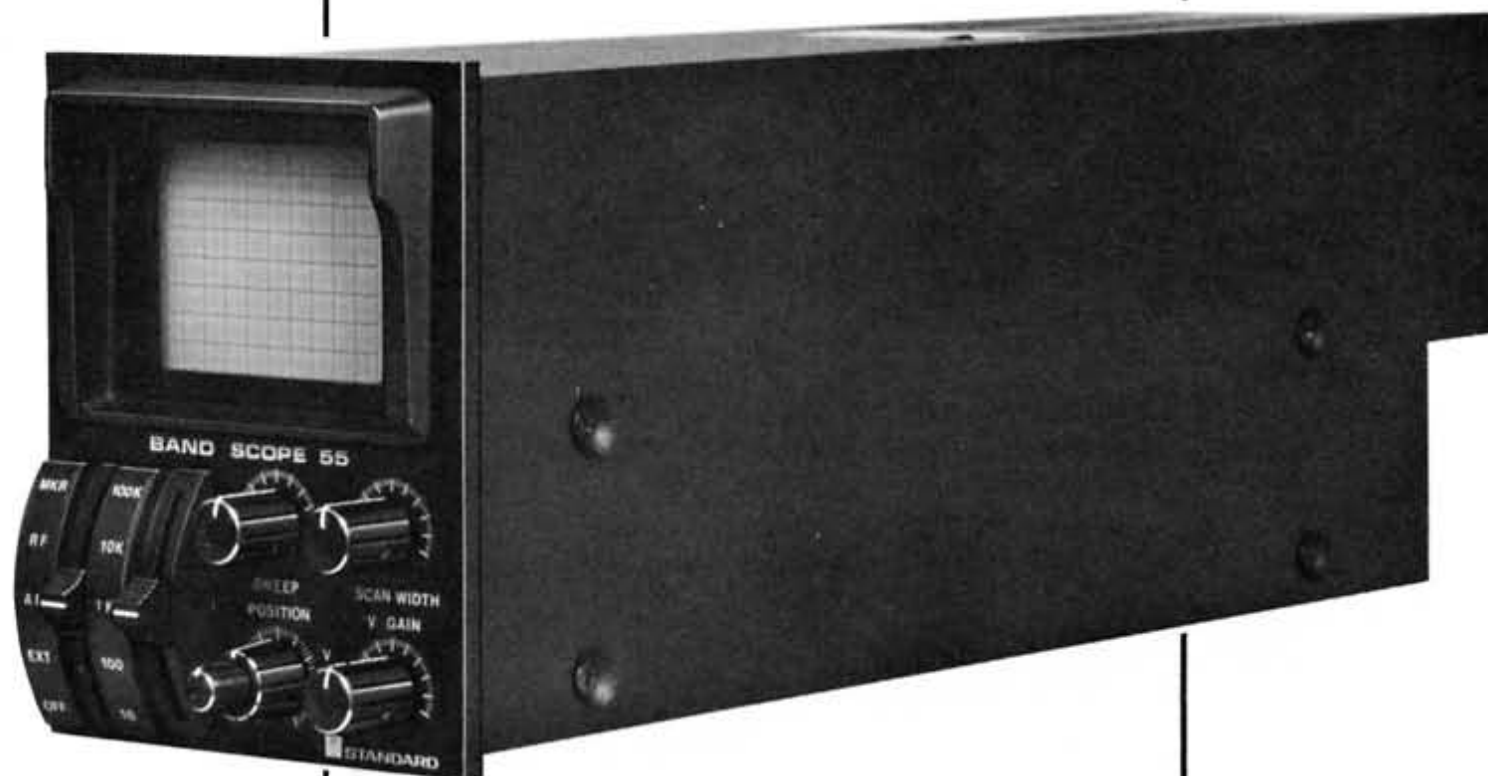


SR STANDARD
