

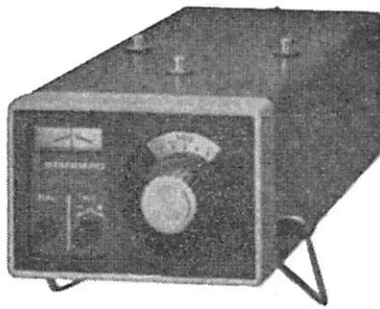
OPERATING INSTRUCTIONS



STANDARD

CV110

2mFM VFO



Thank you for your selection of our new product **CV 110**.

The **STANDARD CV 110** is VFO exclusively used in combination with 144 MHz Amateur Band FM Transceiver.

CV 110 is designed with utmost care through our advanced techniques and ample experience in the field of FM transceivers so as to assure your everlasting satisfaction.

CONTENTS

1. Introduction	2
2. Features	2
3. Operating Parts.....	4
4. How to Use	5
5. Tuning Meter.....	6
6. CAL Knob	6
7. RIT Knob	6
8. Precaution for Mobile Station Operation	7
9. Specifications	8
10. Block Diagram	9
11. Circuit Diagram	10

1. Introduction

The Model **CV-110** is VFO intended to be used with 144 MHz amateur band FM transceiver. It permits communications on unlimited numbers of channels by simply disabling the crystal oscillator of FM transceiver, performing more advanced operations.

The Model **CV-110** is a complete transceive VFO with one crystal oscillator working both for transmission and reception, thus allowing one touch operation of QSY.

2. Features

1) Compact Styling

CV-110 is the same as C 828M in size. The overall dimension is less than half of the size of our conventional models. When used as a mobile station, it can be mounted at vehicle driver's seat area.

2) Push-in/Pull-out Mounting Bracket

CV-110 can be attached to and detached from the mounting bracket by a single motion basis. For attaching, just snap **CV-110** into the bracket. The reverse consequence can be obtained by simply snapping it off toward you.

3) Vibration-resistant Design

Due to the development of fully isolated oscillator block covered with a plate of 1.2 mm thick, **CV-110** is highly resistant against vibrations. The QSO is comparable to that of crystal oscillator even when the unit is used as a mobile station.

4) Excellent Frequency Stability

The employment of MOS FET in the clap circuit and the use of slit steatite bobin, lock type air trimmer, etc., assure excellent frequency stability. The clap circuit has outstanding performance as proved in the circuit of SSB equipment.

5) One Touch Connection

CV-110 can be ready for operation simply by plugging the connecting cable into the external oscillator terminal of C 828M

6) Tuning Meter

When **CV-110** is connected to the transceiver, the center meter functions even when the transceiver is being operated with its own built-in crystal oscillator.

The meter can be used for VFO tuning, checking of frequency deviation of crystal oscillator, etc..

7) RIT

The RIT feature is provided for round table use. It adjusts the transceiver to the deviated frequencies occurring in one or two receiving stations.

8) Remote Control VFO/Crystal Oscillator Selection

CV-110 can be turned on and off by the memory switch mounted on the microphone. The on/off control is made quickly while the microphone is being in use in your hand.

9) **CV-110** incorporates newly adopted glass epoxy printed circuit board for better operational performance.

