INSTALLATION AND OPERATING INSTRUCTIONS

GONSET "*Super 12*"

AMATEUR MOBILE CONVERTER

NOTE:

While this converter will work as well with a fully transistorized auto radio as with a "hybrid" or a vibrator powered receiver, problems arise in getting satisfactory noise clipping with a fully transistorized receiver, and for this reason a "hybrid" receiver is to be preferred from the standpoint of being able to operate the higher frequency bands without ignition interference.

The converter is designed to work only with 12 volt cars with negative ground (standard on American manufactured automobiles).

It should be kept in mind that a receiver using transistors or "hybrid" tubes in the front end is more susceptible to overload from very strong signals than is a receiver using tubes with 100 to 150 volts on the screens. The same applies to this converter; it will overload with somewhat less signal than the older type converter using high plate and screen voltages.

Manufactured by

Gonset Division Young Spring & Wire Corp.
801 So. Main St., Burbank, California

520-318 A

GENERAL

The Gonset "Super 12" amateur converter is designed expressly for mobile use on the 10, 11, 15, 20, 40 and 75 meter bands. It also covers the 19 meter (daytime) and 49 meter (nighttime) short wave broadcast bands, a useful feature in remote areas where reception on the regular broadcast band is not all that could be desired.

Basically the "Super 12" consists of a low-noise r-f stage, a low noise triode mixer, and a modified Clapp high stability oscillator. It is designed to work into practically any standard automobile radio.

ELECTRICAL CONNECTIONS

The single, insulated wire with clip should be connected to the accessory terminal under the dash to pick up positive 12 volts. If the voltage regulator does not hold the voltage fairly constant, an improvement in stability can be obtained by running a wire directly to the "hot" battery terminal and connecting the clip lead to it.

Two antenna input connectors are provided: one for the auto radio antenna and one for the converter antenna. Both take the standard "Motorola type" connector.

The converter output is fed to the auto radio by means of the single, black-sheathed shielded wire which is terminated in an antenna pin plug.

For proper operation of the overall combination, incorporation of a Gonset "Clipper" noise silencer on the auto radio is highly recommended, and should be installed at the same time as the converter itself. The clipper may be used with either a "hybrid" or a standard "vibrator type" receiver, but will **not** function with a **fully transistorized** receiver.

ANTENNA

For maximum performance and freedom from images a resonant antenna should be used. This requires a carefully pruned loading coil on 75, 40, and 20 meters, and also on 15 meters if the antenna is less than about 10½ feet long. If a transmitter is used in the car, the loading coil employed for the transmitter will meet this requirement. Unless you intend to change or short out the loading coil when changing bands, use a plain 10 or 15 meter whip on all bands as a compromise when just "listening around" the various bands.

To obtain optimum impedance match, use RG-58/U or RG-8/U coax (50 ohms) between the antenna (via the changeover relay if used) and the converter input, *of such length that the lead from the antenna terminal to the converter terminal is exactly 21 feet long. This is important.*

Because the base impedance of the antenna approaches the impedance of the coaxial line only on 10 and 15 meters, the line becomes part of the input circuit on the lower frequency bands, and the input circuits of the converter therefore have been designed for use with this critical length of lead-in. Therefore, THESE INSTRUCTIONS MUST BE FOLLOWED FOR PROPER OPERATION OF THE CONVERTER.

A separate antenna input circuit and jack have been provided for the broadcast band, permitting use of the regular auto radio antenna and the usual short, low-capacity lead-in for best results at standard broadcast frequencies.

A 10 meter or 15 meter whip will give good results on both the 19 meter and 49 meter short wave broadcast bands, but still better performance will be obtained by using a 20 meter loaded whip for the 19 meter short wave band and a 40 meter loaded whip for the 49 meter short wave broadcast band. However, because of the high power used by short wave broadcast stations, maximum performance of the converter seldom is required for good reception of these stations.

PRELIMINARY ADJUSTMENTS

With all cables connected, turn the converter on-off (heater) switch to "off" and the "BC-HF" switch to "BC". Turn on the auto set and tune in a very weak station between 1350 and 1400 kc. Then adjust the antenna trimmer on the auto set for maximum gain. Practically all auto sets except those by Automatic Radio Manufacturing Company have such a trimmer, though sometimes it is hidden under a snap button. This adjustment also can be made, if the set has good gain, by tuning to a "dead" frequency between 1350 and 1400 kc., turning the volume control full on, and adjusting the antenna trimmer for maximum background noise. The broadcast set now should exhibit good sensitivity and gain throughout the broadcast band. If not, it is possible that one or more tubes are weak, or the r-f or i-f trimmers are in need of adjustment.