BAND SCOPE
CBS55

OWNER'S MANUAL

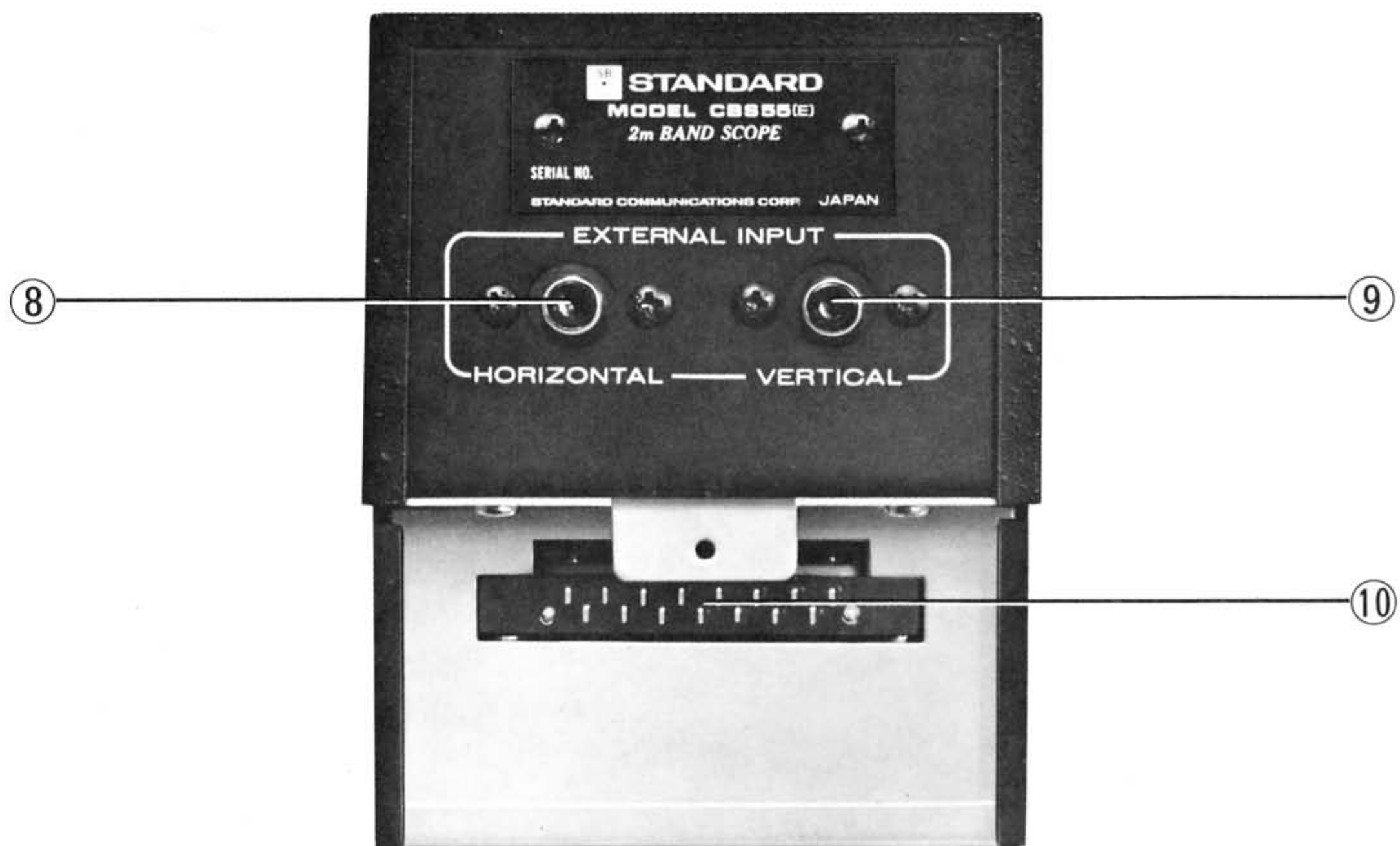
