ARTISAN®
TECHNOLOGY GROUP

Your **definitive** source for quality pre-owned equipment.

Artisan Technology Group
(217) 352-9330 | sales@artisantg.com | artisantg.com

Full-service, independent repair center
with experienced engineers and technicians on staff.

We buy your excess, underutilized, and idle equipment
along with credit for buybacks and trade-ins.

Custom engineering
so your equipment works exactly as you specify.

- Critical and expedited services
- In stock / Ready-to-ship
- Leasing / Rentals / Demos
- ITAR-certified secure asset solutions

Expert team | Trust guarantee | 100% satisfaction

All trademarks, brand names, and brands appearing herein are the property of their respective owners.

Find the *ShibaSoku TG-7/1* at our website: ***Click HERE***

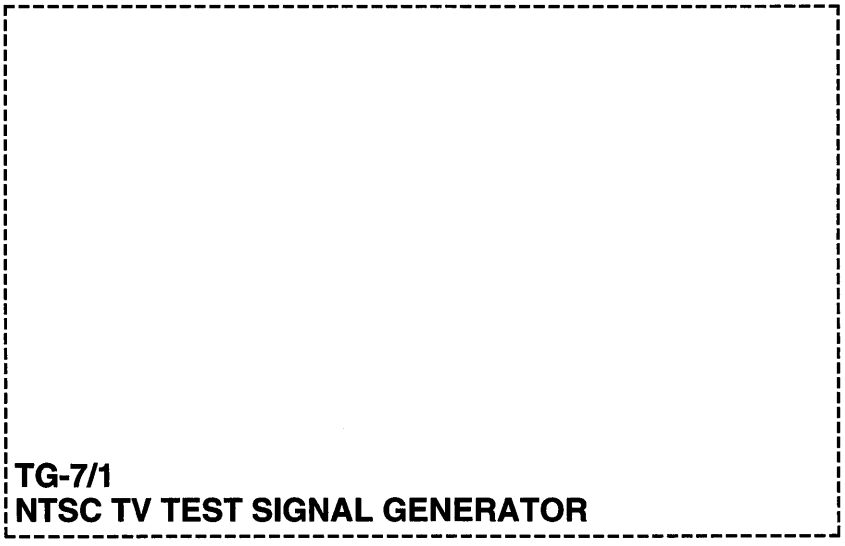
PDM SYSTEM APPROVED ShibaSoku Co.,Ltd.

Document No.	DM—TG-7/1—EB01.00

OPERATING INSTRUCTIONS

MODEL : TG-7/1

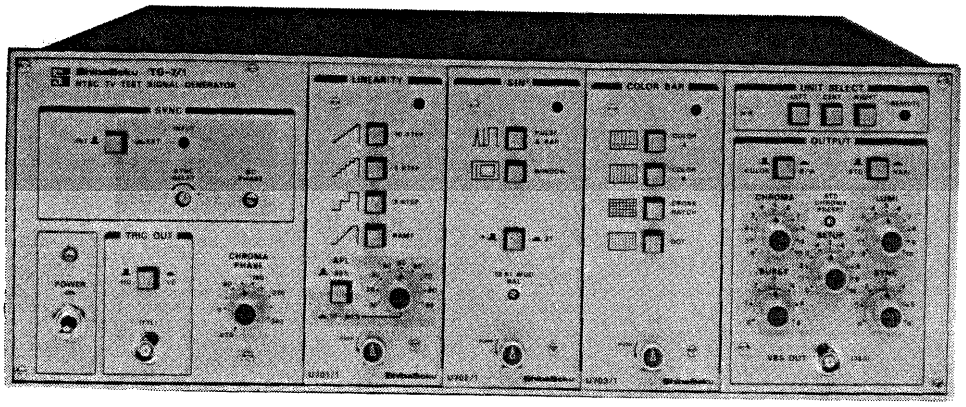
NTSC TV TEST IGNAL GENERATOR



ShibaSoku Co.,Ltd.

PDF processed with CutePDF evaluation edition www.CutePDF.com
Artisan Technology Group | Quality Instrumentation Guaranteed | (888) 88-SOURCE | www.artisantg.com

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com



Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

NOTE

In the specifications of this instrument (TG-7/1 and TG-7/2), the luminance and chrominance signals are available separately. However, in the Model U707 (VITS Generator Unit), the separation of luminance and chrominance signals is impossible because of the circuitry. Therefore the VBS signal is also available at the luminance signal output connector (Y+S OUT) and no signal is available at the chrominance signal output connector (C OUT). Ordinary VBS signal is available at the VBS output connector.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

C O N T E N T S

1. OUTLINE..... 1

2. CONFIGURATION. 2

ACCESSORIES..... 4

3. FEATURES..... 6

4. ELECTRICAL PERFORMANCE..... 7

4-1 Drive signals..... 7

4-2 External sync..... 7

4-3 Test signal (using U702 unit)..... 8

4-4 Temperature test..... 9

4-5 Power supply..... 9

(1) Input voltage..... 9

(2) Power consumption. 9

4-6 Other specifications..... 9

(1) Dimensions..... 9

(2) Weight..... 9

4-7 Remote control facility 9

4-8 VBS signal separation output (option)..... 10

4-9 Drive signal waveforms..... 10

4-10 Video sync signal timing..... 11

5. OPERATION (refer to panel layout figure)..... 12

5-1 Connections..... 12

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

5-2 Precautions before use..... 13
(1) Installation location..... 13
(2) Rack mounting procedure..... 14
(3) Plug-in unit..... 14
(4) Power supply connections..... 16
(5) Ground terminal connection..... 18
6. OPERATION AND FUNCTIONS..... 19
Remote connector description figure..... 25
7. TEST PREPARATIONS..... 26
7-1 Connection of vertical interval keyer..... 28
8. MAINTENANCE.. 30
8-1 Basic check methods. 37
9. PRINCIPLE OF OPERATION..... 48
Block diagram..... 50
10. DESCRIPTION OF CIRCUITRY..... 51
11. LISTING OF ICs USED..... 65
12. EXTERNAL APPEARANCE FIGURE
13. OVERALL CONNECTIONS FIGURE
14. SCHEMATIC DIAGRAM

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

1. OUTLINE

The TV test signal generator is built to conform to the NTSC (National Television System Committee) color TV system and is combined with several plug-in modules that generate test signals for the main frame. It is able to generate the test signals required for the testing, adjustment or measurement of all kinds of video devices and equipment.

An internal sync signal generator, which is a drive source to generate waveforms, features perfect color and line interlaced scanning conditions. It also conforms to requirements of the EIA (Electronics Industries Association) RS-170A. It can also syncronized with signals supplied from an external source through gen-lock. A full-field signal or vertical interval test signal (VITS) can be obtained in the test signal output. The VITS generation line position is determined by the vertical interval keyer (VIK) pulse which is applied to the connector on the rear panel.