Next, set the auto radio to *exactly 1430 kc.* Do not trust the auto radio dial the first time this is done, as the reading often will be found to be off as much as 30 or 40 kc. Check the dial reading against the frequency of known broadcast stations near the frequency to determine how much dial error must be allowed for. If the set has push buttons, it is desirable to set one of them up on this frequency. A frequency of 1430 kc. is employed for converter i-f so that the second harmonic of the oscillator in an auto set with 455 kc. i-f will fall below 3775 kc., in case any oscillator r-f should get back into the converter and be picked up as a steady carrier.

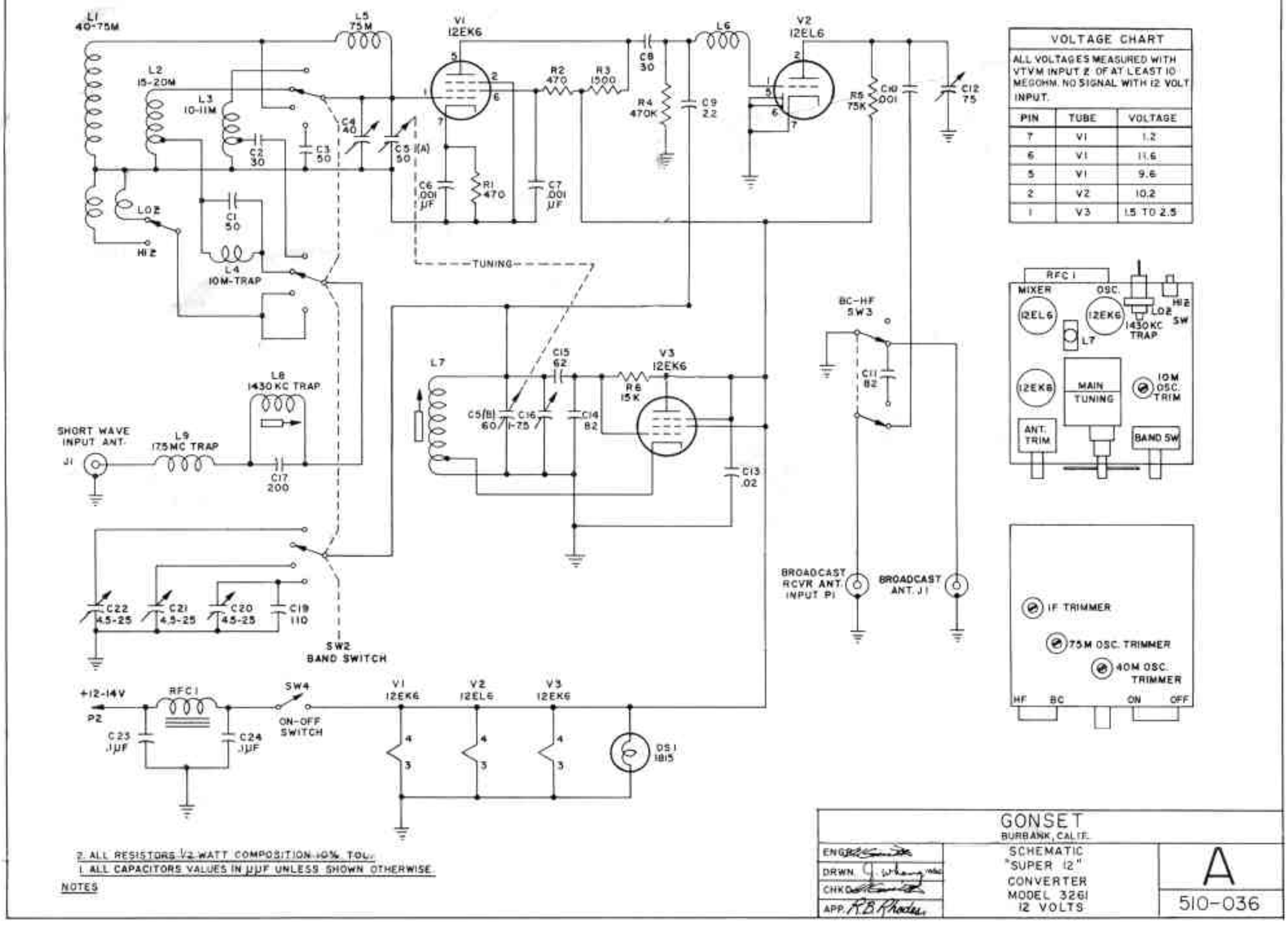
The "BC-HF" switch on the converter is now turned to "HF" and the front panel antenna trimmer on the converter is detuned from maximum background noise (with the heater switch turned on). Next the output trimmer (i-f trimmer) on the under side of the converter (refer to drawing) is peaked for maximum noise.

