

Building The General Class Receiver

The receiver in Fig. 3-10(A) is a four-tube superheterodyne with its own power supply. It includes a beat-frequency oscillator (BFO) for reception of code stations. Tuning is accomplished in the oscillator, converter, and antenna circuits. Since it is more selective, a superheterodyne receiver is generally a better type of receiver than the regenerative type.

Parts List. The parts list for the receiver is given below. Have all the parts on hand before starting to construct the receiver.

RECEIVER — PARTS LIST

<i>Quantity</i>	<i>Reference Symbol</i>	<i>Description</i>
1	A301	Aluminum chassis, 10 × 17 × 3 inches
1	A302	Aluminum panel, black ripple finish, for rack mounting, 10 inches high × 19 inches wide
2	C301, C302	Capacitor, variable, 365 μf
2	C303, C314	Capacitor, ceramic, 0.001 μf, 500 wvdc
1	C304	Capacitor, variable, 50 μf
1	C305	Capacitor, variable miniature-screw type, 150 μf
3	C306, C307, C309	Capacitor, paper, 0.1 μf, 450 wvdc
2	C308, C310	Capacitor, paper, 0.1 μf, 250 wvdc
2	C315, C317	Capacitor, paper, 0.01 μf, 600 wvdc
2	C311, C312	Capacitor, mica, 250 μf
1	C313	Capacitor, p/o L302
2	C316, C318	Capacitor, electrolytic, tubular, 10 μf, 25 wvdc
1	C319	Capacitor, paper, 0.25 μf, 600 wvdc
1	C320	Capacitor, paper, 0.05 μf, 600 wvdc
1	C321	Capacitor, electrolytic, can, dual 20 μf, 450 wvdc

<i>Quantity</i>	<i>Reference Symbol</i>	<i>Description</i>
5	E301-E305	Isolantite feed-thru insulator
1	I301	Pilot light, 6.3 volts
1	J301	Telephone jack, 2 contacts, normally open
1	L301	B&W miniductor No. 3015; or 24 turns of No. 20 wire on 1-inch diameter form 1 1/2 inches long
1	L302	Bfo Transformer, 1500-1600 kc
1	L303	Filter choke, 20h, 50 ma
1	L304	Filter choke, 20h, 20 ma
1	P301	A-c line cord plug
1	R301	Resistor, carbon, 68 ohms, 1/2 watt
1	R302	Resistor, carbon, 27K, 1/2 watt
1	R303	Resistor, carbon, 12K, 2 watts
1	R304	Resistor, carbon, 82K, 1 watt
1	R305	Resistor, variable, carbon, 5K, 2 watts
1	R306	Resistor, carbon, 220 ohms, 1/2 watt
2	R307, R317	Resistor, carbon, 47K, 1 watt
1	R308	Resistor, carbon, 4700 ohms, 1/2 watt
1	R309	Resistor, carbon, 56K, 1/2 watt
1	R310	Resistor, carbon, 470K, 1/2 watt
1	R311	Resistor, p/o L302
2	R312, R315	Resistor, carbon, 220K, 1/2 watt
2	R313, R316	Resistor, carbon, 1500 ohms, 1 watt
1	R314	Resistor, carbon, 56K, 1 watt
1	S301	Toggle switch, SPST, bat handle
1	S302	Rotary switch, two sections, three positions
1	T301	Coil form, polystyrene, 1-inch diameter, four prongs

<i>Quantity</i>	<i>Reference Symbol</i>	<i>Description</i>
1	T302	Coil form, polystyrene, 1-inch diameter, five prongs
2	T303, T304	I-f transformer, 1500-1600 kc
1	T305	Power transformer, Stancor No. PM8407, or equivalent
1	V301	Tube, 6SB7Y
1	V302	Tube, 6SG7
1	V303	Tube, 6SQ7
1	V304	Tube, 6SN7GT
1	V305	Tube, 5Y3G
1	XI301	Pilot-light assembly socket
8 ft.	W301	A-c line cord
1	XT301	Tube socket, bakelite, four prongs
1	XT302	Tube socket, bakelite, five prongs
5	XV301- XV305	Tube socket, bakelite, octal
1	—	Spool No. 22 DCC wire