The main frame's test signal unit are classified by measurement application, and a jultiple number of signals can be generated from a single unit.

Modules with which the main frame can be combined include the linearity (DG, DP) measurement signal unit, frequency response measurement signal unit, transient response (SIN^2) measurement signal unit and video system adjustment pattern signal unit. In addition, special unit are available including the VITS module that conforms to the CCIR recommendation. Up to three unit having a standard width may be housed in the main frame simultaneously, and one test signal from the unit can be selected and fed out.

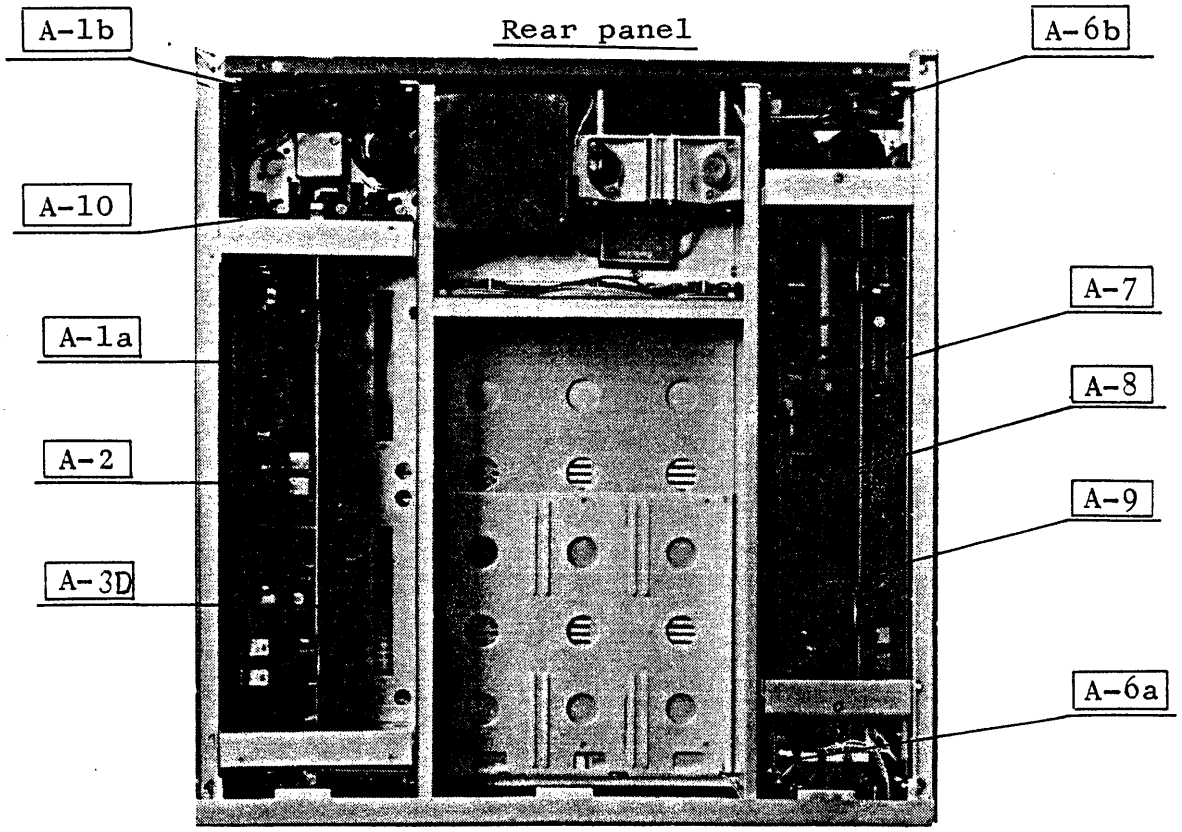
All the selection of the unit output signal can be performed by remote control. Furthermore, options are available which, through

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

combination with an external programmable attenuator, allow the amplitude of the video component, sync component and color burst that make up the test signal to be varied independently or which have the functions of both.

2. CONFIGURATION

The main frame is composed of the following parts: A-1a sync separator and color lock circuitry, A-1b buffer circuitry, A-2 chroma phase shifter and horizontal sawtooth wave generator circuitry, A-3D sync signal, gen-lock and drive signal circuitry, A-6a and A-6b luminance signal and chroma level control circuitry, A-7 B-Y/R-Y modulation circuitry, A-8 color burst modulation circuitry, A-9 output signal amplifier circuitry and A-10 power supply.

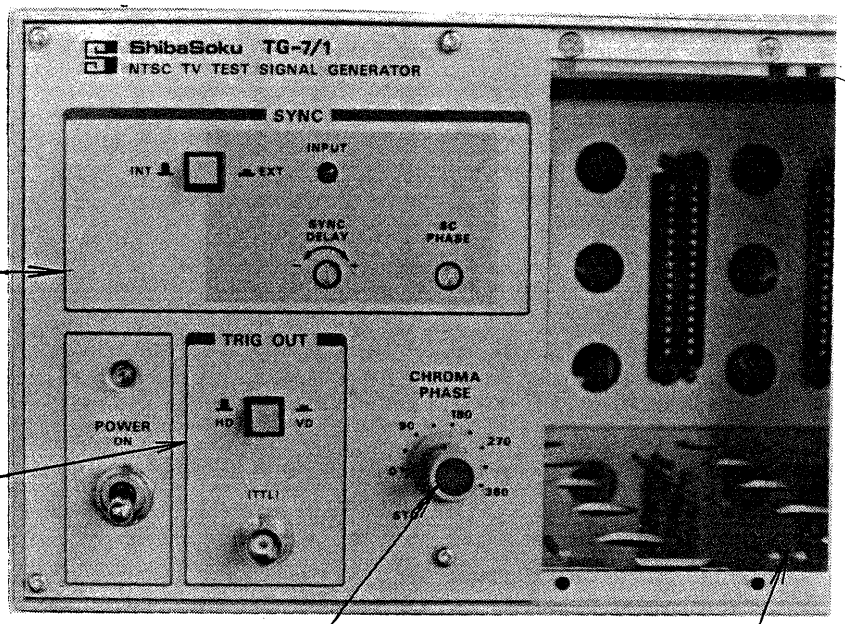


Front panel

Location of printed circuit boards

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Front panel (left side)



