

excellent. Good quality printed circuit boards with immersion tin plating are used throughout. All solder connections were excellent with no resin residue. The only criticisms which can be justified are, first, the "Mickey-Mouse" mounting of the pilot lamp. This lamp is held in place by a spring clip which makes the ground connection. The center connection (hot side) is soldered to the bulb making easy replacement impossible. The second criticism is the placement of the microphone jack on the left side of the chassis. When the unit is installed in an automobile there is a distinct chance of the protrusion of the microphone plug interfering with the right leg of the driver. This plug, along with the beginning of the coiled cord project over three inches beyond the side of the unit. This, however, can be overcome by replacing the plug with a Switchcraft 230 (or equivalent) "Flat Plug." This type of plug protrudes less than 1/2" from the side of the unit, and the microphone cord comes out at 90° from the shank of the plug. Thus, the

interference with the driver can be avoided.

Conclusion

Basically the Regency HR-2 is a high-quality transceiver for use by the amateur f.m.'er. The power output is sufficient for normal direct contacts as well as those contacts made through repeaters. The six channel capabilities along with the built-in strapping options to allow pairing of various crystals gives the amateur f.m.'er the versatility needed while travelling through areas with repeaters on frequencies other than 146.34/146.94 or 146.34/146.76 mc. The HR-2 was not designed to compete with the high-priced commercial equipment, but in many cases it can do the same job as those units in its power class. The expenditure of \$229.00 including crystals for simplex operation on 146.94 mc is well worth considering. The manufacturer is Regency Electronics, Inc., 7900 Pendleton Pike, Indianapolis, Ind. 46226. —K9STH

CQ Reviews:

The Standard SR-C806MA Transceiver

BY GLEN E. ZOOK,* K9STH

ONE of the important contributions to the amateur f.m. market is the SR-C806MA transceiver imported by Standard Communications Corporation, Wilmington, California. This unit is designed for operation in the 2 meter (144-148 mc) amateur band. The transceiver has provisions for up to twelve channel operation with a minimum power output of 10 watts. Accessories include a base station a.c. supply (SR-C12/120-1) and a 25 watt output final amplifier (SR-

CL25L). The unit is equipped from the factory for operation on four channel-combinations: 146.94 mc transmit/ 146.94 receive; 146.34 mc transmit/ 146.76 mc receive; 146.20 mc transmit /146.80 mc receive; and 146.34 mc transmit/ 146.94 mc receive. These frequencies cover the most used repeater frequencies as well as the national calling frequency of 146.940 mc. The receiver is a solid-state dual-conversion superheterodyne design. A ceramic filter is incorporated into the low i.f. stages for adjacent channel rejection. The transmitter is also completely solid-state. A low power switch is located on the front to reduce the 10 watt output to 0.8 watts for short range QSO's. Modulation is phase type (as used in most commercial equipment) and frequency stability is 0.001%. The unit is equipped with a sturdy mounting bracket, built-in 2¼ inch speaker, dynamic push-to-talk microphone, and crystals for operation on four channel-combinations. Additional accessories include filters for alternator hash, and a 25 watt power amplifier.

*FM Editor, CQ.



The Standard Communications Corp. model SR-C806MA 2-meter f.m. transceiver.

Technical Details

The SR-C806MA employs completely solid-

state circuitry. Special features include separate metering jacks for both transmitter and receiver sections. These jacks make tune-up and servicing easier and more accurate. A tuning meter is also provided which gives the following information: relative power output; relative signal strength of received signal; and battery (or power supply) voltage. A twelve position channel selector switch is provided. A red panel light indicates transmit and both the channel selector switch and tuning meter are illuminated.

Receiver

The dual conversion receiver employs an 11.7 mc high i.f. and a 455 kc low i.f. The receiver front end consists of two stages of bi-polar transistor amplification. These transistors are protected during transmit by a diode-connected transistor which shorts any residual r.f. to ground. The 1st mixer stage is a low-noise MOSFET to minimize intermodulation and provide low-noise conversion. In this stage the 2 meter signal is heterodyned to 11.7 mc by the injection of a signal 11.7 mc below the desired frequency. This signal is provided by a multiplier-oscillator chain consisting of three transistors. Provision is made to warp or "rubber" the receive crystals on-frequency operation.