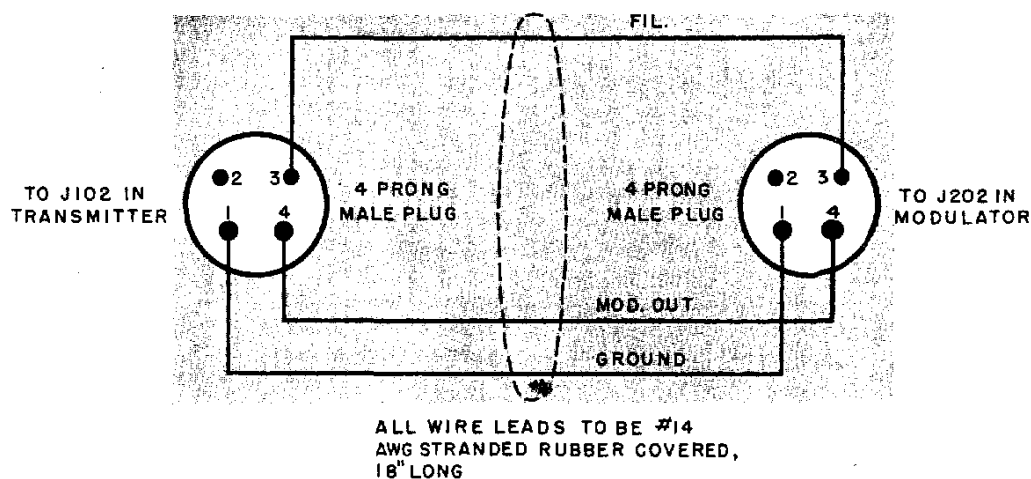


Fig. 3-15. Interconnecting cables for the General Class station.

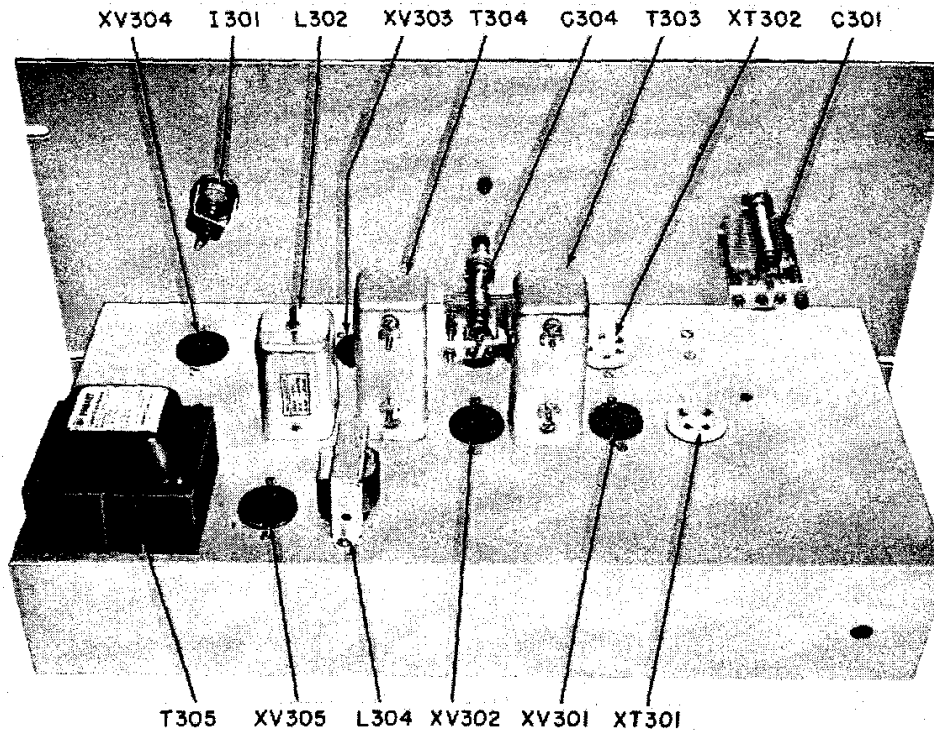


Fig. 3-10B. Layout of General-Class station receiver parts.

