

# The BC 348 Classic Communication Receiver

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*Many people, engaged in a variety of pursuits, benefited in a number of ways from the huge quantity of high quality disposals equipment available as a result of WWII. None did better than the amateur radio operator; the list of surplus electronic gear to be obtained for a minimum outlay in dollars ran to pages upon pages. Most of it required modifications for optimum performance on the amateur bands but these were usually so minor they presented no real problems. The BC 348 was one of the more popular makes on the market, mainly because it could be put to use almost as was — however, most amateurs preferred to carry out their own particular alterations, depending upon need or fancy.*

## ORIGIN

This receiver, widely used in most American and many British aircraft from 1942 onwards, was mass produced in the United States by numerous sub-contractors. Their identity may be ascertained from the suffix to the type-number on the front panel; eg BC348J comes from Wells-Gardner. Several detail differences occur in models from the various 'stables', viz. Some versions incorporate an aerial alignment trimmer, while others do not. Basically, however, almost all versions conform with the details given below:

## BASIC CIRCUIT

Two RF amplifiers, both 6K7  
First detector 6L7  
Separate local oscillator 6C5  
First IF amplifier 6K7  
Second IF amplifier and beat

frequency oscillator 6L7

Third IF amplifier and second detector 6B8

Output valve 6K6

Voltage regulator to oscillator valve RCA991

COMMENT: This valve line-up is a representative one, although numerous permutations occur among different models. In one version, the CW oscillator is combined with the second detector and there are two IF stages. In another, the luxury of three IF stages is achieved by putting the CW oscillator on to the second IF, while the second detector and third IF are combined in one valve. The importance of securing the correct circuit diagram for the particular model purchased is self-evident. The claimed sensitivity for the three IF version is as good as 3 to 7 microvolts overall on all bands, this for 10 milliwatts output into a 4000 ohm

load.

Having 200-500 kHz available makes the set ideal for use with an RF band switched converter. The band spread is such (1 dial turn = 2 kHz) that it is ideal for SSB reception (provided a suitable product detector is included). Also, the stability on this band is rock-like. If used for this form of reception, with an external converter, this latter unit must have an independently tuned RF + 1st converter so as to peak and track with the tuning in the 200-500 kHz band.

## WAVERANGES COVERED

Band No 1 200-500 kHz  
Band No 2 1.5-3.5 MHz  
Band No 3 3.5-6.0 MHz  
Band No 4 6.0-9.5 MHz  
Band No 5 9.5-13.5 MHz  
Band No 6 13.5-18.0 MHz

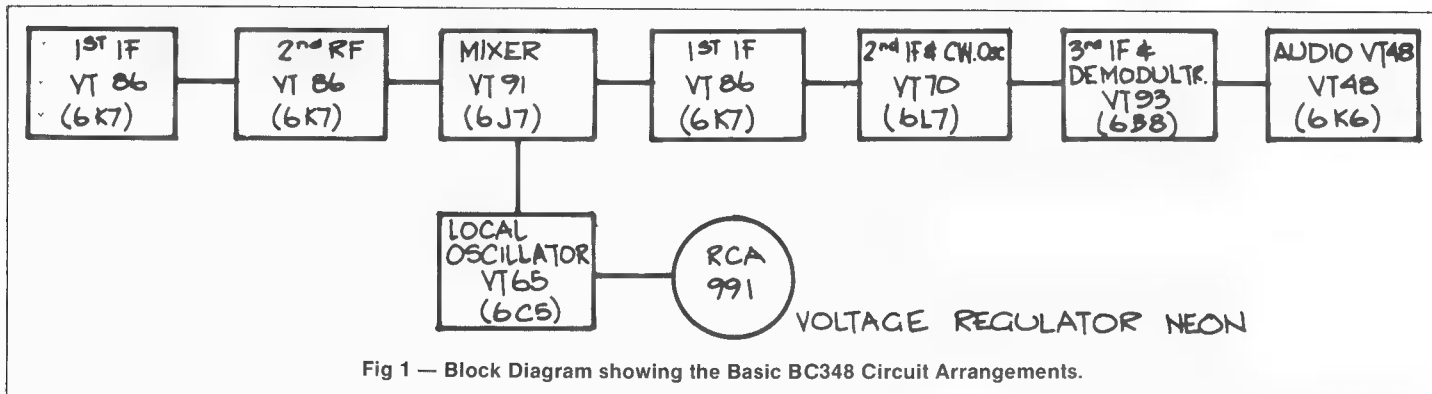


Fig 1 — Block Diagram showing the Basic BC348 Circuit Arrangements.

#### POWER REQUIREMENTS

In its original condition the BC348 comes with a 28 volt dynamotor that is likely to be of little or no value to the average enthusiast.

COMMENT: The space made available when the dynamotor is removed will comfortably accommodate a mains power unit of sufficient size to deliver the 200 volts at 50mA and 6.3 volts at 2.5A required by this receiver. A slightly larger mains power supply unit can be installed if a reserve is required for external converters or a crystal calibrator.

#### CONTROLS

In the centre is the bandchange knob. The range in use is registered in the dial window above it. Below is the reduction-drive tuning knob actuating a four-gang capacitor: to the left, gain control and CW oscillator pitch control. Above them: the crystal gate switch and the CW oscillator on/off switch. Extreme left: manual or automatic gain control lever switch. Top right: dimmer for dial lights. Far right: aerial alignment control (when fitted).