Sync signal control section

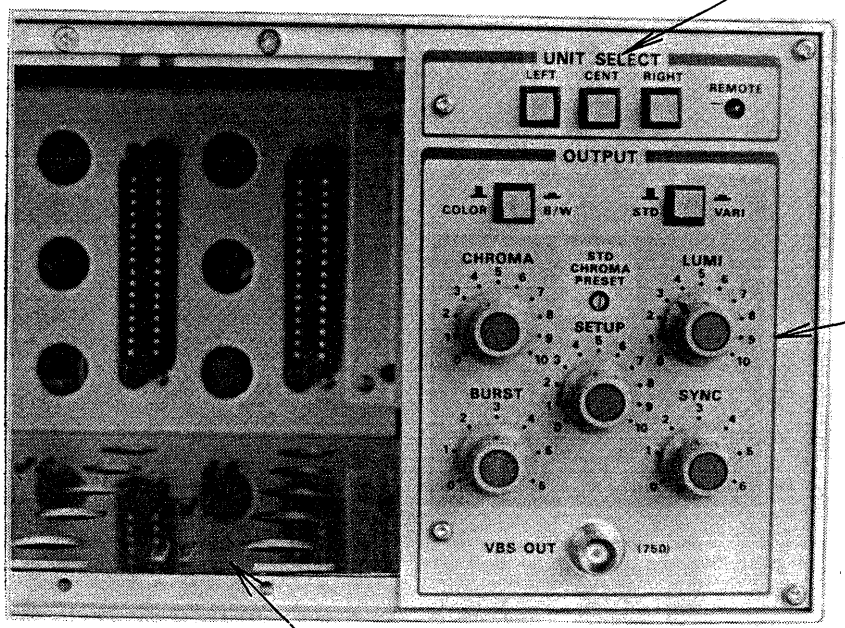
Trigger output control section

Chroma phase control section

Module inserted here

Front panel (right side)