Once the foregoing initial adjustments have been made correctly, it is only necessary to tune the auto set to 1430 kc. and turn on the converter whenever it is desired to use the converter. The separate heater "ON-OFF" switch permits immediate change from broadcast to converter, as when checking adjacent broadcast stations to check the 1430 kc. frequency setting, without having to wait for the converter heaters to reach operating temperature when switching from "BC" to "HF".

OPERATION

The knobs on the front of the converter are self-explanatory. The main tuning knob should be turned until the pointer above the bandspread wheel is closest to the band indicated on the bandswitch. The 19 and 49 meter short wave broadcast bands tune over the range of the dial pointer marked "SWBC".

When changing bands it may be necessary to repeak the front panel antenna trimmer (marked "ANTENNA"). When peaked at the center of an amateur band the adjustment will hold over the entire band. However, care should be taken on the higher frequency bands to see that the trimmer is not peaked to the image frequency. Once the correct position is determined for a given band, it should be noted for future reference.



VOLTAGE CHART		
ALL VOLTAGES MEASURED WITH VTVM INPUT Z OF AT LEAST 10 MEGOHM. NO SIGNAL WITH 12 VOLT INPUT.		
PIN	TUBE	VOLTAGE
7	V1	1.2
6	V1	11.6
5	V1	9.6
2	V2	10.2
1	V3	1.5 TO 2.5

GONSET BURBANK, CALIF.		
ENG.	SCHEMATIC "SUPER 12" CONVERTER MODEL 3261 12 VOLTS	A
DRWN.		510-036
CHK.		
APP. R.B. Rhodes		

SCHEMATIC NO.	DESCRIPTION	GONSET PART NO.
C1	50 µµF TUBULAR NPO TOL. ±10%	
C2	30 µµF SILVER MICA NPO TOL. ±10%	
C3	50 µµF TUBULAR NPO TOL. ±10%	
C4	5-50 µµF ANTENNA TRIMMER	074-048
C5A-B	2-GANG MAIN TUNING	074-049
C6	.001 µF DISC GMV	
C7	.001 µF DISC GMV	
C8	30 µµF SILVER MICA TOL. ±10%	
C9	2.2 µµF TUBULAR NPO TOL. ±.25 µµF	
C10	.001 µF DISC GMV	
C11	82 µµF DISC NPO TOL. ±10%	
C12	5-80 µµF COMPRESSION TRIMMER	089-003
C13	.02 µF DISC GMV	
C14	82 µµF DISC N220 TOL. ±5%	
C15	62 µµF DISC N220 TOL. ±5%	
C16	1-7.5 µµF TUBULAR TRIMMER	089-013
C17	200 µµF (2 100 µµF DISCS) N150	
C18	DELETED	
C19	110 µµF DISC N150 TOL. ±2%	
C20	4.5-25 µµF ROTARY TRIMMER	089-007
C21	4.5-25 µµF ROTARY TRIMMER	089-007
C22	4.5-25 µµF ROTARY TRIMMER	089-007
C23	.1 µF MOLDED TUBULAR TOL. ±20%	
C24	.1 µF MOLDED TUBULAR TOL. ±20%	

SCHEMATIC NO.	DESCRIPTION	GONSET PART NO.
R1	470 Ω 1/2 WATT TOL.±10%	
R2	470 Ω 1/2 WATT TOL. ±10%	
R3	1500 Ω 1/2 WATT TOL. ±10%	
R4	470K Ω 1/2 WATT TOL. ±10%	
R5	75K Ω 1/2 WATT TOL. ±10%	
R6	15K Ω 1/2 WATT TOL. ±10%	
L1	40-75 METER R-F COIL	012-099
L2	15-20 METER R-F COIL	012-098
L3	10-11 METER R-F COIL	011-085
L4	10 METER TRAP COIL	011-084
L5	5.4 µH COIL, 75 METER SERIES	027-004
L6	GRID COIL	012-100
L7	OSCILLATOR COIL	012-103
L8	TRAP COIL, 1430 KC	012-101
L9	TRAP COIL, 17.5 MC	012-102
RFC-1	HASH CHOKE 60 µH	

SCHEMATIC NO.	DESCRIPTION	GONSET PART NO.
P1	CONNECTOR PLUG	344-002
P2	ALLIGATOR CLIP	
J1	CONNECTOR RECEPTACLE	
J2	CONNECTOR RECEPTACLE	
SW1	SLIDE SWITCH SPDT	
SW2	ROTARY SWITCH, 3 POLE 4 POS.	171-041
SW3	SLIDE SWITCH DPDT	
SW4	SLIDE SWITCH SPST	
	REPLACEMENT PARTS LIST	
	CABINET	411-019
	FRONT PANEL	505-083
	VERNIER DIAL	505-095
	KNOB, SMALL	211-010
	KNOB, LARGE	212-012
	FRONT PANEL FRAME	463-002

On the 15 meter band the chance of getting on the wrong peak is especially pronounced when first using the converter because the background noise peaks up slightly louder on the image than on the correct peak. Peaking the trimmer to the image is avoided if it is peaked on a weak amateur signal rather than background noise. On the 40 meter band, however, it is preferable to peak the antenna trimmer on background noise in the center of the band and then not touch it, because on this band it is possible to tune the input circuit to the oscillator frequency and thus "pull" the oscillator (and therefore the main dial tuning) by means of the antenna trimmer. On the other bands the antenna trimmer will not tune to the oscillator frequency, and no oscillator pulling will occur regardless of the setting of the antenna trimmer.