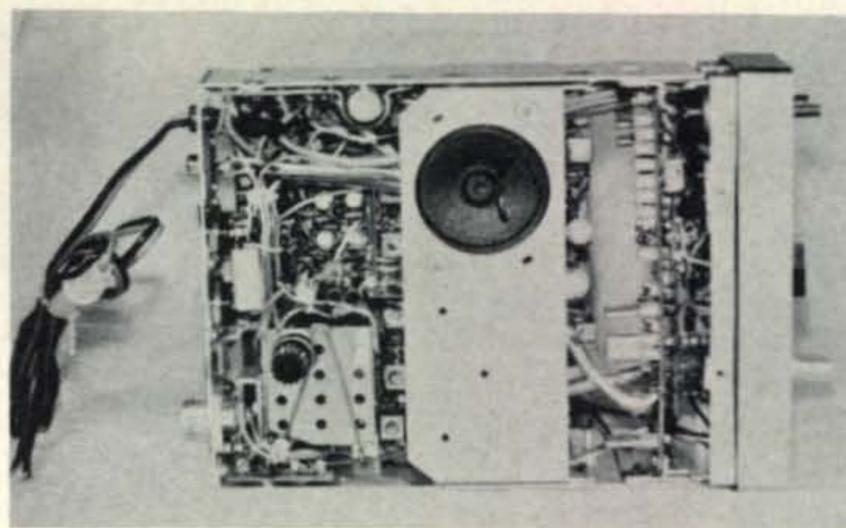
The 11.7 mc i.f. signal is further amplified in a single transistor stage and applied to the 2nd mixer. In the 2nd mixer a 12.155 mc signal is heterodyned producing a 455 kc low i.f. The 455 kc signal passes through a ceramic filter (for adjacent channel rejection) and then through five stages of amplification. This high level signal is then limited and detected. The resulting audio is amplified by two stages of audio, and applied to the 8 ohm speaker via a push-pull output stage.

The squelch circuit is noise activated. The noise is amplified in two stages and then detected to produce the d.c. voltage which controls the squelch switch transistor. This solid-state switch controls a d.c. voltage which cuts off the first audio amplifier stage until a signal overcomes the noise (quiets). At this time the first audio stage turns on and the audio circuits of the transceiver operate.

When a signal is received, the detection of the 455 kc i.f. signal by a diode pair produces an indication of signal strength on the tuning meter. During transmit the r.f. output is rectified by a diode and applied to the meter amplifier to produce a relative output reading.

Transmitter

The transmitter section of the SR-C806MA is crystal controlled by up to twelve switch selectable crystals in the 8 mc range. Frequency multiplication of 18 times is accomplished in two triplers and one doubler stage. Two stages of straight-through amplification are used before the transistor output stage. The output signal is



Top view of the SR-C806MA transceiver showing the crystal mounting board on edge behind the front panel.

applied through a four section Pi-net to the antenna change-over relay. Nominal output impedance is 50 ohms. If the antenna match is such to produce a high reflected power which may damage the transmitter, a directional coupler senses the mismatch and causes the power to be reduced to prevent damage. This is accomplished by controlling the gain of the pre-driver transistors through a two-stage d.c. amplifier circuit.

The audio circuitry of the transmitter section consists of a two transistor amplifier wherein a 6 db/octave pre-emphasis is added. The audio signal then passes through a peak-limiter circuit and a low-pass filter to an integrator circuit. This integrator circuit serves to offset the 6 db/octave pre-emphasis to produce a flat output during normal usage. If the audio input signal is sufficient to produce over-deviation the clipper reduces the negative and positive peaks of the audio signal. The signal is reshaped by the low-pass filter and is flattened by the integrator. The audio signal is then applied to the phase modulator.

Construction

Both the basic transceiver and the 25 watt amplifier (SR-CL25L) are constructed largely of printed circuits. The material used in the construction of these circuits is a phenolic material similar to the XXXP type sometimes used by manufacturers in the United States. This type of board requires extreme caution in repairing. If excessive heat is applied during either soldering or unsoldering operations the plating will often lift from the board material. The boards in the sample transceiver and amplifier showed signs of rework and several questionable solder joints. The boards had not been immersion tinned. The majority of copper plating is protected from oxidation by a lacquer-type coating. The amplifier accessory had several capacitors and chokes supported only by one lead, with the other lead attached to the second lead of another component, also supported by one lead. Also, the amplifier has an adjustment potentiometer sup-



The Standard Communications accessory 25 watt output power amplifier, model SR-CL25L.

ported by leads only and extending beyond the edge of the circuit board.

Two transceivers and two 25 watt amplifiers were examined. One transceiver and one amplifier had minor pieces of hardware missing (mainly screws used to secure the cases). The microphones of both transceivers were missing the retainer ring which mates with a threaded sleeve on the microphone jack. Without this ring it is possible to pull the microphone from the socket during mobile operation.

These quality control problems were discussed with the manufacturer, and numerous improvements in inspection and final assembly have been instituted as described later under "Evaluation."