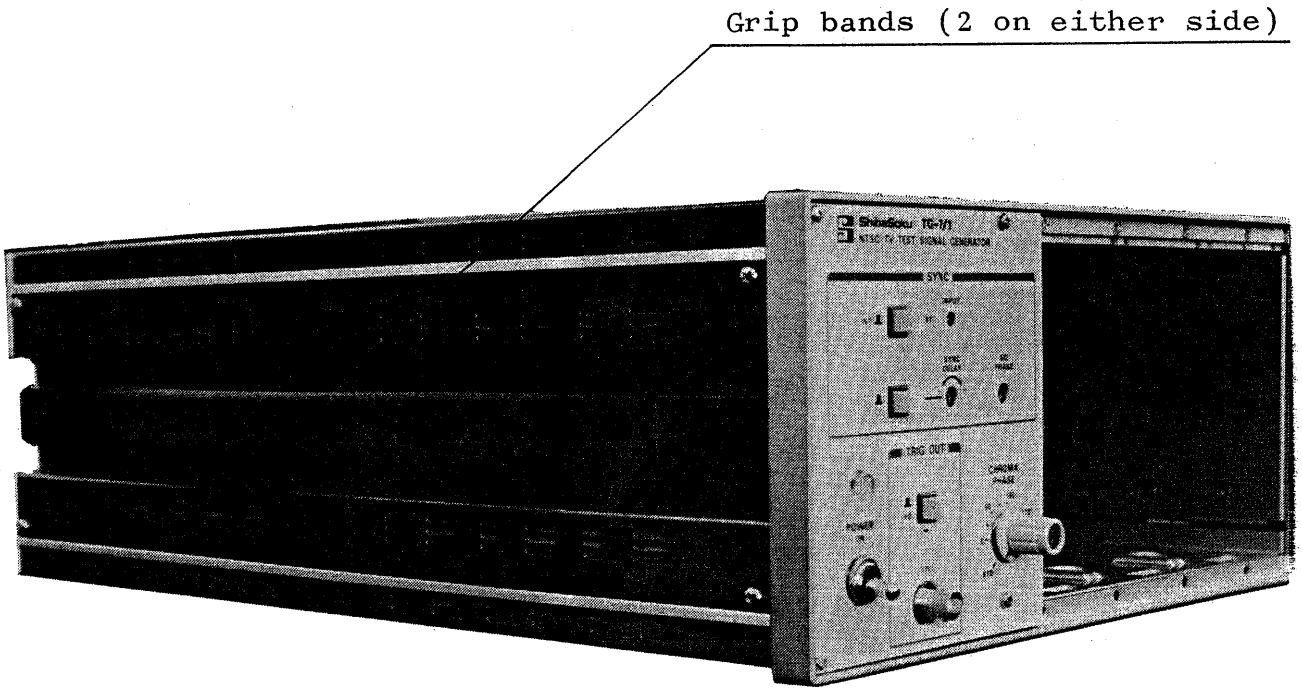
Module (unit) selection section



Output signal level control section

Unit inserted here

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com



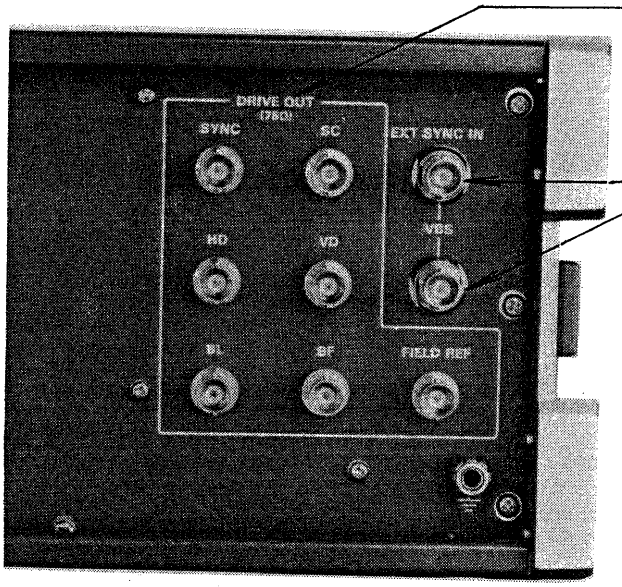
View from front side

Accessories

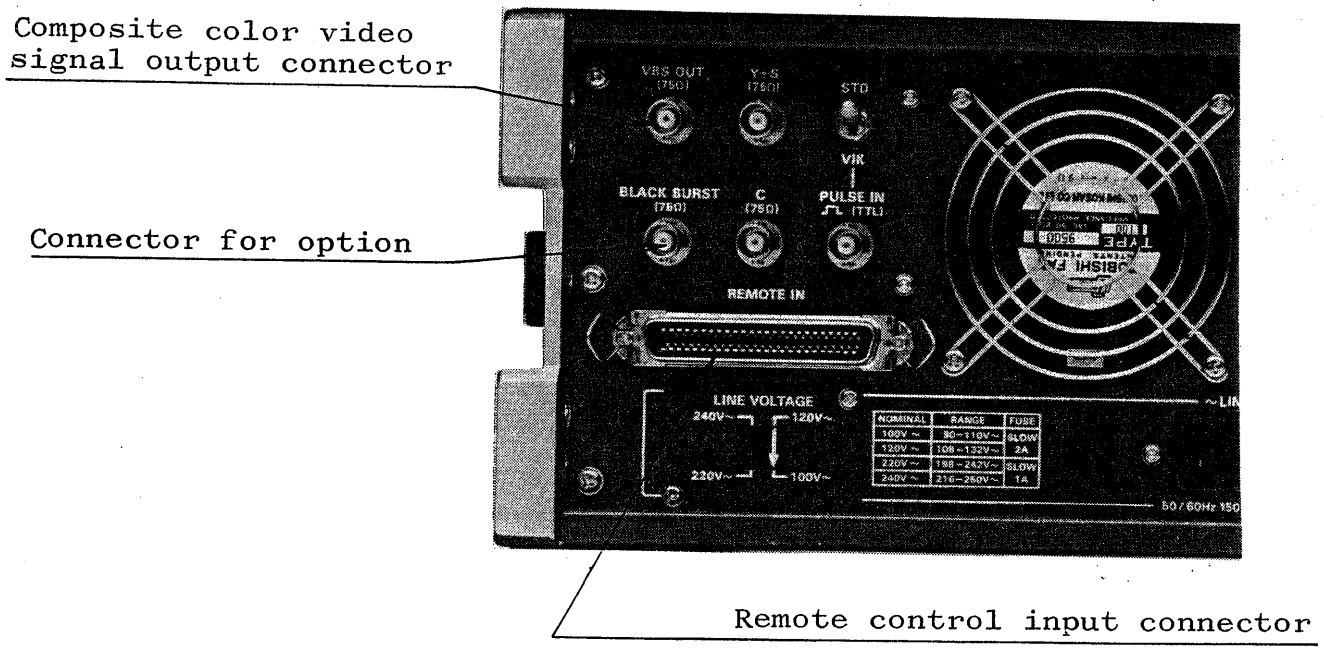
(1)	Remote connector jack	X1
(2)	Extension printed circuit board (44-pin)	X2
	When U704 unit (sine wave signal) is included:	X3
(3)	Power cord	X1

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Rear panel (right side)



Rear panel (left side)



Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

3. FEATURES

① A wide variety of different test signals can be generated by a small number of unit.

② The sync signal generator conforms to the EIA (Electronics Industries Association) RS-170A.

③ Complete color and line interlaced scanning system.

④ Luminance, chrominance, color burst and sync signals can be continuously varied.

⑤ Internal sync signal and subcarrier oscillator features a quartz crystal with a constant-temperature bath for a high level of stability.

⑥ Built-in sync signal generator enabling color lock and gen-lock to VBS or black burst signal.

⑦ The main frame has a 2-axis quadrature modulator for variation of the chroma phase from 0 to 360 degrees with external signal (option) or at panel.

⑧ The main frame and waveform generating unit are DC coupled and so there is no bouncing caused by signal selection.

⑨ Trigger output connector allowing selection between HD and VD with panel switch.

⑩ Generation of test signals in necessary line using vertical interval keyer pulse.

⑪ Possible remote control of signal selection in each unit.

⑫ Separate output connector enabling level of video component, sync component and color burst to be connected by means of an option to external programmable attenuator.

⑬ Since the automatic measuring system can be made up for by using a GP-IB interface, adjustment and inspection procedures will be greatly facilitate.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

4. ELECTRICAL PERFORMANCE

4-1 Drive signals

(1) Subcarrier signal

a.	Frequency:	3.579545MHz ±5Hz
	(At least 10 min. after power supplied at normal temperature)	
b.	Output level:	2Vp-p ±10% (75-ohm termination)
c.	Output impedance:	75 ohms ±5%

(2) HD, VD, sync, BL, BF and FIELD REF signals

a.	Timing:	See separate chart (refer to 4-9)
b.	Output level:	4 Vp-p -10%, +20% (75-ohm termination)
c.	Output impedance:	75 ohms ±5%

(3) H, V trigger signals

a.	Output level:	2.5Vp-p (negative polarity)
b.	Output impedance:	Approx. 470 ohms

4-2 External sync signals

(1) Subcarrier lock

a.	Color burst input level:	0.14Vp-p to 0.6Vp-p
b.	Phase variation:	$\pm 3^{o}$ max. with above level variation
c.	Lock frequency range:	±50 Hz
d.	Input, output phase:	0 to 360^{o}, continously variable

(2) Gen-lock

a.	Sync input level:	0.14Vp-p to 0.6Vp-p
b.	Sync delay range:	More than ±300nS
c.	Indicator:	Selection to INT with sync input or color burst input of less than 0.14Vp-p

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

4-3 Test signals (using U702 unit)

(1)	Luminance signal	
a.	Standard value:	0.714 Vp-p ± 3%
b.	Continuous variation:	More than 0 ∿ 1 Vp-p
(2)	Sync signal	
a.	Standard value:	0.286 Vp-p ± 3%
b.	Continuous variation:	0 to approx. 0.6 Vp-p
(3)	Chroma signal	
a.	Standard value:	±0.05 Vp-p of U702 unit rating, variable
b.	Continuous variation:	More than 0 ∿ 1 Vp-p
(4)	Color burst signal	
a.	Standard value:	0.286 Vp-p to ± 3%
b.	Continuous variation:	0 to approx. 0.6 Vp-p
(5)	Setup	
a.	Standard value:	0 Vp-p
b.	Continuous variation	More than 0 ∿ 1 Vp-p
(6)	Black burst signal	
a.	Sync signal	0.286 Vp-p ± 3%
(7)	Output impedance	
a.	BNC output (2):	75 ohms ± 3%
(8)	VIK pulse input	
a.	Drive input level	TTL (positive)
b.	Input impedance	150 ohms min.
(9)	Noise (within video signal period)	
a.	Hum	1m Vp-p max. at standard output
b.	Synchronous	10m Vp-p max. at standard output
c.	SC leakage	5m Vp-p max. at standard output
(10)	Frequency response (luminance signal only)	
a.	Frequency band	DC to 10 MHz, within ±0.5 dB
b.	Square wave response	Sag, overshoot: 1% max.
(11)	Sync signal waveforms	
a.	Horizontal sync timing	See chart (refer to 4-10)
b.	Vertical sync timing	See chart (refer to 4-10)

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

(12) Modulator response

a. Color burst phase difference from -(B-Y)	±1° max.
b. R-Y phase difference from B-Y	90° ±1° max.
c. R-Y level deviation from B-Y	Level error ±1% max.

(13) Separated output of luminance signal

a. Output amplitude:	Same as that of VBS output
b. Color leak, VBS output versus luminance signal output:	Less than -50 dB

(14) Separated output of chroma signal

a. Output amplitude:	Same as that of VBS output
b. Luminance leak (against 5 MHz sine wave):	Less than -40 dB
c. Phase difference (against VBS output):	±0.5°

4-4 Temperature test

Ambient temperature	0 to 40°C

4-5 Power requirements

(1) Input voltage	90∿110/108∿132/198∿242/216∿250
(2) Power consumption	Approx. 130VA max.