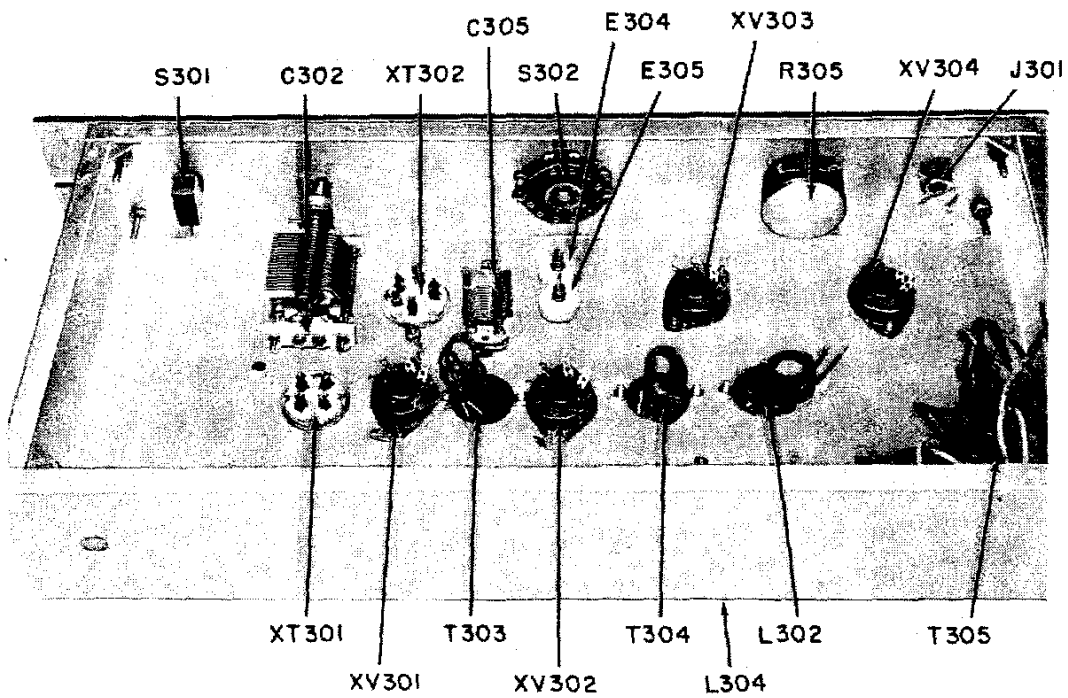


Fig. 3-11. Layout of receiver parts, shown from the bottom.

