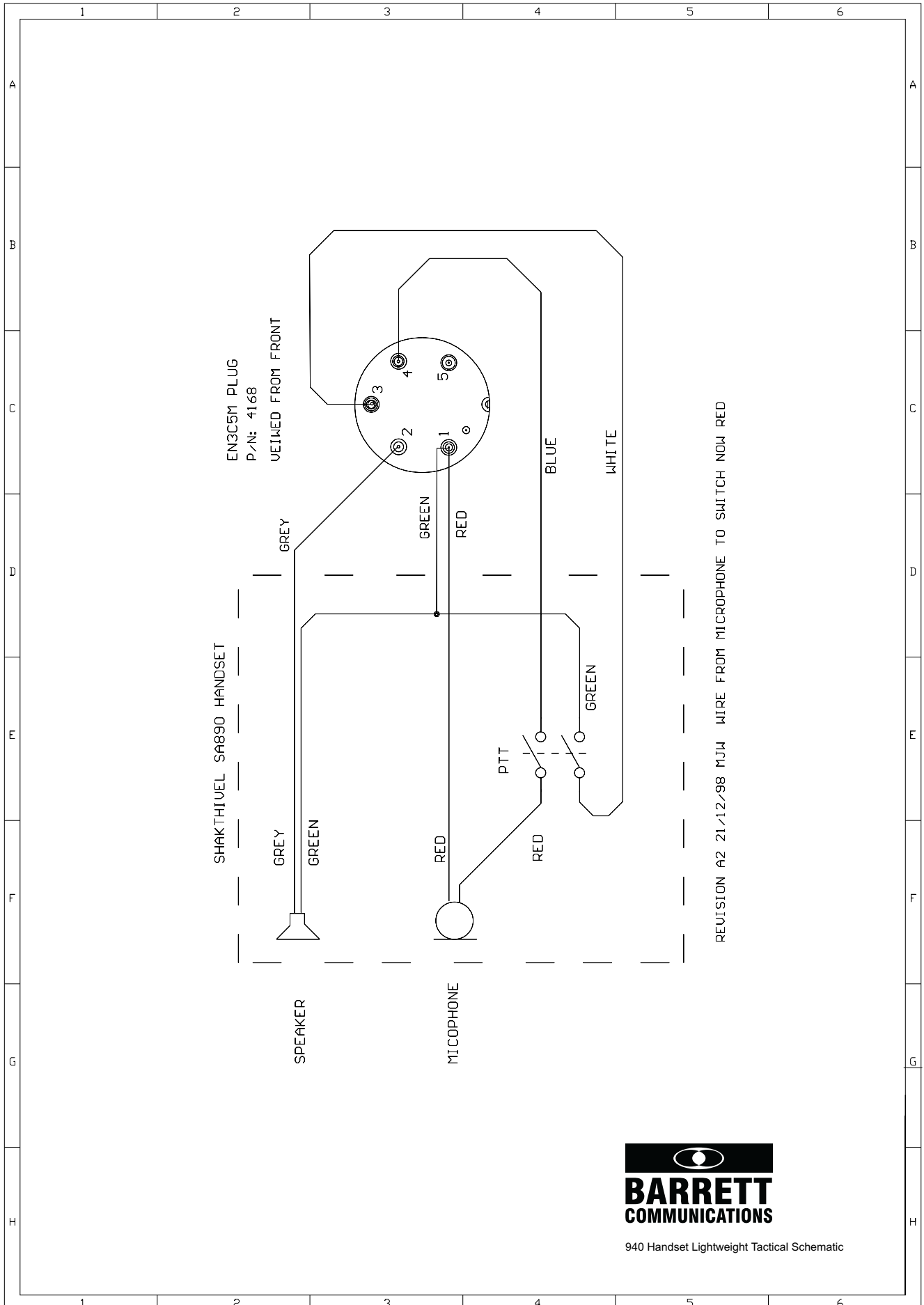
R43	RES SMD 1206 10K	0150
R44	RES SMD 1206 220K	0174
R45	RES SMD 1206 5K6	0129
R47	RES SMD 1206 68K	0158
R48	RES SMD 1206 10K	0150
R49	RES SMD 1206 100K	0170
R50	RES SMD 1206 82K	0162
R61	RES SMD 1206 2K4	0013
RL1	RELAY EP1-3L1	5011
RL2	RELAY EA2-12	5015
U1	I/C MC34060	2480
U2	I/C LM339 SMD	2730
U3	I/C MC33340 SMD	2726
U4	I/C MC1458G SMD	2791
U5	I/C LM339 SMD	2730
Z1	ZENER 5V6 SMD	3311
Z2	ZENER 5V6 SMD	3311