4-6 Other characteristics

(1) Dimensions	426 (W) x 149 (H) x 450 (D) mm
(2) Weight	Approx. 14 kg (main unit only)

4-7 Remote control

(1) Remote control items

a. Sync signal:	Internal/external selection
b. Subcarrier phase:	Externally variable
c. Color/black-and-white:	Subcarrier ON/OFF selection
d. Unit:	Selection with signal conforming to unit standards
e. VIK pulse input:	Standard/VIK operation selection

(2) Selection

a. Speed:	Horizontal blanking or below
b. Drive level:	TTL, max. 5 fan in

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

4-8 VBS signal separation output (option)

(1) Type and output level (standard output)

a. Video signal: 0.714Vp-p ±3%

b. Sync signal: 0.286Vp-p ±3%

c. Color burst signal: 0.286Vp-p ±3%

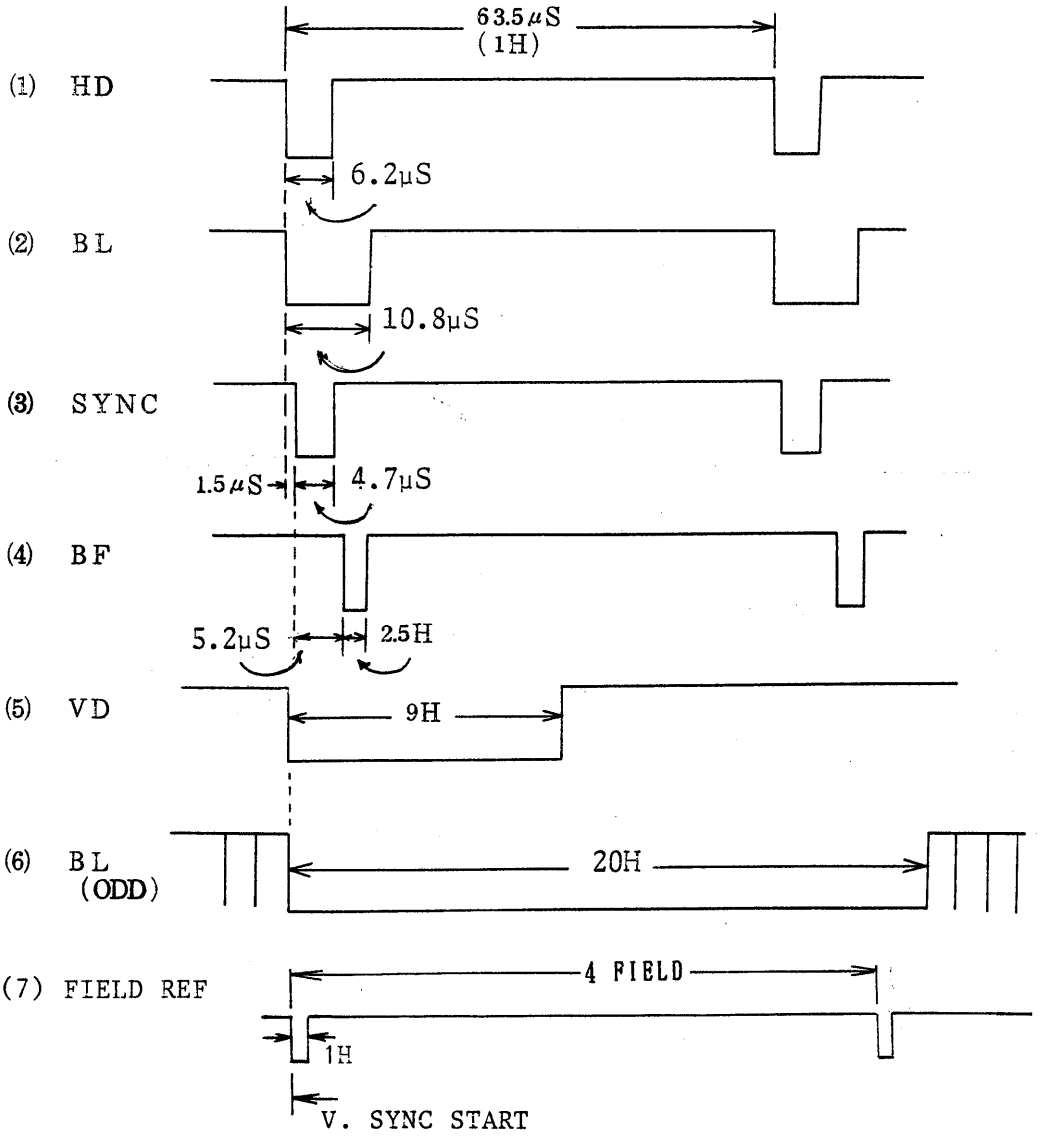
(2) Output impedance

a. Video signal: BNC output, 75 ohms ±3%

b. Sync signal: BNC output, 75 ohms ±3%

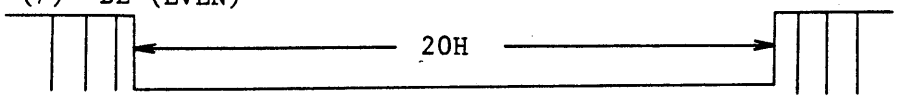
c. Color burst signal: BNC output, 75 ohms ±3%

4-9 Drive signal waveforms

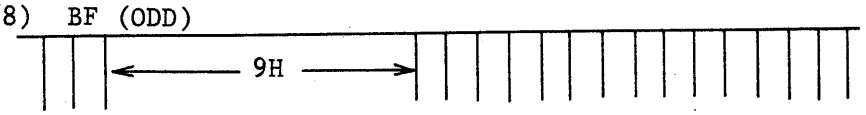


Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

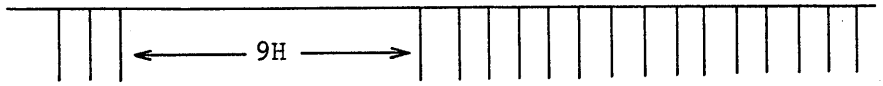
(7) BL (EVEN)



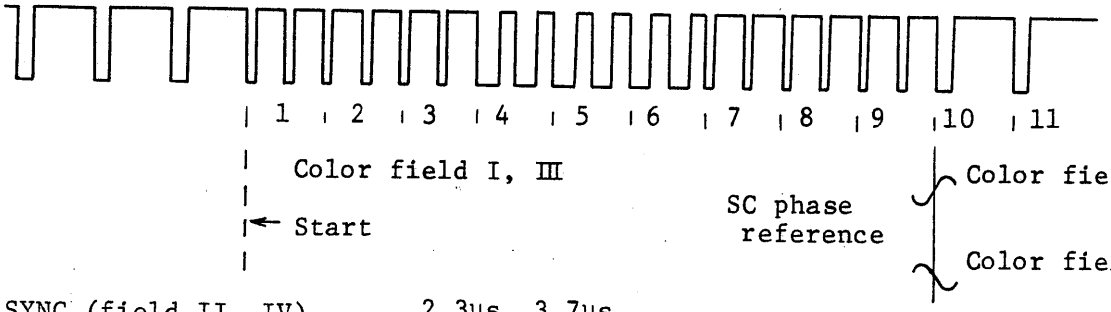
(8) BF (ODD)