Performance

The analysis of published performance data versus actual performance achieved is as follows:

Transmitter	Published	Actual
R.F. OUTPUT (at 13.8 v.d.c.)	10 w.	12 w.
FREQUENCY TOLERANCE	.001%	.0008%
DEVIATION	±7 kc (nom.)	±18 kc
<i>Receiver</i>		
SENSITIVITY (20 db quiet)	0.5 μ V	0.3 μ V
ADJACENT CHANNEL REJECT	60 db	65 db
FREQUENCY TOLERANCE	.001%	.0005%

The deviation of the transmitter was excessive for wideband operation, let alone narrowband. There is an internal deviation adjustment control which can be used to reduce the deviation level. Audio quality was excellent even at the extra wide deviation. The sensitivity and adjacent channel rejection were excellent as were frequency tolerances in both transmitter and receiver sections.

As stated before two transceivers and two amplifiers were examined. The first transceiver had a DOA (dead-on-arrival) transmitter section. The receiver was excellent, however. The second transceiver was used for comparison to published specifications. The first amplifier was coupled to the second transceiver for performance tests. This amplifier had a respectable power output of 21 watts at 12 v.d.c. source voltage. However, when the source voltage was increased to the manufacturer's rating of 13.8 v.d.c. the amplifier immediately failed. The second amplifier was then tried with greater success. At 12

v.d.c. the output was 23 watts. When the source voltage was increased to 13.8 v.d.c. the output increased to 29 watts.

A comparison of the two amplifiers showed that the unit which failed utilized transistors of Japanese manufacture, thus indicating an older model. Because of these failures Standard has now changed to transistors manufactured by TRW in the United States. The second amplifier used these TRW transistors. Also, the workmanship in the second amplifier was vastly superior to that in the first model. The newer model amplifier still uses the XXXP phenolic boards, but soldering techniques seem to be improved.

Evaluation

The Standard SR-C806MA transceiver incorporates features not always found in either commercial f.m. equipment or in equipment designed for amateur f.m. use. These features include twelve channel operation (with various strapping options also possible), complete solid-state design, optional power amplifier, and central metering jacks. The basic performance meets, in most cases, the manufacturer's published specifications. However, the defects in workmanship tend to overshadow the basic merits of the unit. The obvious indication is a need for increased quality control. The Standard Communications Corporation final assembly plant in the United States has recently undergone a personnel change in the final assembly and quality control areas in an attempt to correct these difficulties. The units examined had been produced before the personnel changes. Also, plans are underway to replace the phenolic boards with the newer "Poly-Clad" type of material. This material is not of the quality of a good glass board, but is quite acceptable in terms of both durability and servicability. When the new type of board material is implemented, many workmanship problems associated with the XXXP material will disappear, thus resulting in a unit whose construction should please even the most discriminating amateur.

One inherent problem which Standard recognizes is the audio quality of the built-in 2 1/4" speaker. This speaker is too small for good audio reproduction. Thus, an external speaker (SR-C202KH) is available. There is two watts of audio available at a jack on the rear of the transceiver to drive this or similar speaker. A number of other accessories are available to improve or modify the performance of the SR-C806MA:

Basic transceiver	SR-C806MA	\$335.00
25 w. power amp.	SR-CL25-3H	159.95
10 w. base station		
a.c. power supply	SR-C12/120-1AH	49.95
Portable battery supply	SR-CK002H	19.95

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5/8 wave		
mobile ant.	SR-CAT05H	27.95
Telephone hand set	SR-CMP02H	49.95
25 w. base station		
a.c. power supply	SR-C12/120-5H	89.95
Remote Speaker	SR-C202KH	18.95
25 w. alternator		
whine filter	SR-CFL06AH	7.40
Portable antenna	SR-CAT06H	4.50

The basic Standard SR-C806MA comes equipped with crystals for operating on four channel pairs, mounting bracket, microphone, 2 amp alternator whine filter, and connecting hardware. Price of the basic unit is \$335.00. The manufacturer is Standard Communications Corp., 639, N. Marine Ave., Wilmington, Calif. 90744.

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DX [from page 59]

JW, Svalbard: JW5NM—21025 kc and 28010 kc.
JX, Jan Mayen: JX2HK—28071 kc. JX8YM—28022 kc.
LX, Luxemburg: LX1CF—28020 kc.
OD5, Lebanon: OD5LX—28025 and 14036 kc.
SU, Egypt: SU1IM—14029 kc.
TA, Turkey: TA1RO, 14016 kc.
TJ1, Cameroun: TJ1AW—14015 kc.
UF6, Georgia: UF6VA—7026 kc.
UH8, Turkoman: UH8BO—28017 kc, UH8BX—7005 kc, and UH8CJ—28034 kc.
UI8, Uzbek: UI8IF—14038 kc, UI8IZ—14010 kc and UI8SK—28020 kc.
UJ8, Tadzhik: UJ8AB, 21048 kc.
UL7, Kazakh: UL7AYQ—3502 kc, UL7LH—7029 kc, LU7FAB—7020 kc, UL7XI—7005 kc, UL7CA—14048 kc, UL7XE—14024 kc, and UL7GW—28050 kc.
UM8, Kirghiz: UM8FM—14050 kc.
VP1, British Honduras: VP1WA—21014 kc.
VP8, Falkland Islands: VP8LR—28030 kc.
VS6, Hong Kong: VS6FE—21026 kc.
ZC, Cyprus: ZC4CB—21015 kc and ZC4IK—21016 and 28010 kc.
3B7, St. Brandon: 3B7DA—14065 kc.
4S7, Ceylon: 4S7DA—74053 kc.
5R8, Malagasy: 5R8AP—7004 kc.
5U7, Niger: 5U7AW—14034 kc.
8P6, Barbados: 8P6AE—21032 kc.
9H1, Malta: 9H1BB—14010 kc, 9H1CB—28026 kc, and 9H1R—21029 kc.

