

HA11235

Synchronous Signal Processing System

HITACHI

Rev. 1
Sep. 1993

Functions

- Sync separator
- Horizontal automatic frequency control (AFC)
- Horizontal oscillator
- X-ray protector
- Vertical oscillator
- Vertical driver

Features

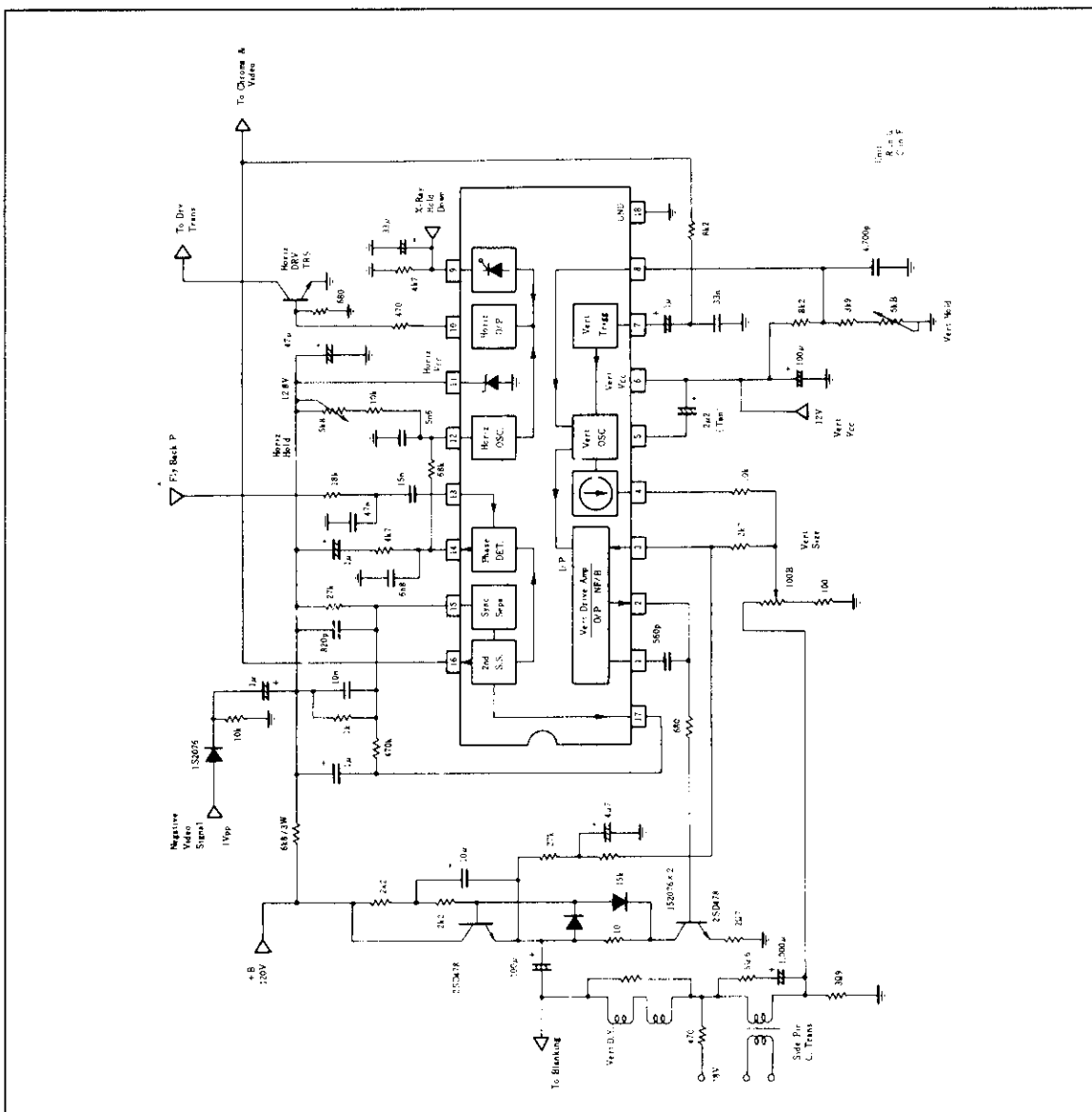
- Fewer external components
- 10 V_{p-p} sync separator output
- Voltage regulator for horizontal supply voltage
- 7.5 Hz/rad horizontal AFC DC loop gain
- Output stage positive feedback eliminated by vertical oscillator's astable multivibrator
- Vertical oscillator waveform used for vertical output drive; only one high-stability (tantalum) capacitor required for vertical stage
- Vertical output stage stabilized by DC feedback to pin 3
- Vertical linearity adjustment can be eliminated