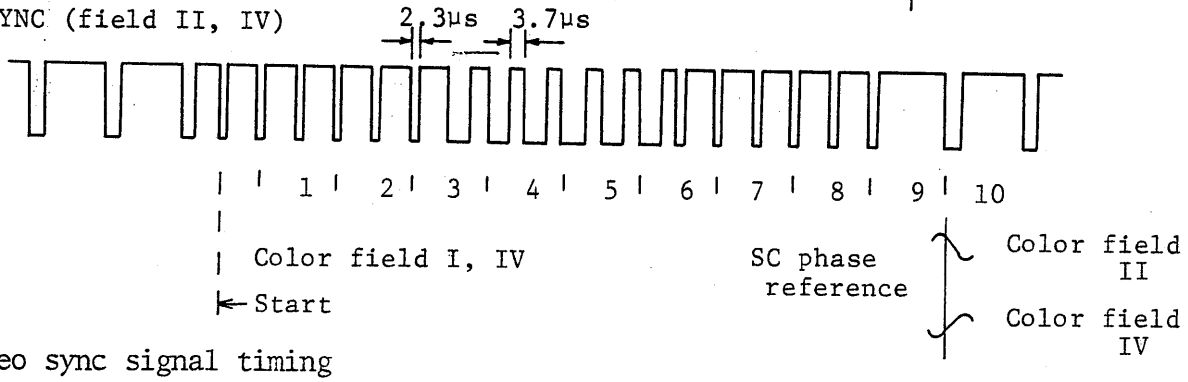
(9) BF (EVEN)



(10) V SYNC (field I, III)

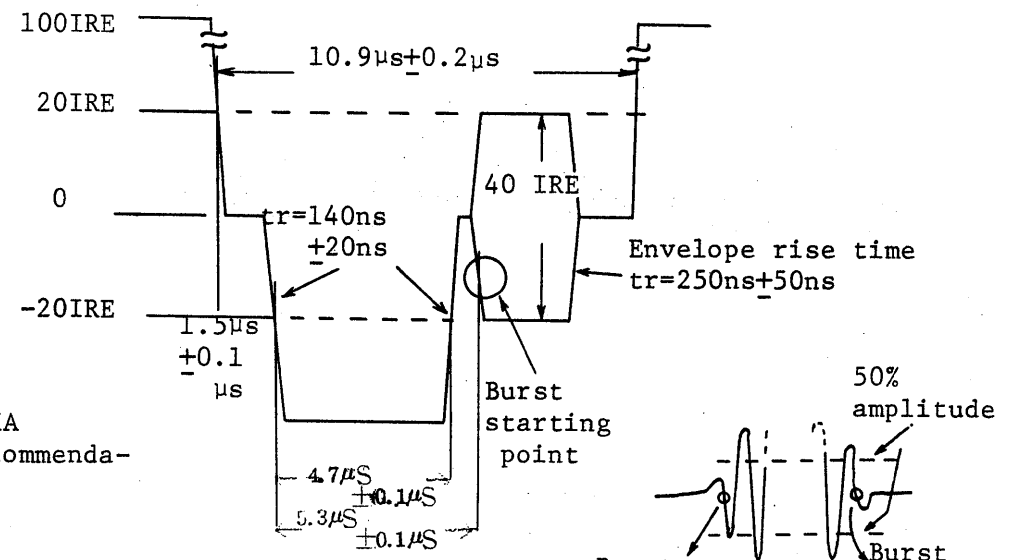


(11) V SYNC (field II, IV)



4-10. Video sync signal timing

(1) Horizontal



(2) Vertical

a. Timing width: Same value as that of (10) or (11) ±0.1μs

Note: IRE: Level scale. The specified video level (=0.714 V) is regarded as 100. With this IRE scale, the sync level (=0.286 V) becomes 40 IRE.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

5. OPERATION (refer to panel layout figure)

5-1 Connections

(1) LINE VOLTAGE

Check that the voltage marking (29) on the rear panel tallies with the power being used. In the event of a different power being used, detach the selector switch and set in accordance with the markings of switch (28).

Note: Always set the POWER switch to OFF when carrying out the above operation.

(2) FUSE

Check that the fuse (26) on the rear panel has the designated amperage.

(3) AC connector

Connect the power connector (27) on the rear panel with the AC power line using the accessory power cord.

(4) VBS OUT

Connect the connectors (20) and (23) on the front and rear panels to the required equipment using BNC cables.
Connect to an oscilloscope for waveform monitoring.
The signal line must be 75-ohm terminated. Since there are two VBS OUT connectors, both (20) and (23) can be used at the same time.

(5) TRIG OUT

When monitoring waveforms on an oscilloscope, connect the connector (8) on the front panel to the external sync input of the oscilloscope. When the output is selected with switch (7), the oscilloscope can easily be triggered.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

(6) UNIT BOX

Mount the required modules into the positions (22) on the front panel. Up to three modules with a standard width may be mounted in any of the positions.

(7) REMOTE

Connect the connector (42) with the remote control unit (option) with the accessory connector.

5-2 Precautions with use

(1) Avoid installing the main frame in any of the following locations. These may downgrade the performance of the generator and may lead to malfunctions.

a. Locations such as in racks which are exposed to high temperatures exceeding 50°C.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

b. Locations which are a constant source of vibration.

c. Locations exposing the electrical parts to noxious gases.

d. Other locations which may not be beneficial for the performance of the generator.

(2) Rack mounting procedure

The main frame can be housed in a 480 mm rack if the rack-mounting adapters are used. Refer to the following page for the actual procedure.

(3) Plug-in unit

A number of different test signals can be provided by selecting the required unit from those indicated below and inserting them into the main frame.