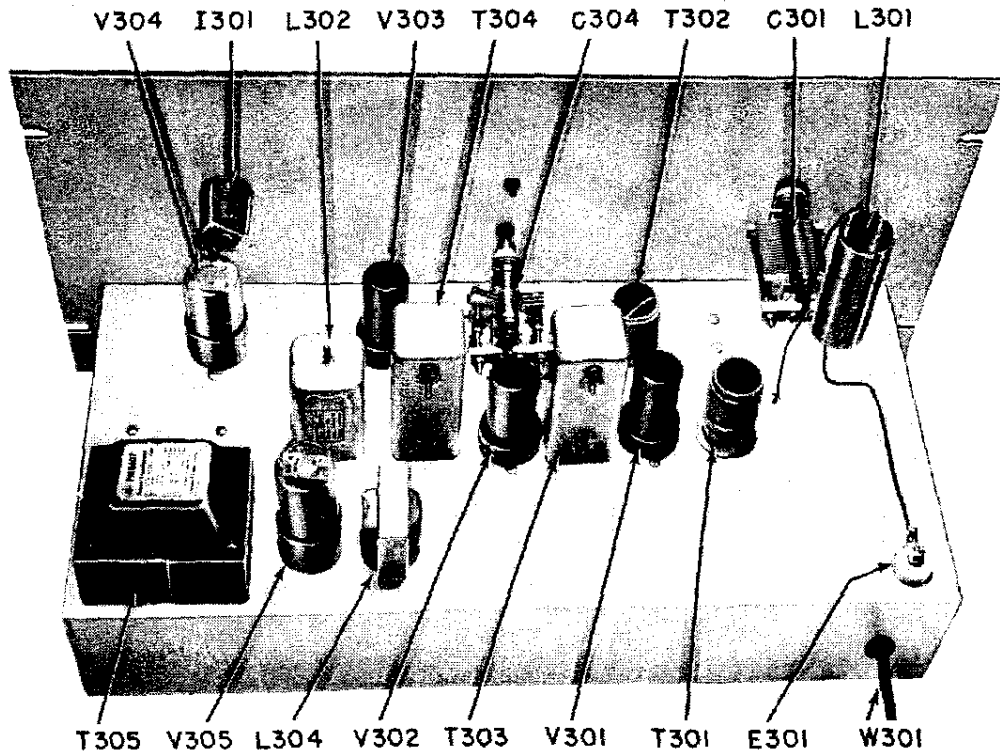


Fig. 3-13. Top view of the General-Class station receiver.

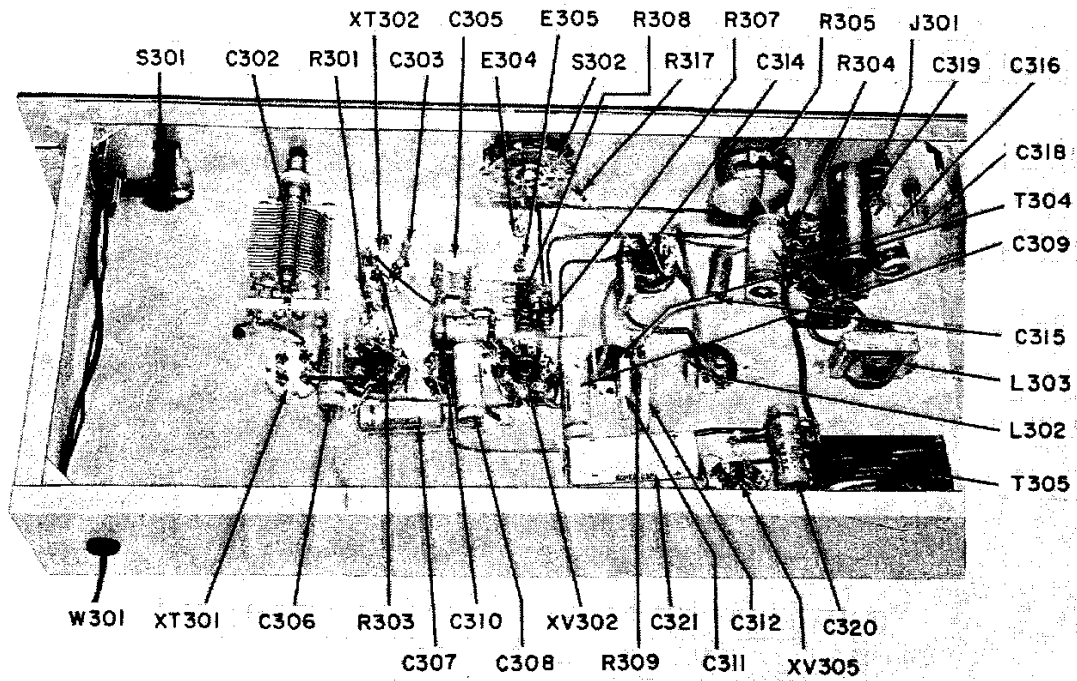


Fig. 3-14. Bottom view of receiver.