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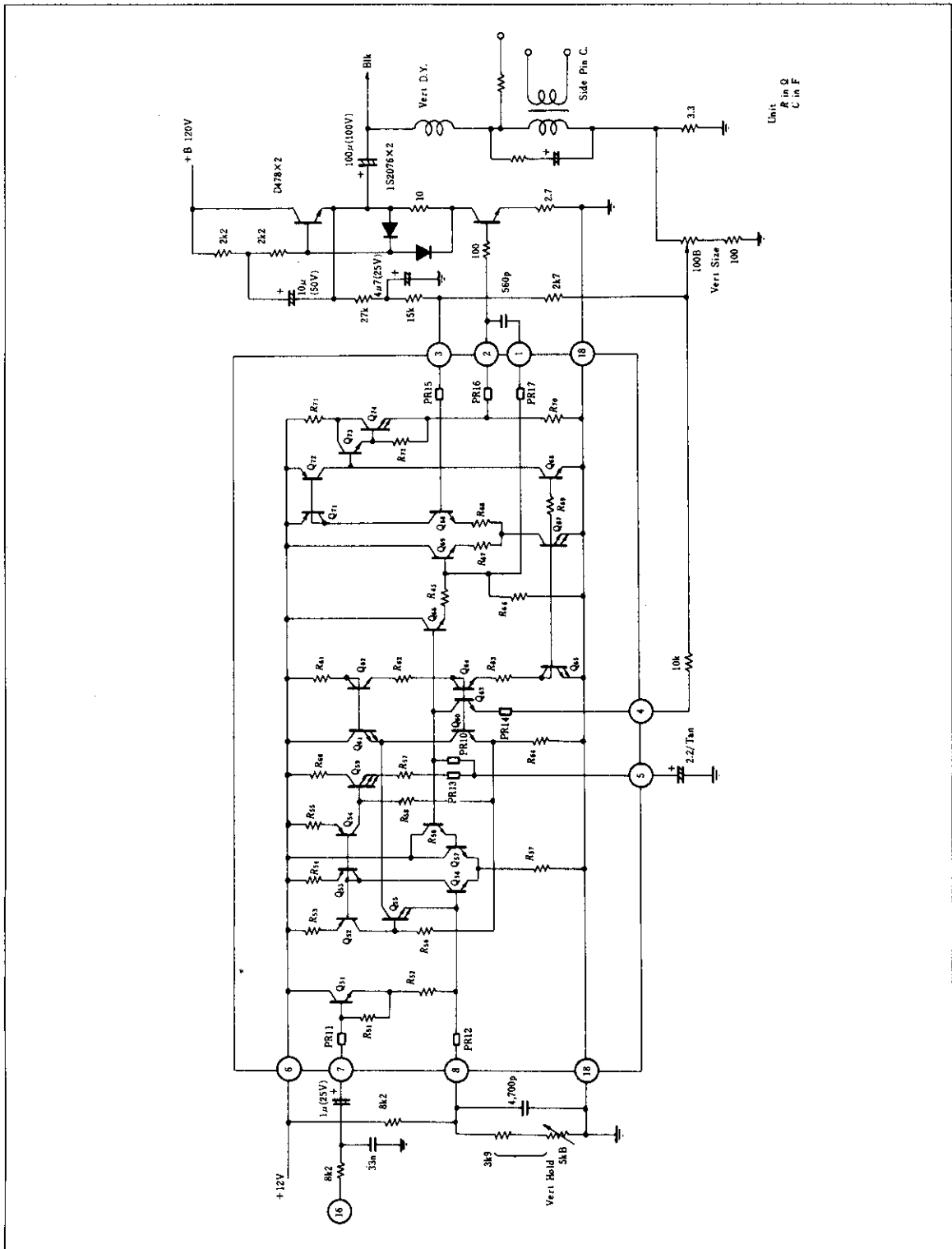
Pin Description