Unit number	Signal waveform
U701/1	Linearity unit
U702/1	SIN^2 unit
U703/1	Color bar unit
U704/1	Sine wave unit
U705/1	Square wave unit
U706/1	Noise test unit
U707/1	VITS unit
U708/1	External signal input unit

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

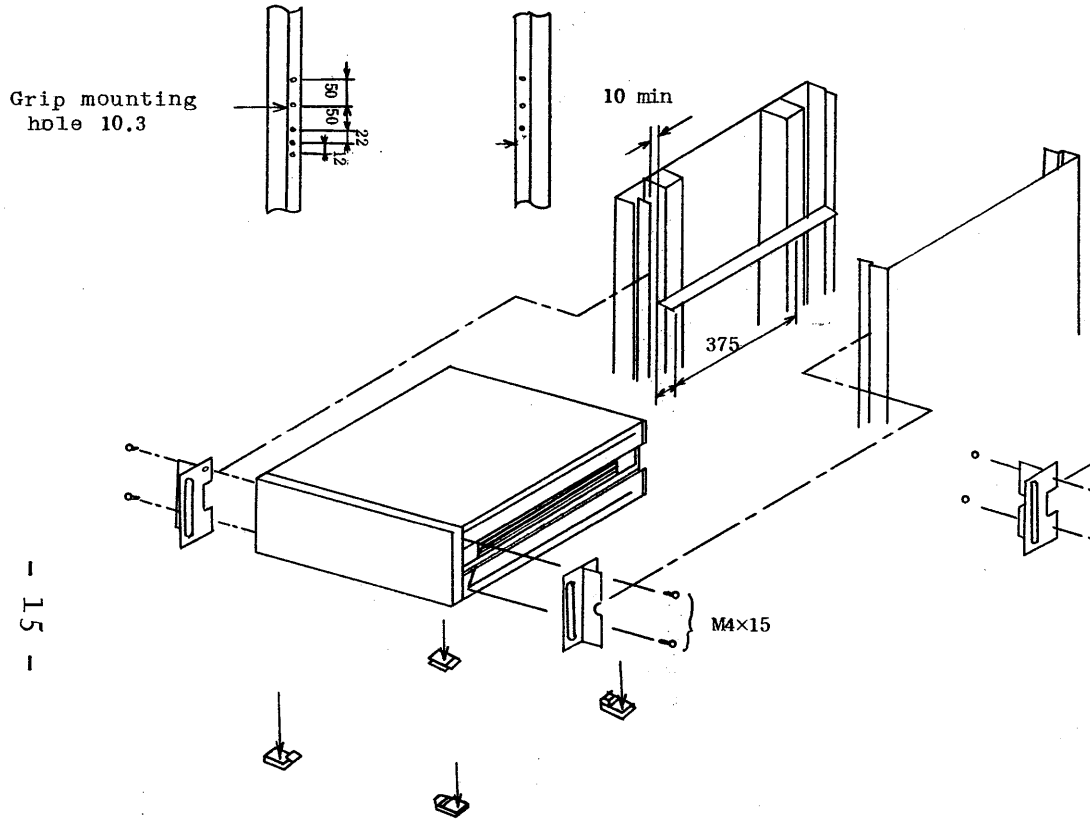
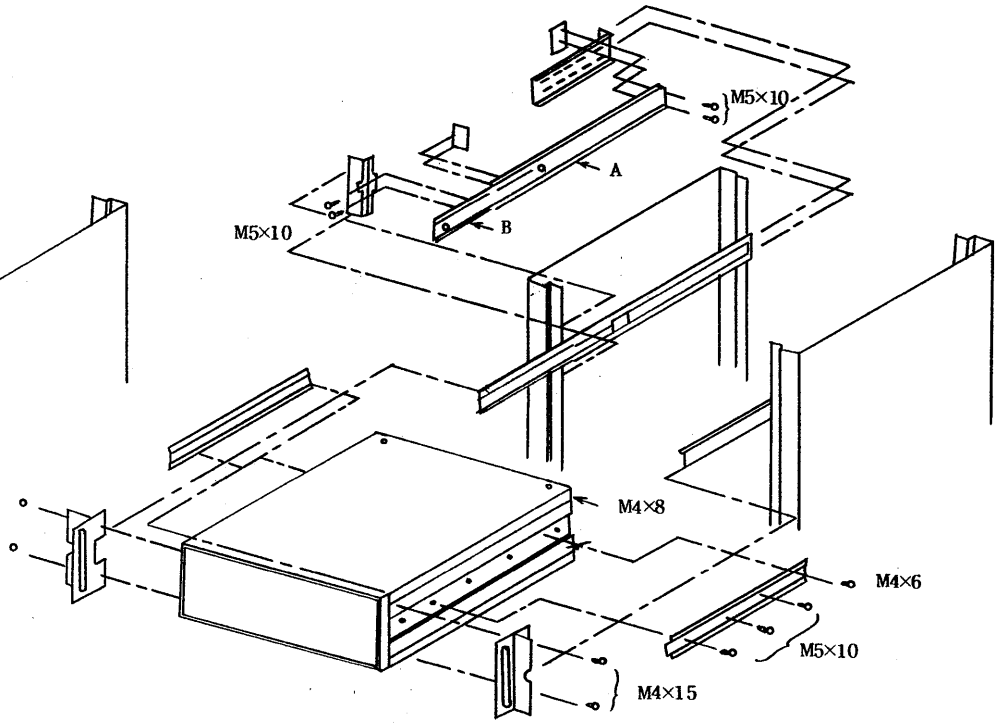


Fig. 1 Rack mounting I (with aluminum L-shaped brackets)

1. Remove the feet (4)
2. Attach the brackets (with grip) (2) to the rack
3. Mount the L-shaped brackets (2) to the rack

Fig. 2 Racking mounting II (with slide bars)

Main frame side



1. Remove the feet (4)
2. Remove the side panel grips (2)
3. Attach the slide bars (2) (made by CHASSIS - TRAK, model C-300-S).
4. Attach the brackets (with grip) (2) to the rack

Rack side

1. Mount the slide bars (fixed side) (2)

A. Atationary section: Cutout section should be placed face-up

B. Intermediate section: Should be mounted so that oval holes are face-down at the front

Rack mounting procedure

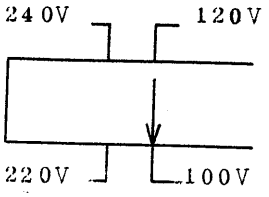
Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

(4) Power supply connections

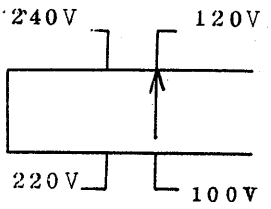
The AC input socket is located on the rear panel of the unit. Connect the accessory power cord and plug it into the power line whose value is designated by the markings on the rear panel.

If the power line voltage is to be changed, plug in the power selector switch in accordance with the instructions below.