COMMENT: The BC348 earns high marks for the intelligent placement of controls. While the right hand rotates the tuning knob, either directly or with the little handle fitted to it, the left hand has all other needful user-controls within short reach. No cross-hands performance is called for.

Being a general coverage receiver the BC348 does not offer electrical bandspreading of the type required for use on the crowded amateur bands. Those bands occupy on the tuning scale 1 inch (1.8 MHz), 2 inches (3.5 MHz), 1/2 inch (7 MHz), and 1 1/2 inches (14MHz). However, the order of tuning knob rotation called for, to cover each of these bands is:

BAND	REVOLUTIONS
1.8 MHz	10
3.5 MHz	16 1/2
7.0 MHz	4 1/2
14.0 MHz	8

It might be added, that when the receiver is used as a 4-6 MHz IF strip for a 144-146MHz converter, this span of 2MHz is covered in no less than 66 revolutions.

#### RECOMMENDED BASIC MODIFICATIONS

HEATERS: In the original model with 28 volt dynamotor, the valve heaters are wired in a complex series-parallel arrangement to allow 6.3 volt valves to operate from 28 volt aircraft batteries. It is recommended that the existing heater wiring (generally pins 2 and 7 on IO valve holders) be removed and a complete re-run made to parallel all heaters for 6.3 volt operation from a mains power unit.

AERIAL INPUT: Because most receivers will be fed from an aerial tuning unit via low impedance cable, it is recommended that the existing aerial terminal be removed and replaced by a Belling-Lee co-axial socket.

USE WITH EXTERNAL CONVERTER: The provision of a coaxial input circuit is especially essential when the BC348 is fed from a converter, to minimize IF breakthrough.

SEPARATING THE GAIN CONTROLS: To facilitate reception of SSB signals it is desirable to fit separate AF and RF gain controls. In the original, there are two ganged potentiometers of 20,000 ohms (front) and 350,000 ohms (rear) operated simultaneously by the front panel gain control knob. It is no difficult matter to disconnect the 20,000 ohm potentiometer — it controls the second RF stage — and reposition it in place of the dial light dimmer, not generally required.

GAIN EQUALIZER: In some models a variable resistor rotates with the gang-capacitor shaft. Its purpose is to equalize the gain over the entire tuning range. It may be removed with profit.

CAPACITORS — A WARNING: Most BC348 receivers purchased today will be at least 40 years old and some deterioration in the condition of the fixed capacitors may have occurred. This will sometimes be self-evident, either through failure of a stage or stages to function, instability or more dramatically by short-circuits on the HT line. To disconnect and test every one of the dozens of capacitors in this model is a tedious business but probably worthwhile in the long run.

SELECTIVITY: The IF strip is aligned at 915 kHz. While this particular frequency is OK for SSB reception and helps eliminate or reduce unwanted images, some may deem this as unsuitable for CW reception, even though the

crystal filter, when in circuit, produces a single signal only. For these CW 'buffs', the addition of an external audio filter will provide all the selectivity the most critical ear would need.

"S" METER: Another modification that can be carried out to advantage is the inclusion of an "S" meter. This can be separately housed in a small metal box set on top of the BC348 and fed from a cable via the front or rear panels — or mounted on the front panel. If the latter, it will be necessary to cut or drill out a hole to suit the meter. This is not a difficult job, as aluminium is a soft metal. When drilling, place a clean rag inside the set behind the panel to catch any small metal fragments. Space does not permit a detailed explanation of the circuit modification but it is commonplace and shown in many journals and handbooks.

AUDIO OUTPUT: The 6K6 output tube delivers enough audio to drive a small speaker, as well as the phones; however, most replace this valve with a power pentode, or add it to the 6K6 for full 3 watts output. The audio quality is exceptionally good. The slightly wider than average 915 kHz IF no doubt contributes to this.

The BC348 and its close cousins BC312 etc were, for the period (1942), outstanding communications receivers in all departments of design, construction and performance and fully deserve the title CLASSIC. AM

## WHAT IS THE HISTORICAL SOCIETY OF AUSTRALIA?

Historical Radio Society of Australia  
49 Sharon Rd, Springvale 3172. Phone (03) 546 5558

The Historical Radio Society of Australia was formed on 17th April, 1982, to cater for the needs of those interested in preserving the equipment and records of past times in radio, especially in this country. It is a non-profit society with members in every state of Australia.

A quarterly newsletter is distributed to members, and members are encouraged to contribute such items as tips on restoration of equipment, information on early equipment and memories of the days when radio was the wonder of the world. The activities of the Society and its members also form subject matter for the newsletter, while a free advertising service is available for purposes within the scope of the Society's objectives (such as the sale or exchange of surplus vintage equipment).

Meetings are held in Melbourne about four times a year, and members in other areas are encouraged to hold their own meetings. The Society has also participated in the Bendigo National Swap Meet, and intends to make this a regular activity, for as long as members are anxious to participate.

The annual membership fee, at present is \$7.50 a yr, covers the twelve month period from July to June, and members who join during the year will receive copies of all newsletters issued during that year.

Membership of HRSA now stands at over one hundred and is steadily increasing. This is an excellent beginning and means that the Society is here to stay — as Australia's first formed such group.

There is no need to own a collection of one sort or another to be eligible for membership — just as long as your interest in early wireless is bona fide, you are invited to join. Write in the first instance for a membership form to the Secretary whose address is given above.

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