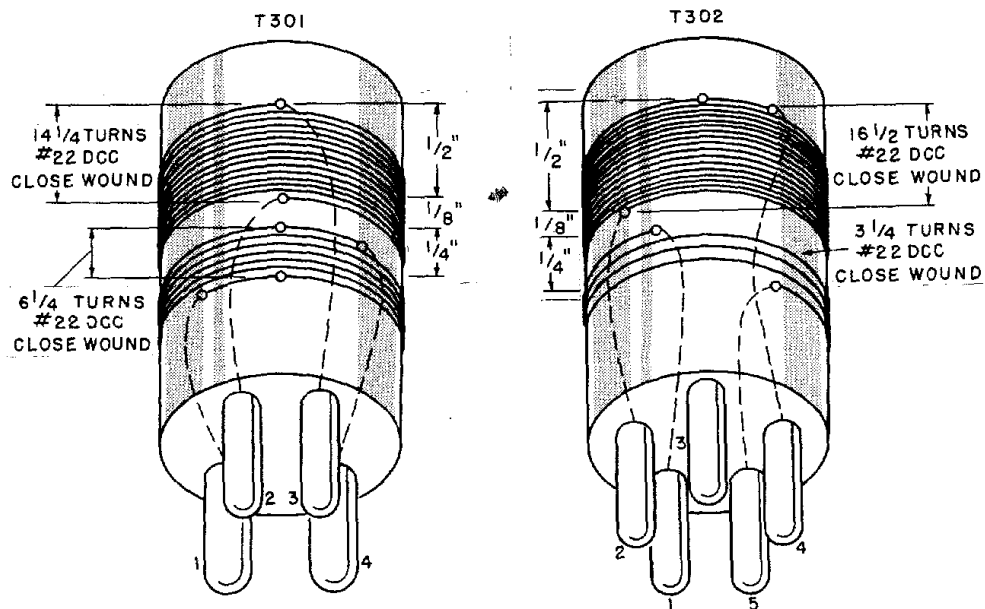


Fig. 3-12. Construction of receiver coils.

Construction.

- Place the chassis on the work bench and lay out all the parts as shown in Figs. 3-10(B) and 3-11.
- Scribe, center-punch, drill and deburr all holes.
- Then mount all components as required.
- Drill all holes in the front panel for clearance of the controls, and mount the panel against the front of the chassis.
- Refer to schematic, Fig. 3-10A, and wire the receiver.
- After completion of wiring, double-check for mistakes.
- Construct the coils as shown in Fig. 3-12, and then place the coils in their respective sockets.
- Figures 3-13 and 3-14 show the completed receiver.

Interconnecting Cable

Make up an interconnecting cable to be used between the modulator and transmitter unit. Figure 3-15 pictures this cable schematically, and lists the necessary parts.

Building The Antenna

An antenna that gives excellent results with this station is the half-wave dipole shown in Fig. 3-16. This antenna has a bi-directional, horizontally transmitted wave. It is easy to load, and gives good reception. Try to mount the antenna as high and

as clear of buildings as possible. The flat- portion of the antenna is designed for best operation at the crystal frequencies recommended in this chapter. If you want to build your antenna for best operation at other crystal frequencies, use the formula:

$$L = \frac{468}{f}$$

where: L = Length of antenna in feet
 f = Frequency of operation desired in MHz

- For example, if you want to operate at 7.2 MHz,
 $L = 468/7.2 = 65$ feet.
Your antenna must be 65 feet long.