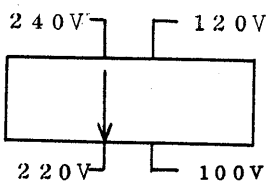
(1) With 100V supply



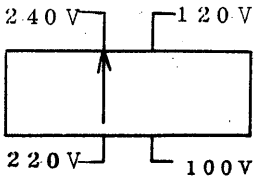
(2) With 120V supply



(3) With 220V supply

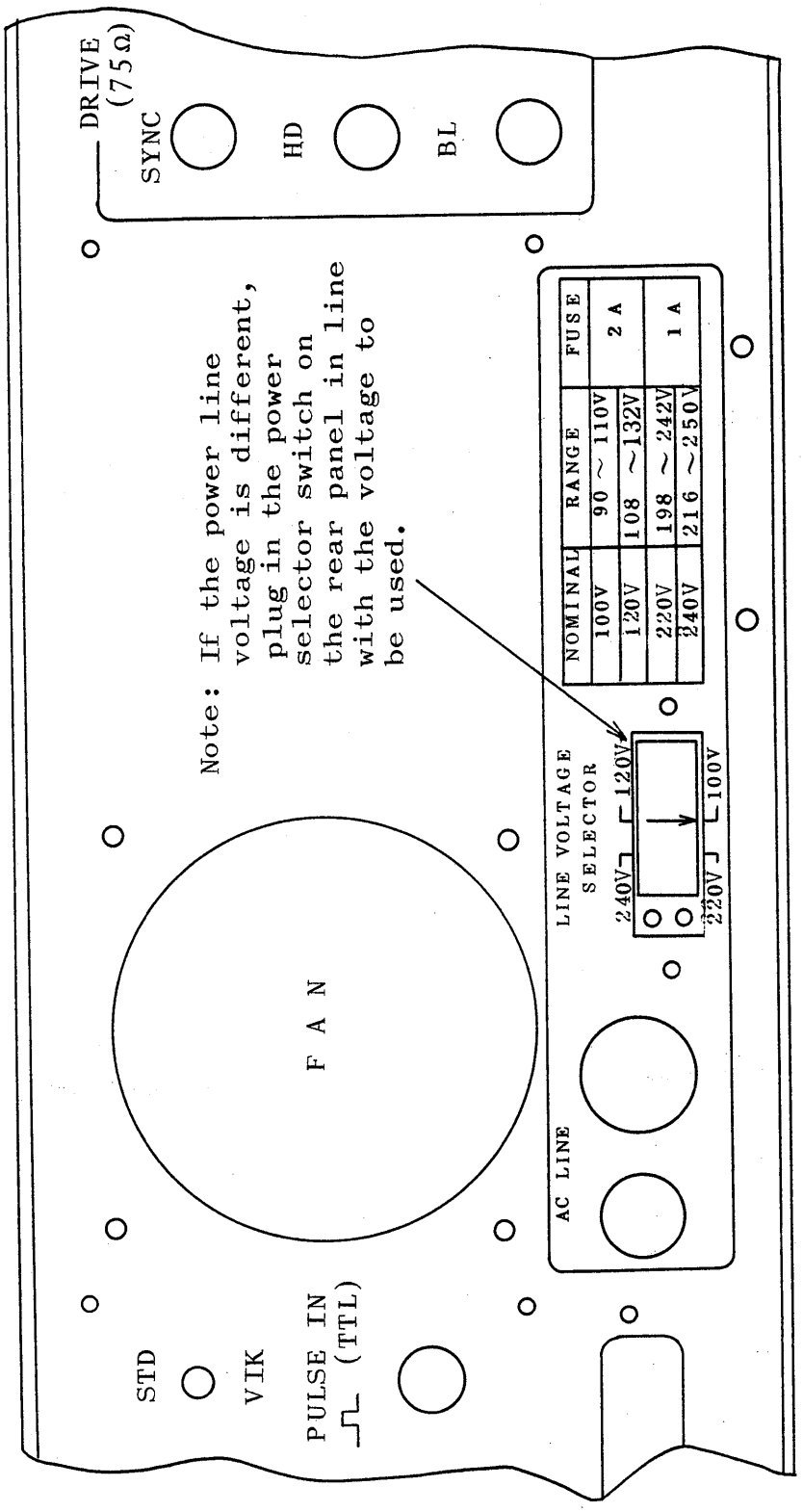


(4) With 240V supply



Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

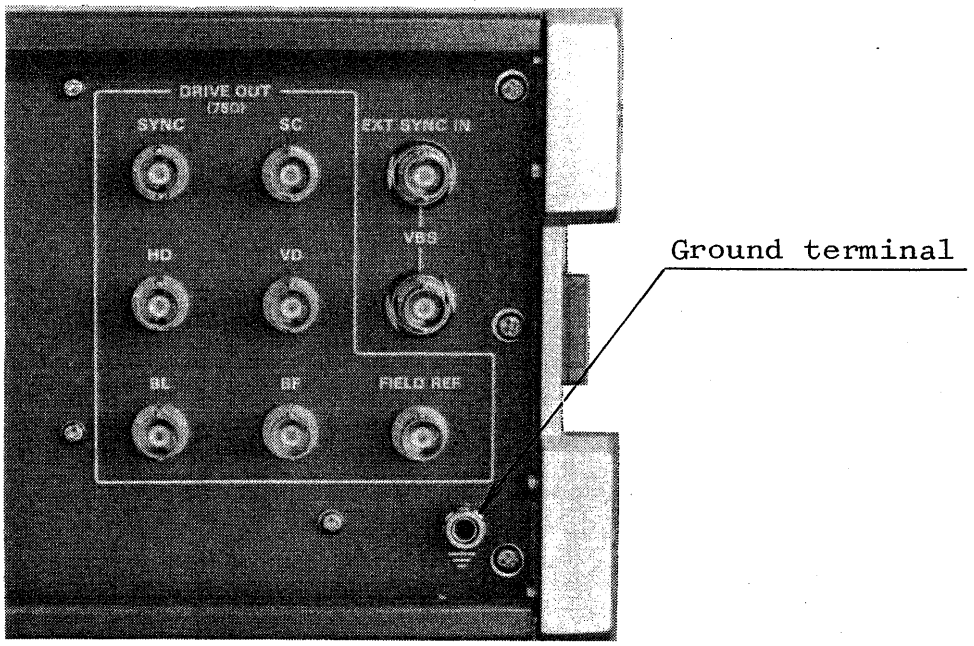
Rear panel side



Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

(5) Ground terminal connection

Although this unit is completely insulated from the AC power supply, it is provided with a ground terminal on the rear panel to safequard against non-insulation accompanying connections operations with other equipment or unforeseen accidents or failures. This terminal should be connected to ground with the lead wire.



Rear panel side

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Artisan Technology Group is an independent supplier of quality pre-owned equipment

Gold-standard solutions

Extend the life of your critical industrial, commercial, and military systems with our superior service and support.

We buy equipment

Planning to upgrade your current equipment? Have surplus equipment taking up shelf space? We'll give it a new home.

Learn more!

Visit us at **artisantg.com** for more info on price quotes, drivers, technical specifications, manuals, and documentation.

Artisan Scientific Corporation dba Artisan Technology Group is not an affiliate, representative, or authorized distributor for any manufacturer listed herein.

We're here to make your life easier. How can we help you today?

(217) 352-9330 | sales@artisantg.com | artisantg.com

ARTISAN® TECHNOLOGY GROUP