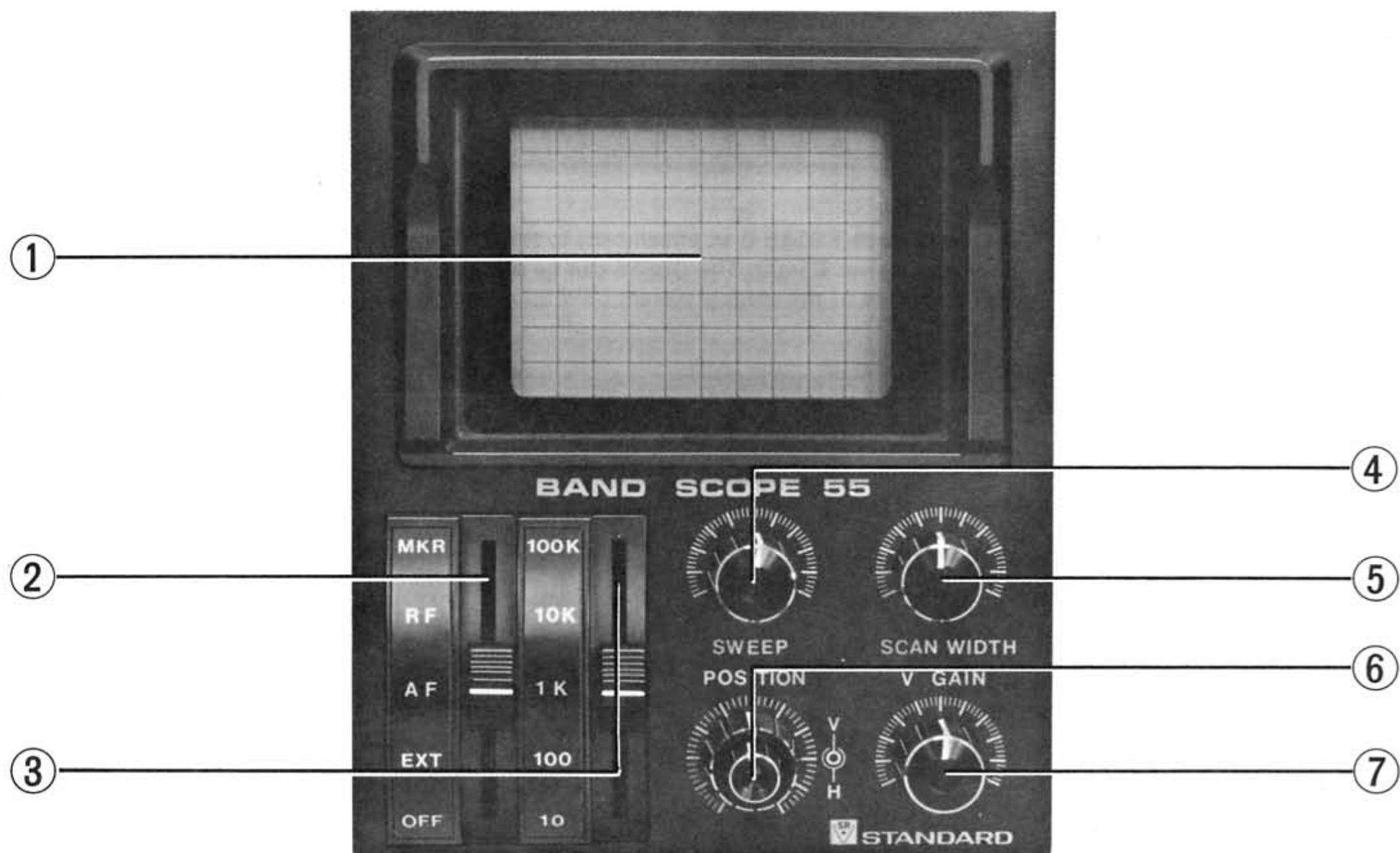