10) Green Lamp Illumination

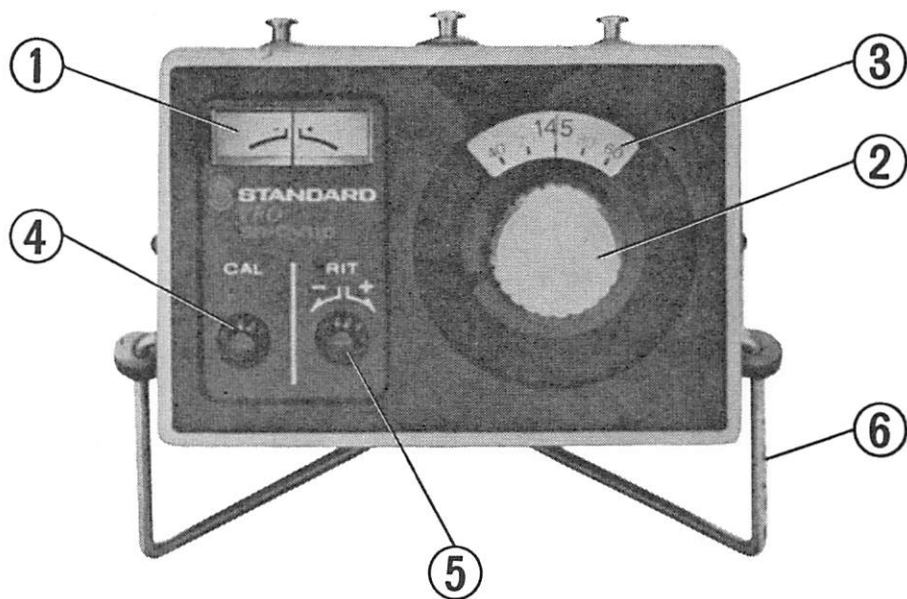
The meter and dial are illuminated green. This protects the operator from dazzling light and assures safe driving of car at night.

11) Removable Stand

The removable stand is used when the unit is operated as a fixed station.

3. Operating Parts

- | | |
|----------------|------------|
| ① Tuning Meter | ④ CAL Knob |
| ② Tuning Knob | ⑤ RIT Knob |
| ③ Dial | ⑥ Stand |



4. How to Use

1) Connection

Plug the connecting cable of **CV-110** into the external oscillator terminal on the side of **C 828M** (refer to the instructions for **C 828M**). **CV-110** will now be ready for operation. This connection completes the connections of both the power supply and the oscillator output circuit.

Note: **CV-110** is designed for exclusive use with **C 828M** (1 crystal transmitting/receiving system). It cannot be used with the transceiver of 2 crystal system.

2) Operation

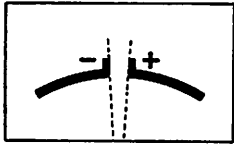
When the connection has been finished, check to make sure that the white line on the RIT knob ⑤ is in the center position. Turn on the power switch of **CV-110**. The tuning meter and the dial will be illuminated indicating that the power is on.

To select **CV-110** or the crystal oscillator built in the transceiver, use the memory switch mounted on the microphone. Set the memory switch to ON and the orange light of the memory lamp will come on indicating that **CV-110** is operating.

Tune in your desired receiving station by turning the tuning knob ②. When the meter of **C 828M** shows maximum deflection and the tuning meter ① of **CV-110** indicates the center position, then the tuning is perfect. This also tunes the transmitting frequency in the receiving station. Your **CV-110** is now ready for QSO operation.

Note: The memory channel oscillator circuit will not operate while **CV-110** is being connected. Be sure to shift the crystal oscillating element by referring to the instructions for **C828M**

5. Tuning Meter



The tuning meter is a high sensitivity ampere meter rated at $\pm 75/\mu\text{A}$. It keeps operating as long as CV-110 is connected to C 828M. As explained in the preceding paragraph 4 "How to Use", accurate tuning point is obtained when the meter pointer indicates the center position. For practical use, however, a minor deviation within the range of the dotted lines (about ± 2.5 KHz) does not affect the operation of the unit.

Note: When no signal is received, the tuning meter may be off the center position. This is in no way an indication that the unit is in trouble.

6. CAL Knob

Turning the CAL Knob ④ will vary both the transmitting and receiving frequencies simultaneously within the range of ± 20 KHz, regardless of the position of the dial scale. To calibrate the dial graduation, use this knob while utilizing the crystal oscillator built in C 828M.

