SIGNAL/ONE'S MODEL CX7

DELUXE INTEGRATED STATION

Supplementary Technical Information

A great many questions are asked concerning details of the CX7 which cannot be adequately described in the brochures. Time rarely permits adequately answering all such questions on an individual basis; we hope that the following random selection of answers to questions asked by mail and at ham conventions will be of interest:

1. Frequency readout in the CX7 is accomplished by combining the MHz indication of the bandswitch with the kHz reading shown on the digital counter display. The latter actually counts the number of cycles of VFO output in a precisely controlled time interval, and therefore is always as accurate as the standard which provides the time reference. In the CX7 this standard is a 100 kHz crystal oscillator located in the counter module. This oscillator also provides 100 kHz markers for band-to-band calibration convenience.

2. The kHz display indicates the frequency of the VFO which is actually controlling the CX7 at any particular moment, and switches automatically to read transmitter frequency when transmitting. Transmit frequency may also be checked while receiving by pressing the "spot" button. A "range" indicator in the readout window lights up to indicate that the controlling VFO is set above or below the normal 1 MHz band in use, in the "overlap" area. Normal end overlap beyond the nominal 1 MHz range of each VFO is at least 50 kHz. A similar "offset" indicator serves as a warning when the "transmitter offset" mode is in use.

3. Once the 100 kHz oscillator is adjusted against WWV (available on the standard 14-15 MHz range), each 1 MHz band may thereafter be calibrated at any convenient 100 kHz point; the resulting frequency readout accuracy at all points will be as good as that with which the calibration process has been accomplished. With moderate care, an actual readout accuracy of 100 Hz at any point in the frequency range of the CX7 is possible.

4. The receiver front end is protected against damage from excessively strong local signals. It's unlikely that the RF amplifier MOSFET can be damaged, short of connecting a high powered transmitter directly to the antenna input.

5. The receiver preselector is independent of all transmitting circuitry and may normally be peaked once when going to a new band and then forgotten unless very large frequency changes are made.

6. "IF Shift" is essentially a passband tuning arrangement which allows maximum utilization of the very steep IF filter skirts to eliminate interference. While it varies the relative position of the signal in the IF passband, it does not affect receiver tuning or calibration.

7. Any linear amplifier must be properly matched to its load in order to deliver maximum output with minimum distortion. This means that any broadband amplifier must be designed for a specific value of load impedence (usually 50 ohms resistive). If the actual load varies significantly from the design value (that is,

if the SWR is substantially greater than 1:1), output power must be reduced to avoid distortion. This is as true of the CX7 as of earlier broadband transmitters, such as the Central 100V, for example. The CX7, however, may be switched to "manual" power amplifier adjustment when the built-in reflectometer indicates excessive load SWR, and is then capable of delivering full rated output into an SWR of 2:1 or greater, without compromise.

8. The semiconductors used for all critical applications in the CX7 are very low noise devices; consequently, not only does the receiver provide exceptional sensitivity even at 10 meters, but the transmitting output signal-to-noise-and-hum ratio is approximately 60 db. (When using a substantial amount of any type compression or clipping, of course, the increased overall gain results in accentuation of background noise picked up by the microphone. For this reason it's always desirable to use relatively little clipping when signals are very strong.)

9. The CX7 incorporates a three way feedback system similar to what is popularly called "ALC." In addition to provision for "ALC" input from an external amplifier, feedback is also provided from the grid and screen of the CX7 output tube. The screen feedback is particularly effective in preventing flat-topping and amplifier damage under conditions of severe load mismatch (such as when the antenna is accidentally disconnected).

10. FSK is applied to VFO B, and keying requires only an external contact closure capable of handling -15 volts in the "open" condition.

11. The "variable offset transmit" system is intended primarily for extremely convenient CW transceive operation, and is activated by the "A/T.O." push button. In this mode the transmit frequency may be varied several kHz above and below the receiver. The beat frequency may be monitored when the "spot" button is pressed -- exactly like spotting a separate CW transmitter and receiver. Split operation using VFO's A and B may be spotted in the same fashion, and of course only a push of the appropriate "transmit VFO" button is required to set up true transceive.

12. Low level transmitter output and receiver input is available in the 39-40 MHz range at a rear panel jack on the CX7. This is intended primarily as an interface for VHF adapters. A broadband 8.815 MHz IF output is also provided for panadapter connection or other special receiving use.

13. Virtually all circuitry in the CX7 (except for the final P.A. stage) is contained in nine glass-epoxy etched circuit modules. Each module is individually removable for service without soldering, and replacement modules will be available through distributors. Full facilities are available at the SIGNAL/ONE factory for repair of the CX7 and of individual modules.

14. An exceptional warranty policy covering the entire CX7 (including output tube) for a full year will be announced shortly.

15. CX7's will be in the hands of Authorized SIGNAL/ONE Dealers in approximately 60 days. The Owner's Manual will be available direct from the factory at approximately the same time, at a price of $10.00 postpaid.

16. Accessory and complementary equipment, including the mobile package, general coverage adapter, VHF transverter for 6 and 2 meters, and high-powered linear amplifier will be announced later. Details will be distributed directly to all individuals on the SIGNAL/ONE mailing list. Estimated initial availability of the linear, general coverage adapter, and mobile package is 180 days.