S.S.B. Log

AX9, Cocos-Keeling: AX9YR—14250 kc.
EA9, Spanish Morocco: EA9EJ—14260 kc.
FH8, Comoro Islands: FH8CG—28506 kc.
FR7, Reunion Island: FR7AG—21222 kc.
GD, Isle of Man: G3YBH will operate GD3YRB during Feb. and March DX tests. QSL via RSGB.
HK, San Andres Island: HK0BKW—21330 kc.
HS1, Thailand: HS1ACW—14205 kc.
HV3, Vatican City: HV3SJ—14259 kc.
JY, Jordan: JY1—28591 kc, JY1B—14332 kc.
MP4B, Bahrein: MP4BHL—28604 kc, MP4BBA—28566 kc and 14264 kc.

ST2, Sudan: ST2SA, 14220 kc.
TA3, Turkey: TA3HC—28548 kc.
TR8, Gabon: TR8VW—28594 kc.
UJ8, Tadzhik: UJ8AJ—14204 kc.
VP8, Falkland Islands: VP8KL—28555 kc.
VP8, South Orkneys: VP8JV—14195 and 14240 kc. QSL to Box 137, Port Stanley, Falkland Islands.
VS6, Hong Kong: VS6DO—14201 and 3806 kc.
YA1, Afghanistan: YA1HD—28497 kc.
ZC4, Cyprus: ZC4DB—28487 kc. and ZC4RAF—28500 kc.
ZD3, Gambia: ZD3D—14225 and 21410 kc.
ZD7, St. Helena: ZD7SD—14259 kc.
ZS2, Marion Island: ZS2MI—21276 kc.
6W8, Senegal: 6W8DY—2801 kc.
7Z3, Saudi Arabia: 7Z3AB—14244 kc.
9K2, Kuwait: 9K2AJ—14214 kc.
9M2, West Malaysia: 9M2CP—14215 kc.
9N1, Nepal: 9N1MM—14212 kc.

Rare Prefixes on the Air

DA1, *DA2*, & *DA4*—These are the new German prefixes currently being issued to foreign military personnel stationed in Germany.
LJ2—LF2F on 14040 kc.
OH8—OH8SO on 14041 kc.
OY3—This rare Faeroe's Island prefix is activated by OY3MH on 28 mc c.w.
RA0—RA0LEX on 28034 and RAEM on 14010 kc.
RI8—RI8IAC works 28 mc c.w. around 28060 kc.
RJ8—Try RJ8JBR on 28545 or 28559.
TF0—Starting Oct. 1, 1970 all foreign nationals in Iceland are required to sign their home calls portable TF. This counts as TF0 for WPX.
TG4—TG4SR operates 15 meter c.w.
UK7—UK7LAA near 14040 kc is a club station in Kazakh.
UK8—UK8GAA near 14001 is a club station in UI8-land.
WX5—WX5RRX was a special call for use aboard the historic British train "Flying Scotsman" during its June-August, 1970 run from Slaton, Texas to Green Bay, Wisconsin.
YA0—YA0CDRC, the Camel Drivers Radio Club station, frequents 14340 and 21375.
4W0—LA8YB/4W is to bet in Yemen for 1 year. QSL to LA3BI.
5L1—5L1B, 14049 kc, is a Liberian station.
5N5—5N5AAF, 28045 kc, and 5N5AAU, 28054 kc, are in Nigeria.
9C9—This is a new prefix for Iran. 9C9WB, 142-10 and 28556. 9C9TW, 28584 kc.

QSL Information

WN2KLB, 404 O'Brien Court, Wyckoff, N.J. 07481 volunteers to be QSL Manager for an African station.
HT1MG, P.O. Box 2988, Managua, Nicaragua needs a QSL Manager located in Kansas City.
AX9YR (Cocos Keeling Island)—Via VK6RU.
CE9AZ (South Shetlands)—To CE3RR.
CN8DW—c/o W6GZI.
CR5SP—Via W2GHK.
CR7IK—To W7VRO.
CW4AR—c/o CX4AR.
DK0WA—Via DK2BI.