"Calibrating Method of Dial Graduation.....Setting to 145 MHz"

1. Set the dial of CV-110 to the "145" position.
 2. Set the channel selector of C 828M to the 145 MHz channel.
 3. Set the memory switch on the microphone to OFF and confirm that the signal from the transmitting station can be caught by the crystal oscillator in C 828M and that the tuning meter of CV-110 is indicating the center position.
 4. Set the memory switch on the microphone to ON so that CV-110 is operated.
 5. Turn the CAL knob slowly to tune accurately to the opposite transmit station.
- Now, the calibration of dial graduation will have been completed.

Note: In calibrating the dial graduation, while you receive signal from a station when the frequency of CV-110 is exactly the same as the frequency of the crystal oscillator in C 828M and ON/OFF operation of memory switch is repeated during the reception, unusual noises may sometimes be heard. This is not an indication that the unit is in trouble.

7. RIT Knob

Turning the RIT knob will vary only the receiving frequency within the range of ± 5 KHz independently of the position of the dial scale. This knob is used to receive one or two stations with deviated frequencies while maintaining the transmitting frequency accurately. For complete transceive operation (regular communication using the same frequency for both transmission and reception), be sure to set the white line on the knob to the center position.

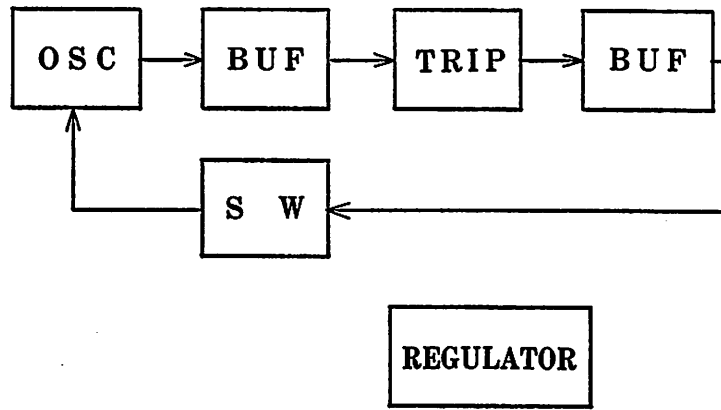
8. Precaution for Mobile Station Operation

For the purpose of safe driving, please avoid using CV-110 for QSY while the car is running. To ensure pleasant driving, the use of the crystal oscillator in C828M is recommended.