Pin No.	Function	Max. Input/Output Voltage/Current
1	Connected to capacitor to prevent parasitic oscillation	Less than V_{CC}
2	Vertical output pin	15 mA
3	Feedback input pin for vertical DC/AC output voltage	Less than V_{CC}
4	Connected to resistor to determine vertical oscillation discharge time constant	5 mA
5	Connected to capacitor for vertical oscillation frequency	Less than V_{CC}
6	Vertical oscillator power supply pin	16 V
7	Vertical sync input pin	Less than V_{CC}
8	Determines vertical oscillation frequency	5 mA
9	X-ray protector input pin	5 mA
10	Horizontal section output pin	15 mA
11	Horizontal oscillator power supply pin	25 mA
12	Connected to horizontal oscillator CR	12 V
13	Phase detector FBP (flyback pulse) input pin	5 V_{p-p}
14	Phase detector output pin	2 mA
15	Sync separator video signal input pin	3 mA
16	Sync separator output pin	15 mA
17	Sync separator feedback pin	12 V
18	GND pin	—

Block Diagram



Circuit Schematics



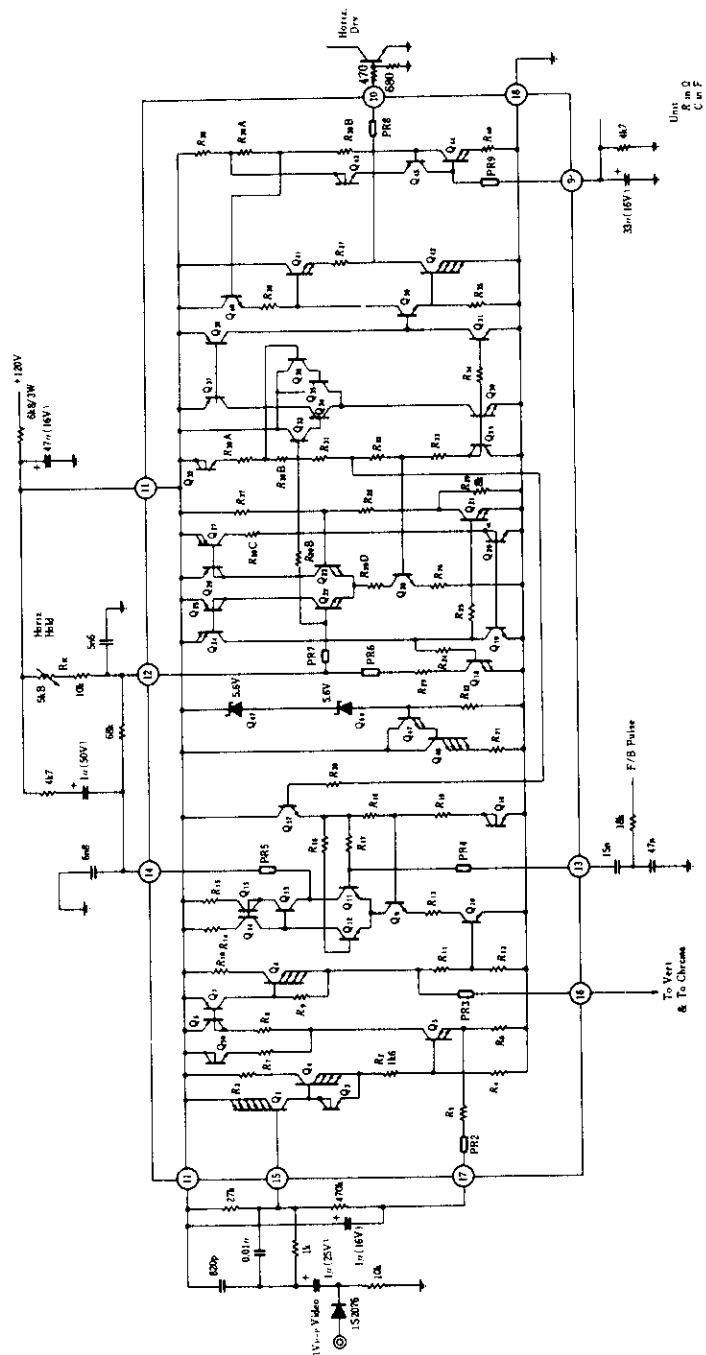


Figure 2 Circuit Schematic (Sync Separator and Horizontal APC)

