

Section 1
GENERAL DESCRIPTION

by one of ten quartz crystals selected by the MEGACYCLE band switch. The main tuning control is a vernier dial calibrated in 100 one-kilocycle divisions. This control operates through a differential mechanism to move the band change "slugs" in the coils enough to cover the range between the one-megacycle band change steps. Thus the Band Switch selects coils and crystals and also roughly positions the tuning slugs. At the same time one of the two ranges (1.5 to 2.5 mc or 2.5 to 3.5 mc) of the variable i-f channel is selected and tuned along with the r-f coils.

The crystal frequencies for the first mixer injection are so chosen that the frequency produced by the first mixer will always fall in the 1.5 to 2.5 mc or 2.5 to 3.5 mc range of the variable i-f channel.

Exceptions to the operation just described are bands 1, 2, and 3. Band 1 (.5 to 1.5 mc) uses an intermediate mixer between the first mixer and the variable i-f coils. This mixer accepts frequencies in the range 10.5 to 11.5 mc from the first mixer. A 12-mc signal developed by the crystal controlled oscillator is applied to the first mixer to determine these frequencies. The crystal controlled oscillator also applies an 8-mc voltage to the intermediate frequency mixer to produce a signal within the range of the variable frequency i-f coils which tune the 2.5 to 3.5 mc spectrum. Bands 2 and 3, which

cover 1.5 to 2.5 mc and 2.5 to 3.5 mc respectively, are identical in span to each band of the variable i-f coils and thus feed through to the second mixer without utilizing the first mixer.

Following the variable i-f and the second mixer are the crystal filter and a four stage fixed intermediate frequency amplifier containing mechanical filters. Conversion to the fixed i-f of 500 kc is accomplished by injecting a 2 to 3 mc signal from a Collins 70E-15 oscillator to produce a difference of 500 kc from the frequency existing in either band of the variable i-f amplifier. Tuning of the 70E-15 oscillator is done by the "kilocycle" tuning control in step with all other circuits.

Stability of the 70E-15 oscillator is assured by temperature-compensated components operating in a sealed and moisture-proof housing.

Separate rectifiers are used to produce automatic volume control and audio voltages. D-c amplification of the automatic volume control voltage is provided to obtain essentially uniform input to the detector. Audio power output is held within 3.5 db over signal input voltage ranges of five to 125,000 microvolts at the antenna terminals. A series type noise limiter clips modulation at 50-85 percent. This allows good reception in the presence of strong noise pulses.

1.1.4 EQUIPMENT SUPPLIED. - The following table lists the equipment supplied.

TYPE	DESCRIPTION	COLLINS PART NUMBER
51J-4	Radio receiver complete with tubes, dust cover for rack mounting, and one mechanical filter to be selected from list below.	522-0144-096
	OR	
51J-4	Radio receiver mounted in cabinet complete with tubes, dust cover, and one mechanical filter to be selected from list below.	522-0144-086
	Instruction Book for 51J-4	520-5014-00

1.1.5 ACCESSORIES AVAILABLE. - The following table lists the accessory equipment available for the 51J-4.

TYPE	DESCRIPTION	COLLINS PART NUMBER
270G-3	Matching speaker (desk mounted)	522-0149-00
271B-3	Dual speaker (rack mounted) Panel space required is 7 inches.	522-8123-004
271B-4	Single speaker (rack mounted) Panel space required is 7 inches.	522-8350-002
	Cabinet for 51J-4 complete with mounting hardware.	505-5959-003
	Set of spare tubes for 51J-4	541-1619-002
F500B-08	800-cycle plug-in filter for 51J-4	526-9007-00
F500B-14	1400 cycle plug-in filter for 51J-4	526-9030-00
F500B-31	3100 cycle plug-in filter for 51J-4	526-9008-00
F500B-60	6000 cycle plug-in filter for 51J-4	526-9009-00
	Headphones, 600 ohm	273-0003-00