940 Transceiver Cloning Cable Schematic



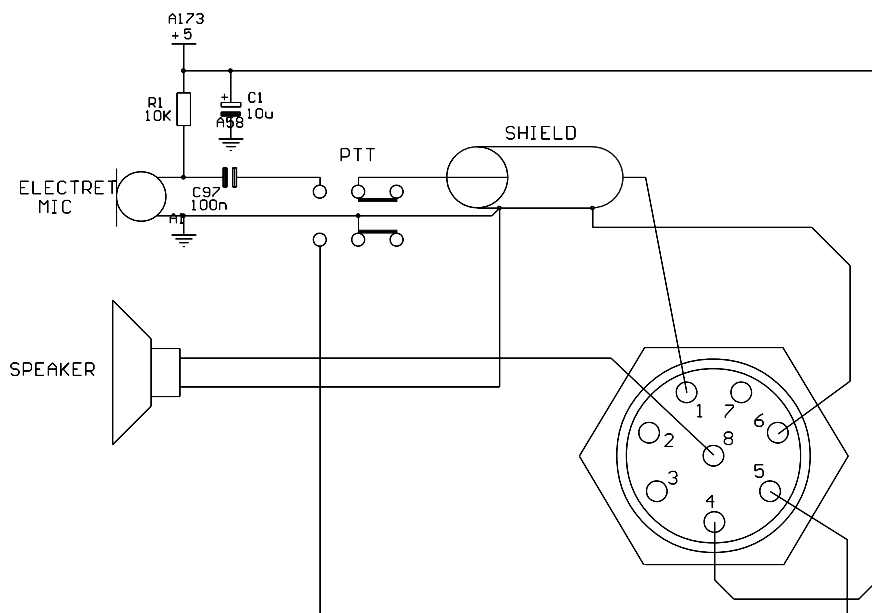
940 Handset Lightweight Tactical Schematic

Barrett P/N BCA94004



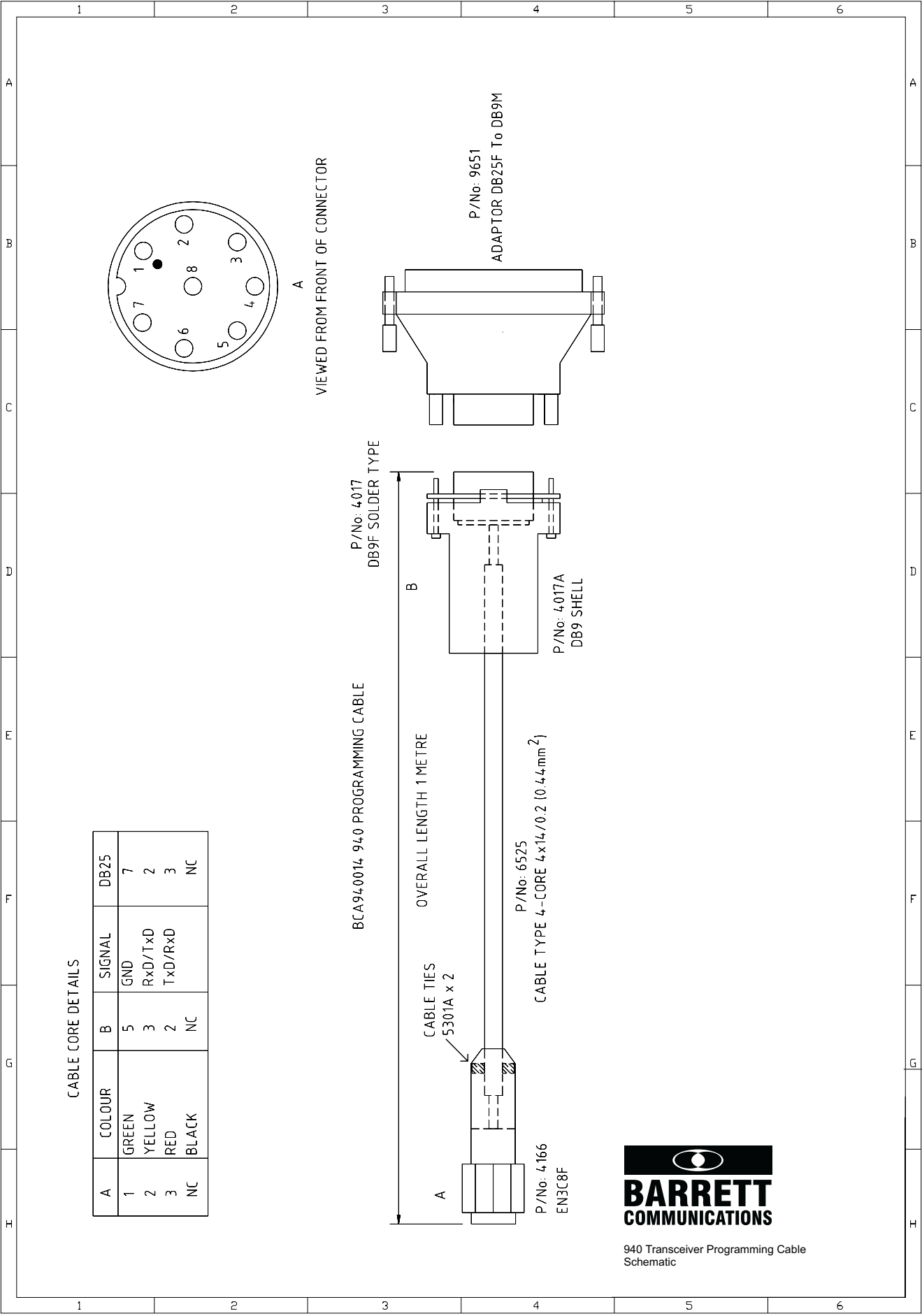
940 Transceiver Mic Schematic

Barrett P/N BCA94013



940 Electret Mic And Speaker Schematic

940 Programming Cable Schematic



Note: Specifications and drawings in this manual are subject to change without notice.