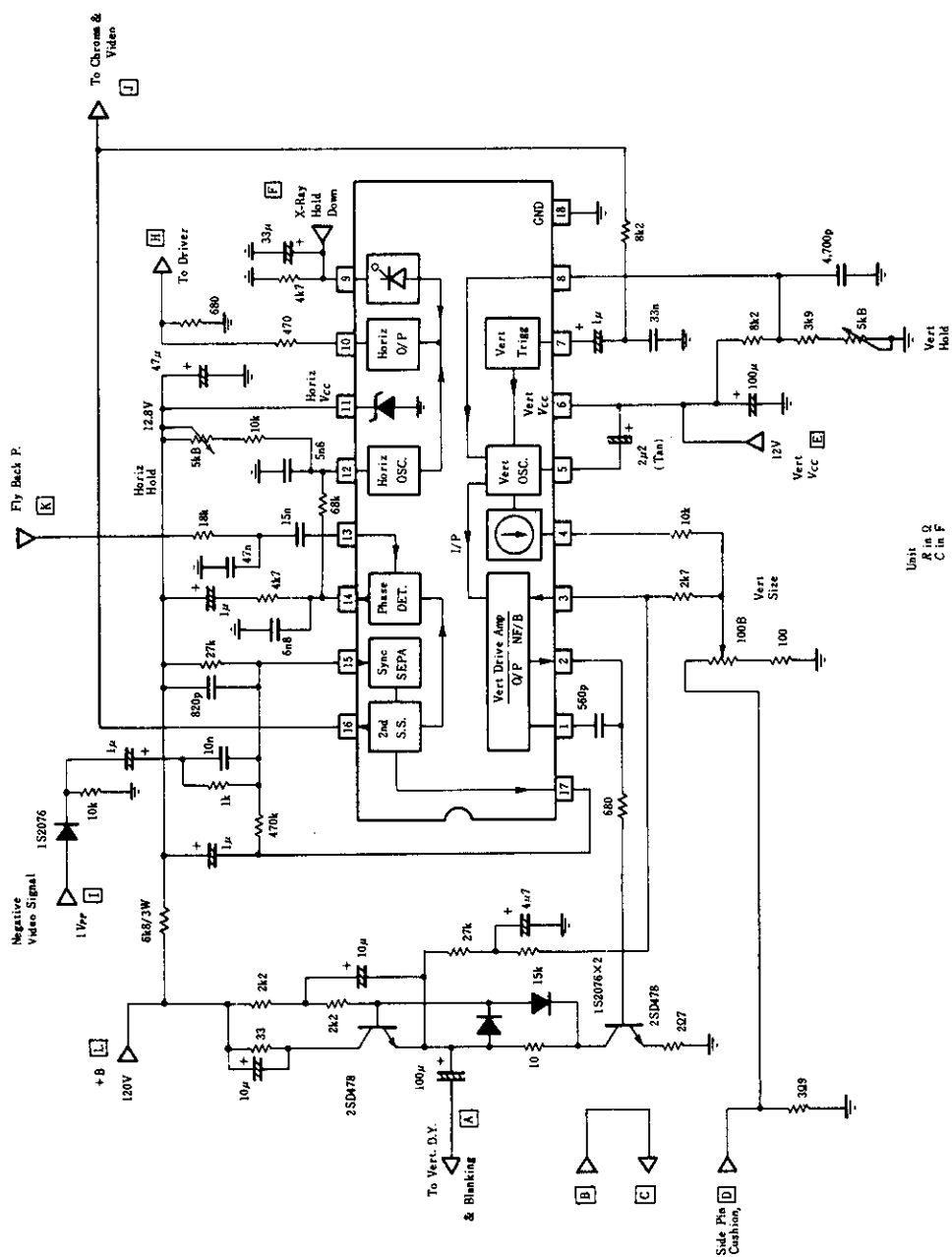


Figure 3 Application Information

Absolute Maximum Ratings (Ta = 25°C unless otherwise specified)

Item	Symbol	Rating	Unit
Supply voltage	V _{CC}	16	V
Operating temperature range	T _{opr}	–20 to +75	°C
Storage temperature range	T _{stg}	–55 to +125	°C
Power dissipation (Ta = 75°C)	P _T	500	mW
Output current (Pin 2, 10, and 16)	I _O	20	mA

Electrical Characteristics**Table 1 Line Circuitry**

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Regulated voltage	V ₁₁	—	12.8	—	V	I _{CC} = 15 mA
Supply current	I _{CC}	—	15	—	mA	
Free-running frequency	f _{oh}	14,734	15,734	16,734	Hz	R _h = 12.6 kΩ, C _h = 5.6 nF
Pull-in range	Δf _{ph}	±450	±650	—	Hz	
APC loop gain	f _c	577.5	750	1070	Hz/μs	
Temperature coefficient	Δf _{oh}	–6.0	–3.0	0	Hz/°C	
Output pulse width	t _{hw}	22.5	25.0	27.5	μs	Pin 10

Table 2 Frame Circuitry

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Free-running frequency	f _{ov}	55	60	65	Hz	R _V = 5.2 kΩ
Pull-in range	Δf _{pv}	—	–10	–7.5	Hz	
Temperature coefficient	Δf _{ov}	–0.03	0	+0.03	Hz/°C	