STANDARD COMMUNICATIONS CORP.

The band scope CBS55 is an attachment to the VHF multi-mode transceiver C5400. The CBS55 can be plugged in the C5400 in place of the speaker system CSP55.

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1. USE

1. RF WAVEFORM OBSERVATION

1-1. Band Scope (Reception Monitor)

When the function switch is placed in the RF position during reception, signal spectrum around the signal to be received (in a range of 40~200 kHz) is displayed on the CRT. At this time, the base line moves downwards by 3~3.5 scales automatically so that the signal spectrum may be easily read.

When the function switch is placed in the MKR position, the IF signal of 10.7 MHz is displayed in the center of CRT together with the signal spectrum (see Fig. 1) as the marker.

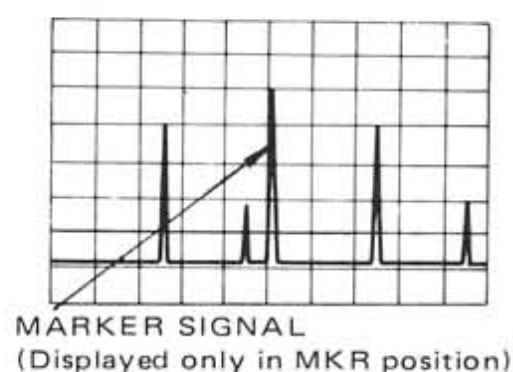
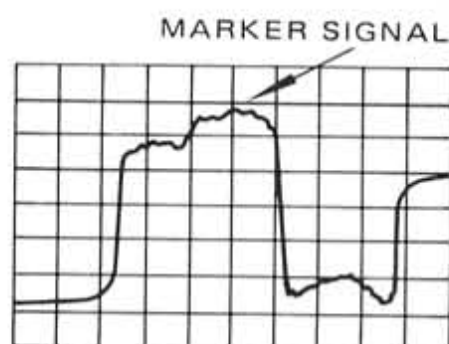


Figure 1.

If the VFO knob of C5400 is turned so that any signal on the CRT overlaps with the marker, then C5400 receives the overlap signal. At this time, the scan width is varied from 4 kHz/div to 20 kHz/div (Fig. 2 and 3) by adjusting the SCAN WIDTH control, so that the operator can easily tune into the desired signal.

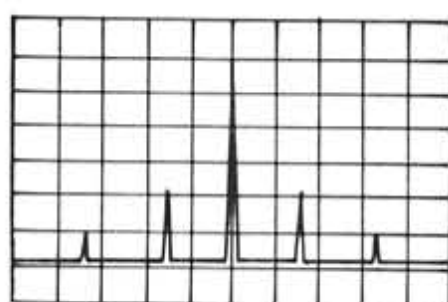
NOTE: When a strong signal is received, the display becomes as shown in Fig. 4. The signal in the center is the correct received signal and the others are generated because a transistor before the IF limiter of CBS55 is saturated. This is not a trouble.



4 kHz/div
Figure 2.



20 kHz/div
Figure 3.



1-2. Transmission Monitor

When the function switch is placed in the RF position during C5400 is in transmission, the RF POWER spectrum of transmitted signal is displayed. In the FM mode, the displayed signal height does not change even if the RF POWER control of C5400 is varied. In the SSB mode, the signal height varies according to sound volume.

2. AF WAVEFORM OBSERVATION

When the function switch is placed in the AF position during reception, Audio output waveform is observed. For every mode, the output is picked out of the stage immediately after the detector, so the output level is constant regardless of the AF GAIN control. During transmission, the MIC AMP output waveform is directly observed. This waveform represents the MIC AMP characteristics. If the waveform is clipped, a distorted signal will be transmitted and splatter may occur. Please check the waveform at times during transmission for clear transmission.

3. USE AS OSCILLOSCOPE

When the function switch is placed in the EXT position, the CBS55 can be used as oscilloscope. The external vertical and horizontal signals are applied to the RCA plugs on the rear panel. The vertical input impedance is 200 k Ω and sensitivity is 2.5 mV/div in a range of up to 200 kHz.

2. OPERATION OF EACH PART

① CRT

A 3-inch cubic CRT is used, so that the display pattern is easy to see.