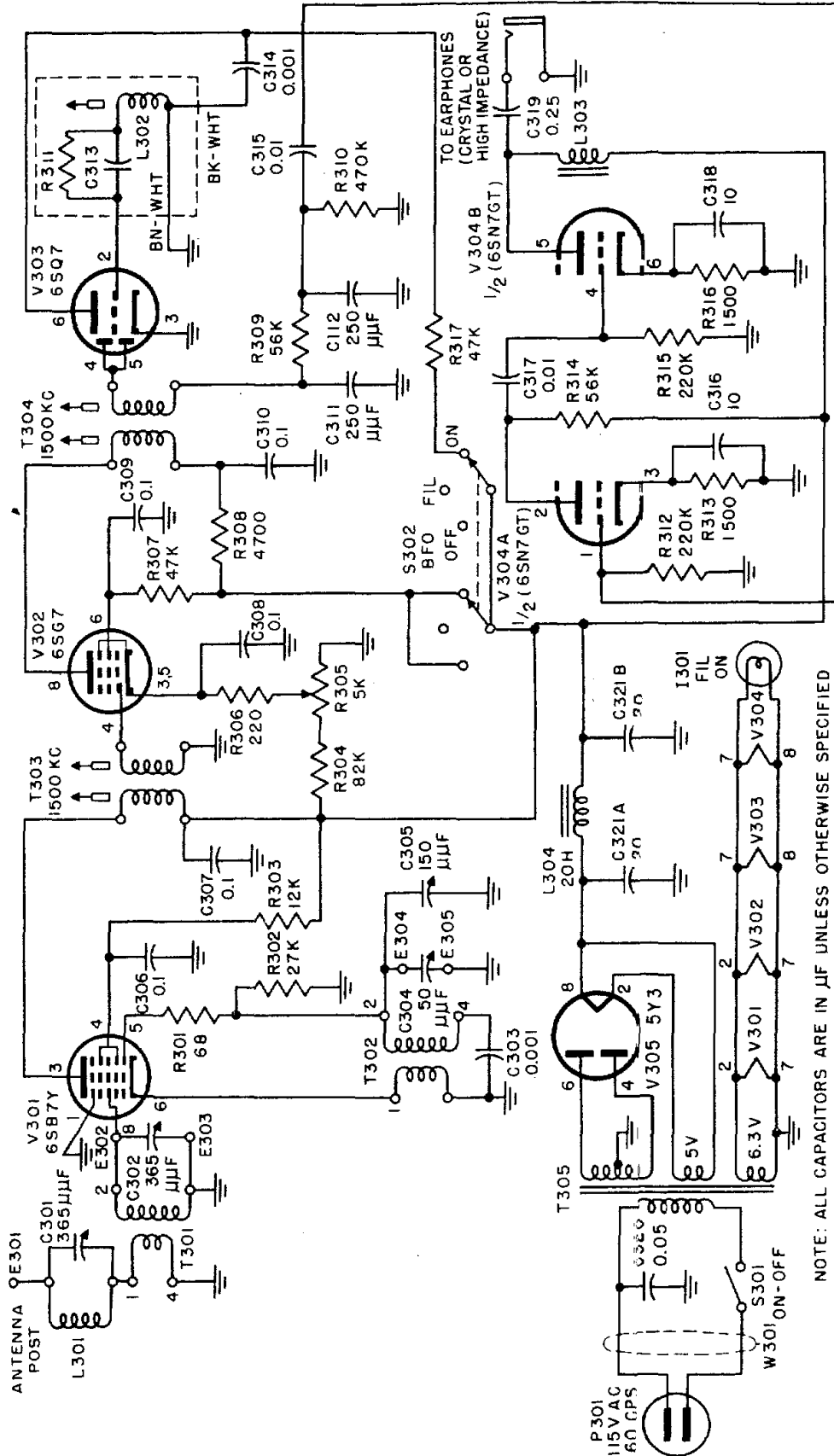
The lead-in is a coaxial-type RG-59/U cable. A coaxial cable has one conductor inside the other. This reduces the undesired radiation, reducing BCI (broadcast interference).

Building The Rack

An inexpensive rack for this station (see Figs. 3-17 and 3-18) can be bought "knocked down" (all parts supplied, unassembled). A rack similar to the one described for the Novice Class station also can be used, but the rack shown in Figs. 3-16 and 3-17 gives a more professional appearance to the completed station. After assembling the transmitter, modulator, and receiver in the rack, connect the interconnecting cable between the transmitter and modulator. Then connect the antenna leads to the terminals on the transmitter and to the receiver antenna input terminal. Use a crystal microphone and a pair of crystal earphones (headset).

Final Tests And Operation

Before operation, the receiver will have to be aligned: all the tunable coils and trimmer capacitors must be adjusted properly. This should



NOTE: ALL CAPACITORS ARE IN μ F UNLESS OTHERWISE SPECIFIED

Fig. 3-10A. Schematic diagram illustrating a typical receiver which might be used in a General-Class station.