Table 3 Sync Separator

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Input voltage peak-to-peak value	V ₁₅	0.2	—	—	V	Negative-going sync
Output voltage	V _{sy}	8.0	10.0	—	V	Peak-to-peak value
Output pulse width	t _{sy}	4.5	5.0	5.5	μs	Pin 16

Typical Performance Curves

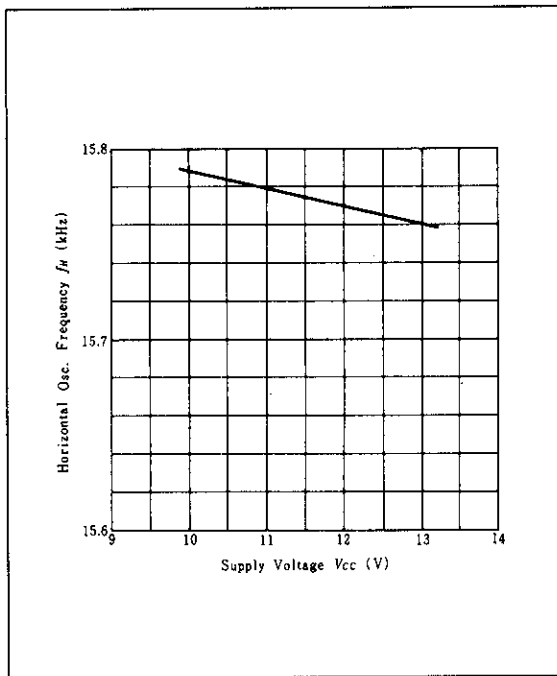


Figure 4 Horizontal Oscillation Frequency vs. Supply Voltage

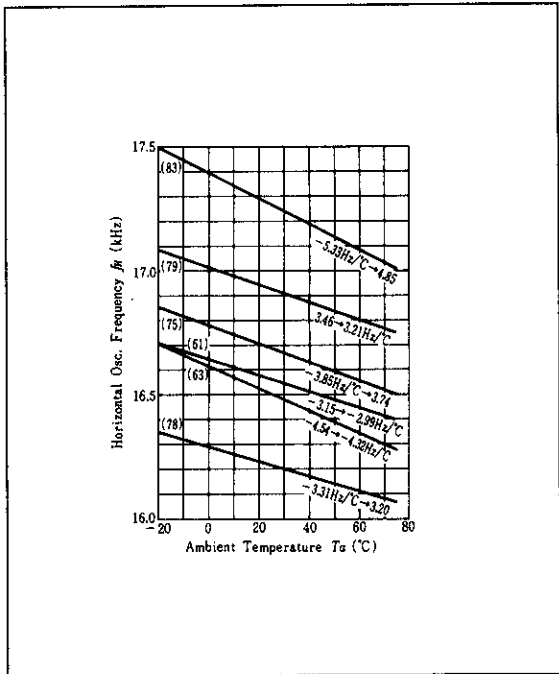


Figure 5 Horizontal Frequency vs. Ambient Temperature

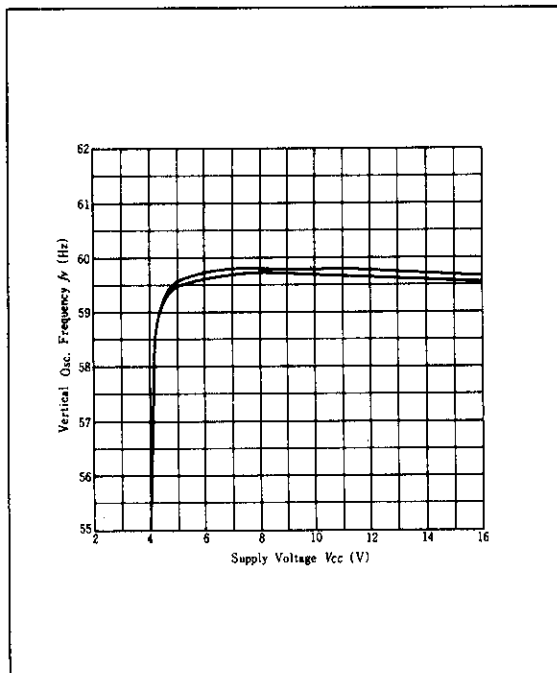


Figure 6 Vertical Oscillation Frequency vs. Supply Voltage

Package Dimensions

Unit : mm