② Function Switch

MKR:

MKR is a abbreviation of MARKER. The marker frequency is equal to the 1st IF frequency of C5400, 10.7 MHz. When the function switch is placed in the MKR position, a signal of 10.7 MHz is displayed as marker. The marker signal does not move even if the tuning dial of C5400 is turned, thus it is easily identified. A signal overlapping with the marker is received by C5400. Signals around the received signal are also observed at a time.

RF:

During reception (RX), the received signal and other signals around it are displayed. When the tuning knob of C5400 is turned, the horizontal locations of signals move continuously, so that the optimum reception condition is obtained.

During transmission (TX), 10.7 MHz signal of the transmitter is displayed.

AF:

Audio output or MIC AMP output waveform is displayed during reception or transmission, respectively.

EXT:

Waveform of signal applied to the VERTICAL terminal of the EXTERNAL INPUT on the rear panel is displayed when the function switch is placed in the EXT position. With the function switch in this position, CBS55 can be used as oscilloscope.

OFF:

All the display functions stop when the function switch is placed in the OFF position, however, the band scope CBS55 is still powered and is in stand-by. The CBS55 is powered ON/OFF by the power switch of C5400.

③ Sweep Range Selection Switch

The sweep range selection switch functions only when the function switch is placed in the AF or EXT position. Sweep range has 5 selections of 100 kHz/10 kHz/1 kHz/100 Hz/10 Hz.

④ Sweep Control

The sweep control changes sweep speed continuously within a sweep range. This control is also effective when the function switch is placed in the RF position. In this case, variable range is always 5~50 Hz regardless of the position of sweep range selection switch.

⑤ Scanning Width Control

The scanning width control is effective when the function switch is placed in the RF position and RF signals are observed. This control varies scanning width from 40 kHz to 200 kHz continuously.

⑥ V/H Position Control

The V/H position control moves location of displayed signals continuously. The inner knob is for vertical control and the outer knob for horizontal control.

⑦ Vertical Gain Control

The vertical gain control changes vertical size of the displayed waveform.

⑧ ⑨ External Input Terminals

These terminals are for signals applied from the external. One is for vertical signal and the other is for horizontal signal. The horizontal terminal works as external input terminal when the attached plug is inserted.

⑩ Connector

This connector is used to connect CBS55 with C5400.

3. CIRCUIT

1. EACH BLOCK

① Main Block (P101)

The MAIN BLOCK consists of RF and IF amplifiers and a CRT driving circuit. The CRT driving circuit consists of a vertical amplifier, a sweep oscillator, a blanking circuit and a horizontal amplifier. Vertical gain is 60 dB and input sensitivity is more than 2.5 mV/div.

Sweep frequency is varied from 10 Hz to 100 kHz with the sweep range selection switch and the sweep control knob on the front panel. However, when an external oscillator is connected to the EXT input terminal on the rear panel, the internal sweep function stops. The vertical input is selected with the function switch: When the function switch is placed in the RF position or MKR position, the IF detector output is applied to the internal input terminal; when the function switch is placed in the AF position, the audio output of C5400 is applied to the internal input terminal; when the function switch is placed in the EXT position, the external vertical input terminal is effective.