A switch is provided on the back plate permitting optional antenna coupling on 40 and 75 meters (also 49 meter broadcast), to allow for different antenna conditions. The best position of the switch (low or high impedance) for a given band and antenna can be determined by experiment. To avoid "leak through" of a powerful, nearby broadcast station on 1430 kc., a 1430 kc. trap is provided. This trap is tuned by means of an adjustable slug on the back plate. If difficulty is experienced with 1430 kc. leak-through on 75 meters as evidenced by a "b-f-o effect" on all signals, proceed as follows: Tune in a loud amateur signal with the antenna switch on the high impedance position. Detune the front panel antenna trimmer to make the "whistle" more noticeable. Then slowly adjust the slug on the 1430 kc. trap until the whistle disappears.

In the immediate vicinity of a station on 1430 kc. a weak whistle might still be apparent due to the fact that the signal may be sufficiently powerful to get into the auto set via the ventilation holes or heater lead. In this case the only recourse is to move the i-f slightly to one side of 1430 kc. while operating in the immediate vicinity of the transmitter.

Never attempt to adjust the oscillator coil slug except to restore 15 and 20 meter calibration after first making sure the i-f is exactly 1430 kc. A fraction of a turn is all that will be required. Calibration on other bands is set by means of the individual ceramic trimmers the location of which is shown on the accompanying drawing.

Any time the coil slug is adjusted (to touch up 15 and 20 meter calibration) it may be necessary to retrim the 10, 40, and 75 meter bands by means of the ceramic "band set" trimmers, as the oscillator slug adjustment affects calibration of all bands. The 40 and 75 meter trimmers can be reached without removing the cabinet, but the 10 meter trimmer cannot. (Refer to layout drawing for location). Because the oscillator frequency will shift considerably when the cabinet is removed, it is necessary to note how many kc. the dial reads high or low on 10 meters with the unit in the cabinet, then adjust the trimmer to move a signal this number of kc. in the right direction when the unit is out of the cabinet, without regard to the actual reading in kilocycles. When the unit is restored to the cabinet the calibration then will be found to be correct.

Ordinarily the calibration of the converter will hold very closely for a long period of time, and adjustment of the oscillator slug or trimmers seldom will be required.

Setting the auto set to exactly 1430 kc. presents somewhat more of a problem when the set employs a "signal seeking tuner". If the output trimmer of the converter is peaked at 1430 kc., the r-f gain switch set in the "high" position, the front panel antenna trimmer on the converter peaked for maximum noise, and the "sensitivity" control knob on the auto set is turned full right, then the background noise will be sufficient to stop the tuner without a signal.

The auto radio dial then can be "inched" along in the vicinity of 1430 kc. a few kc. at a time by just tapping the station selector bar. The difficulty arises in making the initial adjustments, because until they are made the noise may not be sufficient to stop the tuner. An external oscillator set on 1430 kc. will be found useful in making the initial adjustments. Otherwise the initial adjustments must be made with the dial as close to 1430 kc. as can be arrived at with the seeking mechanism "free wheeling".

When the converter is used with a typical car receiver it will be observed that the selectivity is not as good as that of a high quality communications receiver. This is explained by the fact that typical auto sets use only one i.f. stage with only two transformers, and frequently rather low-Q transformers at that. This lack of selectivity is a function of the auto set, and has nothing to do with the converter.

Some receivers are provided with a "sensitivity control" which enables the gain of the receiver to be increased or reduced by means of a screwdriver adjustment. It may be desirable in some cases to reset this control to a more suitable setting after a converter is installed.

NOISE REDUCTION

It is desirable that the vehicle in which the converter is installed be effectively "suppressed" in order to minimize electrical noise, so that the full sensitivity of the converter can be utilized with the vehicle in motion. The required work is somewhat more extensive than for an ordinary auto receiver covering only the broadcast band, and varies somewhat with the particular car.

Usually it is difficult to eliminate every bit of electrical noise in a vehicular installation. Also, above approximately 10 Mc. or thereabouts there is the matter of ignition noise from passing vehicles which are not suppressed. The only practical solution to this problem is an effective noise limiter.

GONSET