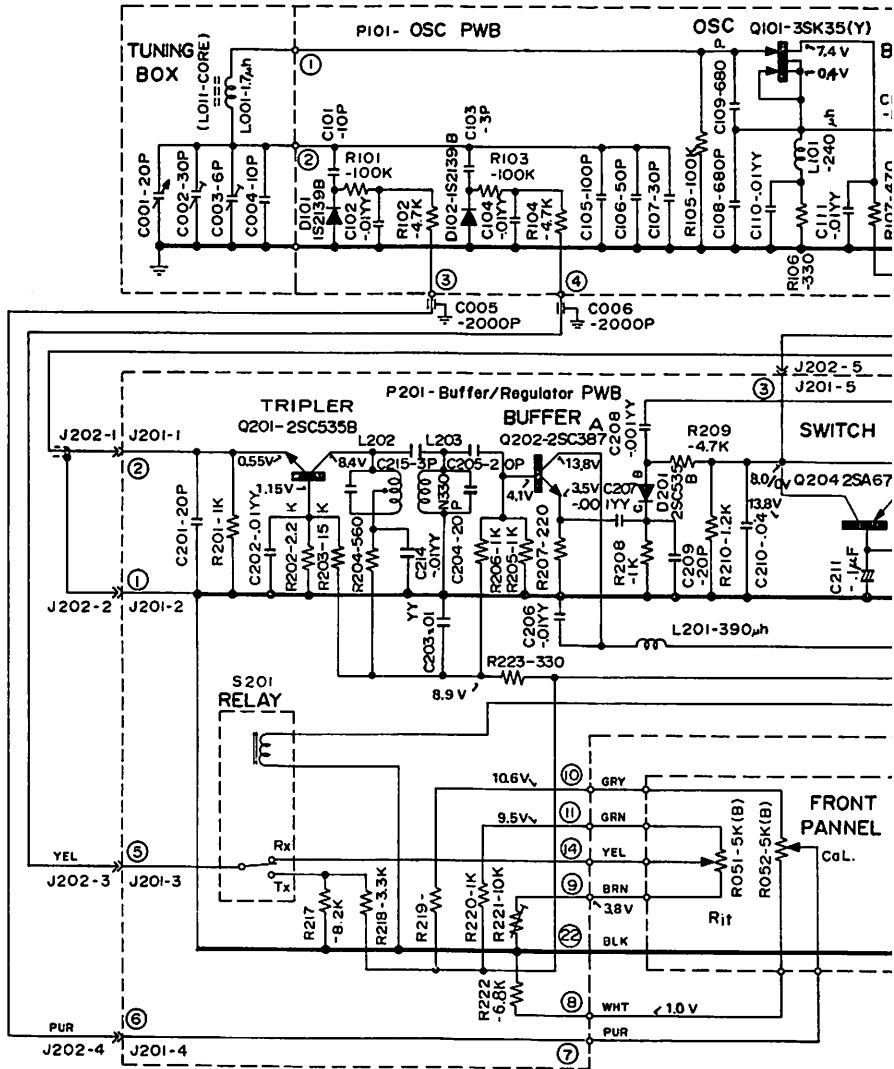
9. Specifications

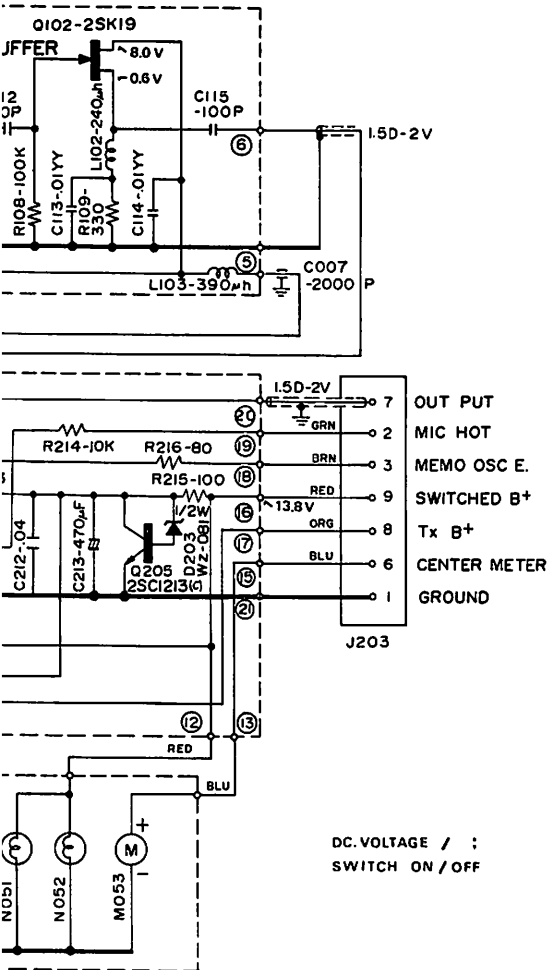
1. Use : VFO for 2 m band FM amateur transceiver
C 828M
2. Frequency Range : 144.0~146.0 MHz
(output frequency : (30.50~31.00) MHz)
3. Current Drain : Less than 250 mA
4. Output Voltage : More than 10 mV
5. RIT Adjustable Range : ± 5 KHz
6. CAL Adjustable Range : ± 20 KHz,
7. Semiconductors : 2 FETs
4 transistors
4 diodes
8. Dimentions : 84×58×235 (mm)
9. Weight : 1.0 kg

10. Block Diagram



11. Circuit Diagram





BETRIEBSANLEITUNG FÜR DEN VFO STANDARD CV 110

Der VFO CV110 ermöglicht frequenzvariablen Betrieb des FM-Transceivers C 828 M. Hierzu muß der VFO über den 9-poligen Anschlußstecker mit der Zubehörfassung an der Rückseite des Gerätes C 828 M verbunden werden. Die Stromversorgung erfolgt aus dem Transceiver. Der VFO besitzt keinen gesonderten Ein/Ausschalter, sondern ist ständig betriebsbereit, solange der Transceiver eingeschaltet ist.