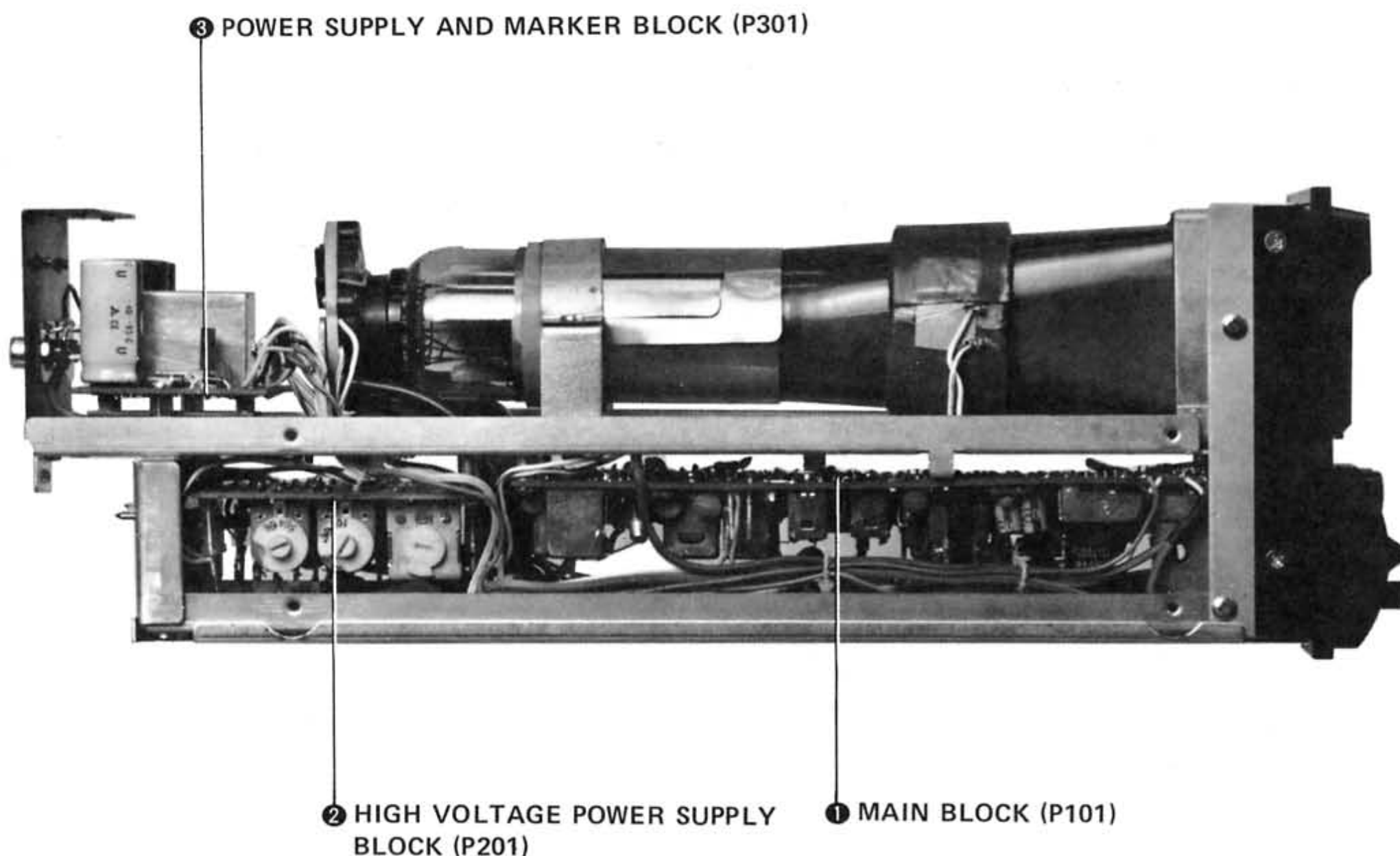
The RF amplifier is a double conversion system. 455 kHz IF signal is detected and then applied to the vertical amplifier. The 1st local oscillator of C5400 is also used as that of CBS55. The 2nd local oscillator uses a varicap diode to which the horizontal output is applied via the SCAN WIDTH variable resistor so that SCAN WIDTH is varied from 40 to 200 kHz.

② High Voltage Power Supply Block (P201)

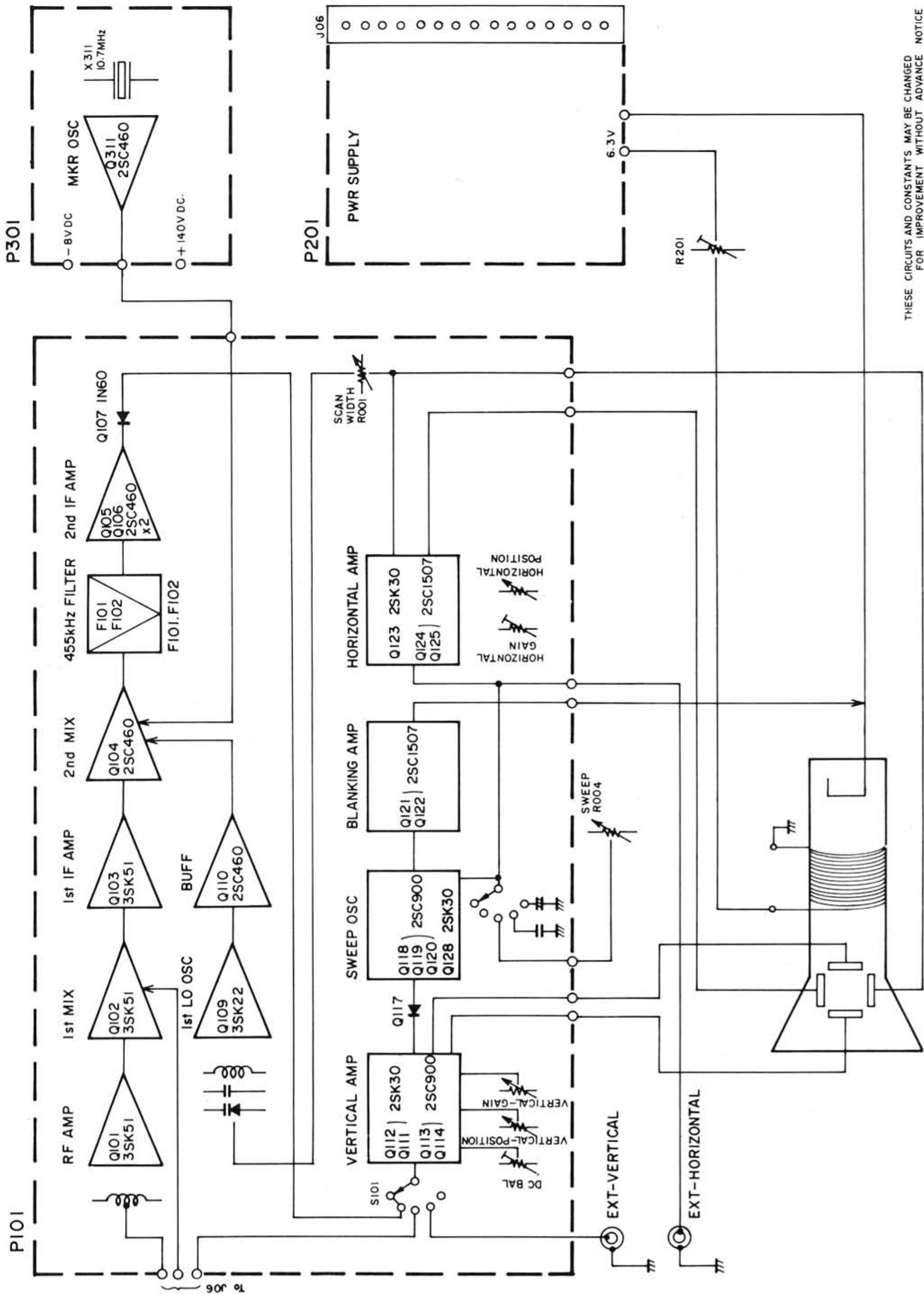
The connector to C5400, a high voltage power supply, and semi-variable resistors for controlling FOCUS, brightness and horizontal position are mounted on the high voltage power supply block. The above 3 semi-variable resistors can be adjusted through the side hole by removing the top panel of C5400 even if CBS55 is plugged in.

③ Power Supply and Marker Block (P301)

The power supply and marker block consists of a -9 V power supply, a +140 V power supply and a marker oscillator. The marker oscillator uses a X'tal to oscillate at 10.7 MHz. The oscillator output is injected into the 2nd MIX of P101 MAIN BLOCK, then detected and displayed on CRT.