Zur Frequenzeinstellung dient der großen Skalenknopf, der über einen Feintrieb den Drehkondensator als frequenzbestimmendes Teil antreibt. Auf dem Rand des Knopfes befinden sich Markierungen, die eine 20kHz-Einteilung darstellen; die VFO-Skala selbst ist in 100kHz-Teilstrichen geeicht.

Zur genauen Einstellung auf eine Gegenstation ist der VFO mit einem Anzeigeelement ausgestattet, das den Diskriminator-Nulldurchgang sichtbar macht. Bei richtiger Einstellung auf die Frequenz der Gegenstation befindet sich der Zeiger des Meßinstrumentes in der Mittelstellung.

Der Regler RIT soll sich normalerweise mit der weißen Markierung in der Mittelstellung befinden. Mit diesem Regler kann die VFO-Frequenz bei Empfang um ca. ± 7 kHz verändert werden, um Abweichungen gegenüber der eigenen Sendefrequenz auszugleichen. Eine solche Einrichtung ist auch als "Clarifier" von KW-Transceivern her bekannt.

Mit Hilfe des Reglers CAL kann der VFO auf bekannte Frequenzen geeicht werden, z. B. auf eine Relaisausgabefrequenz, eine Bake und dergleichen. Hierzu stellt man die Hauptskala auf die bekannte Frequenz ein und verändert den Regler CAL solange, bis das Meßinstrument den Nulldurchgang des Diskriminators anzeigt. Der Variationsbereich dieses Reglers ist ca. ± 25 kHz. Bei größeren Abweichungen kann eine Frequenzkorrektur nur an den frequenzbestimmenden Teilen des Oszillatorschwingkreises vorgenommen werden.

Achtung: Nach erfolgter Eichung Stellung des Reglers merken!

Für Simplex-Verkehr wird der VFO zunächst unter Beachtung des Nulldurchganges am Diskriminatorinstrument auf die Gegenstation eingestellt. Vorausgesetzt, daß sich der Regler RIT in der Mittelstellung befindet, ist jetzt durch Bedienen der PTT-Taste am Mikrofon des Transceivers C 828 M Sendebetrieb auf der gleichen Frequenz möglich.

Genau wie bei Quarzkanalbetrieb gestattet der VFO jedoch auch den Verkehr über Relaisstellen. Hierbei ist zu beachten, daß bei Relaisbetrieb der Sender stets nach tieferen Frequenzen hin geschiftet wird. Je nach Stellung des Schalters für den Frequenzversatz bei Relaisstellenbetrieb am C 828 M ist es deshalb möglich, versehentlich mit der Sendefrequenz außerhalb des 2 m-Bandes - d. h. unter 144 MHz - zu liegen. Deshalb ist der Stellung dieses Schalters und der eingestellten VFO-Frequenz ganz besondere Aufmerksamkeit zu widmen.

Das Öffnen des Gehäuses, die Montage im Fahrzeug oder die Verwendung des Aufstellbügels werden in der Betriebsanleitung für den Transceiver C 828 M ausführlich beschrieben.

TECHNISCHE DATEN

Frequenzbereich:	144 - 146 MHz	Ausgangsspannung:	10 mV
Ausgangsfrequenz:	30,5 - 31,0 MHz	Halbl. Bestückung:	2 FETs, 4 Transistoren.
Stromversorgung:	13,8 V Gleichsp.		4 Dioden
	$\pm 20\%$ aus C 828 M	Gehäuseabmessungen:	B 84 x H 58 x T 235 mm
Stromaufnahme:	250 mA	Gewicht:	1,0 kg