2. BLOCK DIAGRAM



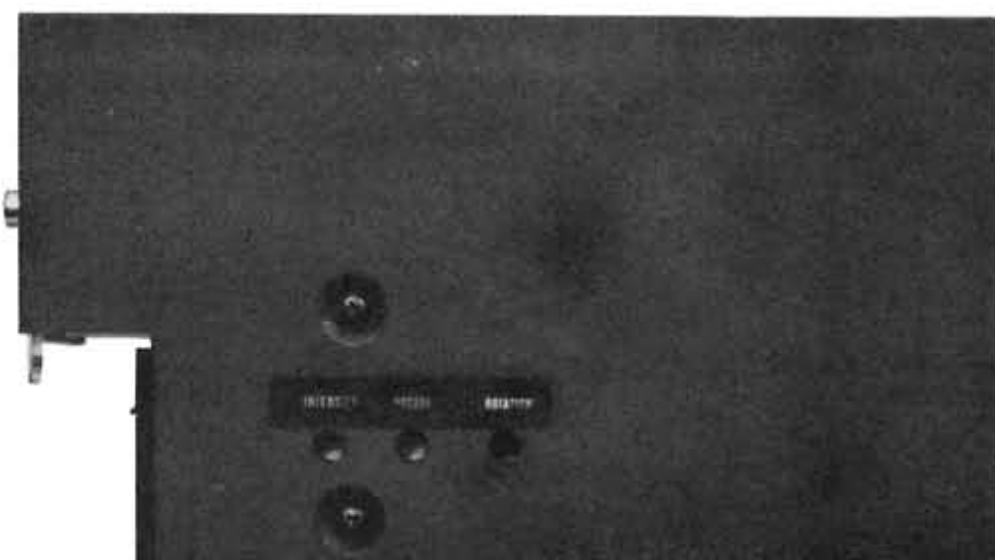
THESE CIRCUITS AND CONSTANTS MAY BE CHANGED
FOR IMPROVEMENT WITHOUT ADVANCE NOTICE

4. ADJUSTMENT

INTENSITY, FOCUS and ROTATION of CRT were adjusted before shipping. If they were out of tune, adjust them in the following procedures with CBS55 plugged in C5400.

1. Power C5400 ON.
2. Adjust the ROTATION adjusting semi-variable resistor so that the bright line is made horizontal.
3. Adjust the INTENSITY adjusting semi-variable resistor so that brightness is made proper. Note that, if brightness is raised too much, CRT life will be shortened.
4. Adjust the FOCUS adjusting semi-variable resistor so that the finest line is obtained.

NOTE: Never remove the front and rear panel since a high voltage is applied to some internal parts. Please contact the dealer if any trouble occurs.



5. SPECIFICATIONS

General:

Dimensions (W x H x D)	97 x 121 x 336.5 mm
Weight	3.2 kg
Power Consumption	15 VA
CRT	85DB31 (effective area 58 x 43 mm)

Oscilloscope:

(1) Vertical Axis

Deflection Sensitivity	more than 2.5 mV/div (1 kHz)
Freq. Characteristic	DC~100 kHz (−3 dB) 200 kHz (−6 dB)
Input Impedance	more than 200 k Ω
Drift	0.2 div/ $^{\circ}$ C (15 min after power-on and on) 1.5 div/hr

(2) Horizontal Axis

Deflection Sensitivity	more than 100 mV/div (1 kHz)
Freq. Characteristic	DC~100 kHz (−6 dB)

(3) Sweep Circuit

Sweep Frequency	10 Hz range: 1~10 Hz 100 Hz range: 10~100 Hz 1 kHz range: 100~1 kHz 10 kHz range: 1 k~10 kHz 100 kHz range: 10 k~100 kHz
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Band Scope:

Scan Width	40~200 kHz
RF Sensitivity	less than 10 dB (vertical output 1 div)
Sweep Freq.	10~50 Hz

These specifications and exterior designs may be changed for improvement without notice.